ANNUAL CCR GROUNDWATER MONITORING & CORRECTIVE ACTION REPORT

Spurlock Landfill

January 31, 2024

Reporting Year – 2023

EAST KENTUCKY POWER COOPERATIVE

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Executive Summary

This annual report documents the status of the groundwater monitoring and corrective action program for Spurlock Station's Coal Combustion Residual (CCR) Landfill (Areas A, B & C) (herein "Spurlock Landfill", "Landfill", or "the Unit") pursuant to 40 Code of Federal Regulations (CFR) §257.90(e). **Table 1-1** provides an overview of the status of the groundwater monitoring and corrective action program for the Unit during the reporting period.

Table 1-1 Overview of the Status of the Groundwater Monitoring & Corrective Action Program for the Unit

Information Required by 40 CFR §257.90(e)(6)	Unit Information
Identify whether the unit was operating at the start of the reporting period under the detection monitoring program or the assessment monitoring program.	Detection monitoring
Identify whether the unit was operating at the end of the reporting period under the detection monitoring program or the assessment monitoring program.	Detection monitoring
If applicable, list all Appendix III (statistically significant increases (SSIs) pursuant to §257.94(e) and the associated monitoring location(s).	MW-5B: Chloride and Sulfate (detected November 2022).
If applicable, provide date when the assessment monitoring program was initiated.	Not Applicable. A successful Alternative Source Demonstration was completed; thus, assessment monitoring was not initiated.
If applicable, list all Appendix IV statistically significant levels (SSLs) pursuant to §257.95(g) and the associated monitoring location(s).	Not Applicable
If applicable, provide the date when the assessment of corrective measures was initiated.	Not Applicable
If applicable, provide the date when the public meeting was held for the assessment of corrective measures.	Not Applicable
If applicable, provide the date when the assessment of corrective measures was completed.	Not Applicable
If applicable, provide the date when a remedy was selected pursuant to §257.97.	Not Applicable
If applicable, provide the date when remedial activities were initiated or identify if they are ongoing.	Not Applicable

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1.0 Introduction

On April 17, 2015, the EPA issued the final version of the federal Coal Combustion Residual (CCR) Rule to regulate the disposal of CCR materials generated at coal-fired units. The CCR Rule is administered as part of the Resource Conservation and Recovery Act (RCRA, 42 United States Code [U.S.C.] §6901 et seq.) using the Subtitle D approach.

East Kentucky Power Cooperative (EKPC) is subject to the CCR Rule and as such must prepare an annual groundwater monitoring and corrective action report for all CCR Units per 40 Code of Federal Regulations (CFR) §257.90(e). The annual report must document the status of the groundwater monitoring and corrective action program for the CCR Unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve problems, and project key activities for the upcoming year.

This document has been prepared to meet those requirements for the Spurlock CCR Landfill at H.L. Spurlock Power Station (Spurlock) located near Maysville, Kentucky. This report covers the 2023 reporting period, from January 1, 2023 through December 31, 2023.

2.0 CCR Rule Compliance

In accordance with 40 CFR §257.90(e), EKPC is required to, at a minimum, provide the following information, to the extent available:

- A map, aerial image, or diagram showing the CCR unit and all background and downgradient monitoring wells/locations that are a part of the groundwater monitoring system, including identification numbers;
- Identify any monitoring wells/locations that were installed and/or decommissioned during the reporting period, along with a narrative description of why those actions were taken;
- Monitoring data obtained under §257.90 through §257.98, including a summary of the number of samples collected, the dates sampling occurred, and which program those samples were required by;
- A narrative description of any transition between monitoring programs (dates, circumstances, and identifying constituents detected at a SSI over background levels); and
- Other information required to be included in the annual report as specified in §257.90 through §257.98, such as:
    - Alternative monitoring frequency;
    - Alternate Source Demonstrations;
    - Assessment monitoring concentrations;
    - Demonstrations of additional time to complete the assessment of corrective measures due to site-specific conditions; and
    - A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the unit that contains all the information specified by §257.90(e)(6).

Other information being provided in this report includes, but is not limited to:

- Groundwater elevation data;
- Laboratory analytical reports and quantification limits; and

- Statistical analysis packages prepared for each compliance monitoring event during the reporting year.

3.0 Facility Information

The Spurlock Landfill is located along South Ripley Road in Mason, County. The site is located approximately five miles northwest of Maysville, Kentucky, and on the United States Geological Survey's Maysville West, Kentucky topographic map. The moderately rolling to hilly topography of the project area is typical for this region unless along a stream where erosion creates steeper slopes. Topographic relief across Spurlock Landfill is approximately 450 ft., with a natural topographic high of nearly 1060 ft. above mean sea level (AMSL) occurring along the western portion of Peg's Hill, and with a topographic low in the valley bottom at approximately 610 ft. AMSL just downgradient of the Landfill footprint. The Landfill is located within a stream valley and is situated in a tributary to Lawrence Creek. **Appendix A**, prepared by Tetra Tech, Inc., shows the Spurlock Landfill property, depicting the groundwater monitoring system present at the Spurlock Landfill. Monitoring wells MW-6 and MW-7 are upgradient monitoring locations, and wells MW-2B, MW-3B, and MW-5B are downgradient monitoring locations.

4.0 Status of Groundwater Monitoring and Corrective Action Program

The CCR Unit did not undergo any program transition in 2023 and EKPC is implementing a detection monitoring program at Spurlock Landfill pursuant to 40 CFR §257.94. In order to comply with the requirements of detection monitoring, EKPC conducts semi-annual groundwater sampling and utilizes an intra-well statistical approach for Appendix III constituents.

EKPC conducts two detection monitoring sampling events per year, one in the first half of the year and another in the second half of the year, as close to six months apart as feasible. Detection monitoring occurred on June 1, 2023 and on November 28, 2023. EKPC will continue to conduct semi-annual monitoring, as needed, approximately every six months for as long as the unit remains in detection monitoring.

5.0 Summary of Key Actions Completed

This Section provides a narrative of the key actions completed at the CCR Unit during the reporting period.

5.1 Groundwater Monitoring Activities

The CCR Rule requires reporting of monitoring data obtained under 40 CFR §257.90 through §257.98 during the reporting year, including a summary of the number of samples collected, the dates sampling occurred, and which program those samples were required by (background, detection, or assessment). **Table 5-1** summarizes those sampling events that occurred during the reporting period. The analytical results received in 2023 are summarized in **Table B-1** in **Appendix B**, while the laboratory analytical reports are included in **Appendix C.**

During the 2023 reporting year at Spurlock Landfill, EKPC collected two semi-annual detection monitoring samples, pursuant to 40 CFR §257.94, from all wells in the Spurlock Landfill monitoring system. The first semi-annual monitoring event occurred on June 1, 2023, and the second semi-

annual monitoring event occurred on November 28-29, 2023. As part of an Alternative Source Demonstration (ASD), additional samples were collected on May 2, 2023 from the Spurlock groundwater monitoring system and from two background wells (PH-MW-01 and PH-MW-02) included in the certified groundwater monitoring system for the immediately adjacent Peg's Hill Landfill. A summary of the analytical results that were received in 2023 is provided in **Appendix B,** with the full laboratory reports located in **Appendix C.** The November 2023 detection monitoring event analytical results were not available on or before December 31, 2023; therefore, the results from the November 2023 sampling event will be included in the 2024 annual report. Included in this report are the results from the November 2022 detection monitoring event, i.e., the second semi-annual 2022 detection monitoring event, which were not received during the 2022 reporting period. Groundwater flow maps and velocity calculations from the included sampling events are in **Appendix D**.

Table 5-1: Annual Sampling & Analysis Summary

Collection Date	Number of Samples Collected	Location of Collected Samples	Monitoring Program
06/01/23	5	MW-6, MW-7, MW-2B, MW-3B & MW-5B	Detection
05/02/23	5	MW-6, MW-7, MW-2B, MW-3B & MW-5B	ASD
11/28-29/23	5	MW-6, MW-7, MW-2B, MW-3B & MW-5B	Detection

5.2 Statistical Analysis and Statistically Significant Increase(s)

Pursuant to 40 CFR §257.93(h)(2), within 90 days after completing sampling and analysis, the owner or operator must determine whether there has been an SSI over background for any Appendix III constituent at each monitoring location. Detection monitoring results, background limits, and SSI(s), if any, are summarized in **Table 1** of the statistical analysis packages in **Appendix E1** and **Appendix E2**.

EKPC did not receive the laboratory analytical results for the second semi-annual 2022 detection monitoring event at Spurlock Landfill (which occurred on November 21, 2022) until January 16, 2023. As a result, those results are included in this report. The statistical analysis of those results was completed on April 6, 2023, within 90 days after receipt of the laboratory analytical results. The statistical analysis conducted for EKPC by Haley & Aldrich identified SSIs over the background values for chloride and sulfate at MW-5B. EKPC pursued an ASD for the identified SSIs, which was successful and is described further in Section 5.3; therefore, the Landfill remained in detection monitoring. The full statistical analysis package for the November 2022 event is provided in **Appendix E1**.

The first semi-annual sampling event of 2023 was conducted on June 1, 2023, the laboratory analysis report was finalized on June16, 2023, and the statistical analysis was completed by Haley & Aldrich on August 16, 2023, within 90 days of receiving the laboratory analysis. The statistical analysis identified no SSIs above background concentrations. The full statistical analysis package for the first semi-annual detection monitoring event of 2023 is provided in **Appendix E2**.

The laboratory analysis of the November 2023 (i.e. the second semi-annual 2023 detection monitoring event) was not completed on or before December 31, 2023, and is not included in this

report. The laboratory results and statistical analysis for the second semi-annual detection monitoring event of 2023 will be included in the 2024 annual report.

5.3 Alternate Source Demonstration(s)

Pursuant to 40 CFR §257.94(e)(2), if an SSI over background for any constituent is identified by the statistical analysis, an operator or owner may demonstrate that a source other than the CCR Unit caused the SSI(s), or the SSI(s) resulted from an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Otherwise, the operator or owner must establish an assessment monitoring program meeting the requirements of 40 CFR §257.95.

Geosyntec, on behalf of EKPC, prepared an ASD for the chloride and sulfate SSIs measured in well MW-5B during the November 2022 detection monitoring event. The ASD successfully demonstrated that both the chloride and sulfate concentrations found above background were not due to a release from the CCR Unit, and therefore, the CCR Unit may continue with the detection monitoring program. The ASD (dated July 2023) is provided in **Appendix F**.

6.0 Problems Encountered and Actions Taken

This section describes any problems encountered with the groundwater monitoring program during the reporting period and the actions taken in response.

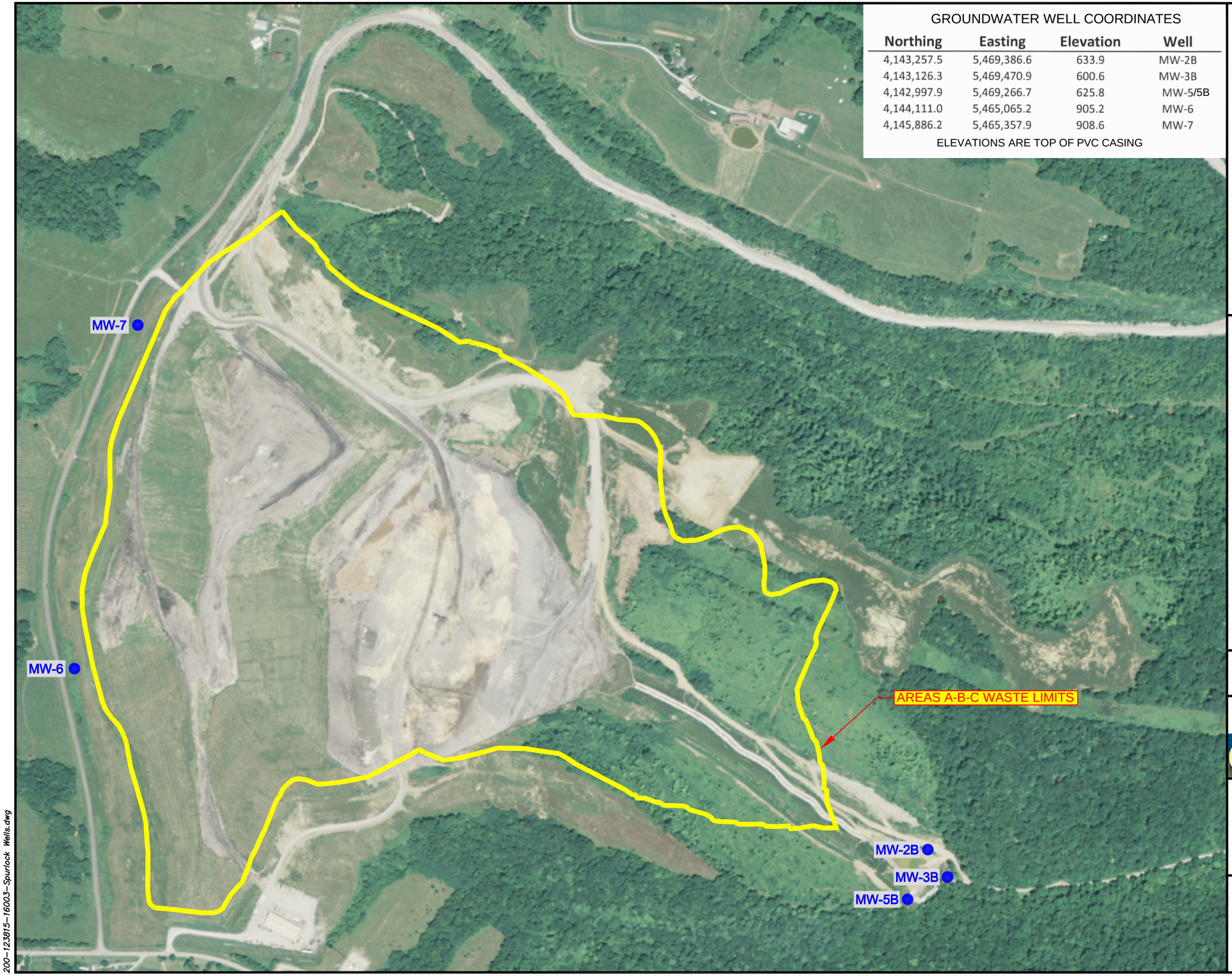
No significant problems were encountered at the Spurlock CCR Landfill in 2023.

7.0 Key Activities Projected for 2024

EKPC will continue semi-annual detection monitoring in 2024.

Additionally, EKPC continues to evaluate the existing groundwater monitoring systems at its CCR units to identify opportunities for continuous improvement. EKPC will provide updates on these efforts in the 2024 Groundwater Monitoring and Corrective Action annual reports for its CCR units.

APPENDIX A – Groundwater Monitoring Locations Map



GROUNDWATER WELL COORDINATES

Northing	Easting	Elevation	Well
4,143,257.5	5,469,386.6	633.9	MW-2B
4,143,126.3	5,469,470.9	600.6	MW-3B
4,142,997.9	5,469,266.7	625.8	MW-5/5B
4,144,111.0	5,465,065.2	905.2	MW-6
4,145,886.2	5,465,357.9	908.6	MW-7

ELEVATIONS ARE TOP OF PVC CASING

N

LEGEND

- GROUNDWATER MONITORING WELL
- SPURLOCK LANDFILL EXISTING A-B-C BOUNDARY

GROUNDWATER MONITORING WELLS INSTALLED AUGUST/SEPTEMBER 2016.

0 250 500

GRAPHIC SCALE, FEET

AERIAL PHOTOGRAPH, CIRCA 2014, OBTAINED FROM:

GIS Kentucky Division of Geographic Information gis.ky.gov "Explore!"

FIGURE 6

Groundwater Monitoring Well Locations
East Kentucky Power Cooperative
Spurlock Landfill
Mason County, Kentucky

TETRA TECH, INC.

424 Lewis Hargett Circle Lexington, Kentucky 40503 (859) 223-8000

200-123815-16003-Spurlock Wells.dwg

APPENDIX B – Summary of Analytical Results

Spurlock Landfill

Annual Reporting Year 2023
Table B-1: Summary of Analytical Results

				Appendix 3 Constituents															
Well ID	**Sample Date**	**Event Type**	**GW Elevation (ft. MSL)**	**Boron** (µg/L)		**Calcium** (µg/L)		**Chloride** (mg/L)		**Fluoride** (mg/L)		**pH** (S.U.)	**Sulfate** (mg/L)		**TDS** (mg/L)
SLF-MW-2B	**11/21/2022**	**Detection**	**579.40**	**3410**	**D**	**86500**	**D**	**1830**	**D**	**0.83**		**7.68**	**490**	**D**	**4020**
SLF-MW-2B	**5/2/2023**	**ASD**	**579.84**	**3990**	**D**	**74700**	**D**	**1850**	**D**			**7.63**	**405**	**D**	
SLF-MW-2B	**6/1/2023**	**Detection**	**579.35**	**3460**		**64200**	**D**	**1890**	**D**	**1.2**	**D**	**7.72**	**412**	**D**	**4000**
SLF-MW-3B	**11/21/2022**	**Detection**	**581.81**	**1690**		**170000**	**D**	**188**	**D**	**0.16**		**7.3**	**384**	**D**	**1130**
SLF-MW-3B	**5/2/2023**	**ASD**	**582.41**	**1710**		**159000**	**D**	**211**	**D**			**7.25**	**371**	**D**	
SLF-MW-3B	**6/1/2023**	**Detection**	**581.99**	**1720**		**174000**	**D**	**186**	**D**	**0.19**		**7.29**	**400**	**D**	**992**
SLF-MW-5R	**11/21/2022**	**Detection**	**606.86**	**929**		**152000**	**D**	**52.9**		**0.15**		**7.19**	**259**	**D**	**794**
SLF-MW-5R	**5/2/2023**	**ASD**	**606.87**	**467**		**119000**	**D**	**31.6**				**7.12**	**162**		
SLF-MW-5R	**6/1/2023**	**Detection**	**606.91**	**694**		**137000**	**D**	**41.1**	**D**	**0.16**		**7.23**	**199**	**D**	**598**
SLF-MW-6	**11/21/2022**	**Detection**	**780.44**	**1430**	**D**	**1330000**	**D**	**21600**	**D**	**< 0.75**	**D**	**7.30**	**422**	**D**	**29000**
SLF-MW-6	**5/2/2023**	**ASD**	**787.61**	**1540**	**D**	**1440000**	**D**	**22500**	**D**			**7.20**	**367**	**D**	
SLF-MW-6	**6/1/2023**	**Detection**	**777.85**	**1320**	**D**	**1530000**	**D**	**23700**	**D**	**< 0.50**	**D**	**7.11**	**458**	**D**	**42100**
SLF-MW-7	**11/21/2022**	**Detection**	**756.70**	**4740**	**D**	**512000**	**D**	**14900**	**D**	**0.53**	**D**	**7.12**	**52.4**	**D**	**23300**
SLF-MW-7	**5/2/2023**	**ASD**	**757.47**	**4670**	**D**	**471000**	**D**	**14500**	**D**			**7.05**	**22.6**		
SLF-MW-7	**6/1/2023**	**Detection**	**756.90**	**4500**	**D**	**519000**	**D**	**15100**	**D**	**0.50**	**D**	**7.04**	**81.0**	**D**	**25500**

Result Notes :	J - Estimated Value	R - Unusable (Quality Control Failure)	
	NA - Not available	D - Result reported from dilution	
Result Units :	mg/L - milligram per liter	µg/L - microgram per liter	S.U. - Standard Units
	ft. MSL - feet above mean sea level	pCi/L - picocurie per liter	
Event Type Abbreviations :	A3 - Appendix III Constituents for Detection Monitoring	A4 - Appendix IV Constituents for Assessment Monitoring	
	ASD - Alternative Source Demonstration		
Event Type Constituents :	Background - A3 and A4	Detection - A3	Annual Screen - A4
	Assessment - A3 (All) and A4 (Detected in annual screen).		ASD - Tested A3 and A4 parameters

Spurlock Landfill

Annual Reporting Year 2023
Table B-1: Summary of Analytical Results

			Appendix 4 Constituents	
Well ID	**Sample Date**	**Event Type**	**Lithium** (µg/L)	
SLF-MW-2B	**5/2/2023**	**ASD**	**312**	**D**
SLF-MW-3B	**5/2/2023**	**ASD**	**397**	
SLF-MW-5R	**5/2/2023**	**ASD**	**81.1**	
SLF-MW-6	**5/2/2023**	**ASD**	**1510**	**D**
SLF-MW-7	**5/2/2023**	**ASD**	**1760**	**D**

Result Notes :	J - Estimated Value	R - Unusable (Quality Control Failure)	
	NA - Not available	D - Result reported from dilution	
Result Units :	mg/L - milligram per liter	µg/L - microgram per liter	S.U. - Standard Units
	ft. MSL - feet above mean sea lev	pCi/L - picocurie per liter	
Event Type Abbreviations :	A3 - Appendix III Constituents for Detection Monitoring	A4 - Appendix IV Constituents for Assessment Monitoring	
	ASD - Alternative Source Demonstration		
Event Type Constituents :	Background - A3 and A4	Detection - A3	Annual Screen - A4
	Assessment - A3 (All) and A4 (Detected in annual screen).		ASD - Tested A3 and A4 parameters

APPENDIX C – Laboratory Analytical Reports

EAST KENTUCKY POWER COOPERATIVE

Report Date: 1/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	11/21/2022
Well ID No:	SLF-MW-2B	Sample Collection Time:	4:41 PM
AKGW No.:	8007-0267	Sample Collected By:	BTB
Well Depth (Ft.):	63.55	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	633.9	Laboratory Certification ID:	KY# 08012
Gradient:	Down		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	579.40	MSL		11/21/2022	4:41 PM	BTB
Turbidity	< 1.0	NTU	SM 2130, B-2001	11/21/2022	4:41 PM	BTB
Conductivity	6783	µS/cm	SM 2510, B-2011	11/21/2022	4:41 PM	BTB
Temperature	56.12	°F	SM 2550, B-2010	11/21/2022	4:41 PM	BTB
Oxidation Reduction Potential	-89.7	mV	SM 2580, B-2011	11/21/2022	4:41 PM	BTB
pH	7.68	S.U.	SM 4500-H+, B-2011	11/21/2022	4:41 PM	BTB
Dissolved Oxygen	1.1	mg/L	SM 4500-O	11/21/2022	4:41 PM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2201090

Sample Received Date:	11/28/2022	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	1:24 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	3410	D	µg/L	36.1	500	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	6:19 PM	JD
Calcium	86500	D	µg/L	5600	10000	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	6:19 PM	JD
Chloride	1830	D	mg/L	5.9	12.5	EPA 300.0 Rev 2.1 (1993)	12/10/2022	1:53 AM	JD
Fluoride	0.83		mg/L	0.05	0.05	EPA 300.0 Rev 2.1 (1993)	12/12/2022	5:22 PM	JD
Sulfate	490	D	mg/L	6.0	25.0	EPA 300.0 Rev 2.1 (1993)	12/10/2022	1:53 AM	JD
Solids, Total Dissolved	4020		mg/L		100	SM 2540, C-2011	11/28/2022	2:11 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

01:25 PM 01/13/2023

Eric Hamilton - QA/QC Chemist

02:09 PM 01/13/2023

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http://www.ekpc.coop

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Report Date: 1/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	11/21/2022
Well ID No:	SLF-MW-3B	Sample Collection Time:	2:56 PM
AKGW No.:	8007-0268	Sample Collected By:	BTB
Well Depth (Ft.):	33.32	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	600.64	Laboratory Certification ID:	KY# 08012
Gradient:	Down		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	581.81	MSL		11/21/2022	2:56 PM	BTB
Turbidity	< 1.0	NTU	SM 2130, B-2001	11/21/2022	2:56 PM	BTB
Conductivity	1669	µS/cm	SM 2510, B-2011	11/21/2022	2:56 PM	BTB
Temperature	57.20	°F	SM 2550, B-2010	11/21/2022	2:56 PM	BTB
Oxidation Reduction Potential	-54.1	mV	SM 2580, B-2011	11/21/2022	2:56 PM	BTB
pH	7.3	S.U.	SM 4500-H+, B-2011	11/21/2022	2:56 PM	BTB
Dissolved Oxygen	< 1.0	mg/L	SM 4500-O	11/21/2022	2:56 PM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2201091

Sample Received Date:	11/28/2022	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	1:24 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	1690		µg/L	3.6	50.0	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	7:08 PM	JD
Calcium	170000	D	µg/L	14000	25000	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	6:23 PM	JD
Chloride	188	D	mg/L	1.2	2.5	EPA 300.0 Rev 2.1 (1993)	12/10/2022	2:12 AM	JD
Fluoride	0.16		mg/L	0.05	0.10	EPA 300.0 Rev 2.1 (1993)	12/14/2022	5:16 PM	JD
Sulfate	384	D	mg/L	1.2	5.0	EPA 300.0 Rev 2.1 (1993)	12/10/2022	2:12 AM	JD
Solids, Total Dissolved	1130		mg/L		50.0	SM 2540, C-2011	11/28/2022	2:11 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

01:25 PM 01/13/2023

Eric Hamilton - QA/QC Chemist

02:09 PM 01/13/2023

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Report Date: 1/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	11/21/2022
Well ID No:	SLF-MW-5R/5B	Sample Collection Time:	3:50 PM
AKGW No.:	8007-0266	Sample Collected By:	BTB
Well Depth (Ft.):	27.05	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	625.71	Laboratory Certification ID:	KY# 08012
Gradient:	Down		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	606.86	MSL		11/21/2022	3:50 PM	BTB
Turbidity	3.92	NTU	SM 2130, B-2001	11/21/2022	3:50 PM	BTB
Conductivity	1078	µS/cm	SM 2510, B-2011	11/21/2022	3:50 PM	BTB
Temperature	55.22	°F	SM 2550, B-2010	11/21/2022	3:50 PM	BTB
Oxidation Reduction Potential	187.5	mV	SM 2580, B-2011	11/21/2022	3:50 PM	BTB
pH	7.19	S.U.	SM 4500-H+, B-2011	11/21/2022	3:50 PM	BTB
Dissolved Oxygen	3.42	mg/L	SM 4500-O	11/21/2022	3:50 PM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2201092

Sample Received Date:	11/28/2022	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	1:24 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	929		µg/L	3.6	50.0	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	8:12 PM	JD
Calcium	152000	D	µg/L	14000	25000	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	6:31 PM	JD
Chloride	52.9		mg/L	0.2	0.5	EPA 300.0 Rev 2.1 (1993)	12/13/2022	7:54 PM	JD
Fluoride	0.15		mg/L	0.05	0.10	EPA 300.0 Rev 2.1 (1993)	12/14/2022	5:35 PM	JD
Sulfate	259	D	mg/L	1.2	5.0	EPA 300.0 Rev 2.1 (1993)	12/10/2022	2:31 AM	JD
Solids, Total Dissolved	794		mg/L		50.0	SM 2540, C-2011	11/28/2022	2:11 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

01:25 PM 01/13/2023

Eric Hamilton - QA/QC Chemist

02:09 PM 01/13/2023

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EAST KENTUCKY POWER COOPERATIVE

Report Date: 1/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	11/21/2022
Well ID No:	SLF-MW-6	Sample Collection Time:	11:54 AM
AKGW No.:	8003-8410	Sample Collected By:	BTB
Well Depth (Ft.):	163.15	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	905.18	Laboratory Certification ID:	KY# 08012
Gradient:	Up		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	780.44	MSL		11/21/2022	11:54 AM	BTB
Turbidity	< 1.0	NTU	SM 2130, B-2001	11/21/2022	11:54 AM	BTB
Conductivity	54620	µS/cm	SM 2510, B-2011	11/21/2022	11:54 AM	BTB
Temperature	54.86	°F	SM 2550, B-2010	11/21/2022	11:54 AM	BTB
Oxidation Reduction Potential	-106.6	mV	SM 2580, B-2011	11/21/2022	11:54 AM	BTB
pH	7.30	S.U.	SM 4500-H+, B-2011	11/21/2022	11:54 AM	BTB
Dissolved Oxygen	< 1.0	mg/L	SM 4500-O	11/21/2022	11:54 AM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2201093

Sample Received Date:	11/28/2022	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	1:24 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	1430	D	µg/L	36.1	500	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	7:17 PM	JD
Calcium	1330000	D	µg/L	112000	200000	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	6:35 PM	JD
Chloride	21600	D	mg/L	118	250	EPA 300.0 Rev 2.1 (1993)	12/10/2022	4:24 AM	JD
Fluoride	< 0.75	D	mg/L	0.72	0.75	EPA 300.0 Rev 2.1 (1993)	12/14/2022	6:50 PM	JD
Sulfate	422	D	mg/L	1.2	5.0	EPA 300.0 Rev 2.1 (1993)	12/10/2022	2:50 AM	JD
Solids, Total Dissolved	29000		mg/L		2500	SM 2540, C-2011	11/28/2022	2:11 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

01:25 PM 01/13/2023

Eric Hamilton - QA/QC Chemist

02:09 PM 01/13/2023

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Report Date: 1/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	11/21/2022
Well ID No:	SLF-MW-7	Sample Collection Time:	1:17 PM
AKGW No.:	8003-8409	Sample Collected By:	BTB
Well Depth (Ft.):	163.51	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	908.58	Laboratory Certification ID:	KY# 08012
Gradient:	Up		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	756.70	MSL		11/21/2022	1:17 PM	BTB
Turbidity	< 1.0	NTU	SM 2130, B-2001	11/21/2022	1:17 PM	BTB
Conductivity	37510	µS/cm	SM 2510, B-2011	11/21/2022	1:17 PM	BTB
Temperature	52.52	°F	SM 2550, B-2010	11/21/2022	1:17 PM	BTB
Oxidation Reduction Potential	-50.3	mV	SM 2580, B-2011	11/21/2022	1:17 PM	BTB
pH	7.12	S.U.	SM 4500-H+, B-2011	11/21/2022	1:17 PM	BTB
Dissolved Oxygen	< 1.0	mg/L	SM 4500-O	11/21/2022	1:17 PM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2201094

Sample Received Date:	11/28/2022	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	1:24 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	4740	D	µg/L	36.1	500	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	7:21 PM	JD
Calcium	512000	D	µg/L	56000	100000	EPA 200.8, Rev. 5.4 (1994)	12/7/2022	6:39 PM	JD
Chloride	14900	D	mg/L	118	250	EPA 300.0 Rev 2.1 (1993)	12/10/2022	4:43 AM	JD
Fluoride	0.53	D	mg/L	0.48	0.50	EPA 300.0 Rev 2.1 (1993)	12/12/2022	10:06 PM	JD
Sulfate	52.4	D	mg/L	1.2	5.0	EPA 300.0 Rev 2.1 (1993)	12/12/2022	9:28 PM	JD
Solids, Total Dissolved	23300		mg/L		1250	SM 2540, C-2011	11/28/2022	2:11 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

01:25 PM 01/13/2023

Eric Hamilton - QA/QC Chemist

02:09 PM 01/13/2023

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EAST KENTUCKY POWER COOPERATIVE

Report Date: 5/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	05/02/2023
Well ID No:	SLF-MW-2B	Sample Collection Time:	3:49 PM
AKGW No.:	8007-0267	Sample Collected By:	BTB
Well Depth (Ft.):	63.55	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	633.9	Laboratory Certification ID:	KY# 08012
Gradient:	Down		

EKPC - Central Laboratory Analyses

Lab Identification #: 2300324

Sample Received Date:	05/03/2023	Sample Receipt Temperatures (°C):	0.4
Sample Received Time:	10:30 AM	Sample Received By:	TY

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	3990	D	µg/L	36.1	62.5	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:38 AM	JD
Calcium	74700	D	µg/L	5600	12000	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:38 AM	JD
Lithium	312	D	µg/L	61.7	125	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:38 AM	JD
Magnesium	26400	D	µg/L	683	1250	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:38 AM	JD
Potassium	25800	D	µg/L	225	312	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:38 AM	JD
Sodium	1460000	D	µg/L	7210	12500	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	12:51 PM	JD
Chloride	1850	D	mg/L	5.9	12.5	EPA 300.0 Rev 2.1 (1993)	5/9/2023	8:40 PM	JD
Sulfate	405	D	mg/L	1.2	5.0	EPA 300.0 Rev 2.1 (1993)	5/9/2023	8:21 PM	JD

ALS Environmental

Lab Identification #: 23050502-01

Sample Received Date:	5/4/2023	Sample Receipt Temperatures (°C):	< 6.0
Sample Received Time:	14:05	Sample Received By:	CMK

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Alkalinity, Bicarbonate (as CaCO3)	264		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN
Alkalinity, Total (as CaCO3)	264		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

10:17 AM 05/16/2023

Eric Hamilton - QA/QC Chemist

10:20 AM 05/16/2023

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EAST KENTUCKY POWER COOPERATIVE

Report Date: 5/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	05/02/2023
Well ID No:	SLF-MW-3B	Sample Collection Time:	2:58 PM
AKGW No.:	8007-0268	Sample Collected By:	BTB
Well Depth (Ft.):	33.32	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	600.64	Laboratory Certification ID:	KY# 08012
Gradient:	Down		

EKPC - Central Laboratory Analyses

Lab Identification #: 2300325

Sample Received Date: 05/03/2023 | Sample Receipt Temperatures (°C): 0.4

Sample Received Time: 10:30 AM | Sample Received By: TY

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	1710		µg/L	3.6	6.2	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	1:57 PM	JD
Calcium	159000	D	µg/L	5600	12000	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:42 AM	JD
Lithium	397		µg/L	6.2	12.5	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	1:57 PM	JD
Magnesium	37000	D	µg/L	683	1250	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:42 AM	JD
Potassium	8680		µg/L	22.5	31.2	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	1:57 PM	JD
Sodium	125000	D	µg/L	721	1250	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:42 AM	JD
Chloride	211	D	mg/L	1.2	2.5	EPA 300.0 Rev 2.1 (1993)	5/9/2023	8:58 PM	JD
Sulfate	371	D	mg/L	1.2	5.0	EPA 300.0 Rev 2.1 (1993)	5/9/2023	8:58 PM	JD

ALS Environmental

Lab Identification #: 23050502-02

Sample Received Date: 5/4/2023 | Sample Receipt Temperatures (°C): < 6.0

Sample Received Time: 14:05 | Sample Received By: CMK

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Alkalinity, Bicarbonate (as CaCO3)	206		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN
Alkalinity, Total (as CaCO3)	206		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

10:17 AM 05/16/2023

Eric Hamilton - QA/QC Chemist

10:20 AM 05/16/2023

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EAST KENTUCKY POWER COOPERATIVE

Report Date: 5/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	05/02/2023
Well ID No:	SLF-MW-5R/5B	Sample Collection Time:	4:24 PM
AKGW No.:	8007-0266	Sample Collected By:	BTB
Well Depth (Ft.):	27.05	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	625.71	Laboratory Certification ID:	KY# 08012
Gradient:	Down		

EKPC - Central Laboratory Analyses

Lab Identification #: 2300326

Sample Received Date:	05/03/2023	Sample Receipt Temperatures (°C):	0.4
Sample Received Time:	10:30 AM	Sample Received By:	TY

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	467		µg/L	3.6	6.2	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	2:00 PM	JD
Calcium	119000	D	µg/L	5600	12000	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:46 AM	JD
Lithium	81.1		µg/L	6.2	12.5	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	2:00 PM	JD
Magnesium	24800	D	µg/L	683	1250	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:46 AM	JD
Potassium	2600		µg/L	22.5	31.2	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	2:00 PM	JD
Sodium	17200		µg/L	72.1	125	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	2:00 PM	JD
Chloride	31.6		mg/L	0.2	0.5	EPA 300.0 Rev 2.1 (1993)	5/9/2023	10:52 PM	JD
Sulfate	162		mg/L	0.24	1.0	EPA 300.0 Rev 2.1 (1993)	5/9/2023	10:52 PM	JD

ALS Environmental

Lab Identification #: 23050502-03

Sample Received Date:	5/4/2023	Sample Receipt Temperatures (°C):	< 6.0
Sample Received Time:	14:05	Sample Received By:	CMK

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Alkalinity, Bicarbonate (as CaCO3)	254		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN
Alkalinity, Total (as CaCO3)	254		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

10:17 AM 05/16/2023

Eric Hamilton - QA/QC Chemist

10:20 AM 05/16/2023

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Report Date: 5/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	05/02/2023
Well ID No:	SLF-MW-6	Sample Collection Time:	12:26 PM
AKGW No.:	8003-8410	Sample Collected By:	BTB
Well Depth (Ft.):	163.15	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	905.18	Laboratory Certification ID:	KY# 08012
Gradient:	Up		

EKPC - Central Laboratory Analyses

Lab Identification #: 2300327

Sample Received Date:	05/03/2023	Sample Receipt Temperatures (°C):	0.4
Sample Received Time:	10:30 AM	Sample Received By:	TY

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	1540	D	µg/L	36.1	62.5	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:50 AM	JD
Calcium	1440000	D	µg/L	56000	120000	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	12:55 PM	JD
Lithium	1510	D	µg/L	61.7	125	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:50 AM	JD
Magnesium	308000	D	µg/L	6830	12500	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	12:55 PM	JD
Potassium	122000	D	µg/L	2250	3120	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	12:55 PM	JD
Sodium	12200000	D	µg/L	72100	125000	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	2:54 PM	JD
Chloride	22500	D	mg/L	118	250	EPA 300.0 Rev 2.1 (1993)	5/9/2023	11:48 PM	JD
Sulfate	367	D	mg/L	1.2	5.0	EPA 300.0 Rev 2.1 (1993)	5/10/2023	12:07 AM	JD

ALS Environmental

Lab Identification #: 23050502-04

Sample Received Date:	5/4/2023	Sample Receipt Temperatures (°C):	< 6.0
Sample Received Time:	14:05	Sample Received By:	CMK

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Alkalinity, Bicarbonate (as CaCO3)	90.2		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN
Alkalinity, Total (as CaCO3)	90.2		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

10:17 AM 05/16/2023

Eric Hamilton - QA/QC Chemist

10:20 AM 05/16/2023

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EAST KENTUCKY POWER COOPERATIVE

Report Date: 5/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	05/02/2023
Well ID No:	SLF-MW-7	Sample Collection Time:	1:40 PM
AKGW No.:	8003-8409	Sample Collected By:	BTB
Well Depth (Ft.):	163.51	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	908.58	Laboratory Certification ID:	KY# 08012
Gradient:	Up		

EKPC - Central Laboratory Analyses

Lab Identification #: 2300328

Sample Received Date:	05/03/2023	Sample Receipt Temperatures (°C):	0.4
Sample Received Time:	10:30 AM	Sample Received By:	TY

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	4670	D	µg/L	36.1	62.5	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:53 AM	JD
Calcium	471000	D	µg/L	28000	60000	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	1:45 PM	JD
Lithium	1760	D	µg/L	61.7	125	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:53 AM	JD
Magnesium	194000	D	µg/L	3410	6250	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	12:59 PM	JD
Potassium	93500	D	µg/L	225	312	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	11:53 AM	JD
Sodium	8320000	D	µg/L	72100	125000	EPA 200.8, Rev. 5.4 (1994)	5/8/2023	2:58 PM	JD
Chloride	14500	D	mg/L	118	250	EPA 300.0 Rev 2.1 (1993)	5/10/2023	12:26 AM	JD
Sulfate	22.6		mg/L	0.24	1.0	EPA 300.0 Rev 2.1 (1993)	5/10/2023	12:45 AM	JD

ALS Environmental

Lab Identification #: 23050502-05

Sample Received Date:	5/4/2023	Sample Receipt Temperatures (°C):	< 6.0
Sample Received Time:	14:05	Sample Received By:	CMK

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Alkalinity, Bicarbonate (as CaCO3)	222		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN
Alkalinity, Total (as CaCO3)	222		mg/L	8.4	10	A2320 B-11	5/8/2023	10:31	QTN

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

10:17 AM 05/16/2023

Eric Hamilton - QA/QC Chemist

10:20 AM 05/16/2023

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Report Date: 6/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	06/01/2023
Well ID No:	SLF-MW-2B	Sample Collection Time:	12:14 PM
AKGW No.:	8007-0267	Sample Collected By:	BTB
Well Depth (Ft.):	63.55	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	633.9	Laboratory Certification ID:	KY# 08012
Gradient:	Down		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	579.35	MSL		06/01/2023	12:14 PM	BTB
Turbidity	1.14	NTU	SM 2130, B-2001	06/01/2023	12:14 PM	BTB
Conductivity	6663	µS/cm	SM 2510, B-2011	06/01/2023	12:14 PM	BTB
Temperature, deg. F	63.14	°F	SM 2550, B-2010	06/01/2023	12:14 PM	BTB
Oxidation Reduction Potential	-155.9	mV	SM 2580, B-2011	06/01/2023	12:14 PM	BTB
pH	7.72	S.U.	SM 4500-H+, B-2011	06/01/2023	12:14 PM	BTB
Dissolved Oxygen	< 1.0	mg/L	SM 4500-O	06/01/2023	12:14 PM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2300415

Sample Received Date:	06/02/2023	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	2:41 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	3460		µg/L	3.6	6.2	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	3:07 PM	JD
Calcium	64200	D	µg/L	5600	12000	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	1:27 PM	JD
Chloride	1890	D	mg/L	47.2	100	EPA 300.0 Rev 2.1 (1993)	6/13/2023	4:57 PM	JD
Fluoride	1.2	D	mg/L	0.48	0.50	EPA 300.0 Rev 2.1 (1993)	6/13/2023	8:06 PM	JD
Sulfate	412	D	mg/L	2.4	10.0	EPA 300.0 Rev 2.1 (1993)	6/13/2023	8:06 PM	JD
Solids, Total Dissolved	4000		mg/L		100	SM 2540, C-2011	6/5/2023	12:28 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist
09:15 AM 06/16/2023

Eric Hamilton - QA/QC Chemist
09:33 AM 06/16/2023

4775 Lexington Road 40391
P.O. Box 707, Winchester
Kentucky 40392-0707
Tel. (859) 744-4812
Fax: (859) 744-6008
http://www.ekpc.coop

A Touchstone Energy® Cooperative

EAST KENTUCKY POWER COOPERATIVE

Report Date: 6/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	06/01/2023
Well ID No:	SLF-MW-3B	Sample Collection Time:	1:58 PM
AKGW No.:	8007-0268	Sample Collected By:	BTB
Well Depth (Ft.):	33.32	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	600.64	Laboratory Certification ID:	KY# 08012
Gradient:	Down		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	581.99	MSL		06/01/2023	1:58 PM	BTB
Turbidity	< 1.0	NTU	SM 2130, B-2001	06/01/2023	1:58 PM	BTB
Conductivity	1635	µS/cm	SM 2510, B-2011	06/01/2023	1:58 PM	BTB
Temperature, deg. F	60.26	°F	SM 2550, B-2010	06/01/2023	1:58 PM	BTB
Oxidation Reduction Potential	-58.1	mV	SM 2580, B-2011	06/01/2023	1:58 PM	BTB
pH	7.29	S.U.	SM 4500-H+, B-2011	06/01/2023	1:58 PM	BTB
Dissolved Oxygen	< 1.0	mg/L	SM 4500-O	06/01/2023	1:58 PM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2300416

Sample Received Date:	06/02/2023	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	2:41 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	1720		µg/L	3.6	6.2	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	3:11 PM	JD
Calcium	174000	D	µg/L	11200	24000	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	1:31 PM	JD
Chloride	186	D	mg/L	5.9	12.5	EPA 300.0 Rev 2.1 (1993)	6/13/2023	5:16 PM	JD
Fluoride	0.19		mg/L	0.05	0.05	EPA 300.0 Rev 2.1 (1993)	6/13/2023	10:18 PM	JD
Sulfate	400	D	mg/L	2.4	10.0	EPA 300.0 Rev 2.1 (1993)	6/13/2023	8:25 PM	JD
Solids, Total Dissolved	992		mg/L		100	SM 2540, C-2011	6/5/2023	12:28 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist
09:15 AM 06/16/2023

Eric Hamilton - QA/QC Chemist
09:33 AM 06/16/2023

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Fax: (859) 744-6008
http://www.ekpc.coop

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EAST KENTUCKY POWER COOPERATIVE

Report Date: 6/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	06/01/2023
Well ID No:	SLF-MW-5R/5B	Sample Collection Time:	1:03 PM
AKGW No.:	8007-0266	Sample Collected By:	BTB
Well Depth (Ft.):	27.05	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	625.71	Laboratory Certification ID:	KY# 08012
Gradient:	Down		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	606.91	MSL		06/01/2023	1:03 PM	BTB
Turbidity	2.78	NTU	SM 2130, B-2001	06/01/2023	1:03 PM	BTB
Conductivity	923	µS/cm	SM 2510, B-2011	06/01/2023	1:03 PM	BTB
Temperature, deg. F	59.72	°F	SM 2550, B-2010	06/01/2023	1:03 PM	BTB
Oxidation Reduction Potential	237.1	mV	SM 2580, B-2011	06/01/2023	1:03 PM	BTB
pH	7.23	S.U.	SM 4500-H+, B-2011	06/01/2023	1:03 PM	BTB
Dissolved Oxygen	4.58	mg/L	SM 4500-O	06/01/2023	1:03 PM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2300417

Sample Received Date:	06/02/2023	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	2:41 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	694		µg/L	3.6	6.2	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	3:19 PM	JD
Calcium	137000	D	µg/L	5600	12000	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	1:34 PM	JD
Chloride	41.1	D	mg/L	1.2	2.5	EPA 300.0 Rev 2.1 (1993)	6/13/2023	5:35 PM	JD
Fluoride	0.16		mg/L	0.05	0.05	EPA 300.0 Rev 2.1 (1993)	6/13/2023	10:37 PM	JD
Sulfate	199	D	mg/L	1.2	5.0	EPA 300.0 Rev 2.1 (1993)	6/13/2023	5:35 PM	JD
Solids, Total Dissolved	598		mg/L		50.0	SM 2540, C-2011	6/5/2023	12:28 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist

09:15 AM 06/16/2023

Eric Hamilton - QA/QC Chemist

09:33 AM 06/16/2023

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EAST KENTUCKY POWER COOPERATIVE

Report Date: 6/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	06/01/2023
Well ID No:	SLF-MW-6	Sample Collection Time:	9:47 AM
AKGW No.:	8003-8410	Sample Collected By:	BTB
Well Depth (Ft.):	163.15	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	905.18	Laboratory Certification ID:	KY# 08012
Gradient:	Up		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	777.85	MSL		06/01/2023	9:47 AM	BTB
Turbidity	1.37	NTU	SM 2130, B-2001	06/01/2023	9:47 AM	BTB
Conductivity	56140	µS/cm	SM 2510, B-2011	06/01/2023	9:47 AM	BTB
Temperature, deg. F	61.52	°F	SM 2550, B-2010	06/01/2023	9:47 AM	BTB
Oxidation Reduction Potential	-114.8	mV	SM 2580, B-2011	06/01/2023	9:47 AM	BTB
pH	7.11	S.U.	SM 4500-H+, B-2011	06/01/2023	9:47 AM	BTB
Dissolved Oxygen	< 1.0	mg/L	SM 4500-O	06/01/2023	9:47 AM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2300418

Sample Received Date:	06/02/2023	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	2:41 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	1320	D	µg/L	18.1	31.2	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	2:45 PM	JD
Calcium	1530000	D	µg/L	56000	120000	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	1:38 PM	JD
Chloride	23700	D	mg/L	472	1000	EPA 300.0 Rev 2.1 (1993)	6/13/2023	5:54 PM	JD
Fluoride	< 0.50	D	mg/L	0.48	0.50	EPA 300.0 Rev 2.1 (1993)	6/13/2023	8:44 PM	JD
Sulfate	458	D	mg/L	2.4	10.0	EPA 300.0 Rev 2.1 (1993)	6/13/2023	8:44 PM	JD
Solids, Total Dissolved	42100		mg/L		1250	SM 2540, C-2011	6/5/2023	12:28 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist
09:15 AM 06/16/2023

Eric Hamilton - QA/QC Chemist
09:33 AM 06/16/2023

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Tel. (859) 744-4812
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EAST KENTUCKY POWER COOPERATIVE

Report Date: 6/16/2023

Certificate of Analysis

Station:	H.L. Spurlock Power Station	Sample Collection Date:	06/01/2023
Well ID No:	SLF-MW-7	Sample Collection Time:	11:00 AM
AKGW No.:	8003-8409	Sample Collected By:	BTB
Well Depth (Ft.):	163.51	Sample Matrix:	Ground Water
Well Elevation (Ft. MSL):	908.58	Laboratory Certification ID:	KY# 08012
Gradient:	Up		

Field Analyses

	Result	Units	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Groundwater Elevation	756.90	MSL		06/01/2023	11:00 AM	BTB
Turbidity	< 1.0	NTU	SM 2130, B-2001	06/01/2023	11:00 AM	BTB
Conductivity	37200	µS/cm	SM 2510, B-2011	06/01/2023	11:00 AM	BTB
Temperature, deg. F	64.76	°F	SM 2550, B-2010	06/01/2023	11:00 AM	BTB
Oxidation Reduction Potential	-60.9	mV	SM 2580, B-2011	06/01/2023	11:00 AM	BTB
pH	7.04	S.U.	SM 4500-H+, B-2011	06/01/2023	11:00 AM	BTB
Dissolved Oxygen	1.02	mg/L	SM 4500-O	06/01/2023	11:00 AM	BTB

EKPC - Central Laboratory Analyses

Lab Identification #: 2300419

Sample Received Date:	06/02/2023	Sample Receipt Temperatures (°C):	< 6
Sample Received Time:	2:41 PM	Sample Received By:	JD

Parameter	Result	Note	Units	MDL	Report Limit	Analysis Method	Date Analyzed:	Time Analyzed:	Analyst:
Boron	4500	D	µg/L	18.1	31.2	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	2:34 PM	JD
Calcium	519000	D	µg/L	28000	60000	EPA 200.8, Rev. 5.4 (1994)	6/5/2023	1:42 PM	JD
Chloride	15100	D	mg/L	472	1000	EPA 300.0 Rev 2.1 (1993)	6/13/2023	6:13 PM	JD
Fluoride	0.50	D	mg/L	0.24	0.25	EPA 300.0 Rev 2.1 (1993)	6/13/2023	9:03 PM	JD
Sulfate	81.0	D	mg/L	1.2	5.0	EPA 300.0 Rev 2.1 (1993)	6/13/2023	9:03 PM	JD
Solids, Total Dissolved	25500		mg/L		1250	SM 2540, C-2011	6/5/2023	12:28 PM	JD

Comments / Notes:

Sample Results are compliant with East Kentucky Power Cooperatives Quality Assurance program. Quality Control sample results achieved laboratory specification.

Result notes: D - Result from dilution, J - Estimated Value, R - Unusable Result (Quality Control Failure), NA - Not Available

Electronically Approved By :

Jared Daugherty - Chemist
09:15 AM 06/16/2023

Eric Hamilton - QA/QC Chemist
09:33 AM 06/16/2023

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P.O. Box 707, Winchester
Kentucky 40392-0707
Tel. (859) 744-4812
Fax: (859) 744-6008
http://www.ekpc.coop

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APPENDIX D – Flow Calculations & Direction Maps

GROUNDWATER FLOW VELOCITY CALCULATION

Facility Name: **Spurlock Landfill**
Sampling Event Date: **May 2nd, 2023**

$$V = \frac{K_h * i}{n_e}$$

INPUT VARIABLES:

Hydraulic Conductivity (K_h) =	3.67E-08	ft/s
Upgradient Water Elevation (h_1) =	639	ft
Downgradient Water Elevation (h_2) =	583	ft
Flow Length (L) =	865	ft
Effective Porosity (n_e) =	0.05	unitless

CALCULATIONS:

dh =	56	ft
Hydraulic Gradient (i) =	0.065	ft/ft
GW Flow Velocity (K_h*i)/n_e =	4.11E-03	ft/day

V = Groundwater flow velocity $\left(\frac{feet}{day}\right)$

K_h = Horizontal Hydraulic Conductivity $\left(\frac{feet}{day}\right)$

i = Horizontal hydraulic gradient $\left(\frac{feet}{foot}\right) = \frac{h_1 - h_2}{L}$

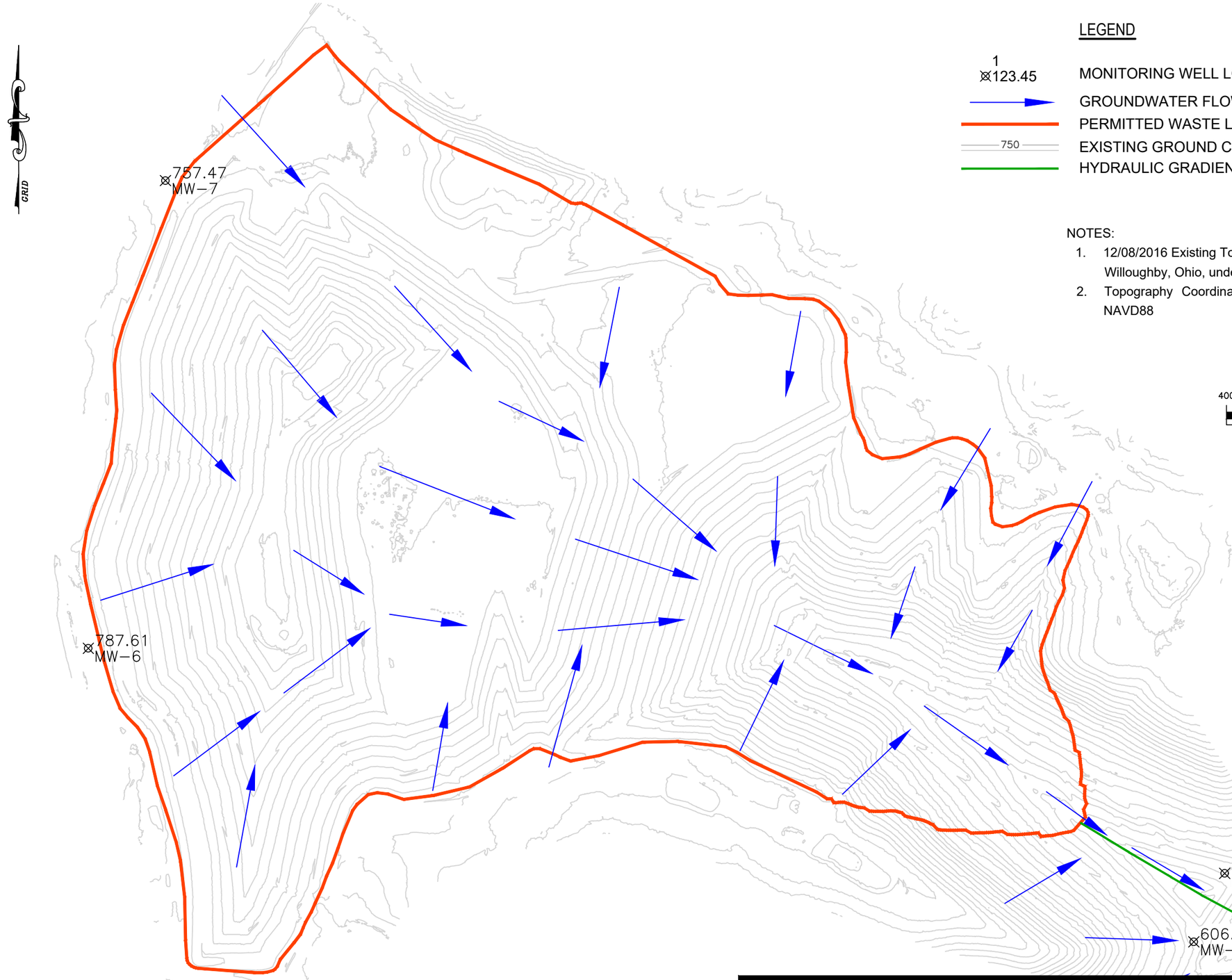
h_1 and h_2 = Groundwater elevation at location 1 and 2

L = Distance between location 1 and 2

n_e = Effective porosity

Notes:

1. Effective porosity estimates based on values from Ordovician limestone according to Groundwater Monitoring System and Hydrogeologic Investigation Report for Spurlock LF dated Oct. 2017 by Tetra Tech.
2. The location of h1 at SE corner of the permitted waste boundary, groundwater elevation of h1 based on creek bed prior to development.
3. The location of h2 is downgradient of the pond and monitoring wells in the creek bed, groundwater elevation of h2 based on creek bed prior to development.
4. Hydraulic conductivity estimates taken from the Groundwater Monitoring System and Hydrogeologic Investigation Report for Peg's Hill dated February 2019 by Geosyntec.
5. Calculations are based on available information and limited data points, therefore, the results reflect estimated values.
6. Flow Length distance is estimated using CAD software measuring from the SE corner of the permitted waste boundary to a location downstream of the pond just beyond the monitoring wells in the creek bed.



LEGEND

1 ⊠123.45	MONITORING WELL LOCATION AND WATER ELEVATION
	GROUNDWATER FLOW DIRECTION
	PERMITTED WASTE LIMIT
750	EXISTING GROUND CONTOURS
	HYDRAULIC GRADIENT FLOW LENGTH

NOTES:

1. 12/08/2016 Existing Topography prepared by Kucera International, Inc., Willoughby, Ohio, under subcontract to Mikon Corporation.
2. Topography Coordinate System is KY State Plane Single Zone, NAD83, NAVD88

400 0 200 400

(SCALE IN FEET)

1 inch = 400 ft.

STATE OF KENTUCKY
1/25/24
SAMUEL T. OAKES
21483
LICENSED PROFESSIONAL ENGINEER

May 2, 2023 EVENT

KENVIRONS
Civil & Environmental Engineers

Project:	2016135
Checked By:	STO
Date:	8-11-2023
Scale:	1"=400'

SPURLOCK STATION LANDFILL
MASON COUNTY, KENTUCKY
GROUNDWATER FLOW MAP

N:\P\2016135\Design\Spurlock Landfill Potentiometric Flow Map_11x17_2023.dwg, 5-2-2023, 1/25/2024 10:08:25 AM, MAS

GROUNDWATER FLOW VELOCITY CALCULATION

Facility Name: **Spurlock Landfill**
Sampling Event Date: **June 1st, 2023**

$$V = \frac{K_h * i}{n_e}$$

INPUT VARIABLES:

Hydraulic Conductivity (K_h) =	3.67E-08	ft/s
Upgradient Water Elevation (h_1) =	639	ft
Downgradient Water Elevation (h_2) =	583	ft
Flow Length (L) =	865	ft
Effective Porosity (n_e) =	0.05	unitless

CALCULATIONS:

dh =	56	ft
Hydraulic Gradient (i) =	0.065	ft/ft
GW Flow Velocity (K_h*i)/n_e =	4.11E-03	ft/day

V = Groundwater flow velocity $\left(\frac{feet}{day}\right)$

K_h = Horizontal Hydraulic Conductivity $\left(\frac{feet}{day}\right)$

i = Horizontal hydraulic gradient $\left(\frac{feet}{foot}\right) = \frac{h_1 - h_2}{L}$

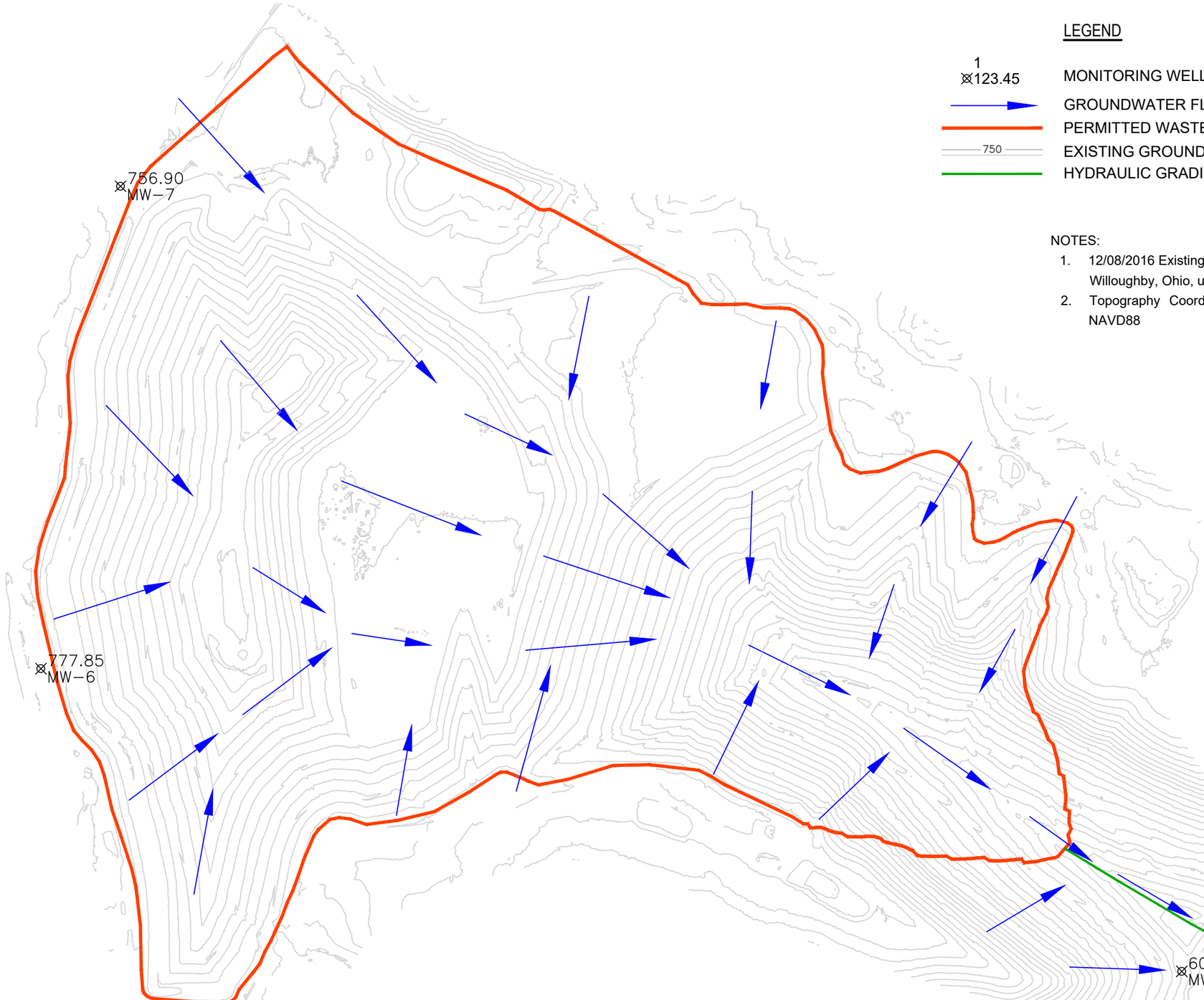
h_1 and h_2 = Groundwater elevation at location 1 and 2

L = Distance between location 1 and 2

n_e = Effective porosity

Notes:

1. Effective porosity estimates based on values from Ordovician limestone according to Groundwater Monitoring System and Hydrogeologic Investigation Report for Spurlock LF dated Oct. 2017 by Tetra Tech.
2. The location of h1 at SE corner of the permitted waste boundary, groundwater elevation of h1 based on creek bed prior to development.
3. The location of h2 is downgradient of the pond and monitoring wells in the creek bed, groundwater elevation of h2 based on creek bed prior to development.
4. Hydraulic conductivity estimates taken from the Groundwater Monitoring System and Hydrogeologic Investigation Report for Peg's Hill dated February 2019 by Geosyntec.
5. Calculations are based on available information and limited data points, therefore, the results reflect estimated values.
6. Flow Length distance is estimated using CAD software measuring from the SE corner of the permitted waste boundary to a location downstream of the pond just beyond the monitoring wells in the creek bed.



LEGEND

1
123.45 — MONITORING WELL LOCATION AND WATER ELEVATION

GROUNDWATER FLOW DIRECTION

PERMITTED WASTE LIMIT

750 — EXISTING GROUND CONTOURS

HYDRAULIC GRADIENT FLOW LENGTH

NOTES:

1. 12/08/2016 Existing Topography prepared by Kucera International, Inc., Willoughby, Ohio, under subcontract to Mikon Corporation.
2. Topography Coordinate System is KY State Plane Single Zone, NAD83, NAVD88

400 0 200 400

(SCALE IN FEET)

1 inch = 400 ft.

STATE OF KENTUCKY
1/25/24
SAMUEL T. OAKES
21483
LICENSED
PROFESSIONAL ENGINEER

June 1, 2023 EVENT

KENVIRONS
Civil & Environmental Engineers

Project:	2016135
Checked By:	STO
Date:	8-15-2023
Scale:	1"=400'

SPURLOCK STATION LANDFILL
MASON COUNTY, KENTUCKY
GROUNDWATER FLOW MAP

N:\P\2016135\Design\Spurlock Landfill Potentiometric Flow Map_11x17_2023.dwg, 6-1-2023, 1/25/2024 10:08:46 AM, MAS

GROUNDWATER FLOW VELOCITY CALCULATION

Facility Name: **Spurlock Landfill**
Sampling Event Date: **November 28th & 29th, 2023**

$$V = \frac{K_h * i}{n_e}$$

INPUT VARIABLES:

Hydraulic Conductivity (K_h) =	3.67E-08	ft/s
Upgradient Water Elevation (h_1) =	639	ft
Downgradient Water Elevation (h_2) =	583	ft
Flow Length (L) =	865	ft
Effective Porosity (n_e) =	0.05	unitless

CALCULATIONS:

dh =	56	ft
Hydraulic Gradient (i) =	0.065	ft/ft
GW Flow Velocity (K_h*i)/n_e =	4.11E-03	ft/day

V = Groundwater flow velocity $\left(\frac{feet}{day}\right)$

K_h = Horizontal Hydraulic Conductivity $\left(\frac{feet}{day}\right)$

i = Horizontal hydraulic gradient $\left(\frac{feet}{foot}\right) = \frac{h_1 - h_2}{L}$

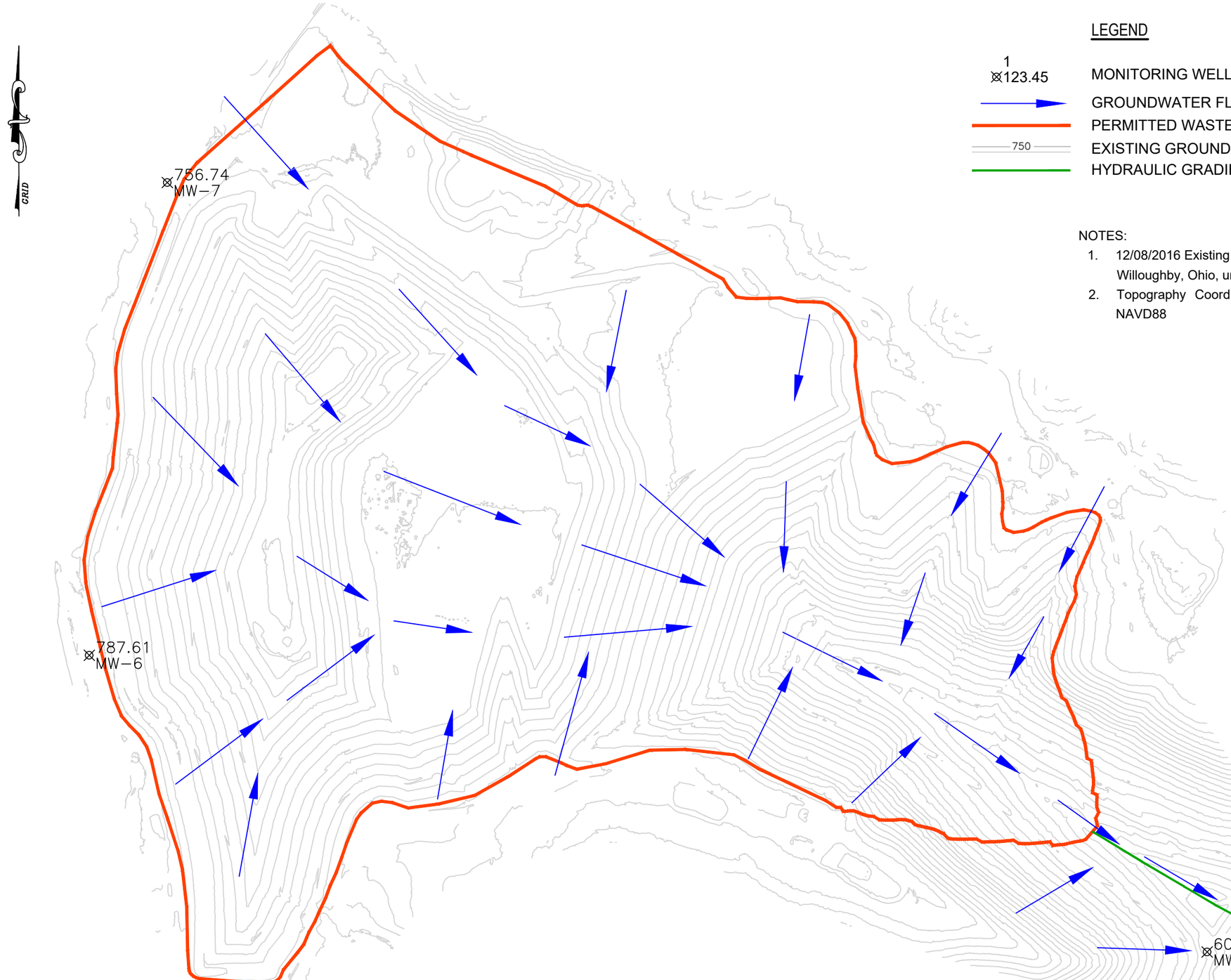
h_1 and h_2 = Groundwater elevation at location 1 and 2

L = Distance between location 1 and 2

n_e = Effective porosity

Notes:

1. Effective porosity estimates based on values from Ordovician limestone according to Groundwater Monitoring System and Hydrogeologic Investigation Report for Spurlock LF dated Oct. 2017 by Tetra Tech.
2. The location of h1 at SE corner of the permitted waste boundary, groundwater elevation of h1 based on creek bed prior to development.
3. The location of h2 is downgradient of the pond and monitoring wells in the creek bed, groundwater elevation of h2 based on creek bed prior to development.
4. Hydraulic conductivity estimates taken from the Groundwater Monitoring System and Hydrogeologic Investigation Report for Peg's Hill dated February 2019 by Geosyntec.
5. Calculations are based on available information and limited data points, therefore, the results reflect estimated values.
6. Flow Length distance is estimated using CAD software measuring from the SE corner of the permitted waste boundary to a location downstream of the pond just beyond the monitoring wells in the creek bed.



LEGEND

1 ⊠123.45	MONITORING WELL LOCATION AND WATER ELEVATION
	GROUNDWATER FLOW DIRECTION
	PERMITTED WASTE LIMIT
750	EXISTING GROUND CONTOURS
	HYDRAULIC GRADIENT FLOW LENGTH

NOTES:

1. 12/08/2016 Existing Topography prepared by Kucera International, Inc., Willoughby, Ohio, under subcontract to Mikon Corporation.
2. Topography Coordinate System is KY State Plane Single Zone, NAD83, NAVD88

400 0 200 400

(SCALE IN FEET)

1 inch = 400 ft.

STATE OF KENTUCKY
1/25/24
SAMUEL T. OAKES
21483
LICENSED PROFESSIONAL ENGINEER

November 28, 2023 EVENT

KENVIRONS
Civil & Environmental Engineers

Project:	2016135
Checked By:	STO
Date:	8-11-2023
Scale:	1"=400'

SPURLOCK STATION LANDFILL
MASON COUNTY, KENTUCKY
GROUNDWATER FLOW MAP

N:\P\2016135\Design\Spurlock Landfill Potentiometric Flow Map_11x17_2023.dwg, 11-28-23, 1/25/2024 10:09:55 AM, MAS

APPENDIX E1 – Statistical Analysis Package (November 2022)

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

27 April 2023
File No. 130592-015

East Kentucky Power Cooperative
4775 Lexington Road
Winchester, KY 40392

Subject: Summary of Appendix III Semi-Annual
Groundwater Detection Monitoring Statistical Evaluation
East Kentucky Power Cooperative
H.L. Spurlock Generating Station Landfill
Maysville, Kentucky

East Kentucky Power Cooperative, Inc. (EKPC) is implementing the 17 April 2015 U.S. Environmental Protection Agency (U.S. EPA) Federal Coal Combustion Residuals (CCR) Rule (40 CFR §257 and 261) for the H.L. Spurlock Generating Station Landfill, located in Mason County, Kentucky. The CCR Rule establishes requirements for the operation, maintenance and closure of landfills and surface impoundments of CCR materials.

This memorandum summarizes the results of statistical evaluations conducted to determine if Appendix III groundwater monitoring constituents have been detected in downgradient wells at levels that exhibit a statistically significant increase (SSI) above background levels, as required by 40 CFR § 257.94. Downgradient locations were defined in the *Groundwater Monitoring System and Hydrogeologic Investigation Report, Spurlock Landfill, H.L. Spurlock Generating Station, Maysville, Kentucky* (Tetra Tech, 10 October 2017). The same TetraTech report indicates that the groundwater monitoring system meets the requirements of 40 CFR §257.91. On 18 January 2023, EKPC provided Haley & Aldrich, Inc. (Haley & Aldrich) with analytical data from groundwater samples collected on 21 November 2022.The results presented herein were previously communicated orally to EKPC on 6 April 2023. Time-series graphs of data collected as part of the CCR Rule monitoring of H.L. Spurlock Generating Station Landfill are included in Attachment 1.

To identify SSIs, sample data from the most recent groundwater sampling event from the downgradient monitoring wells were compared to the Upper Prediction Limits (UPLs) calculated for each Appendix III constituent (boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids (TDS)) to represent background values within the given downgradient wells. Lower Prediction Limits (LPLs) were also calculated for pH[1]. Based on these comparisons, the statistical results identify SSIs above background concentrations for chloride and sulfate, both at SLF-MW-5R. The results of the groundwater detection monitoring evaluation are provided below.

[1] We note that for pH, the LPL was developed to monitor for significant increase or a decrease in pH.

Statistical Evaluation of Appendix III Constituents

The Rule, 40 CFR §257.93(f) (1-4), provides four (4) specific options to statistically evaluate whether water quality downgradient of the CCR Unit represents an SSI of Appendix III parameters compared to background water quality of the CCR Unit. Based on the *Selection of Statistical Procedures* (8 April 2019), background was determined by calculating intra-well UPL for each Appendix III constituent as well as the LPL for pH for each downgradient monitoring location (see footnote 1). Intrawell analysis was determined appropriate to detect changes associated with the unit based on previous statistical evaluations and successful ASD(s). The UPL was used to evaluate potential SSIs at each downgradient well.

UPL STATISTICAL ANALYSIS

Prediction limits are used to predict the UPL of possible future values for each Appendix III constituent as well as the LPL for pH, based on the downgradient monitoring well dataset and a specified number of future statistical comparisons. The prediction limit method is an accepted statistical method identified in the CCR Rule to evaluate the groundwater analytical data at CCR Units. The prediction limits are calculated with minimum 95% confidence level for four (4) future observations to maintain acceptable statistical power while maintaining site-wide false positive rate (SWFPR) of 10% per year or less. Depending on the assumed distribution of background data, parametric or non-parametric procedures were used to develop the UPL for each Appendix III parameter at each downgradient locations that had at least eight sampling events. Parametric prediction limits utilize assumed distributions of the sample background data to develop the prediction limits, and non-parametric limits utilize order statistics or bootstrap methods to develop the prediction limits. The prediction limits were calculated after testing for outlier sample results that would warrant removal from the data set based on likely error in sampling or measurement. Based on initial statistical evaluation and subsequent discussions with laboratory personnel, the TDS sample result at MW-2B from 30 November 2016 was removed from the background data set on the basis of a measurement error. The TDS result is inconsistent with the other analytes in the sample. Intra-well statistical comparison using prediction limit approach was performed for detection monitoring constituents at the downgradient monitoring wells, following the methods outlined in the *Selection of Statistical Procedures*. The results of the intra-well statistical comparisons are summarized in Table 1 with additional details of the intra-well analysis included in Attachment 2. The intra-well comparison uses the historic data from each downgradient well to establish a background limit. The background datasets are updated with new data in minimum sets of four after confirming that the well concentrations are below the intra-well background limit. Prior to updating the new background limit, the combined background data pool will be examined to identify potential outliers, temporal trends, and normality.

BACKGROUND DISTRIBUTIONS AND UPLS

Prior to conducting the statistical analysis for the second semi-annual detection monitoring event of 2022, the groundwater analytical results for samples collected from 21 October 2016 through September 2022 were used to calculate updated intra-well UPL and LPL (for pH) for each downgradient location (SLF-MW-2B, SLF-MW-3B, and SLF-MW-5R). Following four subsequent sampling events, the

new sample results will be evaluated for incorporation into the background data set used for the calculation of the UPL. The variability and distribution of each downgradient well background dataset was evaluated to determine the method for UPL and LPL (for pH) calculation. The development of the UPL and LPL (for pH) for each of the Appendix III constituents is summarized in Table 1, and the supporting statistical software output is included in Attachment 2. The next time background will be reevaluated is prior to the statistical evaluation of the second semi-annual compliance event of 2024.

RESULTS OF APPENDIX III DOWNGRADIENT STATISTICAL COMPARISONS

The sample concentrations for each of the Appendix III constituents from the 2022 second semi-annual detection monitoring sampling event from each downgradient well were compared to their respective UPLs. A sample concentration greater than the UPL (or less than LPL for pH) is considered to represent an SSI over background. Based on these comparisons, SSIs over background were identified for:

- Chloride at SLF-MW-5R
- Sulfate at SLF-MW-5R

We appreciate the opportunity to provide environmental consulting services on this project. Please do not hesitate to call if you have any questions or comments.

Sincerely,
HALEY & ALDRICH, INC.

Lloyd S. Ross
Senior Scientist

Emily Guzik
Project Manager

Enclosures:
Table 1: Summary of Background Sample Results and Comparison of Downgradient Sample Results
Attachment 1: Appendix III Time Series Graphs
Attachment 2: Statistical Output

TABLE

TABLE 1

SUMMARY OF BACKGROUND SAMPLE RESULTS AND COMPARISON OF DOWNGRADIENT SAMPLE RESULTS

FEBRUARY 2023

EAST KENTUCKY POWER COOPERATIVE

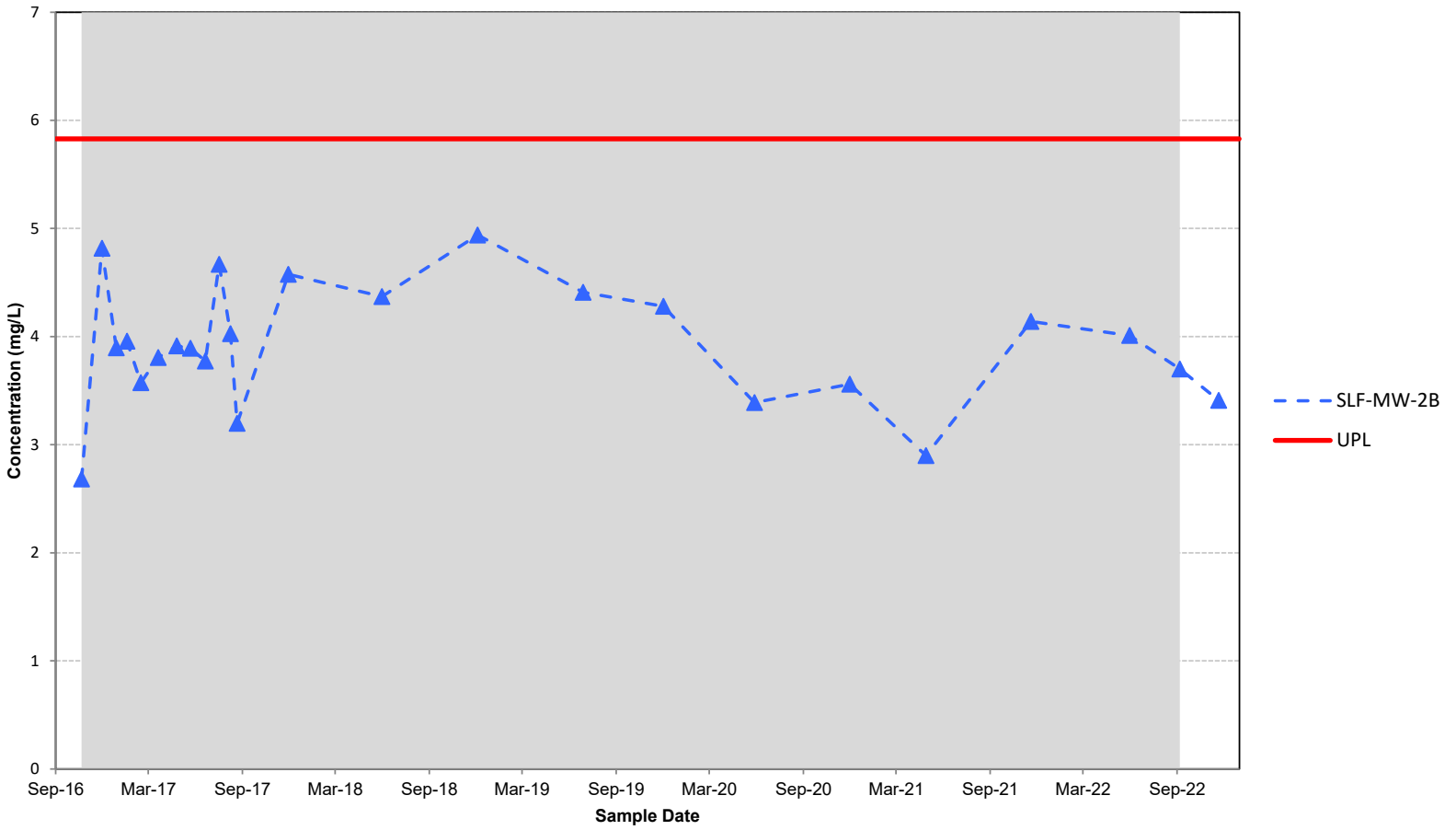
H. L. SPURLOCK GENERATING STATION LANDFILL

	Background Data Set Summary																Intra-well Analysis		
Location Id	**Frequency of Detection**	**Percent Non-Detects**	**Range of Non-Detects**	**Mean**	**50th Percentile (Median)**	**Minimum Detect**	**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variation**	**CCR MCL/RSL**	**Report Result Unit**	**Number of Detection Exceedances**	**Outlier Removed**	**Trend**	**Distribution***	**Background Limit (Upper Prediction Limit)**	**Compliance Round (November 2022)**	**Statistically Significant Increase (SSI) Present?**
CCR Appendix-III: Boron, Total (mg/L)																			
SLF-MW-2B	23 / 23	0	N/A : N/A	3.934	3.914	2.683	4.94	0.326	0.571	0.145	NA	mg/L	No	No	Stable	Normal	5.83	3.41	No
SLF-MW-3B	23 / 23	0	N/A : N/A	3.235	3.392	1.41	6.242	1.619	1.272	0.393	NA	mg/L	No	No	Decreasing	Normal	7.46	1.69	No
SLF-MW-5R	19 / 19	0	N/A : N/A	0.465	0.461	0.22	0.855	0.0242	0.156	0.335	NA	mg/L	No	No	Stable	Normal	1.00	0.929	No
CCR Appendix-III: Calcium, Total (mg/L)																			
SLF-MW-2B	24 / 24	0	N/A : N/A	45.87	43.05	30.76	110	281.7	16.78	0.366	NA	mg/L	Yes	No	Increasing	Non-parametric	110	86.5	No
SLF-MW-3B	24 / 24	0	N/A : N/A	195.8	190.2	138	255	914.7	30.24	0.154	NA	mg/L	No	No	Decreasing	Normal	295	170	No
SLF-MW-5R	20 / 20	0	N/A : N/A	118	118.5	85.1	157	244.6	15.64	0.133	NA	mg/L	No	No	Stable	Normal	171	152	No
CCR Appendix-III: Chloride, Total (mg/L)																			
SLF-MW-2B	24 / 24	0	N/A : N/A	1670	1581	616	2530	198624	445.7	0.267	NA	mg/L	No	No	Stable	Normal	3140	1830	No
SLF-MW-3B	24 / 24	0	N/A : N/A	182	170.5	98	269	2971	54.5	0.299	NA	mg/L	No	No	Increasing	Normal	362	188	No
SLF-MW-5R	20 / 20	0	N/A : N/A	24.16	25.5	12.4	44.1	50.9	7.134	0.295	NA	mg/L	Yes	No	Stable	Normal	48	52.9	Yes
CCR Appendix-III: Fluoride, Total (mg/L)																			
SLF-MW-2B	21 / 23	0.087	0.5 : 0.5	1.796	1.973	0.97	2.647	0.293	0.541	0.301	NA	mg/L	No	No	Stable	Non-parametric	2.65	0.83	No
SLF-MW-3B	2 / 23	0.913	0.5 : 0.5	0.16	0.5	0.16	0.16	0	0	N/A	NA	mg/L	No	No	NT	Non-parametric	0.50	0.16	No
SLF-MW-5R	2 / 19	0.8947	0.5 : 0.5	0.14	0.5	0.13	0.15	0.0001	0.01	0.0714	NA	mg/L	No	No	NT	Non-parametric	0.50	0.15	No
CCR Appendix-III: pH, Field, Total (pH units)																			
SLF-MW-2B	26 / 26	0	N/A : N/A	7.797	7.685	7.28	9	0.161	0.401	0.0515	NA	pH units	Yes	No	Stable	Non-parametric	7.28, 9	7.68	No
SLF-MW-3B	24 / 24	0	N/A : N/A	7.188	7.165	6.97	7.61	0.0284	0.169	0.0235	NA	pH units	No	No	Stable	Normal	6.6, 7.78	7.3	No
SLF-MW-5R	20 / 20	0	N/A : N/A	7.151	7.14	6.94	7.35	0.00984	0.0992	0.0139	NA	pH units	No	No	Stable	Normal	6.79, 7.51	7.19	No
CCR Appendix-III: Sulfate, Total (mg/L)																			
SLF-MW-2B	25 / 25	0	N/A : N/A	285.2	221.8	104	607	23296	152.6	0.535	NA	mg/L	No	No	Stable	Non-parametric	607	490	No
SLF-MW-3B	24 / 24	0	N/A : N/A	470.9	476	336	614.5	6615	81.33	0.173	NA	mg/L	No	No	Decreasing	Normal	739	384	No
SLF-MW-5R	20 / 20	0	N/A : N/A	132.9	131.4	83.4	209	1237	35.17	0.265	NA	mg/L	No	No	Increasing	Normal	252	259	Yes
CCR Appendix-III: Total Dissolved Solids (TDS) (mg/L)																			
SLF-MW-2B	24 / 24	0	N/A : N/A	3487	3525	483	4530	696060	834.3	0.239	NA	mg/L	Yes	Yes	Increasing	Normal	6238	4020	No
SLF-MW-3B	22 / 22	0	N/A : N/A	1231	1220	1100	1410	6872	82.89	0.0673	NA	mg/L	No	No	Stable	Normal	1508	1130	No
SLF-MW-5R	19 / 19	0	N/A : N/A	499.4	480	336	732	8629	92.89	0.186	NA	mg/L	No	No	Stable	Normal	817	794	No

NT: Not Tested

ATTACHMENT 1

Appendix III Time Series Graphs



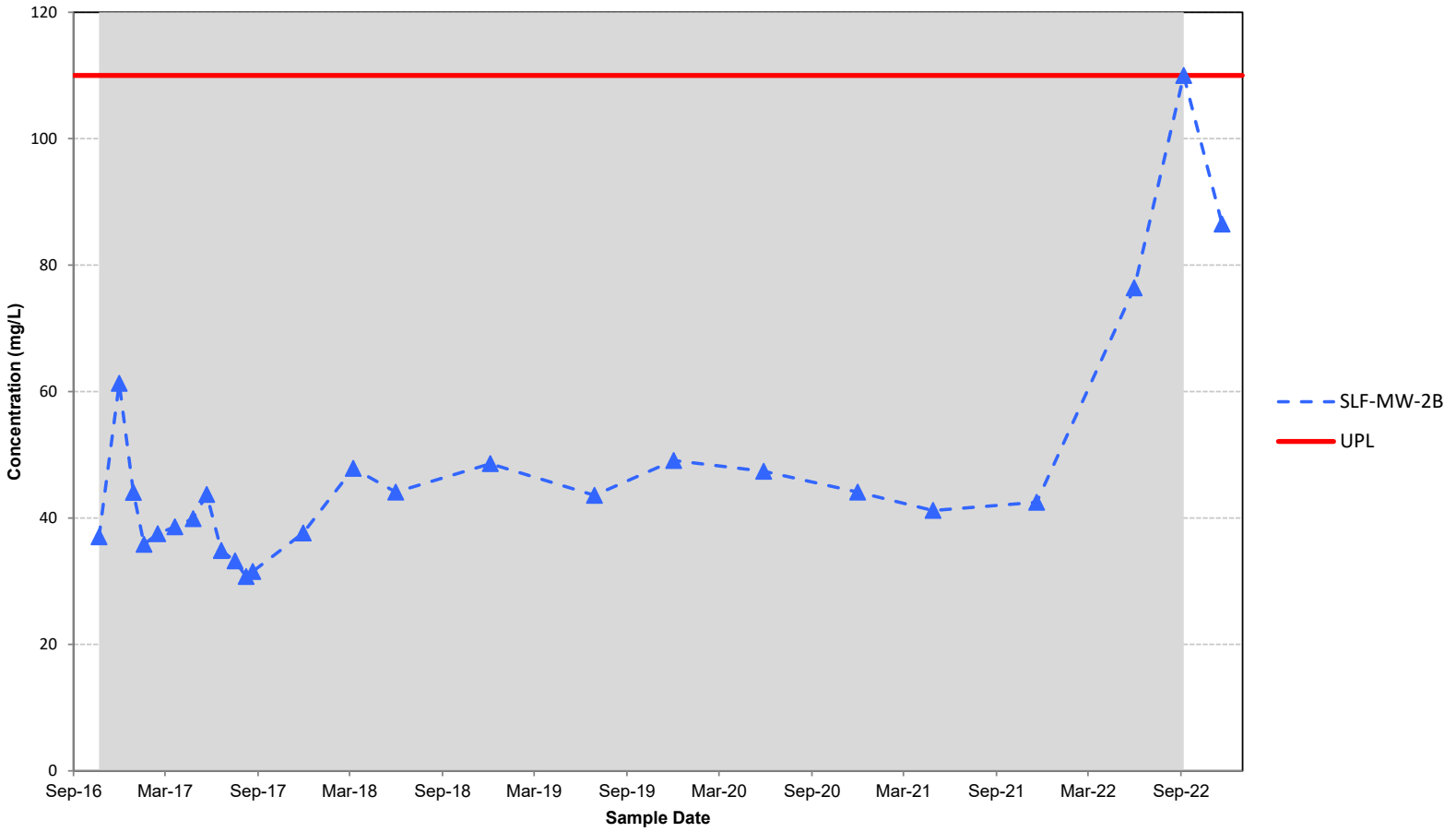
NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

BORON
CONCENTRATION VS. TIME

February 2023 **Figure F-1**



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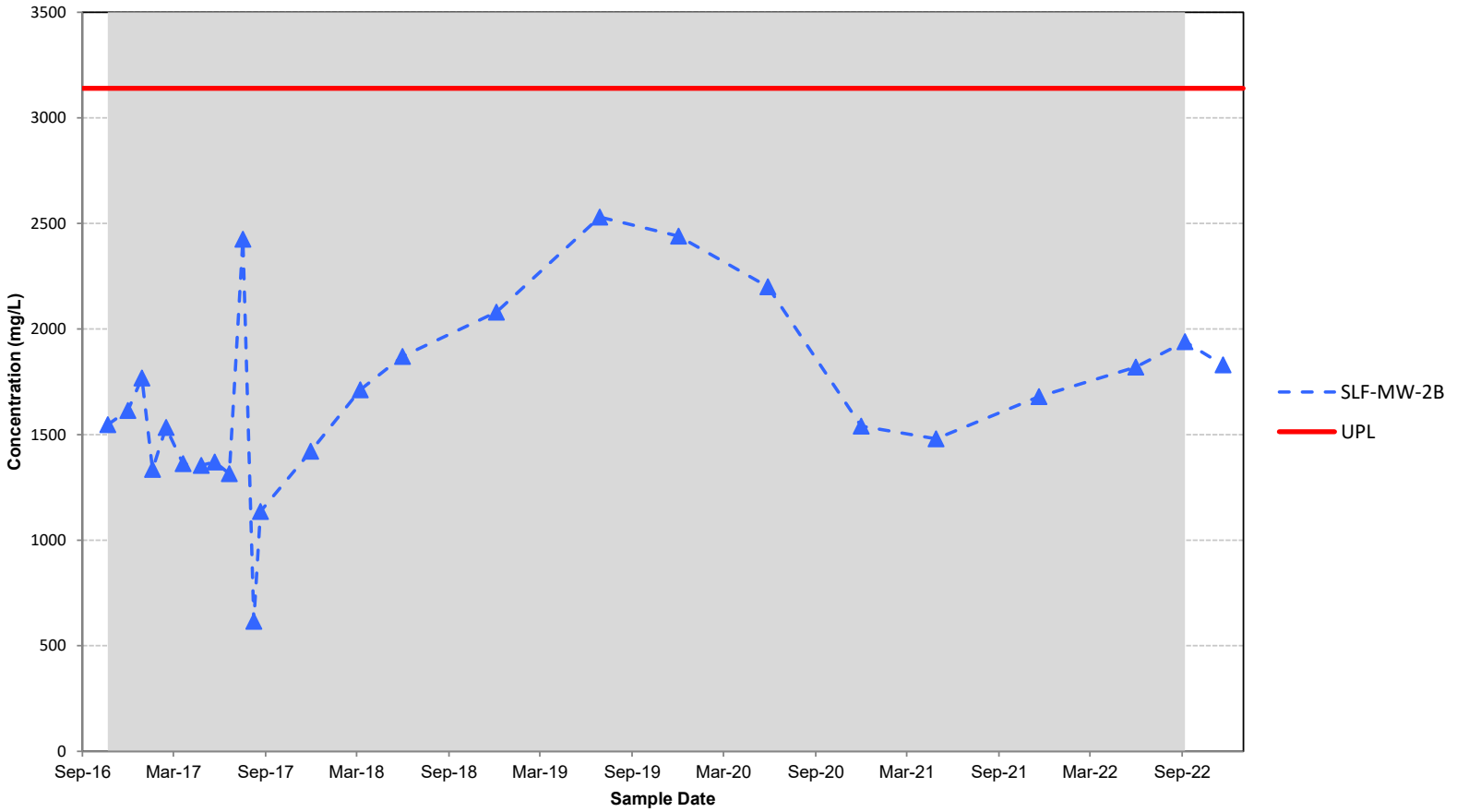
CALCIUM
CONCENTRATION VS. TIME

February 2023 **Figure F-2**



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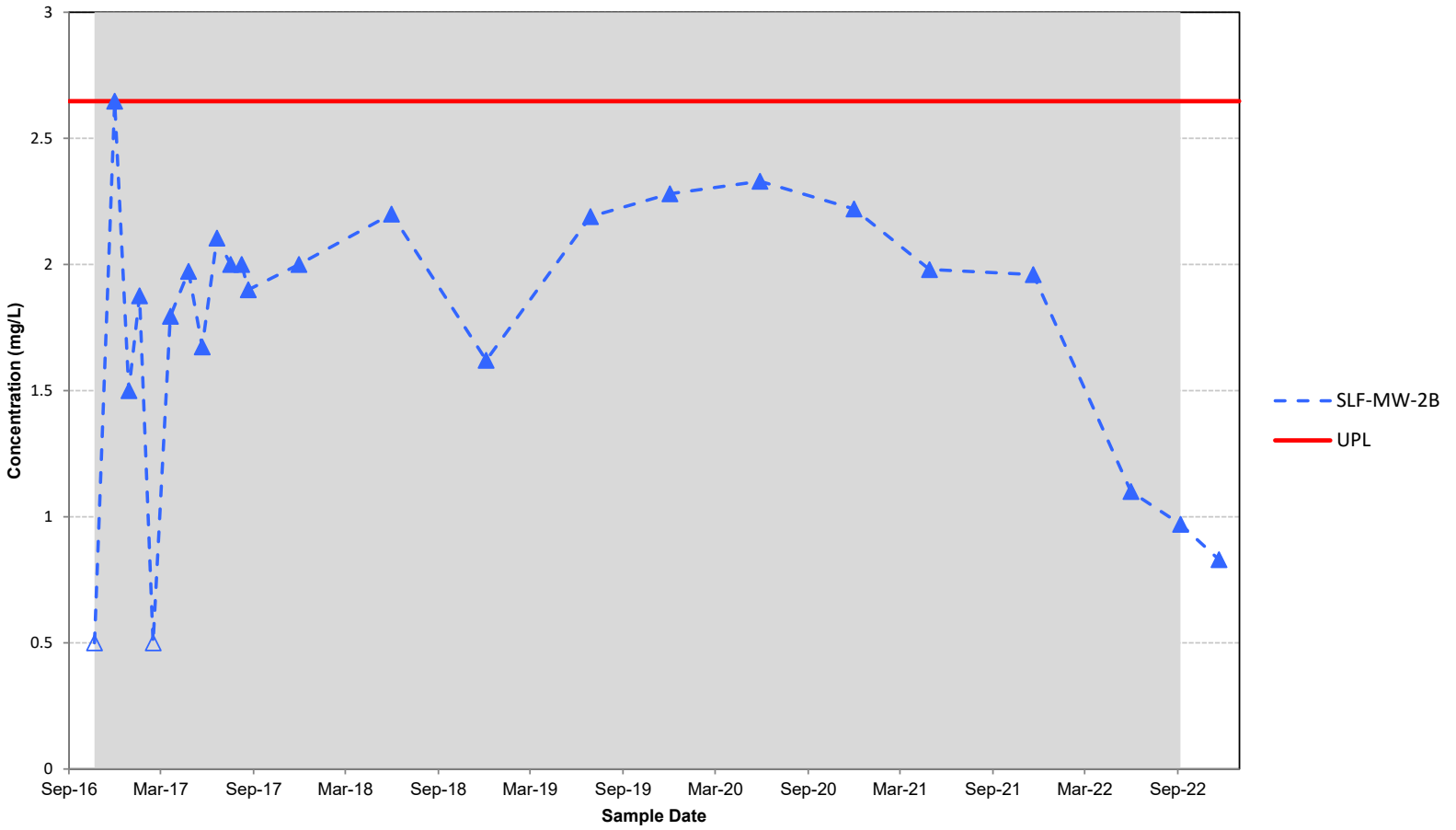
CHLORIDE
CONCENTRATION VS. TIME

February 2023 **Figure F-3**



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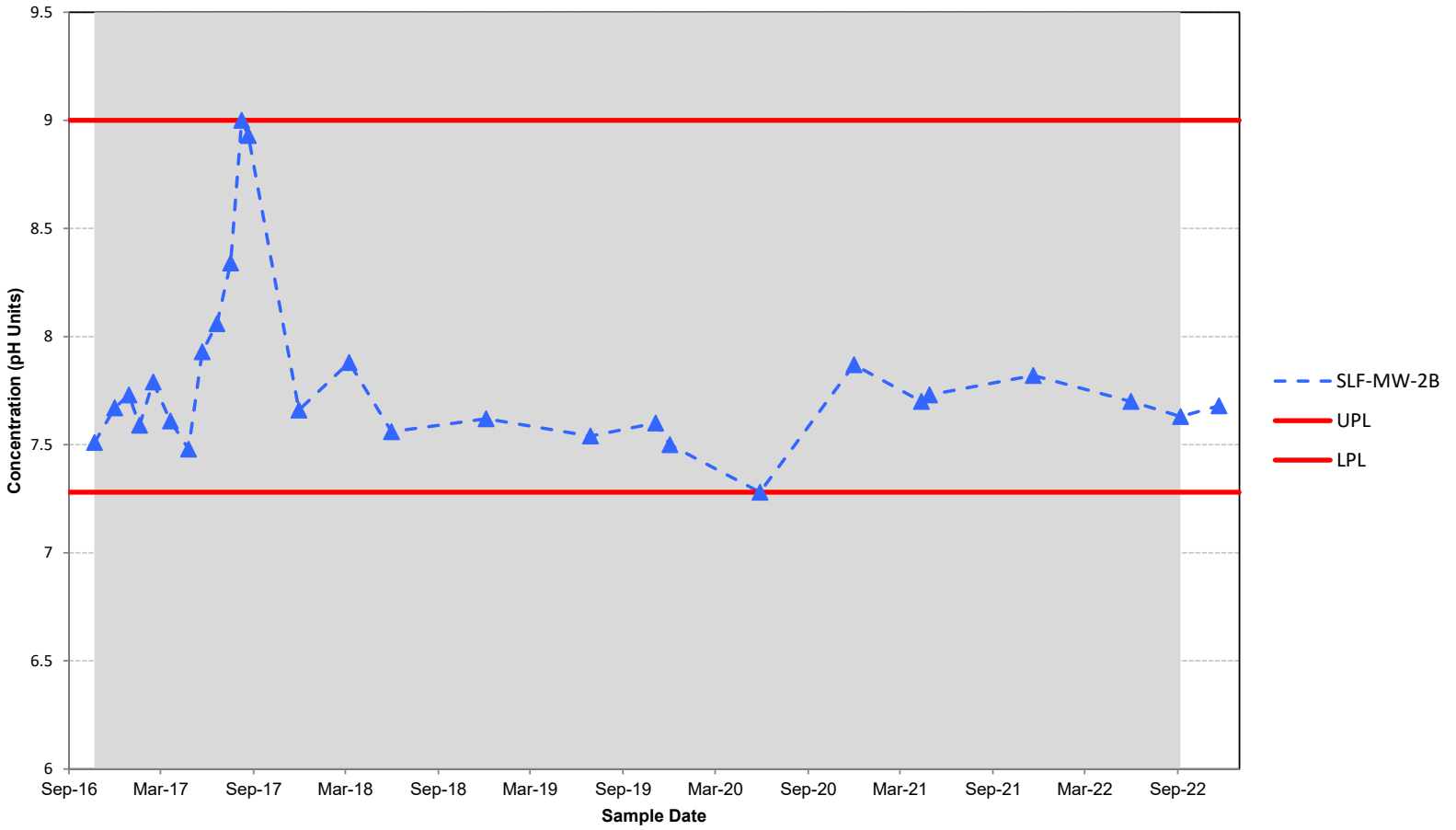
FLUORIDE
CONCENTRATION VS. TIME

February 2023 **Figure F-4**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper and Lower Prediction Limit (UPL and LPL).
3. Shading denotes data used to calculate Statistical Background limits.
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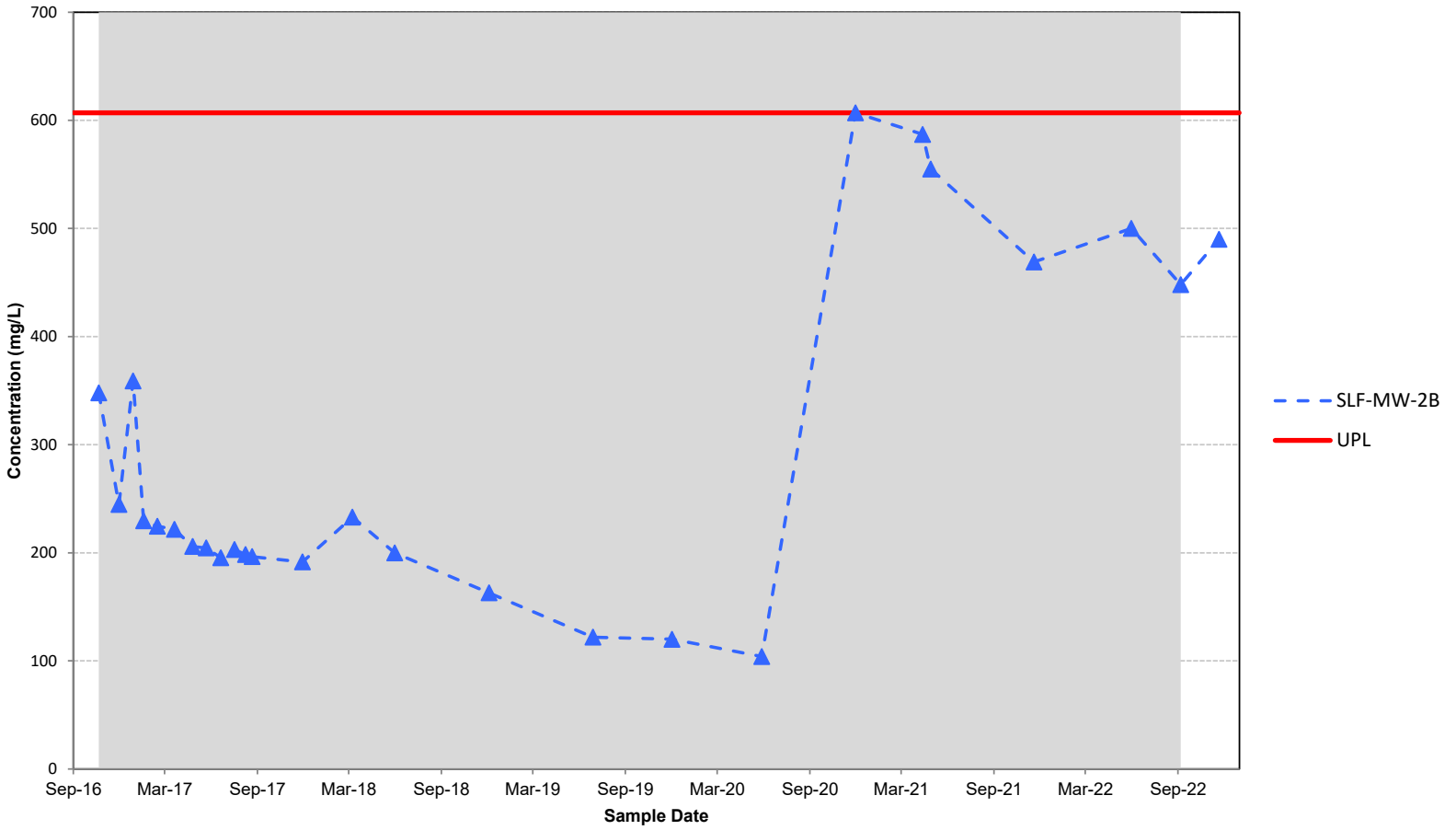
PH, FIELD
CONCENTRATION VS. TIME

February 2023 **Figure F-5**



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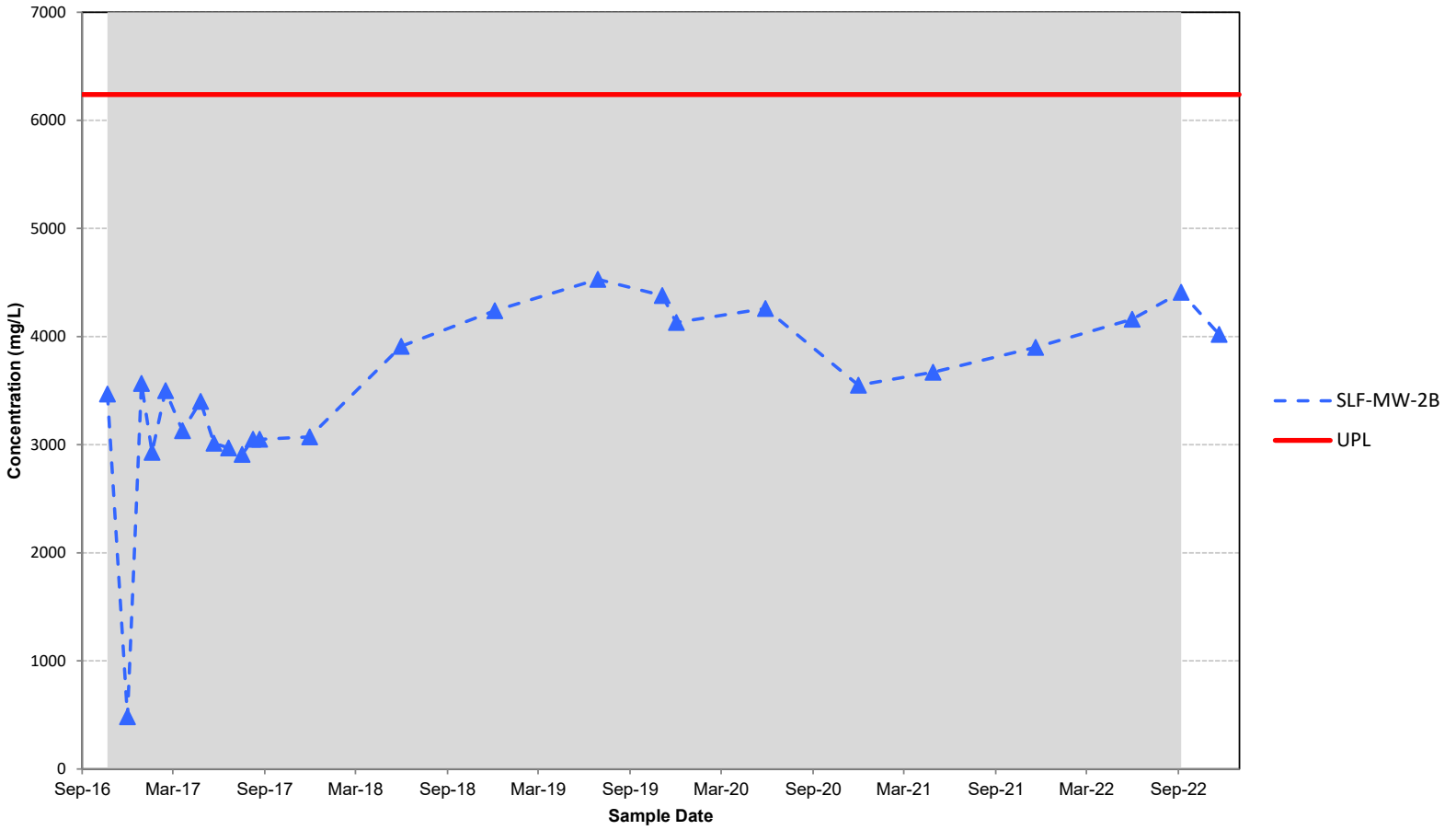
SULFATE
CONCENTRATION VS. TIME

February 2023 **Figure F-6**



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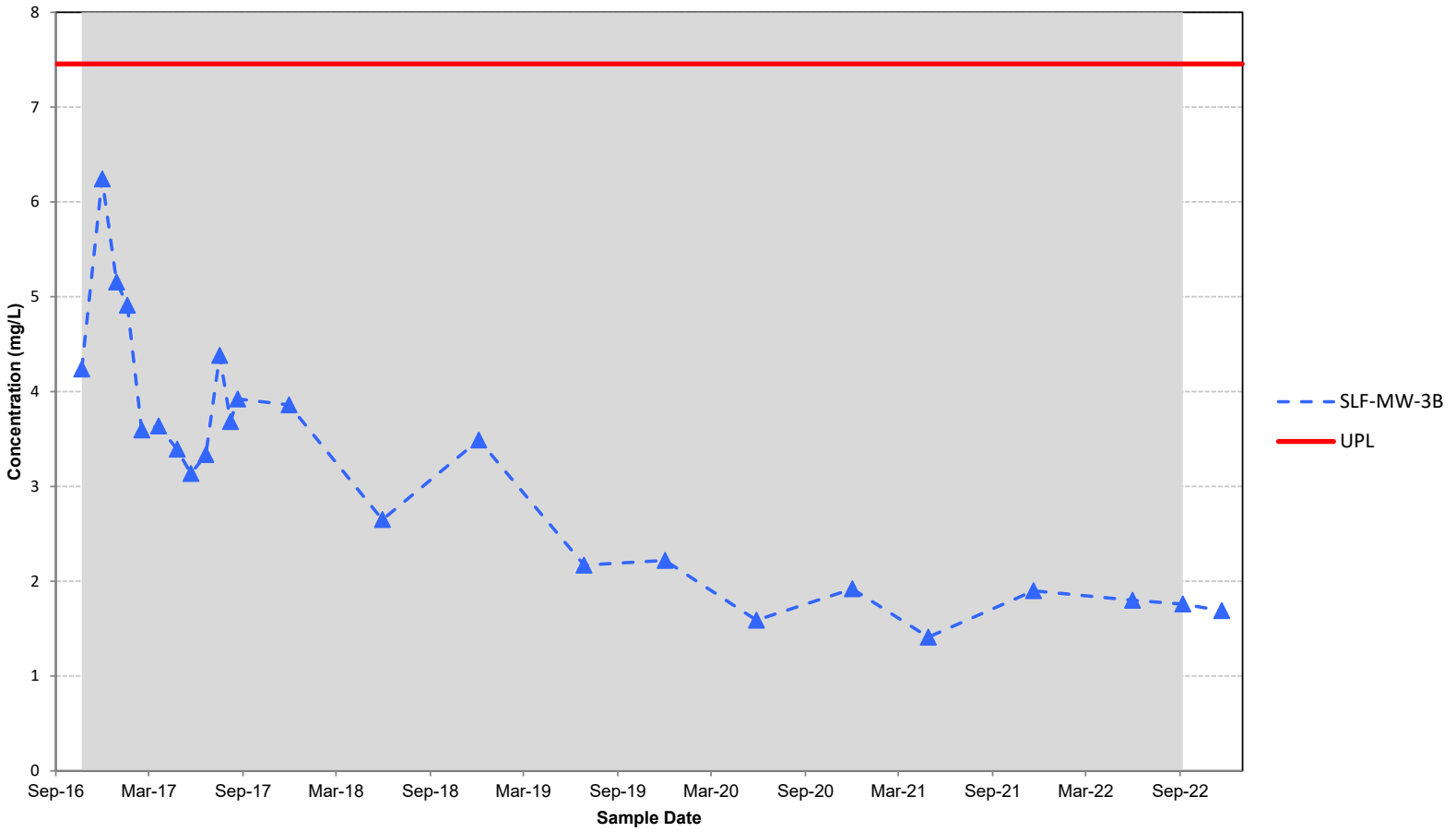
TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATION VS. TIME

February 2023 **Figure F-7**



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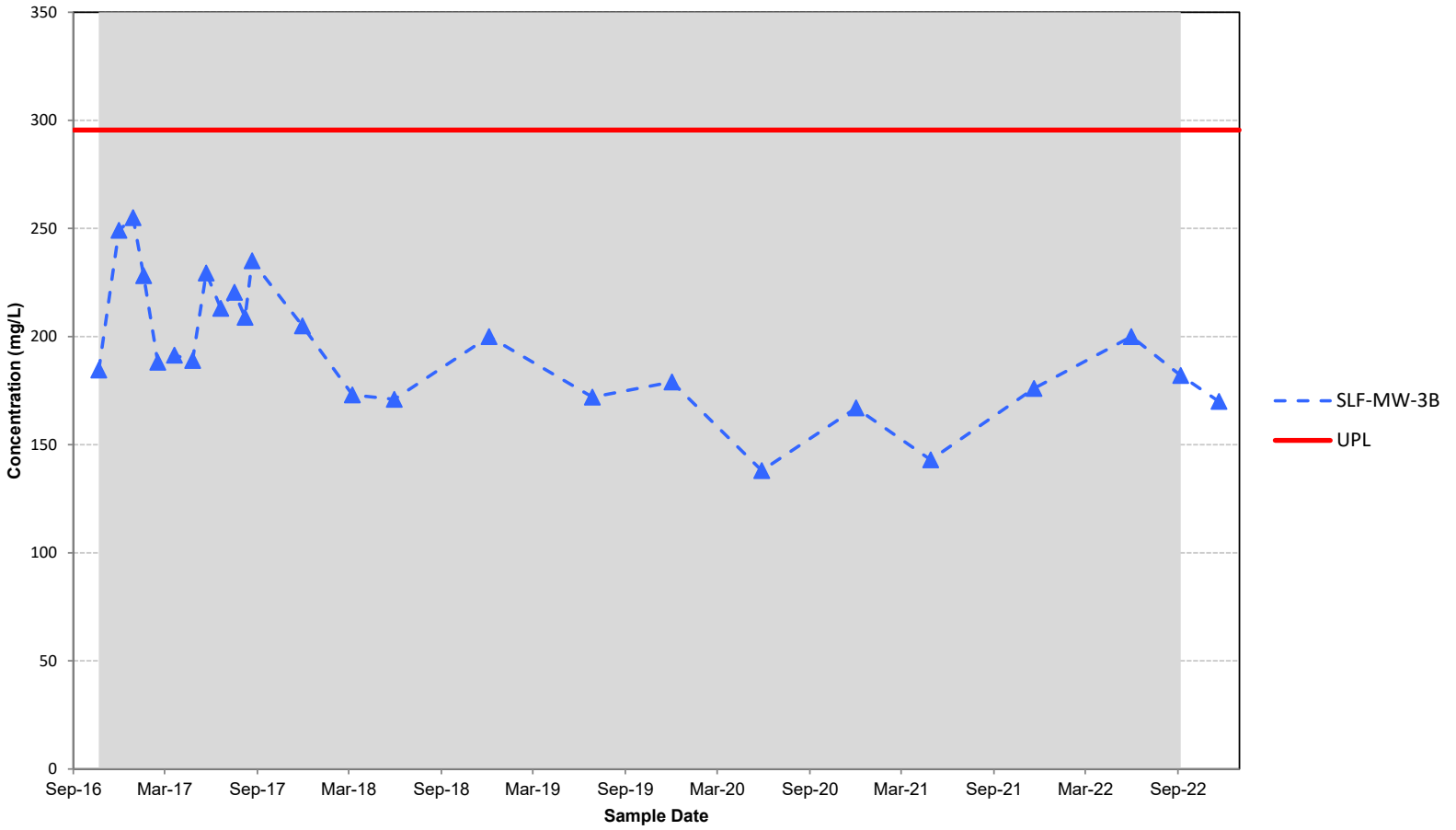
BORON
CONCENTRATION VS. TIME

February 2023 **Figure F-8**



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4. Detection Monitoring was initiated on October 17, 2017.

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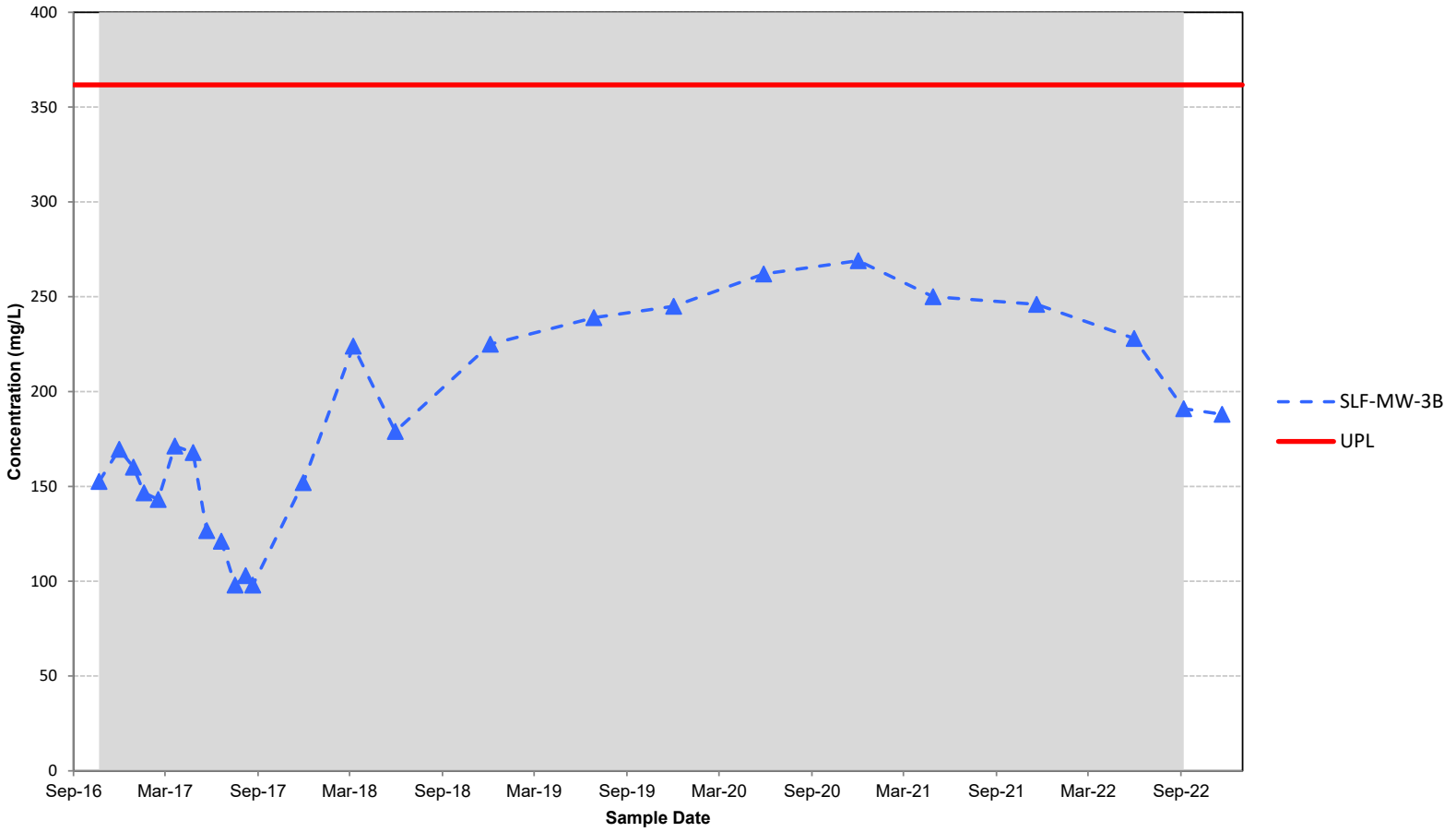
CALCIUM
CONCENTRATION VS. TIME

February 2023 **Figure F-9**



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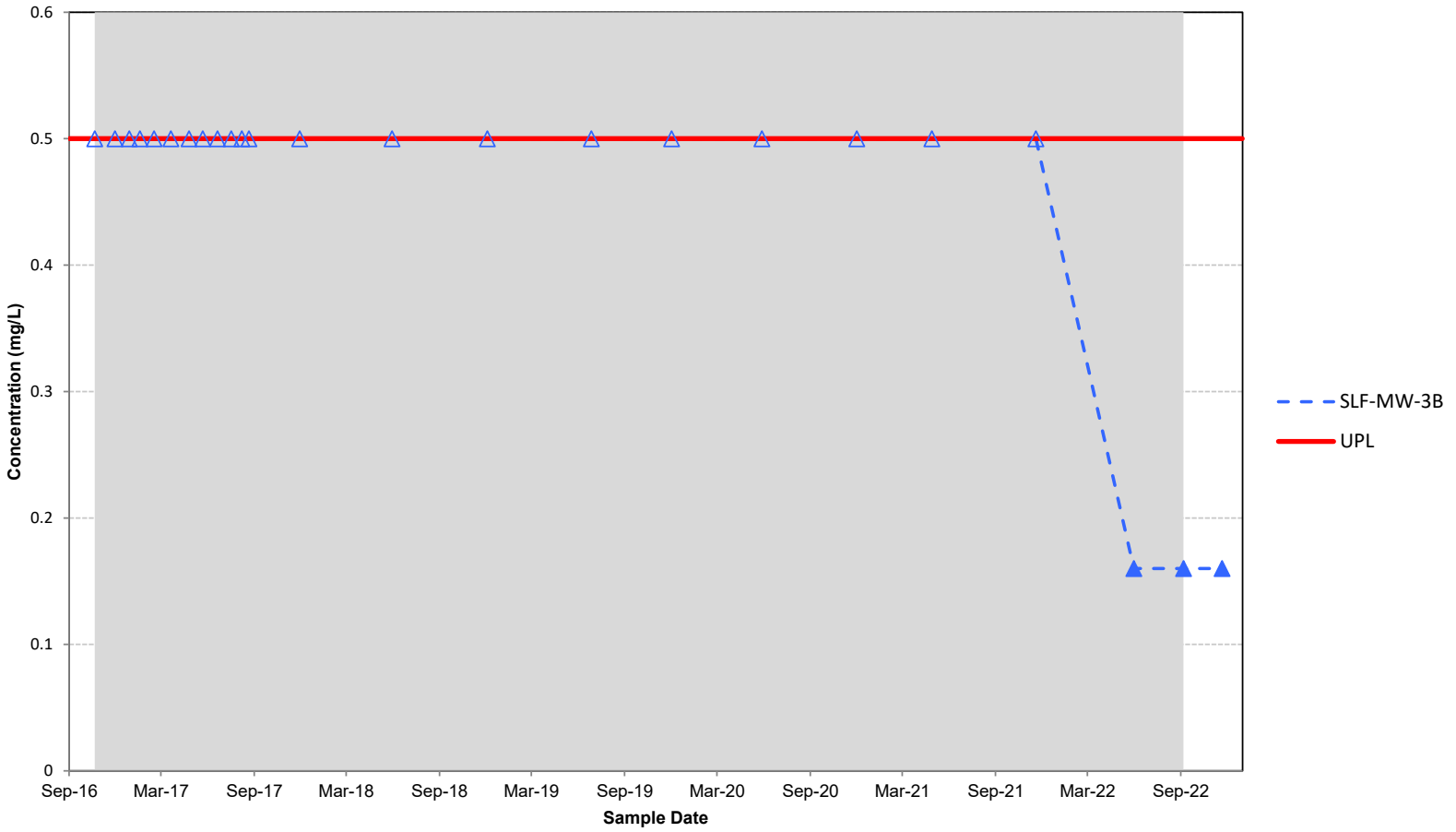
CHLORIDE
CONCENTRATION VS. TIME

February 2023 **Figure F-10**



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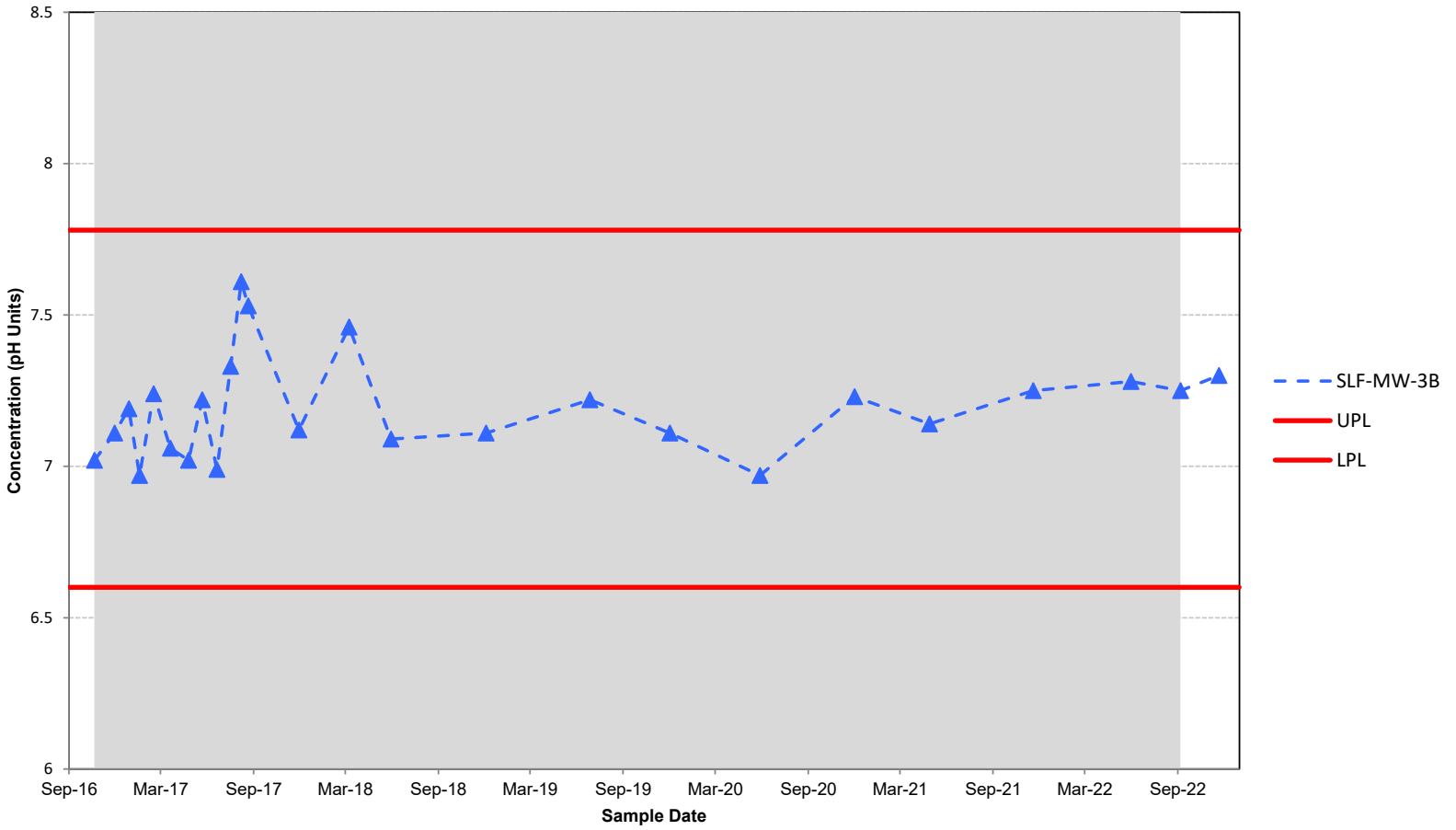
FLUORIDE
CONCENTRATION VS. TIME

February 2023 **Figure F-11**



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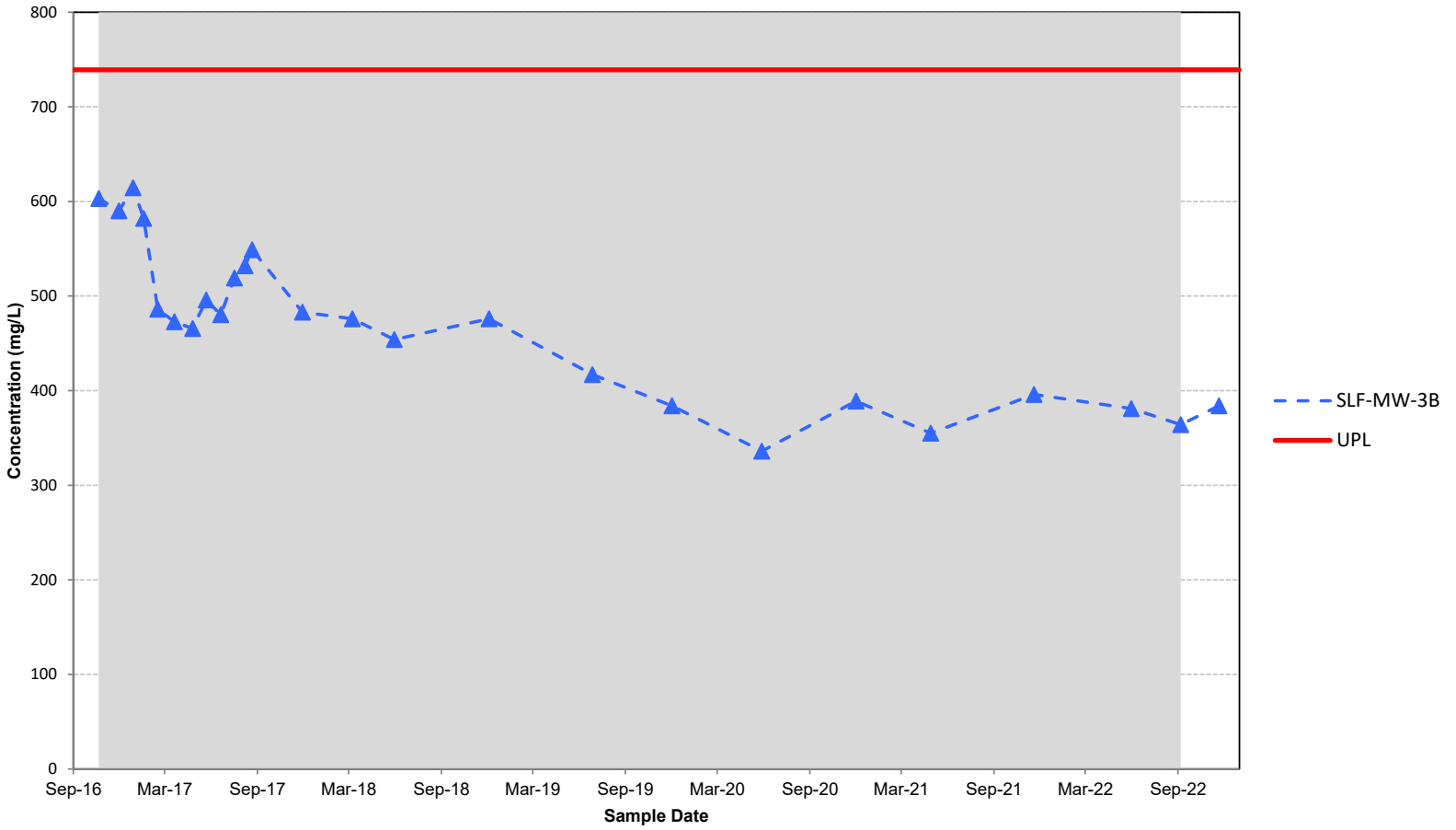
MAYSVILLE, KENTUCKY

PH, FIELD
CONCENTRATION VS. TIME

February 2023 **Figure F-12**



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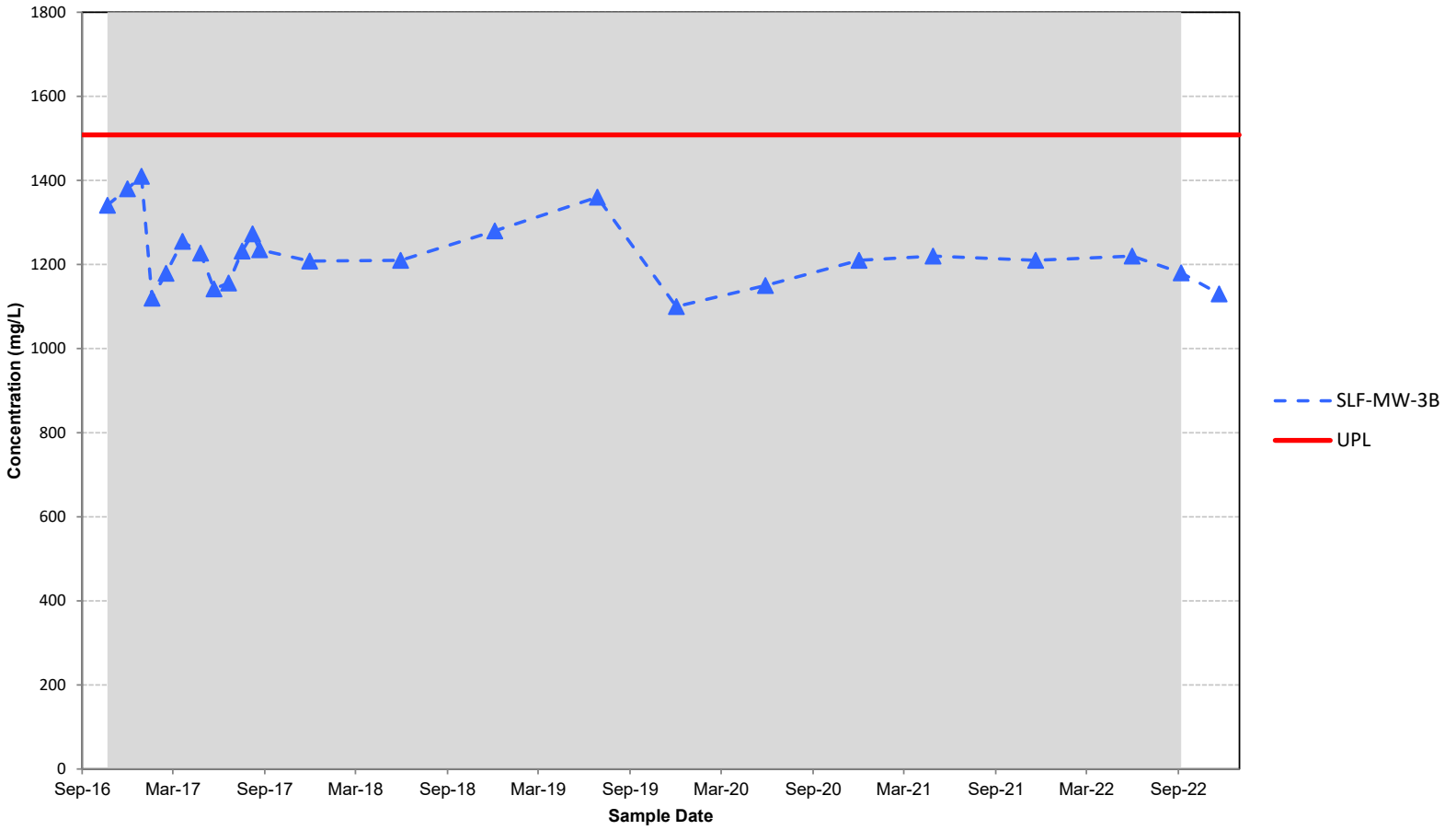
SULFATE
CONCENTRATION VS. TIME

February 2023 **Figure F-13**



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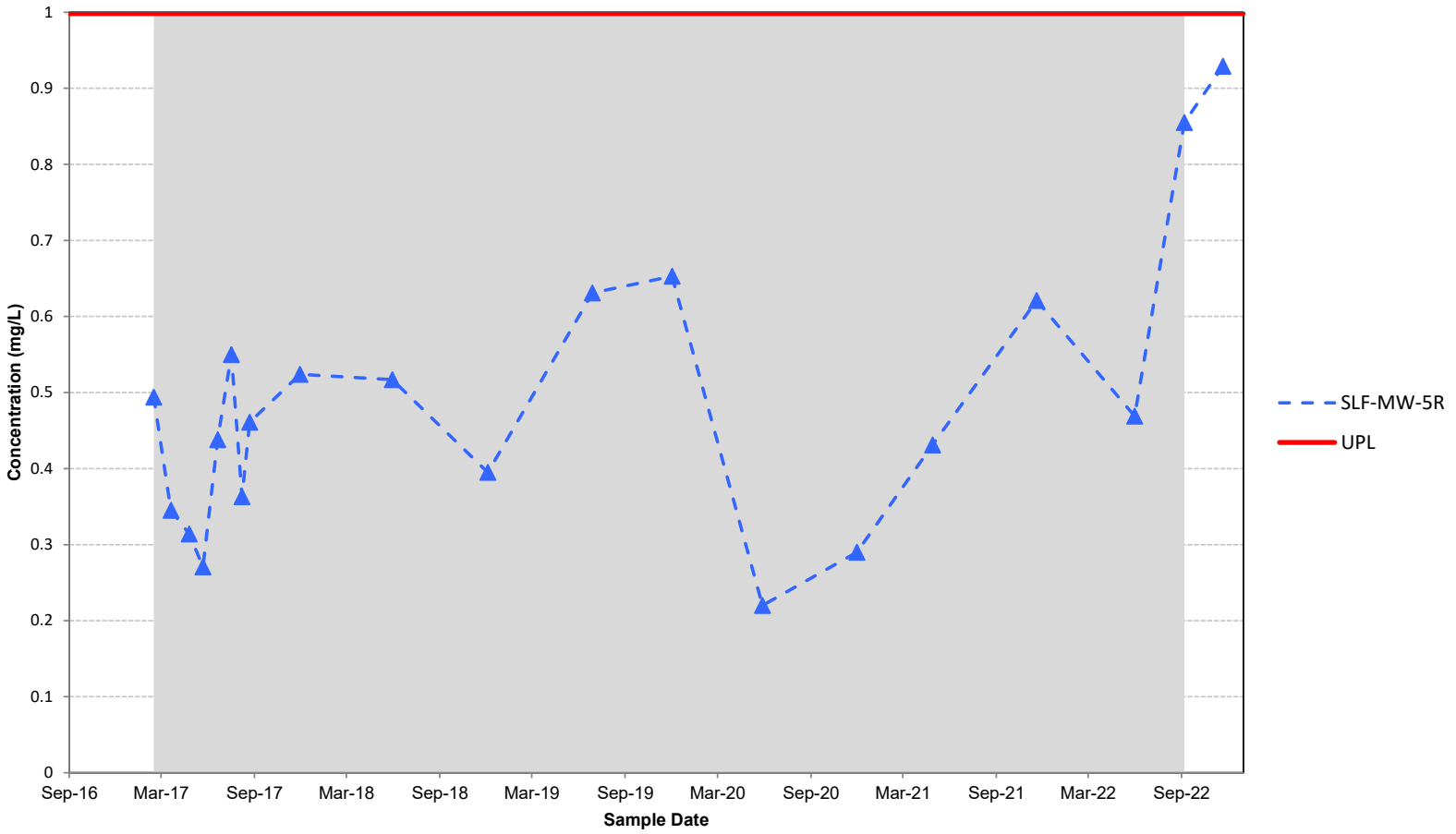
H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATION VS. TIME

February 2023 **Figure F-14**



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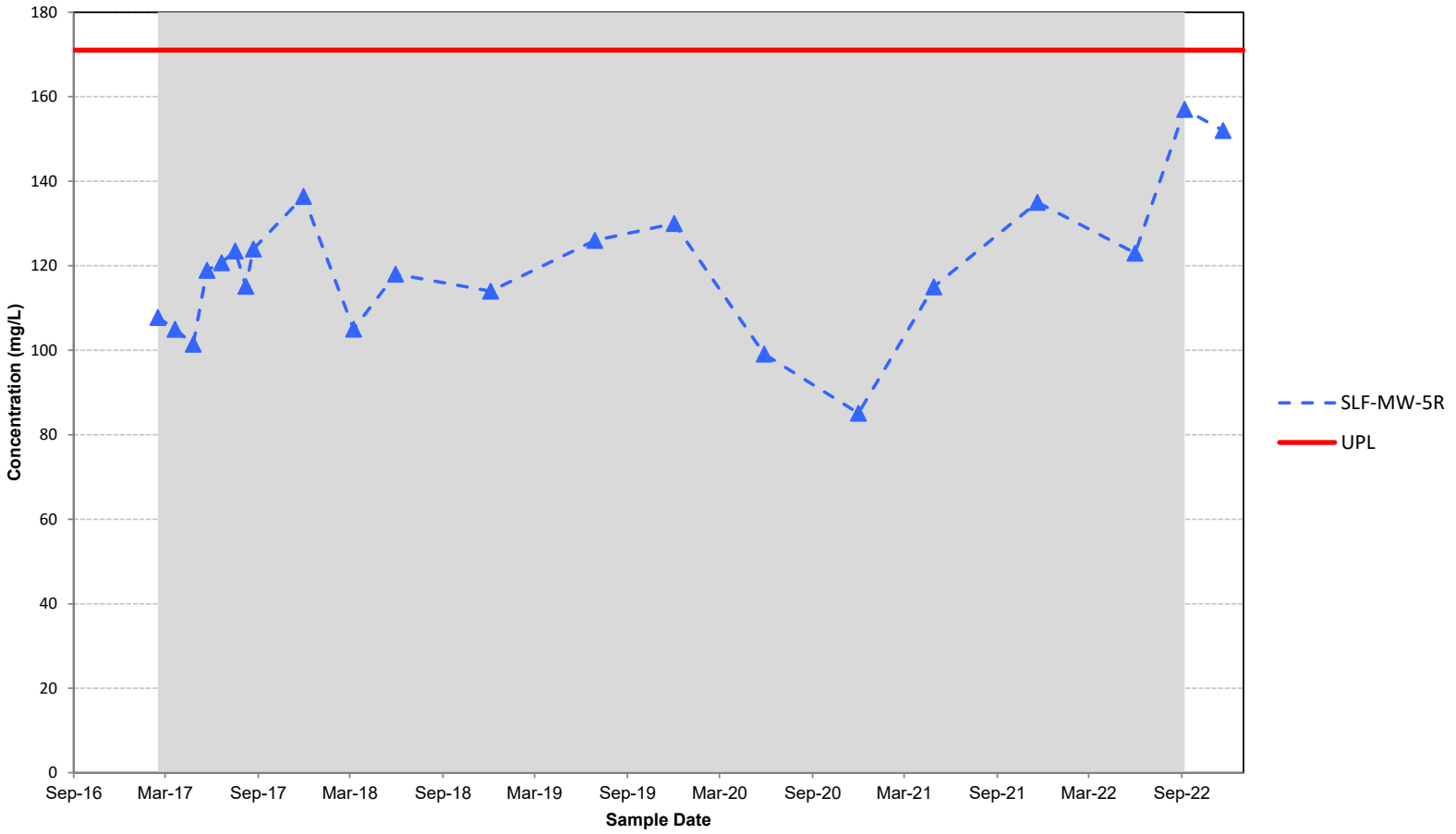
H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

BORON
CONCENTRATION VS. TIME

February 2023 **Figure F-15**



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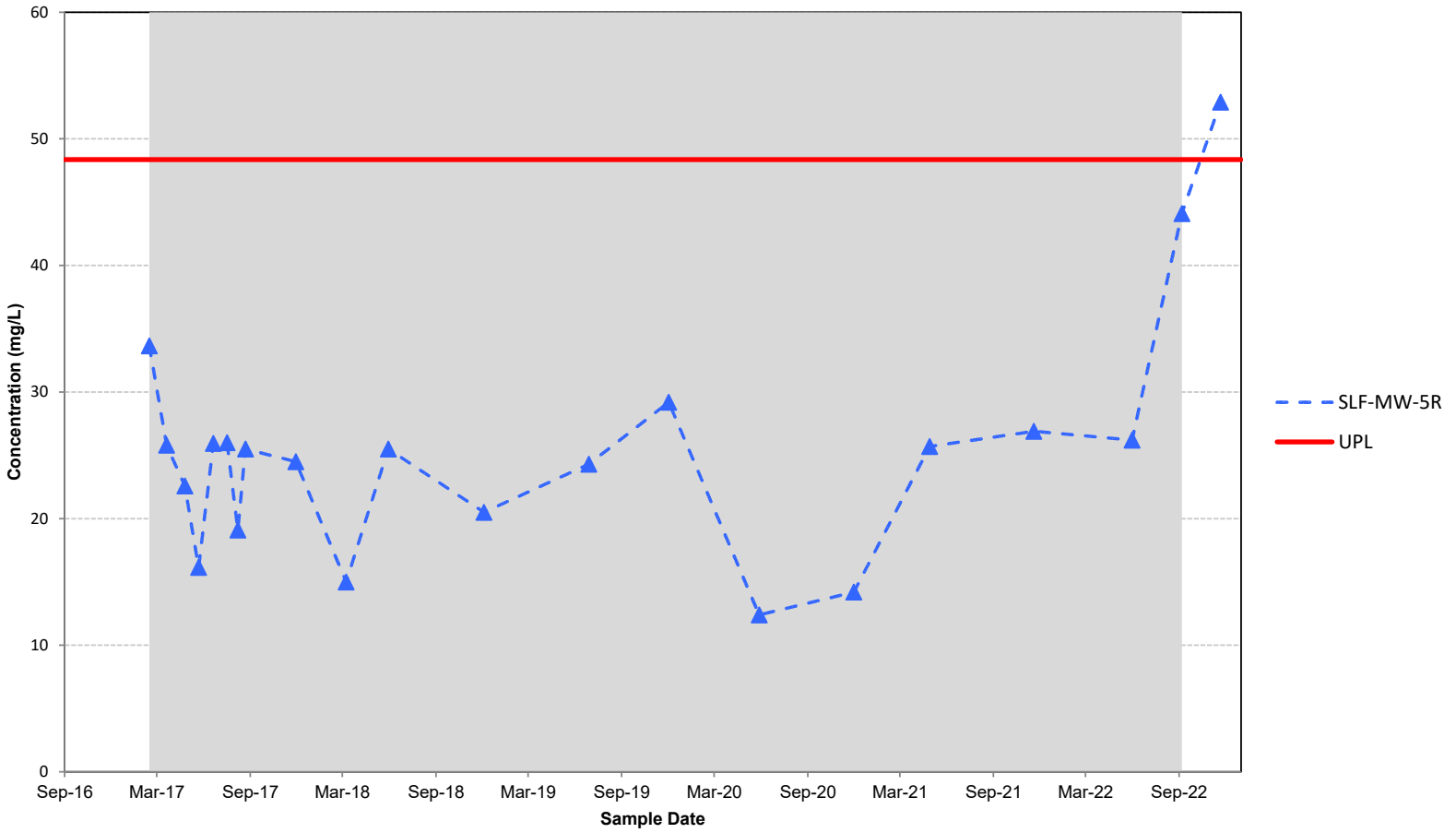
H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

CALCIUM
CONCENTRATION VS. TIME

February 2023 **Figure F-16**



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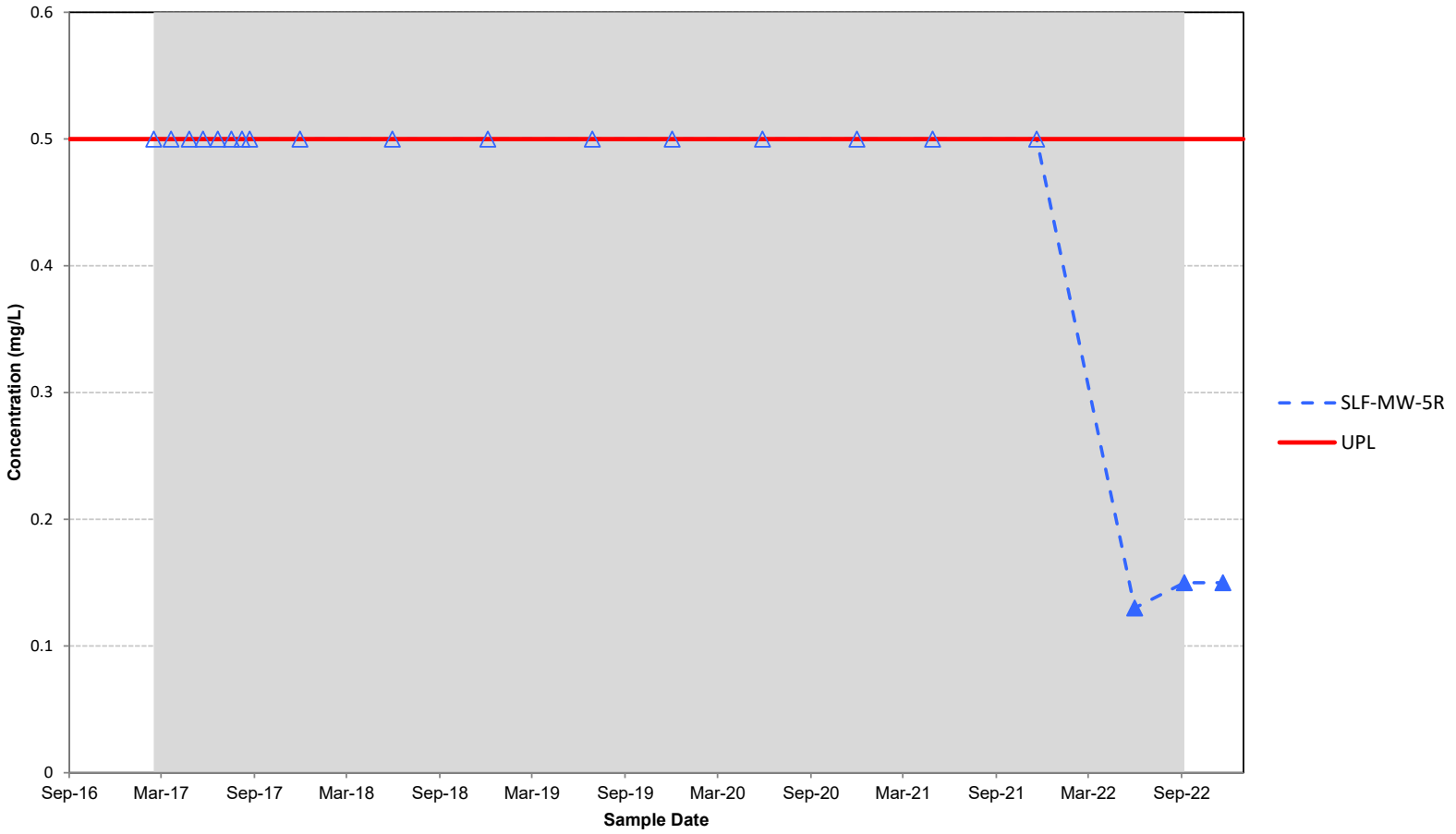
H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

CHLORIDE
CONCENTRATION VS. TIME

February 2023 **Figure F-17**



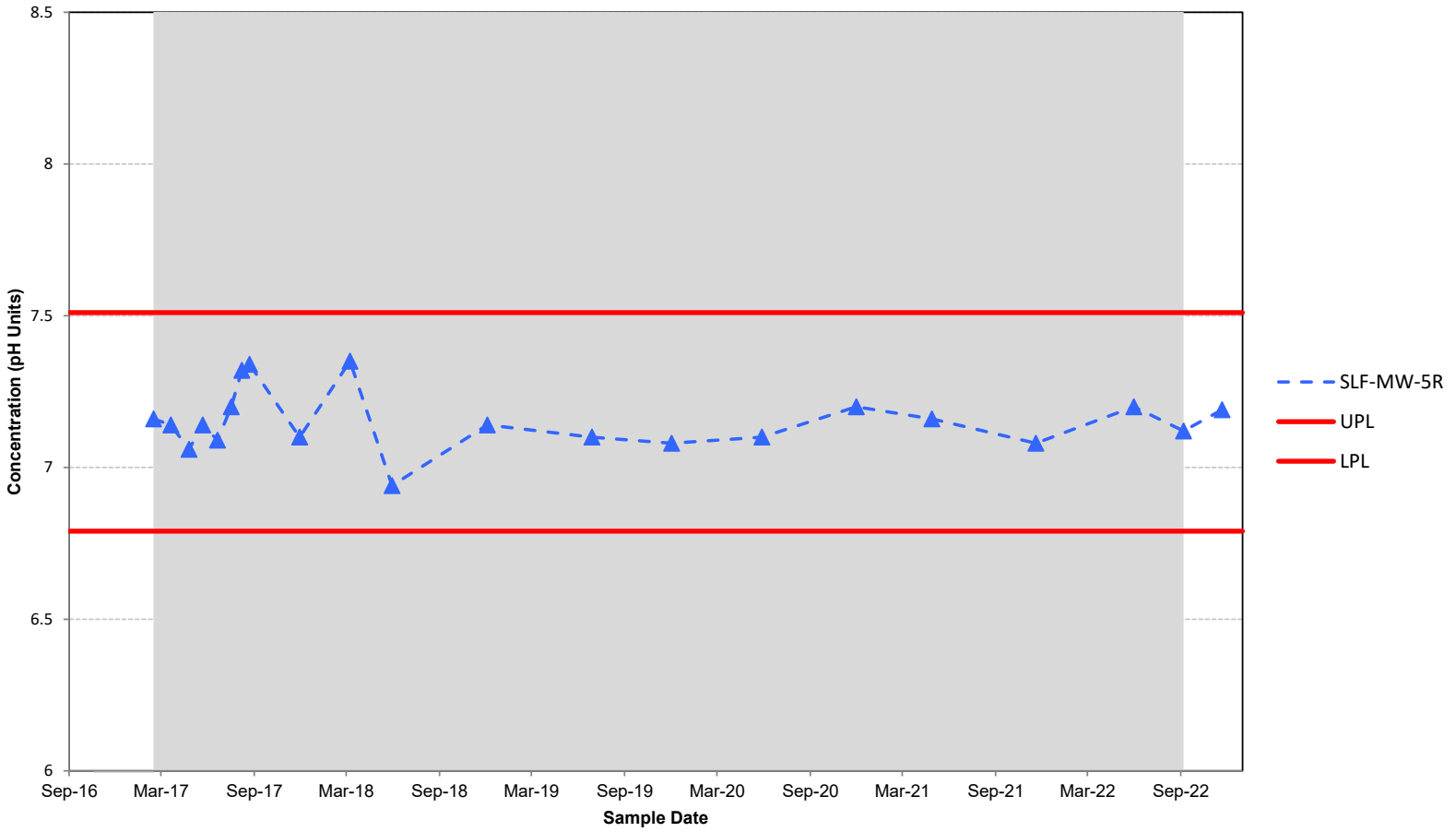
NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

FLUORIDE
CONCENTRATION VS. TIME

February 2023 **Figure F-18**



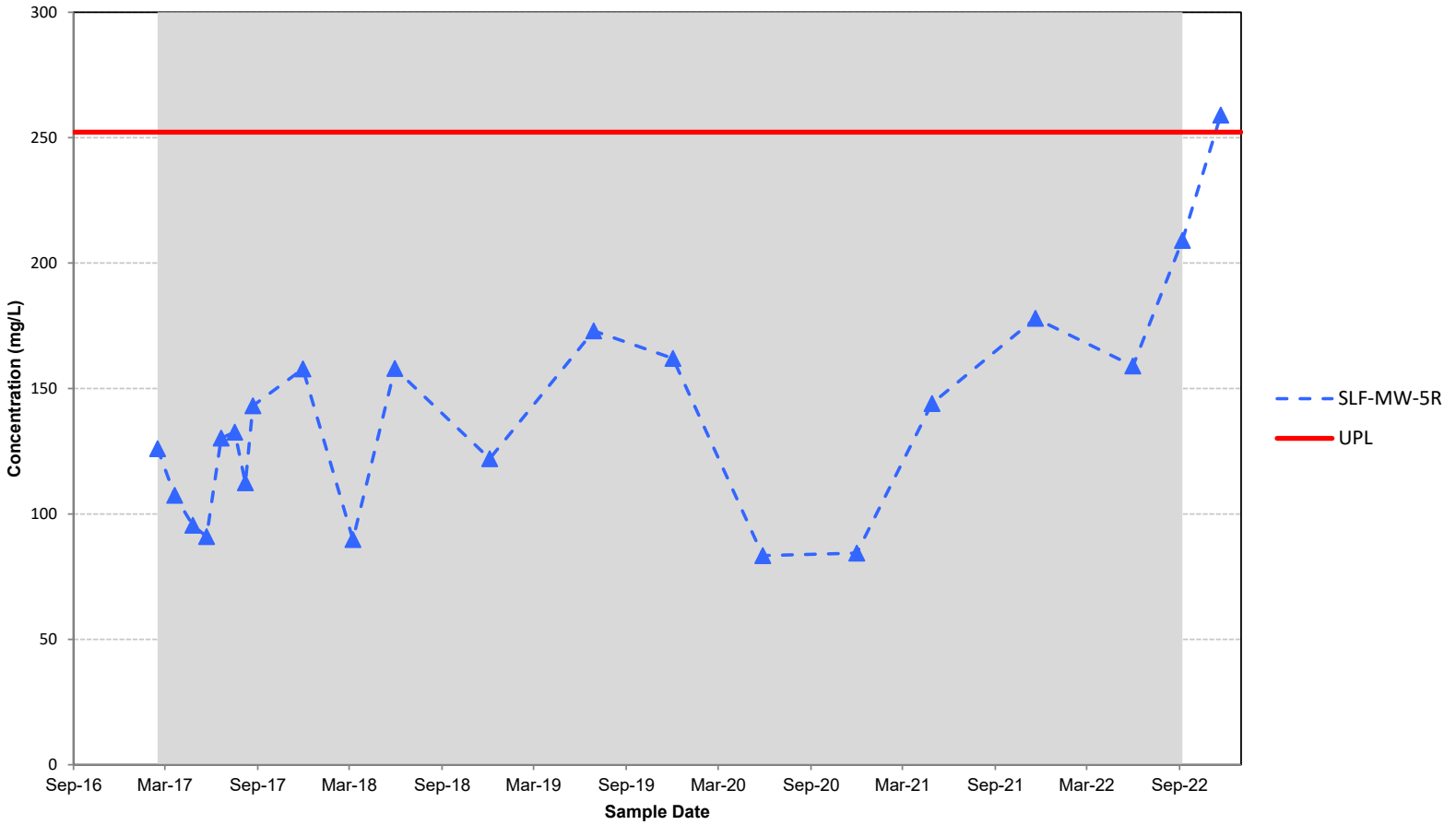
NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper and Lower Prediction Limit (UPL and LPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

PH, FIELD
CONCENTRATION VS. TIME

February 2023 **Figure F-19**



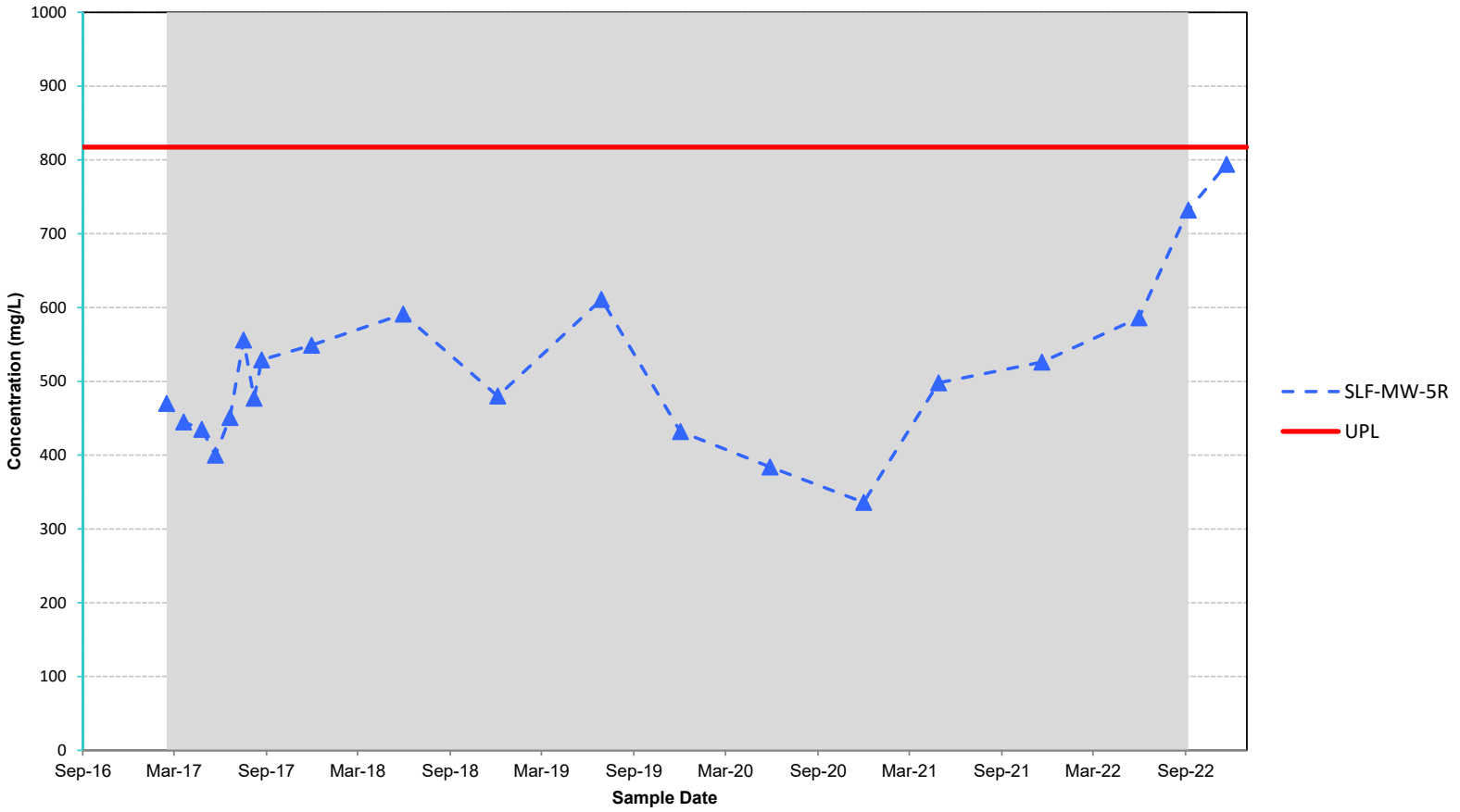
NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

SULFATE
CONCENTRATION VS. TIME

February 2023 **Figure F-20**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATION VS. TIME

February 2023 **Figure F-21**

ATTACHMENT 2

Statistical Output

Concentrations (ppb)

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 65
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	23	0 (0%)	10/21/2016	2683.12	2683.12
			11/30/2016	4817.2	4817.2
			12/28/2016	3895.84	3895.84
			1/18/2017	3956.91	3956.91
			2/14/2017	3573.57	3573.57
			3/20/2017	3806.16	3806.16
			4/25/2017	3914.41	3914.41
			5/22/2017	3891.56	3891.56
			6/20/2017	3773.44	3773.44
			7/17/2017	4668	4668
			8/8/2017	4027	4027
			8/21/2017	3197	3197
			11/29/2017	4576	4576
			5/31/2018	4370	4370
			12/4/2018	4940	4940
			6/28/2019	4410	4410
			12/2/2019	4280	4280
			5/28/2020	3390	3390
			11/30/2020	3560	3560
			4/28/2021	2900	2900
			11/19/2021	4140	4140
			5/31/2022	4010	4010
			9/6/2022	3700	3700
			11/21/2022	**3410**	**3410**
SLF-MW-3B	23	0 (0%)	10/21/2016	4238.42	4238.42
			11/30/2016	6242.46	6242.46
			12/28/2016	5154.49	5154.49
			1/18/2017	4910.63	4910.63
			2/15/2017	3595.68	3595.68
			3/20/2017	3637.76	3637.76
			4/25/2017	3392.27	3392.27
			5/22/2017	3135.58	3135.58
			6/20/2017	3335.63	3335.63
			7/17/2017	4381	4381
			8/7/2017	3684	3684
			8/21/2017	3922	3922
			11/29/2017	3860	3860
			5/30/2018	2650	2650
			12/4/2018	3490	3490
			6/27/2019	2170	2170

			12/2/2019	2220	2220
			5/28/2020	1590	1590
			12/1/2020	1920	1920
			4/28/2021	1410	1410
			11/19/2021	1900	1900
			5/31/2022	1800	1800
			9/6/2022	1760	1760
			11/21/2022	**1690**	**1690**
SLF-MW-5R	19	0 (0%)	2/14/2017	493.993	493.993
			3/20/2017	345.223	345.223
			4/25/2017	314.115	314.115
			5/22/2017	270.744	270.744
			6/20/2017	438.039	438.039
			7/17/2017	550	550
			8/7/2017	363	363
			8/22/2017	461	461
			11/29/2017	524	524
			5/30/2018	517	517
			12/4/2018	395	395
			6/28/2019	631	631
			12/2/2019	653	653
			5/28/2020	220	220
			11/30/2020	290	290
			4/28/2021	431	431
			11/19/2021	621	621
			5/31/2022	469	469
			9/6/2022	855	855
			11/21/2022	**929**	**929**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Boron

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.156053	0.258897	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	2683.12	FALSE
	11/30/2016	4817.2	FALSE
	12/28/2016	3895.84	FALSE
	1/18/2017	3956.91	FALSE
	2/14/2017	3573.57	FALSE
	3/20/2017	3806.16	FALSE
	4/25/2017	3914.41	FALSE
	5/22/2017	3891.56	FALSE
	6/20/2017	3773.44	FALSE
	7/17/2017	4668	FALSE
	8/8/2017	4027	FALSE
	8/21/2017	3197	FALSE
	11/29/2017	4576	FALSE
	5/31/2018	4370	FALSE
	12/4/2018	4940	FALSE
	6/28/2019	4410	FALSE
	12/2/2019	4280	FALSE
	5/28/2020	3390	FALSE
	11/30/2020	3560	FALSE
	4/28/2021	2900	FALSE
	11/19/2021	4140	FALSE
	5/31/2022	4010	FALSE
	9/6/2022	3700	FALSE

Shapiro-Wilks Test of Normality

Parameter: Boron

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2683.12	4940	2256.88	0.4542	1025.07
2	2900	4817.2	1917.2	0.3126	599.317
3	3197	4668	1471	0.2563	377.017
4	3390	4576	1186	0.2139	253.685
5	3560	4410	850	0.1787	151.895
6	3573.57	4370	796.43	0.148	117.872
7	3700	4280	580	0.1201	69.658
8	3773.44	4140	366.56	0.0941	34.4933
9	3806.16	4027	220.84	0.0696	15.3705
10	3891.56	4010	118.44	0.0459	5.4364
11	3895.84	3956.91	61.07	0.0228	1.3924
12	3914.41	3914.41	0		
13	3956.91	3895.84	-61.07		
14	4010	3891.56	-118.44		
15	4027	3806.16	-220.84		
16	4140	3773.44	-366.56		
17	4280	3700	-580		
18	4370	3573.57	-796.43		
19	4410	3560	-850		
20	4576	3390	-1186		
21	4668	3197	-1471		
22	4817.2	2900	-1917.2		
23	4940	2683.12	-2256.88		

Sum of b values = 2651.21
Sample Standard Deviation = 571.284
W Statistic = 0.978953

5% Critical value of 0.914 is less than 0.978953
Data is normally distributed at 95% level of significance

1% Critical value of 0.881 is less than 0.978953
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Boron

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
4817.2	2683.12	2134.08	1	0
3895.84	2683.12	1212.72	2	0
3956.91	2683.12	1273.79	3	0
3573.57	2683.12	890.45	4	0
3806.16	2683.12	1123.04	5	0
3914.41	2683.12	1231.29	6	0
3891.56	2683.12	1208.44	7	0
3773.44	2683.12	1090.32	8	0
4668	2683.12	1984.88	9	0
4027	2683.12	1343.88	10	0
3197	2683.12	513.88	11	0
4576	2683.12	1892.88	12	0
4370	2683.12	1686.88	13	0
4940	2683.12	2256.88	14	0
4410	2683.12	1726.88	15	0
4280	2683.12	1596.88	16	0
3390	2683.12	706.88	17	0
3560	2683.12	876.88	18	0
2900	2683.12	216.88	19	0
4140	2683.12	1456.88	20	0
4010	2683.12	1326.88	21	0
3700	2683.12	1016.88	22	0
3895.84	4817.2	-921.36	22	1
3956.91	4817.2	-860.29	22	2
3573.57	4817.2	-1243.63	22	3
3806.16	4817.2	-1011.04	22	4
3914.41	4817.2	-902.79	22	5
3891.56	4817.2	-925.64	22	6
3773.44	4817.2	-1043.76	22	7
4668	4817.2	-149.2	22	8
4027	4817.2	-790.2	22	9
3197	4817.2	-1620.2	22	10
4576	4817.2	-241.2	22	11
4370	4817.2	-447.2	22	12
4940	4817.2	122.8	23	12
4410	4817.2	-407.2	23	13
4280	4817.2	-537.2	23	14
3390	4817.2	-1427.2	23	15
3560	4817.2	-1257.2	23	16
2900	4817.2	-1917.2	23	17
4140	4817.2	-677.2	23	18
4010	4817.2	-807.2	23	19
3700	4817.2	-1117.2	23	20
3956.91	3895.84	61.07	24	20
3573.57	3895.84	-322.27	24	21

3806.16	3895.84	-89.68	24	22
3914.41	3895.84	18.57	25	22
3891.56	3895.84	-4.28	25	23
3773.44	3895.84	-122.4	25	24
4668	3895.84	772.16	26	24
4027	3895.84	131.16	27	24
3197	3895.84	-698.84	27	25
4576	3895.84	680.16	28	25
4370	3895.84	474.16	29	25
4940	3895.84	1044.16	30	25
4410	3895.84	514.16	31	25
4280	3895.84	384.16	32	25
3390	3895.84	-505.84	32	26
3560	3895.84	-335.84	32	27
2900	3895.84	-995.84	32	28
4140	3895.84	244.16	33	28
4010	3895.84	114.16	34	28
3700	3895.84	-195.84	34	29
3573.57	3956.91	-383.34	34	30
3806.16	3956.91	-150.75	34	31
3914.41	3956.91	-42.5	34	32
3891.56	3956.91	-65.35	34	33
3773.44	3956.91	-183.47	34	34
4668	3956.91	711.09	35	34
4027	3956.91	70.09	36	34
3197	3956.91	-759.91	36	35
4576	3956.91	619.09	37	35
4370	3956.91	413.09	38	35
4940	3956.91	983.09	39	35
4410	3956.91	453.09	40	35
4280	3956.91	323.09	41	35
3390	3956.91	-566.91	41	36
3560	3956.91	-396.91	41	37
2900	3956.91	-1056.91	41	38
4140	3956.91	183.09	42	38
4010	3956.91	53.09	43	38
3700	3956.91	-256.91	43	39
3806.16	3573.57	232.59	44	39
3914.41	3573.57	340.84	45	39
3891.56	3573.57	317.99	46	39
3773.44	3573.57	199.87	47	39
4668	3573.57	1094.43	48	39
4027	3573.57	453.43	49	39
3197	3573.57	-376.57	49	40
4576	3573.57	1002.43	50	40
4370	3573.57	796.43	51	40
4940	3573.57	1366.43	52	40
4410	3573.57	836.43	53	40
4280	3573.57	706.43	54	40
3390	3573.57	-183.57	54	41
3560	3573.57	-13.57	54	42
2900	3573.57	-673.57	54	43
4140	3573.57	566.43	55	43
4010	3573.57	436.43	56	43
3700	3573.57	126.43	57	43

3914.41	3806.16	108.25	58	43
3891.56	3806.16	85.4	59	43
3773.44	3806.16	-32.72	59	44
4668	3806.16	861.84	60	44
4027	3806.16	220.84	61	44
3197	3806.16	-609.16	61	45
4576	3806.16	769.84	62	45
4370	3806.16	563.84	63	45
4940	3806.16	1133.84	64	45
4410	3806.16	603.84	65	45
4280	3806.16	473.84	66	45
3390	3806.16	-416.16	66	46
3560	3806.16	-246.16	66	47
2900	3806.16	-906.16	66	48
4140	3806.16	333.84	67	48
4010	3806.16	203.84	68	48
3700	3806.16	-106.16	68	49
3891.56	3914.41	-22.85	68	50
3773.44	3914.41	-140.97	68	51
4668	3914.41	753.59	69	51
4027	3914.41	112.59	70	51
3197	3914.41	-717.41	70	52
4576	3914.41	661.59	71	52
4370	3914.41	455.59	72	52
4940	3914.41	1025.59	73	52
4410	3914.41	495.59	74	52
4280	3914.41	365.59	75	52
3390	3914.41	-524.41	75	53
3560	3914.41	-354.41	75	54
2900	3914.41	-1014.41	75	55
4140	3914.41	225.59	76	55
4010	3914.41	95.59	77	55
3700	3914.41	-214.41	77	56
3773.44	3891.56	-118.12	77	57
4668	3891.56	776.44	78	57
4027	3891.56	135.44	79	57
3197	3891.56	-694.56	79	58
4576	3891.56	684.44	80	58
4370	3891.56	478.44	81	58
4940	3891.56	1048.44	82	58
4410	3891.56	518.44	83	58
4280	3891.56	388.44	84	58
3390	3891.56	-501.56	84	59
3560	3891.56	-331.56	84	60
2900	3891.56	-991.56	84	61
4140	3891.56	248.44	85	61
4010	3891.56	118.44	86	61
3700	3891.56	-191.56	86	62
4668	3773.44	894.56	87	62
4027	3773.44	253.56	88	62
3197	3773.44	-576.44	88	63
4576	3773.44	802.56	89	63
4370	3773.44	596.56	90	63

4940	3773.44	1166.56	91	63
4410	3773.44	636.56	92	63
4280	3773.44	506.56	93	63
3390	3773.44	-383.44	93	64
3560	3773.44	-213.44	93	65
2900	3773.44	-873.44	93	66
4140	3773.44	366.56	94	66
4010	3773.44	236.56	95	66
3700	3773.44	-73.44	95	67
4027	4668	-641	95	68
3197	4668	-1471	95	69
4576	4668	-92	95	70
4370	4668	-298	95	71
4940	4668	272	96	71
4410	4668	-258	96	72
4280	4668	-388	96	73
3390	4668	-1278	96	74
3560	4668	-1108	96	75
2900	4668	-1768	96	76
4140	4668	-528	96	77
4010	4668	-658	96	78
3700	4668	-968	96	79
3197	4027	-830	96	80
4576	4027	549	97	80
4370	4027	343	98	80
4940	4027	913	99	80
4410	4027	383	100	80
4280	4027	253	101	80
3390	4027	-637	101	81
3560	4027	-467	101	82
2900	4027	-1127	101	83
4140	4027	113	102	83
4010	4027	-17	102	84
3700	4027	-327	102	85
4576	3197	1379	103	85
4370	3197	1173	104	85
4940	3197	1743	105	85
4410	3197	1213	106	85
4280	3197	1083	107	85
3390	3197	193	108	85
3560	3197	363	109	85
2900	3197	-297	109	86
4140	3197	943	110	86
4010	3197	813	111	86
3700	3197	503	112	86
4370	4576	-206	112	87
4940	4576	364	113	87
4410	4576	-166	113	88
4280	4576	-296	113	89
3390	4576	-1186	113	90
3560	4576	-1016	113	91
2900	4576	-1676	113	92
4140	4576	-436	113	93

4010	4576	-566	113	94
3700	4576	-876	113	95
4940	4370	570	114	95
4410	4370	40	115	95
4280	4370	-90	115	96
3390	4370	-980	115	97
3560	4370	-810	115	98
2900	4370	-1470	115	99
4140	4370	-230	115	100
4010	4370	-360	115	101
3700	4370	-670	115	102
4410	4940	-530	115	103
4280	4940	-660	115	104
3390	4940	-1550	115	105
3560	4940	-1380	115	106
2900	4940	-2040	115	107
4140	4940	-800	115	108
4010	4940	-930	115	109
3700	4940	-1240	115	110
4280	4410	-130	115	111
3390	4410	-1020	115	112
3560	4410	-850	115	113
2900	4410	-1510	115	114
4140	4410	-270	115	115
4010	4410	-400	115	116
3700	4410	-710	115	117
3390	4280	-890	115	118
3560	4280	-720	115	119
2900	4280	-1380	115	120
4140	4280	-140	115	121
4010	4280	-270	115	122
3700	4280	-580	115	123
3560	3390	170	116	123
2900	3390	-490	116	124
4140	3390	750	117	124
4010	3390	620	118	124
3700	3390	310	119	124
2900	3560	-660	119	125
4140	3560	580	120	125
4010	3560	450	121	125
3700	3560	140	122	125
4140	2900	1240	123	125
4010	2900	1110	124	125
3700	2900	800	125	125
4010	4140	-130	125	126
3700	4140	-440	125	127
3700	4010	-310	125	128

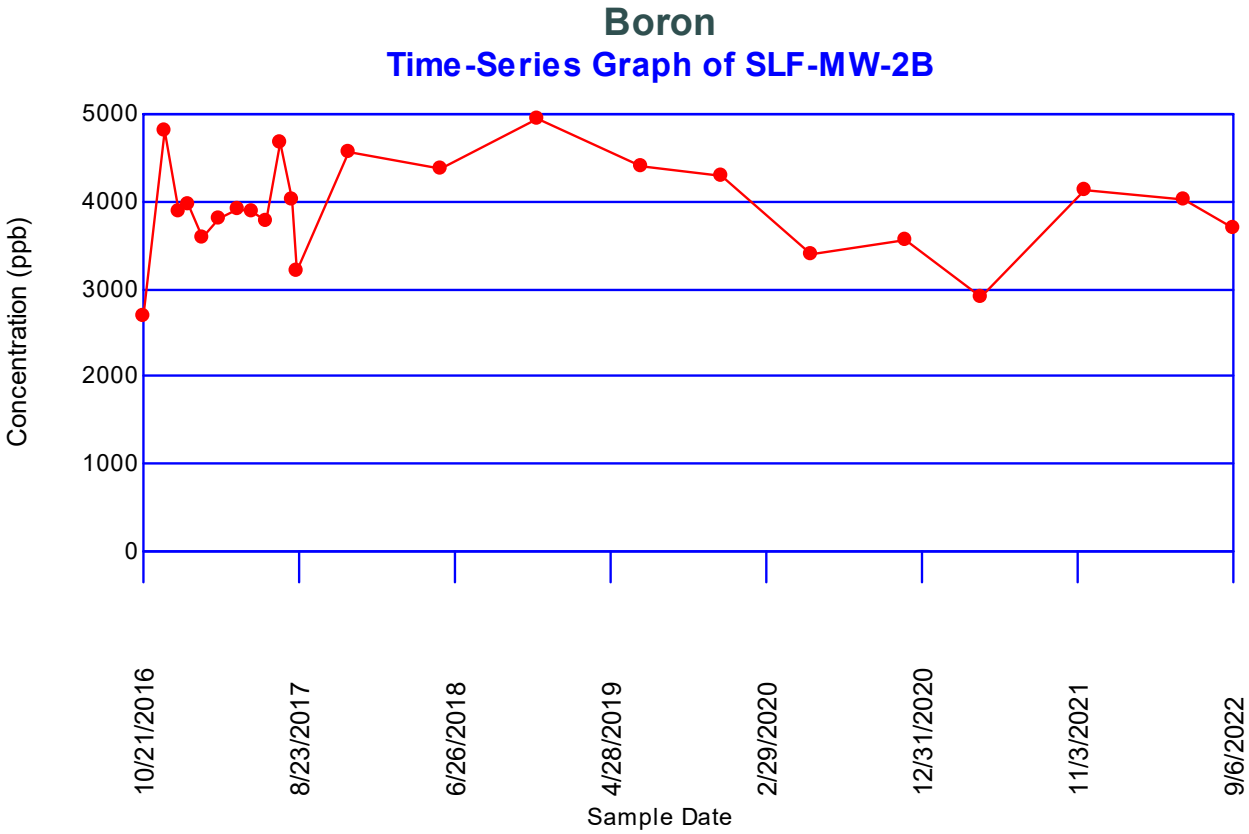
S Statistic = 125 - 128 = -3

Tied Group	Value	Members

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1433.67
Z-Score = -0.0528209
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.0528209| <= 1.97737 indicating no evidence of a trend


Boron
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
5000
4000
3000
2000
1000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Boron

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.29712	0.099982	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	4238.42	FALSE
	11/30/2016	6242.46	FALSE
	12/28/2016	5154.49	FALSE
	1/18/2017	4910.63	FALSE
	2/15/2017	3595.68	FALSE
	3/20/2017	3637.76	FALSE
	4/25/2017	3392.27	FALSE
	5/22/2017	3135.58	FALSE
	6/20/2017	3335.63	FALSE
	7/17/2017	4381	FALSE
	8/7/2017	3684	FALSE
	8/21/2017	3922	FALSE
	11/29/2017	3860	FALSE
	5/30/2018	2650	FALSE
	12/4/2018	3490	FALSE
	6/27/2019	2170	FALSE
	12/2/2019	2220	FALSE
	5/28/2020	1590	FALSE
	12/1/2020	1920	FALSE
	4/28/2021	1410	FALSE
	11/19/2021	1900	FALSE
	5/31/2022	1800	FALSE
	9/6/2022	1760	FALSE

Shapiro-Wilks Test of Normality

Parameter: Boron

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1410	6242.46	4832.46	0.4542	2194.9
2	1590	5154.49	3564.49	0.3126	1114.26
3	1760	4910.63	3150.63	0.2563	807.506
4	1800	4381	2581	0.2139	552.076
5	1900	4238.42	2338.42	0.1787	417.876
6	1920	3922	2002	0.148	296.296
7	2170	3860	1690	0.1201	202.969
8	2220	3684	1464	0.0941	137.762
9	2650	3637.76	987.76	0.0696	68.7481
10	3135.58	3595.68	460.1	0.0459	21.1186
11	3335.63	3490	154.37	0.0228	3.51964
12	3392.27	3392.27	0		
13	3490	3335.63	-154.37		
14	3595.68	3135.58	-460.1		
15	3637.76	2650	-987.76		
16	3684	2220	-1464		
17	3860	2170	-1690		
18	3922	1920	-2002		
19	4238.42	1900	-2338.42		
20	4381	1800	-2581		
21	4910.63	1760	-3150.63		
22	5154.49	1590	-3564.49		
23	6242.46	1410	-4832.46		

Sum of b values = 5817.03
Sample Standard Deviation = 1272.31
W Statistic = 0.950154

5% Critical value of 0.914 is less than 0.950154
Data is normally distributed at 95% level of significance

1% Critical value of 0.881 is less than 0.950154
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Boron

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
6242.46	4238.42	2004.04	1	0
5154.49	4238.42	916.07	2	0
4910.63	4238.42	672.21	3	0
3595.68	4238.42	-642.74	3	1
3637.76	4238.42	-600.66	3	2
3392.27	4238.42	-846.15	3	3
3135.58	4238.42	-1102.84	3	4
3335.63	4238.42	-902.79	3	5
4381	4238.42	142.58	4	5
3684	4238.42	-554.42	4	6
3922	4238.42	-316.42	4	7
3860	4238.42	-378.42	4	8
2650	4238.42	-1588.42	4	9
3490	4238.42	-748.42	4	10
2170	4238.42	-2068.42	4	11
2220	4238.42	-2018.42	4	12
1590	4238.42	-2648.42	4	13
1920	4238.42	-2318.42	4	14
1410	4238.42	-2828.42	4	15
1900	4238.42	-2338.42	4	16
1800	4238.42	-2438.42	4	17
1760	4238.42	-2478.42	4	18
5154.49	6242.46	-1087.97	4	19
4910.63	6242.46	-1331.83	4	20
3595.68	6242.46	-2646.78	4	21
3637.76	6242.46	-2604.7	4	22
3392.27	6242.46	-2850.19	4	23
3135.58	6242.46	-3106.88	4	24
3335.63	6242.46	-2906.83	4	25
4381	6242.46	-1861.46	4	26
3684	6242.46	-2558.46	4	27
3922	6242.46	-2320.46	4	28
3860	6242.46	-2382.46	4	29
2650	6242.46	-3592.46	4	30
3490	6242.46	-2752.46	4	31
2170	6242.46	-4072.46	4	32
2220	6242.46	-4022.46	4	33
1590	6242.46	-4652.46	4	34
1920	6242.46	-4322.46	4	35
1410	6242.46	-4832.46	4	36
1900	6242.46	-4342.46	4	37
1800	6242.46	-4442.46	4	38
1760	6242.46	-4482.46	4	39
4910.63	5154.49	-243.86	4	40
3595.68	5154.49	-1558.81	4	41

3637.76	5154.49	-1516.73	4	42
3392.27	5154.49	-1762.22	4	43
3135.58	5154.49	-2018.91	4	44
3335.63	5154.49	-1818.86	4	45
4381	5154.49	-773.49	4	46
3684	5154.49	-1470.49	4	47
3922	5154.49	-1232.49	4	48
3860	5154.49	-1294.49	4	49
2650	5154.49	-2504.49	4	50
3490	5154.49	-1664.49	4	51
2170	5154.49	-2984.49	4	52
2220	5154.49	-2934.49	4	53
1590	5154.49	-3564.49	4	54
1920	5154.49	-3234.49	4	55
1410	5154.49	-3744.49	4	56
1900	5154.49	-3254.49	4	57
1800	5154.49	-3354.49	4	58
1760	5154.49	-3394.49	4	59
3595.68	4910.63	-1314.95	4	60
3637.76	4910.63	-1272.87	4	61
3392.27	4910.63	-1518.36	4	62
3135.58	4910.63	-1775.05	4	63
3335.63	4910.63	-1575	4	64
4381	4910.63	-529.63	4	65
3684	4910.63	-1226.63	4	66
3922	4910.63	-988.63	4	67
3860	4910.63	-1050.63	4	68
2650	4910.63	-2260.63	4	69
3490	4910.63	-1420.63	4	70
2170	4910.63	-2740.63	4	71
2220	4910.63	-2690.63	4	72
1590	4910.63	-3320.63	4	73
1920	4910.63	-2990.63	4	74
1410	4910.63	-3500.63	4	75
1900	4910.63	-3010.63	4	76
1800	4910.63	-3110.63	4	77
1760	4910.63	-3150.63	4	78
3637.76	3595.68	42.08	5	78
3392.27	3595.68	-203.41	5	79
3135.58	3595.68	-460.1	5	80
3335.63	3595.68	-260.05	5	81
4381	3595.68	785.32	6	81
3684	3595.68	88.32	7	81
3922	3595.68	326.32	8	81
3860	3595.68	264.32	9	81
2650	3595.68	-945.68	9	82
3490	3595.68	-105.68	9	83
2170	3595.68	-1425.68	9	84
2220	3595.68	-1375.68	9	85
1590	3595.68	-2005.68	9	86
1920	3595.68	-1675.68	9	87
1410	3595.68	-2185.68	9	88
1900	3595.68	-1695.68	9	89
1800	3595.68	-1795.68	9	90
1760	3595.68	-1835.68	9	91

3392.27	3637.76	-245.49	9	92
3135.58	3637.76	-502.18	9	93
3335.63	3637.76	-302.13	9	94
4381	3637.76	743.24	10	94
3684	3637.76	46.24	11	94
3922	3637.76	284.24	12	94
3860	3637.76	222.24	13	94
2650	3637.76	-987.76	13	95
3490	3637.76	-147.76	13	96
2170	3637.76	-1467.76	13	97
2220	3637.76	-1417.76	13	98
1590	3637.76	-2047.76	13	99
1920	3637.76	-1717.76	13	100
1410	3637.76	-2227.76	13	101
1900	3637.76	-1737.76	13	102
1800	3637.76	-1837.76	13	103
1760	3637.76	-1877.76	13	104
3135.58	3392.27	-256.69	13	105
3335.63	3392.27	-56.64	13	106
4381	3392.27	988.73	14	106
3684	3392.27	291.73	15	106
3922	3392.27	529.73	16	106
3860	3392.27	467.73	17	106
2650	3392.27	-742.27	17	107
3490	3392.27	97.73	18	107
2170	3392.27	-1222.27	18	108
2220	3392.27	-1172.27	18	109
1590	3392.27	-1802.27	18	110
1920	3392.27	-1472.27	18	111
1410	3392.27	-1982.27	18	112
1900	3392.27	-1492.27	18	113
1800	3392.27	-1592.27	18	114
1760	3392.27	-1632.27	18	115
3335.63	3135.58	200.05	19	115
4381	3135.58	1245.42	20	115
3684	3135.58	548.42	21	115
3922	3135.58	786.42	22	115
3860	3135.58	724.42	23	115
2650	3135.58	-485.58	23	116
3490	3135.58	354.42	24	116
2170	3135.58	-965.58	24	117
2220	3135.58	-915.58	24	118
1590	3135.58	-1545.58	24	119
1920	3135.58	-1215.58	24	120
1410	3135.58	-1725.58	24	121
1900	3135.58	-1235.58	24	122
1800	3135.58	-1335.58	24	123
1760	3135.58	-1375.58	24	124
4381	3335.63	1045.37	25	124
3684	3335.63	348.37	26	124
3922	3335.63	586.37	27	124
3860	3335.63	524.37	28	124
2650	3335.63	-685.63	28	125

3490	3335.63	154.37	29	125
2170	3335.63	-1165.63	29	126
2220	3335.63	-1115.63	29	127
1590	3335.63	-1745.63	29	128
1920	3335.63	-1415.63	29	129
1410	3335.63	-1925.63	29	130
1900	3335.63	-1435.63	29	131
1800	3335.63	-1535.63	29	132
1760	3335.63	-1575.63	29	133
3684	4381	-697	29	134
3922	4381	-459	29	135
3860	4381	-521	29	136
2650	4381	-1731	29	137
3490	4381	-891	29	138
2170	4381	-2211	29	139
2220	4381	-2161	29	140
1590	4381	-2791	29	141
1920	4381	-2461	29	142
1410	4381	-2971	29	143
1900	4381	-2481	29	144
1800	4381	-2581	29	145
1760	4381	-2621	29	146
3922	3684	238	30	146
3860	3684	176	31	146
2650	3684	-1034	31	147
3490	3684	-194	31	148
2170	3684	-1514	31	149
2220	3684	-1464	31	150
1590	3684	-2094	31	151
1920	3684	-1764	31	152
1410	3684	-2274	31	153
1900	3684	-1784	31	154
1800	3684	-1884	31	155
1760	3684	-1924	31	156
3860	3922	-62	31	157
2650	3922	-1272	31	158
3490	3922	-432	31	159
2170	3922	-1752	31	160
2220	3922	-1702	31	161
1590	3922	-2332	31	162
1920	3922	-2002	31	163
1410	3922	-2512	31	164
1900	3922	-2022	31	165
1800	3922	-2122	31	166
1760	3922	-2162	31	167
2650	3860	-1210	31	168
3490	3860	-370	31	169
2170	3860	-1690	31	170
2220	3860	-1640	31	171
1590	3860	-2270	31	172
1920	3860	-1940	31	173
1410	3860	-2450	31	174
1900	3860	-1960	31	175

1800	3860	-2060	31	176
1760	3860	-2100	31	177
3490	2650	840	32	177
2170	2650	-480	32	178
2220	2650	-430	32	179
1590	2650	-1060	32	180
1920	2650	-730	32	181
1410	2650	-1240	32	182
1900	2650	-750	32	183
1800	2650	-850	32	184
1760	2650	-890	32	185
2170	3490	-1320	32	186
2220	3490	-1270	32	187
1590	3490	-1900	32	188
1920	3490	-1570	32	189
1410	3490	-2080	32	190
1900	3490	-1590	32	191
1800	3490	-1690	32	192
1760	3490	-1730	32	193
2220	2170	50	33	193
1590	2170	-580	33	194
1920	2170	-250	33	195
1410	2170	-760	33	196
1900	2170	-270	33	197
1800	2170	-370	33	198
1760	2170	-410	33	199
1590	2220	-630	33	200
1920	2220	-300	33	201
1410	2220	-810	33	202
1900	2220	-320	33	203
1800	2220	-420	33	204
1760	2220	-460	33	205
1920	1590	330	34	205
1410	1590	-180	34	206
1900	1590	310	35	206
1800	1590	210	36	206
1760	1590	170	37	206
1410	1920	-510	37	207
1900	1920	-20	37	208
1800	1920	-120	37	209
1760	1920	-160	37	210
1900	1410	490	38	210
1800	1410	390	39	210
1760	1410	350	40	210
1800	1900	-100	40	211
1760	1900	-140	40	212
1760	1800	-40	40	213

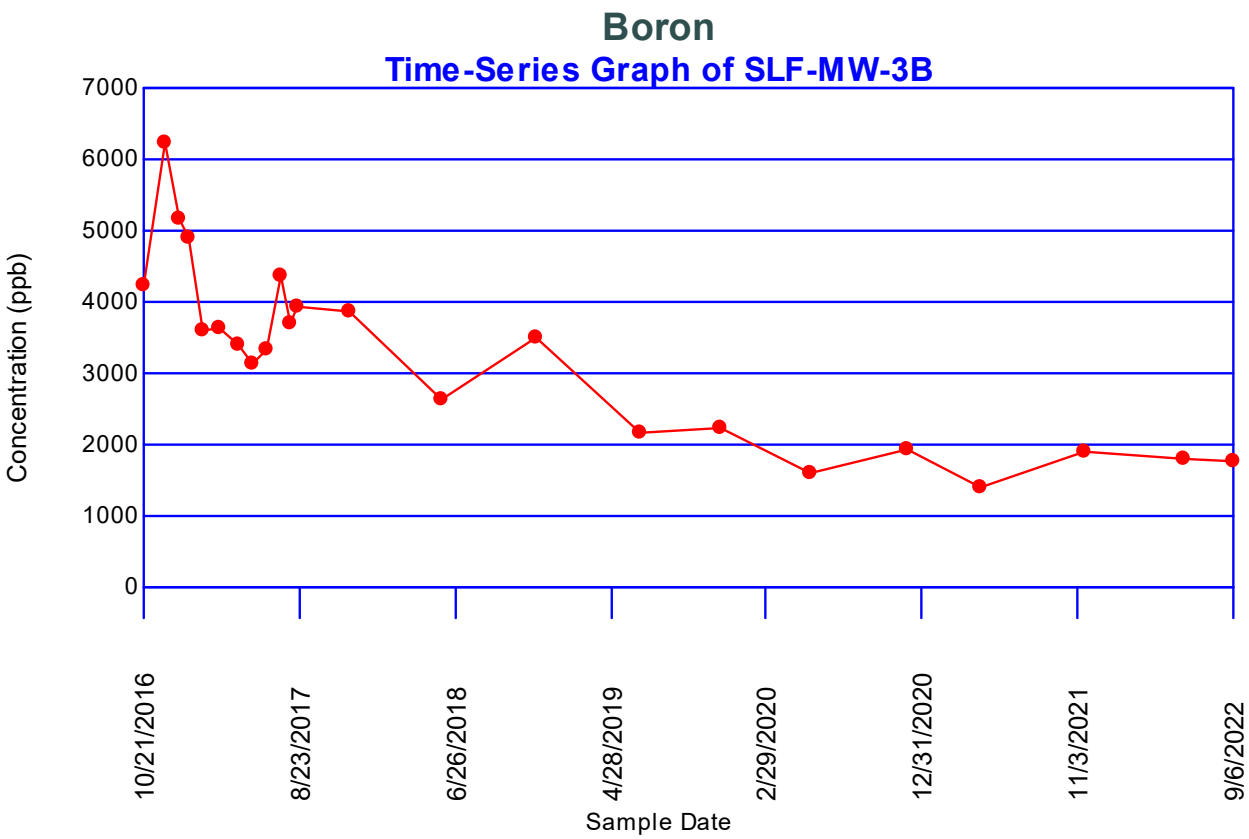
S Statistic = 40 - 213 = -173

Tied Group	Value	Members

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1433.67
Z-Score = -4.5426
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-4.5426| > 1.97737 indicating a trend


Boron
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
7000
6000
5000
4000
3000
2000
1000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Boron

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 19 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.39646	0.170316	0.462	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	493.993	FALSE
	3/20/2017	345.223	FALSE
	4/25/2017	314.115	FALSE
	5/22/2017	270.744	FALSE
	6/20/2017	438.039	FALSE
	7/17/2017	550	FALSE
	8/7/2017	363	FALSE
	8/22/2017	461	FALSE
	11/29/2017	524	FALSE
	5/30/2018	517	FALSE
	12/4/2018	395	FALSE
	6/28/2019	631	FALSE
	12/2/2019	653	FALSE
	5/28/2020	220	FALSE
	11/30/2020	290	FALSE
	4/28/2021	431	FALSE
	11/19/2021	621	FALSE
	5/31/2022	469	FALSE
	9/6/2022	855	FALSE

Shapiro-Wilks Test of Normality

Parameter: Boron

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 9 for 19 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	220	855	635	0.4808	305.308
2	270.744	653	382.256	0.3232	123.545
3	290	631	341	0.2561	87.3301
4	314.115	621	306.885	0.2059	63.1876
5	345.223	550	204.777	0.1641	33.6039
6	363	524	161	0.1271	20.4631
7	395	517	122	0.0932	11.3704
8	431	493.993	62.993	0.0612	3.85517
9	438.039	469	30.961	0.0303	0.938118
10	461	461	0		
11	469	438.039	-30.961		
12	493.993	431	-62.993		
13	517	395	-122		
14	524	363	-161		
15	550	345.223	-204.777		
16	621	314.115	-306.885		
17	631	290	-341		
18	653	270.744	-382.256		
19	855	220	-635		

Sum of b values = 649.602
Sample Standard Deviation = 155.689
W Statistic = 0.967181

5% Critical value of 0.901 is less than 0.967181
Data is normally distributed at 95% level of significance

1% Critical value of 0.863 is less than 0.967181
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Boron

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
345.223	493.993	-148.77	0	1
314.115	493.993	-179.878	0	2
270.744	493.993	-223.249	0	3
438.039	493.993	-55.954	0	4
550	493.993	56.007	1	4
363	493.993	-130.993	1	5
461	493.993	-32.993	1	6
524	493.993	30.007	2	6
517	493.993	23.007	3	6
395	493.993	-98.993	3	7
631	493.993	137.007	4	7
653	493.993	159.007	5	7
220	493.993	-273.993	5	8
290	493.993	-203.993	5	9
431	493.993	-62.993	5	10
621	493.993	127.007	6	10
469	493.993	-24.993	6	11
855	493.993	361.007	7	11
314.115	345.223	-31.108	7	12
270.744	345.223	-74.479	7	13
438.039	345.223	92.816	8	13
550	345.223	204.777	9	13
363	345.223	17.777	10	13
461	345.223	115.777	11	13
524	345.223	178.777	12	13
517	345.223	171.777	13	13
395	345.223	49.777	14	13
631	345.223	285.777	15	13
653	345.223	307.777	16	13
220	345.223	-125.223	16	14
290	345.223	-55.223	16	15
431	345.223	85.777	17	15
621	345.223	275.777	18	15
469	345.223	123.777	19	15
855	345.223	509.777	20	15
270.744	314.115	-43.371	20	16
438.039	314.115	123.924	21	16
550	314.115	235.885	22	16
363	314.115	48.885	23	16
461	314.115	146.885	24	16
524	314.115	209.885	25	16
517	314.115	202.885	26	16
395	314.115	80.885	27	16
631	314.115	316.885	28	16
653	314.115	338.885	29	16

220	314.115	-94.115	29	17
290	314.115	-24.115	29	18
431	314.115	116.885	30	18
621	314.115	306.885	31	18
469	314.115	154.885	32	18
855	314.115	540.885	33	18
438.039	270.744	167.295	34	18
550	270.744	279.256	35	18
363	270.744	92.256	36	18
461	270.744	190.256	37	18
524	270.744	253.256	38	18
517	270.744	246.256	39	18
395	270.744	124.256	40	18
631	270.744	360.256	41	18
653	270.744	382.256	42	18
220	270.744	-50.744	42	19
290	270.744	19.256	43	19
431	270.744	160.256	44	19
621	270.744	350.256	45	19
469	270.744	198.256	46	19
855	270.744	584.256	47	19
550	438.039	111.961	48	19
363	438.039	-75.039	48	20
461	438.039	22.961	49	20
524	438.039	85.961	50	20
517	438.039	78.961	51	20
395	438.039	-43.039	51	21
631	438.039	192.961	52	21
653	438.039	214.961	53	21
220	438.039	-218.039	53	22
290	438.039	-148.039	53	23
431	438.039	-7.039	53	24
621	438.039	182.961	54	24
469	438.039	30.961	55	24
855	438.039	416.961	56	24
363	550	-187	56	25
461	550	-89	56	26
524	550	-26	56	27
517	550	-33	56	28
395	550	-155	56	29
631	550	81	57	29
653	550	103	58	29
220	550	-330	58	30
290	550	-260	58	31
431	550	-119	58	32
621	550	71	59	32
469	550	-81	59	33
855	550	305	60	33
461	363	98	61	33
524	363	161	62	33
517	363	154	63	33
395	363	32	64	33
631	363	268	65	33

653	363	290	66	33
220	363	-143	66	34
290	363	-73	66	35
431	363	68	67	35
621	363	258	68	35
469	363	106	69	35
855	363	492	70	35
524	461	63	71	35
517	461	56	72	35
395	461	-66	72	36
631	461	170	73	36
653	461	192	74	36
220	461	-241	74	37
290	461	-171	74	38
431	461	-30	74	39
621	461	160	75	39
469	461	8	76	39
855	461	394	77	39
517	524	-7	77	40
395	524	-129	77	41
631	524	107	78	41
653	524	129	79	41
220	524	-304	79	42
290	524	-234	79	43
431	524	-93	79	44
621	524	97	80	44
469	524	-55	80	45
855	524	331	81	45
395	517	-122	81	46
631	517	114	82	46
653	517	136	83	46
220	517	-297	83	47
290	517	-227	83	48
431	517	-86	83	49
621	517	104	84	49
469	517	-48	84	50
855	517	338	85	50
631	395	236	86	50
653	395	258	87	50
220	395	-175	87	51
290	395	-105	87	52
431	395	36	88	52
621	395	226	89	52
469	395	74	90	52
855	395	460	91	52
653	631	22	92	52
220	631	-411	92	53
290	631	-341	92	54
431	631	-200	92	55
621	631	-10	92	56
469	631	-162	92	57
855	631	224	93	57

220	653	-433	93	58
290	653	-363	93	59
431	653	-222	93	60
621	653	-32	93	61
469	653	-184	93	62
855	653	202	94	62
290	220	70	95	62
431	220	211	96	62
621	220	401	97	62
469	220	249	98	62
855	220	635	99	62
431	290	141	100	62
621	290	331	101	62
469	290	179	102	62
855	290	565	103	62
621	431	190	104	62
469	431	38	105	62
855	431	424	106	62
469	621	-152	106	63
855	621	234	107	63
855	469	386	108	63

S Statistic = 108 - 63 = 45

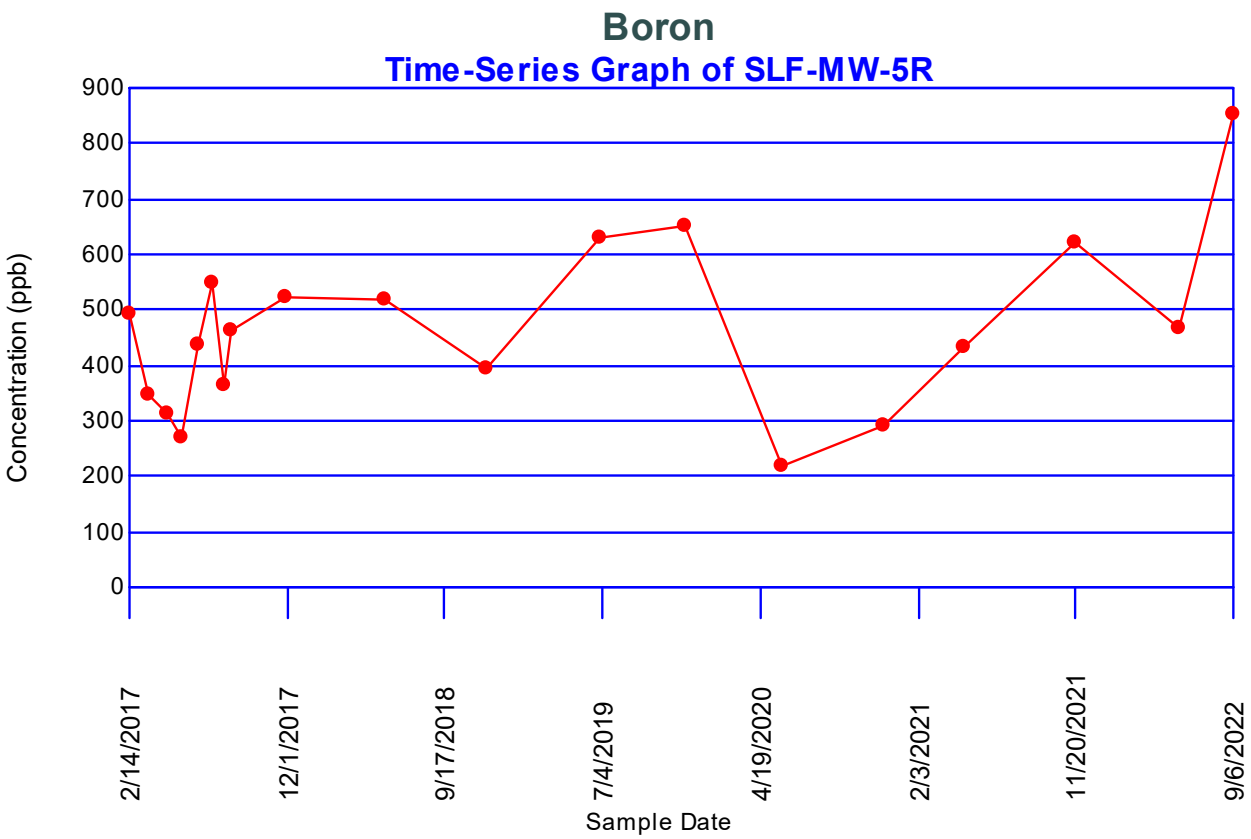
Tied Group	Value	Members

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0

C = 0
D = 0
E = 0
F = 0
a = 14706
b = 52326
c = 684
Group Variance = 817
Z-Score = 1.53937
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.53937| <= 1.97737 indicating no evidence of a trend


Boron
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
900
800
700
600
500
400
300
200
100
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 68
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	24	0 (0%)	10/21/2016	37032.2	37032.2
			11/30/2016	61315.7	61315.7
			12/28/2016	44056.6	44056.6
			1/18/2017	35837.4	35837.4
			2/14/2017	37524.8	37524.8
			3/20/2017	38622.7	38622.7
			4/25/2017	39897.3	39897.3
			5/22/2017	43737.6	43737.6
			6/20/2017	34857	34857
			7/17/2017	33220	33220
			8/8/2017	30756	30756
			8/21/2017	31548	31548
			11/29/2017	37641	37641
			3/8/2018	47865	47865
			5/31/2018	44100	44100
			12/4/2018	48600	48600
			6/28/2019	43600	43600
			12/2/2019	49100	49100
			5/28/2020	47400	47400
			11/30/2020	44100	44100
			4/28/2021	41200	41200
			11/19/2021	42500	42500
			5/31/2022	76400	76400
			9/6/2022	110000	110000
			11/21/2022	**86500**	**86500**
SLF-MW-3B	24	0 (0%)	10/21/2016	184501	184501
			11/30/2016	249120	249120
			12/28/2016	254980	254980
			1/18/2017	228148	228148
			2/15/2017	188140	188140
			3/20/2017	191435	191435
			4/25/2017	188976	188976
			5/22/2017	229431	229431
			6/20/2017	213067	213067
			7/17/2017	220459	220459
			8/7/2017	208907	208907
			8/21/2017	235062	235062
			11/29/2017	204990	204990
			3/8/2018	173000	173000
			5/30/2018	171000	171000

			12/4/2018	200000	200000
			6/27/2019	172000	172000
			12/2/2019	179000	179000
			5/28/2020	138000	138000
			12/1/2020	167000	167000
			4/28/2021	143000	143000
			11/19/2021	176000	176000
			5/31/2022	200000	200000
			9/6/2022	182000	182000
			11/21/2022	**170000**	**170000**
SLF-MW-5R	20	0 (0%)	2/14/2017	107763	107763
			3/20/2017	104972	104972
			4/25/2017	101443	101443
			5/22/2017	118938	118938
			6/20/2017	120726	120726
			7/17/2017	123508	123508
			8/7/2017	115159	115159
			8/22/2017	123970	123970
			11/29/2017	136418	136418
			3/8/2018	105000	105000
			5/30/2018	118000	118000
			12/4/2018	114000	114000
			6/28/2019	126000	126000
			12/2/2019	130000	130000
			5/28/2020	99100	99100
			11/30/2020	85100	85100
			4/28/2021	115000	115000
			11/19/2021	135000	135000
			5/31/2022	123000	123000
			9/6/2022	157000	157000
			11/21/2022	**152000**	**152000**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Calcium

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.634075	0.0806291	0.413	110000
2	0.632237	0.134322	0.421	76400
3	0.452585	0.138086	0.43	61315.7
4	0.0777708	0.144018	0.44	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	37032.2	FALSE
	11/30/2016	**61315.7**	**TRUE**
	12/28/2016	44056.6	FALSE
	1/18/2017	35837.4	FALSE
	2/14/2017	37524.8	FALSE
	3/20/2017	38622.7	FALSE
	4/25/2017	39897.3	FALSE
	5/22/2017	43737.6	FALSE
	6/20/2017	34857	FALSE
	7/17/2017	33220	FALSE
	8/8/2017	30756	FALSE
	8/21/2017	31548	FALSE
	11/29/2017	37641	FALSE
	3/8/2018	47865	FALSE
	5/31/2018	44100	FALSE
	12/4/2018	48600	FALSE
	6/28/2019	43600	FALSE
	12/2/2019	49100	FALSE
	5/28/2020	47400	FALSE
	11/30/2020	44100	FALSE
	4/28/2021	41200	FALSE
	11/19/2021	42500	FALSE
	5/31/2022	**76400**	**TRUE**
	9/6/2022	**110000**	**TRUE**

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	30756	110000	79244	0.4493	35604.3
2	31548	76400	44852	0.3098	13895.1
3	33220	61315.7	28095.7	0.2554	7175.64
4	34857	49100	14243	0.2145	3055.12
5	35837.4	48600	12762.6	0.1807	2306.2
6	37032.2	47865	10832.8	0.1512	1637.92
7	37524.8	47400	9875.2	0.1245	1229.46
8	37641	44100	6459	0.0997	643.962
9	38622.7	44100	5477.3	0.0764	418.466
10	39897.3	44056.6	4159.3	0.0539	224.186
11	41200	43737.6	2537.6	0.0321	81.457
12	42500	43600	1100	0.0107	11.77
13	43600	42500	-1100		
14	43737.6	41200	-2537.6		
15	44056.6	39897.3	-4159.3		
16	44100	38622.7	-5477.3		
17	44100	37641	-6459		
18	47400	37524.8	-9875.2		
19	47865	37032.2	-10832.8		
20	48600	35837.4	-12762.6		
21	49100	34857	-14243		
22	61315.7	33220	-28095.7		
23	76400	31548	-44852		
24	110000	30756	-79244		

Sum of b values = 66283.7
Sample Standard Deviation = 16783.9
W Statistic = 0.678106

5% Critical value of 0.916 exceeds 0.678106
Evidence of non-normality at 95% level of significance

1% Critical value of 0.884 exceeds 0.678106
Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Calcium

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
61315.7	37032.2	24283.5	1	0
44056.6	37032.2	7024.4	2	0
35837.4	37032.2	-1194.8	2	1
37524.8	37032.2	492.6	3	1
38622.7	37032.2	1590.5	4	1
39897.3	37032.2	2865.1	5	1
43737.6	37032.2	6705.4	6	1
34857	37032.2	-2175.2	6	2
33220	37032.2	-3812.2	6	3
30756	37032.2	-6276.2	6	4
31548	37032.2	-5484.2	6	5
37641	37032.2	608.8	7	5
47865	37032.2	10832.8	8	5
44100	37032.2	7067.8	9	5
48600	37032.2	11567.8	10	5
43600	37032.2	6567.8	11	5
49100	37032.2	12067.8	12	5
47400	37032.2	10367.8	13	5
44100	37032.2	7067.8	14	5
41200	37032.2	4167.8	15	5
42500	37032.2	5467.8	16	5
76400	37032.2	39367.8	17	5
110000	37032.2	72967.8	18	5
44056.6	61315.7	-17259.1	18	6
35837.4	61315.7	-25478.3	18	7
37524.8	61315.7	-23790.9	18	8
38622.7	61315.7	-22693	18	9
39897.3	61315.7	-21418.4	18	10
43737.6	61315.7	-17578.1	18	11
34857	61315.7	-26458.7	18	12
33220	61315.7	-28095.7	18	13
30756	61315.7	-30559.7	18	14
31548	61315.7	-29767.7	18	15
37641	61315.7	-23674.7	18	16
47865	61315.7	-13450.7	18	17
44100	61315.7	-17215.7	18	18
48600	61315.7	-12715.7	18	19
43600	61315.7	-17715.7	18	20
49100	61315.7	-12215.7	18	21
47400	61315.7	-13915.7	18	22
44100	61315.7	-17215.7	18	23
41200	61315.7	-20115.7	18	24
42500	61315.7	-18815.7	18	25
76400	61315.7	15084.3	19	25
110000	61315.7	48684.3	20	25

35837.4	44056.6	-8219.2	20	26
37524.8	44056.6	-6531.8	20	27
38622.7	44056.6	-5433.9	20	28
39897.3	44056.6	-4159.3	20	29
43737.6	44056.6	-319	20	30
34857	44056.6	-9199.6	20	31
33220	44056.6	-10836.6	20	32
30756	44056.6	-13300.6	20	33
31548	44056.6	-12508.6	20	34
37641	44056.6	-6415.6	20	35
47865	44056.6	3808.4	21	35
44100	44056.6	43.4	22	35
48600	44056.6	4543.4	23	35
43600	44056.6	-456.6	23	36
49100	44056.6	5043.4	24	36
47400	44056.6	3343.4	25	36
44100	44056.6	43.4	26	36
41200	44056.6	-2856.6	26	37
42500	44056.6	-1556.6	26	38
76400	44056.6	32343.4	27	38
110000	44056.6	65943.4	28	38
37524.8	35837.4	1687.4	29	38
38622.7	35837.4	2785.3	30	38
39897.3	35837.4	4059.9	31	38
43737.6	35837.4	7900.2	32	38
34857	35837.4	-980.4	32	39
33220	35837.4	-2617.4	32	40
30756	35837.4	-5081.4	32	41
31548	35837.4	-4289.4	32	42
37641	35837.4	1803.6	33	42
47865	35837.4	12027.6	34	42
44100	35837.4	8262.6	35	42
48600	35837.4	12762.6	36	42
43600	35837.4	7762.6	37	42
49100	35837.4	13262.6	38	42
47400	35837.4	11562.6	39	42
44100	35837.4	8262.6	40	42
41200	35837.4	5362.6	41	42
42500	35837.4	6662.6	42	42
76400	35837.4	40562.6	43	42
110000	35837.4	74162.6	44	42
38622.7	37524.8	1097.9	45	42
39897.3	37524.8	2372.5	46	42
43737.6	37524.8	6212.8	47	42
34857	37524.8	-2667.8	47	43
33220	37524.8	-4304.8	47	44
30756	37524.8	-6768.8	47	45
31548	37524.8	-5976.8	47	46
37641	37524.8	116.2	48	46
47865	37524.8	10340.2	49	46
44100	37524.8	6575.2	50	46
48600	37524.8	11075.2	51	46
43600	37524.8	6075.2	52	46
49100	37524.8	11575.2	53	46
47400	37524.8	9875.2	54	46

44100	37524.8	6575.2	55	46
41200	37524.8	3675.2	56	46
42500	37524.8	4975.2	57	46
76400	37524.8	38875.2	58	46
110000	37524.8	72475.2	59	46
39897.3	38622.7	1274.6	60	46
43737.6	38622.7	5114.9	61	46
34857	38622.7	-3765.7	61	47
33220	38622.7	-5402.7	61	48
30756	38622.7	-7866.7	61	49
31548	38622.7	-7074.7	61	50
37641	38622.7	-981.7	61	51
47865	38622.7	9242.3	62	51
44100	38622.7	5477.3	63	51
48600	38622.7	9977.3	64	51
43600	38622.7	4977.3	65	51
49100	38622.7	10477.3	66	51
47400	38622.7	8777.3	67	51
44100	38622.7	5477.3	68	51
41200	38622.7	2577.3	69	51
42500	38622.7	3877.3	70	51
76400	38622.7	37777.3	71	51
110000	38622.7	71377.3	72	51
43737.6	39897.3	3840.3	73	51
34857	39897.3	-5040.3	73	52
33220	39897.3	-6677.3	73	53
30756	39897.3	-9141.3	73	54
31548	39897.3	-8349.3	73	55
37641	39897.3	-2256.3	73	56
47865	39897.3	7967.7	74	56
44100	39897.3	4202.7	75	56
48600	39897.3	8702.7	76	56
43600	39897.3	3702.7	77	56
49100	39897.3	9202.7	78	56
47400	39897.3	7502.7	79	56
44100	39897.3	4202.7	80	56
41200	39897.3	1302.7	81	56
42500	39897.3	2602.7	82	56
76400	39897.3	36502.7	83	56
110000	39897.3	70102.7	84	56
34857	43737.6	-8880.6	84	57
33220	43737.6	-10517.6	84	58
30756	43737.6	-12981.6	84	59
31548	43737.6	-12189.6	84	60
37641	43737.6	-6096.6	84	61
47865	43737.6	4127.4	85	61
44100	43737.6	362.4	86	61
48600	43737.6	4862.4	87	61
43600	43737.6	-137.6	87	62
49100	43737.6	5362.4	88	62
47400	43737.6	3662.4	89	62
44100	43737.6	362.4	90	62
41200	43737.6	-2537.6	90	63
42500	43737.6	-1237.6	90	64

76400	43737.6	32662.4	91	64
110000	43737.6	66262.4	92	64
33220	34857	-1637	92	65
30756	34857	-4101	92	66
31548	34857	-3309	92	67
37641	34857	2784	93	67
47865	34857	13008	94	67
44100	34857	9243	95	67
48600	34857	13743	96	67
43600	34857	8743	97	67
49100	34857	14243	98	67
47400	34857	12543	99	67
44100	34857	9243	100	67
41200	34857	6343	101	67
42500	34857	7643	102	67
76400	34857	41543	103	67
110000	34857	75143	104	67
30756	33220	-2464	104	68
31548	33220	-1672	104	69
37641	33220	4421	105	69
47865	33220	14645	106	69
44100	33220	10880	107	69
48600	33220	15380	108	69
43600	33220	10380	109	69
49100	33220	15880	110	69
47400	33220	14180	111	69
44100	33220	10880	112	69
41200	33220	7980	113	69
42500	33220	9280	114	69
76400	33220	43180	115	69
110000	33220	76780	116	69
31548	30756	792	117	69
37641	30756	6885	118	69
47865	30756	17109	119	69
44100	30756	13344	120	69
48600	30756	17844	121	69
43600	30756	12844	122	69
49100	30756	18344	123	69
47400	30756	16644	124	69
44100	30756	13344	125	69
41200	30756	10444	126	69
42500	30756	11744	127	69
76400	30756	45644	128	69
110000	30756	79244	129	69
37641	31548	6093	130	69
47865	31548	16317	131	69
44100	31548	12552	132	69
48600	31548	17052	133	69
43600	31548	12052	134	69
49100	31548	17552	135	69
47400	31548	15852	136	69
44100	31548	12552	137	69
41200	31548	9652	138	69

42500	31548	10952	139	69
76400	31548	44852	140	69
110000	31548	78452	141	69
47865	37641	10224	142	69
44100	37641	6459	143	69
48600	37641	10959	144	69
43600	37641	5959	145	69
49100	37641	11459	146	69
47400	37641	9759	147	69
44100	37641	6459	148	69
41200	37641	3559	149	69
42500	37641	4859	150	69
76400	37641	38759	151	69
110000	37641	72359	152	69
44100	47865	-3765	152	70
48600	47865	735	153	70
43600	47865	-4265	153	71
49100	47865	1235	154	71
47400	47865	-465	154	72
44100	47865	-3765	154	73
41200	47865	-6665	154	74
42500	47865	-5365	154	75
76400	47865	28535	155	75
110000	47865	62135	156	75
48600	44100	4500	157	75
43600	44100	-500	157	76
49100	44100	5000	158	76
47400	44100	3300	159	76
44100	44100	0	159	76
41200	44100	-2900	159	77
42500	44100	-1600	159	78
76400	44100	32300	160	78
110000	44100	65900	161	78
43600	48600	-5000	161	79
49100	48600	500	162	79
47400	48600	-1200	162	80
44100	48600	-4500	162	81
41200	48600	-7400	162	82
42500	48600	-6100	162	83
76400	48600	27800	163	83
110000	48600	61400	164	83
49100	43600	5500	165	83
47400	43600	3800	166	83
44100	43600	500	167	83
41200	43600	-2400	167	84
42500	43600	-1100	167	85
76400	43600	32800	168	85
110000	43600	66400	169	85
47400	49100	-1700	169	86
44100	49100	-5000	169	87
41200	49100	-7900	169	88

42500	49100	-6600	169	89
76400	49100	27300	170	89
110000	49100	60900	171	89
44100	47400	-3300	171	90
41200	47400	-6200	171	91
42500	47400	-4900	171	92
76400	47400	29000	172	92
110000	47400	62600	173	92
41200	44100	-2900	173	93
42500	44100	-1600	173	94
76400	44100	32300	174	94
110000	44100	65900	175	94
42500	41200	1300	176	94
76400	41200	35200	177	94
110000	41200	68800	178	94
76400	42500	33900	179	94
110000	42500	67500	180	94
110000	76400	33600	181	94

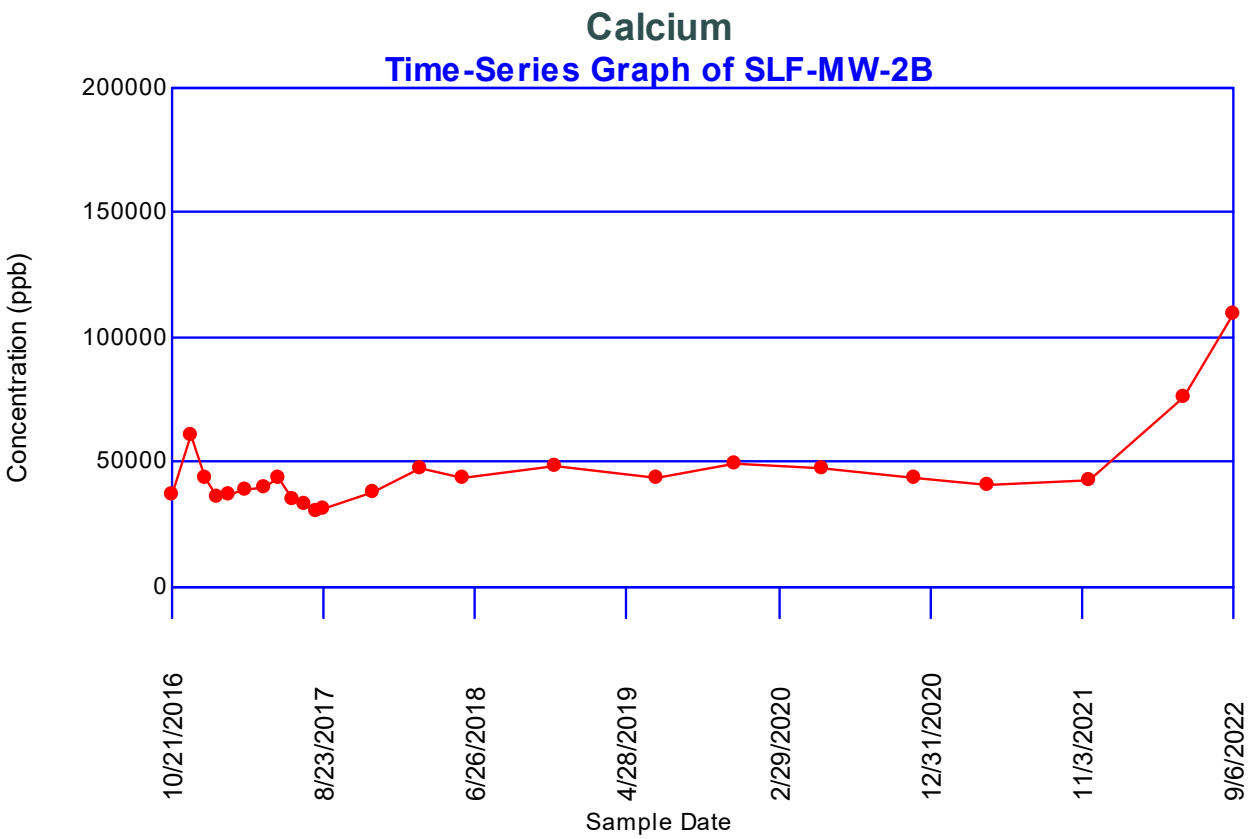
S Statistic = 181 - 94 = 87

Tied Group	Value	Members
1	44100	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1624.33
Z-Score = 2.13384
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|2.13384| > 1.97737 indicating a trend


Calcium
Time-Series Graph of SLF-MW-2B
200000
150000
100000
50000
0
Concentration (ppb)
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Calcium

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.226392	0.298778	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	184501	FALSE
	11/30/2016	249120	FALSE
	12/28/2016	254980	FALSE
	1/18/2017	228148	FALSE
	2/15/2017	188140	FALSE
	3/20/2017	191435	FALSE
	4/25/2017	188976	FALSE
	5/22/2017	229431	FALSE
	6/20/2017	213067	FALSE
	7/17/2017	220459	FALSE
	8/7/2017	208907	FALSE
	8/21/2017	235062	FALSE
	11/29/2017	204990	FALSE
	3/8/2018	173000	FALSE
	5/30/2018	171000	FALSE
	12/4/2018	200000	FALSE
	6/27/2019	172000	FALSE
	12/2/2019	179000	FALSE
	5/28/2020	138000	FALSE
	12/1/2020	167000	FALSE
	4/28/2021	143000	FALSE
	11/19/2021	176000	FALSE
	5/31/2022	200000	FALSE
	9/6/2022	182000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	138000	254980	116980	0.4493	52559.1
2	143000	249120	106120	0.3098	32876
3	167000	235062	68062	0.2554	17383
4	171000	229431	58431	0.2145	12533.4
5	172000	228148	56148	0.1807	10145.9
6	173000	220459	47459	0.1512	7175.8
7	176000	213067	37067	0.1245	4614.84
8	179000	208907	29907	0.0997	2981.73
9	182000	204990	22990	0.0764	1756.44
10	184501	200000	15499	0.0539	835.396
11	188140	200000	11860	0.0321	380.706
12	188976	191435	2459	0.0107	26.3113
13	191435	188976	-2459		
14	200000	188140	-11860		
15	200000	184501	-15499		
16	204990	182000	-22990		
17	208907	179000	-29907		
18	213067	176000	-37067		
19	220459	173000	-47459		
20	228148	172000	-56148		
21	229431	171000	-58431		
22	235062	167000	-68062		
23	249120	143000	-106120		
24	254980	138000	-116980		

Sum of b values = 143269
Sample Standard Deviation = 30244
W Statistic = 0.975657

5% Critical value of 0.916 is less than 0.975657
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.975657
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Calcium

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
249120	184501	64619	1	0
254980	184501	70479	2	0
228148	184501	43647	3	0
188140	184501	3639	4	0
191435	184501	6934	5	0
188976	184501	4475	6	0
229431	184501	44930	7	0
213067	184501	28566	8	0
220459	184501	35958	9	0
208907	184501	24406	10	0
235062	184501	50561	11	0
204990	184501	20489	12	0
173000	184501	-11501	12	1
171000	184501	-13501	12	2
200000	184501	15499	13	2
172000	184501	-12501	13	3
179000	184501	-5501	13	4
138000	184501	-46501	13	5
167000	184501	-17501	13	6
143000	184501	-41501	13	7
176000	184501	-8501	13	8
200000	184501	15499	14	8
182000	184501	-2501	14	9
254980	249120	5860	15	9
228148	249120	-20972	15	10
188140	249120	-60980	15	11
191435	249120	-57685	15	12
188976	249120	-60144	15	13
229431	249120	-19689	15	14
213067	249120	-36053	15	15
220459	249120	-28661	15	16
208907	249120	-40213	15	17
235062	249120	-14058	15	18
204990	249120	-44130	15	19
173000	249120	-76120	15	20
171000	249120	-78120	15	21
200000	249120	-49120	15	22
172000	249120	-77120	15	23
179000	249120	-70120	15	24
138000	249120	-111120	15	25
167000	249120	-82120	15	26
143000	249120	-106120	15	27
176000	249120	-73120	15	28
200000	249120	-49120	15	29
182000	249120	-67120	15	30

228148	254980	-26832	15	31
188140	254980	-66840	15	32
191435	254980	-63545	15	33
188976	254980	-66004	15	34
229431	254980	-25549	15	35
213067	254980	-41913	15	36
220459	254980	-34521	15	37
208907	254980	-46073	15	38
235062	254980	-19918	15	39
204990	254980	-49990	15	40
173000	254980	-81980	15	41
171000	254980	-83980	15	42
200000	254980	-54980	15	43
172000	254980	-82980	15	44
179000	254980	-75980	15	45
138000	254980	-116980	15	46
167000	254980	-87980	15	47
143000	254980	-111980	15	48
176000	254980	-78980	15	49
200000	254980	-54980	15	50
182000	254980	-72980	15	51
188140	228148	-40008	15	52
191435	228148	-36713	15	53
188976	228148	-39172	15	54
229431	228148	1283	16	54
213067	228148	-15081	16	55
220459	228148	-7689	16	56
208907	228148	-19241	16	57
235062	228148	6914	17	57
204990	228148	-23158	17	58
173000	228148	-55148	17	59
171000	228148	-57148	17	60
200000	228148	-28148	17	61
172000	228148	-56148	17	62
179000	228148	-49148	17	63
138000	228148	-90148	17	64
167000	228148	-61148	17	65
143000	228148	-85148	17	66
176000	228148	-52148	17	67
200000	228148	-28148	17	68
182000	228148	-46148	17	69
191435	188140	3295	18	69
188976	188140	836	19	69
229431	188140	41291	20	69
213067	188140	24927	21	69
220459	188140	32319	22	69
208907	188140	20767	23	69
235062	188140	46922	24	69
204990	188140	16850	25	69
173000	188140	-15140	25	70
171000	188140	-17140	25	71
200000	188140	11860	26	71
172000	188140	-16140	26	72
179000	188140	-9140	26	73
138000	188140	-50140	26	74

167000	188140	-21140	26	75
143000	188140	-45140	26	76
176000	188140	-12140	26	77
200000	188140	11860	27	77
182000	188140	-6140	27	78
188976	191435	-2459	27	79
229431	191435	37996	28	79
213067	191435	21632	29	79
220459	191435	29024	30	79
208907	191435	17472	31	79
235062	191435	43627	32	79
204990	191435	13555	33	79
173000	191435	-18435	33	80
171000	191435	-20435	33	81
200000	191435	8565	34	81
172000	191435	-19435	34	82
179000	191435	-12435	34	83
138000	191435	-53435	34	84
167000	191435	-24435	34	85
143000	191435	-48435	34	86
176000	191435	-15435	34	87
200000	191435	8565	35	87
182000	191435	-9435	35	88
229431	188976	40455	36	88
213067	188976	24091	37	88
220459	188976	31483	38	88
208907	188976	19931	39	88
235062	188976	46086	40	88
204990	188976	16014	41	88
173000	188976	-15976	41	89
171000	188976	-17976	41	90
200000	188976	11024	42	90
172000	188976	-16976	42	91
179000	188976	-9976	42	92
138000	188976	-50976	42	93
167000	188976	-21976	42	94
143000	188976	-45976	42	95
176000	188976	-12976	42	96
200000	188976	11024	43	96
182000	188976	-6976	43	97
213067	229431	-16364	43	98
220459	229431	-8972	43	99
208907	229431	-20524	43	100
235062	229431	5631	44	100
204990	229431	-24441	44	101
173000	229431	-56431	44	102
171000	229431	-58431	44	103
200000	229431	-29431	44	104
172000	229431	-57431	44	105
179000	229431	-50431	44	106
138000	229431	-91431	44	107
167000	229431	-62431	44	108
143000	229431	-86431	44	109
176000	229431	-53431	44	110

200000	229431	-29431	44	111
182000	229431	-47431	44	112
220459	213067	7392	45	112
208907	213067	-4160	45	113
235062	213067	21995	46	113
204990	213067	-8077	46	114
173000	213067	-40067	46	115
171000	213067	-42067	46	116
200000	213067	-13067	46	117
172000	213067	-41067	46	118
179000	213067	-34067	46	119
138000	213067	-75067	46	120
167000	213067	-46067	46	121
143000	213067	-70067	46	122
176000	213067	-37067	46	123
200000	213067	-13067	46	124
182000	213067	-31067	46	125
208907	220459	-11552	46	126
235062	220459	14603	47	126
204990	220459	-15469	47	127
173000	220459	-47459	47	128
171000	220459	-49459	47	129
200000	220459	-20459	47	130
172000	220459	-48459	47	131
179000	220459	-41459	47	132
138000	220459	-82459	47	133
167000	220459	-53459	47	134
143000	220459	-77459	47	135
176000	220459	-44459	47	136
200000	220459	-20459	47	137
182000	220459	-38459	47	138
235062	208907	26155	48	138
204990	208907	-3917	48	139
173000	208907	-35907	48	140
171000	208907	-37907	48	141
200000	208907	-8907	48	142
172000	208907	-36907	48	143
179000	208907	-29907	48	144
138000	208907	-70907	48	145
167000	208907	-41907	48	146
143000	208907	-65907	48	147
176000	208907	-32907	48	148
200000	208907	-8907	48	149
182000	208907	-26907	48	150
204990	235062	-30072	48	151
173000	235062	-62062	48	152
171000	235062	-64062	48	153
200000	235062	-35062	48	154
172000	235062	-63062	48	155
179000	235062	-56062	48	156
138000	235062	-97062	48	157
167000	235062	-68062	48	158
143000	235062	-92062	48	159

176000	235062	-59062	48	160
200000	235062	-35062	48	161
182000	235062	-53062	48	162
173000	204990	-31990	48	163
171000	204990	-33990	48	164
200000	204990	-4990	48	165
172000	204990	-32990	48	166
179000	204990	-25990	48	167
138000	204990	-66990	48	168
167000	204990	-37990	48	169
143000	204990	-61990	48	170
176000	204990	-28990	48	171
200000	204990	-4990	48	172
182000	204990	-22990	48	173
171000	173000	-2000	48	174
200000	173000	27000	49	174
172000	173000	-1000	49	175
179000	173000	6000	50	175
138000	173000	-35000	50	176
167000	173000	-6000	50	177
143000	173000	-30000	50	178
176000	173000	3000	51	178
200000	173000	27000	52	178
182000	173000	9000	53	178
200000	171000	29000	54	178
172000	171000	1000	55	178
179000	171000	8000	56	178
138000	171000	-33000	56	179
167000	171000	-4000	56	180
143000	171000	-28000	56	181
176000	171000	5000	57	181
200000	171000	29000	58	181
182000	171000	11000	59	181
172000	200000	-28000	59	182
179000	200000	-21000	59	183
138000	200000	-62000	59	184
167000	200000	-33000	59	185
143000	200000	-57000	59	186
176000	200000	-24000	59	187
200000	200000	0	59	187
182000	200000	-18000	59	188
179000	172000	7000	60	188
138000	172000	-34000	60	189
167000	172000	-5000	60	190
143000	172000	-29000	60	191
176000	172000	4000	61	191
200000	172000	28000	62	191
182000	172000	10000	63	191
138000	179000	-41000	63	192
167000	179000	-12000	63	193
143000	179000	-36000	63	194

176000	179000	-3000	63	195
200000	179000	21000	64	195
182000	179000	3000	65	195
167000	138000	29000	66	195
143000	138000	5000	67	195
176000	138000	38000	68	195
200000	138000	62000	69	195
182000	138000	44000	70	195
143000	167000	-24000	70	196
176000	167000	9000	71	196
200000	167000	33000	72	196
182000	167000	15000	73	196
176000	143000	33000	74	196
200000	143000	57000	75	196
182000	143000	39000	76	196
200000	176000	24000	77	196
182000	176000	6000	78	196
182000	200000	-18000	78	197

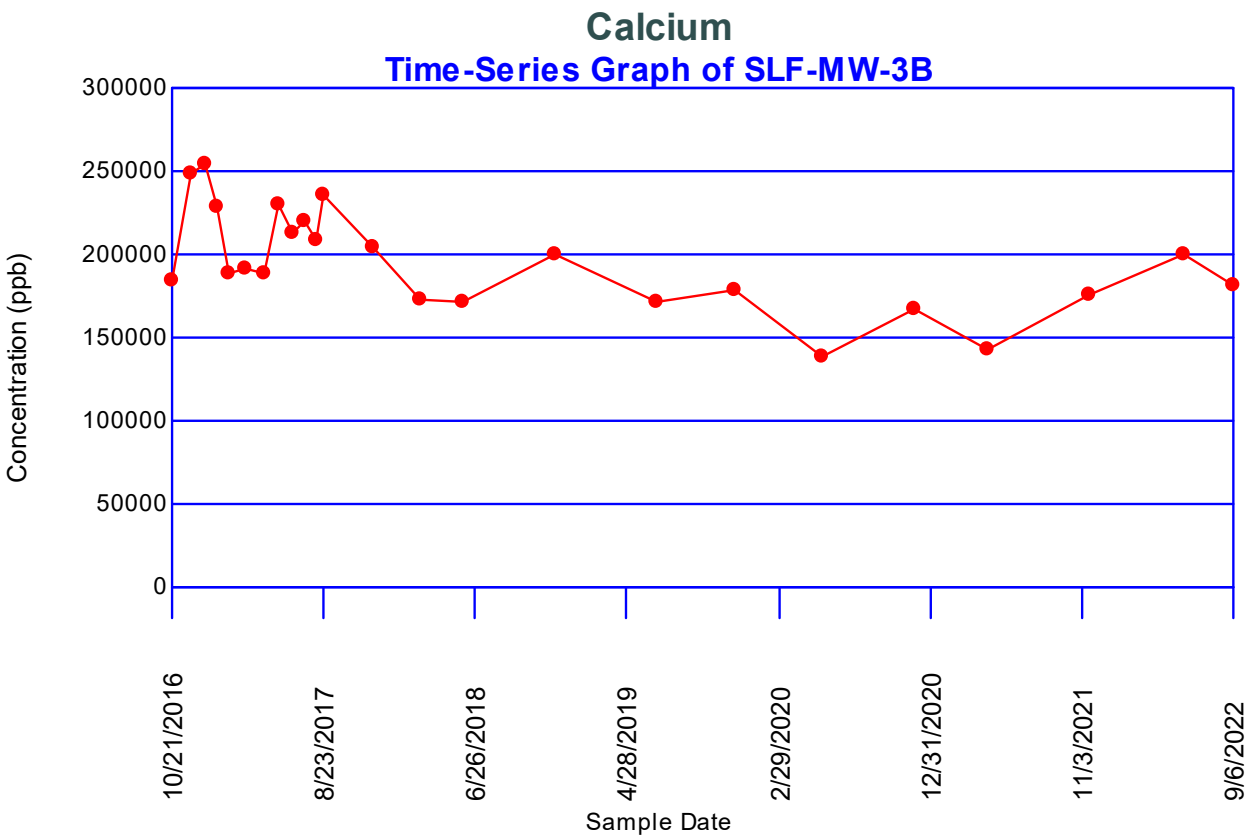
S Statistic = 78 - 197 = -119

Tied Group	Value	Members
1	200000	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1624.33
Z-Score = -2.92782
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-2.92782| > 1.97737 indicating a trend


Calcium
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
300000
250000
200000
150000
100000
50000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Calcium

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 20 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.39599	0.327515	0.45	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	107763	FALSE
	3/20/2017	104972	FALSE
	4/25/2017	101443	FALSE
	5/22/2017	118938	FALSE
	6/20/2017	120726	FALSE
	7/17/2017	123508	FALSE
	8/7/2017	115159	FALSE
	8/22/2017	123970	FALSE
	11/29/2017	136418	FALSE
	3/8/2018	105000	FALSE
	5/30/2018	118000	FALSE
	12/4/2018	114000	FALSE
	6/28/2019	126000	FALSE
	12/2/2019	130000	FALSE
	5/28/2020	99100	FALSE
	11/30/2020	85100	FALSE
	4/28/2021	115000	FALSE
	11/19/2021	135000	FALSE
	5/31/2022	123000	FALSE
	9/6/2022	157000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 10 for 20 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	85100	157000	71900	0.4734	34037.5
2	99100	136418	37318	0.3211	11982.8
3	101443	135000	33557	0.2565	8607.37
4	104972	130000	25028	0.2085	5218.34
5	105000	126000	21000	0.1686	3540.6
6	107763	123970	16207	0.1334	2162.01
7	114000	123508	9508	0.1013	963.16
8	115000	123000	8000	0.0711	568.8
9	115159	120726	5567	0.0422	234.927
10	118000	118938	938	0.014	13.132
11	118938	118000	-938		
12	120726	115159	-5567		
13	123000	115000	-8000		
14	123508	114000	-9508		
15	123970	107763	-16207		
16	126000	105000	-21000		
17	130000	104972	-25028		
18	135000	101443	-33557		
19	136418	99100	-37318		
20	157000	85100	-71900		

Sum of b values = 67328.6
Sample Standard Deviation = 15638.8
W Statistic = 0.975527

5% Critical value of 0.905 is less than 0.975527
Data is normally distributed at 95% level of significance

1% Critical value of 0.868 is less than 0.975527
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Calcium

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
104972	107763	-2791	0	1
101443	107763	-6320	0	2
118938	107763	11175	1	2
120726	107763	12963	2	2
123508	107763	15745	3	2
115159	107763	7396	4	2
123970	107763	16207	5	2
136418	107763	28655	6	2
105000	107763	-2763	6	3
118000	107763	10237	7	3
114000	107763	6237	8	3
126000	107763	18237	9	3
130000	107763	22237	10	3
99100	107763	-8663	10	4
85100	107763	-22663	10	5
115000	107763	7237	11	5
135000	107763	27237	12	5
123000	107763	15237	13	5
157000	107763	49237	14	5
101443	104972	-3529	14	6
118938	104972	13966	15	6
120726	104972	15754	16	6
123508	104972	18536	17	6
115159	104972	10187	18	6
123970	104972	18998	19	6
136418	104972	31446	20	6
105000	104972	28	21	6
118000	104972	13028	22	6
114000	104972	9028	23	6
126000	104972	21028	24	6
130000	104972	25028	25	6
99100	104972	-5872	25	7
85100	104972	-19872	25	8
115000	104972	10028	26	8
135000	104972	30028	27	8
123000	104972	18028	28	8
157000	104972	52028	29	8
118938	101443	17495	30	8
120726	101443	19283	31	8
123508	101443	22065	32	8
115159	101443	13716	33	8
123970	101443	22527	34	8
136418	101443	34975	35	8
105000	101443	3557	36	8
118000	101443	16557	37	8

114000	101443	12557	38	8
126000	101443	24557	39	8
130000	101443	28557	40	8
99100	101443	-2343	40	9
85100	101443	-16343	40	10
115000	101443	13557	41	10
135000	101443	33557	42	10
123000	101443	21557	43	10
157000	101443	55557	44	10
120726	118938	1788	45	10
123508	118938	4570	46	10
115159	118938	-3779	46	11
123970	118938	5032	47	11
136418	118938	17480	48	11
105000	118938	-13938	48	12
118000	118938	-938	48	13
114000	118938	-4938	48	14
126000	118938	7062	49	14
130000	118938	11062	50	14
99100	118938	-19838	50	15
85100	118938	-33838	50	16
115000	118938	-3938	50	17
135000	118938	16062	51	17
123000	118938	4062	52	17
157000	118938	38062	53	17
123508	120726	2782	54	17
115159	120726	-5567	54	18
123970	120726	3244	55	18
136418	120726	15692	56	18
105000	120726	-15726	56	19
118000	120726	-2726	56	20
114000	120726	-6726	56	21
126000	120726	5274	57	21
130000	120726	9274	58	21
99100	120726	-21626	58	22
85100	120726	-35626	58	23
115000	120726	-5726	58	24
135000	120726	14274	59	24
123000	120726	2274	60	24
157000	120726	36274	61	24
115159	123508	-8349	61	25
123970	123508	462	62	25
136418	123508	12910	63	25
105000	123508	-18508	63	26
118000	123508	-5508	63	27
114000	123508	-9508	63	28
126000	123508	2492	64	28
130000	123508	6492	65	28
99100	123508	-24408	65	29
85100	123508	-38408	65	30
115000	123508	-8508	65	31
135000	123508	11492	66	31
123000	123508	-508	66	32
157000	123508	33492	67	32

123970	115159	8811	68	32
136418	115159	21259	69	32
105000	115159	-10159	69	33
118000	115159	2841	70	33
114000	115159	-1159	70	34
126000	115159	10841	71	34
130000	115159	14841	72	34
99100	115159	-16059	72	35
85100	115159	-30059	72	36
115000	115159	-159	72	37
135000	115159	19841	73	37
123000	115159	7841	74	37
157000	115159	41841	75	37
136418	123970	12448	76	37
105000	123970	-18970	76	38
118000	123970	-5970	76	39
114000	123970	-9970	76	40
126000	123970	2030	77	40
130000	123970	6030	78	40
99100	123970	-24870	78	41
85100	123970	-38870	78	42
115000	123970	-8970	78	43
135000	123970	11030	79	43
123000	123970	-970	79	44
157000	123970	33030	80	44
105000	136418	-31418	80	45
118000	136418	-18418	80	46
114000	136418	-22418	80	47
126000	136418	-10418	80	48
130000	136418	-6418	80	49
99100	136418	-37318	80	50
85100	136418	-51318	80	51
115000	136418	-21418	80	52
135000	136418	-1418	80	53
123000	136418	-13418	80	54
157000	136418	20582	81	54
118000	105000	13000	82	54
114000	105000	9000	83	54
126000	105000	21000	84	54
130000	105000	25000	85	54
99100	105000	-5900	85	55
85100	105000	-19900	85	56
115000	105000	10000	86	56
135000	105000	30000	87	56
123000	105000	18000	88	56
157000	105000	52000	89	56
114000	118000	-4000	89	57
126000	118000	8000	90	57
130000	118000	12000	91	57
99100	118000	-18900	91	58
85100	118000	-32900	91	59
115000	118000	-3000	91	60

135000	118000	17000	92	60
123000	118000	5000	93	60
157000	118000	39000	94	60
126000	114000	12000	95	60
130000	114000	16000	96	60
99100	114000	-14900	96	61
85100	114000	-28900	96	62
115000	114000	1000	97	62
135000	114000	21000	98	62
123000	114000	9000	99	62
157000	114000	43000	100	62
130000	126000	4000	101	62
99100	126000	-26900	101	63
85100	126000	-40900	101	64
115000	126000	-11000	101	65
135000	126000	9000	102	65
123000	126000	-3000	102	66
157000	126000	31000	103	66
99100	130000	-30900	103	67
85100	130000	-44900	103	68
115000	130000	-15000	103	69
135000	130000	5000	104	69
123000	130000	-7000	104	70
157000	130000	27000	105	70
85100	99100	-14000	105	71
115000	99100	15900	106	71
135000	99100	35900	107	71
123000	99100	23900	108	71
157000	99100	57900	109	71
115000	85100	29900	110	71
135000	85100	49900	111	71
123000	85100	37900	112	71
157000	85100	71900	113	71
135000	115000	20000	114	71
123000	115000	8000	115	71
157000	115000	42000	116	71
123000	135000	-12000	116	72
157000	135000	22000	117	72
157000	123000	34000	118	72

S Statistic = 118 - 72 = 46

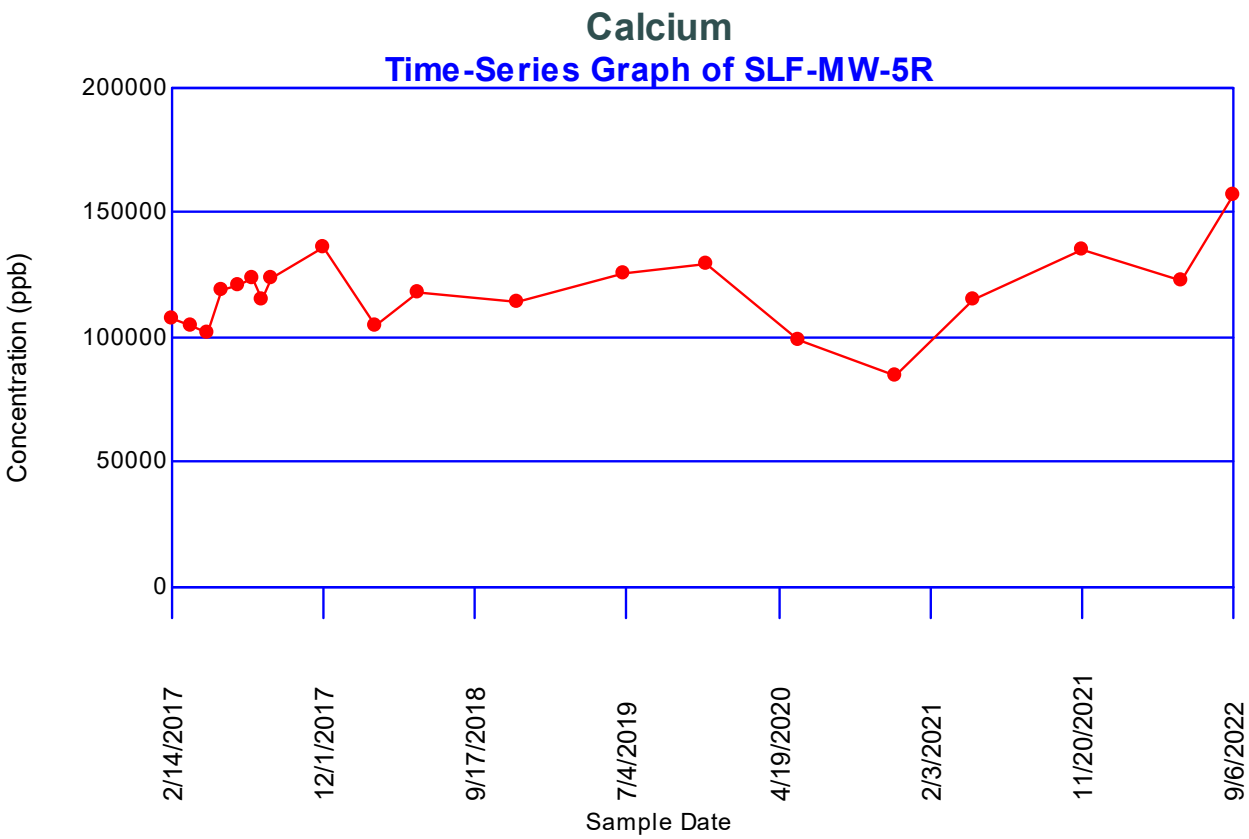
Tied Group	Value	Members

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1

5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 950
Z-Score = 1.45999
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.45999| <= 1.97737 indicating no evidence of a trend


Calcium
Time-Series Graph of SLF-MW-5R
200000
150000
100000
50000
0
Concentration (ppb)
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 68
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	24	0 (0%)	10/21/2016	1.54749e+006	1.54749e+006
			11/30/2016	1.61454e+006	1.61454e+006
			12/28/2016	1.768e+006	1.768e+006
			1/18/2017	1.33503e+006	1.33503e+006
			2/14/2017	1.5337e+006	1.5337e+006
			3/20/2017	1.36241e+006	1.36241e+006
			4/25/2017	1.35437e+006	1.35437e+006
			5/22/2017	1.37044e+006	1.37044e+006
			6/20/2017	1.31495e+006	1.31495e+006
			7/17/2017	2.425e+006	2.425e+006
			8/8/2017	616000	616000
			8/21/2017	1.136e+006	1.136e+006
			11/29/2017	1.421e+006	1.421e+006
			3/8/2018	1.712e+006	1.712e+006
			5/31/2018	1.87e+006	1.87e+006
			12/4/2018	2.08e+006	2.08e+006
			6/28/2019	2.53e+006	2.53e+006
			12/2/2019	2.44e+006	2.44e+006
			5/28/2020	2.2e+006	2.2e+006
			11/30/2020	1.54e+006	1.54e+006
			4/28/2021	1.48e+006	1.48e+006
			11/19/2021	1.68e+006	1.68e+006
			5/31/2022	1.82e+006	1.82e+006
			9/6/2022	1.94e+006	1.94e+006
			11/21/2022	**1.83e+006**	**1.83e+006**
SLF-MW-3B	24	0 (0%)	10/21/2016	152574	152574
			11/30/2016	169582	169582
			12/28/2016	160177	160177
			1/18/2017	146634	146634
			2/15/2017	143113	143113
			3/20/2017	171319	171319
			4/25/2017	167869	167869
			5/22/2017	126662	126662
			6/20/2017	121058	121058
			7/17/2017	98000	98000
			8/7/2017	103000	103000
			8/21/2017	98000	98000
			11/29/2017	152000	152000
			3/8/2018	224000	224000
			5/30/2018	179000	179000

			12/4/2018	225000	225000
			6/27/2019	239000	239000
			12/2/2019	245000	245000
			5/28/2020	262000	262000
			12/1/2020	269000	269000
			4/28/2021	250000	250000
			11/19/2021	246000	246000
			5/31/2022	228000	228000
			9/6/2022	191000	191000
			11/21/2022	**188000**	**188000**
SLF-MW-5R	20	0 (0%)	2/14/2017	33649.2	33649.2
			3/20/2017	25801.9	25801.9
			4/25/2017	22580.8	22580.8
			5/22/2017	16154	16154
			6/20/2017	25945.6	25945.6
			7/17/2017	26000	26000
			8/7/2017	19100	19100
			8/22/2017	25500	25500
			11/29/2017	24500	24500
			3/8/2018	15000	15000
			5/30/2018	25500	25500
			12/4/2018	20500	20500
			6/28/2019	24300	24300
			12/2/2019	29200	29200
			5/28/2020	12400	12400
			11/30/2020	14200	14200
			4/28/2021	25700	25700
			11/19/2021	26900	26900
			5/31/2022	26200	26200
			9/6/2022	44100	44100
			11/21/2022	**52900**	**52900**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Chloride

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0864162	0.386374	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	1.54749e+006	FALSE
	11/30/2016	1.61454e+006	FALSE
	12/28/2016	1.768e+006	FALSE
	1/18/2017	1.33503e+006	FALSE
	2/14/2017	1.5337e+006	FALSE
	3/20/2017	1.36241e+006	FALSE
	4/25/2017	1.35437e+006	FALSE
	5/22/2017	1.37044e+006	FALSE
	6/20/2017	1.31495e+006	FALSE
	7/17/2017	2.425e+006	FALSE
	8/8/2017	616000	FALSE
	8/21/2017	1.136e+006	FALSE
	11/29/2017	1.421e+006	FALSE
	3/8/2018	1.712e+006	FALSE
	5/31/2018	1.87e+006	FALSE
	12/4/2018	2.08e+006	FALSE
	6/28/2019	2.53e+006	FALSE
	12/2/2019	2.44e+006	FALSE
	5/28/2020	2.2e+006	FALSE
	11/30/2020	1.54e+006	FALSE
	4/28/2021	1.48e+006	FALSE
	11/19/2021	1.68e+006	FALSE
	5/31/2022	1.82e+006	FALSE
	9/6/2022	1.94e+006	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chloride

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	616000	2.53e+006	1.914e+006	0.4493	859960
2	1.136e+006	2.44e+006	1.304e+006	0.3098	403979
3	1.31495e+006	2.425e+006	1.11005e+006	0.2554	283507
4	1.33503e+006	2.2e+006	864970	0.2145	185536
5	1.35437e+006	2.08e+006	725630	0.1807	131121
6	1.36241e+006	1.94e+006	577590	0.1512	87331.6
7	1.37044e+006	1.87e+006	499560	0.1245	62195.2
8	1.421e+006	1.82e+006	399000	0.0997	39780.3
9	1.48e+006	1.768e+006	288000	0.0764	22003.2
10	1.5337e+006	1.712e+006	178300	0.0539	9610.37
11	1.54e+006	1.68e+006	140000	0.0321	4494
12	1.54749e+006	1.61454e+006	67050	0.0107	717.435
13	1.61454e+006	1.54749e+006	-67050		
14	1.68e+006	1.54e+006	-140000		
15	1.712e+006	1.5337e+006	-178300		
16	1.768e+006	1.48e+006	-288000		
17	1.82e+006	1.421e+006	-399000		
18	1.87e+006	1.37044e+006	-499560		
19	1.94e+006	1.36241e+006	-577590		
20	2.08e+006	1.35437e+006	-725630		
21	2.2e+006	1.33503e+006	-864970		
22	2.425e+006	1.31495e+006	-1.11005e+006		
23	2.44e+006	1.136e+006	-1.304e+006		
24	2.53e+006	616000	-1.914e+006		

Sum of b values = 2.09024e+006
Sample Standard Deviation = 445673
W Statistic = 0.95638

5% Critical value of 0.916 is less than 0.95638
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.95638
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chloride

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.61454e+006	1.54749e+006	67050	1	0
1.768e+006	1.54749e+006	220510	2	0
1.33503e+006	1.54749e+006	-212460	2	1
1.5337e+006	1.54749e+006	-13790	2	2
1.36241e+006	1.54749e+006	-185080	2	3
1.35437e+006	1.54749e+006	-193120	2	4
1.37044e+006	1.54749e+006	-177050	2	5
1.31495e+006	1.54749e+006	-232540	2	6
2.425e+006	1.54749e+006	877510	3	6
616000	1.54749e+006	-931490	3	7
1.136e+006	1.54749e+006	-411490	3	8
1.421e+006	1.54749e+006	-126490	3	9
1.712e+006	1.54749e+006	164510	4	9
1.87e+006	1.54749e+006	322510	5	9
2.08e+006	1.54749e+006	532510	6	9
2.53e+006	1.54749e+006	982510	7	9
2.44e+006	1.54749e+006	892510	8	9
2.2e+006	1.54749e+006	652510	9	9
1.54e+006	1.54749e+006	-7490	9	10
1.48e+006	1.54749e+006	-67490	9	11
1.68e+006	1.54749e+006	132510	10	11
1.82e+006	1.54749e+006	272510	11	11
1.94e+006	1.54749e+006	392510	12	11
1.768e+006	1.61454e+006	153460	13	11
1.33503e+006	1.61454e+006	-279510	13	12
1.5337e+006	1.61454e+006	-80840	13	13
1.36241e+006	1.61454e+006	-252130	13	14
1.35437e+006	1.61454e+006	-260170	13	15
1.37044e+006	1.61454e+006	-244100	13	16
1.31495e+006	1.61454e+006	-299590	13	17
2.425e+006	1.61454e+006	810460	14	17
616000	1.61454e+006	-998540	14	18
1.136e+006	1.61454e+006	-478540	14	19
1.421e+006	1.61454e+006	-193540	14	20
1.712e+006	1.61454e+006	97460	15	20
1.87e+006	1.61454e+006	255460	16	20
2.08e+006	1.61454e+006	465460	17	20
2.53e+006	1.61454e+006	915460	18	20
2.44e+006	1.61454e+006	825460	19	20
2.2e+006	1.61454e+006	585460	20	20
1.54e+006	1.61454e+006	-74540	20	21
1.48e+006	1.61454e+006	-134540	20	22
1.68e+006	1.61454e+006	65460	21	22
1.82e+006	1.61454e+006	205460	22	22
1.94e+006	1.61454e+006	325460	23	22

1.33503e+006	1.768e+006	-432970	23	23
1.5337e+006	1.768e+006	-234300	23	24
1.36241e+006	1.768e+006	-405590	23	25
1.35437e+006	1.768e+006	-413630	23	26
1.37044e+006	1.768e+006	-397560	23	27
1.31495e+006	1.768e+006	-453050	23	28
2.425e+006	1.768e+006	657000	24	28
616000	1.768e+006	-1.152e+006	24	29
1.136e+006	1.768e+006	-632000	24	30
1.421e+006	1.768e+006	-347000	24	31
1.712e+006	1.768e+006	-56000	24	32
1.87e+006	1.768e+006	102000	25	32
2.08e+006	1.768e+006	312000	26	32
2.53e+006	1.768e+006	762000	27	32
2.44e+006	1.768e+006	672000	28	32
2.2e+006	1.768e+006	432000	29	32
1.54e+006	1.768e+006	-228000	29	33
1.48e+006	1.768e+006	-288000	29	34
1.68e+006	1.768e+006	-88000	29	35
1.82e+006	1.768e+006	52000	30	35
1.94e+006	1.768e+006	172000	31	35
1.5337e+006	1.33503e+006	198670	32	35
1.36241e+006	1.33503e+006	27380	33	35
1.35437e+006	1.33503e+006	19340	34	35
1.37044e+006	1.33503e+006	35410	35	35
1.31495e+006	1.33503e+006	-20080	35	36
2.425e+006	1.33503e+006	1.08997e+006	36	36
616000	1.33503e+006	-719030	36	37
1.136e+006	1.33503e+006	-199030	36	38
1.421e+006	1.33503e+006	85970	37	38
1.712e+006	1.33503e+006	376970	38	38
1.87e+006	1.33503e+006	534970	39	38
2.08e+006	1.33503e+006	744970	40	38
2.53e+006	1.33503e+006	1.19497e+006	41	38
2.44e+006	1.33503e+006	1.10497e+006	42	38
2.2e+006	1.33503e+006	864970	43	38
1.54e+006	1.33503e+006	204970	44	38
1.48e+006	1.33503e+006	144970	45	38
1.68e+006	1.33503e+006	344970	46	38
1.82e+006	1.33503e+006	484970	47	38
1.94e+006	1.33503e+006	604970	48	38
1.36241e+006	1.5337e+006	-171290	48	39
1.35437e+006	1.5337e+006	-179330	48	40
1.37044e+006	1.5337e+006	-163260	48	41
1.31495e+006	1.5337e+006	-218750	48	42
2.425e+006	1.5337e+006	891300	49	42
616000	1.5337e+006	-917700	49	43
1.136e+006	1.5337e+006	-397700	49	44
1.421e+006	1.5337e+006	-112700	49	45
1.712e+006	1.5337e+006	178300	50	45
1.87e+006	1.5337e+006	336300	51	45
2.08e+006	1.5337e+006	546300	52	45
2.53e+006	1.5337e+006	996300	53	45
2.44e+006	1.5337e+006	906300	54	45
2.2e+006	1.5337e+006	666300	55	45

1.54e+006	1.5337e+006	6300	56	45
1.48e+006	1.5337e+006	-53700	56	46
1.68e+006	1.5337e+006	146300	57	46
1.82e+006	1.5337e+006	286300	58	46
1.94e+006	1.5337e+006	406300	59	46
1.35437e+006	1.36241e+006	-8040	59	47
1.37044e+006	1.36241e+006	8030	60	47
1.31495e+006	1.36241e+006	-47460	60	48
2.425e+006	1.36241e+006	1.06259e+006	61	48
616000	1.36241e+006	-746410	61	49
1.136e+006	1.36241e+006	-226410	61	50
1.421e+006	1.36241e+006	58590	62	50
1.712e+006	1.36241e+006	349590	63	50
1.87e+006	1.36241e+006	507590	64	50
2.08e+006	1.36241e+006	717590	65	50
2.53e+006	1.36241e+006	1.16759e+006	66	50
2.44e+006	1.36241e+006	1.07759e+006	67	50
2.2e+006	1.36241e+006	837590	68	50
1.54e+006	1.36241e+006	177590	69	50
1.48e+006	1.36241e+006	117590	70	50
1.68e+006	1.36241e+006	317590	71	50
1.82e+006	1.36241e+006	457590	72	50
1.94e+006	1.36241e+006	577590	73	50
1.37044e+006	1.35437e+006	16070	74	50
1.31495e+006	1.35437e+006	-39420	74	51
2.425e+006	1.35437e+006	1.07063e+006	75	51
616000	1.35437e+006	-738370	75	52
1.136e+006	1.35437e+006	-218370	75	53
1.421e+006	1.35437e+006	66630	76	53
1.712e+006	1.35437e+006	357630	77	53
1.87e+006	1.35437e+006	515630	78	53
2.08e+006	1.35437e+006	725630	79	53
2.53e+006	1.35437e+006	1.17563e+006	80	53
2.44e+006	1.35437e+006	1.08563e+006	81	53
2.2e+006	1.35437e+006	845630	82	53
1.54e+006	1.35437e+006	185630	83	53
1.48e+006	1.35437e+006	125630	84	53
1.68e+006	1.35437e+006	325630	85	53
1.82e+006	1.35437e+006	465630	86	53
1.94e+006	1.35437e+006	585630	87	53
1.31495e+006	1.37044e+006	-55490	87	54
2.425e+006	1.37044e+006	1.05456e+006	88	54
616000	1.37044e+006	-754440	88	55
1.136e+006	1.37044e+006	-234440	88	56
1.421e+006	1.37044e+006	50560	89	56
1.712e+006	1.37044e+006	341560	90	56
1.87e+006	1.37044e+006	499560	91	56
2.08e+006	1.37044e+006	709560	92	56
2.53e+006	1.37044e+006	1.15956e+006	93	56
2.44e+006	1.37044e+006	1.06956e+006	94	56
2.2e+006	1.37044e+006	829560	95	56
1.54e+006	1.37044e+006	169560	96	56
1.48e+006	1.37044e+006	109560	97	56
1.68e+006	1.37044e+006	309560	98	56

1.82e+006	1.37044e+006	449560	99	56
1.94e+006	1.37044e+006	569560	100	56
2.425e+006	1.31495e+006	1.11005e+006	101	56
616000	1.31495e+006	-698950	101	57
1.136e+006	1.31495e+006	-178950	101	58
1.421e+006	1.31495e+006	106050	102	58
1.712e+006	1.31495e+006	397050	103	58
1.87e+006	1.31495e+006	555050	104	58
2.08e+006	1.31495e+006	765050	105	58
2.53e+006	1.31495e+006	1.21505e+006	106	58
2.44e+006	1.31495e+006	1.12505e+006	107	58
2.2e+006	1.31495e+006	885050	108	58
1.54e+006	1.31495e+006	225050	109	58
1.48e+006	1.31495e+006	165050	110	58
1.68e+006	1.31495e+006	365050	111	58
1.82e+006	1.31495e+006	505050	112	58
1.94e+006	1.31495e+006	625050	113	58
616000	2.425e+006	-1.809e+006	113	59
1.136e+006	2.425e+006	-1.289e+006	113	60
1.421e+006	2.425e+006	-1.004e+006	113	61
1.712e+006	2.425e+006	-713000	113	62
1.87e+006	2.425e+006	-555000	113	63
2.08e+006	2.425e+006	-345000	113	64
2.53e+006	2.425e+006	105000	114	64
2.44e+006	2.425e+006	15000	115	64
2.2e+006	2.425e+006	-225000	115	65
1.54e+006	2.425e+006	-885000	115	66
1.48e+006	2.425e+006	-945000	115	67
1.68e+006	2.425e+006	-745000	115	68
1.82e+006	2.425e+006	-605000	115	69
1.94e+006	2.425e+006	-485000	115	70
1.136e+006	616000	520000	116	70
1.421e+006	616000	805000	117	70
1.712e+006	616000	1.096e+006	118	70
1.87e+006	616000	1.254e+006	119	70
2.08e+006	616000	1.464e+006	120	70
2.53e+006	616000	1.914e+006	121	70
2.44e+006	616000	1.824e+006	122	70
2.2e+006	616000	1.584e+006	123	70
1.54e+006	616000	924000	124	70
1.48e+006	616000	864000	125	70
1.68e+006	616000	1.064e+006	126	70
1.82e+006	616000	1.204e+006	127	70
1.94e+006	616000	1.324e+006	128	70
1.421e+006	1.136e+006	285000	129	70
1.712e+006	1.136e+006	576000	130	70
1.87e+006	1.136e+006	734000	131	70
2.08e+006	1.136e+006	944000	132	70
2.53e+006	1.136e+006	1.394e+006	133	70
2.44e+006	1.136e+006	1.304e+006	134	70
2.2e+006	1.136e+006	1.064e+006	135	70
1.54e+006	1.136e+006	404000	136	70
1.48e+006	1.136e+006	344000	137	70

1.68e+006	1.136e+006	544000	138	70
1.82e+006	1.136e+006	684000	139	70
1.94e+006	1.136e+006	804000	140	70
1.712e+006	1.421e+006	291000	141	70
1.87e+006	1.421e+006	449000	142	70
2.08e+006	1.421e+006	659000	143	70
2.53e+006	1.421e+006	1.109e+006	144	70
2.44e+006	1.421e+006	1.019e+006	145	70
2.2e+006	1.421e+006	779000	146	70
1.54e+006	1.421e+006	119000	147	70
1.48e+006	1.421e+006	59000	148	70
1.68e+006	1.421e+006	259000	149	70
1.82e+006	1.421e+006	399000	150	70
1.94e+006	1.421e+006	519000	151	70
1.87e+006	1.712e+006	158000	152	70
2.08e+006	1.712e+006	368000	153	70
2.53e+006	1.712e+006	818000	154	70
2.44e+006	1.712e+006	728000	155	70
2.2e+006	1.712e+006	488000	156	70
1.54e+006	1.712e+006	-172000	156	71
1.48e+006	1.712e+006	-232000	156	72
1.68e+006	1.712e+006	-32000	156	73
1.82e+006	1.712e+006	108000	157	73
1.94e+006	1.712e+006	228000	158	73
2.08e+006	1.87e+006	210000	159	73
2.53e+006	1.87e+006	660000	160	73
2.44e+006	1.87e+006	570000	161	73
2.2e+006	1.87e+006	330000	162	73
1.54e+006	1.87e+006	-330000	162	74
1.48e+006	1.87e+006	-390000	162	75
1.68e+006	1.87e+006	-190000	162	76
1.82e+006	1.87e+006	-50000	162	77
1.94e+006	1.87e+006	70000	163	77
2.53e+006	2.08e+006	450000	164	77
2.44e+006	2.08e+006	360000	165	77
2.2e+006	2.08e+006	120000	166	77
1.54e+006	2.08e+006	-540000	166	78
1.48e+006	2.08e+006	-600000	166	79
1.68e+006	2.08e+006	-400000	166	80
1.82e+006	2.08e+006	-260000	166	81
1.94e+006	2.08e+006	-140000	166	82
2.44e+006	2.53e+006	-90000	166	83
2.2e+006	2.53e+006	-330000	166	84
1.54e+006	2.53e+006	-990000	166	85
1.48e+006	2.53e+006	-1.05e+006	166	86
1.68e+006	2.53e+006	-850000	166	87
1.82e+006	2.53e+006	-710000	166	88
1.94e+006	2.53e+006	-590000	166	89
2.2e+006	2.44e+006	-240000	166	90
1.54e+006	2.44e+006	-900000	166	91
1.48e+006	2.44e+006	-960000	166	92

1.68e+006	2.44e+006	-760000	166	93
1.82e+006	2.44e+006	-620000	166	94
1.94e+006	2.44e+006	-500000	166	95
1.54e+006	2.2e+006	-660000	166	96
1.48e+006	2.2e+006	-720000	166	97
1.68e+006	2.2e+006	-520000	166	98
1.82e+006	2.2e+006	-380000	166	99
1.94e+006	2.2e+006	-260000	166	100
1.48e+006	1.54e+006	-60000	166	101
1.68e+006	1.54e+006	140000	167	101
1.82e+006	1.54e+006	280000	168	101
1.94e+006	1.54e+006	400000	169	101
1.68e+006	1.48e+006	200000	170	101
1.82e+006	1.48e+006	340000	171	101
1.94e+006	1.48e+006	460000	172	101
1.82e+006	1.68e+006	140000	173	101
1.94e+006	1.68e+006	260000	174	101
1.94e+006	1.82e+006	120000	175	101

S Statistic = 175 - 101 = 74

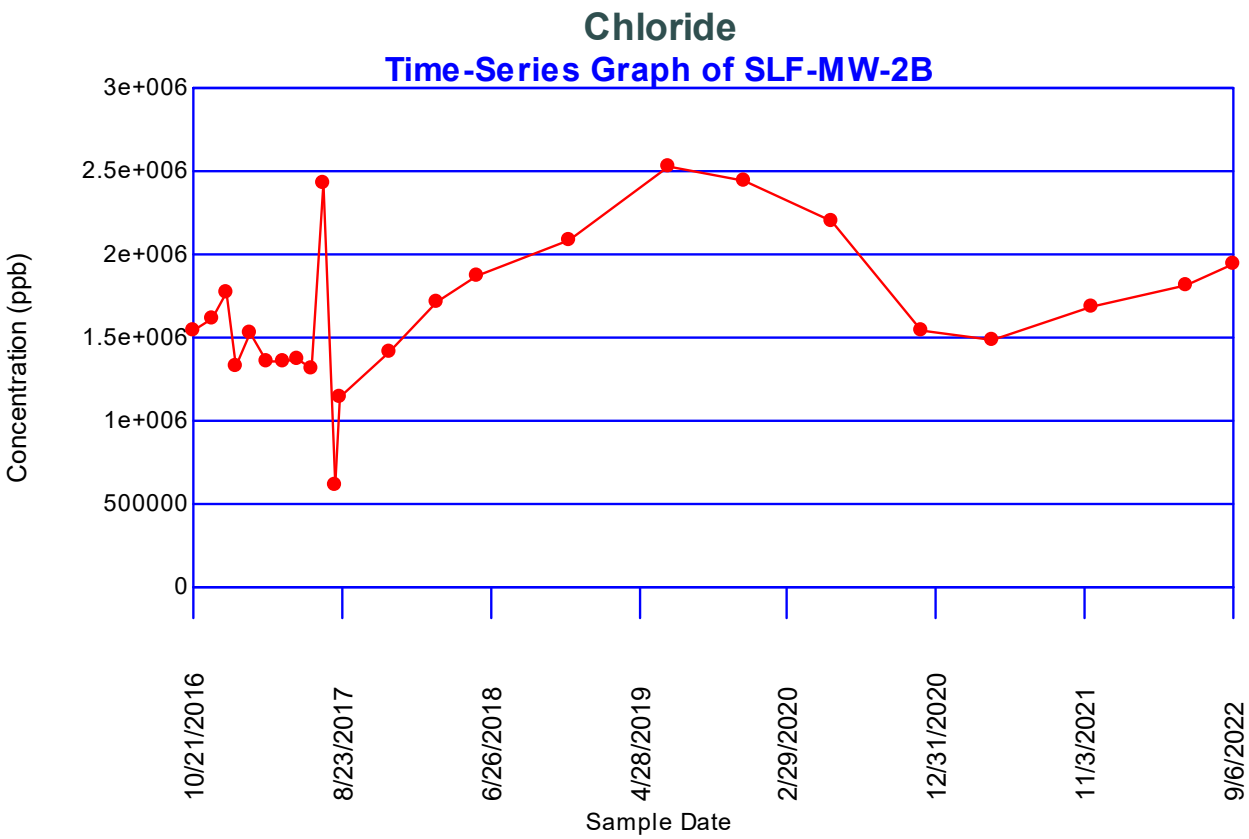
Tied Group	Value	Members

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0

B = 0
C = 0
D = 0
E = 0
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1625.33
Z-Score = 1.81072
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.81072| <= 1.97737 indicating no evidence of a trend


Chloride
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
3e+006
2.5e+006
2e+006
1.5e+006
1e+006
500000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Chloride

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.114458	0.0328947	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	152574	FALSE
	11/30/2016	169582	FALSE
	12/28/2016	160177	FALSE
	1/18/2017	146634	FALSE
	2/15/2017	143113	FALSE
	3/20/2017	171319	FALSE
	4/25/2017	167869	FALSE
	5/22/2017	126662	FALSE
	6/20/2017	121058	FALSE
	7/17/2017	98000	FALSE
	8/7/2017	103000	FALSE
	8/21/2017	98000	FALSE
	11/29/2017	152000	FALSE
	3/8/2018	224000	FALSE
	5/30/2018	179000	FALSE
	12/4/2018	225000	FALSE
	6/27/2019	239000	FALSE
	12/2/2019	245000	FALSE
	5/28/2020	262000	FALSE
	12/1/2020	269000	FALSE
	4/28/2021	250000	FALSE
	11/19/2021	246000	FALSE
	5/31/2022	228000	FALSE
	9/6/2022	191000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chloride

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	98000	269000	171000	0.4493	76830.3
2	98000	262000	164000	0.3098	50807.2
3	103000	250000	147000	0.2554	37543.8
4	121058	246000	124942	0.2145	26800.1
5	126662	245000	118338	0.1807	21383.7
6	143113	239000	95887	0.1512	14498.1
7	146634	228000	81366	0.1245	10130.1
8	152000	225000	73000	0.0997	7278.1
9	152574	224000	71426	0.0764	5456.95
10	160177	191000	30823	0.0539	1661.36
11	167869	179000	11131	0.0321	357.305
12	169582	171319	1737	0.0107	18.5859
13	171319	169582	-1737		
14	179000	167869	-11131		
15	191000	160177	-30823		
16	224000	152574	-71426		
17	225000	152000	-73000		
18	228000	146634	-81366		
19	239000	143113	-95887		
20	245000	126662	-118338		
21	246000	121058	-124942		
22	250000	103000	-147000		
23	262000	98000	-164000		
24	269000	98000	-171000		

Sum of b values = 252766
Sample Standard Deviation = 54505
W Statistic = 0.935051

5% Critical value of 0.916 is less than 0.935051
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.935051
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chloride

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
169582	152574	17008	1	0
160177	152574	7603	2	0
146634	152574	-5940	2	1
143113	152574	-9461	2	2
171319	152574	18745	3	2
167869	152574	15295	4	2
126662	152574	-25912	4	3
121058	152574	-31516	4	4
98000	152574	-54574	4	5
103000	152574	-49574	4	6
98000	152574	-54574	4	7
152000	152574	-574	4	8
224000	152574	71426	5	8
179000	152574	26426	6	8
225000	152574	72426	7	8
239000	152574	86426	8	8
245000	152574	92426	9	8
262000	152574	109426	10	8
269000	152574	116426	11	8
250000	152574	97426	12	8
246000	152574	93426	13	8
228000	152574	75426	14	8
191000	152574	38426	15	8
160177	169582	-9405	15	9
146634	169582	-22948	15	10
143113	169582	-26469	15	11
171319	169582	1737	16	11
167869	169582	-1713	16	12
126662	169582	-42920	16	13
121058	169582	-48524	16	14
98000	169582	-71582	16	15
103000	169582	-66582	16	16
98000	169582	-71582	16	17
152000	169582	-17582	16	18
224000	169582	54418	17	18
179000	169582	9418	18	18
225000	169582	55418	19	18
239000	169582	69418	20	18
245000	169582	75418	21	18
262000	169582	92418	22	18
269000	169582	99418	23	18
250000	169582	80418	24	18
246000	169582	76418	25	18
228000	169582	58418	26	18
191000	169582	21418	27	18

146634	160177	-13543	27	19
143113	160177	-17064	27	20
171319	160177	11142	28	20
167869	160177	7692	29	20
126662	160177	-33515	29	21
121058	160177	-39119	29	22
98000	160177	-62177	29	23
103000	160177	-57177	29	24
98000	160177	-62177	29	25
152000	160177	-8177	29	26
224000	160177	63823	30	26
179000	160177	18823	31	26
225000	160177	64823	32	26
239000	160177	78823	33	26
245000	160177	84823	34	26
262000	160177	101823	35	26
269000	160177	108823	36	26
250000	160177	89823	37	26
246000	160177	85823	38	26
228000	160177	67823	39	26
191000	160177	30823	40	26
143113	146634	-3521	40	27
171319	146634	24685	41	27
167869	146634	21235	42	27
126662	146634	-19972	42	28
121058	146634	-25576	42	29
98000	146634	-48634	42	30
103000	146634	-43634	42	31
98000	146634	-48634	42	32
152000	146634	5366	43	32
224000	146634	77366	44	32
179000	146634	32366	45	32
225000	146634	78366	46	32
239000	146634	92366	47	32
245000	146634	98366	48	32
262000	146634	115366	49	32
269000	146634	122366	50	32
250000	146634	103366	51	32
246000	146634	99366	52	32
228000	146634	81366	53	32
191000	146634	44366	54	32
171319	143113	28206	55	32
167869	143113	24756	56	32
126662	143113	-16451	56	33
121058	143113	-22055	56	34
98000	143113	-45113	56	35
103000	143113	-40113	56	36
98000	143113	-45113	56	37
152000	143113	8887	57	37
224000	143113	80887	58	37
179000	143113	35887	59	37
225000	143113	81887	60	37
239000	143113	95887	61	37
245000	143113	101887	62	37
262000	143113	118887	63	37

269000	143113	125887	64	37
250000	143113	106887	65	37
246000	143113	102887	66	37
228000	143113	84887	67	37
191000	143113	47887	68	37
167869	171319	-3450	68	38
126662	171319	-44657	68	39
121058	171319	-50261	68	40
98000	171319	-73319	68	41
103000	171319	-68319	68	42
98000	171319	-73319	68	43
152000	171319	-19319	68	44
224000	171319	52681	69	44
179000	171319	7681	70	44
225000	171319	53681	71	44
239000	171319	67681	72	44
245000	171319	73681	73	44
262000	171319	90681	74	44
269000	171319	97681	75	44
250000	171319	78681	76	44
246000	171319	74681	77	44
228000	171319	56681	78	44
191000	171319	19681	79	44
126662	167869	-41207	79	45
121058	167869	-46811	79	46
98000	167869	-69869	79	47
103000	167869	-64869	79	48
98000	167869	-69869	79	49
152000	167869	-15869	79	50
224000	167869	56131	80	50
179000	167869	11131	81	50
225000	167869	57131	82	50
239000	167869	71131	83	50
245000	167869	77131	84	50
262000	167869	94131	85	50
269000	167869	101131	86	50
250000	167869	82131	87	50
246000	167869	78131	88	50
228000	167869	60131	89	50
191000	167869	23131	90	50
121058	126662	-5604	90	51
98000	126662	-28662	90	52
103000	126662	-23662	90	53
98000	126662	-28662	90	54
152000	126662	25338	91	54
224000	126662	97338	92	54
179000	126662	52338	93	54
225000	126662	98338	94	54
239000	126662	112338	95	54
245000	126662	118338	96	54
262000	126662	135338	97	54
269000	126662	142338	98	54
250000	126662	123338	99	54
246000	126662	119338	100	54

228000	126662	101338	101	54
191000	126662	64338	102	54
98000	121058	-23058	102	55
103000	121058	-18058	102	56
98000	121058	-23058	102	57
152000	121058	30942	103	57
224000	121058	102942	104	57
179000	121058	57942	105	57
225000	121058	103942	106	57
239000	121058	117942	107	57
245000	121058	123942	108	57
262000	121058	140942	109	57
269000	121058	147942	110	57
250000	121058	128942	111	57
246000	121058	124942	112	57
228000	121058	106942	113	57
191000	121058	69942	114	57
103000	98000	5000	115	57
98000	98000	0	115	57
152000	98000	54000	116	57
224000	98000	126000	117	57
179000	98000	81000	118	57
225000	98000	127000	119	57
239000	98000	141000	120	57
245000	98000	147000	121	57
262000	98000	164000	122	57
269000	98000	171000	123	57
250000	98000	152000	124	57
246000	98000	148000	125	57
228000	98000	130000	126	57
191000	98000	93000	127	57
98000	103000	-5000	127	58
152000	103000	49000	128	58
224000	103000	121000	129	58
179000	103000	76000	130	58
225000	103000	122000	131	58
239000	103000	136000	132	58
245000	103000	142000	133	58
262000	103000	159000	134	58
269000	103000	166000	135	58
250000	103000	147000	136	58
246000	103000	143000	137	58
228000	103000	125000	138	58
191000	103000	88000	139	58
152000	98000	54000	140	58
224000	98000	126000	141	58
179000	98000	81000	142	58
225000	98000	127000	143	58
239000	98000	141000	144	58
245000	98000	147000	145	58
262000	98000	164000	146	58
269000	98000	171000	147	58
250000	98000	152000	148	58

246000	98000	148000	149	58
228000	98000	130000	150	58
191000	98000	93000	151	58
224000	152000	72000	152	58
179000	152000	27000	153	58
225000	152000	73000	154	58
239000	152000	87000	155	58
245000	152000	93000	156	58
262000	152000	110000	157	58
269000	152000	117000	158	58
250000	152000	98000	159	58
246000	152000	94000	160	58
228000	152000	76000	161	58
191000	152000	39000	162	58
179000	224000	-45000	162	59
225000	224000	1000	163	59
239000	224000	15000	164	59
245000	224000	21000	165	59
262000	224000	38000	166	59
269000	224000	45000	167	59
250000	224000	26000	168	59
246000	224000	22000	169	59
228000	224000	4000	170	59
191000	224000	-33000	170	60
225000	179000	46000	171	60
239000	179000	60000	172	60
245000	179000	66000	173	60
262000	179000	83000	174	60
269000	179000	90000	175	60
250000	179000	71000	176	60
246000	179000	67000	177	60
228000	179000	49000	178	60
191000	179000	12000	179	60
239000	225000	14000	180	60
245000	225000	20000	181	60
262000	225000	37000	182	60
269000	225000	44000	183	60
250000	225000	25000	184	60
246000	225000	21000	185	60
228000	225000	3000	186	60
191000	225000	-34000	186	61
245000	239000	6000	187	61
262000	239000	23000	188	61
269000	239000	30000	189	61
250000	239000	11000	190	61
246000	239000	7000	191	61
228000	239000	-11000	191	62
191000	239000	-48000	191	63
262000	245000	17000	192	63
269000	245000	24000	193	63
250000	245000	5000	194	63

246000	245000	1000	195	63
228000	245000	-17000	195	64
191000	245000	-54000	195	65
269000	262000	7000	196	65
250000	262000	-12000	196	66
246000	262000	-16000	196	67
228000	262000	-34000	196	68
191000	262000	-71000	196	69
250000	269000	-19000	196	70
246000	269000	-23000	196	71
228000	269000	-41000	196	72
191000	269000	-78000	196	73
246000	250000	-4000	196	74
228000	250000	-22000	196	75
191000	250000	-59000	196	76
228000	246000	-18000	196	77
191000	246000	-55000	196	78
191000	228000	-37000	196	79

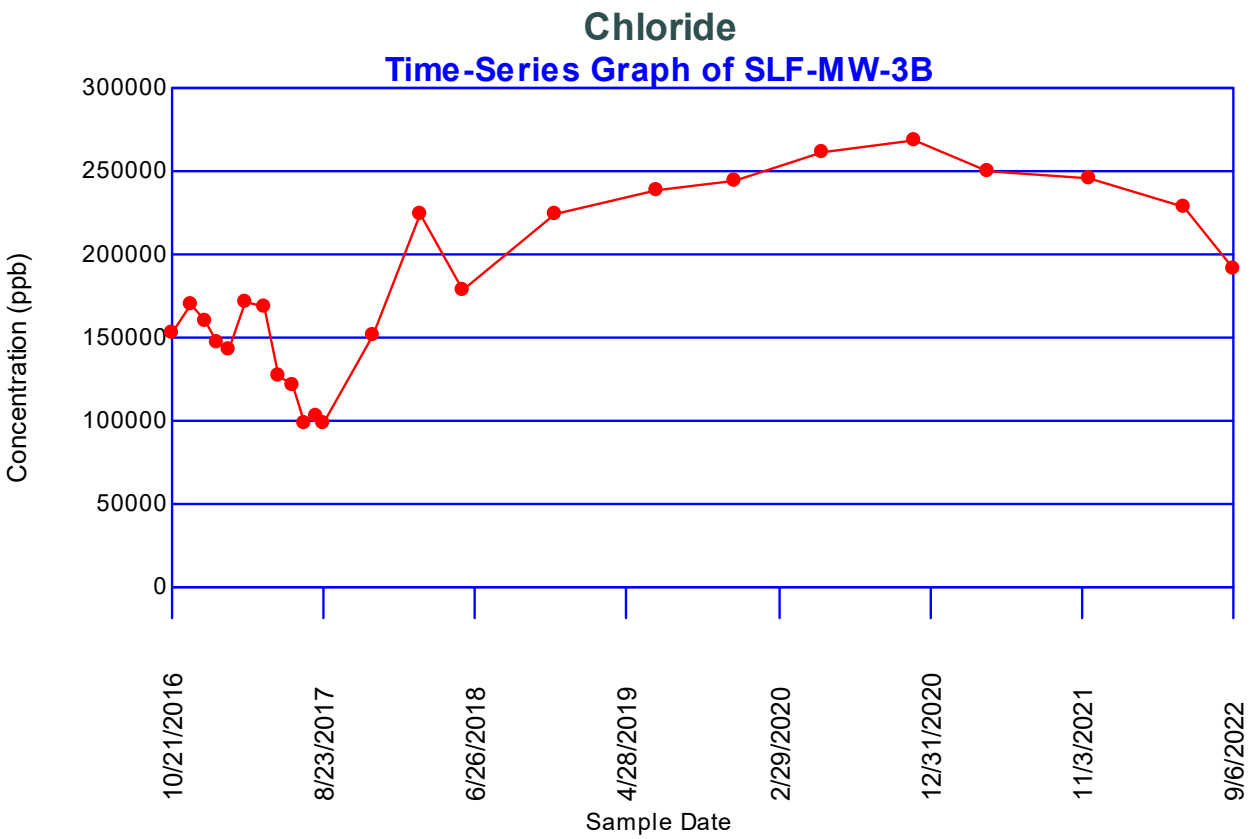
S Statistic = 196 - 79 = 117

Tied Group	Value	Members
1	98000	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1624.33
Z-Score = 2.8782
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|2.8782| > 1.97737 indicating a trend


Chloride
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
300000
250000
200000
150000
100000
50000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Chloride

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 20 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.512027	0.154762	0.45	44100
2	0.361903	0.17931	0.462	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	33649.2	FALSE
	3/20/2017	25801.9	FALSE
	4/25/2017	22580.8	FALSE
	5/22/2017	16154	FALSE
	6/20/2017	25945.6	FALSE
	7/17/2017	26000	FALSE
	8/7/2017	19100	FALSE
	8/22/2017	25500	FALSE
	11/29/2017	24500	FALSE
	3/8/2018	15000	FALSE
	5/30/2018	25500	FALSE
	12/4/2018	20500	FALSE
	6/28/2019	24300	FALSE
	12/2/2019	29200	FALSE
	5/28/2020	12400	FALSE
	11/30/2020	14200	FALSE
	4/28/2021	25700	FALSE
	11/19/2021	26900	FALSE
	5/31/2022	26200	FALSE
	9/6/2022	**44100**	**TRUE**

Shapiro-Wilks Test of Normality

Parameter: Chloride

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 10 for 20 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	12400	44100	31700	0.4734	15006.8
2	14200	33649.2	19449.2	0.3211	6245.14
3	15000	29200	14200	0.2565	3642.3
4	16154	26900	10746	0.2085	2240.54
5	19100	26200	7100	0.1686	1197.06
6	20500	26000	5500	0.1334	733.7
7	22580.8	25945.6	3364.8	0.1013	340.854
8	24300	25801.9	1501.9	0.0711	106.785
9	24500	25700	1200	0.0422	50.64
10	25500	25500	0	0.014	0
11	25500	25500	0		
12	25700	24500	-1200		
13	25801.9	24300	-1501.9		
14	25945.6	22580.8	-3364.8		
15	26000	20500	-5500		
16	26200	19100	-7100		
17	26900	16154	-10746		
18	29200	15000	-14200		
19	33649.2	14200	-19449.2		
20	44100	12400	-31700		

Sum of b values = 29563.8
Sample Standard Deviation = 7134.35
W Statistic = 0.903769

5% Critical value of 0.905 exceeds 0.903769
Evidence of non-normality at 95% level of significance

1% Critical value of 0.868 is less than 0.903769
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chloride

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
25801.9	33649.2	-7847.3	0	1
22580.8	33649.2	-11068.4	0	2
16154	33649.2	-17495.2	0	3
25945.6	33649.2	-7703.6	0	4
26000	33649.2	-7649.2	0	5
19100	33649.2	-14549.2	0	6
25500	33649.2	-8149.2	0	7
24500	33649.2	-9149.2	0	8
15000	33649.2	-18649.2	0	9
25500	33649.2	-8149.2	0	10
20500	33649.2	-13149.2	0	11
24300	33649.2	-9349.2	0	12
29200	33649.2	-4449.2	0	13
12400	33649.2	-21249.2	0	14
14200	33649.2	-19449.2	0	15
25700	33649.2	-7949.2	0	16
26900	33649.2	-6749.2	0	17
26200	33649.2	-7449.2	0	18
44100	33649.2	10450.8	1	18
22580.8	25801.9	-3221.1	1	19
16154	25801.9	-9647.9	1	20
25945.6	25801.9	143.7	2	20
26000	25801.9	198.1	3	20
19100	25801.9	-6701.9	3	21
25500	25801.9	-301.9	3	22
24500	25801.9	-1301.9	3	23
15000	25801.9	-10801.9	3	24
25500	25801.9	-301.9	3	25
20500	25801.9	-5301.9	3	26
24300	25801.9	-1501.9	3	27
29200	25801.9	3398.1	4	27
12400	25801.9	-13401.9	4	28
14200	25801.9	-11601.9	4	29
25700	25801.9	-101.9	4	30
26900	25801.9	1098.1	5	30
26200	25801.9	398.1	6	30
44100	25801.9	18298.1	7	30
16154	22580.8	-6426.8	7	31
25945.6	22580.8	3364.8	8	31
26000	22580.8	3419.2	9	31
19100	22580.8	-3480.8	9	32
25500	22580.8	2919.2	10	32
24500	22580.8	1919.2	11	32
15000	22580.8	-7580.8	11	33
25500	22580.8	2919.2	12	33

20500	22580.8	-2080.8	12	34
24300	22580.8	1719.2	13	34
29200	22580.8	6619.2	14	34
12400	22580.8	-10180.8	14	35
14200	22580.8	-8380.8	14	36
25700	22580.8	3119.2	15	36
26900	22580.8	4319.2	16	36
26200	22580.8	3619.2	17	36
44100	22580.8	21519.2	18	36
25945.6	16154	9791.6	19	36
26000	16154	9846	20	36
19100	16154	2946	21	36
25500	16154	9346	22	36
24500	16154	8346	23	36
15000	16154	-1154	23	37
25500	16154	9346	24	37
20500	16154	4346	25	37
24300	16154	8146	26	37
29200	16154	13046	27	37
12400	16154	-3754	27	38
14200	16154	-1954	27	39
25700	16154	9546	28	39
26900	16154	10746	29	39
26200	16154	10046	30	39
44100	16154	27946	31	39
26000	25945.6	54.4	32	39
19100	25945.6	-6845.6	32	40
25500	25945.6	-445.6	32	41
24500	25945.6	-1445.6	32	42
15000	25945.6	-10945.6	32	43
25500	25945.6	-445.6	32	44
20500	25945.6	-5445.6	32	45
24300	25945.6	-1645.6	32	46
29200	25945.6	3254.4	33	46
12400	25945.6	-13545.6	33	47
14200	25945.6	-11745.6	33	48
25700	25945.6	-245.6	33	49
26900	25945.6	954.4	34	49
26200	25945.6	254.4	35	49
44100	25945.6	18154.4	36	49
19100	26000	-6900	36	50
25500	26000	-500	36	51
24500	26000	-1500	36	52
15000	26000	-11000	36	53
25500	26000	-500	36	54
20500	26000	-5500	36	55
24300	26000	-1700	36	56
29200	26000	3200	37	56
12400	26000	-13600	37	57
14200	26000	-11800	37	58
25700	26000	-300	37	59
26900	26000	900	38	59
26200	26000	200	39	59
44100	26000	18100	40	59

25500	19100	6400	41	59
24500	19100	5400	42	59
15000	19100	-4100	42	60
25500	19100	6400	43	60
20500	19100	1400	44	60
24300	19100	5200	45	60
29200	19100	10100	46	60
12400	19100	-6700	46	61
14200	19100	-4900	46	62
25700	19100	6600	47	62
26900	19100	7800	48	62
26200	19100	7100	49	62
44100	19100	25000	50	62
24500	25500	-1000	50	63
15000	25500	-10500	50	64
25500	25500	0	50	64
20500	25500	-5000	50	65
24300	25500	-1200	50	66
29200	25500	3700	51	66
12400	25500	-13100	51	67
14200	25500	-11300	51	68
25700	25500	200	52	68
26900	25500	1400	53	68
26200	25500	700	54	68
44100	25500	18600	55	68
15000	24500	-9500	55	69
25500	24500	1000	56	69
20500	24500	-4000	56	70
24300	24500	-200	56	71
29200	24500	4700	57	71
12400	24500	-12100	57	72
14200	24500	-10300	57	73
25700	24500	1200	58	73
26900	24500	2400	59	73
26200	24500	1700	60	73
44100	24500	19600	61	73
25500	15000	10500	62	73
20500	15000	5500	63	73
24300	15000	9300	64	73
29200	15000	14200	65	73
12400	15000	-2600	65	74
14200	15000	-800	65	75
25700	15000	10700	66	75
26900	15000	11900	67	75
26200	15000	11200	68	75
44100	15000	29100	69	75
20500	25500	-5000	69	76
24300	25500	-1200	69	77
29200	25500	3700	70	77
12400	25500	-13100	70	78
14200	25500	-11300	70	79
25700	25500	200	71	79

26900	25500	1400	72	79
26200	25500	700	73	79
44100	25500	18600	74	79
24300	20500	3800	75	79
29200	20500	8700	76	79
12400	20500	-8100	76	80
14200	20500	-6300	76	81
25700	20500	5200	77	81
26900	20500	6400	78	81
26200	20500	5700	79	81
44100	20500	23600	80	81
29200	24300	4900	81	81
12400	24300	-11900	81	82
14200	24300	-10100	81	83
25700	24300	1400	82	83
26900	24300	2600	83	83
26200	24300	1900	84	83
44100	24300	19800	85	83
12400	29200	-16800	85	84
14200	29200	-15000	85	85
25700	29200	-3500	85	86
26900	29200	-2300	85	87
26200	29200	-3000	85	88
44100	29200	14900	86	88
14200	12400	1800	87	88
25700	12400	13300	88	88
26900	12400	14500	89	88
26200	12400	13800	90	88
44100	12400	31700	91	88
25700	14200	11500	92	88
26900	14200	12700	93	88
26200	14200	12000	94	88
44100	14200	29900	95	88
26900	25700	1200	96	88
26200	25700	500	97	88
44100	25700	18400	98	88
26200	26900	-700	98	89
44100	26900	17200	99	89
44100	26200	17900	100	89

S Statistic = 100 - 89 = 11

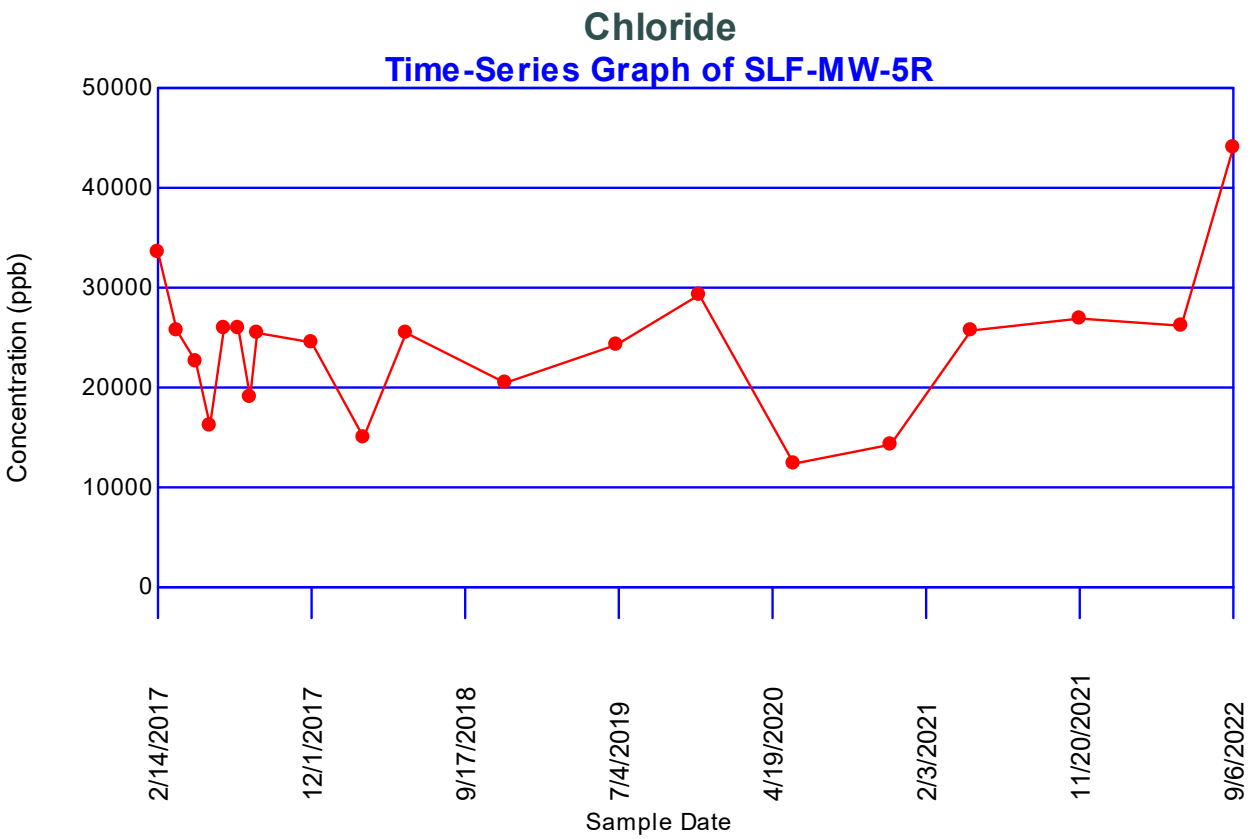
Tied Group	Value	Members
1	25500	2

Time Period	Observations
2/14/2017	1
3/20/2017	1

4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 949
Z-Score = 0.324614
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|0.324614| <= 1.97737 indicating no evidence of a trend


Chloride
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
50000
40000
30000
20000
10000
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 65
Total Non-Detect: 40
Percent Non-Detects: 61.5385%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	23	2 (8.69565%)	10/21/2016	ND<500	ND<500
			11/30/2016	2647.4	2647.4
			12/28/2016	1500	1500
			1/18/2017	1875.9	1875.9
			2/14/2017	ND<500	ND<500
			3/20/2017	1794.9	1794.9
			4/25/2017	1972.9	1972.9
			5/22/2017	1673.4	1673.4
			6/20/2017	2104.9	2104.9
			7/17/2017	2000	2000
			8/8/2017	2000	2000
			8/21/2017	1900	1900
			11/29/2017	2000	2000
			5/31/2018	2200	2200
			12/4/2018	1620	1620
			6/28/2019	2190	2190
			12/2/2019	2280	2280
			5/28/2020	2330	2330
			11/30/2020	2220	2220
			4/28/2021	1980	1980
			11/19/2021	1960	1960
			5/31/2022	1100	1100
			9/6/2022	970	970
			11/21/2022	**830**	**830**
SLF-MW-3B	23	21 (91.3043%)	10/21/2016	ND<500	ND<500
			11/30/2016	ND<500	ND<500
			12/28/2016	ND<500	ND<500
			1/18/2017	ND<500	ND<500
			2/15/2017	ND<500	ND<500
			3/20/2017	ND<500	ND<500
			4/25/2017	ND<500	ND<500
			5/22/2017	ND<500	ND<500
			6/20/2017	ND<500	ND<500
			7/17/2017	ND<500	ND<500
			8/7/2017	ND<500	ND<500
			8/21/2017	ND<500	ND<500
			11/29/2017	ND<500	ND<500
			5/30/2018	ND<500	ND<500
			12/4/2018	ND<500	ND<500
			6/27/2019	ND<500	ND<500

			12/2/2019	ND<500	ND<500
			5/28/2020	ND<500	ND<500
			12/1/2020	ND<500	ND<500
			4/28/2021	ND<500	ND<500
			11/19/2021	ND<500	ND<500
			5/31/2022	160	160
			9/6/2022	160	160
			11/21/2022	**160**	**160**
SLF-MW-5R	19	17 (89.4737%)	2/14/2017	ND<500	ND<500
			3/20/2017	ND<500	ND<500
			4/25/2017	ND<500	ND<500
			5/22/2017	ND<500	ND<500
			6/20/2017	ND<500	ND<500
			7/17/2017	ND<500	ND<500
			8/7/2017	ND<500	ND<500
			8/22/2017	ND<500	ND<500
			11/29/2017	ND<500	ND<500
			5/30/2018	ND<500	ND<500
			12/4/2018	ND<500	ND<500
			6/28/2019	ND<500	ND<500
			12/2/2019	ND<500	ND<500
			5/28/2020	ND<500	ND<500
			11/30/2020	ND<500	ND<500
			4/28/2021	ND<500	ND<500
			11/19/2021	ND<500	ND<500
			5/31/2022	130	130
			9/6/2022	150	150
			11/21/2022	**150**	**150**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Fluoride

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.219029	0.264045	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	ND<500	FALSE
	11/30/2016	2647.4	FALSE
	12/28/2016	1500	FALSE
	1/18/2017	1875.9	FALSE
	2/14/2017	ND<500	FALSE
	3/20/2017	1794.9	FALSE
	4/25/2017	1972.9	FALSE
	5/22/2017	1673.4	FALSE
	6/20/2017	2104.9	FALSE
	7/17/2017	2000	FALSE
	8/8/2017	2000	FALSE
	8/21/2017	1900	FALSE
	11/29/2017	2000	FALSE
	5/31/2018	2200	FALSE
	12/4/2018	1620	FALSE
	6/28/2019	2190	FALSE
	12/2/2019	2280	FALSE
	5/28/2020	2330	FALSE
	11/30/2020	2220	FALSE
	4/28/2021	1980	FALSE
	11/19/2021	1960	FALSE
	5/31/2022	1100	FALSE
	9/6/2022	970	FALSE

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	500	2647.4	2147.4	0.4542	975.349
2	500	2330	1830	0.3126	572.058
3	970	2280	1310	0.2563	335.753
4	1100	2220	1120	0.2139	239.568
5	1500	2200	700	0.1787	125.09
6	1620	2190	570	0.148	84.36
7	1673.4	2104.9	431.5	0.1201	51.8231
8	1794.9	2000	205.1	0.0941	19.2999
9	1875.9	2000	124.1	0.0696	8.63736
10	1900	2000	100	0.0459	4.59
11	1960	1980	20	0.0228	0.456
12	1972.9	1972.9	0		
13	1980	1960	-20		
14	2000	1900	-100		
15	2000	1875.9	-124.1		
16	2000	1794.9	-205.1		
17	2104.9	1673.4	-431.5		
18	2190	1620	-570		
19	2200	1500	-700		
20	2220	1100	-1120		
21	2280	970	-1310		
22	2330	500	-1830		
23	2647.4	500	-2147.4		

Sum of b values = 2416.98
Sample Standard Deviation = 553.155
W Statistic = 0.867822

5% Critical value of 0.914 exceeds 0.867822
Evidence of non-normality at 95% level of significance

1% Critical value of 0.881 exceeds 0.867822
Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Fluoride

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2647.4	ND<500	2147.4	1	0
1500	ND<500	1000	2	0
1875.9	ND<500	1375.9	3	0
ND<500	ND<500	0	3	0
1794.9	ND<500	1294.9	4	0
1972.9	ND<500	1472.9	5	0
1673.4	ND<500	1173.4	6	0
2104.9	ND<500	1604.9	7	0
2000	ND<500	1500	8	0
2000	ND<500	1500	9	0
1900	ND<500	1400	10	0
2000	ND<500	1500	11	0
2200	ND<500	1700	12	0
1620	ND<500	1120	13	0
2190	ND<500	1690	14	0
2280	ND<500	1780	15	0
2330	ND<500	1830	16	0
2220	ND<500	1720	17	0
1980	ND<500	1480	18	0
1960	ND<500	1460	19	0
1100	ND<500	600	20	0
970	ND<500	470	21	0
1500	2647.4	-1147.4	21	1
1875.9	2647.4	-771.5	21	2
ND<500	2647.4	-2147.4	21	3
1794.9	2647.4	-852.5	21	4
1972.9	2647.4	-674.5	21	5
1673.4	2647.4	-974	21	6
2104.9	2647.4	-542.5	21	7
2000	2647.4	-647.4	21	8
2000	2647.4	-647.4	21	9
1900	2647.4	-747.4	21	10
2000	2647.4	-647.4	21	11
2200	2647.4	-447.4	21	12
1620	2647.4	-1027.4	21	13
2190	2647.4	-457.4	21	14
2280	2647.4	-367.4	21	15
2330	2647.4	-317.4	21	16
2220	2647.4	-427.4	21	17
1980	2647.4	-667.4	21	18
1960	2647.4	-687.4	21	19
1100	2647.4	-1547.4	21	20
970	2647.4	-1677.4	21	21
1875.9	1500	375.9	22	21
ND<500	1500	-1000	22	22

1794.9	1500	294.9	23	22
1972.9	1500	472.9	24	22
1673.4	1500	173.4	25	22
2104.9	1500	604.9	26	22
2000	1500	500	27	22
2000	1500	500	28	22
1900	1500	400	29	22
2000	1500	500	30	22
2200	1500	700	31	22
1620	1500	120	32	22
2190	1500	690	33	22
2280	1500	780	34	22
2330	1500	830	35	22
2220	1500	720	36	22
1980	1500	480	37	22
1960	1500	460	38	22
1100	1500	-400	38	23
970	1500	-530	38	24
ND<500	1875.9	-1375.9	38	25
1794.9	1875.9	-81	38	26
1972.9	1875.9	97	39	26
1673.4	1875.9	-202.5	39	27
2104.9	1875.9	229	40	27
2000	1875.9	124.1	41	27
2000	1875.9	124.1	42	27
1900	1875.9	24.1	43	27
2000	1875.9	124.1	44	27
2200	1875.9	324.1	45	27
1620	1875.9	-255.9	45	28
2190	1875.9	314.1	46	28
2280	1875.9	404.1	47	28
2330	1875.9	454.1	48	28
2220	1875.9	344.1	49	28
1980	1875.9	104.1	50	28
1960	1875.9	84.1	51	28
1100	1875.9	-775.9	51	29
970	1875.9	-905.9	51	30
1794.9	ND<500	1294.9	52	30
1972.9	ND<500	1472.9	53	30
1673.4	ND<500	1173.4	54	30
2104.9	ND<500	1604.9	55	30
2000	ND<500	1500	56	30
2000	ND<500	1500	57	30
1900	ND<500	1400	58	30
2000	ND<500	1500	59	30
2200	ND<500	1700	60	30
1620	ND<500	1120	61	30
2190	ND<500	1690	62	30
2280	ND<500	1780	63	30
2330	ND<500	1830	64	30
2220	ND<500	1720	65	30
1980	ND<500	1480	66	30
1960	ND<500	1460	67	30
1100	ND<500	600	68	30
970	ND<500	470	69	30

1972.9	1794.9	178	70	30
1673.4	1794.9	-121.5	70	31
2104.9	1794.9	310	71	31
2000	1794.9	205.1	72	31
2000	1794.9	205.1	73	31
1900	1794.9	105.1	74	31
2000	1794.9	205.1	75	31
2200	1794.9	405.1	76	31
1620	1794.9	-174.9	76	32
2190	1794.9	395.1	77	32
2280	1794.9	485.1	78	32
2330	1794.9	535.1	79	32
2220	1794.9	425.1	80	32
1980	1794.9	185.1	81	32
1960	1794.9	165.1	82	32
1100	1794.9	-694.9	82	33
970	1794.9	-824.9	82	34
1673.4	1972.9	-299.5	82	35
2104.9	1972.9	132	83	35
2000	1972.9	27.1	84	35
2000	1972.9	27.1	85	35
1900	1972.9	-72.9	85	36
2000	1972.9	27.1	86	36
2200	1972.9	227.1	87	36
1620	1972.9	-352.9	87	37
2190	1972.9	217.1	88	37
2280	1972.9	307.1	89	37
2330	1972.9	357.1	90	37
2220	1972.9	247.1	91	37
1980	1972.9	7.1	92	37
1960	1972.9	-12.9	92	38
1100	1972.9	-872.9	92	39
970	1972.9	-1002.9	92	40
2104.9	1673.4	431.5	93	40
2000	1673.4	326.6	94	40
2000	1673.4	326.6	95	40
1900	1673.4	226.6	96	40
2000	1673.4	326.6	97	40
2200	1673.4	526.6	98	40
1620	1673.4	-53.4	98	41
2190	1673.4	516.6	99	41
2280	1673.4	606.6	100	41
2330	1673.4	656.6	101	41
2220	1673.4	546.6	102	41
1980	1673.4	306.6	103	41
1960	1673.4	286.6	104	41
1100	1673.4	-573.4	104	42
970	1673.4	-703.4	104	43
2000	2104.9	-104.9	104	44
2000	2104.9	-104.9	104	45
1900	2104.9	-204.9	104	46
2000	2104.9	-104.9	104	47
2200	2104.9	95.1	105	47

1620	2104.9	-484.9	105	48
2190	2104.9	85.1	106	48
2280	2104.9	175.1	107	48
2330	2104.9	225.1	108	48
2220	2104.9	115.1	109	48
1980	2104.9	-124.9	109	49
1960	2104.9	-144.9	109	50
1100	2104.9	-1004.9	109	51
970	2104.9	-1134.9	109	52
2000	2000	0	109	52
1900	2000	-100	109	53
2000	2000	0	109	53
2200	2000	200	110	53
1620	2000	-380	110	54
2190	2000	190	111	54
2280	2000	280	112	54
2330	2000	330	113	54
2220	2000	220	114	54
1980	2000	-20	114	55
1960	2000	-40	114	56
1100	2000	-900	114	57
970	2000	-1030	114	58
1900	2000	-100	114	59
2000	2000	0	114	59
2200	2000	200	115	59
1620	2000	-380	115	60
2190	2000	190	116	60
2280	2000	280	117	60
2330	2000	330	118	60
2220	2000	220	119	60
1980	2000	-20	119	61
1960	2000	-40	119	62
1100	2000	-900	119	63
970	2000	-1030	119	64
2000	1900	100	120	64
2200	1900	300	121	64
1620	1900	-280	121	65
2190	1900	290	122	65
2280	1900	380	123	65
2330	1900	430	124	65
2220	1900	320	125	65
1980	1900	80	126	65
1960	1900	60	127	65
1100	1900	-800	127	66
970	1900	-930	127	67
2200	2000	200	128	67
1620	2000	-380	128	68
2190	2000	190	129	68
2280	2000	280	130	68
2330	2000	330	131	68
2220	2000	220	132	68
1980	2000	-20	132	69
1960	2000	-40	132	70

1100	2000	-900	132	71
970	2000	-1030	132	72
1620	2200	-580	132	73
2190	2200	-10	132	74
2280	2200	80	133	74
2330	2200	130	134	74
2220	2200	20	135	74
1980	2200	-220	135	75
1960	2200	-240	135	76
1100	2200	-1100	135	77
970	2200	-1230	135	78
2190	1620	570	136	78
2280	1620	660	137	78
2330	1620	710	138	78
2220	1620	600	139	78
1980	1620	360	140	78
1960	1620	340	141	78
1100	1620	-520	141	79
970	1620	-650	141	80
2280	2190	90	142	80
2330	2190	140	143	80
2220	2190	30	144	80
1980	2190	-210	144	81
1960	2190	-230	144	82
1100	2190	-1090	144	83
970	2190	-1220	144	84
2330	2280	50	145	84
2220	2280	-60	145	85
1980	2280	-300	145	86
1960	2280	-320	145	87
1100	2280	-1180	145	88
970	2280	-1310	145	89
2220	2330	-110	145	90
1980	2330	-350	145	91
1960	2330	-370	145	92
1100	2330	-1230	145	93
970	2330	-1360	145	94
1980	2220	-240	145	95
1960	2220	-260	145	96
1100	2220	-1120	145	97
970	2220	-1250	145	98
1960	1980	-20	145	99
1100	1980	-880	145	100
970	1980	-1010	145	101
1100	1960	-860	145	102
970	1960	-990	145	103
970	1100	-130	145	104

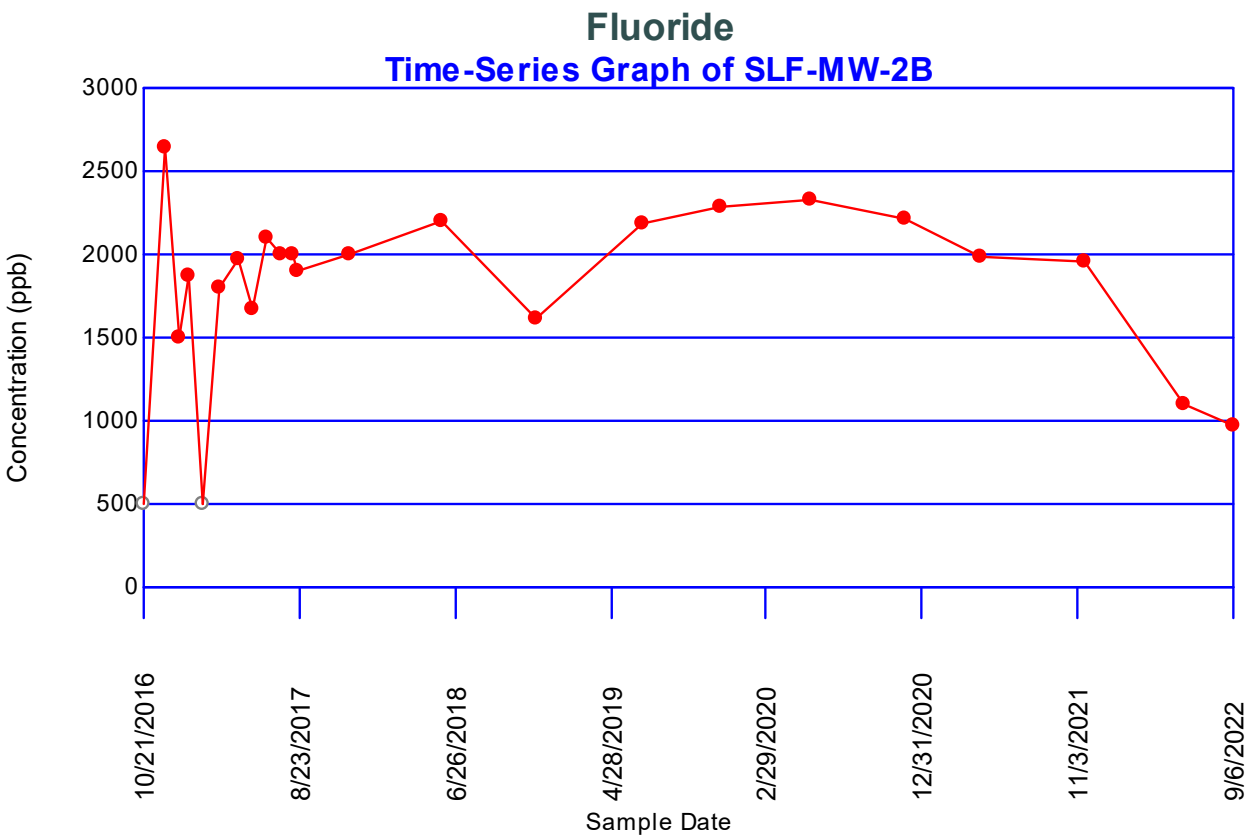
S Statistic = 145 - 104 = 41

Tied Group	Value	Members
1	500	2
2	2000	3

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1429
Z-Score = 1.05814
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.05814| <= 1.97737 indicating no evidence of a trend


Fluoride
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
3000
2500
2000
1500
1000
500
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Fluoride

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.

Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	ND<500	FALSE
	11/30/2016	ND<500	FALSE
	12/28/2016	ND<500	FALSE
	1/18/2017	ND<500	FALSE
	2/15/2017	ND<500	FALSE
	3/20/2017	ND<500	FALSE
	4/25/2017	ND<500	FALSE
	5/22/2017	ND<500	FALSE
	6/20/2017	ND<500	FALSE
	7/17/2017	ND<500	FALSE
	8/7/2017	ND<500	FALSE
	8/21/2017	ND<500	FALSE
	11/29/2017	ND<500	FALSE
	5/30/2018	ND<500	FALSE
	12/4/2018	ND<500	FALSE
	6/27/2019	ND<500	FALSE
	12/2/2019	ND<500	FALSE
	5/28/2020	ND<500	FALSE
	12/1/2020	ND<500	FALSE
	4/28/2021	ND<500	FALSE
	11/19/2021	ND<500	FALSE
	5/31/2022	160	FALSE
	9/6/2022	160	FALSE

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

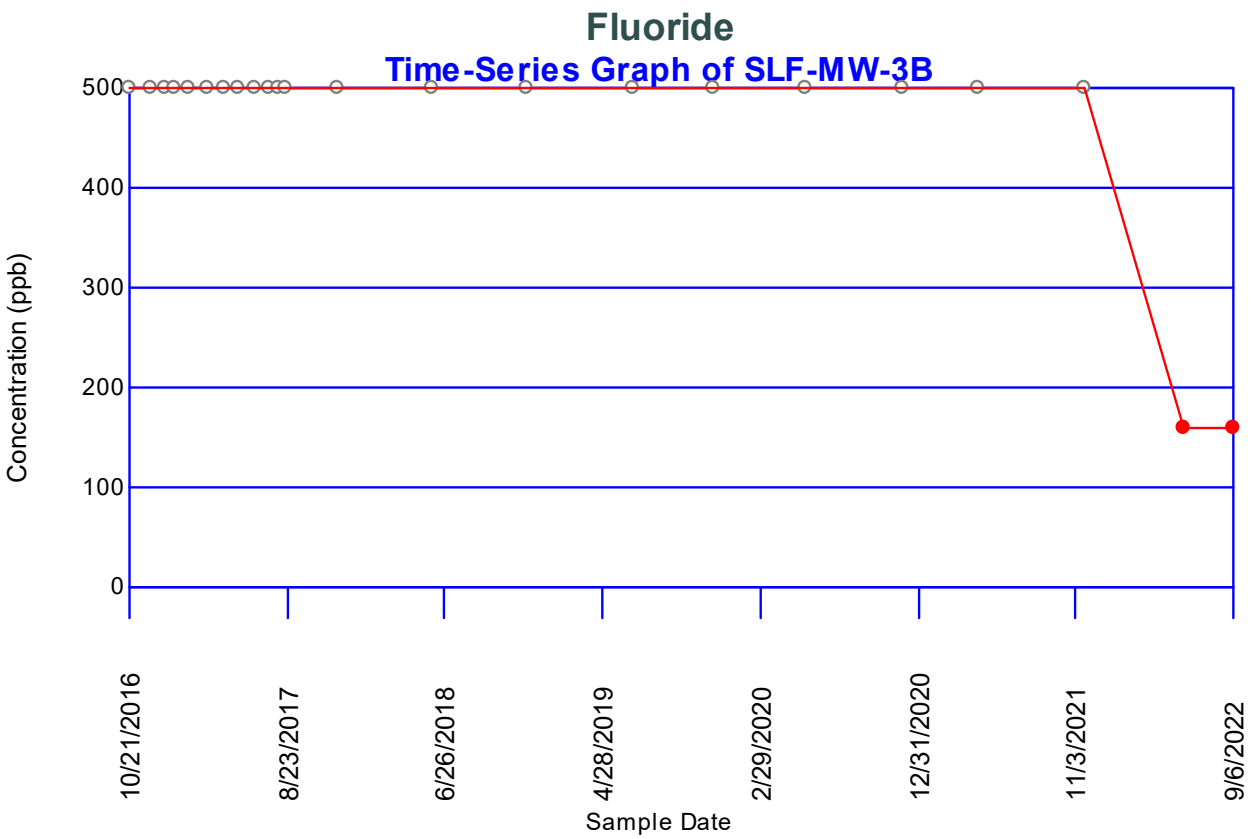
K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	160	500	340	0.4542	154.428
2	160	500	340	0.3126	106.284
3	500	500	0	0.2563	0
4	500	500	0	0.2139	0
5	500	500	0	0.1787	0
6	500	500	0	0.148	0
7	500	500	0	0.1201	0
8	500	500	0	0.0941	0
9	500	500	0	0.0696	0
10	500	500	0	0.0459	0
11	500	500	0	0.0228	0
12	500	500	0		
13	500	500	0		
14	500	500	0		
15	500	500	0		
16	500	500	0		
17	500	500	0		
18	500	500	0		
19	500	500	0		
20	500	500	0		
21	500	500	0		
22	500	160	-340		
23	500	160	-340		

Sum of b values = 260.712
Sample Standard Deviation = 97.9554
W Statistic = 0.32199

5% Critical value of 0.914 exceeds 0.32199
Evidence of non-normality at 95% level of significance

1% Critical value of 0.881 exceeds 0.32199
Evidence of non-normality at 99% level of significance


Fluoride
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
500
400
300
200
100
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Fluoride

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 19 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.

Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	ND<500	FALSE
	3/20/2017	ND<500	FALSE
	4/25/2017	ND<500	FALSE
	5/22/2017	ND<500	FALSE
	6/20/2017	ND<500	FALSE
	7/17/2017	ND<500	FALSE
	8/7/2017	ND<500	FALSE
	8/22/2017	ND<500	FALSE
	11/29/2017	ND<500	FALSE
	5/30/2018	ND<500	FALSE
	12/4/2018	ND<500	FALSE
	6/28/2019	ND<500	FALSE
	12/2/2019	ND<500	FALSE
	5/28/2020	ND<500	FALSE
	11/30/2020	ND<500	FALSE
	4/28/2021	ND<500	FALSE
	11/19/2021	ND<500	FALSE
	5/31/2022	130	FALSE
	9/6/2022	150	FALSE

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

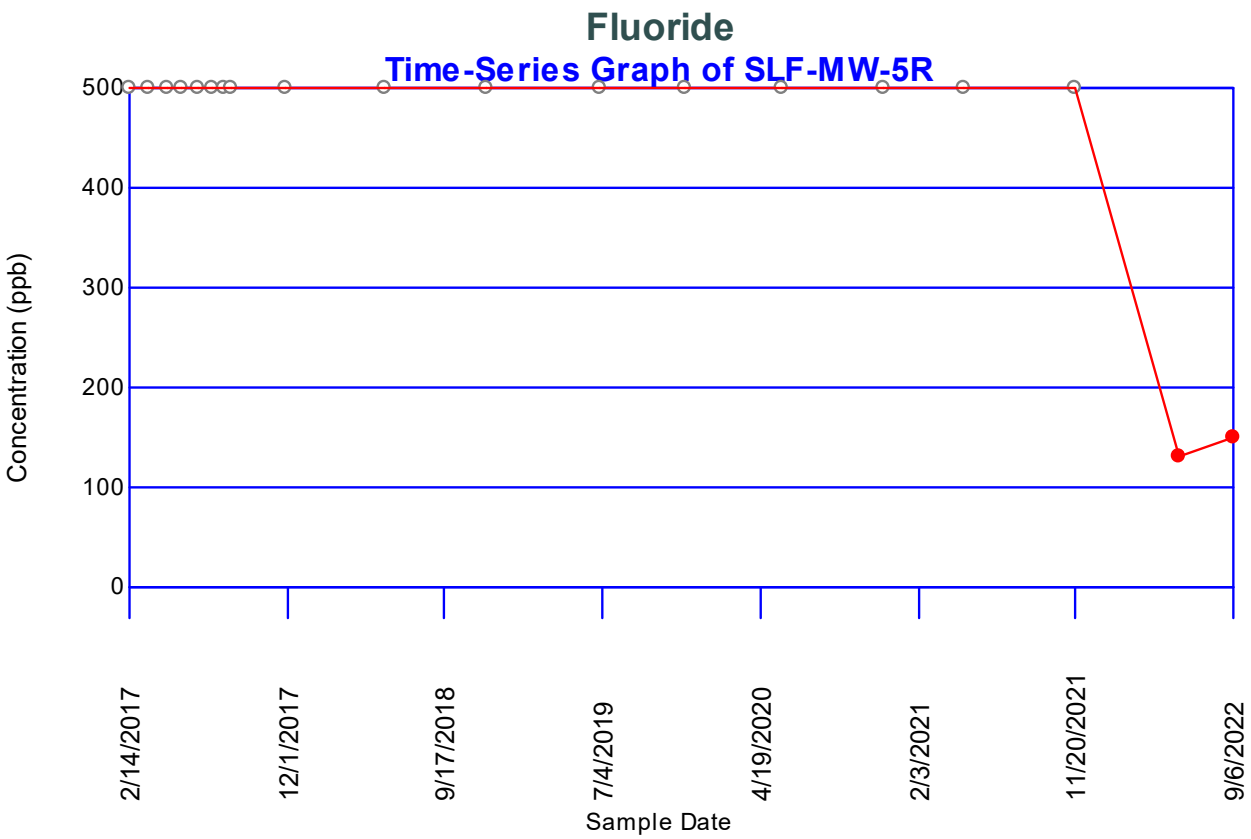
K = 9 for 19 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	130	500	370	0.4808	177.896
2	150	500	350	0.3232	113.12
3	500	500	0	0.2561	0
4	500	500	0	0.2059	0
5	500	500	0	0.1641	0
6	500	500	0	0.1271	0
7	500	500	0	0.0932	0
8	500	500	0	0.0612	0
9	500	500	0	0.0303	0
10	500	500	0		
11	500	500	0		
12	500	500	0		
13	500	500	0		
14	500	500	0		
15	500	500	0		
16	500	500	0		
17	500	500	0		
18	500	150	-350		
19	500	130	-370		

Sum of b values = 291.016
Sample Standard Deviation = 113.558
W Statistic = 0.364862

5% Critical value of 0.901 exceeds 0.364862
Evidence of non-normality at 95% level of significance

1% Critical value of 0.863 exceeds 0.364862
Evidence of non-normality at 99% level of significance


Fluoride
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
500
400
300
200
100
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 70
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	26	0 (0%)	10/21/2016	7.51	7.51
			11/30/2016	7.67	7.67
			12/28/2016	7.73	7.73
			1/18/2017	7.59	7.59
			2/14/2017	7.79	7.79
			3/20/2017	7.61	7.61
			4/25/2017	7.48	7.48
			5/22/2017	7.93	7.93
			6/20/2017	8.06	8.06
			7/17/2017	8.34	8.34
			8/8/2017	9	9
			8/21/2017	8.93	8.93
			11/29/2017	7.66	7.66
			3/8/2018	7.88	7.88
			5/31/2018	7.56	7.56
			12/4/2018	7.62	7.62
			6/28/2019	7.54	7.54
			11/4/2019	7.6	7.6
			12/2/2019	7.5	7.5
			5/28/2020	7.28	7.28
			11/30/2020	7.87	7.87
			4/12/2021	7.7	7.7
			4/28/2021	7.73	7.73
			11/19/2021	7.82	7.82
			5/31/2022	7.7	7.7
			9/6/2022	7.63	7.63
			11/21/2022	**7.68**	**7.68**
SLF-MW-3B	24	0 (0%)	10/21/2016	7.02	7.02
			11/30/2016	7.11	7.11
			12/28/2016	7.19	7.19
			1/18/2017	6.97	6.97
			2/15/2017	7.24	7.24
			3/20/2017	7.06	7.06
			4/25/2017	7.02	7.02
			5/22/2017	7.22	7.22
			6/20/2017	6.99	6.99
			7/17/2017	7.33	7.33
			8/7/2017	7.61	7.61
			8/21/2017	7.53	7.53
			11/29/2017	7.12	7.12

			3/8/2018	7.46	7.46
			5/30/2018	7.09	7.09
			12/4/2018	7.11	7.11
			6/27/2019	7.22	7.22
			12/2/2019	7.11	7.11
			5/28/2020	6.97	6.97
			12/1/2020	7.23	7.23
			4/28/2021	7.14	7.14
			11/19/2021	7.25	7.25
			5/31/2022	7.28	7.28
			9/6/2022	7.25	7.25
			11/21/2022	**7.3**	**7.3**
SLF-MW-5R	20	0 (0%)	2/14/2017	7.16	7.16
			3/20/2017	7.14	7.14
			4/25/2017	7.06	7.06
			5/22/2017	7.14	7.14
			6/20/2017	7.09	7.09
			7/17/2017	7.2	7.2
			8/7/2017	7.32	7.32
			8/22/2017	7.34	7.34
			11/29/2017	7.1	7.1
			3/8/2018	7.35	7.35
			5/30/2018	6.94	6.94
			12/4/2018	7.14	7.14
			6/28/2019	7.1	7.1
			12/2/2019	7.08	7.08
			5/28/2020	7.1	7.1
			11/30/2020	7.2	7.2
			4/28/2021	7.16	7.16
			11/19/2021	7.08	7.08
			5/31/2022	7.2	7.2
			9/6/2022	7.12	7.12
			11/21/2022	**7.19**	**7.19**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: pH, Field

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 7.79731

10 most extreme of 26 measurements

by order of magnitude difference from the mean

1	8/8/2017	SLF-MW-2B	9	1.20269
2	8/21/2017	SLF-MW-2B	8.93	1.13269
3	7/17/2017	SLF-MW-2B	8.34	0.542692
4	5/28/2020	SLF-MW-2B	7.28	-0.517308
5	4/25/2017	SLF-MW-2B	7.48	-0.317308
6	12/2/2019	SLF-MW-2B	7.5	-0.297308
7	10/21/2016	SLF-MW-2B	7.51	-0.287308
8	6/20/2017	SLF-MW-2B	8.06	0.262692
9	6/28/2019	SLF-MW-2B	7.54	-0.257308
10	5/31/2018	SLF-MW-2B	7.56	-0.237308

Iteration i = 9

Mean of 17 measurements = 7.71118
Std Dev = 0.111797
x(i+1) = 7.56 from measurement 5/31/2018 from location SLF-MW-2B
Rosner Statistic R = |7.56 - 7.71118|/0.111797 = 1.35224
Lambda(26, 10, 0.05) = 2.62
1.35224 < 2.62 -- No outliers detected for i = 9

Iteration i = 8

Mean of 18 measurements = 7.70167
Std Dev = 0.11572
x(i+1) = 7.54 from measurement 6/28/2019 from location SLF-MW-2B
Rosner Statistic R = |7.54 - 7.70167|/0.11572 = 1.39705
Lambda(26, 9, 0.05) = 2.648
1.39705 < 2.648 -- No outliers detected for i = 8

Iteration i = 7

Mean of 19 measurements = 7.72053
Std Dev = 0.139303
x(i+1) = 8.06 from measurement 6/20/2017 from location SLF-MW-2B
Rosner Statistic R = |8.06 - 7.72053|/0.139303 = 2.43695
Lambda(26, 8, 0.05) = 2.676
2.43695 < 2.676 -- No outliers detected for i = 7

Iteration i = 6

Mean of 20 measurements = 7.71
Std Dev = 0.143527
x(i+1) = 7.51 from measurement 10/21/2016 from location SLF-MW-2B
Rosner Statistic R = |7.51 - 7.71|/0.143527 = 1.39347
Lambda(26, 7, 0.05) = 2.704
1.39347 < 2.704 -- No outliers detected for i = 6

Iteration i = 5
Mean of 21 measurements = 7.7
Std Dev = 0.147207
x(i+1) = 7.5 from measurement 12/2/2019 from location SLF-MW-2B
Rosner Statistic R = |7.5 - 7.7|/0.147207 = 1.35863
Lambda(26, 6, 0.05) = 2.732
1.35863 < 2.732 -- No outliers detected for i = 5

Iteration i = 4
Mean of 22 measurements = 7.69
Std Dev = 0.151123
x(i+1) = 7.48 from measurement 4/25/2017 from location SLF-MW-2B
Rosner Statistic R = |7.48 - 7.69|/0.151123 = 1.3896
Lambda(26, 5, 0.05) = 2.76
1.3896 < 2.76 -- No outliers detected for i = 4

Iteration i = 3
Mean of 23 measurements = 7.67217
Std Dev = 0.170613
x(i+1) = 7.28 from measurement 5/28/2020 from location SLF-MW-2B
Rosner Statistic R = |7.28 - 7.67217|/0.170613 = 2.29862
Lambda(26, 4, 0.05) = 2.78
2.29862 < 2.78 -- No outliers detected for i = 3

Iteration i = 2
Mean of 24 measurements = 7.7
Std Dev = 0.215467
x(i+1) = 8.34 from measurement 7/17/2017 from location SLF-MW-2B
Rosner Statistic R = |8.34 - 7.7|/0.215467 = 2.97029
Lambda(26, 3, 0.05) = 2.8
2.97029 > 2.8 -- Measurement 7/17/2017 for location SLF-MW-2B is an outlier

Iteration i = 1
Mean of 25 measurements = 7.7492
Std Dev = 0.324049
x(i+1) = 8.93 from measurement 8/21/2017 from location SLF-MW-2B
Rosner Statistic R = |8.93 - 7.7492|/0.324049 = 3.64389
Lambda(26, 2, 0.05) = 2.82
Measurement 8/21/2017 for location SLF-MW-2B is an outlier

Iteration i = 0
Mean of 26 measurements = 7.79731
Std Dev = 0.401224
x(i+1) = 9 from measurement 8/8/2017 from location SLF-MW-2B
Rosner Statistic R = |9 - 7.79731|/0.401224 = 2.99756
Lambda(26, 1, 0.05) = 2.84
Measurement 8/8/2017 for location SLF-MW-2B is an outlier

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 13 for 26 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	7.28	9	1.72	0.4407	0.758004
2	7.48	8.93	1.45	0.3043	0.441235
3	7.5	8.34	0.84	0.2533	0.212772
4	7.51	8.06	0.55	0.2151	0.118305
5	7.54	7.93	0.39	0.1836	0.071604
6	7.56	7.88	0.32	0.1563	0.050016
7	7.59	7.87	0.28	0.1316	0.036848
8	7.6	7.82	0.22	0.1089	0.023958
9	7.61	7.79	0.18	0.0876	0.015768
10	7.62	7.73	0.11	0.0672	0.007392
11	7.63	7.73	0.1	0.0476	0.00476
12	7.66	7.7	0.04	0.0284	0.001136
13	7.67	7.7	0.03	0.0094	0.000282
14	7.7	7.67	-0.03		
15	7.7	7.66	-0.04		
16	7.73	7.63	-0.1		
17	7.73	7.62	-0.11		
18	7.79	7.61	-0.18		
19	7.82	7.6	-0.22		
20	7.87	7.59	-0.28		
21	7.88	7.56	-0.32		
22	7.93	7.54	-0.39		
23	8.06	7.51	-0.55		
24	8.34	7.5	-0.84		
25	8.93	7.48	-1.45		
26	9	7.28	-1.72		

Sum of b values = 1.74208
Sample Standard Deviation = 0.401224
W Statistic = 0.75409

5% Critical value of 0.92 exceeds 0.75409
Evidence of non-normality at 95% level of significance

1% Critical value of 0.891 exceeds 0.75409
Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: pH, Field

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.67	7.51	0.16	1	0
7.73	7.51	0.22	2	0
7.59	7.51	0.08	3	0
7.79	7.51	0.28	4	0
7.61	7.51	0.1	5	0
7.48	7.51	-0.03	5	1
7.93	7.51	0.42	6	1
8.06	7.51	0.55	7	1
8.34	7.51	0.83	8	1
9	7.51	1.49	9	1
8.93	7.51	1.42	10	1
7.66	7.51	0.15	11	1
7.88	7.51	0.37	12	1
7.56	7.51	0.05	13	1
7.62	7.51	0.11	14	1
7.54	7.51	0.03	15	1
7.6	7.51	0.09	16	1
7.5	7.51	-0.01	16	2
7.28	7.51	-0.23	16	3
7.87	7.51	0.36	17	3
7.7	7.51	0.19	18	3
7.73	7.51	0.22	19	3
7.82	7.51	0.31	20	3
7.7	7.51	0.19	21	3
7.63	7.51	0.12	22	3
7.73	7.67	0.06	23	3
7.59	7.67	-0.08	23	4
7.79	7.67	0.12	24	4
7.61	7.67	-0.06	24	5
7.48	7.67	-0.19	24	6
7.93	7.67	0.26	25	6
8.06	7.67	0.39	26	6
8.34	7.67	0.67	27	6
9	7.67	1.33	28	6
8.93	7.67	1.26	29	6
7.66	7.67	-0.01	29	7
7.88	7.67	0.21	30	7
7.56	7.67	-0.11	30	8
7.62	7.67	-0.05	30	9
7.54	7.67	-0.13	30	10
7.6	7.67	-0.07	30	11
7.5	7.67	-0.17	30	12
7.28	7.67	-0.39	30	13
7.87	7.67	0.2	31	13
7.7	7.67	0.03	32	13
7.73	7.67	0.06	33	13

7.82	7.67	0.15	34	13
7.7	7.67	0.03	35	13
7.63	7.67	-0.04	35	14
7.59	7.73	-0.14	35	15
7.79	7.73	0.06	36	15
7.61	7.73	-0.12	36	16
7.48	7.73	-0.25	36	17
7.93	7.73	0.2	37	17
8.06	7.73	0.33	38	17
8.34	7.73	0.61	39	17
9	7.73	1.27	40	17
8.93	7.73	1.2	41	17
7.66	7.73	-0.07	41	18
7.88	7.73	0.15	42	18
7.56	7.73	-0.17	42	19
7.62	7.73	-0.11	42	20
7.54	7.73	-0.19	42	21
7.6	7.73	-0.13	42	22
7.5	7.73	-0.23	42	23
7.28	7.73	-0.45	42	24
7.87	7.73	0.14	43	24
7.7	7.73	-0.03	43	25
7.73	7.73	0	43	25
7.82	7.73	0.09	44	25
7.7	7.73	-0.03	44	26
7.63	7.73	-0.1	44	27
7.79	7.59	0.2	45	27
7.61	7.59	0.02	46	27
7.48	7.59	-0.11	46	28
7.93	7.59	0.34	47	28
8.06	7.59	0.47	48	28
8.34	7.59	0.75	49	28
9	7.59	1.41	50	28
8.93	7.59	1.34	51	28
7.66	7.59	0.07	52	28
7.88	7.59	0.29	53	28
7.56	7.59	-0.03	53	29
7.62	7.59	0.03	54	29
7.54	7.59	-0.05	54	30
7.6	7.59	0.01	55	30
7.5	7.59	-0.09	55	31
7.28	7.59	-0.31	55	32
7.87	7.59	0.28	56	32
7.7	7.59	0.11	57	32
7.73	7.59	0.14	58	32
7.82	7.59	0.23	59	32
7.7	7.59	0.11	60	32
7.63	7.59	0.04	61	32
7.61	7.79	-0.18	61	33
7.48	7.79	-0.31	61	34
7.93	7.79	0.14	62	34
8.06	7.79	0.27	63	34
8.34	7.79	0.55	64	34
9	7.79	1.21	65	34

8.93	7.79	1.14	66	34
7.66	7.79	-0.13	66	35
7.88	7.79	0.09	67	35
7.56	7.79	-0.23	67	36
7.62	7.79	-0.17	67	37
7.54	7.79	-0.25	67	38
7.6	7.79	-0.19	67	39
7.5	7.79	-0.29	67	40
7.28	7.79	-0.51	67	41
7.87	7.79	0.08	68	41
7.7	7.79	-0.09	68	42
7.73	7.79	-0.06	68	43
7.82	7.79	0.03	69	43
7.7	7.79	-0.09	69	44
7.63	7.79	-0.16	69	45
7.48	7.61	-0.13	69	46
7.93	7.61	0.32	70	46
8.06	7.61	0.45	71	46
8.34	7.61	0.73	72	46
9	7.61	1.39	73	46
8.93	7.61	1.32	74	46
7.66	7.61	0.05	75	46
7.88	7.61	0.27	76	46
7.56	7.61	-0.05	76	47
7.62	7.61	0.01	77	47
7.54	7.61	-0.07	77	48
7.6	7.61	-0.01	77	49
7.5	7.61	-0.11	77	50
7.28	7.61	-0.33	77	51
7.87	7.61	0.26	78	51
7.7	7.61	0.09	79	51
7.73	7.61	0.12	80	51
7.82	7.61	0.21	81	51
7.7	7.61	0.09	82	51
7.63	7.61	0.02	83	51
7.93	7.48	0.45	84	51
8.06	7.48	0.58	85	51
8.34	7.48	0.86	86	51
9	7.48	1.52	87	51
8.93	7.48	1.45	88	51
7.66	7.48	0.18	89	51
7.88	7.48	0.4	90	51
7.56	7.48	0.08	91	51
7.62	7.48	0.14	92	51
7.54	7.48	0.06	93	51
7.6	7.48	0.12	94	51
7.5	7.48	0.02	95	51
7.28	7.48	-0.2	95	52
7.87	7.48	0.39	96	52
7.7	7.48	0.22	97	52
7.73	7.48	0.25	98	52
7.82	7.48	0.34	99	52
7.7	7.48	0.22	100	52
7.63	7.48	0.15	101	52

8.06	7.93	0.13	102	52
8.34	7.93	0.41	103	52
9	7.93	1.07	104	52
8.93	7.93	1	105	52
7.66	7.93	-0.27	105	53
7.88	7.93	-0.05	105	54
7.56	7.93	-0.37	105	55
7.62	7.93	-0.31	105	56
7.54	7.93	-0.39	105	57
7.6	7.93	-0.33	105	58
7.5	7.93	-0.43	105	59
7.28	7.93	-0.65	105	60
7.87	7.93	-0.06	105	61
7.7	7.93	-0.23	105	62
7.73	7.93	-0.2	105	63
7.82	7.93	-0.11	105	64
7.7	7.93	-0.23	105	65
7.63	7.93	-0.3	105	66
8.34	8.06	0.28	106	66
9	8.06	0.94	107	66
8.93	8.06	0.87	108	66
7.66	8.06	-0.4	108	67
7.88	8.06	-0.18	108	68
7.56	8.06	-0.5	108	69
7.62	8.06	-0.44	108	70
7.54	8.06	-0.52	108	71
7.6	8.06	-0.46	108	72
7.5	8.06	-0.56	108	73
7.28	8.06	-0.78	108	74
7.87	8.06	-0.19	108	75
7.7	8.06	-0.36	108	76
7.73	8.06	-0.33	108	77
7.82	8.06	-0.24	108	78
7.7	8.06	-0.36	108	79
7.63	8.06	-0.43	108	80
9	8.34	0.66	109	80
8.93	8.34	0.59	110	80
7.66	8.34	-0.68	110	81
7.88	8.34	-0.46	110	82
7.56	8.34	-0.78	110	83
7.62	8.34	-0.72	110	84
7.54	8.34	-0.8	110	85
7.6	8.34	-0.74	110	86
7.5	8.34	-0.84	110	87
7.28	8.34	-1.06	110	88
7.87	8.34	-0.47	110	89
7.7	8.34	-0.64	110	90
7.73	8.34	-0.61	110	91
7.82	8.34	-0.52	110	92
7.7	8.34	-0.64	110	93
7.63	8.34	-0.71	110	94
8.93	9	-0.07	110	95
7.66	9	-1.34	110	96
7.88	9	-1.12	110	97

7.56	9	-1.44	110	98
7.62	9	-1.38	110	99
7.54	9	-1.46	110	100
7.6	9	-1.4	110	101
7.5	9	-1.5	110	102
7.28	9	-1.72	110	103
7.87	9	-1.13	110	104
7.7	9	-1.3	110	105
7.73	9	-1.27	110	106
7.82	9	-1.18	110	107
7.7	9	-1.3	110	108
7.63	9	-1.37	110	109
7.66	8.93	-1.27	110	110
7.88	8.93	-1.05	110	111
7.56	8.93	-1.37	110	112
7.62	8.93	-1.31	110	113
7.54	8.93	-1.39	110	114
7.6	8.93	-1.33	110	115
7.5	8.93	-1.43	110	116
7.28	8.93	-1.65	110	117
7.87	8.93	-1.06	110	118
7.7	8.93	-1.23	110	119
7.73	8.93	-1.2	110	120
7.82	8.93	-1.11	110	121
7.7	8.93	-1.23	110	122
7.63	8.93	-1.3	110	123
7.88	7.66	0.22	111	123
7.56	7.66	-0.1	111	124
7.62	7.66	-0.04	111	125
7.54	7.66	-0.12	111	126
7.6	7.66	-0.06	111	127
7.5	7.66	-0.16	111	128
7.28	7.66	-0.38	111	129
7.87	7.66	0.21	112	129
7.7	7.66	0.04	113	129
7.73	7.66	0.07	114	129
7.82	7.66	0.16	115	129
7.7	7.66	0.04	116	129
7.63	7.66	-0.03	116	130
7.56	7.88	-0.32	116	131
7.62	7.88	-0.26	116	132
7.54	7.88	-0.34	116	133
7.6	7.88	-0.28	116	134
7.5	7.88	-0.38	116	135
7.28	7.88	-0.6	116	136
7.87	7.88	-0.01	116	137
7.7	7.88	-0.18	116	138
7.73	7.88	-0.15	116	139
7.82	7.88	-0.06	116	140
7.7	7.88	-0.18	116	141
7.63	7.88	-0.25	116	142
7.62	7.56	0.06	117	142
7.54	7.56	-0.02	117	143

7.6	7.56	0.04	118	143
7.5	7.56	-0.06	118	144
7.28	7.56	-0.28	118	145
7.87	7.56	0.31	119	145
7.7	7.56	0.14	120	145
7.73	7.56	0.17	121	145
7.82	7.56	0.26	122	145
7.7	7.56	0.14	123	145
7.63	7.56	0.07	124	145
7.54	7.62	-0.08	124	146
7.6	7.62	-0.02	124	147
7.5	7.62	-0.12	124	148
7.28	7.62	-0.34	124	149
7.87	7.62	0.25	125	149
7.7	7.62	0.08	126	149
7.73	7.62	0.11	127	149
7.82	7.62	0.2	128	149
7.7	7.62	0.08	129	149
7.63	7.62	0.01	130	149
7.6	7.54	0.06	131	149
7.5	7.54	-0.04	131	150
7.28	7.54	-0.26	131	151
7.87	7.54	0.33	132	151
7.7	7.54	0.16	133	151
7.73	7.54	0.19	134	151
7.82	7.54	0.28	135	151
7.7	7.54	0.16	136	151
7.63	7.54	0.09	137	151
7.5	7.6	-0.1	137	152
7.28	7.6	-0.32	137	153
7.87	7.6	0.27	138	153
7.7	7.6	0.1	139	153
7.73	7.6	0.13	140	153
7.82	7.6	0.22	141	153
7.7	7.6	0.1	142	153
7.63	7.6	0.03	143	153
7.28	7.5	-0.22	143	154
7.87	7.5	0.37	144	154
7.7	7.5	0.2	145	154
7.73	7.5	0.23	146	154
7.82	7.5	0.32	147	154
7.7	7.5	0.2	148	154
7.63	7.5	0.13	149	154
7.87	7.28	0.59	150	154
7.7	7.28	0.42	151	154
7.73	7.28	0.45	152	154
7.82	7.28	0.54	153	154
7.7	7.28	0.42	154	154
7.63	7.28	0.35	155	154
7.7	7.87	-0.17	155	155
7.73	7.87	-0.14	155	156

7.82	7.87	-0.05	155	157
7.7	7.87	-0.17	155	158
7.63	7.87	-0.24	155	159
7.73	7.7	0.03	156	159
7.82	7.7	0.12	157	159
7.7	7.7	0	157	159
7.63	7.7	-0.07	157	160
7.82	7.73	0.09	158	160
7.7	7.73	-0.03	158	161
7.63	7.73	-0.1	158	162
7.7	7.82	-0.12	158	163
7.63	7.82	-0.19	158	164
7.63	7.7	-0.07	158	165

S Statistic = 158 - 165 = -7

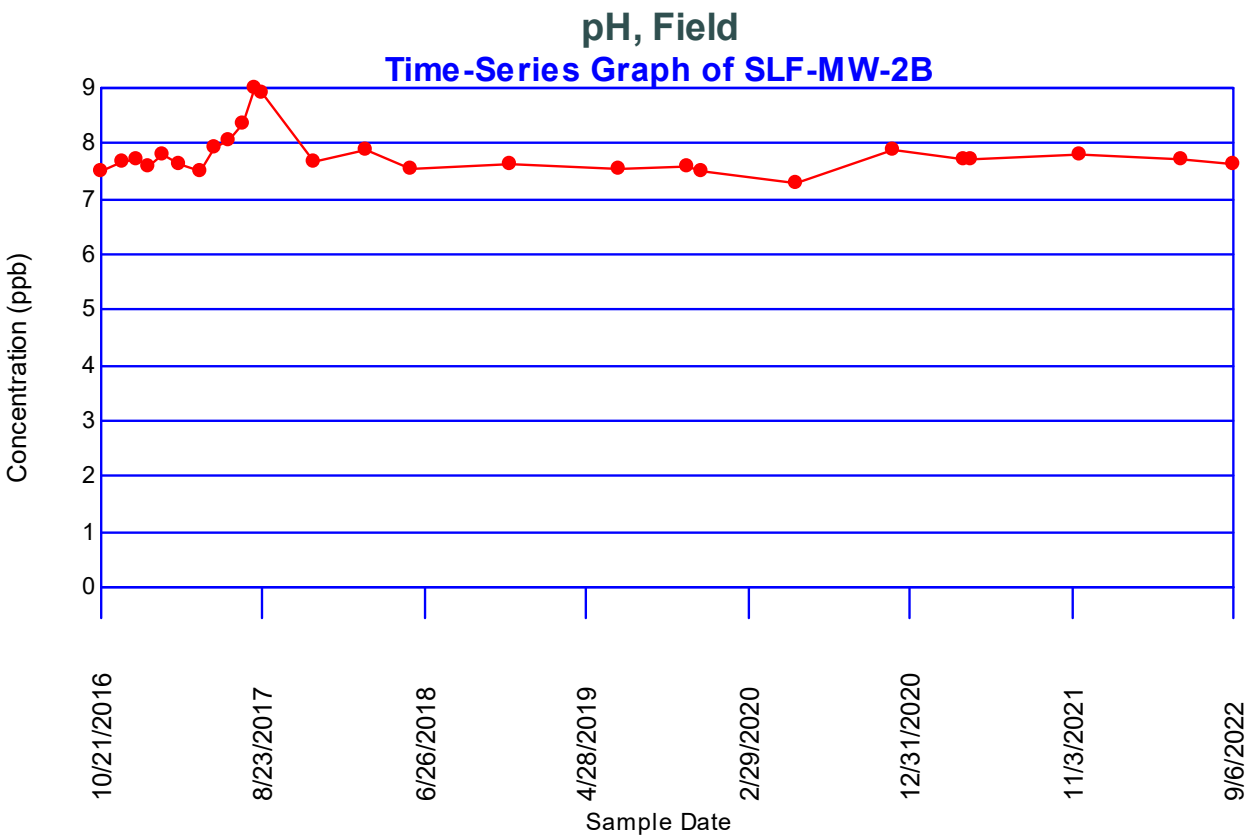
Tied Group	Value	Members
1	7.73	2
2	7.7	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
11/4/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/12/2021	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0

D = 0
E = 4
F = 0
a = 37050
b = 140400
c = 1300
Group Variance = 2056.33
Z-Score = -0.132314
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.132314| <= 1.97737 indicating no evidence of a trend


pH, Field
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
9
8
7
6
5
4
3
2
1
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: pH, Field

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.241935	0.0408163	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	7.02	FALSE
	11/30/2016	7.11	FALSE
	12/28/2016	7.19	FALSE
	1/18/2017	6.97	FALSE
	2/15/2017	7.24	FALSE
	3/20/2017	7.06	FALSE
	4/25/2017	7.02	FALSE
	5/22/2017	7.22	FALSE
	6/20/2017	6.99	FALSE
	7/17/2017	7.33	FALSE
	8/7/2017	7.61	FALSE
	8/21/2017	7.53	FALSE
	11/29/2017	7.12	FALSE
	3/8/2018	7.46	FALSE
	5/30/2018	7.09	FALSE
	12/4/2018	7.11	FALSE
	6/27/2019	7.22	FALSE
	12/2/2019	7.11	FALSE
	5/28/2020	6.97	FALSE
	12/1/2020	7.23	FALSE
	4/28/2021	7.14	FALSE
	11/19/2021	7.25	FALSE
	5/31/2022	7.28	FALSE
	9/6/2022	7.25	FALSE

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.97	7.61	0.64	0.4493	0.287552
2	6.97	7.53	0.56	0.3098	0.173488
3	6.99	7.46	0.47	0.2554	0.120038
4	7.02	7.33	0.31	0.2145	0.066495
5	7.02	7.28	0.26	0.1807	0.046982
6	7.06	7.25	0.19	0.1512	0.028728
7	7.09	7.25	0.16	0.1245	0.01992
8	7.11	7.24	0.13	0.0997	0.012961
9	7.11	7.23	0.12	0.0764	0.009168
10	7.11	7.22	0.11	0.0539	0.005929
11	7.12	7.22	0.1	0.0321	0.00321
12	7.14	7.19	0.05	0.0107	0.000535
13	7.19	7.14	-0.05		
14	7.22	7.12	-0.1		
15	7.22	7.11	-0.11		
16	7.23	7.11	-0.12		
17	7.24	7.11	-0.13		
18	7.25	7.09	-0.16		
19	7.25	7.06	-0.19		
20	7.28	7.02	-0.26		
21	7.33	7.02	-0.31		
22	7.46	6.99	-0.47		
23	7.53	6.97	-0.56		
24	7.61	6.97	-0.64		

Sum of b values = 0.775006
Sample Standard Deviation = 0.168592
W Statistic = 0.918776

5% Critical value of 0.916 is less than 0.918776
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.918776
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: pH, Field

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.11	7.02	0.09	1	0
7.19	7.02	0.17	2	0
6.97	7.02	-0.05	2	1
7.24	7.02	0.22	3	1
7.06	7.02	0.04	4	1
7.02	7.02	0	4	1
7.22	7.02	0.2	5	1
6.99	7.02	-0.03	5	2
7.33	7.02	0.31	6	2
7.61	7.02	0.59	7	2
7.53	7.02	0.51	8	2
7.12	7.02	0.1	9	2
7.46	7.02	0.44	10	2
7.09	7.02	0.07	11	2
7.11	7.02	0.09	12	2
7.22	7.02	0.2	13	2
7.11	7.02	0.09	14	2
6.97	7.02	-0.05	14	3
7.23	7.02	0.21	15	3
7.14	7.02	0.12	16	3
7.25	7.02	0.23	17	3
7.28	7.02	0.26	18	3
7.25	7.02	0.23	19	3
7.19	7.11	0.08	20	3
6.97	7.11	-0.14	20	4
7.24	7.11	0.13	21	4
7.06	7.11	-0.05	21	5
7.02	7.11	-0.09	21	6
7.22	7.11	0.11	22	6
6.99	7.11	-0.12	22	7
7.33	7.11	0.22	23	7
7.61	7.11	0.5	24	7
7.53	7.11	0.42	25	7
7.12	7.11	0.01	26	7
7.46	7.11	0.35	27	7
7.09	7.11	-0.02	27	8
7.11	7.11	0	27	8
7.22	7.11	0.11	28	8
7.11	7.11	0	28	8
6.97	7.11	-0.14	28	9
7.23	7.11	0.12	29	9
7.14	7.11	0.03	30	9
7.25	7.11	0.14	31	9
7.28	7.11	0.17	32	9
7.25	7.11	0.14	33	9

6.97	7.19	-0.22	33	10
7.24	7.19	0.05	34	10
7.06	7.19	-0.13	34	11
7.02	7.19	-0.17	34	12
7.22	7.19	0.03	35	12
6.99	7.19	-0.2	35	13
7.33	7.19	0.14	36	13
7.61	7.19	0.42	37	13
7.53	7.19	0.34	38	13
7.12	7.19	-0.07	38	14
7.46	7.19	0.27	39	14
7.09	7.19	-0.1	39	15
7.11	7.19	-0.08	39	16
7.22	7.19	0.03	40	16
7.11	7.19	-0.08	40	17
6.97	7.19	-0.22	40	18
7.23	7.19	0.04	41	18
7.14	7.19	-0.05	41	19
7.25	7.19	0.06	42	19
7.28	7.19	0.09	43	19
7.25	7.19	0.06	44	19
7.24	6.97	0.27	45	19
7.06	6.97	0.09	46	19
7.02	6.97	0.05	47	19
7.22	6.97	0.25	48	19
6.99	6.97	0.02	49	19
7.33	6.97	0.36	50	19
7.61	6.97	0.64	51	19
7.53	6.97	0.56	52	19
7.12	6.97	0.15	53	19
7.46	6.97	0.49	54	19
7.09	6.97	0.12	55	19
7.11	6.97	0.14	56	19
7.22	6.97	0.25	57	19
7.11	6.97	0.14	58	19
6.97	6.97	0	58	19
7.23	6.97	0.26	59	19
7.14	6.97	0.17	60	19
7.25	6.97	0.28	61	19
7.28	6.97	0.31	62	19
7.25	6.97	0.28	63	19
7.06	7.24	-0.18	63	20
7.02	7.24	-0.22	63	21
7.22	7.24	-0.02	63	22
6.99	7.24	-0.25	63	23
7.33	7.24	0.09	64	23
7.61	7.24	0.37	65	23
7.53	7.24	0.29	66	23
7.12	7.24	-0.12	66	24
7.46	7.24	0.22	67	24
7.09	7.24	-0.15	67	25
7.11	7.24	-0.13	67	26
7.22	7.24	-0.02	67	27
7.11	7.24	-0.13	67	28
6.97	7.24	-0.27	67	29

7.23	7.24	-0.01	67	30
7.14	7.24	-0.1	67	31
7.25	7.24	0.01	68	31
7.28	7.24	0.04	69	31
7.25	7.24	0.01	70	31
7.02	7.06	-0.04	70	32
7.22	7.06	0.16	71	32
6.99	7.06	-0.07	71	33
7.33	7.06	0.27	72	33
7.61	7.06	0.55	73	33
7.53	7.06	0.47	74	33
7.12	7.06	0.06	75	33
7.46	7.06	0.4	76	33
7.09	7.06	0.03	77	33
7.11	7.06	0.05	78	33
7.22	7.06	0.16	79	33
7.11	7.06	0.05	80	33
6.97	7.06	-0.09	80	34
7.23	7.06	0.17	81	34
7.14	7.06	0.08	82	34
7.25	7.06	0.19	83	34
7.28	7.06	0.22	84	34
7.25	7.06	0.19	85	34
7.22	7.02	0.2	86	34
6.99	7.02	-0.03	86	35
7.33	7.02	0.31	87	35
7.61	7.02	0.59	88	35
7.53	7.02	0.51	89	35
7.12	7.02	0.1	90	35
7.46	7.02	0.44	91	35
7.09	7.02	0.07	92	35
7.11	7.02	0.09	93	35
7.22	7.02	0.2	94	35
7.11	7.02	0.09	95	35
6.97	7.02	-0.05	95	36
7.23	7.02	0.21	96	36
7.14	7.02	0.12	97	36
7.25	7.02	0.23	98	36
7.28	7.02	0.26	99	36
7.25	7.02	0.23	100	36
6.99	7.22	-0.23	100	37
7.33	7.22	0.11	101	37
7.61	7.22	0.39	102	37
7.53	7.22	0.31	103	37
7.12	7.22	-0.1	103	38
7.46	7.22	0.24	104	38
7.09	7.22	-0.13	104	39
7.11	7.22	-0.11	104	40
7.22	7.22	0	104	40
7.11	7.22	-0.11	104	41
6.97	7.22	-0.25	104	42
7.23	7.22	0.01	105	42
7.14	7.22	-0.08	105	43
7.25	7.22	0.03	106	43

7.28	7.22	0.06	107	43
7.25	7.22	0.03	108	43
7.33	6.99	0.34	109	43
7.61	6.99	0.62	110	43
7.53	6.99	0.54	111	43
7.12	6.99	0.13	112	43
7.46	6.99	0.47	113	43
7.09	6.99	0.1	114	43
7.11	6.99	0.12	115	43
7.22	6.99	0.23	116	43
7.11	6.99	0.12	117	43
6.97	6.99	-0.02	117	44
7.23	6.99	0.24	118	44
7.14	6.99	0.15	119	44
7.25	6.99	0.26	120	44
7.28	6.99	0.29	121	44
7.25	6.99	0.26	122	44
7.61	7.33	0.28	123	44
7.53	7.33	0.2	124	44
7.12	7.33	-0.21	124	45
7.46	7.33	0.13	125	45
7.09	7.33	-0.24	125	46
7.11	7.33	-0.22	125	47
7.22	7.33	-0.11	125	48
7.11	7.33	-0.22	125	49
6.97	7.33	-0.36	125	50
7.23	7.33	-0.1	125	51
7.14	7.33	-0.19	125	52
7.25	7.33	-0.08	125	53
7.28	7.33	-0.05	125	54
7.25	7.33	-0.08	125	55
7.53	7.61	-0.08	125	56
7.12	7.61	-0.49	125	57
7.46	7.61	-0.15	125	58
7.09	7.61	-0.52	125	59
7.11	7.61	-0.5	125	60
7.22	7.61	-0.39	125	61
7.11	7.61	-0.5	125	62
6.97	7.61	-0.64	125	63
7.23	7.61	-0.38	125	64
7.14	7.61	-0.47	125	65
7.25	7.61	-0.36	125	66
7.28	7.61	-0.33	125	67
7.25	7.61	-0.36	125	68
7.12	7.53	-0.41	125	69
7.46	7.53	-0.07	125	70
7.09	7.53	-0.44	125	71
7.11	7.53	-0.42	125	72
7.22	7.53	-0.31	125	73
7.11	7.53	-0.42	125	74
6.97	7.53	-0.56	125	75
7.23	7.53	-0.3	125	76
7.14	7.53	-0.39	125	77

7.25	7.53	-0.28	125	78
7.28	7.53	-0.25	125	79
7.25	7.53	-0.28	125	80
7.46	7.12	0.34	126	80
7.09	7.12	-0.03	126	81
7.11	7.12	-0.01	126	82
7.22	7.12	0.1	127	82
7.11	7.12	-0.01	127	83
6.97	7.12	-0.15	127	84
7.23	7.12	0.11	128	84
7.14	7.12	0.02	129	84
7.25	7.12	0.13	130	84
7.28	7.12	0.16	131	84
7.25	7.12	0.13	132	84
7.09	7.46	-0.37	132	85
7.11	7.46	-0.35	132	86
7.22	7.46	-0.24	132	87
7.11	7.46	-0.35	132	88
6.97	7.46	-0.49	132	89
7.23	7.46	-0.23	132	90
7.14	7.46	-0.32	132	91
7.25	7.46	-0.21	132	92
7.28	7.46	-0.18	132	93
7.25	7.46	-0.21	132	94
7.11	7.09	0.02	133	94
7.22	7.09	0.13	134	94
7.11	7.09	0.02	135	94
6.97	7.09	-0.12	135	95
7.23	7.09	0.14	136	95
7.14	7.09	0.05	137	95
7.25	7.09	0.16	138	95
7.28	7.09	0.19	139	95
7.25	7.09	0.16	140	95
7.22	7.11	0.11	141	95
7.11	7.11	0	141	95
6.97	7.11	-0.14	141	96
7.23	7.11	0.12	142	96
7.14	7.11	0.03	143	96
7.25	7.11	0.14	144	96
7.28	7.11	0.17	145	96
7.25	7.11	0.14	146	96
7.11	7.22	-0.11	146	97
6.97	7.22	-0.25	146	98
7.23	7.22	0.01	147	98
7.14	7.22	-0.08	147	99
7.25	7.22	0.03	148	99
7.28	7.22	0.06	149	99
7.25	7.22	0.03	150	99
6.97	7.11	-0.14	150	100
7.23	7.11	0.12	151	100
7.14	7.11	0.03	152	100

7.25	7.11	0.14	153	100
7.28	7.11	0.17	154	100
7.25	7.11	0.14	155	100
7.23	6.97	0.26	156	100
7.14	6.97	0.17	157	100
7.25	6.97	0.28	158	100
7.28	6.97	0.31	159	100
7.25	6.97	0.28	160	100
7.14	7.23	-0.09	160	101
7.25	7.23	0.02	161	101
7.28	7.23	0.05	162	101
7.25	7.23	0.02	163	101
7.25	7.14	0.11	164	101
7.28	7.14	0.14	165	101
7.25	7.14	0.11	166	101
7.28	7.25	0.03	167	101
7.25	7.25	0	167	101
7.25	7.28	-0.03	167	102

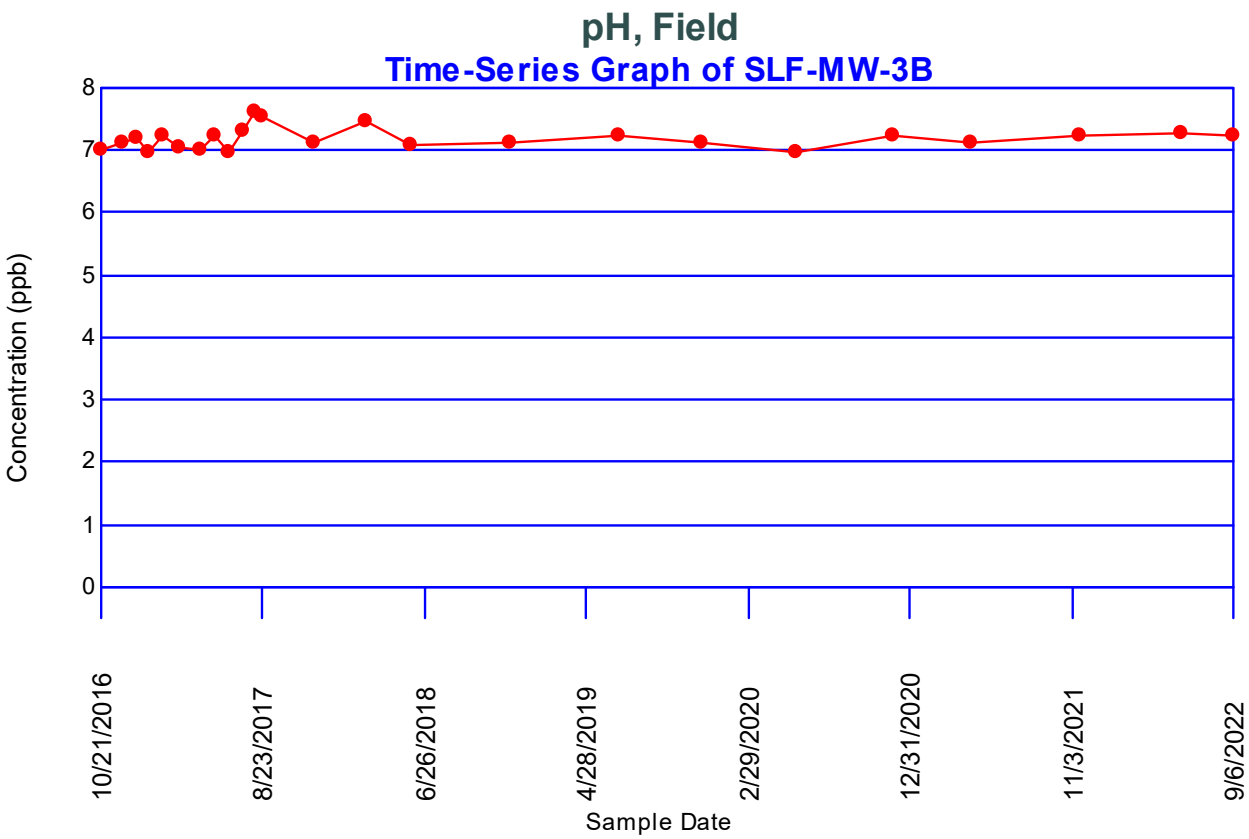
S Statistic = 167 - 102 = 65

Tied Group	Value	Members
1	7.02	2
2	7.11	3
3	6.97	2
4	7.22	2
5	7.25	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1

5/31/2022 1
9/6/2022 1
There are 0 time periods with multiple data

A = 138
B = 0
C = 6
D = 0
E = 14
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1617.67
Z-Score = 1.59124
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.59124| <= 1.97737 indicating no evidence of a trend


pH, Field
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
8
7
6
5
4
3
2
1
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: pH, Field

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 20 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.111111	0.368421	0.45	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	7.16	FALSE
	3/20/2017	7.14	FALSE
	4/25/2017	7.06	FALSE
	5/22/2017	7.14	FALSE
	6/20/2017	7.09	FALSE
	7/17/2017	7.2	FALSE
	8/7/2017	7.32	FALSE
	8/22/2017	7.34	FALSE
	11/29/2017	7.1	FALSE
	3/8/2018	7.35	FALSE
	5/30/2018	6.94	FALSE
	12/4/2018	7.14	FALSE
	6/28/2019	7.1	FALSE
	12/2/2019	7.08	FALSE
	5/28/2020	7.1	FALSE
	11/30/2020	7.2	FALSE
	4/28/2021	7.16	FALSE
	11/19/2021	7.08	FALSE
	5/31/2022	7.2	FALSE
	9/6/2022	7.12	FALSE

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 10 for 20 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.94	7.35	0.41	0.4734	0.194094
2	7.06	7.34	0.28	0.3211	0.089908
3	7.08	7.32	0.24	0.2565	0.06156
4	7.08	7.2	0.12	0.2085	0.02502
5	7.09	7.2	0.11	0.1686	0.018546
6	7.1	7.2	0.1	0.1334	0.01334
7	7.1	7.16	0.06	0.1013	0.006078
8	7.1	7.16	0.06	0.0711	0.004266
9	7.12	7.14	0.02	0.0422	0.000844
10	7.14	7.14	0	0.014	0
11	7.14	7.14	0		
12	7.14	7.12	-0.02		
13	7.16	7.1	-0.06		
14	7.16	7.1	-0.06		
15	7.2	7.1	-0.1		
16	7.2	7.09	-0.11		
17	7.2	7.08	-0.12		
18	7.32	7.08	-0.24		
19	7.34	7.06	-0.28		
20	7.35	6.94	-0.41		

Sum of b values = 0.413656
Sample Standard Deviation = 0.0992021
W Statistic = 0.915131

5% Critical value of 0.905 is less than 0.915131
Data is normally distributed at 95% level of significance

1% Critical value of 0.868 is less than 0.915131
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: pH, Field

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.14	7.16	-0.02	0	1
7.06	7.16	-0.1	0	2
7.14	7.16	-0.02	0	3
7.09	7.16	-0.07	0	4
7.2	7.16	0.04	1	4
7.32	7.16	0.16	2	4
7.34	7.16	0.18	3	4
7.1	7.16	-0.06	3	5
7.35	7.16	0.19	4	5
6.94	7.16	-0.22	4	6
7.14	7.16	-0.02	4	7
7.1	7.16	-0.06	4	8
7.08	7.16	-0.08	4	9
7.1	7.16	-0.06	4	10
7.2	7.16	0.04	5	10
7.16	7.16	0	5	10
7.08	7.16	-0.08	5	11
7.2	7.16	0.04	6	11
7.12	7.16	-0.04	6	12
7.06	7.14	-0.08	6	13
7.14	7.14	0	6	13
7.09	7.14	-0.05	6	14
7.2	7.14	0.06	7	14
7.32	7.14	0.18	8	14
7.34	7.14	0.2	9	14
7.1	7.14	-0.04	9	15
7.35	7.14	0.21	10	15
6.94	7.14	-0.2	10	16
7.14	7.14	0	10	16
7.1	7.14	-0.04	10	17
7.08	7.14	-0.06	10	18
7.1	7.14	-0.04	10	19
7.2	7.14	0.06	11	19
7.16	7.14	0.02	12	19
7.08	7.14	-0.06	12	20
7.2	7.14	0.06	13	20
7.12	7.14	-0.02	13	21
7.14	7.06	0.08	14	21
7.09	7.06	0.03	15	21
7.2	7.06	0.14	16	21
7.32	7.06	0.26	17	21
7.34	7.06	0.28	18	21
7.1	7.06	0.04	19	21
7.35	7.06	0.29	20	21
6.94	7.06	-0.12	20	22

7.14	7.06	0.08	21	22
7.1	7.06	0.04	22	22
7.08	7.06	0.02	23	22
7.1	7.06	0.04	24	22
7.2	7.06	0.14	25	22
7.16	7.06	0.1	26	22
7.08	7.06	0.02	27	22
7.2	7.06	0.14	28	22
7.12	7.06	0.06	29	22
7.09	7.14	-0.05	29	23
7.2	7.14	0.06	30	23
7.32	7.14	0.18	31	23
7.34	7.14	0.2	32	23
7.1	7.14	-0.04	32	24
7.35	7.14	0.21	33	24
6.94	7.14	-0.2	33	25
7.14	7.14	0	33	25
7.1	7.14	-0.04	33	26
7.08	7.14	-0.06	33	27
7.1	7.14	-0.04	33	28
7.2	7.14	0.06	34	28
7.16	7.14	0.02	35	28
7.08	7.14	-0.06	35	29
7.2	7.14	0.06	36	29
7.12	7.14	-0.02	36	30
7.2	7.09	0.11	37	30
7.32	7.09	0.23	38	30
7.34	7.09	0.25	39	30
7.1	7.09	0.01	40	30
7.35	7.09	0.26	41	30
6.94	7.09	-0.15	41	31
7.14	7.09	0.05	42	31
7.1	7.09	0.01	43	31
7.08	7.09	-0.01	43	32
7.1	7.09	0.01	44	32
7.2	7.09	0.11	45	32
7.16	7.09	0.07	46	32
7.08	7.09	-0.01	46	33
7.2	7.09	0.11	47	33
7.12	7.09	0.03	48	33
7.32	7.2	0.12	49	33
7.34	7.2	0.14	50	33
7.1	7.2	-0.1	50	34
7.35	7.2	0.15	51	34
6.94	7.2	-0.26	51	35
7.14	7.2	-0.06	51	36
7.1	7.2	-0.1	51	37
7.08	7.2	-0.12	51	38
7.1	7.2	-0.1	51	39
7.2	7.2	0	51	39
7.16	7.2	-0.04	51	40
7.08	7.2	-0.12	51	41
7.2	7.2	0	51	41
7.12	7.2	-0.08	51	42

7.34	7.32	0.02	52	42
7.1	7.32	-0.22	52	43
7.35	7.32	0.03	53	43
6.94	7.32	-0.38	53	44
7.14	7.32	-0.18	53	45
7.1	7.32	-0.22	53	46
7.08	7.32	-0.24	53	47
7.1	7.32	-0.22	53	48
7.2	7.32	-0.12	53	49
7.16	7.32	-0.16	53	50
7.08	7.32	-0.24	53	51
7.2	7.32	-0.12	53	52
7.12	7.32	-0.2	53	53
7.1	7.34	-0.24	53	54
7.35	7.34	0.01	54	54
6.94	7.34	-0.4	54	55
7.14	7.34	-0.2	54	56
7.1	7.34	-0.24	54	57
7.08	7.34	-0.26	54	58
7.1	7.34	-0.24	54	59
7.2	7.34	-0.14	54	60
7.16	7.34	-0.18	54	61
7.08	7.34	-0.26	54	62
7.2	7.34	-0.14	54	63
7.12	7.34	-0.22	54	64
7.35	7.1	0.25	55	64
6.94	7.1	-0.16	55	65
7.14	7.1	0.04	56	65
7.1	7.1	0	56	65
7.08	7.1	-0.02	56	66
7.1	7.1	0	56	66
7.2	7.1	0.1	57	66
7.16	7.1	0.06	58	66
7.08	7.1	-0.02	58	67
7.2	7.1	0.1	59	67
7.12	7.1	0.02	60	67
6.94	7.35	-0.41	60	68
7.14	7.35	-0.21	60	69
7.1	7.35	-0.25	60	70
7.08	7.35	-0.27	60	71
7.1	7.35	-0.25	60	72
7.2	7.35	-0.15	60	73
7.16	7.35	-0.19	60	74
7.08	7.35	-0.27	60	75
7.2	7.35	-0.15	60	76
7.12	7.35	-0.23	60	77
7.14	6.94	0.2	61	77
7.1	6.94	0.16	62	77
7.08	6.94	0.14	63	77
7.1	6.94	0.16	64	77
7.2	6.94	0.26	65	77
7.16	6.94	0.22	66	77

7.08	6.94	0.14	67	77
7.2	6.94	0.26	68	77
7.12	6.94	0.18	69	77
7.1	7.14	-0.04	69	78
7.08	7.14	-0.06	69	79
7.1	7.14	-0.04	69	80
7.2	7.14	0.06	70	80
7.16	7.14	0.02	71	80
7.08	7.14	-0.06	71	81
7.2	7.14	0.06	72	81
7.12	7.14	-0.02	72	82
7.08	7.1	-0.02	72	83
7.1	7.1	0	72	83
7.2	7.1	0.1	73	83
7.16	7.1	0.06	74	83
7.08	7.1	-0.02	74	84
7.2	7.1	0.1	75	84
7.12	7.1	0.02	76	84
7.1	7.08	0.02	77	84
7.2	7.08	0.12	78	84
7.16	7.08	0.08	79	84
7.08	7.08	0	79	84
7.2	7.08	0.12	80	84
7.12	7.08	0.04	81	84
7.2	7.1	0.1	82	84
7.16	7.1	0.06	83	84
7.08	7.1	-0.02	83	85
7.2	7.1	0.1	84	85
7.12	7.1	0.02	85	85
7.16	7.2	-0.04	85	86
7.08	7.2	-0.12	85	87
7.2	7.2	0	85	87
7.12	7.2	-0.08	85	88
7.08	7.16	-0.08	85	89
7.2	7.16	0.04	86	89
7.12	7.16	-0.04	86	90
7.2	7.08	0.12	87	90
7.12	7.08	0.04	88	90
7.12	7.2	-0.08	88	91

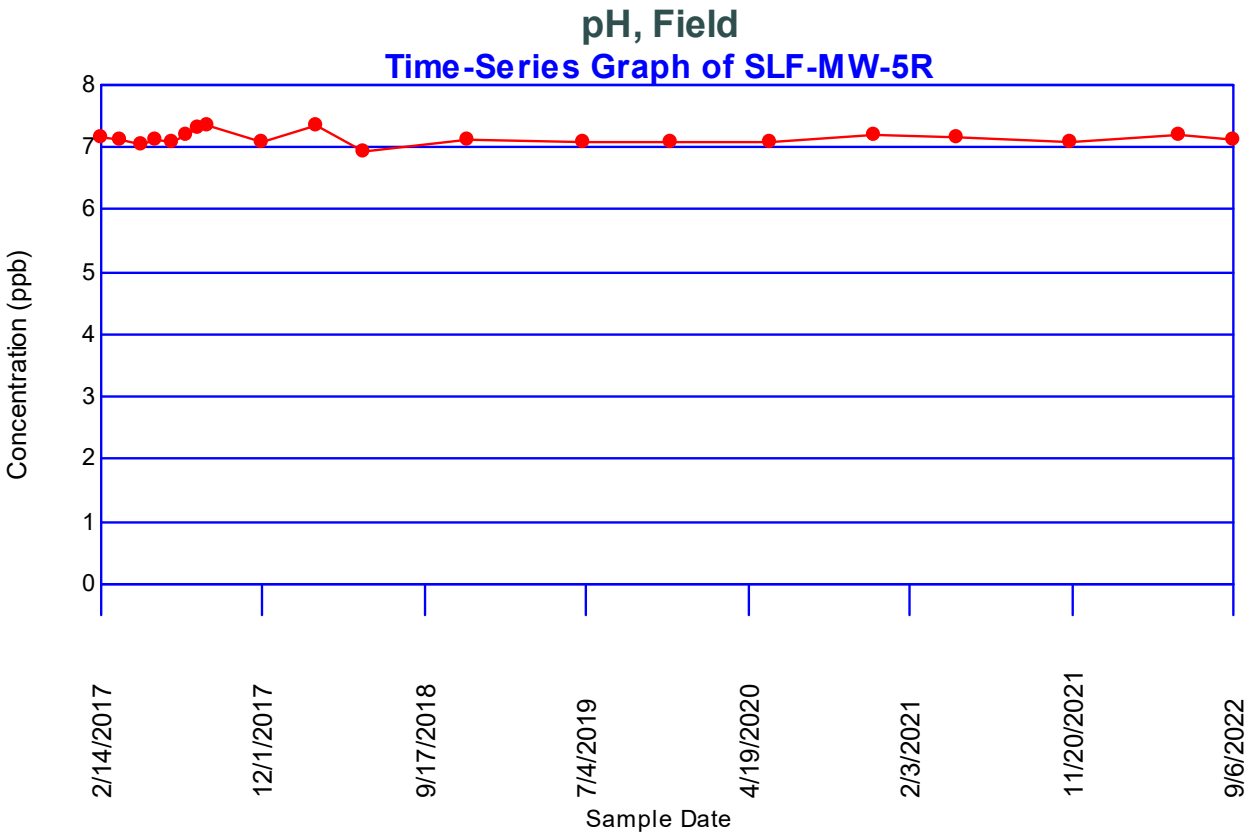
S Statistic = 88 - 91 = -3

Tied Group	Value	Members
1	7.16	2
2	7.14	3
3	7.2	3
4	7.1	3
5	7.08	2

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 234
B = 0
C = 18
D = 0
E = 22
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 937
Z-Score = -0.0653372
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.0653372| <= 1.97737 indicating no evidence of a trend


pH, Field
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
8
7
6
5
4
3
2
1
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 69
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	25	0 (0%)	10/21/2016	347901	347901
			11/30/2016	244670	244670
			12/28/2016	359044	359044
			1/18/2017	229595	229595
			2/14/2017	224624	224624
			3/20/2017	221785	221785
			4/25/2017	205884	205884
			5/22/2017	204497	204497
			6/20/2017	195436	195436
			7/17/2017	203000	203000
			8/8/2017	198500	198500
			8/21/2017	196500	196500
			11/29/2017	191600	191600
			3/8/2018	233000	233000
			5/31/2018	200000	200000
			12/4/2018	163000	163000
			6/28/2019	122000	122000
			12/2/2019	120000	120000
			5/28/2020	104000	104000
			11/30/2020	607000	607000
			4/12/2021	587000	587000
			4/28/2021	555000	555000
			11/19/2021	469000	469000
			5/31/2022	500000	500000
			9/6/2022	448000	448000
			11/21/2022	**490000**	**490000**
SLF-MW-3B	24	0 (0%)	10/21/2016	603053	603053
			11/30/2016	589957	589957
			12/28/2016	614466	614466
			1/18/2017	582135	582135
			2/15/2017	486076	486076
			3/20/2017	472830	472830
			4/25/2017	465682	465682
			5/22/2017	495843	495843
			6/20/2017	480297	480297
			7/17/2017	519000	519000
			8/7/2017	532000	532000
			8/21/2017	549000	549000
			11/29/2017	483000	483000
			3/8/2018	476000	476000

			5/30/2018	454000	454000
			12/4/2018	476000	476000
			6/27/2019	417000	417000
			12/2/2019	384000	384000
			5/28/2020	336000	336000
			12/1/2020	389000	389000
			4/28/2021	355000	355000
			11/19/2021	396000	396000
			5/31/2022	381000	381000
			9/6/2022	364000	364000
			11/21/2022	**384000**	**384000**
SLF-MW-5R	20	0 (0%)	2/14/2017	126012	126012
			3/20/2017	107411	107411
			4/25/2017	95475.3	95475.3
			5/22/2017	90985.1	90985.1
			6/20/2017	130226	130226
			7/17/2017	132600	132600
			8/7/2017	112400	112400
			8/22/2017	143100	143100
			11/29/2017	157800	157800
			3/8/2018	89800	89800
			5/30/2018	158000	158000
			12/4/2018	122000	122000
			6/28/2019	173000	173000
			12/2/2019	162000	162000
			5/28/2020	83400	83400
			11/30/2020	84400	84400
			4/28/2021	144000	144000
			11/19/2021	178000	178000
			5/31/2022	159000	159000
			9/6/2022	209000	209000
			11/21/2022	**259000**	**259000**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Sulfate

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 25 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.107216	0.0399113	0.406	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	347901	FALSE
	11/30/2016	244670	FALSE
	12/28/2016	359044	FALSE
	1/18/2017	229595	FALSE
	2/14/2017	224624	FALSE
	3/20/2017	221785	FALSE
	4/25/2017	205884	FALSE
	5/22/2017	204497	FALSE
	6/20/2017	195436	FALSE
	7/17/2017	203000	FALSE
	8/8/2017	198500	FALSE
	8/21/2017	196500	FALSE
	11/29/2017	191600	FALSE
	3/8/2018	233000	FALSE
	5/31/2018	200000	FALSE
	12/4/2018	163000	FALSE
	6/28/2019	122000	FALSE
	12/2/2019	120000	FALSE
	5/28/2020	104000	FALSE
	11/30/2020	607000	FALSE
	4/12/2021	587000	FALSE
	4/28/2021	555000	FALSE
	11/19/2021	469000	FALSE
	5/31/2022	500000	FALSE
	9/6/2022	448000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 25 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	104000	607000	503000	0.445	223835
2	120000	587000	467000	0.3069	143322
3	122000	555000	433000	0.2543	110112
4	163000	500000	337000	0.2148	72387.6
5	191600	469000	277400	0.1822	50542.3
6	195436	448000	252564	0.1539	38869.6
7	196500	359044	162544	0.1283	20854.4
8	198500	347901	149401	0.1046	15627.3
9	200000	244670	44670	0.0823	3676.34
10	203000	233000	30000	0.061	1830
11	204497	229595	25098	0.0403	1011.45
12	205884	224624	18740	0.02	374.8
13	221785	221785	0		
14	224624	205884	-18740		
15	229595	204497	-25098		
16	233000	203000	-30000		
17	244670	200000	-44670		
18	347901	198500	-149401		
19	359044	196500	-162544		
20	448000	195436	-252564		
21	469000	191600	-277400		
22	500000	163000	-337000		
23	555000	122000	-433000		
24	587000	120000	-467000		
25	607000	104000	-503000		

Sum of b values = 682443
Sample Standard Deviation = 152630
W Statistic = 0.832989

5% Critical value of 0.918 exceeds 0.832989
Evidence of non-normality at 95% level of significance

1% Critical value of 0.888 exceeds 0.832989
Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Sulfate

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
244670	347901	-103231	0	1
359044	347901	11143	1	1
229595	347901	-118306	1	2
224624	347901	-123277	1	3
221785	347901	-126116	1	4
205884	347901	-142017	1	5
204497	347901	-143404	1	6
195436	347901	-152465	1	7
203000	347901	-144901	1	8
198500	347901	-149401	1	9
196500	347901	-151401	1	10
191600	347901	-156301	1	11
233000	347901	-114901	1	12
200000	347901	-147901	1	13
163000	347901	-184901	1	14
122000	347901	-225901	1	15
120000	347901	-227901	1	16
104000	347901	-243901	1	17
607000	347901	259099	2	17
587000	347901	239099	3	17
555000	347901	207099	4	17
469000	347901	121099	5	17
500000	347901	152099	6	17
448000	347901	100099	7	17
359044	244670	114374	8	17
229595	244670	-15075	8	18
224624	244670	-20046	8	19
221785	244670	-22885	8	20
205884	244670	-38786	8	21
204497	244670	-40173	8	22
195436	244670	-49234	8	23
203000	244670	-41670	8	24
198500	244670	-46170	8	25
196500	244670	-48170	8	26
191600	244670	-53070	8	27
233000	244670	-11670	8	28
200000	244670	-44670	8	29
163000	244670	-81670	8	30
122000	244670	-122670	8	31
120000	244670	-124670	8	32
104000	244670	-140670	8	33
607000	244670	362330	9	33
587000	244670	342330	10	33
555000	244670	310330	11	33
469000	244670	224330	12	33
500000	244670	255330	13	33

448000	244670	203330	14	33
229595	359044	-129449	14	34
224624	359044	-134420	14	35
221785	359044	-137259	14	36
205884	359044	-153160	14	37
204497	359044	-154547	14	38
195436	359044	-163608	14	39
203000	359044	-156044	14	40
198500	359044	-160544	14	41
196500	359044	-162544	14	42
191600	359044	-167444	14	43
233000	359044	-126044	14	44
200000	359044	-159044	14	45
163000	359044	-196044	14	46
122000	359044	-237044	14	47
120000	359044	-239044	14	48
104000	359044	-255044	14	49
607000	359044	247956	15	49
587000	359044	227956	16	49
555000	359044	195956	17	49
469000	359044	109956	18	49
500000	359044	140956	19	49
448000	359044	88956	20	49
224624	229595	-4971	20	50
221785	229595	-7810	20	51
205884	229595	-23711	20	52
204497	229595	-25098	20	53
195436	229595	-34159	20	54
203000	229595	-26595	20	55
198500	229595	-31095	20	56
196500	229595	-33095	20	57
191600	229595	-37995	20	58
233000	229595	3405	21	58
200000	229595	-29595	21	59
163000	229595	-66595	21	60
122000	229595	-107595	21	61
120000	229595	-109595	21	62
104000	229595	-125595	21	63
607000	229595	377405	22	63
587000	229595	357405	23	63
555000	229595	325405	24	63
469000	229595	239405	25	63
500000	229595	270405	26	63
448000	229595	218405	27	63
221785	224624	-2839	27	64
205884	224624	-18740	27	65
204497	224624	-20127	27	66
195436	224624	-29188	27	67
203000	224624	-21624	27	68
198500	224624	-26124	27	69
196500	224624	-28124	27	70
191600	224624	-33024	27	71
233000	224624	8376	28	71
200000	224624	-24624	28	72

163000	224624	-61624	28	73
122000	224624	-102624	28	74
120000	224624	-104624	28	75
104000	224624	-120624	28	76
607000	224624	382376	29	76
587000	224624	362376	30	76
555000	224624	330376	31	76
469000	224624	244376	32	76
500000	224624	275376	33	76
448000	224624	223376	34	76
205884	221785	-15901	34	77
204497	221785	-17288	34	78
195436	221785	-26349	34	79
203000	221785	-18785	34	80
198500	221785	-23285	34	81
196500	221785	-25285	34	82
191600	221785	-30185	34	83
233000	221785	11215	35	83
200000	221785	-21785	35	84
163000	221785	-58785	35	85
122000	221785	-99785	35	86
120000	221785	-101785	35	87
104000	221785	-117785	35	88
607000	221785	385215	36	88
587000	221785	365215	37	88
555000	221785	333215	38	88
469000	221785	247215	39	88
500000	221785	278215	40	88
448000	221785	226215	41	88
204497	205884	-1387	41	89
195436	205884	-10448	41	90
203000	205884	-2884	41	91
198500	205884	-7384	41	92
196500	205884	-9384	41	93
191600	205884	-14284	41	94
233000	205884	27116	42	94
200000	205884	-5884	42	95
163000	205884	-42884	42	96
122000	205884	-83884	42	97
120000	205884	-85884	42	98
104000	205884	-101884	42	99
607000	205884	401116	43	99
587000	205884	381116	44	99
555000	205884	349116	45	99
469000	205884	263116	46	99
500000	205884	294116	47	99
448000	205884	242116	48	99
195436	204497	-9061	48	100
203000	204497	-1497	48	101
198500	204497	-5997	48	102
196500	204497	-7997	48	103
191600	204497	-12897	48	104
233000	204497	28503	49	104
200000	204497	-4497	49	105

163000	204497	-41497	49	106
122000	204497	-82497	49	107
120000	204497	-84497	49	108
104000	204497	-100497	49	109
607000	204497	402503	50	109
587000	204497	382503	51	109
555000	204497	350503	52	109
469000	204497	264503	53	109
500000	204497	295503	54	109
448000	204497	243503	55	109
203000	195436	7564	56	109
198500	195436	3064	57	109
196500	195436	1064	58	109
191600	195436	-3836	58	110
233000	195436	37564	59	110
200000	195436	4564	60	110
163000	195436	-32436	60	111
122000	195436	-73436	60	112
120000	195436	-75436	60	113
104000	195436	-91436	60	114
607000	195436	411564	61	114
587000	195436	391564	62	114
555000	195436	359564	63	114
469000	195436	273564	64	114
500000	195436	304564	65	114
448000	195436	252564	66	114
198500	203000	-4500	66	115
196500	203000	-6500	66	116
191600	203000	-11400	66	117
233000	203000	30000	67	117
200000	203000	-3000	67	118
163000	203000	-40000	67	119
122000	203000	-81000	67	120
120000	203000	-83000	67	121
104000	203000	-99000	67	122
607000	203000	404000	68	122
587000	203000	384000	69	122
555000	203000	352000	70	122
469000	203000	266000	71	122
500000	203000	297000	72	122
448000	203000	245000	73	122
196500	198500	-2000	73	123
191600	198500	-6900	73	124
233000	198500	34500	74	124
200000	198500	1500	75	124
163000	198500	-35500	75	125
122000	198500	-76500	75	126
120000	198500	-78500	75	127
104000	198500	-94500	75	128
607000	198500	408500	76	128
587000	198500	388500	77	128
555000	198500	356500	78	128
469000	198500	270500	79	128
500000	198500	301500	80	128

448000	198500	249500	81	128
191600	196500	-4900	81	129
233000	196500	36500	82	129
200000	196500	3500	83	129
163000	196500	-33500	83	130
122000	196500	-74500	83	131
120000	196500	-76500	83	132
104000	196500	-92500	83	133
607000	196500	410500	84	133
587000	196500	390500	85	133
555000	196500	358500	86	133
469000	196500	272500	87	133
500000	196500	303500	88	133
448000	196500	251500	89	133
233000	191600	41400	90	133
200000	191600	8400	91	133
163000	191600	-28600	91	134
122000	191600	-69600	91	135
120000	191600	-71600	91	136
104000	191600	-87600	91	137
607000	191600	415400	92	137
587000	191600	395400	93	137
555000	191600	363400	94	137
469000	191600	277400	95	137
500000	191600	308400	96	137
448000	191600	256400	97	137
200000	233000	-33000	97	138
163000	233000	-70000	97	139
122000	233000	-111000	97	140
120000	233000	-113000	97	141
104000	233000	-129000	97	142
607000	233000	374000	98	142
587000	233000	354000	99	142
555000	233000	322000	100	142
469000	233000	236000	101	142
500000	233000	267000	102	142
448000	233000	215000	103	142
163000	200000	-37000	103	143
122000	200000	-78000	103	144
120000	200000	-80000	103	145
104000	200000	-96000	103	146
607000	200000	407000	104	146
587000	200000	387000	105	146
555000	200000	355000	106	146
469000	200000	269000	107	146
500000	200000	300000	108	146
448000	200000	248000	109	146
122000	163000	-41000	109	147
120000	163000	-43000	109	148
104000	163000	-59000	109	149
607000	163000	444000	110	149
587000	163000	424000	111	149

555000	163000	392000	112	149
469000	163000	306000	113	149
500000	163000	337000	114	149
448000	163000	285000	115	149
120000	122000	-2000	115	150
104000	122000	-18000	115	151
607000	122000	485000	116	151
587000	122000	465000	117	151
555000	122000	433000	118	151
469000	122000	347000	119	151
500000	122000	378000	120	151
448000	122000	326000	121	151
104000	120000	-16000	121	152
607000	120000	487000	122	152
587000	120000	467000	123	152
555000	120000	435000	124	152
469000	120000	349000	125	152
500000	120000	380000	126	152
448000	120000	328000	127	152
607000	104000	503000	128	152
587000	104000	483000	129	152
555000	104000	451000	130	152
469000	104000	365000	131	152
500000	104000	396000	132	152
448000	104000	344000	133	152
587000	607000	-20000	133	153
555000	607000	-52000	133	154
469000	607000	-138000	133	155
500000	607000	-107000	133	156
448000	607000	-159000	133	157
555000	587000	-32000	133	158
469000	587000	-118000	133	159
500000	587000	-87000	133	160
448000	587000	-139000	133	161
469000	555000	-86000	133	162
500000	555000	-55000	133	163
448000	555000	-107000	133	164
500000	469000	31000	134	164
448000	469000	-21000	134	165
448000	500000	-52000	134	166

S Statistic = 134 - 166 = -32

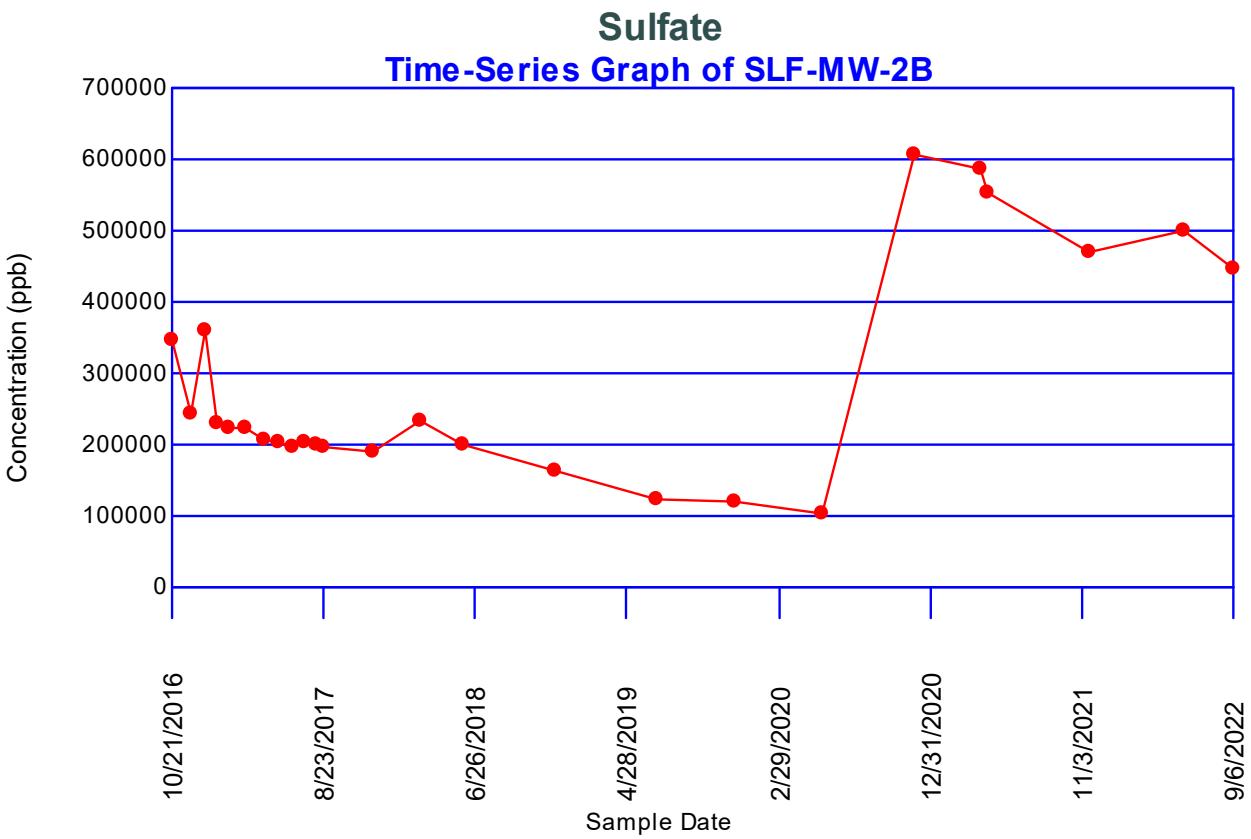
Tied Group	Value	Members

Time Period	Observations
10/21/2016	1
11/30/2016	1

12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/12/2021	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1833.33
Z-Score = -0.724004
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.724004| <= 1.97737 indicating no evidence of a trend


Sulfate
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
700000
600000
500000
400000
300000
200000
100000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Sulfate

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0978536	0.110255	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	603053	FALSE
	11/30/2016	589957	FALSE
	12/28/2016	614466	FALSE
	1/18/2017	582135	FALSE
	2/15/2017	486076	FALSE
	3/20/2017	472830	FALSE
	4/25/2017	465682	FALSE
	5/22/2017	495843	FALSE
	6/20/2017	480297	FALSE
	7/17/2017	519000	FALSE
	8/7/2017	532000	FALSE
	8/21/2017	549000	FALSE
	11/29/2017	483000	FALSE
	3/8/2018	476000	FALSE
	5/30/2018	454000	FALSE
	12/4/2018	476000	FALSE
	6/27/2019	417000	FALSE
	12/2/2019	384000	FALSE
	5/28/2020	336000	FALSE
	12/1/2020	389000	FALSE
	4/28/2021	355000	FALSE
	11/19/2021	396000	FALSE
	5/31/2022	381000	FALSE
	9/6/2022	364000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	336000	614466	278466	0.4493	125115
2	355000	603053	248053	0.3098	76846.8
3	364000	589957	225957	0.2554	57709.4
4	381000	582135	201135	0.2145	43143.5
5	384000	549000	165000	0.1807	29815.5
6	389000	532000	143000	0.1512	21621.6
7	396000	519000	123000	0.1245	15313.5
8	417000	495843	78843	0.0997	7860.65
9	454000	486076	32076	0.0764	2450.61
10	465682	483000	17318	0.0539	933.44
11	472830	480297	7467	0.0321	239.691
12	476000	476000	0	0.0107	0
13	476000	476000	0		
14	480297	472830	-7467		
15	483000	465682	-17318		
16	486076	454000	-32076		
17	495843	417000	-78843		
18	519000	396000	-123000		
19	532000	389000	-143000		
20	549000	384000	-165000		
21	582135	381000	-201135		
22	589957	364000	-225957		
23	603053	355000	-248053		
24	614466	336000	-278466		

Sum of b values = 381049
Sample Standard Deviation = 81331.4
W Statistic = 0.954373

5% Critical value of 0.916 is less than 0.954373
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.954373
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Sulfate

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
589957	603053	-13096	0	1
614466	603053	11413	1	1
582135	603053	-20918	1	2
486076	603053	-116977	1	3
472830	603053	-130223	1	4
465682	603053	-137371	1	5
495843	603053	-107210	1	6
480297	603053	-122756	1	7
519000	603053	-84053	1	8
532000	603053	-71053	1	9
549000	603053	-54053	1	10
483000	603053	-120053	1	11
476000	603053	-127053	1	12
454000	603053	-149053	1	13
476000	603053	-127053	1	14
417000	603053	-186053	1	15
384000	603053	-219053	1	16
336000	603053	-267053	1	17
389000	603053	-214053	1	18
355000	603053	-248053	1	19
396000	603053	-207053	1	20
381000	603053	-222053	1	21
364000	603053	-239053	1	22
614466	589957	24509	2	22
582135	589957	-7822	2	23
486076	589957	-103881	2	24
472830	589957	-117127	2	25
465682	589957	-124275	2	26
495843	589957	-94114	2	27
480297	589957	-109660	2	28
519000	589957	-70957	2	29
532000	589957	-57957	2	30
549000	589957	-40957	2	31
483000	589957	-106957	2	32
476000	589957	-113957	2	33
454000	589957	-135957	2	34
476000	589957	-113957	2	35
417000	589957	-172957	2	36
384000	589957	-205957	2	37
336000	589957	-253957	2	38
389000	589957	-200957	2	39
355000	589957	-234957	2	40
396000	589957	-193957	2	41
381000	589957	-208957	2	42
364000	589957	-225957	2	43

582135	614466	-32331	2	44
486076	614466	-128390	2	45
472830	614466	-141636	2	46
465682	614466	-148784	2	47
495843	614466	-118623	2	48
480297	614466	-134169	2	49
519000	614466	-95466	2	50
532000	614466	-82466	2	51
549000	614466	-65466	2	52
483000	614466	-131466	2	53
476000	614466	-138466	2	54
454000	614466	-160466	2	55
476000	614466	-138466	2	56
417000	614466	-197466	2	57
384000	614466	-230466	2	58
336000	614466	-278466	2	59
389000	614466	-225466	2	60
355000	614466	-259466	2	61
396000	614466	-218466	2	62
381000	614466	-233466	2	63
364000	614466	-250466	2	64
486076	582135	-96059	2	65
472830	582135	-109305	2	66
465682	582135	-116453	2	67
495843	582135	-86292	2	68
480297	582135	-101838	2	69
519000	582135	-63135	2	70
532000	582135	-50135	2	71
549000	582135	-33135	2	72
483000	582135	-99135	2	73
476000	582135	-106135	2	74
454000	582135	-128135	2	75
476000	582135	-106135	2	76
417000	582135	-165135	2	77
384000	582135	-198135	2	78
336000	582135	-246135	2	79
389000	582135	-193135	2	80
355000	582135	-227135	2	81
396000	582135	-186135	2	82
381000	582135	-201135	2	83
364000	582135	-218135	2	84
472830	486076	-13246	2	85
465682	486076	-20394	2	86
495843	486076	9767	3	86
480297	486076	-5779	3	87
519000	486076	32924	4	87
532000	486076	45924	5	87
549000	486076	62924	6	87
483000	486076	-3076	6	88
476000	486076	-10076	6	89
454000	486076	-32076	6	90
476000	486076	-10076	6	91
417000	486076	-69076	6	92
384000	486076	-102076	6	93
336000	486076	-150076	6	94

389000	486076	-97076	6	95
355000	486076	-131076	6	96
396000	486076	-90076	6	97
381000	486076	-105076	6	98
364000	486076	-122076	6	99
465682	472830	-7148	6	100
495843	472830	23013	7	100
480297	472830	7467	8	100
519000	472830	46170	9	100
532000	472830	59170	10	100
549000	472830	76170	11	100
483000	472830	10170	12	100
476000	472830	3170	13	100
454000	472830	-18830	13	101
476000	472830	3170	14	101
417000	472830	-55830	14	102
384000	472830	-88830	14	103
336000	472830	-136830	14	104
389000	472830	-83830	14	105
355000	472830	-117830	14	106
396000	472830	-76830	14	107
381000	472830	-91830	14	108
364000	472830	-108830	14	109
495843	465682	30161	15	109
480297	465682	14615	16	109
519000	465682	53318	17	109
532000	465682	66318	18	109
549000	465682	83318	19	109
483000	465682	17318	20	109
476000	465682	10318	21	109
454000	465682	-11682	21	110
476000	465682	10318	22	110
417000	465682	-48682	22	111
384000	465682	-81682	22	112
336000	465682	-129682	22	113
389000	465682	-76682	22	114
355000	465682	-110682	22	115
396000	465682	-69682	22	116
381000	465682	-84682	22	117
364000	465682	-101682	22	118
480297	495843	-15546	22	119
519000	495843	23157	23	119
532000	495843	36157	24	119
549000	495843	53157	25	119
483000	495843	-12843	25	120
476000	495843	-19843	25	121
454000	495843	-41843	25	122
476000	495843	-19843	25	123
417000	495843	-78843	25	124
384000	495843	-111843	25	125
336000	495843	-159843	25	126
389000	495843	-106843	25	127
355000	495843	-140843	25	128
396000	495843	-99843	25	129

381000	495843	-114843	25	130
364000	495843	-131843	25	131
519000	480297	38703	26	131
532000	480297	51703	27	131
549000	480297	68703	28	131
483000	480297	2703	29	131
476000	480297	-4297	29	132
454000	480297	-26297	29	133
476000	480297	-4297	29	134
417000	480297	-63297	29	135
384000	480297	-96297	29	136
336000	480297	-144297	29	137
389000	480297	-91297	29	138
355000	480297	-125297	29	139
396000	480297	-84297	29	140
381000	480297	-99297	29	141
364000	480297	-116297	29	142
532000	519000	13000	30	142
549000	519000	30000	31	142
483000	519000	-36000	31	143
476000	519000	-43000	31	144
454000	519000	-65000	31	145
476000	519000	-43000	31	146
417000	519000	-102000	31	147
384000	519000	-135000	31	148
336000	519000	-183000	31	149
389000	519000	-130000	31	150
355000	519000	-164000	31	151
396000	519000	-123000	31	152
381000	519000	-138000	31	153
364000	519000	-155000	31	154
549000	532000	17000	32	154
483000	532000	-49000	32	155
476000	532000	-56000	32	156
454000	532000	-78000	32	157
476000	532000	-56000	32	158
417000	532000	-115000	32	159
384000	532000	-148000	32	160
336000	532000	-196000	32	161
389000	532000	-143000	32	162
355000	532000	-177000	32	163
396000	532000	-136000	32	164
381000	532000	-151000	32	165
364000	532000	-168000	32	166
483000	549000	-66000	32	167
476000	549000	-73000	32	168
454000	549000	-95000	32	169
476000	549000	-73000	32	170
417000	549000	-132000	32	171
384000	549000	-165000	32	172
336000	549000	-213000	32	173
389000	549000	-160000	32	174
355000	549000	-194000	32	175

396000	549000	-153000	32	176
381000	549000	-168000	32	177
364000	549000	-185000	32	178
476000	483000	-7000	32	179
454000	483000	-29000	32	180
476000	483000	-7000	32	181
417000	483000	-66000	32	182
384000	483000	-99000	32	183
336000	483000	-147000	32	184
389000	483000	-94000	32	185
355000	483000	-128000	32	186
396000	483000	-87000	32	187
381000	483000	-102000	32	188
364000	483000	-119000	32	189
454000	476000	-22000	32	190
476000	476000	0	32	190
417000	476000	-59000	32	191
384000	476000	-92000	32	192
336000	476000	-140000	32	193
389000	476000	-87000	32	194
355000	476000	-121000	32	195
396000	476000	-80000	32	196
381000	476000	-95000	32	197
364000	476000	-112000	32	198
476000	454000	22000	33	198
417000	454000	-37000	33	199
384000	454000	-70000	33	200
336000	454000	-118000	33	201
389000	454000	-65000	33	202
355000	454000	-99000	33	203
396000	454000	-58000	33	204
381000	454000	-73000	33	205
364000	454000	-90000	33	206
417000	476000	-59000	33	207
384000	476000	-92000	33	208
336000	476000	-140000	33	209
389000	476000	-87000	33	210
355000	476000	-121000	33	211
396000	476000	-80000	33	212
381000	476000	-95000	33	213
364000	476000	-112000	33	214
384000	417000	-33000	33	215
336000	417000	-81000	33	216
389000	417000	-28000	33	217
355000	417000	-62000	33	218
396000	417000	-21000	33	219
381000	417000	-36000	33	220
364000	417000	-53000	33	221
336000	384000	-48000	33	222
389000	384000	5000	34	222
355000	384000	-29000	34	223

396000	384000	12000	35	223
381000	384000	-3000	35	224
364000	384000	-20000	35	225
389000	336000	53000	36	225
355000	336000	19000	37	225
396000	336000	60000	38	225
381000	336000	45000	39	225
364000	336000	28000	40	225
355000	389000	-34000	40	226
396000	389000	7000	41	226
381000	389000	-8000	41	227
364000	389000	-25000	41	228
396000	355000	41000	42	228
381000	355000	26000	43	228
364000	355000	9000	44	228
381000	396000	-15000	44	229
364000	396000	-32000	44	230
364000	381000	-17000	44	231

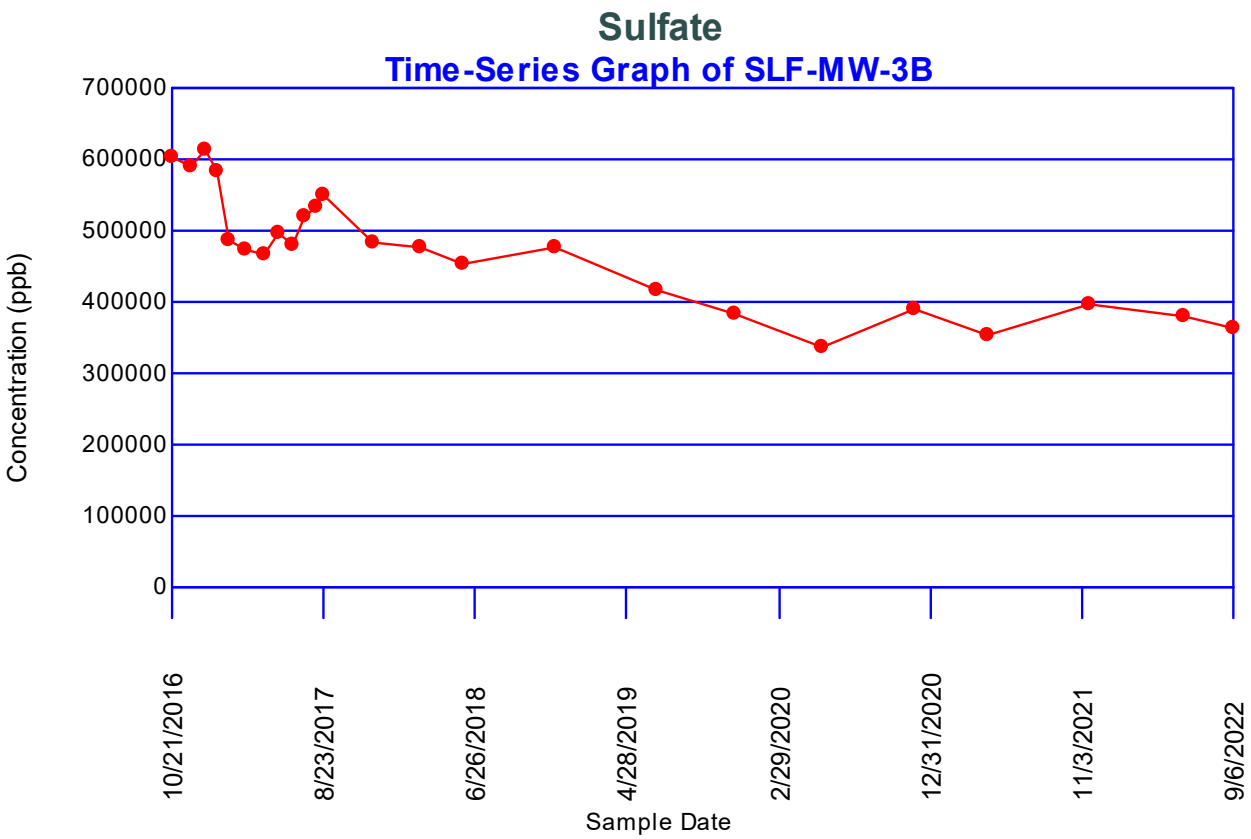
S Statistic = 44 - 231 = -187

Tied Group	Value	Members
1	476000	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1624.33
Z-Score = -4.61504
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-4.61504| > 1.97737 indicating a trend


Sulfate
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
700000
600000
500000
400000
300000
200000
100000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Sulfate

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 20 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.302013	0.0714286	0.45	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	126012	FALSE
	3/20/2017	107411	FALSE
	4/25/2017	95475.3	FALSE
	5/22/2017	90985.1	FALSE
	6/20/2017	130226	FALSE
	7/17/2017	132600	FALSE
	8/7/2017	112400	FALSE
	8/22/2017	143100	FALSE
	11/29/2017	157800	FALSE
	3/8/2018	89800	FALSE
	5/30/2018	158000	FALSE
	12/4/2018	122000	FALSE
	6/28/2019	173000	FALSE
	12/2/2019	162000	FALSE
	5/28/2020	83400	FALSE
	11/30/2020	84400	FALSE
	4/28/2021	144000	FALSE
	11/19/2021	178000	FALSE
	5/31/2022	159000	FALSE
	9/6/2022	209000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 10 for 20 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	83400	209000	125600	0.4734	59459
2	84400	178000	93600	0.3211	30055
3	89800	173000	83200	0.2565	21340.8
4	90985.1	162000	71014.9	0.2085	14806.6
5	95475.3	159000	63524.7	0.1686	10710.3
6	107411	158000	50589	0.1334	6748.57
7	112400	157800	45400	0.1013	4599.02
8	122000	144000	22000	0.0711	1564.2
9	126012	143100	17088	0.0422	721.114
10	130226	132600	2374	0.014	33.236
11	132600	130226	-2374		
12	143100	126012	-17088		
13	144000	122000	-22000		
14	157800	112400	-45400		
15	158000	107411	-50589		
16	159000	95475.3	-63524.7		
17	162000	90985.1	-71014.9		
18	173000	89800	-83200		
19	178000	84400	-93600		
20	209000	83400	-125600		

Sum of b values = 150038
Sample Standard Deviation = 35168.4
W Statistic = 0.957949

5% Critical value of 0.905 is less than 0.957949
Data is normally distributed at 95% level of significance

1% Critical value of 0.868 is less than 0.957949
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Sulfate

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
107411	126012	-18601	0	1
95475.3	126012	-30536.7	0	2
90985.1	126012	-35026.9	0	3
130226	126012	4214	1	3
132600	126012	6588	2	3
112400	126012	-13612	2	4
143100	126012	17088	3	4
157800	126012	31788	4	4
89800	126012	-36212	4	5
158000	126012	31988	5	5
122000	126012	-4012	5	6
173000	126012	46988	6	6
162000	126012	35988	7	6
83400	126012	-42612	7	7
84400	126012	-41612	7	8
144000	126012	17988	8	8
178000	126012	51988	9	8
159000	126012	32988	10	8
209000	126012	82988	11	8
95475.3	107411	-11935.7	11	9
90985.1	107411	-16425.9	11	10
130226	107411	22815	12	10
132600	107411	25189	13	10
112400	107411	4989	14	10
143100	107411	35689	15	10
157800	107411	50389	16	10
89800	107411	-17611	16	11
158000	107411	50589	17	11
122000	107411	14589	18	11
173000	107411	65589	19	11
162000	107411	54589	20	11
83400	107411	-24011	20	12
84400	107411	-23011	20	13
144000	107411	36589	21	13
178000	107411	70589	22	13
159000	107411	51589	23	13
209000	107411	101589	24	13
90985.1	95475.3	-4490.2	24	14
130226	95475.3	34750.7	25	14
132600	95475.3	37124.7	26	14
112400	95475.3	16924.7	27	14
143100	95475.3	47624.7	28	14
157800	95475.3	62324.7	29	14
89800	95475.3	-5675.3	29	15
158000	95475.3	62524.7	30	15

122000	95475.3	26524.7	31	15
173000	95475.3	77524.7	32	15
162000	95475.3	66524.7	33	15
83400	95475.3	-12075.3	33	16
84400	95475.3	-11075.3	33	17
144000	95475.3	48524.7	34	17
178000	95475.3	82524.7	35	17
159000	95475.3	63524.7	36	17
209000	95475.3	113525	37	17
130226	90985.1	39240.9	38	17
132600	90985.1	41614.9	39	17
112400	90985.1	21414.9	40	17
143100	90985.1	52114.9	41	17
157800	90985.1	66814.9	42	17
89800	90985.1	-1185.1	42	18
158000	90985.1	67014.9	43	18
122000	90985.1	31014.9	44	18
173000	90985.1	82014.9	45	18
162000	90985.1	71014.9	46	18
83400	90985.1	-7585.1	46	19
84400	90985.1	-6585.1	46	20
144000	90985.1	53014.9	47	20
178000	90985.1	87014.9	48	20
159000	90985.1	68014.9	49	20
209000	90985.1	118015	50	20
132600	130226	2374	51	20
112400	130226	-17826	51	21
143100	130226	12874	52	21
157800	130226	27574	53	21
89800	130226	-40426	53	22
158000	130226	27774	54	22
122000	130226	-8226	54	23
173000	130226	42774	55	23
162000	130226	31774	56	23
83400	130226	-46826	56	24
84400	130226	-45826	56	25
144000	130226	13774	57	25
178000	130226	47774	58	25
159000	130226	28774	59	25
209000	130226	78774	60	25
112400	132600	-20200	60	26
143100	132600	10500	61	26
157800	132600	25200	62	26
89800	132600	-42800	62	27
158000	132600	25400	63	27
122000	132600	-10600	63	28
173000	132600	40400	64	28
162000	132600	29400	65	28
83400	132600	-49200	65	29
84400	132600	-48200	65	30
144000	132600	11400	66	30
178000	132600	45400	67	30
159000	132600	26400	68	30
209000	132600	76400	69	30

143100	112400	30700	70	30
157800	112400	45400	71	30
89800	112400	-22600	71	31
158000	112400	45600	72	31
122000	112400	9600	73	31
173000	112400	60600	74	31
162000	112400	49600	75	31
83400	112400	-29000	75	32
84400	112400	-28000	75	33
144000	112400	31600	76	33
178000	112400	65600	77	33
159000	112400	46600	78	33
209000	112400	96600	79	33
157800	143100	14700	80	33
89800	143100	-53300	80	34
158000	143100	14900	81	34
122000	143100	-21100	81	35
173000	143100	29900	82	35
162000	143100	18900	83	35
83400	143100	-59700	83	36
84400	143100	-58700	83	37
144000	143100	900	84	37
178000	143100	34900	85	37
159000	143100	15900	86	37
209000	143100	65900	87	37
89800	157800	-68000	87	38
158000	157800	200	88	38
122000	157800	-35800	88	39
173000	157800	15200	89	39
162000	157800	4200	90	39
83400	157800	-74400	90	40
84400	157800	-73400	90	41
144000	157800	-13800	90	42
178000	157800	20200	91	42
159000	157800	1200	92	42
209000	157800	51200	93	42
158000	89800	68200	94	42
122000	89800	32200	95	42
173000	89800	83200	96	42
162000	89800	72200	97	42
83400	89800	-6400	97	43
84400	89800	-5400	97	44
144000	89800	54200	98	44
178000	89800	88200	99	44
159000	89800	69200	100	44
209000	89800	119200	101	44
122000	158000	-36000	101	45
173000	158000	15000	102	45
162000	158000	4000	103	45
83400	158000	-74600	103	46
84400	158000	-73600	103	47
144000	158000	-14000	103	48

178000	158000	20000	104	48
159000	158000	1000	105	48
209000	158000	51000	106	48
173000	122000	51000	107	48
162000	122000	40000	108	48
83400	122000	-38600	108	49
84400	122000	-37600	108	50
144000	122000	22000	109	50
178000	122000	56000	110	50
159000	122000	37000	111	50
209000	122000	87000	112	50
162000	173000	-11000	112	51
83400	173000	-89600	112	52
84400	173000	-88600	112	53
144000	173000	-29000	112	54
178000	173000	5000	113	54
159000	173000	-14000	113	55
209000	173000	36000	114	55
83400	162000	-78600	114	56
84400	162000	-77600	114	57
144000	162000	-18000	114	58
178000	162000	16000	115	58
159000	162000	-3000	115	59
209000	162000	47000	116	59
84400	83400	1000	117	59
144000	83400	60600	118	59
178000	83400	94600	119	59
159000	83400	75600	120	59
209000	83400	125600	121	59
144000	84400	59600	122	59
178000	84400	93600	123	59
159000	84400	74600	124	59
209000	84400	124600	125	59
178000	144000	34000	126	59
159000	144000	15000	127	59
209000	144000	65000	128	59
159000	178000	-19000	128	60
209000	178000	31000	129	60
209000	159000	50000	130	60

S Statistic = 130 - 60 = 70

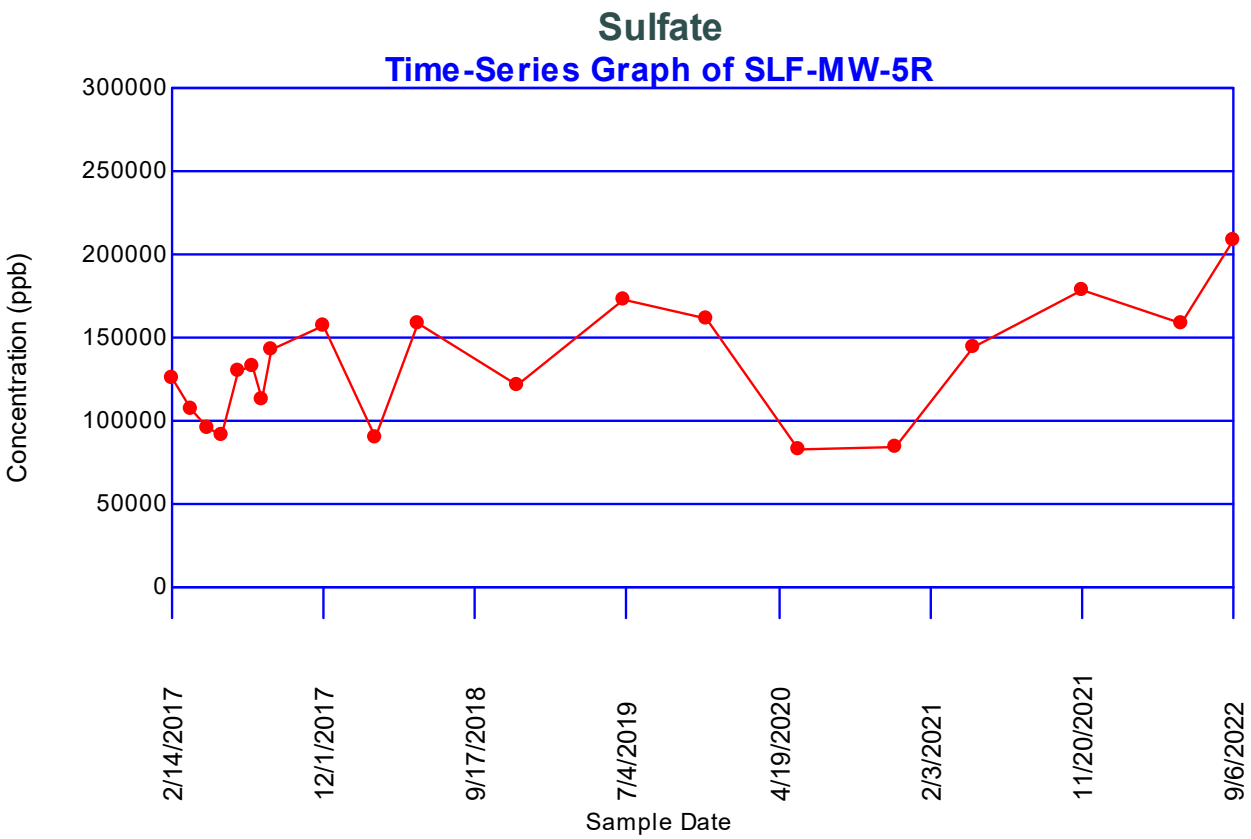
Tied Group	Value	Members

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1

5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 950
Z-Score = 2.23866
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|2.23866| > 1.97737 indicating a trend


Sulfate
Time-Series Graph of SLF-MW-5R
300000
250000
200000
150000
100000
50000
0
Concentration (ppb)
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Total Dissolved Solids (TDS)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 65
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	24	0 (0%)	10/21/2016	3.468e+006	3.468e+006
			11/30/2016	483000	483000
			12/28/2016	3.5667e+006	3.5667e+006
			1/18/2017	2.93e+006	2.93e+006
			2/14/2017	3.5e+006	3.5e+006
			3/20/2017	3.13e+006	3.13e+006
			4/25/2017	3.4e+006	3.4e+006
			5/22/2017	3.014e+006	3.014e+006
			6/20/2017	2.97e+006	2.97e+006
			7/17/2017	2.91e+006	2.91e+006
			8/8/2017	3.05e+006	3.05e+006
			8/21/2017	3.05e+006	3.05e+006
			11/29/2017	3.072e+006	3.072e+006
			5/31/2018	3.91e+006	3.91e+006
			12/4/2018	4.24e+006	4.24e+006
			6/28/2019	4.53e+006	4.53e+006
			11/4/2019	4.38e+006	4.38e+006
			12/2/2019	4.13e+006	4.13e+006
			5/28/2020	4.26e+006	4.26e+006
			11/30/2020	3.55e+006	3.55e+006
			4/28/2021	3.67e+006	3.67e+006
			11/19/2021	3.9e+006	3.9e+006
			5/31/2022	4.16e+006	4.16e+006
			9/6/2022	4.41e+006	4.41e+006
			11/21/2022	**4.02e+006**	**4.02e+006**
SLF-MW-3B	22	0 (0%)	10/21/2016	1.341e+006	1.341e+006
			11/30/2016	1.38e+006	1.38e+006
			12/28/2016	1.41e+006	1.41e+006
			1/18/2017	1.12e+006	1.12e+006
			2/15/2017	1.179e+006	1.179e+006
			3/20/2017	1.255e+006	1.255e+006
			4/25/2017	1.227e+006	1.227e+006
			5/22/2017	1.142e+006	1.142e+006
			6/20/2017	1.156e+006	1.156e+006
			7/17/2017	1.232e+006	1.232e+006
			8/7/2017	1.273e+006	1.273e+006
			8/21/2017	1.235e+006	1.235e+006
			11/29/2017	1.208e+006	1.208e+006
			12/4/2018	1.28e+006	1.28e+006
			6/27/2019	1.36e+006	1.36e+006

			12/2/2019	1.1e+006	1.1e+006
			5/28/2020	1.15e+006	1.15e+006
			12/1/2020	1.21e+006	1.21e+006
			4/28/2021	1.22e+006	1.22e+006
			11/19/2021	1.21e+006	1.21e+006
			5/31/2022	1.22e+006	1.22e+006
			9/6/2022	1.18e+006	1.18e+006
			11/21/2022	**1.13e+006**	**1.13e+006**
SLF-MW-5R	19	0 (0%)	2/14/2017	470000	470000
			3/20/2017	445000	445000
			4/25/2017	435000	435000
			5/22/2017	400000	400000
			6/20/2017	451000	451000
			7/17/2017	556000	556000
			8/7/2017	477000	477000
			8/22/2017	529000	529000
			11/29/2017	549000	549000
			5/30/2018	591000	591000
			12/4/2018	480000	480000
			6/28/2019	611000	611000
			12/2/2019	432000	432000
			5/28/2020	384000	384000
			11/30/2020	336000	336000
			4/28/2021	498000	498000
			11/19/2021	526000	526000
			5/31/2022	586000	586000
			9/6/2022	732000	732000
			11/21/2022	**794000**	**794000**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.09375	0.627919	0.413	483000
2	0.0961538	0.0408163	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	3.468e+006	FALSE
	11/30/2016	**483000**	**TRUE**
	12/28/2016	3.5667e+006	FALSE
	1/18/2017	2.93e+006	FALSE
	2/14/2017	3.5e+006	FALSE
	3/20/2017	3.13e+006	FALSE
	4/25/2017	3.4e+006	FALSE
	5/22/2017	3.014e+006	FALSE
	6/20/2017	2.97e+006	FALSE
	7/17/2017	2.91e+006	FALSE
	8/8/2017	3.05e+006	FALSE
	8/21/2017	3.05e+006	FALSE
	11/29/2017	3.072e+006	FALSE
	5/31/2018	3.91e+006	FALSE
	12/4/2018	4.24e+006	FALSE
	6/28/2019	4.53e+006	FALSE
	11/4/2019	4.38e+006	FALSE
	12/2/2019	4.13e+006	FALSE
	5/28/2020	4.26e+006	FALSE
	11/30/2020	3.55e+006	FALSE
	4/28/2021	3.67e+006	FALSE
	11/19/2021	3.9e+006	FALSE
	5/31/2022	4.16e+006	FALSE
	9/6/2022	4.41e+006	FALSE

Dixon's Test for Outliers

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0961538	0.0408163	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	3.468e+006	FALSE
	12/28/2016	3.5667e+006	FALSE
	1/18/2017	2.93e+006	FALSE
	2/14/2017	3.5e+006	FALSE
	3/20/2017	3.13e+006	FALSE
	4/25/2017	3.4e+006	FALSE
	5/22/2017	3.014e+006	FALSE
	6/20/2017	2.97e+006	FALSE
	7/17/2017	2.91e+006	FALSE
	8/8/2017	3.05e+006	FALSE
	8/21/2017	3.05e+006	FALSE
	11/29/2017	3.072e+006	FALSE
	5/31/2018	3.91e+006	FALSE
	12/4/2018	4.24e+006	FALSE
	6/28/2019	4.53e+006	FALSE
	11/4/2019	4.38e+006	FALSE
	12/2/2019	4.13e+006	FALSE
	5/28/2020	4.26e+006	FALSE
	11/30/2020	3.55e+006	FALSE
	4/28/2021	3.67e+006	FALSE
	11/19/2021	3.9e+006	FALSE
	5/31/2022	4.16e+006	FALSE
	9/6/2022	4.41e+006	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2.91e+006	4.53e+006	1.62e+006	0.4542	735804
2	2.93e+006	4.41e+006	1.48e+006	0.3126	462648
3	2.97e+006	4.38e+006	1.41e+006	0.2563	361383
4	3.014e+006	4.26e+006	1.246e+006	0.2139	266519
5	3.05e+006	4.24e+006	1.19e+006	0.1787	212653
6	3.05e+006	4.16e+006	1.11e+006	0.148	164280
7	3.072e+006	4.13e+006	1.058e+006	0.1201	127066
8	3.13e+006	3.91e+006	780000	0.0941	73398
9	3.4e+006	3.9e+006	500000	0.0696	34800
10	3.468e+006	3.67e+006	202000	0.0459	9271.8
11	3.5e+006	3.5667e+006	66700	0.0228	1520.76
12	3.55e+006	3.55e+006	0		
13	3.5667e+006	3.5e+006	-66700		
14	3.67e+006	3.468e+006	-202000		
15	3.9e+006	3.4e+006	-500000		
16	3.91e+006	3.13e+006	-780000		
17	4.13e+006	3.072e+006	-1.058e+006		
18	4.16e+006	3.05e+006	-1.11e+006		
19	4.24e+006	3.05e+006	-1.19e+006		
20	4.26e+006	3.014e+006	-1.246e+006		
21	4.38e+006	2.97e+006	-1.41e+006		
22	4.41e+006	2.93e+006	-1.48e+006		
23	4.53e+006	2.91e+006	-1.62e+006		

Sum of b values = 2.44934e+006
Sample Standard Deviation = 547479
W Statistic = 0.909791

5% Critical value of 0.914 exceeds 0.909791
Evidence of non-normality at 95% level of significance

1% Critical value of 0.881 is less than 0.909791
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Dissolved Solids (TDS)
Location: SLF-MW-2B
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
3.5667e+006	3.468e+006	98700	1	0
2.93e+006	3.468e+006	-538000	1	1
3.5e+006	3.468e+006	32000	2	1
3.13e+006	3.468e+006	-338000	2	2
3.4e+006	3.468e+006	-68000	2	3
3.014e+006	3.468e+006	-454000	2	4
2.97e+006	3.468e+006	-498000	2	5
2.91e+006	3.468e+006	-558000	2	6
3.05e+006	3.468e+006	-418000	2	7
3.05e+006	3.468e+006	-418000	2	8
3.072e+006	3.468e+006	-396000	2	9
3.91e+006	3.468e+006	442000	3	9
4.24e+006	3.468e+006	772000	4	9
4.53e+006	3.468e+006	1.062e+006	5	9
4.38e+006	3.468e+006	912000	6	9
4.13e+006	3.468e+006	662000	7	9
4.26e+006	3.468e+006	792000	8	9
3.55e+006	3.468e+006	82000	9	9
3.67e+006	3.468e+006	202000	10	9
3.9e+006	3.468e+006	432000	11	9
4.16e+006	3.468e+006	692000	12	9
4.41e+006	3.468e+006	942000	13	9
2.93e+006	3.5667e+006	-636700	13	10
3.5e+006	3.5667e+006	-66700	13	11
3.13e+006	3.5667e+006	-436700	13	12
3.4e+006	3.5667e+006	-166700	13	13
3.014e+006	3.5667e+006	-552700	13	14
2.97e+006	3.5667e+006	-596700	13	15
2.91e+006	3.5667e+006	-656700	13	16
3.05e+006	3.5667e+006	-516700	13	17
3.05e+006	3.5667e+006	-516700	13	18
3.072e+006	3.5667e+006	-494700	13	19
3.91e+006	3.5667e+006	343300	14	19
4.24e+006	3.5667e+006	673300	15	19
4.53e+006	3.5667e+006	963300	16	19
4.38e+006	3.5667e+006	813300	17	19
4.13e+006	3.5667e+006	563300	18	19
4.26e+006	3.5667e+006	693300	19	19
3.55e+006	3.5667e+006	-16700	19	20
3.67e+006	3.5667e+006	103300	20	20
3.9e+006	3.5667e+006	333300	21	20
4.16e+006	3.5667e+006	593300	22	20
4.41e+006	3.5667e+006	843300	23	20
3.5e+006	2.93e+006	570000	24	20
3.13e+006	2.93e+006	200000	25	20

3.4e+006	2.93e+006	470000	26	20
3.014e+006	2.93e+006	84000	27	20
2.97e+006	2.93e+006	40000	28	20
2.91e+006	2.93e+006	-20000	28	21
3.05e+006	2.93e+006	120000	29	21
3.05e+006	2.93e+006	120000	30	21
3.072e+006	2.93e+006	142000	31	21
3.91e+006	2.93e+006	980000	32	21
4.24e+006	2.93e+006	1.31e+006	33	21
4.53e+006	2.93e+006	1.6e+006	34	21
4.38e+006	2.93e+006	1.45e+006	35	21
4.13e+006	2.93e+006	1.2e+006	36	21
4.26e+006	2.93e+006	1.33e+006	37	21
3.55e+006	2.93e+006	620000	38	21
3.67e+006	2.93e+006	740000	39	21
3.9e+006	2.93e+006	970000	40	21
4.16e+006	2.93e+006	1.23e+006	41	21
4.41e+006	2.93e+006	1.48e+006	42	21
3.13e+006	3.5e+006	-370000	42	22
3.4e+006	3.5e+006	-100000	42	23
3.014e+006	3.5e+006	-486000	42	24
2.97e+006	3.5e+006	-530000	42	25
2.91e+006	3.5e+006	-590000	42	26
3.05e+006	3.5e+006	-450000	42	27
3.05e+006	3.5e+006	-450000	42	28
3.072e+006	3.5e+006	-428000	42	29
3.91e+006	3.5e+006	410000	43	29
4.24e+006	3.5e+006	740000	44	29
4.53e+006	3.5e+006	1.03e+006	45	29
4.38e+006	3.5e+006	880000	46	29
4.13e+006	3.5e+006	630000	47	29
4.26e+006	3.5e+006	760000	48	29
3.55e+006	3.5e+006	50000	49	29
3.67e+006	3.5e+006	170000	50	29
3.9e+006	3.5e+006	400000	51	29
4.16e+006	3.5e+006	660000	52	29
4.41e+006	3.5e+006	910000	53	29
3.4e+006	3.13e+006	270000	54	29
3.014e+006	3.13e+006	-116000	54	30
2.97e+006	3.13e+006	-160000	54	31
2.91e+006	3.13e+006	-220000	54	32
3.05e+006	3.13e+006	-80000	54	33
3.05e+006	3.13e+006	-80000	54	34
3.072e+006	3.13e+006	-58000	54	35
3.91e+006	3.13e+006	780000	55	35
4.24e+006	3.13e+006	1.11e+006	56	35
4.53e+006	3.13e+006	1.4e+006	57	35
4.38e+006	3.13e+006	1.25e+006	58	35
4.13e+006	3.13e+006	1e+006	59	35
4.26e+006	3.13e+006	1.13e+006	60	35
3.55e+006	3.13e+006	420000	61	35
3.67e+006	3.13e+006	540000	62	35
3.9e+006	3.13e+006	770000	63	35
4.16e+006	3.13e+006	1.03e+006	64	35
4.41e+006	3.13e+006	1.28e+006	65	35

3.014e+006	3.4e+006	-386000	65	36
2.97e+006	3.4e+006	-430000	65	37
2.91e+006	3.4e+006	-490000	65	38
3.05e+006	3.4e+006	-350000	65	39
3.05e+006	3.4e+006	-350000	65	40
3.072e+006	3.4e+006	-328000	65	41
3.91e+006	3.4e+006	510000	66	41
4.24e+006	3.4e+006	840000	67	41
4.53e+006	3.4e+006	1.13e+006	68	41
4.38e+006	3.4e+006	980000	69	41
4.13e+006	3.4e+006	730000	70	41
4.26e+006	3.4e+006	860000	71	41
3.55e+006	3.4e+006	150000	72	41
3.67e+006	3.4e+006	270000	73	41
3.9e+006	3.4e+006	500000	74	41
4.16e+006	3.4e+006	760000	75	41
4.41e+006	3.4e+006	1.01e+006	76	41
2.97e+006	3.014e+006	-44000	76	42
2.91e+006	3.014e+006	-104000	76	43
3.05e+006	3.014e+006	36000	77	43
3.05e+006	3.014e+006	36000	78	43
3.072e+006	3.014e+006	58000	79	43
3.91e+006	3.014e+006	896000	80	43
4.24e+006	3.014e+006	1.226e+006	81	43
4.53e+006	3.014e+006	1.516e+006	82	43
4.38e+006	3.014e+006	1.366e+006	83	43
4.13e+006	3.014e+006	1.116e+006	84	43
4.26e+006	3.014e+006	1.246e+006	85	43
3.55e+006	3.014e+006	536000	86	43
3.67e+006	3.014e+006	656000	87	43
3.9e+006	3.014e+006	886000	88	43
4.16e+006	3.014e+006	1.146e+006	89	43
4.41e+006	3.014e+006	1.396e+006	90	43
2.91e+006	2.97e+006	-60000	90	44
3.05e+006	2.97e+006	80000	91	44
3.05e+006	2.97e+006	80000	92	44
3.072e+006	2.97e+006	102000	93	44
3.91e+006	2.97e+006	940000	94	44
4.24e+006	2.97e+006	1.27e+006	95	44
4.53e+006	2.97e+006	1.56e+006	96	44
4.38e+006	2.97e+006	1.41e+006	97	44
4.13e+006	2.97e+006	1.16e+006	98	44
4.26e+006	2.97e+006	1.29e+006	99	44
3.55e+006	2.97e+006	580000	100	44
3.67e+006	2.97e+006	700000	101	44
3.9e+006	2.97e+006	930000	102	44
4.16e+006	2.97e+006	1.19e+006	103	44
4.41e+006	2.97e+006	1.44e+006	104	44
3.05e+006	2.91e+006	140000	105	44
3.05e+006	2.91e+006	140000	106	44
3.072e+006	2.91e+006	162000	107	44
3.91e+006	2.91e+006	1e+006	108	44
4.24e+006	2.91e+006	1.33e+006	109	44

4.53e+006	2.91e+006	1.62e+006	110	44
4.38e+006	2.91e+006	1.47e+006	111	44
4.13e+006	2.91e+006	1.22e+006	112	44
4.26e+006	2.91e+006	1.35e+006	113	44
3.55e+006	2.91e+006	640000	114	44
3.67e+006	2.91e+006	760000	115	44
3.9e+006	2.91e+006	990000	116	44
4.16e+006	2.91e+006	1.25e+006	117	44
4.41e+006	2.91e+006	1.5e+006	118	44
3.05e+006	3.05e+006	0	118	44
3.072e+006	3.05e+006	22000	119	44
3.91e+006	3.05e+006	860000	120	44
4.24e+006	3.05e+006	1.19e+006	121	44
4.53e+006	3.05e+006	1.48e+006	122	44
4.38e+006	3.05e+006	1.33e+006	123	44
4.13e+006	3.05e+006	1.08e+006	124	44
4.26e+006	3.05e+006	1.21e+006	125	44
3.55e+006	3.05e+006	500000	126	44
3.67e+006	3.05e+006	620000	127	44
3.9e+006	3.05e+006	850000	128	44
4.16e+006	3.05e+006	1.11e+006	129	44
4.41e+006	3.05e+006	1.36e+006	130	44
3.072e+006	3.05e+006	22000	131	44
3.91e+006	3.05e+006	860000	132	44
4.24e+006	3.05e+006	1.19e+006	133	44
4.53e+006	3.05e+006	1.48e+006	134	44
4.38e+006	3.05e+006	1.33e+006	135	44
4.13e+006	3.05e+006	1.08e+006	136	44
4.26e+006	3.05e+006	1.21e+006	137	44
3.55e+006	3.05e+006	500000	138	44
3.67e+006	3.05e+006	620000	139	44
3.9e+006	3.05e+006	850000	140	44
4.16e+006	3.05e+006	1.11e+006	141	44
4.41e+006	3.05e+006	1.36e+006	142	44
3.91e+006	3.072e+006	838000	143	44
4.24e+006	3.072e+006	1.168e+006	144	44
4.53e+006	3.072e+006	1.458e+006	145	44
4.38e+006	3.072e+006	1.308e+006	146	44
4.13e+006	3.072e+006	1.058e+006	147	44
4.26e+006	3.072e+006	1.188e+006	148	44
3.55e+006	3.072e+006	478000	149	44
3.67e+006	3.072e+006	598000	150	44
3.9e+006	3.072e+006	828000	151	44
4.16e+006	3.072e+006	1.088e+006	152	44
4.41e+006	3.072e+006	1.338e+006	153	44
4.24e+006	3.91e+006	330000	154	44
4.53e+006	3.91e+006	620000	155	44
4.38e+006	3.91e+006	470000	156	44
4.13e+006	3.91e+006	220000	157	44
4.26e+006	3.91e+006	350000	158	44
3.55e+006	3.91e+006	-360000	158	45
3.67e+006	3.91e+006	-240000	158	46
3.9e+006	3.91e+006	-10000	158	47

4.16e+006	3.91e+006	250000	159	47
4.41e+006	3.91e+006	500000	160	47
4.53e+006	4.24e+006	290000	161	47
4.38e+006	4.24e+006	140000	162	47
4.13e+006	4.24e+006	-110000	162	48
4.26e+006	4.24e+006	20000	163	48
3.55e+006	4.24e+006	-690000	163	49
3.67e+006	4.24e+006	-570000	163	50
3.9e+006	4.24e+006	-340000	163	51
4.16e+006	4.24e+006	-80000	163	52
4.41e+006	4.24e+006	170000	164	52
4.38e+006	4.53e+006	-150000	164	53
4.13e+006	4.53e+006	-400000	164	54
4.26e+006	4.53e+006	-270000	164	55
3.55e+006	4.53e+006	-980000	164	56
3.67e+006	4.53e+006	-860000	164	57
3.9e+006	4.53e+006	-630000	164	58
4.16e+006	4.53e+006	-370000	164	59
4.41e+006	4.53e+006	-120000	164	60
4.13e+006	4.38e+006	-250000	164	61
4.26e+006	4.38e+006	-120000	164	62
3.55e+006	4.38e+006	-830000	164	63
3.67e+006	4.38e+006	-710000	164	64
3.9e+006	4.38e+006	-480000	164	65
4.16e+006	4.38e+006	-220000	164	66
4.41e+006	4.38e+006	30000	165	66
4.26e+006	4.13e+006	130000	166	66
3.55e+006	4.13e+006	-580000	166	67
3.67e+006	4.13e+006	-460000	166	68
3.9e+006	4.13e+006	-230000	166	69
4.16e+006	4.13e+006	30000	167	69
4.41e+006	4.13e+006	280000	168	69
3.55e+006	4.26e+006	-710000	168	70
3.67e+006	4.26e+006	-590000	168	71
3.9e+006	4.26e+006	-360000	168	72
4.16e+006	4.26e+006	-100000	168	73
4.41e+006	4.26e+006	150000	169	73
3.67e+006	3.55e+006	120000	170	73
3.9e+006	3.55e+006	350000	171	73
4.16e+006	3.55e+006	610000	172	73
4.41e+006	3.55e+006	860000	173	73
3.9e+006	3.67e+006	230000	174	73
4.16e+006	3.67e+006	490000	175	73
4.41e+006	3.67e+006	740000	176	73
4.16e+006	3.9e+006	260000	177	73
4.41e+006	3.9e+006	510000	178	73
4.41e+006	4.16e+006	250000	179	73

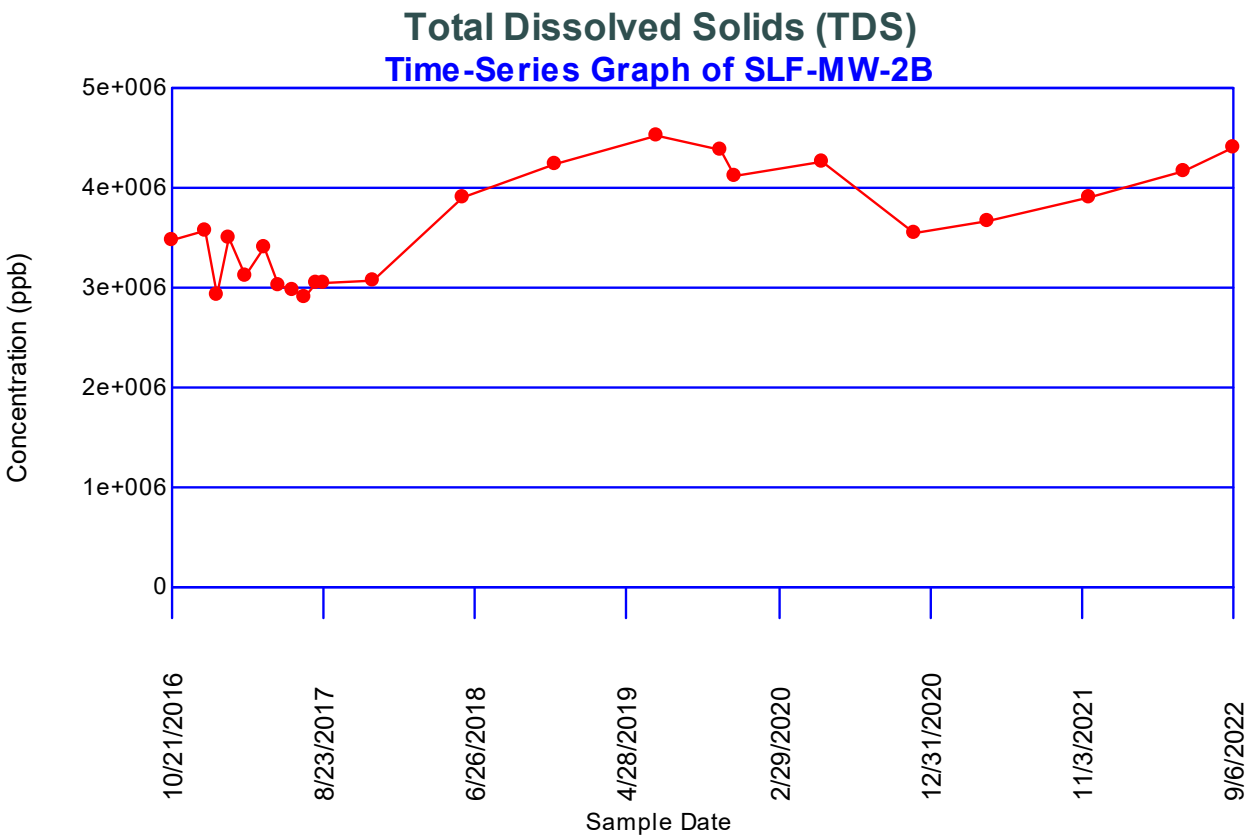
S Statistic = 179 - 73 = 106

Tied Group	Value	Members
1	3.05e+006	2

Time Period	Observations
10/21/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
11/4/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1432.67
Z-Score = 2.77407
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|2.77407| > 1.97737 indicating a trend


Total Dissolved Solids (TDS)
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
5e+006
4e+006
3e+006
2e+006
1e+006
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 22 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.186567	0.161538	0.43	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	1.341e+006	FALSE
	11/30/2016	1.38e+006	FALSE
	12/28/2016	1.41e+006	FALSE
	1/18/2017	1.12e+006	FALSE
	2/15/2017	1.179e+006	FALSE
	3/20/2017	1.255e+006	FALSE
	4/25/2017	1.227e+006	FALSE
	5/22/2017	1.142e+006	FALSE
	6/20/2017	1.156e+006	FALSE
	7/17/2017	1.232e+006	FALSE
	8/7/2017	1.273e+006	FALSE
	8/21/2017	1.235e+006	FALSE
	11/29/2017	1.208e+006	FALSE
	12/4/2018	1.28e+006	FALSE
	6/27/2019	1.36e+006	FALSE
	12/2/2019	1.1e+006	FALSE
	5/28/2020	1.15e+006	FALSE
	12/1/2020	1.21e+006	FALSE
	4/28/2021	1.22e+006	FALSE
	11/19/2021	1.21e+006	FALSE
	5/31/2022	1.22e+006	FALSE
	9/6/2022	1.18e+006	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 22 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.1e+006	1.41e+006	310000	0.459	142290
2	1.12e+006	1.38e+006	260000	0.3156	82056
3	1.142e+006	1.36e+006	218000	0.2571	56047.8
4	1.15e+006	1.341e+006	191000	0.2131	40702.1
5	1.156e+006	1.28e+006	124000	0.1764	21873.6
6	1.179e+006	1.273e+006	94000	0.1443	13564.2
7	1.18e+006	1.255e+006	75000	0.115	8625
8	1.208e+006	1.235e+006	27000	0.0878	2370.6
9	1.21e+006	1.232e+006	22000	0.0618	1359.6
10	1.21e+006	1.227e+006	17000	0.0368	625.6
11	1.22e+006	1.22e+006	0	0.0122	0
12	1.22e+006	1.22e+006	0		
13	1.227e+006	1.21e+006	-17000		
14	1.232e+006	1.21e+006	-22000		
15	1.235e+006	1.208e+006	-27000		
16	1.255e+006	1.18e+006	-75000		
17	1.273e+006	1.179e+006	-94000		
18	1.28e+006	1.156e+006	-124000		
19	1.341e+006	1.15e+006	-191000		
20	1.36e+006	1.142e+006	-218000		
21	1.38e+006	1.12e+006	-260000		
22	1.41e+006	1.1e+006	-310000		

Sum of b values = 369514
Sample Standard Deviation = 82894.8
W Statistic = 0.946214

5% Critical value of 0.911 is less than 0.946214
Data is normally distributed at 95% level of significance

1% Critical value of 0.878 is less than 0.946214
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Dissolved Solids (TDS)
Location: SLF-MW-3B
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.38e+006	1.341e+006	39000	1	0
1.41e+006	1.341e+006	69000	2	0
1.12e+006	1.341e+006	-221000	2	1
1.179e+006	1.341e+006	-162000	2	2
1.255e+006	1.341e+006	-86000	2	3
1.227e+006	1.341e+006	-114000	2	4
1.142e+006	1.341e+006	-199000	2	5
1.156e+006	1.341e+006	-185000	2	6
1.232e+006	1.341e+006	-109000	2	7
1.273e+006	1.341e+006	-68000	2	8
1.235e+006	1.341e+006	-106000	2	9
1.208e+006	1.341e+006	-133000	2	10
1.28e+006	1.341e+006	-61000	2	11
1.36e+006	1.341e+006	19000	3	11
1.1e+006	1.341e+006	-241000	3	12
1.15e+006	1.341e+006	-191000	3	13
1.21e+006	1.341e+006	-131000	3	14
1.22e+006	1.341e+006	-121000	3	15
1.21e+006	1.341e+006	-131000	3	16
1.22e+006	1.341e+006	-121000	3	17
1.18e+006	1.341e+006	-161000	3	18
1.41e+006	1.38e+006	30000	4	18
1.12e+006	1.38e+006	-260000	4	19
1.179e+006	1.38e+006	-201000	4	20
1.255e+006	1.38e+006	-125000	4	21
1.227e+006	1.38e+006	-153000	4	22
1.142e+006	1.38e+006	-238000	4	23
1.156e+006	1.38e+006	-224000	4	24
1.232e+006	1.38e+006	-148000	4	25
1.273e+006	1.38e+006	-107000	4	26
1.235e+006	1.38e+006	-145000	4	27
1.208e+006	1.38e+006	-172000	4	28
1.28e+006	1.38e+006	-100000	4	29
1.36e+006	1.38e+006	-20000	4	30
1.1e+006	1.38e+006	-280000	4	31
1.15e+006	1.38e+006	-230000	4	32
1.21e+006	1.38e+006	-170000	4	33
1.22e+006	1.38e+006	-160000	4	34
1.21e+006	1.38e+006	-170000	4	35
1.22e+006	1.38e+006	-160000	4	36
1.18e+006	1.38e+006	-200000	4	37
1.12e+006	1.41e+006	-290000	4	38
1.179e+006	1.41e+006	-231000	4	39
1.255e+006	1.41e+006	-155000	4	40
1.227e+006	1.41e+006	-183000	4	41

1.142e+006	1.41e+006	-268000	4	42
1.156e+006	1.41e+006	-254000	4	43
1.232e+006	1.41e+006	-178000	4	44
1.273e+006	1.41e+006	-137000	4	45
1.235e+006	1.41e+006	-175000	4	46
1.208e+006	1.41e+006	-202000	4	47
1.28e+006	1.41e+006	-130000	4	48
1.36e+006	1.41e+006	-50000	4	49
1.1e+006	1.41e+006	-310000	4	50
1.15e+006	1.41e+006	-260000	4	51
1.21e+006	1.41e+006	-200000	4	52
1.22e+006	1.41e+006	-190000	4	53
1.21e+006	1.41e+006	-200000	4	54
1.22e+006	1.41e+006	-190000	4	55
1.18e+006	1.41e+006	-230000	4	56
1.179e+006	1.12e+006	59000	5	56
1.255e+006	1.12e+006	135000	6	56
1.227e+006	1.12e+006	107000	7	56
1.142e+006	1.12e+006	22000	8	56
1.156e+006	1.12e+006	36000	9	56
1.232e+006	1.12e+006	112000	10	56
1.273e+006	1.12e+006	153000	11	56
1.235e+006	1.12e+006	115000	12	56
1.208e+006	1.12e+006	88000	13	56
1.28e+006	1.12e+006	160000	14	56
1.36e+006	1.12e+006	240000	15	56
1.1e+006	1.12e+006	-20000	15	57
1.15e+006	1.12e+006	30000	16	57
1.21e+006	1.12e+006	90000	17	57
1.22e+006	1.12e+006	100000	18	57
1.21e+006	1.12e+006	90000	19	57
1.22e+006	1.12e+006	100000	20	57
1.18e+006	1.12e+006	60000	21	57
1.255e+006	1.179e+006	76000	22	57
1.227e+006	1.179e+006	48000	23	57
1.142e+006	1.179e+006	-37000	23	58
1.156e+006	1.179e+006	-23000	23	59
1.232e+006	1.179e+006	53000	24	59
1.273e+006	1.179e+006	94000	25	59
1.235e+006	1.179e+006	56000	26	59
1.208e+006	1.179e+006	29000	27	59
1.28e+006	1.179e+006	101000	28	59
1.36e+006	1.179e+006	181000	29	59
1.1e+006	1.179e+006	-79000	29	60
1.15e+006	1.179e+006	-29000	29	61
1.21e+006	1.179e+006	31000	30	61
1.22e+006	1.179e+006	41000	31	61
1.21e+006	1.179e+006	31000	32	61
1.22e+006	1.179e+006	41000	33	61
1.18e+006	1.179e+006	1000	34	61
1.227e+006	1.255e+006	-28000	34	62
1.142e+006	1.255e+006	-113000	34	63
1.156e+006	1.255e+006	-99000	34	64
1.232e+006	1.255e+006	-23000	34	65

1.273e+006	1.255e+006	18000	35	65
1.235e+006	1.255e+006	-20000	35	66
1.208e+006	1.255e+006	-47000	35	67
1.28e+006	1.255e+006	25000	36	67
1.36e+006	1.255e+006	105000	37	67
1.1e+006	1.255e+006	-155000	37	68
1.15e+006	1.255e+006	-105000	37	69
1.21e+006	1.255e+006	-45000	37	70
1.22e+006	1.255e+006	-35000	37	71
1.21e+006	1.255e+006	-45000	37	72
1.22e+006	1.255e+006	-35000	37	73
1.18e+006	1.255e+006	-75000	37	74
1.142e+006	1.227e+006	-85000	37	75
1.156e+006	1.227e+006	-71000	37	76
1.232e+006	1.227e+006	5000	38	76
1.273e+006	1.227e+006	46000	39	76
1.235e+006	1.227e+006	8000	40	76
1.208e+006	1.227e+006	-19000	40	77
1.28e+006	1.227e+006	53000	41	77
1.36e+006	1.227e+006	133000	42	77
1.1e+006	1.227e+006	-127000	42	78
1.15e+006	1.227e+006	-77000	42	79
1.21e+006	1.227e+006	-17000	42	80
1.22e+006	1.227e+006	-7000	42	81
1.21e+006	1.227e+006	-17000	42	82
1.22e+006	1.227e+006	-7000	42	83
1.18e+006	1.227e+006	-47000	42	84
1.156e+006	1.142e+006	14000	43	84
1.232e+006	1.142e+006	90000	44	84
1.273e+006	1.142e+006	131000	45	84
1.235e+006	1.142e+006	93000	46	84
1.208e+006	1.142e+006	66000	47	84
1.28e+006	1.142e+006	138000	48	84
1.36e+006	1.142e+006	218000	49	84
1.1e+006	1.142e+006	-42000	49	85
1.15e+006	1.142e+006	8000	50	85
1.21e+006	1.142e+006	68000	51	85
1.22e+006	1.142e+006	78000	52	85
1.21e+006	1.142e+006	68000	53	85
1.22e+006	1.142e+006	78000	54	85
1.18e+006	1.142e+006	38000	55	85
1.232e+006	1.156e+006	76000	56	85
1.273e+006	1.156e+006	117000	57	85
1.235e+006	1.156e+006	79000	58	85
1.208e+006	1.156e+006	52000	59	85
1.28e+006	1.156e+006	124000	60	85
1.36e+006	1.156e+006	204000	61	85
1.1e+006	1.156e+006	-56000	61	86
1.15e+006	1.156e+006	-6000	61	87
1.21e+006	1.156e+006	54000	62	87
1.22e+006	1.156e+006	64000	63	87
1.21e+006	1.156e+006	54000	64	87
1.22e+006	1.156e+006	64000	65	87
1.18e+006	1.156e+006	24000	66	87

1.273e+006	1.232e+006	41000	67	87
1.235e+006	1.232e+006	3000	68	87
1.208e+006	1.232e+006	-24000	68	88
1.28e+006	1.232e+006	48000	69	88
1.36e+006	1.232e+006	128000	70	88
1.1e+006	1.232e+006	-132000	70	89
1.15e+006	1.232e+006	-82000	70	90
1.21e+006	1.232e+006	-22000	70	91
1.22e+006	1.232e+006	-12000	70	92
1.21e+006	1.232e+006	-22000	70	93
1.22e+006	1.232e+006	-12000	70	94
1.18e+006	1.232e+006	-52000	70	95
1.235e+006	1.273e+006	-38000	70	96
1.208e+006	1.273e+006	-65000	70	97
1.28e+006	1.273e+006	7000	71	97
1.36e+006	1.273e+006	87000	72	97
1.1e+006	1.273e+006	-173000	72	98
1.15e+006	1.273e+006	-123000	72	99
1.21e+006	1.273e+006	-63000	72	100
1.22e+006	1.273e+006	-53000	72	101
1.21e+006	1.273e+006	-63000	72	102
1.22e+006	1.273e+006	-53000	72	103
1.18e+006	1.273e+006	-93000	72	104
1.208e+006	1.235e+006	-27000	72	105
1.28e+006	1.235e+006	45000	73	105
1.36e+006	1.235e+006	125000	74	105
1.1e+006	1.235e+006	-135000	74	106
1.15e+006	1.235e+006	-85000	74	107
1.21e+006	1.235e+006	-25000	74	108
1.22e+006	1.235e+006	-15000	74	109
1.21e+006	1.235e+006	-25000	74	110
1.22e+006	1.235e+006	-15000	74	111
1.18e+006	1.235e+006	-55000	74	112
1.28e+006	1.208e+006	72000	75	112
1.36e+006	1.208e+006	152000	76	112
1.1e+006	1.208e+006	-108000	76	113
1.15e+006	1.208e+006	-58000	76	114
1.21e+006	1.208e+006	2000	77	114
1.22e+006	1.208e+006	12000	78	114
1.21e+006	1.208e+006	2000	79	114
1.22e+006	1.208e+006	12000	80	114
1.18e+006	1.208e+006	-28000	80	115
1.36e+006	1.28e+006	80000	81	115
1.1e+006	1.28e+006	-180000	81	116
1.15e+006	1.28e+006	-130000	81	117
1.21e+006	1.28e+006	-70000	81	118
1.22e+006	1.28e+006	-60000	81	119
1.21e+006	1.28e+006	-70000	81	120
1.22e+006	1.28e+006	-60000	81	121
1.18e+006	1.28e+006	-100000	81	122
1.1e+006	1.36e+006	-260000	81	123

1.15e+006	1.36e+006	-210000	81	124
1.21e+006	1.36e+006	-150000	81	125
1.22e+006	1.36e+006	-140000	81	126
1.21e+006	1.36e+006	-150000	81	127
1.22e+006	1.36e+006	-140000	81	128
1.18e+006	1.36e+006	-180000	81	129
1.15e+006	1.1e+006	50000	82	129
1.21e+006	1.1e+006	110000	83	129
1.22e+006	1.1e+006	120000	84	129
1.21e+006	1.1e+006	110000	85	129
1.22e+006	1.1e+006	120000	86	129
1.18e+006	1.1e+006	80000	87	129
1.21e+006	1.15e+006	60000	88	129
1.22e+006	1.15e+006	70000	89	129
1.21e+006	1.15e+006	60000	90	129
1.22e+006	1.15e+006	70000	91	129
1.18e+006	1.15e+006	30000	92	129
1.22e+006	1.21e+006	10000	93	129
1.21e+006	1.21e+006	0	93	129
1.22e+006	1.21e+006	10000	94	129
1.18e+006	1.21e+006	-30000	94	130
1.21e+006	1.22e+006	-10000	94	131
1.22e+006	1.22e+006	0	94	131
1.18e+006	1.22e+006	-40000	94	132
1.22e+006	1.21e+006	10000	95	132
1.18e+006	1.21e+006	-30000	95	133
1.18e+006	1.22e+006	-40000	95	134

S Statistic = 95 - 134 = -39

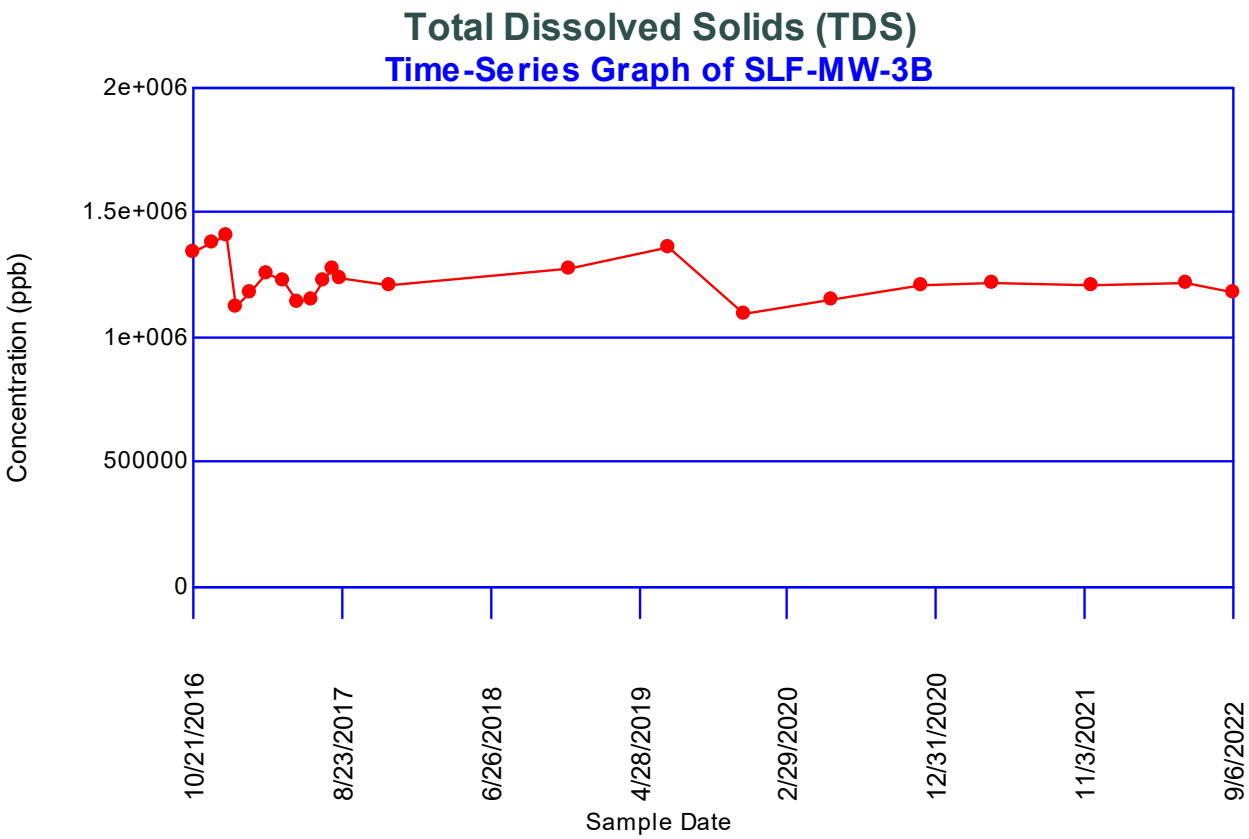
Tied Group	Value	Members
1	1.21e+006	2
2	1.22e+006	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
12/4/2018	1
6/27/2019	1

12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 22638
b = 83160
c = 924
Group Variance = 1255.67
Z-Score = -1.07237
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.07237| <= 1.97737 indicating no evidence of a trend


Total Dissolved Solids (TDS)
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
2e+006
1.5e+006
1e+006
500000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 19 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.424699	0.25098	0.462	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	470000	FALSE
	3/20/2017	445000	FALSE
	4/25/2017	435000	FALSE
	5/22/2017	400000	FALSE
	6/20/2017	451000	FALSE
	7/17/2017	556000	FALSE
	8/7/2017	477000	FALSE
	8/22/2017	529000	FALSE
	11/29/2017	549000	FALSE
	5/30/2018	591000	FALSE
	12/4/2018	480000	FALSE
	6/28/2019	611000	FALSE
	12/2/2019	432000	FALSE
	5/28/2020	384000	FALSE
	11/30/2020	336000	FALSE
	4/28/2021	498000	FALSE
	11/19/2021	526000	FALSE
	5/31/2022	586000	FALSE
	9/6/2022	732000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 9 for 19 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	336000	732000	396000	0.4808	190397
2	384000	611000	227000	0.3232	73366.4
3	400000	591000	191000	0.2561	48915.1
4	432000	586000	154000	0.2059	31708.6
5	435000	556000	121000	0.1641	19856.1
6	445000	549000	104000	0.1271	13218.4
7	451000	529000	78000	0.0932	7269.6
8	470000	526000	56000	0.0612	3427.2
9	477000	498000	21000	0.0303	636.3
10	480000	480000	0		
11	498000	477000	-21000		
12	526000	470000	-56000		
13	529000	451000	-78000		
14	549000	445000	-104000		
15	556000	435000	-121000		
16	586000	432000	-154000		
17	591000	400000	-191000		
18	611000	384000	-227000		
19	732000	336000	-396000		

Sum of b values = 388794
Sample Standard Deviation = 92894.3
W Statistic = 0.973171

5% Critical value of 0.901 is less than 0.973171
Data is normally distributed at 95% level of significance

1% Critical value of 0.863 is less than 0.973171
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Dissolved Solids (TDS)
Location: SLF-MW-5R
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
445000	470000	-25000	0	1
435000	470000	-35000	0	2
400000	470000	-70000	0	3
451000	470000	-19000	0	4
556000	470000	86000	1	4
477000	470000	7000	2	4
529000	470000	59000	3	4
549000	470000	79000	4	4
591000	470000	121000	5	4
480000	470000	10000	6	4
611000	470000	141000	7	4
432000	470000	-38000	7	5
384000	470000	-86000	7	6
336000	470000	-134000	7	7
498000	470000	28000	8	7
526000	470000	56000	9	7
586000	470000	116000	10	7
732000	470000	262000	11	7
435000	445000	-10000	11	8
400000	445000	-45000	11	9
451000	445000	6000	12	9
556000	445000	111000	13	9
477000	445000	32000	14	9
529000	445000	84000	15	9
549000	445000	104000	16	9
591000	445000	146000	17	9
480000	445000	35000	18	9
611000	445000	166000	19	9
432000	445000	-13000	19	10
384000	445000	-61000	19	11
336000	445000	-109000	19	12
498000	445000	53000	20	12
526000	445000	81000	21	12
586000	445000	141000	22	12
732000	445000	287000	23	12
400000	435000	-35000	23	13
451000	435000	16000	24	13
556000	435000	121000	25	13
477000	435000	42000	26	13
529000	435000	94000	27	13
549000	435000	114000	28	13
591000	435000	156000	29	13
480000	435000	45000	30	13
611000	435000	176000	31	13
432000	435000	-3000	31	14

384000	435000	-51000	31	15
336000	435000	-99000	31	16
498000	435000	63000	32	16
526000	435000	91000	33	16
586000	435000	151000	34	16
732000	435000	297000	35	16
451000	400000	51000	36	16
556000	400000	156000	37	16
477000	400000	77000	38	16
529000	400000	129000	39	16
549000	400000	149000	40	16
591000	400000	191000	41	16
480000	400000	80000	42	16
611000	400000	211000	43	16
432000	400000	32000	44	16
384000	400000	-16000	44	17
336000	400000	-64000	44	18
498000	400000	98000	45	18
526000	400000	126000	46	18
586000	400000	186000	47	18
732000	400000	332000	48	18
556000	451000	105000	49	18
477000	451000	26000	50	18
529000	451000	78000	51	18
549000	451000	98000	52	18
591000	451000	140000	53	18
480000	451000	29000	54	18
611000	451000	160000	55	18
432000	451000	-19000	55	19
384000	451000	-67000	55	20
336000	451000	-115000	55	21
498000	451000	47000	56	21
526000	451000	75000	57	21
586000	451000	135000	58	21
732000	451000	281000	59	21
477000	556000	-79000	59	22
529000	556000	-27000	59	23
549000	556000	-7000	59	24
591000	556000	35000	60	24
480000	556000	-76000	60	25
611000	556000	55000	61	25
432000	556000	-124000	61	26
384000	556000	-172000	61	27
336000	556000	-220000	61	28
498000	556000	-58000	61	29
526000	556000	-30000	61	30
586000	556000	30000	62	30
732000	556000	176000	63	30
529000	477000	52000	64	30
549000	477000	72000	65	30
591000	477000	114000	66	30
480000	477000	3000	67	30
611000	477000	134000	68	30

432000	477000	-45000	68	31
384000	477000	-93000	68	32
336000	477000	-141000	68	33
498000	477000	21000	69	33
526000	477000	49000	70	33
586000	477000	109000	71	33
732000	477000	255000	72	33
549000	529000	20000	73	33
591000	529000	62000	74	33
480000	529000	-49000	74	34
611000	529000	82000	75	34
432000	529000	-97000	75	35
384000	529000	-145000	75	36
336000	529000	-193000	75	37
498000	529000	-31000	75	38
526000	529000	-3000	75	39
586000	529000	57000	76	39
732000	529000	203000	77	39
591000	549000	42000	78	39
480000	549000	-69000	78	40
611000	549000	62000	79	40
432000	549000	-117000	79	41
384000	549000	-165000	79	42
336000	549000	-213000	79	43
498000	549000	-51000	79	44
526000	549000	-23000	79	45
586000	549000	37000	80	45
732000	549000	183000	81	45
480000	591000	-111000	81	46
611000	591000	20000	82	46
432000	591000	-159000	82	47
384000	591000	-207000	82	48
336000	591000	-255000	82	49
498000	591000	-93000	82	50
526000	591000	-65000	82	51
586000	591000	-5000	82	52
732000	591000	141000	83	52
611000	480000	131000	84	52
432000	480000	-48000	84	53
384000	480000	-96000	84	54
336000	480000	-144000	84	55
498000	480000	18000	85	55
526000	480000	46000	86	55
586000	480000	106000	87	55
732000	480000	252000	88	55
432000	611000	-179000	88	56
384000	611000	-227000	88	57
336000	611000	-275000	88	58
498000	611000	-113000	88	59
526000	611000	-85000	88	60
586000	611000	-25000	88	61
732000	611000	121000	89	61

384000	432000	-48000	89	62
336000	432000	-96000	89	63
498000	432000	66000	90	63
526000	432000	94000	91	63
586000	432000	154000	92	63
732000	432000	300000	93	63
336000	384000	-48000	93	64
498000	384000	114000	94	64
526000	384000	142000	95	64
586000	384000	202000	96	64
732000	384000	348000	97	64
498000	336000	162000	98	64
526000	336000	190000	99	64
586000	336000	250000	100	64
732000	336000	396000	101	64
526000	498000	28000	102	64
586000	498000	88000	103	64
732000	498000	234000	104	64
586000	526000	60000	105	64
732000	526000	206000	106	64
732000	586000	146000	107	64

S Statistic = 107 - 64 = 43

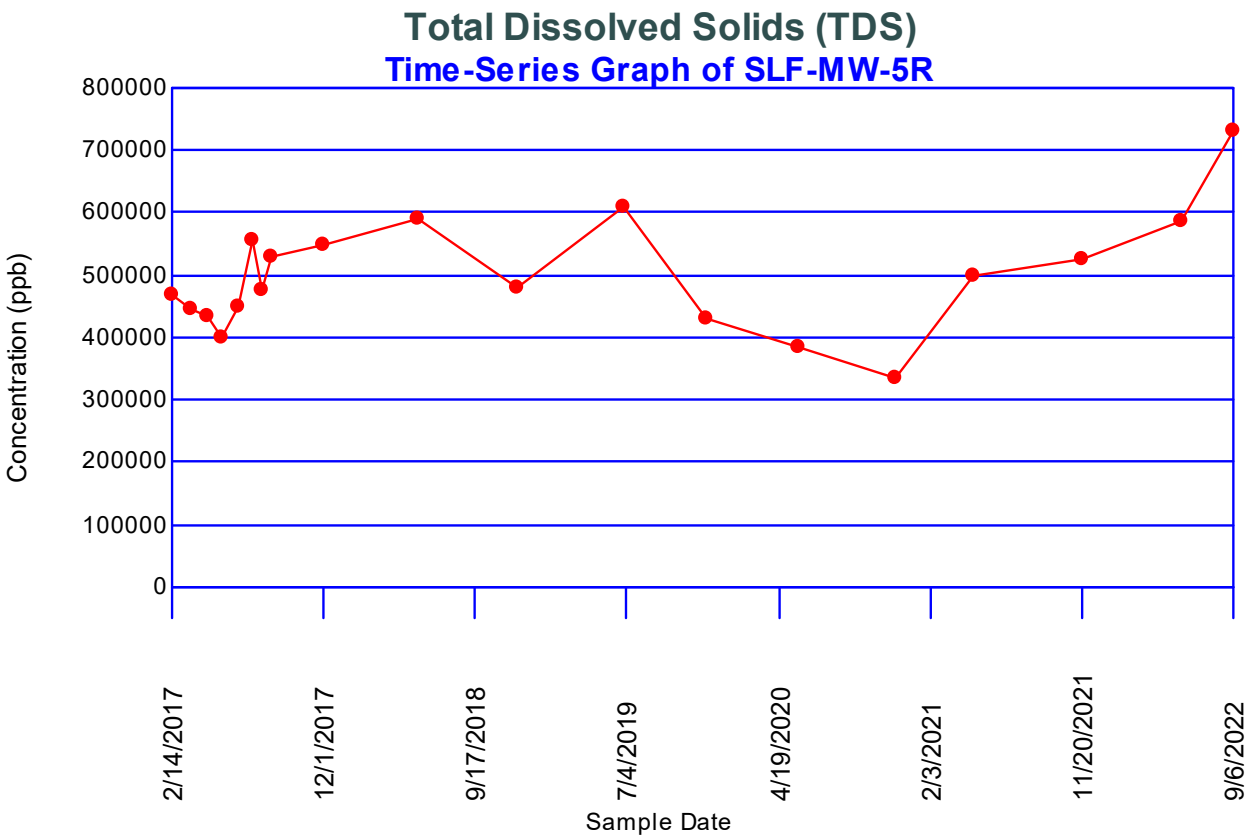
Tied Group	Value	Members

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0

C = 0
D = 0
E = 0
F = 0
a = 14706
b = 52326
c = 684
Group Variance = 817
Z-Score = 1.46939
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.46939| <= 1.97737 indicating no evidence of a trend


Total Dissolved Solids (TDS)
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
800000
700000
600000
500000
400000
300000
200000
100000
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-2B

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	2683.12
	11/30/2016	4817.2
	12/28/2016	3895.84
	1/18/2017	3956.91
	2/14/2017	3573.57
	3/20/2017	3806.16
	4/25/2017	3914.41
	5/22/2017	3891.56
	6/20/2017	3773.44
	7/17/2017	4668
	8/8/2017	4027
	8/21/2017	3197
	11/29/2017	4576
	5/31/2018	4370
	12/4/2018	4940
	6/28/2019	4410
	12/2/2019	4280
	5/28/2020	3390
	11/30/2020	3560
	4/28/2021	2900
	11/19/2021	4140
	5/31/2022	4010
	9/6/2022	3700

From 23 baseline samples
Baseline mean = 3933.92
Baseline std Dev = 571.284

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 23 (background observations) - 1
t(0.9975, 22) = 3.24764

Date	Samples	Mean	Interval	Significant
11/21/2022	1	3410	[0, 5829.15]	FALSE
9/6/2022	1	3700	[0, 5829.15]	FALSE
5/31/2022	1	4010	[0, 5829.15]	FALSE
11/19/2021	1	4140	[0, 5829.15]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	4238.42
	11/30/2016	6242.46
	12/28/2016	5154.49
	1/18/2017	4910.63
	2/15/2017	3595.68
	3/20/2017	3637.76
	4/25/2017	3392.27
	5/22/2017	3135.58
	6/20/2017	3335.63
	7/17/2017	4381
	8/7/2017	3684
	8/21/2017	3922
	11/29/2017	3860
	5/30/2018	2650
	12/4/2018	3490
	6/27/2019	2170
	12/2/2019	2220
	5/28/2020	1590
	12/1/2020	1920
	4/28/2021	1410
	11/19/2021	1900
	5/31/2022	1800
	9/6/2022	1760

From 23 baseline samples
Baseline mean = 3234.78
Baseline std Dev = 1272.31

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 23 (background observations) - 1
t(0.9975, 22) = 3.24764

Date	Samples	Mean	Interval	Significant
11/21/2022	1	1690	[0, 7455.66]	FALSE
9/6/2022	1	1760	[0, 7455.66]	FALSE
5/31/2022	1	1800	[0, 7455.66]	FALSE
11/19/2021	1	1900	[0, 7455.66]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	493.993
	3/20/2017	345.223
	4/25/2017	314.115
	5/22/2017	270.744
	6/20/2017	438.039
	7/17/2017	550
	8/7/2017	363
	8/22/2017	461
	11/29/2017	524
	5/30/2018	517
	12/4/2018	395
	6/28/2019	631
	12/2/2019	653
	5/28/2020	220
	11/30/2020	290
	4/28/2021	431
	11/19/2021	621
	5/31/2022	469
	9/6/2022	855

From 19 baseline samples
Baseline mean = 465.374
Baseline std Dev = 155.689

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 19 (background observations) - 1
t(0.9975, 18) = 3.33596

Date	Samples	Mean	Interval	Significant
11/21/2022	1	929	[0, 998.238]	FALSE
9/6/2022	1	855	[0, 998.238]	FALSE
5/31/2022	1	469	[0, 998.238]	FALSE
11/19/2021	1	621	[0, 998.238]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-2B

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 24
Maximum Baseline Concentration = 110000
Confidence Level = 85.7%
False Positive Rate = 14.3%

Baseline Measurements	Date	Value
	10/21/2016	37032.2
	11/30/2016	61315.7
	12/28/2016	44056.6
	1/18/2017	35837.4
	2/14/2017	37524.8
	3/20/2017	38622.7
	4/25/2017	39897.3
	5/22/2017	43737.6
	6/20/2017	34857
	7/17/2017	33220
	8/8/2017	30756
	8/21/2017	31548
	11/29/2017	37641
	3/8/2018	47865
	5/31/2018	44100
	12/4/2018	48600
	6/28/2019	43600
	12/2/2019	49100
	5/28/2020	47400
	11/30/2020	44100
	4/28/2021	41200
	11/19/2021	42500
	5/31/2022	76400
	9/6/2022	110000

Date	Count	Mean	Significant
11/21/2022	1	86500	FALSE
9/6/2022	1	110000	FALSE
5/31/2022	1	76400	FALSE
11/19/2021	1	42500	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	184501
	11/30/2016	249120
	12/28/2016	254980
	1/18/2017	228148
	2/15/2017	188140
	3/20/2017	191435
	4/25/2017	188976
	5/22/2017	229431
	6/20/2017	213067
	7/17/2017	220459
	8/7/2017	208907
	8/21/2017	235062
	11/29/2017	204990
	3/8/2018	173000
	5/30/2018	171000
	12/4/2018	200000
	6/27/2019	172000
	12/2/2019	179000
	5/28/2020	138000
	12/1/2020	167000
	4/28/2021	143000
	11/19/2021	176000
	5/31/2022	200000
	9/6/2022	182000

From 24 baseline samples
Baseline mean = 195759
Baseline std Dev = 30244

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	170000	[0, 295488]	FALSE
9/6/2022	1	182000	[0, 295488]	FALSE
5/31/2022	1	200000	[0, 295488]	FALSE
11/19/2021	1	176000	[0, 295488]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	107763
	3/20/2017	104972
	4/25/2017	101443
	5/22/2017	118938
	6/20/2017	120726
	7/17/2017	123508
	8/7/2017	115159
	8/22/2017	123970
	11/29/2017	136418
	3/8/2018	105000
	5/30/2018	118000
	12/4/2018	114000
	6/28/2019	126000
	12/2/2019	130000
	5/28/2020	99100
	11/30/2020	85100
	4/28/2021	115000
	11/19/2021	135000
	5/31/2022	123000
	9/6/2022	157000

From 20 baseline samples
Baseline mean = 118005
Baseline std Dev = 15638.8

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 20 (background observations) - 1
t(0.9975, 19) = 3.30994

Date	Samples	Mean	Interval	Significant
11/21/2022	1	152000	[0, 171047]	FALSE
9/6/2022	1	157000	[0, 171047]	FALSE
5/31/2022	1	123000	[0, 171047]	FALSE
11/19/2021	1	135000	[0, 171047]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-2B

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	1.54749e+006
	11/30/2016	1.61454e+006
	12/28/2016	1.768e+006
	1/18/2017	1.33503e+006
	2/14/2017	1.5337e+006
	3/20/2017	1.36241e+006
	4/25/2017	1.35437e+006
	5/22/2017	1.37044e+006
	6/20/2017	1.31495e+006
	7/17/2017	2.425e+006
	8/8/2017	616000
	8/21/2017	1.136e+006
	11/29/2017	1.421e+006
	3/8/2018	1.712e+006
	5/31/2018	1.87e+006
	12/4/2018	2.08e+006
	6/28/2019	2.53e+006
	12/2/2019	2.44e+006
	5/28/2020	2.2e+006
	11/30/2020	1.54e+006
	4/28/2021	1.48e+006
	11/19/2021	1.68e+006
	5/31/2022	1.82e+006
	9/6/2022	1.94e+006

From 24 baseline samples
Baseline mean = 1.67046e+006
Baseline std Dev = 445673

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	1.83e+006	[0, 3.14005e+00	FALSE
9/6/2022	1	1.94e+006	[0, 3.14005e+00	FALSE
5/31/2022	1	1.82e+006	[0, 3.14005e+00	FALSE
11/19/2021	1	1.68e+006	[0, 3.14005e+00	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	152574
	11/30/2016	169582
	12/28/2016	160177
	1/18/2017	146634
	2/15/2017	143113
	3/20/2017	171319
	4/25/2017	167869
	5/22/2017	126662
	6/20/2017	121058
	7/17/2017	98000
	8/7/2017	103000
	8/21/2017	98000
	11/29/2017	152000
	3/8/2018	224000
	5/30/2018	179000
	12/4/2018	225000
	6/27/2019	239000
	12/2/2019	245000
	5/28/2020	262000
	12/1/2020	269000
	4/28/2021	250000
	11/19/2021	246000
	5/31/2022	228000
	9/6/2022	191000

From 24 baseline samples
Baseline mean = 182000
Baseline std Dev = 54505

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	188000	[0, 361729]	FALSE
9/6/2022	1	191000	[0, 361729]	FALSE
5/31/2022	1	228000	[0, 361729]	FALSE
11/19/2021	1	246000	[0, 361729]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	33649.2
	3/20/2017	25801.9
	4/25/2017	22580.8
	5/22/2017	16154
	6/20/2017	25945.6
	7/17/2017	26000
	8/7/2017	19100
	8/22/2017	25500
	11/29/2017	24500
	3/8/2018	15000
	5/30/2018	25500
	12/4/2018	20500
	6/28/2019	24300
	12/2/2019	29200
	5/28/2020	12400
	11/30/2020	14200
	4/28/2021	25700
	11/19/2021	26900
	5/31/2022	26200
	9/6/2022	44100

From 20 baseline samples
Baseline mean = 24161.6
Baseline std Dev = 7134.35

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 20 (background observations) - 1
t(0.9975, 19) = 3.30994

Date	Samples	Mean	Interval	Significant
11/21/2022	**1**	**52900**	**[0, 48359]**	**TRUE**
9/6/2022	1	44100	[0, 48359]	FALSE
5/31/2022	1	26200	[0, 48359]	FALSE
11/19/2021	1	26900	[0, 48359]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-2B

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 8.69565%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 23
Maximum Baseline Concentration = 2647.4
Confidence Level = 85.2%
False Positive Rate = 14.8%

Baseline Measurements	Date	Value
	10/21/2016	ND<500
	11/30/2016	2647.4
	12/28/2016	1500
	1/18/2017	1875.9
	2/14/2017	ND<500
	3/20/2017	1794.9
	4/25/2017	1972.9
	5/22/2017	1673.4
	6/20/2017	2104.9
	7/17/2017	2000
	8/8/2017	2000
	8/21/2017	1900
	11/29/2017	2000
	5/31/2018	2200
	12/4/2018	1620
	6/28/2019	2190
	12/2/2019	2280
	5/28/2020	2330
	11/30/2020	2220
	4/28/2021	1980
	11/19/2021	1960
	5/31/2022	1100
	9/6/2022	970

Date	Count	Mean	Significant
11/21/2022	1	830	FALSE
9/6/2022	1	970	FALSE
5/31/2022	1	1100	FALSE
11/19/2021	1	1960	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-3B

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 91.3043%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 23
Maximum Baseline Concentration = 500
Confidence Level = 85.2%
False Positive Rate = 14.8%

Baseline Measurements	Date	Value
	10/21/2016	ND<500
	11/30/2016	ND<500
	12/28/2016	ND<500
	1/18/2017	ND<500
	2/15/2017	ND<500
	3/20/2017	ND<500
	4/25/2017	ND<500
	5/22/2017	ND<500
	6/20/2017	ND<500
	7/17/2017	ND<500
	8/7/2017	ND<500
	8/21/2017	ND<500
	11/29/2017	ND<500
	5/30/2018	ND<500
	12/4/2018	ND<500
	6/27/2019	ND<500
	12/2/2019	ND<500
	5/28/2020	ND<500
	12/1/2020	ND<500
	4/28/2021	ND<500
	11/19/2021	ND<500
	5/31/2022	160
	9/6/2022	160

Date	Count	Mean	Significant
11/21/2022	1	160	FALSE
9/6/2022	1	160	FALSE
5/31/2022	1	160	FALSE
11/19/2021	1	500	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-5R

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 89.4737%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 19
Maximum Baseline Concentration = 500
Confidence Level = 82.6%
False Positive Rate = 17.4%

Baseline Measurements	Date	Value
	2/14/2017	ND<500
	3/20/2017	ND<500
	4/25/2017	ND<500
	5/22/2017	ND<500
	6/20/2017	ND<500
	7/17/2017	ND<500
	8/7/2017	ND<500
	8/22/2017	ND<500
	11/29/2017	ND<500
	5/30/2018	ND<500
	12/4/2018	ND<500
	6/28/2019	ND<500
	12/2/2019	ND<500
	5/28/2020	ND<500
	11/30/2020	ND<500
	4/28/2021	ND<500
	11/19/2021	ND<500
	5/31/2022	130
	9/6/2022	150

Date	Count	Mean	Significant
11/21/2022	1	150	FALSE
9/6/2022	1	150	FALSE
5/31/2022	1	130	FALSE
11/19/2021	1	500	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-2B

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 26
Maximum Baseline Concentration = 9
Confidence Level = 86.7%
False Positive Rate = 13.3%

Baseline Measurements	Date	Value
	10/21/2016	7.51
	11/30/2016	7.67
	12/28/2016	7.73
	1/18/2017	7.59
	2/14/2017	7.79
	3/20/2017	7.61
	4/25/2017	7.48
	5/22/2017	7.93
	6/20/2017	8.06
	7/17/2017	8.34
	8/8/2017	9
	8/21/2017	8.93
	11/29/2017	7.66
	3/8/2018	7.88
	5/31/2018	7.56
	12/4/2018	7.62
	6/28/2019	7.54
	11/4/2019	7.6
	12/2/2019	7.5
	5/28/2020	7.28
	11/30/2020	7.87
	4/12/2021	7.7
	4/28/2021	7.73
	11/19/2021	7.82
	5/31/2022	7.7
	9/6/2022	7.63

Date	Count	Mean	Significant
11/21/2022	1	7.68	FALSE
9/6/2022	1	7.63	FALSE
5/31/2022	1	7.7	FALSE
11/19/2021	1	7.82	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% Two-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	7.02
	11/30/2016	7.11
	12/28/2016	7.19
	1/18/2017	6.97
	2/15/2017	7.24
	3/20/2017	7.06
	4/25/2017	7.02
	5/22/2017	7.22
	6/20/2017	6.99
	7/17/2017	7.33
	8/7/2017	7.61
	8/21/2017	7.53
	11/29/2017	7.12
	3/8/2018	7.46
	5/30/2018	7.09
	12/4/2018	7.11
	6/27/2019	7.22
	12/2/2019	7.11
	5/28/2020	6.97
	12/1/2020	7.23
	4/28/2021	7.14
	11/19/2021	7.25
	5/31/2022	7.28
	9/6/2022	7.25

From 24 baseline samples
Baseline mean = 7.18833
Baseline std Dev = 0.168592

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/4)/2 = 99.875 %
t is Percentile of Student's T-Test (0.99/4/2) = 0.99875
Degrees of Freedom = 24 (background observations) - 1
t(0.99875, 24) = 3.44261

Date	Samples	Mean	Interval	Significant
11/21/2022	1	7.3	[6.6, 7.78]	FALSE
9/6/2022	1	7.25	[6.6, 7.78]	FALSE
5/31/2022	1	7.28	[6.6, 7.78]	FALSE
11/19/2021	1	7.25	[6.6, 7.78]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% Two-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	7.16
	3/20/2017	7.14
	4/25/2017	7.06
	5/22/2017	7.14
	6/20/2017	7.09
	7/17/2017	7.2
	8/7/2017	7.32
	8/22/2017	7.34
	11/29/2017	7.1
	3/8/2018	7.35
	5/30/2018	6.94
	12/4/2018	7.14
	6/28/2019	7.1
	12/2/2019	7.08
	5/28/2020	7.1
	11/30/2020	7.2
	4/28/2021	7.16
	11/19/2021	7.08
	5/31/2022	7.2
	9/6/2022	7.12

From 20 baseline samples
Baseline mean = 7.151
Baseline std Dev = 0.0992021

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/4)/2 = 99.875 %
t is Percentile of Student's T-Test (0.99/4/2) = 0.99875
Degrees of Freedom = 20 (background observations) - 1
t(0.99875, 20) = 3.53444

Date	Samples	Mean	Interval	Significant
11/21/2022	1	7.19	[6.79, 7.51]	FALSE
9/6/2022	1	7.12	[6.79, 7.51]	FALSE
5/31/2022	1	7.2	[6.79, 7.51]	FALSE
11/19/2021	1	7.08	[6.79, 7.51]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-2B

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 25
Maximum Baseline Concentration = 607000
Confidence Level = 86.2%
False Positive Rate = 13.8%

Baseline Measurements	Date	Value
	10/21/2016	347901
	11/30/2016	244670
	12/28/2016	359044
	1/18/2017	229595
	2/14/2017	224624
	3/20/2017	221785
	4/25/2017	205884
	5/22/2017	204497
	6/20/2017	195436
	7/17/2017	203000
	8/8/2017	198500
	8/21/2017	196500
	11/29/2017	191600
	3/8/2018	233000
	5/31/2018	200000
	12/4/2018	163000
	6/28/2019	122000
	12/2/2019	120000
	5/28/2020	104000
	11/30/2020	607000
	4/12/2021	587000
	4/28/2021	555000
	11/19/2021	469000
	5/31/2022	500000
	9/6/2022	448000

Date	Count	Mean	Significant
11/21/2022	1	490000	FALSE
9/6/2022	1	448000	FALSE
5/31/2022	1	500000	FALSE
11/19/2021	1	469000	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	603053
	11/30/2016	589957
	12/28/2016	614466
	1/18/2017	582135
	2/15/2017	486076
	3/20/2017	472830
	4/25/2017	465682
	5/22/2017	495843
	6/20/2017	480297
	7/17/2017	519000
	8/7/2017	532000
	8/21/2017	549000
	11/29/2017	483000
	3/8/2018	476000
	5/30/2018	454000
	12/4/2018	476000
	6/27/2019	417000
	12/2/2019	384000
	5/28/2020	336000
	12/1/2020	389000
	4/28/2021	355000
	11/19/2021	396000
	5/31/2022	381000
	9/6/2022	364000

From 24 baseline samples
Baseline mean = 470889
Baseline std Dev = 81331.4

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	384000	[0, 739078]	FALSE
9/6/2022	1	364000	[0, 739078]	FALSE
5/31/2022	1	381000	[0, 739078]	FALSE
11/19/2021	1	396000	[0, 739078]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	126012
	3/20/2017	107411
	4/25/2017	95475.3
	5/22/2017	90985.1
	6/20/2017	130226
	7/17/2017	132600
	8/7/2017	112400
	8/22/2017	143100
	11/29/2017	157800
	3/8/2018	89800
	5/30/2018	158000
	12/4/2018	122000
	6/28/2019	173000
	12/2/2019	162000
	5/28/2020	83400
	11/30/2020	84400
	4/28/2021	144000
	11/19/2021	178000
	5/31/2022	159000
	9/6/2022	209000

From 20 baseline samples
Baseline mean = 132930
Baseline std Dev = 35168.4

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 20 (background observations) - 1
t(0.9975, 19) = 3.30994

Date	Samples	Mean	Interval	Significant
11/21/2022	**1**	**259000**	**[0, 252210]**	**TRUE**
9/6/2022	1	209000	[0, 252210]	FALSE
5/31/2022	1	159000	[0, 252210]	FALSE
11/19/2021	1	178000	[0, 252210]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-2B

Parameter: Total Dissolved Solids (TDS)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	3.468e+006
	11/30/2016	483000
	12/28/2016	3.5667e+006
	1/18/2017	2.93e+006
	2/14/2017	3.5e+006
	3/20/2017	3.13e+006
	4/25/2017	3.4e+006
	5/22/2017	3.014e+006
	6/20/2017	2.97e+006
	7/17/2017	2.91e+006
	8/8/2017	3.05e+006
	8/21/2017	3.05e+006
	11/29/2017	3.072e+006
	5/31/2018	3.91e+006
	12/4/2018	4.24e+006
	6/28/2019	4.53e+006
	11/4/2019	4.38e+006
	12/2/2019	4.13e+006
	5/28/2020	4.26e+006
	11/30/2020	3.55e+006
	4/28/2021	3.67e+006
	11/19/2021	3.9e+006
	5/31/2022	4.16e+006
	9/6/2022	4.41e+006

From 24 baseline samples
Baseline mean = 3.48682e+006
Baseline std Dev = 834302

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	4.02e+006	[0, 6.23791e+00	FALSE
9/6/2022	1	4.41e+006	[0, 6.23791e+00	FALSE
5/31/2022	1	4.16e+006	[0, 6.23791e+00	FALSE
11/19/2021	1	3.9e+006	[0, 6.23791e+00	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Total Dissolved Solids (TDS)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	1.341e+006
	11/30/2016	1.38e+006
	12/28/2016	1.41e+006
	1/18/2017	1.12e+006
	2/15/2017	1.179e+006
	3/20/2017	1.255e+006
	4/25/2017	1.227e+006
	5/22/2017	1.142e+006
	6/20/2017	1.156e+006
	7/17/2017	1.232e+006
	8/7/2017	1.273e+006
	8/21/2017	1.235e+006
	11/29/2017	1.208e+006
	12/4/2018	1.28e+006
	6/27/2019	1.36e+006
	12/2/2019	1.1e+006
	5/28/2020	1.15e+006
	12/1/2020	1.21e+006
	4/28/2021	1.22e+006
	11/19/2021	1.21e+006
	5/31/2022	1.22e+006
	9/6/2022	1.18e+006

From 22 baseline samples
Baseline mean = 1.23127e+006
Baseline std Dev = 82894.8

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 22 (background observations) - 1
t(0.9975, 21) = 3.2662

Date	Samples	Mean	Interval	Significant
11/21/2022	1	1.13e+006	[0, 1.50811e+006	FALSE
9/6/2022	1	1.18e+006	[0, 1.50811e+006	FALSE
5/31/2022	1	1.22e+006	[0, 1.50811e+006	FALSE
11/19/2021	1	1.21e+006	[0, 1.50811e+006	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Total Dissolved Solids (TDS)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	470000
	3/20/2017	445000
	4/25/2017	435000
	5/22/2017	400000
	6/20/2017	451000
	7/17/2017	556000
	8/7/2017	477000
	8/22/2017	529000
	11/29/2017	549000
	5/30/2018	591000
	12/4/2018	480000
	6/28/2019	611000
	12/2/2019	432000
	5/28/2020	384000
	11/30/2020	336000
	4/28/2021	498000
	11/19/2021	526000
	5/31/2022	586000
	9/6/2022	732000

From 19 baseline samples
Baseline mean = 499368
Baseline std Dev = 92894.3

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 19 (background observations) - 1
t(0.9975, 18) = 3.33596

Date	Samples	Mean	Interval	Significant
11/21/2022	1	794000	[0, 817311]	FALSE
9/6/2022	1	732000	[0, 817311]	FALSE
5/31/2022	1	586000	[0, 817311]	FALSE
11/19/2021	1	526000	[0, 817311]	FALSE

APPENDIX E2 – Statistical Analysis Package (June 2023)

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

19 October 2023
File No. 130592-015

East Kentucky Power Cooperative
4775 Lexington Road
Winchester, KY 40392

Subject: Summary of Appendix III Semi-Annual
Groundwater Detection Monitoring Statistical Evaluation
East Kentucky Power Cooperative
H.L. Spurlock Generating Station Landfill
Maysville, Kentucky

East Kentucky Power Cooperative, Inc. (EKPC) is implementing the 17 April 2015 U.S. Environmental Protection Agency (U.S. EPA) Federal Coal Combustion Residuals (CCR) Rule (40 CFR §257 and 261) for the H.L. Spurlock Generating Station Landfill, located in Mason County, Kentucky. The CCR Rule establishes requirements for the operation, maintenance and closure of landfills and surface impoundments of CCR materials.

This memorandum summarizes the results of statistical evaluations conducted to determine if Appendix III groundwater monitoring constituents have been detected in downgradient wells at levels that exhibit a statistically significant increase (SSI) above background levels, as required by 40 CFR § 257.94. Downgradient locations were defined in the *Groundwater Monitoring System and Hydrogeologic Investigation Report, Spurlock Landfill, H.L. Spurlock Generating Station, Maysville, Kentucky* (Tetra Tech, 10 October 2017). The same TetraTech report indicates that the groundwater monitoring system meets the requirements of 40 CFR §257.91. On 22 June 2023, EKPC provided Haley & Aldrich, Inc. (Haley & Aldrich) with analytical data from groundwater samples collected on 1 June 2023.The results presented herein were previously communicated orally to EKPC on 16 August 2023. Time-series graphs of data collected as part of the CCR Rule monitoring of H.L. Spurlock Generating Station Landfill are included in Attachment 1.

To identify SSIs, sample data from the most recent groundwater sampling event from the downgradient monitoring wells were compared to the Upper Prediction Limits (UPLs) calculated for each Appendix III constituent (boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids (TDS)) to represent background values within the given downgradient wells. Lower Prediction Limits (LPLs) were also calculated for pH[1]. Based on these comparisons, the statistical results identify no SSIs above background concentrations. The results of the groundwater detection monitoring evaluation are provided below.

[1] We note that for pH, a Statistically Significant Difference (SSD) can be an increase or a decrease.

Statistical Evaluation of Appendix III Constituents

The Rule, 40 CFR §257.93(f) (1-4), provides four (4) specific options to statistically evaluate whether water quality downgradient of the CCR Unit represents an SSI of Appendix III parameters compared to background water quality of the CCR Unit. Based on the *Selection of Statistical Procedures* (8 April 2019), background was determined by calculating intra-well UPL for each Appendix III constituent as well as the LPL for pH for each downgradient monitoring location (see footnote 1). Intrawell analysis was determined appropriate to detect changes associated with the unit based on previous statistical evaluations and successful ASD(s). The UPL was used to evaluate potential SSIs at each downgradient well.

UPL STATISTICAL ANALYSIS

Prediction limits are used to predict the UPL of possible future values for each Appendix III constituent as well as the LPL for pH, based on the downgradient monitoring well dataset and a specified number of future statistical comparisons. The prediction limit method is an accepted statistical method identified in the CCR Rule to evaluate the groundwater analytical data at CCR Units. The prediction limits are calculated with minimum 95% confidence level for four (4) future observations to maintain acceptable statistical power while maintaining site-wide false positive rate (SWFPR) of 10% per year or less. Depending on the assumed distribution of background data, parametric or non-parametric procedures were used to develop the UPL for each Appendix III parameter at each downgradient locations that had at least eight sampling events. Parametric prediction limits utilize assumed distributions of the sample background data to develop the prediction limits, and non-parametric limits utilize order statistics or bootstrap methods to develop the prediction limits. The prediction limits were calculated after testing for outlier sample results that would warrant removal from the data set based on likely error in sampling or measurement. Based on initial statistical evaluation and subsequent discussions with laboratory personnel, the TDS sample result at MW-2B from 30 November 2016 was removed from the background data set based on failure of two correctness criteria defined under Part 1030 Data Quality in Standard Methods For the Examination of Water and Wastewater[2]. Specifically, the measured TDS value was less than 30% of the chloride value, a component of the calculated TDS value and therefore was outside of the ± 20% acceptance range. Additionally, the measured TDS divided by the conductivity yielded a ratio of 0.08, which is outside the acceptance criteria of 0.55-0.70. The sample was deemed suspect and unusable after the holding time for TDS had expired, therefore no reanalysis was possible. Intra-well statistical comparison using prediction limit approach was performed for detection monitoring constituents at the downgradient monitoring wells, following the methods outlined in the *Selection of Statistical Procedures*. The results of the intra-well statistical comparisons are summarized in Table 1 with additional details of the intra-well analysis included in Attachment 2. The intra-well comparison uses the historic data from each downgradient well to establish a background limit. The background datasets are updated with new data in minimum sets of four after confirming that the well concentrations are below the intra-well background limit. Prior to updating the new

[2] Standard Methods Committee of the American Public Health Association, American Water Works Association, and Water Environment Federation, 2011. Lipps WC, Baxter TE, Braun-Howland E, editors. Washington DC: APHA Press.

background limit, the combined background data pool will be examined to identify potential outliers, temporal trends, and normality.

BACKGROUND DISTRIBUTIONS AND UPLS

Prior to conducting the statistical analysis for the second semi-annual detection monitoring event of 2022, the groundwater analytical results for samples collected from 21 October 2016 through September 2022 were used to calculate updated intra-well UPL and LPL (for pH) for each downgradient location (SLF-MW-2B, SLF-MW-3B, and SLF-MW-5R). Following four subsequent sampling events, the new sample results will be evaluated for incorporation into the background data set used for the calculation of the UPL. The variability and distribution of each downgradient well background dataset was evaluated to determine the method for UPL and LPL (for pH) calculation. The development of the UPL and LPL (for pH) for each of the Appendix III constituents is summarized in Table 1, and the supporting statistical software output is included in Attachment 2. The next time background will be reevaluated is prior to the statistical evaluation of the second semi-annual compliance event of 2024.

RESULTS OF APPENDIX III DOWNGRADIENT STATISTICAL COMPARISONS

The sample concentrations for each of the Appendix III constituents from the 2023 first semi-annual detection monitoring sampling event from each downgradient well were compared to their respective UPLs. A sample concentration greater than the UPL (or less than LPL for pH) is considered to represent an SSI over background. Based on these comparisons, there are no SSIs over background.

We appreciate the opportunity to provide environmental consulting services on this project. Please do not hesitate to call if you have any questions or comments.

Sincerely,
HALEY & ALDRICH, INC.

Lloyd S. Ross
Senior Scientist

Emily Guzik
Project Manager

Enclosures:
Table 1: Summary of Background Sample Results and Comparison of Downgradient Sample Results
Attachment 1: Appendix III Time Series Graphs
Attachment 2: Statistical Output

TABLE

TABLE 1

SUMMARY OF BACKGROUND SAMPLE RESULTS AND COMPARISON OF DOWNGRADIENT SAMPLE RESULTS

JULY 2023

EAST KENTUCKY POWER COOPERATIVE

H. L. SPURLOCK GENERATING STATION LANDFILL

	Background Data Set Summary																Intra-well Analysis		
Location Id	**Frequency of Detection**	**Percent Non-Detects**	**Range of Non-Detects**	**Mean**	**50th Percentile (Median)**	**Minimum Detect**	**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variation**	**CCR MCL/RSL**	**Report Result Unit**	**Number of Detection Exceedances**	**Outlier Removed**	**Trend**	**Distribution***	**Background Limit (Upper Prediction Limit)**	**Compliance Round (June 2023)**	**Statistically Significant Increase (SSI) Present?**
CCR Appendix-III: Boron, Total (mg/L)																			
SLF-MW-2B	23 / 23	0	N/A : N/A	3.934	3.914	2.683	4.94	0.326	0.571	0.145	NA	mg/L	No	No	Stable	Normal	5.83	3.46	No
SLF-MW-3B	23 / 23	0	N/A : N/A	3.235	3.392	1.41	6.242	1.619	1.272	0.393	NA	mg/L	No	No	Decreasing	Normal	7.46	1.72	No
SLF-MW-5R	19 / 19	0	N/A : N/A	0.465	0.461	0.22	0.855	0.0242	0.156	0.335	NA	mg/L	No	No	Stable	Normal	1.00	0.694	No
CCR Appendix-III: Calcium, Total (mg/L)																			
SLF-MW-2B	24 / 24	0	N/A : N/A	45.87	43.05	30.76	110	281.7	16.78	0.366	NA	mg/L	Yes	No	Increasing	Non-parametric	110	64.2	No
SLF-MW-3B	24 / 24	0	N/A : N/A	195.8	190.2	138	255	914.7	30.24	0.154	NA	mg/L	No	No	Decreasing	Normal	295	174	No
SLF-MW-5R	20 / 20	0	N/A : N/A	118	118.5	85.1	157	244.6	15.64	0.133	NA	mg/L	No	No	Stable	Normal	171	137	No
CCR Appendix-III: Chloride, Total (mg/L)																			
SLF-MW-2B	24 / 24	0	N/A : N/A	1670	1581	616	2530	198624	445.7	0.267	NA	mg/L	No	No	Stable	Normal	3140	1890	No
SLF-MW-3B	24 / 24	0	N/A : N/A	182	170.5	98	269	2971	54.5	0.299	NA	mg/L	No	No	Increasing	Normal	362	186	No
SLF-MW-5R	20 / 20	0	N/A : N/A	24.16	25.5	12.4	44.1	50.9	7.134	0.295	NA	mg/L	Yes	No	Stable	Normal	48	41.1	No
CCR Appendix-III: Fluoride, Total (mg/L)																			
SLF-MW-2B	21 / 23	0.087	0.5 : 0.5	1.796	1.973	0.97	2.647	0.293	0.541	0.301	NA	mg/L	No	No	Stable	Non-parametric	2.65	1.2	No
SLF-MW-3B	2 / 23	0.913	0.5 : 0.5	0.16	0.5	0.16	0.16	0	0	N/A	NA	mg/L	No	No	NT	Non-parametric	0.50	0.2	No
SLF-MW-5R	2 / 19	0.8947	0.5 : 0.5	0.14	0.5	0.13	0.15	0.0001	0.01	0.0714	NA	mg/L	No	No	NT	Non-parametric	0.50	0.2	No
CCR Appendix-III: pH, Field, Total (pH units)																			
SLF-MW-2B	26 / 26	0	N/A : N/A	7.797	7.685	7.28	9	0.161	0.401	0.0515	NA	pH units	Yes	No	Stable	Non-parametric	7.28, 9	7.72	No
SLF-MW-3B	24 / 24	0	N/A : N/A	7.188	7.165	6.97	7.61	0.0284	0.169	0.0235	NA	pH units	No	No	Stable	Normal	6.6, 7.78	7.29	No
SLF-MW-5R	20 / 20	0	N/A : N/A	7.151	7.14	6.94	7.35	0.00984	0.0992	0.0139	NA	pH units	No	No	Stable	Normal	6.79, 7.51	7.23	No
CCR Appendix-III: Sulfate, Total (mg/L)																			
SLF-MW-2B	25 / 25	0	N/A : N/A	285.2	221.8	104	607	23296	152.6	0.535	NA	mg/L	No	No	Stable	Non-parametric	607	412	No
SLF-MW-3B	24 / 24	0	N/A : N/A	470.9	476	336	614.5	6615	81.33	0.173	NA	mg/L	No	No	Decreasing	Normal	739	400	No
SLF-MW-5R	20 / 20	0	N/A : N/A	132.9	131.4	83.4	209	1237	35.17	0.265	NA	mg/L	No	No	Increasing	Normal	252	199	No
CCR Appendix-III: Total Dissolved Solids (TDS) (mg/L)																			
SLF-MW-2B	24 / 24	0	N/A : N/A	3487	3525	483	4530	696060	834.3	0.239	NA	mg/L	Yes	Yes	Increasing	Normal	6238	4000	No
SLF-MW-3B	22 / 22	0	N/A : N/A	1231	1220	1100	1410	6872	82.89	0.0673	NA	mg/L	No	No	Stable	Normal	1508	992	No
SLF-MW-5R	19 / 19	0	N/A : N/A	499.4	480	336	732	8629	92.89	0.186	NA	mg/L	No	No	Stable	Normal	817	598	No

Notes and Abbreviations:

mg/L - Milligram per liter

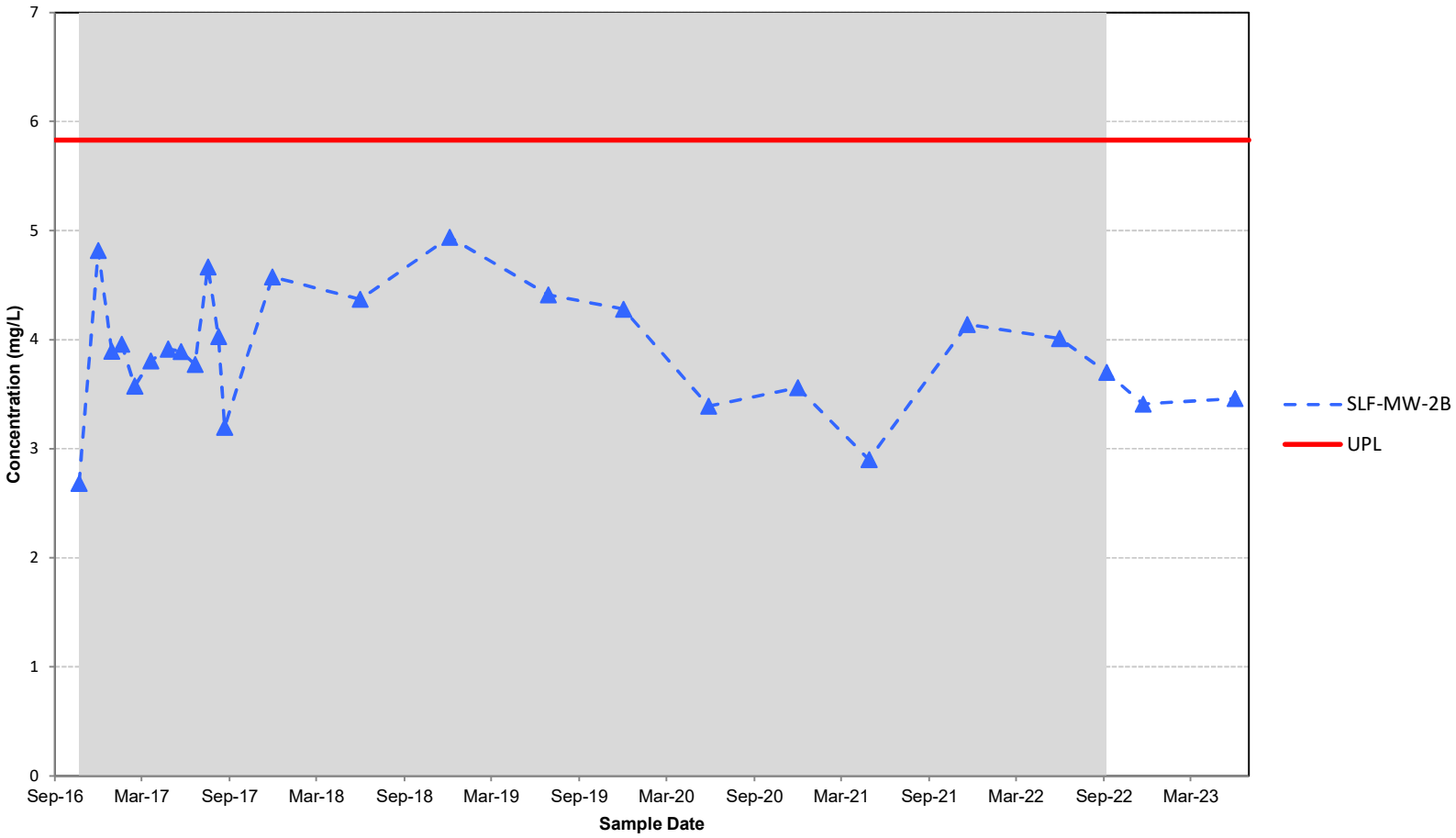
N/A - Not Applicable

NT - Not Tested

* - Determined based on Shapiro-Wilks statistical test at 5% significance level and residual plot probability

ATTACHMENT 1

Appendix III Time Series Graphs



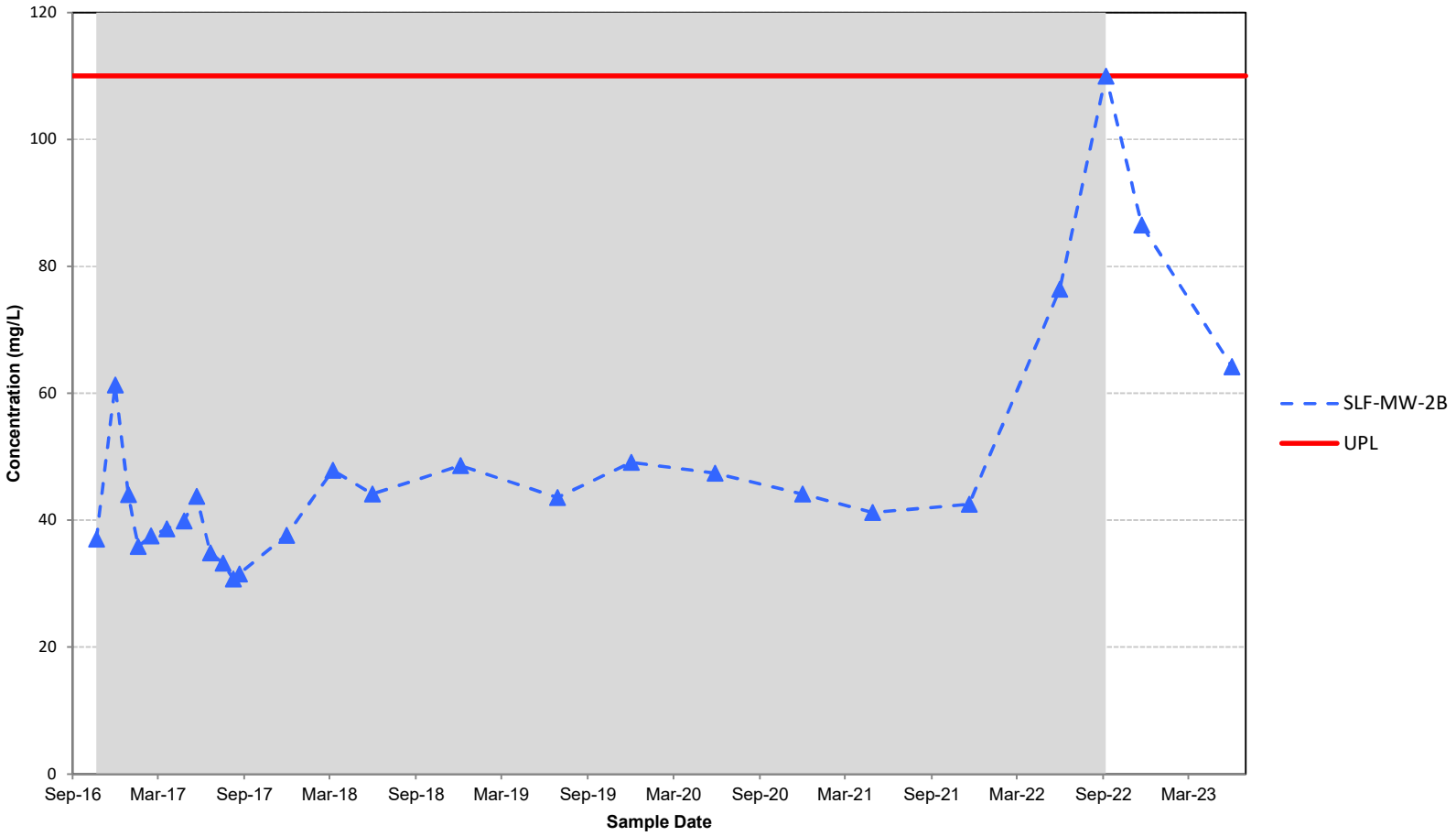
NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

BORON
CONCENTRATION VS. TIME

July 2023 **Figure F-1**



NOTES:
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2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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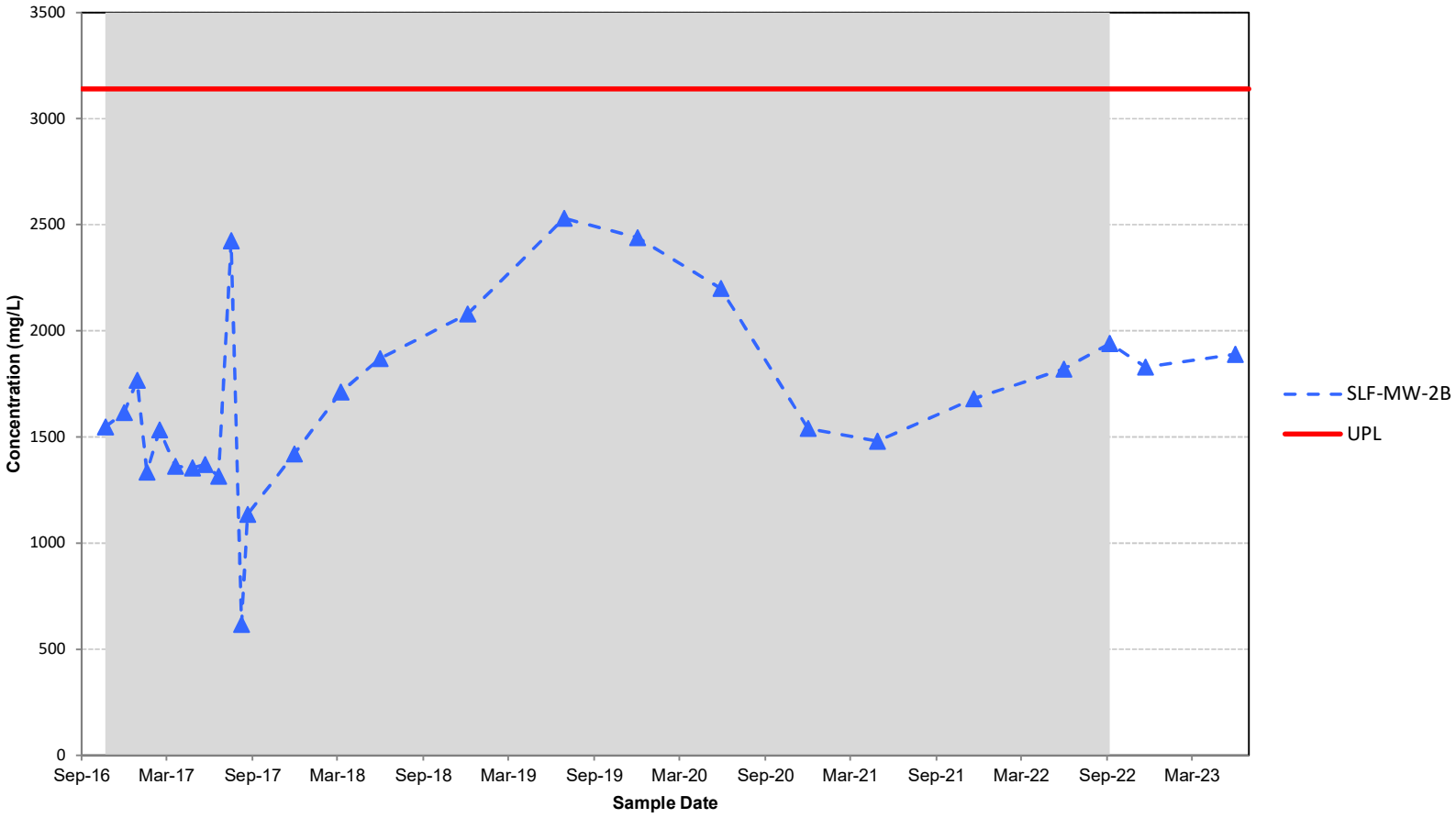
CALCIUM
CONCENTRATION VS. TIME

July 2023 **Figure F-2**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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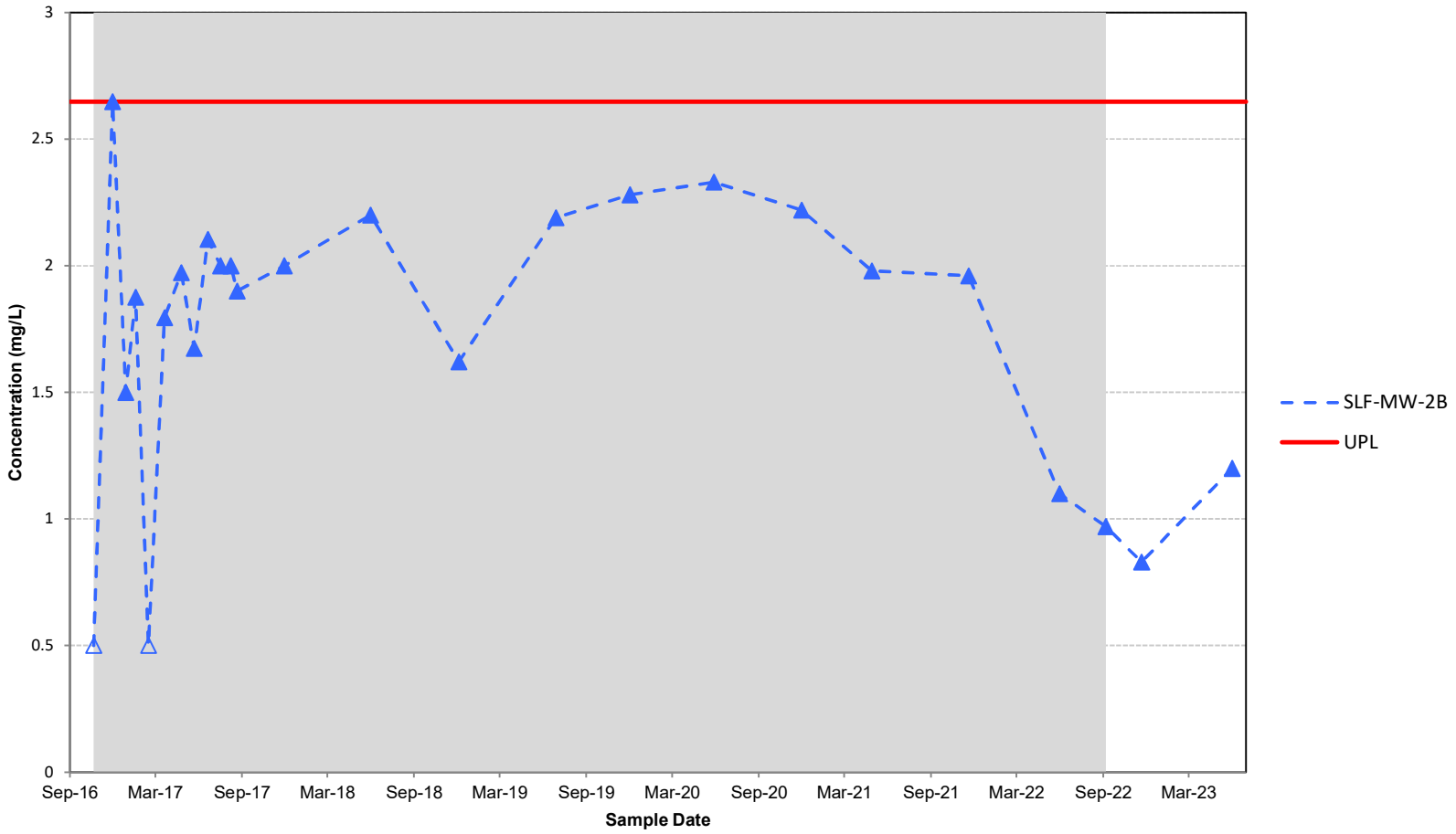
CHLORIDE
CONCENTRATION VS. TIME

July 2023 **Figure F-3**



NOTES:

1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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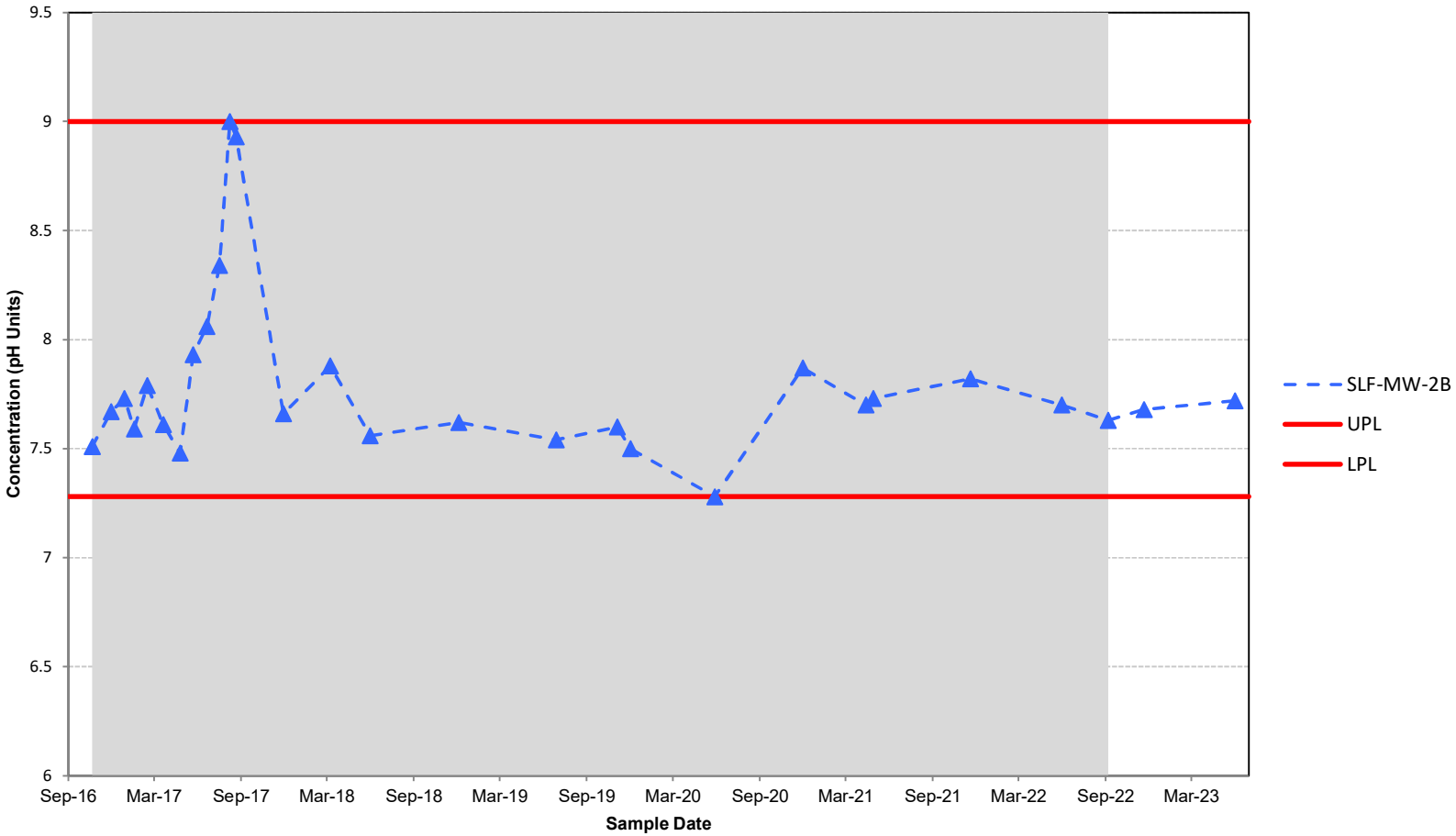
FLUORIDE
CONCENTRATION VS. TIME

July 2023 **Figure F-4**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper and Lower Prediction Limit (UPL and LPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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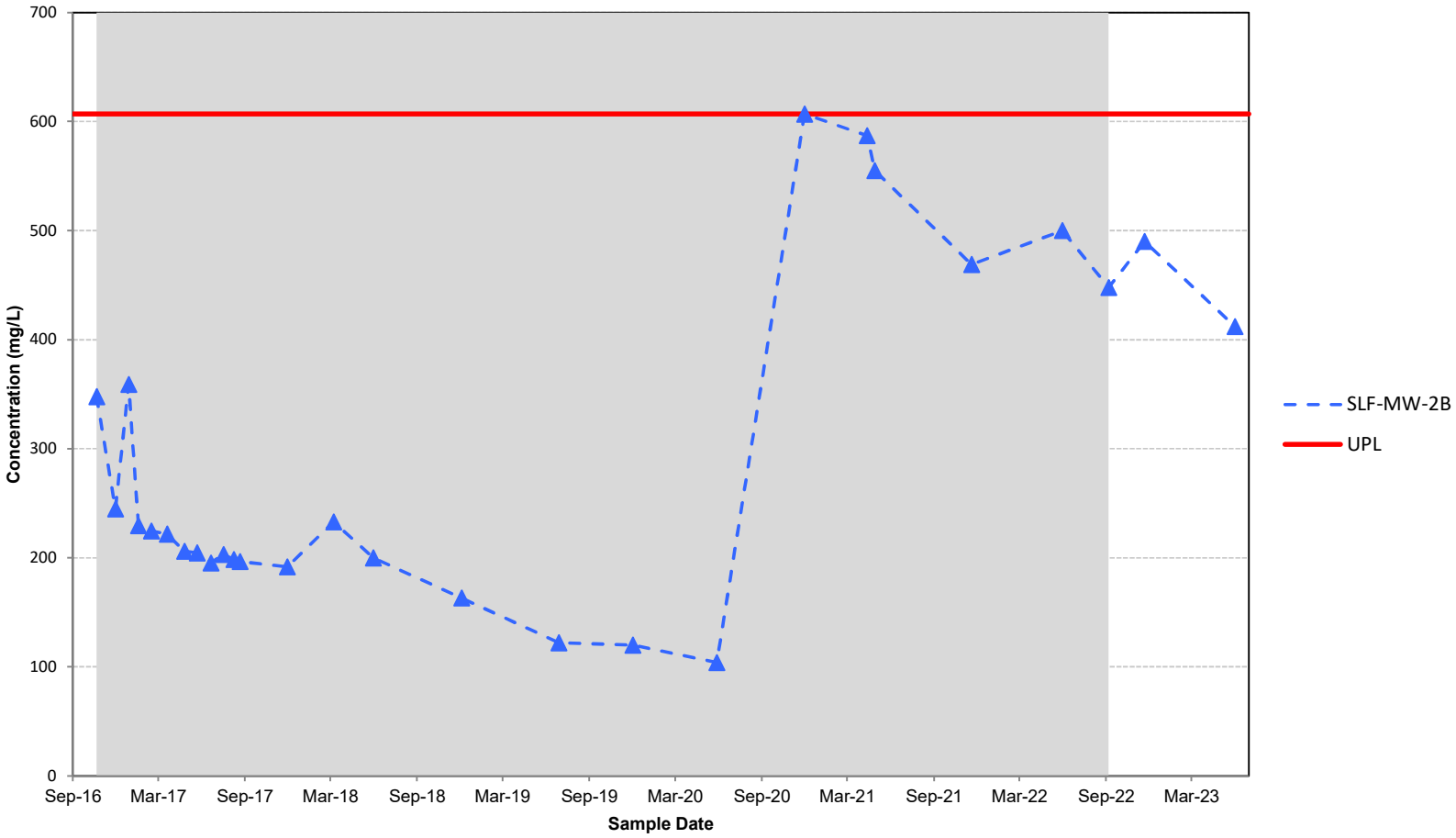
PH, FIELD
CONCENTRATION VS. TIME

July 2023 **Figure F-5**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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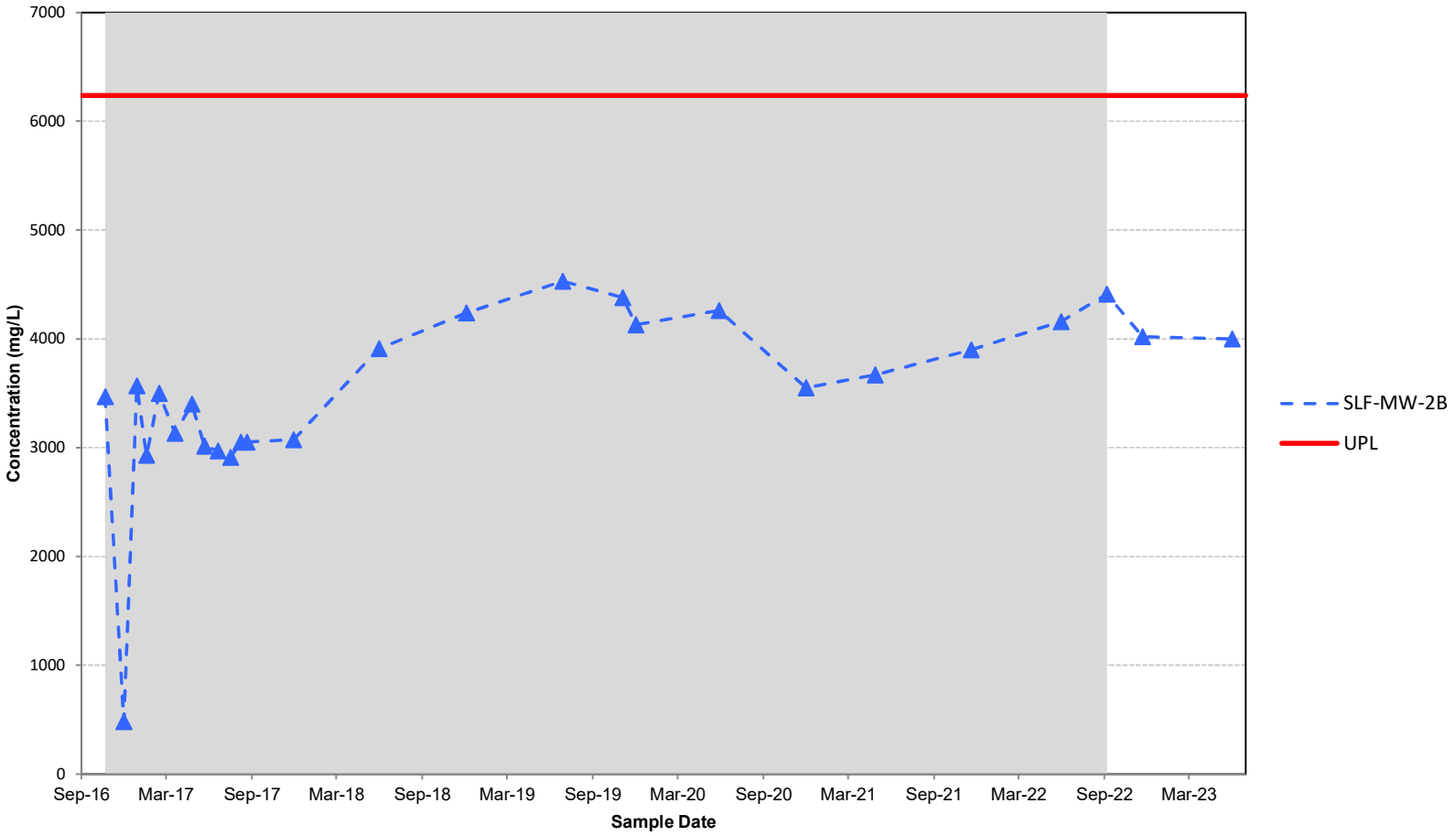
MAYSVILLE, KENTUCKY

SULFATE
CONCENTRATION VS. TIME

July 2023 **Figure F-6**



NOTES:

1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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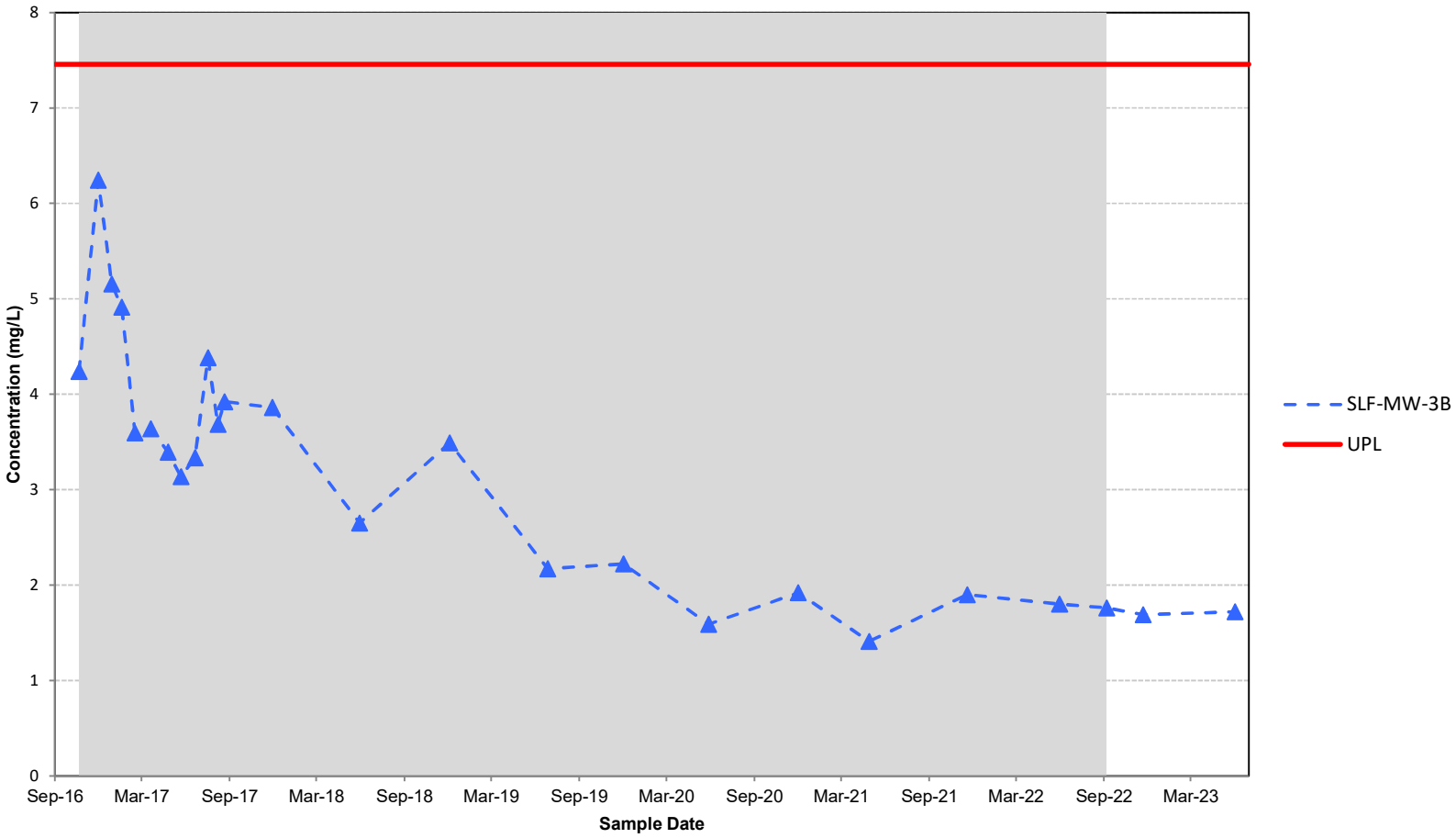
MAYSVILLE, KENTUCKY

TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATION VS. TIME

July 2023 **Figure F-7**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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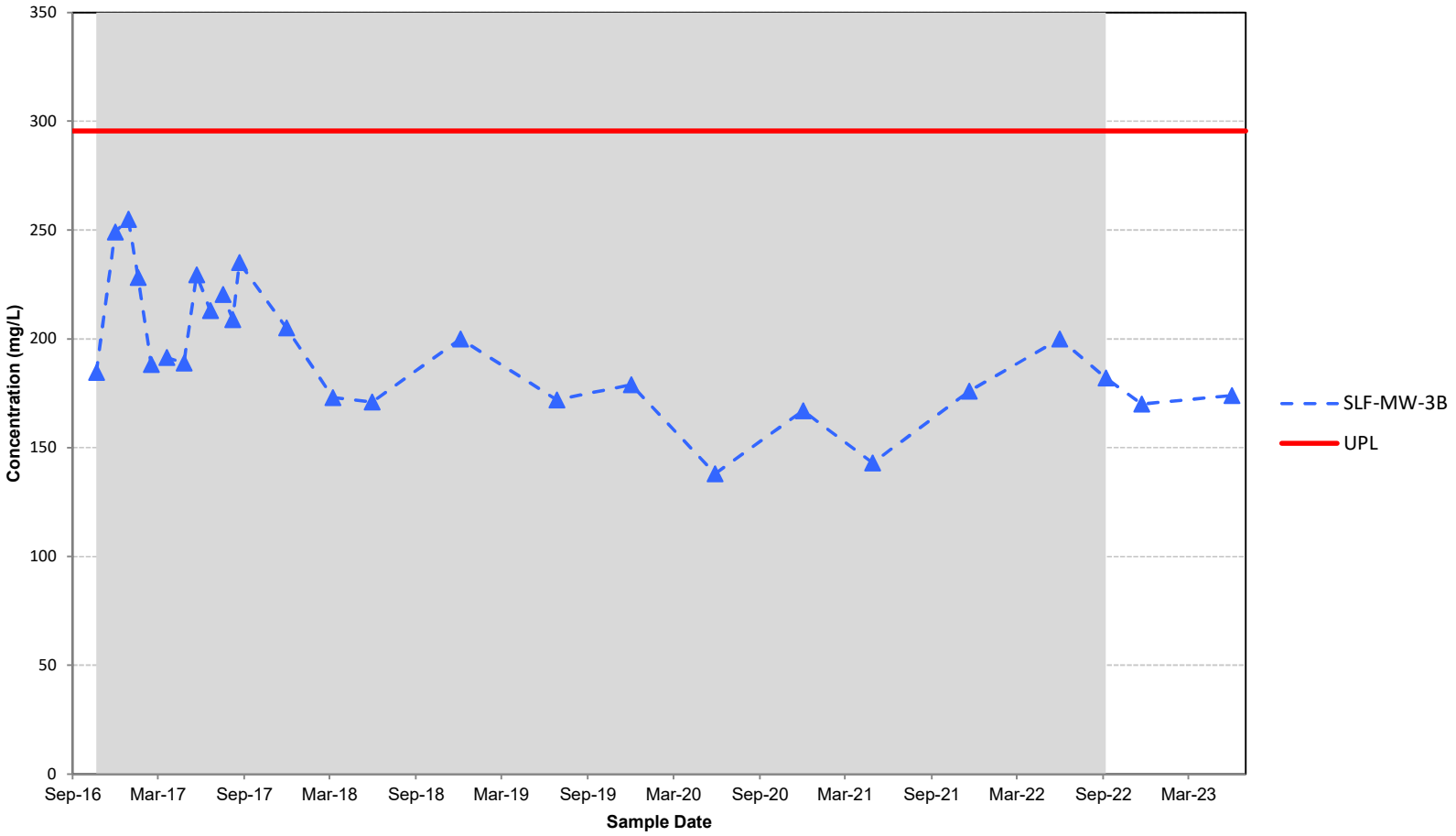
H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

BORON
CONCENTRATION VS. TIME

July 2023 **Figure F-8**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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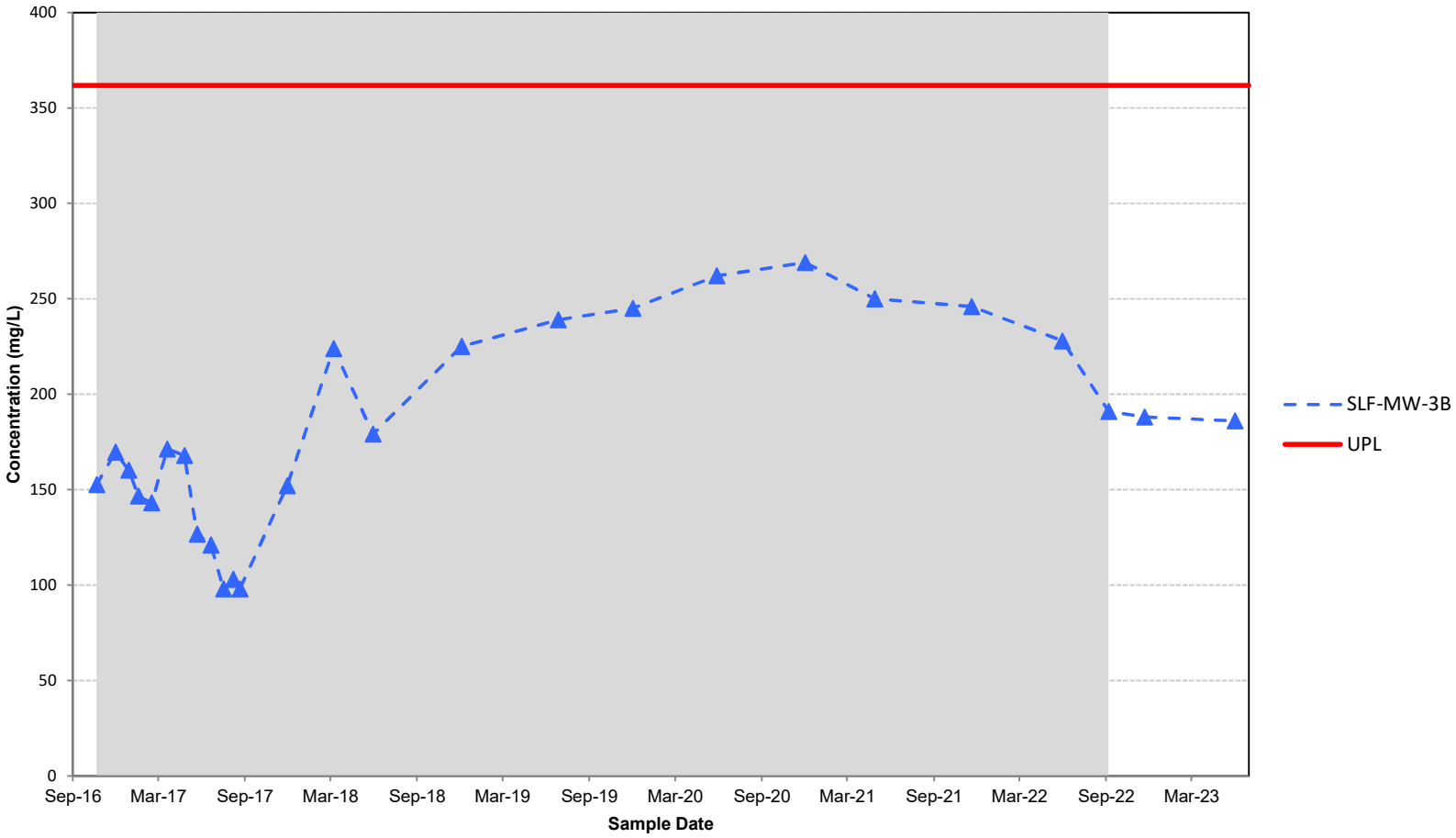
H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

CALCIUM
CONCENTRATION VS. TIME

February 2023 **Figure F-9**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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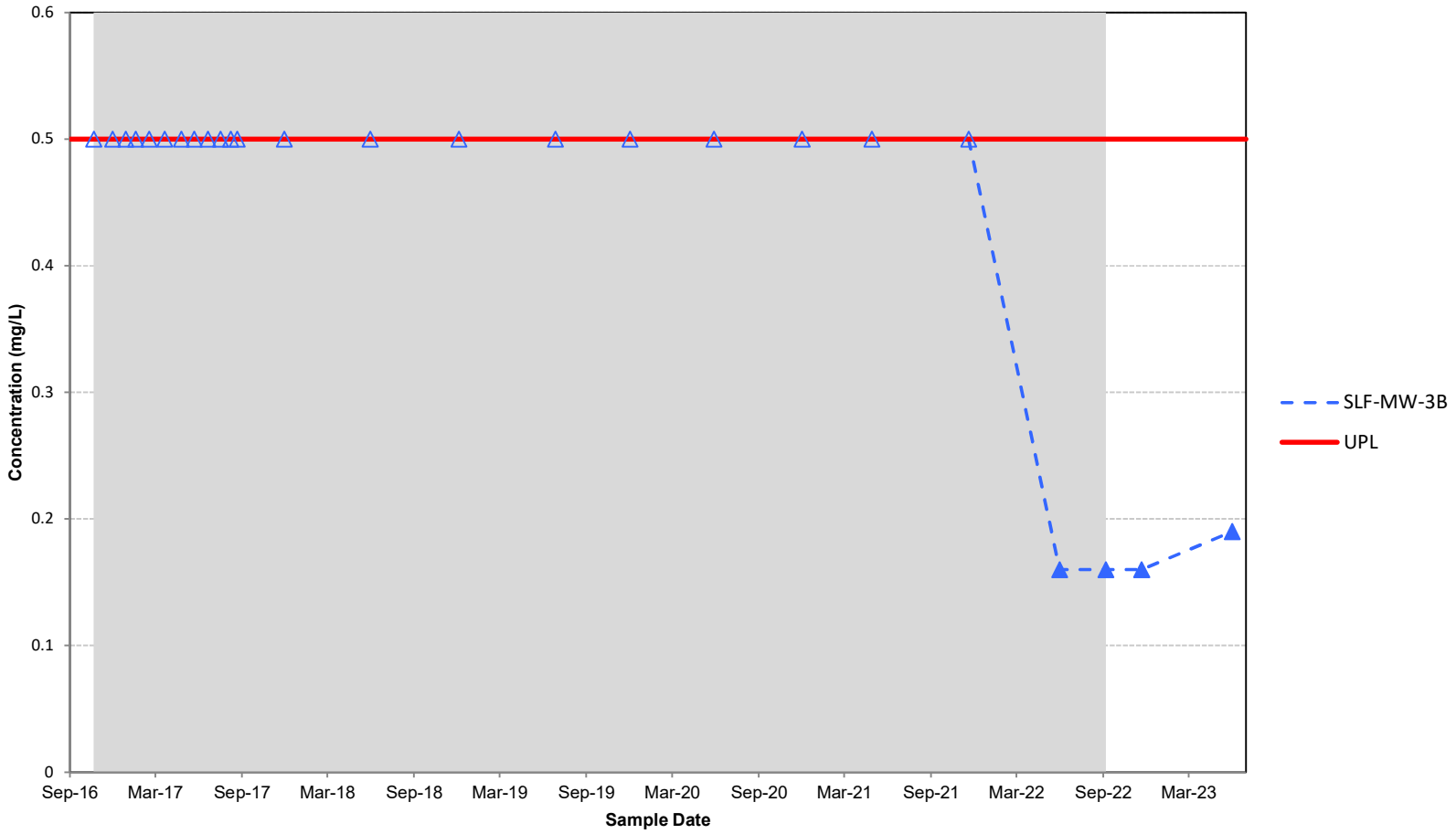
H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

CHLORIDE
CONCENTRATION VS. TIME

July 2023 **Figure F-10**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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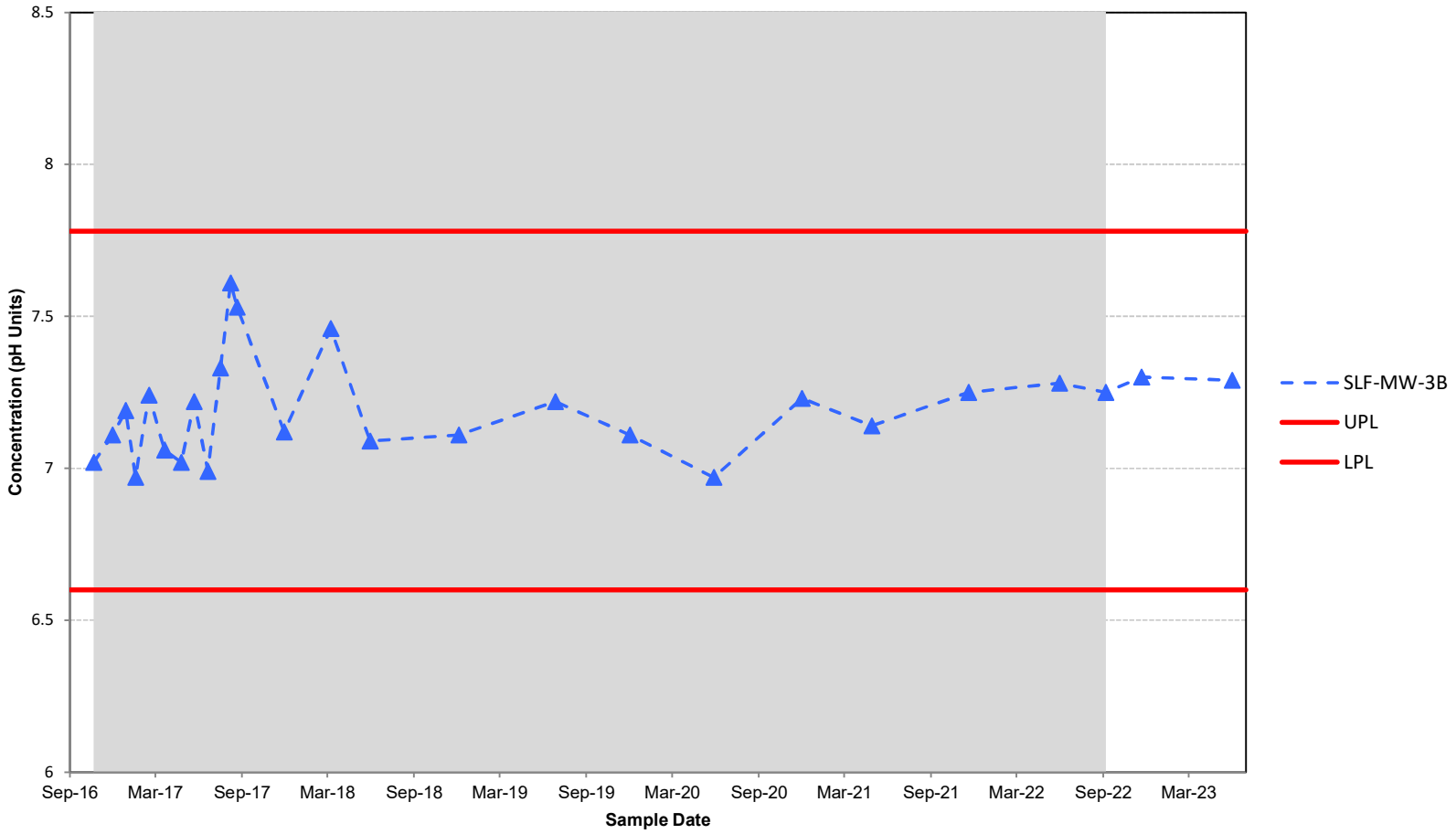
H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

FLUORIDE
CONCENTRATION VS. TIME

July 2023 **Figure F-11**



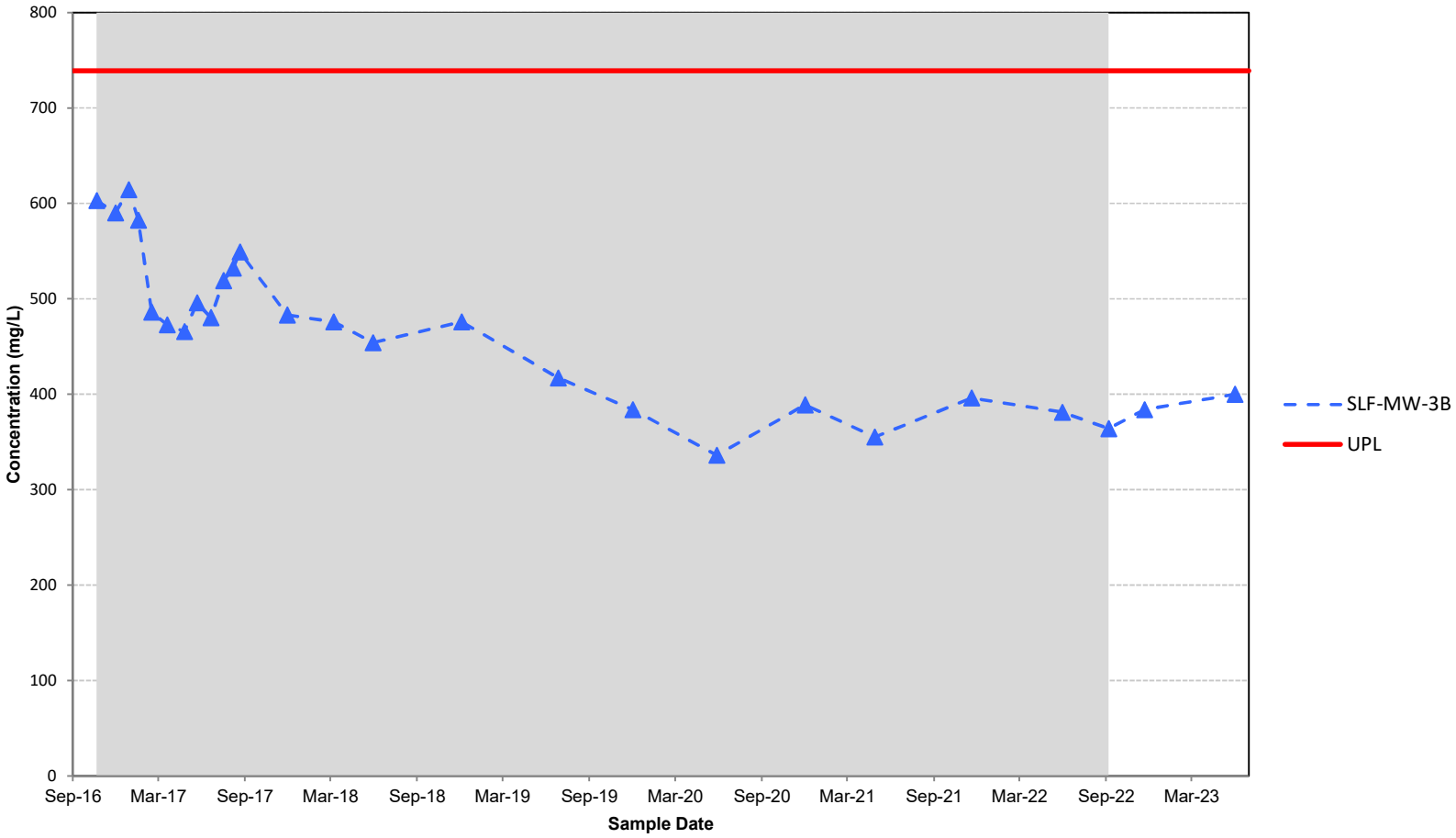
NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper and Lower Prediction Limit (UPL and LPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

PH, FIELD
CONCENTRATION VS. TIME

July 2023 **Figure F-12**



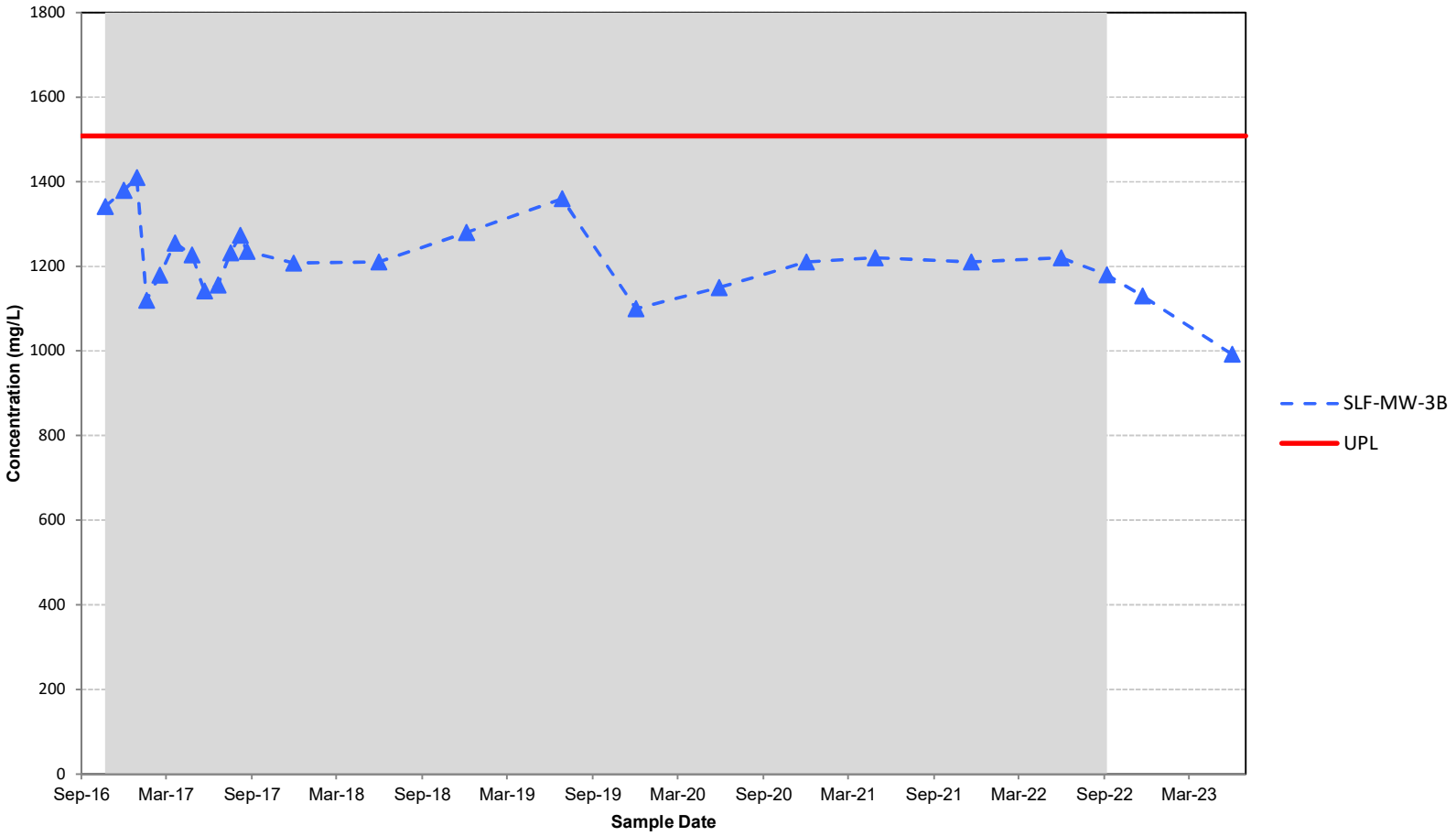
NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

SULFATE
CONCENTRATION VS. TIME

July 2023 **Figure F-13**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

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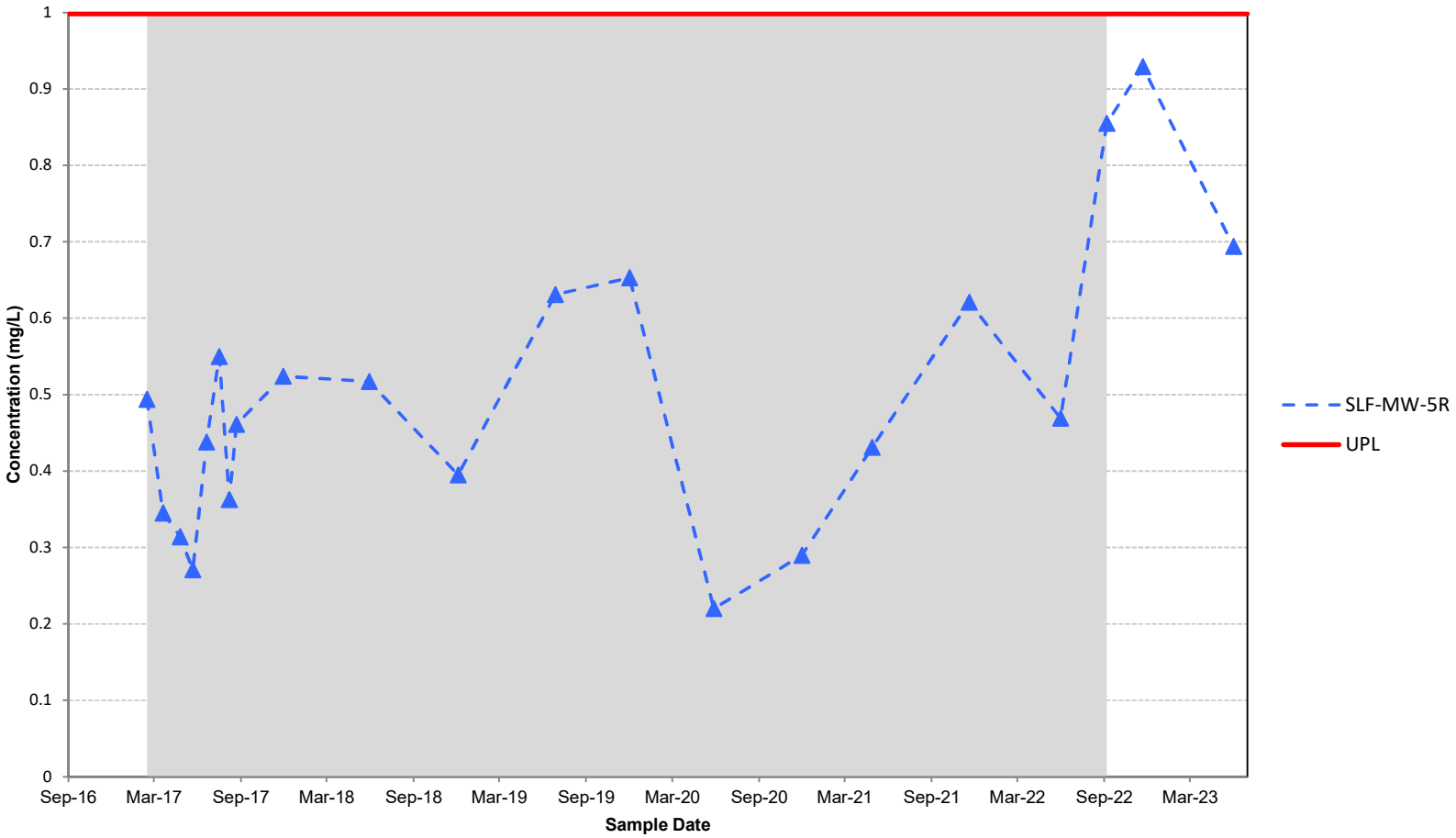
TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATION VS. TIME

July 2023 **Figure F-14**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

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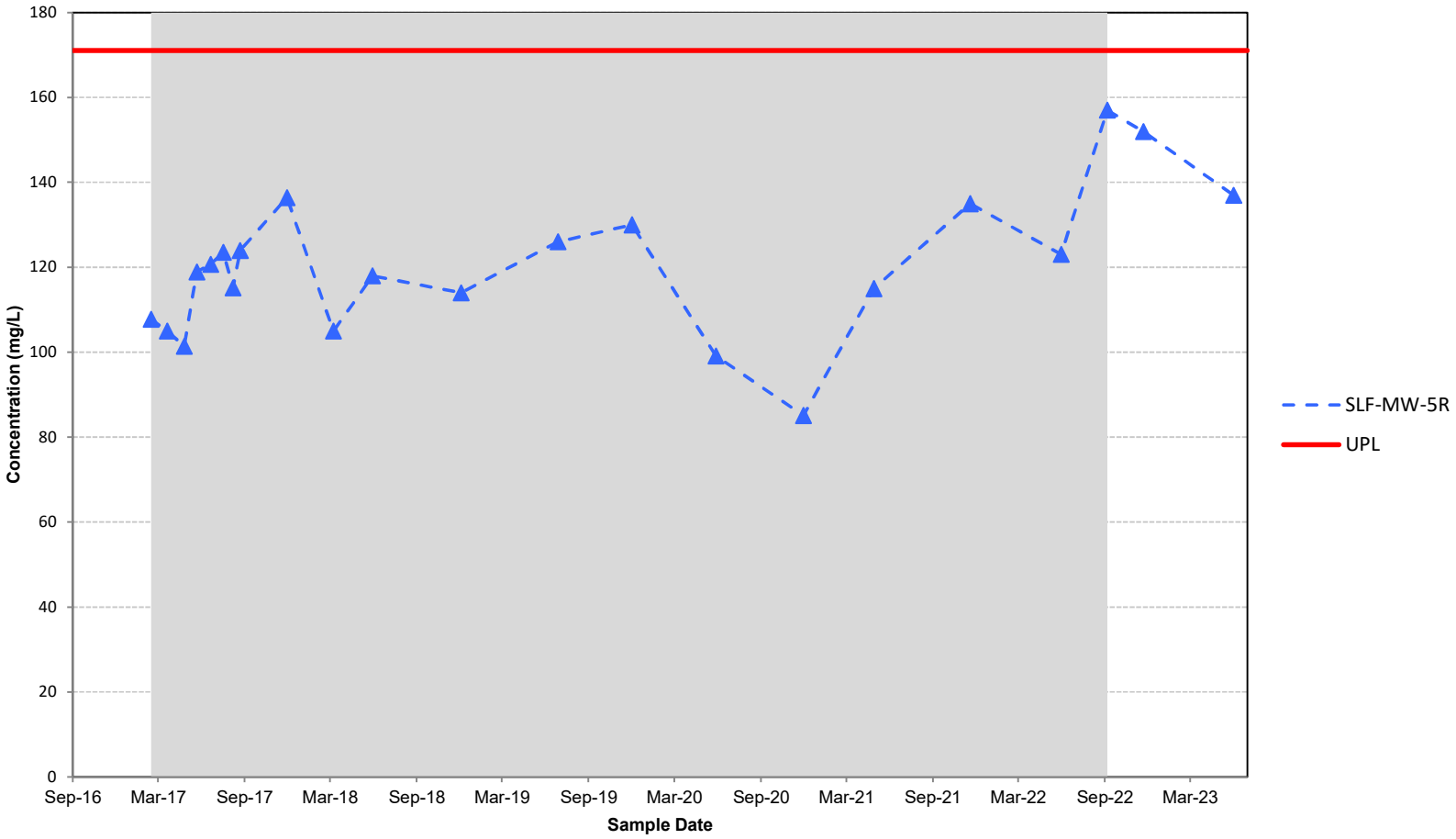
MAYSVILLE, KENTUCKY

BORON
CONCENTRATION VS. TIME

July 2023 **Figure F-15**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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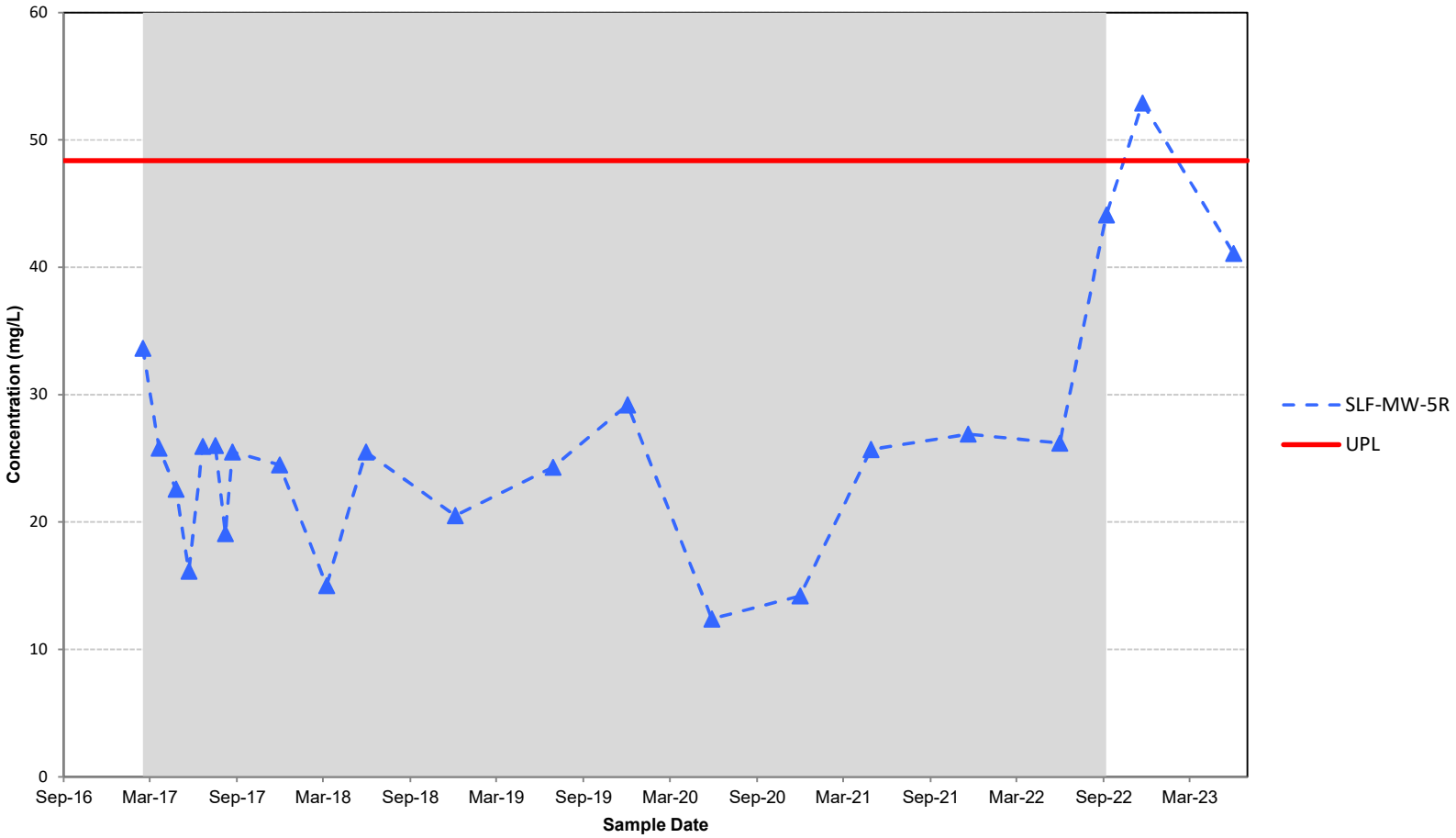
MAYSVILLE, KENTUCKY

CALCIUM
CONCENTRATION VS. TIME

July 2023 **Figure F-16**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

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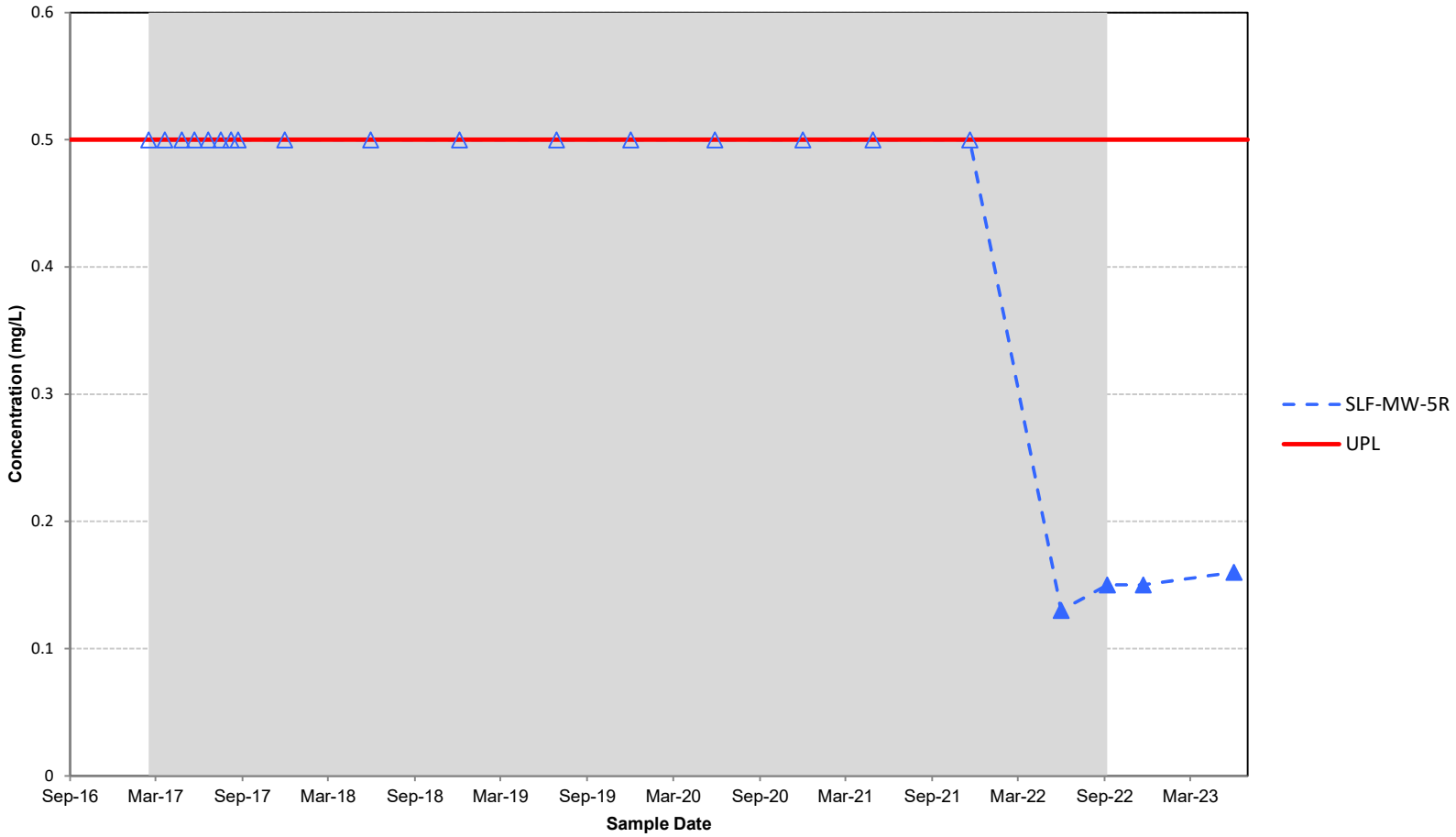
MAYSVILLE, KENTUCKY

CHLORIDE
CONCENTRATION VS. TIME

July 2023 **Figure F-17**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

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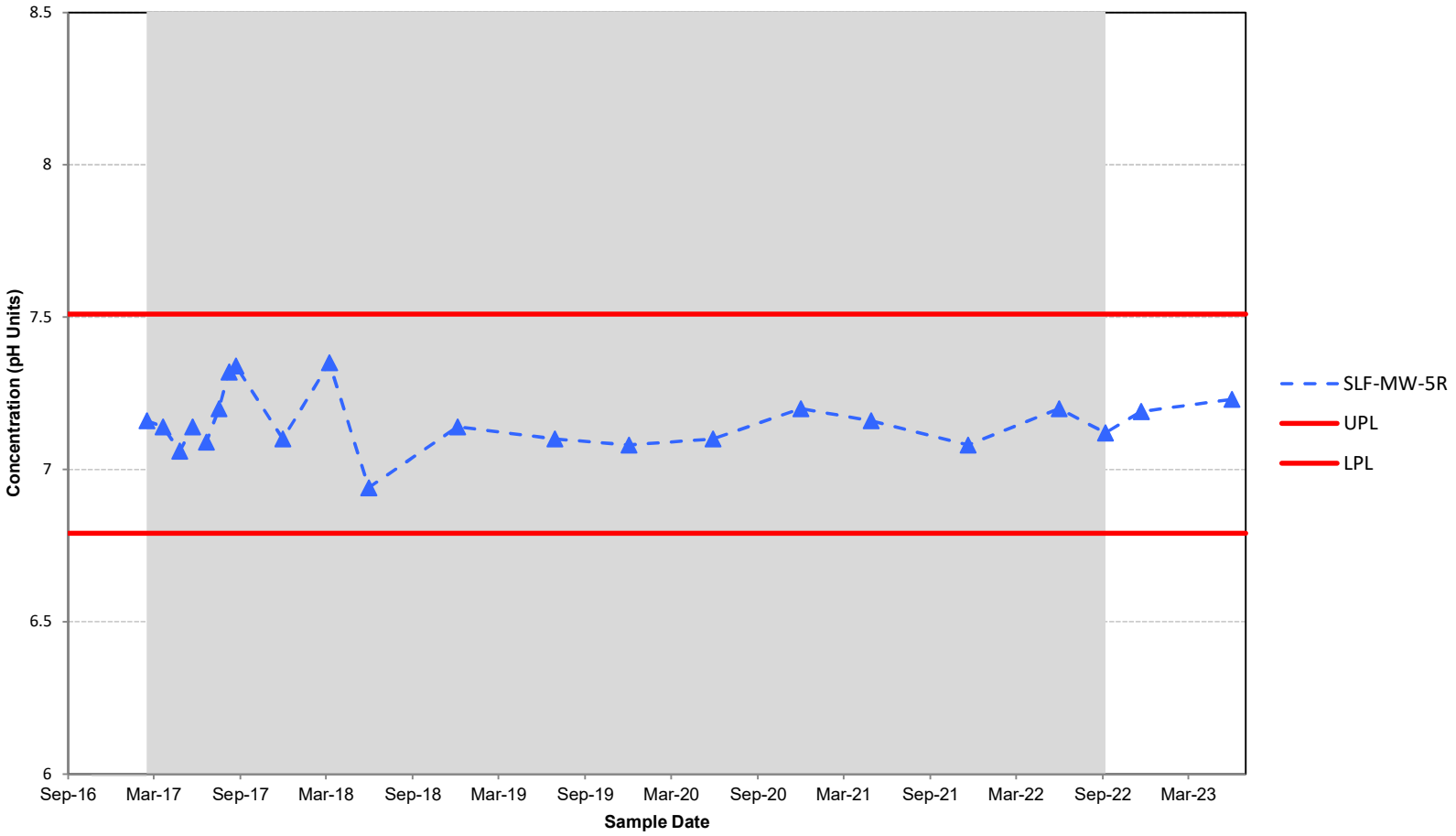
MAYSVILLE, KENTUCKY

FLUORIDE
CONCENTRATION VS. TIME

July 2023 **Figure F-18**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper and Lower Prediction Limit (UPL and LPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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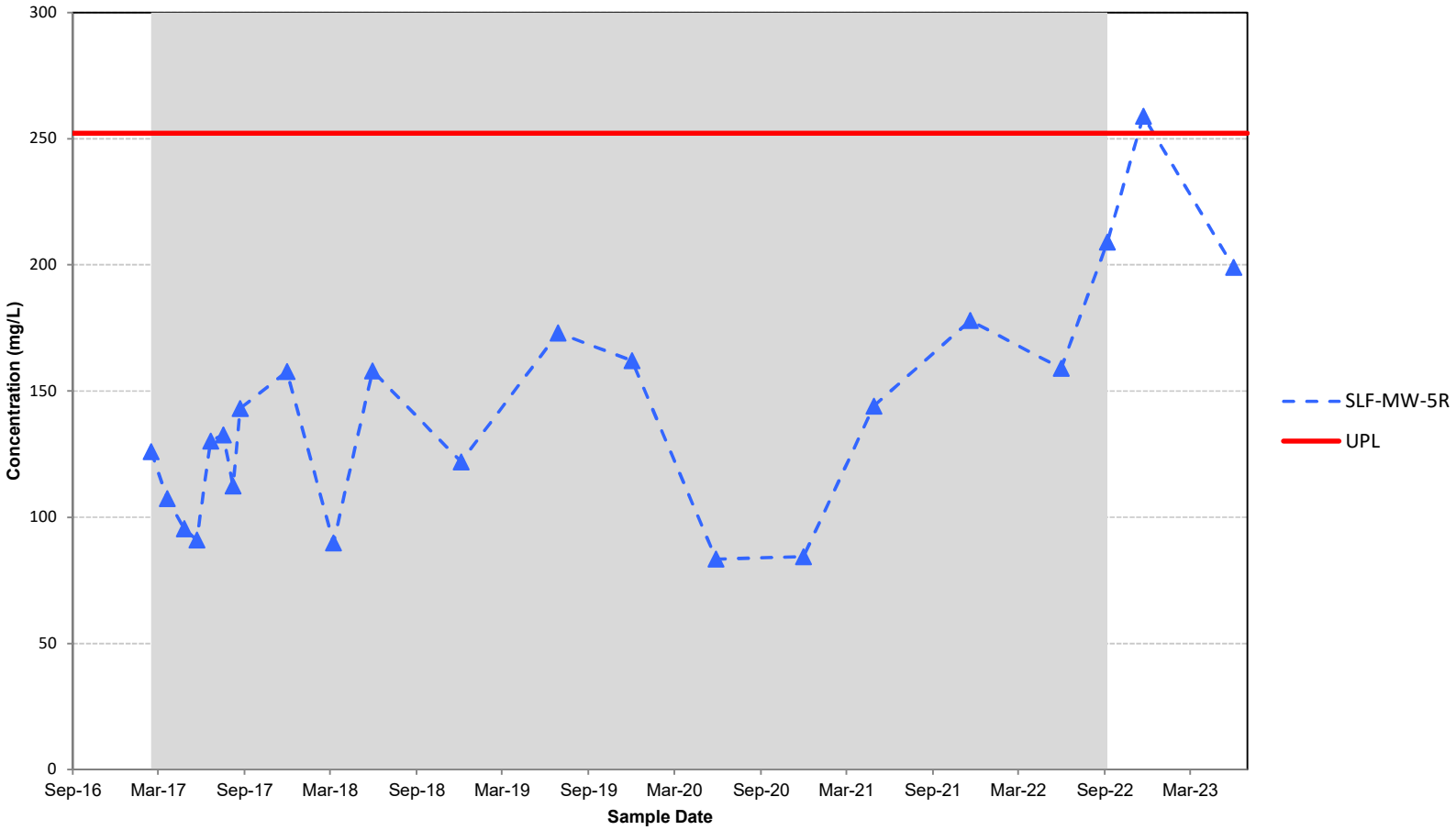
H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

PH, FIELD
CONCENTRATION VS. TIME

July 2023 **Figure F-19**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

HALEY ALDRICH

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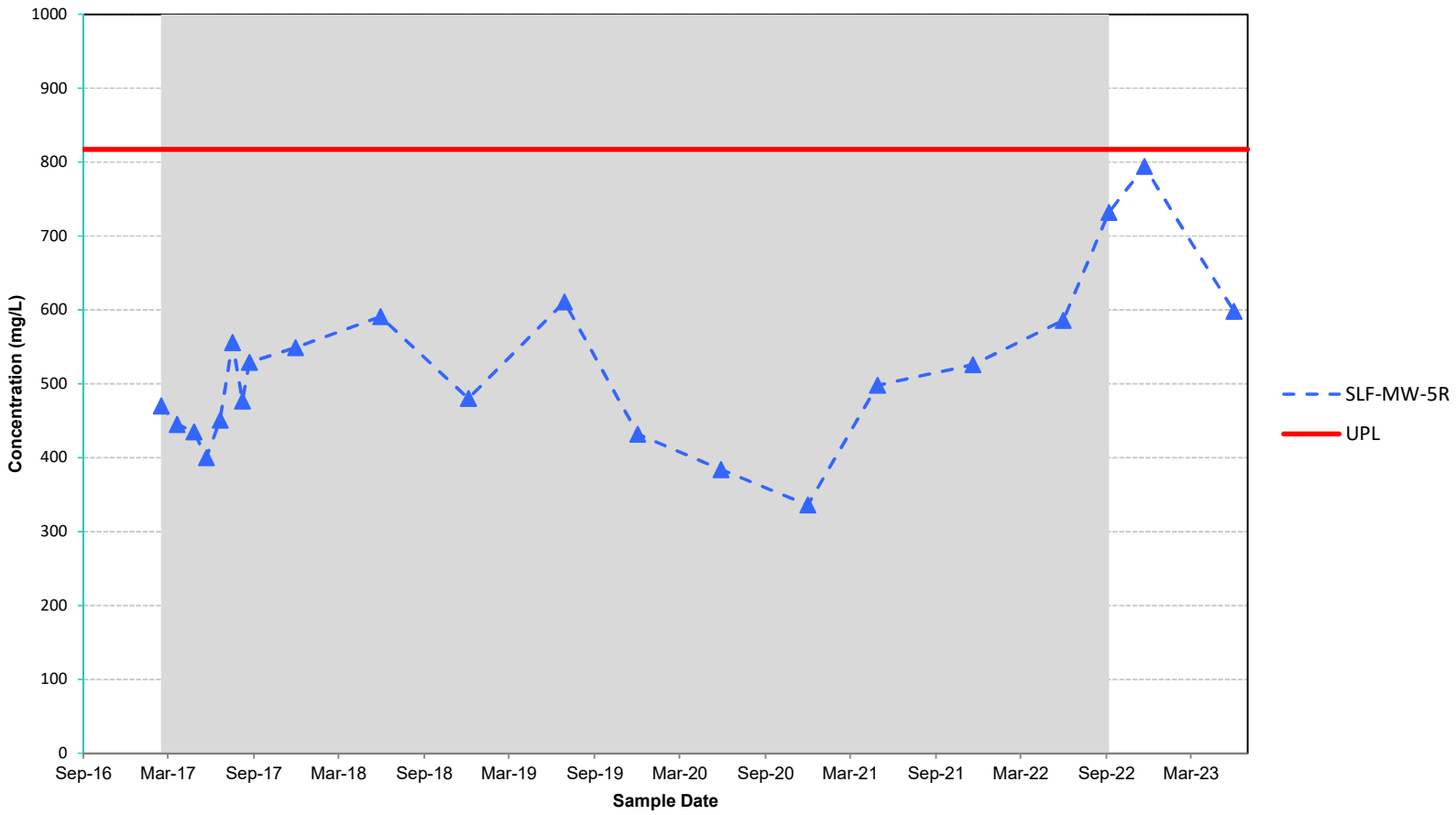
MAYSVILLE, KENTUCKY

SULFATE
CONCENTRATION VS. TIME

July 2023 **Figure F-20**



NOTES:
1. Solid symbol indicates a detected concentration. Open symbol indicates a non-detect, the laboratory reporting limit is graphed.
2. Screening Level shown is the Upper Prediction Limit (UPL).
3. Shading denotes data used to calculate Statistical Background limits.
4. Detection Monitoring was initiated on October 17, 2017.

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H.L. SPURLOCK GENERATING STATION
MAYSVILLE, KENTUCKY

TOTAL DISSOLVED SOLIDS (TDS) CONCENTRATION VS. TIME

July 2023 **Figure F-21**

ATTACHMENT 2

Statistical Output

Concentrations (ppb)

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 65
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	23	0 (0%)	10/21/2016	2683.12	2683.12
			11/30/2016	4817.2	4817.2
			12/28/2016	3895.84	3895.84
			1/18/2017	3956.91	3956.91
			2/14/2017	3573.57	3573.57
			3/20/2017	3806.16	3806.16
			4/25/2017	3914.41	3914.41
			5/22/2017	3891.56	3891.56
			6/20/2017	3773.44	3773.44
			7/17/2017	4668	4668
			8/8/2017	4027	4027
			8/21/2017	3197	3197
			11/29/2017	4576	4576
			5/31/2018	4370	4370
			12/4/2018	4940	4940
			6/28/2019	4410	4410
			12/2/2019	4280	4280
			5/28/2020	3390	3390
			11/30/2020	3560	3560
			4/28/2021	2900	2900
			11/19/2021	4140	4140
			5/31/2022	4010	4010
			9/6/2022	3700	3700
			11/21/2022	**3410**	**3410**
SLF-MW-3B	23	0 (0%)	10/21/2016	4238.42	4238.42
			11/30/2016	6242.46	6242.46
			12/28/2016	5154.49	5154.49
			1/18/2017	4910.63	4910.63
			2/15/2017	3595.68	3595.68
			3/20/2017	3637.76	3637.76
			4/25/2017	3392.27	3392.27
			5/22/2017	3135.58	3135.58
			6/20/2017	3335.63	3335.63
			7/17/2017	4381	4381
			8/7/2017	3684	3684
			8/21/2017	3922	3922
			11/29/2017	3860	3860
			5/30/2018	2650	2650
			12/4/2018	3490	3490
			6/27/2019	2170	2170

			12/2/2019	2220	2220
			5/28/2020	1590	1590
			12/1/2020	1920	1920
			4/28/2021	1410	1410
			11/19/2021	1900	1900
			5/31/2022	1800	1800
			9/6/2022	1760	1760
			11/21/2022	**1690**	**1690**
SLF-MW-5R	19	0 (0%)	2/14/2017	493.993	493.993
			3/20/2017	345.223	345.223
			4/25/2017	314.115	314.115
			5/22/2017	270.744	270.744
			6/20/2017	438.039	438.039
			7/17/2017	550	550
			8/7/2017	363	363
			8/22/2017	461	461
			11/29/2017	524	524
			5/30/2018	517	517
			12/4/2018	395	395
			6/28/2019	631	631
			12/2/2019	653	653
			5/28/2020	220	220
			11/30/2020	290	290
			4/28/2021	431	431
			11/19/2021	621	621
			5/31/2022	469	469
			9/6/2022	855	855
			11/21/2022	**929**	**929**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Boron

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.156053	0.258897	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	2683.12	FALSE
	11/30/2016	4817.2	FALSE
	12/28/2016	3895.84	FALSE
	1/18/2017	3956.91	FALSE
	2/14/2017	3573.57	FALSE
	3/20/2017	3806.16	FALSE
	4/25/2017	3914.41	FALSE
	5/22/2017	3891.56	FALSE
	6/20/2017	3773.44	FALSE
	7/17/2017	4668	FALSE
	8/8/2017	4027	FALSE
	8/21/2017	3197	FALSE
	11/29/2017	4576	FALSE
	5/31/2018	4370	FALSE
	12/4/2018	4940	FALSE
	6/28/2019	4410	FALSE
	12/2/2019	4280	FALSE
	5/28/2020	3390	FALSE
	11/30/2020	3560	FALSE
	4/28/2021	2900	FALSE
	11/19/2021	4140	FALSE
	5/31/2022	4010	FALSE
	9/6/2022	3700	FALSE

Shapiro-Wilks Test of Normality

Parameter: Boron

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2683.12	4940	2256.88	0.4542	1025.07
2	2900	4817.2	1917.2	0.3126	599.317
3	3197	4668	1471	0.2563	377.017
4	3390	4576	1186	0.2139	253.685
5	3560	4410	850	0.1787	151.895
6	3573.57	4370	796.43	0.148	117.872
7	3700	4280	580	0.1201	69.658
8	3773.44	4140	366.56	0.0941	34.4933
9	3806.16	4027	220.84	0.0696	15.3705
10	3891.56	4010	118.44	0.0459	5.4364
11	3895.84	3956.91	61.07	0.0228	1.3924
12	3914.41	3914.41	0		
13	3956.91	3895.84	-61.07		
14	4010	3891.56	-118.44		
15	4027	3806.16	-220.84		
16	4140	3773.44	-366.56		
17	4280	3700	-580		
18	4370	3573.57	-796.43		
19	4410	3560	-850		
20	4576	3390	-1186		
21	4668	3197	-1471		
22	4817.2	2900	-1917.2		
23	4940	2683.12	-2256.88		

Sum of b values = 2651.21
Sample Standard Deviation = 571.284
W Statistic = 0.978953

5% Critical value of 0.914 is less than 0.978953
Data is normally distributed at 95% level of significance

1% Critical value of 0.881 is less than 0.978953
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Boron

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
4817.2	2683.12	2134.08	1	0
3895.84	2683.12	1212.72	2	0
3956.91	2683.12	1273.79	3	0
3573.57	2683.12	890.45	4	0
3806.16	2683.12	1123.04	5	0
3914.41	2683.12	1231.29	6	0
3891.56	2683.12	1208.44	7	0
3773.44	2683.12	1090.32	8	0
4668	2683.12	1984.88	9	0
4027	2683.12	1343.88	10	0
3197	2683.12	513.88	11	0
4576	2683.12	1892.88	12	0
4370	2683.12	1686.88	13	0
4940	2683.12	2256.88	14	0
4410	2683.12	1726.88	15	0
4280	2683.12	1596.88	16	0
3390	2683.12	706.88	17	0
3560	2683.12	876.88	18	0
2900	2683.12	216.88	19	0
4140	2683.12	1456.88	20	0
4010	2683.12	1326.88	21	0
3700	2683.12	1016.88	22	0
3895.84	4817.2	-921.36	22	1
3956.91	4817.2	-860.29	22	2
3573.57	4817.2	-1243.63	22	3
3806.16	4817.2	-1011.04	22	4
3914.41	4817.2	-902.79	22	5
3891.56	4817.2	-925.64	22	6
3773.44	4817.2	-1043.76	22	7
4668	4817.2	-149.2	22	8
4027	4817.2	-790.2	22	9
3197	4817.2	-1620.2	22	10
4576	4817.2	-241.2	22	11
4370	4817.2	-447.2	22	12
4940	4817.2	122.8	23	12
4410	4817.2	-407.2	23	13
4280	4817.2	-537.2	23	14
3390	4817.2	-1427.2	23	15
3560	4817.2	-1257.2	23	16
2900	4817.2	-1917.2	23	17
4140	4817.2	-677.2	23	18
4010	4817.2	-807.2	23	19
3700	4817.2	-1117.2	23	20
3956.91	3895.84	61.07	24	20
3573.57	3895.84	-322.27	24	21

3806.16	3895.84	-89.68	24	22
3914.41	3895.84	18.57	25	22
3891.56	3895.84	-4.28	25	23
3773.44	3895.84	-122.4	25	24
4668	3895.84	772.16	26	24
4027	3895.84	131.16	27	24
3197	3895.84	-698.84	27	25
4576	3895.84	680.16	28	25
4370	3895.84	474.16	29	25
4940	3895.84	1044.16	30	25
4410	3895.84	514.16	31	25
4280	3895.84	384.16	32	25
3390	3895.84	-505.84	32	26
3560	3895.84	-335.84	32	27
2900	3895.84	-995.84	32	28
4140	3895.84	244.16	33	28
4010	3895.84	114.16	34	28
3700	3895.84	-195.84	34	29
3573.57	3956.91	-383.34	34	30
3806.16	3956.91	-150.75	34	31
3914.41	3956.91	-42.5	34	32
3891.56	3956.91	-65.35	34	33
3773.44	3956.91	-183.47	34	34
4668	3956.91	711.09	35	34
4027	3956.91	70.09	36	34
3197	3956.91	-759.91	36	35
4576	3956.91	619.09	37	35
4370	3956.91	413.09	38	35
4940	3956.91	983.09	39	35
4410	3956.91	453.09	40	35
4280	3956.91	323.09	41	35
3390	3956.91	-566.91	41	36
3560	3956.91	-396.91	41	37
2900	3956.91	-1056.91	41	38
4140	3956.91	183.09	42	38
4010	3956.91	53.09	43	38
3700	3956.91	-256.91	43	39
3806.16	3573.57	232.59	44	39
3914.41	3573.57	340.84	45	39
3891.56	3573.57	317.99	46	39
3773.44	3573.57	199.87	47	39
4668	3573.57	1094.43	48	39
4027	3573.57	453.43	49	39
3197	3573.57	-376.57	49	40
4576	3573.57	1002.43	50	40
4370	3573.57	796.43	51	40
4940	3573.57	1366.43	52	40
4410	3573.57	836.43	53	40
4280	3573.57	706.43	54	40
3390	3573.57	-183.57	54	41
3560	3573.57	-13.57	54	42
2900	3573.57	-673.57	54	43
4140	3573.57	566.43	55	43
4010	3573.57	436.43	56	43
3700	3573.57	126.43	57	43

3914.41	3806.16	108.25	58	43
3891.56	3806.16	85.4	59	43
3773.44	3806.16	-32.72	59	44
4668	3806.16	861.84	60	44
4027	3806.16	220.84	61	44
3197	3806.16	-609.16	61	45
4576	3806.16	769.84	62	45
4370	3806.16	563.84	63	45
4940	3806.16	1133.84	64	45
4410	3806.16	603.84	65	45
4280	3806.16	473.84	66	45
3390	3806.16	-416.16	66	46
3560	3806.16	-246.16	66	47
2900	3806.16	-906.16	66	48
4140	3806.16	333.84	67	48
4010	3806.16	203.84	68	48
3700	3806.16	-106.16	68	49
3891.56	3914.41	-22.85	68	50
3773.44	3914.41	-140.97	68	51
4668	3914.41	753.59	69	51
4027	3914.41	112.59	70	51
3197	3914.41	-717.41	70	52
4576	3914.41	661.59	71	52
4370	3914.41	455.59	72	52
4940	3914.41	1025.59	73	52
4410	3914.41	495.59	74	52
4280	3914.41	365.59	75	52
3390	3914.41	-524.41	75	53
3560	3914.41	-354.41	75	54
2900	3914.41	-1014.41	75	55
4140	3914.41	225.59	76	55
4010	3914.41	95.59	77	55
3700	3914.41	-214.41	77	56
3773.44	3891.56	-118.12	77	57
4668	3891.56	776.44	78	57
4027	3891.56	135.44	79	57
3197	3891.56	-694.56	79	58
4576	3891.56	684.44	80	58
4370	3891.56	478.44	81	58
4940	3891.56	1048.44	82	58
4410	3891.56	518.44	83	58
4280	3891.56	388.44	84	58
3390	3891.56	-501.56	84	59
3560	3891.56	-331.56	84	60
2900	3891.56	-991.56	84	61
4140	3891.56	248.44	85	61
4010	3891.56	118.44	86	61
3700	3891.56	-191.56	86	62
4668	3773.44	894.56	87	62
4027	3773.44	253.56	88	62
3197	3773.44	-576.44	88	63
4576	3773.44	802.56	89	63
4370	3773.44	596.56	90	63

4940	3773.44	1166.56	91	63
4410	3773.44	636.56	92	63
4280	3773.44	506.56	93	63
3390	3773.44	-383.44	93	64
3560	3773.44	-213.44	93	65
2900	3773.44	-873.44	93	66
4140	3773.44	366.56	94	66
4010	3773.44	236.56	95	66
3700	3773.44	-73.44	95	67
4027	4668	-641	95	68
3197	4668	-1471	95	69
4576	4668	-92	95	70
4370	4668	-298	95	71
4940	4668	272	96	71
4410	4668	-258	96	72
4280	4668	-388	96	73
3390	4668	-1278	96	74
3560	4668	-1108	96	75
2900	4668	-1768	96	76
4140	4668	-528	96	77
4010	4668	-658	96	78
3700	4668	-968	96	79
3197	4027	-830	96	80
4576	4027	549	97	80
4370	4027	343	98	80
4940	4027	913	99	80
4410	4027	383	100	80
4280	4027	253	101	80
3390	4027	-637	101	81
3560	4027	-467	101	82
2900	4027	-1127	101	83
4140	4027	113	102	83
4010	4027	-17	102	84
3700	4027	-327	102	85
4576	3197	1379	103	85
4370	3197	1173	104	85
4940	3197	1743	105	85
4410	3197	1213	106	85
4280	3197	1083	107	85
3390	3197	193	108	85
3560	3197	363	109	85
2900	3197	-297	109	86
4140	3197	943	110	86
4010	3197	813	111	86
3700	3197	503	112	86
4370	4576	-206	112	87
4940	4576	364	113	87
4410	4576	-166	113	88
4280	4576	-296	113	89
3390	4576	-1186	113	90
3560	4576	-1016	113	91
2900	4576	-1676	113	92
4140	4576	-436	113	93

4010	4576	-566	113	94
3700	4576	-876	113	95
4940	4370	570	114	95
4410	4370	40	115	95
4280	4370	-90	115	96
3390	4370	-980	115	97
3560	4370	-810	115	98
2900	4370	-1470	115	99
4140	4370	-230	115	100
4010	4370	-360	115	101
3700	4370	-670	115	102
4410	4940	-530	115	103
4280	4940	-660	115	104
3390	4940	-1550	115	105
3560	4940	-1380	115	106
2900	4940	-2040	115	107
4140	4940	-800	115	108
4010	4940	-930	115	109
3700	4940	-1240	115	110
4280	4410	-130	115	111
3390	4410	-1020	115	112
3560	4410	-850	115	113
2900	4410	-1510	115	114
4140	4410	-270	115	115
4010	4410	-400	115	116
3700	4410	-710	115	117
3390	4280	-890	115	118
3560	4280	-720	115	119
2900	4280	-1380	115	120
4140	4280	-140	115	121
4010	4280	-270	115	122
3700	4280	-580	115	123
3560	3390	170	116	123
2900	3390	-490	116	124
4140	3390	750	117	124
4010	3390	620	118	124
3700	3390	310	119	124
2900	3560	-660	119	125
4140	3560	580	120	125
4010	3560	450	121	125
3700	3560	140	122	125
4140	2900	1240	123	125
4010	2900	1110	124	125
3700	2900	800	125	125
4010	4140	-130	125	126
3700	4140	-440	125	127
3700	4010	-310	125	128

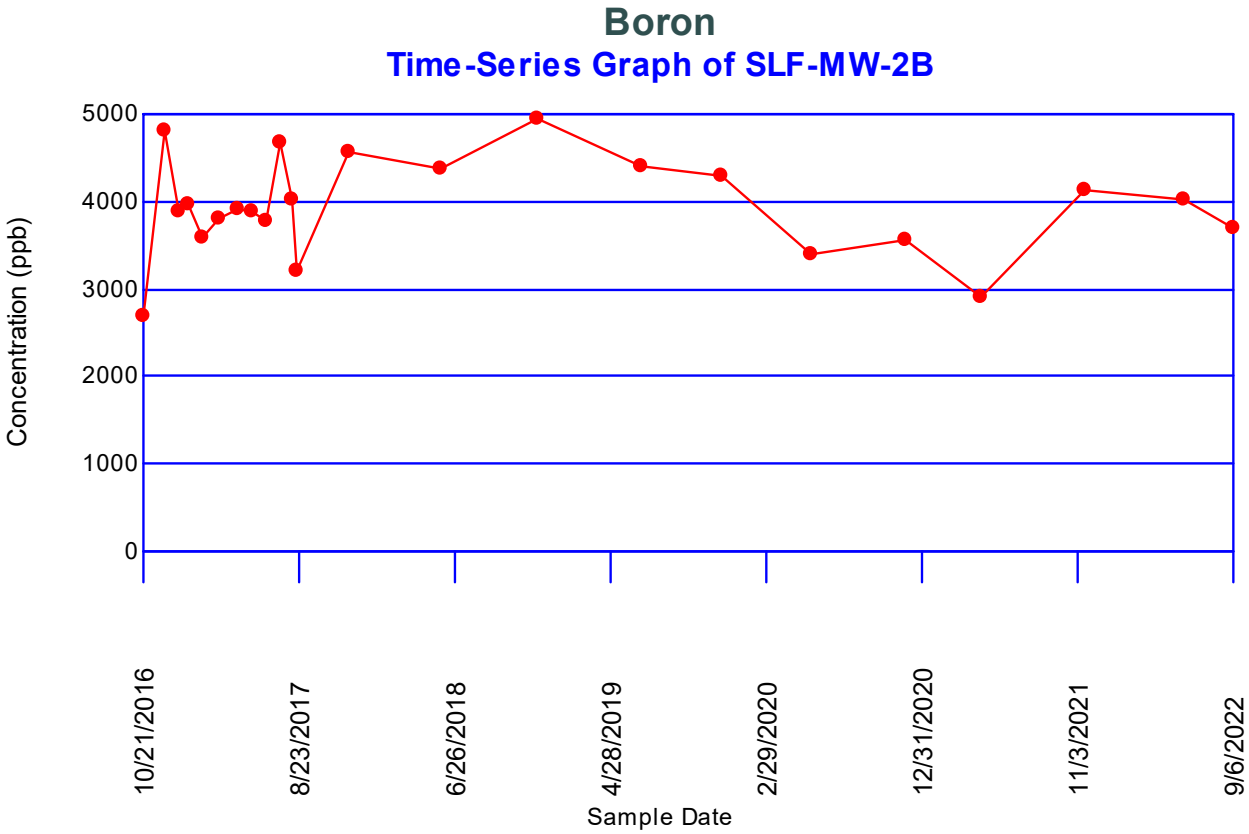
S Statistic = 125 - 128 = -3

Tied Group	Value	Members

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1433.67
Z-Score = -0.0528209
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.0528209| <= 1.97737 indicating no evidence of a trend


Boron
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
5000
4000
3000
2000
1000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Boron

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.29712	0.099982	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	4238.42	FALSE
	11/30/2016	6242.46	FALSE
	12/28/2016	5154.49	FALSE
	1/18/2017	4910.63	FALSE
	2/15/2017	3595.68	FALSE
	3/20/2017	3637.76	FALSE
	4/25/2017	3392.27	FALSE
	5/22/2017	3135.58	FALSE
	6/20/2017	3335.63	FALSE
	7/17/2017	4381	FALSE
	8/7/2017	3684	FALSE
	8/21/2017	3922	FALSE
	11/29/2017	3860	FALSE
	5/30/2018	2650	FALSE
	12/4/2018	3490	FALSE
	6/27/2019	2170	FALSE
	12/2/2019	2220	FALSE
	5/28/2020	1590	FALSE
	12/1/2020	1920	FALSE
	4/28/2021	1410	FALSE
	11/19/2021	1900	FALSE
	5/31/2022	1800	FALSE
	9/6/2022	1760	FALSE

Shapiro-Wilks Test of Normality

Parameter: Boron

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1410	6242.46	4832.46	0.4542	2194.9
2	1590	5154.49	3564.49	0.3126	1114.26
3	1760	4910.63	3150.63	0.2563	807.506
4	1800	4381	2581	0.2139	552.076
5	1900	4238.42	2338.42	0.1787	417.876
6	1920	3922	2002	0.148	296.296
7	2170	3860	1690	0.1201	202.969
8	2220	3684	1464	0.0941	137.762
9	2650	3637.76	987.76	0.0696	68.7481
10	3135.58	3595.68	460.1	0.0459	21.1186
11	3335.63	3490	154.37	0.0228	3.51964
12	3392.27	3392.27	0		
13	3490	3335.63	-154.37		
14	3595.68	3135.58	-460.1		
15	3637.76	2650	-987.76		
16	3684	2220	-1464		
17	3860	2170	-1690		
18	3922	1920	-2002		
19	4238.42	1900	-2338.42		
20	4381	1800	-2581		
21	4910.63	1760	-3150.63		
22	5154.49	1590	-3564.49		
23	6242.46	1410	-4832.46		

Sum of b values = 5817.03
Sample Standard Deviation = 1272.31
W Statistic = 0.950154

5% Critical value of 0.914 is less than 0.950154
Data is normally distributed at 95% level of significance

1% Critical value of 0.881 is less than 0.950154
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Boron

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
6242.46	4238.42	2004.04	1	0
5154.49	4238.42	916.07	2	0
4910.63	4238.42	672.21	3	0
3595.68	4238.42	-642.74	3	1
3637.76	4238.42	-600.66	3	2
3392.27	4238.42	-846.15	3	3
3135.58	4238.42	-1102.84	3	4
3335.63	4238.42	-902.79	3	5
4381	4238.42	142.58	4	5
3684	4238.42	-554.42	4	6
3922	4238.42	-316.42	4	7
3860	4238.42	-378.42	4	8
2650	4238.42	-1588.42	4	9
3490	4238.42	-748.42	4	10
2170	4238.42	-2068.42	4	11
2220	4238.42	-2018.42	4	12
1590	4238.42	-2648.42	4	13
1920	4238.42	-2318.42	4	14
1410	4238.42	-2828.42	4	15
1900	4238.42	-2338.42	4	16
1800	4238.42	-2438.42	4	17
1760	4238.42	-2478.42	4	18
5154.49	6242.46	-1087.97	4	19
4910.63	6242.46	-1331.83	4	20
3595.68	6242.46	-2646.78	4	21
3637.76	6242.46	-2604.7	4	22
3392.27	6242.46	-2850.19	4	23
3135.58	6242.46	-3106.88	4	24
3335.63	6242.46	-2906.83	4	25
4381	6242.46	-1861.46	4	26
3684	6242.46	-2558.46	4	27
3922	6242.46	-2320.46	4	28
3860	6242.46	-2382.46	4	29
2650	6242.46	-3592.46	4	30
3490	6242.46	-2752.46	4	31
2170	6242.46	-4072.46	4	32
2220	6242.46	-4022.46	4	33
1590	6242.46	-4652.46	4	34
1920	6242.46	-4322.46	4	35
1410	6242.46	-4832.46	4	36
1900	6242.46	-4342.46	4	37
1800	6242.46	-4442.46	4	38
1760	6242.46	-4482.46	4	39
4910.63	5154.49	-243.86	4	40
3595.68	5154.49	-1558.81	4	41

3637.76	5154.49	-1516.73	4	42
3392.27	5154.49	-1762.22	4	43
3135.58	5154.49	-2018.91	4	44
3335.63	5154.49	-1818.86	4	45
4381	5154.49	-773.49	4	46
3684	5154.49	-1470.49	4	47
3922	5154.49	-1232.49	4	48
3860	5154.49	-1294.49	4	49
2650	5154.49	-2504.49	4	50
3490	5154.49	-1664.49	4	51
2170	5154.49	-2984.49	4	52
2220	5154.49	-2934.49	4	53
1590	5154.49	-3564.49	4	54
1920	5154.49	-3234.49	4	55
1410	5154.49	-3744.49	4	56
1900	5154.49	-3254.49	4	57
1800	5154.49	-3354.49	4	58
1760	5154.49	-3394.49	4	59
3595.68	4910.63	-1314.95	4	60
3637.76	4910.63	-1272.87	4	61
3392.27	4910.63	-1518.36	4	62
3135.58	4910.63	-1775.05	4	63
3335.63	4910.63	-1575	4	64
4381	4910.63	-529.63	4	65
3684	4910.63	-1226.63	4	66
3922	4910.63	-988.63	4	67
3860	4910.63	-1050.63	4	68
2650	4910.63	-2260.63	4	69
3490	4910.63	-1420.63	4	70
2170	4910.63	-2740.63	4	71
2220	4910.63	-2690.63	4	72
1590	4910.63	-3320.63	4	73
1920	4910.63	-2990.63	4	74
1410	4910.63	-3500.63	4	75
1900	4910.63	-3010.63	4	76
1800	4910.63	-3110.63	4	77
1760	4910.63	-3150.63	4	78
3637.76	3595.68	42.08	5	78
3392.27	3595.68	-203.41	5	79
3135.58	3595.68	-460.1	5	80
3335.63	3595.68	-260.05	5	81
4381	3595.68	785.32	6	81
3684	3595.68	88.32	7	81
3922	3595.68	326.32	8	81
3860	3595.68	264.32	9	81
2650	3595.68	-945.68	9	82
3490	3595.68	-105.68	9	83
2170	3595.68	-1425.68	9	84
2220	3595.68	-1375.68	9	85
1590	3595.68	-2005.68	9	86
1920	3595.68	-1675.68	9	87
1410	3595.68	-2185.68	9	88
1900	3595.68	-1695.68	9	89
1800	3595.68	-1795.68	9	90
1760	3595.68	-1835.68	9	91

3392.27	3637.76	-245.49	9	92
3135.58	3637.76	-502.18	9	93
3335.63	3637.76	-302.13	9	94
4381	3637.76	743.24	10	94
3684	3637.76	46.24	11	94
3922	3637.76	284.24	12	94
3860	3637.76	222.24	13	94
2650	3637.76	-987.76	13	95
3490	3637.76	-147.76	13	96
2170	3637.76	-1467.76	13	97
2220	3637.76	-1417.76	13	98
1590	3637.76	-2047.76	13	99
1920	3637.76	-1717.76	13	100
1410	3637.76	-2227.76	13	101
1900	3637.76	-1737.76	13	102
1800	3637.76	-1837.76	13	103
1760	3637.76	-1877.76	13	104
3135.58	3392.27	-256.69	13	105
3335.63	3392.27	-56.64	13	106
4381	3392.27	988.73	14	106
3684	3392.27	291.73	15	106
3922	3392.27	529.73	16	106
3860	3392.27	467.73	17	106
2650	3392.27	-742.27	17	107
3490	3392.27	97.73	18	107
2170	3392.27	-1222.27	18	108
2220	3392.27	-1172.27	18	109
1590	3392.27	-1802.27	18	110
1920	3392.27	-1472.27	18	111
1410	3392.27	-1982.27	18	112
1900	3392.27	-1492.27	18	113
1800	3392.27	-1592.27	18	114
1760	3392.27	-1632.27	18	115
3335.63	3135.58	200.05	19	115
4381	3135.58	1245.42	20	115
3684	3135.58	548.42	21	115
3922	3135.58	786.42	22	115
3860	3135.58	724.42	23	115
2650	3135.58	-485.58	23	116
3490	3135.58	354.42	24	116
2170	3135.58	-965.58	24	117
2220	3135.58	-915.58	24	118
1590	3135.58	-1545.58	24	119
1920	3135.58	-1215.58	24	120
1410	3135.58	-1725.58	24	121
1900	3135.58	-1235.58	24	122
1800	3135.58	-1335.58	24	123
1760	3135.58	-1375.58	24	124
4381	3335.63	1045.37	25	124
3684	3335.63	348.37	26	124
3922	3335.63	586.37	27	124
3860	3335.63	524.37	28	124
2650	3335.63	-685.63	28	125

3490	3335.63	154.37	29	125
2170	3335.63	-1165.63	29	126
2220	3335.63	-1115.63	29	127
1590	3335.63	-1745.63	29	128
1920	3335.63	-1415.63	29	129
1410	3335.63	-1925.63	29	130
1900	3335.63	-1435.63	29	131
1800	3335.63	-1535.63	29	132
1760	3335.63	-1575.63	29	133
3684	4381	-697	29	134
3922	4381	-459	29	135
3860	4381	-521	29	136
2650	4381	-1731	29	137
3490	4381	-891	29	138
2170	4381	-2211	29	139
2220	4381	-2161	29	140
1590	4381	-2791	29	141
1920	4381	-2461	29	142
1410	4381	-2971	29	143
1900	4381	-2481	29	144
1800	4381	-2581	29	145
1760	4381	-2621	29	146
3922	3684	238	30	146
3860	3684	176	31	146
2650	3684	-1034	31	147
3490	3684	-194	31	148
2170	3684	-1514	31	149
2220	3684	-1464	31	150
1590	3684	-2094	31	151
1920	3684	-1764	31	152
1410	3684	-2274	31	153
1900	3684	-1784	31	154
1800	3684	-1884	31	155
1760	3684	-1924	31	156
3860	3922	-62	31	157
2650	3922	-1272	31	158
3490	3922	-432	31	159
2170	3922	-1752	31	160
2220	3922	-1702	31	161
1590	3922	-2332	31	162
1920	3922	-2002	31	163
1410	3922	-2512	31	164
1900	3922	-2022	31	165
1800	3922	-2122	31	166
1760	3922	-2162	31	167
2650	3860	-1210	31	168
3490	3860	-370	31	169
2170	3860	-1690	31	170
2220	3860	-1640	31	171
1590	3860	-2270	31	172
1920	3860	-1940	31	173
1410	3860	-2450	31	174
1900	3860	-1960	31	175

1800	3860	-2060	31	176
1760	3860	-2100	31	177
3490	2650	840	32	177
2170	2650	-480	32	178
2220	2650	-430	32	179
1590	2650	-1060	32	180
1920	2650	-730	32	181
1410	2650	-1240	32	182
1900	2650	-750	32	183
1800	2650	-850	32	184
1760	2650	-890	32	185
2170	3490	-1320	32	186
2220	3490	-1270	32	187
1590	3490	-1900	32	188
1920	3490	-1570	32	189
1410	3490	-2080	32	190
1900	3490	-1590	32	191
1800	3490	-1690	32	192
1760	3490	-1730	32	193
2220	2170	50	33	193
1590	2170	-580	33	194
1920	2170	-250	33	195
1410	2170	-760	33	196
1900	2170	-270	33	197
1800	2170	-370	33	198
1760	2170	-410	33	199
1590	2220	-630	33	200
1920	2220	-300	33	201
1410	2220	-810	33	202
1900	2220	-320	33	203
1800	2220	-420	33	204
1760	2220	-460	33	205
1920	1590	330	34	205
1410	1590	-180	34	206
1900	1590	310	35	206
1800	1590	210	36	206
1760	1590	170	37	206
1410	1920	-510	37	207
1900	1920	-20	37	208
1800	1920	-120	37	209
1760	1920	-160	37	210
1900	1410	490	38	210
1800	1410	390	39	210
1760	1410	350	40	210
1800	1900	-100	40	211
1760	1900	-140	40	212
1760	1800	-40	40	213

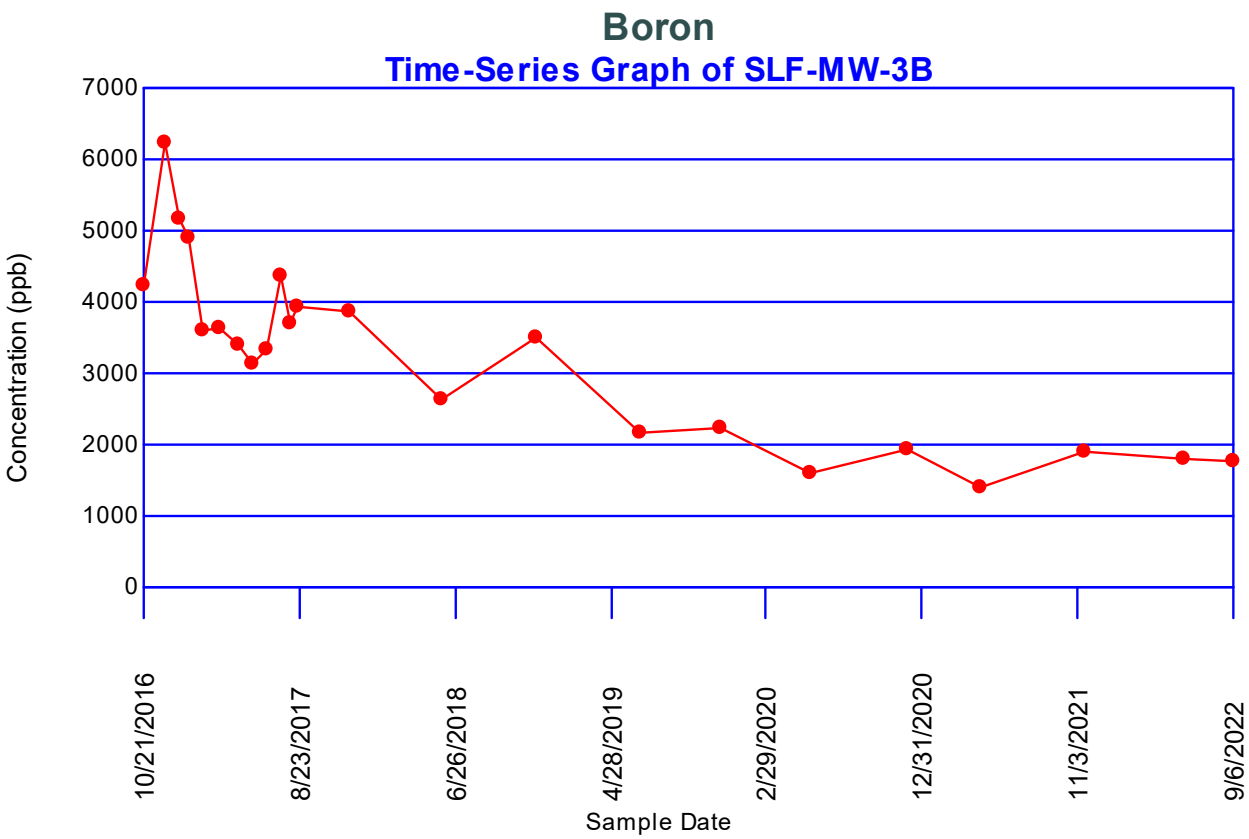
S Statistic = 40 - 213 = -173

Tied Group	Value	Members

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1433.67
Z-Score = -4.5426
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-4.5426| > 1.97737 indicating a trend


Boron
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
7000
6000
5000
4000
3000
2000
1000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Boron

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 19 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.39646	0.170316	0.462	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	493.993	FALSE
	3/20/2017	345.223	FALSE
	4/25/2017	314.115	FALSE
	5/22/2017	270.744	FALSE
	6/20/2017	438.039	FALSE
	7/17/2017	550	FALSE
	8/7/2017	363	FALSE
	8/22/2017	461	FALSE
	11/29/2017	524	FALSE
	5/30/2018	517	FALSE
	12/4/2018	395	FALSE
	6/28/2019	631	FALSE
	12/2/2019	653	FALSE
	5/28/2020	220	FALSE
	11/30/2020	290	FALSE
	4/28/2021	431	FALSE
	11/19/2021	621	FALSE
	5/31/2022	469	FALSE
	9/6/2022	855	FALSE

Shapiro-Wilks Test of Normality

Parameter: Boron

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 9 for 19 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	220	855	635	0.4808	305.308
2	270.744	653	382.256	0.3232	123.545
3	290	631	341	0.2561	87.3301
4	314.115	621	306.885	0.2059	63.1876
5	345.223	550	204.777	0.1641	33.6039
6	363	524	161	0.1271	20.4631
7	395	517	122	0.0932	11.3704
8	431	493.993	62.993	0.0612	3.85517
9	438.039	469	30.961	0.0303	0.938118
10	461	461	0		
11	469	438.039	-30.961		
12	493.993	431	-62.993		
13	517	395	-122		
14	524	363	-161		
15	550	345.223	-204.777		
16	621	314.115	-306.885		
17	631	290	-341		
18	653	270.744	-382.256		
19	855	220	-635		

Sum of b values = 649.602
Sample Standard Deviation = 155.689
W Statistic = 0.967181

5% Critical value of 0.901 is less than 0.967181
Data is normally distributed at 95% level of significance

1% Critical value of 0.863 is less than 0.967181
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Boron

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
345.223	493.993	-148.77	0	1
314.115	493.993	-179.878	0	2
270.744	493.993	-223.249	0	3
438.039	493.993	-55.954	0	4
550	493.993	56.007	1	4
363	493.993	-130.993	1	5
461	493.993	-32.993	1	6
524	493.993	30.007	2	6
517	493.993	23.007	3	6
395	493.993	-98.993	3	7
631	493.993	137.007	4	7
653	493.993	159.007	5	7
220	493.993	-273.993	5	8
290	493.993	-203.993	5	9
431	493.993	-62.993	5	10
621	493.993	127.007	6	10
469	493.993	-24.993	6	11
855	493.993	361.007	7	11
314.115	345.223	-31.108	7	12
270.744	345.223	-74.479	7	13
438.039	345.223	92.816	8	13
550	345.223	204.777	9	13
363	345.223	17.777	10	13
461	345.223	115.777	11	13
524	345.223	178.777	12	13
517	345.223	171.777	13	13
395	345.223	49.777	14	13
631	345.223	285.777	15	13
653	345.223	307.777	16	13
220	345.223	-125.223	16	14
290	345.223	-55.223	16	15
431	345.223	85.777	17	15
621	345.223	275.777	18	15
469	345.223	123.777	19	15
855	345.223	509.777	20	15
270.744	314.115	-43.371	20	16
438.039	314.115	123.924	21	16
550	314.115	235.885	22	16
363	314.115	48.885	23	16
461	314.115	146.885	24	16
524	314.115	209.885	25	16
517	314.115	202.885	26	16
395	314.115	80.885	27	16
631	314.115	316.885	28	16
653	314.115	338.885	29	16

220	314.115	-94.115	29	17
290	314.115	-24.115	29	18
431	314.115	116.885	30	18
621	314.115	306.885	31	18
469	314.115	154.885	32	18
855	314.115	540.885	33	18
438.039	270.744	167.295	34	18
550	270.744	279.256	35	18
363	270.744	92.256	36	18
461	270.744	190.256	37	18
524	270.744	253.256	38	18
517	270.744	246.256	39	18
395	270.744	124.256	40	18
631	270.744	360.256	41	18
653	270.744	382.256	42	18
220	270.744	-50.744	42	19
290	270.744	19.256	43	19
431	270.744	160.256	44	19
621	270.744	350.256	45	19
469	270.744	198.256	46	19
855	270.744	584.256	47	19
550	438.039	111.961	48	19
363	438.039	-75.039	48	20
461	438.039	22.961	49	20
524	438.039	85.961	50	20
517	438.039	78.961	51	20
395	438.039	-43.039	51	21
631	438.039	192.961	52	21
653	438.039	214.961	53	21
220	438.039	-218.039	53	22
290	438.039	-148.039	53	23
431	438.039	-7.039	53	24
621	438.039	182.961	54	24
469	438.039	30.961	55	24
855	438.039	416.961	56	24
363	550	-187	56	25
461	550	-89	56	26
524	550	-26	56	27
517	550	-33	56	28
395	550	-155	56	29
631	550	81	57	29
653	550	103	58	29
220	550	-330	58	30
290	550	-260	58	31
431	550	-119	58	32
621	550	71	59	32
469	550	-81	59	33
855	550	305	60	33
461	363	98	61	33
524	363	161	62	33
517	363	154	63	33
395	363	32	64	33
631	363	268	65	33

653	363	290	66	33
220	363	-143	66	34
290	363	-73	66	35
431	363	68	67	35
621	363	258	68	35
469	363	106	69	35
855	363	492	70	35
524	461	63	71	35
517	461	56	72	35
395	461	-66	72	36
631	461	170	73	36
653	461	192	74	36
220	461	-241	74	37
290	461	-171	74	38
431	461	-30	74	39
621	461	160	75	39
469	461	8	76	39
855	461	394	77	39
517	524	-7	77	40
395	524	-129	77	41
631	524	107	78	41
653	524	129	79	41
220	524	-304	79	42
290	524	-234	79	43
431	524	-93	79	44
621	524	97	80	44
469	524	-55	80	45
855	524	331	81	45
395	517	-122	81	46
631	517	114	82	46
653	517	136	83	46
220	517	-297	83	47
290	517	-227	83	48
431	517	-86	83	49
621	517	104	84	49
469	517	-48	84	50
855	517	338	85	50
631	395	236	86	50
653	395	258	87	50
220	395	-175	87	51
290	395	-105	87	52
431	395	36	88	52
621	395	226	89	52
469	395	74	90	52
855	395	460	91	52
653	631	22	92	52
220	631	-411	92	53
290	631	-341	92	54
431	631	-200	92	55
621	631	-10	92	56
469	631	-162	92	57
855	631	224	93	57

220	653	-433	93	58
290	653	-363	93	59
431	653	-222	93	60
621	653	-32	93	61
469	653	-184	93	62
855	653	202	94	62
290	220	70	95	62
431	220	211	96	62
621	220	401	97	62
469	220	249	98	62
855	220	635	99	62
431	290	141	100	62
621	290	331	101	62
469	290	179	102	62
855	290	565	103	62
621	431	190	104	62
469	431	38	105	62
855	431	424	106	62
469	621	-152	106	63
855	621	234	107	63
855	469	386	108	63

S Statistic = 108 - 63 = 45

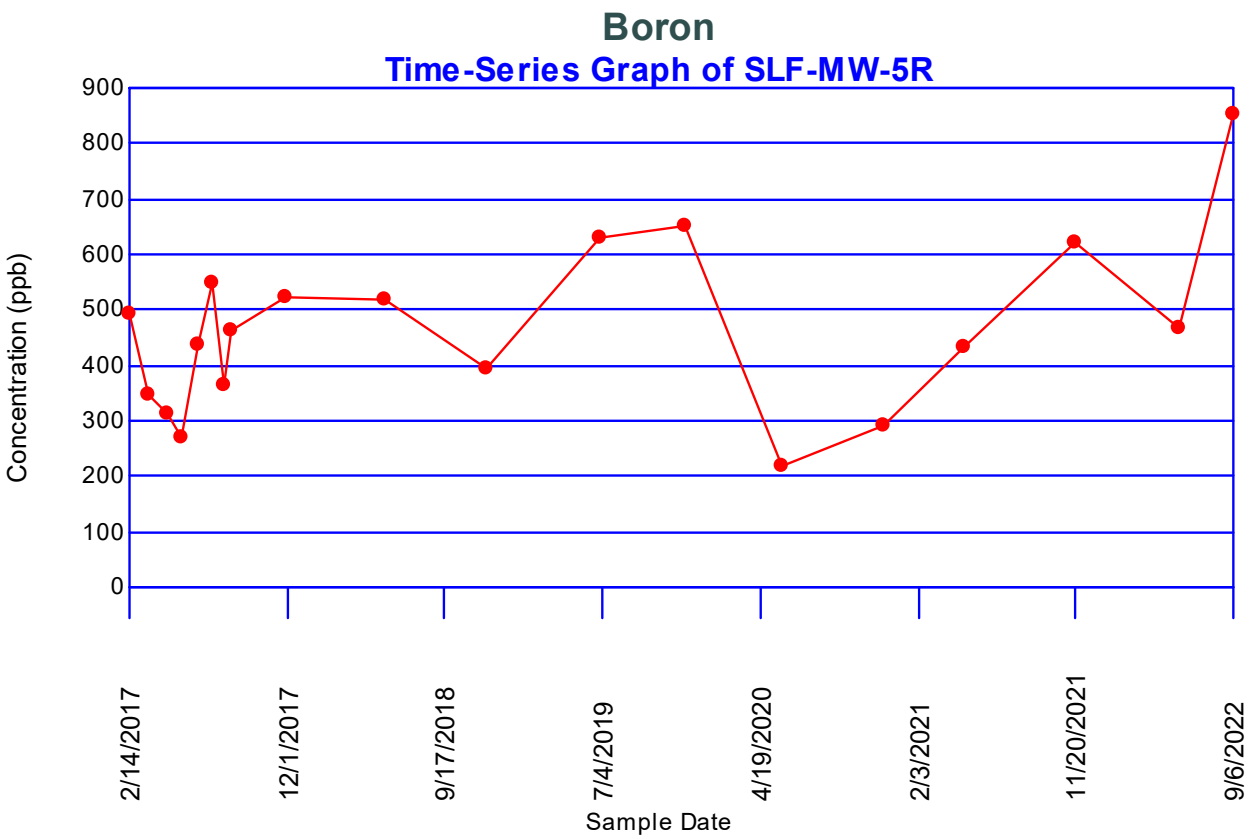
Tied Group	Value	Members

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0

C = 0
D = 0
E = 0
F = 0
a = 14706
b = 52326
c = 684
Group Variance = 817
Z-Score = 1.53937
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.53937| <= 1.97737 indicating no evidence of a trend


Boron
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
900
800
700
600
500
400
300
200
100
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 68
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	24	0 (0%)	10/21/2016	37032.2	37032.2
			11/30/2016	61315.7	61315.7
			12/28/2016	44056.6	44056.6
			1/18/2017	35837.4	35837.4
			2/14/2017	37524.8	37524.8
			3/20/2017	38622.7	38622.7
			4/25/2017	39897.3	39897.3
			5/22/2017	43737.6	43737.6
			6/20/2017	34857	34857
			7/17/2017	33220	33220
			8/8/2017	30756	30756
			8/21/2017	31548	31548
			11/29/2017	37641	37641
			3/8/2018	47865	47865
			5/31/2018	44100	44100
			12/4/2018	48600	48600
			6/28/2019	43600	43600
			12/2/2019	49100	49100
			5/28/2020	47400	47400
			11/30/2020	44100	44100
			4/28/2021	41200	41200
			11/19/2021	42500	42500
			5/31/2022	76400	76400
			9/6/2022	110000	110000
			11/21/2022	**86500**	**86500**
SLF-MW-3B	24	0 (0%)	10/21/2016	184501	184501
			11/30/2016	249120	249120
			12/28/2016	254980	254980
			1/18/2017	228148	228148
			2/15/2017	188140	188140
			3/20/2017	191435	191435
			4/25/2017	188976	188976
			5/22/2017	229431	229431
			6/20/2017	213067	213067
			7/17/2017	220459	220459
			8/7/2017	208907	208907
			8/21/2017	235062	235062
			11/29/2017	204990	204990
			3/8/2018	173000	173000
			5/30/2018	171000	171000

			12/4/2018	200000	200000
			6/27/2019	172000	172000
			12/2/2019	179000	179000
			5/28/2020	138000	138000
			12/1/2020	167000	167000
			4/28/2021	143000	143000
			11/19/2021	176000	176000
			5/31/2022	200000	200000
			9/6/2022	182000	182000
			11/21/2022	**170000**	**170000**
SLF-MW-5R	20	0 (0%)	2/14/2017	107763	107763
			3/20/2017	104972	104972
			4/25/2017	101443	101443
			5/22/2017	118938	118938
			6/20/2017	120726	120726
			7/17/2017	123508	123508
			8/7/2017	115159	115159
			8/22/2017	123970	123970
			11/29/2017	136418	136418
			3/8/2018	105000	105000
			5/30/2018	118000	118000
			12/4/2018	114000	114000
			6/28/2019	126000	126000
			12/2/2019	130000	130000
			5/28/2020	99100	99100
			11/30/2020	85100	85100
			4/28/2021	115000	115000
			11/19/2021	135000	135000
			5/31/2022	123000	123000
			9/6/2022	157000	157000
			11/21/2022	**152000**	**152000**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Calcium

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.634075	0.0806291	0.413	110000
2	0.632237	0.134322	0.421	76400
3	0.452585	0.138086	0.43	61315.7
4	0.0777708	0.144018	0.44	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	37032.2	FALSE
	11/30/2016	**61315.7**	**TRUE**
	12/28/2016	44056.6	FALSE
	1/18/2017	35837.4	FALSE
	2/14/2017	37524.8	FALSE
	3/20/2017	38622.7	FALSE
	4/25/2017	39897.3	FALSE
	5/22/2017	43737.6	FALSE
	6/20/2017	34857	FALSE
	7/17/2017	33220	FALSE
	8/8/2017	30756	FALSE
	8/21/2017	31548	FALSE
	11/29/2017	37641	FALSE
	3/8/2018	47865	FALSE
	5/31/2018	44100	FALSE
	12/4/2018	48600	FALSE
	6/28/2019	43600	FALSE
	12/2/2019	49100	FALSE
	5/28/2020	47400	FALSE
	11/30/2020	44100	FALSE
	4/28/2021	41200	FALSE
	11/19/2021	42500	FALSE
	5/31/2022	**76400**	**TRUE**
	9/6/2022	**110000**	**TRUE**

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	30756	110000	79244	0.4493	35604.3
2	31548	76400	44852	0.3098	13895.1
3	33220	61315.7	28095.7	0.2554	7175.64
4	34857	49100	14243	0.2145	3055.12
5	35837.4	48600	12762.6	0.1807	2306.2
6	37032.2	47865	10832.8	0.1512	1637.92
7	37524.8	47400	9875.2	0.1245	1229.46
8	37641	44100	6459	0.0997	643.962
9	38622.7	44100	5477.3	0.0764	418.466
10	39897.3	44056.6	4159.3	0.0539	224.186
11	41200	43737.6	2537.6	0.0321	81.457
12	42500	43600	1100	0.0107	11.77
13	43600	42500	-1100		
14	43737.6	41200	-2537.6		
15	44056.6	39897.3	-4159.3		
16	44100	38622.7	-5477.3		
17	44100	37641	-6459		
18	47400	37524.8	-9875.2		
19	47865	37032.2	-10832.8		
20	48600	35837.4	-12762.6		
21	49100	34857	-14243		
22	61315.7	33220	-28095.7		
23	76400	31548	-44852		
24	110000	30756	-79244		

Sum of b values = 66283.7
Sample Standard Deviation = 16783.9
W Statistic = 0.678106

5% Critical value of 0.916 exceeds 0.678106
Evidence of non-normality at 95% level of significance

1% Critical value of 0.884 exceeds 0.678106
Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Calcium

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
61315.7	37032.2	24283.5	1	0
44056.6	37032.2	7024.4	2	0
35837.4	37032.2	-1194.8	2	1
37524.8	37032.2	492.6	3	1
38622.7	37032.2	1590.5	4	1
39897.3	37032.2	2865.1	5	1
43737.6	37032.2	6705.4	6	1
34857	37032.2	-2175.2	6	2
33220	37032.2	-3812.2	6	3
30756	37032.2	-6276.2	6	4
31548	37032.2	-5484.2	6	5
37641	37032.2	608.8	7	5
47865	37032.2	10832.8	8	5
44100	37032.2	7067.8	9	5
48600	37032.2	11567.8	10	5
43600	37032.2	6567.8	11	5
49100	37032.2	12067.8	12	5
47400	37032.2	10367.8	13	5
44100	37032.2	7067.8	14	5
41200	37032.2	4167.8	15	5
42500	37032.2	5467.8	16	5
76400	37032.2	39367.8	17	5
110000	37032.2	72967.8	18	5
44056.6	61315.7	-17259.1	18	6
35837.4	61315.7	-25478.3	18	7
37524.8	61315.7	-23790.9	18	8
38622.7	61315.7	-22693	18	9
39897.3	61315.7	-21418.4	18	10
43737.6	61315.7	-17578.1	18	11
34857	61315.7	-26458.7	18	12
33220	61315.7	-28095.7	18	13
30756	61315.7	-30559.7	18	14
31548	61315.7	-29767.7	18	15
37641	61315.7	-23674.7	18	16
47865	61315.7	-13450.7	18	17
44100	61315.7	-17215.7	18	18
48600	61315.7	-12715.7	18	19
43600	61315.7	-17715.7	18	20
49100	61315.7	-12215.7	18	21
47400	61315.7	-13915.7	18	22
44100	61315.7	-17215.7	18	23
41200	61315.7	-20115.7	18	24
42500	61315.7	-18815.7	18	25
76400	61315.7	15084.3	19	25
110000	61315.7	48684.3	20	25

35837.4	44056.6	-8219.2	20	26
37524.8	44056.6	-6531.8	20	27
38622.7	44056.6	-5433.9	20	28
39897.3	44056.6	-4159.3	20	29
43737.6	44056.6	-319	20	30
34857	44056.6	-9199.6	20	31
33220	44056.6	-10836.6	20	32
30756	44056.6	-13300.6	20	33
31548	44056.6	-12508.6	20	34
37641	44056.6	-6415.6	20	35
47865	44056.6	3808.4	21	35
44100	44056.6	43.4	22	35
48600	44056.6	4543.4	23	35
43600	44056.6	-456.6	23	36
49100	44056.6	5043.4	24	36
47400	44056.6	3343.4	25	36
44100	44056.6	43.4	26	36
41200	44056.6	-2856.6	26	37
42500	44056.6	-1556.6	26	38
76400	44056.6	32343.4	27	38
110000	44056.6	65943.4	28	38
37524.8	35837.4	1687.4	29	38
38622.7	35837.4	2785.3	30	38
39897.3	35837.4	4059.9	31	38
43737.6	35837.4	7900.2	32	38
34857	35837.4	-980.4	32	39
33220	35837.4	-2617.4	32	40
30756	35837.4	-5081.4	32	41
31548	35837.4	-4289.4	32	42
37641	35837.4	1803.6	33	42
47865	35837.4	12027.6	34	42
44100	35837.4	8262.6	35	42
48600	35837.4	12762.6	36	42
43600	35837.4	7762.6	37	42
49100	35837.4	13262.6	38	42
47400	35837.4	11562.6	39	42
44100	35837.4	8262.6	40	42
41200	35837.4	5362.6	41	42
42500	35837.4	6662.6	42	42
76400	35837.4	40562.6	43	42
110000	35837.4	74162.6	44	42
38622.7	37524.8	1097.9	45	42
39897.3	37524.8	2372.5	46	42
43737.6	37524.8	6212.8	47	42
34857	37524.8	-2667.8	47	43
33220	37524.8	-4304.8	47	44
30756	37524.8	-6768.8	47	45
31548	37524.8	-5976.8	47	46
37641	37524.8	116.2	48	46
47865	37524.8	10340.2	49	46
44100	37524.8	6575.2	50	46
48600	37524.8	11075.2	51	46
43600	37524.8	6075.2	52	46
49100	37524.8	11575.2	53	46
47400	37524.8	9875.2	54	46

44100	37524.8	6575.2	55	46
41200	37524.8	3675.2	56	46
42500	37524.8	4975.2	57	46
76400	37524.8	38875.2	58	46
110000	37524.8	72475.2	59	46
39897.3	38622.7	1274.6	60	46
43737.6	38622.7	5114.9	61	46
34857	38622.7	-3765.7	61	47
33220	38622.7	-5402.7	61	48
30756	38622.7	-7866.7	61	49
31548	38622.7	-7074.7	61	50
37641	38622.7	-981.7	61	51
47865	38622.7	9242.3	62	51
44100	38622.7	5477.3	63	51
48600	38622.7	9977.3	64	51
43600	38622.7	4977.3	65	51
49100	38622.7	10477.3	66	51
47400	38622.7	8777.3	67	51
44100	38622.7	5477.3	68	51
41200	38622.7	2577.3	69	51
42500	38622.7	3877.3	70	51
76400	38622.7	37777.3	71	51
110000	38622.7	71377.3	72	51
43737.6	39897.3	3840.3	73	51
34857	39897.3	-5040.3	73	52
33220	39897.3	-6677.3	73	53
30756	39897.3	-9141.3	73	54
31548	39897.3	-8349.3	73	55
37641	39897.3	-2256.3	73	56
47865	39897.3	7967.7	74	56
44100	39897.3	4202.7	75	56
48600	39897.3	8702.7	76	56
43600	39897.3	3702.7	77	56
49100	39897.3	9202.7	78	56
47400	39897.3	7502.7	79	56
44100	39897.3	4202.7	80	56
41200	39897.3	1302.7	81	56
42500	39897.3	2602.7	82	56
76400	39897.3	36502.7	83	56
110000	39897.3	70102.7	84	56
34857	43737.6	-8880.6	84	57
33220	43737.6	-10517.6	84	58
30756	43737.6	-12981.6	84	59
31548	43737.6	-12189.6	84	60
37641	43737.6	-6096.6	84	61
47865	43737.6	4127.4	85	61
44100	43737.6	362.4	86	61
48600	43737.6	4862.4	87	61
43600	43737.6	-137.6	87	62
49100	43737.6	5362.4	88	62
47400	43737.6	3662.4	89	62
44100	43737.6	362.4	90	62
41200	43737.6	-2537.6	90	63
42500	43737.6	-1237.6	90	64

76400	43737.6	32662.4	91	64
110000	43737.6	66262.4	92	64
33220	34857	-1637	92	65
30756	34857	-4101	92	66
31548	34857	-3309	92	67
37641	34857	2784	93	67
47865	34857	13008	94	67
44100	34857	9243	95	67
48600	34857	13743	96	67
43600	34857	8743	97	67
49100	34857	14243	98	67
47400	34857	12543	99	67
44100	34857	9243	100	67
41200	34857	6343	101	67
42500	34857	7643	102	67
76400	34857	41543	103	67
110000	34857	75143	104	67
30756	33220	-2464	104	68
31548	33220	-1672	104	69
37641	33220	4421	105	69
47865	33220	14645	106	69
44100	33220	10880	107	69
48600	33220	15380	108	69
43600	33220	10380	109	69
49100	33220	15880	110	69
47400	33220	14180	111	69
44100	33220	10880	112	69
41200	33220	7980	113	69
42500	33220	9280	114	69
76400	33220	43180	115	69
110000	33220	76780	116	69
31548	30756	792	117	69
37641	30756	6885	118	69
47865	30756	17109	119	69
44100	30756	13344	120	69
48600	30756	17844	121	69
43600	30756	12844	122	69
49100	30756	18344	123	69
47400	30756	16644	124	69
44100	30756	13344	125	69
41200	30756	10444	126	69
42500	30756	11744	127	69
76400	30756	45644	128	69
110000	30756	79244	129	69
37641	31548	6093	130	69
47865	31548	16317	131	69
44100	31548	12552	132	69
48600	31548	17052	133	69
43600	31548	12052	134	69
49100	31548	17552	135	69
47400	31548	15852	136	69
44100	31548	12552	137	69
41200	31548	9652	138	69

42500	31548	10952	139	69
76400	31548	44852	140	69
110000	31548	78452	141	69
47865	37641	10224	142	69
44100	37641	6459	143	69
48600	37641	10959	144	69
43600	37641	5959	145	69
49100	37641	11459	146	69
47400	37641	9759	147	69
44100	37641	6459	148	69
41200	37641	3559	149	69
42500	37641	4859	150	69
76400	37641	38759	151	69
110000	37641	72359	152	69
44100	47865	-3765	152	70
48600	47865	735	153	70
43600	47865	-4265	153	71
49100	47865	1235	154	71
47400	47865	-465	154	72
44100	47865	-3765	154	73
41200	47865	-6665	154	74
42500	47865	-5365	154	75
76400	47865	28535	155	75
110000	47865	62135	156	75
48600	44100	4500	157	75
43600	44100	-500	157	76
49100	44100	5000	158	76
47400	44100	3300	159	76
44100	44100	0	159	76
41200	44100	-2900	159	77
42500	44100	-1600	159	78
76400	44100	32300	160	78
110000	44100	65900	161	78
43600	48600	-5000	161	79
49100	48600	500	162	79
47400	48600	-1200	162	80
44100	48600	-4500	162	81
41200	48600	-7400	162	82
42500	48600	-6100	162	83
76400	48600	27800	163	83
110000	48600	61400	164	83
49100	43600	5500	165	83
47400	43600	3800	166	83
44100	43600	500	167	83
41200	43600	-2400	167	84
42500	43600	-1100	167	85
76400	43600	32800	168	85
110000	43600	66400	169	85
47400	49100	-1700	169	86
44100	49100	-5000	169	87
41200	49100	-7900	169	88

42500	49100	-6600	169	89
76400	49100	27300	170	89
110000	49100	60900	171	89
44100	47400	-3300	171	90
41200	47400	-6200	171	91
42500	47400	-4900	171	92
76400	47400	29000	172	92
110000	47400	62600	173	92
41200	44100	-2900	173	93
42500	44100	-1600	173	94
76400	44100	32300	174	94
110000	44100	65900	175	94
42500	41200	1300	176	94
76400	41200	35200	177	94
110000	41200	68800	178	94
76400	42500	33900	179	94
110000	42500	67500	180	94
110000	76400	33600	181	94

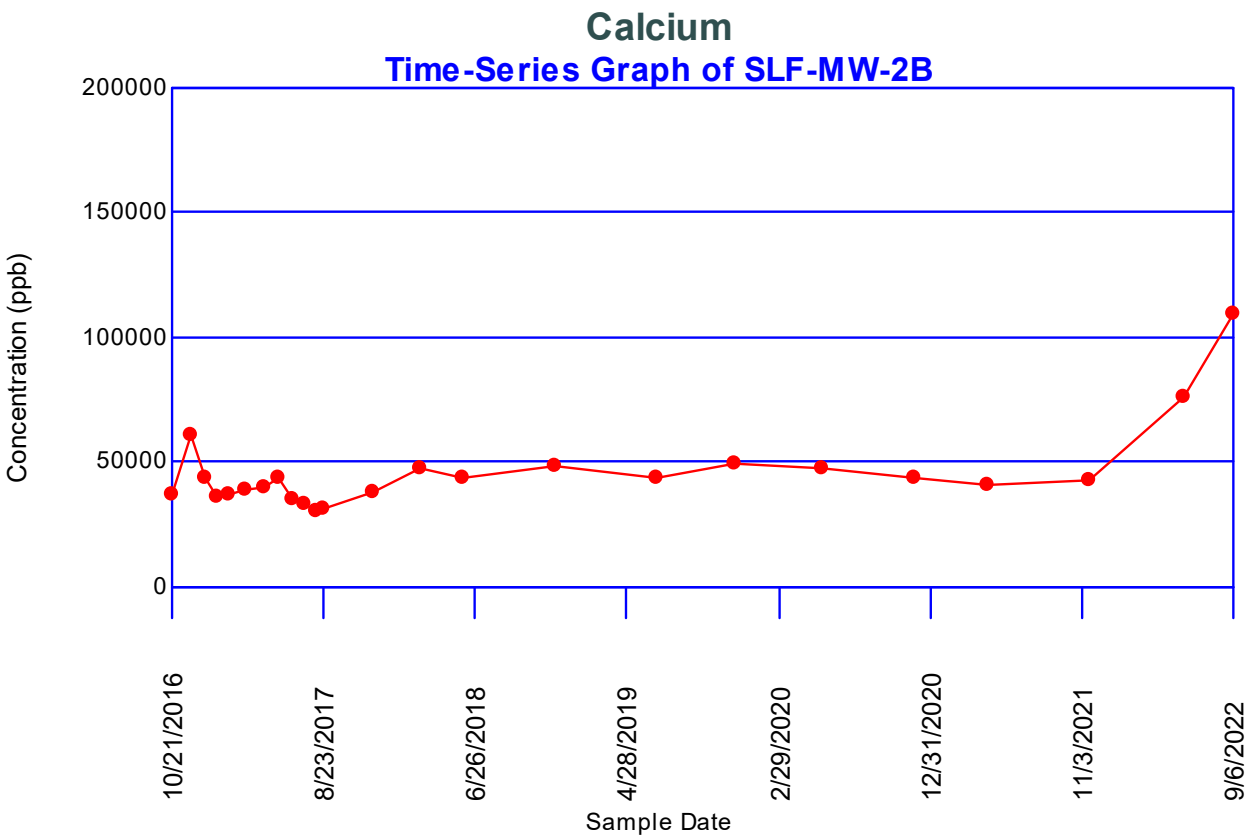
S Statistic = 181 - 94 = 87

Tied Group	Value	Members
1	44100	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1624.33
Z-Score = 2.13384
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|2.13384| > 1.97737 indicating a trend


Calcium
Time-Series Graph of SLF-MW-2B
200000
150000
100000
50000
0
Concentration (ppb)
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Calcium

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.226392	0.298778	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	184501	FALSE
	11/30/2016	249120	FALSE
	12/28/2016	254980	FALSE
	1/18/2017	228148	FALSE
	2/15/2017	188140	FALSE
	3/20/2017	191435	FALSE
	4/25/2017	188976	FALSE
	5/22/2017	229431	FALSE
	6/20/2017	213067	FALSE
	7/17/2017	220459	FALSE
	8/7/2017	208907	FALSE
	8/21/2017	235062	FALSE
	11/29/2017	204990	FALSE
	3/8/2018	173000	FALSE
	5/30/2018	171000	FALSE
	12/4/2018	200000	FALSE
	6/27/2019	172000	FALSE
	12/2/2019	179000	FALSE
	5/28/2020	138000	FALSE
	12/1/2020	167000	FALSE
	4/28/2021	143000	FALSE
	11/19/2021	176000	FALSE
	5/31/2022	200000	FALSE
	9/6/2022	182000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	138000	254980	116980	0.4493	52559.1
2	143000	249120	106120	0.3098	32876
3	167000	235062	68062	0.2554	17383
4	171000	229431	58431	0.2145	12533.4
5	172000	228148	56148	0.1807	10145.9
6	173000	220459	47459	0.1512	7175.8
7	176000	213067	37067	0.1245	4614.84
8	179000	208907	29907	0.0997	2981.73
9	182000	204990	22990	0.0764	1756.44
10	184501	200000	15499	0.0539	835.396
11	188140	200000	11860	0.0321	380.706
12	188976	191435	2459	0.0107	26.3113
13	191435	188976	-2459		
14	200000	188140	-11860		
15	200000	184501	-15499		
16	204990	182000	-22990		
17	208907	179000	-29907		
18	213067	176000	-37067		
19	220459	173000	-47459		
20	228148	172000	-56148		
21	229431	171000	-58431		
22	235062	167000	-68062		
23	249120	143000	-106120		
24	254980	138000	-116980		

Sum of b values = 143269
Sample Standard Deviation = 30244
W Statistic = 0.975657

5% Critical value of 0.916 is less than 0.975657
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.975657
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Calcium

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
249120	184501	64619	1	0
254980	184501	70479	2	0
228148	184501	43647	3	0
188140	184501	3639	4	0
191435	184501	6934	5	0
188976	184501	4475	6	0
229431	184501	44930	7	0
213067	184501	28566	8	0
220459	184501	35958	9	0
208907	184501	24406	10	0
235062	184501	50561	11	0
204990	184501	20489	12	0
173000	184501	-11501	12	1
171000	184501	-13501	12	2
200000	184501	15499	13	2
172000	184501	-12501	13	3
179000	184501	-5501	13	4
138000	184501	-46501	13	5
167000	184501	-17501	13	6
143000	184501	-41501	13	7
176000	184501	-8501	13	8
200000	184501	15499	14	8
182000	184501	-2501	14	9
254980	249120	5860	15	9
228148	249120	-20972	15	10
188140	249120	-60980	15	11
191435	249120	-57685	15	12
188976	249120	-60144	15	13
229431	249120	-19689	15	14
213067	249120	-36053	15	15
220459	249120	-28661	15	16
208907	249120	-40213	15	17
235062	249120	-14058	15	18
204990	249120	-44130	15	19
173000	249120	-76120	15	20
171000	249120	-78120	15	21
200000	249120	-49120	15	22
172000	249120	-77120	15	23
179000	249120	-70120	15	24
138000	249120	-111120	15	25
167000	249120	-82120	15	26
143000	249120	-106120	15	27
176000	249120	-73120	15	28
200000	249120	-49120	15	29
182000	249120	-67120	15	30

228148	254980	-26832	15	31
188140	254980	-66840	15	32
191435	254980	-63545	15	33
188976	254980	-66004	15	34
229431	254980	-25549	15	35
213067	254980	-41913	15	36
220459	254980	-34521	15	37
208907	254980	-46073	15	38
235062	254980	-19918	15	39
204990	254980	-49990	15	40
173000	254980	-81980	15	41
171000	254980	-83980	15	42
200000	254980	-54980	15	43
172000	254980	-82980	15	44
179000	254980	-75980	15	45
138000	254980	-116980	15	46
167000	254980	-87980	15	47
143000	254980	-111980	15	48
176000	254980	-78980	15	49
200000	254980	-54980	15	50
182000	254980	-72980	15	51
188140	228148	-40008	15	52
191435	228148	-36713	15	53
188976	228148	-39172	15	54
229431	228148	1283	16	54
213067	228148	-15081	16	55
220459	228148	-7689	16	56
208907	228148	-19241	16	57
235062	228148	6914	17	57
204990	228148	-23158	17	58
173000	228148	-55148	17	59
171000	228148	-57148	17	60
200000	228148	-28148	17	61
172000	228148	-56148	17	62
179000	228148	-49148	17	63
138000	228148	-90148	17	64
167000	228148	-61148	17	65
143000	228148	-85148	17	66
176000	228148	-52148	17	67
200000	228148	-28148	17	68
182000	228148	-46148	17	69
191435	188140	3295	18	69
188976	188140	836	19	69
229431	188140	41291	20	69
213067	188140	24927	21	69
220459	188140	32319	22	69
208907	188140	20767	23	69
235062	188140	46922	24	69
204990	188140	16850	25	69
173000	188140	-15140	25	70
171000	188140	-17140	25	71
200000	188140	11860	26	71
172000	188140	-16140	26	72
179000	188140	-9140	26	73
138000	188140	-50140	26	74

167000	188140	-21140	26	75
143000	188140	-45140	26	76
176000	188140	-12140	26	77
200000	188140	11860	27	77
182000	188140	-6140	27	78
188976	191435	-2459	27	79
229431	191435	37996	28	79
213067	191435	21632	29	79
220459	191435	29024	30	79
208907	191435	17472	31	79
235062	191435	43627	32	79
204990	191435	13555	33	79
173000	191435	-18435	33	80
171000	191435	-20435	33	81
200000	191435	8565	34	81
172000	191435	-19435	34	82
179000	191435	-12435	34	83
138000	191435	-53435	34	84
167000	191435	-24435	34	85
143000	191435	-48435	34	86
176000	191435	-15435	34	87
200000	191435	8565	35	87
182000	191435	-9435	35	88
229431	188976	40455	36	88
213067	188976	24091	37	88
220459	188976	31483	38	88
208907	188976	19931	39	88
235062	188976	46086	40	88
204990	188976	16014	41	88
173000	188976	-15976	41	89
171000	188976	-17976	41	90
200000	188976	11024	42	90
172000	188976	-16976	42	91
179000	188976	-9976	42	92
138000	188976	-50976	42	93
167000	188976	-21976	42	94
143000	188976	-45976	42	95
176000	188976	-12976	42	96
200000	188976	11024	43	96
182000	188976	-6976	43	97
213067	229431	-16364	43	98
220459	229431	-8972	43	99
208907	229431	-20524	43	100
235062	229431	5631	44	100
204990	229431	-24441	44	101
173000	229431	-56431	44	102
171000	229431	-58431	44	103
200000	229431	-29431	44	104
172000	229431	-57431	44	105
179000	229431	-50431	44	106
138000	229431	-91431	44	107
167000	229431	-62431	44	108
143000	229431	-86431	44	109
176000	229431	-53431	44	110

200000	229431	-29431	44	111
182000	229431	-47431	44	112
220459	213067	7392	45	112
208907	213067	-4160	45	113
235062	213067	21995	46	113
204990	213067	-8077	46	114
173000	213067	-40067	46	115
171000	213067	-42067	46	116
200000	213067	-13067	46	117
172000	213067	-41067	46	118
179000	213067	-34067	46	119
138000	213067	-75067	46	120
167000	213067	-46067	46	121
143000	213067	-70067	46	122
176000	213067	-37067	46	123
200000	213067	-13067	46	124
182000	213067	-31067	46	125
208907	220459	-11552	46	126
235062	220459	14603	47	126
204990	220459	-15469	47	127
173000	220459	-47459	47	128
171000	220459	-49459	47	129
200000	220459	-20459	47	130
172000	220459	-48459	47	131
179000	220459	-41459	47	132
138000	220459	-82459	47	133
167000	220459	-53459	47	134
143000	220459	-77459	47	135
176000	220459	-44459	47	136
200000	220459	-20459	47	137
182000	220459	-38459	47	138
235062	208907	26155	48	138
204990	208907	-3917	48	139
173000	208907	-35907	48	140
171000	208907	-37907	48	141
200000	208907	-8907	48	142
172000	208907	-36907	48	143
179000	208907	-29907	48	144
138000	208907	-70907	48	145
167000	208907	-41907	48	146
143000	208907	-65907	48	147
176000	208907	-32907	48	148
200000	208907	-8907	48	149
182000	208907	-26907	48	150
204990	235062	-30072	48	151
173000	235062	-62062	48	152
171000	235062	-64062	48	153
200000	235062	-35062	48	154
172000	235062	-63062	48	155
179000	235062	-56062	48	156
138000	235062	-97062	48	157
167000	235062	-68062	48	158
143000	235062	-92062	48	159

176000	235062	-59062	48	160
200000	235062	-35062	48	161
182000	235062	-53062	48	162
173000	204990	-31990	48	163
171000	204990	-33990	48	164
200000	204990	-4990	48	165
172000	204990	-32990	48	166
179000	204990	-25990	48	167
138000	204990	-66990	48	168
167000	204990	-37990	48	169
143000	204990	-61990	48	170
176000	204990	-28990	48	171
200000	204990	-4990	48	172
182000	204990	-22990	48	173
171000	173000	-2000	48	174
200000	173000	27000	49	174
172000	173000	-1000	49	175
179000	173000	6000	50	175
138000	173000	-35000	50	176
167000	173000	-6000	50	177
143000	173000	-30000	50	178
176000	173000	3000	51	178
200000	173000	27000	52	178
182000	173000	9000	53	178
200000	171000	29000	54	178
172000	171000	1000	55	178
179000	171000	8000	56	178
138000	171000	-33000	56	179
167000	171000	-4000	56	180
143000	171000	-28000	56	181
176000	171000	5000	57	181
200000	171000	29000	58	181
182000	171000	11000	59	181
172000	200000	-28000	59	182
179000	200000	-21000	59	183
138000	200000	-62000	59	184
167000	200000	-33000	59	185
143000	200000	-57000	59	186
176000	200000	-24000	59	187
200000	200000	0	59	187
182000	200000	-18000	59	188
179000	172000	7000	60	188
138000	172000	-34000	60	189
167000	172000	-5000	60	190
143000	172000	-29000	60	191
176000	172000	4000	61	191
200000	172000	28000	62	191
182000	172000	10000	63	191
138000	179000	-41000	63	192
167000	179000	-12000	63	193
143000	179000	-36000	63	194

176000	179000	-3000	63	195
200000	179000	21000	64	195
182000	179000	3000	65	195
167000	138000	29000	66	195
143000	138000	5000	67	195
176000	138000	38000	68	195
200000	138000	62000	69	195
182000	138000	44000	70	195
143000	167000	-24000	70	196
176000	167000	9000	71	196
200000	167000	33000	72	196
182000	167000	15000	73	196
176000	143000	33000	74	196
200000	143000	57000	75	196
182000	143000	39000	76	196
200000	176000	24000	77	196
182000	176000	6000	78	196
182000	200000	-18000	78	197

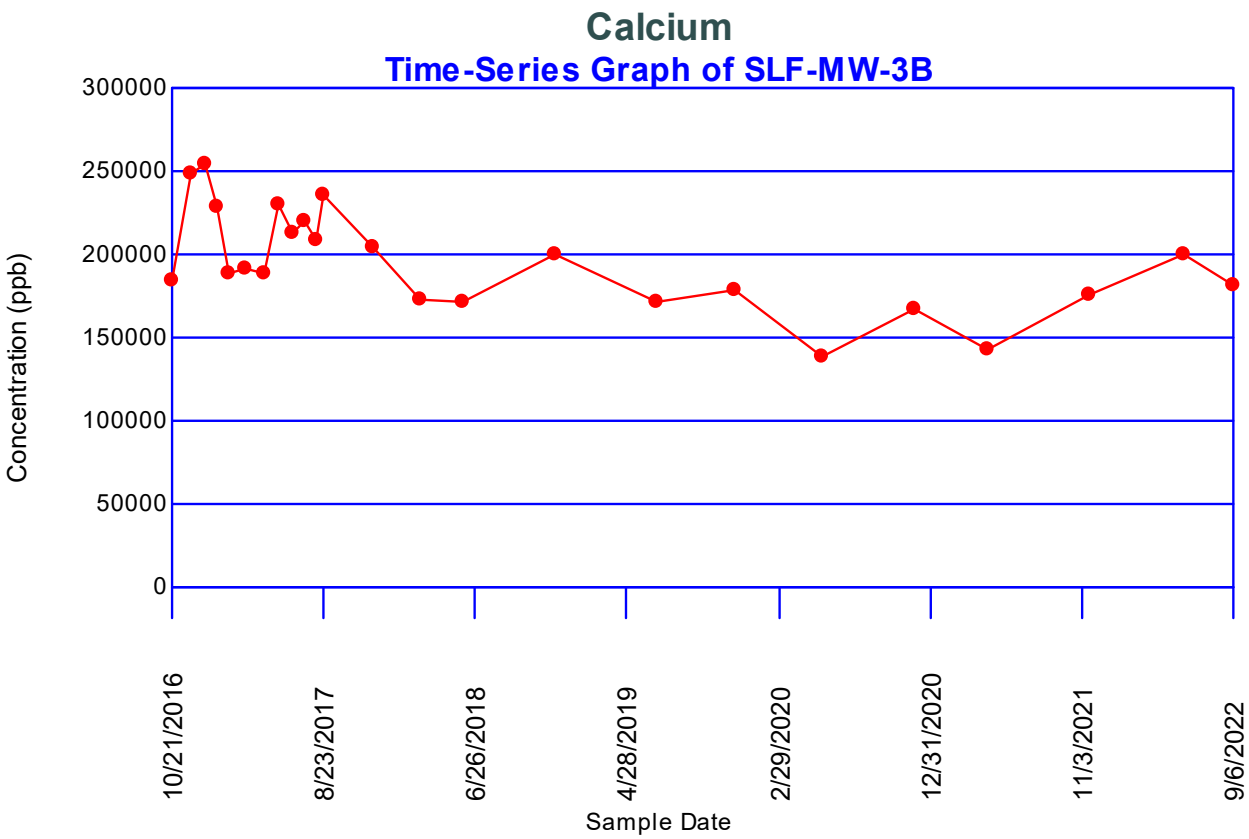
S Statistic = 78 - 197 = -119

Tied Group	Value	Members
1	200000	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1624.33
Z-Score = -2.92782
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-2.92782| > 1.97737 indicating a trend


Calcium
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
300000
250000
200000
150000
100000
50000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Calcium

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 20 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.39599	0.327515	0.45	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	107763	FALSE
	3/20/2017	104972	FALSE
	4/25/2017	101443	FALSE
	5/22/2017	118938	FALSE
	6/20/2017	120726	FALSE
	7/17/2017	123508	FALSE
	8/7/2017	115159	FALSE
	8/22/2017	123970	FALSE
	11/29/2017	136418	FALSE
	3/8/2018	105000	FALSE
	5/30/2018	118000	FALSE
	12/4/2018	114000	FALSE
	6/28/2019	126000	FALSE
	12/2/2019	130000	FALSE
	5/28/2020	99100	FALSE
	11/30/2020	85100	FALSE
	4/28/2021	115000	FALSE
	11/19/2021	135000	FALSE
	5/31/2022	123000	FALSE
	9/6/2022	157000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Calcium

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 10 for 20 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	85100	157000	71900	0.4734	34037.5
2	99100	136418	37318	0.3211	11982.8
3	101443	135000	33557	0.2565	8607.37
4	104972	130000	25028	0.2085	5218.34
5	105000	126000	21000	0.1686	3540.6
6	107763	123970	16207	0.1334	2162.01
7	114000	123508	9508	0.1013	963.16
8	115000	123000	8000	0.0711	568.8
9	115159	120726	5567	0.0422	234.927
10	118000	118938	938	0.014	13.132
11	118938	118000	-938		
12	120726	115159	-5567		
13	123000	115000	-8000		
14	123508	114000	-9508		
15	123970	107763	-16207		
16	126000	105000	-21000		
17	130000	104972	-25028		
18	135000	101443	-33557		
19	136418	99100	-37318		
20	157000	85100	-71900		

Sum of b values = 67328.6
Sample Standard Deviation = 15638.8
W Statistic = 0.975527

5% Critical value of 0.905 is less than 0.975527
Data is normally distributed at 95% level of significance

1% Critical value of 0.868 is less than 0.975527
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Calcium

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
104972	107763	-2791	0	1
101443	107763	-6320	0	2
118938	107763	11175	1	2
120726	107763	12963	2	2
123508	107763	15745	3	2
115159	107763	7396	4	2
123970	107763	16207	5	2
136418	107763	28655	6	2
105000	107763	-2763	6	3
118000	107763	10237	7	3
114000	107763	6237	8	3
126000	107763	18237	9	3
130000	107763	22237	10	3
99100	107763	-8663	10	4
85100	107763	-22663	10	5
115000	107763	7237	11	5
135000	107763	27237	12	5
123000	107763	15237	13	5
157000	107763	49237	14	5
101443	104972	-3529	14	6
118938	104972	13966	15	6
120726	104972	15754	16	6
123508	104972	18536	17	6
115159	104972	10187	18	6
123970	104972	18998	19	6
136418	104972	31446	20	6
105000	104972	28	21	6
118000	104972	13028	22	6
114000	104972	9028	23	6
126000	104972	21028	24	6
130000	104972	25028	25	6
99100	104972	-5872	25	7
85100	104972	-19872	25	8
115000	104972	10028	26	8
135000	104972	30028	27	8
123000	104972	18028	28	8
157000	104972	52028	29	8
118938	101443	17495	30	8
120726	101443	19283	31	8
123508	101443	22065	32	8
115159	101443	13716	33	8
123970	101443	22527	34	8
136418	101443	34975	35	8
105000	101443	3557	36	8
118000	101443	16557	37	8

114000	101443	12557	38	8
126000	101443	24557	39	8
130000	101443	28557	40	8
99100	101443	-2343	40	9
85100	101443	-16343	40	10
115000	101443	13557	41	10
135000	101443	33557	42	10
123000	101443	21557	43	10
157000	101443	55557	44	10
120726	118938	1788	45	10
123508	118938	4570	46	10
115159	118938	-3779	46	11
123970	118938	5032	47	11
136418	118938	17480	48	11
105000	118938	-13938	48	12
118000	118938	-938	48	13
114000	118938	-4938	48	14
126000	118938	7062	49	14
130000	118938	11062	50	14
99100	118938	-19838	50	15
85100	118938	-33838	50	16
115000	118938	-3938	50	17
135000	118938	16062	51	17
123000	118938	4062	52	17
157000	118938	38062	53	17
123508	120726	2782	54	17
115159	120726	-5567	54	18
123970	120726	3244	55	18
136418	120726	15692	56	18
105000	120726	-15726	56	19
118000	120726	-2726	56	20
114000	120726	-6726	56	21
126000	120726	5274	57	21
130000	120726	9274	58	21
99100	120726	-21626	58	22
85100	120726	-35626	58	23
115000	120726	-5726	58	24
135000	120726	14274	59	24
123000	120726	2274	60	24
157000	120726	36274	61	24
115159	123508	-8349	61	25
123970	123508	462	62	25
136418	123508	12910	63	25
105000	123508	-18508	63	26
118000	123508	-5508	63	27
114000	123508	-9508	63	28
126000	123508	2492	64	28
130000	123508	6492	65	28
99100	123508	-24408	65	29
85100	123508	-38408	65	30
115000	123508	-8508	65	31
135000	123508	11492	66	31
123000	123508	-508	66	32
157000	123508	33492	67	32

123970	115159	8811	68	32
136418	115159	21259	69	32
105000	115159	-10159	69	33
118000	115159	2841	70	33
114000	115159	-1159	70	34
126000	115159	10841	71	34
130000	115159	14841	72	34
99100	115159	-16059	72	35
85100	115159	-30059	72	36
115000	115159	-159	72	37
135000	115159	19841	73	37
123000	115159	7841	74	37
157000	115159	41841	75	37
136418	123970	12448	76	37
105000	123970	-18970	76	38
118000	123970	-5970	76	39
114000	123970	-9970	76	40
126000	123970	2030	77	40
130000	123970	6030	78	40
99100	123970	-24870	78	41
85100	123970	-38870	78	42
115000	123970	-8970	78	43
135000	123970	11030	79	43
123000	123970	-970	79	44
157000	123970	33030	80	44
105000	136418	-31418	80	45
118000	136418	-18418	80	46
114000	136418	-22418	80	47
126000	136418	-10418	80	48
130000	136418	-6418	80	49
99100	136418	-37318	80	50
85100	136418	-51318	80	51
115000	136418	-21418	80	52
135000	136418	-1418	80	53
123000	136418	-13418	80	54
157000	136418	20582	81	54
118000	105000	13000	82	54
114000	105000	9000	83	54
126000	105000	21000	84	54
130000	105000	25000	85	54
99100	105000	-5900	85	55
85100	105000	-19900	85	56
115000	105000	10000	86	56
135000	105000	30000	87	56
123000	105000	18000	88	56
157000	105000	52000	89	56
114000	118000	-4000	89	57
126000	118000	8000	90	57
130000	118000	12000	91	57
99100	118000	-18900	91	58
85100	118000	-32900	91	59
115000	118000	-3000	91	60

135000	118000	17000	92	60
123000	118000	5000	93	60
157000	118000	39000	94	60
126000	114000	12000	95	60
130000	114000	16000	96	60
99100	114000	-14900	96	61
85100	114000	-28900	96	62
115000	114000	1000	97	62
135000	114000	21000	98	62
123000	114000	9000	99	62
157000	114000	43000	100	62
130000	126000	4000	101	62
99100	126000	-26900	101	63
85100	126000	-40900	101	64
115000	126000	-11000	101	65
135000	126000	9000	102	65
123000	126000	-3000	102	66
157000	126000	31000	103	66
99100	130000	-30900	103	67
85100	130000	-44900	103	68
115000	130000	-15000	103	69
135000	130000	5000	104	69
123000	130000	-7000	104	70
157000	130000	27000	105	70
85100	99100	-14000	105	71
115000	99100	15900	106	71
135000	99100	35900	107	71
123000	99100	23900	108	71
157000	99100	57900	109	71
115000	85100	29900	110	71
135000	85100	49900	111	71
123000	85100	37900	112	71
157000	85100	71900	113	71
135000	115000	20000	114	71
123000	115000	8000	115	71
157000	115000	42000	116	71
123000	135000	-12000	116	72
157000	135000	22000	117	72
157000	123000	34000	118	72

S Statistic = 118 - 72 = 46

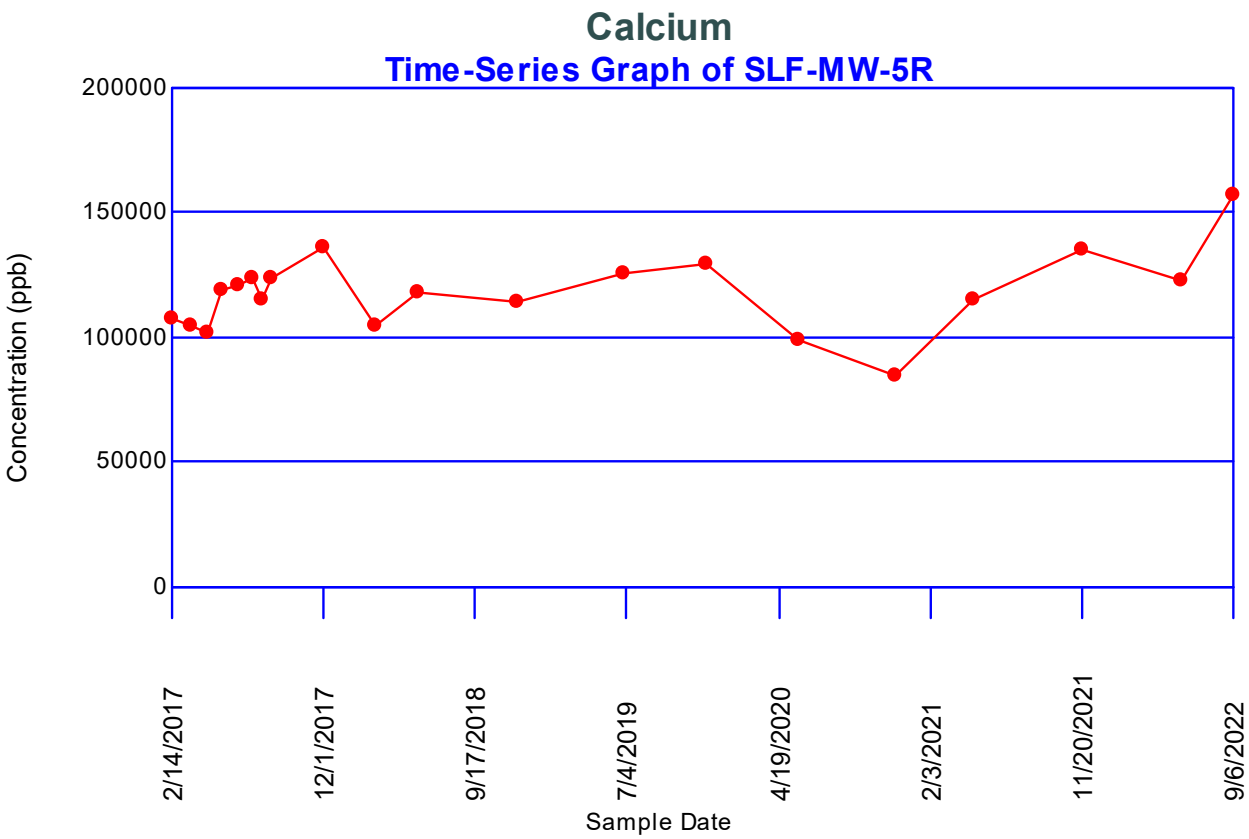
Tied Group	Value	Members

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1

5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 950
Z-Score = 1.45999
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.45999| <= 1.97737 indicating no evidence of a trend


Calcium
Time-Series Graph of SLF-MW-5R
200000
150000
100000
50000
0
Concentration (ppb)
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 68
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	24	0 (0%)	10/21/2016	1.54749e+006	1.54749e+006
			11/30/2016	1.61454e+006	1.61454e+006
			12/28/2016	1.768e+006	1.768e+006
			1/18/2017	1.33503e+006	1.33503e+006
			2/14/2017	1.5337e+006	1.5337e+006
			3/20/2017	1.36241e+006	1.36241e+006
			4/25/2017	1.35437e+006	1.35437e+006
			5/22/2017	1.37044e+006	1.37044e+006
			6/20/2017	1.31495e+006	1.31495e+006
			7/17/2017	2.425e+006	2.425e+006
			8/8/2017	616000	616000
			8/21/2017	1.136e+006	1.136e+006
			11/29/2017	1.421e+006	1.421e+006
			3/8/2018	1.712e+006	1.712e+006
			5/31/2018	1.87e+006	1.87e+006
			12/4/2018	2.08e+006	2.08e+006
			6/28/2019	2.53e+006	2.53e+006
			12/2/2019	2.44e+006	2.44e+006
			5/28/2020	2.2e+006	2.2e+006
			11/30/2020	1.54e+006	1.54e+006
			4/28/2021	1.48e+006	1.48e+006
			11/19/2021	1.68e+006	1.68e+006
			5/31/2022	1.82e+006	1.82e+006
			9/6/2022	1.94e+006	1.94e+006
			11/21/2022	**1.83e+006**	**1.83e+006**
SLF-MW-3B	24	0 (0%)	10/21/2016	152574	152574
			11/30/2016	169582	169582
			12/28/2016	160177	160177
			1/18/2017	146634	146634
			2/15/2017	143113	143113
			3/20/2017	171319	171319
			4/25/2017	167869	167869
			5/22/2017	126662	126662
			6/20/2017	121058	121058
			7/17/2017	98000	98000
			8/7/2017	103000	103000
			8/21/2017	98000	98000
			11/29/2017	152000	152000
			3/8/2018	224000	224000
			5/30/2018	179000	179000

			12/4/2018	225000	225000
			6/27/2019	239000	239000
			12/2/2019	245000	245000
			5/28/2020	262000	262000
			12/1/2020	269000	269000
			4/28/2021	250000	250000
			11/19/2021	246000	246000
			5/31/2022	228000	228000
			9/6/2022	191000	191000
			11/21/2022	**188000**	**188000**
SLF-MW-5R	20	0 (0%)	2/14/2017	33649.2	33649.2
			3/20/2017	25801.9	25801.9
			4/25/2017	22580.8	22580.8
			5/22/2017	16154	16154
			6/20/2017	25945.6	25945.6
			7/17/2017	26000	26000
			8/7/2017	19100	19100
			8/22/2017	25500	25500
			11/29/2017	24500	24500
			3/8/2018	15000	15000
			5/30/2018	25500	25500
			12/4/2018	20500	20500
			6/28/2019	24300	24300
			12/2/2019	29200	29200
			5/28/2020	12400	12400
			11/30/2020	14200	14200
			4/28/2021	25700	25700
			11/19/2021	26900	26900
			5/31/2022	26200	26200
			9/6/2022	44100	44100
			11/21/2022	**52900**	**52900**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Chloride

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0864162	0.386374	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	1.54749e+006	FALSE
	11/30/2016	1.61454e+006	FALSE
	12/28/2016	1.768e+006	FALSE
	1/18/2017	1.33503e+006	FALSE
	2/14/2017	1.5337e+006	FALSE
	3/20/2017	1.36241e+006	FALSE
	4/25/2017	1.35437e+006	FALSE
	5/22/2017	1.37044e+006	FALSE
	6/20/2017	1.31495e+006	FALSE
	7/17/2017	2.425e+006	FALSE
	8/8/2017	616000	FALSE
	8/21/2017	1.136e+006	FALSE
	11/29/2017	1.421e+006	FALSE
	3/8/2018	1.712e+006	FALSE
	5/31/2018	1.87e+006	FALSE
	12/4/2018	2.08e+006	FALSE
	6/28/2019	2.53e+006	FALSE
	12/2/2019	2.44e+006	FALSE
	5/28/2020	2.2e+006	FALSE
	11/30/2020	1.54e+006	FALSE
	4/28/2021	1.48e+006	FALSE
	11/19/2021	1.68e+006	FALSE
	5/31/2022	1.82e+006	FALSE
	9/6/2022	1.94e+006	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chloride

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	616000	2.53e+006	1.914e+006	0.4493	859960
2	1.136e+006	2.44e+006	1.304e+006	0.3098	403979
3	1.31495e+006	2.425e+006	1.11005e+006	0.2554	283507
4	1.33503e+006	2.2e+006	864970	0.2145	185536
5	1.35437e+006	2.08e+006	725630	0.1807	131121
6	1.36241e+006	1.94e+006	577590	0.1512	87331.6
7	1.37044e+006	1.87e+006	499560	0.1245	62195.2
8	1.421e+006	1.82e+006	399000	0.0997	39780.3
9	1.48e+006	1.768e+006	288000	0.0764	22003.2
10	1.5337e+006	1.712e+006	178300	0.0539	9610.37
11	1.54e+006	1.68e+006	140000	0.0321	4494
12	1.54749e+006	1.61454e+006	67050	0.0107	717.435
13	1.61454e+006	1.54749e+006	-67050		
14	1.68e+006	1.54e+006	-140000		
15	1.712e+006	1.5337e+006	-178300		
16	1.768e+006	1.48e+006	-288000		
17	1.82e+006	1.421e+006	-399000		
18	1.87e+006	1.37044e+006	-499560		
19	1.94e+006	1.36241e+006	-577590		
20	2.08e+006	1.35437e+006	-725630		
21	2.2e+006	1.33503e+006	-864970		
22	2.425e+006	1.31495e+006	-1.11005e+006		
23	2.44e+006	1.136e+006	-1.304e+006		
24	2.53e+006	616000	-1.914e+006		

Sum of b values = 2.09024e+006
Sample Standard Deviation = 445673
W Statistic = 0.95638

5% Critical value of 0.916 is less than 0.95638
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.95638
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chloride

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.61454e+006	1.54749e+006	67050	1	0
1.768e+006	1.54749e+006	220510	2	0
1.33503e+006	1.54749e+006	-212460	2	1
1.5337e+006	1.54749e+006	-13790	2	2
1.36241e+006	1.54749e+006	-185080	2	3
1.35437e+006	1.54749e+006	-193120	2	4
1.37044e+006	1.54749e+006	-177050	2	5
1.31495e+006	1.54749e+006	-232540	2	6
2.425e+006	1.54749e+006	877510	3	6
616000	1.54749e+006	-931490	3	7
1.136e+006	1.54749e+006	-411490	3	8
1.421e+006	1.54749e+006	-126490	3	9
1.712e+006	1.54749e+006	164510	4	9
1.87e+006	1.54749e+006	322510	5	9
2.08e+006	1.54749e+006	532510	6	9
2.53e+006	1.54749e+006	982510	7	9
2.44e+006	1.54749e+006	892510	8	9
2.2e+006	1.54749e+006	652510	9	9
1.54e+006	1.54749e+006	-7490	9	10
1.48e+006	1.54749e+006	-67490	9	11
1.68e+006	1.54749e+006	132510	10	11
1.82e+006	1.54749e+006	272510	11	11
1.94e+006	1.54749e+006	392510	12	11
1.768e+006	1.61454e+006	153460	13	11
1.33503e+006	1.61454e+006	-279510	13	12
1.5337e+006	1.61454e+006	-80840	13	13
1.36241e+006	1.61454e+006	-252130	13	14
1.35437e+006	1.61454e+006	-260170	13	15
1.37044e+006	1.61454e+006	-244100	13	16
1.31495e+006	1.61454e+006	-299590	13	17
2.425e+006	1.61454e+006	810460	14	17
616000	1.61454e+006	-998540	14	18
1.136e+006	1.61454e+006	-478540	14	19
1.421e+006	1.61454e+006	-193540	14	20
1.712e+006	1.61454e+006	97460	15	20
1.87e+006	1.61454e+006	255460	16	20
2.08e+006	1.61454e+006	465460	17	20
2.53e+006	1.61454e+006	915460	18	20
2.44e+006	1.61454e+006	825460	19	20
2.2e+006	1.61454e+006	585460	20	20
1.54e+006	1.61454e+006	-74540	20	21
1.48e+006	1.61454e+006	-134540	20	22
1.68e+006	1.61454e+006	65460	21	22
1.82e+006	1.61454e+006	205460	22	22
1.94e+006	1.61454e+006	325460	23	22

1.33503e+006	1.768e+006	-432970	23	23
1.5337e+006	1.768e+006	-234300	23	24
1.36241e+006	1.768e+006	-405590	23	25
1.35437e+006	1.768e+006	-413630	23	26
1.37044e+006	1.768e+006	-397560	23	27
1.31495e+006	1.768e+006	-453050	23	28
2.425e+006	1.768e+006	657000	24	28
616000	1.768e+006	-1.152e+006	24	29
1.136e+006	1.768e+006	-632000	24	30
1.421e+006	1.768e+006	-347000	24	31
1.712e+006	1.768e+006	-56000	24	32
1.87e+006	1.768e+006	102000	25	32
2.08e+006	1.768e+006	312000	26	32
2.53e+006	1.768e+006	762000	27	32
2.44e+006	1.768e+006	672000	28	32
2.2e+006	1.768e+006	432000	29	32
1.54e+006	1.768e+006	-228000	29	33
1.48e+006	1.768e+006	-288000	29	34
1.68e+006	1.768e+006	-88000	29	35
1.82e+006	1.768e+006	52000	30	35
1.94e+006	1.768e+006	172000	31	35
1.5337e+006	1.33503e+006	198670	32	35
1.36241e+006	1.33503e+006	27380	33	35
1.35437e+006	1.33503e+006	19340	34	35
1.37044e+006	1.33503e+006	35410	35	35
1.31495e+006	1.33503e+006	-20080	35	36
2.425e+006	1.33503e+006	1.08997e+006	36	36
616000	1.33503e+006	-719030	36	37
1.136e+006	1.33503e+006	-199030	36	38
1.421e+006	1.33503e+006	85970	37	38
1.712e+006	1.33503e+006	376970	38	38
1.87e+006	1.33503e+006	534970	39	38
2.08e+006	1.33503e+006	744970	40	38
2.53e+006	1.33503e+006	1.19497e+006	41	38
2.44e+006	1.33503e+006	1.10497e+006	42	38
2.2e+006	1.33503e+006	864970	43	38
1.54e+006	1.33503e+006	204970	44	38
1.48e+006	1.33503e+006	144970	45	38
1.68e+006	1.33503e+006	344970	46	38
1.82e+006	1.33503e+006	484970	47	38
1.94e+006	1.33503e+006	604970	48	38
1.36241e+006	1.5337e+006	-171290	48	39
1.35437e+006	1.5337e+006	-179330	48	40
1.37044e+006	1.5337e+006	-163260	48	41
1.31495e+006	1.5337e+006	-218750	48	42
2.425e+006	1.5337e+006	891300	49	42
616000	1.5337e+006	-917700	49	43
1.136e+006	1.5337e+006	-397700	49	44
1.421e+006	1.5337e+006	-112700	49	45
1.712e+006	1.5337e+006	178300	50	45
1.87e+006	1.5337e+006	336300	51	45
2.08e+006	1.5337e+006	546300	52	45
2.53e+006	1.5337e+006	996300	53	45
2.44e+006	1.5337e+006	906300	54	45
2.2e+006	1.5337e+006	666300	55	45

1.54e+006	1.5337e+006	6300	56	45
1.48e+006	1.5337e+006	-53700	56	46
1.68e+006	1.5337e+006	146300	57	46
1.82e+006	1.5337e+006	286300	58	46
1.94e+006	1.5337e+006	406300	59	46
1.35437e+006	1.36241e+006	-8040	59	47
1.37044e+006	1.36241e+006	8030	60	47
1.31495e+006	1.36241e+006	-47460	60	48
2.425e+006	1.36241e+006	1.06259e+006	61	48
616000	1.36241e+006	-746410	61	49
1.136e+006	1.36241e+006	-226410	61	50
1.421e+006	1.36241e+006	58590	62	50
1.712e+006	1.36241e+006	349590	63	50
1.87e+006	1.36241e+006	507590	64	50
2.08e+006	1.36241e+006	717590	65	50
2.53e+006	1.36241e+006	1.16759e+006	66	50
2.44e+006	1.36241e+006	1.07759e+006	67	50
2.2e+006	1.36241e+006	837590	68	50
1.54e+006	1.36241e+006	177590	69	50
1.48e+006	1.36241e+006	117590	70	50
1.68e+006	1.36241e+006	317590	71	50
1.82e+006	1.36241e+006	457590	72	50
1.94e+006	1.36241e+006	577590	73	50
1.37044e+006	1.35437e+006	16070	74	50
1.31495e+006	1.35437e+006	-39420	74	51
2.425e+006	1.35437e+006	1.07063e+006	75	51
616000	1.35437e+006	-738370	75	52
1.136e+006	1.35437e+006	-218370	75	53
1.421e+006	1.35437e+006	66630	76	53
1.712e+006	1.35437e+006	357630	77	53
1.87e+006	1.35437e+006	515630	78	53
2.08e+006	1.35437e+006	725630	79	53
2.53e+006	1.35437e+006	1.17563e+006	80	53
2.44e+006	1.35437e+006	1.08563e+006	81	53
2.2e+006	1.35437e+006	845630	82	53
1.54e+006	1.35437e+006	185630	83	53
1.48e+006	1.35437e+006	125630	84	53
1.68e+006	1.35437e+006	325630	85	53
1.82e+006	1.35437e+006	465630	86	53
1.94e+006	1.35437e+006	585630	87	53
1.31495e+006	1.37044e+006	-55490	87	54
2.425e+006	1.37044e+006	1.05456e+006	88	54
616000	1.37044e+006	-754440	88	55
1.136e+006	1.37044e+006	-234440	88	56
1.421e+006	1.37044e+006	50560	89	56
1.712e+006	1.37044e+006	341560	90	56
1.87e+006	1.37044e+006	499560	91	56
2.08e+006	1.37044e+006	709560	92	56
2.53e+006	1.37044e+006	1.15956e+006	93	56
2.44e+006	1.37044e+006	1.06956e+006	94	56
2.2e+006	1.37044e+006	829560	95	56
1.54e+006	1.37044e+006	169560	96	56
1.48e+006	1.37044e+006	109560	97	56
1.68e+006	1.37044e+006	309560	98	56

1.82e+006	1.37044e+006	449560	99	56
1.94e+006	1.37044e+006	569560	100	56
2.425e+006	1.31495e+006	1.11005e+006	101	56
616000	1.31495e+006	-698950	101	57
1.136e+006	1.31495e+006	-178950	101	58
1.421e+006	1.31495e+006	106050	102	58
1.712e+006	1.31495e+006	397050	103	58
1.87e+006	1.31495e+006	555050	104	58
2.08e+006	1.31495e+006	765050	105	58
2.53e+006	1.31495e+006	1.21505e+006	106	58
2.44e+006	1.31495e+006	1.12505e+006	107	58
2.2e+006	1.31495e+006	885050	108	58
1.54e+006	1.31495e+006	225050	109	58
1.48e+006	1.31495e+006	165050	110	58
1.68e+006	1.31495e+006	365050	111	58
1.82e+006	1.31495e+006	505050	112	58
1.94e+006	1.31495e+006	625050	113	58
616000	2.425e+006	-1.809e+006	113	59
1.136e+006	2.425e+006	-1.289e+006	113	60
1.421e+006	2.425e+006	-1.004e+006	113	61
1.712e+006	2.425e+006	-713000	113	62
1.87e+006	2.425e+006	-555000	113	63
2.08e+006	2.425e+006	-345000	113	64
2.53e+006	2.425e+006	105000	114	64
2.44e+006	2.425e+006	15000	115	64
2.2e+006	2.425e+006	-225000	115	65
1.54e+006	2.425e+006	-885000	115	66
1.48e+006	2.425e+006	-945000	115	67
1.68e+006	2.425e+006	-745000	115	68
1.82e+006	2.425e+006	-605000	115	69
1.94e+006	2.425e+006	-485000	115	70
1.136e+006	616000	520000	116	70
1.421e+006	616000	805000	117	70
1.712e+006	616000	1.096e+006	118	70
1.87e+006	616000	1.254e+006	119	70
2.08e+006	616000	1.464e+006	120	70
2.53e+006	616000	1.914e+006	121	70
2.44e+006	616000	1.824e+006	122	70
2.2e+006	616000	1.584e+006	123	70
1.54e+006	616000	924000	124	70
1.48e+006	616000	864000	125	70
1.68e+006	616000	1.064e+006	126	70
1.82e+006	616000	1.204e+006	127	70
1.94e+006	616000	1.324e+006	128	70
1.421e+006	1.136e+006	285000	129	70
1.712e+006	1.136e+006	576000	130	70
1.87e+006	1.136e+006	734000	131	70
2.08e+006	1.136e+006	944000	132	70
2.53e+006	1.136e+006	1.394e+006	133	70
2.44e+006	1.136e+006	1.304e+006	134	70
2.2e+006	1.136e+006	1.064e+006	135	70
1.54e+006	1.136e+006	404000	136	70
1.48e+006	1.136e+006	344000	137	70

1.68e+006	1.136e+006	544000	138	70
1.82e+006	1.136e+006	684000	139	70
1.94e+006	1.136e+006	804000	140	70
1.712e+006	1.421e+006	291000	141	70
1.87e+006	1.421e+006	449000	142	70
2.08e+006	1.421e+006	659000	143	70
2.53e+006	1.421e+006	1.109e+006	144	70
2.44e+006	1.421e+006	1.019e+006	145	70
2.2e+006	1.421e+006	779000	146	70
1.54e+006	1.421e+006	119000	147	70
1.48e+006	1.421e+006	59000	148	70
1.68e+006	1.421e+006	259000	149	70
1.82e+006	1.421e+006	399000	150	70
1.94e+006	1.421e+006	519000	151	70
1.87e+006	1.712e+006	158000	152	70
2.08e+006	1.712e+006	368000	153	70
2.53e+006	1.712e+006	818000	154	70
2.44e+006	1.712e+006	728000	155	70
2.2e+006	1.712e+006	488000	156	70
1.54e+006	1.712e+006	-172000	156	71
1.48e+006	1.712e+006	-232000	156	72
1.68e+006	1.712e+006	-32000	156	73
1.82e+006	1.712e+006	108000	157	73
1.94e+006	1.712e+006	228000	158	73
2.08e+006	1.87e+006	210000	159	73
2.53e+006	1.87e+006	660000	160	73
2.44e+006	1.87e+006	570000	161	73
2.2e+006	1.87e+006	330000	162	73
1.54e+006	1.87e+006	-330000	162	74
1.48e+006	1.87e+006	-390000	162	75
1.68e+006	1.87e+006	-190000	162	76
1.82e+006	1.87e+006	-50000	162	77
1.94e+006	1.87e+006	70000	163	77
2.53e+006	2.08e+006	450000	164	77
2.44e+006	2.08e+006	360000	165	77
2.2e+006	2.08e+006	120000	166	77
1.54e+006	2.08e+006	-540000	166	78
1.48e+006	2.08e+006	-600000	166	79
1.68e+006	2.08e+006	-400000	166	80
1.82e+006	2.08e+006	-260000	166	81
1.94e+006	2.08e+006	-140000	166	82
2.44e+006	2.53e+006	-90000	166	83
2.2e+006	2.53e+006	-330000	166	84
1.54e+006	2.53e+006	-990000	166	85
1.48e+006	2.53e+006	-1.05e+006	166	86
1.68e+006	2.53e+006	-850000	166	87
1.82e+006	2.53e+006	-710000	166	88
1.94e+006	2.53e+006	-590000	166	89
2.2e+006	2.44e+006	-240000	166	90
1.54e+006	2.44e+006	-900000	166	91
1.48e+006	2.44e+006	-960000	166	92

1.68e+006	2.44e+006	-760000	166	93
1.82e+006	2.44e+006	-620000	166	94
1.94e+006	2.44e+006	-500000	166	95
1.54e+006	2.2e+006	-660000	166	96
1.48e+006	2.2e+006	-720000	166	97
1.68e+006	2.2e+006	-520000	166	98
1.82e+006	2.2e+006	-380000	166	99
1.94e+006	2.2e+006	-260000	166	100
1.48e+006	1.54e+006	-60000	166	101
1.68e+006	1.54e+006	140000	167	101
1.82e+006	1.54e+006	280000	168	101
1.94e+006	1.54e+006	400000	169	101
1.68e+006	1.48e+006	200000	170	101
1.82e+006	1.48e+006	340000	171	101
1.94e+006	1.48e+006	460000	172	101
1.82e+006	1.68e+006	140000	173	101
1.94e+006	1.68e+006	260000	174	101
1.94e+006	1.82e+006	120000	175	101

S Statistic = 175 - 101 = 74

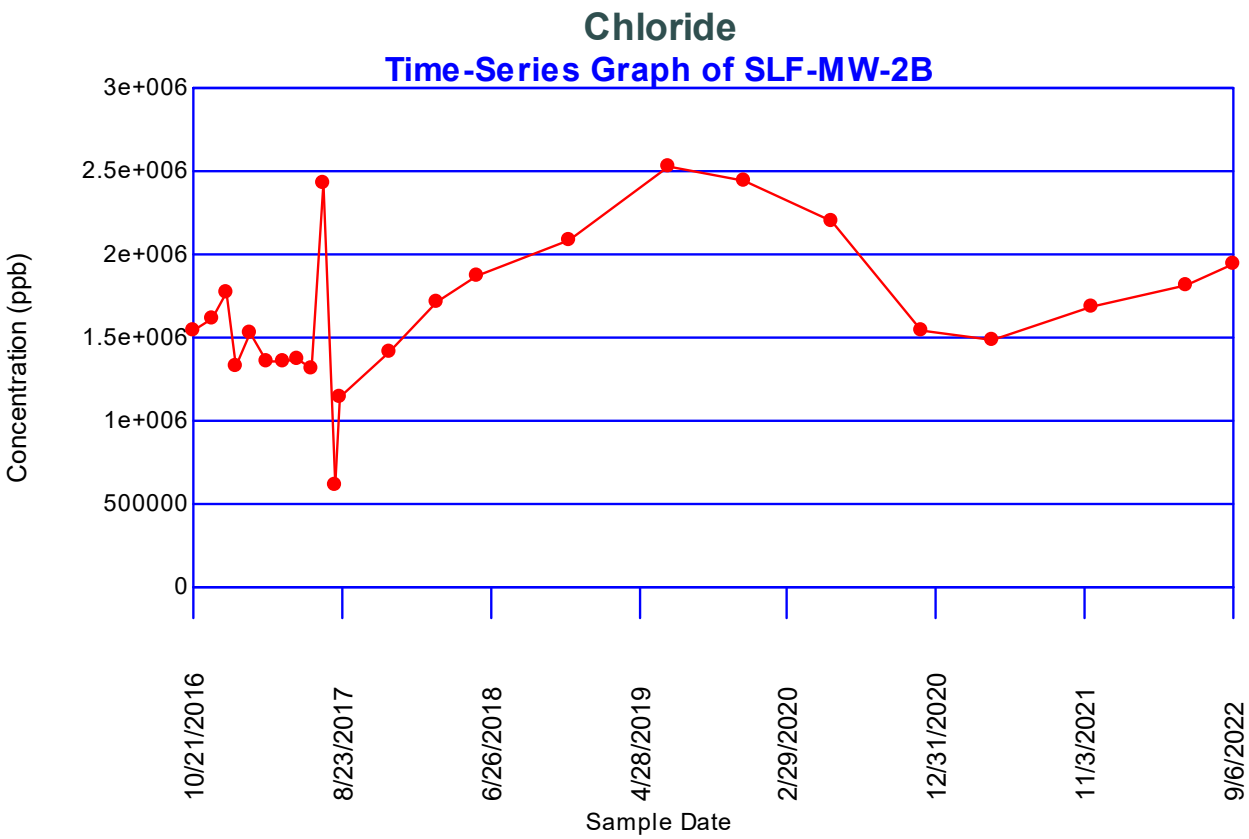
Tied Group	Value	Members

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0

B = 0
C = 0
D = 0
E = 0
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1625.33
Z-Score = 1.81072
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.81072| <= 1.97737 indicating no evidence of a trend


Chloride
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
3e+006
2.5e+006
2e+006
1.5e+006
1e+006
500000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Chloride

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.114458	0.0328947	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	152574	FALSE
	11/30/2016	169582	FALSE
	12/28/2016	160177	FALSE
	1/18/2017	146634	FALSE
	2/15/2017	143113	FALSE
	3/20/2017	171319	FALSE
	4/25/2017	167869	FALSE
	5/22/2017	126662	FALSE
	6/20/2017	121058	FALSE
	7/17/2017	98000	FALSE
	8/7/2017	103000	FALSE
	8/21/2017	98000	FALSE
	11/29/2017	152000	FALSE
	3/8/2018	224000	FALSE
	5/30/2018	179000	FALSE
	12/4/2018	225000	FALSE
	6/27/2019	239000	FALSE
	12/2/2019	245000	FALSE
	5/28/2020	262000	FALSE
	12/1/2020	269000	FALSE
	4/28/2021	250000	FALSE
	11/19/2021	246000	FALSE
	5/31/2022	228000	FALSE
	9/6/2022	191000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chloride

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	98000	269000	171000	0.4493	76830.3
2	98000	262000	164000	0.3098	50807.2
3	103000	250000	147000	0.2554	37543.8
4	121058	246000	124942	0.2145	26800.1
5	126662	245000	118338	0.1807	21383.7
6	143113	239000	95887	0.1512	14498.1
7	146634	228000	81366	0.1245	10130.1
8	152000	225000	73000	0.0997	7278.1
9	152574	224000	71426	0.0764	5456.95
10	160177	191000	30823	0.0539	1661.36
11	167869	179000	11131	0.0321	357.305
12	169582	171319	1737	0.0107	18.5859
13	171319	169582	-1737		
14	179000	167869	-11131		
15	191000	160177	-30823		
16	224000	152574	-71426		
17	225000	152000	-73000		
18	228000	146634	-81366		
19	239000	143113	-95887		
20	245000	126662	-118338		
21	246000	121058	-124942		
22	250000	103000	-147000		
23	262000	98000	-164000		
24	269000	98000	-171000		

Sum of b values = 252766
Sample Standard Deviation = 54505
W Statistic = 0.935051

5% Critical value of 0.916 is less than 0.935051
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.935051
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chloride

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
169582	152574	17008	1	0
160177	152574	7603	2	0
146634	152574	-5940	2	1
143113	152574	-9461	2	2
171319	152574	18745	3	2
167869	152574	15295	4	2
126662	152574	-25912	4	3
121058	152574	-31516	4	4
98000	152574	-54574	4	5
103000	152574	-49574	4	6
98000	152574	-54574	4	7
152000	152574	-574	4	8
224000	152574	71426	5	8
179000	152574	26426	6	8
225000	152574	72426	7	8
239000	152574	86426	8	8
245000	152574	92426	9	8
262000	152574	109426	10	8
269000	152574	116426	11	8
250000	152574	97426	12	8
246000	152574	93426	13	8
228000	152574	75426	14	8
191000	152574	38426	15	8
160177	169582	-9405	15	9
146634	169582	-22948	15	10
143113	169582	-26469	15	11
171319	169582	1737	16	11
167869	169582	-1713	16	12
126662	169582	-42920	16	13
121058	169582	-48524	16	14
98000	169582	-71582	16	15
103000	169582	-66582	16	16
98000	169582	-71582	16	17
152000	169582	-17582	16	18
224000	169582	54418	17	18
179000	169582	9418	18	18
225000	169582	55418	19	18
239000	169582	69418	20	18
245000	169582	75418	21	18
262000	169582	92418	22	18
269000	169582	99418	23	18
250000	169582	80418	24	18
246000	169582	76418	25	18
228000	169582	58418	26	18
191000	169582	21418	27	18

146634	160177	-13543	27	19
143113	160177	-17064	27	20
171319	160177	11142	28	20
167869	160177	7692	29	20
126662	160177	-33515	29	21
121058	160177	-39119	29	22
98000	160177	-62177	29	23
103000	160177	-57177	29	24
98000	160177	-62177	29	25
152000	160177	-8177	29	26
224000	160177	63823	30	26
179000	160177	18823	31	26
225000	160177	64823	32	26
239000	160177	78823	33	26
245000	160177	84823	34	26
262000	160177	101823	35	26
269000	160177	108823	36	26
250000	160177	89823	37	26
246000	160177	85823	38	26
228000	160177	67823	39	26
191000	160177	30823	40	26
143113	146634	-3521	40	27
171319	146634	24685	41	27
167869	146634	21235	42	27
126662	146634	-19972	42	28
121058	146634	-25576	42	29
98000	146634	-48634	42	30
103000	146634	-43634	42	31
98000	146634	-48634	42	32
152000	146634	5366	43	32
224000	146634	77366	44	32
179000	146634	32366	45	32
225000	146634	78366	46	32
239000	146634	92366	47	32
245000	146634	98366	48	32
262000	146634	115366	49	32
269000	146634	122366	50	32
250000	146634	103366	51	32
246000	146634	99366	52	32
228000	146634	81366	53	32
191000	146634	44366	54	32
171319	143113	28206	55	32
167869	143113	24756	56	32
126662	143113	-16451	56	33
121058	143113	-22055	56	34
98000	143113	-45113	56	35
103000	143113	-40113	56	36
98000	143113	-45113	56	37
152000	143113	8887	57	37
224000	143113	80887	58	37
179000	143113	35887	59	37
225000	143113	81887	60	37
239000	143113	95887	61	37
245000	143113	101887	62	37
262000	143113	118887	63	37

269000	143113	125887	64	37
250000	143113	106887	65	37
246000	143113	102887	66	37
228000	143113	84887	67	37
191000	143113	47887	68	37
167869	171319	-3450	68	38
126662	171319	-44657	68	39
121058	171319	-50261	68	40
98000	171319	-73319	68	41
103000	171319	-68319	68	42
98000	171319	-73319	68	43
152000	171319	-19319	68	44
224000	171319	52681	69	44
179000	171319	7681	70	44
225000	171319	53681	71	44
239000	171319	67681	72	44
245000	171319	73681	73	44
262000	171319	90681	74	44
269000	171319	97681	75	44
250000	171319	78681	76	44
246000	171319	74681	77	44
228000	171319	56681	78	44
191000	171319	19681	79	44
126662	167869	-41207	79	45
121058	167869	-46811	79	46
98000	167869	-69869	79	47
103000	167869	-64869	79	48
98000	167869	-69869	79	49
152000	167869	-15869	79	50
224000	167869	56131	80	50
179000	167869	11131	81	50
225000	167869	57131	82	50
239000	167869	71131	83	50
245000	167869	77131	84	50
262000	167869	94131	85	50
269000	167869	101131	86	50
250000	167869	82131	87	50
246000	167869	78131	88	50
228000	167869	60131	89	50
191000	167869	23131	90	50
121058	126662	-5604	90	51
98000	126662	-28662	90	52
103000	126662	-23662	90	53
98000	126662	-28662	90	54
152000	126662	25338	91	54
224000	126662	97338	92	54
179000	126662	52338	93	54
225000	126662	98338	94	54
239000	126662	112338	95	54
245000	126662	118338	96	54
262000	126662	135338	97	54
269000	126662	142338	98	54
250000	126662	123338	99	54
246000	126662	119338	100	54

228000	126662	101338	101	54
191000	126662	64338	102	54
98000	121058	-23058	102	55
103000	121058	-18058	102	56
98000	121058	-23058	102	57
152000	121058	30942	103	57
224000	121058	102942	104	57
179000	121058	57942	105	57
225000	121058	103942	106	57
239000	121058	117942	107	57
245000	121058	123942	108	57
262000	121058	140942	109	57
269000	121058	147942	110	57
250000	121058	128942	111	57
246000	121058	124942	112	57
228000	121058	106942	113	57
191000	121058	69942	114	57
103000	98000	5000	115	57
98000	98000	0	115	57
152000	98000	54000	116	57
224000	98000	126000	117	57
179000	98000	81000	118	57
225000	98000	127000	119	57
239000	98000	141000	120	57
245000	98000	147000	121	57
262000	98000	164000	122	57
269000	98000	171000	123	57
250000	98000	152000	124	57
246000	98000	148000	125	57
228000	98000	130000	126	57
191000	98000	93000	127	57
98000	103000	-5000	127	58
152000	103000	49000	128	58
224000	103000	121000	129	58
179000	103000	76000	130	58
225000	103000	122000	131	58
239000	103000	136000	132	58
245000	103000	142000	133	58
262000	103000	159000	134	58
269000	103000	166000	135	58
250000	103000	147000	136	58
246000	103000	143000	137	58
228000	103000	125000	138	58
191000	103000	88000	139	58
152000	98000	54000	140	58
224000	98000	126000	141	58
179000	98000	81000	142	58
225000	98000	127000	143	58
239000	98000	141000	144	58
245000	98000	147000	145	58
262000	98000	164000	146	58
269000	98000	171000	147	58
250000	98000	152000	148	58

246000	98000	148000	149	58
228000	98000	130000	150	58
191000	98000	93000	151	58
224000	152000	72000	152	58
179000	152000	27000	153	58
225000	152000	73000	154	58
239000	152000	87000	155	58
245000	152000	93000	156	58
262000	152000	110000	157	58
269000	152000	117000	158	58
250000	152000	98000	159	58
246000	152000	94000	160	58
228000	152000	76000	161	58
191000	152000	39000	162	58
179000	224000	-45000	162	59
225000	224000	1000	163	59
239000	224000	15000	164	59
245000	224000	21000	165	59
262000	224000	38000	166	59
269000	224000	45000	167	59
250000	224000	26000	168	59
246000	224000	22000	169	59
228000	224000	4000	170	59
191000	224000	-33000	170	60
225000	179000	46000	171	60
239000	179000	60000	172	60
245000	179000	66000	173	60
262000	179000	83000	174	60
269000	179000	90000	175	60
250000	179000	71000	176	60
246000	179000	67000	177	60
228000	179000	49000	178	60
191000	179000	12000	179	60
239000	225000	14000	180	60
245000	225000	20000	181	60
262000	225000	37000	182	60
269000	225000	44000	183	60
250000	225000	25000	184	60
246000	225000	21000	185	60
228000	225000	3000	186	60
191000	225000	-34000	186	61
245000	239000	6000	187	61
262000	239000	23000	188	61
269000	239000	30000	189	61
250000	239000	11000	190	61
246000	239000	7000	191	61
228000	239000	-11000	191	62
191000	239000	-48000	191	63
262000	245000	17000	192	63
269000	245000	24000	193	63
250000	245000	5000	194	63

246000	245000	1000	195	63
228000	245000	-17000	195	64
191000	245000	-54000	195	65
269000	262000	7000	196	65
250000	262000	-12000	196	66
246000	262000	-16000	196	67
228000	262000	-34000	196	68
191000	262000	-71000	196	69
250000	269000	-19000	196	70
246000	269000	-23000	196	71
228000	269000	-41000	196	72
191000	269000	-78000	196	73
246000	250000	-4000	196	74
228000	250000	-22000	196	75
191000	250000	-59000	196	76
228000	246000	-18000	196	77
191000	246000	-55000	196	78
191000	228000	-37000	196	79

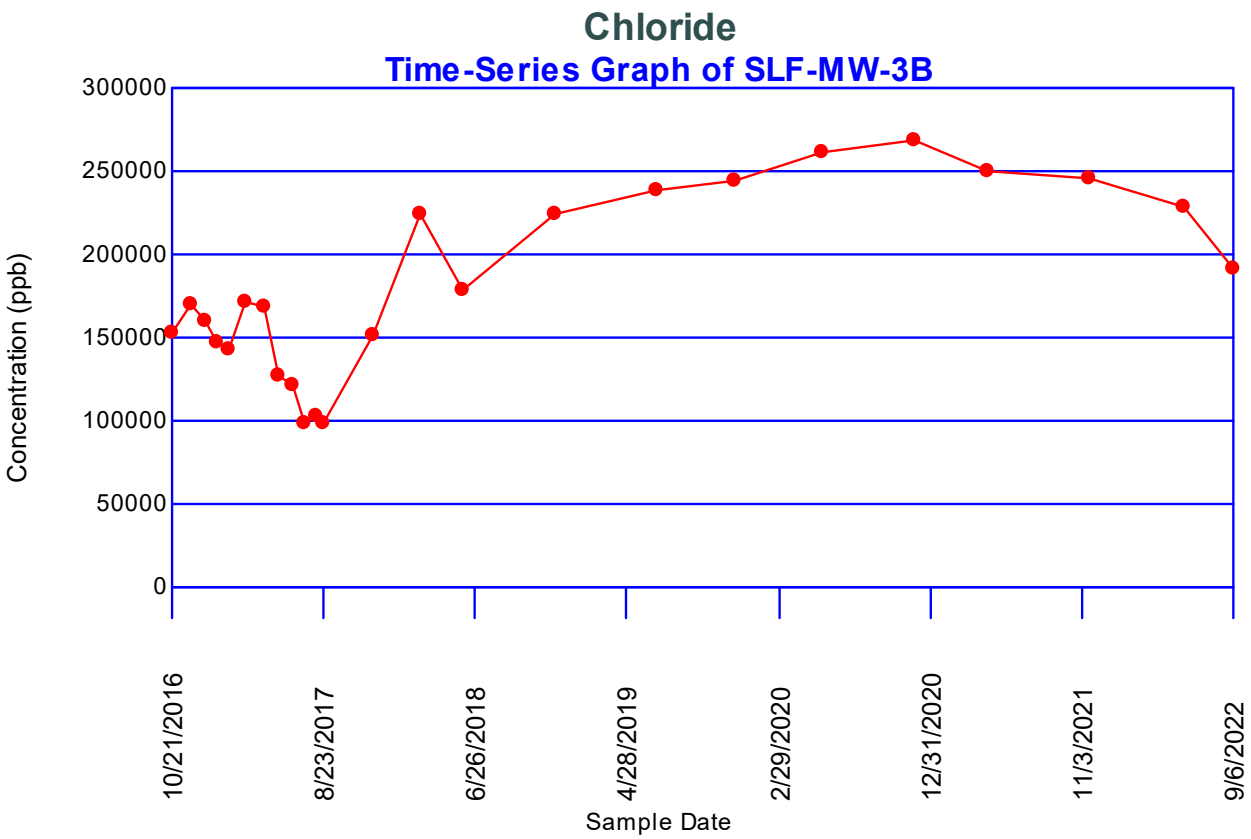
S Statistic = 196 - 79 = 117

Tied Group	Value	Members
1	98000	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1624.33
Z-Score = 2.8782
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|2.8782| > 1.97737 indicating a trend


Chloride
Time-Series Graph of SLF-MW-3B
300000
250000
200000
150000
100000
50000
0
Concentration (ppb)
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Chloride

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 20 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.512027	0.154762	0.45	44100
2	0.361903	0.17931	0.462	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	33649.2	FALSE
	3/20/2017	25801.9	FALSE
	4/25/2017	22580.8	FALSE
	5/22/2017	16154	FALSE
	6/20/2017	25945.6	FALSE
	7/17/2017	26000	FALSE
	8/7/2017	19100	FALSE
	8/22/2017	25500	FALSE
	11/29/2017	24500	FALSE
	3/8/2018	15000	FALSE
	5/30/2018	25500	FALSE
	12/4/2018	20500	FALSE
	6/28/2019	24300	FALSE
	12/2/2019	29200	FALSE
	5/28/2020	12400	FALSE
	11/30/2020	14200	FALSE
	4/28/2021	25700	FALSE
	11/19/2021	26900	FALSE
	5/31/2022	26200	FALSE
	9/6/2022	**44100**	**TRUE**

Shapiro-Wilks Test of Normality

Parameter: Chloride

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 10 for 20 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	12400	44100	31700	0.4734	15006.8
2	14200	33649.2	19449.2	0.3211	6245.14
3	15000	29200	14200	0.2565	3642.3
4	16154	26900	10746	0.2085	2240.54
5	19100	26200	7100	0.1686	1197.06
6	20500	26000	5500	0.1334	733.7
7	22580.8	25945.6	3364.8	0.1013	340.854
8	24300	25801.9	1501.9	0.0711	106.785
9	24500	25700	1200	0.0422	50.64
10	25500	25500	0	0.014	0
11	25500	25500	0		
12	25700	24500	-1200		
13	25801.9	24300	-1501.9		
14	25945.6	22580.8	-3364.8		
15	26000	20500	-5500		
16	26200	19100	-7100		
17	26900	16154	-10746		
18	29200	15000	-14200		
19	33649.2	14200	-19449.2		
20	44100	12400	-31700		

Sum of b values = 29563.8
Sample Standard Deviation = 7134.35
W Statistic = 0.903769

5% Critical value of 0.905 exceeds 0.903769
Evidence of non-normality at 95% level of significance

1% Critical value of 0.868 is less than 0.903769
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chloride

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
25801.9	33649.2	-7847.3	0	1
22580.8	33649.2	-11068.4	0	2
16154	33649.2	-17495.2	0	3
25945.6	33649.2	-7703.6	0	4
26000	33649.2	-7649.2	0	5
19100	33649.2	-14549.2	0	6
25500	33649.2	-8149.2	0	7
24500	33649.2	-9149.2	0	8
15000	33649.2	-18649.2	0	9
25500	33649.2	-8149.2	0	10
20500	33649.2	-13149.2	0	11
24300	33649.2	-9349.2	0	12
29200	33649.2	-4449.2	0	13
12400	33649.2	-21249.2	0	14
14200	33649.2	-19449.2	0	15
25700	33649.2	-7949.2	0	16
26900	33649.2	-6749.2	0	17
26200	33649.2	-7449.2	0	18
44100	33649.2	10450.8	1	18
22580.8	25801.9	-3221.1	1	19
16154	25801.9	-9647.9	1	20
25945.6	25801.9	143.7	2	20
26000	25801.9	198.1	3	20
19100	25801.9	-6701.9	3	21
25500	25801.9	-301.9	3	22
24500	25801.9	-1301.9	3	23
15000	25801.9	-10801.9	3	24
25500	25801.9	-301.9	3	25
20500	25801.9	-5301.9	3	26
24300	25801.9	-1501.9	3	27
29200	25801.9	3398.1	4	27
12400	25801.9	-13401.9	4	28
14200	25801.9	-11601.9	4	29
25700	25801.9	-101.9	4	30
26900	25801.9	1098.1	5	30
26200	25801.9	398.1	6	30
44100	25801.9	18298.1	7	30
16154	22580.8	-6426.8	7	31
25945.6	22580.8	3364.8	8	31
26000	22580.8	3419.2	9	31
19100	22580.8	-3480.8	9	32
25500	22580.8	2919.2	10	32
24500	22580.8	1919.2	11	32
15000	22580.8	-7580.8	11	33
25500	22580.8	2919.2	12	33

20500	22580.8	-2080.8	12	34
24300	22580.8	1719.2	13	34
29200	22580.8	6619.2	14	34
12400	22580.8	-10180.8	14	35
14200	22580.8	-8380.8	14	36
25700	22580.8	3119.2	15	36
26900	22580.8	4319.2	16	36
26200	22580.8	3619.2	17	36
44100	22580.8	21519.2	18	36
25945.6	16154	9791.6	19	36
26000	16154	9846	20	36
19100	16154	2946	21	36
25500	16154	9346	22	36
24500	16154	8346	23	36
15000	16154	-1154	23	37
25500	16154	9346	24	37
20500	16154	4346	25	37
24300	16154	8146	26	37
29200	16154	13046	27	37
12400	16154	-3754	27	38
14200	16154	-1954	27	39
25700	16154	9546	28	39
26900	16154	10746	29	39
26200	16154	10046	30	39
44100	16154	27946	31	39
26000	25945.6	54.4	32	39
19100	25945.6	-6845.6	32	40
25500	25945.6	-445.6	32	41
24500	25945.6	-1445.6	32	42
15000	25945.6	-10945.6	32	43
25500	25945.6	-445.6	32	44
20500	25945.6	-5445.6	32	45
24300	25945.6	-1645.6	32	46
29200	25945.6	3254.4	33	46
12400	25945.6	-13545.6	33	47
14200	25945.6	-11745.6	33	48
25700	25945.6	-245.6	33	49
26900	25945.6	954.4	34	49
26200	25945.6	254.4	35	49
44100	25945.6	18154.4	36	49
19100	26000	-6900	36	50
25500	26000	-500	36	51
24500	26000	-1500	36	52
15000	26000	-11000	36	53
25500	26000	-500	36	54
20500	26000	-5500	36	55
24300	26000	-1700	36	56
29200	26000	3200	37	56
12400	26000	-13600	37	57
14200	26000	-11800	37	58
25700	26000	-300	37	59
26900	26000	900	38	59
26200	26000	200	39	59
44100	26000	18100	40	59

25500	19100	6400	41	59
24500	19100	5400	42	59
15000	19100	-4100	42	60
25500	19100	6400	43	60
20500	19100	1400	44	60
24300	19100	5200	45	60
29200	19100	10100	46	60
12400	19100	-6700	46	61
14200	19100	-4900	46	62
25700	19100	6600	47	62
26900	19100	7800	48	62
26200	19100	7100	49	62
44100	19100	25000	50	62
24500	25500	-1000	50	63
15000	25500	-10500	50	64
25500	25500	0	50	64
20500	25500	-5000	50	65
24300	25500	-1200	50	66
29200	25500	3700	51	66
12400	25500	-13100	51	67
14200	25500	-11300	51	68
25700	25500	200	52	68
26900	25500	1400	53	68
26200	25500	700	54	68
44100	25500	18600	55	68
15000	24500	-9500	55	69
25500	24500	1000	56	69
20500	24500	-4000	56	70
24300	24500	-200	56	71
29200	24500	4700	57	71
12400	24500	-12100	57	72
14200	24500	-10300	57	73
25700	24500	1200	58	73
26900	24500	2400	59	73
26200	24500	1700	60	73
44100	24500	19600	61	73
25500	15000	10500	62	73
20500	15000	5500	63	73
24300	15000	9300	64	73
29200	15000	14200	65	73
12400	15000	-2600	65	74
14200	15000	-800	65	75
25700	15000	10700	66	75
26900	15000	11900	67	75
26200	15000	11200	68	75
44100	15000	29100	69	75
20500	25500	-5000	69	76
24300	25500	-1200	69	77
29200	25500	3700	70	77
12400	25500	-13100	70	78
14200	25500	-11300	70	79
25700	25500	200	71	79

26900	25500	1400	72	79
26200	25500	700	73	79
44100	25500	18600	74	79
24300	20500	3800	75	79
29200	20500	8700	76	79
12400	20500	-8100	76	80
14200	20500	-6300	76	81
25700	20500	5200	77	81
26900	20500	6400	78	81
26200	20500	5700	79	81
44100	20500	23600	80	81
29200	24300	4900	81	81
12400	24300	-11900	81	82
14200	24300	-10100	81	83
25700	24300	1400	82	83
26900	24300	2600	83	83
26200	24300	1900	84	83
44100	24300	19800	85	83
12400	29200	-16800	85	84
14200	29200	-15000	85	85
25700	29200	-3500	85	86
26900	29200	-2300	85	87
26200	29200	-3000	85	88
44100	29200	14900	86	88
14200	12400	1800	87	88
25700	12400	13300	88	88
26900	12400	14500	89	88
26200	12400	13800	90	88
44100	12400	31700	91	88
25700	14200	11500	92	88
26900	14200	12700	93	88
26200	14200	12000	94	88
44100	14200	29900	95	88
26900	25700	1200	96	88
26200	25700	500	97	88
44100	25700	18400	98	88
26200	26900	-700	98	89
44100	26900	17200	99	89
44100	26200	17900	100	89

S Statistic = 100 - 89 = 11

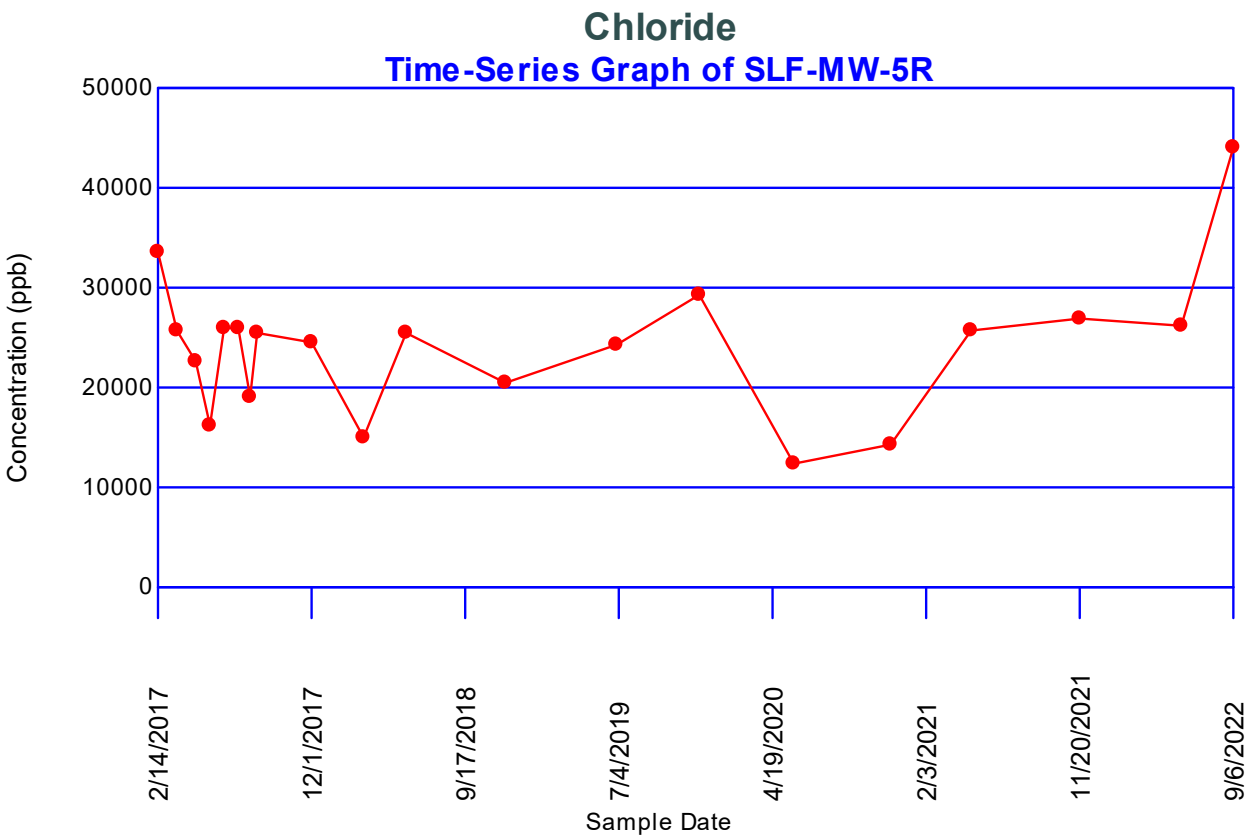
Tied Group	Value	Members
1	25500	2

Time Period	Observations
2/14/2017	1
3/20/2017	1

4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 949
Z-Score = 0.324614
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|0.324614| <= 1.97737 indicating no evidence of a trend


Chloride
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
50000
40000
30000
20000
10000
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 65
Total Non-Detect: 40
Percent Non-Detects: 61.5385%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	23	2 (8.69565%)	10/21/2016	ND<500	ND<500
			11/30/2016	2647.4	2647.4
			12/28/2016	1500	1500
			1/18/2017	1875.9	1875.9
			2/14/2017	ND<500	ND<500
			3/20/2017	1794.9	1794.9
			4/25/2017	1972.9	1972.9
			5/22/2017	1673.4	1673.4
			6/20/2017	2104.9	2104.9
			7/17/2017	2000	2000
			8/8/2017	2000	2000
			8/21/2017	1900	1900
			11/29/2017	2000	2000
			5/31/2018	2200	2200
			12/4/2018	1620	1620
			6/28/2019	2190	2190
			12/2/2019	2280	2280
			5/28/2020	2330	2330
			11/30/2020	2220	2220
			4/28/2021	1980	1980
			11/19/2021	1960	1960
			5/31/2022	1100	1100
			9/6/2022	970	970
			11/21/2022	**830**	**830**
SLF-MW-3B	23	21 (91.3043%)	10/21/2016	ND<500	ND<500
			11/30/2016	ND<500	ND<500
			12/28/2016	ND<500	ND<500
			1/18/2017	ND<500	ND<500
			2/15/2017	ND<500	ND<500
			3/20/2017	ND<500	ND<500
			4/25/2017	ND<500	ND<500
			5/22/2017	ND<500	ND<500
			6/20/2017	ND<500	ND<500
			7/17/2017	ND<500	ND<500
			8/7/2017	ND<500	ND<500
			8/21/2017	ND<500	ND<500
			11/29/2017	ND<500	ND<500
			5/30/2018	ND<500	ND<500
			12/4/2018	ND<500	ND<500
			6/27/2019	ND<500	ND<500

			12/2/2019	ND<500	ND<500
			5/28/2020	ND<500	ND<500
			12/1/2020	ND<500	ND<500
			4/28/2021	ND<500	ND<500
			11/19/2021	ND<500	ND<500
			5/31/2022	160	160
			9/6/2022	160	160
			11/21/2022	**160**	**160**
SLF-MW-5R	19	17 (89.4737%)	2/14/2017	ND<500	ND<500
			3/20/2017	ND<500	ND<500
			4/25/2017	ND<500	ND<500
			5/22/2017	ND<500	ND<500
			6/20/2017	ND<500	ND<500
			7/17/2017	ND<500	ND<500
			8/7/2017	ND<500	ND<500
			8/22/2017	ND<500	ND<500
			11/29/2017	ND<500	ND<500
			5/30/2018	ND<500	ND<500
			12/4/2018	ND<500	ND<500
			6/28/2019	ND<500	ND<500
			12/2/2019	ND<500	ND<500
			5/28/2020	ND<500	ND<500
			11/30/2020	ND<500	ND<500
			4/28/2021	ND<500	ND<500
			11/19/2021	ND<500	ND<500
			5/31/2022	130	130
			9/6/2022	150	150
			11/21/2022	**150**	**150**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Fluoride

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.219029	0.264045	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	ND<500	FALSE
	11/30/2016	2647.4	FALSE
	12/28/2016	1500	FALSE
	1/18/2017	1875.9	FALSE
	2/14/2017	ND<500	FALSE
	3/20/2017	1794.9	FALSE
	4/25/2017	1972.9	FALSE
	5/22/2017	1673.4	FALSE
	6/20/2017	2104.9	FALSE
	7/17/2017	2000	FALSE
	8/8/2017	2000	FALSE
	8/21/2017	1900	FALSE
	11/29/2017	2000	FALSE
	5/31/2018	2200	FALSE
	12/4/2018	1620	FALSE
	6/28/2019	2190	FALSE
	12/2/2019	2280	FALSE
	5/28/2020	2330	FALSE
	11/30/2020	2220	FALSE
	4/28/2021	1980	FALSE
	11/19/2021	1960	FALSE
	5/31/2022	1100	FALSE
	9/6/2022	970	FALSE

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	500	2647.4	2147.4	0.4542	975.349
2	500	2330	1830	0.3126	572.058
3	970	2280	1310	0.2563	335.753
4	1100	2220	1120	0.2139	239.568
5	1500	2200	700	0.1787	125.09
6	1620	2190	570	0.148	84.36
7	1673.4	2104.9	431.5	0.1201	51.8231
8	1794.9	2000	205.1	0.0941	19.2999
9	1875.9	2000	124.1	0.0696	8.63736
10	1900	2000	100	0.0459	4.59
11	1960	1980	20	0.0228	0.456
12	1972.9	1972.9	0		
13	1980	1960	-20		
14	2000	1900	-100		
15	2000	1875.9	-124.1		
16	2000	1794.9	-205.1		
17	2104.9	1673.4	-431.5		
18	2190	1620	-570		
19	2200	1500	-700		
20	2220	1100	-1120		
21	2280	970	-1310		
22	2330	500	-1830		
23	2647.4	500	-2147.4		

Sum of b values = 2416.98
Sample Standard Deviation = 553.155
W Statistic = 0.867822

5% Critical value of 0.914 exceeds 0.867822
Evidence of non-normality at 95% level of significance

1% Critical value of 0.881 exceeds 0.867822
Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Fluoride

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2647.4	ND<500	2147.4	1	0
1500	ND<500	1000	2	0
1875.9	ND<500	1375.9	3	0
ND<500	ND<500	0	3	0
1794.9	ND<500	1294.9	4	0
1972.9	ND<500	1472.9	5	0
1673.4	ND<500	1173.4	6	0
2104.9	ND<500	1604.9	7	0
2000	ND<500	1500	8	0
2000	ND<500	1500	9	0
1900	ND<500	1400	10	0
2000	ND<500	1500	11	0
2200	ND<500	1700	12	0
1620	ND<500	1120	13	0
2190	ND<500	1690	14	0
2280	ND<500	1780	15	0
2330	ND<500	1830	16	0
2220	ND<500	1720	17	0
1980	ND<500	1480	18	0
1960	ND<500	1460	19	0
1100	ND<500	600	20	0
970	ND<500	470	21	0
1500	2647.4	-1147.4	21	1
1875.9	2647.4	-771.5	21	2
ND<500	2647.4	-2147.4	21	3
1794.9	2647.4	-852.5	21	4
1972.9	2647.4	-674.5	21	5
1673.4	2647.4	-974	21	6
2104.9	2647.4	-542.5	21	7
2000	2647.4	-647.4	21	8
2000	2647.4	-647.4	21	9
1900	2647.4	-747.4	21	10
2000	2647.4	-647.4	21	11
2200	2647.4	-447.4	21	12
1620	2647.4	-1027.4	21	13
2190	2647.4	-457.4	21	14
2280	2647.4	-367.4	21	15
2330	2647.4	-317.4	21	16
2220	2647.4	-427.4	21	17
1980	2647.4	-667.4	21	18
1960	2647.4	-687.4	21	19
1100	2647.4	-1547.4	21	20
970	2647.4	-1677.4	21	21
1875.9	1500	375.9	22	21
ND<500	1500	-1000	22	22

1794.9	1500	294.9	23	22
1972.9	1500	472.9	24	22
1673.4	1500	173.4	25	22
2104.9	1500	604.9	26	22
2000	1500	500	27	22
2000	1500	500	28	22
1900	1500	400	29	22
2000	1500	500	30	22
2200	1500	700	31	22
1620	1500	120	32	22
2190	1500	690	33	22
2280	1500	780	34	22
2330	1500	830	35	22
2220	1500	720	36	22
1980	1500	480	37	22
1960	1500	460	38	22
1100	1500	-400	38	23
970	1500	-530	38	24
ND<500	1875.9	-1375.9	38	25
1794.9	1875.9	-81	38	26
1972.9	1875.9	97	39	26
1673.4	1875.9	-202.5	39	27
2104.9	1875.9	229	40	27
2000	1875.9	124.1	41	27
2000	1875.9	124.1	42	27
1900	1875.9	24.1	43	27
2000	1875.9	124.1	44	27
2200	1875.9	324.1	45	27
1620	1875.9	-255.9	45	28
2190	1875.9	314.1	46	28
2280	1875.9	404.1	47	28
2330	1875.9	454.1	48	28
2220	1875.9	344.1	49	28
1980	1875.9	104.1	50	28
1960	1875.9	84.1	51	28
1100	1875.9	-775.9	51	29
970	1875.9	-905.9	51	30
1794.9	ND<500	1294.9	52	30
1972.9	ND<500	1472.9	53	30
1673.4	ND<500	1173.4	54	30
2104.9	ND<500	1604.9	55	30
2000	ND<500	1500	56	30
2000	ND<500	1500	57	30
1900	ND<500	1400	58	30
2000	ND<500	1500	59	30
2200	ND<500	1700	60	30
1620	ND<500	1120	61	30
2190	ND<500	1690	62	30
2280	ND<500	1780	63	30
2330	ND<500	1830	64	30
2220	ND<500	1720	65	30
1980	ND<500	1480	66	30
1960	ND<500	1460	67	30
1100	ND<500	600	68	30
970	ND<500	470	69	30

1972.9	1794.9	178	70	30
1673.4	1794.9	-121.5	70	31
2104.9	1794.9	310	71	31
2000	1794.9	205.1	72	31
2000	1794.9	205.1	73	31
1900	1794.9	105.1	74	31
2000	1794.9	205.1	75	31
2200	1794.9	405.1	76	31
1620	1794.9	-174.9	76	32
2190	1794.9	395.1	77	32
2280	1794.9	485.1	78	32
2330	1794.9	535.1	79	32
2220	1794.9	425.1	80	32
1980	1794.9	185.1	81	32
1960	1794.9	165.1	82	32
1100	1794.9	-694.9	82	33
970	1794.9	-824.9	82	34
1673.4	1972.9	-299.5	82	35
2104.9	1972.9	132	83	35
2000	1972.9	27.1	84	35
2000	1972.9	27.1	85	35
1900	1972.9	-72.9	85	36
2000	1972.9	27.1	86	36
2200	1972.9	227.1	87	36
1620	1972.9	-352.9	87	37
2190	1972.9	217.1	88	37
2280	1972.9	307.1	89	37
2330	1972.9	357.1	90	37
2220	1972.9	247.1	91	37
1980	1972.9	7.1	92	37
1960	1972.9	-12.9	92	38
1100	1972.9	-872.9	92	39
970	1972.9	-1002.9	92	40
2104.9	1673.4	431.5	93	40
2000	1673.4	326.6	94	40
2000	1673.4	326.6	95	40
1900	1673.4	226.6	96	40
2000	1673.4	326.6	97	40
2200	1673.4	526.6	98	40
1620	1673.4	-53.4	98	41
2190	1673.4	516.6	99	41
2280	1673.4	606.6	100	41
2330	1673.4	656.6	101	41
2220	1673.4	546.6	102	41
1980	1673.4	306.6	103	41
1960	1673.4	286.6	104	41
1100	1673.4	-573.4	104	42
970	1673.4	-703.4	104	43
2000	2104.9	-104.9	104	44
2000	2104.9	-104.9	104	45
1900	2104.9	-204.9	104	46
2000	2104.9	-104.9	104	47
2200	2104.9	95.1	105	47

1620	2104.9	-484.9	105	48
2190	2104.9	85.1	106	48
2280	2104.9	175.1	107	48
2330	2104.9	225.1	108	48
2220	2104.9	115.1	109	48
1980	2104.9	-124.9	109	49
1960	2104.9	-144.9	109	50
1100	2104.9	-1004.9	109	51
970	2104.9	-1134.9	109	52
2000	2000	0	109	52
1900	2000	-100	109	53
2000	2000	0	109	53
2200	2000	200	110	53
1620	2000	-380	110	54
2190	2000	190	111	54
2280	2000	280	112	54
2330	2000	330	113	54
2220	2000	220	114	54
1980	2000	-20	114	55
1960	2000	-40	114	56
1100	2000	-900	114	57
970	2000	-1030	114	58
1900	2000	-100	114	59
2000	2000	0	114	59
2200	2000	200	115	59
1620	2000	-380	115	60
2190	2000	190	116	60
2280	2000	280	117	60
2330	2000	330	118	60
2220	2000	220	119	60
1980	2000	-20	119	61
1960	2000	-40	119	62
1100	2000	-900	119	63
970	2000	-1030	119	64
2000	1900	100	120	64
2200	1900	300	121	64
1620	1900	-280	121	65
2190	1900	290	122	65
2280	1900	380	123	65
2330	1900	430	124	65
2220	1900	320	125	65
1980	1900	80	126	65
1960	1900	60	127	65
1100	1900	-800	127	66
970	1900	-930	127	67
2200	2000	200	128	67
1620	2000	-380	128	68
2190	2000	190	129	68
2280	2000	280	130	68
2330	2000	330	131	68
2220	2000	220	132	68
1980	2000	-20	132	69
1960	2000	-40	132	70

1100	2000	-900	132	71
970	2000	-1030	132	72
1620	2200	-580	132	73
2190	2200	-10	132	74
2280	2200	80	133	74
2330	2200	130	134	74
2220	2200	20	135	74
1980	2200	-220	135	75
1960	2200	-240	135	76
1100	2200	-1100	135	77
970	2200	-1230	135	78
2190	1620	570	136	78
2280	1620	660	137	78
2330	1620	710	138	78
2220	1620	600	139	78
1980	1620	360	140	78
1960	1620	340	141	78
1100	1620	-520	141	79
970	1620	-650	141	80
2280	2190	90	142	80
2330	2190	140	143	80
2220	2190	30	144	80
1980	2190	-210	144	81
1960	2190	-230	144	82
1100	2190	-1090	144	83
970	2190	-1220	144	84
2330	2280	50	145	84
2220	2280	-60	145	85
1980	2280	-300	145	86
1960	2280	-320	145	87
1100	2280	-1180	145	88
970	2280	-1310	145	89
2220	2330	-110	145	90
1980	2330	-350	145	91
1960	2330	-370	145	92
1100	2330	-1230	145	93
970	2330	-1360	145	94
1980	2220	-240	145	95
1960	2220	-260	145	96
1100	2220	-1120	145	97
970	2220	-1250	145	98
1960	1980	-20	145	99
1100	1980	-880	145	100
970	1980	-1010	145	101
1100	1960	-860	145	102
970	1960	-990	145	103
970	1100	-130	145	104

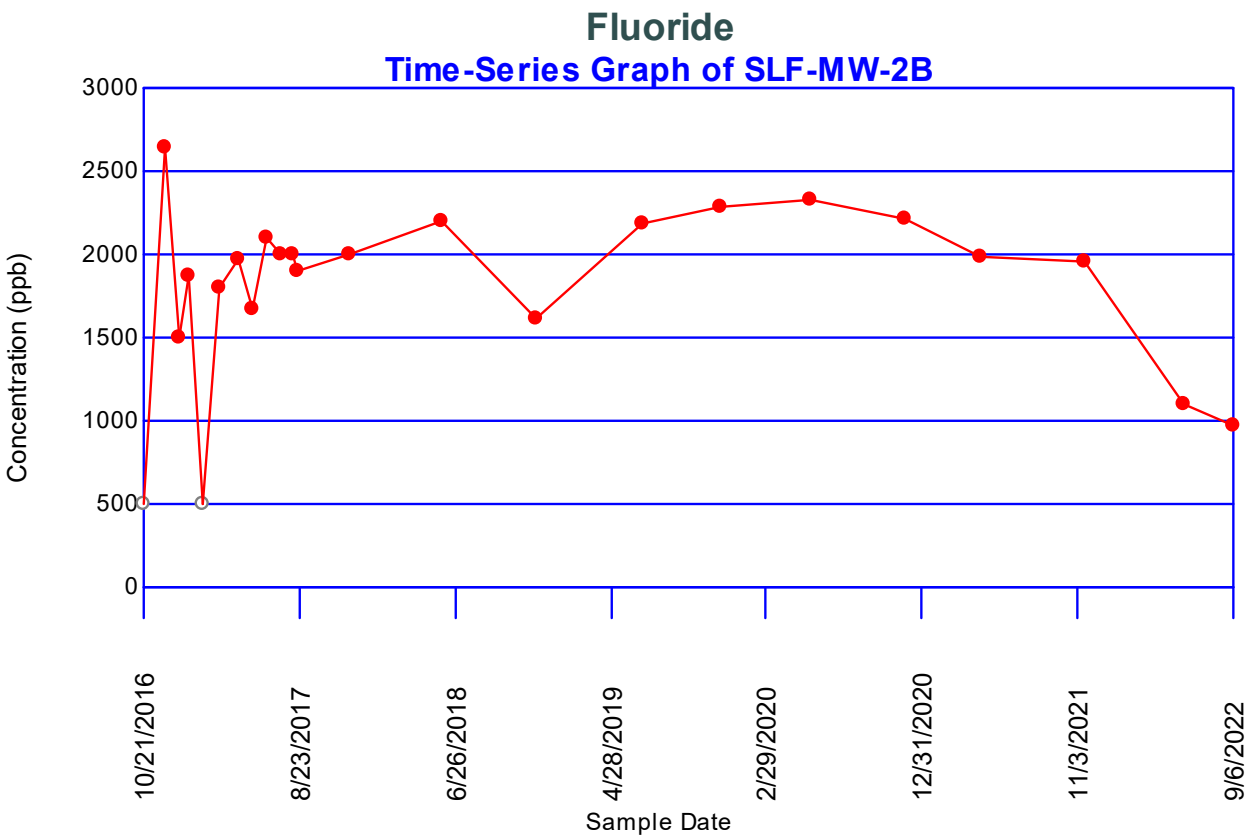
S Statistic = 145 - 104 = 41

Tied Group	Value	Members
1	500	2
2	2000	3

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1429
Z-Score = 1.05814
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.05814| <= 1.97737 indicating no evidence of a trend


Fluoride
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
3000
2500
2000
1500
1000
500
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Fluoride

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.

Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	ND<500	FALSE
	11/30/2016	ND<500	FALSE
	12/28/2016	ND<500	FALSE
	1/18/2017	ND<500	FALSE
	2/15/2017	ND<500	FALSE
	3/20/2017	ND<500	FALSE
	4/25/2017	ND<500	FALSE
	5/22/2017	ND<500	FALSE
	6/20/2017	ND<500	FALSE
	7/17/2017	ND<500	FALSE
	8/7/2017	ND<500	FALSE
	8/21/2017	ND<500	FALSE
	11/29/2017	ND<500	FALSE
	5/30/2018	ND<500	FALSE
	12/4/2018	ND<500	FALSE
	6/27/2019	ND<500	FALSE
	12/2/2019	ND<500	FALSE
	5/28/2020	ND<500	FALSE
	12/1/2020	ND<500	FALSE
	4/28/2021	ND<500	FALSE
	11/19/2021	ND<500	FALSE
	5/31/2022	160	FALSE
	9/6/2022	160	FALSE

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

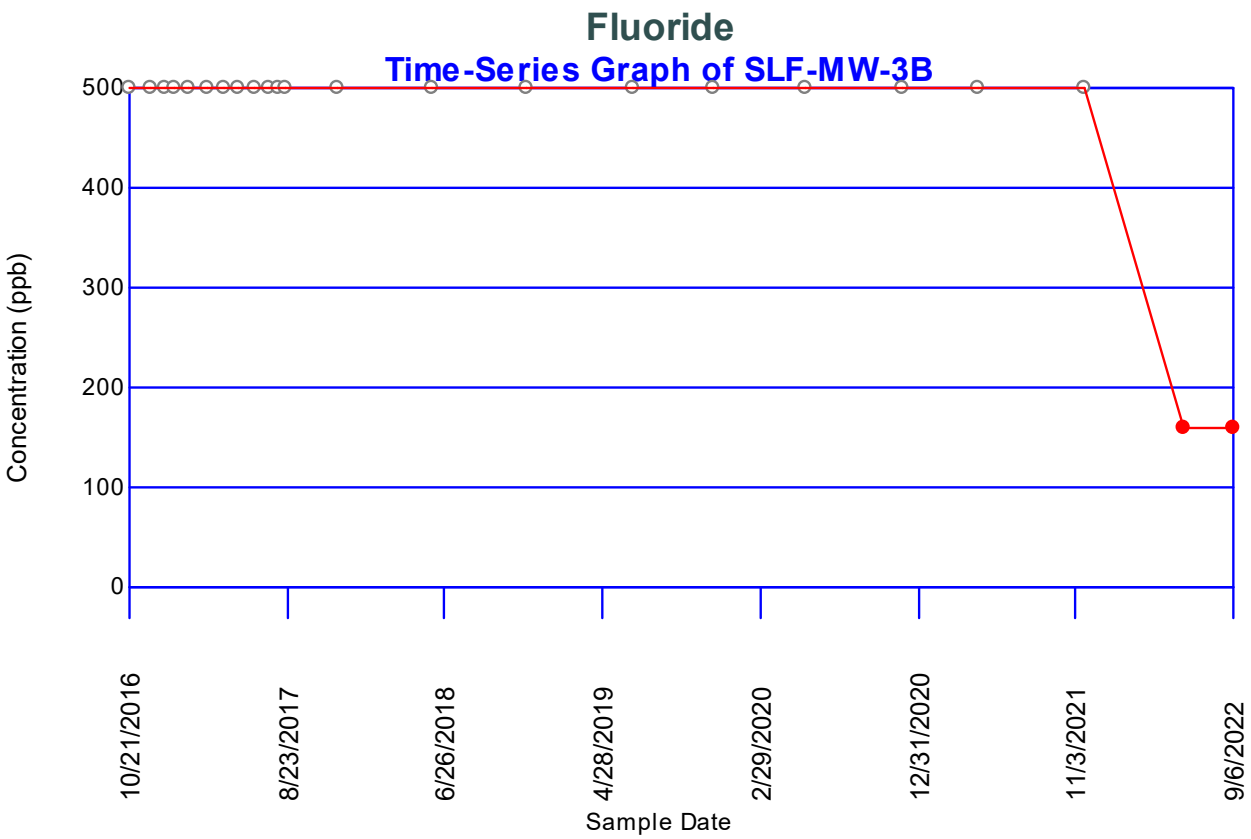
K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	160	500	340	0.4542	154.428
2	160	500	340	0.3126	106.284
3	500	500	0	0.2563	0
4	500	500	0	0.2139	0
5	500	500	0	0.1787	0
6	500	500	0	0.148	0
7	500	500	0	0.1201	0
8	500	500	0	0.0941	0
9	500	500	0	0.0696	0
10	500	500	0	0.0459	0
11	500	500	0	0.0228	0
12	500	500	0		
13	500	500	0		
14	500	500	0		
15	500	500	0		
16	500	500	0		
17	500	500	0		
18	500	500	0		
19	500	500	0		
20	500	500	0		
21	500	500	0		
22	500	160	-340		
23	500	160	-340		

Sum of b values = 260.712
Sample Standard Deviation = 97.9554
W Statistic = 0.32199

5% Critical value of 0.914 exceeds 0.32199
Evidence of non-normality at 95% level of significance

1% Critical value of 0.881 exceeds 0.32199
Evidence of non-normality at 99% level of significance


Fluoride
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
500
400
300
200
100
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Fluoride

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 19 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier

A Divide-By-Zero error occurred in the calculations.

Additional Outliers May Exist.

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	ND<500	FALSE
	3/20/2017	ND<500	FALSE
	4/25/2017	ND<500	FALSE
	5/22/2017	ND<500	FALSE
	6/20/2017	ND<500	FALSE
	7/17/2017	ND<500	FALSE
	8/7/2017	ND<500	FALSE
	8/22/2017	ND<500	FALSE
	11/29/2017	ND<500	FALSE
	5/30/2018	ND<500	FALSE
	12/4/2018	ND<500	FALSE
	6/28/2019	ND<500	FALSE
	12/2/2019	ND<500	FALSE
	5/28/2020	ND<500	FALSE
	11/30/2020	ND<500	FALSE
	4/28/2021	ND<500	FALSE
	11/19/2021	ND<500	FALSE
	5/31/2022	130	FALSE
	9/6/2022	150	FALSE

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

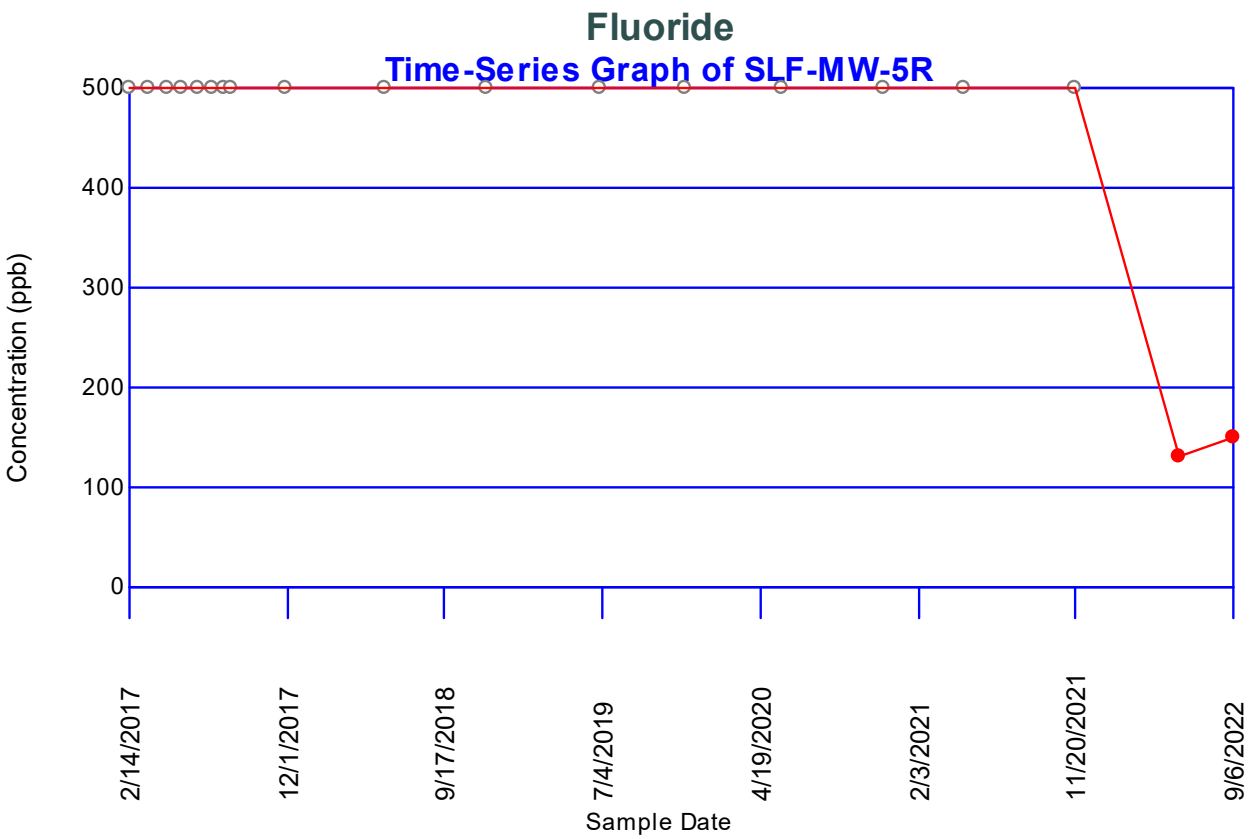
K = 9 for 19 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	130	500	370	0.4808	177.896
2	150	500	350	0.3232	113.12
3	500	500	0	0.2561	0
4	500	500	0	0.2059	0
5	500	500	0	0.1641	0
6	500	500	0	0.1271	0
7	500	500	0	0.0932	0
8	500	500	0	0.0612	0
9	500	500	0	0.0303	0
10	500	500	0		
11	500	500	0		
12	500	500	0		
13	500	500	0		
14	500	500	0		
15	500	500	0		
16	500	500	0		
17	500	500	0		
18	500	150	-350		
19	500	130	-370		

Sum of b values = 291.016
Sample Standard Deviation = 113.558
W Statistic = 0.364862

5% Critical value of 0.901 exceeds 0.364862
Evidence of non-normality at 95% level of significance

1% Critical value of 0.863 exceeds 0.364862
Evidence of non-normality at 99% level of significance


Fluoride
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
500
400
300
200
100
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 70
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	26	0 (0%)	10/21/2016	7.51	7.51
			11/30/2016	7.67	7.67
			12/28/2016	7.73	7.73
			1/18/2017	7.59	7.59
			2/14/2017	7.79	7.79
			3/20/2017	7.61	7.61
			4/25/2017	7.48	7.48
			5/22/2017	7.93	7.93
			6/20/2017	8.06	8.06
			7/17/2017	8.34	8.34
			8/8/2017	9	9
			8/21/2017	8.93	8.93
			11/29/2017	7.66	7.66
			3/8/2018	7.88	7.88
			5/31/2018	7.56	7.56
			12/4/2018	7.62	7.62
			6/28/2019	7.54	7.54
			11/4/2019	7.6	7.6
			12/2/2019	7.5	7.5
			5/28/2020	7.28	7.28
			11/30/2020	7.87	7.87
			4/12/2021	7.7	7.7
			4/28/2021	7.73	7.73
			11/19/2021	7.82	7.82
			5/31/2022	7.7	7.7
			9/6/2022	7.63	7.63
			11/21/2022	**7.68**	**7.68**
SLF-MW-3B	24	0 (0%)	10/21/2016	7.02	7.02
			11/30/2016	7.11	7.11
			12/28/2016	7.19	7.19
			1/18/2017	6.97	6.97
			2/15/2017	7.24	7.24
			3/20/2017	7.06	7.06
			4/25/2017	7.02	7.02
			5/22/2017	7.22	7.22
			6/20/2017	6.99	6.99
			7/17/2017	7.33	7.33
			8/7/2017	7.61	7.61
			8/21/2017	7.53	7.53
			11/29/2017	7.12	7.12

			3/8/2018	7.46	7.46
			5/30/2018	7.09	7.09
			12/4/2018	7.11	7.11
			6/27/2019	7.22	7.22
			12/2/2019	7.11	7.11
			5/28/2020	6.97	6.97
			12/1/2020	7.23	7.23
			4/28/2021	7.14	7.14
			11/19/2021	7.25	7.25
			5/31/2022	7.28	7.28
			9/6/2022	7.25	7.25
			11/21/2022	**7.3**	**7.3**
SLF-MW-5R	20	0 (0%)	2/14/2017	7.16	7.16
			3/20/2017	7.14	7.14
			4/25/2017	7.06	7.06
			5/22/2017	7.14	7.14
			6/20/2017	7.09	7.09
			7/17/2017	7.2	7.2
			8/7/2017	7.32	7.32
			8/22/2017	7.34	7.34
			11/29/2017	7.1	7.1
			3/8/2018	7.35	7.35
			5/30/2018	6.94	6.94
			12/4/2018	7.14	7.14
			6/28/2019	7.1	7.1
			12/2/2019	7.08	7.08
			5/28/2020	7.1	7.1
			11/30/2020	7.2	7.2
			4/28/2021	7.16	7.16
			11/19/2021	7.08	7.08
			5/31/2022	7.2	7.2
			9/6/2022	7.12	7.12
			11/21/2022	**7.19**	**7.19**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Rosner's Test for Outliers

Parameter: pH, Field

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Data set mean = 7.79731

10 most extreme of 26 measurements

by order of magnitude difference from the mean

1	8/8/2017	SLF-MW-2B	9	1.20269
2	8/21/2017	SLF-MW-2B	8.93	1.13269
3	7/17/2017	SLF-MW-2B	8.34	0.542692
4	5/28/2020	SLF-MW-2B	7.28	-0.517308
5	4/25/2017	SLF-MW-2B	7.48	-0.317308
6	12/2/2019	SLF-MW-2B	7.5	-0.297308
7	10/21/2016	SLF-MW-2B	7.51	-0.287308
8	6/20/2017	SLF-MW-2B	8.06	0.262692
9	6/28/2019	SLF-MW-2B	7.54	-0.257308
10	5/31/2018	SLF-MW-2B	7.56	-0.237308

Iteration i = 9

Mean of 17 measurements = 7.71118
Std Dev = 0.111797
x(i+1) = 7.56 from measurement 5/31/2018 from location SLF-MW-2B
Rosner Statistic R = |7.56 - 7.71118|/0.111797 = 1.35224
Lambda(26, 10, 0.05) = 2.62
1.35224 < 2.62 -- No outliers detected for i = 9

Iteration i = 8

Mean of 18 measurements = 7.70167
Std Dev = 0.11572
x(i+1) = 7.54 from measurement 6/28/2019 from location SLF-MW-2B
Rosner Statistic R = |7.54 - 7.70167|/0.11572 = 1.39705
Lambda(26, 9, 0.05) = 2.648
1.39705 < 2.648 -- No outliers detected for i = 8

Iteration i = 7

Mean of 19 measurements = 7.72053
Std Dev = 0.139303
x(i+1) = 8.06 from measurement 6/20/2017 from location SLF-MW-2B
Rosner Statistic R = |8.06 - 7.72053|/0.139303 = 2.43695
Lambda(26, 8, 0.05) = 2.676
2.43695 < 2.676 -- No outliers detected for i = 7

Iteration i = 6

Mean of 20 measurements = 7.71
Std Dev = 0.143527
x(i+1) = 7.51 from measurement 10/21/2016 from location SLF-MW-2B
Rosner Statistic R = |7.51 - 7.71|/0.143527 = 1.39347
Lambda(26, 7, 0.05) = 2.704
1.39347 < 2.704 -- No outliers detected for i = 6

Iteration i = 5
Mean of 21 measurements = 7.7
Std Dev = 0.147207
x(i+1) = 7.5 from measurement 12/2/2019 from location SLF-MW-2B
Rosner Statistic R = |7.5 - 7.7|/0.147207 = 1.35863
Lambda(26, 6, 0.05) = 2.732
1.35863 < 2.732 -- No outliers detected for i = 5

Iteration i = 4
Mean of 22 measurements = 7.69
Std Dev = 0.151123
x(i+1) = 7.48 from measurement 4/25/2017 from location SLF-MW-2B
Rosner Statistic R = |7.48 - 7.69|/0.151123 = 1.3896
Lambda(26, 5, 0.05) = 2.76
1.3896 < 2.76 -- No outliers detected for i = 4

Iteration i = 3
Mean of 23 measurements = 7.67217
Std Dev = 0.170613
x(i+1) = 7.28 from measurement 5/28/2020 from location SLF-MW-2B
Rosner Statistic R = |7.28 - 7.67217|/0.170613 = 2.29862
Lambda(26, 4, 0.05) = 2.78
2.29862 < 2.78 -- No outliers detected for i = 3

Iteration i = 2
Mean of 24 measurements = 7.7
Std Dev = 0.215467
x(i+1) = 8.34 from measurement 7/17/2017 from location SLF-MW-2B
Rosner Statistic R = |8.34 - 7.7|/0.215467 = 2.97029
Lambda(26, 3, 0.05) = 2.8
2.97029 > 2.8 -- Measurement 7/17/2017 for location SLF-MW-2B is an outlier

Iteration i = 1
Mean of 25 measurements = 7.7492
Std Dev = 0.324049
x(i+1) = 8.93 from measurement 8/21/2017 from location SLF-MW-2B
Rosner Statistic R = |8.93 - 7.7492|/0.324049 = 3.64389
Lambda(26, 2, 0.05) = 2.82
Measurement 8/21/2017 for location SLF-MW-2B is an outlier

Iteration i = 0
Mean of 26 measurements = 7.79731
Std Dev = 0.401224
x(i+1) = 9 from measurement 8/8/2017 from location SLF-MW-2B
Rosner Statistic R = |9 - 7.79731|/0.401224 = 2.99756
Lambda(26, 1, 0.05) = 2.84
Measurement 8/8/2017 for location SLF-MW-2B is an outlier

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 13 for 26 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	7.28	9	1.72	0.4407	0.758004
2	7.48	8.93	1.45	0.3043	0.441235
3	7.5	8.34	0.84	0.2533	0.212772
4	7.51	8.06	0.55	0.2151	0.118305
5	7.54	7.93	0.39	0.1836	0.071604
6	7.56	7.88	0.32	0.1563	0.050016
7	7.59	7.87	0.28	0.1316	0.036848
8	7.6	7.82	0.22	0.1089	0.023958
9	7.61	7.79	0.18	0.0876	0.015768
10	7.62	7.73	0.11	0.0672	0.007392
11	7.63	7.73	0.1	0.0476	0.00476
12	7.66	7.7	0.04	0.0284	0.001136
13	7.67	7.7	0.03	0.0094	0.000282
14	7.7	7.67	-0.03		
15	7.7	7.66	-0.04		
16	7.73	7.63	-0.1		
17	7.73	7.62	-0.11		
18	7.79	7.61	-0.18		
19	7.82	7.6	-0.22		
20	7.87	7.59	-0.28		
21	7.88	7.56	-0.32		
22	7.93	7.54	-0.39		
23	8.06	7.51	-0.55		
24	8.34	7.5	-0.84		
25	8.93	7.48	-1.45		
26	9	7.28	-1.72		

Sum of b values = 1.74208
Sample Standard Deviation = 0.401224
W Statistic = 0.75409

5% Critical value of 0.92 exceeds 0.75409
Evidence of non-normality at 95% level of significance

1% Critical value of 0.891 exceeds 0.75409
Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: pH, Field

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.67	7.51	0.16	1	0
7.73	7.51	0.22	2	0
7.59	7.51	0.08	3	0
7.79	7.51	0.28	4	0
7.61	7.51	0.1	5	0
7.48	7.51	-0.03	5	1
7.93	7.51	0.42	6	1
8.06	7.51	0.55	7	1
8.34	7.51	0.83	8	1
9	7.51	1.49	9	1
8.93	7.51	1.42	10	1
7.66	7.51	0.15	11	1
7.88	7.51	0.37	12	1
7.56	7.51	0.05	13	1
7.62	7.51	0.11	14	1
7.54	7.51	0.03	15	1
7.6	7.51	0.09	16	1
7.5	7.51	-0.01	16	2
7.28	7.51	-0.23	16	3
7.87	7.51	0.36	17	3
7.7	7.51	0.19	18	3
7.73	7.51	0.22	19	3
7.82	7.51	0.31	20	3
7.7	7.51	0.19	21	3
7.63	7.51	0.12	22	3
7.73	7.67	0.06	23	3
7.59	7.67	-0.08	23	4
7.79	7.67	0.12	24	4
7.61	7.67	-0.06	24	5
7.48	7.67	-0.19	24	6
7.93	7.67	0.26	25	6
8.06	7.67	0.39	26	6
8.34	7.67	0.67	27	6
9	7.67	1.33	28	6
8.93	7.67	1.26	29	6
7.66	7.67	-0.01	29	7
7.88	7.67	0.21	30	7
7.56	7.67	-0.11	30	8
7.62	7.67	-0.05	30	9
7.54	7.67	-0.13	30	10
7.6	7.67	-0.07	30	11
7.5	7.67	-0.17	30	12
7.28	7.67	-0.39	30	13
7.87	7.67	0.2	31	13
7.7	7.67	0.03	32	13
7.73	7.67	0.06	33	13

7.82	7.67	0.15	34	13
7.7	7.67	0.03	35	13
7.63	7.67	-0.04	35	14
7.59	7.73	-0.14	35	15
7.79	7.73	0.06	36	15
7.61	7.73	-0.12	36	16
7.48	7.73	-0.25	36	17
7.93	7.73	0.2	37	17
8.06	7.73	0.33	38	17
8.34	7.73	0.61	39	17
9	7.73	1.27	40	17
8.93	7.73	1.2	41	17
7.66	7.73	-0.07	41	18
7.88	7.73	0.15	42	18
7.56	7.73	-0.17	42	19
7.62	7.73	-0.11	42	20
7.54	7.73	-0.19	42	21
7.6	7.73	-0.13	42	22
7.5	7.73	-0.23	42	23
7.28	7.73	-0.45	42	24
7.87	7.73	0.14	43	24
7.7	7.73	-0.03	43	25
7.73	7.73	0	43	25
7.82	7.73	0.09	44	25
7.7	7.73	-0.03	44	26
7.63	7.73	-0.1	44	27
7.79	7.59	0.2	45	27
7.61	7.59	0.02	46	27
7.48	7.59	-0.11	46	28
7.93	7.59	0.34	47	28
8.06	7.59	0.47	48	28
8.34	7.59	0.75	49	28
9	7.59	1.41	50	28
8.93	7.59	1.34	51	28
7.66	7.59	0.07	52	28
7.88	7.59	0.29	53	28
7.56	7.59	-0.03	53	29
7.62	7.59	0.03	54	29
7.54	7.59	-0.05	54	30
7.6	7.59	0.01	55	30
7.5	7.59	-0.09	55	31
7.28	7.59	-0.31	55	32
7.87	7.59	0.28	56	32
7.7	7.59	0.11	57	32
7.73	7.59	0.14	58	32
7.82	7.59	0.23	59	32
7.7	7.59	0.11	60	32
7.63	7.59	0.04	61	32
7.61	7.79	-0.18	61	33
7.48	7.79	-0.31	61	34
7.93	7.79	0.14	62	34
8.06	7.79	0.27	63	34
8.34	7.79	0.55	64	34
9	7.79	1.21	65	34

8.93	7.79	1.14	66	34
7.66	7.79	-0.13	66	35
7.88	7.79	0.09	67	35
7.56	7.79	-0.23	67	36
7.62	7.79	-0.17	67	37
7.54	7.79	-0.25	67	38
7.6	7.79	-0.19	67	39
7.5	7.79	-0.29	67	40
7.28	7.79	-0.51	67	41
7.87	7.79	0.08	68	41
7.7	7.79	-0.09	68	42
7.73	7.79	-0.06	68	43
7.82	7.79	0.03	69	43
7.7	7.79	-0.09	69	44
7.63	7.79	-0.16	69	45
7.48	7.61	-0.13	69	46
7.93	7.61	0.32	70	46
8.06	7.61	0.45	71	46
8.34	7.61	0.73	72	46
9	7.61	1.39	73	46
8.93	7.61	1.32	74	46
7.66	7.61	0.05	75	46
7.88	7.61	0.27	76	46
7.56	7.61	-0.05	76	47
7.62	7.61	0.01	77	47
7.54	7.61	-0.07	77	48
7.6	7.61	-0.01	77	49
7.5	7.61	-0.11	77	50
7.28	7.61	-0.33	77	51
7.87	7.61	0.26	78	51
7.7	7.61	0.09	79	51
7.73	7.61	0.12	80	51
7.82	7.61	0.21	81	51
7.7	7.61	0.09	82	51
7.63	7.61	0.02	83	51
7.93	7.48	0.45	84	51
8.06	7.48	0.58	85	51
8.34	7.48	0.86	86	51
9	7.48	1.52	87	51
8.93	7.48	1.45	88	51
7.66	7.48	0.18	89	51
7.88	7.48	0.4	90	51
7.56	7.48	0.08	91	51
7.62	7.48	0.14	92	51
7.54	7.48	0.06	93	51
7.6	7.48	0.12	94	51
7.5	7.48	0.02	95	51
7.28	7.48	-0.2	95	52
7.87	7.48	0.39	96	52
7.7	7.48	0.22	97	52
7.73	7.48	0.25	98	52
7.82	7.48	0.34	99	52
7.7	7.48	0.22	100	52
7.63	7.48	0.15	101	52

8.06	7.93	0.13	102	52
8.34	7.93	0.41	103	52
9	7.93	1.07	104	52
8.93	7.93	1	105	52
7.66	7.93	-0.27	105	53
7.88	7.93	-0.05	105	54
7.56	7.93	-0.37	105	55
7.62	7.93	-0.31	105	56
7.54	7.93	-0.39	105	57
7.6	7.93	-0.33	105	58
7.5	7.93	-0.43	105	59
7.28	7.93	-0.65	105	60
7.87	7.93	-0.06	105	61
7.7	7.93	-0.23	105	62
7.73	7.93	-0.2	105	63
7.82	7.93	-0.11	105	64
7.7	7.93	-0.23	105	65
7.63	7.93	-0.3	105	66
8.34	8.06	0.28	106	66
9	8.06	0.94	107	66
8.93	8.06	0.87	108	66
7.66	8.06	-0.4	108	67
7.88	8.06	-0.18	108	68
7.56	8.06	-0.5	108	69
7.62	8.06	-0.44	108	70
7.54	8.06	-0.52	108	71
7.6	8.06	-0.46	108	72
7.5	8.06	-0.56	108	73
7.28	8.06	-0.78	108	74
7.87	8.06	-0.19	108	75
7.7	8.06	-0.36	108	76
7.73	8.06	-0.33	108	77
7.82	8.06	-0.24	108	78
7.7	8.06	-0.36	108	79
7.63	8.06	-0.43	108	80
9	8.34	0.66	109	80
8.93	8.34	0.59	110	80
7.66	8.34	-0.68	110	81
7.88	8.34	-0.46	110	82
7.56	8.34	-0.78	110	83
7.62	8.34	-0.72	110	84
7.54	8.34	-0.8	110	85
7.6	8.34	-0.74	110	86
7.5	8.34	-0.84	110	87
7.28	8.34	-1.06	110	88
7.87	8.34	-0.47	110	89
7.7	8.34	-0.64	110	90
7.73	8.34	-0.61	110	91
7.82	8.34	-0.52	110	92
7.7	8.34	-0.64	110	93
7.63	8.34	-0.71	110	94
8.93	9	-0.07	110	95
7.66	9	-1.34	110	96
7.88	9	-1.12	110	97

7.56	9	-1.44	110	98
7.62	9	-1.38	110	99
7.54	9	-1.46	110	100
7.6	9	-1.4	110	101
7.5	9	-1.5	110	102
7.28	9	-1.72	110	103
7.87	9	-1.13	110	104
7.7	9	-1.3	110	105
7.73	9	-1.27	110	106
7.82	9	-1.18	110	107
7.7	9	-1.3	110	108
7.63	9	-1.37	110	109
7.66	8.93	-1.27	110	110
7.88	8.93	-1.05	110	111
7.56	8.93	-1.37	110	112
7.62	8.93	-1.31	110	113
7.54	8.93	-1.39	110	114
7.6	8.93	-1.33	110	115
7.5	8.93	-1.43	110	116
7.28	8.93	-1.65	110	117
7.87	8.93	-1.06	110	118
7.7	8.93	-1.23	110	119
7.73	8.93	-1.2	110	120
7.82	8.93	-1.11	110	121
7.7	8.93	-1.23	110	122
7.63	8.93	-1.3	110	123
7.88	7.66	0.22	111	123
7.56	7.66	-0.1	111	124
7.62	7.66	-0.04	111	125
7.54	7.66	-0.12	111	126
7.6	7.66	-0.06	111	127
7.5	7.66	-0.16	111	128
7.28	7.66	-0.38	111	129
7.87	7.66	0.21	112	129
7.7	7.66	0.04	113	129
7.73	7.66	0.07	114	129
7.82	7.66	0.16	115	129
7.7	7.66	0.04	116	129
7.63	7.66	-0.03	116	130
7.56	7.88	-0.32	116	131
7.62	7.88	-0.26	116	132
7.54	7.88	-0.34	116	133
7.6	7.88	-0.28	116	134
7.5	7.88	-0.38	116	135
7.28	7.88	-0.6	116	136
7.87	7.88	-0.01	116	137
7.7	7.88	-0.18	116	138
7.73	7.88	-0.15	116	139
7.82	7.88	-0.06	116	140
7.7	7.88	-0.18	116	141
7.63	7.88	-0.25	116	142
7.62	7.56	0.06	117	142
7.54	7.56	-0.02	117	143

7.6	7.56	0.04	118	143
7.5	7.56	-0.06	118	144
7.28	7.56	-0.28	118	145
7.87	7.56	0.31	119	145
7.7	7.56	0.14	120	145
7.73	7.56	0.17	121	145
7.82	7.56	0.26	122	145
7.7	7.56	0.14	123	145
7.63	7.56	0.07	124	145
7.54	7.62	-0.08	124	146
7.6	7.62	-0.02	124	147
7.5	7.62	-0.12	124	148
7.28	7.62	-0.34	124	149
7.87	7.62	0.25	125	149
7.7	7.62	0.08	126	149
7.73	7.62	0.11	127	149
7.82	7.62	0.2	128	149
7.7	7.62	0.08	129	149
7.63	7.62	0.01	130	149
7.6	7.54	0.06	131	149
7.5	7.54	-0.04	131	150
7.28	7.54	-0.26	131	151
7.87	7.54	0.33	132	151
7.7	7.54	0.16	133	151
7.73	7.54	0.19	134	151
7.82	7.54	0.28	135	151
7.7	7.54	0.16	136	151
7.63	7.54	0.09	137	151
7.5	7.6	-0.1	137	152
7.28	7.6	-0.32	137	153
7.87	7.6	0.27	138	153
7.7	7.6	0.1	139	153
7.73	7.6	0.13	140	153
7.82	7.6	0.22	141	153
7.7	7.6	0.1	142	153
7.63	7.6	0.03	143	153
7.28	7.5	-0.22	143	154
7.87	7.5	0.37	144	154
7.7	7.5	0.2	145	154
7.73	7.5	0.23	146	154
7.82	7.5	0.32	147	154
7.7	7.5	0.2	148	154
7.63	7.5	0.13	149	154
7.87	7.28	0.59	150	154
7.7	7.28	0.42	151	154
7.73	7.28	0.45	152	154
7.82	7.28	0.54	153	154
7.7	7.28	0.42	154	154
7.63	7.28	0.35	155	154
7.7	7.87	-0.17	155	155
7.73	7.87	-0.14	155	156

7.82	7.87	-0.05	155	157
7.7	7.87	-0.17	155	158
7.63	7.87	-0.24	155	159
7.73	7.7	0.03	156	159
7.82	7.7	0.12	157	159
7.7	7.7	0	157	159
7.63	7.7	-0.07	157	160
7.82	7.73	0.09	158	160
7.7	7.73	-0.03	158	161
7.63	7.73	-0.1	158	162
7.7	7.82	-0.12	158	163
7.63	7.82	-0.19	158	164
7.63	7.7	-0.07	158	165

S Statistic = 158 - 165 = -7

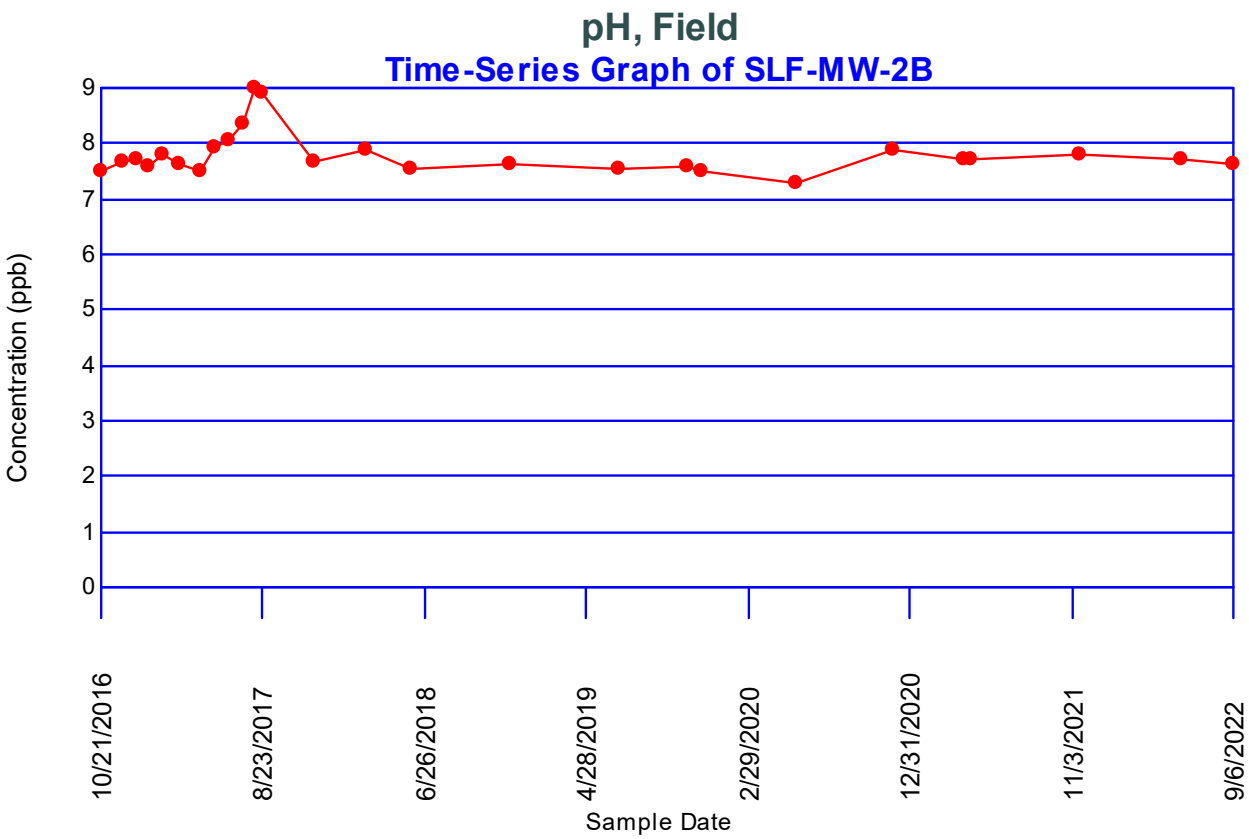
Tied Group	Value	Members
1	7.73	2
2	7.7	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
11/4/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/12/2021	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0

D = 0
E = 4
F = 0
a = 37050
b = 140400
c = 1300
Group Variance = 2056.33
Z-Score = -0.132314
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.132314| <= 1.97737 indicating no evidence of a trend


pH, Field
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
9
8
7
6
5
4
3
2
1
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: pH, Field

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.241935	0.0408163	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	7.02	FALSE
	11/30/2016	7.11	FALSE
	12/28/2016	7.19	FALSE
	1/18/2017	6.97	FALSE
	2/15/2017	7.24	FALSE
	3/20/2017	7.06	FALSE
	4/25/2017	7.02	FALSE
	5/22/2017	7.22	FALSE
	6/20/2017	6.99	FALSE
	7/17/2017	7.33	FALSE
	8/7/2017	7.61	FALSE
	8/21/2017	7.53	FALSE
	11/29/2017	7.12	FALSE
	3/8/2018	7.46	FALSE
	5/30/2018	7.09	FALSE
	12/4/2018	7.11	FALSE
	6/27/2019	7.22	FALSE
	12/2/2019	7.11	FALSE
	5/28/2020	6.97	FALSE
	12/1/2020	7.23	FALSE
	4/28/2021	7.14	FALSE
	11/19/2021	7.25	FALSE
	5/31/2022	7.28	FALSE
	9/6/2022	7.25	FALSE

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.97	7.61	0.64	0.4493	0.287552
2	6.97	7.53	0.56	0.3098	0.173488
3	6.99	7.46	0.47	0.2554	0.120038
4	7.02	7.33	0.31	0.2145	0.066495
5	7.02	7.28	0.26	0.1807	0.046982
6	7.06	7.25	0.19	0.1512	0.028728
7	7.09	7.25	0.16	0.1245	0.01992
8	7.11	7.24	0.13	0.0997	0.012961
9	7.11	7.23	0.12	0.0764	0.009168
10	7.11	7.22	0.11	0.0539	0.005929
11	7.12	7.22	0.1	0.0321	0.00321
12	7.14	7.19	0.05	0.0107	0.000535
13	7.19	7.14	-0.05		
14	7.22	7.12	-0.1		
15	7.22	7.11	-0.11		
16	7.23	7.11	-0.12		
17	7.24	7.11	-0.13		
18	7.25	7.09	-0.16		
19	7.25	7.06	-0.19		
20	7.28	7.02	-0.26		
21	7.33	7.02	-0.31		
22	7.46	6.99	-0.47		
23	7.53	6.97	-0.56		
24	7.61	6.97	-0.64		

Sum of b values = 0.775006
Sample Standard Deviation = 0.168592
W Statistic = 0.918776

5% Critical value of 0.916 is less than 0.918776
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.918776
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: pH, Field

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.11	7.02	0.09	1	0
7.19	7.02	0.17	2	0
6.97	7.02	-0.05	2	1
7.24	7.02	0.22	3	1
7.06	7.02	0.04	4	1
7.02	7.02	0	4	1
7.22	7.02	0.2	5	1
6.99	7.02	-0.03	5	2
7.33	7.02	0.31	6	2
7.61	7.02	0.59	7	2
7.53	7.02	0.51	8	2
7.12	7.02	0.1	9	2
7.46	7.02	0.44	10	2
7.09	7.02	0.07	11	2
7.11	7.02	0.09	12	2
7.22	7.02	0.2	13	2
7.11	7.02	0.09	14	2
6.97	7.02	-0.05	14	3
7.23	7.02	0.21	15	3
7.14	7.02	0.12	16	3
7.25	7.02	0.23	17	3
7.28	7.02	0.26	18	3
7.25	7.02	0.23	19	3
7.19	7.11	0.08	20	3
6.97	7.11	-0.14	20	4
7.24	7.11	0.13	21	4
7.06	7.11	-0.05	21	5
7.02	7.11	-0.09	21	6
7.22	7.11	0.11	22	6
6.99	7.11	-0.12	22	7
7.33	7.11	0.22	23	7
7.61	7.11	0.5	24	7
7.53	7.11	0.42	25	7
7.12	7.11	0.01	26	7
7.46	7.11	0.35	27	7
7.09	7.11	-0.02	27	8
7.11	7.11	0	27	8
7.22	7.11	0.11	28	8
7.11	7.11	0	28	8
6.97	7.11	-0.14	28	9
7.23	7.11	0.12	29	9
7.14	7.11	0.03	30	9
7.25	7.11	0.14	31	9
7.28	7.11	0.17	32	9
7.25	7.11	0.14	33	9

6.97	7.19	-0.22	33	10
7.24	7.19	0.05	34	10
7.06	7.19	-0.13	34	11
7.02	7.19	-0.17	34	12
7.22	7.19	0.03	35	12
6.99	7.19	-0.2	35	13
7.33	7.19	0.14	36	13
7.61	7.19	0.42	37	13
7.53	7.19	0.34	38	13
7.12	7.19	-0.07	38	14
7.46	7.19	0.27	39	14
7.09	7.19	-0.1	39	15
7.11	7.19	-0.08	39	16
7.22	7.19	0.03	40	16
7.11	7.19	-0.08	40	17
6.97	7.19	-0.22	40	18
7.23	7.19	0.04	41	18
7.14	7.19	-0.05	41	19
7.25	7.19	0.06	42	19
7.28	7.19	0.09	43	19
7.25	7.19	0.06	44	19
7.24	6.97	0.27	45	19
7.06	6.97	0.09	46	19
7.02	6.97	0.05	47	19
7.22	6.97	0.25	48	19
6.99	6.97	0.02	49	19
7.33	6.97	0.36	50	19
7.61	6.97	0.64	51	19
7.53	6.97	0.56	52	19
7.12	6.97	0.15	53	19
7.46	6.97	0.49	54	19
7.09	6.97	0.12	55	19
7.11	6.97	0.14	56	19
7.22	6.97	0.25	57	19
7.11	6.97	0.14	58	19
6.97	6.97	0	58	19
7.23	6.97	0.26	59	19
7.14	6.97	0.17	60	19
7.25	6.97	0.28	61	19
7.28	6.97	0.31	62	19
7.25	6.97	0.28	63	19
7.06	7.24	-0.18	63	20
7.02	7.24	-0.22	63	21
7.22	7.24	-0.02	63	22
6.99	7.24	-0.25	63	23
7.33	7.24	0.09	64	23
7.61	7.24	0.37	65	23
7.53	7.24	0.29	66	23
7.12	7.24	-0.12	66	24
7.46	7.24	0.22	67	24
7.09	7.24	-0.15	67	25
7.11	7.24	-0.13	67	26
7.22	7.24	-0.02	67	27
7.11	7.24	-0.13	67	28
6.97	7.24	-0.27	67	29

7.23	7.24	-0.01	67	30
7.14	7.24	-0.1	67	31
7.25	7.24	0.01	68	31
7.28	7.24	0.04	69	31
7.25	7.24	0.01	70	31
7.02	7.06	-0.04	70	32
7.22	7.06	0.16	71	32
6.99	7.06	-0.07	71	33
7.33	7.06	0.27	72	33
7.61	7.06	0.55	73	33
7.53	7.06	0.47	74	33
7.12	7.06	0.06	75	33
7.46	7.06	0.4	76	33
7.09	7.06	0.03	77	33
7.11	7.06	0.05	78	33
7.22	7.06	0.16	79	33
7.11	7.06	0.05	80	33
6.97	7.06	-0.09	80	34
7.23	7.06	0.17	81	34
7.14	7.06	0.08	82	34
7.25	7.06	0.19	83	34
7.28	7.06	0.22	84	34
7.25	7.06	0.19	85	34
7.22	7.02	0.2	86	34
6.99	7.02	-0.03	86	35
7.33	7.02	0.31	87	35
7.61	7.02	0.59	88	35
7.53	7.02	0.51	89	35
7.12	7.02	0.1	90	35
7.46	7.02	0.44	91	35
7.09	7.02	0.07	92	35
7.11	7.02	0.09	93	35
7.22	7.02	0.2	94	35
7.11	7.02	0.09	95	35
6.97	7.02	-0.05	95	36
7.23	7.02	0.21	96	36
7.14	7.02	0.12	97	36
7.25	7.02	0.23	98	36
7.28	7.02	0.26	99	36
7.25	7.02	0.23	100	36
6.99	7.22	-0.23	100	37
7.33	7.22	0.11	101	37
7.61	7.22	0.39	102	37
7.53	7.22	0.31	103	37
7.12	7.22	-0.1	103	38
7.46	7.22	0.24	104	38
7.09	7.22	-0.13	104	39
7.11	7.22	-0.11	104	40
7.22	7.22	0	104	40
7.11	7.22	-0.11	104	41
6.97	7.22	-0.25	104	42
7.23	7.22	0.01	105	42
7.14	7.22	-0.08	105	43
7.25	7.22	0.03	106	43

7.28	7.22	0.06	107	43
7.25	7.22	0.03	108	43
7.33	6.99	0.34	109	43
7.61	6.99	0.62	110	43
7.53	6.99	0.54	111	43
7.12	6.99	0.13	112	43
7.46	6.99	0.47	113	43
7.09	6.99	0.1	114	43
7.11	6.99	0.12	115	43
7.22	6.99	0.23	116	43
7.11	6.99	0.12	117	43
6.97	6.99	-0.02	117	44
7.23	6.99	0.24	118	44
7.14	6.99	0.15	119	44
7.25	6.99	0.26	120	44
7.28	6.99	0.29	121	44
7.25	6.99	0.26	122	44
7.61	7.33	0.28	123	44
7.53	7.33	0.2	124	44
7.12	7.33	-0.21	124	45
7.46	7.33	0.13	125	45
7.09	7.33	-0.24	125	46
7.11	7.33	-0.22	125	47
7.22	7.33	-0.11	125	48
7.11	7.33	-0.22	125	49
6.97	7.33	-0.36	125	50
7.23	7.33	-0.1	125	51
7.14	7.33	-0.19	125	52
7.25	7.33	-0.08	125	53
7.28	7.33	-0.05	125	54
7.25	7.33	-0.08	125	55
7.53	7.61	-0.08	125	56
7.12	7.61	-0.49	125	57
7.46	7.61	-0.15	125	58
7.09	7.61	-0.52	125	59
7.11	7.61	-0.5	125	60
7.22	7.61	-0.39	125	61
7.11	7.61	-0.5	125	62
6.97	7.61	-0.64	125	63
7.23	7.61	-0.38	125	64
7.14	7.61	-0.47	125	65
7.25	7.61	-0.36	125	66
7.28	7.61	-0.33	125	67
7.25	7.61	-0.36	125	68
7.12	7.53	-0.41	125	69
7.46	7.53	-0.07	125	70
7.09	7.53	-0.44	125	71
7.11	7.53	-0.42	125	72
7.22	7.53	-0.31	125	73
7.11	7.53	-0.42	125	74
6.97	7.53	-0.56	125	75
7.23	7.53	-0.3	125	76
7.14	7.53	-0.39	125	77

7.25	7.53	-0.28	125	78
7.28	7.53	-0.25	125	79
7.25	7.53	-0.28	125	80
7.46	7.12	0.34	126	80
7.09	7.12	-0.03	126	81
7.11	7.12	-0.01	126	82
7.22	7.12	0.1	127	82
7.11	7.12	-0.01	127	83
6.97	7.12	-0.15	127	84
7.23	7.12	0.11	128	84
7.14	7.12	0.02	129	84
7.25	7.12	0.13	130	84
7.28	7.12	0.16	131	84
7.25	7.12	0.13	132	84
7.09	7.46	-0.37	132	85
7.11	7.46	-0.35	132	86
7.22	7.46	-0.24	132	87
7.11	7.46	-0.35	132	88
6.97	7.46	-0.49	132	89
7.23	7.46	-0.23	132	90
7.14	7.46	-0.32	132	91
7.25	7.46	-0.21	132	92
7.28	7.46	-0.18	132	93
7.25	7.46	-0.21	132	94
7.11	7.09	0.02	133	94
7.22	7.09	0.13	134	94
7.11	7.09	0.02	135	94
6.97	7.09	-0.12	135	95
7.23	7.09	0.14	136	95
7.14	7.09	0.05	137	95
7.25	7.09	0.16	138	95
7.28	7.09	0.19	139	95
7.25	7.09	0.16	140	95
7.22	7.11	0.11	141	95
7.11	7.11	0	141	95
6.97	7.11	-0.14	141	96
7.23	7.11	0.12	142	96
7.14	7.11	0.03	143	96
7.25	7.11	0.14	144	96
7.28	7.11	0.17	145	96
7.25	7.11	0.14	146	96
7.11	7.22	-0.11	146	97
6.97	7.22	-0.25	146	98
7.23	7.22	0.01	147	98
7.14	7.22	-0.08	147	99
7.25	7.22	0.03	148	99
7.28	7.22	0.06	149	99
7.25	7.22	0.03	150	99
6.97	7.11	-0.14	150	100
7.23	7.11	0.12	151	100
7.14	7.11	0.03	152	100

7.25	7.11	0.14	153	100
7.28	7.11	0.17	154	100
7.25	7.11	0.14	155	100
7.23	6.97	0.26	156	100
7.14	6.97	0.17	157	100
7.25	6.97	0.28	158	100
7.28	6.97	0.31	159	100
7.25	6.97	0.28	160	100
7.14	7.23	-0.09	160	101
7.25	7.23	0.02	161	101
7.28	7.23	0.05	162	101
7.25	7.23	0.02	163	101
7.25	7.14	0.11	164	101
7.28	7.14	0.14	165	101
7.25	7.14	0.11	166	101
7.28	7.25	0.03	167	101
7.25	7.25	0	167	101
7.25	7.28	-0.03	167	102

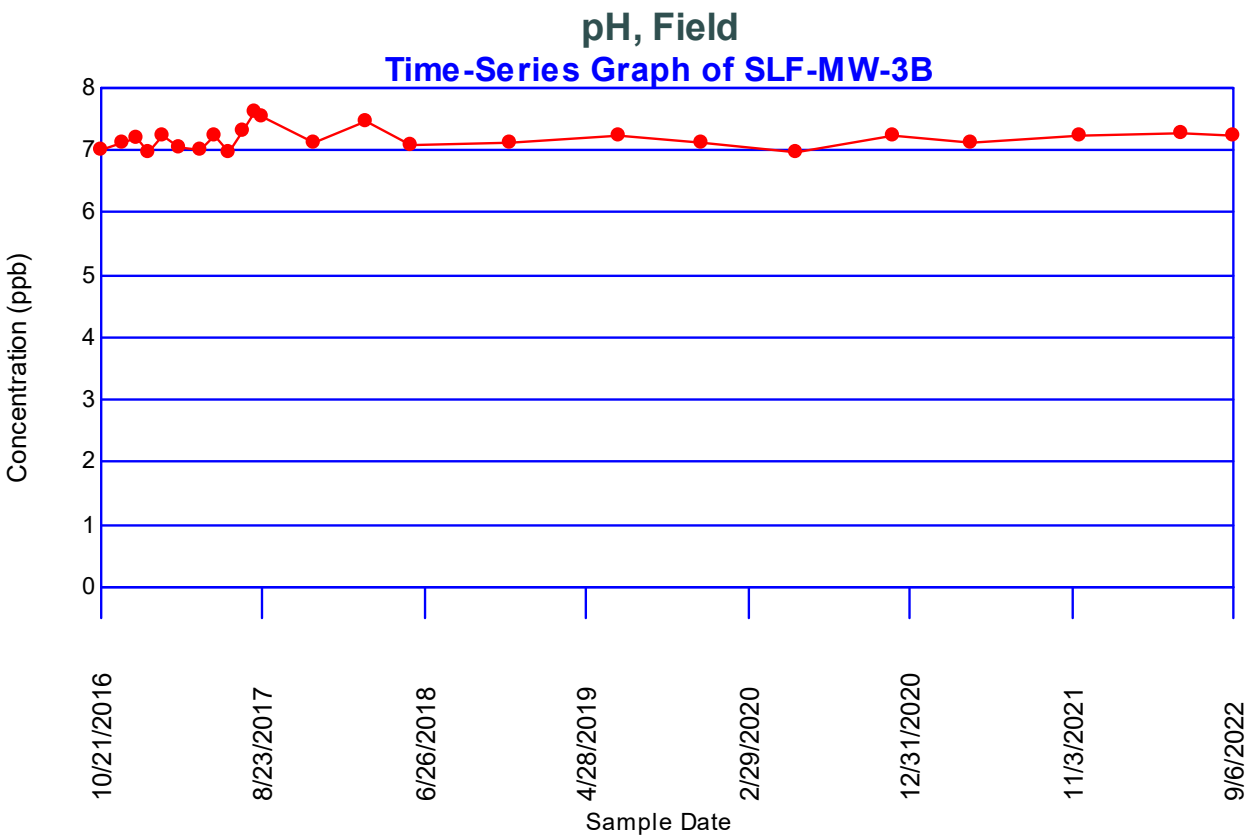
S Statistic = 167 - 102 = 65

Tied Group	Value	Members
1	7.02	2
2	7.11	3
3	6.97	2
4	7.22	2
5	7.25	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1

5/31/2022 1
9/6/2022 1
There are 0 time periods with multiple data

A = 138
B = 0
C = 6
D = 0
E = 14
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1617.67
Z-Score = 1.59124
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.59124| <= 1.97737 indicating no evidence of a trend


pH, Field
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
8
7
6
5
4
3
2
1
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: pH, Field

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 20 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.111111	0.368421	0.45	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	7.16	FALSE
	3/20/2017	7.14	FALSE
	4/25/2017	7.06	FALSE
	5/22/2017	7.14	FALSE
	6/20/2017	7.09	FALSE
	7/17/2017	7.2	FALSE
	8/7/2017	7.32	FALSE
	8/22/2017	7.34	FALSE
	11/29/2017	7.1	FALSE
	3/8/2018	7.35	FALSE
	5/30/2018	6.94	FALSE
	12/4/2018	7.14	FALSE
	6/28/2019	7.1	FALSE
	12/2/2019	7.08	FALSE
	5/28/2020	7.1	FALSE
	11/30/2020	7.2	FALSE
	4/28/2021	7.16	FALSE
	11/19/2021	7.08	FALSE
	5/31/2022	7.2	FALSE
	9/6/2022	7.12	FALSE

Shapiro-Wilks Test of Normality

Parameter: pH, Field

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 10 for 20 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.94	7.35	0.41	0.4734	0.194094
2	7.06	7.34	0.28	0.3211	0.089908
3	7.08	7.32	0.24	0.2565	0.06156
4	7.08	7.2	0.12	0.2085	0.02502
5	7.09	7.2	0.11	0.1686	0.018546
6	7.1	7.2	0.1	0.1334	0.01334
7	7.1	7.16	0.06	0.1013	0.006078
8	7.1	7.16	0.06	0.0711	0.004266
9	7.12	7.14	0.02	0.0422	0.000844
10	7.14	7.14	0	0.014	0
11	7.14	7.14	0		
12	7.14	7.12	-0.02		
13	7.16	7.1	-0.06		
14	7.16	7.1	-0.06		
15	7.2	7.1	-0.1		
16	7.2	7.09	-0.11		
17	7.2	7.08	-0.12		
18	7.32	7.08	-0.24		
19	7.34	7.06	-0.28		
20	7.35	6.94	-0.41		

Sum of b values = 0.413656
Sample Standard Deviation = 0.0992021
W Statistic = 0.915131

5% Critical value of 0.905 is less than 0.915131
Data is normally distributed at 95% level of significance

1% Critical value of 0.868 is less than 0.915131
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: pH, Field

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.14	7.16	-0.02	0	1
7.06	7.16	-0.1	0	2
7.14	7.16	-0.02	0	3
7.09	7.16	-0.07	0	4
7.2	7.16	0.04	1	4
7.32	7.16	0.16	2	4
7.34	7.16	0.18	3	4
7.1	7.16	-0.06	3	5
7.35	7.16	0.19	4	5
6.94	7.16	-0.22	4	6
7.14	7.16	-0.02	4	7
7.1	7.16	-0.06	4	8
7.08	7.16	-0.08	4	9
7.1	7.16	-0.06	4	10
7.2	7.16	0.04	5	10
7.16	7.16	0	5	10
7.08	7.16	-0.08	5	11
7.2	7.16	0.04	6	11
7.12	7.16	-0.04	6	12
7.06	7.14	-0.08	6	13
7.14	7.14	0	6	13
7.09	7.14	-0.05	6	14
7.2	7.14	0.06	7	14
7.32	7.14	0.18	8	14
7.34	7.14	0.2	9	14
7.1	7.14	-0.04	9	15
7.35	7.14	0.21	10	15
6.94	7.14	-0.2	10	16
7.14	7.14	0	10	16
7.1	7.14	-0.04	10	17
7.08	7.14	-0.06	10	18
7.1	7.14	-0.04	10	19
7.2	7.14	0.06	11	19
7.16	7.14	0.02	12	19
7.08	7.14	-0.06	12	20
7.2	7.14	0.06	13	20
7.12	7.14	-0.02	13	21
7.14	7.06	0.08	14	21
7.09	7.06	0.03	15	21
7.2	7.06	0.14	16	21
7.32	7.06	0.26	17	21
7.34	7.06	0.28	18	21
7.1	7.06	0.04	19	21
7.35	7.06	0.29	20	21
6.94	7.06	-0.12	20	22

7.14	7.06	0.08	21	22
7.1	7.06	0.04	22	22
7.08	7.06	0.02	23	22
7.1	7.06	0.04	24	22
7.2	7.06	0.14	25	22
7.16	7.06	0.1	26	22
7.08	7.06	0.02	27	22
7.2	7.06	0.14	28	22
7.12	7.06	0.06	29	22
7.09	7.14	-0.05	29	23
7.2	7.14	0.06	30	23
7.32	7.14	0.18	31	23
7.34	7.14	0.2	32	23
7.1	7.14	-0.04	32	24
7.35	7.14	0.21	33	24
6.94	7.14	-0.2	33	25
7.14	7.14	0	33	25
7.1	7.14	-0.04	33	26
7.08	7.14	-0.06	33	27
7.1	7.14	-0.04	33	28
7.2	7.14	0.06	34	28
7.16	7.14	0.02	35	28
7.08	7.14	-0.06	35	29
7.2	7.14	0.06	36	29
7.12	7.14	-0.02	36	30
7.2	7.09	0.11	37	30
7.32	7.09	0.23	38	30
7.34	7.09	0.25	39	30
7.1	7.09	0.01	40	30
7.35	7.09	0.26	41	30
6.94	7.09	-0.15	41	31
7.14	7.09	0.05	42	31
7.1	7.09	0.01	43	31
7.08	7.09	-0.01	43	32
7.1	7.09	0.01	44	32
7.2	7.09	0.11	45	32
7.16	7.09	0.07	46	32
7.08	7.09	-0.01	46	33
7.2	7.09	0.11	47	33
7.12	7.09	0.03	48	33
7.32	7.2	0.12	49	33
7.34	7.2	0.14	50	33
7.1	7.2	-0.1	50	34
7.35	7.2	0.15	51	34
6.94	7.2	-0.26	51	35
7.14	7.2	-0.06	51	36
7.1	7.2	-0.1	51	37
7.08	7.2	-0.12	51	38
7.1	7.2	-0.1	51	39
7.2	7.2	0	51	39
7.16	7.2	-0.04	51	40
7.08	7.2	-0.12	51	41
7.2	7.2	0	51	41
7.12	7.2	-0.08	51	42

7.34	7.32	0.02	52	42
7.1	7.32	-0.22	52	43
7.35	7.32	0.03	53	43
6.94	7.32	-0.38	53	44
7.14	7.32	-0.18	53	45
7.1	7.32	-0.22	53	46
7.08	7.32	-0.24	53	47
7.1	7.32	-0.22	53	48
7.2	7.32	-0.12	53	49
7.16	7.32	-0.16	53	50
7.08	7.32	-0.24	53	51
7.2	7.32	-0.12	53	52
7.12	7.32	-0.2	53	53
7.1	7.34	-0.24	53	54
7.35	7.34	0.01	54	54
6.94	7.34	-0.4	54	55
7.14	7.34	-0.2	54	56
7.1	7.34	-0.24	54	57
7.08	7.34	-0.26	54	58
7.1	7.34	-0.24	54	59
7.2	7.34	-0.14	54	60
7.16	7.34	-0.18	54	61
7.08	7.34	-0.26	54	62
7.2	7.34	-0.14	54	63
7.12	7.34	-0.22	54	64
7.35	7.1	0.25	55	64
6.94	7.1	-0.16	55	65
7.14	7.1	0.04	56	65
7.1	7.1	0	56	65
7.08	7.1	-0.02	56	66
7.1	7.1	0	56	66
7.2	7.1	0.1	57	66
7.16	7.1	0.06	58	66
7.08	7.1	-0.02	58	67
7.2	7.1	0.1	59	67
7.12	7.1	0.02	60	67
6.94	7.35	-0.41	60	68
7.14	7.35	-0.21	60	69
7.1	7.35	-0.25	60	70
7.08	7.35	-0.27	60	71
7.1	7.35	-0.25	60	72
7.2	7.35	-0.15	60	73
7.16	7.35	-0.19	60	74
7.08	7.35	-0.27	60	75
7.2	7.35	-0.15	60	76
7.12	7.35	-0.23	60	77
7.14	6.94	0.2	61	77
7.1	6.94	0.16	62	77
7.08	6.94	0.14	63	77
7.1	6.94	0.16	64	77
7.2	6.94	0.26	65	77
7.16	6.94	0.22	66	77

7.08	6.94	0.14	67	77
7.2	6.94	0.26	68	77
7.12	6.94	0.18	69	77
7.1	7.14	-0.04	69	78
7.08	7.14	-0.06	69	79
7.1	7.14	-0.04	69	80
7.2	7.14	0.06	70	80
7.16	7.14	0.02	71	80
7.08	7.14	-0.06	71	81
7.2	7.14	0.06	72	81
7.12	7.14	-0.02	72	82
7.08	7.1	-0.02	72	83
7.1	7.1	0	72	83
7.2	7.1	0.1	73	83
7.16	7.1	0.06	74	83
7.08	7.1	-0.02	74	84
7.2	7.1	0.1	75	84
7.12	7.1	0.02	76	84
7.1	7.08	0.02	77	84
7.2	7.08	0.12	78	84
7.16	7.08	0.08	79	84
7.08	7.08	0	79	84
7.2	7.08	0.12	80	84
7.12	7.08	0.04	81	84
7.2	7.1	0.1	82	84
7.16	7.1	0.06	83	84
7.08	7.1	-0.02	83	85
7.2	7.1	0.1	84	85
7.12	7.1	0.02	85	85
7.16	7.2	-0.04	85	86
7.08	7.2	-0.12	85	87
7.2	7.2	0	85	87
7.12	7.2	-0.08	85	88
7.08	7.16	-0.08	85	89
7.2	7.16	0.04	86	89
7.12	7.16	-0.04	86	90
7.2	7.08	0.12	87	90
7.12	7.08	0.04	88	90
7.12	7.2	-0.08	88	91

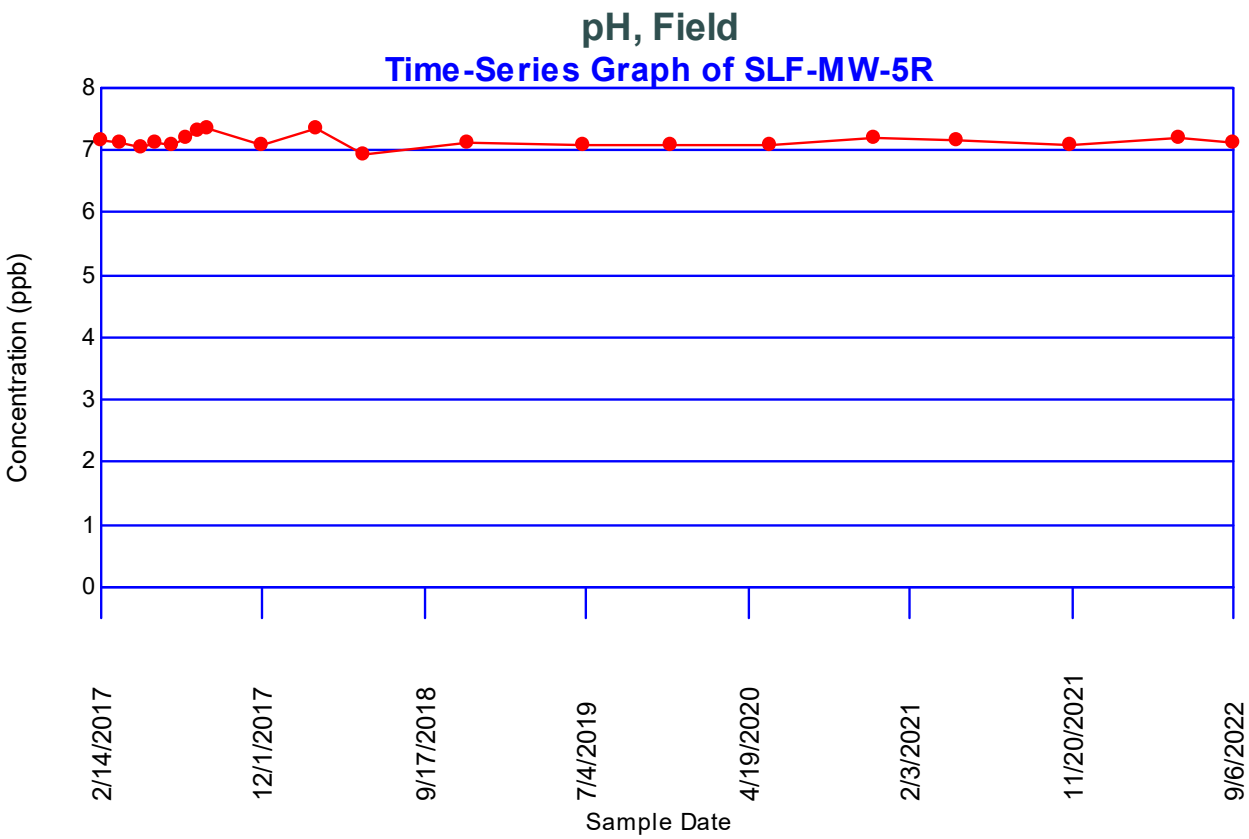
S Statistic = 88 - 91 = -3

Tied Group	Value	Members
1	7.16	2
2	7.14	3
3	7.2	3
4	7.1	3
5	7.08	2

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 234
B = 0
C = 18
D = 0
E = 22
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 937
Z-Score = -0.0653372
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.0653372| <= 1.97737 indicating no evidence of a trend


pH, Field
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
8
7
6
5
4
3
2
1
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 69
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	25	0 (0%)	10/21/2016	347901	347901
			11/30/2016	244670	244670
			12/28/2016	359044	359044
			1/18/2017	229595	229595
			2/14/2017	224624	224624
			3/20/2017	221785	221785
			4/25/2017	205884	205884
			5/22/2017	204497	204497
			6/20/2017	195436	195436
			7/17/2017	203000	203000
			8/8/2017	198500	198500
			8/21/2017	196500	196500
			11/29/2017	191600	191600
			3/8/2018	233000	233000
			5/31/2018	200000	200000
			12/4/2018	163000	163000
			6/28/2019	122000	122000
			12/2/2019	120000	120000
			5/28/2020	104000	104000
			11/30/2020	607000	607000
			4/12/2021	587000	587000
			4/28/2021	555000	555000
			11/19/2021	469000	469000
			5/31/2022	500000	500000
			9/6/2022	448000	448000
			11/21/2022	**490000**	**490000**
SLF-MW-3B	24	0 (0%)	10/21/2016	603053	603053
			11/30/2016	589957	589957
			12/28/2016	614466	614466
			1/18/2017	582135	582135
			2/15/2017	486076	486076
			3/20/2017	472830	472830
			4/25/2017	465682	465682
			5/22/2017	495843	495843
			6/20/2017	480297	480297
			7/17/2017	519000	519000
			8/7/2017	532000	532000
			8/21/2017	549000	549000
			11/29/2017	483000	483000
			3/8/2018	476000	476000

			5/30/2018	454000	454000
			12/4/2018	476000	476000
			6/27/2019	417000	417000
			12/2/2019	384000	384000
			5/28/2020	336000	336000
			12/1/2020	389000	389000
			4/28/2021	355000	355000
			11/19/2021	396000	396000
			5/31/2022	381000	381000
			9/6/2022	364000	364000
			11/21/2022	**384000**	**384000**
SLF-MW-5R	20	0 (0%)	2/14/2017	126012	126012
			3/20/2017	107411	107411
			4/25/2017	95475.3	95475.3
			5/22/2017	90985.1	90985.1
			6/20/2017	130226	130226
			7/17/2017	132600	132600
			8/7/2017	112400	112400
			8/22/2017	143100	143100
			11/29/2017	157800	157800
			3/8/2018	89800	89800
			5/30/2018	158000	158000
			12/4/2018	122000	122000
			6/28/2019	173000	173000
			12/2/2019	162000	162000
			5/28/2020	83400	83400
			11/30/2020	84400	84400
			4/28/2021	144000	144000
			11/19/2021	178000	178000
			5/31/2022	159000	159000
			9/6/2022	209000	209000
			11/21/2022	**259000**	**259000**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Sulfate

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 25 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.107216	0.0399113	0.406	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	347901	FALSE
	11/30/2016	244670	FALSE
	12/28/2016	359044	FALSE
	1/18/2017	229595	FALSE
	2/14/2017	224624	FALSE
	3/20/2017	221785	FALSE
	4/25/2017	205884	FALSE
	5/22/2017	204497	FALSE
	6/20/2017	195436	FALSE
	7/17/2017	203000	FALSE
	8/8/2017	198500	FALSE
	8/21/2017	196500	FALSE
	11/29/2017	191600	FALSE
	3/8/2018	233000	FALSE
	5/31/2018	200000	FALSE
	12/4/2018	163000	FALSE
	6/28/2019	122000	FALSE
	12/2/2019	120000	FALSE
	5/28/2020	104000	FALSE
	11/30/2020	607000	FALSE
	4/12/2021	587000	FALSE
	4/28/2021	555000	FALSE
	11/19/2021	469000	FALSE
	5/31/2022	500000	FALSE
	9/6/2022	448000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 25 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	104000	607000	503000	0.445	223835
2	120000	587000	467000	0.3069	143322
3	122000	555000	433000	0.2543	110112
4	163000	500000	337000	0.2148	72387.6
5	191600	469000	277400	0.1822	50542.3
6	195436	448000	252564	0.1539	38869.6
7	196500	359044	162544	0.1283	20854.4
8	198500	347901	149401	0.1046	15627.3
9	200000	244670	44670	0.0823	3676.34
10	203000	233000	30000	0.061	1830
11	204497	229595	25098	0.0403	1011.45
12	205884	224624	18740	0.02	374.8
13	221785	221785	0		
14	224624	205884	-18740		
15	229595	204497	-25098		
16	233000	203000	-30000		
17	244670	200000	-44670		
18	347901	198500	-149401		
19	359044	196500	-162544		
20	448000	195436	-252564		
21	469000	191600	-277400		
22	500000	163000	-337000		
23	555000	122000	-433000		
24	587000	120000	-467000		
25	607000	104000	-503000		

Sum of b values = 682443
Sample Standard Deviation = 152630
W Statistic = 0.832989

5% Critical value of 0.918 exceeds 0.832989
Evidence of non-normality at 95% level of significance

1% Critical value of 0.888 exceeds 0.832989
Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Sulfate

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
244670	347901	-103231	0	1
359044	347901	11143	1	1
229595	347901	-118306	1	2
224624	347901	-123277	1	3
221785	347901	-126116	1	4
205884	347901	-142017	1	5
204497	347901	-143404	1	6
195436	347901	-152465	1	7
203000	347901	-144901	1	8
198500	347901	-149401	1	9
196500	347901	-151401	1	10
191600	347901	-156301	1	11
233000	347901	-114901	1	12
200000	347901	-147901	1	13
163000	347901	-184901	1	14
122000	347901	-225901	1	15
120000	347901	-227901	1	16
104000	347901	-243901	1	17
607000	347901	259099	2	17
587000	347901	239099	3	17
555000	347901	207099	4	17
469000	347901	121099	5	17
500000	347901	152099	6	17
448000	347901	100099	7	17
359044	244670	114374	8	17
229595	244670	-15075	8	18
224624	244670	-20046	8	19
221785	244670	-22885	8	20
205884	244670	-38786	8	21
204497	244670	-40173	8	22
195436	244670	-49234	8	23
203000	244670	-41670	8	24
198500	244670	-46170	8	25
196500	244670	-48170	8	26
191600	244670	-53070	8	27
233000	244670	-11670	8	28
200000	244670	-44670	8	29
163000	244670	-81670	8	30
122000	244670	-122670	8	31
120000	244670	-124670	8	32
104000	244670	-140670	8	33
607000	244670	362330	9	33
587000	244670	342330	10	33
555000	244670	310330	11	33
469000	244670	224330	12	33
500000	244670	255330	13	33

448000	244670	203330	14	33
229595	359044	-129449	14	34
224624	359044	-134420	14	35
221785	359044	-137259	14	36
205884	359044	-153160	14	37
204497	359044	-154547	14	38
195436	359044	-163608	14	39
203000	359044	-156044	14	40
198500	359044	-160544	14	41
196500	359044	-162544	14	42
191600	359044	-167444	14	43
233000	359044	-126044	14	44
200000	359044	-159044	14	45
163000	359044	-196044	14	46
122000	359044	-237044	14	47
120000	359044	-239044	14	48
104000	359044	-255044	14	49
607000	359044	247956	15	49
587000	359044	227956	16	49
555000	359044	195956	17	49
469000	359044	109956	18	49
500000	359044	140956	19	49
448000	359044	88956	20	49
224624	229595	-4971	20	50
221785	229595	-7810	20	51
205884	229595	-23711	20	52
204497	229595	-25098	20	53
195436	229595	-34159	20	54
203000	229595	-26595	20	55
198500	229595	-31095	20	56
196500	229595	-33095	20	57
191600	229595	-37995	20	58
233000	229595	3405	21	58
200000	229595	-29595	21	59
163000	229595	-66595	21	60
122000	229595	-107595	21	61
120000	229595	-109595	21	62
104000	229595	-125595	21	63
607000	229595	377405	22	63
587000	229595	357405	23	63
555000	229595	325405	24	63
469000	229595	239405	25	63
500000	229595	270405	26	63
448000	229595	218405	27	63
221785	224624	-2839	27	64
205884	224624	-18740	27	65
204497	224624	-20127	27	66
195436	224624	-29188	27	67
203000	224624	-21624	27	68
198500	224624	-26124	27	69
196500	224624	-28124	27	70
191600	224624	-33024	27	71
233000	224624	8376	28	71
200000	224624	-24624	28	72

163000	224624	-61624	28	73
122000	224624	-102624	28	74
120000	224624	-104624	28	75
104000	224624	-120624	28	76
607000	224624	382376	29	76
587000	224624	362376	30	76
555000	224624	330376	31	76
469000	224624	244376	32	76
500000	224624	275376	33	76
448000	224624	223376	34	76
205884	221785	-15901	34	77
204497	221785	-17288	34	78
195436	221785	-26349	34	79
203000	221785	-18785	34	80
198500	221785	-23285	34	81
196500	221785	-25285	34	82
191600	221785	-30185	34	83
233000	221785	11215	35	83
200000	221785	-21785	35	84
163000	221785	-58785	35	85
122000	221785	-99785	35	86
120000	221785	-101785	35	87
104000	221785	-117785	35	88
607000	221785	385215	36	88
587000	221785	365215	37	88
555000	221785	333215	38	88
469000	221785	247215	39	88
500000	221785	278215	40	88
448000	221785	226215	41	88
204497	205884	-1387	41	89
195436	205884	-10448	41	90
203000	205884	-2884	41	91
198500	205884	-7384	41	92
196500	205884	-9384	41	93
191600	205884	-14284	41	94
233000	205884	27116	42	94
200000	205884	-5884	42	95
163000	205884	-42884	42	96
122000	205884	-83884	42	97
120000	205884	-85884	42	98
104000	205884	-101884	42	99
607000	205884	401116	43	99
587000	205884	381116	44	99
555000	205884	349116	45	99
469000	205884	263116	46	99
500000	205884	294116	47	99
448000	205884	242116	48	99
195436	204497	-9061	48	100
203000	204497	-1497	48	101
198500	204497	-5997	48	102
196500	204497	-7997	48	103
191600	204497	-12897	48	104
233000	204497	28503	49	104
200000	204497	-4497	49	105

163000	204497	-41497	49	106
122000	204497	-82497	49	107
120000	204497	-84497	49	108
104000	204497	-100497	49	109
607000	204497	402503	50	109
587000	204497	382503	51	109
555000	204497	350503	52	109
469000	204497	264503	53	109
500000	204497	295503	54	109
448000	204497	243503	55	109
203000	195436	7564	56	109
198500	195436	3064	57	109
196500	195436	1064	58	109
191600	195436	-3836	58	110
233000	195436	37564	59	110
200000	195436	4564	60	110
163000	195436	-32436	60	111
122000	195436	-73436	60	112
120000	195436	-75436	60	113
104000	195436	-91436	60	114
607000	195436	411564	61	114
587000	195436	391564	62	114
555000	195436	359564	63	114
469000	195436	273564	64	114
500000	195436	304564	65	114
448000	195436	252564	66	114
198500	203000	-4500	66	115
196500	203000	-6500	66	116
191600	203000	-11400	66	117
233000	203000	30000	67	117
200000	203000	-3000	67	118
163000	203000	-40000	67	119
122000	203000	-81000	67	120
120000	203000	-83000	67	121
104000	203000	-99000	67	122
607000	203000	404000	68	122
587000	203000	384000	69	122
555000	203000	352000	70	122
469000	203000	266000	71	122
500000	203000	297000	72	122
448000	203000	245000	73	122
196500	198500	-2000	73	123
191600	198500	-6900	73	124
233000	198500	34500	74	124
200000	198500	1500	75	124
163000	198500	-35500	75	125
122000	198500	-76500	75	126
120000	198500	-78500	75	127
104000	198500	-94500	75	128
607000	198500	408500	76	128
587000	198500	388500	77	128
555000	198500	356500	78	128
469000	198500	270500	79	128
500000	198500	301500	80	128

448000	198500	249500	81	128
191600	196500	-4900	81	129
233000	196500	36500	82	129
200000	196500	3500	83	129
163000	196500	-33500	83	130
122000	196500	-74500	83	131
120000	196500	-76500	83	132
104000	196500	-92500	83	133
607000	196500	410500	84	133
587000	196500	390500	85	133
555000	196500	358500	86	133
469000	196500	272500	87	133
500000	196500	303500	88	133
448000	196500	251500	89	133
233000	191600	41400	90	133
200000	191600	8400	91	133
163000	191600	-28600	91	134
122000	191600	-69600	91	135
120000	191600	-71600	91	136
104000	191600	-87600	91	137
607000	191600	415400	92	137
587000	191600	395400	93	137
555000	191600	363400	94	137
469000	191600	277400	95	137
500000	191600	308400	96	137
448000	191600	256400	97	137
200000	233000	-33000	97	138
163000	233000	-70000	97	139
122000	233000	-111000	97	140
120000	233000	-113000	97	141
104000	233000	-129000	97	142
607000	233000	374000	98	142
587000	233000	354000	99	142
555000	233000	322000	100	142
469000	233000	236000	101	142
500000	233000	267000	102	142
448000	233000	215000	103	142
163000	200000	-37000	103	143
122000	200000	-78000	103	144
120000	200000	-80000	103	145
104000	200000	-96000	103	146
607000	200000	407000	104	146
587000	200000	387000	105	146
555000	200000	355000	106	146
469000	200000	269000	107	146
500000	200000	300000	108	146
448000	200000	248000	109	146
122000	163000	-41000	109	147
120000	163000	-43000	109	148
104000	163000	-59000	109	149
607000	163000	444000	110	149
587000	163000	424000	111	149

555000	163000	392000	112	149
469000	163000	306000	113	149
500000	163000	337000	114	149
448000	163000	285000	115	149
120000	122000	-2000	115	150
104000	122000	-18000	115	151
607000	122000	485000	116	151
587000	122000	465000	117	151
555000	122000	433000	118	151
469000	122000	347000	119	151
500000	122000	378000	120	151
448000	122000	326000	121	151
104000	120000	-16000	121	152
607000	120000	487000	122	152
587000	120000	467000	123	152
555000	120000	435000	124	152
469000	120000	349000	125	152
500000	120000	380000	126	152
448000	120000	328000	127	152
607000	104000	503000	128	152
587000	104000	483000	129	152
555000	104000	451000	130	152
469000	104000	365000	131	152
500000	104000	396000	132	152
448000	104000	344000	133	152
587000	607000	-20000	133	153
555000	607000	-52000	133	154
469000	607000	-138000	133	155
500000	607000	-107000	133	156
448000	607000	-159000	133	157
555000	587000	-32000	133	158
469000	587000	-118000	133	159
500000	587000	-87000	133	160
448000	587000	-139000	133	161
469000	555000	-86000	133	162
500000	555000	-55000	133	163
448000	555000	-107000	133	164
500000	469000	31000	134	164
448000	469000	-21000	134	165
448000	500000	-52000	134	166

S Statistic = 134 - 166 = -32

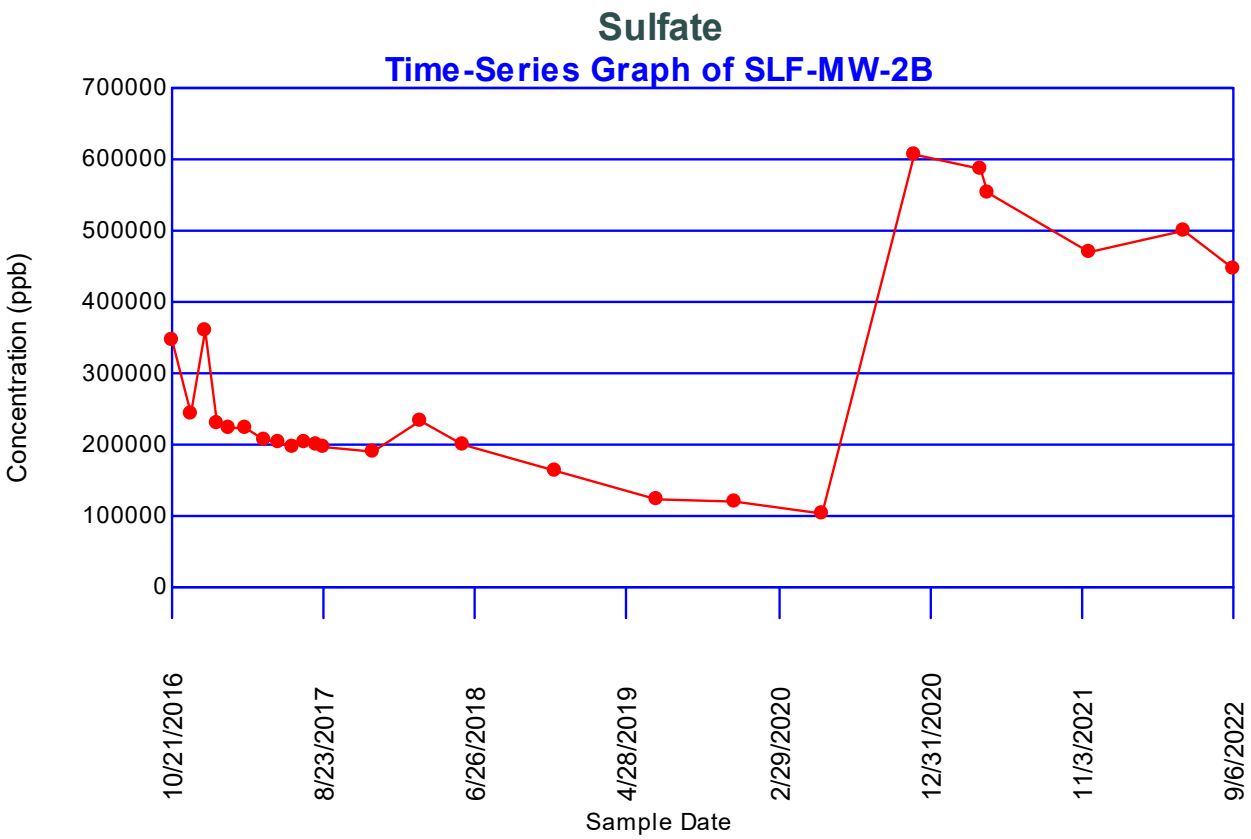
Tied Group	Value	Members

Time Period	Observations
10/21/2016	1
11/30/2016	1

12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/12/2021	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1833.33
Z-Score = -0.724004
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.724004| <= 1.97737 indicating no evidence of a trend


Sulfate
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
700000
600000
500000
400000
300000
200000
100000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Sulfate

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0978536	0.110255	0.413	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	603053	FALSE
	11/30/2016	589957	FALSE
	12/28/2016	614466	FALSE
	1/18/2017	582135	FALSE
	2/15/2017	486076	FALSE
	3/20/2017	472830	FALSE
	4/25/2017	465682	FALSE
	5/22/2017	495843	FALSE
	6/20/2017	480297	FALSE
	7/17/2017	519000	FALSE
	8/7/2017	532000	FALSE
	8/21/2017	549000	FALSE
	11/29/2017	483000	FALSE
	3/8/2018	476000	FALSE
	5/30/2018	454000	FALSE
	12/4/2018	476000	FALSE
	6/27/2019	417000	FALSE
	12/2/2019	384000	FALSE
	5/28/2020	336000	FALSE
	12/1/2020	389000	FALSE
	4/28/2021	355000	FALSE
	11/19/2021	396000	FALSE
	5/31/2022	381000	FALSE
	9/6/2022	364000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 12 for 24 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	336000	614466	278466	0.4493	125115
2	355000	603053	248053	0.3098	76846.8
3	364000	589957	225957	0.2554	57709.4
4	381000	582135	201135	0.2145	43143.5
5	384000	549000	165000	0.1807	29815.5
6	389000	532000	143000	0.1512	21621.6
7	396000	519000	123000	0.1245	15313.5
8	417000	495843	78843	0.0997	7860.65
9	454000	486076	32076	0.0764	2450.61
10	465682	483000	17318	0.0539	933.44
11	472830	480297	7467	0.0321	239.691
12	476000	476000	0	0.0107	0
13	476000	476000	0		
14	480297	472830	-7467		
15	483000	465682	-17318		
16	486076	454000	-32076		
17	495843	417000	-78843		
18	519000	396000	-123000		
19	532000	389000	-143000		
20	549000	384000	-165000		
21	582135	381000	-201135		
22	589957	364000	-225957		
23	603053	355000	-248053		
24	614466	336000	-278466		

Sum of b values = 381049
Sample Standard Deviation = 81331.4
W Statistic = 0.954373

5% Critical value of 0.916 is less than 0.954373
Data is normally distributed at 95% level of significance

1% Critical value of 0.884 is less than 0.954373
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Sulfate

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
589957	603053	-13096	0	1
614466	603053	11413	1	1
582135	603053	-20918	1	2
486076	603053	-116977	1	3
472830	603053	-130223	1	4
465682	603053	-137371	1	5
495843	603053	-107210	1	6
480297	603053	-122756	1	7
519000	603053	-84053	1	8
532000	603053	-71053	1	9
549000	603053	-54053	1	10
483000	603053	-120053	1	11
476000	603053	-127053	1	12
454000	603053	-149053	1	13
476000	603053	-127053	1	14
417000	603053	-186053	1	15
384000	603053	-219053	1	16
336000	603053	-267053	1	17
389000	603053	-214053	1	18
355000	603053	-248053	1	19
396000	603053	-207053	1	20
381000	603053	-222053	1	21
364000	603053	-239053	1	22
614466	589957	24509	2	22
582135	589957	-7822	2	23
486076	589957	-103881	2	24
472830	589957	-117127	2	25
465682	589957	-124275	2	26
495843	589957	-94114	2	27
480297	589957	-109660	2	28
519000	589957	-70957	2	29
532000	589957	-57957	2	30
549000	589957	-40957	2	31
483000	589957	-106957	2	32
476000	589957	-113957	2	33
454000	589957	-135957	2	34
476000	589957	-113957	2	35
417000	589957	-172957	2	36
384000	589957	-205957	2	37
336000	589957	-253957	2	38
389000	589957	-200957	2	39
355000	589957	-234957	2	40
396000	589957	-193957	2	41
381000	589957	-208957	2	42
364000	589957	-225957	2	43

582135	614466	-32331	2	44
486076	614466	-128390	2	45
472830	614466	-141636	2	46
465682	614466	-148784	2	47
495843	614466	-118623	2	48
480297	614466	-134169	2	49
519000	614466	-95466	2	50
532000	614466	-82466	2	51
549000	614466	-65466	2	52
483000	614466	-131466	2	53
476000	614466	-138466	2	54
454000	614466	-160466	2	55
476000	614466	-138466	2	56
417000	614466	-197466	2	57
384000	614466	-230466	2	58
336000	614466	-278466	2	59
389000	614466	-225466	2	60
355000	614466	-259466	2	61
396000	614466	-218466	2	62
381000	614466	-233466	2	63
364000	614466	-250466	2	64
486076	582135	-96059	2	65
472830	582135	-109305	2	66
465682	582135	-116453	2	67
495843	582135	-86292	2	68
480297	582135	-101838	2	69
519000	582135	-63135	2	70
532000	582135	-50135	2	71
549000	582135	-33135	2	72
483000	582135	-99135	2	73
476000	582135	-106135	2	74
454000	582135	-128135	2	75
476000	582135	-106135	2	76
417000	582135	-165135	2	77
384000	582135	-198135	2	78
336000	582135	-246135	2	79
389000	582135	-193135	2	80
355000	582135	-227135	2	81
396000	582135	-186135	2	82
381000	582135	-201135	2	83
364000	582135	-218135	2	84
472830	486076	-13246	2	85
465682	486076	-20394	2	86
495843	486076	9767	3	86
480297	486076	-5779	3	87
519000	486076	32924	4	87
532000	486076	45924	5	87
549000	486076	62924	6	87
483000	486076	-3076	6	88
476000	486076	-10076	6	89
454000	486076	-32076	6	90
476000	486076	-10076	6	91
417000	486076	-69076	6	92
384000	486076	-102076	6	93
336000	486076	-150076	6	94

389000	486076	-97076	6	95
355000	486076	-131076	6	96
396000	486076	-90076	6	97
381000	486076	-105076	6	98
364000	486076	-122076	6	99
465682	472830	-7148	6	100
495843	472830	23013	7	100
480297	472830	7467	8	100
519000	472830	46170	9	100
532000	472830	59170	10	100
549000	472830	76170	11	100
483000	472830	10170	12	100
476000	472830	3170	13	100
454000	472830	-18830	13	101
476000	472830	3170	14	101
417000	472830	-55830	14	102
384000	472830	-88830	14	103
336000	472830	-136830	14	104
389000	472830	-83830	14	105
355000	472830	-117830	14	106
396000	472830	-76830	14	107
381000	472830	-91830	14	108
364000	472830	-108830	14	109
495843	465682	30161	15	109
480297	465682	14615	16	109
519000	465682	53318	17	109
532000	465682	66318	18	109
549000	465682	83318	19	109
483000	465682	17318	20	109
476000	465682	10318	21	109
454000	465682	-11682	21	110
476000	465682	10318	22	110
417000	465682	-48682	22	111
384000	465682	-81682	22	112
336000	465682	-129682	22	113
389000	465682	-76682	22	114
355000	465682	-110682	22	115
396000	465682	-69682	22	116
381000	465682	-84682	22	117
364000	465682	-101682	22	118
480297	495843	-15546	22	119
519000	495843	23157	23	119
532000	495843	36157	24	119
549000	495843	53157	25	119
483000	495843	-12843	25	120
476000	495843	-19843	25	121
454000	495843	-41843	25	122
476000	495843	-19843	25	123
417000	495843	-78843	25	124
384000	495843	-111843	25	125
336000	495843	-159843	25	126
389000	495843	-106843	25	127
355000	495843	-140843	25	128
396000	495843	-99843	25	129

381000	495843	-114843	25	130
364000	495843	-131843	25	131
519000	480297	38703	26	131
532000	480297	51703	27	131
549000	480297	68703	28	131
483000	480297	2703	29	131
476000	480297	-4297	29	132
454000	480297	-26297	29	133
476000	480297	-4297	29	134
417000	480297	-63297	29	135
384000	480297	-96297	29	136
336000	480297	-144297	29	137
389000	480297	-91297	29	138
355000	480297	-125297	29	139
396000	480297	-84297	29	140
381000	480297	-99297	29	141
364000	480297	-116297	29	142
532000	519000	13000	30	142
549000	519000	30000	31	142
483000	519000	-36000	31	143
476000	519000	-43000	31	144
454000	519000	-65000	31	145
476000	519000	-43000	31	146
417000	519000	-102000	31	147
384000	519000	-135000	31	148
336000	519000	-183000	31	149
389000	519000	-130000	31	150
355000	519000	-164000	31	151
396000	519000	-123000	31	152
381000	519000	-138000	31	153
364000	519000	-155000	31	154
549000	532000	17000	32	154
483000	532000	-49000	32	155
476000	532000	-56000	32	156
454000	532000	-78000	32	157
476000	532000	-56000	32	158
417000	532000	-115000	32	159
384000	532000	-148000	32	160
336000	532000	-196000	32	161
389000	532000	-143000	32	162
355000	532000	-177000	32	163
396000	532000	-136000	32	164
381000	532000	-151000	32	165
364000	532000	-168000	32	166
483000	549000	-66000	32	167
476000	549000	-73000	32	168
454000	549000	-95000	32	169
476000	549000	-73000	32	170
417000	549000	-132000	32	171
384000	549000	-165000	32	172
336000	549000	-213000	32	173
389000	549000	-160000	32	174
355000	549000	-194000	32	175

396000	549000	-153000	32	176
381000	549000	-168000	32	177
364000	549000	-185000	32	178
476000	483000	-7000	32	179
454000	483000	-29000	32	180
476000	483000	-7000	32	181
417000	483000	-66000	32	182
384000	483000	-99000	32	183
336000	483000	-147000	32	184
389000	483000	-94000	32	185
355000	483000	-128000	32	186
396000	483000	-87000	32	187
381000	483000	-102000	32	188
364000	483000	-119000	32	189
454000	476000	-22000	32	190
476000	476000	0	32	190
417000	476000	-59000	32	191
384000	476000	-92000	32	192
336000	476000	-140000	32	193
389000	476000	-87000	32	194
355000	476000	-121000	32	195
396000	476000	-80000	32	196
381000	476000	-95000	32	197
364000	476000	-112000	32	198
476000	454000	22000	33	198
417000	454000	-37000	33	199
384000	454000	-70000	33	200
336000	454000	-118000	33	201
389000	454000	-65000	33	202
355000	454000	-99000	33	203
396000	454000	-58000	33	204
381000	454000	-73000	33	205
364000	454000	-90000	33	206
417000	476000	-59000	33	207
384000	476000	-92000	33	208
336000	476000	-140000	33	209
389000	476000	-87000	33	210
355000	476000	-121000	33	211
396000	476000	-80000	33	212
381000	476000	-95000	33	213
364000	476000	-112000	33	214
384000	417000	-33000	33	215
336000	417000	-81000	33	216
389000	417000	-28000	33	217
355000	417000	-62000	33	218
396000	417000	-21000	33	219
381000	417000	-36000	33	220
364000	417000	-53000	33	221
336000	384000	-48000	33	222
389000	384000	5000	34	222
355000	384000	-29000	34	223

396000	384000	12000	35	223
381000	384000	-3000	35	224
364000	384000	-20000	35	225
389000	336000	53000	36	225
355000	336000	19000	37	225
396000	336000	60000	38	225
381000	336000	45000	39	225
364000	336000	28000	40	225
355000	389000	-34000	40	226
396000	389000	7000	41	226
381000	389000	-8000	41	227
364000	389000	-25000	41	228
396000	355000	41000	42	228
381000	355000	26000	43	228
364000	355000	9000	44	228
381000	396000	-15000	44	229
364000	396000	-32000	44	230
364000	381000	-17000	44	231

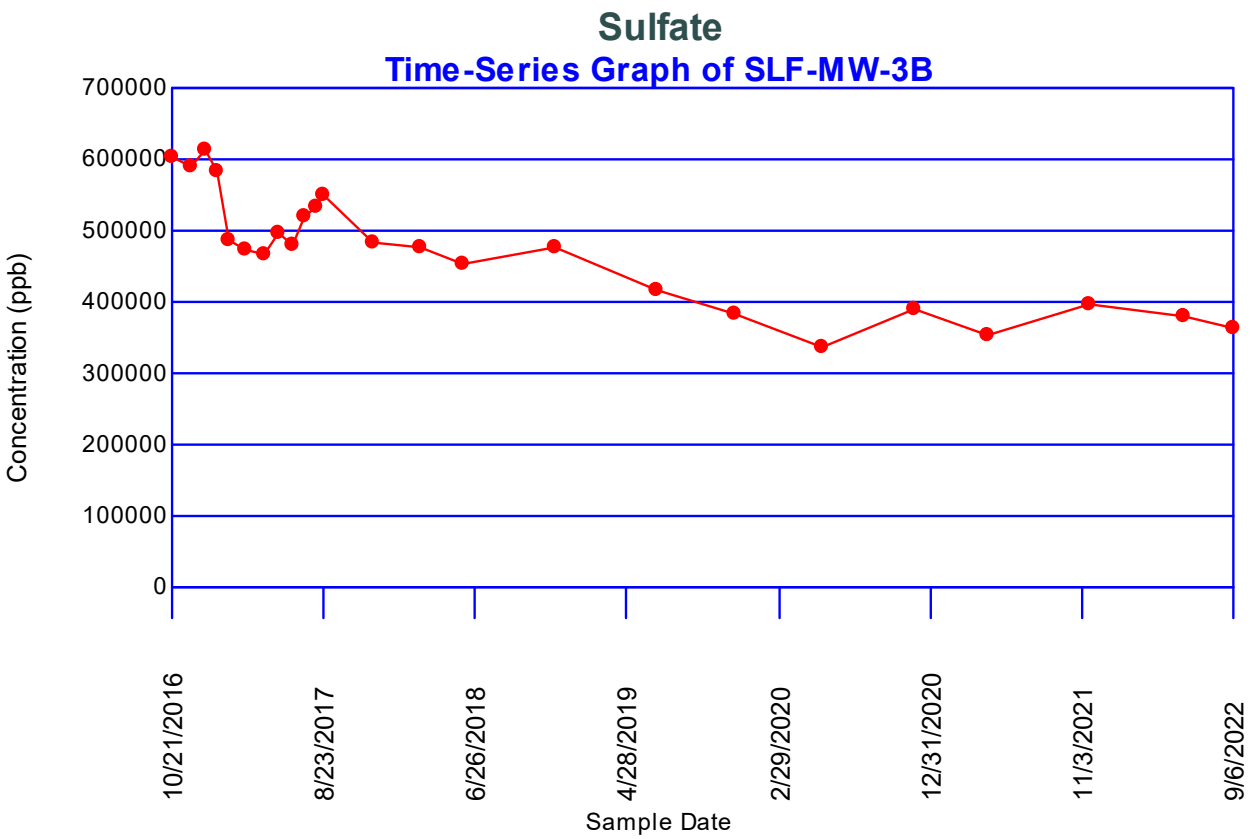
S Statistic = 44 - 231 = -187

Tied Group	Value	Members
1	476000	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/27/2019	1
12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1624.33
Z-Score = -4.61504
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-4.61504| > 1.97737 indicating a trend


Sulfate
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
700000
600000
500000
400000
300000
200000
100000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Sulfate

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 20 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.302013	0.0714286	0.45	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	126012	FALSE
	3/20/2017	107411	FALSE
	4/25/2017	95475.3	FALSE
	5/22/2017	90985.1	FALSE
	6/20/2017	130226	FALSE
	7/17/2017	132600	FALSE
	8/7/2017	112400	FALSE
	8/22/2017	143100	FALSE
	11/29/2017	157800	FALSE
	3/8/2018	89800	FALSE
	5/30/2018	158000	FALSE
	12/4/2018	122000	FALSE
	6/28/2019	173000	FALSE
	12/2/2019	162000	FALSE
	5/28/2020	83400	FALSE
	11/30/2020	84400	FALSE
	4/28/2021	144000	FALSE
	11/19/2021	178000	FALSE
	5/31/2022	159000	FALSE
	9/6/2022	209000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 10 for 20 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	83400	209000	125600	0.4734	59459
2	84400	178000	93600	0.3211	30055
3	89800	173000	83200	0.2565	21340.8
4	90985.1	162000	71014.9	0.2085	14806.6
5	95475.3	159000	63524.7	0.1686	10710.3
6	107411	158000	50589	0.1334	6748.57
7	112400	157800	45400	0.1013	4599.02
8	122000	144000	22000	0.0711	1564.2
9	126012	143100	17088	0.0422	721.114
10	130226	132600	2374	0.014	33.236
11	132600	130226	-2374		
12	143100	126012	-17088		
13	144000	122000	-22000		
14	157800	112400	-45400		
15	158000	107411	-50589		
16	159000	95475.3	-63524.7		
17	162000	90985.1	-71014.9		
18	173000	89800	-83200		
19	178000	84400	-93600		
20	209000	83400	-125600		

Sum of b values = 150038
Sample Standard Deviation = 35168.4
W Statistic = 0.957949

5% Critical value of 0.905 is less than 0.957949
Data is normally distributed at 95% level of significance

1% Critical value of 0.868 is less than 0.957949
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Sulfate

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
107411	126012	-18601	0	1
95475.3	126012	-30536.7	0	2
90985.1	126012	-35026.9	0	3
130226	126012	4214	1	3
132600	126012	6588	2	3
112400	126012	-13612	2	4
143100	126012	17088	3	4
157800	126012	31788	4	4
89800	126012	-36212	4	5
158000	126012	31988	5	5
122000	126012	-4012	5	6
173000	126012	46988	6	6
162000	126012	35988	7	6
83400	126012	-42612	7	7
84400	126012	-41612	7	8
144000	126012	17988	8	8
178000	126012	51988	9	8
159000	126012	32988	10	8
209000	126012	82988	11	8
95475.3	107411	-11935.7	11	9
90985.1	107411	-16425.9	11	10
130226	107411	22815	12	10
132600	107411	25189	13	10
112400	107411	4989	14	10
143100	107411	35689	15	10
157800	107411	50389	16	10
89800	107411	-17611	16	11
158000	107411	50589	17	11
122000	107411	14589	18	11
173000	107411	65589	19	11
162000	107411	54589	20	11
83400	107411	-24011	20	12
84400	107411	-23011	20	13
144000	107411	36589	21	13
178000	107411	70589	22	13
159000	107411	51589	23	13
209000	107411	101589	24	13
90985.1	95475.3	-4490.2	24	14
130226	95475.3	34750.7	25	14
132600	95475.3	37124.7	26	14
112400	95475.3	16924.7	27	14
143100	95475.3	47624.7	28	14
157800	95475.3	62324.7	29	14
89800	95475.3	-5675.3	29	15
158000	95475.3	62524.7	30	15

122000	95475.3	26524.7	31	15
173000	95475.3	77524.7	32	15
162000	95475.3	66524.7	33	15
83400	95475.3	-12075.3	33	16
84400	95475.3	-11075.3	33	17
144000	95475.3	48524.7	34	17
178000	95475.3	82524.7	35	17
159000	95475.3	63524.7	36	17
209000	95475.3	113525	37	17
130226	90985.1	39240.9	38	17
132600	90985.1	41614.9	39	17
112400	90985.1	21414.9	40	17
143100	90985.1	52114.9	41	17
157800	90985.1	66814.9	42	17
89800	90985.1	-1185.1	42	18
158000	90985.1	67014.9	43	18
122000	90985.1	31014.9	44	18
173000	90985.1	82014.9	45	18
162000	90985.1	71014.9	46	18
83400	90985.1	-7585.1	46	19
84400	90985.1	-6585.1	46	20
144000	90985.1	53014.9	47	20
178000	90985.1	87014.9	48	20
159000	90985.1	68014.9	49	20
209000	90985.1	118015	50	20
132600	130226	2374	51	20
112400	130226	-17826	51	21
143100	130226	12874	52	21
157800	130226	27574	53	21
89800	130226	-40426	53	22
158000	130226	27774	54	22
122000	130226	-8226	54	23
173000	130226	42774	55	23
162000	130226	31774	56	23
83400	130226	-46826	56	24
84400	130226	-45826	56	25
144000	130226	13774	57	25
178000	130226	47774	58	25
159000	130226	28774	59	25
209000	130226	78774	60	25
112400	132600	-20200	60	26
143100	132600	10500	61	26
157800	132600	25200	62	26
89800	132600	-42800	62	27
158000	132600	25400	63	27
122000	132600	-10600	63	28
173000	132600	40400	64	28
162000	132600	29400	65	28
83400	132600	-49200	65	29
84400	132600	-48200	65	30
144000	132600	11400	66	30
178000	132600	45400	67	30
159000	132600	26400	68	30
209000	132600	76400	69	30

143100	112400	30700	70	30
157800	112400	45400	71	30
89800	112400	-22600	71	31
158000	112400	45600	72	31
122000	112400	9600	73	31
173000	112400	60600	74	31
162000	112400	49600	75	31
83400	112400	-29000	75	32
84400	112400	-28000	75	33
144000	112400	31600	76	33
178000	112400	65600	77	33
159000	112400	46600	78	33
209000	112400	96600	79	33
157800	143100	14700	80	33
89800	143100	-53300	80	34
158000	143100	14900	81	34
122000	143100	-21100	81	35
173000	143100	29900	82	35
162000	143100	18900	83	35
83400	143100	-59700	83	36
84400	143100	-58700	83	37
144000	143100	900	84	37
178000	143100	34900	85	37
159000	143100	15900	86	37
209000	143100	65900	87	37
89800	157800	-68000	87	38
158000	157800	200	88	38
122000	157800	-35800	88	39
173000	157800	15200	89	39
162000	157800	4200	90	39
83400	157800	-74400	90	40
84400	157800	-73400	90	41
144000	157800	-13800	90	42
178000	157800	20200	91	42
159000	157800	1200	92	42
209000	157800	51200	93	42
158000	89800	68200	94	42
122000	89800	32200	95	42
173000	89800	83200	96	42
162000	89800	72200	97	42
83400	89800	-6400	97	43
84400	89800	-5400	97	44
144000	89800	54200	98	44
178000	89800	88200	99	44
159000	89800	69200	100	44
209000	89800	119200	101	44
122000	158000	-36000	101	45
173000	158000	15000	102	45
162000	158000	4000	103	45
83400	158000	-74600	103	46
84400	158000	-73600	103	47
144000	158000	-14000	103	48

178000	158000	20000	104	48
159000	158000	1000	105	48
209000	158000	51000	106	48
173000	122000	51000	107	48
162000	122000	40000	108	48
83400	122000	-38600	108	49
84400	122000	-37600	108	50
144000	122000	22000	109	50
178000	122000	56000	110	50
159000	122000	37000	111	50
209000	122000	87000	112	50
162000	173000	-11000	112	51
83400	173000	-89600	112	52
84400	173000	-88600	112	53
144000	173000	-29000	112	54
178000	173000	5000	113	54
159000	173000	-14000	113	55
209000	173000	36000	114	55
83400	162000	-78600	114	56
84400	162000	-77600	114	57
144000	162000	-18000	114	58
178000	162000	16000	115	58
159000	162000	-3000	115	59
209000	162000	47000	116	59
84400	83400	1000	117	59
144000	83400	60600	118	59
178000	83400	94600	119	59
159000	83400	75600	120	59
209000	83400	125600	121	59
144000	84400	59600	122	59
178000	84400	93600	123	59
159000	84400	74600	124	59
209000	84400	124600	125	59
178000	144000	34000	126	59
159000	144000	15000	127	59
209000	144000	65000	128	59
159000	178000	-19000	128	60
209000	178000	31000	129	60
209000	159000	50000	130	60

S Statistic = 130 - 60 = 70

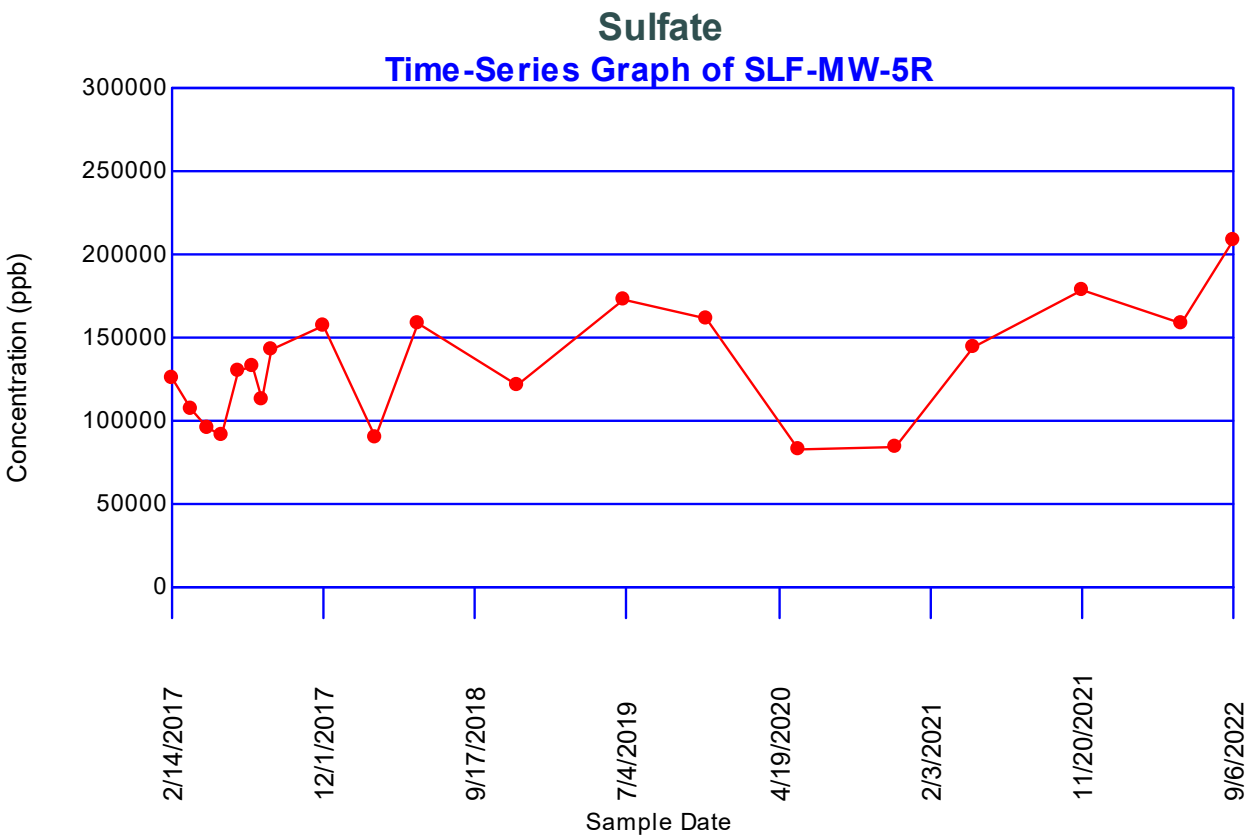
Tied Group	Value	Members

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1

5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
3/8/2018	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 950
Z-Score = 2.23866
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|2.23866| > 1.97737 indicating a trend


Sulfate
Time-Series Graph of SLF-MW-5R
300000
250000
200000
150000
100000
50000
0
Concentration (ppb)
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Concentrations (ppb)

Parameter: Total Dissolved Solids (TDS)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 65
Total Non-Detect: 0
Percent Non-Detects: 0%
Total Background Measurements: 0
There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
SLF-MW-2B	24	0 (0%)	10/21/2016	3.468e+006	3.468e+006
			11/30/2016	483000	483000
			12/28/2016	3.5667e+006	3.5667e+006
			1/18/2017	2.93e+006	2.93e+006
			2/14/2017	3.5e+006	3.5e+006
			3/20/2017	3.13e+006	3.13e+006
			4/25/2017	3.4e+006	3.4e+006
			5/22/2017	3.014e+006	3.014e+006
			6/20/2017	2.97e+006	2.97e+006
			7/17/2017	2.91e+006	2.91e+006
			8/8/2017	3.05e+006	3.05e+006
			8/21/2017	3.05e+006	3.05e+006
			11/29/2017	3.072e+006	3.072e+006
			5/31/2018	3.91e+006	3.91e+006
			12/4/2018	4.24e+006	4.24e+006
			6/28/2019	4.53e+006	4.53e+006
			11/4/2019	4.38e+006	4.38e+006
			12/2/2019	4.13e+006	4.13e+006
			5/28/2020	4.26e+006	4.26e+006
			11/30/2020	3.55e+006	3.55e+006
			4/28/2021	3.67e+006	3.67e+006
			11/19/2021	3.9e+006	3.9e+006
			5/31/2022	4.16e+006	4.16e+006
			9/6/2022	4.41e+006	4.41e+006
			11/21/2022	**4.02e+006**	**4.02e+006**
SLF-MW-3B	22	0 (0%)	10/21/2016	1.341e+006	1.341e+006
			11/30/2016	1.38e+006	1.38e+006
			12/28/2016	1.41e+006	1.41e+006
			1/18/2017	1.12e+006	1.12e+006
			2/15/2017	1.179e+006	1.179e+006
			3/20/2017	1.255e+006	1.255e+006
			4/25/2017	1.227e+006	1.227e+006
			5/22/2017	1.142e+006	1.142e+006
			6/20/2017	1.156e+006	1.156e+006
			7/17/2017	1.232e+006	1.232e+006
			8/7/2017	1.273e+006	1.273e+006
			8/21/2017	1.235e+006	1.235e+006
			11/29/2017	1.208e+006	1.208e+006
			12/4/2018	1.28e+006	1.28e+006
			6/27/2019	1.36e+006	1.36e+006

			12/2/2019	1.1e+006	1.1e+006
			5/28/2020	1.15e+006	1.15e+006
			12/1/2020	1.21e+006	1.21e+006
			4/28/2021	1.22e+006	1.22e+006
			11/19/2021	1.21e+006	1.21e+006
			5/31/2022	1.22e+006	1.22e+006
			9/6/2022	1.18e+006	1.18e+006
			11/21/2022	**1.13e+006**	**1.13e+006**
SLF-MW-5R	19	0 (0%)	2/14/2017	470000	470000
			3/20/2017	445000	445000
			4/25/2017	435000	435000
			5/22/2017	400000	400000
			6/20/2017	451000	451000
			7/17/2017	556000	556000
			8/7/2017	477000	477000
			8/22/2017	529000	529000
			11/29/2017	549000	549000
			5/30/2018	591000	591000
			12/4/2018	480000	480000
			6/28/2019	611000	611000
			12/2/2019	432000	432000
			5/28/2020	384000	384000
			11/30/2020	336000	336000
			4/28/2021	498000	498000
			11/19/2021	526000	526000
			5/31/2022	586000	586000
			9/6/2022	732000	732000
			11/21/2022	**794000**	**794000**

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 24 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.09375	0.627919	0.413	483000
2	0.0961538	0.0408163	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	3.468e+006	FALSE
	11/30/2016	**483000**	**TRUE**
	12/28/2016	3.5667e+006	FALSE
	1/18/2017	2.93e+006	FALSE
	2/14/2017	3.5e+006	FALSE
	3/20/2017	3.13e+006	FALSE
	4/25/2017	3.4e+006	FALSE
	5/22/2017	3.014e+006	FALSE
	6/20/2017	2.97e+006	FALSE
	7/17/2017	2.91e+006	FALSE
	8/8/2017	3.05e+006	FALSE
	8/21/2017	3.05e+006	FALSE
	11/29/2017	3.072e+006	FALSE
	5/31/2018	3.91e+006	FALSE
	12/4/2018	4.24e+006	FALSE
	6/28/2019	4.53e+006	FALSE
	11/4/2019	4.38e+006	FALSE
	12/2/2019	4.13e+006	FALSE
	5/28/2020	4.26e+006	FALSE
	11/30/2020	3.55e+006	FALSE
	4/28/2021	3.67e+006	FALSE
	11/19/2021	3.9e+006	FALSE
	5/31/2022	4.16e+006	FALSE
	9/6/2022	4.41e+006	FALSE

Dixon's Test for Outliers

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-2B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 23 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0961538	0.0408163	0.421	None

Loc.	Date	Conc.	Outlier
SLF-MW-2B	10/21/2016	3.468e+006	FALSE
	12/28/2016	3.5667e+006	FALSE
	1/18/2017	2.93e+006	FALSE
	2/14/2017	3.5e+006	FALSE
	3/20/2017	3.13e+006	FALSE
	4/25/2017	3.4e+006	FALSE
	5/22/2017	3.014e+006	FALSE
	6/20/2017	2.97e+006	FALSE
	7/17/2017	2.91e+006	FALSE
	8/8/2017	3.05e+006	FALSE
	8/21/2017	3.05e+006	FALSE
	11/29/2017	3.072e+006	FALSE
	5/31/2018	3.91e+006	FALSE
	12/4/2018	4.24e+006	FALSE
	6/28/2019	4.53e+006	FALSE
	11/4/2019	4.38e+006	FALSE
	12/2/2019	4.13e+006	FALSE
	5/28/2020	4.26e+006	FALSE
	11/30/2020	3.55e+006	FALSE
	4/28/2021	3.67e+006	FALSE
	11/19/2021	3.9e+006	FALSE
	5/31/2022	4.16e+006	FALSE
	9/6/2022	4.41e+006	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-2B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 23 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2.91e+006	4.53e+006	1.62e+006	0.4542	735804
2	2.93e+006	4.41e+006	1.48e+006	0.3126	462648
3	2.97e+006	4.38e+006	1.41e+006	0.2563	361383
4	3.014e+006	4.26e+006	1.246e+006	0.2139	266519
5	3.05e+006	4.24e+006	1.19e+006	0.1787	212653
6	3.05e+006	4.16e+006	1.11e+006	0.148	164280
7	3.072e+006	4.13e+006	1.058e+006	0.1201	127066
8	3.13e+006	3.91e+006	780000	0.0941	73398
9	3.4e+006	3.9e+006	500000	0.0696	34800
10	3.468e+006	3.67e+006	202000	0.0459	9271.8
11	3.5e+006	3.5667e+006	66700	0.0228	1520.76
12	3.55e+006	3.55e+006	0		
13	3.5667e+006	3.5e+006	-66700		
14	3.67e+006	3.468e+006	-202000		
15	3.9e+006	3.4e+006	-500000		
16	3.91e+006	3.13e+006	-780000		
17	4.13e+006	3.072e+006	-1.058e+006		
18	4.16e+006	3.05e+006	-1.11e+006		
19	4.24e+006	3.05e+006	-1.19e+006		
20	4.26e+006	3.014e+006	-1.246e+006		
21	4.38e+006	2.97e+006	-1.41e+006		
22	4.41e+006	2.93e+006	-1.48e+006		
23	4.53e+006	2.91e+006	-1.62e+006		

Sum of b values = 2.44934e+006
Sample Standard Deviation = 547479
W Statistic = 0.909791

5% Critical value of 0.914 exceeds 0.909791
Evidence of non-normality at 95% level of significance

1% Critical value of 0.881 is less than 0.909791
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Dissolved Solids (TDS)
Location: SLF-MW-2B
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
3.5667e+006	3.468e+006	98700	1	0
2.93e+006	3.468e+006	-538000	1	1
3.5e+006	3.468e+006	32000	2	1
3.13e+006	3.468e+006	-338000	2	2
3.4e+006	3.468e+006	-68000	2	3
3.014e+006	3.468e+006	-454000	2	4
2.97e+006	3.468e+006	-498000	2	5
2.91e+006	3.468e+006	-558000	2	6
3.05e+006	3.468e+006	-418000	2	7
3.05e+006	3.468e+006	-418000	2	8
3.072e+006	3.468e+006	-396000	2	9
3.91e+006	3.468e+006	442000	3	9
4.24e+006	3.468e+006	772000	4	9
4.53e+006	3.468e+006	1.062e+006	5	9
4.38e+006	3.468e+006	912000	6	9
4.13e+006	3.468e+006	662000	7	9
4.26e+006	3.468e+006	792000	8	9
3.55e+006	3.468e+006	82000	9	9
3.67e+006	3.468e+006	202000	10	9
3.9e+006	3.468e+006	432000	11	9
4.16e+006	3.468e+006	692000	12	9
4.41e+006	3.468e+006	942000	13	9
2.93e+006	3.5667e+006	-636700	13	10
3.5e+006	3.5667e+006	-66700	13	11
3.13e+006	3.5667e+006	-436700	13	12
3.4e+006	3.5667e+006	-166700	13	13
3.014e+006	3.5667e+006	-552700	13	14
2.97e+006	3.5667e+006	-596700	13	15
2.91e+006	3.5667e+006	-656700	13	16
3.05e+006	3.5667e+006	-516700	13	17
3.05e+006	3.5667e+006	-516700	13	18
3.072e+006	3.5667e+006	-494700	13	19
3.91e+006	3.5667e+006	343300	14	19
4.24e+006	3.5667e+006	673300	15	19
4.53e+006	3.5667e+006	963300	16	19
4.38e+006	3.5667e+006	813300	17	19
4.13e+006	3.5667e+006	563300	18	19
4.26e+006	3.5667e+006	693300	19	19
3.55e+006	3.5667e+006	-16700	19	20
3.67e+006	3.5667e+006	103300	20	20
3.9e+006	3.5667e+006	333300	21	20
4.16e+006	3.5667e+006	593300	22	20
4.41e+006	3.5667e+006	843300	23	20
3.5e+006	2.93e+006	570000	24	20
3.13e+006	2.93e+006	200000	25	20

3.4e+006	2.93e+006	470000	26	20
3.014e+006	2.93e+006	84000	27	20
2.97e+006	2.93e+006	40000	28	20
2.91e+006	2.93e+006	-20000	28	21
3.05e+006	2.93e+006	120000	29	21
3.05e+006	2.93e+006	120000	30	21
3.072e+006	2.93e+006	142000	31	21
3.91e+006	2.93e+006	980000	32	21
4.24e+006	2.93e+006	1.31e+006	33	21
4.53e+006	2.93e+006	1.6e+006	34	21
4.38e+006	2.93e+006	1.45e+006	35	21
4.13e+006	2.93e+006	1.2e+006	36	21
4.26e+006	2.93e+006	1.33e+006	37	21
3.55e+006	2.93e+006	620000	38	21
3.67e+006	2.93e+006	740000	39	21
3.9e+006	2.93e+006	970000	40	21
4.16e+006	2.93e+006	1.23e+006	41	21
4.41e+006	2.93e+006	1.48e+006	42	21
3.13e+006	3.5e+006	-370000	42	22
3.4e+006	3.5e+006	-100000	42	23
3.014e+006	3.5e+006	-486000	42	24
2.97e+006	3.5e+006	-530000	42	25
2.91e+006	3.5e+006	-590000	42	26
3.05e+006	3.5e+006	-450000	42	27
3.05e+006	3.5e+006	-450000	42	28
3.072e+006	3.5e+006	-428000	42	29
3.91e+006	3.5e+006	410000	43	29
4.24e+006	3.5e+006	740000	44	29
4.53e+006	3.5e+006	1.03e+006	45	29
4.38e+006	3.5e+006	880000	46	29
4.13e+006	3.5e+006	630000	47	29
4.26e+006	3.5e+006	760000	48	29
3.55e+006	3.5e+006	50000	49	29
3.67e+006	3.5e+006	170000	50	29
3.9e+006	3.5e+006	400000	51	29
4.16e+006	3.5e+006	660000	52	29
4.41e+006	3.5e+006	910000	53	29
3.4e+006	3.13e+006	270000	54	29
3.014e+006	3.13e+006	-116000	54	30
2.97e+006	3.13e+006	-160000	54	31
2.91e+006	3.13e+006	-220000	54	32
3.05e+006	3.13e+006	-80000	54	33
3.05e+006	3.13e+006	-80000	54	34
3.072e+006	3.13e+006	-58000	54	35
3.91e+006	3.13e+006	780000	55	35
4.24e+006	3.13e+006	1.11e+006	56	35
4.53e+006	3.13e+006	1.4e+006	57	35
4.38e+006	3.13e+006	1.25e+006	58	35
4.13e+006	3.13e+006	1e+006	59	35
4.26e+006	3.13e+006	1.13e+006	60	35
3.55e+006	3.13e+006	420000	61	35
3.67e+006	3.13e+006	540000	62	35
3.9e+006	3.13e+006	770000	63	35
4.16e+006	3.13e+006	1.03e+006	64	35
4.41e+006	3.13e+006	1.28e+006	65	35

3.014e+006	3.4e+006	-386000	65	36
2.97e+006	3.4e+006	-430000	65	37
2.91e+006	3.4e+006	-490000	65	38
3.05e+006	3.4e+006	-350000	65	39
3.05e+006	3.4e+006	-350000	65	40
3.072e+006	3.4e+006	-328000	65	41
3.91e+006	3.4e+006	510000	66	41
4.24e+006	3.4e+006	840000	67	41
4.53e+006	3.4e+006	1.13e+006	68	41
4.38e+006	3.4e+006	980000	69	41
4.13e+006	3.4e+006	730000	70	41
4.26e+006	3.4e+006	860000	71	41
3.55e+006	3.4e+006	150000	72	41
3.67e+006	3.4e+006	270000	73	41
3.9e+006	3.4e+006	500000	74	41
4.16e+006	3.4e+006	760000	75	41
4.41e+006	3.4e+006	1.01e+006	76	41
2.97e+006	3.014e+006	-44000	76	42
2.91e+006	3.014e+006	-104000	76	43
3.05e+006	3.014e+006	36000	77	43
3.05e+006	3.014e+006	36000	78	43
3.072e+006	3.014e+006	58000	79	43
3.91e+006	3.014e+006	896000	80	43
4.24e+006	3.014e+006	1.226e+006	81	43
4.53e+006	3.014e+006	1.516e+006	82	43
4.38e+006	3.014e+006	1.366e+006	83	43
4.13e+006	3.014e+006	1.116e+006	84	43
4.26e+006	3.014e+006	1.246e+006	85	43
3.55e+006	3.014e+006	536000	86	43
3.67e+006	3.014e+006	656000	87	43
3.9e+006	3.014e+006	886000	88	43
4.16e+006	3.014e+006	1.146e+006	89	43
4.41e+006	3.014e+006	1.396e+006	90	43
2.91e+006	2.97e+006	-60000	90	44
3.05e+006	2.97e+006	80000	91	44
3.05e+006	2.97e+006	80000	92	44
3.072e+006	2.97e+006	102000	93	44
3.91e+006	2.97e+006	940000	94	44
4.24e+006	2.97e+006	1.27e+006	95	44
4.53e+006	2.97e+006	1.56e+006	96	44
4.38e+006	2.97e+006	1.41e+006	97	44
4.13e+006	2.97e+006	1.16e+006	98	44
4.26e+006	2.97e+006	1.29e+006	99	44
3.55e+006	2.97e+006	580000	100	44
3.67e+006	2.97e+006	700000	101	44
3.9e+006	2.97e+006	930000	102	44
4.16e+006	2.97e+006	1.19e+006	103	44
4.41e+006	2.97e+006	1.44e+006	104	44
3.05e+006	2.91e+006	140000	105	44
3.05e+006	2.91e+006	140000	106	44
3.072e+006	2.91e+006	162000	107	44
3.91e+006	2.91e+006	1e+006	108	44
4.24e+006	2.91e+006	1.33e+006	109	44

4.53e+006	2.91e+006	1.62e+006	110	44
4.38e+006	2.91e+006	1.47e+006	111	44
4.13e+006	2.91e+006	1.22e+006	112	44
4.26e+006	2.91e+006	1.35e+006	113	44
3.55e+006	2.91e+006	640000	114	44
3.67e+006	2.91e+006	760000	115	44
3.9e+006	2.91e+006	990000	116	44
4.16e+006	2.91e+006	1.25e+006	117	44
4.41e+006	2.91e+006	1.5e+006	118	44
3.05e+006	3.05e+006	0	118	44
3.072e+006	3.05e+006	22000	119	44
3.91e+006	3.05e+006	860000	120	44
4.24e+006	3.05e+006	1.19e+006	121	44
4.53e+006	3.05e+006	1.48e+006	122	44
4.38e+006	3.05e+006	1.33e+006	123	44
4.13e+006	3.05e+006	1.08e+006	124	44
4.26e+006	3.05e+006	1.21e+006	125	44
3.55e+006	3.05e+006	500000	126	44
3.67e+006	3.05e+006	620000	127	44
3.9e+006	3.05e+006	850000	128	44
4.16e+006	3.05e+006	1.11e+006	129	44
4.41e+006	3.05e+006	1.36e+006	130	44
3.072e+006	3.05e+006	22000	131	44
3.91e+006	3.05e+006	860000	132	44
4.24e+006	3.05e+006	1.19e+006	133	44
4.53e+006	3.05e+006	1.48e+006	134	44
4.38e+006	3.05e+006	1.33e+006	135	44
4.13e+006	3.05e+006	1.08e+006	136	44
4.26e+006	3.05e+006	1.21e+006	137	44
3.55e+006	3.05e+006	500000	138	44
3.67e+006	3.05e+006	620000	139	44
3.9e+006	3.05e+006	850000	140	44
4.16e+006	3.05e+006	1.11e+006	141	44
4.41e+006	3.05e+006	1.36e+006	142	44
3.91e+006	3.072e+006	838000	143	44
4.24e+006	3.072e+006	1.168e+006	144	44
4.53e+006	3.072e+006	1.458e+006	145	44
4.38e+006	3.072e+006	1.308e+006	146	44
4.13e+006	3.072e+006	1.058e+006	147	44
4.26e+006	3.072e+006	1.188e+006	148	44
3.55e+006	3.072e+006	478000	149	44
3.67e+006	3.072e+006	598000	150	44
3.9e+006	3.072e+006	828000	151	44
4.16e+006	3.072e+006	1.088e+006	152	44
4.41e+006	3.072e+006	1.338e+006	153	44
4.24e+006	3.91e+006	330000	154	44
4.53e+006	3.91e+006	620000	155	44
4.38e+006	3.91e+006	470000	156	44
4.13e+006	3.91e+006	220000	157	44
4.26e+006	3.91e+006	350000	158	44
3.55e+006	3.91e+006	-360000	158	45
3.67e+006	3.91e+006	-240000	158	46
3.9e+006	3.91e+006	-10000	158	47

4.16e+006	3.91e+006	250000	159	47
4.41e+006	3.91e+006	500000	160	47
4.53e+006	4.24e+006	290000	161	47
4.38e+006	4.24e+006	140000	162	47
4.13e+006	4.24e+006	-110000	162	48
4.26e+006	4.24e+006	20000	163	48
3.55e+006	4.24e+006	-690000	163	49
3.67e+006	4.24e+006	-570000	163	50
3.9e+006	4.24e+006	-340000	163	51
4.16e+006	4.24e+006	-80000	163	52
4.41e+006	4.24e+006	170000	164	52
4.38e+006	4.53e+006	-150000	164	53
4.13e+006	4.53e+006	-400000	164	54
4.26e+006	4.53e+006	-270000	164	55
3.55e+006	4.53e+006	-980000	164	56
3.67e+006	4.53e+006	-860000	164	57
3.9e+006	4.53e+006	-630000	164	58
4.16e+006	4.53e+006	-370000	164	59
4.41e+006	4.53e+006	-120000	164	60
4.13e+006	4.38e+006	-250000	164	61
4.26e+006	4.38e+006	-120000	164	62
3.55e+006	4.38e+006	-830000	164	63
3.67e+006	4.38e+006	-710000	164	64
3.9e+006	4.38e+006	-480000	164	65
4.16e+006	4.38e+006	-220000	164	66
4.41e+006	4.38e+006	30000	165	66
4.26e+006	4.13e+006	130000	166	66
3.55e+006	4.13e+006	-580000	166	67
3.67e+006	4.13e+006	-460000	166	68
3.9e+006	4.13e+006	-230000	166	69
4.16e+006	4.13e+006	30000	167	69
4.41e+006	4.13e+006	280000	168	69
3.55e+006	4.26e+006	-710000	168	70
3.67e+006	4.26e+006	-590000	168	71
3.9e+006	4.26e+006	-360000	168	72
4.16e+006	4.26e+006	-100000	168	73
4.41e+006	4.26e+006	150000	169	73
3.67e+006	3.55e+006	120000	170	73
3.9e+006	3.55e+006	350000	171	73
4.16e+006	3.55e+006	610000	172	73
4.41e+006	3.55e+006	860000	173	73
3.9e+006	3.67e+006	230000	174	73
4.16e+006	3.67e+006	490000	175	73
4.41e+006	3.67e+006	740000	176	73
4.16e+006	3.9e+006	260000	177	73
4.41e+006	3.9e+006	510000	178	73
4.41e+006	4.16e+006	250000	179	73

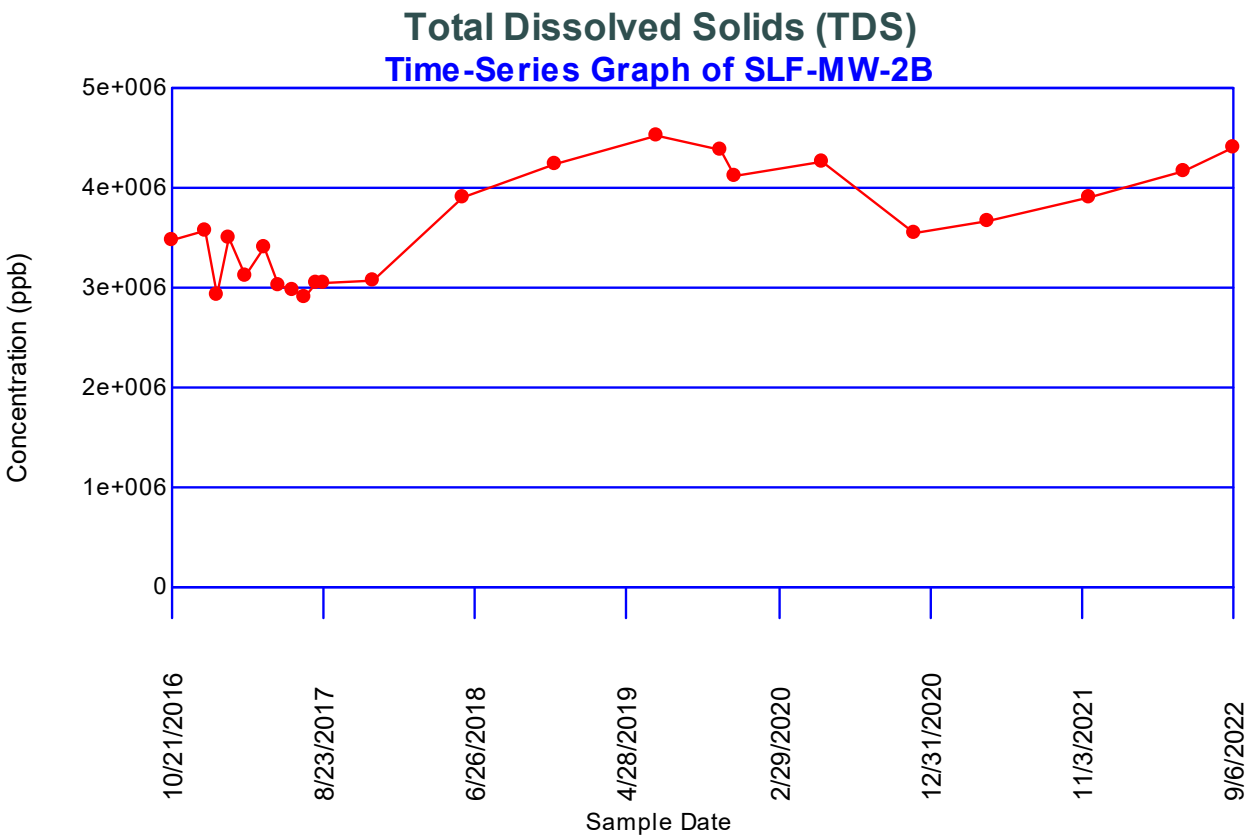
S Statistic = 179 - 73 = 106

Tied Group	Value	Members
1	3.05e+006	2

Time Period	Observations
10/21/2016	1
12/28/2016	1
1/18/2017	1
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/8/2017	1
8/21/2017	1
11/29/2017	1
5/31/2018	1
12/4/2018	1
6/28/2019	1
11/4/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1432.67
Z-Score = 2.77407
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|2.77407| > 1.97737 indicating a trend


Total Dissolved Solids (TDS)
Time-Series Graph of SLF-MW-2B
Concentration (ppb)
5e+006
4e+006
3e+006
2e+006
1e+006
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-3B

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 22 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.186567	0.161538	0.43	None

Loc.	Date	Conc.	Outlier
SLF-MW-3B	10/21/2016	1.341e+006	FALSE
	11/30/2016	1.38e+006	FALSE
	12/28/2016	1.41e+006	FALSE
	1/18/2017	1.12e+006	FALSE
	2/15/2017	1.179e+006	FALSE
	3/20/2017	1.255e+006	FALSE
	4/25/2017	1.227e+006	FALSE
	5/22/2017	1.142e+006	FALSE
	6/20/2017	1.156e+006	FALSE
	7/17/2017	1.232e+006	FALSE
	8/7/2017	1.273e+006	FALSE
	8/21/2017	1.235e+006	FALSE
	11/29/2017	1.208e+006	FALSE
	12/4/2018	1.28e+006	FALSE
	6/27/2019	1.36e+006	FALSE
	12/2/2019	1.1e+006	FALSE
	5/28/2020	1.15e+006	FALSE
	12/1/2020	1.21e+006	FALSE
	4/28/2021	1.22e+006	FALSE
	11/19/2021	1.21e+006	FALSE
	5/31/2022	1.22e+006	FALSE
	9/6/2022	1.18e+006	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-3B

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 11 for 22 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.1e+006	1.41e+006	310000	0.459	142290
2	1.12e+006	1.38e+006	260000	0.3156	82056
3	1.142e+006	1.36e+006	218000	0.2571	56047.8
4	1.15e+006	1.341e+006	191000	0.2131	40702.1
5	1.156e+006	1.28e+006	124000	0.1764	21873.6
6	1.179e+006	1.273e+006	94000	0.1443	13564.2
7	1.18e+006	1.255e+006	75000	0.115	8625
8	1.208e+006	1.235e+006	27000	0.0878	2370.6
9	1.21e+006	1.232e+006	22000	0.0618	1359.6
10	1.21e+006	1.227e+006	17000	0.0368	625.6
11	1.22e+006	1.22e+006	0	0.0122	0
12	1.22e+006	1.22e+006	0		
13	1.227e+006	1.21e+006	-17000		
14	1.232e+006	1.21e+006	-22000		
15	1.235e+006	1.208e+006	-27000		
16	1.255e+006	1.18e+006	-75000		
17	1.273e+006	1.179e+006	-94000		
18	1.28e+006	1.156e+006	-124000		
19	1.341e+006	1.15e+006	-191000		
20	1.36e+006	1.142e+006	-218000		
21	1.38e+006	1.12e+006	-260000		
22	1.41e+006	1.1e+006	-310000		

Sum of b values = 369514
Sample Standard Deviation = 82894.8
W Statistic = 0.946214

5% Critical value of 0.911 is less than 0.946214
Data is normally distributed at 95% level of significance

1% Critical value of 0.878 is less than 0.946214
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Dissolved Solids (TDS)
Location: SLF-MW-3B
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.38e+006	1.341e+006	39000	1	0
1.41e+006	1.341e+006	69000	2	0
1.12e+006	1.341e+006	-221000	2	1
1.179e+006	1.341e+006	-162000	2	2
1.255e+006	1.341e+006	-86000	2	3
1.227e+006	1.341e+006	-114000	2	4
1.142e+006	1.341e+006	-199000	2	5
1.156e+006	1.341e+006	-185000	2	6
1.232e+006	1.341e+006	-109000	2	7
1.273e+006	1.341e+006	-68000	2	8
1.235e+006	1.341e+006	-106000	2	9
1.208e+006	1.341e+006	-133000	2	10
1.28e+006	1.341e+006	-61000	2	11
1.36e+006	1.341e+006	19000	3	11
1.1e+006	1.341e+006	-241000	3	12
1.15e+006	1.341e+006	-191000	3	13
1.21e+006	1.341e+006	-131000	3	14
1.22e+006	1.341e+006	-121000	3	15
1.21e+006	1.341e+006	-131000	3	16
1.22e+006	1.341e+006	-121000	3	17
1.18e+006	1.341e+006	-161000	3	18
1.41e+006	1.38e+006	30000	4	18
1.12e+006	1.38e+006	-260000	4	19
1.179e+006	1.38e+006	-201000	4	20
1.255e+006	1.38e+006	-125000	4	21
1.227e+006	1.38e+006	-153000	4	22
1.142e+006	1.38e+006	-238000	4	23
1.156e+006	1.38e+006	-224000	4	24
1.232e+006	1.38e+006	-148000	4	25
1.273e+006	1.38e+006	-107000	4	26
1.235e+006	1.38e+006	-145000	4	27
1.208e+006	1.38e+006	-172000	4	28
1.28e+006	1.38e+006	-100000	4	29
1.36e+006	1.38e+006	-20000	4	30
1.1e+006	1.38e+006	-280000	4	31
1.15e+006	1.38e+006	-230000	4	32
1.21e+006	1.38e+006	-170000	4	33
1.22e+006	1.38e+006	-160000	4	34
1.21e+006	1.38e+006	-170000	4	35
1.22e+006	1.38e+006	-160000	4	36
1.18e+006	1.38e+006	-200000	4	37
1.12e+006	1.41e+006	-290000	4	38
1.179e+006	1.41e+006	-231000	4	39
1.255e+006	1.41e+006	-155000	4	40
1.227e+006	1.41e+006	-183000	4	41

1.142e+006	1.41e+006	-268000	4	42
1.156e+006	1.41e+006	-254000	4	43
1.232e+006	1.41e+006	-178000	4	44
1.273e+006	1.41e+006	-137000	4	45
1.235e+006	1.41e+006	-175000	4	46
1.208e+006	1.41e+006	-202000	4	47
1.28e+006	1.41e+006	-130000	4	48
1.36e+006	1.41e+006	-50000	4	49
1.1e+006	1.41e+006	-310000	4	50
1.15e+006	1.41e+006	-260000	4	51
1.21e+006	1.41e+006	-200000	4	52
1.22e+006	1.41e+006	-190000	4	53
1.21e+006	1.41e+006	-200000	4	54
1.22e+006	1.41e+006	-190000	4	55
1.18e+006	1.41e+006	-230000	4	56
1.179e+006	1.12e+006	59000	5	56
1.255e+006	1.12e+006	135000	6	56
1.227e+006	1.12e+006	107000	7	56
1.142e+006	1.12e+006	22000	8	56
1.156e+006	1.12e+006	36000	9	56
1.232e+006	1.12e+006	112000	10	56
1.273e+006	1.12e+006	153000	11	56
1.235e+006	1.12e+006	115000	12	56
1.208e+006	1.12e+006	88000	13	56
1.28e+006	1.12e+006	160000	14	56
1.36e+006	1.12e+006	240000	15	56
1.1e+006	1.12e+006	-20000	15	57
1.15e+006	1.12e+006	30000	16	57
1.21e+006	1.12e+006	90000	17	57
1.22e+006	1.12e+006	100000	18	57
1.21e+006	1.12e+006	90000	19	57
1.22e+006	1.12e+006	100000	20	57
1.18e+006	1.12e+006	60000	21	57
1.255e+006	1.179e+006	76000	22	57
1.227e+006	1.179e+006	48000	23	57
1.142e+006	1.179e+006	-37000	23	58
1.156e+006	1.179e+006	-23000	23	59
1.232e+006	1.179e+006	53000	24	59
1.273e+006	1.179e+006	94000	25	59
1.235e+006	1.179e+006	56000	26	59
1.208e+006	1.179e+006	29000	27	59
1.28e+006	1.179e+006	101000	28	59
1.36e+006	1.179e+006	181000	29	59
1.1e+006	1.179e+006	-79000	29	60
1.15e+006	1.179e+006	-29000	29	61
1.21e+006	1.179e+006	31000	30	61
1.22e+006	1.179e+006	41000	31	61
1.21e+006	1.179e+006	31000	32	61
1.22e+006	1.179e+006	41000	33	61
1.18e+006	1.179e+006	1000	34	61
1.227e+006	1.255e+006	-28000	34	62
1.142e+006	1.255e+006	-113000	34	63
1.156e+006	1.255e+006	-99000	34	64
1.232e+006	1.255e+006	-23000	34	65

1.273e+006	1.255e+006	18000	35	65
1.235e+006	1.255e+006	-20000	35	66
1.208e+006	1.255e+006	-47000	35	67
1.28e+006	1.255e+006	25000	36	67
1.36e+006	1.255e+006	105000	37	67
1.1e+006	1.255e+006	-155000	37	68
1.15e+006	1.255e+006	-105000	37	69
1.21e+006	1.255e+006	-45000	37	70
1.22e+006	1.255e+006	-35000	37	71
1.21e+006	1.255e+006	-45000	37	72
1.22e+006	1.255e+006	-35000	37	73
1.18e+006	1.255e+006	-75000	37	74
1.142e+006	1.227e+006	-85000	37	75
1.156e+006	1.227e+006	-71000	37	76
1.232e+006	1.227e+006	5000	38	76
1.273e+006	1.227e+006	46000	39	76
1.235e+006	1.227e+006	8000	40	76
1.208e+006	1.227e+006	-19000	40	77
1.28e+006	1.227e+006	53000	41	77
1.36e+006	1.227e+006	133000	42	77
1.1e+006	1.227e+006	-127000	42	78
1.15e+006	1.227e+006	-77000	42	79
1.21e+006	1.227e+006	-17000	42	80
1.22e+006	1.227e+006	-7000	42	81
1.21e+006	1.227e+006	-17000	42	82
1.22e+006	1.227e+006	-7000	42	83
1.18e+006	1.227e+006	-47000	42	84
1.156e+006	1.142e+006	14000	43	84
1.232e+006	1.142e+006	90000	44	84
1.273e+006	1.142e+006	131000	45	84
1.235e+006	1.142e+006	93000	46	84
1.208e+006	1.142e+006	66000	47	84
1.28e+006	1.142e+006	138000	48	84
1.36e+006	1.142e+006	218000	49	84
1.1e+006	1.142e+006	-42000	49	85
1.15e+006	1.142e+006	8000	50	85
1.21e+006	1.142e+006	68000	51	85
1.22e+006	1.142e+006	78000	52	85
1.21e+006	1.142e+006	68000	53	85
1.22e+006	1.142e+006	78000	54	85
1.18e+006	1.142e+006	38000	55	85
1.232e+006	1.156e+006	76000	56	85
1.273e+006	1.156e+006	117000	57	85
1.235e+006	1.156e+006	79000	58	85
1.208e+006	1.156e+006	52000	59	85
1.28e+006	1.156e+006	124000	60	85
1.36e+006	1.156e+006	204000	61	85
1.1e+006	1.156e+006	-56000	61	86
1.15e+006	1.156e+006	-6000	61	87
1.21e+006	1.156e+006	54000	62	87
1.22e+006	1.156e+006	64000	63	87
1.21e+006	1.156e+006	54000	64	87
1.22e+006	1.156e+006	64000	65	87
1.18e+006	1.156e+006	24000	66	87

1.273e+006	1.232e+006	41000	67	87
1.235e+006	1.232e+006	3000	68	87
1.208e+006	1.232e+006	-24000	68	88
1.28e+006	1.232e+006	48000	69	88
1.36e+006	1.232e+006	128000	70	88
1.1e+006	1.232e+006	-132000	70	89
1.15e+006	1.232e+006	-82000	70	90
1.21e+006	1.232e+006	-22000	70	91
1.22e+006	1.232e+006	-12000	70	92
1.21e+006	1.232e+006	-22000	70	93
1.22e+006	1.232e+006	-12000	70	94
1.18e+006	1.232e+006	-52000	70	95
1.235e+006	1.273e+006	-38000	70	96
1.208e+006	1.273e+006	-65000	70	97
1.28e+006	1.273e+006	7000	71	97
1.36e+006	1.273e+006	87000	72	97
1.1e+006	1.273e+006	-173000	72	98
1.15e+006	1.273e+006	-123000	72	99
1.21e+006	1.273e+006	-63000	72	100
1.22e+006	1.273e+006	-53000	72	101
1.21e+006	1.273e+006	-63000	72	102
1.22e+006	1.273e+006	-53000	72	103
1.18e+006	1.273e+006	-93000	72	104
1.208e+006	1.235e+006	-27000	72	105
1.28e+006	1.235e+006	45000	73	105
1.36e+006	1.235e+006	125000	74	105
1.1e+006	1.235e+006	-135000	74	106
1.15e+006	1.235e+006	-85000	74	107
1.21e+006	1.235e+006	-25000	74	108
1.22e+006	1.235e+006	-15000	74	109
1.21e+006	1.235e+006	-25000	74	110
1.22e+006	1.235e+006	-15000	74	111
1.18e+006	1.235e+006	-55000	74	112
1.28e+006	1.208e+006	72000	75	112
1.36e+006	1.208e+006	152000	76	112
1.1e+006	1.208e+006	-108000	76	113
1.15e+006	1.208e+006	-58000	76	114
1.21e+006	1.208e+006	2000	77	114
1.22e+006	1.208e+006	12000	78	114
1.21e+006	1.208e+006	2000	79	114
1.22e+006	1.208e+006	12000	80	114
1.18e+006	1.208e+006	-28000	80	115
1.36e+006	1.28e+006	80000	81	115
1.1e+006	1.28e+006	-180000	81	116
1.15e+006	1.28e+006	-130000	81	117
1.21e+006	1.28e+006	-70000	81	118
1.22e+006	1.28e+006	-60000	81	119
1.21e+006	1.28e+006	-70000	81	120
1.22e+006	1.28e+006	-60000	81	121
1.18e+006	1.28e+006	-100000	81	122
1.1e+006	1.36e+006	-260000	81	123

1.15e+006	1.36e+006	-210000	81	124
1.21e+006	1.36e+006	-150000	81	125
1.22e+006	1.36e+006	-140000	81	126
1.21e+006	1.36e+006	-150000	81	127
1.22e+006	1.36e+006	-140000	81	128
1.18e+006	1.36e+006	-180000	81	129
1.15e+006	1.1e+006	50000	82	129
1.21e+006	1.1e+006	110000	83	129
1.22e+006	1.1e+006	120000	84	129
1.21e+006	1.1e+006	110000	85	129
1.22e+006	1.1e+006	120000	86	129
1.18e+006	1.1e+006	80000	87	129
1.21e+006	1.15e+006	60000	88	129
1.22e+006	1.15e+006	70000	89	129
1.21e+006	1.15e+006	60000	90	129
1.22e+006	1.15e+006	70000	91	129
1.18e+006	1.15e+006	30000	92	129
1.22e+006	1.21e+006	10000	93	129
1.21e+006	1.21e+006	0	93	129
1.22e+006	1.21e+006	10000	94	129
1.18e+006	1.21e+006	-30000	94	130
1.21e+006	1.22e+006	-10000	94	131
1.22e+006	1.22e+006	0	94	131
1.18e+006	1.22e+006	-40000	94	132
1.22e+006	1.21e+006	10000	95	132
1.18e+006	1.21e+006	-30000	95	133
1.18e+006	1.22e+006	-40000	95	134

S Statistic = 95 - 134 = -39

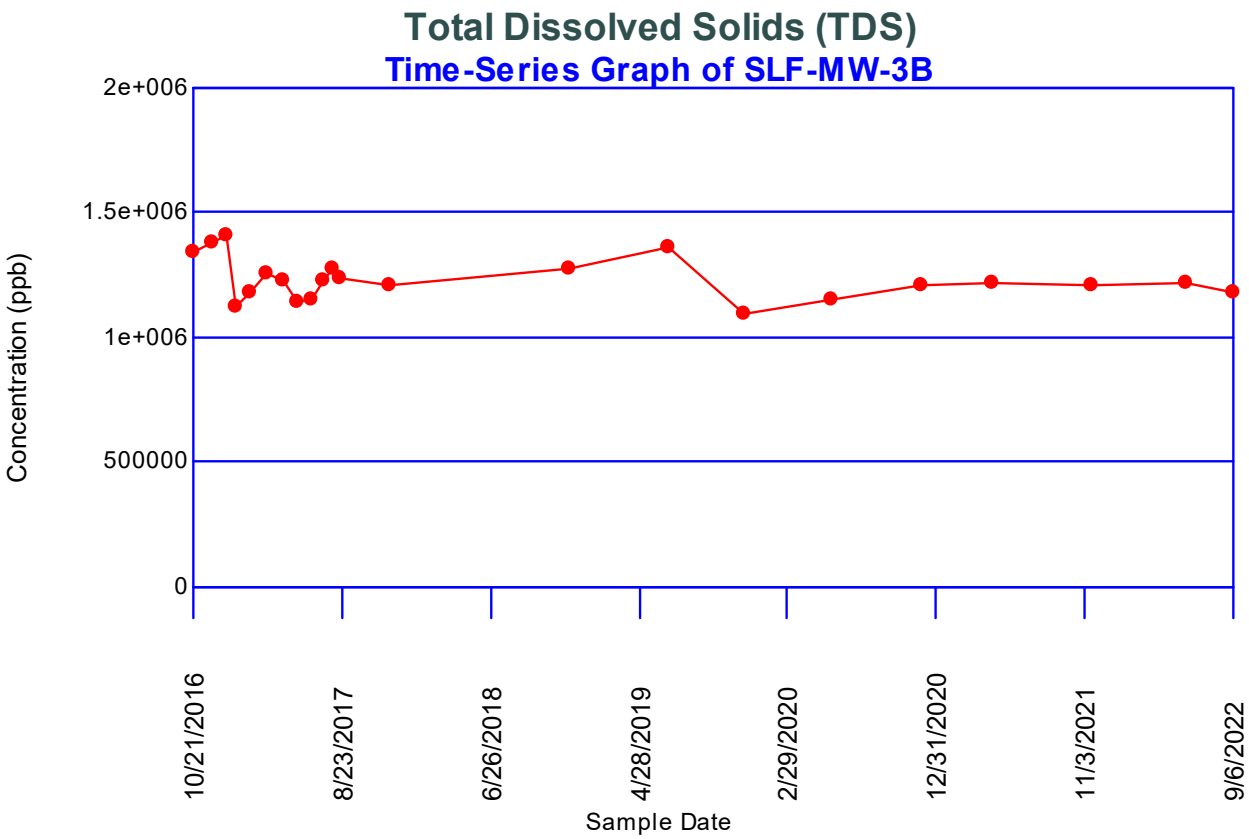
Tied Group	Value	Members
1	1.21e+006	2
2	1.22e+006	2

Time Period	Observations
10/21/2016	1
11/30/2016	1
12/28/2016	1
1/18/2017	1
2/15/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/21/2017	1
11/29/2017	1
12/4/2018	1
6/27/2019	1

12/2/2019	1
5/28/2020	1
12/1/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 22638
b = 83160
c = 924
Group Variance = 1255.67
Z-Score = -1.07237
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.07237| <= 1.97737 indicating no evidence of a trend


Total Dissolved Solids (TDS)
Time-Series Graph of SLF-MW-3B
Concentration (ppb)
2e+006
1.5e+006
1e+006
500000
0
10/21/2016
8/23/2017
6/26/2018
4/28/2019
2/29/2020
12/31/2020
11/3/2021
9/6/2022
Sample Date

Dixon's Test for Outliers

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-5R

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 19 Measurements...
5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.424699	0.25098	0.462	None

Loc.	Date	Conc.	Outlier
SLF-MW-5R	2/14/2017	470000	FALSE
	3/20/2017	445000	FALSE
	4/25/2017	435000	FALSE
	5/22/2017	400000	FALSE
	6/20/2017	451000	FALSE
	7/17/2017	556000	FALSE
	8/7/2017	477000	FALSE
	8/22/2017	529000	FALSE
	11/29/2017	549000	FALSE
	5/30/2018	591000	FALSE
	12/4/2018	480000	FALSE
	6/28/2019	611000	FALSE
	12/2/2019	432000	FALSE
	5/28/2020	384000	FALSE
	11/30/2020	336000	FALSE
	4/28/2021	498000	FALSE
	11/19/2021	526000	FALSE
	5/31/2022	586000	FALSE
	9/6/2022	732000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Dissolved Solids (TDS)

Location: SLF-MW-5R

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 9 for 19 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	336000	732000	396000	0.4808	190397
2	384000	611000	227000	0.3232	73366.4
3	400000	591000	191000	0.2561	48915.1
4	432000	586000	154000	0.2059	31708.6
5	435000	556000	121000	0.1641	19856.1
6	445000	549000	104000	0.1271	13218.4
7	451000	529000	78000	0.0932	7269.6
8	470000	526000	56000	0.0612	3427.2
9	477000	498000	21000	0.0303	636.3
10	480000	480000	0		
11	498000	477000	-21000		
12	526000	470000	-56000		
13	529000	451000	-78000		
14	549000	445000	-104000		
15	556000	435000	-121000		
16	586000	432000	-154000		
17	591000	400000	-191000		
18	611000	384000	-227000		
19	732000	336000	-396000		

Sum of b values = 388794
Sample Standard Deviation = 92894.3
W Statistic = 0.973171

5% Critical value of 0.901 is less than 0.973171
Data is normally distributed at 95% level of significance

1% Critical value of 0.863 is less than 0.973171
Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Dissolved Solids (TDS)
Location: SLF-MW-5R
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
445000	470000	-25000	0	1
435000	470000	-35000	0	2
400000	470000	-70000	0	3
451000	470000	-19000	0	4
556000	470000	86000	1	4
477000	470000	7000	2	4
529000	470000	59000	3	4
549000	470000	79000	4	4
591000	470000	121000	5	4
480000	470000	10000	6	4
611000	470000	141000	7	4
432000	470000	-38000	7	5
384000	470000	-86000	7	6
336000	470000	-134000	7	7
498000	470000	28000	8	7
526000	470000	56000	9	7
586000	470000	116000	10	7
732000	470000	262000	11	7
435000	445000	-10000	11	8
400000	445000	-45000	11	9
451000	445000	6000	12	9
556000	445000	111000	13	9
477000	445000	32000	14	9
529000	445000	84000	15	9
549000	445000	104000	16	9
591000	445000	146000	17	9
480000	445000	35000	18	9
611000	445000	166000	19	9
432000	445000	-13000	19	10
384000	445000	-61000	19	11
336000	445000	-109000	19	12
498000	445000	53000	20	12
526000	445000	81000	21	12
586000	445000	141000	22	12
732000	445000	287000	23	12
400000	435000	-35000	23	13
451000	435000	16000	24	13
556000	435000	121000	25	13
477000	435000	42000	26	13
529000	435000	94000	27	13
549000	435000	114000	28	13
591000	435000	156000	29	13
480000	435000	45000	30	13
611000	435000	176000	31	13
432000	435000	-3000	31	14

384000	435000	-51000	31	15
336000	435000	-99000	31	16
498000	435000	63000	32	16
526000	435000	91000	33	16
586000	435000	151000	34	16
732000	435000	297000	35	16
451000	400000	51000	36	16
556000	400000	156000	37	16
477000	400000	77000	38	16
529000	400000	129000	39	16
549000	400000	149000	40	16
591000	400000	191000	41	16
480000	400000	80000	42	16
611000	400000	211000	43	16
432000	400000	32000	44	16
384000	400000	-16000	44	17
336000	400000	-64000	44	18
498000	400000	98000	45	18
526000	400000	126000	46	18
586000	400000	186000	47	18
732000	400000	332000	48	18
556000	451000	105000	49	18
477000	451000	26000	50	18
529000	451000	78000	51	18
549000	451000	98000	52	18
591000	451000	140000	53	18
480000	451000	29000	54	18
611000	451000	160000	55	18
432000	451000	-19000	55	19
384000	451000	-67000	55	20
336000	451000	-115000	55	21
498000	451000	47000	56	21
526000	451000	75000	57	21
586000	451000	135000	58	21
732000	451000	281000	59	21
477000	556000	-79000	59	22
529000	556000	-27000	59	23
549000	556000	-7000	59	24
591000	556000	35000	60	24
480000	556000	-76000	60	25
611000	556000	55000	61	25
432000	556000	-124000	61	26
384000	556000	-172000	61	27
336000	556000	-220000	61	28
498000	556000	-58000	61	29
526000	556000	-30000	61	30
586000	556000	30000	62	30
732000	556000	176000	63	30
529000	477000	52000	64	30
549000	477000	72000	65	30
591000	477000	114000	66	30
480000	477000	3000	67	30
611000	477000	134000	68	30

432000	477000	-45000	68	31
384000	477000	-93000	68	32
336000	477000	-141000	68	33
498000	477000	21000	69	33
526000	477000	49000	70	33
586000	477000	109000	71	33
732000	477000	255000	72	33
549000	529000	20000	73	33
591000	529000	62000	74	33
480000	529000	-49000	74	34
611000	529000	82000	75	34
432000	529000	-97000	75	35
384000	529000	-145000	75	36
336000	529000	-193000	75	37
498000	529000	-31000	75	38
526000	529000	-3000	75	39
586000	529000	57000	76	39
732000	529000	203000	77	39
591000	549000	42000	78	39
480000	549000	-69000	78	40
611000	549000	62000	79	40
432000	549000	-117000	79	41
384000	549000	-165000	79	42
336000	549000	-213000	79	43
498000	549000	-51000	79	44
526000	549000	-23000	79	45
586000	549000	37000	80	45
732000	549000	183000	81	45
480000	591000	-111000	81	46
611000	591000	20000	82	46
432000	591000	-159000	82	47
384000	591000	-207000	82	48
336000	591000	-255000	82	49
498000	591000	-93000	82	50
526000	591000	-65000	82	51
586000	591000	-5000	82	52
732000	591000	141000	83	52
611000	480000	131000	84	52
432000	480000	-48000	84	53
384000	480000	-96000	84	54
336000	480000	-144000	84	55
498000	480000	18000	85	55
526000	480000	46000	86	55
586000	480000	106000	87	55
732000	480000	252000	88	55
432000	611000	-179000	88	56
384000	611000	-227000	88	57
336000	611000	-275000	88	58
498000	611000	-113000	88	59
526000	611000	-85000	88	60
586000	611000	-25000	88	61
732000	611000	121000	89	61

384000	432000	-48000	89	62
336000	432000	-96000	89	63
498000	432000	66000	90	63
526000	432000	94000	91	63
586000	432000	154000	92	63
732000	432000	300000	93	63
336000	384000	-48000	93	64
498000	384000	114000	94	64
526000	384000	142000	95	64
586000	384000	202000	96	64
732000	384000	348000	97	64
498000	336000	162000	98	64
526000	336000	190000	99	64
586000	336000	250000	100	64
732000	336000	396000	101	64
526000	498000	28000	102	64
586000	498000	88000	103	64
732000	498000	234000	104	64
586000	526000	60000	105	64
732000	526000	206000	106	64
732000	586000	146000	107	64

S Statistic = 107 - 64 = 43

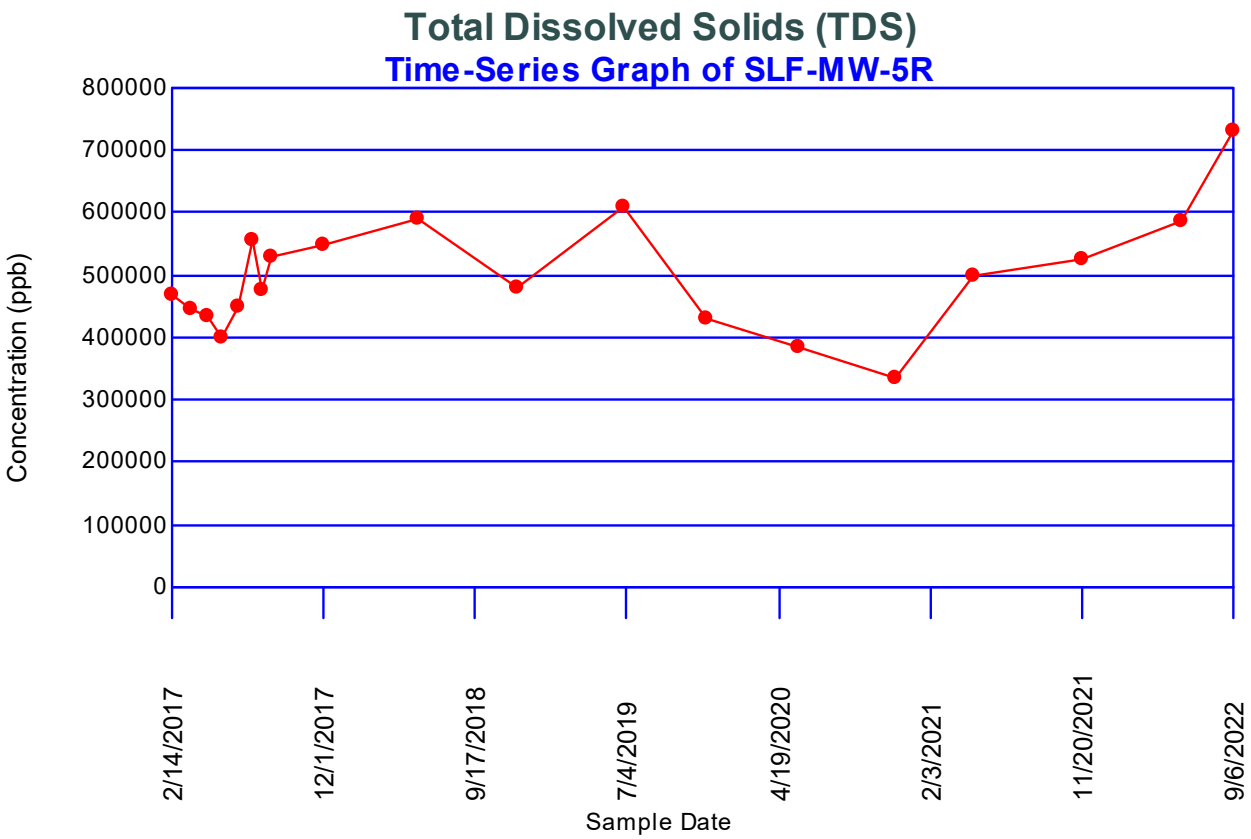
Tied Group	Value	Members

Time Period	Observations
2/14/2017	1
3/20/2017	1
4/25/2017	1
5/22/2017	1
6/20/2017	1
7/17/2017	1
8/7/2017	1
8/22/2017	1
11/29/2017	1
5/30/2018	1
12/4/2018	1
6/28/2019	1
12/2/2019	1
5/28/2020	1
11/30/2020	1
4/28/2021	1
11/19/2021	1
5/31/2022	1
9/6/2022	1

There are 0 time periods with multiple data

A = 0
B = 0

C = 0
D = 0
E = 0
F = 0
a = 14706
b = 52326
c = 684
Group Variance = 817
Z-Score = 1.46939
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.46939| <= 1.97737 indicating no evidence of a trend


Total Dissolved Solids (TDS)
Time-Series Graph of SLF-MW-5R
Concentration (ppb)
800000
700000
600000
500000
400000
300000
200000
100000
0
2/14/2017
12/1/2017
9/17/2018
7/4/2019
4/19/2020
2/3/2021
11/20/2021
9/6/2022
Sample Date

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-2B

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	2683.12
	11/30/2016	4817.2
	12/28/2016	3895.84
	1/18/2017	3956.91
	2/14/2017	3573.57
	3/20/2017	3806.16
	4/25/2017	3914.41
	5/22/2017	3891.56
	6/20/2017	3773.44
	7/17/2017	4668
	8/8/2017	4027
	8/21/2017	3197
	11/29/2017	4576
	5/31/2018	4370
	12/4/2018	4940
	6/28/2019	4410
	12/2/2019	4280
	5/28/2020	3390
	11/30/2020	3560
	4/28/2021	2900
	11/19/2021	4140
	5/31/2022	4010
	9/6/2022	3700

From 23 baseline samples
Baseline mean = 3933.92
Baseline std Dev = 571.284

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 23 (background observations) - 1
t(0.9975, 22) = 3.24764

Date	Samples	Mean	Interval	Significant
11/21/2022	1	3410	[0, 5829.15]	FALSE
9/6/2022	1	3700	[0, 5829.15]	FALSE
5/31/2022	1	4010	[0, 5829.15]	FALSE
11/19/2021	1	4140	[0, 5829.15]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	4238.42
	11/30/2016	6242.46
	12/28/2016	5154.49
	1/18/2017	4910.63
	2/15/2017	3595.68
	3/20/2017	3637.76
	4/25/2017	3392.27
	5/22/2017	3135.58
	6/20/2017	3335.63
	7/17/2017	4381
	8/7/2017	3684
	8/21/2017	3922
	11/29/2017	3860
	5/30/2018	2650
	12/4/2018	3490
	6/27/2019	2170
	12/2/2019	2220
	5/28/2020	1590
	12/1/2020	1920
	4/28/2021	1410
	11/19/2021	1900
	5/31/2022	1800
	9/6/2022	1760

From 23 baseline samples
Baseline mean = 3234.78
Baseline std Dev = 1272.31

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 23 (background observations) - 1
t(0.9975, 22) = 3.24764

Date	Samples	Mean	Interval	Significant
11/21/2022	1	1690	[0, 7455.66]	FALSE
9/6/2022	1	1760	[0, 7455.66]	FALSE
5/31/2022	1	1800	[0, 7455.66]	FALSE
11/19/2021	1	1900	[0, 7455.66]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Boron

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	493.993
	3/20/2017	345.223
	4/25/2017	314.115
	5/22/2017	270.744
	6/20/2017	438.039
	7/17/2017	550
	8/7/2017	363
	8/22/2017	461
	11/29/2017	524
	5/30/2018	517
	12/4/2018	395
	6/28/2019	631
	12/2/2019	653
	5/28/2020	220
	11/30/2020	290
	4/28/2021	431
	11/19/2021	621
	5/31/2022	469
	9/6/2022	855

From 19 baseline samples
Baseline mean = 465.374
Baseline std Dev = 155.689

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 19 (background observations) - 1
t(0.9975, 18) = 3.33596

Date	Samples	Mean	Interval	Significant
11/21/2022	1	929	[0, 998.238]	FALSE
9/6/2022	1	855	[0, 998.238]	FALSE
5/31/2022	1	469	[0, 998.238]	FALSE
11/19/2021	1	621	[0, 998.238]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-2B

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 24
Maximum Baseline Concentration = 110000
Confidence Level = 85.7%
False Positive Rate = 14.3%

Baseline Measurements	Date	Value
	10/21/2016	37032.2
	11/30/2016	61315.7
	12/28/2016	44056.6
	1/18/2017	35837.4
	2/14/2017	37524.8
	3/20/2017	38622.7
	4/25/2017	39897.3
	5/22/2017	43737.6
	6/20/2017	34857
	7/17/2017	33220
	8/8/2017	30756
	8/21/2017	31548
	11/29/2017	37641
	3/8/2018	47865
	5/31/2018	44100
	12/4/2018	48600
	6/28/2019	43600
	12/2/2019	49100
	5/28/2020	47400
	11/30/2020	44100
	4/28/2021	41200
	11/19/2021	42500
	5/31/2022	76400
	9/6/2022	110000

Date	Count	Mean	Significant
11/21/2022	1	86500	FALSE
9/6/2022	1	110000	FALSE
5/31/2022	1	76400	FALSE
11/19/2021	1	42500	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	184501
	11/30/2016	249120
	12/28/2016	254980
	1/18/2017	228148
	2/15/2017	188140
	3/20/2017	191435
	4/25/2017	188976
	5/22/2017	229431
	6/20/2017	213067
	7/17/2017	220459
	8/7/2017	208907
	8/21/2017	235062
	11/29/2017	204990
	3/8/2018	173000
	5/30/2018	171000
	12/4/2018	200000
	6/27/2019	172000
	12/2/2019	179000
	5/28/2020	138000
	12/1/2020	167000
	4/28/2021	143000
	11/19/2021	176000
	5/31/2022	200000
	9/6/2022	182000

From 24 baseline samples
Baseline mean = 195759
Baseline std Dev = 30244

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	170000	[0, 295488]	FALSE
9/6/2022	1	182000	[0, 295488]	FALSE
5/31/2022	1	200000	[0, 295488]	FALSE
11/19/2021	1	176000	[0, 295488]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Calcium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	107763
	3/20/2017	104972
	4/25/2017	101443
	5/22/2017	118938
	6/20/2017	120726
	7/17/2017	123508
	8/7/2017	115159
	8/22/2017	123970
	11/29/2017	136418
	3/8/2018	105000
	5/30/2018	118000
	12/4/2018	114000
	6/28/2019	126000
	12/2/2019	130000
	5/28/2020	99100
	11/30/2020	85100
	4/28/2021	115000
	11/19/2021	135000
	5/31/2022	123000
	9/6/2022	157000

From 20 baseline samples
Baseline mean = 118005
Baseline std Dev = 15638.8

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 20 (background observations) - 1
t(0.9975, 19) = 3.30994

Date	Samples	Mean	Interval	Significant
11/21/2022	1	152000	[0, 171047]	FALSE
9/6/2022	1	157000	[0, 171047]	FALSE
5/31/2022	1	123000	[0, 171047]	FALSE
11/19/2021	1	135000	[0, 171047]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-2B

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	1.54749e+006
	11/30/2016	1.61454e+006
	12/28/2016	1.768e+006
	1/18/2017	1.33503e+006
	2/14/2017	1.5337e+006
	3/20/2017	1.36241e+006
	4/25/2017	1.35437e+006
	5/22/2017	1.37044e+006
	6/20/2017	1.31495e+006
	7/17/2017	2.425e+006
	8/8/2017	616000
	8/21/2017	1.136e+006
	11/29/2017	1.421e+006
	3/8/2018	1.712e+006
	5/31/2018	1.87e+006
	12/4/2018	2.08e+006
	6/28/2019	2.53e+006
	12/2/2019	2.44e+006
	5/28/2020	2.2e+006
	11/30/2020	1.54e+006
	4/28/2021	1.48e+006
	11/19/2021	1.68e+006
	5/31/2022	1.82e+006
	9/6/2022	1.94e+006

From 24 baseline samples
Baseline mean = 1.67046e+006
Baseline std Dev = 445673

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	1.83e+006	[0, 3.14005e+00	FALSE
9/6/2022	1	1.94e+006	[0, 3.14005e+00	FALSE
5/31/2022	1	1.82e+006	[0, 3.14005e+00	FALSE
11/19/2021	1	1.68e+006	[0, 3.14005e+00	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	152574
	11/30/2016	169582
	12/28/2016	160177
	1/18/2017	146634
	2/15/2017	143113
	3/20/2017	171319
	4/25/2017	167869
	5/22/2017	126662
	6/20/2017	121058
	7/17/2017	98000
	8/7/2017	103000
	8/21/2017	98000
	11/29/2017	152000
	3/8/2018	224000
	5/30/2018	179000
	12/4/2018	225000
	6/27/2019	239000
	12/2/2019	245000
	5/28/2020	262000
	12/1/2020	269000
	4/28/2021	250000
	11/19/2021	246000
	5/31/2022	228000
	9/6/2022	191000

From 24 baseline samples
Baseline mean = 182000
Baseline std Dev = 54505

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	188000	[0, 361729]	FALSE
9/6/2022	1	191000	[0, 361729]	FALSE
5/31/2022	1	228000	[0, 361729]	FALSE
11/19/2021	1	246000	[0, 361729]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	33649.2
	3/20/2017	25801.9
	4/25/2017	22580.8
	5/22/2017	16154
	6/20/2017	25945.6
	7/17/2017	26000
	8/7/2017	19100
	8/22/2017	25500
	11/29/2017	24500
	3/8/2018	15000
	5/30/2018	25500
	12/4/2018	20500
	6/28/2019	24300
	12/2/2019	29200
	5/28/2020	12400
	11/30/2020	14200
	4/28/2021	25700
	11/19/2021	26900
	5/31/2022	26200
	9/6/2022	44100

From 20 baseline samples
Baseline mean = 24161.6
Baseline std Dev = 7134.35

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 20 (background observations) - 1
t(0.9975, 19) = 3.30994

Date	Samples	Mean	Interval	Significant
11/21/2022	**1**	**52900**	**[0, 48359]**	**TRUE**
9/6/2022	1	44100	[0, 48359]	FALSE
5/31/2022	1	26200	[0, 48359]	FALSE
11/19/2021	1	26900	[0, 48359]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-2B

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 8.69565%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 23
Maximum Baseline Concentration = 2647.4
Confidence Level = 85.2%
False Positive Rate = 14.8%

Baseline Measurements	Date	Value
	10/21/2016	ND<500
	11/30/2016	2647.4
	12/28/2016	1500
	1/18/2017	1875.9
	2/14/2017	ND<500
	3/20/2017	1794.9
	4/25/2017	1972.9
	5/22/2017	1673.4
	6/20/2017	2104.9
	7/17/2017	2000
	8/8/2017	2000
	8/21/2017	1900
	11/29/2017	2000
	5/31/2018	2200
	12/4/2018	1620
	6/28/2019	2190
	12/2/2019	2280
	5/28/2020	2330
	11/30/2020	2220
	4/28/2021	1980
	11/19/2021	1960
	5/31/2022	1100
	9/6/2022	970

Date	Count	Mean	Significant
11/21/2022	1	830	FALSE
9/6/2022	1	970	FALSE
5/31/2022	1	1100	FALSE
11/19/2021	1	1960	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-3B

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 91.3043%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 23
Maximum Baseline Concentration = 500
Confidence Level = 85.2%
False Positive Rate = 14.8%

Baseline Measurements	Date	Value
	10/21/2016	ND<500
	11/30/2016	ND<500
	12/28/2016	ND<500
	1/18/2017	ND<500
	2/15/2017	ND<500
	3/20/2017	ND<500
	4/25/2017	ND<500
	5/22/2017	ND<500
	6/20/2017	ND<500
	7/17/2017	ND<500
	8/7/2017	ND<500
	8/21/2017	ND<500
	11/29/2017	ND<500
	5/30/2018	ND<500
	12/4/2018	ND<500
	6/27/2019	ND<500
	12/2/2019	ND<500
	5/28/2020	ND<500
	12/1/2020	ND<500
	4/28/2021	ND<500
	11/19/2021	ND<500
	5/31/2022	160
	9/6/2022	160

Date	Count	Mean	Significant
11/21/2022	1	160	FALSE
9/6/2022	1	160	FALSE
5/31/2022	1	160	FALSE
11/19/2021	1	500	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-5R

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 89.4737%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 19
Maximum Baseline Concentration = 500
Confidence Level = 82.6%
False Positive Rate = 17.4%

Baseline Measurements	Date	Value
	2/14/2017	ND<500
	3/20/2017	ND<500
	4/25/2017	ND<500
	5/22/2017	ND<500
	6/20/2017	ND<500
	7/17/2017	ND<500
	8/7/2017	ND<500
	8/22/2017	ND<500
	11/29/2017	ND<500
	5/30/2018	ND<500
	12/4/2018	ND<500
	6/28/2019	ND<500
	12/2/2019	ND<500
	5/28/2020	ND<500
	11/30/2020	ND<500
	4/28/2021	ND<500
	11/19/2021	ND<500
	5/31/2022	130
	9/6/2022	150

Date	Count	Mean	Significant
11/21/2022	1	150	FALSE
9/6/2022	1	150	FALSE
5/31/2022	1	130	FALSE
11/19/2021	1	500	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-2B

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 26
Maximum Baseline Concentration = 9
Confidence Level = 86.7%
False Positive Rate = 13.3%

Baseline Measurements	Date	Value
	10/21/2016	7.51
	11/30/2016	7.67
	12/28/2016	7.73
	1/18/2017	7.59
	2/14/2017	7.79
	3/20/2017	7.61
	4/25/2017	7.48
	5/22/2017	7.93
	6/20/2017	8.06
	7/17/2017	8.34
	8/8/2017	9
	8/21/2017	8.93
	11/29/2017	7.66
	3/8/2018	7.88
	5/31/2018	7.56
	12/4/2018	7.62
	6/28/2019	7.54
	11/4/2019	7.6
	12/2/2019	7.5
	5/28/2020	7.28
	11/30/2020	7.87
	4/12/2021	7.7
	4/28/2021	7.73
	11/19/2021	7.82
	5/31/2022	7.7
	9/6/2022	7.63

Date	Count	Mean	Significant
11/21/2022	1	7.68	FALSE
9/6/2022	1	7.63	FALSE
5/31/2022	1	7.7	FALSE
11/19/2021	1	7.82	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% Two-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	7.02
	11/30/2016	7.11
	12/28/2016	7.19
	1/18/2017	6.97
	2/15/2017	7.24
	3/20/2017	7.06
	4/25/2017	7.02
	5/22/2017	7.22
	6/20/2017	6.99
	7/17/2017	7.33
	8/7/2017	7.61
	8/21/2017	7.53
	11/29/2017	7.12
	3/8/2018	7.46
	5/30/2018	7.09
	12/4/2018	7.11
	6/27/2019	7.22
	12/2/2019	7.11
	5/28/2020	6.97
	12/1/2020	7.23
	4/28/2021	7.14
	11/19/2021	7.25
	5/31/2022	7.28
	9/6/2022	7.25

From 24 baseline samples
Baseline mean = 7.18833
Baseline std Dev = 0.168592

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/4)/2 = 99.875 %
t is Percentile of Student's T-Test (0.99/4/2) = 0.99875
Degrees of Freedom = 24 (background observations) - 1
t(0.99875, 24) = 3.44261

Date	Samples	Mean	Interval	Significant
11/21/2022	1	7.3	[6.6, 7.78]	FALSE
9/6/2022	1	7.25	[6.6, 7.78]	FALSE
5/31/2022	1	7.28	[6.6, 7.78]	FALSE
11/19/2021	1	7.25	[6.6, 7.78]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: pH, Field

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% Two-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	7.16
	3/20/2017	7.14
	4/25/2017	7.06
	5/22/2017	7.14
	6/20/2017	7.09
	7/17/2017	7.2
	8/7/2017	7.32
	8/22/2017	7.34
	11/29/2017	7.1
	3/8/2018	7.35
	5/30/2018	6.94
	12/4/2018	7.14
	6/28/2019	7.1
	12/2/2019	7.08
	5/28/2020	7.1
	11/30/2020	7.2
	4/28/2021	7.16
	11/19/2021	7.08
	5/31/2022	7.2
	9/6/2022	7.12

From 20 baseline samples
Baseline mean = 7.151
Baseline std Dev = 0.0992021

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.05/4)/2 = 99.875 %
t is Percentile of Student's T-Test (0.99/4/2) = 0.99875
Degrees of Freedom = 20 (background observations) - 1
t(0.99875, 20) = 3.53444

Date	Samples	Mean	Interval	Significant
11/21/2022	1	7.19	[6.79, 7.51]	FALSE
9/6/2022	1	7.12	[6.79, 7.51]	FALSE
5/31/2022	1	7.2	[6.79, 7.51]	FALSE
11/19/2021	1	7.08	[6.79, 7.51]	FALSE

Non-Parametric Prediction Interval

Intra-Well Comparison for SLF-MW-2B

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%
Future Samples (k) = 4
Recent Dates = 4
Baseline Measurements (n) = 25
Maximum Baseline Concentration = 607000
Confidence Level = 86.2%
False Positive Rate = 13.8%

Baseline Measurements	Date	Value
	10/21/2016	347901
	11/30/2016	244670
	12/28/2016	359044
	1/18/2017	229595
	2/14/2017	224624
	3/20/2017	221785
	4/25/2017	205884
	5/22/2017	204497
	6/20/2017	195436
	7/17/2017	203000
	8/8/2017	198500
	8/21/2017	196500
	11/29/2017	191600
	3/8/2018	233000
	5/31/2018	200000
	12/4/2018	163000
	6/28/2019	122000
	12/2/2019	120000
	5/28/2020	104000
	11/30/2020	607000
	4/12/2021	587000
	4/28/2021	555000
	11/19/2021	469000
	5/31/2022	500000
	9/6/2022	448000

Date	Count	Mean	Significant
11/21/2022	1	490000	FALSE
9/6/2022	1	448000	FALSE
5/31/2022	1	500000	FALSE
11/19/2021	1	469000	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	603053
	11/30/2016	589957
	12/28/2016	614466
	1/18/2017	582135
	2/15/2017	486076
	3/20/2017	472830
	4/25/2017	465682
	5/22/2017	495843
	6/20/2017	480297
	7/17/2017	519000
	8/7/2017	532000
	8/21/2017	549000
	11/29/2017	483000
	3/8/2018	476000
	5/30/2018	454000
	12/4/2018	476000
	6/27/2019	417000
	12/2/2019	384000
	5/28/2020	336000
	12/1/2020	389000
	4/28/2021	355000
	11/19/2021	396000
	5/31/2022	381000
	9/6/2022	364000

From 24 baseline samples
Baseline mean = 470889
Baseline std Dev = 81331.4

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	384000	[0, 739078]	FALSE
9/6/2022	1	364000	[0, 739078]	FALSE
5/31/2022	1	381000	[0, 739078]	FALSE
11/19/2021	1	396000	[0, 739078]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	126012
	3/20/2017	107411
	4/25/2017	95475.3
	5/22/2017	90985.1
	6/20/2017	130226
	7/17/2017	132600
	8/7/2017	112400
	8/22/2017	143100
	11/29/2017	157800
	3/8/2018	89800
	5/30/2018	158000
	12/4/2018	122000
	6/28/2019	173000
	12/2/2019	162000
	5/28/2020	83400
	11/30/2020	84400
	4/28/2021	144000
	11/19/2021	178000
	5/31/2022	159000
	9/6/2022	209000

From 20 baseline samples
Baseline mean = 132930
Baseline std Dev = 35168.4

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 20 (background observations) - 1
t(0.9975, 19) = 3.30994

Date	Samples	Mean	Interval	Significant
11/21/2022	**1**	**259000**	**[0, 252210]**	**TRUE**
9/6/2022	1	209000	[0, 252210]	FALSE
5/31/2022	1	159000	[0, 252210]	FALSE
11/19/2021	1	178000	[0, 252210]	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-2B

Parameter: Total Dissolved Solids (TDS)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	3.468e+006
	11/30/2016	483000
	12/28/2016	3.5667e+006
	1/18/2017	2.93e+006
	2/14/2017	3.5e+006
	3/20/2017	3.13e+006
	4/25/2017	3.4e+006
	5/22/2017	3.014e+006
	6/20/2017	2.97e+006
	7/17/2017	2.91e+006
	8/8/2017	3.05e+006
	8/21/2017	3.05e+006
	11/29/2017	3.072e+006
	5/31/2018	3.91e+006
	12/4/2018	4.24e+006
	6/28/2019	4.53e+006
	11/4/2019	4.38e+006
	12/2/2019	4.13e+006
	5/28/2020	4.26e+006
	11/30/2020	3.55e+006
	4/28/2021	3.67e+006
	11/19/2021	3.9e+006
	5/31/2022	4.16e+006
	9/6/2022	4.41e+006

From 24 baseline samples
Baseline mean = 3.48682e+006
Baseline std Dev = 834302

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 24 (background observations) - 1
t(0.9975, 23) = 3.23085

Date	Samples	Mean	Interval	Significant
11/21/2022	1	4.02e+006	[0, 6.23791e+00	FALSE
9/6/2022	1	4.41e+006	[0, 6.23791e+00	FALSE
5/31/2022	1	4.16e+006	[0, 6.23791e+00	FALSE
11/19/2021	1	3.9e+006	[0, 6.23791e+00	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-3B

Parameter: Total Dissolved Solids (TDS)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	10/21/2016	1.341e+006
	11/30/2016	1.38e+006
	12/28/2016	1.41e+006
	1/18/2017	1.12e+006
	2/15/2017	1.179e+006
	3/20/2017	1.255e+006
	4/25/2017	1.227e+006
	5/22/2017	1.142e+006
	6/20/2017	1.156e+006
	7/17/2017	1.232e+006
	8/7/2017	1.273e+006
	8/21/2017	1.235e+006
	11/29/2017	1.208e+006
	12/4/2018	1.28e+006
	6/27/2019	1.36e+006
	12/2/2019	1.1e+006
	5/28/2020	1.15e+006
	12/1/2020	1.21e+006
	4/28/2021	1.22e+006
	11/19/2021	1.21e+006
	5/31/2022	1.22e+006
	9/6/2022	1.18e+006

From 22 baseline samples
Baseline mean = 1.23127e+006
Baseline std Dev = 82894.8

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 22 (background observations) - 1
t(0.9975, 21) = 3.2662

Date	Samples	Mean	Interval	Significant
11/21/2022	1	1.13e+006	[0, 1.50811e+006	FALSE
9/6/2022	1	1.18e+006	[0, 1.50811e+006	FALSE
5/31/2022	1	1.22e+006	[0, 1.50811e+006	FALSE
11/19/2021	1	1.21e+006	[0, 1.50811e+006	FALSE

Parametric Prediction Interval Analysis

Intra-Well Comparison for SLF-MW-5R

Parameter: Total Dissolved Solids (TDS)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Intra-Well Unified Guid. Formula 99% One-Sided Comparison

Baseline Samples	Date	Result
	2/14/2017	470000
	3/20/2017	445000
	4/25/2017	435000
	5/22/2017	400000
	6/20/2017	451000
	7/17/2017	556000
	8/7/2017	477000
	8/22/2017	529000
	11/29/2017	549000
	5/30/2018	591000
	12/4/2018	480000
	6/28/2019	611000
	12/2/2019	432000
	5/28/2020	384000
	11/30/2020	336000
	4/28/2021	498000
	11/19/2021	526000
	5/31/2022	586000
	9/6/2022	732000

From 19 baseline samples
Baseline mean = 499368
Baseline std Dev = 92894.3

For 4 recent sampling event(s)
Actual confidence level is 1.0 - (0.01/4) = 99.75 %
t is Percentile of Student's T-Test (0.99/4) = 0.9975
Degrees of Freedom = 19 (background observations) - 1
t(0.9975, 18) = 3.33596

Date	Samples	Mean	Interval	Significant
11/21/2022	1	794000	[0, 817311]	FALSE
9/6/2022	1	732000	[0, 817311]	FALSE
5/31/2022	1	586000	[0, 817311]	FALSE
11/19/2021	1	526000	[0, 817311]	FALSE

APPENDIX F – Alternate Source Demonstration(s)

Prepared for

East Kentucky Power Cooperative
P.O. Box 707
Winchester, Kentucky 40392-0707

ALTERNATE SOURCE DEMONSTRATION

SPURLOCK STATION LANDFILL
MAYSVILLE, KENTUCKY

Prepared by

engineers | scientists | innovators

1255 Roberts Boulevard, Suite 200
Kennesaw, Georgia 30144

Project Number GR9795

July 2023

EAST KENTUCKY POWER COOPERATIVE
A Touchstone Energy® Cooperative

ALTERNATE SOURCE DEMONSTRATION

H.L. Spurlock Generating Station
Spurlock Landfill
Maysville, Kentucky

July 5, 2023

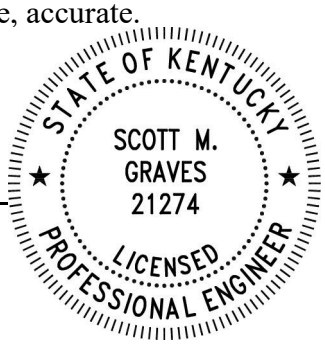
Herwig Goldemund, Ph.D.
Principal

Robert Glazier
Project Director

Certification Statement

Alternate Source Demonstration
H.L. Spurlock Generating Station
Spurlock Landfill
Maysville, Kentucky
July 5, 2023

I, Scott Graves, a qualified professional engineer registered in the Commonwealth of Kentucky, certify that the above document was completed consistent with the requirements stipulated in 40 CFR 257.94(e)(2) and that the information contained herein is, to the best of my knowledge, accurate.



Seal and Signature

07/05/2023

Date

Geosyntec
consultants

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LIST OF ACRONYMS

ASD	alternate source demonstration
B	boron
$\delta^{11}B$	boron isotope composition
bgs	below ground surface
Ca	calcium
CCR	coal combustion residual
CFR	Code of Federal Regulations
cm/sec	centimeter per second
Cl	chloride
DO	dissolved oxygen
EKPC	East Kentucky Power Cooperative
FGD	flue gas desulfurization
ft. bgs	feet below ground surface
ft./ft.	feet per foot
ft./yr.	feet per year
HCO_3	bicarbonate
K	potassium
KPDES	Kentucky Pollution Discharge Elimination System
Li	lithium
δ^7Li	lithium isotope composition
LPL	lower prediction limit
mg/L	milligram per liter
Na	sodium
SSI	statistically significant increase
Sr	strontium
$^{87}Sr/^{86}Sr$	strontium isotope composition
SO_4	sulfate
TDS	total dissolved solids
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UPL	upper prediction limit
UTL	upper tolerance limit

1. INTRODUCTION

1.1 Introduction and Purpose

The Federal Coal Combustion Residuals (CCR) Rule provides a process under 40 Code of Federal Regulations (CFR) Section 257.94(e)(2) for the owner/operator of a regulated CCR unit to demonstrate that a statistically significant increase (SSI) above background concentrations of Appendix III constituents during the detection monitoring program is not due to a release of CCR constituents from the CCR unit. An SSI for Appendix III constituents might be a potential indication of a release of CCR constituents from the CCR unit to groundwater. However, the CCR unit may remain in the detection monitoring program if it can be demonstrated that an SSI is due to an error (i.e., sampling error, laboratory error, or statistical analysis error), due to natural variation in groundwater quality, or due to an alternate source (other than the regulated CCR unit). The Federal CCR Rule does not contain requirements nor reference agency guidance for a successful alternate source demonstration other than certification of its accuracy by a Professional Engineer.

Geosyntec Consultants, Inc. (Geosyntec) previously prepared a total of eight successful Alternate Source Demonstrations (ASDs) for East Kentucky Power Cooperative's (EKPC's) CCR Landfill at the Spurlock Generating Station in Maysville, Kentucky, referred to herein as the Site, the Landfill, and the CCR Unit (Geosyntec, 2018a and b, 2019b, 2020, 2021b and c, and 2022a and b). One of the major findings of the previous ASD reports was the fact that the upgradient groundwater monitoring wells MW-6 and MW-7 are not representative of background groundwater conditions that could be compared to downgradient conditions at wells MW-2B, MW-3B, and MW-5B/R to detect a potential release from the regulated unit (Geosyntec, 2018a and b). Together with previous demonstrations that certify that the SSI(s) were not due to a release from the unit, there was enough evidence that a new statistical approach was needed for the detection monitoring program at this CCR Unit. Therefore, Haley & Aldrich certified new statistical methods on 8 April 2019 that shifted the statistical approach from inter-well to intra-well statistics (Haley & Aldrich, 2019a).

On 21 November 2022, EKPC collected samples for the second semi-annual 2022 detection monitoring event. Groundwater sampling results were statistically analyzed by Haley & Aldrich, and SSIs for chloride (Cl) and sulfate (SO_4) were identified in monitoring well MW-5B/R. EKPC was verbally notified on 6 April 2023 of the SSIs and

commissioned Geosyntec to evaluate if the SSIs detected during the detection monitoring event were caused by a release from the CCR Unit. This report constitutes an ASD to evaluate whether the SSIs for Cl and SO_4 in well MW-5R/B are due to a release from the CCR Unit.

1.2 Site Description

The Spurlock Landfill occupies a disposal area of approximately 177 acres and is located along South Ripley Road in Mason County, Kentucky. The Site is located approximately five miles northwest of Maysville, Kentucky. Immediately adjacent to the Spurlock Landfill lies the site of the recently permitted Peg's Hill CCR Landfill (**Figure 1**). Construction activities for the Peg's Hill Landfill have started in early 2023 and waste placement is anticipated to commence in September 2023.

The Spurlock Landfill consists of three sections, designated as Areas A, B, and C (see **Figure 2**) and is permitted to accept approximately 1.8 million tons of CCR annually, including fly ash, bottom ash, and flue gas desulfurization (FGD) process wastes and relocated CCR from the Spurlock Ash Pond.

1.3 Description of the CCR Unit

The areal extent of the Spurlock Landfill was developed in three major sections, designated as Area A, Area B, and Area C. Area A was the earliest section developed, with landfilling operations commencing in 1982, followed by development of Area B. Area C was the most recent section developed, with initial construction taking place in approximately 2010, and final phase cell construction for Area C, Phase 5 ending in October 2021. As indicated above, the adjacent Peg's Hill Landfill has been permitted, with the initial phase of construction to be completed and receipt of waste to commence in 2023.

The CCR Unit that is the subject of this ASD includes all three areas of the Spurlock Landfill (A, B, and C), which are underlain by different liner systems as further described in Subsection 2.2 below. Peg's Hill Landfill will be a new, and separate, CCR Unit under 40 CFR Part 257 that has not yet received any waste.

1.4 Groundwater Monitoring System

Figure 2 depicts the layout of the Landfill together with the certified CCR groundwater monitoring well network. A *Groundwater Monitoring System and Hydrogeologic Investigation Report* was prepared in support of certifying the monitoring well network at the Landfill (Tetra Tech, 2017). Groundwater monitoring activities were implemented to comply with the requirements of 40 CFR 257.90 through 257.98.

The Landfill is underlain by three bedrock formations, including (from top to bottom) the Grant Lake Formation (both Upper and Lower members), the Fairview Formation, and the Kope Formation, all of which were deposited and formed during the Upper Ordovician geologic period. All three formations are comprised of interbedded limestone and shale, but their percentages vary in each of the formations. The Grant Formation contains about 70-90% limestone, the Fairview Formation contains about 50-60% limestone, while the Kope Formation consists of 20-30% limestone. The uppermost aquifer in the downgradient hydrogeologic position was determined to be in the weathered and fractured (upper) portion of the Kope Formation. (Tetra Tech, 2017).

The certified groundwater monitoring well network consists of two upgradient monitoring wells (MW-6 and MW-7) and three downgradient monitoring wells (MW-2B, MW-3B, and MW-5B/R), as depicted on **Figure 2**. The upgradient monitoring wells (i.e., MW-6 and MW-7) were installed as 2-inch diameter wells to a total depth of 160 ft. feet below ground surface (ft. bgs) with a 10-foot screened interval between 150 ft. and 160 ft. bgs. As such, they were installed within the same geologic formation (i.e., the Kope Formation) as the downgradient wells, but much deeper within the bedrock compared to the downgradient wells. Since fractures in bedrock generally decrease with depth (and therefore, recharge and transmission of groundwater within these fractures generally decreases with depth), the water chemistry within these deeper wells may be affected by the longer residence time in this different hydrogeologic position that increases the dissolved solids relative to more shallow wells. Three shallower downgradient monitoring wells were installed as 2-inch diameter wells to total depths of 60 ft. bgs (MW-2B), 30 ft. bgs (MW-3B), and 40 ft. bgs (MW-5) in the same geologic unit as the upgradient wells. They were completed with a 10-foot screen at the bottom of the boring. MW-5 did not produce sufficient volumes of water for sampling, and it was subsequently replaced in January 2017 with a 4-inch well at the same location and designated as groundwater monitoring well MW-5B, which is screened from 14 ft. to 24 ft. bgs. Note that well MW-5B is also referred to as MW-5R in some reports and

therefore, it is designated as MW-5B/R in this ASD report. All well screens have an opening size of 0.01 inches (i.e., 10-slot).

As further described in **Section 2.4** below, Geosyntec conducted a hydrogeologic investigation within the adjacent planned Peg's Hill CCR Landfill area and installed and certified a CCR monitoring well network at that location (Geosyntec, 2019a and 2021a). The monitoring well network at Peg's Hill is depicted on **Figure 3** and contains two background wells (PH-MW-01 and PH-MW-02) and three downgradient wells (PH-MW-03A, PH-MW-04, and PH-MW-05). As part of this ASD, groundwater samples were collected from background wells PH-MW-01 and PH-MW-02 at Peg's Hill to characterize background conditions in a similar hydrogeologic setting without the presence of a CCR landfill and/or CCR waste. No CCR has been placed to date in the Peg's Hill area.

1.5 Detection Monitoring Program

Groundwater monitoring under the CCR Rule at the Landfill began in October 2016 following the installation and development of each monitoring well. At least eight baseline groundwater samples were collected from each upgradient and downgradient well prior to October 17, 2017. Baseline sampling events were conducted between October 2016 and August 2017 for wells MW-2B, MW-3B, MW-5B/R, MW-6, and MW-7. Detection monitoring for the Landfill began in October 2017, and the initial detection monitoring sampling event was conducted in November 2017.

Statistical estimates of the upper end of the range of background concentrations were initially calculated by Haley and Aldrich (2018a and b) using the baseline monitoring data and inter-well statistical methods. The initial background concentrations were calculated using the Upper Tolerance Limit (UTL) method as described in the U.S. Environmental Protection Agency's (USEPA) 2009 Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities - Unified Guidance (Unified Guidance) and 40 CFR Section 257.93(f)(3).

Following the first two ASDs finding no release from the CCR Unit and based on the sampling data obtained from the groundwater monitoring network, Haley and Aldrich reevaluated the statistical approach and determined that intra-well statistical testing is a more appropriate method for detecting potential releases from the CCR Unit. An intra-well approach was certified and has been used for statistical evaluation for groundwater

detection monitoring at the Landfill since the second half of 2018, pursuant to 40 CFR 257.94 (Haley and Aldrich, 2019a). Haley and Aldrich established intra-well background by calculating the intra-well Upper Prediction Limit (UPL) for each Appendix III constituent (as well as the Lower Prediction Limit [LPL] for pH) separately for each downgradient monitoring location.

Prior to conducting the statistical analysis for the second semi-annual detection monitoring event of 2022, the groundwater analytical results for samples collected from October 2016 through September 2022 were used by Haley and Aldrich (2023) to calculate updated intra-well UPLs and LPL (for pH) for each downgradient well. These current intra-well background UPLs (and LPL for pH) are provided in **Table 1** and are used to evaluate potential SSIs at each downgradient well during a given semi-annual groundwater monitoring event.

In addition, leachate data from previous ASD demonstrations as well as the current leachate sampling results are included in **Table 1** for comparison purposes.

1.6 Basis of the Statistically Significant Increase

The concentrations of each Appendix III constituent from the second 2022 semi-annual detection monitoring sampling event were compared to their respective UPLs/LPL at the three downgradient wells. A sample concentration greater than the UPL (or lower than the LPL) is considered to represent an SSI. Statistically significant increases for Cl and SO_4 were detected at MW-5B/R (Haley and Aldrich, 2023). No other SSIs were identified at the Landfill. The results are summarized in **Table 1**.

2. CONCEPTUAL SITE MODEL

2.1 Waste Description

The Spurlock Landfill currently occupies a disposal area of 176.67 acres and is permitted to accept approximately 1.8 million tons of CCR materials annually. These materials include fly ash, bottom ash, and FGD process wastes.

2.2 Engineered Barrier Systems

The original extent of Areas A and B is underlain by in-situ clay material that was not engineered to meet certain thickness and/or hydraulic performance criteria (EKPC, personal communication). However, in-situ clay materials tested for the expansion design had measured vertical hydraulic conductivities of approximately 10^{-8} centimeters per second (cm/sec) (Kenvirons, 2002).

Subsequently, a horizontal and vertical expansion was designed for the Spurlock Landfill, which included horizontal "expansion areas" outside of the original footprint of Areas A and B to allow for a vertical expansion on top of these areas while still maintaining the appropriate side slopes. Based on design drawings presented in the March 2002 Permit Modification Application (Kenvirons, 2002), the Area A and B expansion areas of the Landfill are underlain by an engineered 24-inch clay liner with a maximum vertical hydraulic conductivity of 10^{-7} cm/sec.

Similar to the Area A and B expansion areas, Phase 1 of Area C is underlain by an engineered 24-inch clay liner with a maximum vertical hydraulic conductivity of 10^{-7} cm/sec. Areas underlain by this engineered clay liner also contain a leachate collection layer composed of materials with a vertical hydraulic conductivity of 10^{-2} cm/sec on top of the clay liner.

The liner system for Phases 2, 3 and 4 of Area C consists of two components to meet the requirements of 40 CFR 257.70: an upper component consisting of a 60-mil HDPE geomembrane and a lower component consisting of at least a two-foot compacted soil layer with a maximum vertical hydraulic conductivity of 10^{-7} cm/sec over subgrade construction. Areas underlain by this CCR Rule engineered liner system also contain a leachate collection and removal system that meets the requirements of 40 CFR 257.70 (Kenvirons, 2018). It is also noted that the recently completed Phase 5 of Area C was designed and constructed with a liner system and leachate collection/removal system

consistent with that of Phases 2 through 4 and meeting the requirements of 40 CFR 257.70.

2.3 Potential Release Mechanisms

The potential release mechanism for CCR constituents from the Spurlock Landfill to groundwater would be via infiltration of precipitation into the CCR, dissolution of the soluble components of the CCR materials into leachate, and (potential) migration of leachate to groundwater through defects and cracks in the engineered barrier system. It is noted, however, that the expansion areas outside of Areas A and B (as well as Area C) are constructed with an engineered liner system and are equipped with a leachate collection system composed of a drainage layer containing materials with a hydraulic conductivity of 10^{-2} cm/sec on top of the 24-inch clay liner and/or the geomembrane liner (for Phases 2 and 3 of Area C). This drainage layer conveys leachate towards lined sedimentation Pond 1, where it mixes with stormwater and is treated by aeration/gravity settling before discharge via Outfall 008 permitted through the Kentucky Pollutant Discharge Elimination System (KPDES) Permit No. KY0022250.

While the removal of leachate from large portions of the Landfill reduces the potential for a downward hydraulic gradient driving force, seepage into the subsurface cannot be excluded, especially from the original areas that may not contain a fully engineered liner system with a drainage layer on top. However, seepage (if it occurs at all) is expected to be minor due to low leachate generation rate as a result of the dry-handling of the CCR waste, the low permeability of the CCR waste (which limits percolation of rainwater through the waste), the storm water run-on/runoff controls, and the aforementioned engineered liner systems as well as in-situ clays with measured vertical hydraulic conductivities of approximately 10^{-8} cm/sec.

2.4 Migration Pathways and Site-Specific Hydrogeologic Setting

To illustrate potential groundwater migration pathways within, below, and around the Spurlock Landfill, several cross sections were developed and presented in the July 2018 ASD report (Geosyntec, 2018a). These cross-sections illustrated that there was likely not a continuous aquifer between upgradient (i.e., MW-6 and MW-7) and downgradient (i.e., MW-2B, MW-3B, and MW-5B/R) monitoring wells since many dry borings were encountered below the footprint of the Landfill during previous hydrogeologic

investigations conducted in support of designing and permitting the initial areas and phases of the Landfill.

Geosyntec conducted a hydrogeologic investigation within the adjacent permitted Peg's Hill CCR Landfill area in support of certifying a CCR monitoring well network at that location (Geosyntec, 2019a and 2021a). The Peg's Hill CCR Landfill site is located in the adjacent watershed from the existing Spurlock CCR Landfill, which is the subject of this ASD report, and therefore, the geology and hydrogeology at that location are very similar to the Spurlock Landfill.

During the hydrogeologic investigation at the Peg's Hill Landfill, longer-term (i.e., 11-day) aquifer recovery tests were performed in each of the five installed wells because the wells did not recover within a few hours after initial drawdown. This was done in lieu of traditional slug testing and provided a better and more reliable estimate of hydraulic conductivity within the monitored formation (i.e., the upper portions of the Kope Formation, which constitutes the uppermost aquifer at both the existing Spurlock Landfill as well as the permitted Peg's Hill Landfill). The horizontal hydraulic conductivity values estimated for the Kope Formation from these aquifer recovery tests ranged from 5.6×10^{-7} cm/sec to 1.9×10^{-6} cm/sec. These results are lower than the short-term slug test results reported by Tetra Tech (2017) for Spurlock Landfill, which ranged from 2.9×10^{-5} cm/sec to 1.4×10^{-4} cm/sec, but they are consistent with the horizontal hydraulic conductivity values for secondary permeability associated with "tight" fractured rock in bedrock wells (Heath, 1983). The hydraulic conductivity values obtained through longer-term aquifer testing are also within the ranges expected for shale and limestone (Dominico and Schwartz, 1990). Using an average horizontal hydraulic conductivity of 1.12×10^{-6} cm/sec, an effective porosity of 6% for shale, and a gradient of 0.066 ft./ft., a groundwater flow velocity of 1.27 ft./year was calculated (Geosyntec, 2019a).

The slow well recovery, the low hydraulic conductivity and the low groundwater flow velocity indicate that the formation does not yield much water and that the water entering a well likely has had long residence times, which is also consistent with the salinity levels detected in samples from certain wells that have low yields and slow recoveries, such as upgradient wells MW-6 and MW-7 as well as downgradient well MW-2B at Spurlock Landfill.

A representative cross-section (A-A') between upgradient well MW-7 and downgradient well MW-3B is presented on **Figure 4**. The figure also includes water level

measurements taken in November 2022. Previous hydrogeologic investigations summarized in Geosyntec (2019a) indicated that many exploratory borings along hillsides and ridges in this area did not contain groundwater, and only wells located near valley bottoms and drainage features contained sufficient water for sampling purposes. The presence of landfill liners, low-permeability clays, leachate collection systems, and landfilled dry CCR materials over large areas of potential groundwater recharge further reduces recharge within the footprint of the Landfill. The cross-section illustrates that, consistent with previous hydrogeologic investigation reports describing the geologic and hydrogeologic site setting, the area below the Landfill likely does not contain a continuous aquifer between the upgradient and downgradient locations.

3. ALTERNATE SOURCE DEMONSTRATION

3.1 Evaluation of Error

3.1.1 Potential Sampling Error

Geosyntec was not present during groundwater sampling events. However, EKPC's field technicians are knowledgeable of the Site and have been briefed on the Site's *Sampling and Analysis Plan*, which details sampling protocols to be followed for each groundwater monitoring event. In addition, based on historical evaluations of field sampling records and communications with EKPC, there is little potential for false positive laboratory results due to suspended solids in the samples or inconsistent purging/sampling technique.

3.1.2 Potential Laboratory Analysis Error

EKPC conducts quality assurance/quality control (QA/QC) for data collected during groundwater monitoring activities as prescribed in Spurlock Landfill's *Sampling and Analysis Plan*. The QA/QC controls consist of data quality objectives, field and laboratory QA/QC requirements, and data validation (Stage I-III) components. Geosyntec did not conduct independent data validation of the laboratory results to evaluate whether laboratory analysis errors might have occurred during this event. However, previous and current charge balance calculations conducted for major cations and anions in the leachate and groundwater samples were/are indicative of good data quality. Therefore, there is a low potential for laboratory error.

3.1.3 Potential Statistical Analysis Error

Geosyntec performed high-level reviews of the *Summary of Appendix III Semi-Annual Groundwater Detection Monitoring Statistical Evaluation* reports prepared by Haley and Aldrich (2019b and c, 2020, 2021, 2022a and b, and 2023) and did not identify concerns in the approach presented. The potential for statistical error is low.

3.2 Natural Variation

Based on the hydrogeologic setting of the Site, which is discussed in Subsection 2.4, it is possible that the full extent of natural variation at the Spurlock Landfill has not been captured by the intra-well prediction limits calculated to date due to low recharge and

slow groundwater flow velocities. Very little of the precipitation recharges into the upper portions of the Kope Formation, and most of the surface water runs off quickly through the various drainage channels and valleys towards larger streams and rivers. Only wells located close to these drainage valleys receive somewhat higher recharge. This hydrogeologic setting results in increased natural variation depending on climatic conditions (i.e., drought versus wet conditions) and seasonal groundwater recharge. It is therefore possible, and most likely, that the SSIs for Cl and SO_4 in monitoring well MW-5B/R are due to natural variation.

3.2.1 Groundwater and Leachate Sampling Results

The initial ASD (Geosyntec 2018a) as well as the ASD conducted to update the CSM under the modified statistical intra-well approach (Geosyntec, 2019b) indicated that the leachate chemistry was substantially different from the chemistry of downgradient wells, including well MW-5B/R, which had previously not exhibited an SSI under either the inter-well or the intra-well statistical approaches. Based on multiple geochemical characterizations and ASDs conducted to date, which used multiple lines of evidence, a release of CCR leachate from the Spurlock Landfill was determined to be unlikely, and natural variation in groundwater quality was identified as the cause for SSIs at the Site.

To confirm these previous findings and to further evaluate the groundwater results from November 2022, an additional round of groundwater and leachate sampling was conducted on 2 May 2023. Moreover, a surface water sample was collected from the leachate and stormwater pond connected to permitted Outfall 008 and, as briefly discussed in Section 1.4, groundwater samples were collected from the two background wells PH-MW-01 and PH-MW-02 at the adjacent Peg's Hill Landfill.

Table 1 includes a summary of Appendix III parameters for the four comprehensive leachate sampling events conducted between March 2018 and May 2023, and **Table 2** summarizes the groundwater, surface water, and leachate results from the supplemental May 2023 sampling event. The analytical results from upgradient wells MW-6 and MW-7 are also included in **Table 2** to provide context regarding low recharge and high salinity, even though the results from these upgradient wells are no longer used for statistical comparisons since the transition from inter-well to intra-well statistics.

As can be seen in **Table 1**, the results of Appendix III parameters in leachate have generally been consistent across the four comprehensive leachate sampling events. An

additional leachate sampling event conducted in September 2020 was limited to the measurement of pH and is not discussed herein.

As discussed in the previous ASDs, the difference in the geochemical composition between the three downgradient wells is likely due to slow recharge as a result of fewer and smaller water-bearing fractures deeper within the bedrock. Shallower wells with more prolific water-producing fractures, like MW-5B/R, are more oxygenated and appear to receive younger (and "fresher") groundwater recharge, while water collected from lower-producing deeper wells is generally more reducing and has had a longer time to interact with the rock matrix, leading to increased weathering and dissolution of solutes (including naturally occurring, or geogenic, constituents/contaminants) into the water, increasing salinity and TDS concentrations in groundwater (e.g., Degnan et al., 2020; USGS, 2019). This phenomenon is illustrated by the chemical characteristics of the upgradient wells MW-6 and MW-7, which are not impacted by leachate, but indicate a very saline geochemical makeup with TDS and Cl concentrations consistent with seawater (see **Table 2**). As discussed in Section 1.4, these wells were installed deep into bedrock and yield very little water. The resulting long residence times of groundwater in these small fractures increase not only the level of salinity, but also a number of other "CCR indicator parameters" such as B or Ca, as well as some more mobile Appendix IV parameters such as lithium (Li). Similarly, the geochemical composition of samples collected from downgradient wells installed deeper into the bedrock, especially MW-2B, is likely the result of these weathering processes and longer groundwater residence times.

To date, groundwater statistical results from well MW-5B/R had not exhibited SSIs for any Appendix III constituents until the second semiannual 2022 sampling event. The new detections of SSIs for Cl and SO_4 in this well warranted the deployment of additional geochemical forensic tools. These additional tools included stable isotope analyses performed for groundwater and leachate samples collected from the five monitoring wells and the leachate collection pipe at the Spurlock Landfill and two background groundwater samples collected at the Peg's Hill Landfill. These samples were shipped on ice under chain-of-custody protocol to SiREM laboratory (SiREM) in Knoxville, Tennessee. SiREM provided all sample handling and reporting for these analyses but subcontracted the actual isotope analyses to Isodetect in Leipzig, Germany. The SiREM laboratory report for the isotope analyses is included in **Appendix A**, and the isotope results are discussed in Section 3.2.4 below.

3.2.2 Piper and Stiff Diagrams

To further evaluate geochemical similarities or dissimilarities between groundwater and surface water samples as well as site-specific leachate, updated Piper and Stiff diagrams were constructed using the results from the supplemental May 2023 sampling event.

Piper diagrams are trilinear diagrams that plot the relative contributions of major ions to the overall geochemical makeup of a liquid sample. The diagram has three components. The large diamond-shaped component displays the combined cation and anion composition of major solutes. The two smaller triangular components display the cation components and the anion components, separately and in greater detail. The sample data are plotted as a percentage of the total milliequivalents on the diagram with each component reaching 100 percent at its respective corner of the diagram. If the results from discrete samples plot relatively close to each other, their respective chemical compositions are similar, and they might have a similar (or the same) source of solutes.

Figure 5 depicts the updated Piper diagram. As can be seen, the leachate sample and groundwater from MW-5B/R plot in very different areas of the diagram, indicating that they are geochemically dissimilar and that groundwater from MW-5B/R does not indicate an impact from site-specific leachate. The surface water sample from the leachate and stormwater collection pond (i.e., Outfall 008) plots close to the leachate sample, which is expected since it is a mix of leachate and stormwater runoff. Furthermore, the geochemical makeup of groundwater from MW-2B is very similar to groundwater samples from upgradient wells MW-6 and MW-7 as these samples plot very close to each other. This is consistent with the discussion above and indicates that the geochemical makeup of the deeper groundwater wells (including MW-2B) is affected by low recharge and long groundwater residence times, leading to increased salinity and dissolution of naturally occurring constituents into groundwater. In addition, the geochemical makeup of groundwater samples from downgradient wells MW-2B, MW-3B and MW-5B/R at Spurlock and background wells at Peg's Hill is very different for all wells, indicating that they represent distinct localized conditions affected by varying degrees of recharge, further supporting the wide natural variability in groundwater conditions.

Stiff diagrams plot the chemical compositions of each sample as polygons. Similar-shaped polygons for different samples indicate similar geochemical compositions, and they might have a similar (or the same) source of solutes. The relative size of each polygon is an indication of the ionic strength (or "concentration") of the respective

sample. **Figures 6A** through **6C** depict the updated Stiff diagrams, organized by decreasing ionic strength as indicated by the different scales of these three figures. **Figure 6A** depicts the high-salinity samples of upgradient wells MW-6 and MW-7 as well as MW-2B. Groundwater from MW-2B has a lower ionic strength compared to the upgradient wells, but it has a very similar geochemical makeup that is dominated by Na and Cl. **Figure 6B** depicts the geochemical makeup of leachate, the pond (Outfall 008), and groundwater from MW-3B. As can be seen, the leachate and stormwater pond samples are similar, but well MW-3B is less dominated by Na and K compared to leachate and stormwater in the pond. Note that there is about an order of magnitude difference in the ionic strengths between **Figures 6A** and **6B**. **Figure 6C** depicts the two background wells from Peg's Hill as well as well MW-5B/R. Note again the difference in scale. Again, the geochemistry of groundwater from well MW-5B/R does not indicate an impact from site-specific leachate.

3.2.3 Ion Ratios

Ion ratios of mobile CCR indicator parameters (i.e., B, SO_4, and Cl) were calculated during previous ASDs, and have been updated using the most recent supplemental leachate and groundwater/surface water sampling results from May 2023. The updated ion ratios are summarized in **Table 2**, including for the upgradient wells MW-6 and MW-7 at Spurlock and background wells PH-MW-01 and PH-MW-02 from Peg's Hill to provide additional context.

Ion ratios for highly mobile constituents are useful indicators (i.e., "leachate tracers") for geochemical characterization purposes since dilution of "source leachate" (usually with much higher solute mass per liter) by groundwater (usually with much lower solute mass per liter) generally does not change these ratios. Note that Li was again included as a constituent to calculate ion ratios since Li is usually weakly sorbed/attenuated and also acts as a "leachate tracer" and is contained in site-specific leachate and groundwater at detectable concentrations. As can be seen in **Table 2**, these ion ratios are very different between each downgradient well and the CCR leachate. Moreover, upgradient wells at Spurlock and background wells at Peg's Hill are also distinctly different from leachate as well as from all other wells. These differences further support that the geochemical signature in well MW-5B/R is inconsistent with a potential leachate release from the CCR Unit and that each well represents a unique localized groundwater condition, including at Peg's Hill background conditions.

3.2.4 Isotope Analyses

Stable isotope analysis of solutes are powerful tools to fingerprint the potential sources of detected solutes. Samples of leachate and groundwater from upgradient wells MW-6 and MW-7, and downgradient wells MW-2B, MW-3B, and MW-5B/R were collected in May 2023 for stable isotope analysis at the same time the major solute samples were collected. Samples for stable isotope and major solute analysis were also collected from Peg's Hill background wells PH-MW-01 and PH-MW-02, which serve as additional reference points for characterizing background groundwater quality. The stable isotope analytical results are summarized in **Table 2**.

Coal ash leachates have distinctive B, Li, and strontium (Sr) stable isotope compositions and undergo limited isotope fractionation during transport in the environment; therefore, the stable isotopic composition of groundwater potentially containing CCR leachate solutes should reflect the leachate stable isotope composition (Harkness, et al., 2015 and 2016). $\delta^{11}B$ and $\delta^{7}Li$ are used to denote the stable isotope composition of two stable isotopes of B ($^{11}B/^{10}B$) and Li ($^{7}Li/\ ^{6}Li$), respectively. The ratios of the two isotopes are compared to the ratio in a reference standard and utilized in an equation that expresses the differences (delta, or δ) in the ratios in parts per thousand (per mil, or $^{0}/_{00}$). Ratios of stable isotopes of Sr are denoted by the simple numerical ratio itself ($^{87}Sr/^{86}Sr$) without comparison to a reference standard.

Literature values for the $\delta^{11}B$ isotope ratios for CCR leachates have been determined between -20‰ and +5‰, while the $\delta^{7}Li$ ratios are also generally low and a range between -5‰ to +15‰ has been found for CCR leachates. Background groundwater and surface water samples frequently have more positive isotopic composition of $\delta^{11}B$ and $\delta^{7}Li$ compared to CCR leachates. Conversely, the $^{87}Sr/^{86}Sr$ tend to be higher in CCR leachates compared to background samples, with ranges between 0.7098 and 0.7125 (Harkness et al., 2015 and 2016). As can be seen in **Table 2**, site-specific leachate from the Spurlock Landfill falls within the ranges reported in the literature for other leachates. Also, groundwater samples from upgradient and downgradient locations at Spurlock have higher $\delta^{11}B$ and $\delta^{7}Li$ isotopic ratios and lower $^{87}Sr/^{86}Sr$ ratios, as would be expected for background samples that have not been impacted by CCR leachates. Of note, one of the background locations at the Peg's Hill Landfill (i.e., PH-MW-01), which is located in an adjacent (and unconnected) watershed, had isotopic compositions of $\delta^{11}B$ and $\delta^{7}Li$ that appear similar to CCR leachates. However, a CCR impact can be excluded given that this well is located far away from the Spurlock Landfill and is situated in a background

location for the planned Peg's Hill Landfill that has not yet received CCR waste. Furthermore, the $^{87}Sr/^{86}Sr$ ratio of this sample is much lower than CCR leachate and consistent with a background isotopic signature for $^{87}Sr/^{86}Sr$.

An even greater level of confidence can be developed by plotting two different stable isotope compositions on one diagram (cross plots). Comparisons of the $\delta^{11}B$, $\delta^{7}Li$, and $^{87}Sr/^{86}Sr$(data presented in **Figures 7** through **9** show a clear separation between the stable isotopic composition of leachate and groundwater samples from all wells except for the $\delta^{11}B$ and $\delta^{7}Li$ plot for the Peg's Hill background well PH-MW-01. These evaluations indicate that the stable isotopic compositions detected at downgradient wells MW-2B, MW-3B, and MW-5B/R are unrelated to potential leachate releases from the CCR Unit. As discussed above, the isotopic composition of the groundwater sample from Peg's Hill background well PH-MW-01 does not align with the other groundwater samples. However, this is not indicative of a release of CCR leachate because well PH-MW-01 is located in a different watershed where other factors could be affecting the isotopic composition, possibly including natural variation.

Figures 10 through **15** show that the Cl and SO_4 SSIs identified at downgradient well MW-5B/R during the second half 2022 detection monitoring event are not the result of a release from the CCR Unit. The figures show each sample's $\delta^{11}B$, $\delta^{7}Li$, and $^{87}Sr/^{86}Sr$ composition on the x-axis and Cl and SO_4 concentrations on the y-axis. Cl and SO_4 concentrations and stable isotope data for downgradient wells generally plot closer to upgradient/background wells than leachate, especially for the SO_4 plots. If a CCR leachate release occurred, **Figures 10** through **15** would have shown downgradient wells to have similar $\delta^{11}B$, $\delta^{7}Li$, and/or $^{87}Sr/^{86}Sr$ stable isotope composition as leachate in addition to similarly low Cl and high SO_4 concentrations. Therefore, this isotope analysis presents another line of evidence that the geochemical fingerprints within samples of downgradient groundwater monitoring wells are not derived from a release of CCR leachate.

3.3 Alternate Source

As described in Section 3.2 above, the SSIs for Cl and SO_4 in well MW-5B/R are not due to a release from the CCR Unit, thus are likely the result of natural variation in groundwater quality due to differences in groundwater recharge and the resulting varying dissolution of solutes into groundwater. While this is not an "alternate source" in a more conventional sense (such as an industrial release of chemicals), it is a natural/geogenic

source all around the CCR Unit and not a release of leachate from the regulated CCR Unit. This natural variation may not have been fully captured within the data set used to calculate intra-well prediction limits to date.

4. CONCLUSIONS

This ASD for the Spurlock Landfill was prepared in accordance with 40 CFR 257.94(e)(2). The following lines of evidence demonstrate that the SSIs for Cl and SO_4 in monitoring well MW-5B/R are not due to a leachate release from the regulated CCR Unit.

1. The updated CSM reaffirmed that there is no continuous aquifer between upgradient and downgradient locations at the CCR Unit; conditions below the Spurlock Landfill are likely dry (i.e., little to no groundwater or evidence of aquifer continuity was encountered during previous hydrogeologic investigations even prior to landfill construction) with limited to no recharge to areas covered by the Spurlock Landfill and an unlikely migration pathway for CCR leachate towards groundwater. This CSM is supported by the geochemical characterization of groundwater that shows large variability in groundwater characteristics amongst upgradient and background wells as well as downgradient wells, suggesting highly localized conditions inconsistent with a continuous aquifer.

2. The chemical characteristics of CCR leachate and groundwater samples downgradient of the CCR Unit are distinctly different; ion ratios of mobile and less reactive constituents indicate that the groundwater chemistry is not affected by a release of CCR leachate from the Unit. These constituents will not be attenuated by mineral precipitation or adsorption reactions.

3. Updated Piper and Stiff diagrams indicate that the geochemistry of downgradient well MW-5B/R is dissimilar from site-specific leachate, which is inconsistent with a leachate release from the regulated CCR Unit.

4. The site-specific hydrogeologic conditions, including very low hydraulic conductivities, result in substantial variability and natural fluctuations in groundwater quality depending on seasonality and climate that may not have been fully captured within the data set used to calculate intra-well prediction limits to date.

5. The stable isotopic composition and solute concentrations of downgradient groundwater samples do not reflect the distinctive isotopic signatures of the

CCR leachate. The stable isotopic composition of groundwater potentially containing CCR leachate solutes would reflect the leachate composition because limited or no B, Li, and Sr stable isotope fractionation occurs during migration in the environment.

Based on these multiple lines of evidence, the SSIs for Cl and SO_4 detected in well MW-5B/R during the second semi-annual 2022 detection monitoring event are not due to a leachate release from the regulated CCR Unit but are likely the result of natural variation. Based on these findings, Geosyntec has determined that the CCR Unit may remain in the detection monitoring program pursuant to 40 CFR 257.94(e)(2) and does not need to establish an assessment monitoring program.

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TABLES

Table 1 - Summary of Intra-Well Statistics of Detection Monitoring Program Data in Comparison to Leachate Data

Alternative Source Demonstration for Chloride and Sulfate under the Federal CCR Rule

Spurlock Station Landfill, Maysville, Kentucky

Constituent[1]	MW-2B		MW-3B		MW-5B/R		Leachate			
	2nd Half 2022 Detection Monitoring Event[2]	Background Limit[3] (Upper Prediction Limit)	2nd Half 2022 Detection Monitoring Event2	Background Limit[3] (Upper Prediction Limit)	2nd Half 2022 Detection Monitoring Event2	Background Limit[3] (Upper Prediction Limit)	March 2018	April 2021	September 2022	May 2023
Boron	3.41	5.83	1.69	7.46	0.929	1.00	31.1	31.5	31.4	26.3
Calcium	86.5	110	170	295	152	171	507	505	582	484
Chloride	1,830	3,140	188	362	**52.9** [4]	48	325	807	642	976
Fluoride	0.83	2.65	0.16	0.50	0.15	0.50	<0.50[5]	0.73	0.17	0.7
pH	7.68	7.28 / 9.00	7.30	6.60 / 7.78	7.19	6.79 / 7.51	8.26	7.87	7.93	8.10
Sulfate	490	607	384	739	**259** [4]	252	2,160	2,260	2,020	2,220
Total Dissolved Solids	4,020	6,238	1,130	1,508	794	817	4,084	5,090	4,950	NA

NA = Not analyzed

Notes:

[1]All concentrations are in milligrams per liter (mg/L), except pH, which is expressed in standard units (s.u.).

[2]Second half 2022 detection monitoring event conducted on 21 November 2022.

[3]Intra-well UPL - 95% Upper Prediction Limit developed by Haley & Aldrich using data collected between October 2016 and September 2022; the reporting limit (RL) is used for values below the RL (e.g., for fluoride); pH has both a UPL and a Lower Prediction Limit (LPL).

[4]Bold numbers and yellow highlights indicate statistically significant increase(s) above background for the November 2022 detection monitoring program samples.

[5]Value is less than the reporting limit.

Sample results provided by East Kentucky Power Cooperative.

Table 2. CCR Leachate and Groundwater Characteristics at the Spurlock Landfill

	Leachate[1]	Pond (Outfall 008)[1]	Upgradient Wells[2,3]		Downgradient Wells[3]			Peg's Hill Wells[1]	
			MW-6	MW-7	MW-2B	MW-3B	MW-5B/R	PH-MW-01	PH-MW-02
Field Parameters									
pH (s.u.)	8.10	8.41	6.99	7.00	7.75	7.31	7.25	6.10	7.43
Conductivity (µS/cm)	7,135	3,895	55,683	37,070	7,025	1,722	843	2,432	1,839
DO (mg/L)	4.76	8.83	0.51	0.67	0.85	0.66	3.37	1.01	1.06
ORP (mV)	147.1	142.7	-31.4	-34.0	-40.2	21.0	107.7	141.7	13.6
Turbidity (NTU)	0.85	6.13	1.22	0.61	0.84	1.15	1.46	0.54	0.59
Appendix III									
Boron (mg/L)	26.3	12.0	1.54	4.67	3.99	1.71	0.467	1.22	1.39
Calcium (mg/L)	484	335	1,440	471	74.7	159	119	316	29.7
Chloride (mg/L)	976	458	22,500	14,500	1,850	211	31.6	53.7	298
Fluoride (mg/L)	0.70	0.38	--	--	--	--	--	--	--
pH (s.u.)	8.10	8.41	6.99	7.00	7.75	7.31	7.25	6.10	7.43
Sulfate (mg/L)	2,220	1,250	367	22.6	405	371	162	246	32.4
TDS (mg/L)	--	3,040	--	--	--	--	--	--	--
Major Ions									
Magnesium (mg/L)	23.6	23.9	308	194	26.4	37	24.8	91.9	10.0
Potassium (mg/L)	856	424	122	93.5	25.8	8.68	2.6	14.0	11.5
Sodium (mg/L)	391	200	12,200	8,320	1,460	125	17.2	145	305
Bicarb. Alkalinity (mg/L)	120	108	90.2	222	264	206	254	1,140	450
Select Appendix IV									
Lithium (µg/L)	5,860	2,920	1,510	1,760	312	397	81.1	73.6	90.4
Stable Isotopes									
$\delta^{11}B$ (‰)	0.20 ± 0.76	--	24.94 ± 0.73	27.02 ± 0.50	20.04 ± 0.73	10.50 ± 0.67	8.09 ± 0.69	0.81 ± 0.69	17.11 ± 0.52
$\Delta^{7}Li$ (‰)	13.75 ± 0.52	--	28.98 ± 0.59	25.38 ± 0.57	25.86 ± 0.65	23.64 ± 0.56	26.05 ± 0.57	13.44 ± 0.60	25.02 ± 0.61
$^{87}Sr/^{86}Sr$	0.71109 ± 0.00003	--	0.71016 ± 0.00004	0.71033 ± 0.00003	0.70994 ± 0.00004	0.70976 ± 0.00003	0.70954 ± 0.00003	0.71008 ± 0.00003	0.71006 ± 0.00004
Ion Ratios (mol/mol)									
B/SO_4 (x10^-3)	105	85.4	37.3	1,838	87.7	41.0	25.7	44.1	382
B/Cl (x10^-3)	88.6	86.1	0.225	1.06	7.09	26.6	48.6	74.7	15.3
SO_4/Cl	0.840	1.01	0.006	0.0006	0.081	0.650	1.89	1.69	0.040
Li/B (x10^-3)	347	379	1,526	586	122	361	270	93.9	101
Li/Cl (x10^-3)	30.7	32.6	0.343	0.621	0.863	9.62	13.1	7.01	1.55
Li/SO_4 (x10^-3)	36.6	32.3	57.0	1,078	10.7	14.8	6.93	4.14	38.6

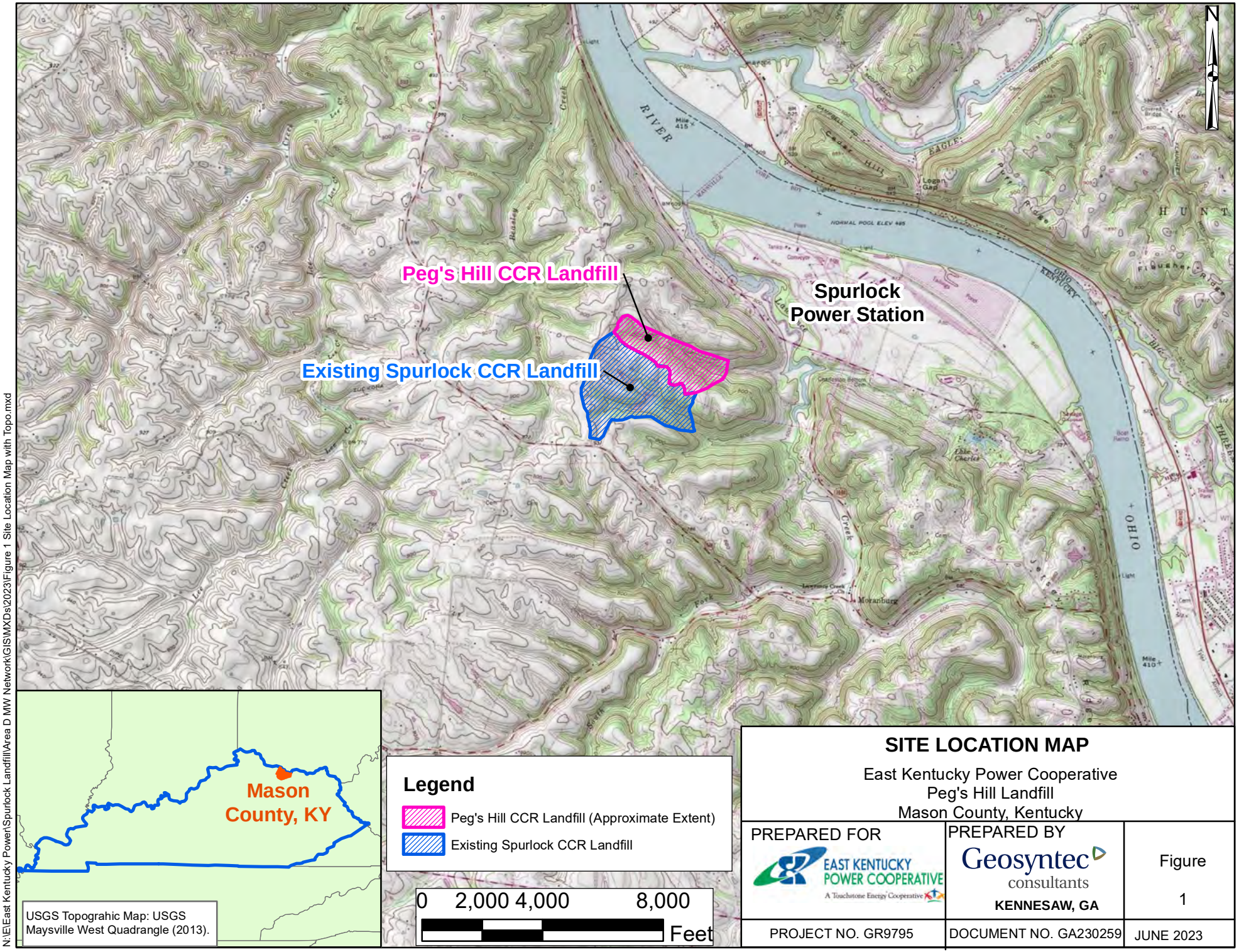
-- = Not analyzed

[1]Sampled on 5/2/2023

[2]Upgradient wells are no longer used for statistical analyses but are still sampled and results are provided for context.

[3]Sampling results are from the ASD sampling event conducted on 5/2/2023 concurrent with the leachate and pond sampling, and do not reflect the November 2022 compliance sampling.

FIGURES

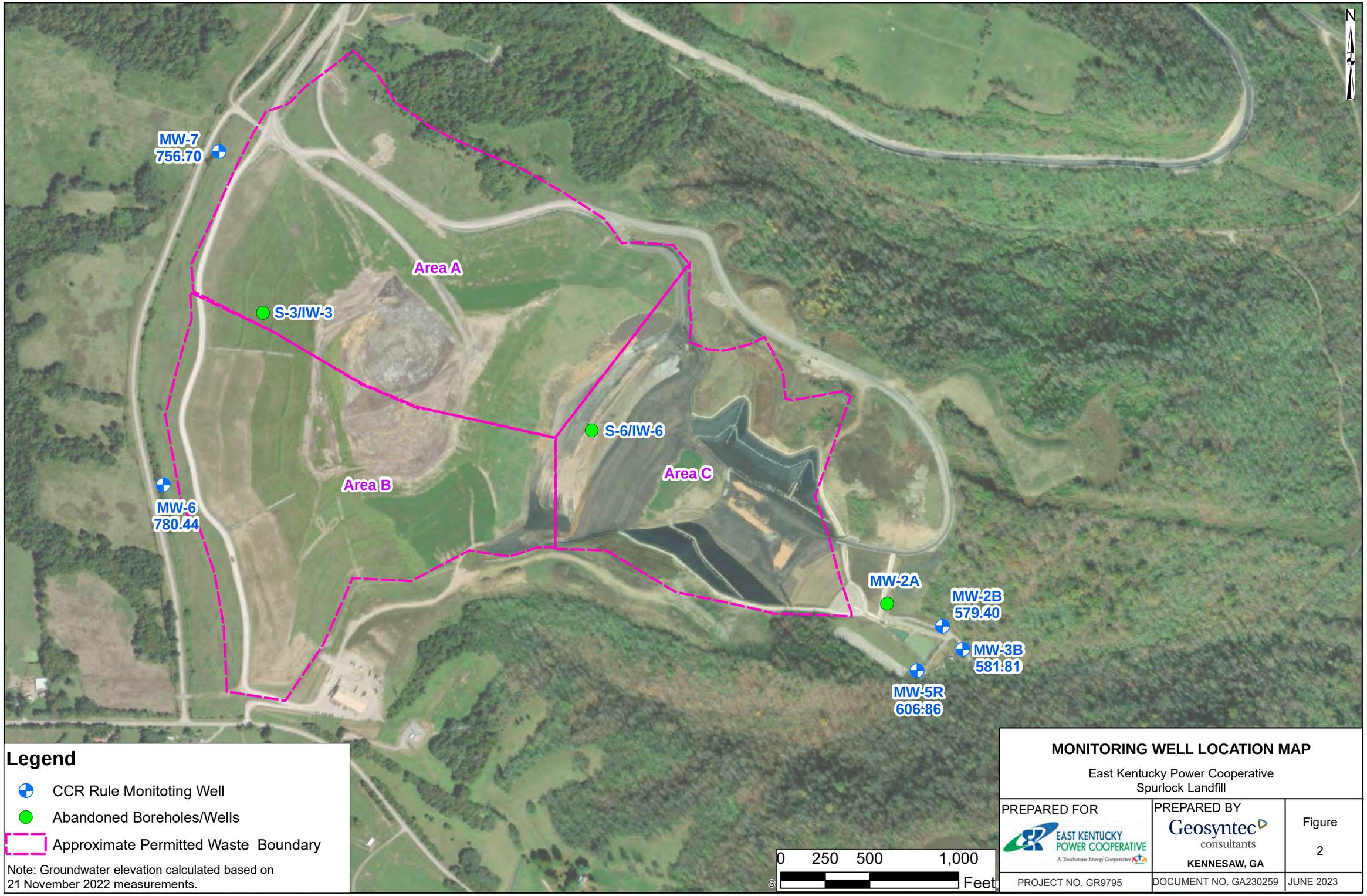


SITE LOCATION MAP

East Kentucky Power Cooperative
Peg's Hill Landfill
Mason County, Kentucky

PREPARED FOR	PREPARED BY	Figure
EAST KENTUCKY POWER COOPERATIVE A Touchstone Energy Cooperative	Geosyntec consultants KENNESAW, GA	1
PROJECT NO. GR9795	DOCUMENT NO. GA230259	JUNE 2023

N:\E\East Kentucky Power\Spurlock Landfill\Area D MW Network\GIS\MXDs\2023\Figure 1 Site Location Map with Topo.mxd



Legend

- CCR Rule Monitoting Well
- Abandoned Boreholes/Wells
- Approximate Permitted Waste Boundary

Note: Groundwater elevation calculated based on 21 November 2022 measurements.

MONITORING WELL LOCATION MAP

East Kentucky Power Cooperative
Spurlock Landfill

PREPARED FOR	PREPARED BY	Figure
EAST KENTUCKY POWER COOPERATIVE, A Touchstone Energy Cooperative	Geosyntec consultants, KENNESAW, GA	2
PROJECT NO. GR9795	DOCUMENT NO. GA230259	JUNE 2023

N:\E\East Kentucky Power\Spurlock Landfill\Area D MW Network\GIS\MXDs\2021\ASD\Monitoring Well Location Map June 2021.mxd\DY 7/8/2021

Legend

- Monitoring Well
- Proposed Permitted Waste boundary (Approximate Extent)

0 375 750 1,500 Feet

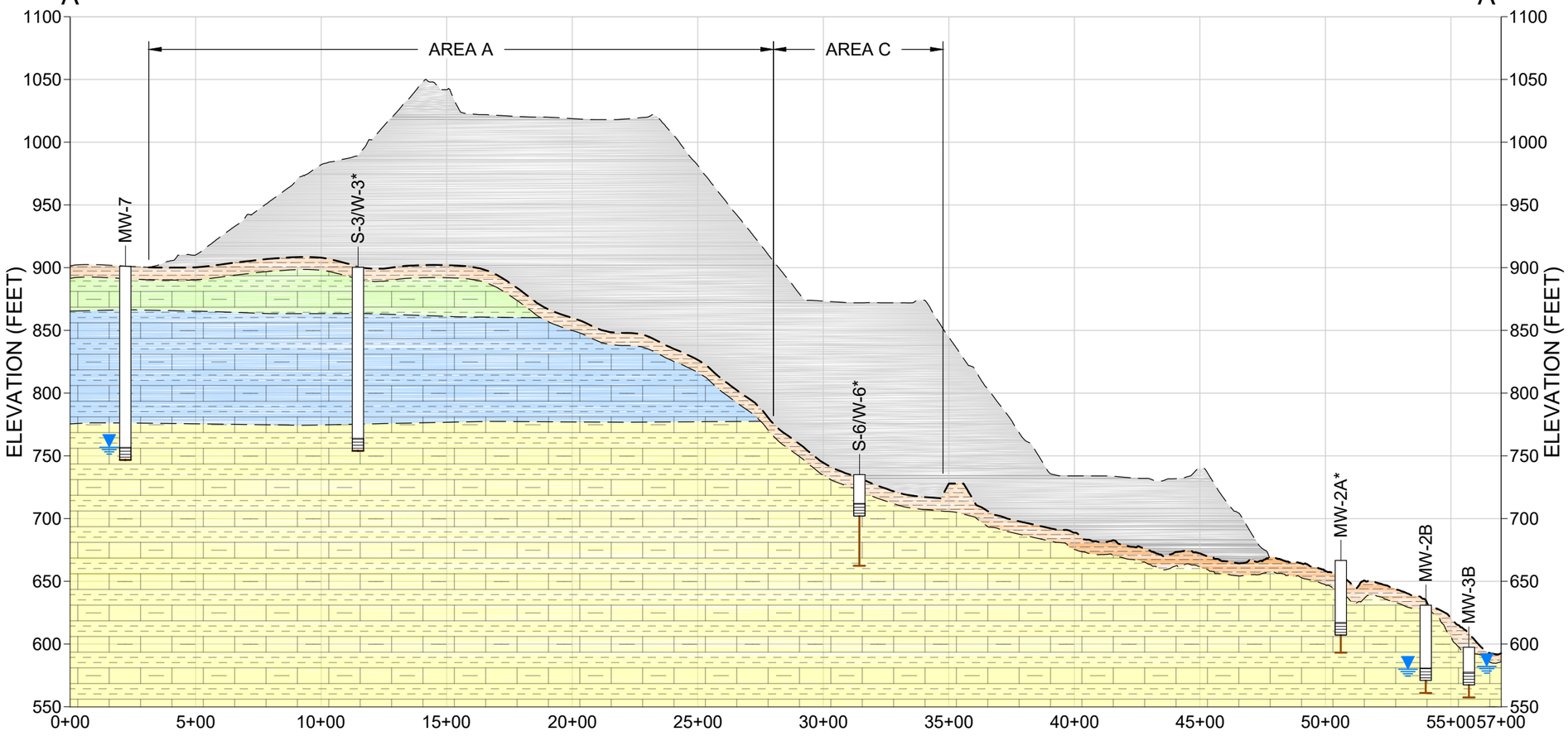
PEG'S HILL CCR LANDFILL MONITORING WELL NETWORK

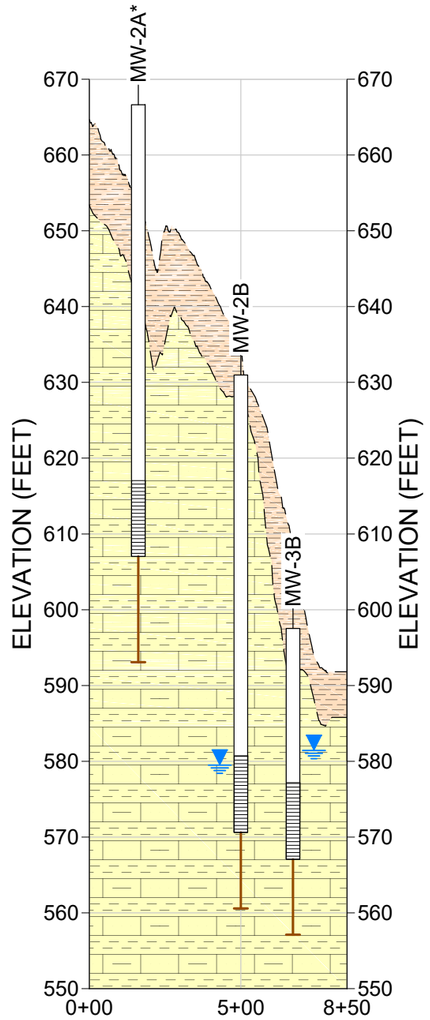
East Kentucky Power Cooperative
Peg's Hill Landfill
Mason County, Kentucky

PREPARED FOR	PREPARED BY	Figure
EAST KENTUCKY POWER COOPERATIVE A Touchstone Energy Cooperative	Geosyntec consultants KENNESAW, GA	3
PROJECT NO. GR9795	DOCUMENT NO. GA230259	JUNE 2023

N:\E\East Kentucky Power\Spurlock Landfill\Area D MW Network\GIS\MXDs\2023\Figure 3 Peg's Hill CCR Landfill Monitoring Well Network.mxd; DYifru; 6/23/2023 DY

CROSS-SECTION A-A'





0 500' 1000'
HORIZONTAL SCALE IN FEET
0 100' 200'
VERTICAL SCALE IN FEET
VERTICAL EXAGGERATION = 5X

0 500' 1000'
HORIZONTAL SCALE IN FEET
0 20' 40'
VERTICAL SCALE IN FEET
VERTICAL EXAGGERATION = 25X

LEGEND

LITHOLOGIC DESCRIPTIONS

- ASH
- LIGHT BROWN OR RED BROWN OR BROWN SILTY CLAY, LEAN CLAY OR FAT CLAY WITH LIMESTONE PIECES
- LOWER GRANT LAKE FORMATION (INTERBEDDED LIMESTONE (70-75%) WITH SHALE (25-30%))
- FAIRVIEW FORMATION (INTERBEDDED LIMESTONE (55-60%) WITH SHALE (35-45%))
- KOPE FORMATION (INTERBEDDED SHALE (70-80%) WITH LIMESTONE (20-30%))

- PIEZOMETER / WELL
- SCREEN INTERVAL
- SOIL BORING
- GROUNDWATER ELEVATION (21 NOVEMBER 2022)
- 24" SOIL LINER ($1X10^{-7}$ CM/SEC)
- CLAY / POZOTEC LAYER
- * ABANDONED BORING / WELL

NOTE:

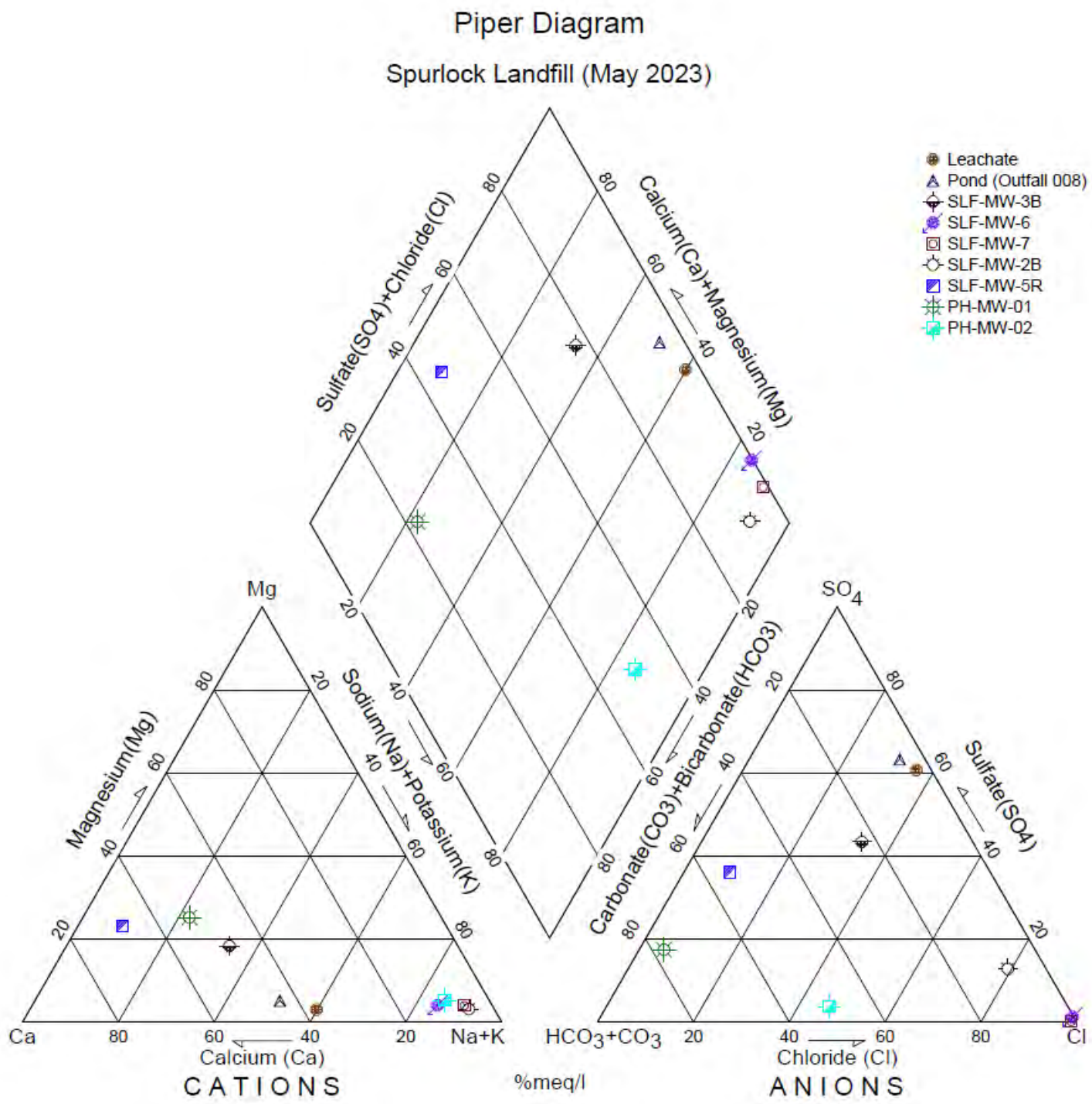
1. TOP OF ASH ELEVATION FROM 2019 WAS OBTAINED FROM SURVEY CONDUCTED ON 25 NOVEMBER 2020 BY MIKON.

KEY MAP SECTION A-A'

CROSS-SECTION A-A'
East Kentucky Power Cooperative
Spurlock Landfill
Mason County, Kentucky

PREPARED BY:	PREPARED FOR:		FIGURE
Geosyntec consultants	EAST KENTUCKY POWER COOPERATIVE, A Touchstone Energy Cooperative		4
KENNESAW, GA	PROJECT #: GR9795	GA230259	June 2023

L:\CADD\E\EAST KENTUCKY POWER\DRAWINGS\GR7134.00 - SPURLOCK LANDFILL\GR7134-001



Notes: Data depicted on this diagram are from the supplemental groundwater and leachate sampling event conducted on 2 May 2023.

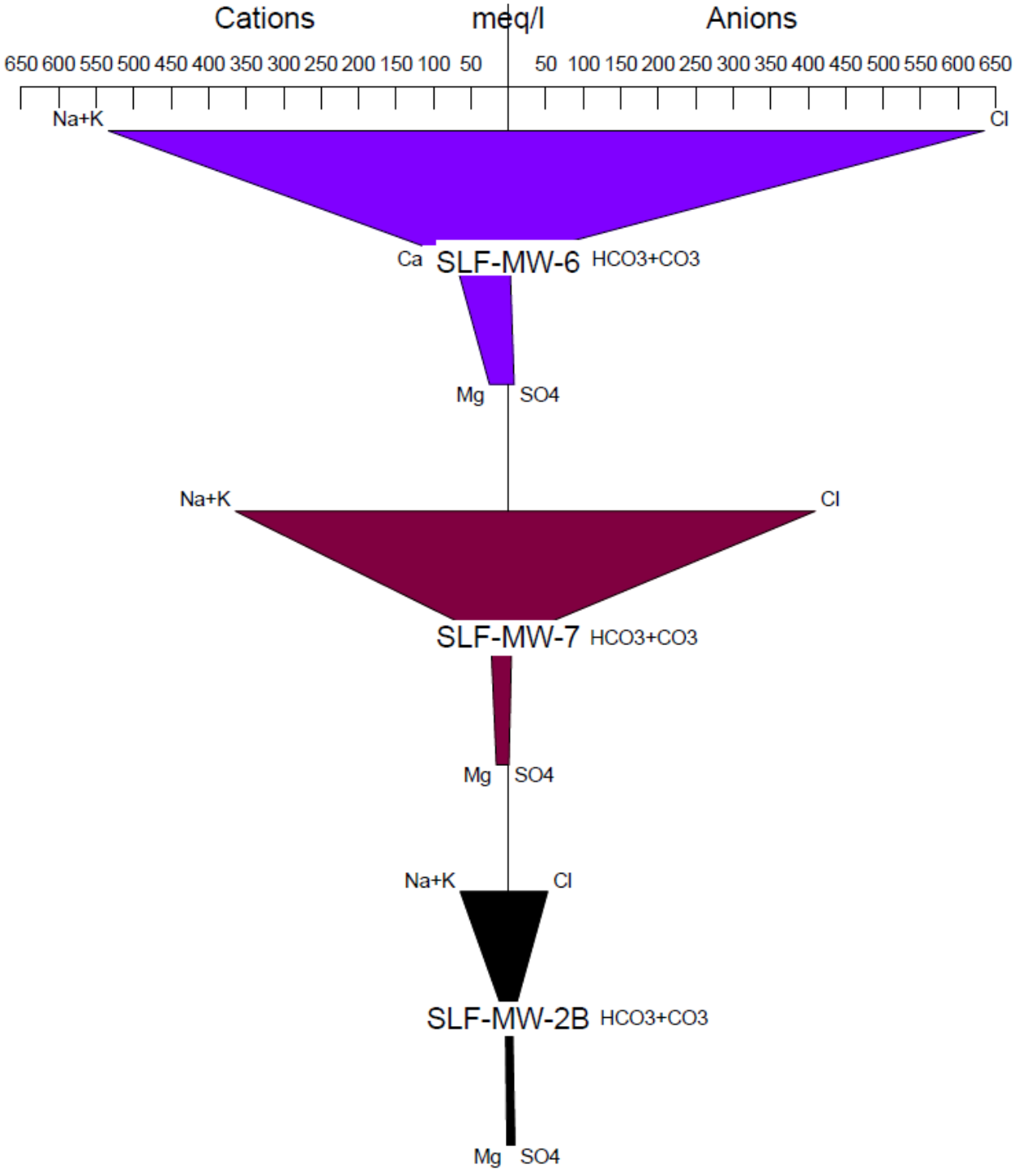
Trilinear (Piper) Diagram

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE	Geosyntec consultants KENNESAW, GA	**Figure 5**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\July 2023

Stiff Diagram
Spurlock Landfill (May 2023)



Notes: Data depicted on this diagram are from the supplemental groundwater and leachate sampling event conducted on 2 May 2023.

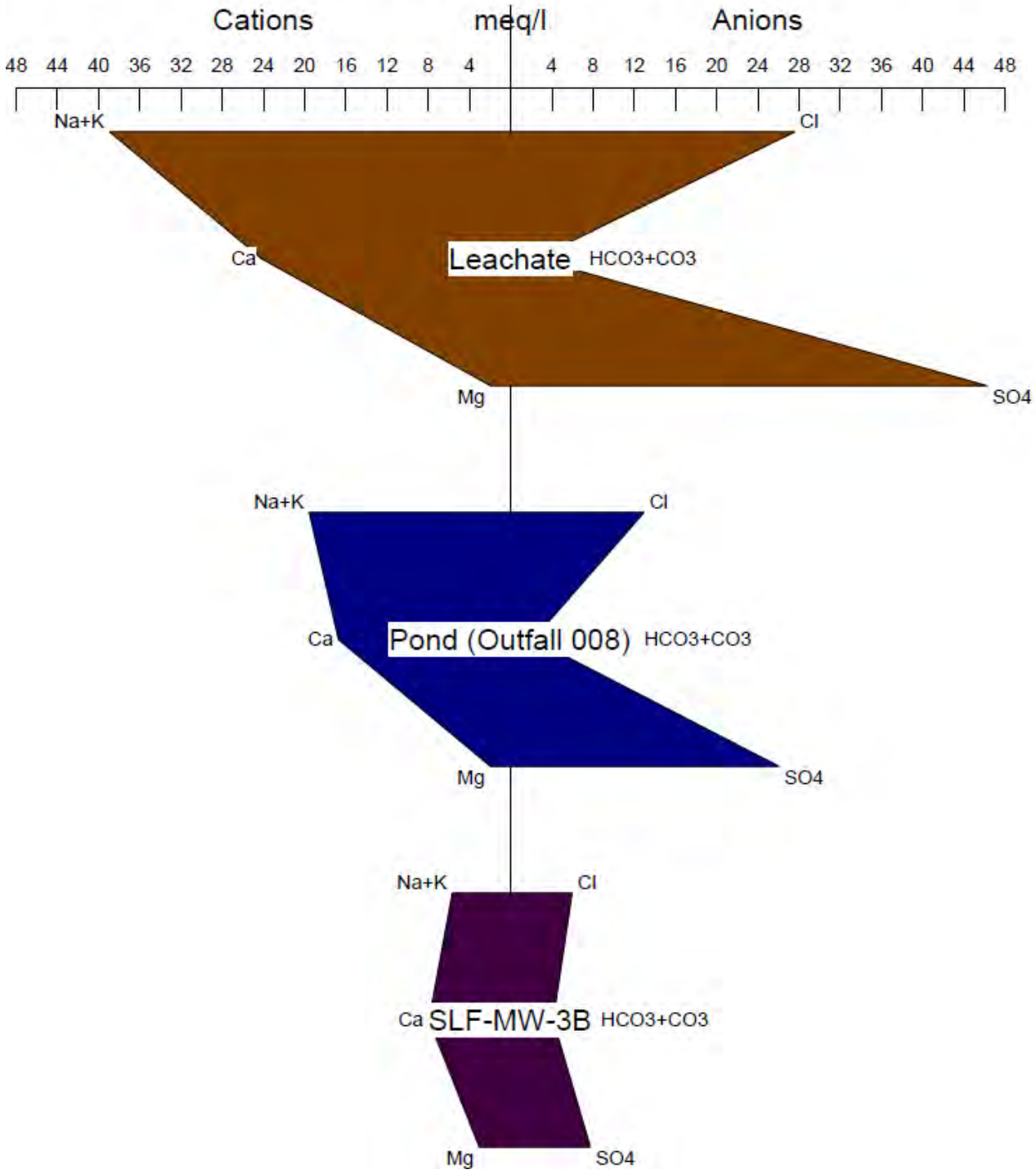
Stiff Diagram A

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE A Touchstone Energy Cooperative	Geosyntec consultants KENNESAW, GA	**Figure 6A**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\July 2023

Stiff Diagram
Spurlock Landfill (May 2023)



Notes: Data depicted on this diagram are from the supplemental groundwater and leachate sampling event conducted on 2 May 2023.
Note scale change vs. Figure 6A.

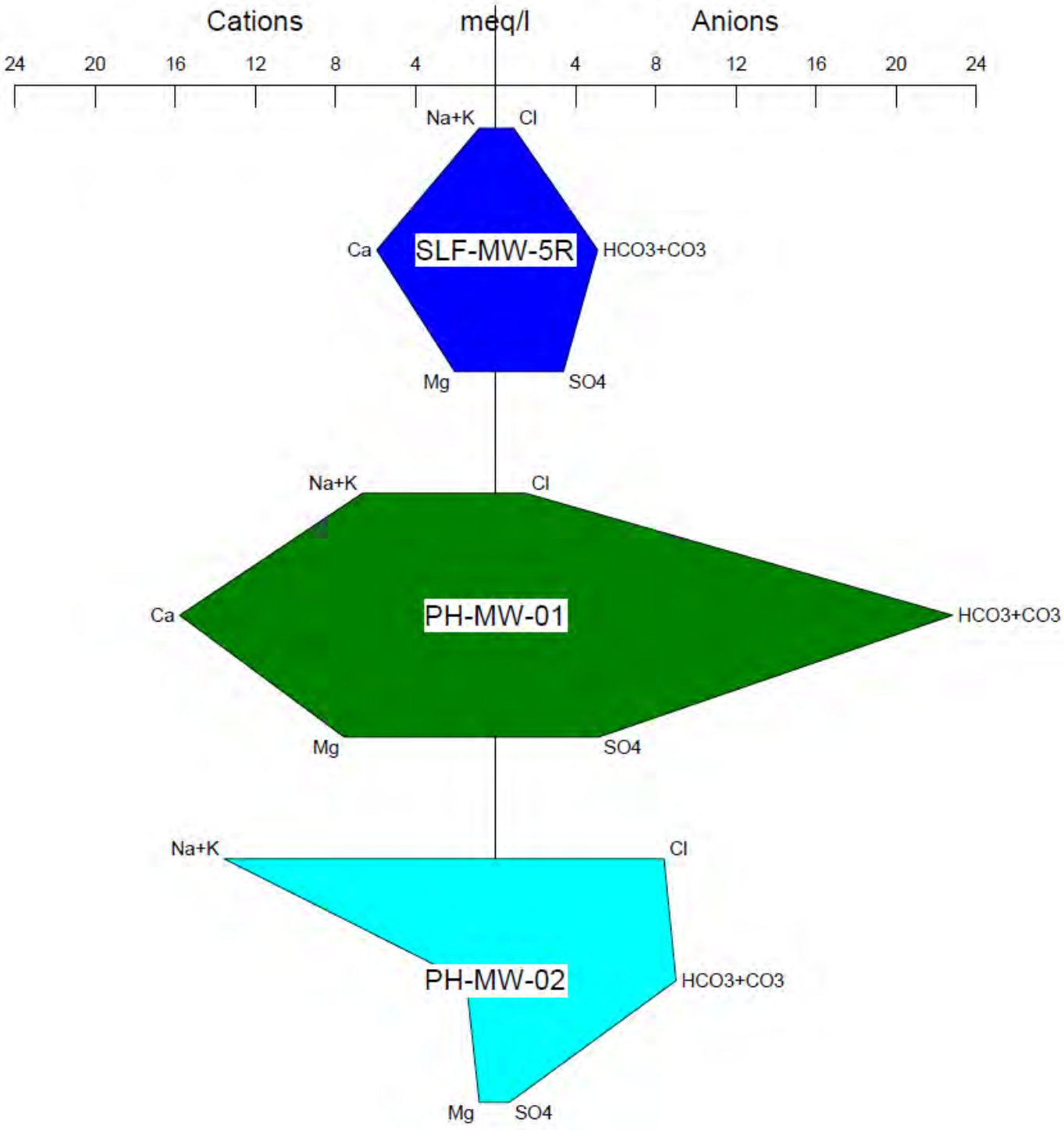
Stiff Diagram B

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE A Touchstone Energy Cooperative	Geosyntec consultants KENNESAW, GA	**Figure 6B**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\July 2023

Stiff Diagram
Spurlock Landfill (May 2023)



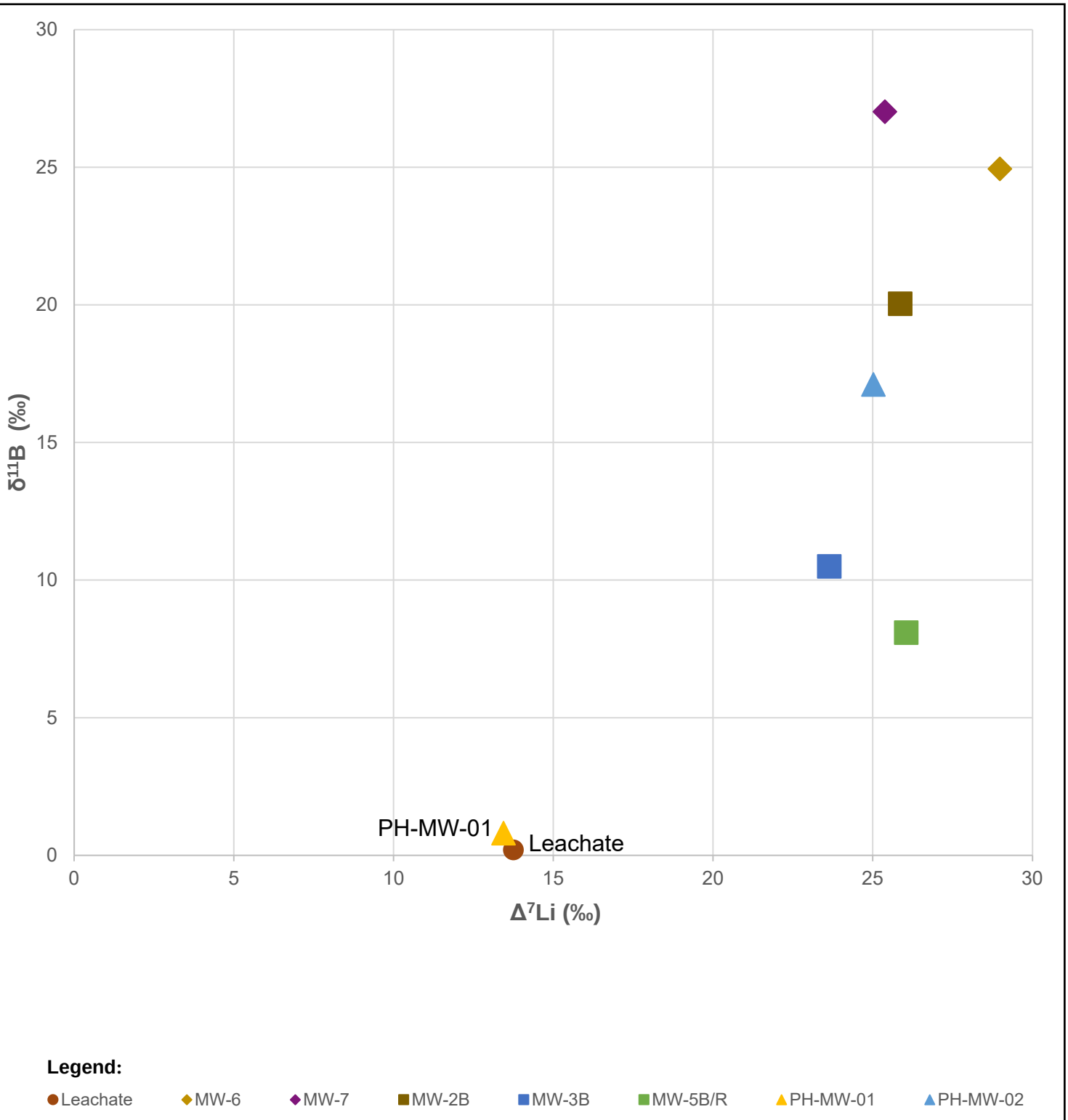
Notes: Data depicted on this diagram are from the supplemental groundwater and leachate sampling event conducted on 2 May 2023.
Note scale change vs. Figure 6A.

Stiff Diagram C

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE A Touchstone Energy Cooperative	Geosyntec consultants KENNESAW, GA	**Figure 6C**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\July 2023



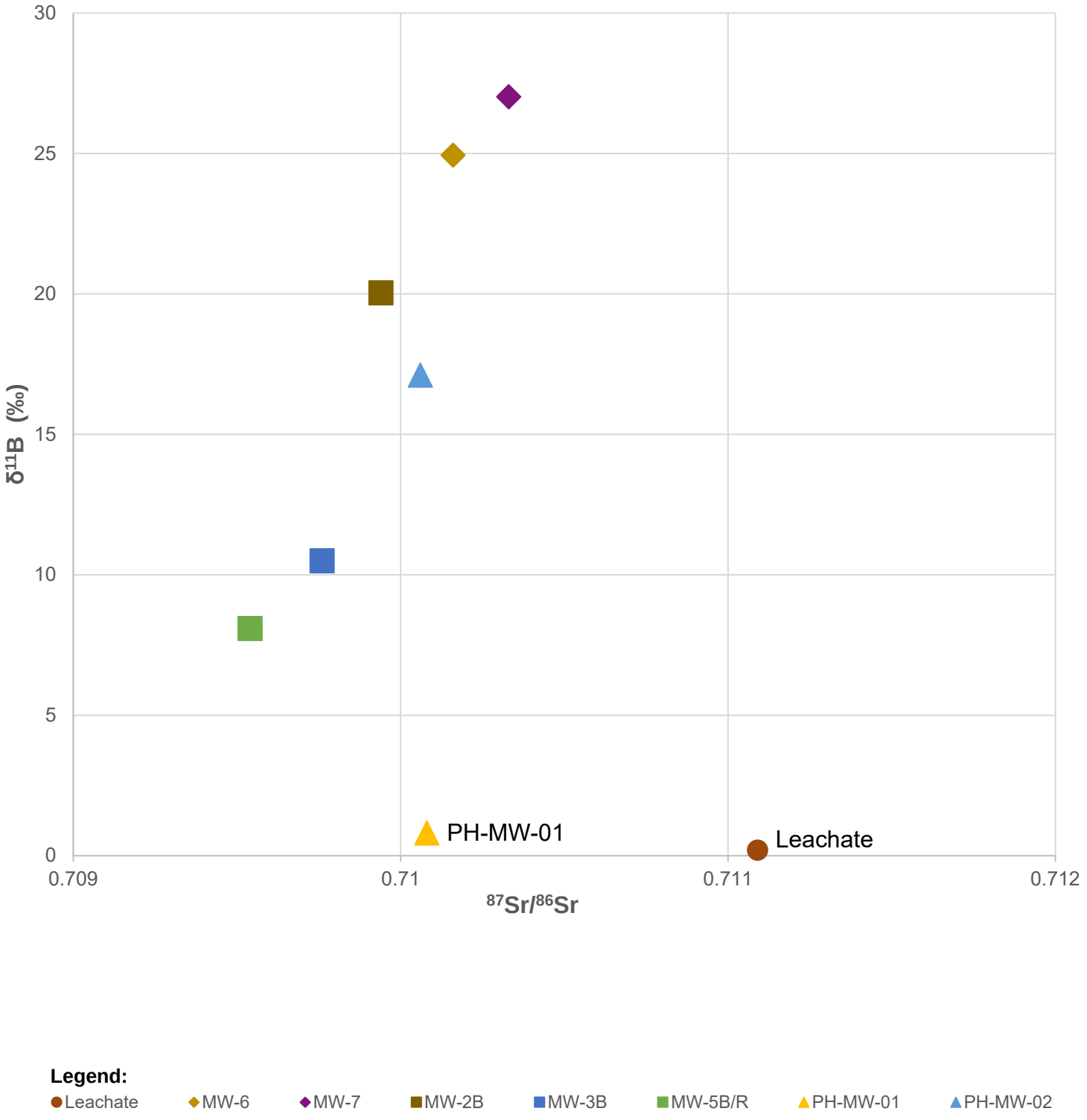
Notes:
Leachate data are shown with a circle symbol.
Upgradient well data shown with a diamond symbol.
Downgradient well data shown with a square symbol.
Peg's Hill well data shown with a triangle symbol.
Leachate and groundwater data from sampling event conducted on 5/2/2023.

Boron Isotope vs. Lithium Isotope Compositions

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE	Geosyntec consultants KENNESAW, GA	**Figure 7**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\October 2022



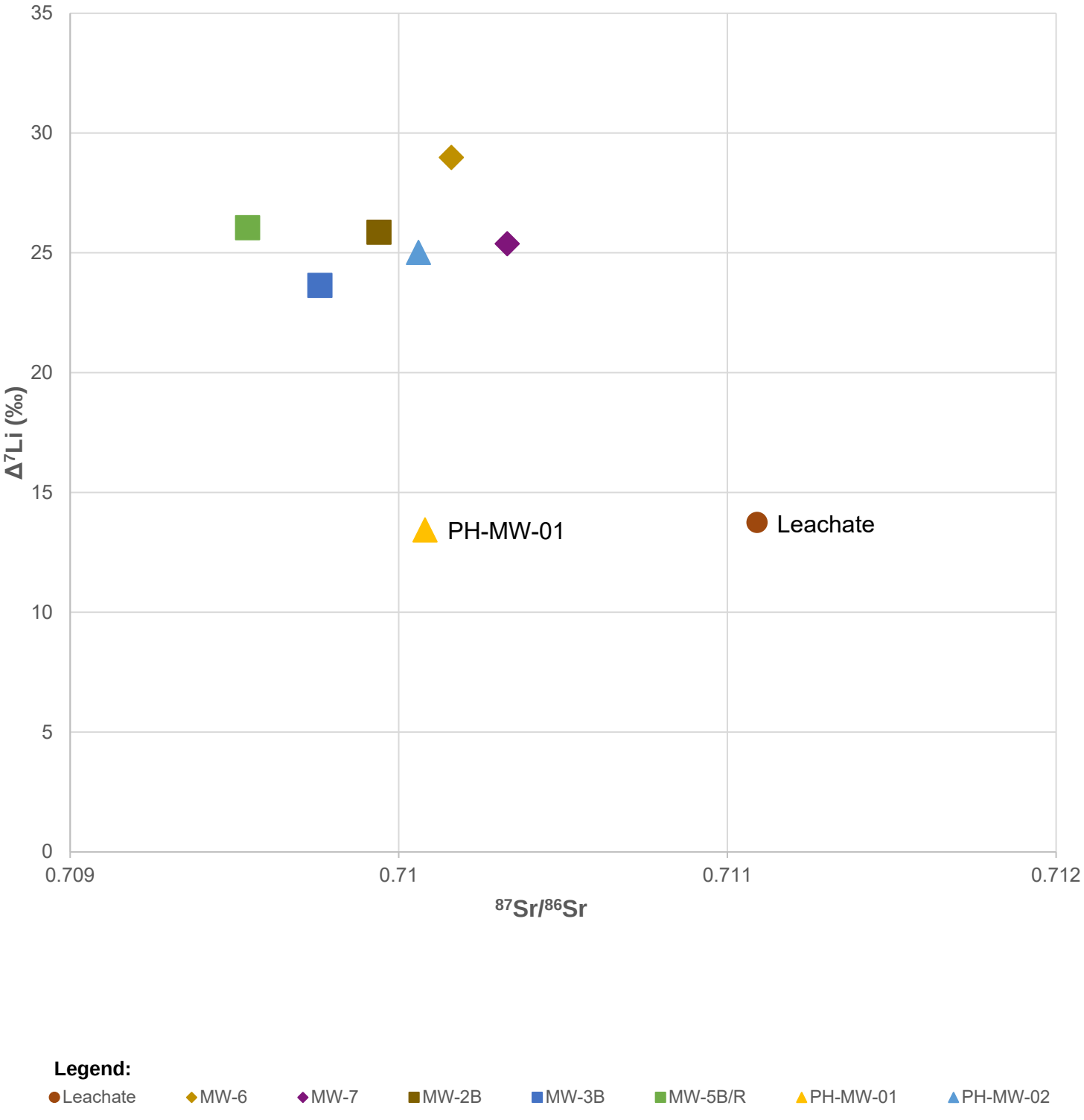
Notes:
Leachate data are shown with a circle symbol.
Upgradient well data shown with a diamond symbol.
Downgradient well data shown with a square symbol.
Peg's Hill well data shown with a triangle symbol.
Leachate and groundwater data from sampling event conducted on 5/2/2023.

Boron Isotope vs. Strontium Isotope Compositions

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE	Geosyntec consultants KENNESAW, GA	**Figure 8**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\October 2022



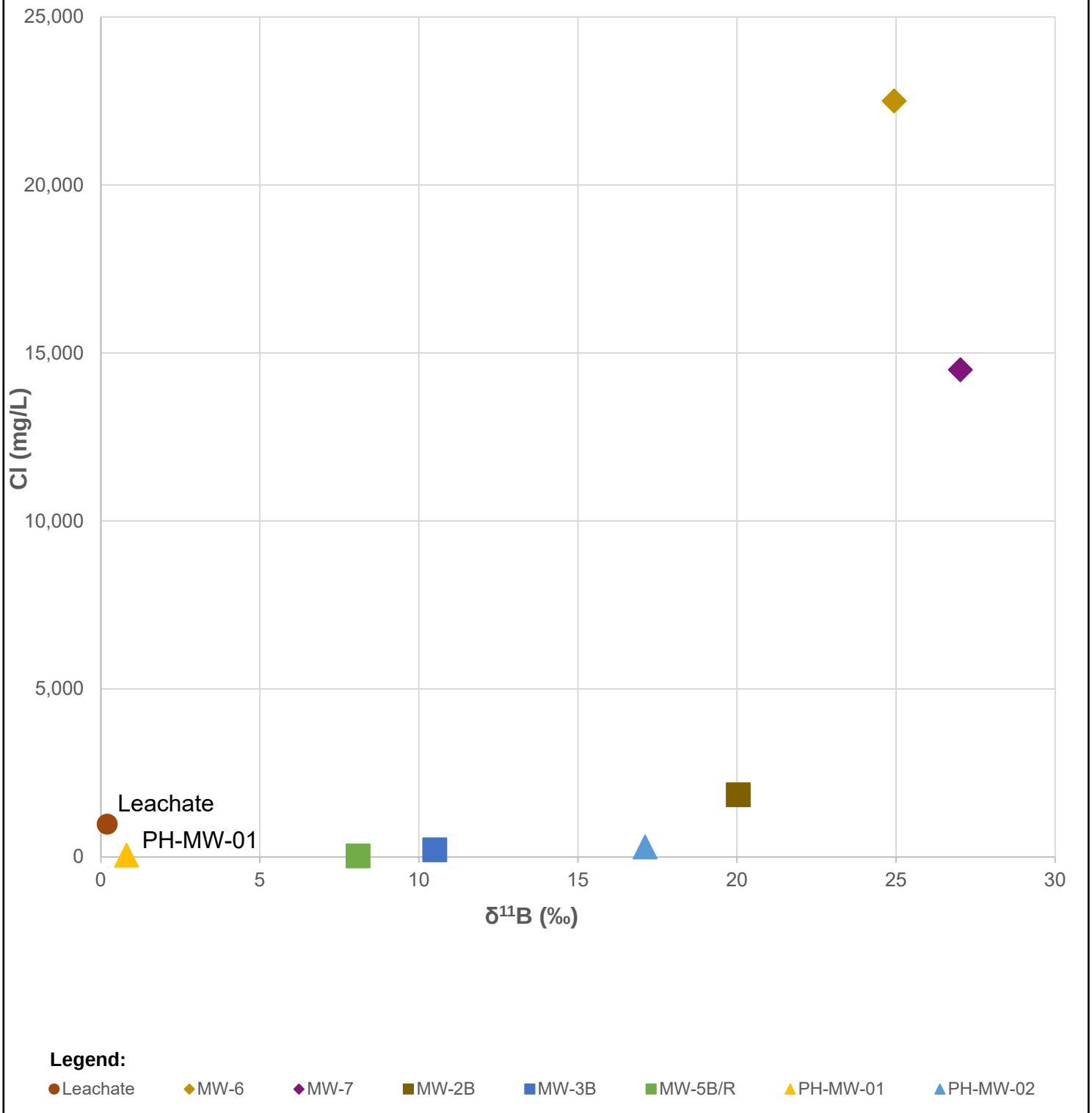
Notes:
Leachate data are shown with a circle symbol.
Upgradient well data shown with a diamond symbol.
Downgradient well data shown with a square symbol.
Peg's Hill well data shown with a triangle symbol.
Leachate and groundwater data from sampling event conducted on 5/2/2023.

Lithium Isotope vs. Strontium Isotope Compositions

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE A Touchstone Energy Cooperative	Geosyntec consultants KENNESAW, GA	**Figure 9**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\October 2022



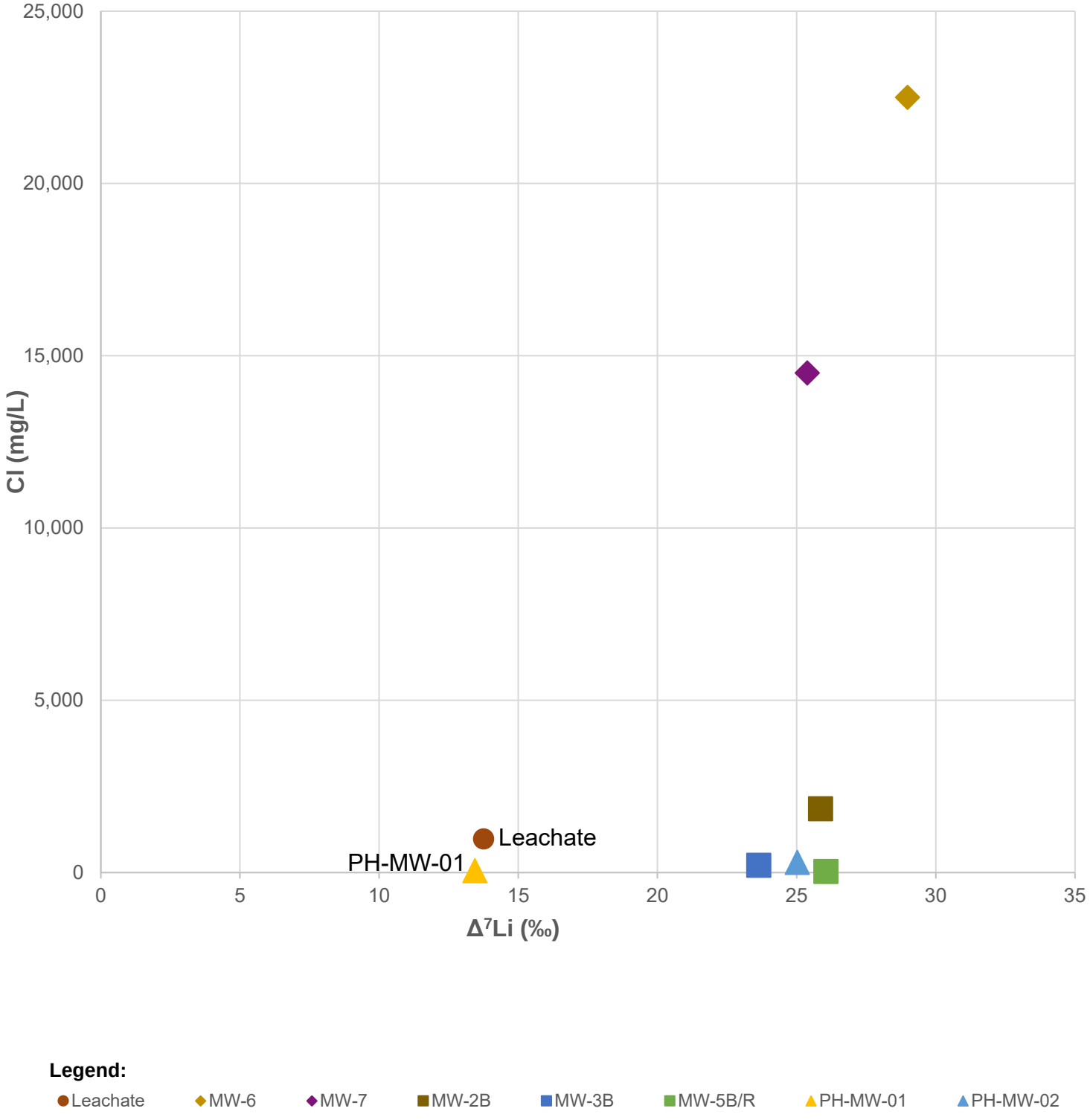
Notes:
Leachate data are shown with a circle symbol.
Upgradient well data shown with a diamond symbol.
Downgradient well data shown with a square symbol.
Peg's Hill well data shown with a triangle symbol.
Leachate and groundwater data from sampling event conducted on 5/2/2023.

Chloride Concentration vs. Boron Isotope Compositions

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE	Geosyntec consultants KENNESAW, GA	**Figure 10**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\October 2022



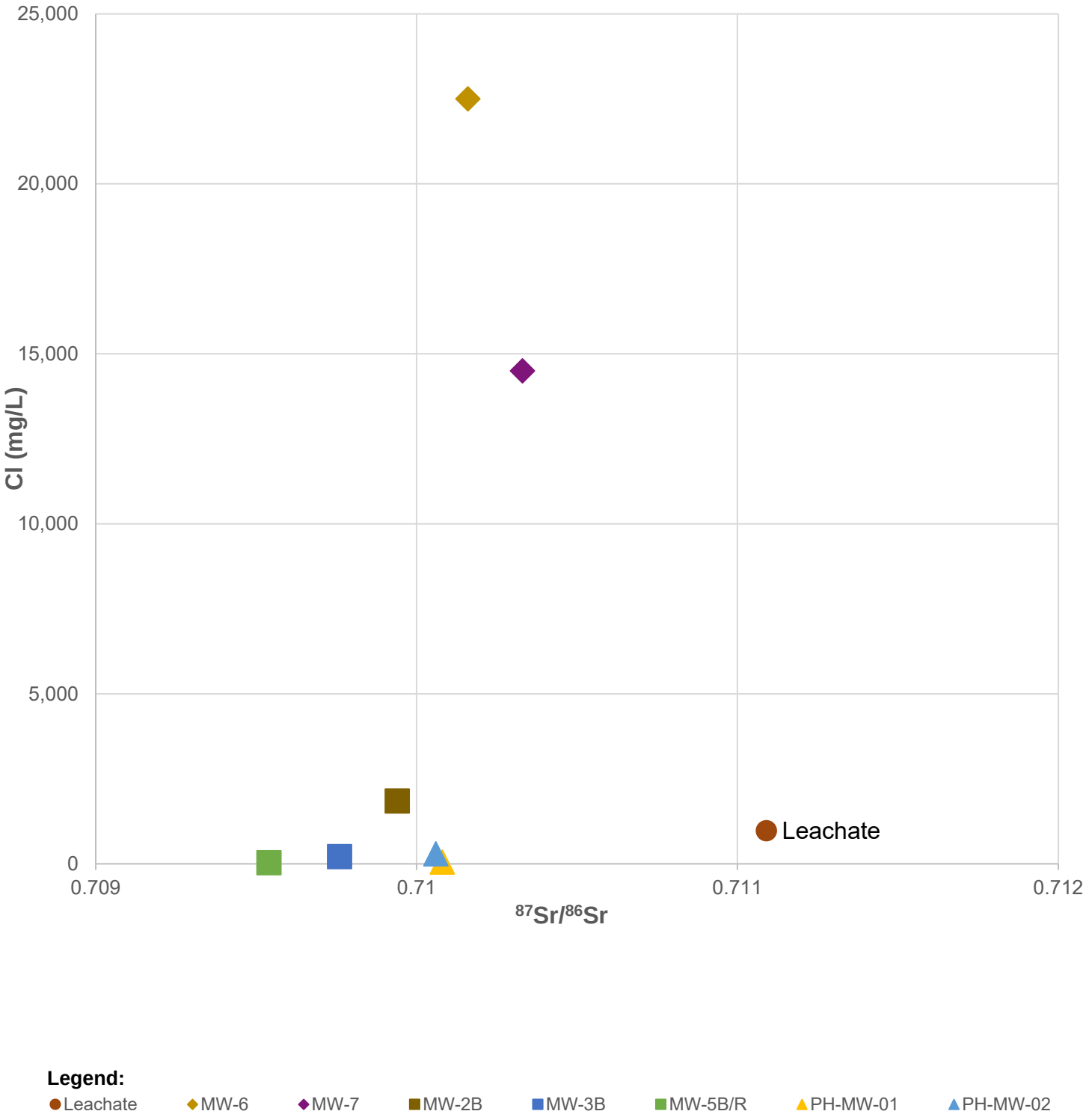
Notes:
Leachate data are shown with a circle symbol.
Upgradient well data shown with a diamond symbol.
Downgradient well data shown with a square symbol.
Peg's Hill well data shown with a triangle symbol.
Leachate and groundwater data from sampling event conducted on 5/2/2023.

Chloride Concentration vs. Lithium Isotope Compositions

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE	Geosyntec consultants KENNESAW, GA	**Figure 11**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\October 2022



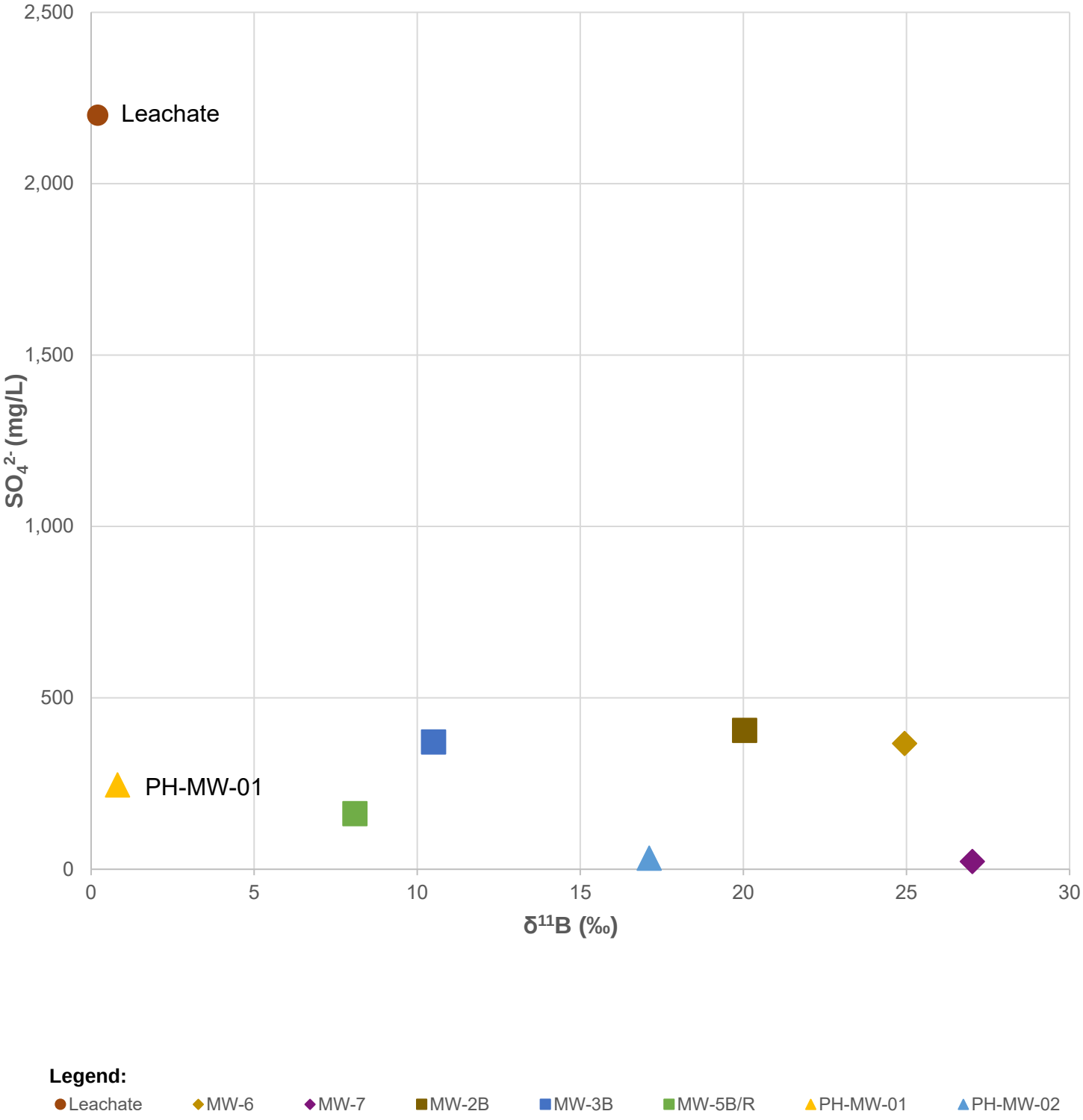
Notes:
Leachate data are shown with a circle symbol.
Upgradient well data shown with a diamond symbol.
Downgradient well data shown with a square symbol.
Peg's Hill well data shown with a triangle symbol.
Leachate and groundwater data from sampling event conducted on 5/2/2023.

Chloride Concentration vs. Strontium Isotope Compositions

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE A Touchstone Energy Cooperative	Geosyntec consultants KENNESAW, GA	**Figure 12**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\October 2022



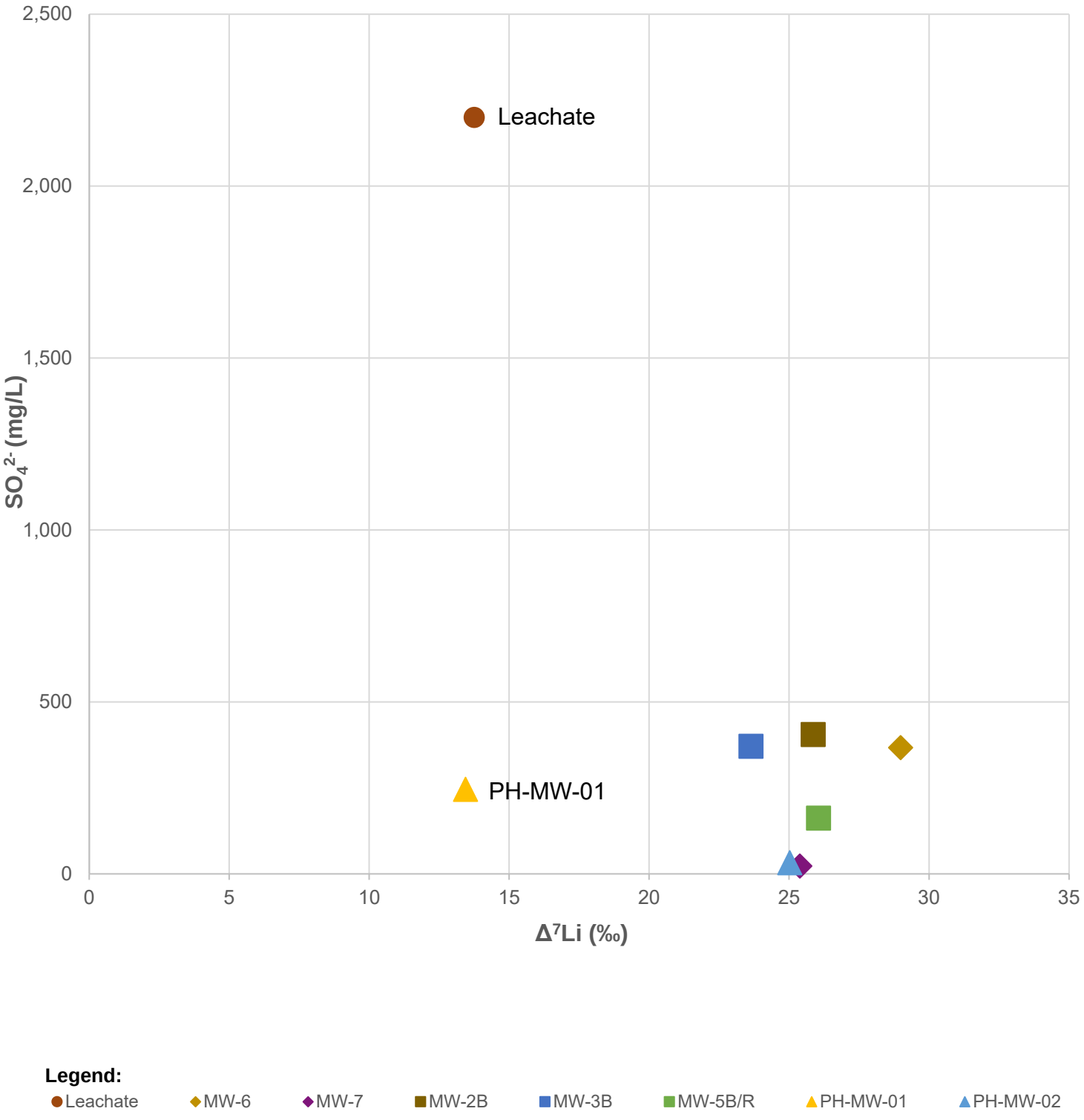
Notes:
Leachate data are shown with a circle symbol.
Upgradient well data shown with a diamond symbol.
Downgradient well data shown with a square symbol.
Peg's Hill well data shown with a triangle symbol.
Leachate and groundwater data from sampling event conducted on 5/2/2023.

Sulfate Concentration vs. Boron Isotope Compositions

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE	Geosyntec consultants KENNESAW, GA	**Figure 13**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\October 2022



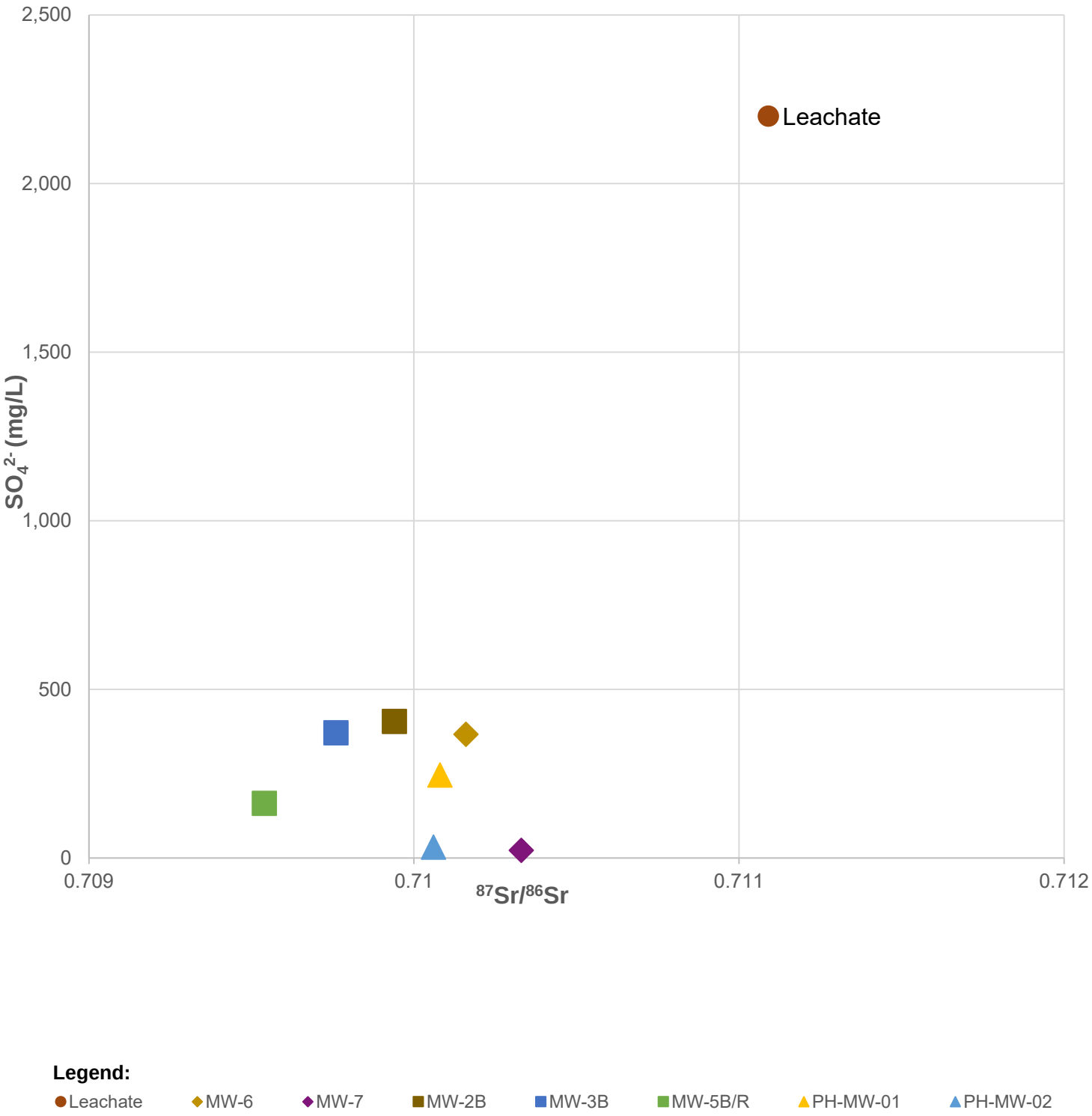
Notes:
Leachate data are shown with a circle symbol.
Upgradient well data shown with a diamond symbol.
Downgradient well data shown with a square symbol.
Peg's Hill well data shown with a triangle symbol.
Leachate and groundwater data from sampling event conducted on 5/2/2023.

Sulfate Concentration vs. Lithium Isotope Compositions

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE A Touchstone Energy Cooperative	Geosyntec consultants KENNESAW, GA	**Figure 14**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\October 2022



Notes:
Leachate data are shown with a circle symbol.
Upgradient well data shown with a diamond symbol.
Downgradient well data shown with a square symbol.
Peg's Hill well data shown with a triangle symbol.
Leachate and groundwater data from sampling event conducted on 5/2/2023.

Sulfate Concentration vs. Strontium Isotope Compositions

Spurlock Station Landfill
Maysville, Kentucky

PREPARED FOR	PREPARED BY	
EAST KENTUCKY POWER COOPERATIVE A Touchstone Energy Cooperative	Geosyntec consultants KENNESAW, GA	**Figure 15**
PROJECT NO. GR9795	DOCUMENT NO. GA230259	

N:\E\East Kentucky Power\Appendix III ASDs\Spurlock Landfill\October 2022

APPENDIX A

SiREM
Leading Science · Lasting Solutions

130 Stone Rd. W
Guelph, ON N1G 3Z2
(519) 822-2265

Analytical Results

Client: Geosyntec Consultants Inc.
Client Project Number: Not Provided
Date Samples Received: May 8, 2023
Date Samples Analyzed: May/June 2023
IsoDetect Internal Project No: 23-29-GG

SiREM File Reference: S-9786

Client Sample ID	SiREM Reference ID	Isodetect Reference ID	Client Sample Date	δ^7Li		δ^{11}B		$^{87}Sr/^{86}Sr$	
				[‰]	2SD[‰]	[‰]	2SD[‰]	$^{87}Sr/^{86}Sr$	2SD
Spurlock LF ASD MW-2B	23-13846	23-29GG-01	02-May-23	25.86	0.65	20.04	0.73	0.70994	0.00004
Spurlock LF ASD MW-3B	23-13847	23-29GG-02	02-May-23	23.64	0.56	10.50	0.67	0.70976	0.00003
Spurlock LF ASD MW-5R	23-13848	23-29GG-03	02-May-23	26.05	0.57	8.09	0.69	0.70954	0.00003
Spurlock LF ASD MW-6	23-13849	23-29GG-04	02-May-23	28.98	0.59	24.94	0.73	0.71016	0.00004
Spurlock LF ASD MW-7	23-13850	23-29GG-05	02-May-23	25.38	0.57	27.02	0.50	0.71033	0.00003
Spurlock LF ASD Leachate	23-13851	23-29GG-06	02-May-23	13.75	0.52	0.20	0.76	0.71109	0.00003
Peg´s Hill ASD MW-01	23-13852	23-29GG-07	02-May-23	13.44	0.60	0.81	0.69	0.71008	0.00003
Peg´s Hill ASD MW-02	23-13853	23-29GG-08	02-May-23	25.02	0.61	17.11	0.52	0.71006	0.00004

Comments:
Method: Compound Specific Isotope Analysis (CSIA)
-- - not applicable
n.d. - not determinable/not detectable (below LOQ)
2SD - standard deviation calculated from two independent consecutive measurements.
Li delta value (δ7Li) - calculated against LSVEC NIST 8545 RM
Boron delta value (δ11B) - calculated against NIST SRM 951 RM

Analyst:

Brooke Rapien
Laboratory Technician II

Results approved:

Brent G. Pautler, Ph.D.
Chemistry Services Manager

SiREM

Chain-of-Custody Form

siremlab.com

180A Market Place Blvd.
Knoxville, TN 37922
(865) 330-0037

Lab # S-97786

Project Name: Spurlock Landfill ASD	Project #
Project Manager: Herwig Goldemund	
Email: HGoldemund@geosyntec.com	
Company: Geosyntec	
Address: 10211 Wincopin Circle, 4th Floor, Columbia, Maryland 21044	
Phone #: (678) 202-9530	
Sampler's Signature: Ben Bray EH 5/5/23	Sampler's Printed Name: Ben Bray

Preservative Key
0. None
1. HCL
2. Other_____
3. Other_____
4. Other_____
5. Other_____
6. Other_____

Client Sample ID	Lab ID	Sampling Date	Sampling Time	Matrix	# of Containers	Preservative	Analysis: Isotopic Analysis (Sr, B, Li)	Other Information
Spurlock LF ASD MW-2B		05/02/23	15:49	Water	1		X	Preservative: None
Spurlock LF ASD MW-3B		05/02/23	14:58	Water	1		X	Preservative: None
Spurlock LF ASD MW-5R		05/02/23	16:24	Water	1		X	Preservative: None
Spurlock LF ASD MW-6		05/02/23	12:26	Water	1		X	Preservative: None
Spurlock LF ASD MW-7		05/02/23	13:40	Water	1		X	Preservative: None
Spurlock LF ASD Leachate		05/02/23	16:42	Water	1		X	Preservative: None
Peg's Hill ASD MW-01		05/02/23	09:32	Water	1		X	Preservative: None
Peg's Hill ASD MW-02		05/02/23	10:50	Water	1		X	Preservative: None

Sample Receipt

Cooler Condition: good

Cooler Temperature: 16.4°C (KA56)

Custody Seals: Yes ☐ No ☒

Invoice Information

P.O. #

Bill To:

For Lab Use Only

Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature: Eric Hamilton	Signature: Kathrand Crarchion	Signature	Signature	Signature	Signature
Printed Name: Eric Hamilton	Printed Name: Kathrand Crarchion	Printed Name	Printed Name	Printed Name	Printed Name
Firm	Firm: SiREM	Firm	Firm	Firm	Firm
Date/Time: 05/05/2023 12:03	Date/Time: 05/08/23 1220	Date/Time	Date/Time	Date/Time	Date/Time

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

In the absence of an executed agreement, submission of samples to SiREM implies consent for performance of analyses specified on this Chain-of-Custody form and agreement with the terms and conditions of the SiREM Laboratory Services Agreement. The entity submitting samples shall be responsible for payment in full for said analyses.

Chain of Custody for CSIA of organic pollutants

Isodetect Umweltmonitoring GmbH

Contact information				Project information			
Company:	SiREM	Email:	xdruar@siremlab.com	Project ID:	Spurlock Landfill ASD	Field site:	
Contact:	Ximena Druar	Address:	130 Stone Rd W Guelph, ON N1G 3Z2, Canada	Project description:			
Phone:	519-880-5424			Sampled by:		Company:	Geosyntec Consultants

Client Sample ID/ Sampling point	Sampling		Matrix	Conditions (e.g. Temp., O_2, R_h, pH)	Sampling type[§]	Sample volume for CSIA	Fixative[#]	CSIA for*	Isotope ratio^	Other Notes (e.g. troubles, weather)
	Date	Time								
Spurlock LF ASD MW-2B	5/2/23	1549	Water		2	1L	5-None	Sr, B, Li		S-9786
Spurlock LF ASD MW-3B	5/2/23	1458	Water		2	1L	5-None	Sr, B, Li		S-9786
Spurlock LF ASD MW-5R	5/2/23	1624	Water		2	1L	5-None	Sr, B, Li		S-9786
Spurlock LF ASD MW-6	5/2/23	1226	Water		2	1L	5-None	Sr, B, Li		S-9786
Spurlock LF ASD MW-7	5/2/23	1340	Water		2	1L	5-None	Sr, B, Li		S-9786
Spurlock LF ASD Leachate	5/2/23	1642	Water		2	1L	5-None	Sr, B, Li		S-9786
Peg's Hill ASD MW-01	5/2/23	0932	Water		2	1L	5-None	Sr, B, Li		S-9786
Peg's Hill ASD MW-02	5/2/23	1050	Water		2	1L	5-None	Sr, B, Li		S-9786

[§] 1 – Submersible pump, 2 – Suction pump, 3 – Bailer, 4 – Tap/outlet, 5 – Trial pit, 6 – Percussion drilling, 7 – Direct push sampling, 8 – Hand excavation, 9 – others (give sampling type)

* 1 – BTEX, 2 – halogenated VOC, 3 – PAH, 4 – Fuel additives (MTBE, ETBE, TAME, TAEE etc.), 5 – Explosives (TNT, RDX, dinitrotoluene, nitrobenzenes etc.),
6 – Petroleum hydrocarbons (e.g. alkylated benzenes, alkanes etc.), 7 – Chlorobenzenes, 8 – Gas hydrocarbons (e.g. methane, ethane, propane, butane, etc.),
9 – Pesticides (HCH, DDT, phenoxy acids, atrazine, bromacil, etc.), 10 – others (give target compounds)

^ 1 – $^{13}C/^{12}C$, 2 – $^{2}H/^{1}H$, 3 – $^{37}Cl/^{35}Cl$, 4 – $^{15}N/^{14}N$, 5 – $^{81}Br/^{79}Br$, 6 – others (give target isotope ratio)

1 – NaOH, 2 – $Na_3PO_4 \cdot 12H_2O$, 3 – HCl, 4 – H_2SO_4, 5 – none, 6 – others (give preservative)

Relinquished by	Received by	Relinquished by	Received by
Signature: KM Cracchiola	Signature:	Signature:	Signature:
Name: Kaitland Cracchiola	Name:	Name:	Name:
Company: SiREM	Company:	Company:	Company:
Date/Time: 05/11/23 1600	Date/Time:	Date/Time:	Date/Time:

Isodetect GmbH, Deutscher Platz 5b, 04103 Leipzig, Germany **Phone: +49 (0)341-355-35851, Fax: +49 (0)341-355-35852, Email: kuntze@isodetect.de www.isodetect.de**