

# **2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT**

**TWIN OAKS POWER STATION  
COAL COMBUSTION RESIDUALS (CCR) LANDFILL  
ROBERTSON COUNTY, TEXAS**

**January 28, 2022**

**Prepared By:**



**1120 NW Stallings Drive  
Nacogdoches, Texas 75964  
TBPG Firm No. 50027**

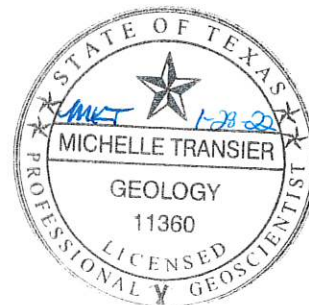
# 2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

## TWIN OAKS POWER STATION COAL COMBUSTION RESIDUALS (CCR) LANDFILL ROBERTSON COUNTY, TEXAS

January 28, 2022



Michelle K. Transier, P.G.  
Geologist



Prepared by:  
Hydrex Environmental  
Nacogdoches, Texas  
TBPG Firm No. 50027

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1<sup>st</sup> 2021 Semi-Annual Groundwater Monitoring and Corrective Action Report

July 27, 2021 Alternate Source/Error Demonstration

Background Groundwater Statistical Evaluation and Update

## Introduction

This 2021 Annual Groundwater Monitoring and Corrective Action Report for the Twin Oaks Power Station Coal Combustion Residuals (“CCR”) Landfill (“the “facility”) is prepared in accordance with the requirements of the facility’s Groundwater Sampling and Analysis Plan (“GWSAP”), the state CCR Rules, 30 TAC Chapter 352, and the federal CCR Rule, 40 CFR Part 257, Subpart D. This semi-annual report summarizes the groundwater monitoring activities performed through the 2<sup>nd</sup> 2021 semi-annual detection groundwater sampling event for the facility. The annual reporting requirements under the CCR Rule, the relevant CCR Rule citations, and the corresponding location of those required contents in this report are listed below:

- Status of the groundwater monitoring program (§ 257.90(e)): .....Appendix B
- Summary of key actions completed (§ 257.90(e)): ..... p. 1
- Any problems encountered and actions taken to resolve such problems (§ 257.90(e)): ...p. 2-3
- Project key activities for the upcoming year (§ 257.90(e)): ..... p. 3
- Map, aerial image, or diagram of CCR Unit and monitoring wells (§ 257.90(e)(1)): . Appendix C
- Identification of new monitoring wells installed or abandoned during the preceding year and narrative description (§ 257.90(e)(2)): ..... Not applicable.  
 No monitoring wells have been installed or abandoned at the facility in 2021.
- Summary of groundwater data, wells sampled, date sampled, and whether sample was required under detection or assessment monitoring (§ 257.90(e)(3)): ..... Appendix D
- Narrative discussion of any transition between monitoring programs (§ 257.90(e)(4)):.....p. 2-3

## Key Actions Completed and any Problems Encountered

The monitoring network at the Twin Oaks Power Station CCR Landfill includes 8 monitoring wells (upgradient wells MW-7, MW-11, MW-12, and MW-16 and downgradient wells MW-13, MW-14, MW-15, and MW-17). Groundwater monitoring is performed in accordance with the facility’s GWSAP, 30 TAC Chapter 352 Subchapter H, and 40 CFR Part 257, Subpart D. Specific sampling events and dates for calendar year 2021 are summarized in the following table:

### Summary of Sampling Events

Event Date	Monitoring Wells (MW) Sampled	Event Type
April 28, 2021	MW-7, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17	Semi-Annual Detection Monitoring
June 23, 2021	MW-14 and MW-15	Verification Resampling
October 18, 2021	MW-7, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17	Semi-Annual Detection Monitoring

No significant problems were encountered during the sampling event in 2021.

## Detection Monitoring

Detection monitoring is conducted at the Twin Oaks Power Station CCR Landfill on a semi-annual schedule in accordance with applicable federal and state regulations. Laboratory analysis for detection events include those detection monitoring constituents listed in Table D-1 of the facility’s GWSAP. A table of groundwater analytical results for all monitoring wells sampled during 2021 is included in Appendix D of this report.

### First Semi-Annual Groundwater Monitoring Event (April 2021)

The first semi-annual detection monitoring event was conducted on April 28, 2021. Groundwater samples were obtained from monitoring wells MW-7, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17 for analysis of detection monitoring constituents. Additionally, a duplicate sample was collected at monitoring well MW-7 and analyzed for all detection monitoring constituents. The duplicate sample provided comparable results for all constituents. Intrawell statistical evaluation of data from the April 2021 event, performed in accordance with the provisions of the GWSAP, 30 TAC §352.941, and 40 CFR § 257.94, indicated unverified (“initial”) intrawell statistical exceedances for calcium and sulfate in monitor well MW-14 and for calcium in MW-15. Subsequently, verification resampling was conducted on June 23, 2021, as provided for and in accordance with the GWSAP. The results of verification resampling confirmed the intrawell statistical exceedance values for calcium and sulfate in MW-14 and for calcium in MW-15 on June 30, 2021 and SSIs were determined on July 6, 2021. Statistical evaluation results are included in the 1<sup>st</sup> 2021 Semi-Annual Groundwater Monitoring and Corrective Action Report (Appendix E) dated July 27, 2021.

Review of relevant information for the facility indicated the values are likely the result of natural groundwater variation and not a release from the CCR Landfill. In accordance with the facility’s GWSAP, 30 TAC §352.941(c), and 40 CFR 257.94(e)(2), an alternate source demonstration (ASD) was prepared to address the calculated SSIs for MW-14 and MW-15. Notice of the intent to perform an ASD was provided to TCEQ on July 14, 2021. Based on observed variability, monitoring wells MW-14 and MW-15 were reevaluated using interwell control chart techniques as provided in EPA Unified Guidance. Control chart evaluations utilized sulfate and calcium data from upgradient monitoring wells MW-7, MW-11, MW-12, and MW-16. The results of the interwell statistical reevaluation indicate the sulfate concentrations reported for monitoring well MW-14 and the calcium concentrations reported for MW-14 and MW-15 fall within the statistically determined limit of concentrations developed for upgradient monitoring wells. Sulfate concentration data from MW-14 and calcium concentration data from MW-14 and MW-15 were further evaluated for statistically significant increasing trends. No statistically increasing trends were noted for the sulfate and calcium data. Based on this evaluation, no release from the CCR Landfill is indicated. A copy of the Alternate Source/Error Demonstration report dated July 27, 2021 is included in Appendix E of this report.

A summary of the results of statistical evaluation is presented in the table below.

### Summary of Statistical Exceedances for the First Semi-Annual Groundwater Monitoring Event (April 2021)

Well	Constituent	Initial Result (mg/L)	Verification Resampling Result (mg/L)	Intrawell Statistical Limit (mg/L)	Interwell Statistical Limit (mg/L)	Site-wide Data Range (mg/L)	Statistical Exceedance Confirmed?	Resolution
MW-14	sulfate	493	545	401.3	1550	24.3 - 1550	No	Maintain Detection Monitoring

**Summary of Statistical Exceedances for the First Semi-Annual Groundwater Monitoring Event (April 2021)**

Well	Constituent	Initial Result (mg/L)	Verification Resampling Result (mg/L)	Intrawell Statistical Limit (mg/L)	Interwell Statistical Limit (mg/L)	Site-wide Data Range (mg/L)	Statistical Exceedance Confirmed?	Resolution
MW-14	calcium	117	130	115.2	326	15.4 - 326	No	Maintain Detection Monitoring
MW-15	calcium	29.0	30.0	28.93	326	15.4 - 326	No	Maintain Detection Monitoring

Monitoring wells MW-7, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17 remained in detection monitoring status.

**Second Semi-Annual Groundwater Monitoring Event (October 2021)**

The second semi-annual detection monitoring event was conducted on October 18, 2021. Groundwater samples were obtained from monitoring wells MW-7, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17 for analysis of detection monitoring constituents. Additionally, a duplicate sample was collected at monitoring well MW-7 and analyzed for all detection monitoring constituents. The duplicate sample provided comparable results for all constituents. Intrawell statistical evaluation of data from the October 2021 event, performed in accordance with the provisions of the GWSAP, 30 TAC §352.941, and 40 CFR § 257.94, indicated no intrawell statistical exceedances for any constituent or monitoring well. Monitoring wells MW-7, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17 remain in detection monitoring status.

**Groundwater Elevation, Flow Rate, and Direction**

Water levels were measured in all monitoring wells prior to purging in accordance with the GWSAP. A table summarizing groundwater elevation data collected during the 2021 detection monitoring events is included in Appendix B. Hydraulic gradient and flow rate calculations, along with a groundwater elevation map showing groundwater flow direction for the October 2021 detection monitoring event, are also included in Appendix C.

**Project Key Activities for 2022**

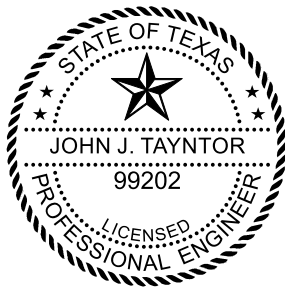
Based on the data available at the time of this report, the detection monitoring program currently in place for the Twin Oaks Power Station CCR Landfill meets the requirements of applicable regulations. Therefore, no change to the groundwater monitoring system, monitoring schedule, or monitoring program is proposed.

## **Appendix A**

# CERTIFICATION STATEMENT

## COAL COMBUSTION RESIDUALS (CCR) LANDFILL TWIN OAKS POWER STATION ROBERTSON COUNTY, TEXAS

I certify I am a licensed professional engineer in the State of Texas and a *qualified professional engineer* as defined in 40 CFR §257.53. I certify that the groundwater monitoring data and other information presented in the 2021 Annual Groundwater Monitoring and Corrective Action Report, prepared by Hydrex Environmental on behalf of the Twin Oaks Power Station, are appropriate and meet the requirements of 40 CFR Part 257, Subpart D.



A handwritten signature in black ink, appearing to read "J. Tayntor", written over a horizontal line.

John J. Tayntor, P.E.  
Auckland Consulting, LLC  
TBPE Firm Registration No. F-16721

01/28/2022

Date



## **Appendix B**

## Monitoring Well Network and Program Summary

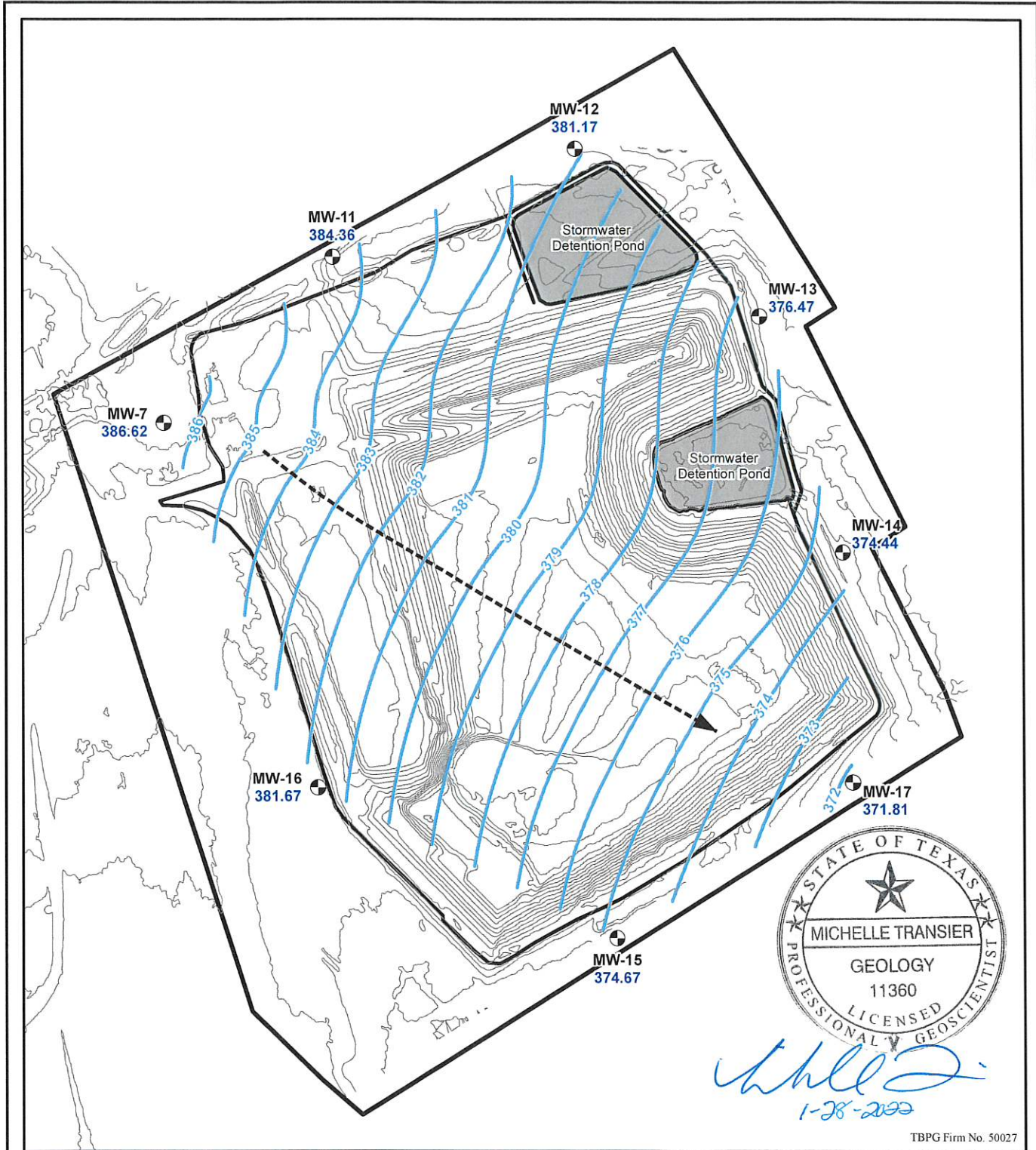
Well ID	Well Designation	Aquifer	2021
			Monitoring Status
MW-7	Upgradient	Uppermost	Detection Monitoring
MW-11	Upgradient	Uppermost	Detection Monitoring
MW-12	Upgradient	Uppermost	Detection Monitoring
MW-13	Downgradient	Uppermost	Detection Monitoring
MW-14	Downgradient	Uppermost	Detection Monitoring
MW-15	Downgradient	Uppermost	Detection Monitoring
MW-16	Upgradient	Uppermost	Detection Monitoring
MW-17	Downgradient	Uppermost	Detection Monitoring

## **Appendix C**

## Groundwater Elevation Summary Table

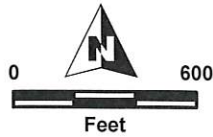
Twin Oaks Power Station  
Coal Combustion Residuals (CCR) Landfill  
Robertson County, Texas

Well ID	Date	Top of Casing Elevation (ft-amsl)	Depth to Water (ft)	Groundwater Elevation (ft-amsl)
MW-7	4/28/2021	411.60	24.99	386.61
	10/18/2021	411.60	24.98	386.62
MW-11	4/28/2021	406.93	22.40	384.53
	10/18/2021	406.93	22.57	384.36
MW-12	4/28/2021	387.27	5.35	381.92
	10/18/2021	387.27	6.10	381.17
MW-13	4/28/2021	398.32	20.84	377.48
	10/18/2021	398.32	21.85	376.47
MW-14	4/28/2021	394.68	19.68	375.00
	10/18/2021	394.68	20.24	374.44
MW-15	4/28/2021	410.47	35.25	375.22
	10/18/2021	410.47	35.80	374.67
MW-16	4/28/2021	422.54	40.84	381.70
	10/18/2021	422.54	40.87	381.67
MW-17	4/28/2021	405.87	33.18	372.69
	10/18/2021	405.87	34.06	371.81



TBPG Firm No. 50027

- Monitor Well
- Approx. Groundwater Flow Direction
- Groundwater Contour
- Pond
- 5-ft Ground Surface Contour
- Property Boundary
- Groundwater Elevation (Elevation Feet, MSL)



**GROUNDWATER CONTOUR MAP**

← WATER LEVELS MEASURED (10/18/2021) →

**CCR Landfill**  
**Twin Oaks Power Station**  
**13065 Plant Road**  
**Bremond (Robertson County), Texas 76629**

Map Revised: 12/28/2021 | Project Number: I-14-1007 | GIS Analyst: NCF

Twin Oaks Power Station  
 Coal Combustion Residuals Landfill

### Groundwater Flow Rate Calculations

Approximate hydraulic gradients were calculated based on data presented on the individual groundwater gradient map for the October 2021 monitoring event.

Calculation of hydraulic gradient was performed using the following equation:

$$i = \frac{\Delta h}{\Delta d}$$

Where:  $\Delta h$  = approximate change in hydraulic head between two known points  
 $\Delta d$  = approximate change in distance between two known points along flow paths

Gradient Measurement Line	$\Delta h$ (feet)	$\Delta d$ (feet)	$i$ (feet/feet)	Monitoring Event
from well MW-7 to MW-17	14.81	3370	0.0044	October 2021

### Estimated Flow Rate Calculations

The estimated groundwater flow rate was calculated for each monitoring event using the following formula:

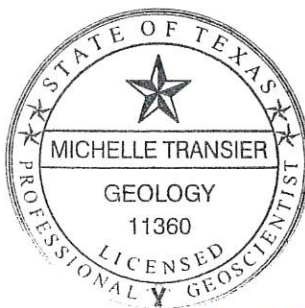
$$v = \frac{ki}{n_e}$$

Where:  $v$  = flow rate  
 $k$  = hydraulic conductivity  
 $i$  = hydraulic gradient (above)  
 $n_e$  = effective porosity

Flow Rate Measurement Line	$k$ (cm/sec)	$n_e$	$i$ (feet/feet)	$v$ (feet/year)	Monitoring Event
from well MW-7 to MW-17	4.85E-03	0.25	0.0044	88.38	October 2021

Note: Hydraulic conductivity ( $k$ ) and effective porosity ( $n_e$ ) values as derived from slug test results conducted March 2016.

Hydrex Environmental  
 TBPG Firm No. 50027



*Michelle Transier*  
 1-28-2022

## **Appendix D**

**Groundwater Monitoring Analytical Results Summary Table**

Well ID	Sampling Date	Boron (mg/L)	Total Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (SU)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)	Total Antimony (mg/L)	Total Arsenic (mg/L)	Total Barium (mg/L)	Total Beryllium (mg/L)	Total Cadmium (mg/L)	Total Chromium (mg/L)	Total Cobalt (mg/L)	Fluoride (mg/L)	Total Lead (mg/L)	Total Lithium (mg/L)	Total Mercury (mg/L)	Total Molybdenum (mg/L)	Total Selenium (mg/L)	Total Thallium (mg/L)	Radium 226 & 228 (Combined) (pCi/L)
MW-7	04/28/21	0.295	258	259	<0.500	6.5	952	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-7	10/18/21	0.286	284	257	<0.500	6.7	940	1730	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-11	04/28/21	0.175	152	176	<0.500	6.5	612	1130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-11	04/28/21	0.175	134	157	<0.500	7.0	528	1160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-12	04/28/21	0.0373	15.4	74.6	<0.500	6.5	38.1	221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-12	04/28/21	0.0332	20.9	77.6	<0.500	6.8	40.7	390	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-13	04/28/21	0.0587	26.1	105	<0.500	6.4	78.9	398	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-13	04/28/21	0.0567	33.8	104	<0.500	6.7	99.0	437	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Background Limits*		0.1206	59.59	120.1	0.584	4.972-7.724	195.2	631.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	04/28/21	0.391	117	381	0.510	6.7	493	1520	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	06/23/21	NA	130	NA	NA	NA	545	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	04/28/21	0.347	118	403	<0.500	7.0	<0.500	1760	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Background Limits*		0.6019	141.2	440.9	0.682	4.924-7.57	841.2	1940	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	04/28/21	0.0475	29.0	155	<0.500	6.7	34.5	404	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	06/23/21	NA	30.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	04/28/21	0.0445	26.0	131	<0.500	6.7	39.8	434	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Background Limits*		0.06659	37.94	197.6	0.5	4.322-7.577	49.99	482.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-16	04/28/21	0.0271	43.2	189	<0.500	6.9	82.8	677	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-16	04/28/21	0.0338	64.3	234	<0.500	7.1	81.0	715	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-17	04/28/21	0.0314	156	798	<0.500	5.8	26.1	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-17	04/28/21	0.0317	220	1060	<0.500	6.2	94.1	2300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Background Limits*		0.362	396.5	1728	0.5	3.992-7.76	168	3264	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

\*Background limits are intrawell statistical limits including data collected between June 2016 and June 2021.



## **Laboratory Reports**

## ANALYTICAL REPORT


Eurofins Xenco, Stafford  
4145 Greenbriar Dr  
Stafford, TX 77477  
Tel: (281)240-4200

Laboratory Job ID: 860-13937-1  
Client Project/Site: Twin Oaks PP

**For:**

Hydrex Environmental  
1120 NW Stallings Drive  
Nacogdoches, Texas 75964

Attn: Michelle Transier



*Authorized for release by:  
11/10/2021 6:40:53 PM*

Chad Bechtold, Project Manager  
(813)690-3563  
[chad.bechtold@eurofinset.com](mailto:chad.bechtold@eurofinset.com)

### LINKS

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results through  
**Total Access**

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[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Qualifiers

### HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F2	MS/MSD RPD exceeds control limits
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
U	Indicates the analyte was analyzed for but not detected.

## Glossary

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

# Appendix A

## Laboratory Data Package Cover Page - Page 1 of 4

This data package is for Eurofins Xenco, Stafford job number 860-13937-1 and consists of:

- R1 - Field chain-of-custody documentation;
- R2 - Sample identification cross-reference;
- R3 - Test reports (analytical data sheets) for each environmental sample that includes:
  - a. Items consistent with NELAC Chapter 5,
  - b. dilution factors,
  - c. preparation methods,
  - d. cleanup methods, and
  - e. if required for the project, tentatively identified compounds (TICs).
- R4 - Surrogate recovery data including:
  - a. Calculated recovery (%R), and
  - b. The laboratory's surrogate QC limits.
- R5 - Test reports/summary forms for blank samples;
- R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
  - a. LCS spiking amounts,
  - b. Calculated %R for each analyte, and
  - c. The laboratory's LCS QC limits.
- R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a. Samples associated with the MS/MSD clearly identified,
  - b. MS/MSD spiking amounts,
  - c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d. Calculated %Rs and relative percent differences (RPDs), and
  - e. The laboratory's MS/MSD QC limits
- R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
  - a. The amount of analyte measured in the duplicate,
  - b. The calculated RPD, and
  - c. The laboratory's QC limits for analytical duplicates.
- R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 - Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Chad Bechtold

Name (printed)



Signature

11/10/2021

Date

Project Manager

Official Title (printed)

# Laboratory Review Checklist: Reportable Data - Page 2 of 4

Laboratory Name:	Eurofins Xenco, Stafford	LRC Date:	11/10/2021
Project Name:	Twin Oaks PP	Laboratory Job Number:	860-13937-1
Reviewer Name:	Chad Bechtold		

# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
R1	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			R07C
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?		X			R08C
R9	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

- Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
- O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
- NA = Not applicable;
- NR = Not reviewed;
- ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

# Laboratory Review checklist: Supporting Data - Page 3 of 4

Laboratory Name:	Eurofins Xenco, Stafford	LRC Date:	11/10/2021
Project Name:	Twin Oaks PP	Laboratory Job Number:	860-13937-1
Reviewer Name:	Chad Bechtold		

# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	<b>Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	<b>Mass spectral tuning</b>					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	<b>Internal standards (IS)</b>					
		Were IS area counts and retention times within the method-required QC limits?			X		
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	<b>Tentatively identified compounds (TICs)</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	<b>Interference Check Sample (ICS) results</b>					
		Were percent recoveries within method QC limits?	X				
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSSs?	X				
S11	OI	<b>Proficiency test reports</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>					
		Are laboratory SOPs current and on file for each method performed?	X				
<p>1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</p> <p>3. NA = Not applicable;</p> <p>4. NR = Not reviewed;</p> <p>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>							

# Laboratory Review Checklist: Exception Reports - Page 4 of 4

Laboratory Name:	Eurofins Xenco, Stafford	LRC Date:	11/10/2021
Project Name:	Twin Oaks PP	Laboratory Job Number:	860-13937-1
Reviewer Name:	Chad Bechtold		

ER # <sup>1</sup>	Description
R07C	Method 300_ORGFM_28D: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 860-28078 were outside control limits for Chloride and Sulfate. The native samples used for the MS/MSD contained Chloride and Sulfate at a concentration greater than 4 times the spike amount added. However, the associated laboratory control sample (LCS) recovery was within acceptance limits.
R08C	Method 300.0: The sample duplicate precision for the following sample associated with analytical batch 860-28078 was outside control limits: (860-13937-A-5 MS) and (860-13937-A-5 MSD). The associated Laboratory Control Sample / Laboratory Control Sample Duplicate (LCS/LCSD) precision met acceptance criteria.
	<ol style="list-style-type: none"> <li>Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</li> <li>O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</li> <li>NA = Not applicable;</li> <li>NR = Not reviewed;</li> <li>ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</li> </ol>





# Case Narrative

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

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**Job ID: 860-13937-1**

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**Laboratory: Eurofins Xenco, Stafford**

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**Narrative**

**Job Narrative  
860-13937-1**

**Receipt**

The samples were received on 10/19/2021 10:12 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.5°C

**HPLC/IC**

Method 300\_ORGFM\_28D: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 860-28078 were outside control limits for Chloride and Sulfate. The native samples used for the MS/MSD contained Chloride and Sulfate at a concentration greater than 4 times the spike amount added. However, the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 300\_ORGFM\_28D: The sample duplicate precision for the following sample associated with analytical batch 860-28078 was outside control limits: (860-13937-A-5 MS) and (860-13937-A-5 MSD). The associated Laboratory Control Sample / Laboratory Control Sample Duplicate (LCS/LCSD) precision met acceptance criteria.

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

**Metals**

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

**General Chemistry**

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



# Detection Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Client Sample ID: MW-7

Lab Sample ID: 860-13937-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	257		0.500	mg/L	1		300.0	Total/NA
Sulfate	940		5.00	mg/L	10		300.0	Total/NA
Calcium	284		10.0	mg/L	50		6010B	Total/NA
Boron	0.286		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	1730		20.0	mg/L	1		SM 2540C	Total/NA
pH	6.7	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.4	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: DUP

Lab Sample ID: 860-13937-2

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	257		0.500	mg/L	1		300.0	Total/NA
Sulfate	940		5.00	mg/L	10		300.0	Total/NA
Calcium	285		10.0	mg/L	50		6010B	Total/NA
Boron	0.292		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	1740		20.0	mg/L	1		SM 2540C	Total/NA
pH	6.7	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.8	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-11

Lab Sample ID: 860-13937-3

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	157		0.500	mg/L	1		300.0	Total/NA
Sulfate	528		5.00	mg/L	10		300.0	Total/NA
Calcium	134		10.0	mg/L	50		6010B	Total/NA
Boron	0.175		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	1160		10.0	mg/L	1		SM 2540C	Total/NA
pH	7.0	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.7	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-16

Lab Sample ID: 860-13937-4

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	234		0.500	mg/L	1		300.0	Total/NA
Sulfate	81.0		0.500	mg/L	1		300.0	Total/NA
Calcium	64.3		0.200	mg/L	1		6010B	Total/NA
Boron	0.0338		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	715		10.0	mg/L	1		SM 2540C	Total/NA
pH	7.1	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.5	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-12

Lab Sample ID: 860-13937-5

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	77.6		0.500	mg/L	1		300.0	Total/NA
Sulfate	40.7	F2	0.500	mg/L	1		300.0	Total/NA
Calcium	20.9		0.200	mg/L	1		6010B	Total/NA
Boron	0.0332		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	390		10.0	mg/L	1		SM 2540C	Total/NA
pH	6.8	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.1	HF		Celsius	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Xenco, Stafford

## Detection Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

### Client Sample ID: MW-13

Lab Sample ID: 860-13937-6

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	104		0.500	mg/L	1		300.0	Total/NA
Sulfate	99.0		0.500	mg/L	1		300.0	Total/NA
Calcium	33.8		0.200	mg/L	1		6010B	Total/NA
Boron	0.0567		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	437		10.0	mg/L	1		SM 2540C	Total/NA
pH	6.7	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.6	HF		Celsius	1		SM 4500 H+ B	Total/NA

### Client Sample ID: MW-15

Lab Sample ID: 860-13937-7

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	131		0.500	mg/L	1		300.0	Total/NA
Sulfate	39.8		0.500	mg/L	1		300.0	Total/NA
Calcium	26.0		0.200	mg/L	1		6010B	Total/NA
Boron	0.0445		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	434		10.0	mg/L	1		SM 2540C	Total/NA
pH	6.7	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.2	HF		Celsius	1		SM 4500 H+ B	Total/NA

### Client Sample ID: MW-14

Lab Sample ID: 860-13937-8

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	403		0.500	mg/L	1		300.0	Total/NA
Calcium	118		10.0	mg/L	50		6010B	Total/NA
Boron	0.347		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	1760		20.0	mg/L	1		SM 2540C	Total/NA
pH	7.0	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.9	HF		Celsius	1		SM 4500 H+ B	Total/NA

### Client Sample ID: MW-17

Lab Sample ID: 860-13937-9

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	1060		5.00	mg/L	10		300.0	Total/NA
Sulfate	94.1		0.500	mg/L	1		300.0	Total/NA
Calcium	220		10.0	mg/L	50		6010B	Total/NA
Boron	0.0317		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	2300		20.0	mg/L	1		SM 2540C	Total/NA
pH	6.2	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.7	HF		Celsius	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Xenco, Stafford

# Client Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

**Client Sample ID: MW-7**

**Lab Sample ID: 860-13937-1**

Date Collected: 10/18/21 11:24

Matrix: Water

Date Received: 10/19/21 10:12

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	257		0.500	mg/L			10/26/21 14:51	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 14:51	1
Sulfate	940		5.00	mg/L			10/26/21 15:01	10

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	284		10.0	mg/L		10/20/21 09:10	10/21/21 23:17	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.286		0.0100	mg/L		10/20/21 09:02	11/10/21 12:54	1

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1730		20.0	mg/L			10/25/21 11:25	1
pH	6.7	HF		SU			10/21/21 16:57	1
Temperature	18.4	HF		Celsius			10/21/21 16:57	1

**Client Sample ID: DUP**

**Lab Sample ID: 860-13937-2**

Date Collected: 10/18/21 11:24

Matrix: Water

Date Received: 10/19/21 10:12

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	257		0.500	mg/L			10/26/21 15:12	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 15:12	1
Sulfate	940		5.00	mg/L			10/26/21 15:22	10

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	285		10.0	mg/L		10/20/21 09:10	10/21/21 23:28	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.292		0.0100	mg/L		10/20/21 09:02	11/10/21 12:57	1

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1740		20.0	mg/L			10/25/21 11:25	1
pH	6.7	HF		SU			10/21/21 16:57	1
Temperature	18.8	HF		Celsius			10/21/21 16:57	1

**Client Sample ID: MW-11**

**Lab Sample ID: 860-13937-3**

Date Collected: 10/18/21 12:06

Matrix: Water

Date Received: 10/19/21 10:12

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	157		0.500	mg/L			10/26/21 15:32	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 15:32	1
Sulfate	528		5.00	mg/L			10/27/21 01:03	10

Eurofins Xenco, Stafford

# Client Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Client Sample ID: MW-11

Lab Sample ID: 860-13937-3

Date Collected: 10/18/21 12:06

Matrix: Water

Date Received: 10/19/21 10:12

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	134		10.0	mg/L		10/20/21 09:10	10/21/21 23:31	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.175		0.0100	mg/L		10/20/21 09:02	11/10/21 13:00	1

### General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1160		10.0	mg/L			10/25/21 11:25	1
pH	7.0	HF		SU			10/21/21 16:57	1
Temperature	18.7	HF		Celsius			10/21/21 16:57	1

## Client Sample ID: MW-16

Lab Sample ID: 860-13937-4

Date Collected: 10/18/21 12:46

Matrix: Water

Date Received: 10/19/21 10:12

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	234		0.500	mg/L			10/26/21 19:31	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 19:31	1
Sulfate	81.0		0.500	mg/L			10/26/21 19:31	1

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	64.3		0.200	mg/L		10/20/21 09:10	10/21/21 20:34	1

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0338		0.0100	mg/L		10/20/21 09:02	11/10/21 13:03	1

### General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	715		10.0	mg/L			10/25/21 11:25	1
pH	7.1	HF		SU			10/21/21 16:57	1
Temperature	18.5	HF		Celsius			10/21/21 16:57	1

## Client Sample ID: MW-12

Lab Sample ID: 860-13937-5

Date Collected: 10/18/21 13:27

Matrix: Water

Date Received: 10/19/21 10:12

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	77.6		0.500	mg/L			10/26/21 20:03	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 20:03	1
Sulfate	40.7	F2	0.500	mg/L			10/26/21 20:03	1

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	20.9		0.200	mg/L		10/20/21 09:10	10/21/21 20:37	1

# Client Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Client Sample ID: MW-12

Lab Sample ID: 860-13937-5

Date Collected: 10/18/21 13:27

Matrix: Water

Date Received: 10/19/21 10:12

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0332		0.0100	mg/L		10/20/21 09:02	11/10/21 13:13	1

### General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	390		10.0	mg/L			10/25/21 11:25	1
pH	6.8	HF		SU			10/21/21 16:57	1
Temperature	19.1	HF		Celsius			10/21/21 16:57	1

## Client Sample ID: MW-13

Lab Sample ID: 860-13937-6

Date Collected: 10/18/21 13:58

Matrix: Water

Date Received: 10/19/21 10:12

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	104		0.500	mg/L			10/26/21 20:34	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 20:34	1
Sulfate	99.0		0.500	mg/L			10/26/21 20:34	1

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	33.8		0.200	mg/L		10/21/21 09:20	10/22/21 20:17	1

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0567		0.0100	mg/L		10/20/21 09:02	11/10/21 13:16	1

### General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	437		10.0	mg/L			10/25/21 11:25	1
pH	6.7	HF		SU			10/21/21 16:57	1
Temperature	18.6	HF		Celsius			10/21/21 16:57	1

## Client Sample ID: MW-15

Lab Sample ID: 860-13937-7

Date Collected: 10/18/21 14:33

Matrix: Water

Date Received: 10/19/21 10:12

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	131		0.500	mg/L			10/26/21 21:05	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 21:05	1
Sulfate	39.8		0.500	mg/L			10/26/21 21:05	1

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	26.0		0.200	mg/L		10/21/21 09:20	10/22/21 20:21	1

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0445		0.0100	mg/L		10/20/21 09:02	11/10/21 13:19	1

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# Client Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

**Client Sample ID: MW-15**

**Lab Sample ID: 860-13937-7**

Date Collected: 10/18/21 14:33

Matrix: Water

Date Received: 10/19/21 10:12

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	434		10.0	mg/L			10/25/21 11:25	1
pH	6.7	HF		SU			10/21/21 16:57	1
Temperature	18.2	HF		Celsius			10/21/21 16:57	1

**Client Sample ID: MW-14**

**Lab Sample ID: 860-13937-8**

Date Collected: 10/18/21 15:04

Matrix: Water

Date Received: 10/19/21 10:12

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	403		0.500	mg/L			10/26/21 21:15	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 21:15	1
Sulfate	<0.500	U	0.500	mg/L			10/26/21 21:15	1

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	118		10.0	mg/L		10/21/21 09:20	10/22/21 20:39	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.347		0.0100	mg/L		10/20/21 09:02	11/10/21 13:22	1

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1760		20.0	mg/L			10/25/21 11:25	1
pH	7.0	HF		SU			10/21/21 16:57	1
Temperature	18.9	HF		Celsius			10/21/21 16:57	1

**Client Sample ID: MW-17**

**Lab Sample ID: 860-13937-9**

Date Collected: 10/18/21 15:32

Matrix: Water

Date Received: 10/19/21 10:12

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1060		5.00	mg/L			10/26/21 21:46	10
Fluoride	<0.500	U	0.500	mg/L			10/26/21 21:36	1
Sulfate	94.1		0.500	mg/L			10/26/21 21:36	1

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	220		10.0	mg/L		10/21/21 09:20	10/22/21 20:50	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0317		0.0100	mg/L		10/20/21 09:02	11/10/21 13:25	1

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2300		20.0	mg/L			10/25/21 11:25	1
pH	6.2	HF		SU			10/21/21 16:57	1
Temperature	18.7	HF		Celsius			10/21/21 16:57	1

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# QC Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Method: 300.0 - Anions, Ion Chromatography

**Lab Sample ID: MB 860-28078/3**  
**Matrix: Water**  
**Analysis Batch: 28078**

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

Analyte	MB	MB	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Chloride	<0.500	U	0.500	mg/L			10/26/21 08:33	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 08:33	1
Sulfate	<0.500	U	0.500	mg/L			10/26/21 08:33	1

**Lab Sample ID: MB 860-28078/49**  
**Matrix: Water**  
**Analysis Batch: 28078**

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

Analyte	MB	MB	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Chloride	<0.500	U	0.500	mg/L			10/26/21 18:08	1
Fluoride	<0.500	U	0.500	mg/L			10/26/21 18:08	1
Sulfate	<0.500	U	0.500	mg/L			10/26/21 18:08	1

**Lab Sample ID: LCS 860-28078/4**  
**Matrix: Water**  
**Analysis Batch: 28078**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	10.0	10.01		mg/L		100	90 - 110
Sulfate	10.0	9.433		mg/L		94	90 - 110

**Lab Sample ID: LCS 860-28078/50**  
**Matrix: Water**  
**Analysis Batch: 28078**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	10.0	10.06		mg/L		101	90 - 110
Sulfate	10.0	9.534		mg/L		95	90 - 110

**Lab Sample ID: LCSD 860-28078/5**  
**Matrix: Water**  
**Analysis Batch: 28078**

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Fluoride	10.0	10.02		mg/L		100	90 - 110	0	20
Sulfate	10.0	9.573		mg/L		96	90 - 110	1	20

**Lab Sample ID: LCSD 860-28078/51**  
**Matrix: Water**  
**Analysis Batch: 28078**

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Fluoride	10.0	9.984		mg/L		100	90 - 110	1	20
Sulfate	10.0	9.461		mg/L		95	90 - 110	1	20



# QC Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 860-13937-4 MS  
Matrix: Water  
Analysis Batch: 28078

Client Sample ID: MW-16  
Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	
	Result	Qualifier	Added	Result	Qualifier				Limits	
Chloride	234		10.0	251.8	4	mg/L		176	90 - 110	
Fluoride	<0.500	U	10.0	10.03		mg/L		100	90 - 110	
Sulfate	81.0		10.0	90.77	4	mg/L		98	90 - 110	

Lab Sample ID: 860-13937-4 MSD  
Matrix: Water  
Analysis Batch: 28078

Client Sample ID: MW-16  
Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.		RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits	RPD	Limit	
Chloride	234		10.0	250.5	4	mg/L		163	90 - 110	0	20	
Fluoride	<0.500	U	10.0	9.991		mg/L		100	90 - 110	0	20	
Sulfate	81.0		10.0	90.06	4	mg/L		91	90 - 110	1	20	

Lab Sample ID: 860-13937-5 MS  
Matrix: Water  
Analysis Batch: 28078

Client Sample ID: MW-12  
Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	
	Result	Qualifier	Added	Result	Qualifier				Limits	
Chloride	77.6		10.0	87.06	4	mg/L		95	90 - 110	
Fluoride	<0.500	U	10.0	10.15		mg/L		101	90 - 110	
Sulfate	40.7	F2	10.0	95.08	4	mg/L		544	90 - 110	

Lab Sample ID: 860-13937-5 MSD  
Matrix: Water  
Analysis Batch: 28078

Client Sample ID: MW-12  
Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.		RPD	RPD
	Result	Qualifier	Added	Result	Qualifier				Limits	RPD	Limit	
Chloride	77.6		10.0	88.46	4	mg/L		109	90 - 110	2	20	
Fluoride	<0.500	U	10.0	10.23		mg/L		102	90 - 110	1	20	
Sulfate	40.7	F2	10.0	231.3	4 F2	mg/L		1906	90 - 110	83	20	

## Method: 6010B - Metals (ICP)

Lab Sample ID: MB 860-27065/1-B  
Matrix: Water  
Analysis Batch: 27724

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 27309

Analyte	MB	MB	RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Calcium	<0.200	U	0.200	mg/L		10/20/21 09:10	10/21/21 19:54	1

Lab Sample ID: LCS 860-27065/2-B  
Matrix: Water  
Analysis Batch: 27724

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 27309

Analyte	Spike	Added	LCS	LCS	Unit	D	%Rec	%Rec.	
			Result	Qualifier				Limits	
Calcium	25.0	25.72	mg/L		103	80 - 120			

# QC Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Method: 6010B - Metals (ICP) (Continued)

**Lab Sample ID:** LCSD 860-27065/3-B  
**Matrix:** Water  
**Analysis Batch:** 27724

**Client Sample ID:** Lab Control Sample Dup  
**Prep Type:** Total/NA  
**Prep Batch:** 27309

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	25.0	25.58		mg/L		102	80 - 120	1	20

**Lab Sample ID:** MB 860-27245/1-B  
**Matrix:** Water  
**Analysis Batch:** 27885

**Client Sample ID:** Method Blank  
**Prep Type:** Total/NA  
**Prep Batch:** 27505

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	<0.200	U	0.200	mg/L		10/21/21 09:21	10/22/21 19:23	1

**Lab Sample ID:** LCS 860-27245/2-B  
**Matrix:** Water  
**Analysis Batch:** 27885

**Client Sample ID:** Lab Control Sample  
**Prep Type:** Total/NA  
**Prep Batch:** 27505

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	25.0	25.75		mg/L		103	80 - 120

**Lab Sample ID:** LCSD 860-27245/3-B  
**Matrix:** Water  
**Analysis Batch:** 27885

**Client Sample ID:** Lab Control Sample Dup  
**Prep Type:** Total/NA  
**Prep Batch:** 27505

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	25.0	25.86		mg/L		103	80 - 120	0	20

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

**Lab Sample ID:** MB 860-27301/1-A  
**Matrix:** Water  
**Analysis Batch:** 30118

**Client Sample ID:** Method Blank  
**Prep Type:** Total/NA  
**Prep Batch:** 27301

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.0100	U	0.0100	mg/L		10/20/21 09:02	11/10/21 12:35	1

**Lab Sample ID:** LCS 860-27301/2-A  
**Matrix:** Water  
**Analysis Batch:** 30118

**Client Sample ID:** Lab Control Sample  
**Prep Type:** Total/NA  
**Prep Batch:** 27301

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.100	0.09573		mg/L		96	80 - 120

**Lab Sample ID:** LCSD 860-27301/3-A  
**Matrix:** Water  
**Analysis Batch:** 30118

**Client Sample ID:** Lab Control Sample Dup  
**Prep Type:** Total/NA  
**Prep Batch:** 27301

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.100	0.09516		mg/L		95	80 - 120	1	20

# QC Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

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

**Lab Sample ID: MB 860-27961/1**  
**Matrix: Water**  
**Analysis Batch: 27961**

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<5.00	U	5.00	mg/L			10/25/21 11:25	1

**Lab Sample ID: LCS 860-27961/2**  
**Matrix: Water**  
**Analysis Batch: 27961**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	1075		mg/L		108	80 - 120

**Lab Sample ID: LCSD 860-27961/3**  
**Matrix: Water**  
**Analysis Batch: 27961**

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids	1000	1072		mg/L		107	80 - 120	0	10

**Lab Sample ID: 860-13937-5 DU**  
**Matrix: Water**  
**Analysis Batch: 27961**

**Client Sample ID: MW-12**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	390		361.0		mg/L		8	10

# QC Association Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## HPLC/IC

### Analysis Batch: 28078

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-1	MW-7	Total/NA	Water	300.0	
860-13937-1	MW-7	Total/NA	Water	300.0	
860-13937-2	DUP	Total/NA	Water	300.0	
860-13937-2	DUP	Total/NA	Water	300.0	
860-13937-3	MW-11	Total/NA	Water	300.0	
860-13937-3	MW-11	Total/NA	Water	300.0	
860-13937-4	MW-16	Total/NA	Water	300.0	
860-13937-5	MW-12	Total/NA	Water	300.0	
860-13937-6	MW-13	Total/NA	Water	300.0	
860-13937-7	MW-15	Total/NA	Water	300.0	
860-13937-8	MW-14	Total/NA	Water	300.0	
860-13937-9	MW-17	Total/NA	Water	300.0	
860-13937-9	MW-17	Total/NA	Water	300.0	
MB 860-28078/3	Method Blank	Total/NA	Water	300.0	
MB 860-28078/49	Method Blank	Total/NA	Water	300.0	
LCS 860-28078/4	Lab Control Sample	Total/NA	Water	300.0	
LCS 860-28078/50	Lab Control Sample	Total/NA	Water	300.0	
LCS 860-28078/5	Lab Control Sample Dup	Total/NA	Water	300.0	
LCS 860-28078/51	Lab Control Sample Dup	Total/NA	Water	300.0	
860-13937-4 MS	MW-16	Total/NA	Water	300.0	
860-13937-4 MSD	MW-16	Total/NA	Water	300.0	
860-13937-5 MS	MW-12	Total/NA	Water	300.0	
860-13937-5 MSD	MW-12	Total/NA	Water	300.0	

## Metals

### Filtration Batch: 27065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 860-27065/1-B	Method Blank	Total/NA	Water	Filtration	
LCS 860-27065/2-B	Lab Control Sample	Total/NA	Water	Filtration	
LCS 860-27065/3-B	Lab Control Sample Dup	Total/NA	Water	Filtration	

### Filtration Batch: 27245

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 860-27245/1-B	Method Blank	Total/NA	Water	Filtration	
LCS 860-27245/2-B	Lab Control Sample	Total/NA	Water	Filtration	
LCS 860-27245/3-B	Lab Control Sample Dup	Total/NA	Water	Filtration	

### Prep Batch: 27301

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-1	MW-7	Total/NA	Water	3010A	
860-13937-2	DUP	Total/NA	Water	3010A	
860-13937-3	MW-11	Total/NA	Water	3010A	
860-13937-4	MW-16	Total/NA	Water	3010A	
860-13937-5	MW-12	Total/NA	Water	3010A	
860-13937-6	MW-13	Total/NA	Water	3010A	
860-13937-7	MW-15	Total/NA	Water	3010A	
860-13937-8	MW-14	Total/NA	Water	3010A	
860-13937-9	MW-17	Total/NA	Water	3010A	
MB 860-27301/1-A	Method Blank	Total/NA	Water	3010A	
LCS 860-27301/2-A	Lab Control Sample	Total/NA	Water	3010A	

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# QC Association Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Metals (Continued)

### Prep Batch: 27301 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCSD 860-27301/3-A	Lab Control Sample Dup	Total/NA	Water	3010A	

### Prep Batch: 27309

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-1	MW-7	Total/NA	Water	3010A	
860-13937-2	DUP	Total/NA	Water	3010A	
860-13937-3	MW-11	Total/NA	Water	3010A	
860-13937-4	MW-16	Total/NA	Water	3010A	
860-13937-5	MW-12	Total/NA	Water	3010A	
MB 860-27065/1-B	Method Blank	Total/NA	Water	3010A	27065
LCS 860-27065/2-B	Lab Control Sample	Total/NA	Water	3010A	27065
LCSD 860-27065/3-B	Lab Control Sample Dup	Total/NA	Water	3010A	27065

### Prep Batch: 27505

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-6	MW-13	Total/NA	Water	3010A	
860-13937-7	MW-15	Total/NA	Water	3010A	
860-13937-8	MW-14	Total/NA	Water	3010A	
860-13937-9	MW-17	Total/NA	Water	3010A	
MB 860-27245/1-B	Method Blank	Total/NA	Water	3010A	27245
LCS 860-27245/2-B	Lab Control Sample	Total/NA	Water	3010A	27245
LCSD 860-27245/3-B	Lab Control Sample Dup	Total/NA	Water	3010A	27245

### Analysis Batch: 27724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-1	MW-7	Total/NA	Water	6010B	27309
860-13937-2	DUP	Total/NA	Water	6010B	27309
860-13937-3	MW-11	Total/NA	Water	6010B	27309
860-13937-4	MW-16	Total/NA	Water	6010B	27309
860-13937-5	MW-12	Total/NA	Water	6010B	27309
MB 860-27065/1-B	Method Blank	Total/NA	Water	6010B	27309
LCS 860-27065/2-B	Lab Control Sample	Total/NA	Water	6010B	27309
LCSD 860-27065/3-B	Lab Control Sample Dup	Total/NA	Water	6010B	27309

### Analysis Batch: 27885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-6	MW-13	Total/NA	Water	6010B	27505
860-13937-7	MW-15	Total/NA	Water	6010B	27505
860-13937-8	MW-14	Total/NA	Water	6010B	27505
860-13937-9	MW-17	Total/NA	Water	6010B	27505
MB 860-27245/1-B	Method Blank	Total/NA	Water	6010B	27505
LCS 860-27245/2-B	Lab Control Sample	Total/NA	Water	6010B	27505
LCSD 860-27245/3-B	Lab Control Sample Dup	Total/NA	Water	6010B	27505

### Analysis Batch: 30118

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-1	MW-7	Total/NA	Water	6020A	27301
860-13937-2	DUP	Total/NA	Water	6020A	27301
860-13937-3	MW-11	Total/NA	Water	6020A	27301
860-13937-4	MW-16	Total/NA	Water	6020A	27301
860-13937-5	MW-12	Total/NA	Water	6020A	27301

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# QC Association Summary

Client: Hydrex Environmental  
 Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Metals (Continued)

### Analysis Batch: 30118 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-6	MW-13	Total/NA	Water	6020A	27301
860-13937-7	MW-15	Total/NA	Water	6020A	27301
860-13937-8	MW-14	Total/NA	Water	6020A	27301
860-13937-9	MW-17	Total/NA	Water	6020A	27301
MB 860-27301/1-A	Method Blank	Total/NA	Water	6020A	27301
LCS 860-27301/2-A	Lab Control Sample	Total/NA	Water	6020A	27301
LCSD 860-27301/3-A	Lab Control Sample Dup	Total/NA	Water	6020A	27301

## General Chemistry

### Analysis Batch: 27613

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-1	MW-7	Total/NA	Water	SM 4500 H+ B	
860-13937-2	DUP	Total/NA	Water	SM 4500 H+ B	
860-13937-3	MW-11	Total/NA	Water	SM 4500 H+ B	
860-13937-4	MW-16	Total/NA	Water	SM 4500 H+ B	
860-13937-5	MW-12	Total/NA	Water	SM 4500 H+ B	
860-13937-6	MW-13	Total/NA	Water	SM 4500 H+ B	
860-13937-7	MW-15	Total/NA	Water	SM 4500 H+ B	
860-13937-8	MW-14	Total/NA	Water	SM 4500 H+ B	
860-13937-9	MW-17	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 27961

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-13937-1	MW-7	Total/NA	Water	SM 2540C	
860-13937-2	DUP	Total/NA	Water	SM 2540C	
860-13937-3	MW-11	Total/NA	Water	SM 2540C	
860-13937-4	MW-16	Total/NA	Water	SM 2540C	
860-13937-5	MW-12	Total/NA	Water	SM 2540C	
860-13937-6	MW-13	Total/NA	Water	SM 2540C	
860-13937-7	MW-15	Total/NA	Water	SM 2540C	
860-13937-8	MW-14	Total/NA	Water	SM 2540C	
860-13937-9	MW-17	Total/NA	Water	SM 2540C	
MB 860-27961/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 860-27961/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 860-27961/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
860-13937-5 DU	MW-12	Total/NA	Water	SM 2540C	

# Lab Chronicle

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Client Sample ID: MW-7

Lab Sample ID: 860-13937-1

Date Collected: 10/18/21 11:24

Matrix: Water

Date Received: 10/19/21 10:12

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			28078	10/26/21 14:51	ANP	XEN STF
Total/NA	Analysis	300.0		10			28078	10/26/21 15:01	ANP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27309	10/20/21 09:10	PB	XEN STF
Total/NA	Analysis	6010B		50			27724	10/21/21 23:17	DP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27301	10/20/21 09:02	PB	XEN STF
Total/NA	Analysis	6020A		1			30118	11/10/21 12:54	DCL	XEN STF
Total/NA	Analysis	SM 2540C		1	50 mL	200 mL	27961	10/25/21 11:25	ADL	XEN STF
Total/NA	Analysis	SM 4500 H+ B		1			27613	10/21/21 16:57	JP	XEN STF

## Client Sample ID: DUP

Lab Sample ID: 860-13937-2

Date Collected: 10/18/21 11:24

Matrix: Water

Date Received: 10/19/21 10:12

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			28078	10/26/21 15:12	ANP	XEN STF
Total/NA	Analysis	300.0		10			28078	10/26/21 15:22	ANP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27309	10/20/21 09:10	PB	XEN STF
Total/NA	Analysis	6010B		50			27724	10/21/21 23:28	DP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27301	10/20/21 09:02	PB	XEN STF
Total/NA	Analysis	6020A		1			30118	11/10/21 12:57	DCL	XEN STF
Total/NA	Analysis	SM 2540C		1	50 mL	200 mL	27961	10/25/21 11:25	ADL	XEN STF
Total/NA	Analysis	SM 4500 H+ B		1			27613	10/21/21 16:57	JP	XEN STF

## Client Sample ID: MW-11

Lab Sample ID: 860-13937-3

Date Collected: 10/18/21 12:06

Matrix: Water

Date Received: 10/19/21 10:12

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			28078	10/26/21 15:32	ANP	XEN STF
Total/NA	Analysis	300.0		10			28078	10/27/21 01:03	ANP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27309	10/20/21 09:10	PB	XEN STF
Total/NA	Analysis	6010B		50			27724	10/21/21 23:31	DP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27301	10/20/21 09:02	PB	XEN STF
Total/NA	Analysis	6020A		1			30118	11/10/21 13:00	DCL	XEN STF
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	27961	10/25/21 11:25	ADL	XEN STF
Total/NA	Analysis	SM 4500 H+ B		1			27613	10/21/21 16:57	JP	XEN STF

## Client Sample ID: MW-16

Lab Sample ID: 860-13937-4

Date Collected: 10/18/21 12:46

Matrix: Water

Date Received: 10/19/21 10:12

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			28078	10/26/21 19:31	ANP	XEN STF

# Lab Chronicle

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

**Client Sample ID: MW-16**

**Lab Sample ID: 860-13937-4**

Date Collected: 10/18/21 12:46

Matrix: Water

Date Received: 10/19/21 10:12

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	27309	10/20/21 09:10	PB	XEN STF
Total/NA	Analysis	6010B		1			27724	10/21/21 20:34	DP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27301	10/20/21 09:02	PB	XEN STF
Total/NA	Analysis	6020A		1			30118	11/10/21 13:03	DCL	XEN STF
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	27961	10/25/21 11:25	ADL	XEN STF
Total/NA	Analysis	SM 4500 H+ B		1			27613	10/21/21 16:57	JP	XEN STF

**Client Sample ID: MW-12**

**Lab Sample ID: 860-13937-5**

Date Collected: 10/18/21 13:27

Matrix: Water

Date Received: 10/19/21 10:12

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			28078	10/26/21 20:03	ANP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27309	10/20/21 09:10	PB	XEN STF
Total/NA	Analysis	6010B		1			27724	10/21/21 20:37	DP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27301	10/20/21 09:02	PB	XEN STF
Total/NA	Analysis	6020A		1			30118	11/10/21 13:13	DCL	XEN STF
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	27961	10/25/21 11:25	ADL	XEN STF
Total/NA	Analysis	SM 4500 H+ B		1			27613	10/21/21 16:57	JP	XEN STF

**Client Sample ID: MW-13**

**Lab Sample ID: 860-13937-6**

Date Collected: 10/18/21 13:58

Matrix: Water

Date Received: 10/19/21 10:12

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			28078	10/26/21 20:34	ANP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27505	10/21/21 09:20	PB	XEN STF
Total/NA	Analysis	6010B		1			27885	10/22/21 20:17	DP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27301	10/20/21 09:02	PB	XEN STF
Total/NA	Analysis	6020A		1			30118	11/10/21 13:16	DCL	XEN STF
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	27961	10/25/21 11:25	ADL	XEN STF
Total/NA	Analysis	SM 4500 H+ B		1			27613	10/21/21 16:57	JP	XEN STF

**Client Sample ID: MW-15**

**Lab Sample ID: 860-13937-7**

Date Collected: 10/18/21 14:33

Matrix: Water

Date Received: 10/19/21 10:12

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			28078	10/26/21 21:05	ANP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27505	10/21/21 09:20	PB	XEN STF
Total/NA	Analysis	6010B		1			27885	10/22/21 20:21	DP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27301	10/20/21 09:02	PB	XEN STF
Total/NA	Analysis	6020A		1			30118	11/10/21 13:19	DCL	XEN STF
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	27961	10/25/21 11:25	ADL	XEN STF

Eurofins Xenco, Stafford



# Lab Chronicle

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

**Client Sample ID: MW-15**

Date Collected: 10/18/21 14:33

Date Received: 10/19/21 10:12

**Lab Sample ID: 860-13937-7**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 H+ B		1			27613	10/21/21 16:57	JP	XEN STF

**Client Sample ID: MW-14**

Date Collected: 10/18/21 15:04

Date Received: 10/19/21 10:12

**Lab Sample ID: 860-13937-8**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			28078	10/26/21 21:15	ANP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27505	10/21/21 09:20	PB	XEN STF
Total/NA	Analysis	6010B		50			27885	10/22/21 20:39	DP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27301	10/20/21 09:02	PB	XEN STF
Total/NA	Analysis	6020A		1			30118	11/10/21 13:22	DCL	XEN STF
Total/NA	Analysis	SM 2540C		1	50 mL	200 mL	27961	10/25/21 11:25	ADL	XEN STF
Total/NA	Analysis	SM 4500 H+ B		1			27613	10/21/21 16:57	JP	XEN STF

**Client Sample ID: MW-17**

Date Collected: 10/18/21 15:32

Date Received: 10/19/21 10:12

**Lab Sample ID: 860-13937-9**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1			28078	10/26/21 21:36	ANP	XEN STF
Total/NA	Analysis	300.0		10			28078	10/26/21 21:46	ANP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27505	10/21/21 09:20	PB	XEN STF
Total/NA	Analysis	6010B		50			27885	10/22/21 20:50	DP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	27301	10/20/21 09:02	PB	XEN STF
Total/NA	Analysis	6020A		1			30118	11/10/21 13:25	DCL	XEN STF
Total/NA	Analysis	SM 2540C		1	50 mL	200 mL	27961	10/25/21 11:25	ADL	XEN STF
Total/NA	Analysis	SM 4500 H+ B		1			27613	10/21/21 16:57	JP	XEN STF

**Laboratory References:**

XEN STF = Eurofins Xenco, Stafford, 4145 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

# Accreditation/Certification Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

## Laboratory: Eurofins Xenco, Stafford

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	21-038-0	08-04-22
Florida	NELAP	E871002	06-30-22
Louisiana	NELAP	03054	06-30-22
Oklahoma	State	1306	08-31-22
Texas	NELAP	T104704215-21-44	06-30-22
Texas	TCEQ Water Supply	T104704215	12-31-21

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# Method Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	XEN STF
6010B	Metals (ICP)	SW846	XEN STF
6020A	Metals (ICP/MS)	SW846	XEN STF
SM 2540C	Solids, Total Dissolved (TDS)	SM	XEN STF
SM 4500 H+ B	pH	SM	XEN STF
3010A	Preparation, Total Metals	SW846	XEN STF

#### Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

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

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

#### Laboratory References:

XEN STF = Eurofins Xenco, Stafford, 4145 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

# Sample Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-13937-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
860-13937-1	MW-7	Water	10/18/21 11:24	10/19/21 10:12
860-13937-2	DUP	Water	10/18/21 11:24	10/19/21 10:12
860-13937-3	MW-11	Water	10/18/21 12:06	10/19/21 10:12
860-13937-4	MW-16	Water	10/18/21 12:46	10/19/21 10:12
860-13937-5	MW-12	Water	10/18/21 13:27	10/19/21 10:12
860-13937-6	MW-13	Water	10/18/21 13:58	10/19/21 10:12
860-13937-7	MW-15	Water	10/18/21 14:33	10/19/21 10:12
860-13937-8	MW-14	Water	10/18/21 15:04	10/19/21 10:12
860-13937-9	MW-17	Water	10/18/21 15:32	10/19/21 10:12

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4147 Greenbriar Dr  
Stafford, TX 77477  
Phone: 281-240-4200

Chain of Custody Re



Environment Testing  
America



860-1-3937 Chain of Custody

CCO No:  
860-4966-439.1

Page: 1 of 1

Lab #:

Analysis Requested

Temp 7.5 IR ID:HOU-272  
C/F +0.0  
Corrected Temp: 2.5

Client Information  
Client Contact: Michelle Transler  
Company: Hydrex Environmental  
Address: 1120 NW State St  
City: Ft Worth TX, 75964  
State, Zip: TX, 75964  
Phone: 936-568-9451(Tel)  
Email: mtransler@hydrex-inc.com  
Project Name: Twin Oaks PP  
Project #: 86000207  
SSOW#:   
TAT Requested (days):   
Compliance Project:  Yes  No  
PO #: 1-14-1007  
MO #: 1-14-1007

Sample Identification  
Sample Date  
Sample Time  
Sample Type (G=grab)  
Matrix (Aspirator, Swab, Other)  
Preservation Code:  
Field Filtered Sample (Yes or No)  
Region (MS, MD, VA, etc)

Sample ID	Sample Date	Sample Time	Sample Type	Matrix	Preservation Code	Field Filtered Sample	Region	300_ORGFM_28D	CI, F, & SO4; SM4600_H+	pH	6020A Boron; 6010B Calcium	2540C_Calc	TDS	Total Number of containers	Special Instructions/Note:
MM-7	10/18/21	1124	G	W		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			3	
DUP	10/18/21	1124	G	W		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			3	
MM-11	10/18/21	1206	G	W		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			3	
MM-16	10/18/21	1246	G	W		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			3	
MM-12	10/18/21	1327	G	W		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			3	
MM-13	10/18/21	1358	G	W		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			3	
MM-15	10/18/21	1433	G	W		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			3	
MM-14	10/18/21	1504	G	W		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			3	
MM-17	10/18/21	1532	G	W		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>			3	

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

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

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

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Custody Seals Intact:  Yes  No Custody Seal No. \_\_\_\_\_

Special Instructions/IOC Requirements: \_\_\_\_\_

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

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Cooler Temperature(s) °C and Other Remarks: \_\_\_\_\_

## Login Sample Receipt Checklist

Client: Hydrex Environmental

Job Number: 860-13937-1

Login Number: 13937

List Source: Eurofins Xenco, Stafford

List Number: 1

Creator: Torrez, Lisandra

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

**October 2021 Event**  
**Results of Statistical Calculations**

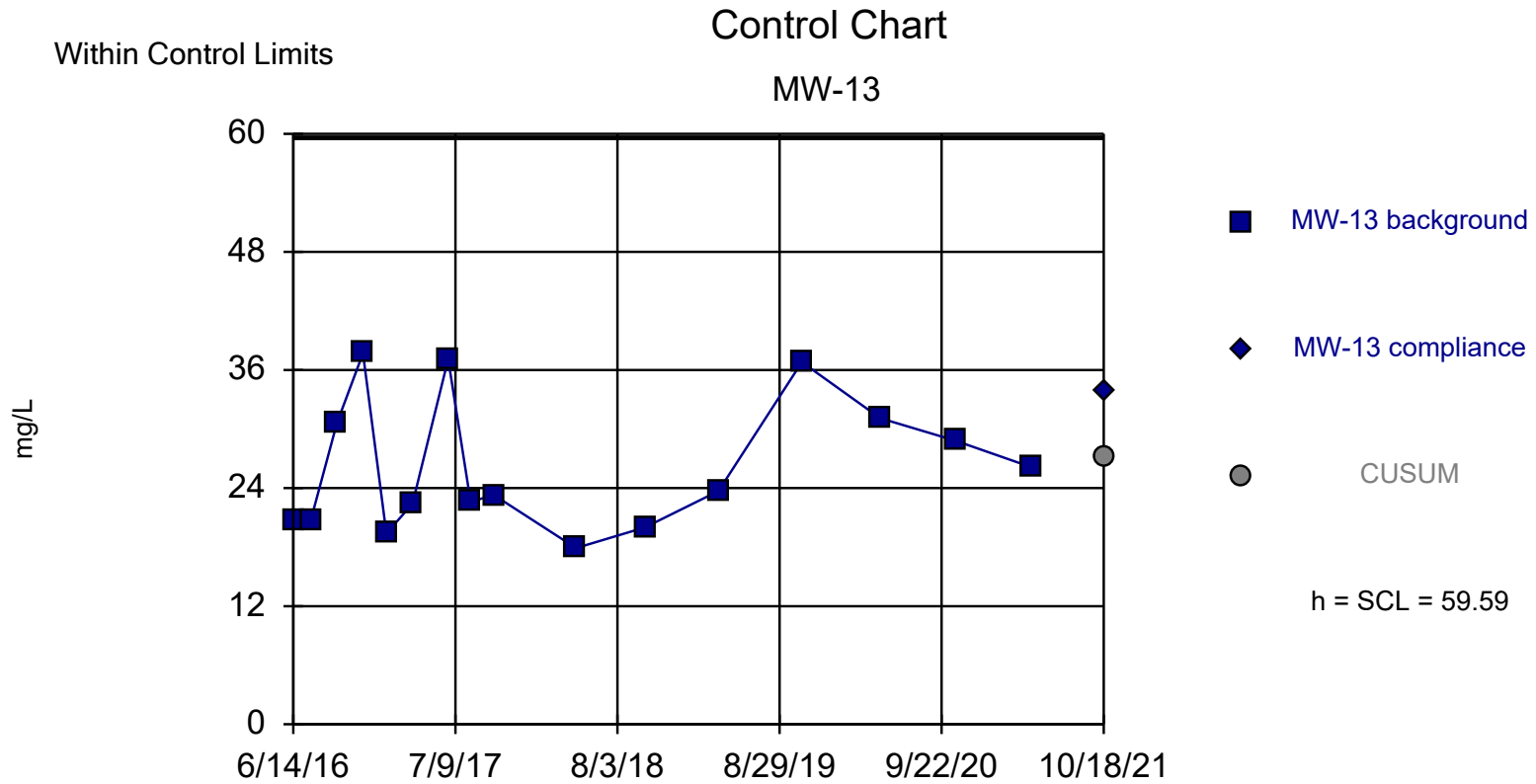
## **Control Charts and Prediction Limits**



# Shewhart-Cusum Control Chart / Rank Sum

Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks    Printed 12/29/2021, 9:28 AM

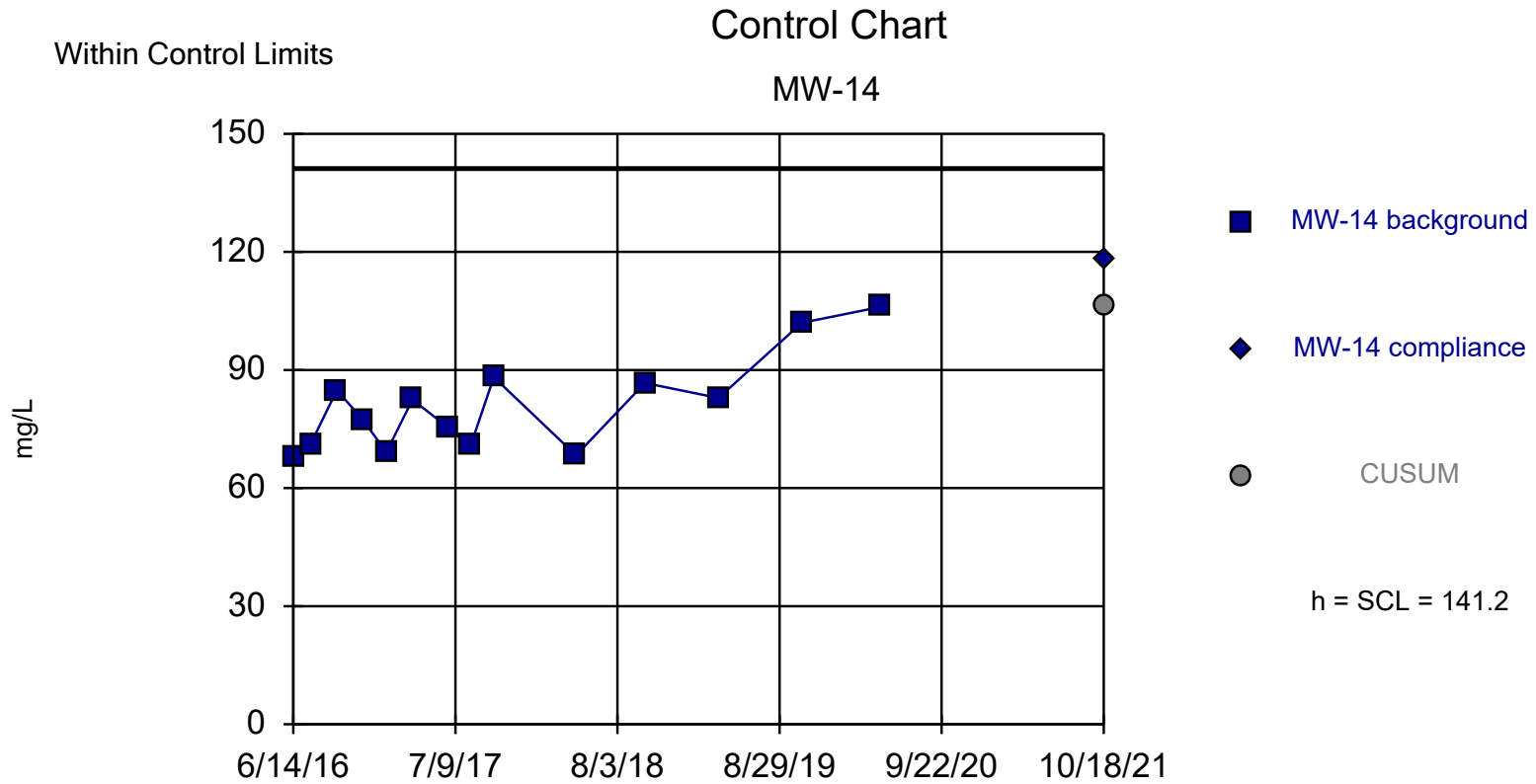
<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>h</u>	<u>SCL</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Method</u>
Calcium (mg/L)	MW-13	No	59.59	59.59	16	0	No	Param Intra
Chloride (mg/L)	MW-13	No	120.1	120.1	15	0	No	Param Intra
Fluoride (mg/L)	MW-13	No	PL=...	n/a	16	81.25	No	NP Intra PL (NDs)
pH (SU)	MW-13	No	7.7...	7.7...	16	0	No	Param Intra
Sulfate (mg/L)	MW-13	No	195.2	195.2	16	6.25	No	Param Intra
Total Dissolved Solids (mg/L)	MW-13	No	631.9	631.9	16	0	No	Param Intra
Calcium (mg/L)	MW-14	No	141.2	141.2	14	0	No	Param Intra
Chloride (mg/L)	MW-14	No	440.9	440.9	15	0	No	Param Intra
Fluoride (mg/L)	MW-14	No	PL=...	n/a	16	75	No	NP Intra PL (NDs)
pH (SU)	MW-14	No	7.5...	7.5...	16	0	x^4	Param Intra
Sulfate (mg/L)	MW-14	No	841.2	841.2	15	0	sqrt(x)	Param Intra
Total Dissolved Solids (mg/L)	MW-14	No	1940	1940	15	0	No	Param Intra
Calcium (mg/L)	MW-15	No	37.94	37.94	16	0	sqrt(x)	Param Intra
Chloride (mg/L)	MW-15	No	197.6	197.6	16	0	No	Param Intra
Fluoride (mg/L)	MW-15	No	PL=0.5	n/a	16	87.5	No	NP Intra PL (NDs)
pH (SU)	MW-15	No	7.5...	7.5...	16	0	x^4	Param Intra
Sulfate (mg/L)	MW-15	No	49.99	49.99	16	0	No	Param Intra
Total Dissolved Solids (mg/L)	MW-15	No	482.6	482.6	16	0	No	Param Intra
Calcium (mg/L)	MW-17	No	396.5	396.5	16	0	No	Param Intra
Chloride (mg/L)	MW-17	No	1728	1728	16	0	No	Param Intra
Fluoride (mg/L)	MW-17	No	PL=0.5	n/a	16	87.5	No	NP Intra PL (NDs)
pH (SU)	MW-17	No	7.7...	7.7...	16	0	No	Param Intra
Sulfate (mg/L)	MW-17	No	158.4	158.4	16	6.25	No	Param Intra
Total Dissolved Solids (mg/L)	MW-17	No	3264	3264	16	0	No	Param Intra



Background Data Summary: Mean=26.18, Std. Dev.=6.682, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8874, critical = 0.887. Report alpha = 0.000098. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

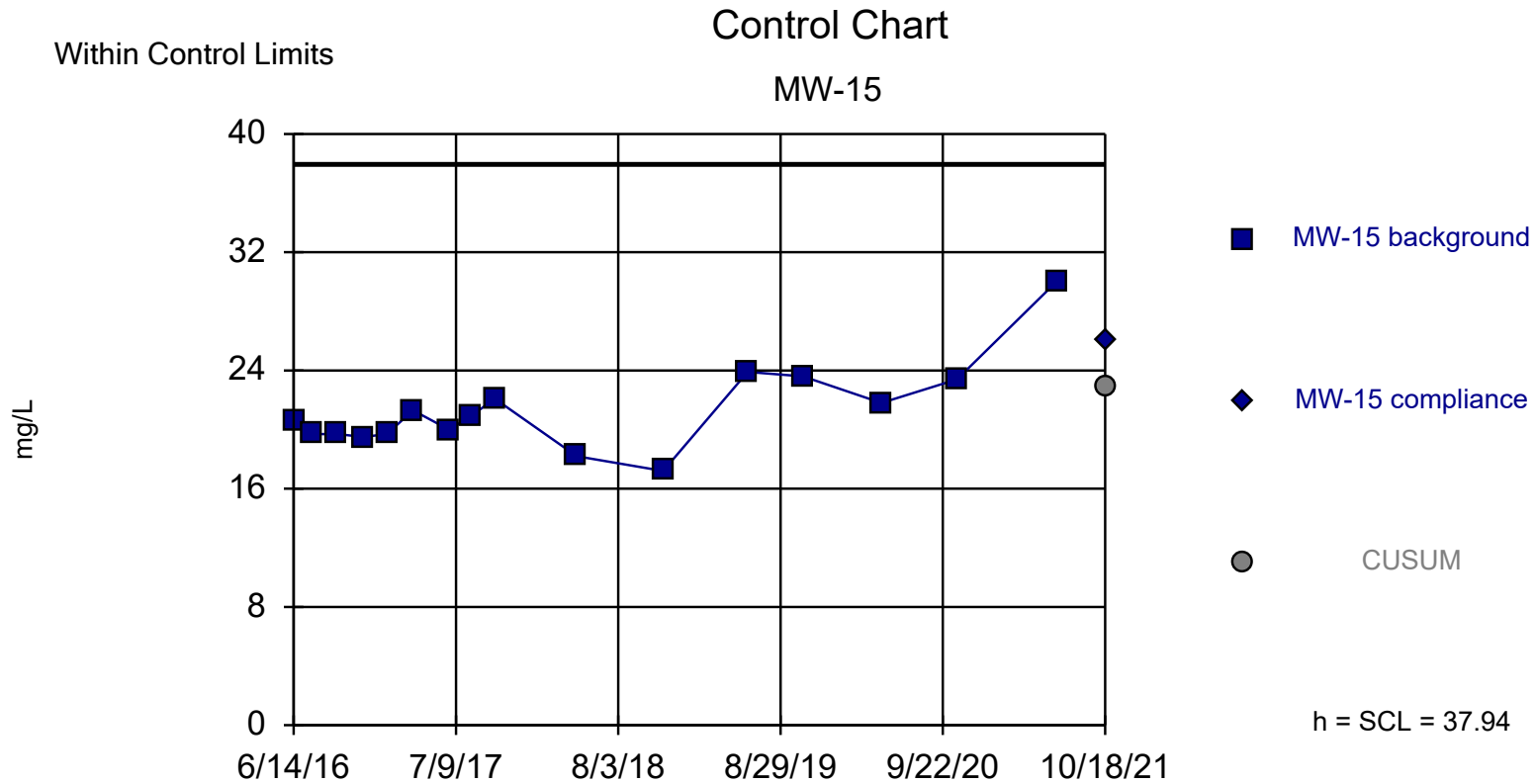
Constituent: Calcium Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



Background Data Summary: Mean=80.96, Std. Dev.=12.04, n=14. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8921, critical = 0.874. Report alpha = 0.000166. Dates ending 4/28/2020 used for control stats. Standardized h=5, SCL=5.

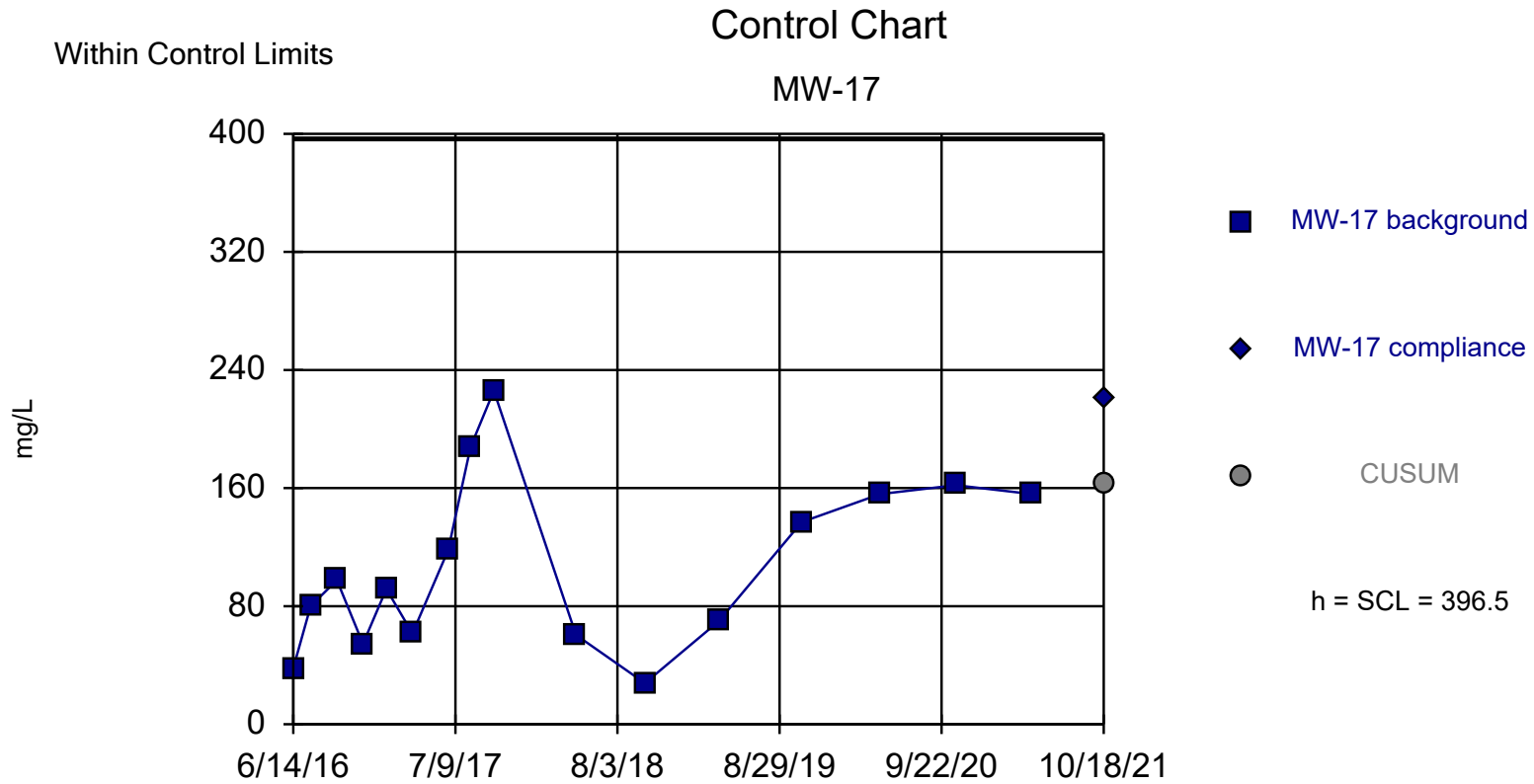
Constituent: Calcium Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



Background Data Summary (based on square root transformation): Mean=4.61, Std. Dev.=0.3099, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8969, critical = 0.887. Report alpha = 0.00012. Dates ending 6/23/2021 used for control stats. Standardized h=5, SCL=5.

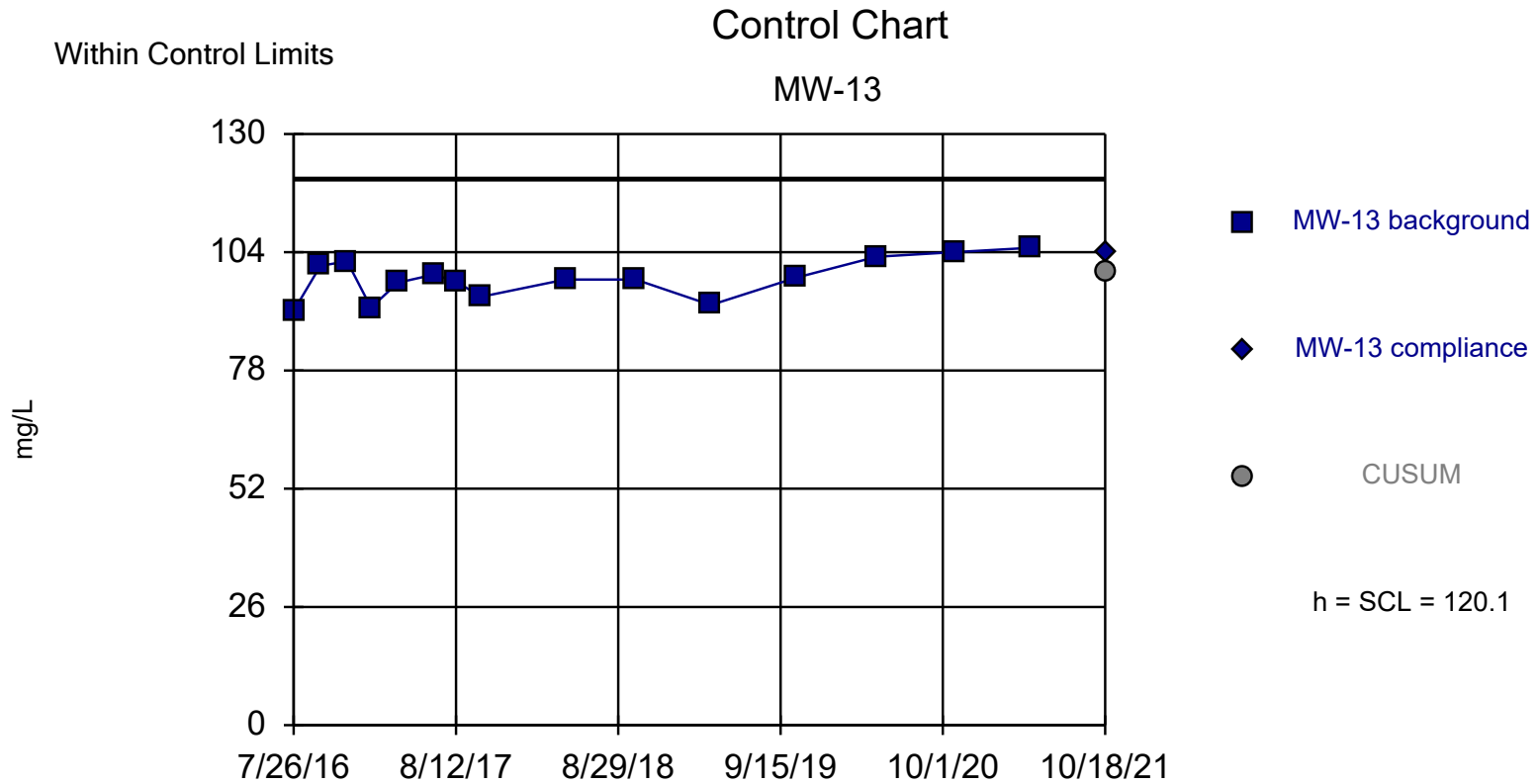
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Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



Background Data Summary: Mean=107.8, Std. Dev.=57.75, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9499, critical = 0.887. Report alpha = 0.00012. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

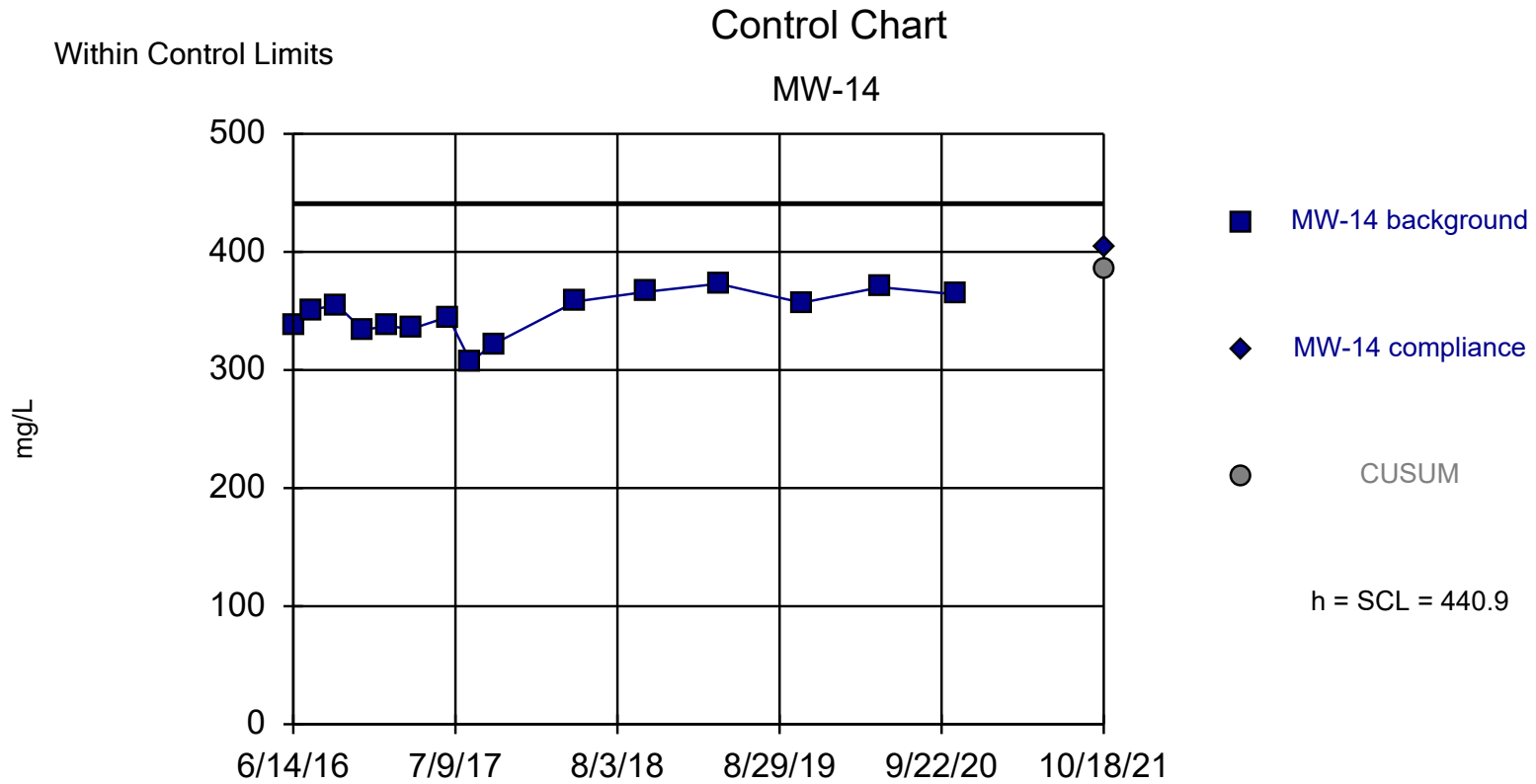
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Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



Background Data Summary: Mean=98.18, Std. Dev.=4.38, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9494, critical = 0.881. Report alpha = 0.000136. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

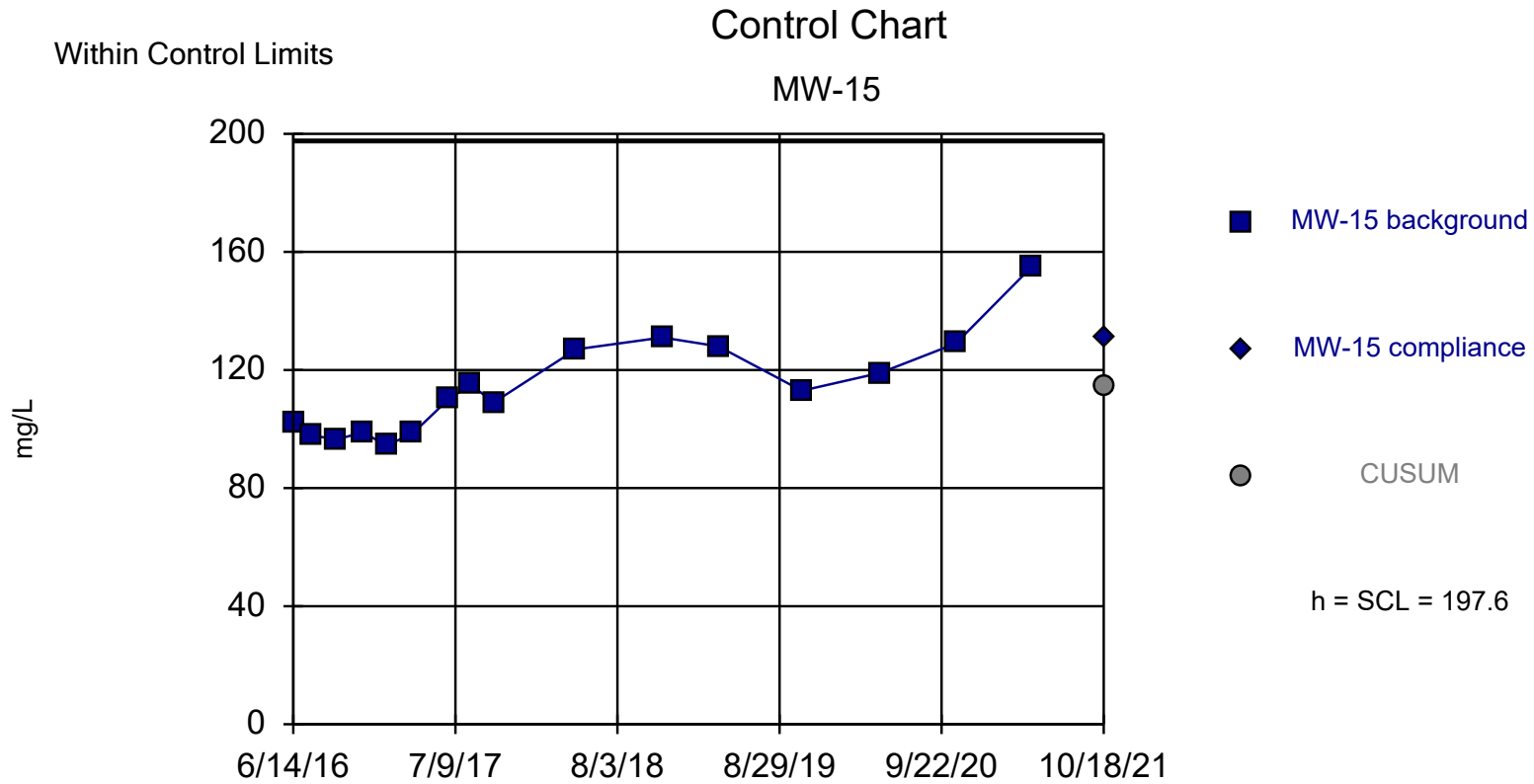
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



Background Data Summary: Mean=347.4, Std. Dev.=18.7, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9535, critical = 0.881. Report alpha = 0.000136. Dates ending 10/27/2020 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

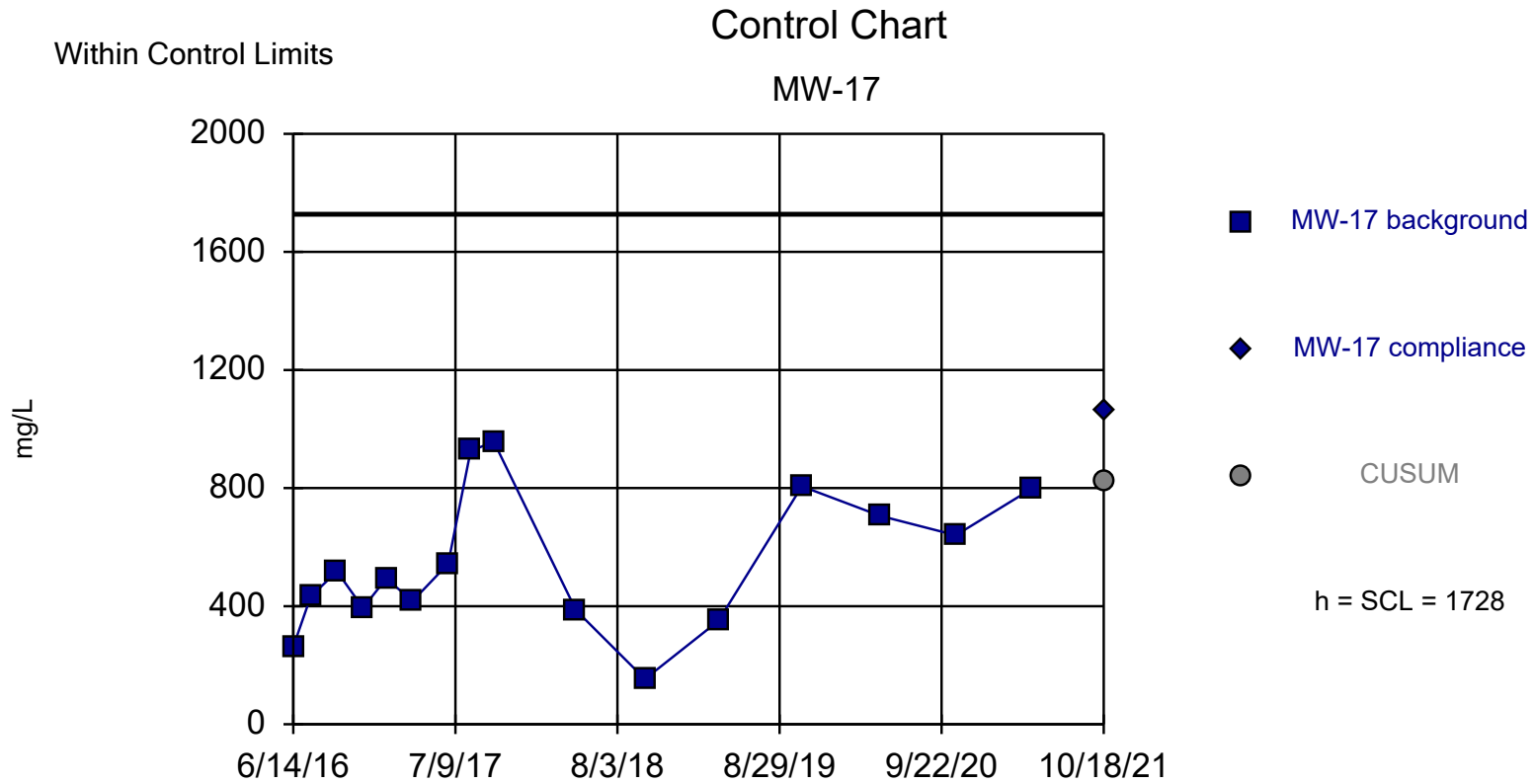


Background Data Summary: Mean=114, Std. Dev.=16.72, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9096, critical = 0.887. Report alpha = 0.0001. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks





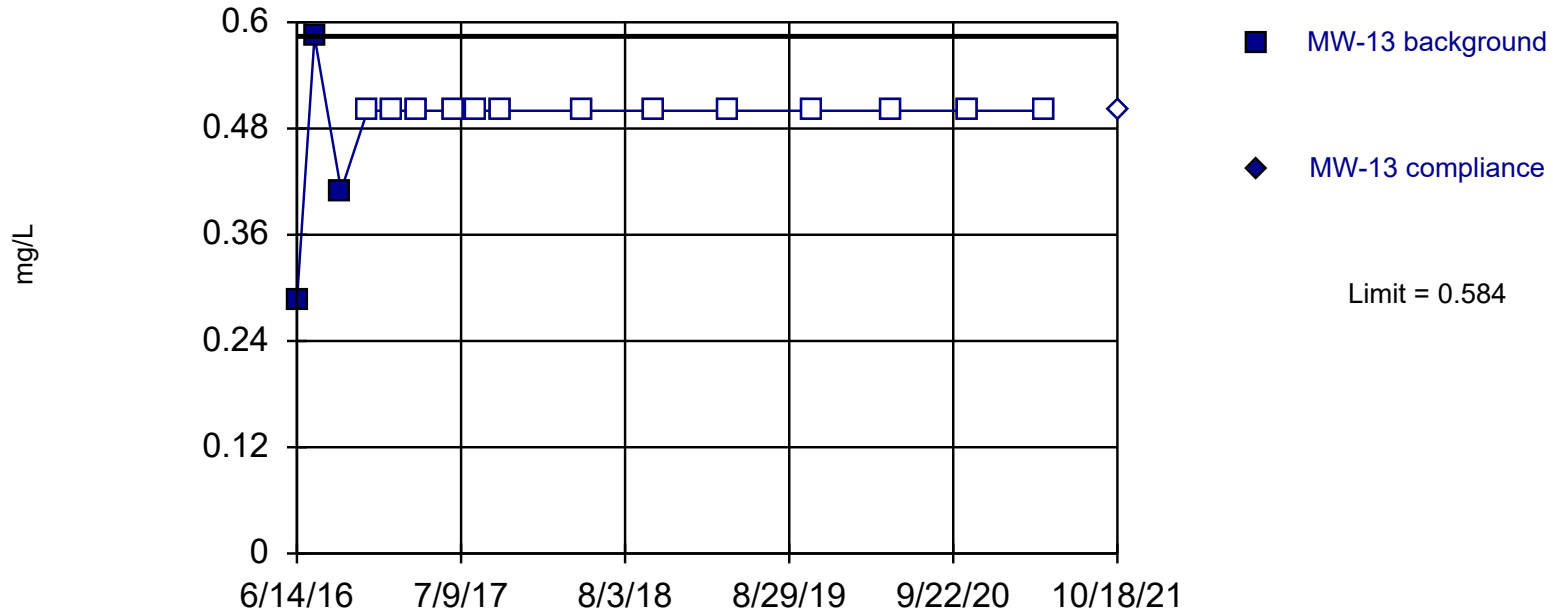
Background Data Summary: Mean=549, Std. Dev.=235.7, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9592, critical = 0.887. Report alpha = 0.0001. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

### Prediction Limit Intrawell Non-parametric



Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 16 background values. 81.25% NDs. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Seasonality was not detected with 95% confidence.

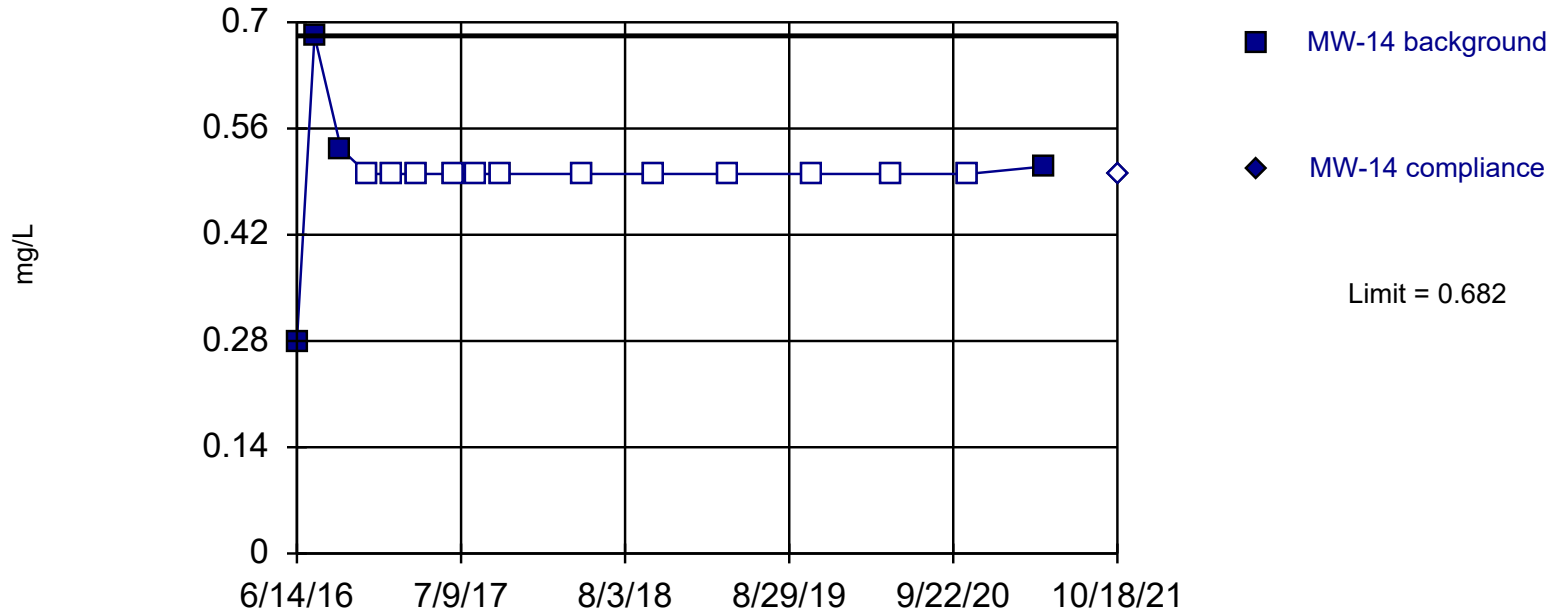
Constituent: Fluoride Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

## Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 16 background values. 75% NDs. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Seasonality was not detected with 95% confidence.

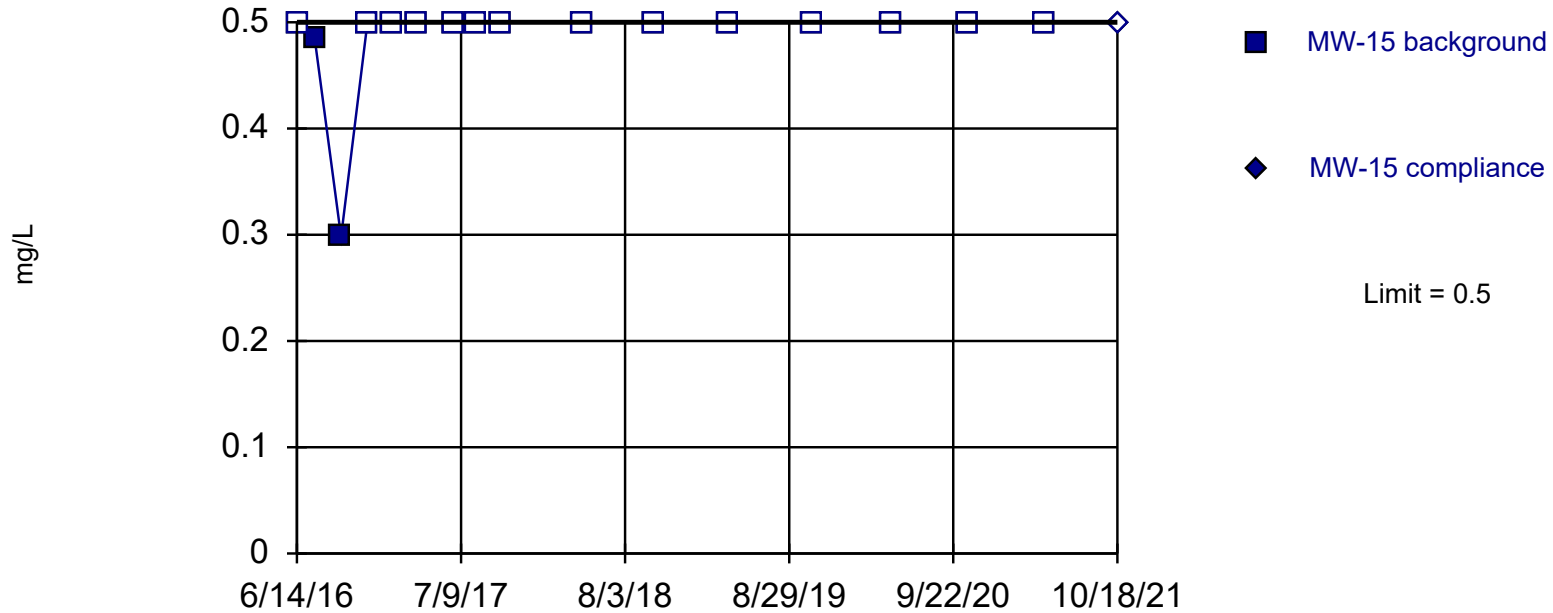
Constituent: Fluoride Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

### Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 16 background values. 87.5% NDs. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Seasonality was not detected with 95% confidence.

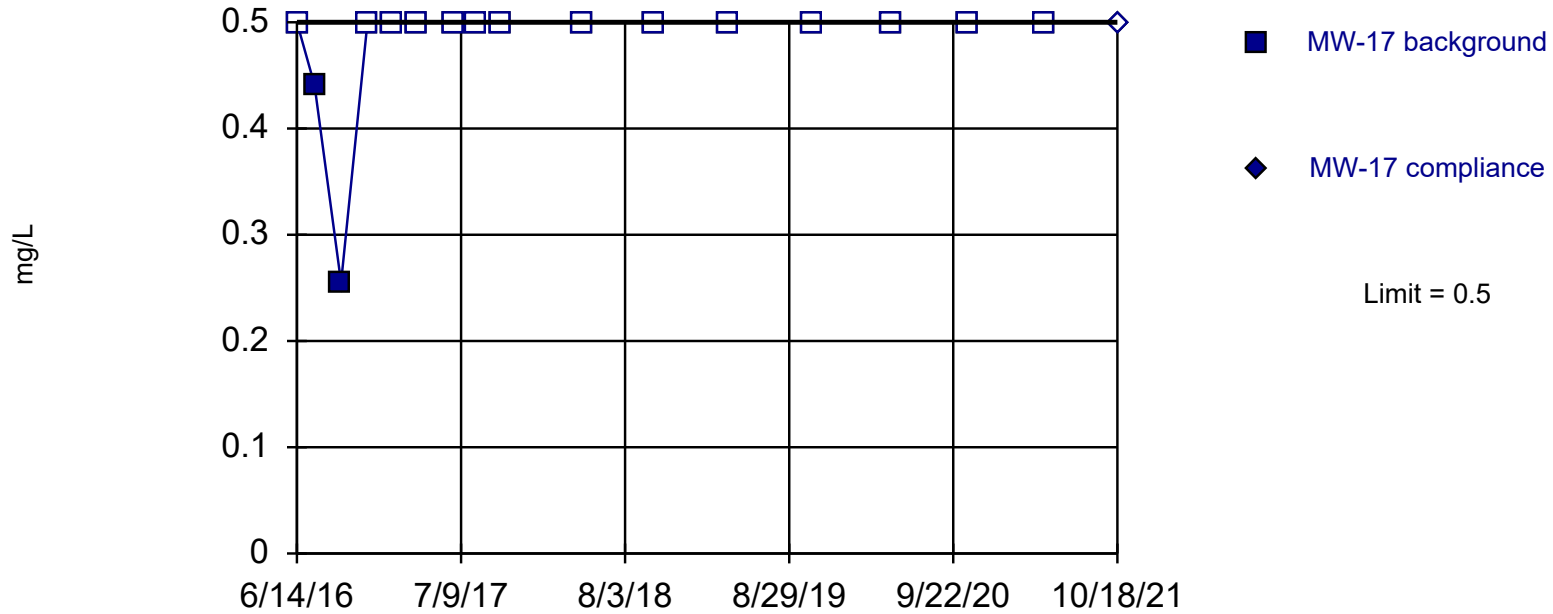
Constituent: Fluoride Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

### Prediction Limit

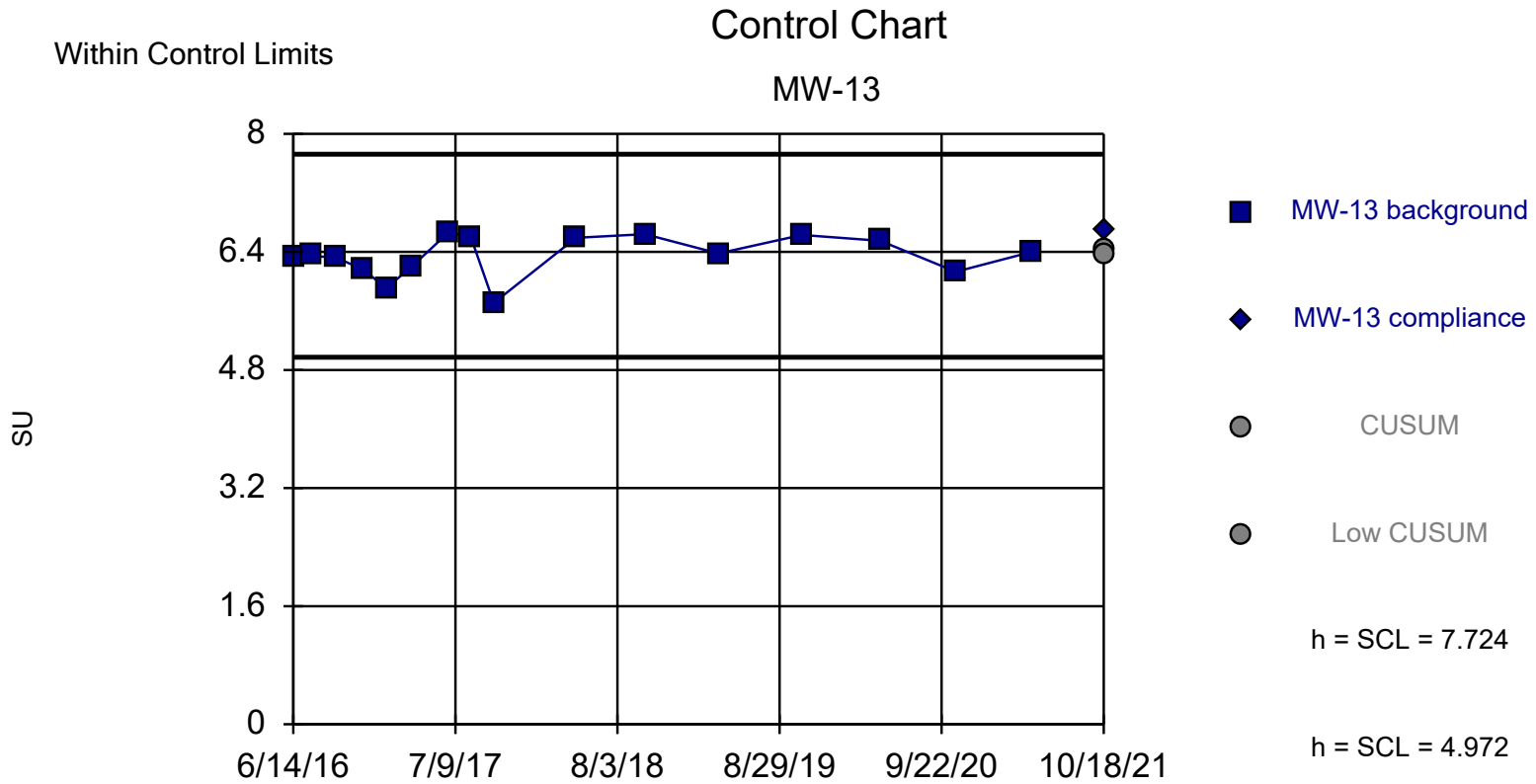
Intrawell Non-parametric



Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 16 background values. 87.5% NDs. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Seasonality was not detected with 95% confidence.

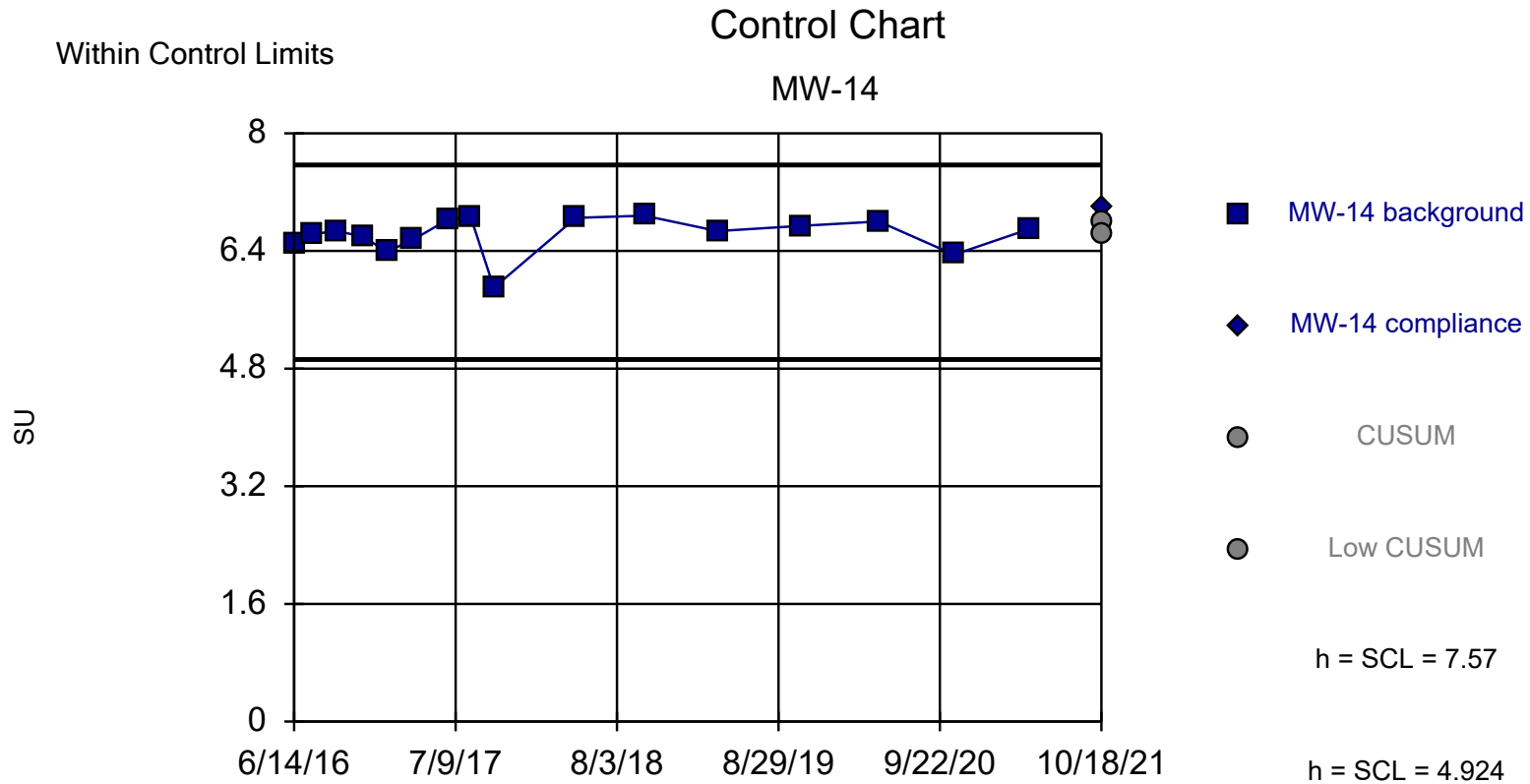
Constituent: Fluoride Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



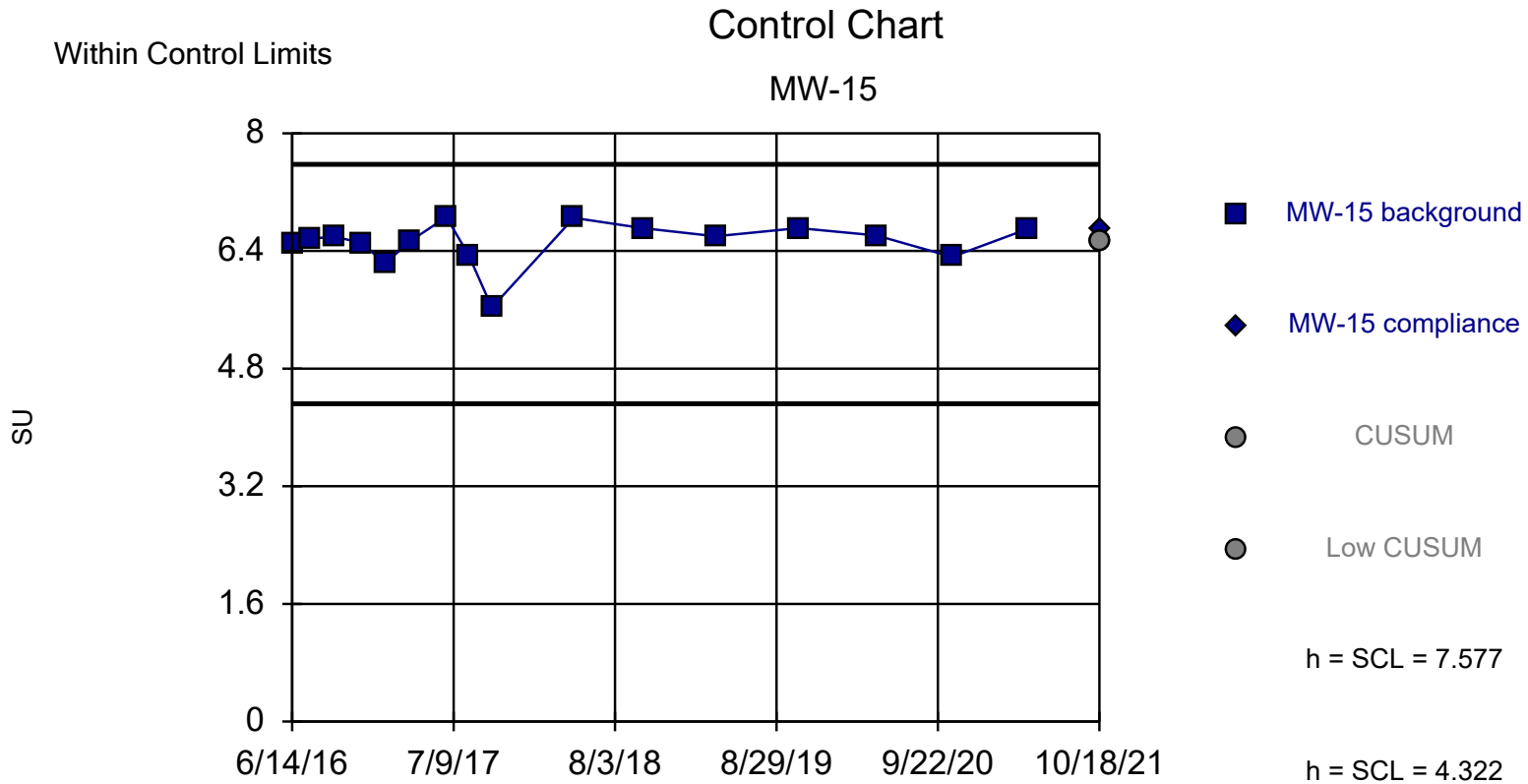
Background Data Summary: Mean=6.348, Std. Dev.=0.2752, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9107, critical = 0.887. Report alpha = 0.0001. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: pH    Analysis Run 12/29/2021 9:27 AM    View: Control Chart 2021 BER  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary (based on  $x^4$  transformation): Mean=1936, Std. Dev.=269.6, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @ $\alpha = 0.05$ , calculated = 0.8958, critical = 0.887. Report  $\alpha = 0.0001$ . Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: pH    Analysis Run 12/29/2021 9:27 AM    View: Control Chart 2021 BER  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

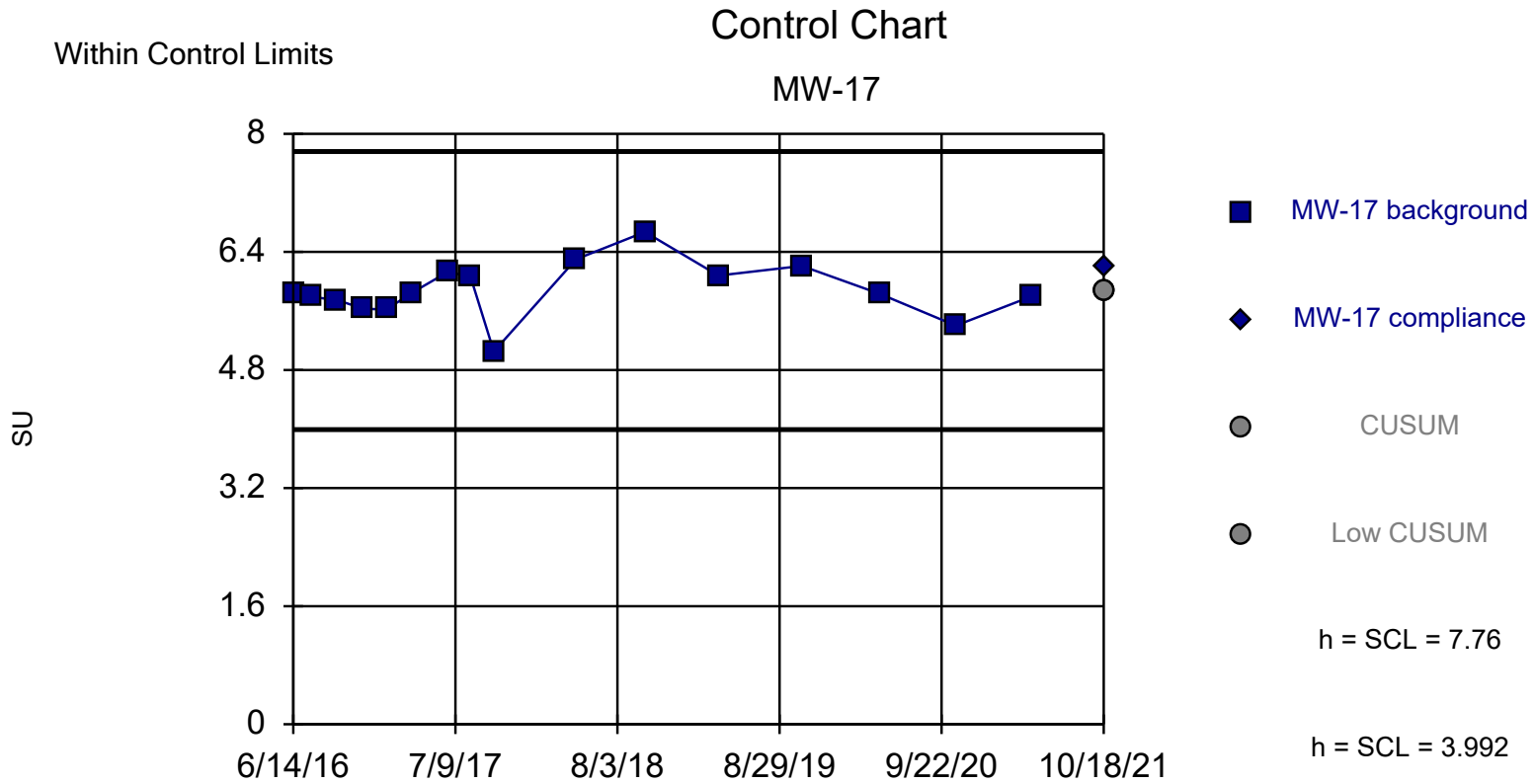


Background Data Summary (based on  $x^4$  transformation): Mean=1823, Std. Dev.=294.8, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8946, critical = 0.887. Report alpha = 0.0001. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: pH Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

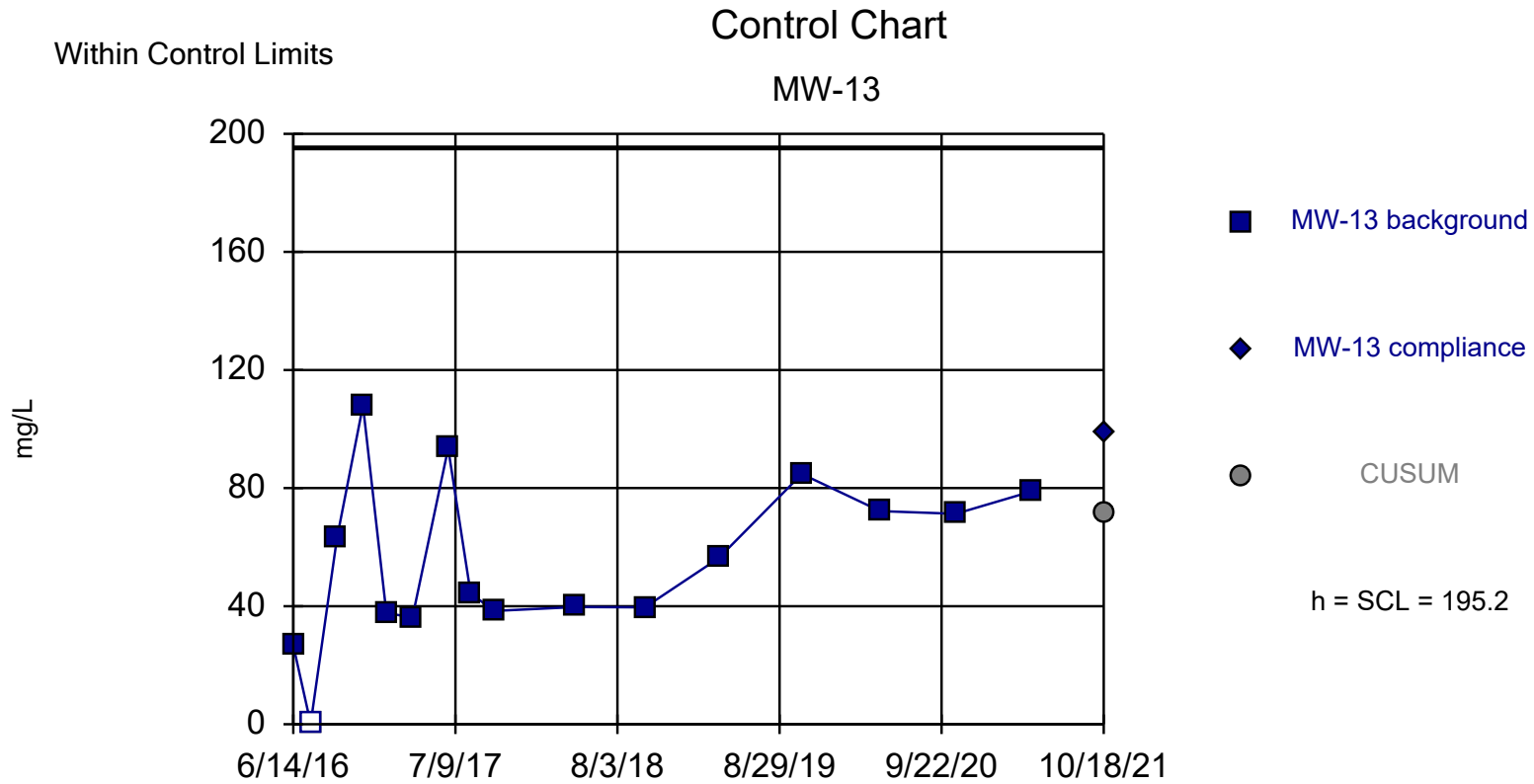
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks





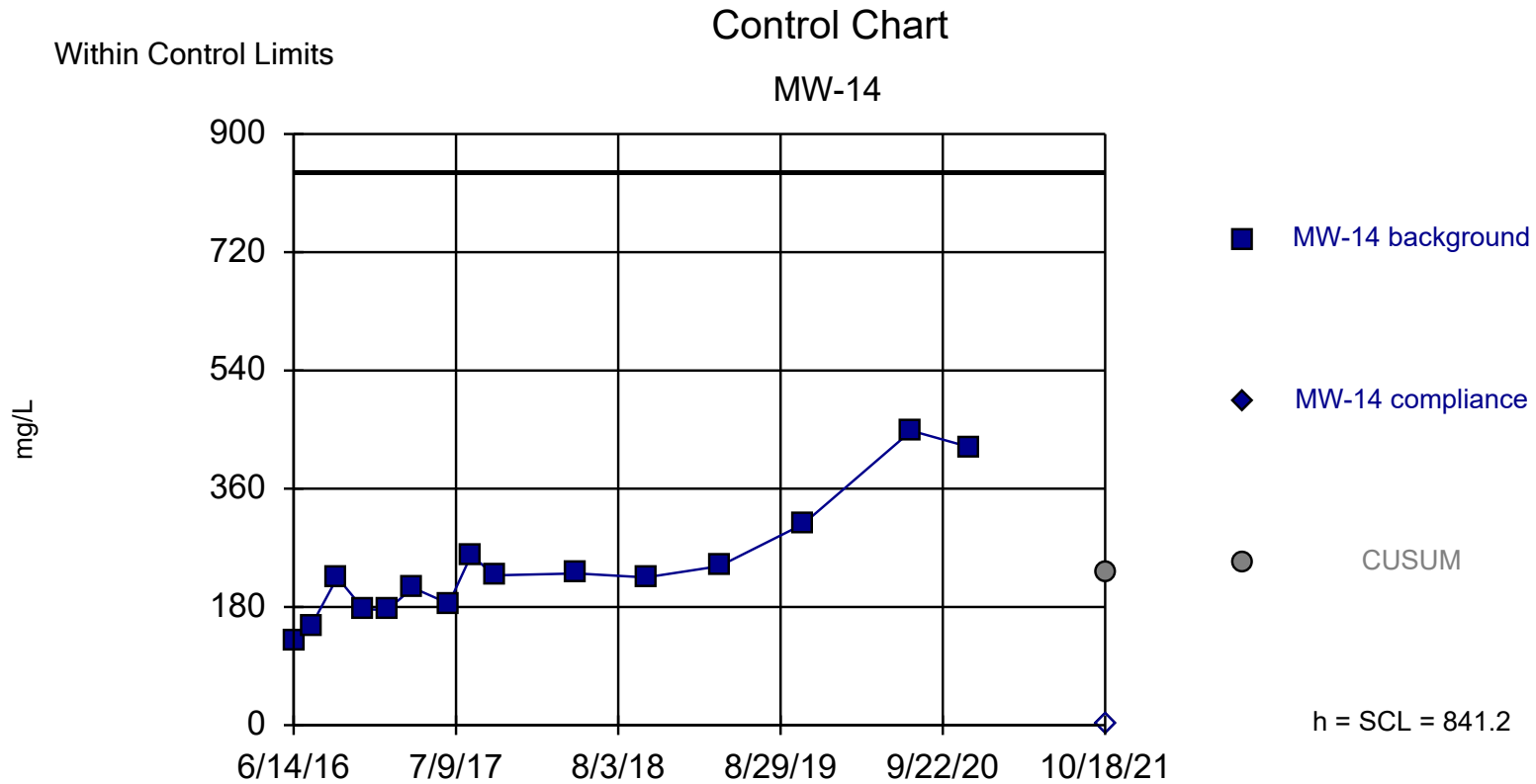
Background Data Summary: Mean=5.876, Std. Dev.=0.3768, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9721, critical = 0.887. Report alpha = 0.0001. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: pH    Analysis Run 12/29/2021 9:27 AM    View: Control Chart 2021 BER  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

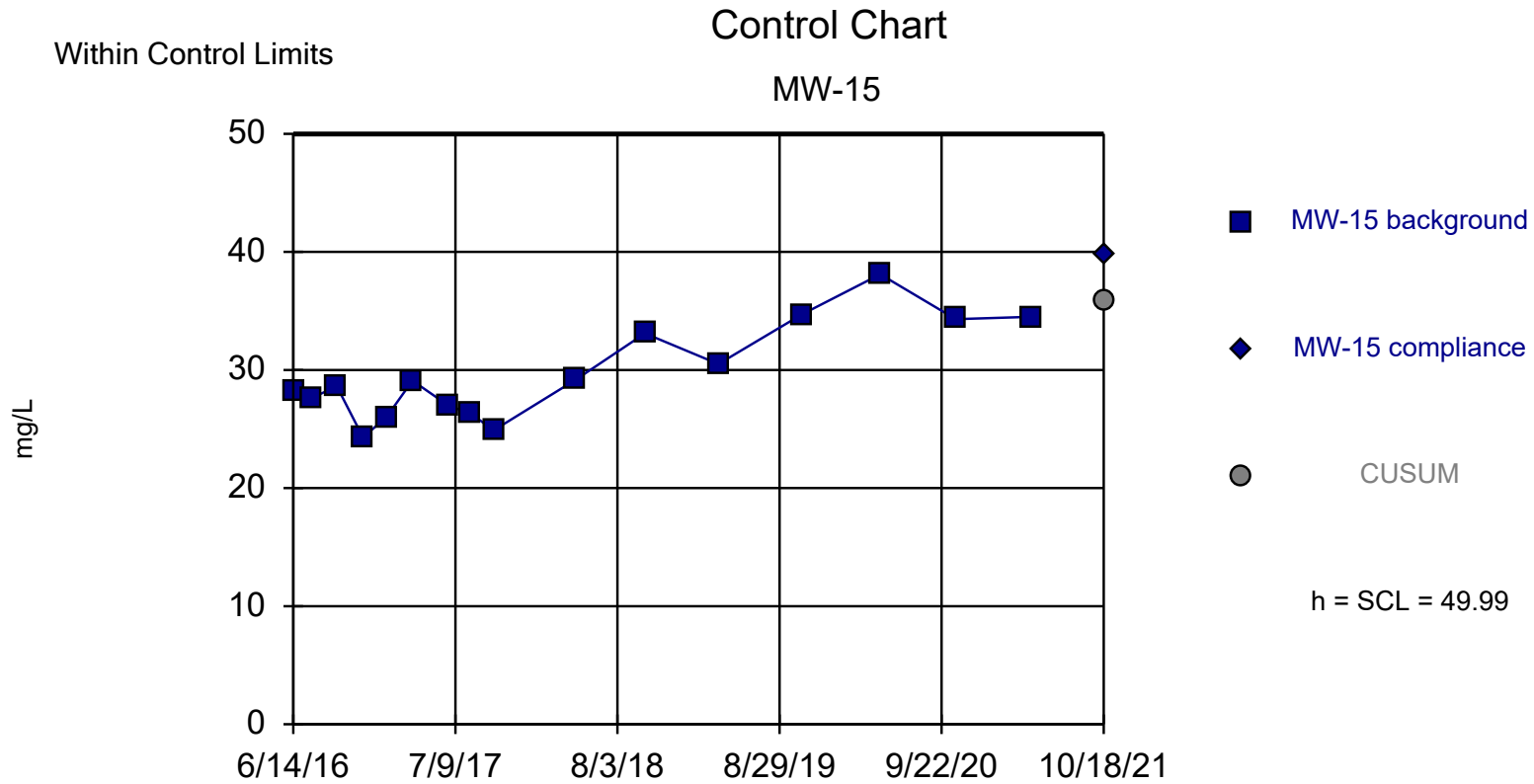


Background Data Summary: Mean=55.67, Std. Dev.=27.91, n=16, 6.25% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.969, critical = 0.887. Report alpha = 0.0001. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Sulfate    Analysis Run 12/29/2021 9:27 AM    View: Control Chart 2021 BER  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

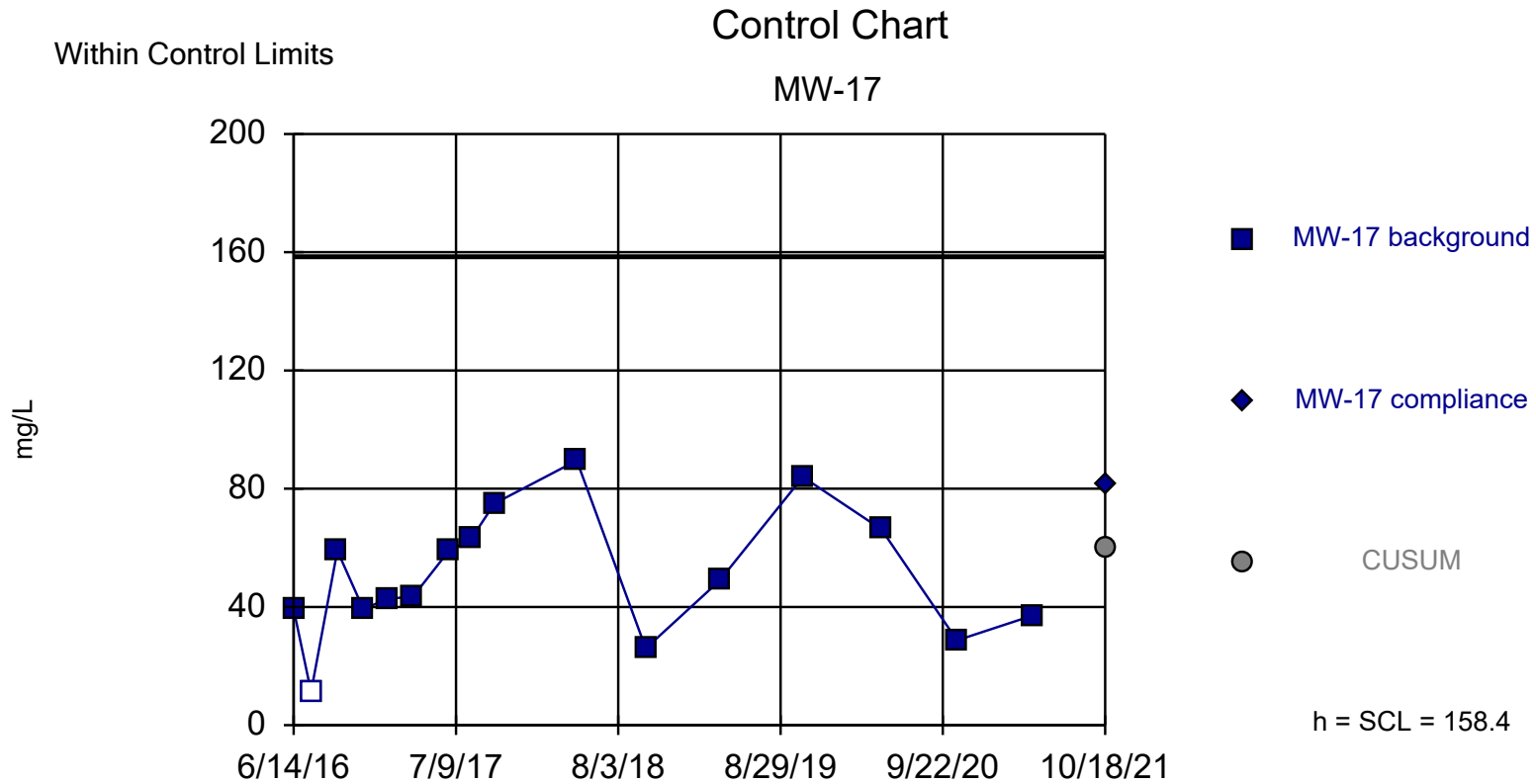


Background Data Summary (based on square root transformation): Mean=15.29, Std. Dev.=2.743, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9051, critical = 0.881. Report alpha = 0.000156. Dates ending 11/23/2020 used for control stats. Standardized h=5, SCL=5.



Background Data Summary: Mean=29.78, Std. Dev.=4.042, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9351, critical = 0.887. Report alpha = 0.00009. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

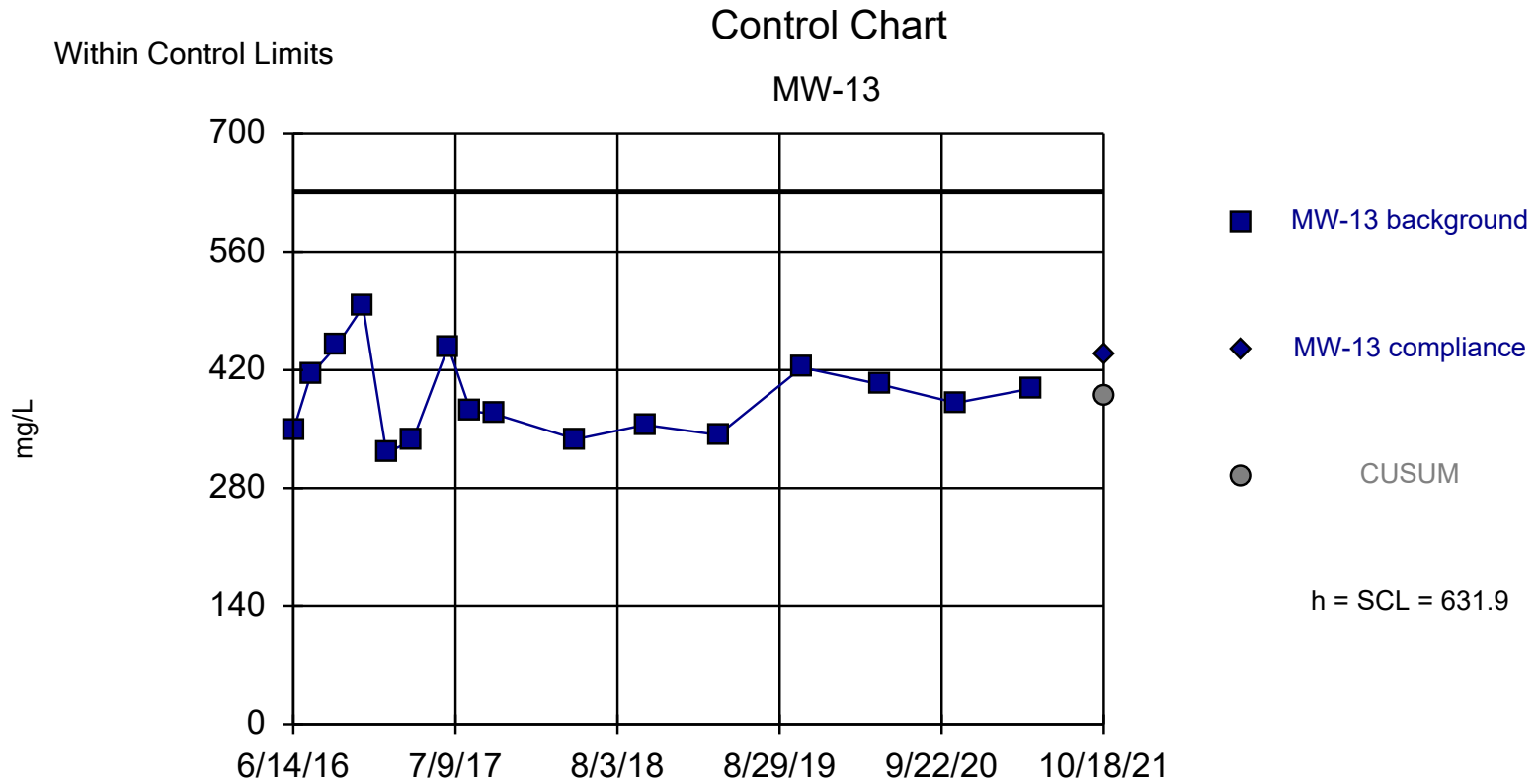
Constituent: Sulfate Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



Background Data Summary: Mean=50.77, Std. Dev.=21.53, n=16, 6.25% NDs. Seasonality was detected with 95% confidence and data were deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9783, critical = 0.887. Report alpha = 0.00009. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

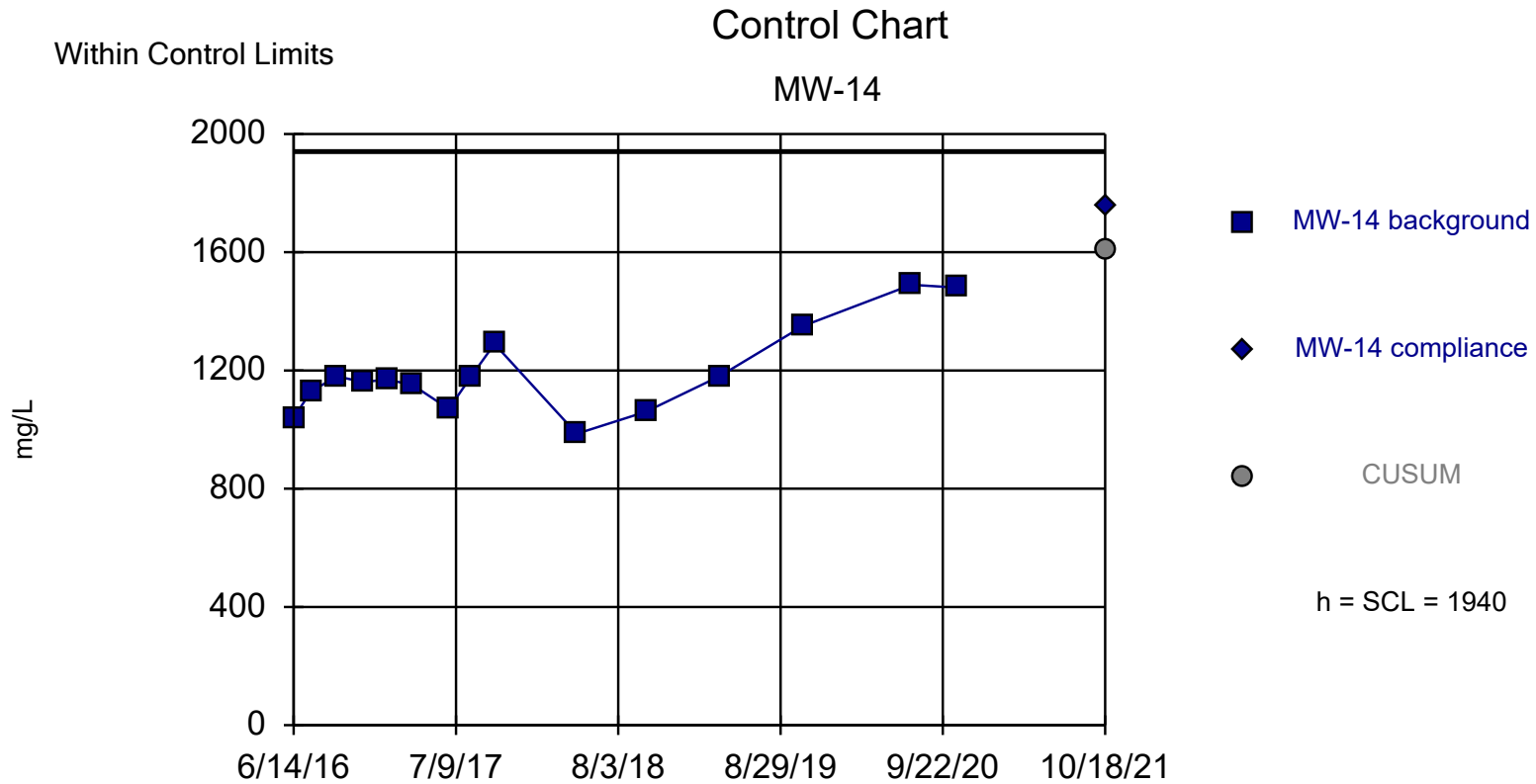
Constituent: Sulfate Analysis Run 12/29/2021 9:27 AM View: Control Chart 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



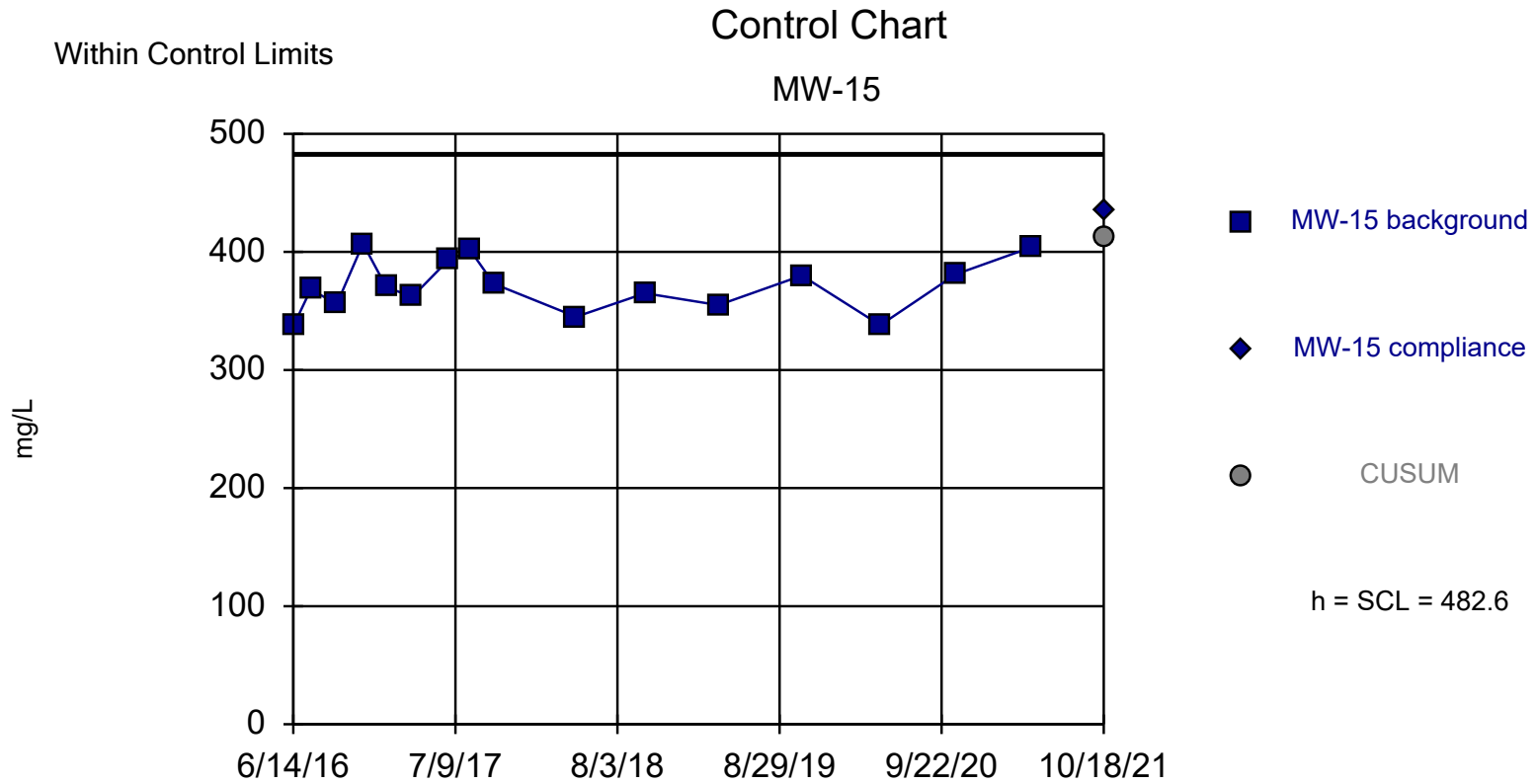
Background Data Summary: Mean=387, Std. Dev.=48.98, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9431, critical = 0.887. Report alpha = 0.00009. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids    Analysis Run 12/29/2021 9:27 AM    View: Control Chart 2021 BER  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=1194, Std. Dev.=149.2, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8979, critical = 0.881. Report alpha = 0.000116. Dates ending 10/27/2020 used for control stats. Standardized h=5, SCL=5.

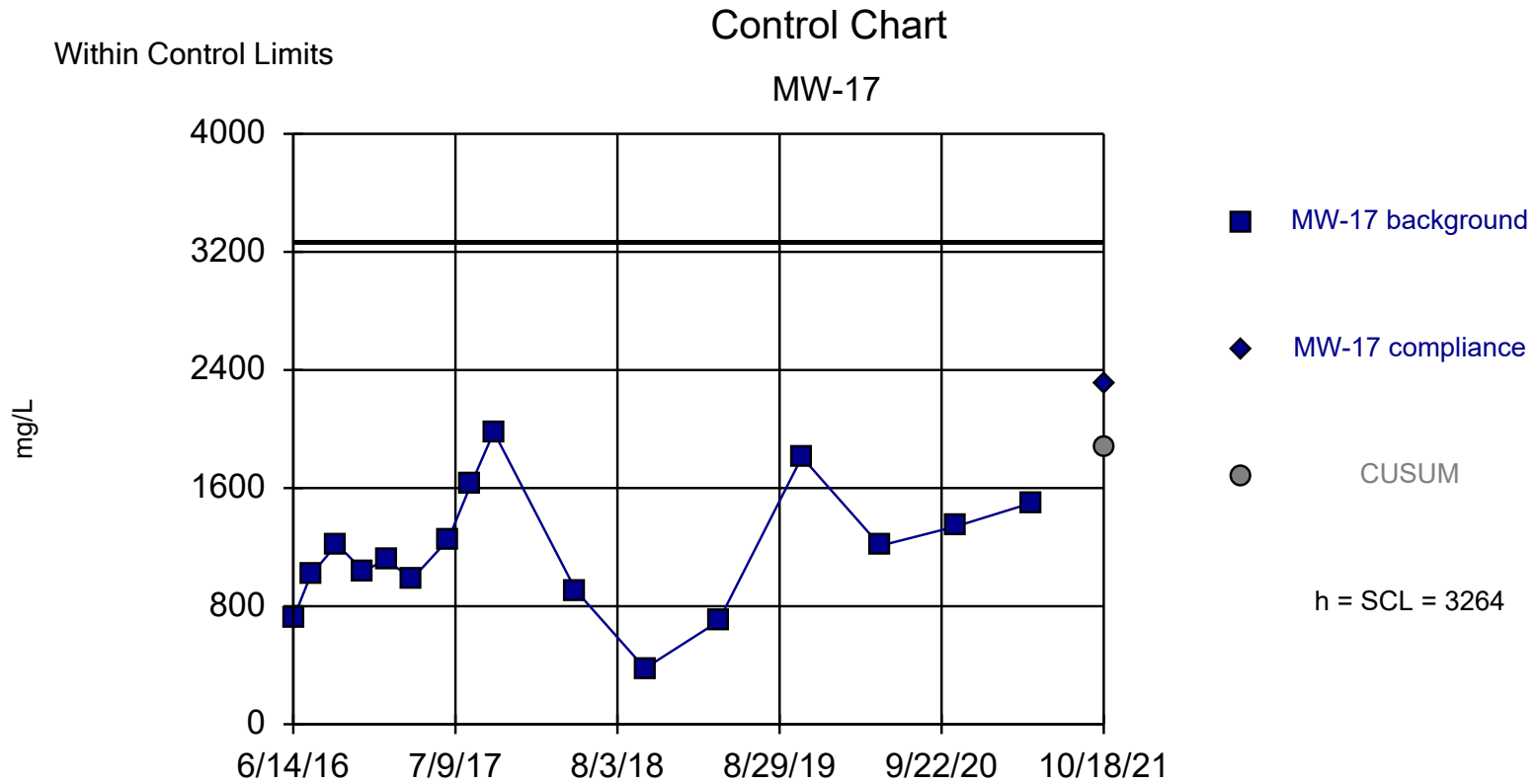
Constituent: Total Dissolved Solids    Analysis Run 12/29/2021 9:27 AM    View: Control Chart 2021 BER  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=370.9, Std. Dev.=22.34, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9549, critical = 0.887. Report alpha = 0.000098. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids    Analysis Run 12/29/2021 9:27 AM    View: Control Chart 2021 BER  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks





Background Data Summary: Mean=1173, Std. Dev.=418.2, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9847, critical = 0.887. Report alpha = 0.000098. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids    Analysis Run 12/29/2021 9:27 AM    View: Control Chart 2021 BER  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

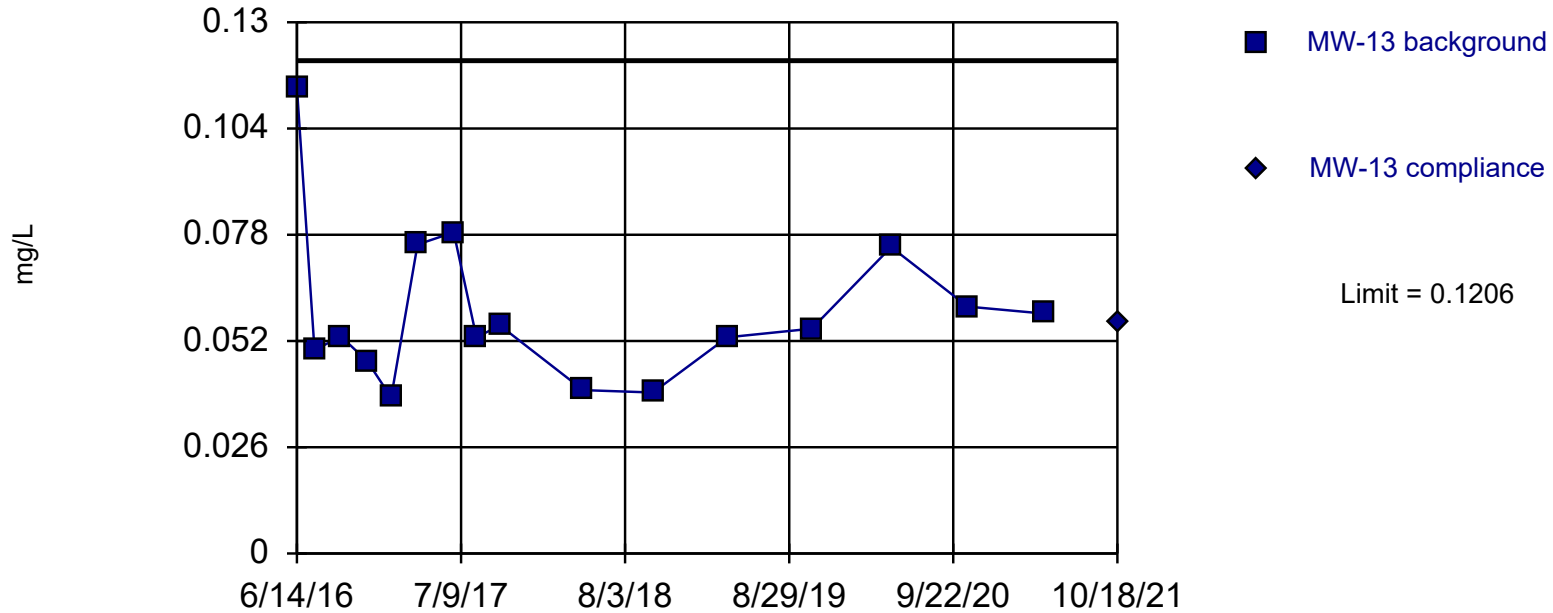
# Prediction Limit

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks Printed 12/29/2021, 9:27 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bq N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-13	0.1206	10/18/2021	0.0567	No	16	0	sqrt(x)	0.000...	Param Intra 1 of 2
Boron (mg/L)	MW-14	0.6019	10/18/2021	0.347	No	15	0	No	0.000...	Param Intra 1 of 2
Boron (mg/L)	MW-15	0.06659	10/18/2021	0.0445	No	16	0	No	0.000...	Param Intra 1 of 2
Boron (mg/L)	MW-17	0.362	10/18/2021	0.0317	No	15	0	n/a	0.007533	NP Intra (normality) ...

Within Limit

### Prediction Limit Intrawell Parametric



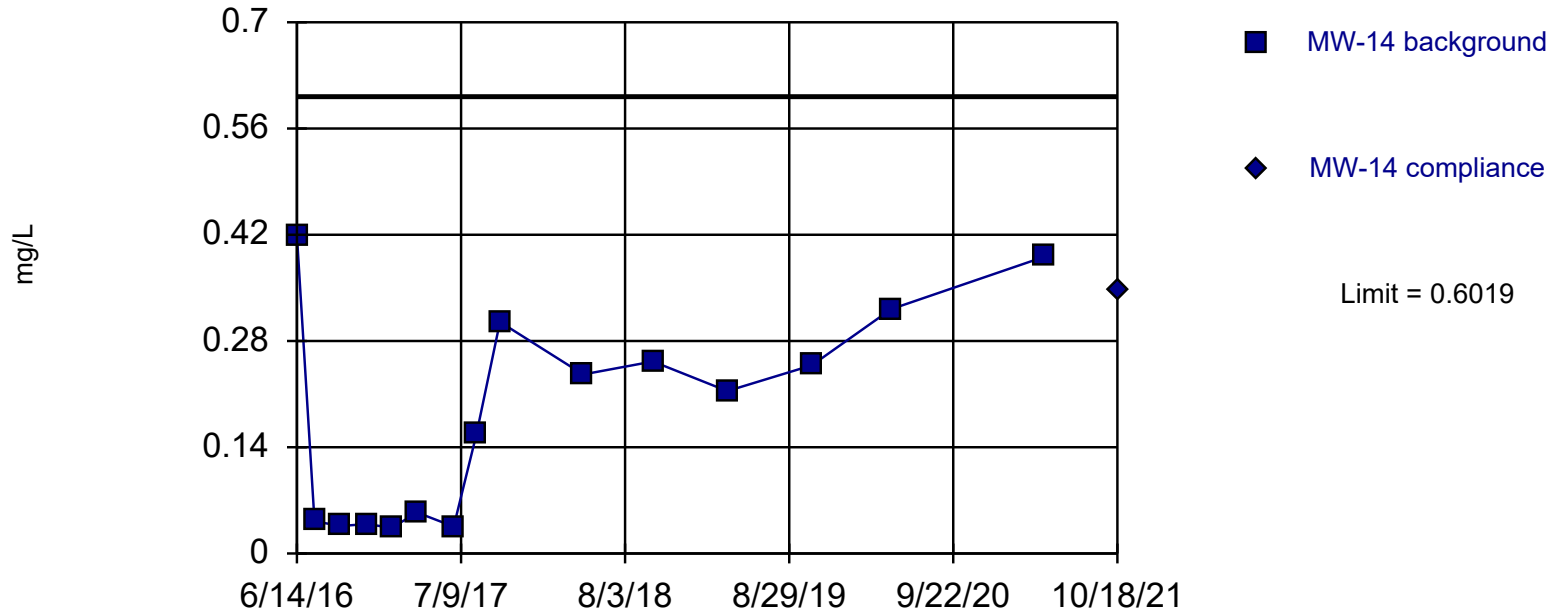
Background Data Summary (based on square root transformation): Mean=0.2406, Std. Dev.=0.03654, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8931, critical = 0.844. Kappa = 2.919 (c=15, w=21, 1 of 2, event alpha = 0.05132). Report alpha = 0.0001672.

Constituent: Boron Analysis Run 12/29/2021 9:26 AM View: Prediction Limit 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

### Prediction Limit Intrawell Parametric

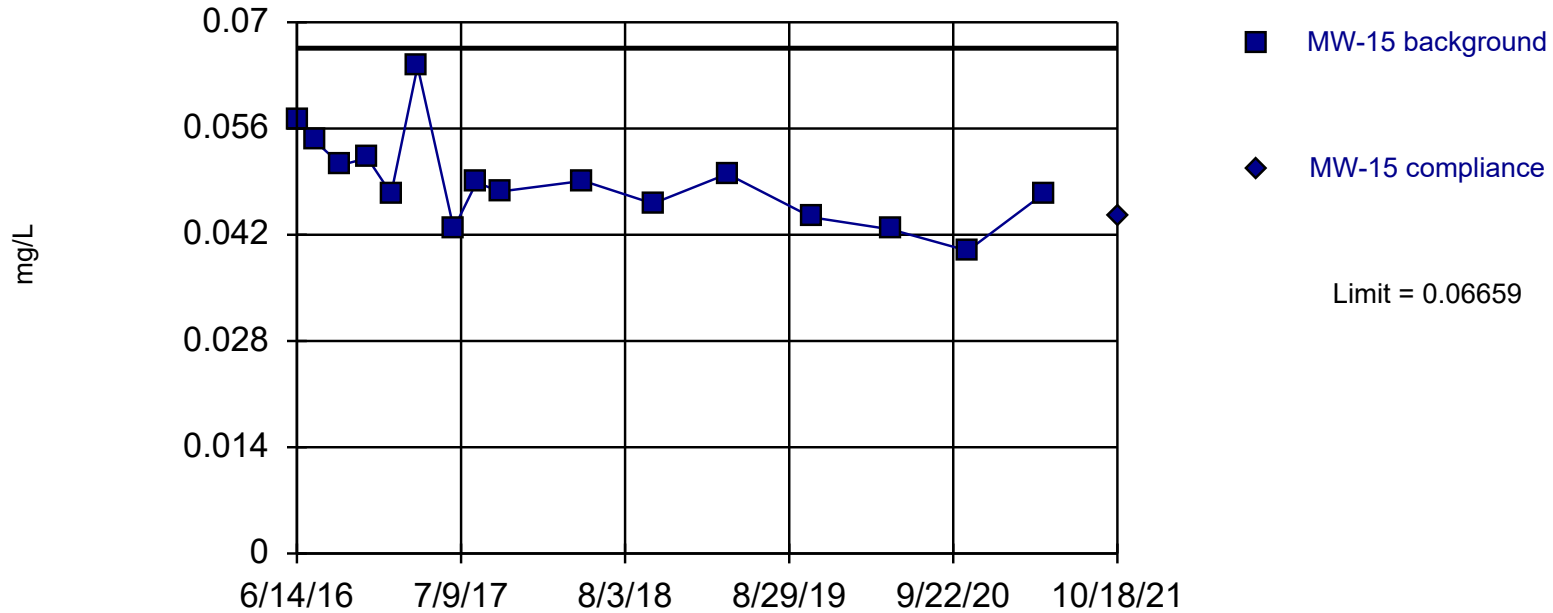


Background Data Summary: Mean=0.1857, Std. Dev.=0.1387, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8773, critical = 0.835. Kappa = 3 (c=15, w=21, 1 of 2, event alpha = 0.05132). Report alpha = 0.0001672.

Constituent: Boron Analysis Run 12/29/2021 9:26 AM View: Prediction Limit 2021 BER  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

### Prediction Limit Intrawell Parametric



Background Data Summary: Mean=0.04909, Std. Dev.=0.005995, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9456, critical = 0.844. Kappa = 2.919 (c=15, w=21, 1 of 2, event alpha = 0.05132). Report alpha = 0.0001672.

Constituent: Boron Analysis Run 12/29/2021 9:26 AM View: Prediction Limit 2021 BER

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



## **Appendix E**

**1<sup>st</sup> 2021 Semi-Annual Groundwater Monitoring and  
Corrective Action Report**



**1<sup>st</sup> 2021 SEMI-ANNUAL GROUNDWATER  
MONITORING AND CORRECTIVE ACTION  
REPORT**

**TWIN OAKS POWER STATION  
COAL COMBUSTION RESIDUALS (CCR) LANDFILL  
ROBERTSON COUNTY, TEXAS**

**July 27, 2021**

**Prepared By:**



**1120 NW Stallings Drive  
Nacogdoches, Texas 75964  
TBPG Firm No. 50027**

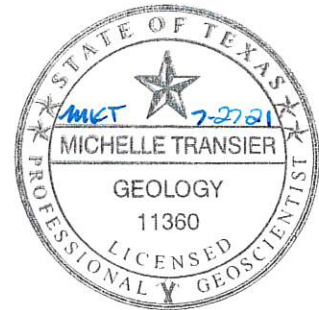
# 1<sup>st</sup> 2021 SEMI-ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

## TWIN OAKS POWER STATION COAL COMBUSTION RESIDUALS (CCR) LANDFILL ROBERTSON COUNTY, TEXAS

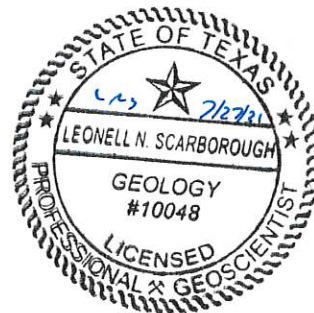
July 27, 2021



Michelle K. Transier, P.G.  
Geologist



Leonell N. Scarborough, P.G.  
Senior Hydrogeologist



Prepared by:  
Hydrex Environmental  
Nacogdoches, Texas  
TBPG Firm No. 50027

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## Appendices

### **Appendix A – Signed and Sealed Report Certification by Professional Engineer**

Certification Statement

### **Appendix B – Groundwater Monitoring Program Summary Tables and Forms**

Monitoring Well Network and Program Summary Table

### **Appendix C – Groundwater Elevation Data, Flow Rate Calculations, and Maps**

Groundwater Elevation Summary Table

Groundwater Elevation Map

Groundwater Flow Rate Calculations

### **Appendix D – Analytical Results Summary and Statistical Evaluation Data**

Groundwater Monitoring Analytical Results Summary Table

Laboratory Reports

April 2021 Event – Results of Statistical Calculation

June 2021 Event – Results of Statistical Calculation

### **Appendix E – Copy of Associated Reports**

July 27, 2021 Alternate Source/Error Demonstration

## Introduction

This 1<sup>st</sup> 2021 Semi-Annual Groundwater Monitoring and Corrective Action Report for the Twin Oaks Power Station Coal Combustion Residuals (“CCR”) Landfill (“the “facility”) is prepared in accordance with the requirements of the facility’s Groundwater Sampling and Analysis Plan (“GWSAP”), the state CCR Rules, 30 TAC Chapter 352, and the federal CCR Rule, 40 CFR Part 257, Subpart D. This semi-annual report summarizes the groundwater monitoring activities performed through the 1<sup>st</sup> 2021 semi-annual detection groundwater sampling event for the facility. The reporting requirements under the CCR Rule, the relevant CCR Rule citations, and the corresponding location of those required contents in this report are listed below:

- Status of the groundwater monitoring program (§ 257.90(e)): .....Appendix B
- Summary of key actions completed (§ 257.90(e)): ..... p. 1
- Any problems encountered and actions taken to resolve such problems (§ 257.90(e)): ..... p. 2
- Project key activities for the upcoming year (§ 257.90(e)): ..... p. 3
- Map, aerial image, or diagram of CCR Unit and monitoring wells (§ 257.90(e)(1)): . Appendix C
- Identification of new monitoring wells installed or abandoned during the preceding year and narrative description (§ 257.90(e)(2)): ..... Not applicable.  
 No monitoring wells have been installed or abandoned at the facility in 2021.
- Summary of groundwater data, wells sampled, date sampled, and whether sample was required under detection or assessment monitoring (§ 257.90(e)(3)): ..... Appendix D
- Narrative discussion of any transition between monitoring programs (§ 257.90(e)(4)):..... p. 2
- Upon completion of the 2<sup>nd</sup> 2021 groundwater sampling event, an annual groundwater monitoring report for 2021 will be prepared by January 31, 2022.

## Key Actions Completed and any Problems Encountered

The monitoring network at the Twin Oaks Power Station CCR Landfill includes 8 monitoring wells (upgradient wells MW-7, MW-11, MW-12, and MW-16 and downgradient wells MW-13, MW-14, MW-15, and MW-17). Groundwater monitoring is performed in accordance with the facility’s GWSAP, 30 TAC Chapter 352 Subchapter H, and 40 CFR Part 257, Subpart D. Specific sampling events and dates for calendar year 2021 are summarized in the following table:

### Summary of Sampling Events

Event Date	Monitoring Wells (MW) Sampled	Event Type
April 28, 2021	MW-7, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17	Semi-Annual Detection Monitoring
June 23, 2021	MW-14 and MW-15	Verification Resampling

No significant problems were encountered during the sampling event in 2021.

## Detection Monitoring

Detection monitoring is conducted at the Twin Oaks Power Station CCR Landfill on a semi-annual schedule in accordance with applicable federal and state regulations. Laboratory analysis for detection events include those detection monitoring constituents listed in Table D-1 of the facility’s GWSAP. A table of groundwater analytical results for all monitoring wells sampled during 2021 is included in Appendix D of this report.

### First Semi-Annual Groundwater Monitoring Event (April 2021)

The first semi-annual detection monitoring event was conducted on April 28, 2021. Groundwater samples were obtained from monitoring wells MW-7, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, and MW-17 for analysis of detection monitoring constituents. Additionally, a duplicate sample was collected at monitoring well MW-7 and analyzed for all detection monitoring constituents. The duplicate sample provided comparable results for all constituents. Intrawell statistical evaluation of data from the April 2021 event, performed in accordance with the provisions of the GWSAP, 30 TAC §352.941, and 40 CFR § 257.94, indicated unverified (“initial”) intrawell statistical exceedances for calcium and sulfate in monitor well MW-14 and for calcium in MW-15. Subsequently, verification resampling was conducted on June 23, 2021, as provided for and in accordance with the GWSAP. The results of verification resampling confirmed the intrawell statistical exceedance values for calcium and sulfate in MW-14 and for calcium in MW-15 on June 30, 2021 and an SSI was determined on July 6, 2021. Review of data indicated that the values are likely the result of natural groundwater variation at the facility. In accordance with the facility’s GWSAP, notice of intent to perform an alternate source/error demonstration (ASD) was given to TCEQ on July 14, 2021 and an ASD will be submitted 90 days from the date an SSI was determined.

A summary of the results of statistical evaluation is presented in the table below.

### Summary of Statistical Exceedances for the Second Semi-Annual Groundwater Monitoring Event (April 2021)

Well	Constituent	Initial Result (mg/L)	Statistical Limit (mg/L)	Verification Resampling Result (mg/L)	Intrawell Statistical Exceedance Confirmed?	Recommendation
MW-14	sulfate	493	401.3	545	Yes	Alternate Source/Error Demonstration
	calcium	117	115.2	130	Yes	Alternate Source/Error Demonstration
MW-15	calcium	29.0	28.93	30.0	Yes	Alternate Source/Error Demonstration

Monitoring wells MW-7, MW-11, MW-12, MW-13, MW-16, and MW-17 remain in detection monitoring status. Monitoring wells MW14 and MW-15 also remain in detection monitoring status as determined by the ASD included in Appendix E.

### Groundwater Elevation, Flow Rate, and Direction

Water levels were measured in all monitoring wells prior to purging in accordance with the GWSAP. A table summarizing groundwater elevation data collected during the April 2021 detection monitoring event is included in Appendix B. Hydraulic gradient and flow rate

calculations, along with a groundwater elevation map showing groundwater flow direction for the April 2021 detection monitoring event, are also included in Appendix C.

### **Project Key Activities for 2021**

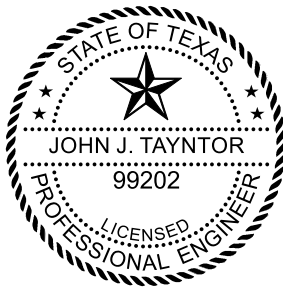
Based on the data available at the time of this report, the detection monitoring program currently in place for the Twin Oaks Power Station CCR Landfill meets the requirements of applicable regulations. An ASD, performed within 90 days of the July 6, 2021 SSI determination, is included in Appendix E. Therefore, no change to the groundwater monitoring system, monitoring schedule, or monitoring program is proposed.

## **Appendix A**

# CERTIFICATION STATEMENT

## COAL COMBUSTION RESIDUALS (CCR) LANDFILL TWIN OAKS POWER STATION ROBERTSON COUNTY, TEXAS

I certify I am a licensed professional engineer in the State of Texas and a *qualified professional engineer* as defined in 40 CFR §257.53. I certify that the groundwater monitoring data and other information presented in the 1<sup>st</sup> 2021 Semi-Annual Groundwater Monitoring and Corrective Action Report, prepared by Hydrex Environmental on behalf of the Twin Oaks Power Station, are appropriate and meet the requirements of 40 CFR Part 257, Subpart D.



A handwritten signature in black ink, appearing to read "J. Tayntor", written over a horizontal line.

John J. Tayntor, P.E.  
Auckland Consulting, LLC  
TBPE Firm Registration No. F-16721

07/27/2021

Date



## **Appendix B**

## Monitoring Well Network and Program Summary

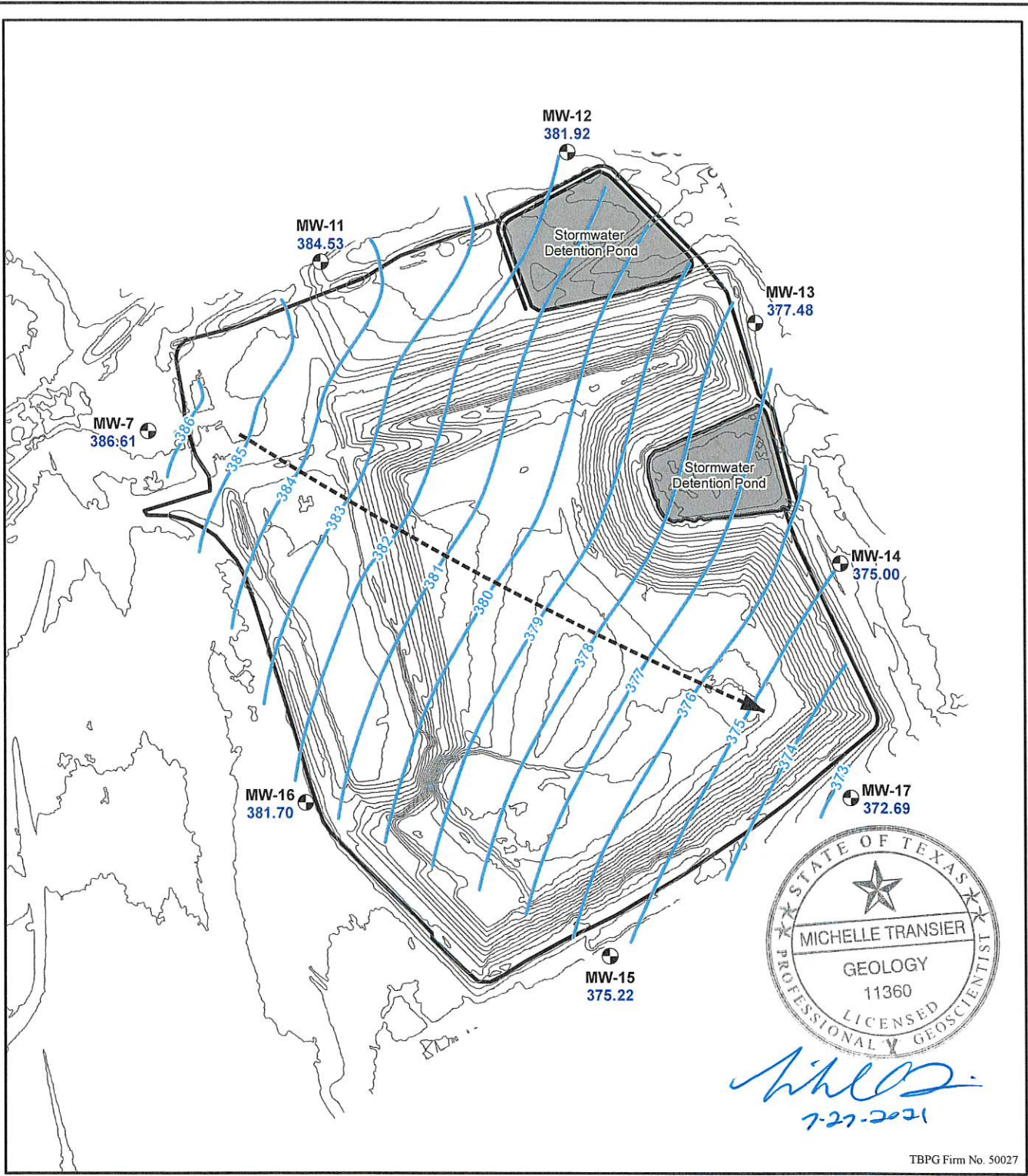
Well ID	Well Designation	Aquifer	2021
			Monitoring Status
MW-7	Upgradient	Uppermost	Detection Monitoring
MW-11	Upgradient	Uppermost	Detection Monitoring
MW-12	Upgradient	Uppermost	Detection Monitoring
MW-13	Downgradient	Uppermost	Detection Monitoring
MW-14	Downgradient	Uppermost	Detection Monitoring
MW-15	Downgradient	Uppermost	Detection Monitoring
MW-16	Upgradient	Uppermost	Detection Monitoring
MW-17	Downgradient	Uppermost	Detection Monitoring

## **Appendix C**

## Groundwater Elevation Summary Table

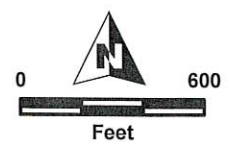
Twin Oaks Power Station  
Coal Combustion Residuals (CCR) Landfill  
Robertson County, Texas

Well ID	Date	Top of Casing Elevation (ft-amsl)	Depth to Water (ft)	Groundwater Elevation (ft-amsl)
MW-7	4/28/2021	411.60	24.99	386.61
MW-11	4/28/2021	406.93	22.40	384.53
MW-12	4/28/2021	387.27	5.35	381.92
MW-13	4/28/2021	398.32	20.84	377.48
MW-14	4/28/2021	394.68	19.68	375.00
MW-15	4/28/2021	410.47	35.25	375.22
MW-16	4/28/2021	422.54	40.84	381.70
MW-17	4/28/2021	405.87	33.18	372.69



TBPG Firm No. 50027

Monitor Well	5-ft Ground Surface Contour
Approx. Groundwater Flow Direction	Access Road/ Perimeter Berm
Groundwater Contour	Groundwater Elevation 385 (Elevation Feet, MSL)
Pond	



GROUNDWATER CONTOUR MAP  
 ← WATER LEVELS MEASURED 04/28/2021 →

CCR Landfill  
 Twin Oaks Power Station  
 13065 Plant Road  
 Bremond (Robertson County), Texas 76629  
 Map Revised: 06/03/2021 | Project Number: I-14-1007 | GIS Analyst: SMD

Twin Oaks Power Station  
 Coal Combustion Residuals Landfill

### Groundwater Flow Rate Calculations

Approximate hydraulic gradients were calculated based on data presented on the individual groundwater gradient map for the April 2021 monitoring event.

Calculation of hydraulic gradient was performed using the following equation:

$$i = \frac{\Delta h}{\Delta d}$$

Where:  $\Delta h$  = approximate change in hydraulic head between two known points  
 $\Delta d$  = approximate change in distance between two known points along flow paths

Gradient Measurement Line	$\Delta h$ (feet)	$\Delta d$ (feet)	$i$ (feet/feet)	Monitoring Event
from well MW-7 to MW-17	13.92	3370	0.0041	April 2021

### Estimated Flow Rate Calculations

The estimated groundwater flow rate was calculated for each monitoring event using the following formula:

$$v = \frac{ki}{n_e}$$

Where:  $v$  = flow rate  
 $k$  = hydraulic conductivity  
 $i$  = hydraulic gradient (above)  
 $n_e$  = effective porosity

Flow Rate Measurement Line	$k$ (cm/sec)	$n_e$	$i$ (feet/feet)	$v$ (feet/year)	Monitoring Event
from well MW-7 to MW-17	4.85E-03	0.3	0.0041	68.63	April 2021

Note: Hydraulic conductivity ( $k$ ) and effective porosity ( $n_e$ ) values as derived from slug test results conducted March 2016.

Hydrex Environmental  
 TBPG Firm No. 50027



*Michelle Transier*  
 7-27-2021

## **Appendix D**

**Groundwater Monitoring Analytical Results Summary Table**

Well ID	Sampling Date	Boron (mg/L)	Total Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (SU)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)	Total Antimony (mg/L)	Total Arsenic (mg/L)	Total Barium (mg/L)	Total Beryllium (mg/L)	Total Cadmium (mg/L)	Total Chromium (mg/L)	Total Cobalt (mg/L)	Fluoride (mg/L)	Total Lead (mg/L)	Total Lithium (mg/L)	Total Mercury (mg/L)	Total Molybdenum (mg/L)	Total Selenium (mg/L)	Total Thallium (mg/L)	Radium 226 & 228 (Combined) (pCi/L)
MW-7	04/28/21	0.295	258	259	<0.500	6.5	952	1800	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-11	04/28/21	0.175	152	176	<0.500	6.5	612	1130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-12	04/28/21	0.0373	15.4	74.6	<0.500	6.5	38.1	221	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-13	04/28/21	0.0587	26.1	105	<0.500	6.4	78.9	398	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Background Limits*	0.1382	37.7	119.4	0.584	4.847-7.797	193.1	660.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	04/28/21	0.391	117	381	0.510	6.7	493	1520	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-14	06/23/21	NA	130	NA	NA	NA	545	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Background Limits*	0.5796	115.2	436.5	0.682	4.951-7.714	401.3	1541	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	04/28/21	0.0475	29.0	155	<0.500	6.7	34.5	404	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-15	06/23/21	NA	30.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Background Limits*	0.06917	28.93	175.8	0.5	4.356-7.767	40.2	476.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-16	04/28/21	0.0271	43.2	189	<0.500	6.9	82.8	677	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-17	04/28/21	0.0314	156	798	<0.500	5.8	26.1	1500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Background Limits*	0.362	555.1	1678	0.5	3.887-7.908	160.2	3191	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

\*Background limits are intrawell statistical limits including data collected between June 2016 and June 2019.



## **Laboratory Reports**


## ANALYTICAL REPORT

Eurofins Xenco, Stafford  
4147 Greenbriar Dr  
Stafford, TX 77477  
Tel: (281)240-4200

Laboratory Job ID: 860-2956-1  
Client Project/Site: Twin Oaks PP

For:  
Hydrex Environmental  
1120 NW Stallings Drive  
Nacogdoches, Texas 75964

Attn: Michelle Transier



Authorized for release by:  
5/18/2021 4:55:19 PM

Chad Bechtold, Project Manager  
(850)878-3994  
[chad.bechtold@eurofinset.com](mailto:chad.bechtold@eurofinset.com)

### LINKS

Review your project  
results through  
**TotalAccess**

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Definitions/Glossary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Qualifiers

### HPLC/IC

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
U	Indicates the analyte was analyzed for but not detected.

## Glossary

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

# Case Narrative

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

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**Job ID: 860-2956-1**

---

**Laboratory: Eurofins Xenco, Stafford**

---

**Narrative**

**Job Narrative  
860-2956-1**

**Receipt**

The samples were received on 4/30/2021 11:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.6°C

**HPLC/IC**

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

**Metals**

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

**General Chemistry**

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



# Detection Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Client Sample ID: MW-7

Lab Sample ID: 860-2956-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	259		0.500	mg/L	1		300.0	Total/NA
Sulfate	952		5.00	mg/L	10		300.0	Total/NA
Calcium	258		10.0	mg/L	50		6010B	Total/NA
Boron	0.295	F1	0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	1800		20.0	mg/L	1		SM 2540C	Total/NA
pH	6.5	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.0	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: DUP#1

Lab Sample ID: 860-2956-2

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	258		0.500	mg/L	1		300.0	Total/NA
Sulfate	962		5.00	mg/L	10		300.0	Total/NA
Calcium	248		10.0	mg/L	50		6010B	Total/NA
Boron	0.286		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	1750		20.0	mg/L	1		SM 2540C	Total/NA
pH	6.5	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.1	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-11

Lab Sample ID: 860-2956-3

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	176		0.500	mg/L	1		300.0	Total/NA
Sulfate	612		5.00	mg/L	10		300.0	Total/NA
Calcium	152		10.0	mg/L	50		6010B	Total/NA
Boron	0.175		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	1130		20.0	mg/L	1		SM 2540C	Total/NA
pH	6.5	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.1	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-12

Lab Sample ID: 860-2956-4

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	74.6		0.500	mg/L	1		300.0	Total/NA
Sulfate	38.1		0.500	mg/L	1		300.0	Total/NA
Calcium	15.4		0.200	mg/L	1		6010B	Total/NA
Boron	0.0373		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	221		10.0	mg/L	1		SM 2540C	Total/NA
pH	6.5	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	18.8	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-16

Lab Sample ID: 860-2956-5

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	189		0.500	mg/L	1		300.0	Total/NA
Sulfate	82.8		0.500	mg/L	1		300.0	Total/NA
Calcium	43.2		0.200	mg/L	1		6010B	Total/NA
Boron	0.0271		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	677		10.0	mg/L	1		SM 2540C	Total/NA
pH	6.9	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.1	HF		Celsius	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Xenco, Stafford

# Detection Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Client Sample ID: MW-13

Lab Sample ID: 860-2956-6

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	105		0.500	mg/L	1		300.0	Total/NA
Sulfate	78.9		0.500	mg/L	1		300.0	Total/NA
Calcium	26.1		0.200	mg/L	1		6010B	Total/NA
Boron	0.0587		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	398		10.0	mg/L	1		SM 2540C	Total/NA
pH	6.4	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.1	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-15

Lab Sample ID: 860-2956-7

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	155		0.500	mg/L	1		300.0	Total/NA
Sulfate	34.5		0.500	mg/L	1		300.0	Total/NA
Calcium	29.0		0.200	mg/L	1		6010B	Total/NA
Boron	0.0475		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	404		10.0	mg/L	1		SM 2540C	Total/NA
pH	6.7	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.1	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-14

Lab Sample ID: 860-2956-8

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	381		0.500	mg/L	1		300.0	Total/NA
Fluoride	0.510		0.500	mg/L	1		300.0	Total/NA
Sulfate	493		5.00	mg/L	10		300.0	Total/NA
Calcium	117		10.0	mg/L	50		6010B	Total/NA
Boron	0.391		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	1520		20.0	mg/L	1		SM 2540C	Total/NA
pH	6.7	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.3	HF		Celsius	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-17

Lab Sample ID: 860-2956-9

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Chloride	798		5.00	mg/L	10		300.0	Total/NA
Sulfate	26.1		0.500	mg/L	1		300.0	Total/NA
Calcium	156		10.0	mg/L	50		6010B	Total/NA
Boron	0.0314		0.0100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	1500		20.0	mg/L	1		SM 2540C	Total/NA
pH	5.8	HF		SU	1		SM 4500 H+ B	Total/NA
Temperature	19.4	HF		Celsius	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Xenco, Stafford

# Client Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

**Client Sample ID: MW-7**

**Lab Sample ID: 860-2956-1**

Date Collected: 04/28/21 10:48

Matrix: Water

Date Received: 04/30/21 11:15

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	259		0.500	mg/L			05/04/21 12:05	1
Fluoride	<0.500	U	0.500	mg/L			05/04/21 12:05	1
Sulfate	952		5.00	mg/L			05/04/21 12:17	10

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	258		10.0	mg/L		05/05/21 09:30	05/05/21 20:13	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.295	F1	0.0100	mg/L		05/08/21 13:30	05/18/21 11:55	1

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1800		20.0	mg/L			05/04/21 13:11	1
pH	6.5	HF		SU			05/06/21 10:16	1
Temperature	19.0	HF		Celsius			05/06/21 10:16	1

**Client Sample ID: DUP#1**

**Lab Sample ID: 860-2956-2**

Date Collected: 04/28/21 10:48

Matrix: Water

Date Received: 04/30/21 11:15

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	258		0.500	mg/L			05/04/21 12:29	1
Fluoride	<0.500	U	0.500	mg/L			05/04/21 12:29	1
Sulfate	962		5.00	mg/L			05/04/21 12:41	10

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	248		10.0	mg/L		05/05/21 09:30	05/05/21 20:09	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.286		0.0100	mg/L		05/08/21 13:30	05/18/21 12:20	1

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1750		20.0	mg/L			05/04/21 13:11	1
pH	6.5	HF		SU			05/06/21 10:16	1
Temperature	19.1	HF		Celsius			05/06/21 10:16	1

**Client Sample ID: MW-11**

**Lab Sample ID: 860-2956-3**

Date Collected: 04/28/21 11:20

Matrix: Water

Date Received: 04/30/21 11:15

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	176		0.500	mg/L			05/04/21 12:54	1
Fluoride	<0.500	U	0.500	mg/L			05/04/21 12:54	1
Sulfate	612		5.00	mg/L			05/04/21 13:06	10

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# Client Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Client Sample ID: MW-11

Lab Sample ID: 860-2956-3

Date Collected: 04/28/21 11:20

Matrix: Water

Date Received: 04/30/21 11:15

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	152		10.0	mg/L		05/05/21 09:30	05/05/21 20:16	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.175		0.0100	mg/L		05/08/21 13:30	05/18/21 12:23	1

### General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1130		20.0	mg/L			05/04/21 13:11	1
pH	6.5	HF		SU			05/06/21 10:16	1
Temperature	19.1	HF		Celsius			05/06/21 10:16	1

## Client Sample ID: MW-12

Lab Sample ID: 860-2956-4

Date Collected: 04/28/21 11:46

Matrix: Water

Date Received: 04/30/21 11:15

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	74.6		0.500	mg/L			05/04/21 13:18	1
Fluoride	<0.500	U	0.500	mg/L			05/04/21 13:18	1
Sulfate	38.1		0.500	mg/L			05/04/21 13:18	1

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	15.4		0.200	mg/L		05/05/21 09:30	05/05/21 19:47	1

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0373		0.0100	mg/L		05/08/21 13:30	05/18/21 12:26	1

### General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	221		10.0	mg/L			05/04/21 13:11	1
pH	6.5	HF		SU			05/06/21 10:16	1
Temperature	18.8	HF		Celsius			05/06/21 10:16	1

## Client Sample ID: MW-16

Lab Sample ID: 860-2956-5

Date Collected: 04/28/21 12:20

Matrix: Water

Date Received: 04/30/21 11:15

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	189		0.500	mg/L			05/04/21 13:54	1
Fluoride	<0.500	U	0.500	mg/L			05/04/21 13:54	1
Sulfate	82.8		0.500	mg/L			05/04/21 13:54	1

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	43.2		0.200	mg/L		05/05/21 09:30	05/05/21 19:51	1

# Client Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Client Sample ID: MW-16

Lab Sample ID: 860-2956-5

Date Collected: 04/28/21 12:20

Matrix: Water

Date Received: 04/30/21 11:15

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0271		0.0100	mg/L		05/08/21 13:30	05/18/21 12:29	1

### General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	677		10.0	mg/L			05/04/21 13:11	1
pH	6.9	HF		SU			05/06/21 10:16	1
Temperature	19.1	HF		Celsius			05/06/21 10:16	1

## Client Sample ID: MW-13

Lab Sample ID: 860-2956-6

Date Collected: 04/28/21 12:50

Matrix: Water

Date Received: 04/30/21 11:15

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	105		0.500	mg/L			05/04/21 14:19	1
Fluoride	<0.500	U	0.500	mg/L			05/04/21 14:19	1
Sulfate	78.9		0.500	mg/L			05/04/21 14:19	1

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	26.1		0.200	mg/L		05/05/21 09:30	05/05/21 19:55	1

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0587		0.0100	mg/L		05/08/21 13:30	05/18/21 12:32	1

### General Chemistry

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	398		10.0	mg/L			05/04/21 13:11	1
pH	6.4	HF		SU			05/06/21 10:16	1
Temperature	19.1	HF		Celsius			05/06/21 10:16	1

## Client Sample ID: MW-15

Lab Sample ID: 860-2956-7

Date Collected: 04/28/21 13:17

Matrix: Water

Date Received: 04/30/21 11:15

### Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	155		0.500	mg/L			05/04/21 14:31	1
Fluoride	<0.500	U	0.500	mg/L			05/04/21 14:31	1
Sulfate	34.5		0.500	mg/L			05/04/21 14:31	1

### Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	29.0		0.200	mg/L		05/10/21 09:00	05/13/21 19:44	1

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0475		0.0100	mg/L		05/08/21 13:30	05/18/21 12:36	1

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# Client Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

**Client Sample ID: MW-15**

**Lab Sample ID: 860-2956-7**

Date Collected: 04/28/21 13:17

Matrix: Water

Date Received: 04/30/21 11:15

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	404		10.0	mg/L			05/04/21 13:16	1
pH	6.7	HF		SU			05/06/21 15:06	1
Temperature	19.1	HF		Celsius			05/06/21 15:06	1

**Client Sample ID: MW-14**

**Lab Sample ID: 860-2956-8**

Date Collected: 04/28/21 13:42

Matrix: Water

Date Received: 04/30/21 11:15

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	381		0.500	mg/L			05/04/21 14:43	1
Fluoride	0.510		0.500	mg/L			05/04/21 14:43	1
Sulfate	493		5.00	mg/L			05/04/21 14:55	10

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	117		10.0	mg/L		05/10/21 09:00	05/13/21 20:49	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.391		0.0100	mg/L		05/08/21 13:30	05/18/21 12:42	1

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1520		20.0	mg/L			05/04/21 13:11	1
pH	6.7	HF		SU			05/06/21 15:06	1
Temperature	19.3	HF		Celsius			05/06/21 15:06	1

**Client Sample ID: MW-17**

**Lab Sample ID: 860-2956-9**

Date Collected: 04/28/21 14:07

Matrix: Water

Date Received: 04/30/21 11:15

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	798		5.00	mg/L			05/04/21 15:19	10
Fluoride	<0.500	U	0.500	mg/L			05/04/21 15:07	1
Sulfate	26.1		0.500	mg/L			05/04/21 15:07	1

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	156		10.0	mg/L		05/10/21 09:00	05/13/21 20:52	50

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

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0314		0.0100	mg/L		05/08/21 13:30	05/18/21 12:39	1

**General Chemistry**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1500		20.0	mg/L			05/04/21 13:11	1
pH	5.8	HF		SU			05/06/21 15:06	1
Temperature	19.4	HF		Celsius			05/06/21 15:06	1

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# QC Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 860-6237/3  
Matrix: Water  
Analysis Batch: 6237

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

Analyte	MB MB		RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Chloride	<0.500	U	0.500	mg/L			05/04/21 08:55	1
Fluoride	<0.500	U	0.500	mg/L			05/04/21 08:55	1
Sulfate	<0.500	U	0.500	mg/L			05/04/21 08:55	1

Lab Sample ID: LCS 860-6237/4  
Matrix: Water  
Analysis Batch: 6237

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	10.0	9.886		mg/L		99	90 - 110
Sulfate	10.0	9.735		mg/L		97	90 - 110

Lab Sample ID: LCSD 860-6237/5  
Matrix: Water  
Analysis Batch: 6237

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	10.0	9.938		mg/L		99	90 - 110	1	20
Sulfate	10.0	9.742		mg/L		97	90 - 110	0	20

## Method: 6010B - Metals (ICP)

Lab Sample ID: MB 860-6437/1-A  
Matrix: Water  
Analysis Batch: 6628

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 6437

Analyte	MB MB		RL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier						
Calcium	<0.200	U	0.200	mg/L		05/05/21 09:30	05/05/21 18:02	1

Lab Sample ID: LCS 860-6437/2-A  
Matrix: Water  
Analysis Batch: 6628

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 6437

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits

Lab Sample ID: LCSD 860-6437/3-A  
Matrix: Water  
Analysis Batch: 6628

Client Sample ID: Lab Control Sample Dup  
Prep Type: Total/NA  
Prep Batch: 6437

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit

# QC Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 860-6995/1-A  
Matrix: Water  
Analysis Batch: 7636

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 6995

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	<0.200	U	0.200	mg/L		05/10/21 09:00	05/13/21 18:04	1

Lab Sample ID: LCS 860-6995/2-A  
Matrix: Water  
Analysis Batch: 7636

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 6995

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	25.0	24.82		mg/L		99	80 - 120

Lab Sample ID: LCSD 860-6995/3-A  
Matrix: Water  
Analysis Batch: 7636

Client Sample ID: Lab Control Sample Dup  
Prep Type: Total/NA  
Prep Batch: 6995

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	25.0	24.70		mg/L		99	80 - 120	0	20

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

Lab Sample ID: MB 860-6931/1-A  
Matrix: Water  
Analysis Batch: 8057

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 6931

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.0100	U	0.0100	mg/L		05/08/21 13:30	05/18/21 12:17	1

Lab Sample ID: LCS 860-6931/2-A  
Matrix: Water  
Analysis Batch: 8057

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 6931

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.100	0.1034		mg/L		103	80 - 120

Lab Sample ID: LCSD 860-6931/3-A  
Matrix: Water  
Analysis Batch: 8057

Client Sample ID: Lab Control Sample Dup  
Prep Type: Total/NA  
Prep Batch: 6931

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.100	0.1048		mg/L		105	80 - 120	1	20

Lab Sample ID: 860-2956-1 MS  
Matrix: Water  
Analysis Batch: 8057

Client Sample ID: MW-7  
Prep Type: Total/NA  
Prep Batch: 6931

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.295	F1	0.100	0.3706		mg/L		75	75 - 125

# QC Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 860-2956-1 MSD  
Matrix: Water  
Analysis Batch: 8057

Client Sample ID: MW-7  
Prep Type: Total/NA  
Prep Batch: 6931

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	0.295	F1	0.100	0.3670	F1	mg/L		72	75 - 125	1	20

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

Lab Sample ID: MB 860-6313/1  
Matrix: Water  
Analysis Batch: 6313

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<5.00	U	5.00	mg/L			05/04/21 13:11	1

Lab Sample ID: LCS 860-6313/2  
Matrix: Water  
Analysis Batch: 6313

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	970.0		mg/L		97	80 - 120

Lab Sample ID: LCSD 860-6313/3  
Matrix: Water  
Analysis Batch: 6313

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids	1000	1039		mg/L		104	80 - 120	7	10

Lab Sample ID: MB 860-6315/1  
Matrix: Water  
Analysis Batch: 6315

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<5.00	U	5.00	mg/L			05/04/21 13:16	1

Lab Sample ID: LCS 860-6315/2  
Matrix: Water  
Analysis Batch: 6315

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	1059		mg/L		106	80 - 120

Lab Sample ID: LCSD 860-6315/3  
Matrix: Water  
Analysis Batch: 6315

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids	1000	1114		mg/L		111	80 - 120	5	10

# QC Sample Results

Client: Hydrex Environmental  
 Project/Site: Twin Oaks PP

Job ID: 860-2956-1

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

Lab Sample ID: 860-2956-7 DU  
 Matrix: Water  
 Analysis Batch: 6315

Client Sample ID: MW-15  
 Prep Type: Total/NA

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Total Dissolved Solids	404		378.0		mg/L		7	10

## Method: SM 4500 H+ B - pH

Lab Sample ID: 860-2956-1 DU  
 Matrix: Water  
 Analysis Batch: 6625

Client Sample ID: MW-7  
 Prep Type: Total/NA

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
pH	6.5	HF	6.5		SU		0.5	20
Temperature	19.0	HF	18.7		Celsius		2	20



# QC Association Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## HPLC/IC

### Analysis Batch: 6237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-1	MW-7	Total/NA	Water	300.0	
860-2956-1	MW-7	Total/NA	Water	300.0	
860-2956-2	DUP#1	Total/NA	Water	300.0	
860-2956-2	DUP#1	Total/NA	Water	300.0	
860-2956-3	MW-11	Total/NA	Water	300.0	
860-2956-3	MW-11	Total/NA	Water	300.0	
860-2956-4	MW-12	Total/NA	Water	300.0	
860-2956-5	MW-16	Total/NA	Water	300.0	
860-2956-6	MW-13	Total/NA	Water	300.0	
860-2956-7	MW-15	Total/NA	Water	300.0	
860-2956-8	MW-14	Total/NA	Water	300.0	
860-2956-8	MW-14	Total/NA	Water	300.0	
860-2956-9	MW-17	Total/NA	Water	300.0	
860-2956-9	MW-17	Total/NA	Water	300.0	
MB 860-6237/3	Method Blank	Total/NA	Water	300.0	
LCS 860-6237/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 860-6237/5	Lab Control Sample Dup	Total/NA	Water	300.0	

## Metals

### Prep Batch: 6437

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-1	MW-7	Total/NA	Water	3010A	
860-2956-2	DUP#1	Total/NA	Water	3010A	
860-2956-3	MW-11	Total/NA	Water	3010A	
860-2956-4	MW-12	Total/NA	Water	3010A	
860-2956-5	MW-16	Total/NA	Water	3010A	
860-2956-6	MW-13	Total/NA	Water	3010A	
MB 860-6437/1-A	Method Blank	Total/NA	Water	3010A	
LCS 860-6437/2-A	Lab Control Sample	Total/NA	Water	3010A	
LCSD 860-6437/3-A	Lab Control Sample Dup	Total/NA	Water	3010A	

### Analysis Batch: 6628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-1	MW-7	Total/NA	Water	6010B	6437
860-2956-2	DUP#1	Total/NA	Water	6010B	6437
860-2956-3	MW-11	Total/NA	Water	6010B	6437
860-2956-4	MW-12	Total/NA	Water	6010B	6437
860-2956-5	MW-16	Total/NA	Water	6010B	6437
860-2956-6	MW-13	Total/NA	Water	6010B	6437
MB 860-6437/1-A	Method Blank	Total/NA	Water	6010B	6437
LCS 860-6437/2-A	Lab Control Sample	Total/NA	Water	6010B	6437
LCSD 860-6437/3-A	Lab Control Sample Dup	Total/NA	Water	6010B	6437

### Prep Batch: 6931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-1	MW-7	Total/NA	Water	3010A	
860-2956-2	DUP#1	Total/NA	Water	3010A	
860-2956-3	MW-11	Total/NA	Water	3010A	
860-2956-4	MW-12	Total/NA	Water	3010A	
860-2956-5	MW-16	Total/NA	Water	3010A	

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# QC Association Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Metals (Continued)

### Prep Batch: 6931 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-6	MW-13	Total/NA	Water	3010A	
860-2956-7	MW-15	Total/NA	Water	3010A	
860-2956-8	MW-14	Total/NA	Water	3010A	
860-2956-9	MW-17	Total/NA	Water	3010A	
MB 860-6931/1-A	Method Blank	Total/NA	Water	3010A	
LCS 860-6931/2-A	Lab Control Sample	Total/NA	Water	3010A	
LCSD 860-6931/3-A	Lab Control Sample Dup	Total/NA	Water	3010A	
860-2956-1 MS	MW-7	Total/NA	Water	3010A	
860-2956-1 MSD	MW-7	Total/NA	Water	3010A	

### Prep Batch: 6995

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-7	MW-15	Total/NA	Water	3010A	
860-2956-8	MW-14	Total/NA	Water	3010A	
860-2956-9	MW-17	Total/NA	Water	3010A	
MB 860-6995/1-A	Method Blank	Total/NA	Water	3010A	
LCS 860-6995/2-A	Lab Control Sample	Total/NA	Water	3010A	
LCSD 860-6995/3-A	Lab Control Sample Dup	Total/NA	Water	3010A	

### Analysis Batch: 7636

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-7	MW-15	Total/NA	Water	6010B	6995
860-2956-8	MW-14	Total/NA	Water	6010B	6995
860-2956-9	MW-17	Total/NA	Water	6010B	6995
MB 860-6995/1-A	Method Blank	Total/NA	Water	6010B	6995
LCS 860-6995/2-A	Lab Control Sample	Total/NA	Water	6010B	6995
LCSD 860-6995/3-A	Lab Control Sample Dup	Total/NA	Water	6010B	6995

### Analysis Batch: 8057

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-1	MW-7	Total/NA	Water	6020A	6931
860-2956-2	DUP#1	Total/NA	Water	6020A	6931
860-2956-3	MW-11	Total/NA	Water	6020A	6931
860-2956-4	MW-12	Total/NA	Water	6020A	6931
860-2956-5	MW-16	Total/NA	Water	6020A	6931
860-2956-6	MW-13	Total/NA	Water	6020A	6931
860-2956-7	MW-15	Total/NA	Water	6020A	6931
860-2956-8	MW-14	Total/NA	Water	6020A	6931
860-2956-9	MW-17	Total/NA	Water	6020A	6931
MB 860-6931/1-A	Method Blank	Total/NA	Water	6020A	6931
LCS 860-6931/2-A	Lab Control Sample	Total/NA	Water	6020A	6931
LCSD 860-6931/3-A	Lab Control Sample Dup	Total/NA	Water	6020A	6931
860-2956-1 MS	MW-7	Total/NA	Water	6020A	6931
860-2956-1 MSD	MW-7	Total/NA	Water	6020A	6931

## General Chemistry

### Analysis Batch: 6313

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-1	MW-7	Total/NA	Water	SM 2540C	
860-2956-2	DUP#1	Total/NA	Water	SM 2540C	

Eurofins Xenco, Stafford

# QC Association Summary

Client: Hydrex Environmental  
 Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## General Chemistry (Continued)

### Analysis Batch: 6313 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-3	MW-11	Total/NA	Water	SM 2540C	
860-2956-4	MW-12	Total/NA	Water	SM 2540C	
860-2956-5	MW-16	Total/NA	Water	SM 2540C	
860-2956-6	MW-13	Total/NA	Water	SM 2540C	
860-2956-8	MW-14	Total/NA	Water	SM 2540C	
860-2956-9	MW-17	Total/NA	Water	SM 2540C	
MB 860-6313/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 860-6313/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 860-6313/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

### Analysis Batch: 6315

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-7	MW-15	Total/NA	Water	SM 2540C	
MB 860-6315/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 860-6315/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 860-6315/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
860-2956-7 DU	MW-15	Total/NA	Water	SM 2540C	

### Analysis Batch: 6625

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-2956-1	MW-7	Total/NA	Water	SM 4500 H+ B	
860-2956-2	DUP#1	Total/NA	Water	SM 4500 H+ B	
860-2956-3	MW-11	Total/NA	Water	SM 4500 H+ B	
860-2956-4	MW-12	Total/NA	Water	SM 4500 H+ B	
860-2956-5	MW-16	Total/NA	Water	SM 4500 H+ B	
860-2956-6	MW-13	Total/NA	Water	SM 4500 H+ B	
860-2956-7	MW-15	Total/NA	Water	SM 4500 H+ B	
860-2956-8	MW-14	Total/NA	Water	SM 4500 H+ B	
860-2956-9	MW-17	Total/NA	Water	SM 4500 H+ B	
860-2956-1 DU	MW-7	Total/NA	Water	SM 4500 H+ B	

# Lab Chronicle

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

**Client Sample ID: MW-7**

**Lab Sample ID: 860-2956-1**

Date Collected: 04/28/21 10:48

Matrix: Water

Date Received: 04/30/21 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	6237	05/04/21 12:05	WP	XS
Total/NA	Analysis	300.0		10	6237	05/04/21 12:17	WP	XS
Total/NA	Prep	3010A			6437	05/05/21 09:30	MD	XS
Total/NA	Analysis	6010B		50	6628	05/05/21 20:13	DP	XS
Total/NA	Prep	3010A			6931	05/08/21 13:30	MD	XS
Total/NA	Analysis	6020A		1	8057	05/18/21 11:55	DCL	XS
Total/NA	Analysis	SM 2540C		1	6313	05/04/21 13:11	DTN	XS
Total/NA	Analysis	SM 4500 H+ B		1	6625	05/06/21 10:16	ANP	XS

**Client Sample ID: DUP#1**

**Lab Sample ID: 860-2956-2**

Date Collected: 04/28/21 10:48

Matrix: Water

Date Received: 04/30/21 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	6237	05/04/21 12:29	WP	XS
Total/NA	Analysis	300.0		10	6237	05/04/21 12:41	WP	XS
Total/NA	Prep	3010A			6437	05/05/21 09:30	MD	XS
Total/NA	Analysis	6010B		50	6628	05/05/21 20:09	DP	XS
Total/NA	Prep	3010A			6931	05/08/21 13:30	MD	XS
Total/NA	Analysis	6020A		1	8057	05/18/21 12:20	DCL	XS
Total/NA	Analysis	SM 2540C		1	6313	05/04/21 13:11	DTN	XS
Total/NA	Analysis	SM 4500 H+ B		1	6625	05/06/21 10:16	ANP	XS

**Client Sample ID: MW-11**

**Lab Sample ID: 860-2956-3**

Date Collected: 04/28/21 11:20

Matrix: Water

Date Received: 04/30/21 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	6237	05/04/21 12:54	WP	XS
Total/NA	Analysis	300.0		10	6237	05/04/21 13:06	WP	XS
Total/NA	Prep	3010A			6437	05/05/21 09:30	MD	XS
Total/NA	Analysis	6010B		50	6628	05/05/21 20:16	DP	XS
Total/NA	Prep	3010A			6931	05/08/21 13:30	MD	XS
Total/NA	Analysis	6020A		1	8057	05/18/21 12:23	DCL	XS
Total/NA	Analysis	SM 2540C		1	6313	05/04/21 13:11	DTN	XS
Total/NA	Analysis	SM 4500 H+ B		1	6625	05/06/21 10:16	ANP	XS

**Client Sample ID: MW-12**

**Lab Sample ID: 860-2956-4**

Date Collected: 04/28/21 11:46

Matrix: Water

Date Received: 04/30/21 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	6237	05/04/21 13:18	WP	XS

# Lab Chronicle

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Client Sample ID: MW-12

Lab Sample ID: 860-2956-4

Date Collected: 04/28/21 11:46

Matrix: Water

Date Received: 04/30/21 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			6437	05/05/21 09:30	MD	XS
Total/NA	Analysis	6010B		1	6628	05/05/21 19:47	DP	XS
Total/NA	Prep	3010A			6931	05/08/21 13:30	MD	XS
Total/NA	Analysis	6020A		1	8057	05/18/21 12:26	DCL	XS
Total/NA	Analysis	SM 2540C		1	6313	05/04/21 13:11	DTN	XS
Total/NA	Analysis	SM 4500 H+ B		1	6625	05/06/21 10:16	ANP	XS

## Client Sample ID: MW-16

Lab Sample ID: 860-2956-5

Date Collected: 04/28/21 12:20

Matrix: Water

Date Received: 04/30/21 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	6237	05/04/21 13:54	WP	XS
Total/NA	Prep	3010A			6437	05/05/21 09:30	MD	XS
Total/NA	Analysis	6010B		1	6628	05/05/21 19:51	DP	XS
Total/NA	Prep	3010A			6931	05/08/21 13:30	MD	XS
Total/NA	Analysis	6020A		1	8057	05/18/21 12:29	DCL	XS
Total/NA	Analysis	SM 2540C		1	6313	05/04/21 13:11	DTN	XS
Total/NA	Analysis	SM 4500 H+ B		1	6625	05/06/21 10:16	ANP	XS

## Client Sample ID: MW-13

Lab Sample ID: 860-2956-6

Date Collected: 04/28/21 12:50

Matrix: Water

Date Received: 04/30/21 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	6237	05/04/21 14:19	WP	XS
Total/NA	Prep	3010A			6437	05/05/21 09:30	MD	XS
Total/NA	Analysis	6010B		1	6628	05/05/21 19:55	DP	XS
Total/NA	Prep	3010A			6931	05/08/21 13:30	MD	XS
Total/NA	Analysis	6020A		1	8057	05/18/21 12:32	DCL	XS
Total/NA	Analysis	SM 2540C		1	6313	05/04/21 13:11	DTN	XS
Total/NA	Analysis	SM 4500 H+ B		1	6625	05/06/21 10:16	ANP	XS

## Client Sample ID: MW-15

Lab Sample ID: 860-2956-7

Date Collected: 04/28/21 13:17

Matrix: Water

Date Received: 04/30/21 11:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	6237	05/04/21 14:31	WP	XS
Total/NA	Prep	3010A			6995	05/10/21 09:00	MD	XS
Total/NA	Analysis	6010B		1	7636	05/13/21 19:44	DP	XS
Total/NA	Prep	3010A			6931	05/08/21 13:30	MD	XS
Total/NA	Analysis	6020A		1	8057	05/18/21 12:36	DCL	XS
Total/NA	Analysis	SM 2540C		1	6315	05/04/21 13:16	DTN	XS

Eurofins Xenco, Stafford

# Lab Chronicle

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

**Client Sample ID: MW-15**  
Date Collected: 04/28/21 13:17  
Date Received: 04/30/21 11:15

**Lab Sample ID: 860-2956-7**  
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 H+ B		1	6625	05/06/21 15:06	ANP	XS

**Client Sample ID: MW-14**  
Date Collected: 04/28/21 13:42  
Date Received: 04/30/21 11:15

**Lab Sample ID: 860-2956-8**  
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	6237	05/04/21 14:43	WP	XS
Total/NA	Analysis	300.0		10	6237	05/04/21 14:55	WP	XS
Total/NA	Prep	3010A			6995	05/10/21 09:00	MD	XS
Total/NA	Analysis	6010B		50	7636	05/13/21 20:49	DP	XS
Total/NA	Prep	3010A			6931	05/08/21 13:30	MD	XS
Total/NA	Analysis	6020A		1	8057	05/18/21 12:42	DCL	XS
Total/NA	Analysis	SM 2540C		1	6313	05/04/21 13:11	DTN	XS
Total/NA	Analysis	SM 4500 H+ B		1	6625	05/06/21 15:06	ANP	XS

**Client Sample ID: MW-17**  
Date Collected: 04/28/21 14:07  
Date Received: 04/30/21 11:15

**Lab Sample ID: 860-2956-9**  
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	6237	05/04/21 15:07	WP	XS
Total/NA	Analysis	300.0		10	6237	05/04/21 15:19	WP	XS
Total/NA	Prep	3010A			6995	05/10/21 09:00	MD	XS
Total/NA	Analysis	6010B		50	7636	05/13/21 20:52	DP	XS
Total/NA	Prep	3010A			6931	05/08/21 13:30	MD	XS
Total/NA	Analysis	6020A		1	8057	05/18/21 12:39	DCL	XS
Total/NA	Analysis	SM 2540C		1	6313	05/04/21 13:11	DTN	XS
Total/NA	Analysis	SM 4500 H+ B		1	6625	05/06/21 15:06	ANP	XS

**Laboratory References:**

XS = Eurofins Xenco, Stafford, 4147 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

# Accreditation/Certification Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

## Laboratory: Eurofins Xenco, Stafford

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	20-025-0	08-04-21
Florida	NELAP	E871002	06-30-21
Louisiana	NELAP	03054	06-30-21
North Carolina (WW/SW)	State	681	12-31-21
Oklahoma	State	1306	08-31-21
Texas	NELAP	T104704215-21-41	06-30-21

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# Method Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	XS
6010B	Metals (ICP)	SW846	XS
6020A	Metals (ICP/MS)	SW846	XS
SM 2540C	Solids, Total Dissolved (TDS)	SM	XS
SM 4500 H+ B	pH	SM	XS
3010A	Preparation, Total Metals	SW846	XS

**Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

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

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

**Laboratory References:**

XS = Eurofins Xenco, Stafford, 4147 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200



# Sample Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-2956-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
860-2956-1	MW-7	Water	04/28/21 10:48	04/30/21 11:15	
860-2956-2	DUP#1	Water	04/28/21 10:48	04/30/21 11:15	
860-2956-3	MW-11	Water	04/28/21 11:20	04/30/21 11:15	
860-2956-4	MW-12	Water	04/28/21 11:46	04/30/21 11:15	
860-2956-5	MW-16	Water	04/28/21 12:20	04/30/21 11:15	
860-2956-6	MW-13	Water	04/28/21 12:50	04/30/21 11:15	
860-2956-7	MW-15	Water	04/28/21 13:17	04/30/21 11:15	
860-2956-8	MW-14	Water	04/28/21 13:42	04/30/21 11:15	
860-2956-9	MW-17	Water	04/28/21 14:07	04/30/21 11:15	



# Chain of Custody Record



### Client Information

Client Contact: Michelle Transler  
 Company: Hydrex Environmental  
 Address: 1120 NW Stallings Drive  
 City: Nacogdoches  
 State, Zip: TX, 75964  
 Phone: 936-568-9451 (Tel)  
 Email: mtransler@hydrex-inc.com  
 Project Name: Twin Oaks PP  
 Site:

Sampler: Lab P/N: Bechtold, Chad  
 Phone: E-Mail: chad.bechtold@eurofins.com  
 PMSID:

Due Date Requested:  
 TAT Requested (days):  
 Compliance Project:  Yes  No  
 PO #: 1-14-1007  
 WO #: 1-14-1007  
 Project #: 86000207  
 SSOVM#:

Carrier Tracking No(s): 860-1301-439\_1  
 State of Origin:  
 Page: Page 1 of 1  
 Job #:

COCC No: 860-1301-439\_1  
 Preservation Codes:  
 A - HCL  
 B - NaOH  
 C - Zn Acetate  
 D - Nitric Acid  
 E - NaHSO4  
 F - MeOH  
 G - Amethlor  
 H - Ascorbic Acid  
 I - Ice  
 J - DI Water  
 K - EDTA  
 L - EDTA  
 Other:  
 M - Hexane  
 N - None  
 O - AsNaO2  
 P - Na2OAS  
 Q - Na2SO3  
 R - Na2S2O3  
 S - H2SO4  
 T - TSP Dodecahydrate  
 U - Acetone  
 V - MCAA  
 W - pH 4-5  
 Z - other (specify)

Sample Identification	Sample Date	Sample Time	Sample Type (G=comp, G=grab)	Matrix (W=water, S=solid, O=organic, B=trace, A=air)	Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Total Number of containers	Special Instructions/Note
					Yes	No	Yes	No		
MW 7	4-28-21	1048	G		X	N	X	N		
DUP# 1	4-28-21	1048	G		X	N	X	N		
MW 11	4-28-21	1120	G		X	N	X	N		
MW 12	4-28-21	1466	G		X	N	X	N		
MW 13	4-28-21	1250	G		X	N	X	N		
MW 15	4-28-21	1317	G		X	N	X	N		
MW 14	4-28-21	1342	G		X	N	X	N		
MW 17	4-28-21	1407	G		X	N	X	N		
Temp Blank	4-28-21		G		X	N	X	N		



Temp: 4.5 IR ID: HOU-272  
 C/F: +0.1  
 Corrected Temp: 4.6

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

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

Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Custody Seals Intact:  Yes  No Custody Seal No.:

Special Instructions/QC Requirements:  
 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months

Method of Shipment:  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Cooler Temperature(s) °C and Other Remarks:

## Login Sample Receipt Checklist

Client: Hydrex Environmental

Job Number: 860-2956-1

Login Number: 2956

List Source: Eurofins Stafford

List Number: 1

Creator: Torrez, Lisandra

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

# Appendix A

## Laboratory Data Package Cover Page - Page 1 of 4

This data package is for Eurofins Stafford job number 860-2956-1 and consists of:

- R1 - Field chain-of-custody documentation;
- R2 - Sample identification cross-reference;
- R3 - Test reports (analytical data sheets) for each environmental sample that includes:
  - a. Items consistent with NELAC Chapter 5,
  - b. dilution factors,
  - c. preparation methods,
  - d. cleanup methods, and
  - e. if required for the project, tentatively identified compounds (TICs).
- R4 - Surrogate recovery data including:
  - a. Calculated recovery (%R), and
  - b. The laboratory's surrogate QC limits.
- R5 - Test reports/summary forms for blank samples;
- R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
  - a. LCS spiking amounts,
  - b. Calculated %R for each analyte, and
  - c. The laboratory's LCS QC limits.
- R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a. Samples associated with the MS/MSD clearly identified,
  - b. MS/MSD spiking amounts,
  - c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d. Calculated %Rs and relative percent differences (RPDs), and
  - e. The laboratory's MS/MSD QC limits
- R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
  - a. The amount of analyte measured in the duplicate,
  - b. The calculated RPD, and
  - c. The laboratory's QC limits for analytical duplicates.
- R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 - Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Chad Bechtold  
Name (printed)



Signature

5/18/2021  
Date

Project Manager  
Official Title (printed)

# Laboratory Review Checklist: Reportable Data - Page 2 of 4

Laboratory Name:	Eurofins Stafford	LRC Date:	5/18/2021
Project Name:	Twin Oaks PP	Laboratory Job Number:	860-2956-1
Reviewer Name:	Chad Bechtold		

# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
R1	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?	X				
		Were MS/MSD analyzed at the appropriate frequency?	X				
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?		X			R07C
		Were MS/MSD RPDs within laboratory QC limits?	X				
R8	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?	X				
		Were analytical duplicates analyzed at the appropriate frequency?	X				
		Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

- Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
- O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
- NA = Not applicable;
- NR = Not reviewed;
- ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

# Laboratory Review checklist: Supporting Data - Page 3 of 4

Laboratory Name:	Eurofins Stafford	LRC Date:	5/18/2021
Project Name:	Twin Oaks PP	Laboratory Job Number:	860-2956-1
Reviewer Name:	Chad Bechtold		

# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	<b>Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	<b>Mass spectral tuning</b>					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	<b>Internal standards (IS)</b>					
		Were IS area counts and retention times within the method-required QC limits?			X		
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	<b>Tentatively identified compounds (TICs)</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	<b>Interference Check Sample (ICS) results</b>					
		Were percent recoveries within method QC limits?	X				
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?	X				
S10	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSS?	X				
S11	OI	<b>Proficiency test reports</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>					
		Are laboratory SOPs current and on file for each method performed?	X				
<p>1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</p> <p>3. NA = Not applicable;</p> <p>4. NR = Not reviewed;</p> <p>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>							

# Laboratory Review Checklist: Exception Reports - Page 4 of 4

Laboratory Name:	Eurofins Stafford	LRC Date:	5/18/2021
Project Name:	Twin Oaks PP	Laboratory Job Number:	860-2956-1
Reviewer Name:	Chad Bechtold		

ER # <sup>1</sup>	Description
R07C	Method 6020A: 860-2956-1 MSD failed the recovery criteria for the following analyte(s): Boron. Matrix interference is suspected.
	<ol style="list-style-type: none"> <li>1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</li> <li>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</li> <li>3. NA = Not applicable;</li> <li>4. NR = Not reviewed;</li> <li>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</li> </ol>

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## ANALYTICAL REPORT

Eurofins Xenco, Stafford  
4147 Greenbriar Dr  
Stafford, TX 77477  
Tel: (281)240-4200

Laboratory Job ID: 860-6639-1  
Client Project/Site: Twin Oaks PP

For:  
Hydrex Environmental  
1120 NW Stallings Drive  
Nacogdoches, Texas 75964

Attn: Michelle Transier



Authorized for release by:  
6/30/2021 11:53:08 AM

Chad Bechtold, Project Manager  
(813)690-3563  
[chad.bechtold@eurofinset.com](mailto:chad.bechtold@eurofinset.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:

[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Definitions/Glossary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-6639-1

## Qualifiers

### HPLC/IC

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

## Glossary

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

# Appendix A

## Laboratory Data Package Cover Page - Page 1 of 4

This data package is for Eurofins Xenco, Stafford job number 860-6639-1 and consists of:

- R1 - Field chain-of-custody documentation;
- R2 - Sample identification cross-reference;
- R3 - Test reports (analytical data sheets) for each environmental sample that includes:
  - a. Items consistent with NELAC Chapter 5,
  - b. dilution factors,
  - c. preparation methods,
  - d. cleanup methods, and
  - e. if required for the project, tentatively identified compounds (TICs).
- R4 - Surrogate recovery data including:
  - a. Calculated recovery (%R), and
  - b. The laboratory's surrogate QC limits.
- R5 - Test reports/summary forms for blank samples;
- R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
  - a. LCS spiking amounts,
  - b. Calculated %R for each analyte, and
  - c. The laboratory's LCS QC limits.
- R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a. Samples associated with the MS/MSD clearly identified,
  - b. MS/MSD spiking amounts,
  - c. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
  - d. Calculated %Rs and relative percent differences (RPDs), and
  - e. The laboratory's MS/MSD QC limits
- R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
  - a. The amount of analyte measured in the duplicate,
  - b. The calculated RPD, and
  - c. The laboratory's QC limits for analytical duplicates.
- R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 - Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Chad Bechtold

Name (printed)



Signature

6/30/2021

Date

Project Manager

Official Title (printed)

# Laboratory Review Checklist: Reportable Data - Page 2 of 4

Laboratory Name:	Eurofins Xenco, Stafford	LRC Date:	6/30/2021
Project Name:	Twin Oaks PP	Laboratory Job Number:	860-6639-1
Reviewer Name:	Chad Bechtold		

# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
R1	OI	<b>Chain-of-custody (C-O-C)</b>					
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X				
		Were all departures from standard conditions described in an exception report?	X				
R2	OI	<b>Sample and quality control (QC) identification</b>					
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?	X				
R3	OI	<b>Test reports</b>					
		Were all samples prepared and analyzed within holding times?	X				
		Other than those results < MQL, were all other raw values bracketed by calibration standards?	X				
		Were calculations checked by a peer or supervisor?	X				
		Were all analyte identifications checked by a peer or supervisor?	X				
		Were sample detection limits reported for all analytes not detected?	X				
		Were all results for soil and sediment samples reported on a dry weight basis?			X		
		Were % moisture (or solids) reported for all soil and sediment samples?			X		
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?			X		
		If required for the project, are TICs reported?			X		
R4	O	<b>Surrogate recovery data</b>					
		Were surrogates added prior to extraction?			X		
		Were surrogate percent recoveries in all samples within the laboratory QC limits?			X		
R5	OI	<b>Test reports/summary forms for blank samples</b>					
		Were appropriate type(s) of blanks analyzed?	X				
		Were blanks analyzed at the appropriate frequency?	X				
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		Were blank concentrations < MQL?	X				
R6	OI	<b>Laboratory control samples (LCS):</b>					
		Were all COCs included in the LCS?	X				
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		Were LCSs analyzed at the required frequency?	X				
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?	X				
		Was the LCSD RPD within QC limits?	X				
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>					
		Were the project/method specified analytes included in the MS and MSD?			X		
		Were MS/MSD analyzed at the appropriate frequency?			X		
		Were MS (and MSD, if applicable) %Rs within the laboratory QC limits?			X		
		Were MS/MSD RPDs within laboratory QC limits?			X		
R8	OI	<b>Analytical duplicate data</b>					
		Were appropriate analytical duplicates analyzed for each matrix?			X		
		Were analytical duplicates analyzed at the appropriate frequency?			X		
		Were RPDs or relative standard deviations within the laboratory QC limits?			X		
R9	OI	<b>Method quantitation limits (MQLs):</b>					
		Are the MQLs for each method analyte included in the laboratory data package?	X				
		Do the MQLs correspond to the concentration of the lowest non-zero calibration standard?	X				
		Are unadjusted MQLs and DCSs included in the laboratory data package?	X				
R10	OI	<b>Other problems/anomalies</b>					
		Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?	X				
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

- Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
- O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
- NA = Not applicable;
- NR = Not reviewed;
- ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

# Laboratory Review checklist: Supporting Data - Page 3 of 4

Laboratory Name:	Eurofins Xenco, Stafford	LRC Date:	6/30/2021
Project Name:	Twin Oaks PP	Laboratory Job Number:	860-6639-1
Reviewer Name:	Chad Bechtold		

# <sup>1</sup>	A <sup>2</sup>	Description	Yes	No	NA <sup>3</sup>	NR <sup>4</sup>	ER# <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>					
		Were response factors and/or relative response factors for each analyte within QC limits?	X				
		Were percent RSDs or correlation coefficient criteria met?	X				
		Was the number of standards recommended in the method used for all analytes?	X				
		Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		Are ICAL data available for all instruments used?	X				
		Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	<b>Initial and continuing calibration verification (ICV and CCV) and continuing calibration blank (CCB):</b>					
		Was the CCV analyzed at the method-required frequency?	X				
		Were percent differences for each analyte within the method-required QC limits?	X				
		Was the ICAL curve verified for each analyte?	X				
		Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	<b>Mass spectral tuning</b>					
		Was the appropriate compound for the method used for tuning?			X		
		Were ion abundance data within the method-required QC limits?			X		
S4	O	<b>Internal standards (IS)</b>					
		Were IS area counts and retention times within the method-required QC limits?			X		
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>					
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X				
		Were data associated with manual integrations flagged on the raw data?	X				
S6	O	<b>Dual column confirmation</b>					
		Did dual column confirmation results meet the method-required QC?			X		
S7	O	<b>Tentatively identified compounds (TICs)</b>					
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	I	<b>Interference Check Sample (ICS) results</b>					
		Were percent recoveries within method QC limits?	X				
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>					
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X		
S10	OI	<b>Method detection limit (MDL) studies</b>					
		Was a MDL study performed for each reported analyte?	X				
		Is the MDL either adjusted or supported by the analysis of DCSSs?	X				
S11	OI	<b>Proficiency test reports</b>					
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X				
S12	OI	<b>Standards documentation</b>					
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	<b>Compound/analyte identification procedures</b>					
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	<b>Demonstration of analyst competency (DOC)</b>					
		Was DOC conducted consistent with NELAC Chapter 5?	X				
		Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>					
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X				
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>					
		Are laboratory SOPs current and on file for each method performed?	X				
<p>1. Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.</p> <p>2. O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);</p> <p>3. NA = Not applicable;</p> <p>4. NR = Not reviewed;</p> <p>5. ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).</p>							

# Laboratory Review Checklist: Exception Reports - Page 4 of 4

Laboratory Name:	Eurofins Xenco, Stafford	LRC Date:	6/30/2021
Project Name:	Twin Oaks PP	Laboratory Job Number:	860-6639-1
Reviewer Name:	Chad Bechtold		

ER # <sup>1</sup>	Description
1.	Items identified by the letter "R" must be included in the laboratory data package submitted in the TRRP-required report(s). Items identified by the letter "S" should be retained and made available upon request for the appropriate retention period.
2.	O = organic analyses; I = inorganic analyses (and general chemistry, when applicable);
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# Case Narrative

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-6639-1

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**Job ID: 860-6639-1**

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**Laboratory: Eurofins Xenco, Stafford**

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**Narrative**

**Job Narrative  
860-6639-1**

**Receipt**

The samples were received on 6/24/2021 10:19 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.6°C

**HPLC/IC**

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

**Metals**

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

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# Detection Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-6639-1

## Client Sample ID: MW-14

Lab Sample ID: 860-6639-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	545		5.00	mg/L	10		300.0	Total/NA
Calcium	130		10.0	mg/L	50		6010B	Total/NA

## Client Sample ID: MW-15

Lab Sample ID: 860-6639-2

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
Calcium	30.0		0.200	mg/L	1		6010B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Xenco, Stafford



# Client Sample Results

Client: Hydrex Environmental  
 Project/Site: Twin Oaks PP

Job ID: 860-6639-1

**Client Sample ID: MW-14**

**Lab Sample ID: 860-6639-1**

Date Collected: 06/23/21 10:05

Matrix: Water

Date Received: 06/24/21 10:19

**Method: 300.0 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	545		5.00	mg/L			06/29/21 12:43	10

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	130		10.0	mg/L		06/26/21 11:00	06/26/21 22:53	50

**Client Sample ID: MW-15**

**Lab Sample ID: 860-6639-2**

Date Collected: 06/23/21 11:00

Matrix: Water

Date Received: 06/24/21 10:19

**Method: 6010B - Metals (ICP)**

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	30.0		0.200	mg/L		06/26/21 11:00	06/26/21 22:42	1





# QC Sample Results

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-6639-1

## Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 860-13053/3  
Matrix: Water  
Analysis Batch: 13053

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<0.500	U	0.500	mg/L			06/29/21 08:39	1

Lab Sample ID: MB 860-13053/39  
Matrix: Water  
Analysis Batch: 13053

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<0.500	U	0.500	mg/L			06/29/21 16:03	1

Lab Sample ID: LCS 860-13053/4  
Matrix: Water  
Analysis Batch: 13053

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	10.0	10.08		mg/L		101	90 - 110

Lab Sample ID: LCS 860-13053/40  
Matrix: Water  
Analysis Batch: 13053

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	10.0	10.11		mg/L		101	90 - 110

Lab Sample ID: LCSD 860-13053/41  
Matrix: Water  
Analysis Batch: 13053

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	10.0	10.07		mg/L		101	90 - 110	0	20

Lab Sample ID: LCSD 860-13053/5  
Matrix: Water  
Analysis Batch: 13053

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	10.0	9.961		mg/L		100	90 - 110	1	20

## Method: 6010B - Metals (ICP)

Lab Sample ID: MB 860-12855/1-A  
Matrix: Water  
Analysis Batch: 12976

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 12855

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	<0.200	U	0.200	mg/L		06/26/21 11:00	06/26/21 21:51	1

# QC Sample Results

Client: Hydrex Environmental  
 Project/Site: Twin Oaks PP

Job ID: 860-6639-1

## Method: 6010B - Metals (ICP) (Continued)

**Lab Sample ID: LCS 860-12855/2-A**  
**Matrix: Water**  
**Analysis Batch: 12976**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 12855**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	25.0	26.06		mg/L		104	80 - 120

**Lab Sample ID: LCSD 860-12855/3-A**  
**Matrix: Water**  
**Analysis Batch: 12976**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 12855**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	25.0	26.15		mg/L		105	80 - 120	0	20



# QC Association Summary

Client: Hydrex Environmental  
 Project/Site: Twin Oaks PP

Job ID: 860-6639-1

## HPLC/IC

### Analysis Batch: 13053

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-6639-1	MW-14	Total/NA	Water	300.0	
MB 860-13053/3	Method Blank	Total/NA	Water	300.0	
MB 860-13053/39	Method Blank	Total/NA	Water	300.0	
LCS 860-13053/4	Lab Control Sample	Total/NA	Water	300.0	
LCS 860-13053/40	Lab Control Sample	Total/NA	Water	300.0	
LCSD 860-13053/41	Lab Control Sample Dup	Total/NA	Water	300.0	
LCSD 860-13053/5	Lab Control Sample Dup	Total/NA	Water	300.0	

## Metals

### Prep Batch: 12855

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-6639-1	MW-14	Total/NA	Water	3010A	
860-6639-2	MW-15	Total/NA	Water	3010A	
MB 860-12855/1-A	Method Blank	Total/NA	Water	3010A	
LCS 860-12855/2-A	Lab Control Sample	Total/NA	Water	3010A	
LCSD 860-12855/3-A	Lab Control Sample Dup	Total/NA	Water	3010A	

### Analysis Batch: 12976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
860-6639-1	MW-14	Total/NA	Water	6010B	12855
860-6639-2	MW-15	Total/NA	Water	6010B	12855
MB 860-12855/1-A	Method Blank	Total/NA	Water	6010B	12855
LCS 860-12855/2-A	Lab Control Sample	Total/NA	Water	6010B	12855
LCSD 860-12855/3-A	Lab Control Sample Dup	Total/NA	Water	6010B	12855

# Lab Chronicle

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-6639-1

**Client Sample ID: MW-14**  
Date Collected: 06/23/21 10:05  
Date Received: 06/24/21 10:19

**Lab Sample ID: 860-6639-1**  
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		10			13053	06/29/21 12:43	WP	XEN STF
Total/NA	Prep	3010A			50 mL	50 mL	12855	06/26/21 11:00	MD	XEN STF
Total/NA	Analysis	6010B		50			12976	06/26/21 22:53	DP	XEN STF

**Client Sample ID: MW-15**  
Date Collected: 06/23/21 11:00  
Date Received: 06/24/21 10:19

**Lab Sample ID: 860-6639-2**  
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	12855	06/26/21 11:00	MD	XEN STF
Total/NA	Analysis	6010B		1			12976	06/26/21 22:42	DP	XEN STF

**Laboratory References:**

XEN STF = Eurofins Xenco, Stafford, 4147 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200



# Accreditation/Certification Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-6639-1

## Laboratory: Eurofins Xenco, Stafford

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

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	20-025-0	08-04-21
Florida	NELAP	E871002	06-30-21
Louisiana	NELAP	03054	06-30-21
North Carolina (WW/SW)	State	681	12-31-21
Oklahoma	State	1306	08-31-21
Texas	NELAP	T104704215-21-41	06-30-21
USDA	US Federal Programs	P330-19-00137	04-24-22

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# Method Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-6639-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	XEN STF
6010B	Metals (ICP)	SW846	XEN STF
3010A	Preparation, Total Metals	SW846	XEN STF

**Protocol References:**

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.  
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

XEN STF = Eurofins Xenco, Stafford, 4147 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200



# Sample Summary

Client: Hydrex Environmental  
Project/Site: Twin Oaks PP

Job ID: 860-6639-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
860-6639-1	MW-14	Water	06/23/21 10:05	06/24/21 10:19	
860-6639-2	MW-15	Water	06/23/21 11:00	06/24/21 10:19	

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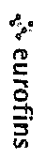
14

15

**Eurofins Xenco, Stafford**

4147 Greenbriar Dr  
Stafford, TX 77477  
Phone: 281-240-4200

**Chain of Custody Record**



eur  
st

**Client Information**

Client Contact: **Michelle Tranter**  
Company: **Hydrex Environmental**  
Address: **1120 NW Stallings Drive**  
City: **Nacogdoches**  
State, Zip: **TX 75964**  
Phone: **936-568-9451 (Tel)**  
Email: **mtranter@hydrex-inc.com**  
Project Name: **Twin Oaks PP**  
Site: **SSOV#:**

Sampler: **SKH Dwyer**

Lab P#: **Bechtold, Chad**  
E-Mail: **chad.bechtold@eurofinsel.com**

Carrier Tracking No(s):

COO No: **980-2450-793.1**

Page: **1 of 1**

Due Date Requested:

TAT Requested (days):

**Analysis Requested**

Preservation Codes:

- A HCL
- B NaOH
- C Zn Acetate
- D Nitric Acid
- E NaHSO4
- F MeOH
- G Amchlor
- H Ascorbic Acid
- I Ice
- J DI Water
- K EDTA
- L EDA
- Other
- M Hexane
- N None
- O AsNaO2
- P Na2O4S
- Q Na2SO3
- R Na2S2O3
- S H2SO4
- T TSP Dodecylhydrate
- U Acetone
- V MCAA
- W pH 4.5
- Z other (Specify)

**Sample Identification**

Sample ID	Sample Date	Sample Time	Sample Type (G=Comp, G=grab)	Preservation Code	Matrix (Water, Sealed, Original, A+M)
MMW-14	6-23-21	1005	G		Water
MMW-15	6-23-21	1100	G		Water



**Field Filtered Sample (Yes or No)**  
**Perform MS/MSD (Yes or No)**

300\_ORGFM\_28D Sulfate  
6010B Calcium

**Total Number of containers**

2

**Special Instructions/Note:**

Temp: **3.5TR** ID: HOU-272  
C/F +0  
Corrected Temp: **3 C**

**Possible Hazard Identification**

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Radiological

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

**Empty Kit Relinquished by:**

Date:

Time:

Method of Shipment:

**Relinquished by:**

Date/Time: **06-23-21 / 1500**

Company: **Hydrex**

Received by: **Fedex**

Date/Time: **06-23-21 / 1500**

Company: **Fedex**

**Relinquished by:**

Date/Time:

Company:

Received by: **Krusader**

Date/Time: **6/24/21 10:19**

Company:

**Relinquished by:**

Date/Time:

Company:

Received by:

Date/Time:

Company:

**Custody Seals Intact:**

Δ Yes Δ No

Custody Seal No.

Cooler Temperature(s) °C and Other Remarks:



## Login Sample Receipt Checklist

Client: Hydrex Environmental

Job Number: 860-6639-1

**Login Number: 6639**

**List Source: Eurofins Xenco, Stafford**

**List Number: 1**

**Creator: Torrez, Lisandra**

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



**April 2021 Event**  
**Results of Statistical Calculations**

## **Control Charts and Prediction Limits**

# Shewhart-Cusum Control Chart / Rank Sum

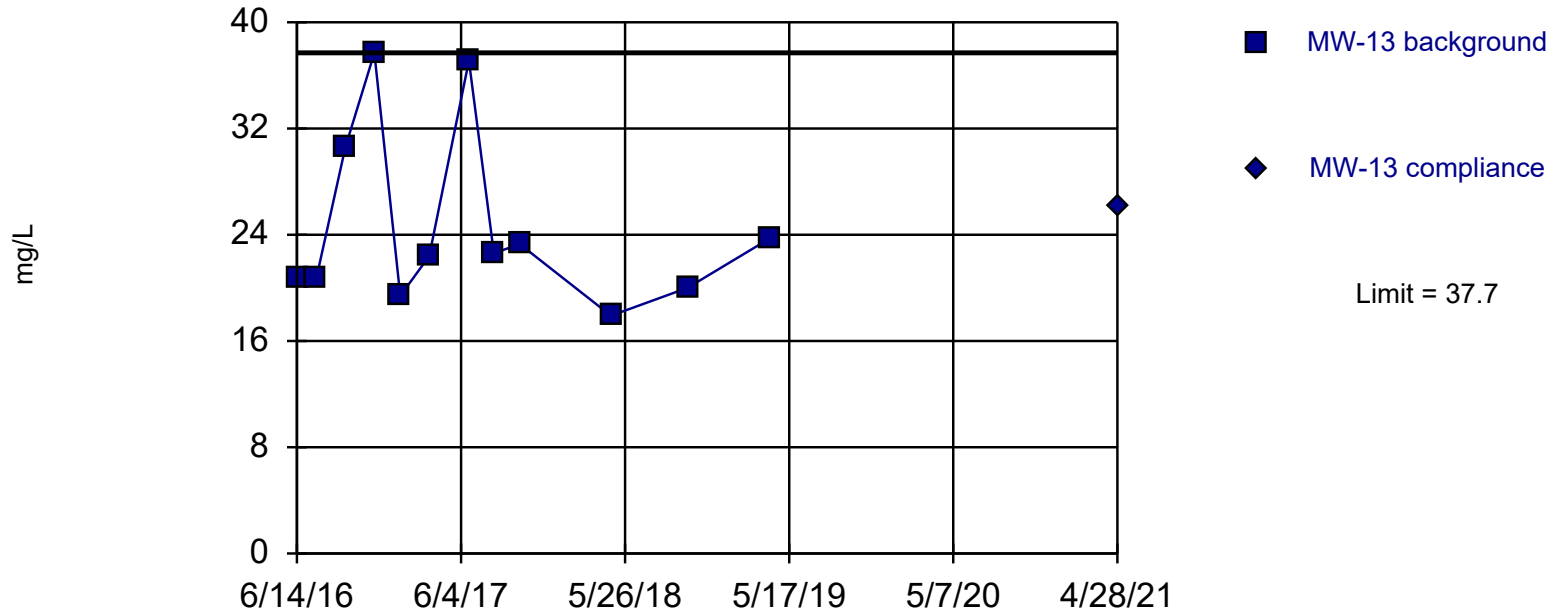
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks    Printed 6/7/2021, 9:20 AM

<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>h</u>	<u>SCL</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Method</u>
Calcium (mg/L)	MW-13	No	PL=...	n/a	12	0	No	NP Intra PL (normality)
Chloride (mg/L)	MW-13	No	119.4	119.4	12	0	x^3	Param Intra
Fluoride (mg/L)	MW-13	No	PL=...	n/a	12	75	No	NP Intra PL (NDs)
pH (SU)	MW-13	No	7.7...	7.7...	12	0	No	Param Intra
Sulfate (mg/L)	MW-13	No	193.1	193.1	12	8.333	No	Param Intra
Total Dissolved Solids (mg/L)	MW-13	No	660.3	660.3	12	0	No	Param Intra
<b>Calcium (mg/L)</b>	<b>MW-14</b>	<b>Yes</b>	<b>115.2</b>	<b>115.2</b>	<b>12</b>	<b>0</b>	<b>No</b>	<b>Param Intra</b>
Chloride (mg/L)	MW-14	No	436.5	436.5	12	0	No	Param Intra
Fluoride (mg/L)	MW-14	No	PL=...	n/a	12	75	No	NP Intra PL (NDs)
pH (SU)	MW-14	No	7.7...	7.7...	12	0	x^3	Param Intra
<b>Sulfate (mg/L)</b>	<b>MW-14</b>	<b>Yes</b>	<b>401.3</b>	<b>401.3</b>	<b>12</b>	<b>0</b>	<b>No</b>	<b>Param Intra</b>
Total Dissolved Solids (mg/L)	MW-14	No	1541	1541	12	0	No	Param Intra
<b>Calcium (mg/L)</b>	<b>MW-15</b>	<b>Yes</b>	<b>28.93</b>	<b>28.93</b>	<b>12</b>	<b>0</b>	<b>No</b>	<b>Param Intra</b>
Chloride (mg/L)	MW-15	No	175.8	175.8	12	0	No	Param Intra
Fluoride (mg/L)	MW-15	No	PL=0.5	n/a	12	83.33	No	NP Intra PL (NDs)
pH (SU)	MW-15	No	7.7...	7.7...	12	0	x^3	Param Intra
Sulfate (mg/L)	MW-15	No	40.2	40.2	12	0	No	Param Intra
Total Dissolved Solids (mg/L)	MW-15	No	476.9	476.9	12	0	No	Param Intra
Calcium (mg/L)	MW-17	No	555.1	555.1	12	0	sqrt(x)	Param Intra
Chloride (mg/L)	MW-17	No	1678	1678	12	0	No	Param Intra
Fluoride (mg/L)	MW-17	No	PL=0.5	n/a	12	83.33	No	NP Intra PL (NDs)
pH (SU)	MW-17	No	7.9...	7.9...	12	0	No	Param Intra
Sulfate (mg/L)	MW-17	No	160.2	160.2	12	8.333	No	Param Intra
Total Dissolved Solids (mg/L)	MW-17	No	3191	3191	12	0	No	Param Intra

Within Limit

### Prediction Limit

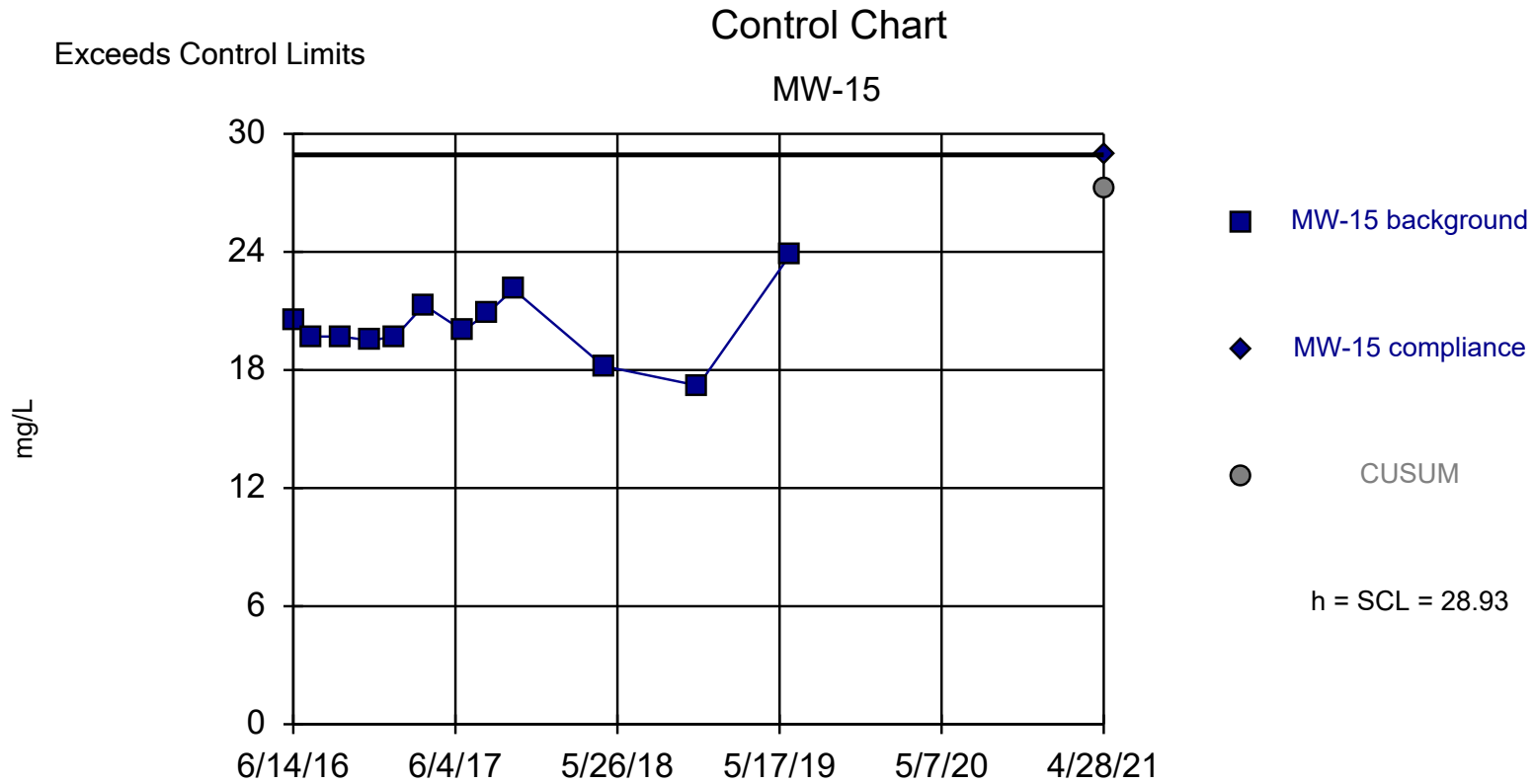
Intrawell Non-parametric



Non-parametric test used in lieu of control chart because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 12 background values. Well-constituent pair annual alpha = 0.02143. Individual comparison alpha = 0.01077 (1 of 2). Seasonality was not detected with 95% confidence.

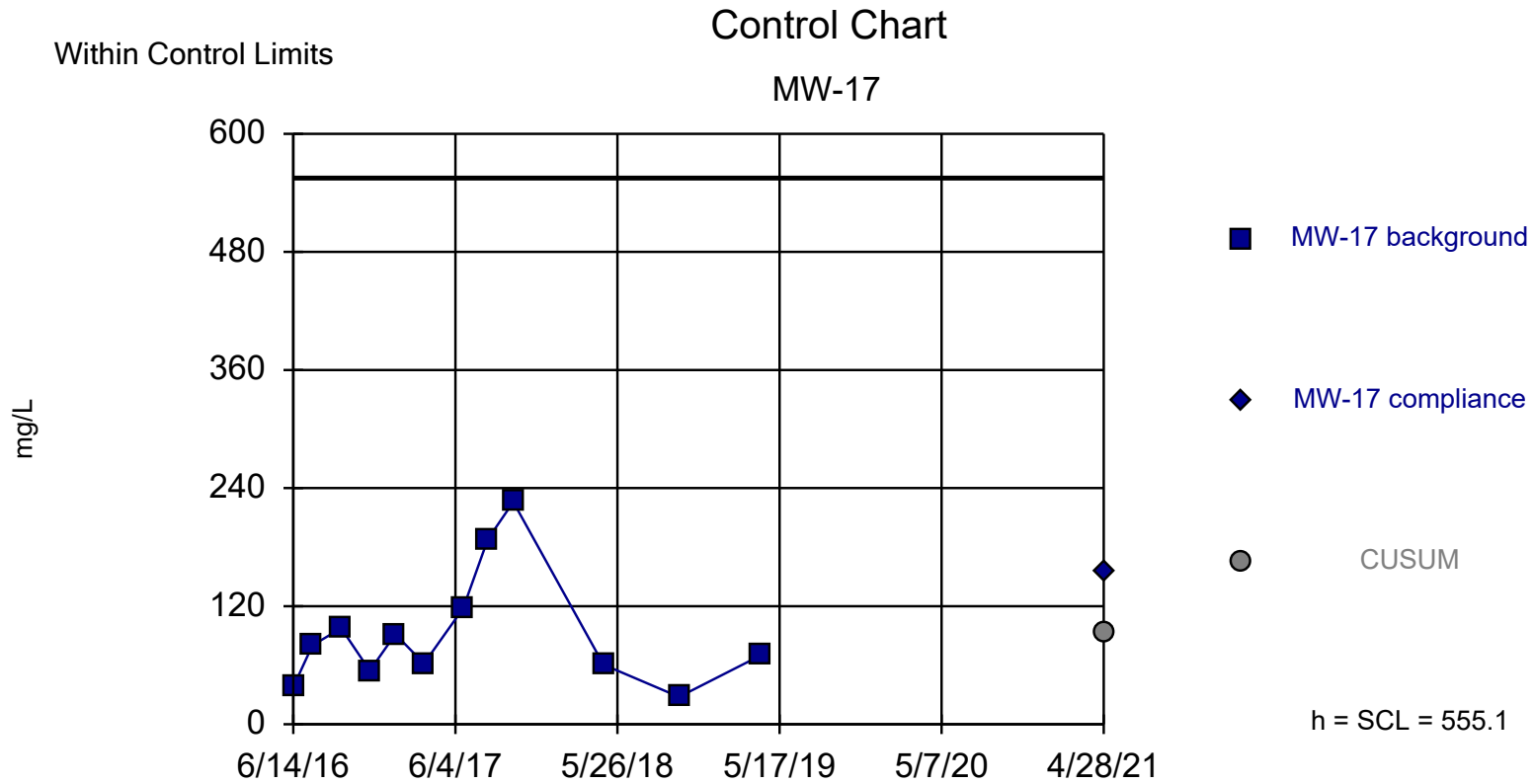
Constituent: Calcium    Analysis Run 6/7/2021 9:19 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks





Background Data Summary: Mean=20.23, Std. Dev.=1.742, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9604, critical = 0.859. Report alpha = 0.000284. Dates ending 6/11/2019 used for control stats. Standardized h=5, SCL=5.

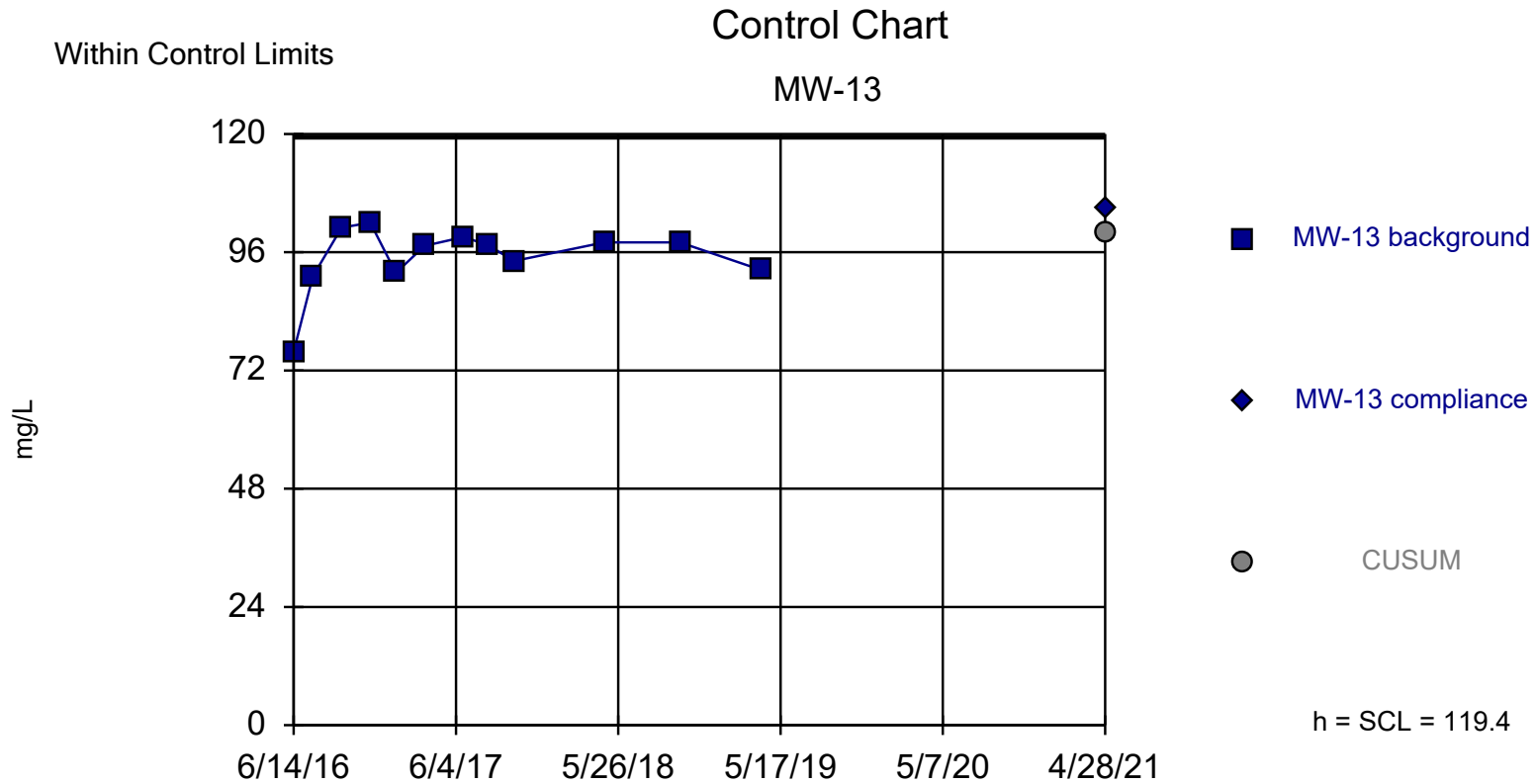
Constituent: Calcium    Analysis Run 6/7/2021 9:19 AM  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary (based on square root transformation): Mean=9.233, Std. Dev.=2.865, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9332, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

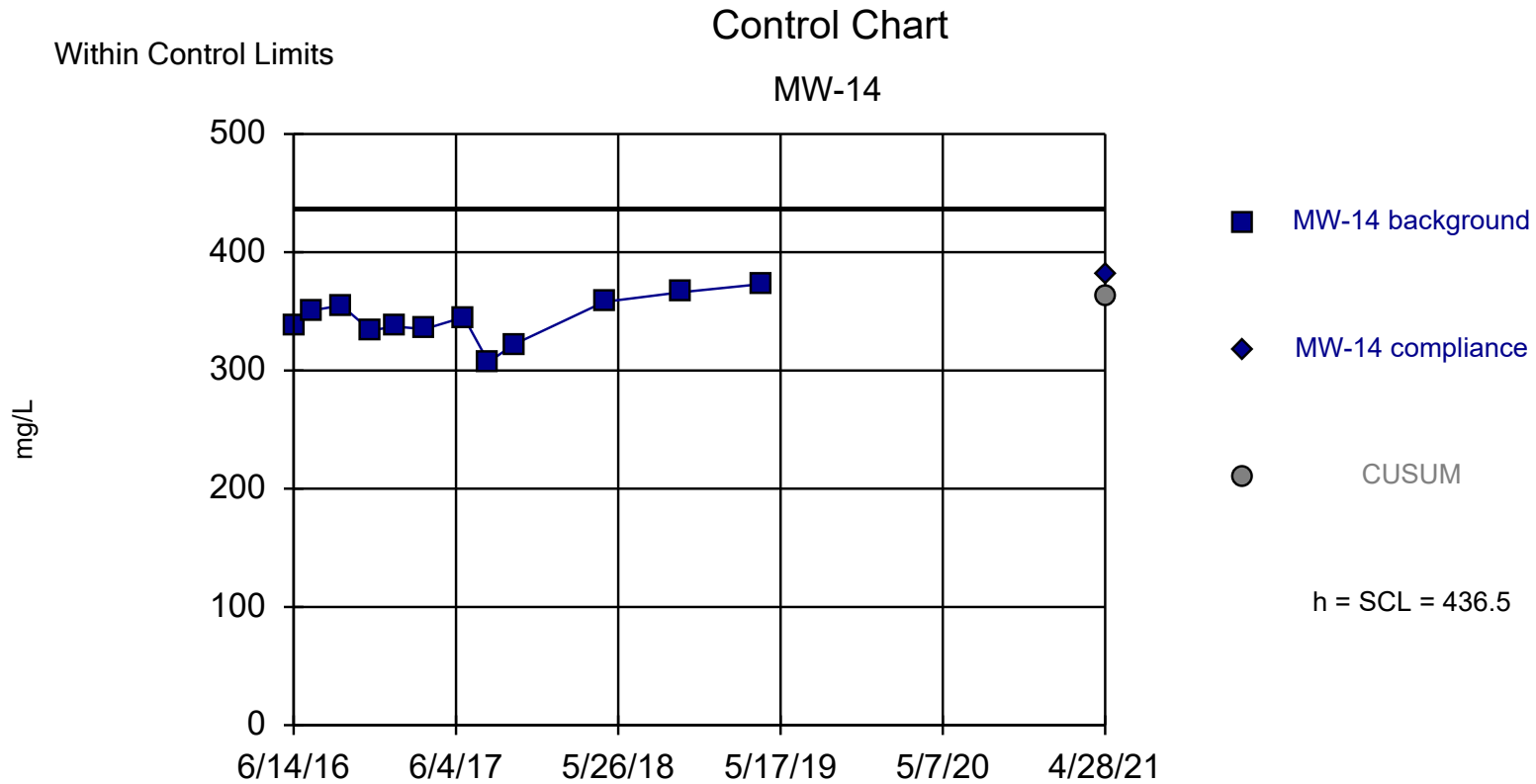
Constituent: Calcium    Analysis Run 6/7/2021 9:19 AM  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks





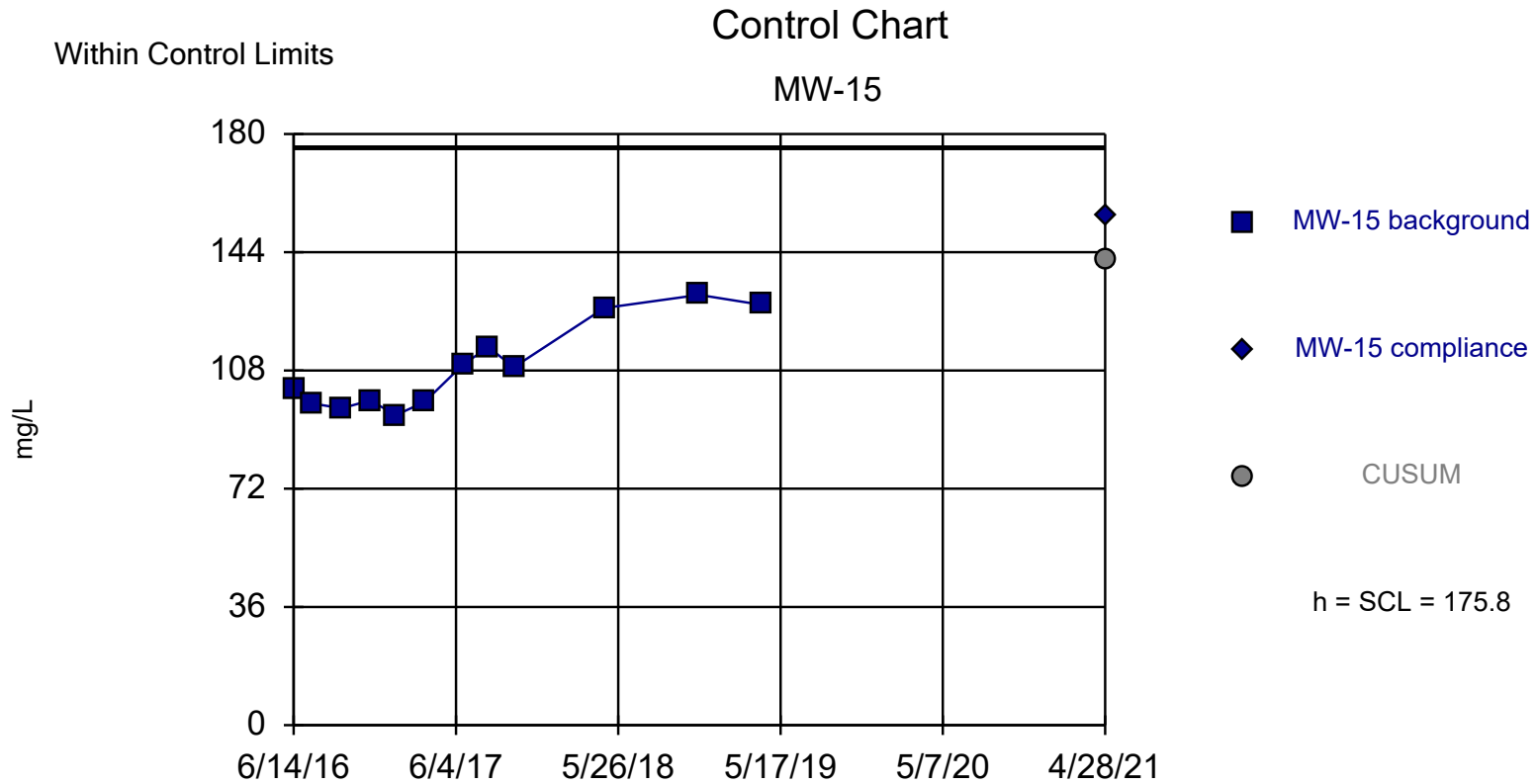
Background Data Summary (based on cube transformation): Mean=865191, Std. Dev.=167087, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8621, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride    Analysis Run 6/7/2021 9:19 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



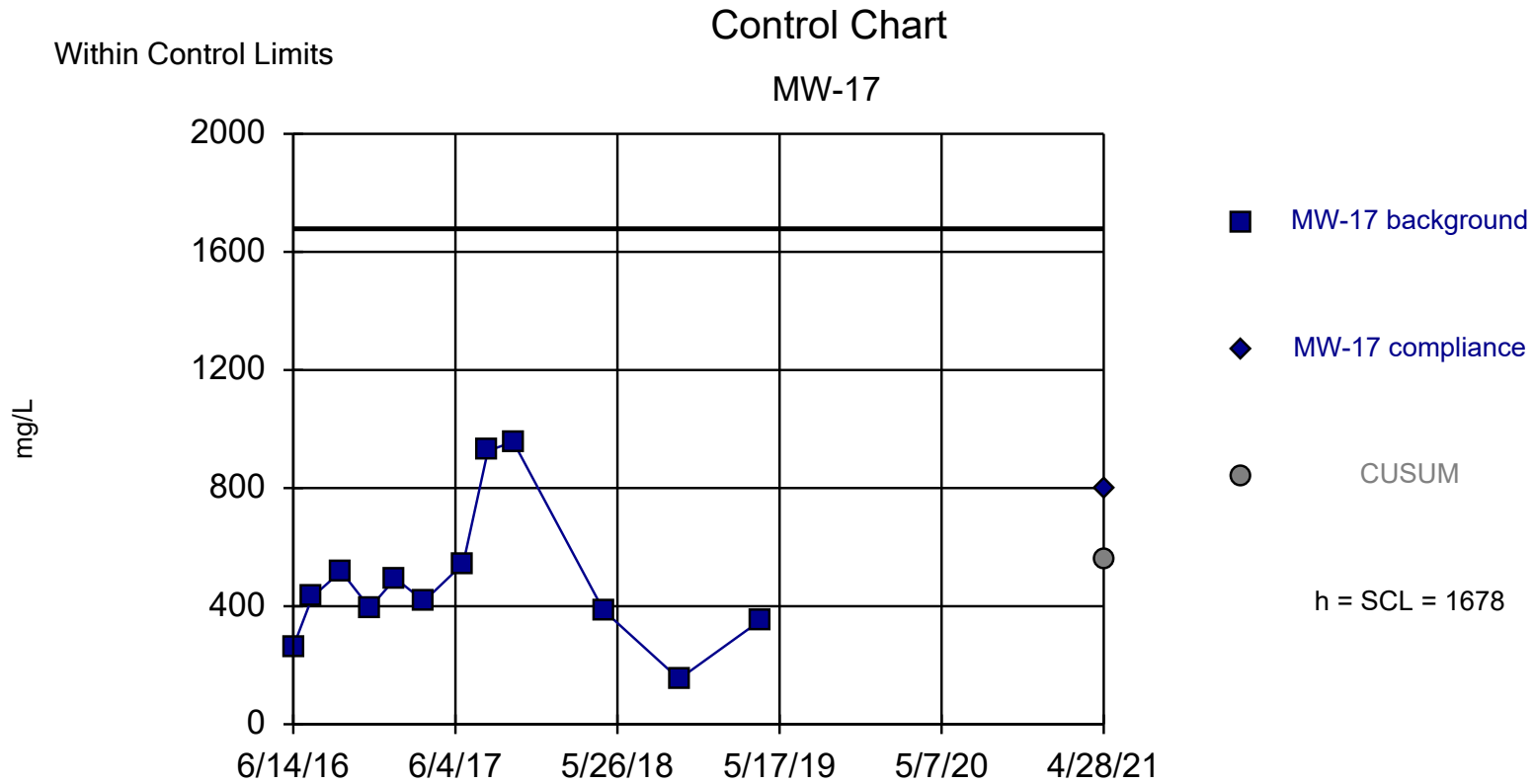
Background Data Summary: Mean=343.3, Std. Dev.=18.63, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9777, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride    Analysis Run 6/7/2021 9:19 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=109, Std. Dev.=13.36, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8656, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride    Analysis Run 6/7/2021 9:19 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



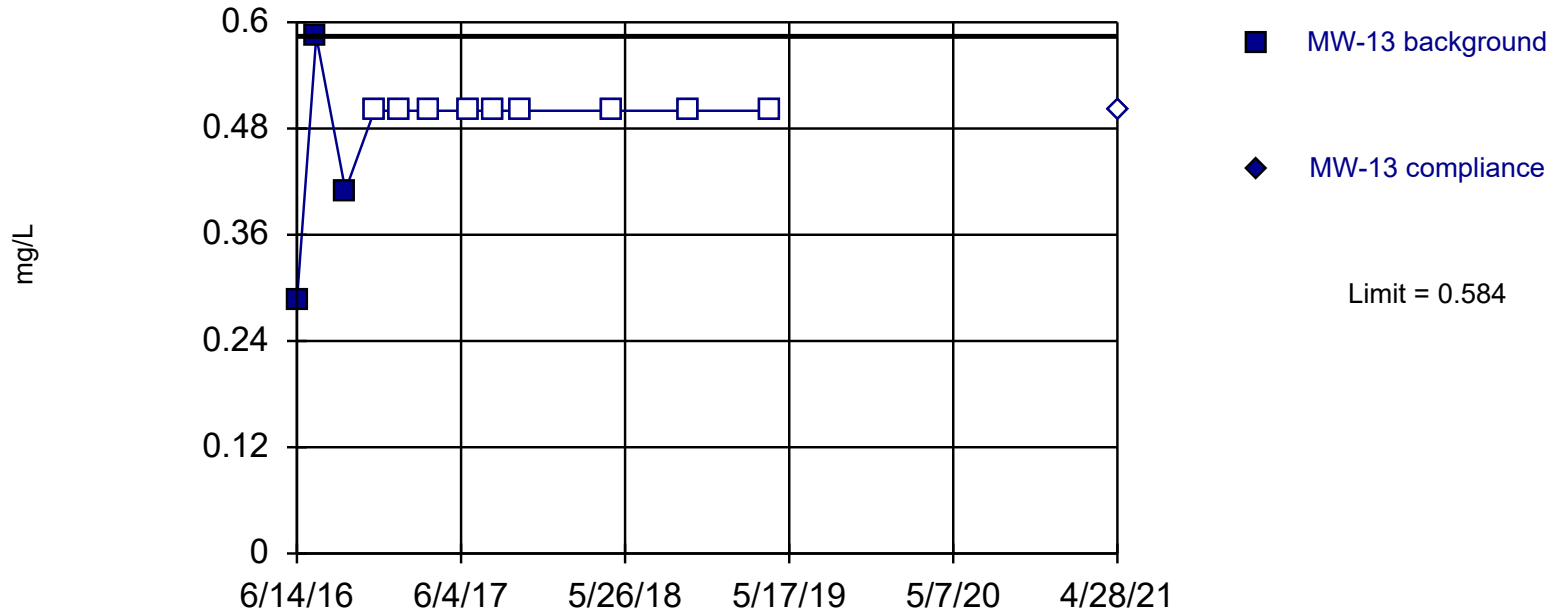
Background Data Summary: Mean=486.2, Std. Dev.=238.4, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8683, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride    Analysis Run 6/7/2021 9:19 AM  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

Within Limit

### Prediction Limit

Intrawell Non-parametric



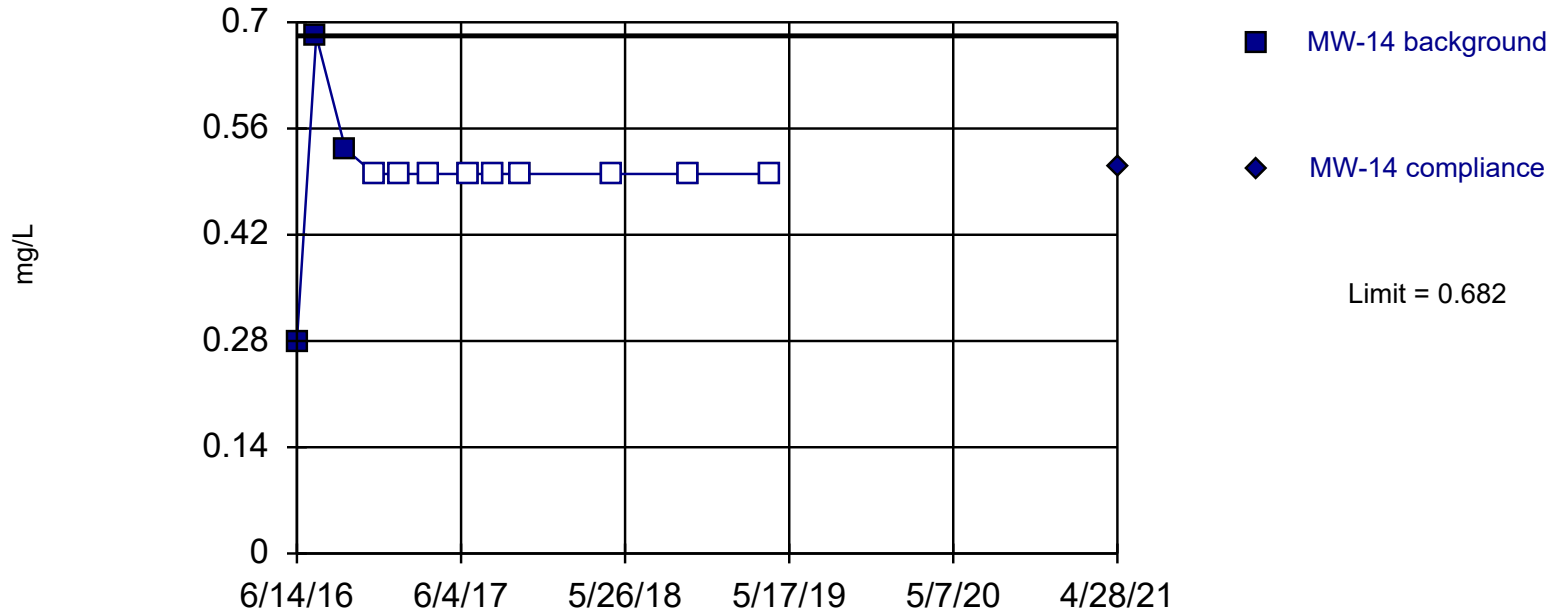
Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 12 background values. 75% NDs. Well-constituent pair annual alpha = 0.02143. Individual comparison alpha = 0.01077 (1 of 2). Seasonality was not detected with 95% confidence.

Constituent: Fluoride Analysis Run 6/7/2021 9:19 AM  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

## Prediction Limit

Intrawell Non-parametric



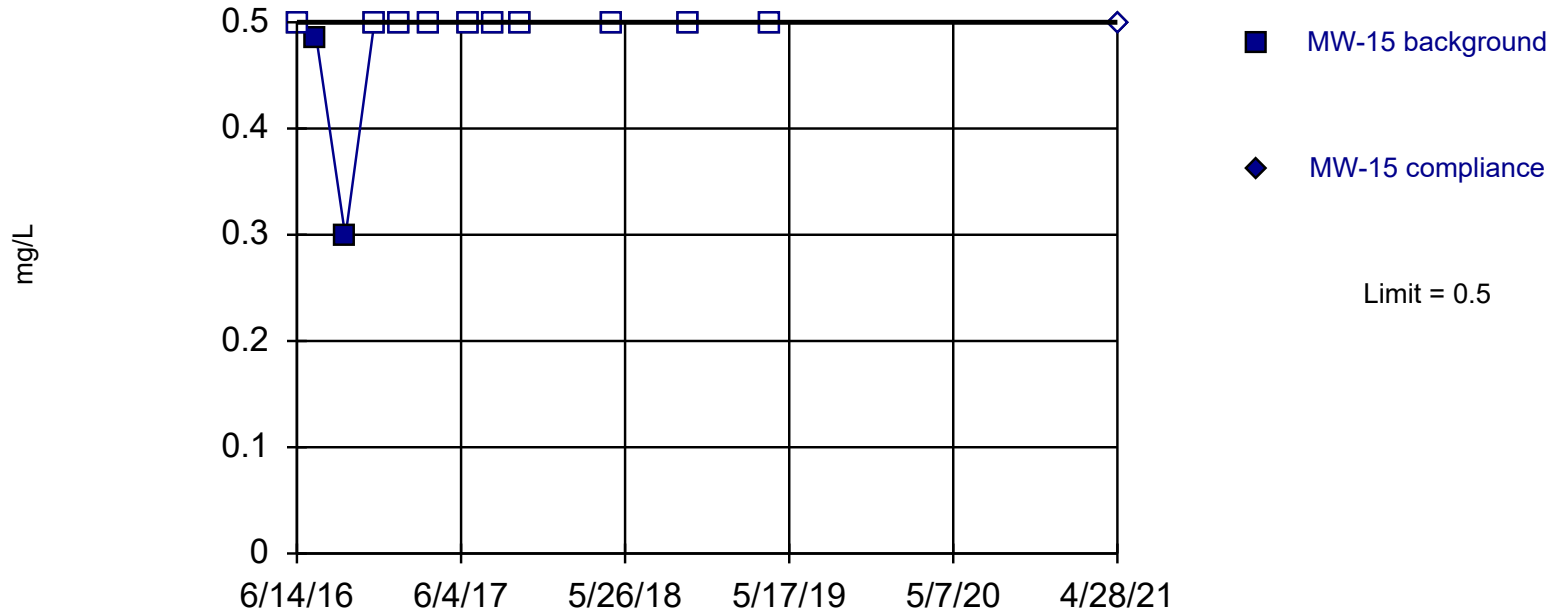
Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 12 background values. 75% NDs. Well-constituent pair annual alpha = 0.02143. Individual comparison alpha = 0.01077 (1 of 2). Seasonality was not detected with 95% confidence.

Constituent: Fluoride Analysis Run 6/7/2021 9:19 AM  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

### Prediction Limit

Intrawell Non-parametric

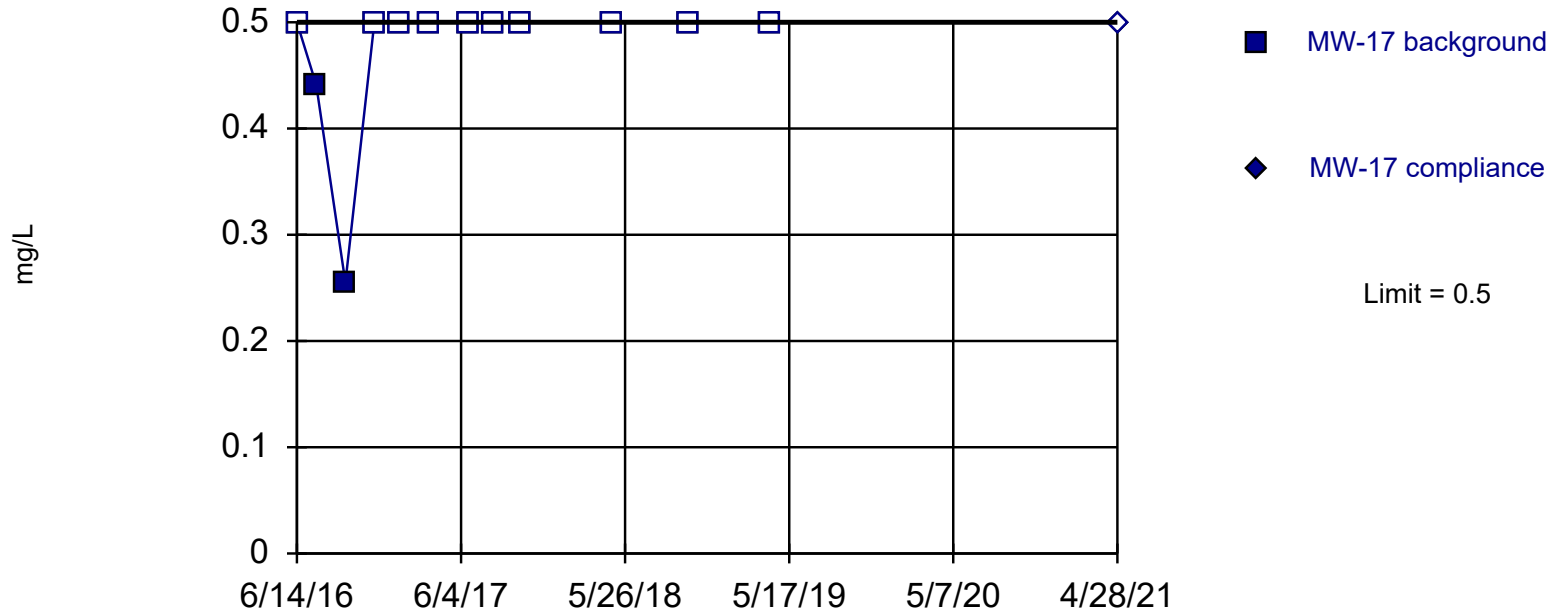


Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 12 background values. 83.33% NDs. Well-constituent pair annual alpha = 0.02143. Individual comparison alpha = 0.01077 (1 of 2). Seasonality was not detected with 95% confidence.

Constituent: Fluoride    Analysis Run 6/7/2021 9:19 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

Within Limit

### Prediction Limit Intrawell Non-parametric

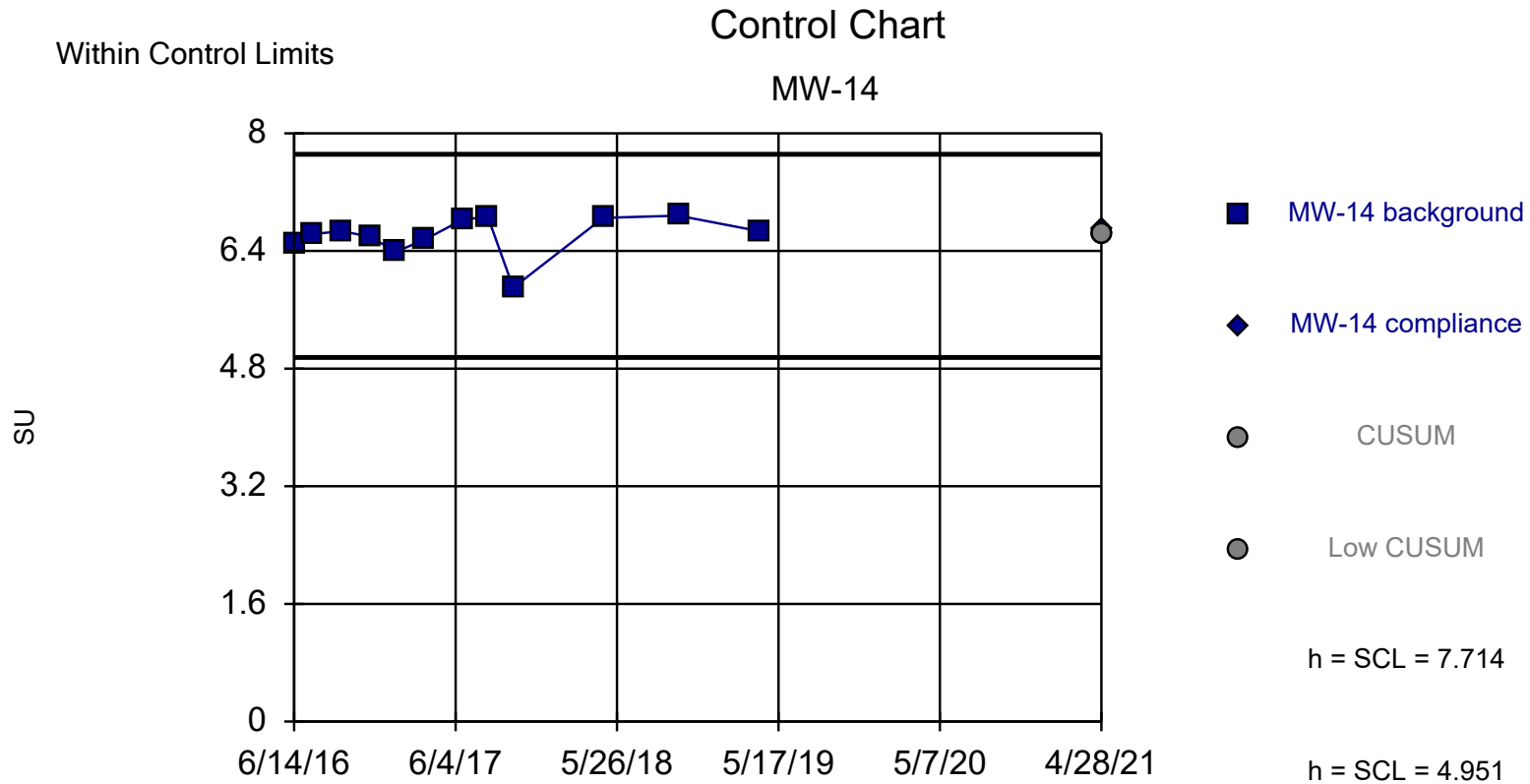


Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 12 background values. 83.33% NDs. Well-constituent pair annual alpha = 0.02143. Individual comparison alpha = 0.01077 (1 of 2). Seasonality was not detected with 95% confidence.

Constituent: Fluoride Analysis Run 6/7/2021 9:19 AM  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



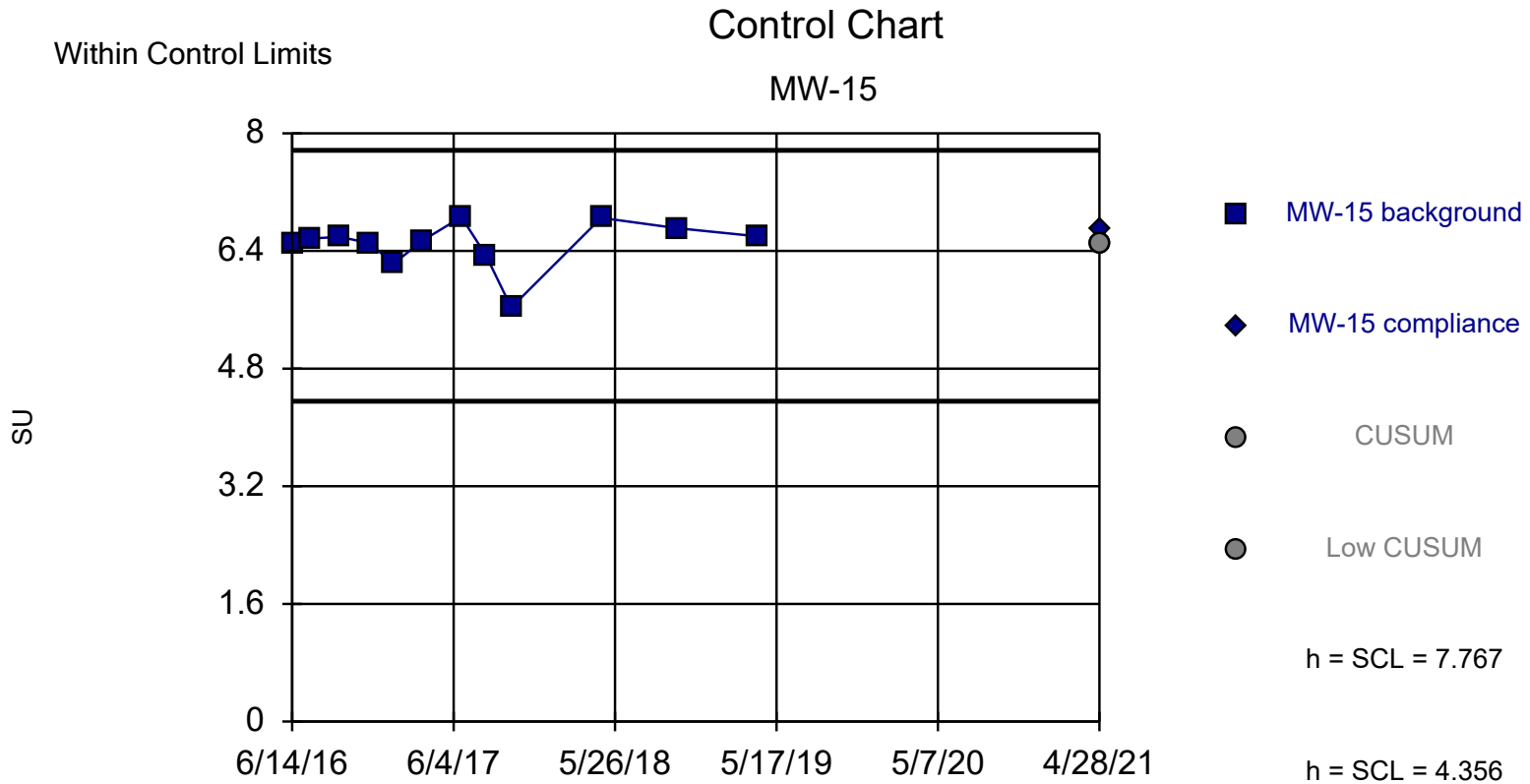




Background Data Summary (based on cube transformation): Mean=290.2, Std. Dev.=33.78, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8656, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: pH Analysis Run 6/7/2021 9:20 AM

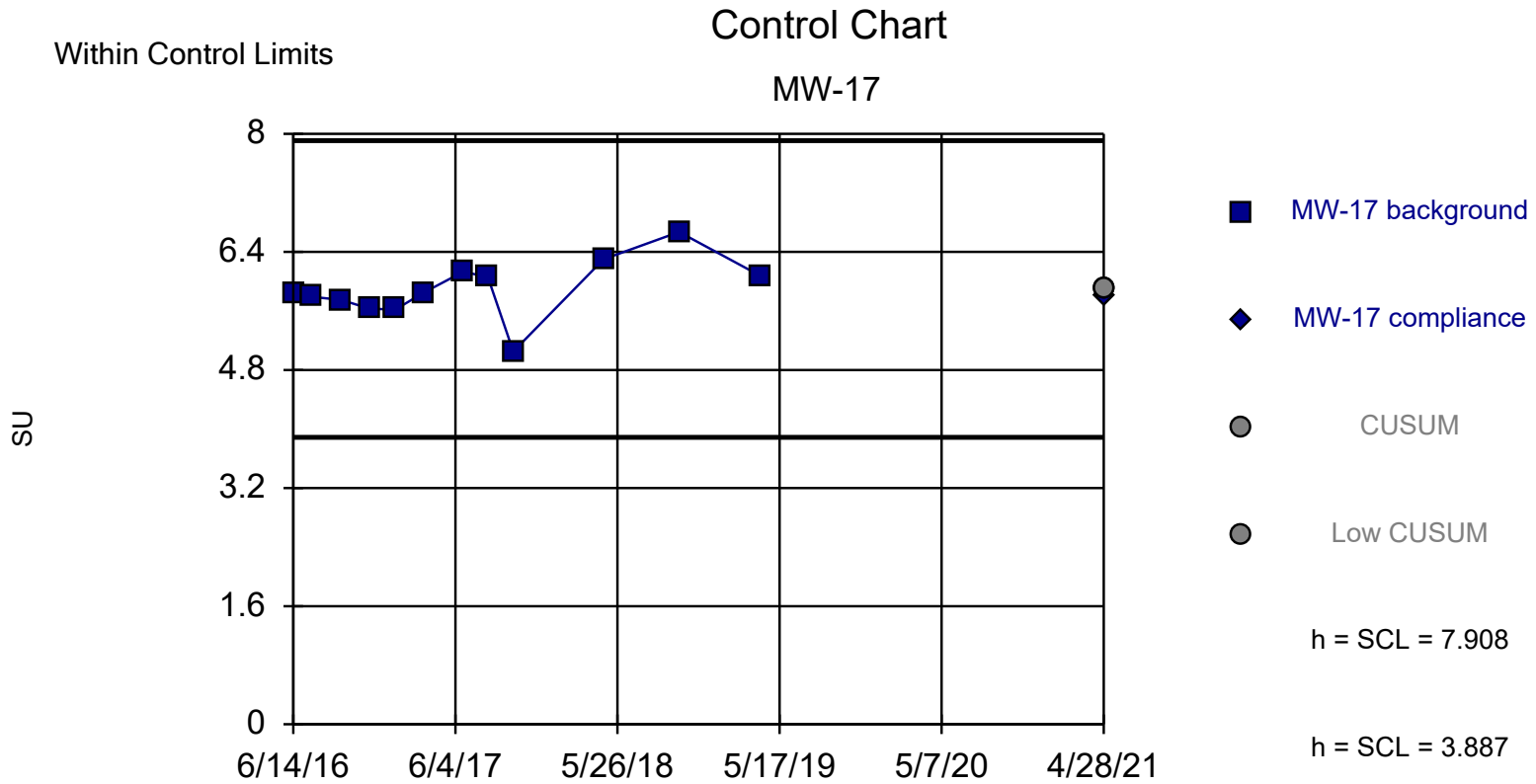
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



Background Data Summary (based on cube transformation): Mean=275.6, Std. Dev.=38.59, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8778, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: pH Analysis Run 6/7/2021 9:20 AM

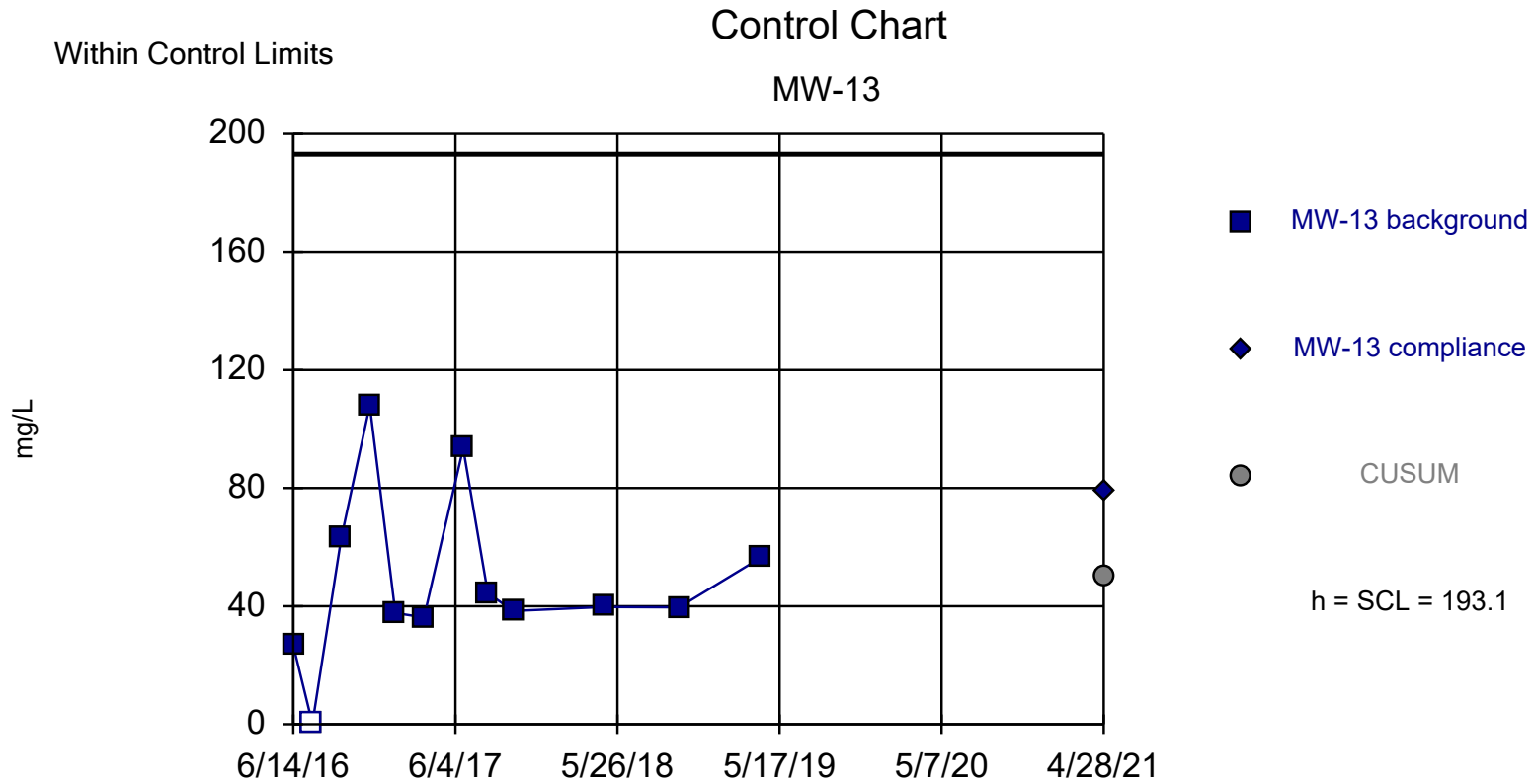
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

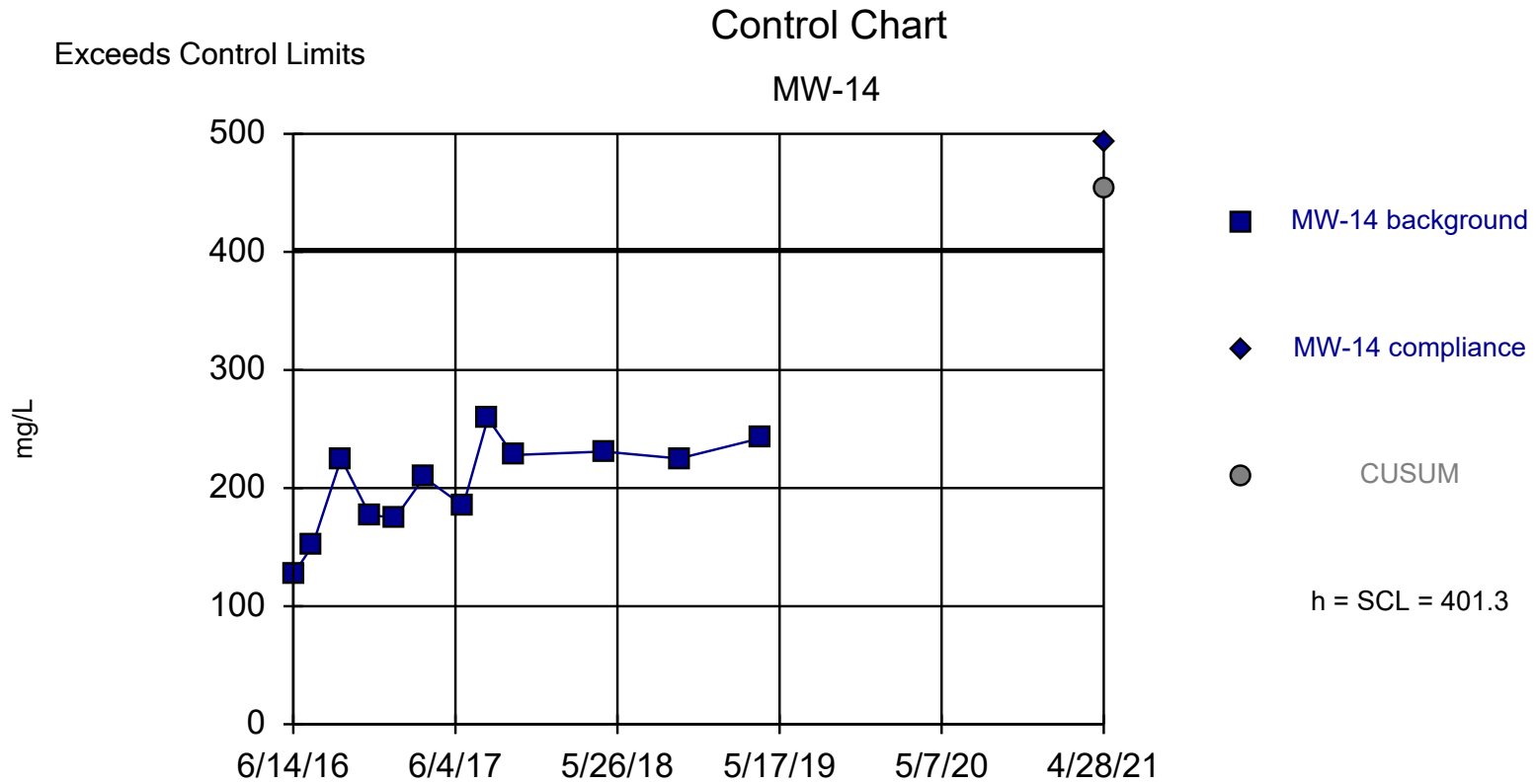


Background Data Summary: Mean=5.898, Std. Dev.=0.4021, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.962, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: pH Analysis Run 6/7/2021 9:20 AM

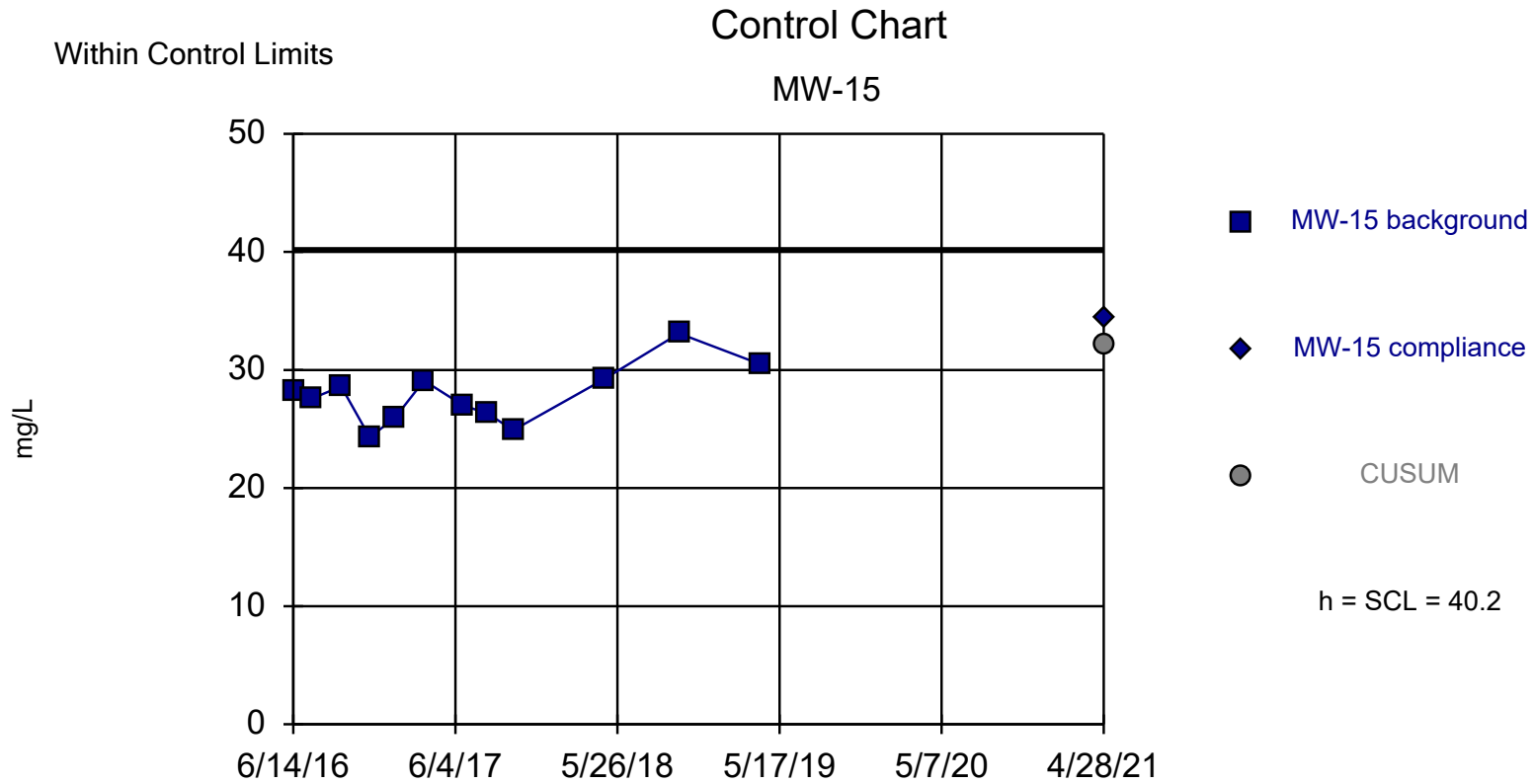
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks





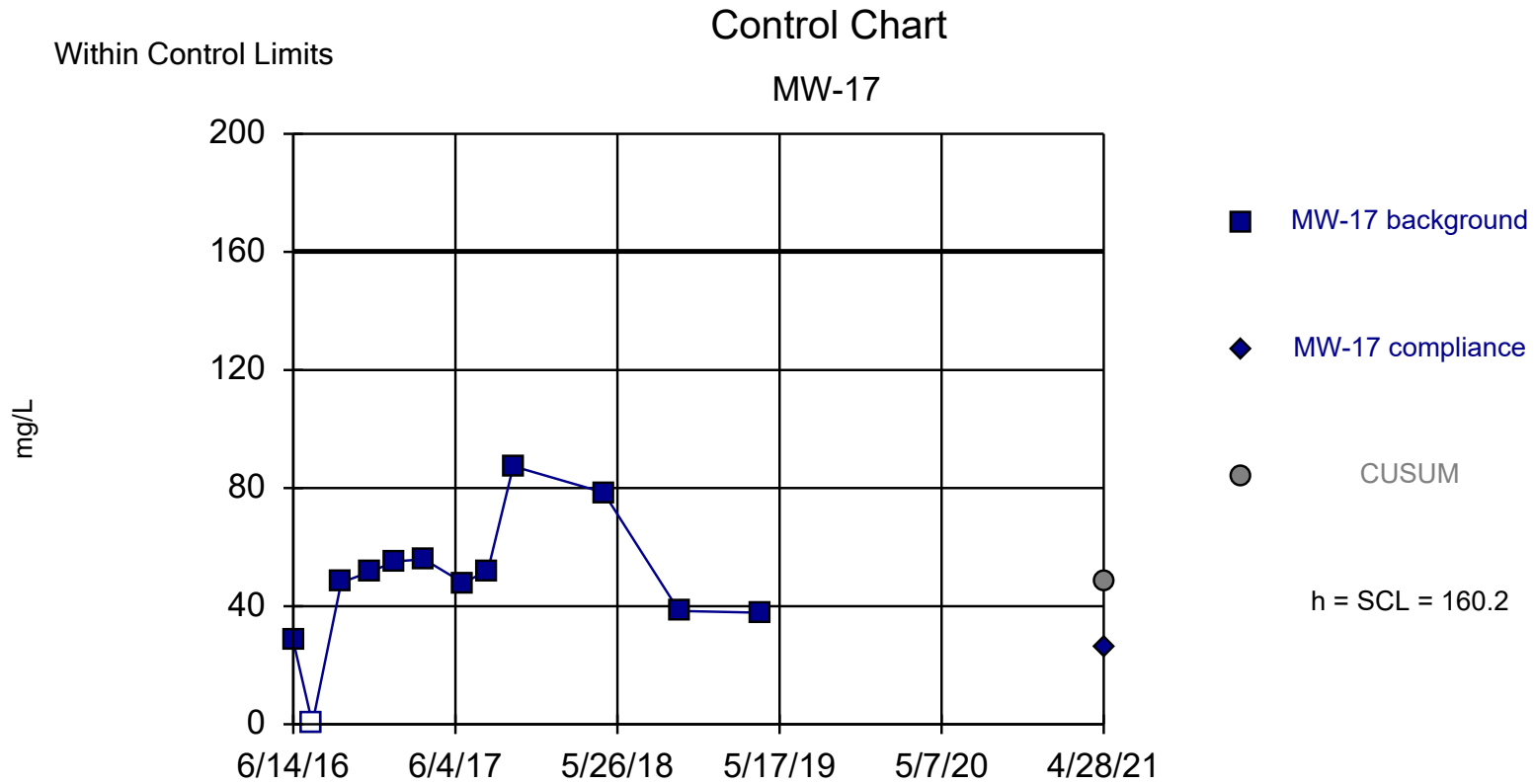
Background Data Summary: Mean=202.8, Std. Dev.=39.7, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9442, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Sulfate    Analysis Run 6/7/2021 9:20 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=27.9, Std. Dev.=2.459, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9717, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

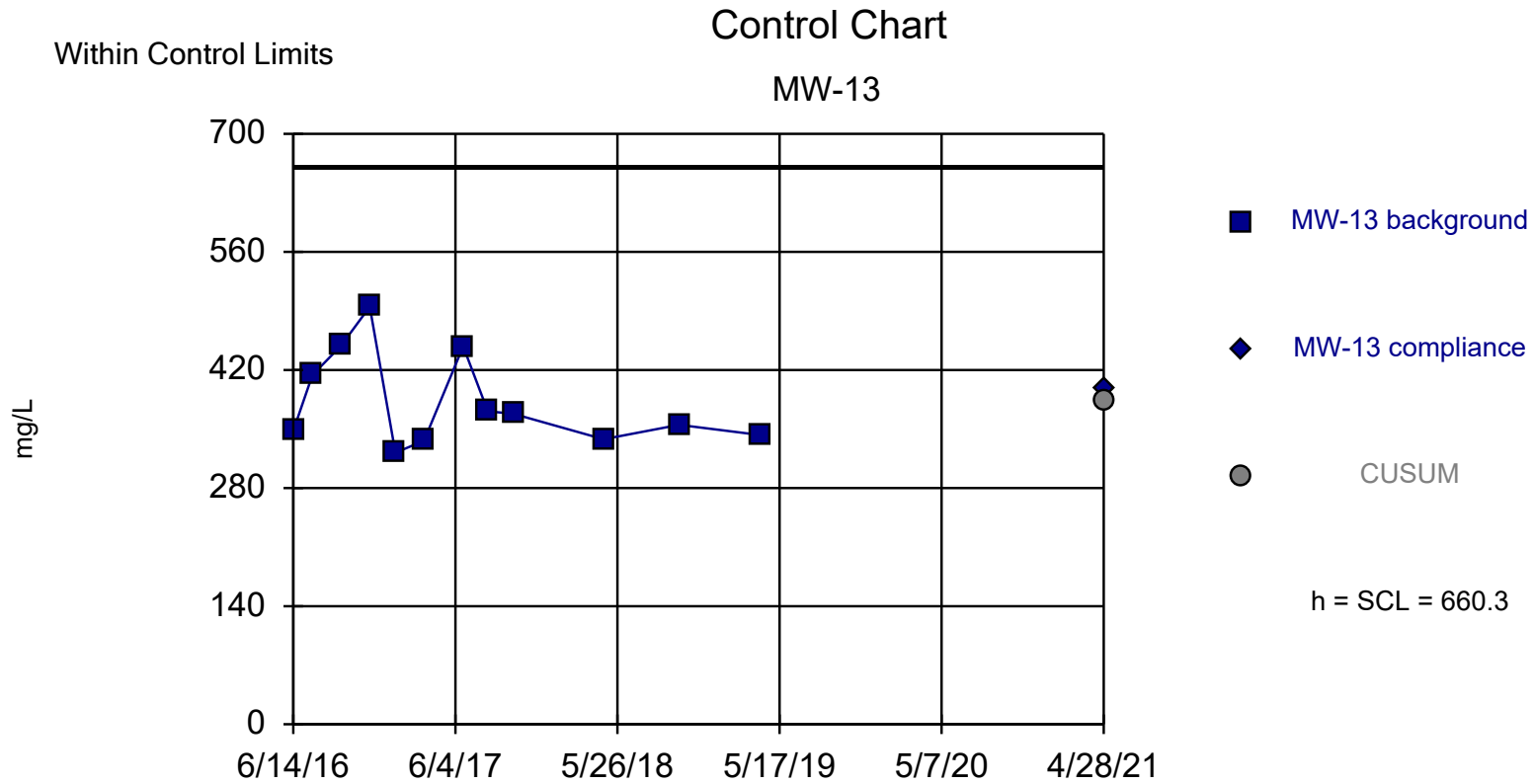
Constituent: Sulfate    Analysis Run 6/7/2021 9:20 AM  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=48.43, Std. Dev.=22.35, n=12, 8.333% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9396, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

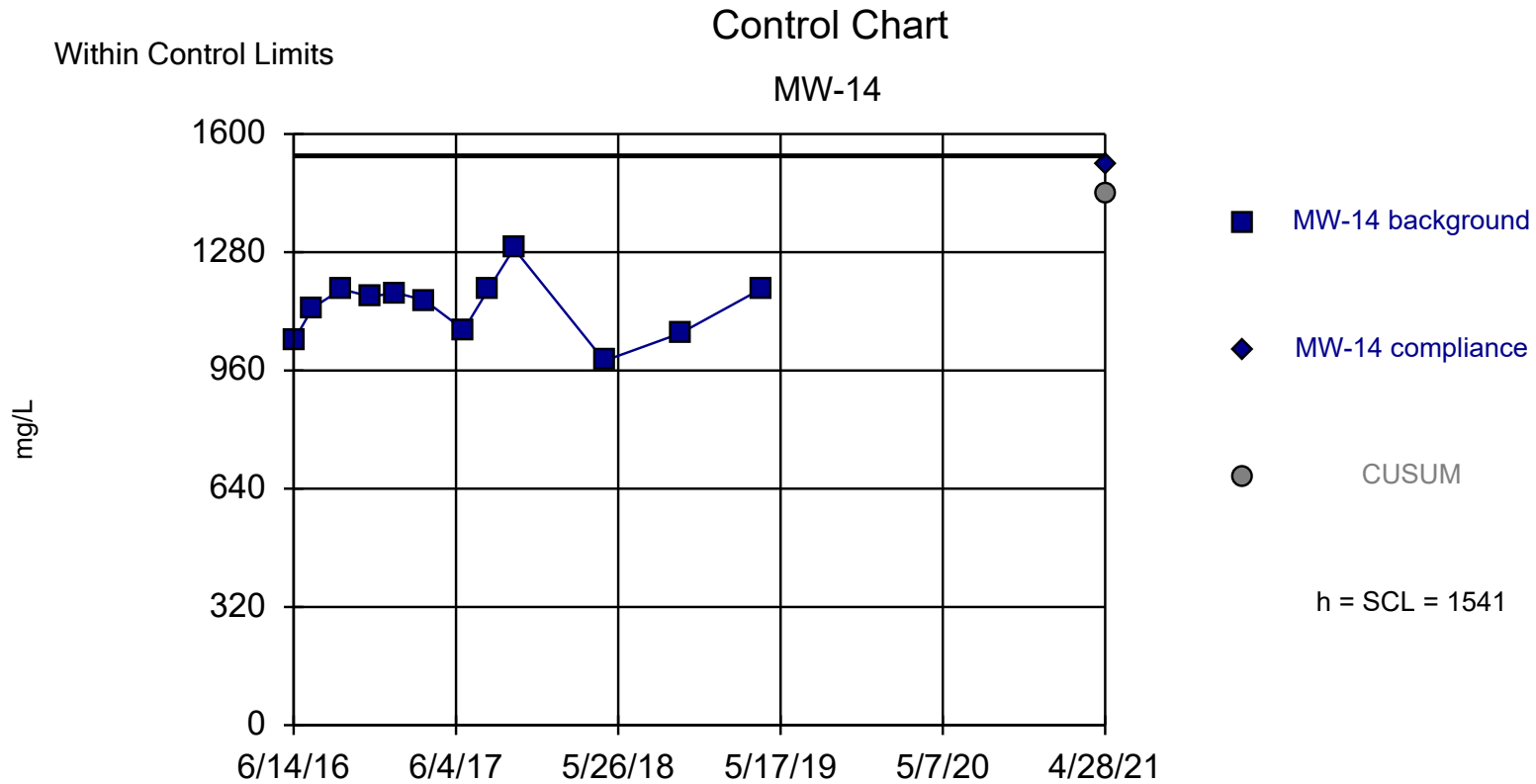
Constituent: Sulfate    Analysis Run 6/7/2021 9:20 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks





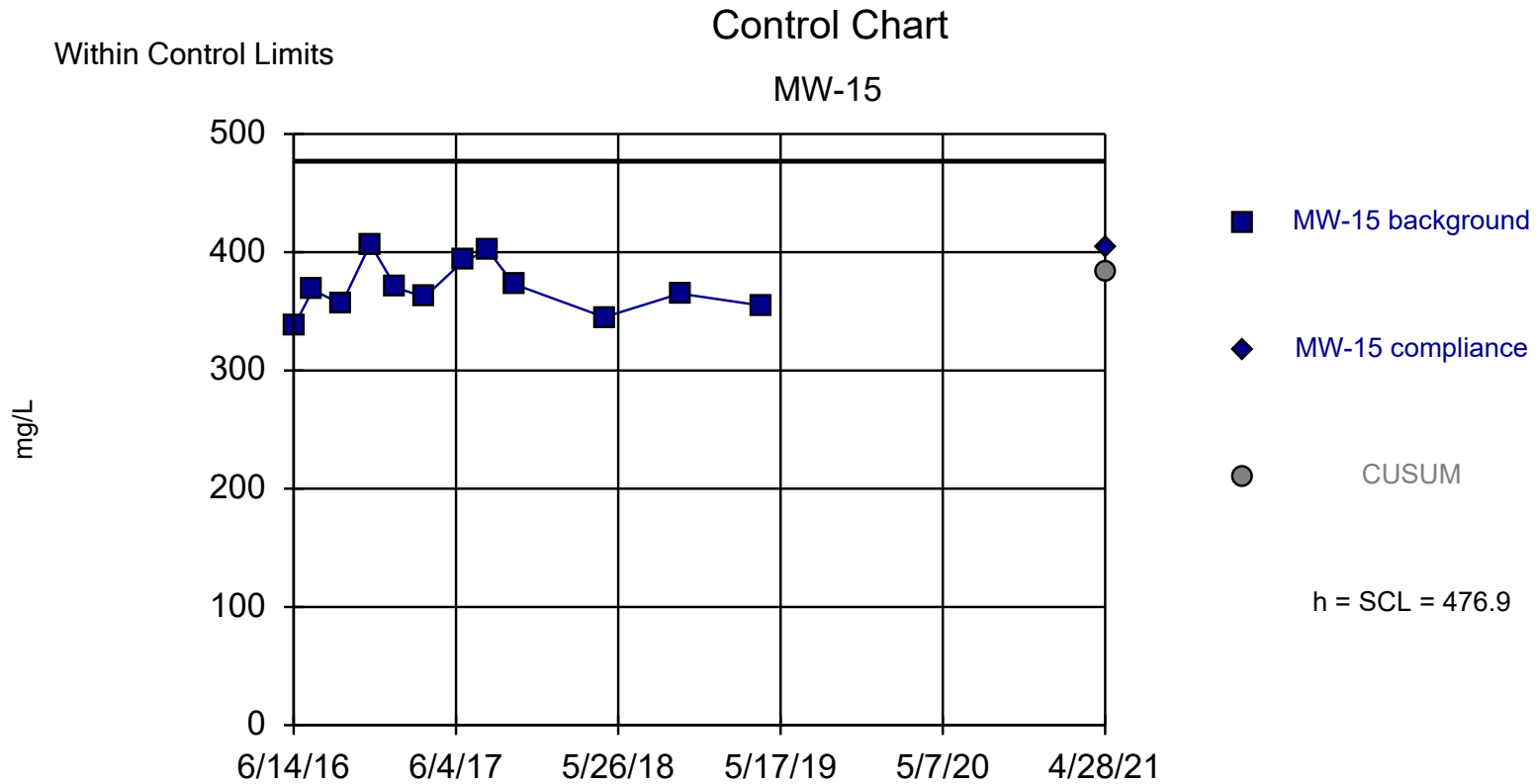
Background Data Summary: Mean=382.3, Std. Dev.=55.61, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8686, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids    Analysis Run 6/7/2021 9:20 AM  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



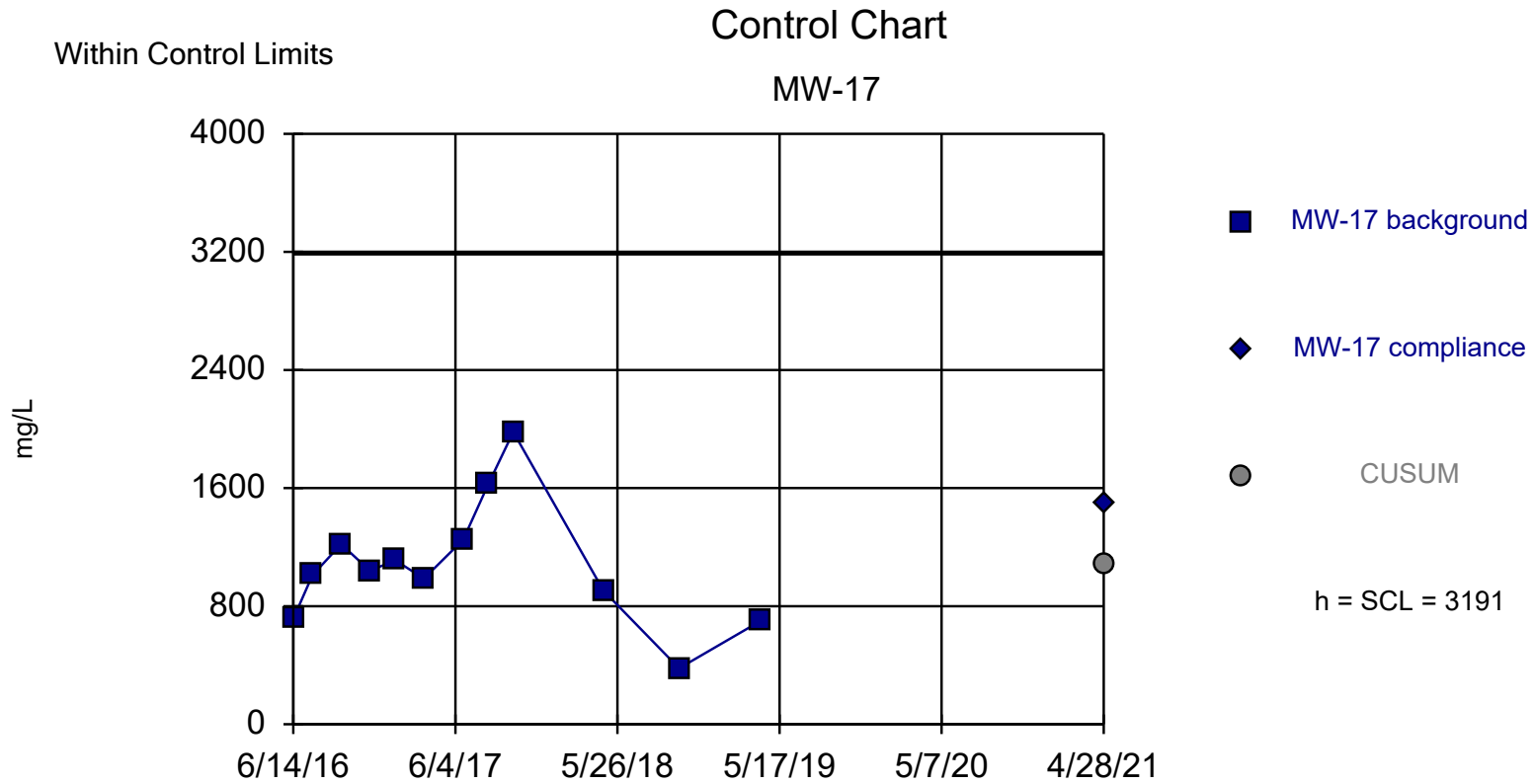
Background Data Summary: Mean=1133, Std. Dev.=81.59, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9416, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids    Analysis Run 6/7/2021 9:20 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=369.3, Std. Dev.=21.51, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9458, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids    Analysis Run 6/7/2021 9:20 AM  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=1076, Std. Dev.=423, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9554, critical = 0.859. Report alpha = 0.000284. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids    Analysis Run 6/7/2021 9:20 AM  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

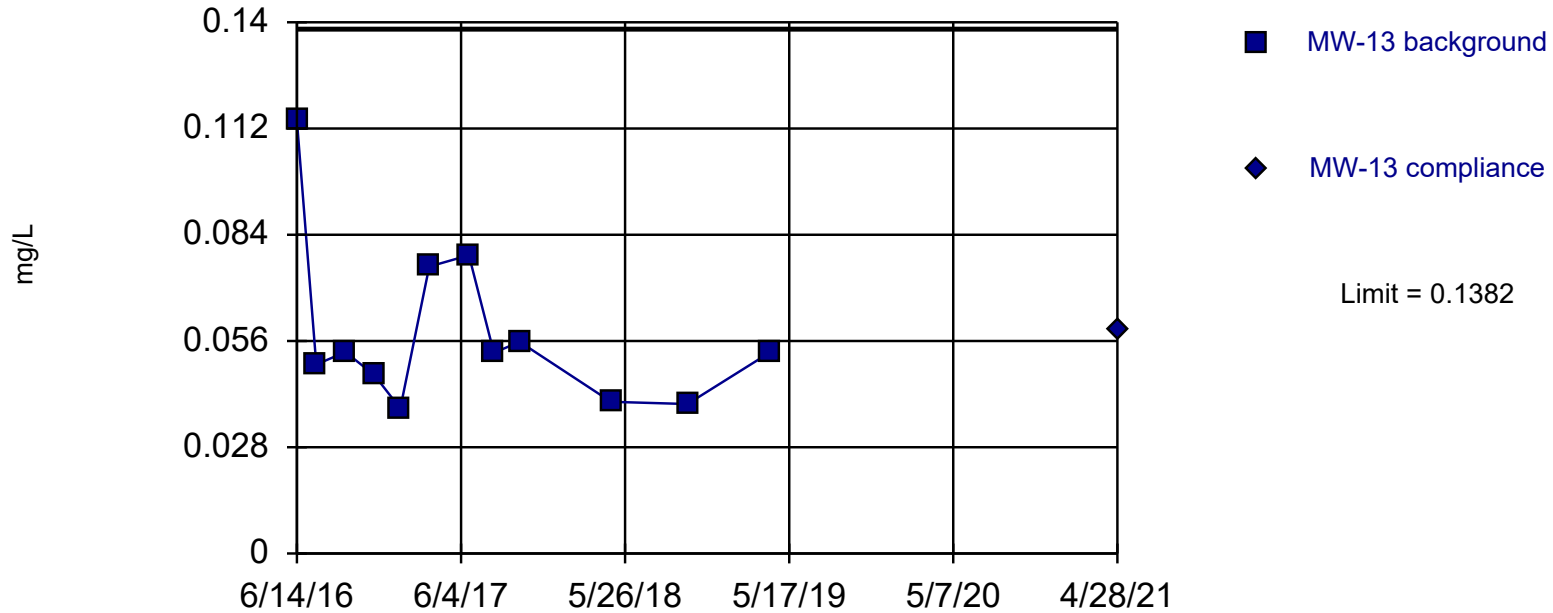
# Prediction Limit

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks Printed 6/7/2021, 10:02 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bq N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-13	0.1382	4/28/2021	0.0587	No	12	0	sqrt(x)	0.000...	Param Intra 1 of 2
Boron (mg/L)	MW-14	0.5796	4/28/2021	0.391	No	12	0	No	0.000...	Param Intra 1 of 2
Boron (mg/L)	MW-15	0.06917	4/28/2021	0.0475	No	12	0	No	0.000...	Param Intra 1 of 2
Boron (mg/L)	MW-17	0.362	4/28/2021	0.0314	No	11	0	n/a	0.01276	NP Intra (normality) ...

Within Limit

Prediction Limit  
Intrawell Parametric

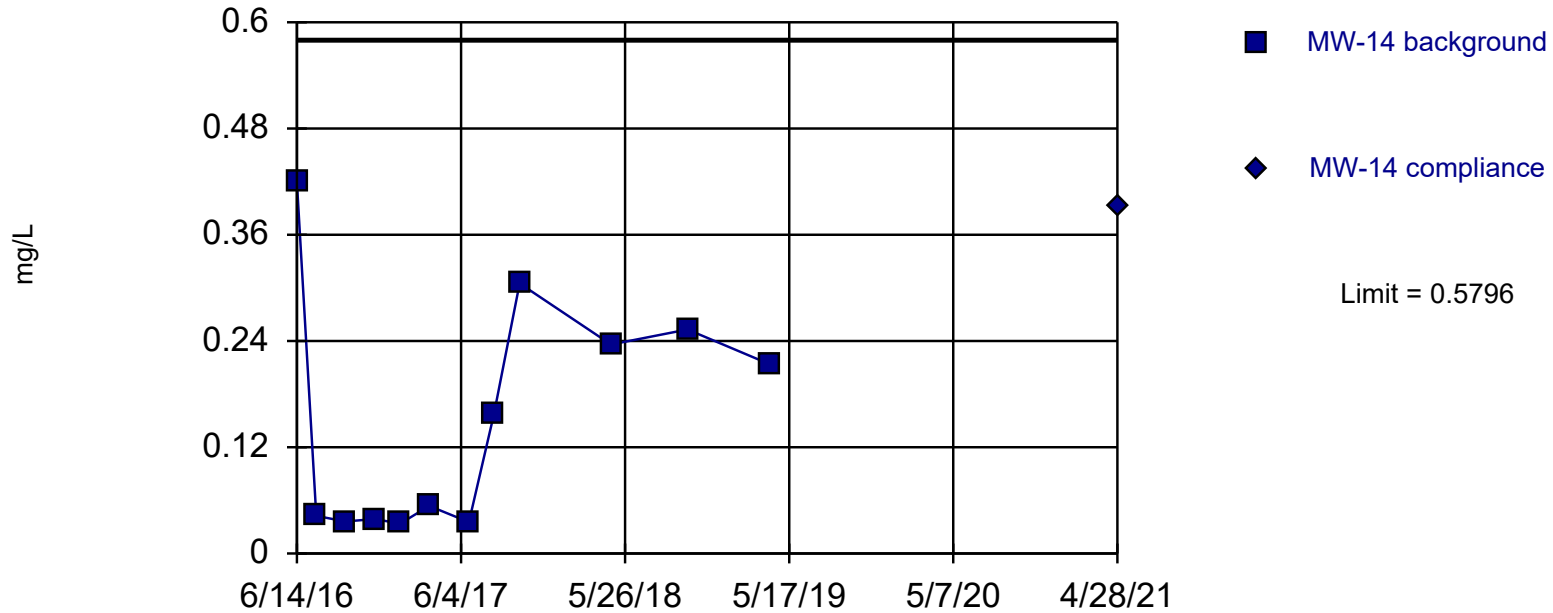


Background Data Summary (based on square root transformation): Mean=0.2378, Std. Dev.=0.0413, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8518, critical = 0.805. Kappa = 3.243 (c=15, w=21, 1 of 2, event alpha = 0.05132). Report alpha = 0.0001672.

Constituent: Boron Analysis Run 6/7/2021 10:02 AM  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

### Prediction Limit Intrawell Parametric

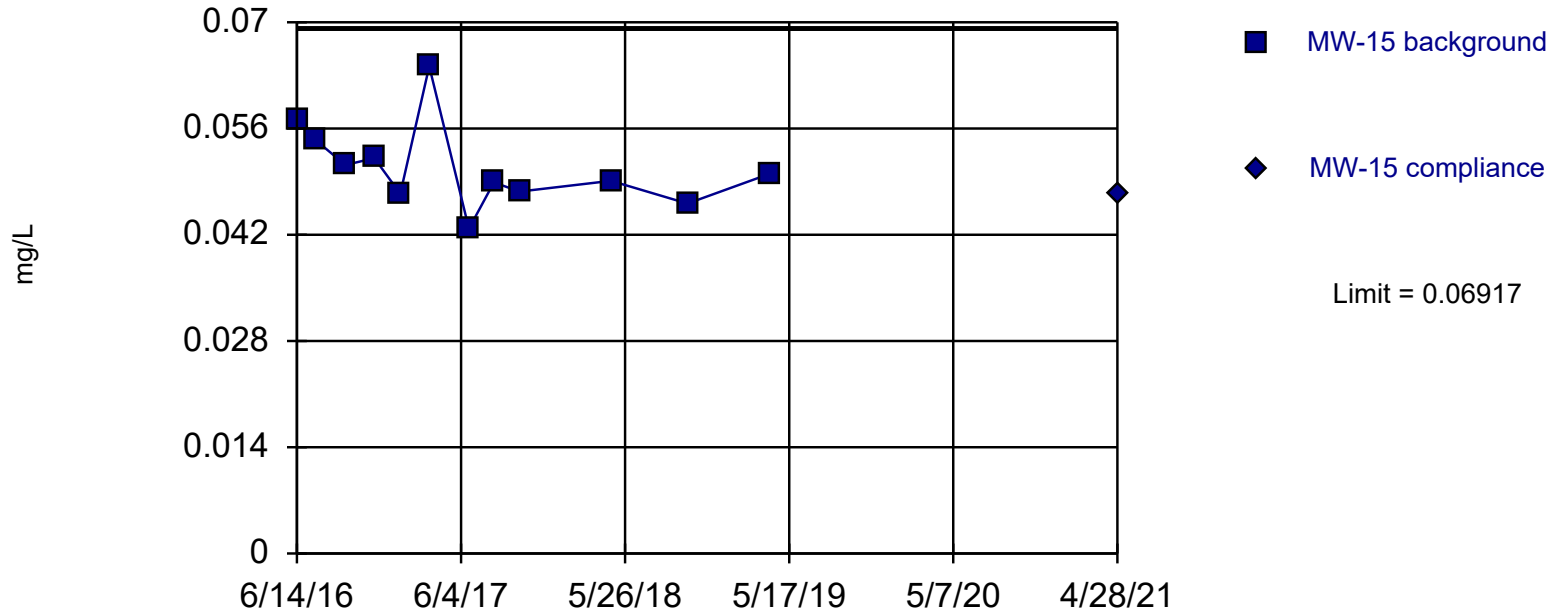


Background Data Summary: Mean=0.152, Std. Dev.=0.1319, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8434, critical = 0.805. Kappa = 3.243 (c=15, w=21, 1 of 2, event alpha = 0.05132). Report alpha = 0.0001672.

Constituent: Boron Analysis Run 6/7/2021 10:02 AM  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

Within Limit

### Prediction Limit Intrawell Parametric



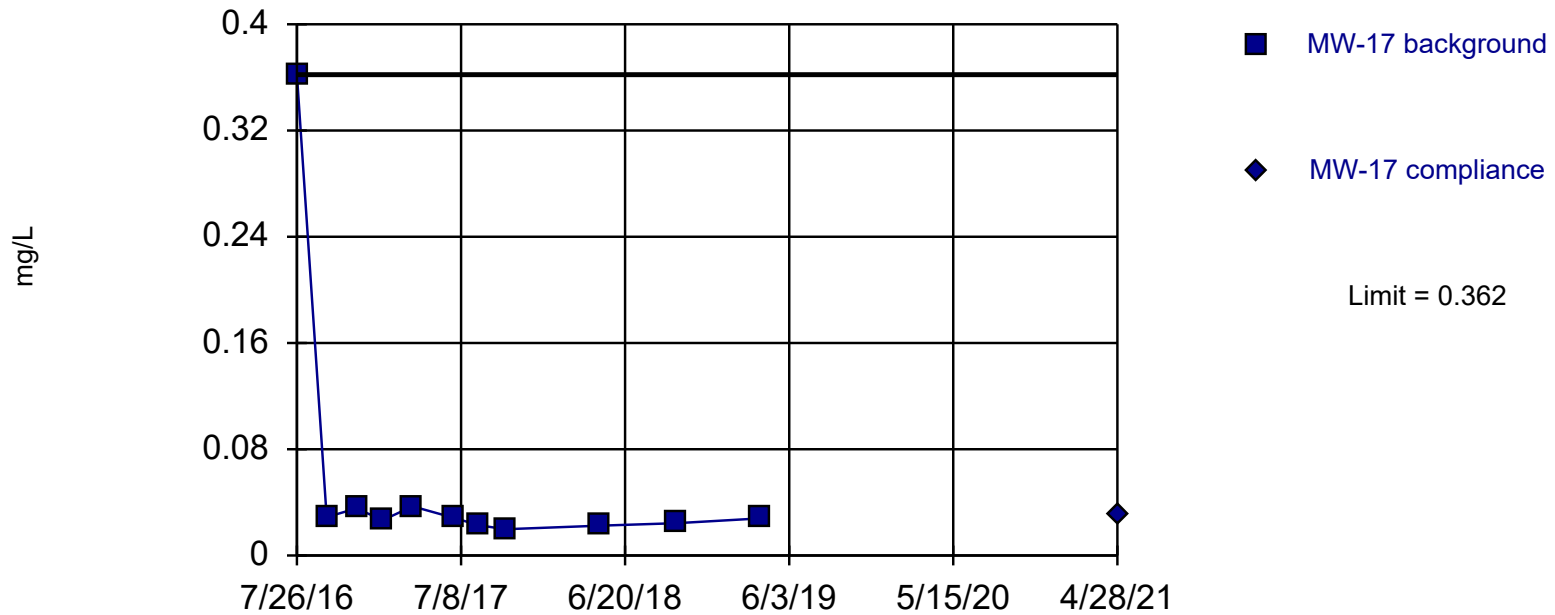
Background Data Summary: Mean=0.05092, Std. Dev.=0.005627, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9255, critical = 0.805. Kappa = 3.243 (c=15, w=21, 1 of 2, event alpha = 0.05132). Report alpha = 0.0001672.

Constituent: Boron Analysis Run 6/7/2021 10:02 AM  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



Within Limit

### Prediction Limit Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 11 background values. Well-constituent pair annual alpha = 0.02537. Individual comparison alpha = 0.01276 (1 of 2). Seasonality was not detected with 95% confidence.

Constituent: Boron Analysis Run 6/7/2021 10:02 AM  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

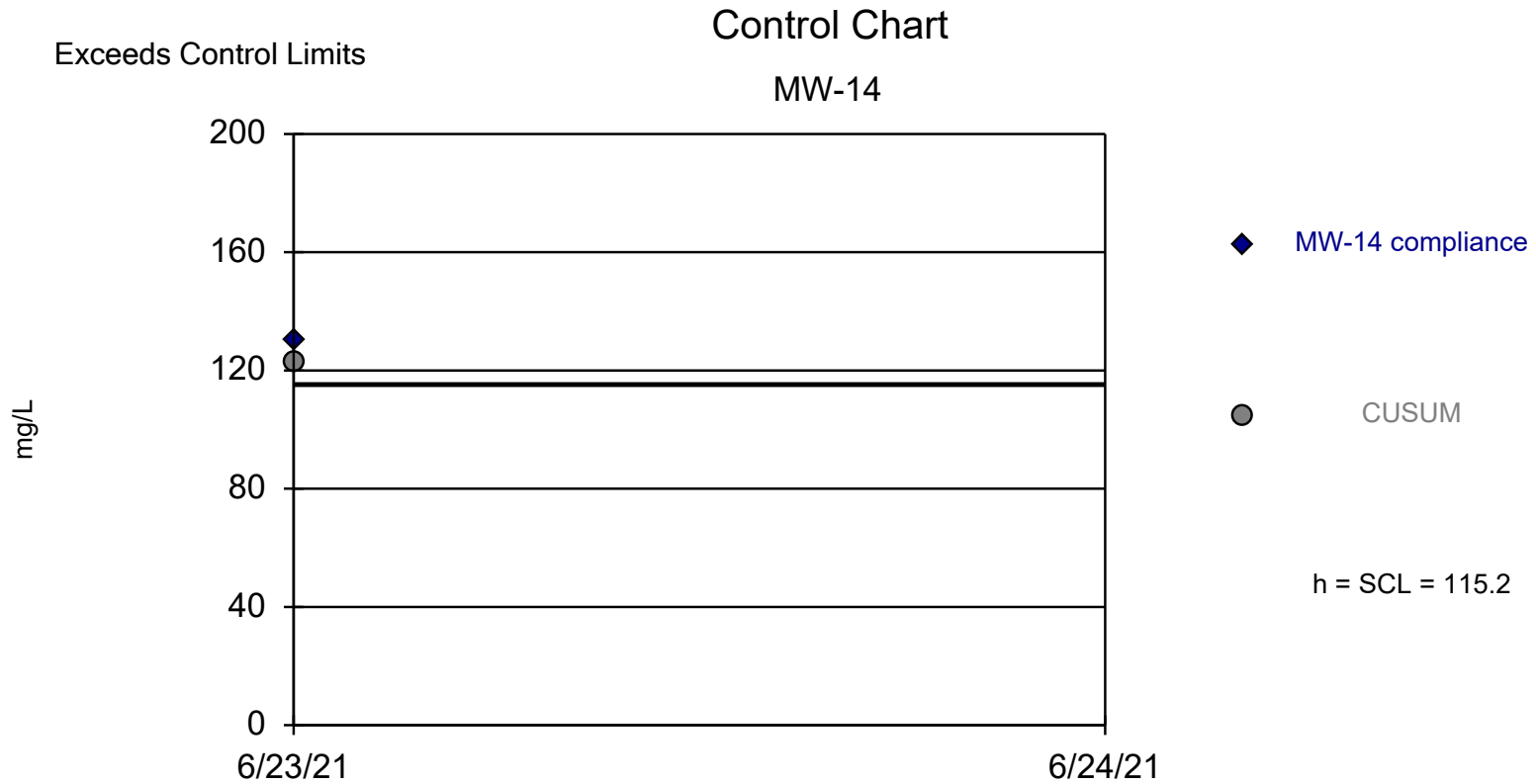
**June 2021 Event**  
**Results of Statistical Calculations**

## **Control Charts**

# Shewhart-Cusum Control Chart / Rank Sum

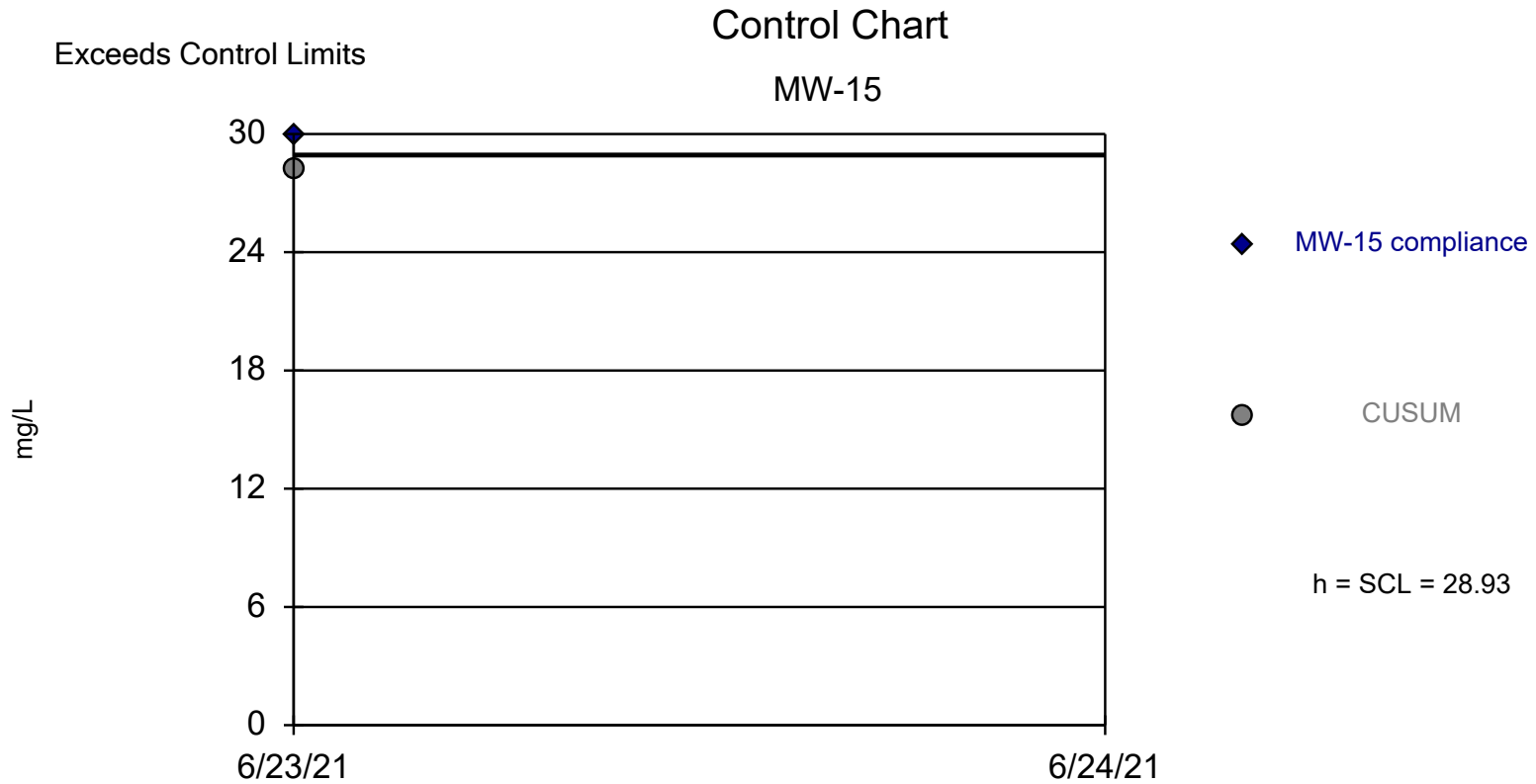
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks    Printed 7/6/2021, 9:22 AM

<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>h</u>	<u>SCL</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Method</u>
Calcium (mg/L)	MW-14	Yes	115.2	115.2	12	0	No	Param Intra
Sulfate (mg/L)	MW-14	Yes	401.3	401.3	12	0	No	Param Intra
Calcium (mg/L)	MW-15	Yes	28.93	28.93	12	0	No	Param Intra



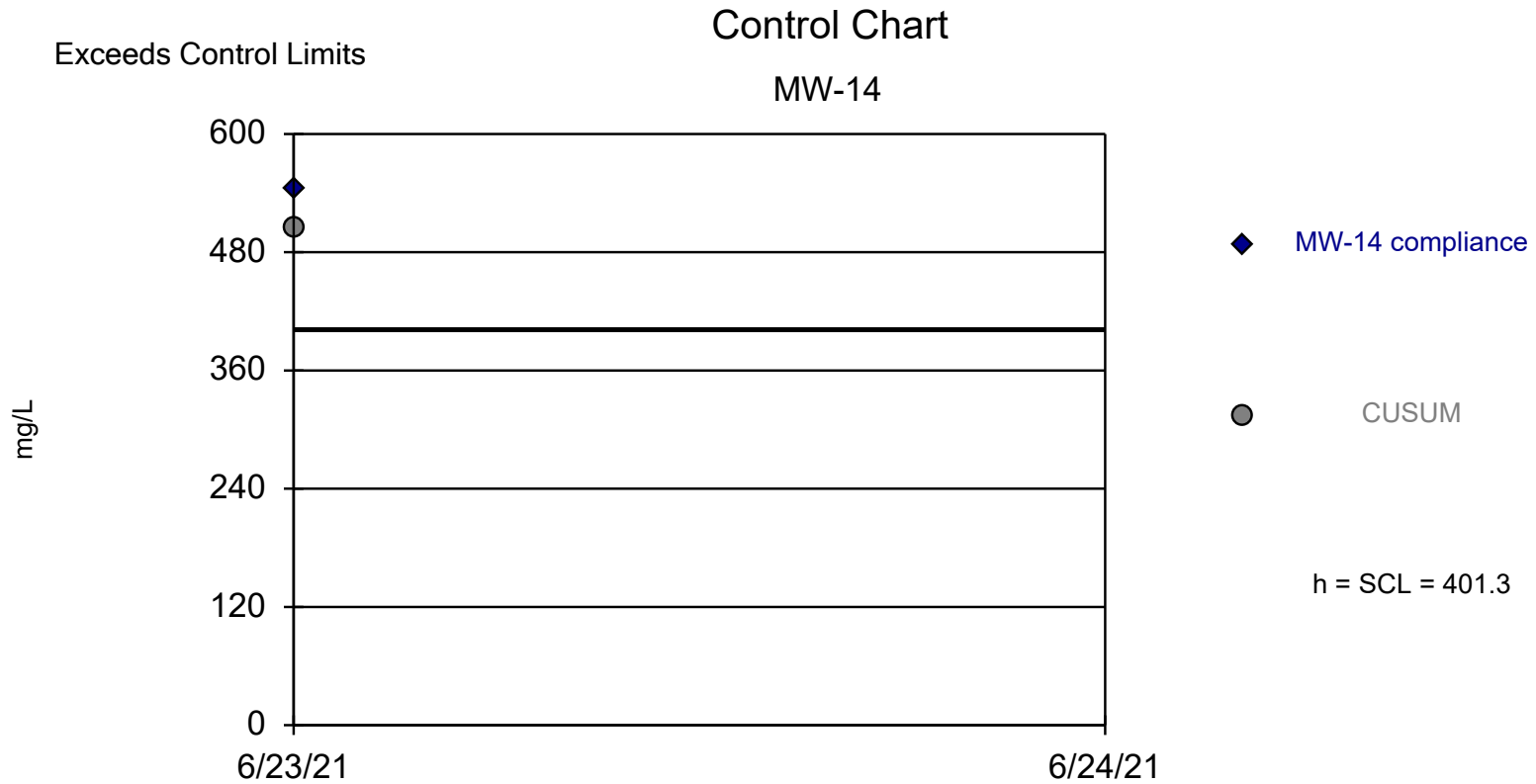
Background Data Summary: Mean=77.12, Std. Dev.=7.621, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8903, critical = 0.859. Report alpha = 0.000264. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Calcium    Analysis Run 7/6/2021 9:22 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=20.23, Std. Dev.=1.742, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9604, critical = 0.859. Report alpha = 0.000264. Dates ending 6/11/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Calcium    Analysis Run 7/6/2021 9:22 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=202.8, Std. Dev.=39.7, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9442, critical = 0.859. Report alpha = 0.000264. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Sulfate    Analysis Run 7/6/2021 9:22 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

## **Appendix E**



**July 27, 2021**

**Alternate Source/Error Demonstration**

**ALTERNATE SOURCE/ERROR  
DEMONSTRATION**

**TWIN OAKS POWER STATION  
COAL COMBUSTION RESIDUALS (CCR) LANDFILL  
ROBERTSON COUNTY, TEXAS**

**July 27, 2021**

**Prepared By:**



**1120 NW Stallings Drive  
Nacogdoches, Texas 75964  
TBPG Firm No. 50027**

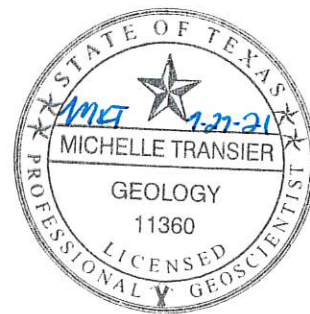
**ALTERNATE SOURCE/ERROR  
DEMONSTRATION**

**TWIN OAKS POWER STATION  
COAL COMBUSTION RESIDUALS (CCR) LANDFILL  
ROBERTSON COUNTY, TEXAS**

**July 27, 2021**



Michelle K. Transier, P.G.  
Geologist



**Prepared by:  
Hydrex Environmental  
Nacogdoches, Texas  
TBPG Firm No. 50027**

## Contents

<b>Introduction .....</b>	<b>1</b>
Summary of Verification Resampling Results .....	1
<b>Alternate Source/Error Demonstration .....</b>	<b>2</b>
Summary of Data Relevant to Alternate Source/Error Demonstration .....	2

## Appendices

### **Appendix A – Signed and Sealed Report Certification by Professional Engineer**

Certification Statement

### **Appendix B – Groundwater Elevation Map**

Groundwater Contour Map – April 2021

### **Appendix C – Statistical Evaluation Data**

Intrawell Shewhart-Cusum Control Chart / Rank Sum

Interwell Prediction Limit

Trend Test

## Introduction

This Alternate Source/Error Demonstration (“ASD”) report for the Twin Oaks Power Station Coal Combustion Residuals (“CCR”) Landfill (the “facility”) is prepared in accordance with the requirements of the facility’s Groundwater Sampling and Analysis Plan (“GWSAP”), the state CCR Rules, 30 TAC Chapter 352, and the federal CCR Rule, 40 CFR Part 257, Subpart D. This report summarizes the groundwater monitoring activities performed for the verification resampling event for the facility and the evaluations demonstrating that calculated statistically significant increases (“SSIs”) for calcium and sulfate in monitoring well MW-14 and calcium in MW-15 are attributable to natural variation in groundwater quality. This ASD has been certified by a qualified licensed professional geoscientist and qualified licensed professional engineer within 90 days of determining SSIs for calcium and sulfate in MW-14 and for calcium in MW-15 in accordance with 30 TAC §352.941(c)(2), 40 CFR §257.93(h)(2), and 40 CFR §257.94(e)(2). SSIs for calcium and sulfate in MW-14 and calcium in MW-15 were determined on July 6, 2021 based on statistical evaluations of the calcium and sulfate concentrations observed in the 1<sup>st</sup> 2021 semi-annual sampling event. Notice of the intent to perform this ASD was provided to TCEQ on July 14, 2021. The calculated SSIs and the timeline for completion of an ASD were documented in the 1<sup>st</sup> 2021 Semi-Annual Groundwater Monitoring and Corrective Action Report dated July 27, 2021.

Statistical evaluation of data from the April 2021 event indicated unverified (“initial”) intrawell statistical exceedance values for calcium and sulfate concentrations in monitoring well MW-14 and for calcium concentrations in MW-15. Subsequently, verification resampling, utilizing a 1-of-*m* approach, was conducted on June 23, 2021 as provided for and in accordance with the GWSAP. A summary of the verification resampling results is presented below.

### Summary of Verification Resampling Results

Well	Constituent	Initial Result (mg/L)	Statistical Limit (mg/L)	Verification Resampling Result (mg/L)	Intrawell Statistical Exceedance Confirmed?	Recommended Action
MW-14	sulfate	493	401.3	545	Yes	Alternate Source/Error Demonstration
	calcium	117	115.2	130	Yes	Alternate Source/Error Demonstration
MW-15	calcium	29.0	28.93	30.0	Yes	Alternate Source/Error Demonstration

Statistical reevaluation was performed in accordance with the GWSAP, 30 TAC §352.931, 40 CFR §257.93(h)(1), and EPA Unified Guidance methodologies. The results of the verification resampling confirmed the intrawell statistical exceedance values for calcium and sulfate concentrations in monitoring well MW-14 and for calcium in MW-15 on June 30, 2021 and SSIs were determined on July 6, 2021. A review of relevant information for the facility indicates the values are likely the result of natural groundwater variation and not a release from the CCR Landfill. In accordance with the facility’s GWSAP, 30 TAC §352.941(c), and 40 CFR §257.94(e)(2), an ASD has been prepared to address the calculated SSIs for MW-14 and MW-15.

### Alternate Source/Error Demonstration

Statistical evaluations confirmed an intrawell statistical exceedance values for calcium and sulfate concentrations in monitoring well MW-14 and for calcium concentration in MW-15 during the June 2021 verification resampling event. Review of calcium and sulfate data for the facility indicates significant spatial variability in reported calcium and sulfate concentrations. Based on this observed variability, monitoring wells MW-14 and MW-15 were reevaluated using interwell control chart techniques as provided in EPA Unified Guidance. Control chart evaluation utilized calcium and sulfate data from upgradient monitoring wells MW-7, MW-11, MW-12, and MW-16. These wells are located upgradient of the CCR Landfill and considered unaffected by CCR waste disposal activities. The results of the interwell statistical reevaluation indicate the calcium and sulfate concentrations reported for monitoring well MW-14 and calcium concentrations reported for MW-15 fall within the statistically determined limit of concentrations developed for upgradient monitoring wells. Calcium and sulfate concentration data from MW-14 and calcium concentration data from MW-15 were further evaluated for statistically significant increasing trends. No statistically increasing trends were noted for the calcium and sulfate data in MW-14 and calcium data in MW-15.

Based on this evaluation, no release from the CCR Landfill is indicated. Instead, the calcium and sulfate concentrations in MW-14 and the calcium concentrations in MW-15 result from natural variability in groundwater quality not caused by the CCR Landfill as evidenced by data from upgradient wells. Therefore, no change to the detection monitoring status of monitoring wells MW-14 and MW-15 is necessary and the site maintains a detection monitoring status. A summary of relevant data is presented below.

#### Summary of Data Relevant to Alternate Source/Error Demonstration

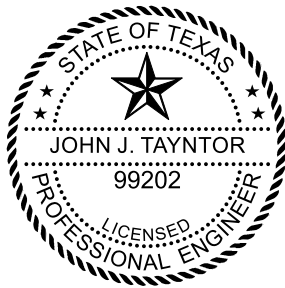
Well	Constituent	Initial Result (mg/L)	Verification Resampling Result (mg/L)	Intrawell Statistical Limit (mg/L)	Interwell Statistical Limit (mg/L)	Site-wide Sulfate Data Range (mg/L)	Statistical Exceedance Confirmed?	Recommended Action
MW-14	sulfate	493	545	401.3	1550	24.3 - 1550	No	Maintain Detection Monitoring
	calcium	117	130	115.2	326	15.4 - 326	No	Maintain Detection Monitoring
MW-15	calcium	29.0	30.0	28.93	326	15.4 - 326	No	Maintain Detection Monitoring

## **Appendix A**

# CERTIFICATION STATEMENT

## COAL COMBUSTION RESIDUALS (CCR) LANDFILL TWIN OAKS POWER STATION ROBERTSON COUNTY, TEXAS

I certify I am a licensed professional engineer in the State of Texas and a *qualified professional engineer* as defined in 40 CFR §257.53. I certify that the groundwater monitoring data presented in the Alternate Source/Error Demonstration report, prepared by Hydrex Environmental on behalf of the Twin Oaks Power Station, are appropriate and meet the requirements of 40 CFR Part 257, Subpart D.



A handwritten signature in black ink, appearing to read "J. Tayntor", written over a horizontal line.

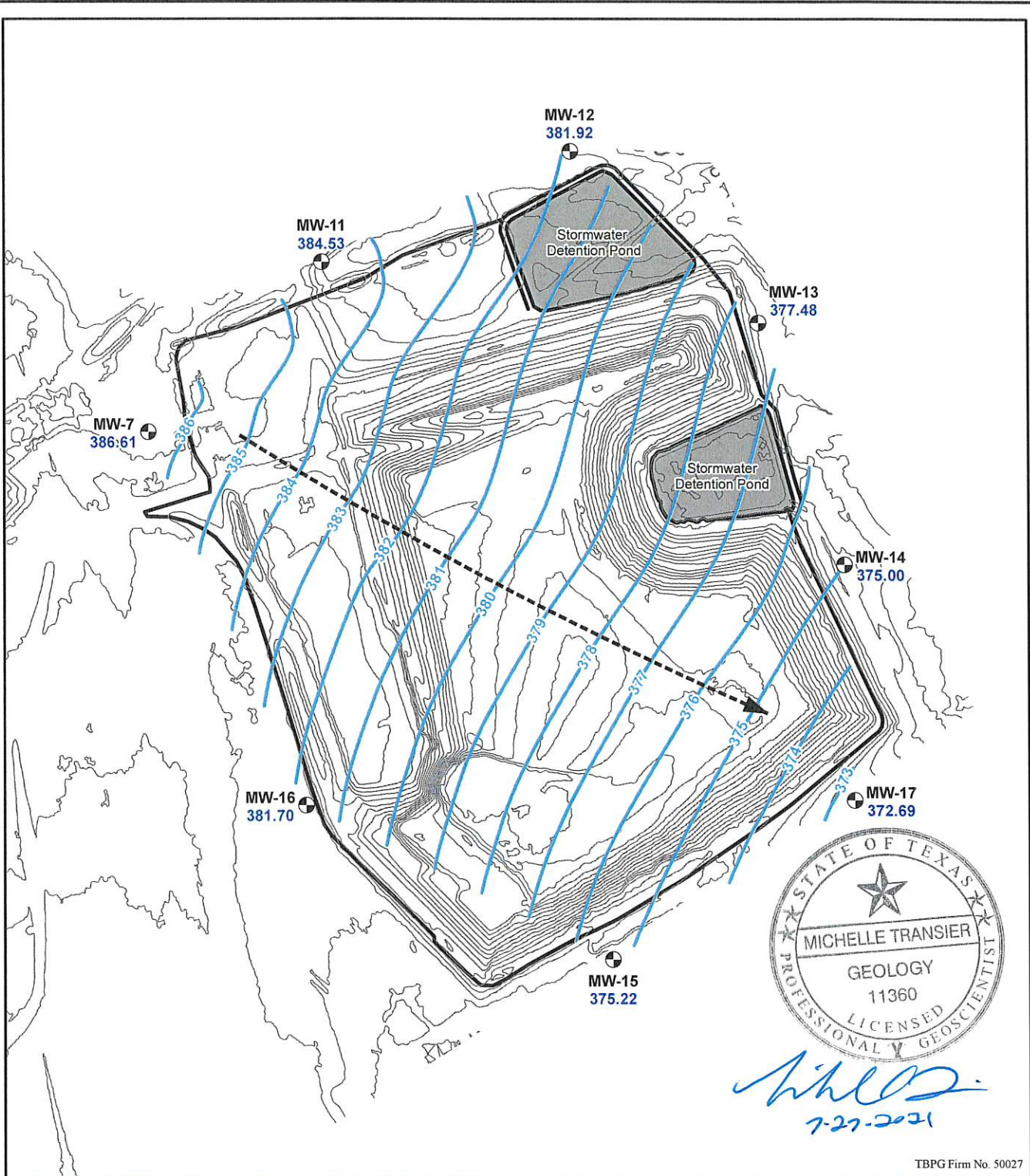
John J. Tayntor, P.E.  
Auckland Consulting, LLC  
TBPE Firm Registration No. F-16721

07/27/2021

Date

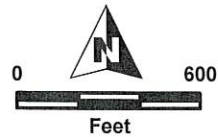


## **Appendix B**



TBPG Firm No. 50027

- Monitor Well
- Approx. Groundwater Flow Direction
- Groundwater Contour
- Pond
- 5-ft Ground Surface Contour
- Access Road/ Perimeter Berm
- Groundwater Elevation (Elevation Feet, MSL)



GROUNDWATER CONTOUR MAP

← WATER LEVELS MEASURED 04/28/2021 →

CCR Landfill  
Twin Oaks Power Station  
13065 Plant Road  
Bremond (Robertson County), Texas 76629

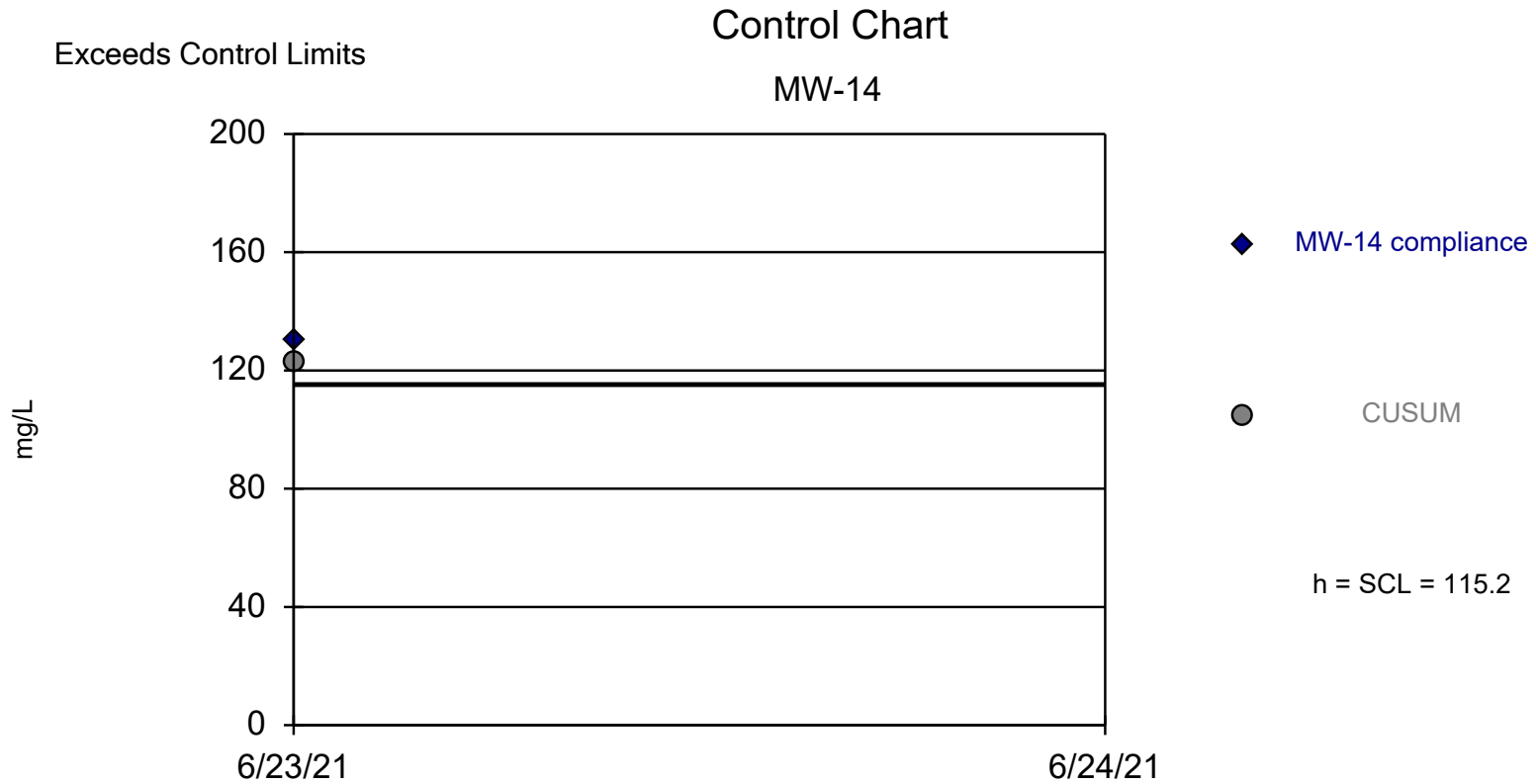
Map Revised: 06/03/2021	Project Number: I-14-1007	GIS Analyst: SMD
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## **Appendix C**

# Shewhart-Cusum Control Chart / Rank Sum

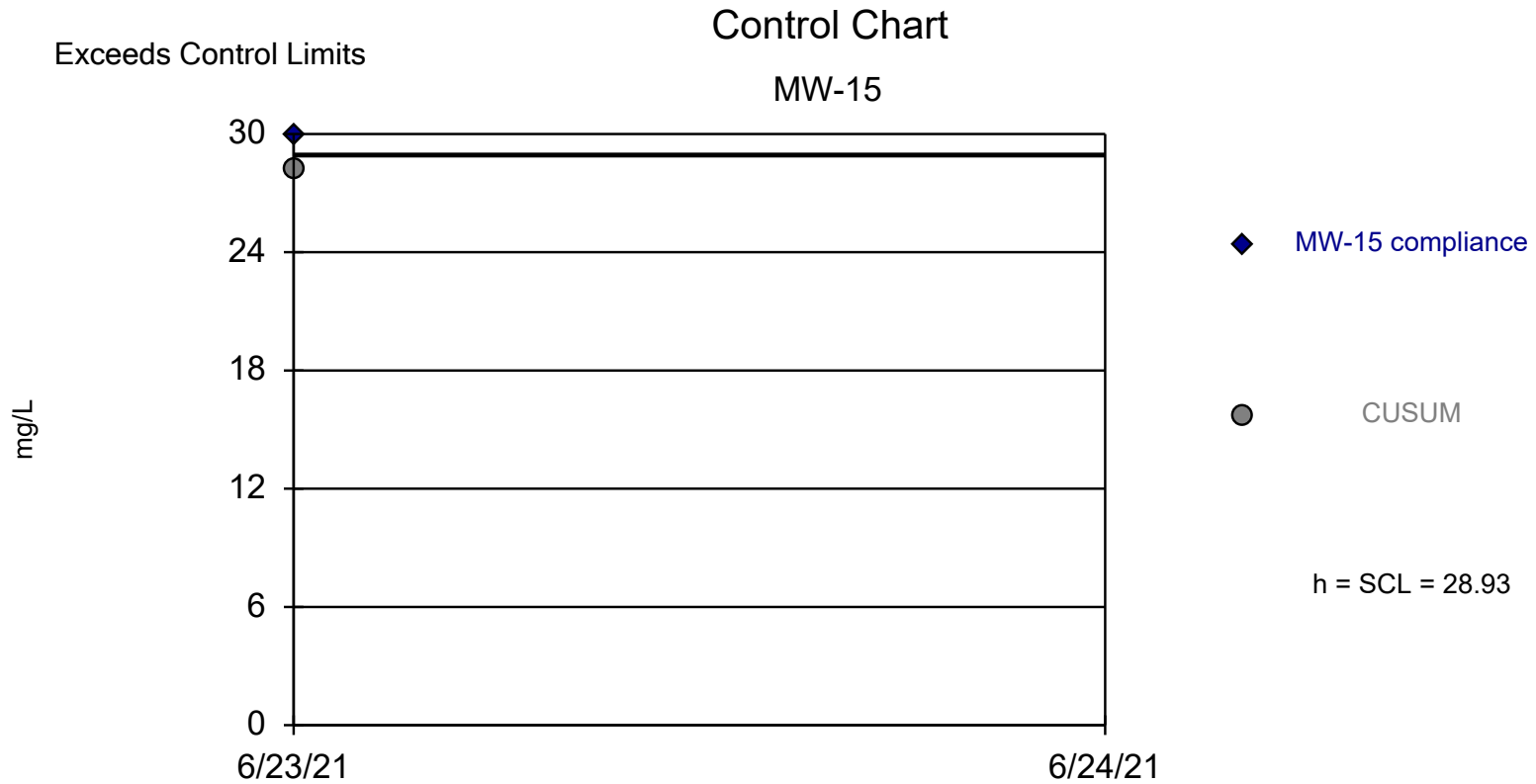
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks    Printed 7/6/2021, 9:22 AM

<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>h</u>	<u>SCL</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Method</u>
Calcium (mg/L)	MW-14	Yes	115.2	115.2	12	0	No	Param Intra
Sulfate (mg/L)	MW-14	Yes	401.3	401.3	12	0	No	Param Intra
Calcium (mg/L)	MW-15	Yes	28.93	28.93	12	0	No	Param Intra



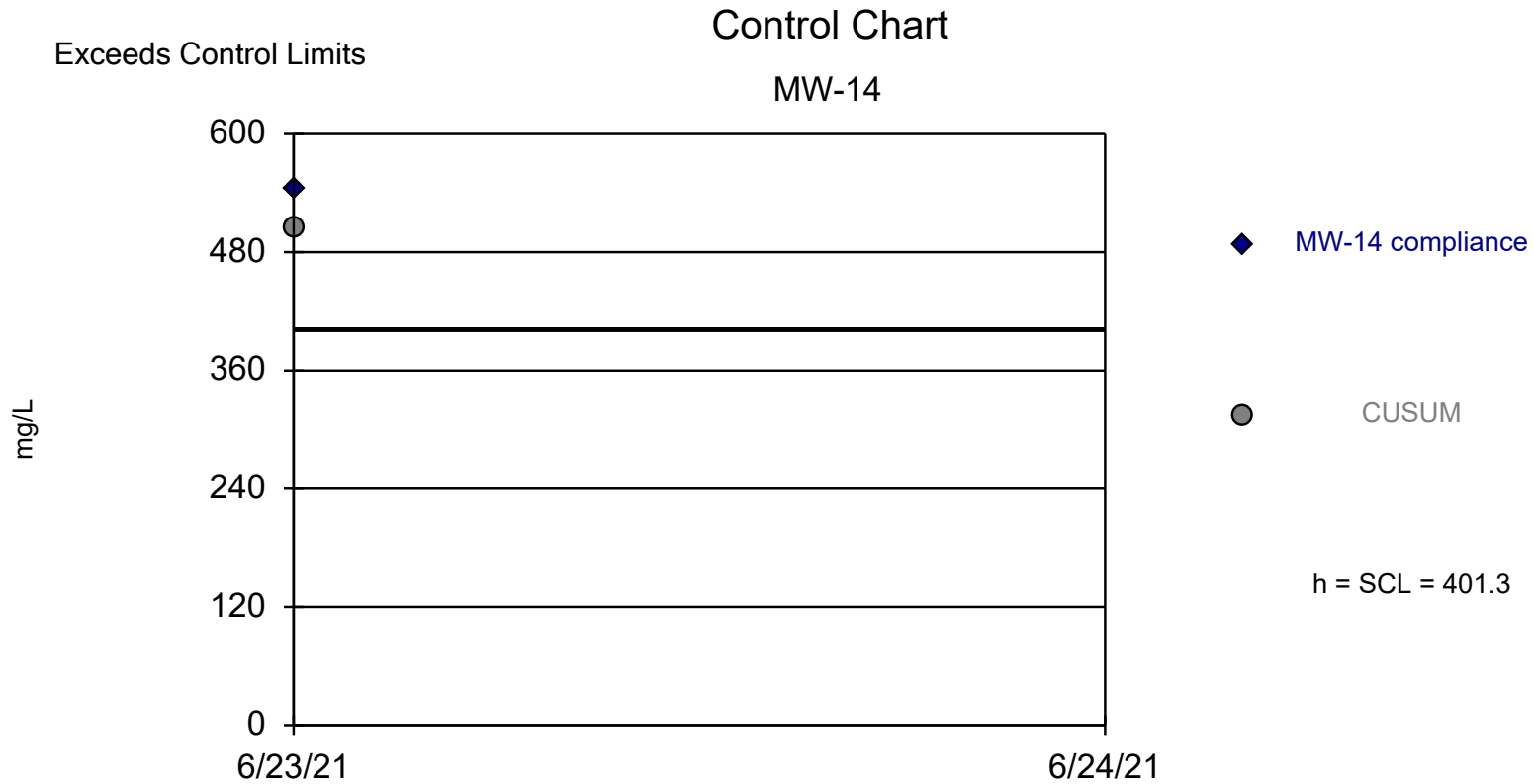
Background Data Summary: Mean=77.12, Std. Dev.=7.621, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8903, critical = 0.859. Report alpha = 0.000264. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Calcium    Analysis Run 7/6/2021 9:22 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=20.23, Std. Dev.=1.742, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9604, critical = 0.859. Report alpha = 0.000264. Dates ending 6/11/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Calcium    Analysis Run 7/6/2021 9:22 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks



Background Data Summary: Mean=202.8, Std. Dev.=39.7, n=12. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9442, critical = 0.859. Report alpha = 0.000264. Dates ending 4/4/2019 used for control stats. Standardized h=5, SCL=5.

Constituent: Sulfate    Analysis Run 7/6/2021 9:22 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

# Shewhart-Cusum Control Chart / Rank Sum

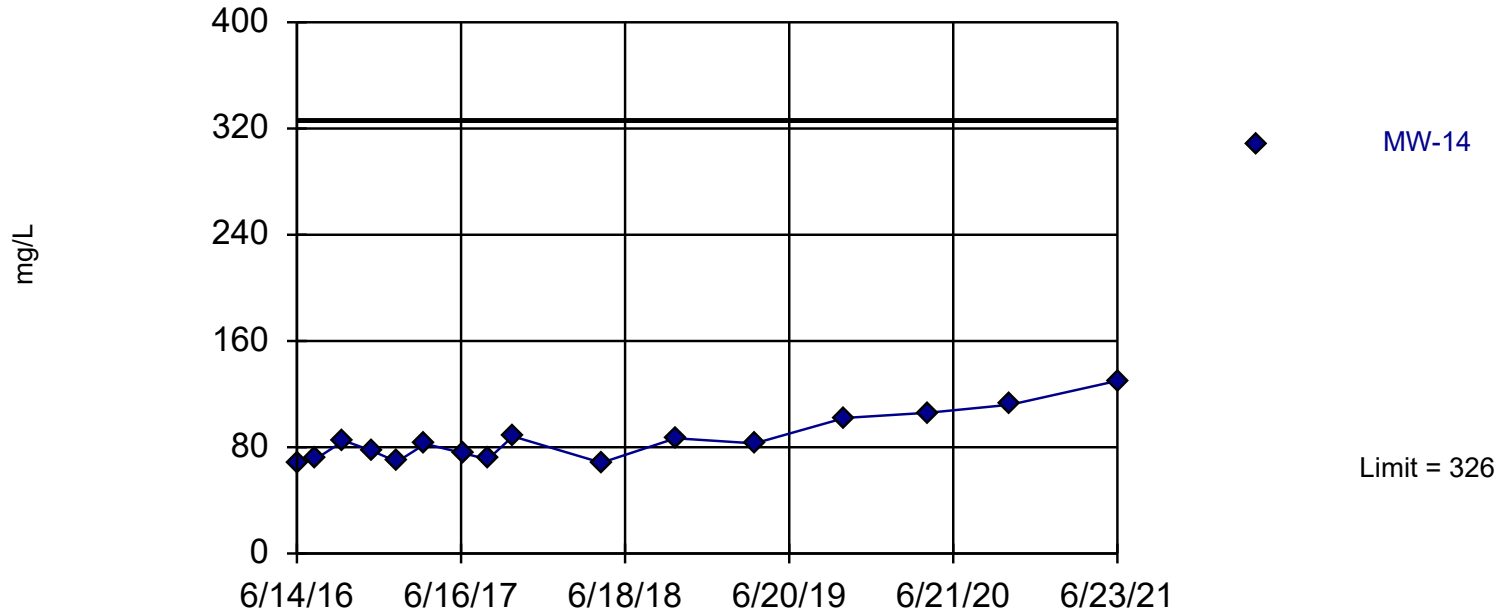
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks    Printed 7/6/2021, 9:21 AM

<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>h</u>	<u>SCL</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Method</u>
Calcium (mg/L)	MW-14	No	PL=326	n/a	64	0	No	NP Inter PL (normality)
Sulfate (mg/L)	MW-14	No	PL=...	n/a	64	0	No	NP Inter PL (normality)
Calcium (mg/L)	MW-15	No	PL=326	n/a	64	0	No	NP Inter PL (normality)



Within Limit

### Prediction Limit Interwell Non-parametric

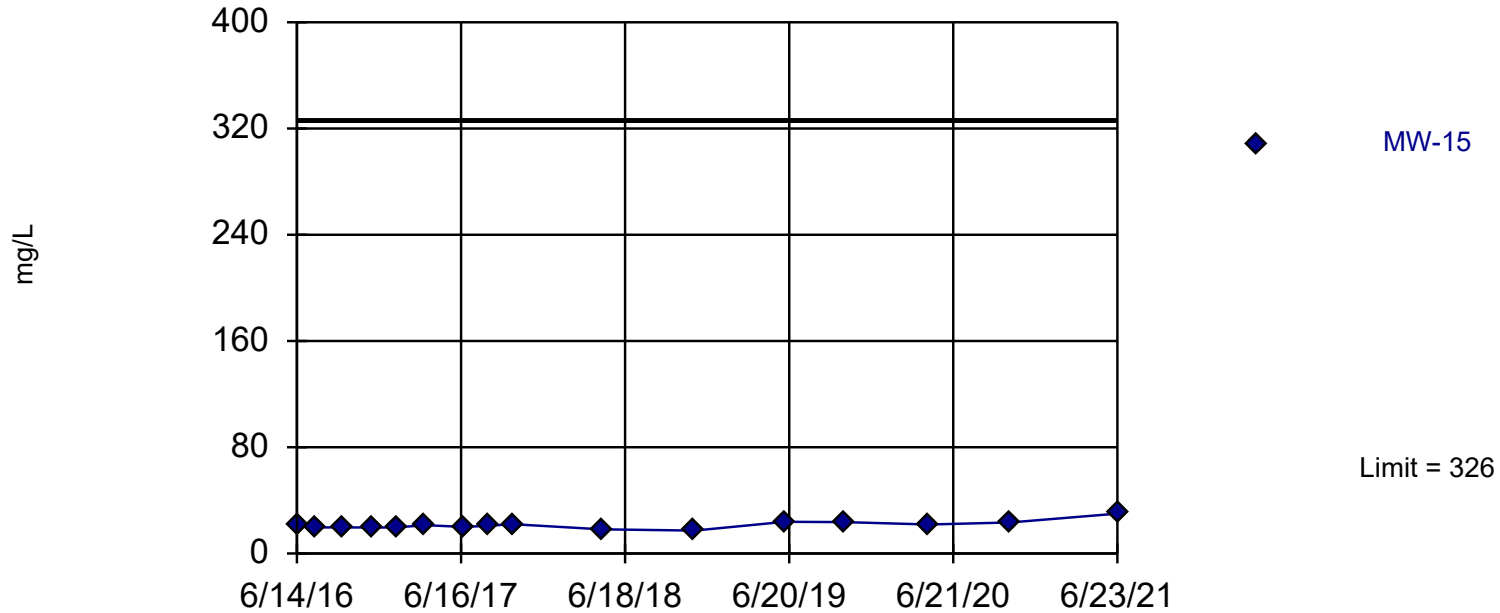


Non-parametric test used in lieu of interwell control chart because the Shapiro Francia normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 64 background values. Annual per-constituent alpha = 0.01887. Individual comparison alpha = 0.0004534 (1 of 2). Most recent point compared to limit. Assumes 20 future values. Seasonality was not detected with 95% confidence.

Constituent: Calcium    Analysis Run 7/6/2021 9:20 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

Within Limit

### Prediction Limit Interwell Non-parametric

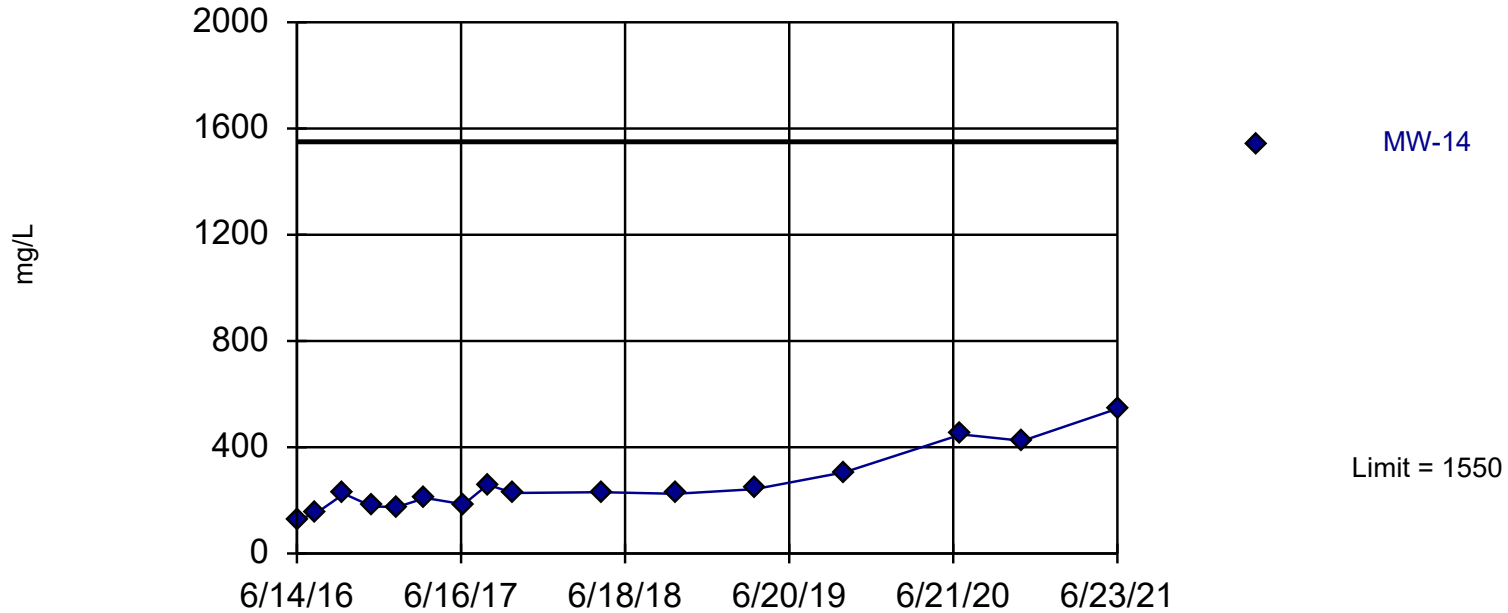


Non-parametric test used in lieu of interwell control chart because the Shapiro Francia normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 64 background values. Annual per-constituent alpha = 0.01887. Individual comparison alpha = 0.0004534 (1 of 2). Most recent point compared to limit. Assumes 20 future values. Seasonality was not detected with 95% confidence.

Constituent: Calcium    Analysis Run 7/6/2021 9:20 AM  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

Within Limit

### Prediction Limit Interwell Non-parametric



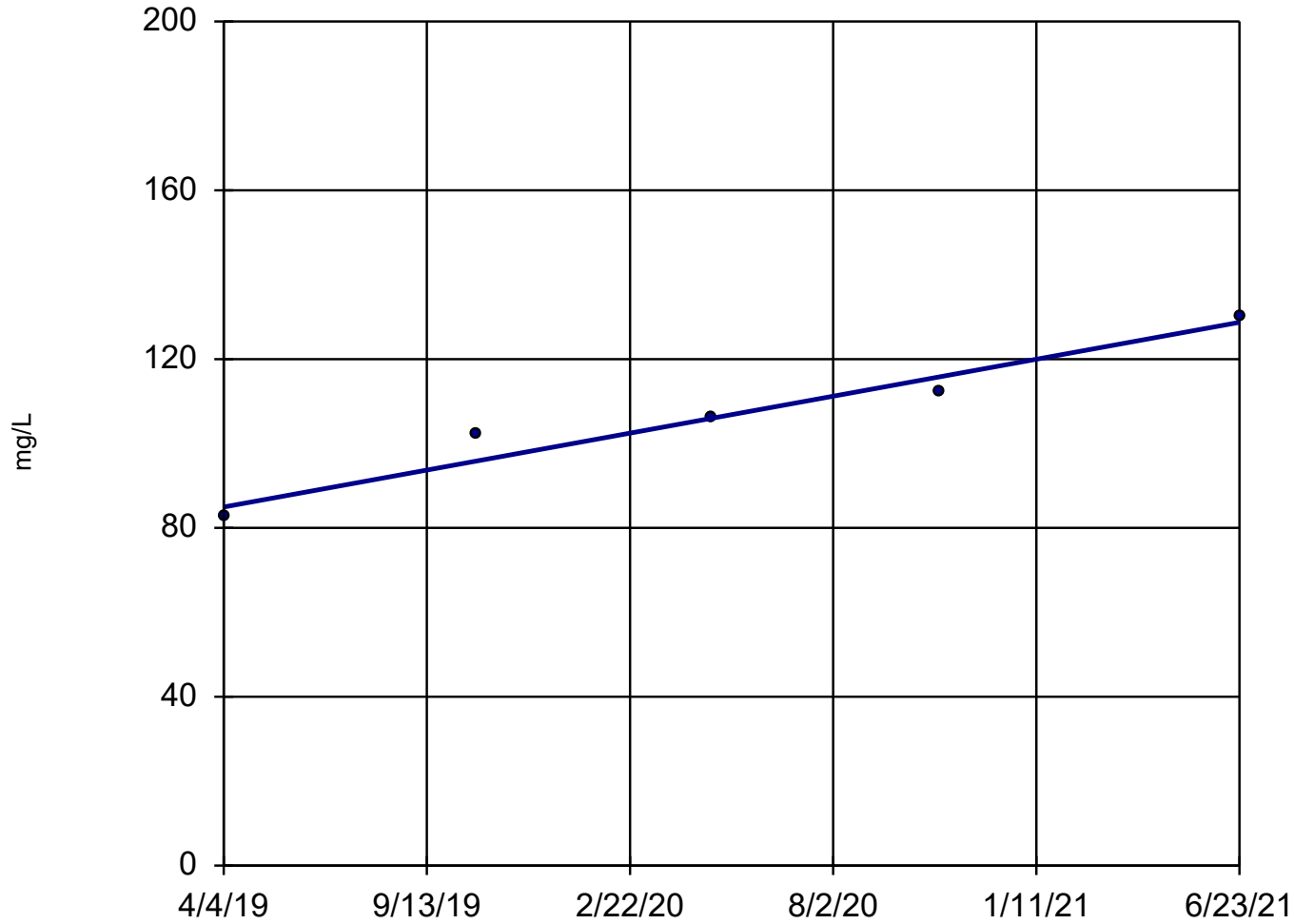
# Trend Test

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks Printed 7/6/2021, 9:17 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Calcium (mg/L)	MW-14	19.69	10	10	No	5	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-14	126.3	8	10	No	5	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-15	1.4	0	10	No	5	0	n/a	n/a	0.02	NP

# Sen's Slope Estimator

MW-14

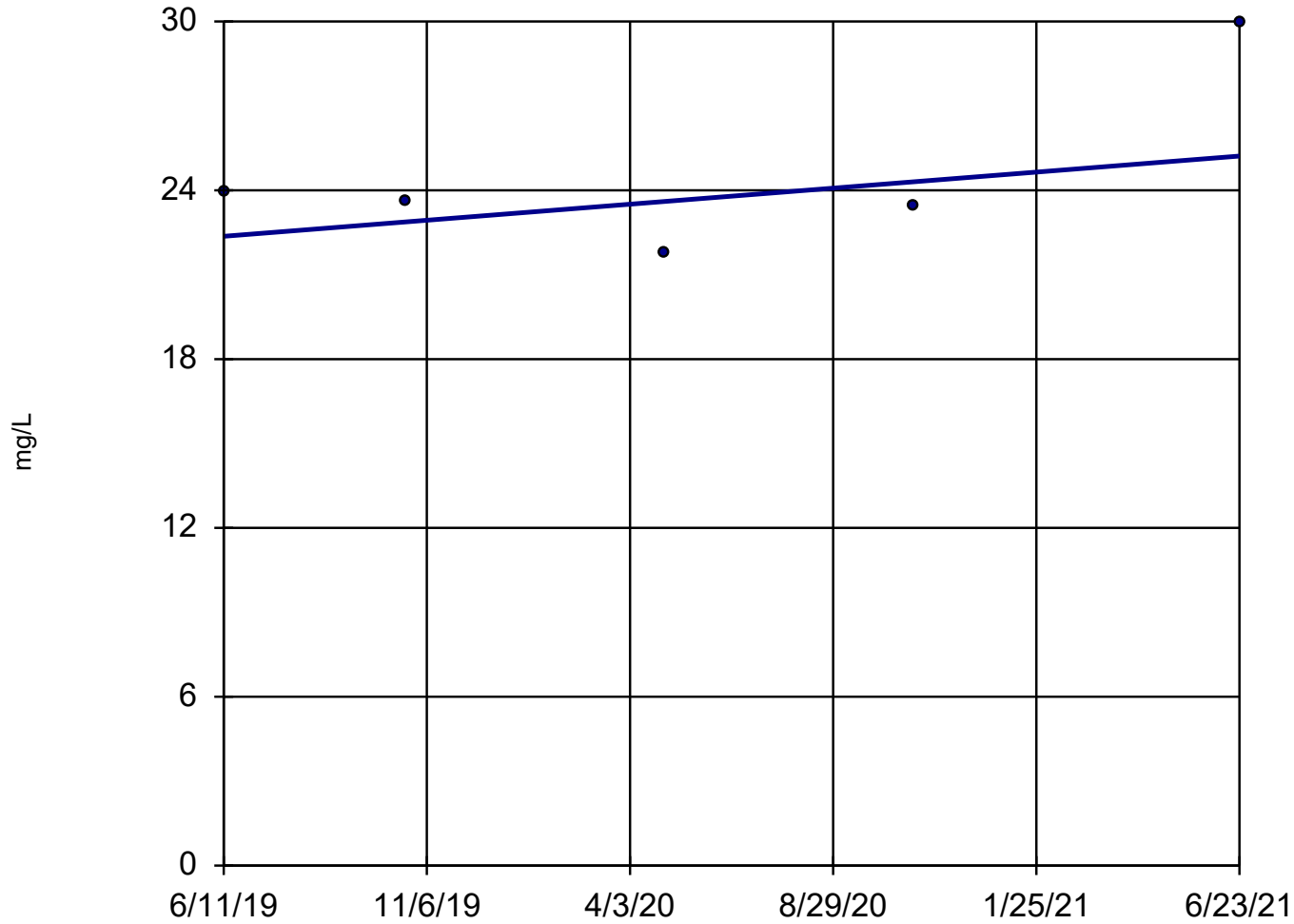


n = 5  
Slope = 19.69 units per year.  
Mann-Kendall statistic = 10  
critical = 10  
Trend not significant at 98% confidence level ( $\alpha = 0.01$  per tail).

Constituent: Calcium Analysis Run 7/6/2021 9:16 AM  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-15

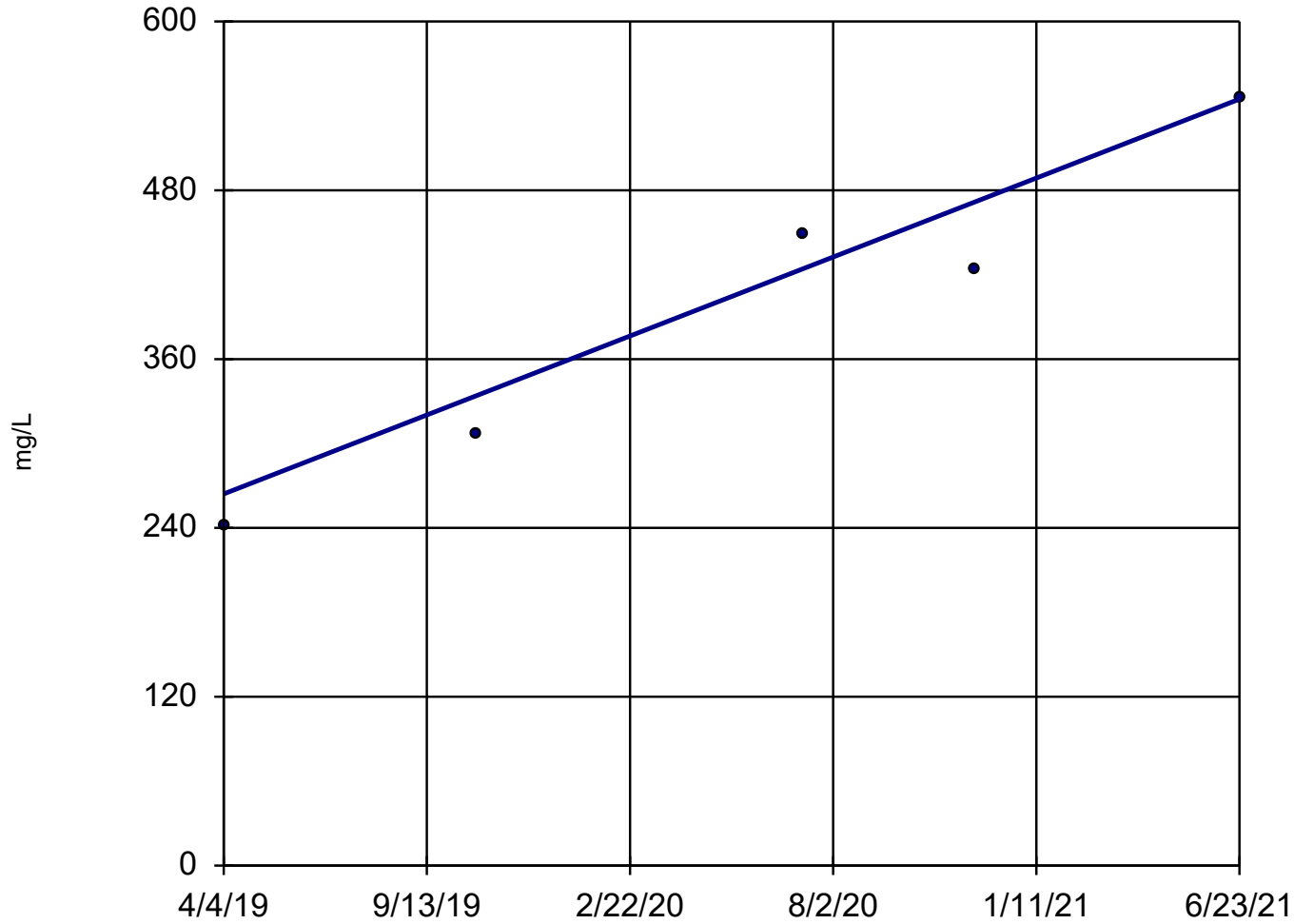


n = 5  
Slope = 1.4 units per year.  
Mann-Kendall statistic = 0  
critical = 10  
Trend not significant at 98% confidence level ( $\alpha = 0.01$  per tail).

Constituent: Calcium Analysis Run 7/6/2021 9:16 AM  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-14



n = 5  
Slope = 126.3 units per year.  
Mann-Kendall statistic = 8  
critical = 10  
Trend not significant at 98% confidence level ( $\alpha = 0.01$  per tail).

Constituent: Sulfate Analysis Run 7/6/2021 9:16 AM

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

**Background Groundwater Statistical Evaluation and  
Update**



# **BACKGROUND GROUNDWATER STATISTICAL EVALUATION AND UPDATE**

**TWIN OAKS POWER STATION  
COAL COMBUSTION RESIDUALS (CCR) LANDFILL  
ROBERTSON COUNTY, TEXAS**

**January 28, 2022**

**Prepared By:**



**1120 NW Stallings Drive  
Nacogdoches, Texas 75964  
TBPG Firm No. 50027**

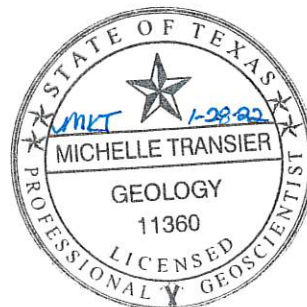
# BACKGROUND GROUNDWATER STATISTICAL EVALUATION AND UPDATE

## TWIN OAKS POWER STATION COAL COMBUSTION RESIDUALS (CCR) LANDFILL ROBERTSON COUNTY, TEXAS

January 28, 2022



Michelle K. Transier, P.G.  
Geologist



Prepared by:  
Hydrex Environmental  
Nacogdoches, Texas  
TBPG Firm No. 50027

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## Appendices

- Appendix A – Groundwater Contour Map**
- Appendix B – Baseline Data Set**
- Appendix C – Statistical Evaluation of Background Data**

## **Introduction**

The following information is submitted, on behalf of Twin Oaks Power Station Coal Combustion Residuals (CCR) Landfill, as an updated evaluation of the background groundwater data pool for the above-referenced facility. This correspondence includes statistical evaluation of Appendix III (detection monitoring constituents) monitoring data, performed in accordance with 30 TAC §352.941, 40 CFR §257.94, and using the statistical procedures presented in the approved Groundwater Sampling and Analysis Plan (GWSAP), for monitoring wells MW-13, MW-14, MW-15, and MW-17. This background evaluation includes data collected between June 2016 and June 2021. The findings of the background evaluation are presented below.

## **Statistical Methodologies**

Statistical evaluation of constituent concentration data for the facility shows high levels of spatial variability between upgradient groundwater monitoring wells (MW-7, MW-11, MW-12, and MW-16). Since the facility's upgradient monitoring wells are unaffected by landfilling of CCR waste due to their hydrologic position with respect to waste placement, the upgradient spatial variability observed is considered a reflection of the groundwater quality within the uppermost aquifer passing beneath the CCR facility. Based on the geologic environment that is present at the site, this natural spatial variability is expected to be evident in all monitoring wells installed for purposes of compliance with the performance standards detailed in 30 TAC §352.911 and 40 CFR 257.91(a), including the facility's downgradient monitoring wells.

In our professional opinion, interwell statistical evaluations alone would not adequately account for the natural spatial variability of the groundwater quality that has been observed within the uppermost aquifer and may lead to unacceptable rates of false positive results. Although all of the monitoring wells are screened in the same aquifer, the variable geochemistry at the site is such that data from upgradient wells may not be adequately representative of natural conditions in the downgradient wells. Background sampling data from downgradient wells provide an indication of background groundwater quality that is as representative or more representative than that provided by the upgradient wells, in accordance with 30 TAC §352.911 and 40 CFR 257.91(a)(ii). Therefore, intrawell statistical methodologies are the most appropriate methodologies for evaluating the facility's groundwater monitoring data as per the requirements of 30 TAC §352.931 and 40 CFR 257.93(h). Analysis of the downgradient background data indicates that constituent levels are representative of groundwater quality within the uppermost aquifer passing beneath the CCR facility, not affected by landfilling of CCR waste, and are thus appropriate for use as background data for statistical comparison in future sampling events. In our professional opinion, the statistical methodologies employed to meet the requirements of 30 TAC §352.931 and 40 CFR 257.93(h) are in accordance with the recommendations presented in Environmental Protection Agency (EPA) document titled, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance (Unified Guidance) and meet the performance standards detailed in 30 TAC §352.911 and 40 CFR 257.91(a).

## Outliers

Statistical evaluations applied to groundwater monitoring data assume the use of appropriate and representative background data. Data that reflect natural and non-impacted conditions are necessary for identification of true statistically significant increases. Determination of appropriate and representative background data necessitates evaluation of the data set for outliers. The outlier analysis identifies data points that do not seem to fit the distribution of the rest of the data set and determines if the identified difference is statistically significant. The purpose of identification of outliers within groundwater monitoring background data sets is to eliminate data that would result in a skewed statistical limit. Statistical evaluation of the background data for the referenced wells included an outlier analysis. In addition to statistical identification of outliers, the background data set was also reviewed for visually apparent outliers.

As some constituents are often sporadically detected in groundwater samples, the resultant non-parametric evaluations may employ high value background data points if high value outliers are not removed. Although removal of these high value outliers normally increases the statistical power, EPA guidance recommends that outliers generally not be removed unless an error or discrepancy is identified. Therefore, constituent concentrations that present statistical outliers with no apparent trends or source for the increased concentrations were closely scrutinized prior to removal from the data set. Concentrations determined to be visually apparent outliers were evaluated to determine if the concentrations represented natural conditions. Outlier values not determined to be representative of natural conditions were removed from the background data set. The following table presents all determined outliers and the results of the outlier analysis for the referenced wells. In addition, copies of the results of the statistical outlier analyses are included as attachments to this report (Appendix C).

### Results of Outlier Analysis

Well ID	Sample Date	Constituent	Value*	Retained in Data Set?	Reason for Removal/Retention
MW-13	6/14/2016	chloride	75.8	No	Statistically low value outlier
MW-14	10/10/2017	pH	5.9	Yes	Statistically low value outlier/within ranges of pH concentrations at site/representative of natural variation
	10/27/2020	boron	0.497	No	Visually high value outlier
	10/27/2020	calcium	112	No	Visually high value outlier
	6/23/2021		130	No	Visually high value outlier
	4/28/2021	chloride	381	No	Visually high value outlier
	6/23/2021	sulfate	545	No	Visually high value outlier
	4/28/2021	TDS	1520	No	Visually high value outlier
MW-15	6/23/2021	calcium	30	Yes	Statistically high value outlier/within ranges of calcium concentrations at site/representative of natural variation
	10/10/2017	pH	5.63	Yes	Statistically low value outlier/within ranges of pH concentrations at site/representative of natural variation
MW-17	7/26/2016	boron	0.362	Yes	Statistically high value outlier/within ranges of boron concentrations at site/representative of natural variation

\*Value: pH – SU, all others – mg/L

### Trend Analysis

In addition to outliers, background data sets should be evaluated for any statistical trends. A combination Mann-Kendall and Sen’s Slope Estimator analysis was employed to evaluate the referenced background data for significant trends. The Mann-Kendall test evaluates the data for trends, while the Sen’s Slope Estimator analysis indicates if a data trend is increasing or decreasing. Increasing statistical trends can indicate potential impact to a well. Increasing trends for chloride in MW-15 and for sulfate in MW-14 and MW-15 were indicated during evaluation of the proposed background data set. Further evaluation indicated the chloride and sulfate concentrations to be within concentrations in upgradient wells across the site. Therefore, chloride in MW-15 and for sulfate in MW-14 MW-15 are considered to be unaffected by landfilling of CCR waste. Copies of the results of the statistical trend analyses are included as attachments to this report (Appendix C).

### Recommendations for Background Database Update

The following table presents the proposed intrawell statistical limits for monitoring wells MW-13, MW-14, MW-15, and MW-17.

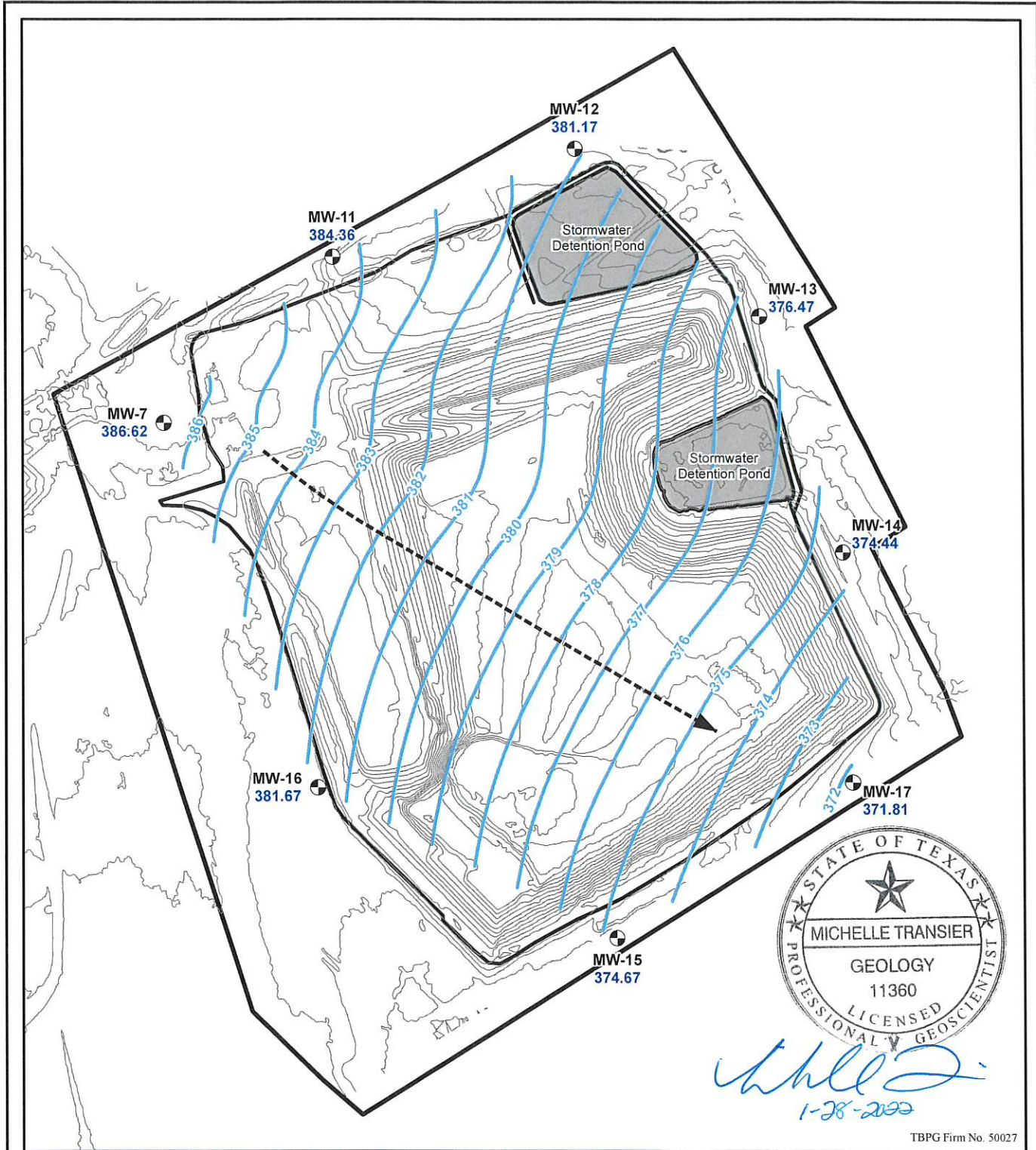
**Table Comparing Background Limits**

Constituent	MW-13		MW-14		MW-15		MW-17	
	Previous Limit	Updated Limit	Previous Limit	Updated Limit	Previous Limit	Updated Limit	Previous Limit	Updated Limit
<b>Detection Monitoring Constituents</b>								
Boron (mg/L)	0.1382	0.1206	0.5796	0.6019	0.06917	0.06659	0.362	0.362
Calcium (mg/L)	37.7	59.59	115.2	141.2	28.93	37.94	555.1	396.5
Chloride (mg/L)	119.4	120.1	436.5	440.9	175.8	197.6	1678	1728
Fluoride (mg/L)	0.584	0.584	0.682	0.682	0.5	0.5	0.5	0.5
pH (SU)	4.847-7.797	4.972-7.724	4.951-7.714	4.924-7.57	4.356-7.767	4.322-7.577	3.887-7.908	3.992-7.76
Sulfate (mg/L)	193.1	195.2	401.3	841.2	40.2	49.99	160.2	168
Total Dissolved Solids (mg/L)	660.3	631.9	1541	1940	476.9	482.6	3191	3264

Review of data collected demonstrates no indication of a release from the landfill. Evaluation of the constituent data shows somewhat high spatial variability with only moderate temporal variability across the site. Furthermore, the highest statistical background values for detection monitoring constituents are predominantly found in wells located upgradient of waste disposal activities. Therefore, the retained groundwater monitoring data collected through June 2021 are considered to be unaffected by landfilling of CCR waste and appropriate for use as background data for future statistical evaluations.

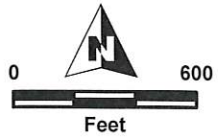
Based on the results of this evaluation, retained groundwater monitoring data collected during the period of June 2016 and June 2021 for monitoring wells MW-13, MW-14, MW-15, and MW-17 at Twin Oaks Power Station CCR Landfill is recommended for use as the background data set. The retained constituent data will be utilized in statistical evaluation of groundwater monitoring data in accordance with the facility’s approved GWSAP. A copy of the updated background data set documentation in table format is included in Appendix B of this report.

**Appendix A**  
**Groundwater Contour Map**



TBPG Firm No. 50027

<ul style="list-style-type: none"> <li> Monitor Well</li> <li> Approx. Groundwater Flow Direction</li> <li> Groundwater Contour</li> <li> Pond</li> </ul>	<ul style="list-style-type: none"> <li> 5-ft Ground Surface Contour</li> <li> Property Boundary</li> <li> Groundwater Elevation (Elevation Feet, MSL)</li> </ul>
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GROUNDWATER CONTOUR MAP

← WATER LEVELS MEASURED (10/18/2021) →

CCR Landfill  
Twin Oaks Power Station  
13065 Plant Road  
Bremond (Robertson County), Texas 76629

Map Revised: 12/28/2021	Project Number: I-14-1007	GIS Analyst: NCF
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**Appendix B**  
**Baseline Data Set**

**Twin Oaks Power Station – Coal Combustion Residuals (CCR) Landfill  
Updated Data Set (June 2016 - June 2021)**

Well ID	Date	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (SU)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
MW-7 (Upgradient)	6/14/2016	0.313	179	186	<0.2	6.37	702	1460
	7/26/2016	0.566	208	257	0.459	6.37	880	1590
	9/27/2016	0.306	199	218	0.272	6.33	826	1550
	11/29/2016	0.288	217	208	<0.5	6.38	731	1550
	1/24/2017	0.264	199	206	<0.5	6.07	703	1530
	1/25/2017	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	3/28/2017	0.37	263	216	<0.5	6.27	730	1390
	6/22/2017	0.257	218	219	<0.5	6.81	671	1800
	8/15/2017	0.257	229	260	<0.5	6.49	782	708
	10/10/2017	0.259	186	258	<0.5	6.15	785	1650
	4/26/2018	0.257	232	300	<0.5	6.58	998	1660
	10/9/2018	0.303	326	312	<0.5	6.72	1070	1730
	4/4/2019	0.332	284	285	<0.5	6.36	908	1780
	10/21/2019	0.286	312	285	<0.5	6.5	1040	1950
	4/28/2020	0.322	268	274	<0.5	6.42	1550	1780
	10/27/2020	0.298	245	262	<0.5	6.06	930	1670
4/28/2021	0.295	258	259	<0.5	6.5	952	1800	
MW-11 (Upgradient)	6/14/2016	0.0975	93.9	143	<0.2	6.25	419	923
	7/26/2016	0.153	87.8	151	0.448	6.28	430	935
	9/27/2016	0.0947	90.2	138	0.256	6.28	437	888
	11/29/2016	0.0863	95.9	138	<0.5	6.26	418	952
	1/24/2017	0.0861	102	135	<0.5	6.17	416	913
	3/28/2017	0.149	88.8	138	<0.5	6.18	424	908
	6/22/2017	0.0952	74.2	124	<0.5	6.78	362	796
	8/15/2017	0.0675	55.6	109	<0.5	2.12	337	2890
	10/10/2017	0.0673	84.6	124	<0.5	6.39	363	890
	4/26/2018	0.0805	64.4	124	<0.5	6.55	365	785
	10/9/2018	0.102	109	153	<0.5	6.63	445	902
	4/4/2019	0.119	94.8	141	<0.5	6.3	406	862
	10/21/2019	0.11	127	155	<0.5	6.48	487	992
	4/28/2020	0.14	137	185	<0.5	6.42	606	1170
	10/27/2020	0.147	142	184	<0.5	6.07	621	1120
	4/28/2021	0.175	152	176	<0.5	6.5	612	1130

**Twin Oaks Power Station – Coal Combustion Residuals (CCR) Landfill  
Updated Data Set (June 2016 - June 2021)**

Well ID	Date	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (SU)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
MW-12 (Upgradient)	6/14/2016	0.0366	19.1	87.1	<0.2	6.28	50	314
	7/26/2016	0.0635	21.2	85.9	0.484	6.37	48.1	307
	9/27/2016	0.0367	22	88.3	0.29	6.22	56.4	299
	11/29/2016	0.0359	22.3	84.9	<0.5	6.27	49.6	355
	1/24/2017	0.0321	22	83.2	<0.5	5.97	48.9	284
	3/28/2017	0.0615	23.2	87.6	<0.5	6.21	52.3	314
	6/22/2017	0.0378	18.6	84.3	<0.5	6.68	48.5	296
	8/15/2017	0.0334	20.2	84.2	<0.5	7.07	48.8	300
	10/10/2017	0.0285	21.9	83.4	<0.5	6.33	48.6	300
	4/26/2018	0.026	17.3	82.9	<0.5	6.62	50.3	279
	10/9/2018	0.0335	20.8	83.5	<0.5	6.71	50	267
	4/4/2019	0.0424	19.4	78.3	<0.5	6.56	42.6	256
	10/21/2019	0.0326	21.5	80.3	<0.5	6.48	46.1	313
	4/28/2020	0.0304	16.9	76.9	<0.5	6.47	43.4	275
	10/27/2020	0.028	18.3	76.5	<0.5	6.2	40.5	283
4/28/2021	0.0373	15.4	74.6	<0.5	6.5	38.1	221	
MW-13	6/14/2016	0.114	20.7	75.8**	0.285	6.32	26.7	348
	7/26/2016	0.0498	20.7	91.1	0.584	6.35	<0.2	414
	9/27/2016	0.0531	30.6	101	0.41	6.32	62.9	449
	11/29/2016	0.047	37.7	102	<0.5	6.16	108	495
	1/24/2017	0.0382	19.4	91.8	<0.5	5.91	37.7	322
	3/28/2017	0.0756	22.4	97.3	<0.5	6.21	36.2	336
	6/22/2017	0.0786	37.1	99.1	<0.5	6.66	93.5	448
	8/15/2017	0.0529	22.6	97.4	<0.5	6.61	44.4	371
	10/10/2017	0.0558	23.3	94.2	<0.5	5.71	38.4	368
	4/26/2018	0.04	17.9	98	<0.5	6.59	39.7	338
	10/9/2018	0.0394	20	98	<0.5	6.64	39.6	355
	4/4/2019	0.0529	23.7	92.4	<0.5	6.38	56.2	343
	10/22/2019	0.055	36.8	98.4	<0.5	6.63	84.8	423
	4/28/2020	0.075	31.1	103	<0.5	6.55	72.2	403
	10/27/2020	0.0604	28.8	104	<0.5	6.13	71.3	381
4/28/2021	0.0587	26.1	105	<0.5	6.4	78.9	398	

**Twin Oaks Power Station – Coal Combustion Residuals (CCR) Landfill  
Updated Data Set (June 2016 - June 2021)**

Well ID	Date	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (SU)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
MW-14	6/14/2016	0.419	68.1	337	0.28	6.51	127	1040
	7/26/2016	0.0425	71.2	351	0.682	6.63	151	1130
	9/27/2016	0.0362	84.9	355	0.533	6.67	225	1180
	11/29/2016	0.0388	77.3	334	<0.5	6.59	177	1160
	1/24/2017	0.0338	69.1	337	<0.5	6.39	175	1170
	3/28/2017	0.0537	82.5	335	<0.5	6.55	209	1150
	6/22/2017	0.0355	75.4	345	<0.5	6.83	185	1070
	8/15/2017	0.157	70.8	307	<0.5	6.86	259	1180
	10/10/2017	0.305	88.2	322	<0.5	5.9	228	1290
	4/26/2018	0.236	68.3	358	<0.5	6.85	231	986
	10/9/2018	0.253	86.7	366	<0.5	6.88	225	1060
	4/4/2019	0.214	82.9	373	<0.5	6.67	242	1180
	10/22/2019	0.248	102	357	<0.5	6.74	306	1350
	4/28/2020	0.322	106	370	<0.5	6.8	467**	1680**
	7/9/2020	n/a	n/a	n/a	n/a	n/a	448^+	1490^
	10/27/2020	0.497	112**	364	<0.5	6.35	493**	1480
	11/23/2020	n/a	n/a	n/a	n/a	n/a	424^+	n/a
4/28/2021	0.391	117**	381**	0.51	6.7	493**	1520**	
6/23/2021	n/a	130^+**	n/a	n/a	n/a	545^+**	n/a	
MW-15	6/14/2016	0.0571	20.5	102	<0.2	6.49	28.2	337
	7/26/2016	0.0544	19.7	97.9	0.486	6.57	27.6	368
	9/27/2016	0.0512	19.7	96.5	0.298	6.59	28.6	356
	11/29/2016	0.0521	19.5	98.9	<0.5	6.51	24.3	407
	1/24/2017	0.0474	19.7	94.4	<0.5	6.23	26	370
	3/28/2017	0.0642	21.3	98.4	<0.5	6.54	29.1	362
	6/22/2017	0.0428	20	110	<0.5	6.86	27	393
	8/15/2017	0.0489	20.9	115	<0.5	6.34	26.3	401
	10/10/2017	0.0477	22.1	109	<0.5	5.63	24.9	373
	4/26/2018	0.0491	18.2	127	<0.5	6.85	29.2	345
	10/9/2018	0.0461	26.2*	138*	<0.5	6.71	33.1	365
	11/20/2018	n/a	17.2^	131^	n/a	n/a	n/a	n/a
	4/4/2019	0.05	26.8*	128	<0.5	6.6	30.5	355
	6/11/2019	n/a	23.9^+	n/a	n/a	n/a	n/a	n/a
	10/22/2019	0.0443	23.6	113	<0.5	6.71	34.7	380
	4/28/2020	0.0427	21.8	119	<0.5	6.61	38.1	338
	10/27/2020	0.0399	23.4	129	<0.5	6.32	34.3	381
4/28/2021	0.0475	29**	155	<0.5	6.7	34.5	404	
6/23/2021	n/a	30^+	n/a	n/a	n/a	n/a	n/a	

**Twin Oaks Power Station – Coal Combustion Residuals (CCR) Landfill  
Updated Data Set (June 2016 - June 2021)**

Well ID	Date	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (SU)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
MW-16 (Upgradient)	6/14/2016	0.0566	57.2	230	<0.2	6.11	37.5	648
	7/26/2016	0.179	59.3	238	0.441	6.21	38	744
	9/27/2016	0.0475	59	244	0.252	6.16	41.2	670
	11/29/2016	0.0453	63.2	267	<0.5	6.19	36.9	832
	1/24/2017	0.0419	64.4	253	<0.5	5.97	44.5	676
	3/28/2017	0.0548	63	255	<0.5	6.11	57.2	671
	6/22/2017	0.0367	67	268	<0.5	6.48	63.1	675
	8/15/2017	0.0376	73.2	270	<0.5	6.51	68.1	670
	10/10/2017	0.0379	78	289	<0.5	5.05	71.9	781
	4/26/2018	0.0372	73.3	254	<0.5	6.4	142*	662
	6/26/2018	n/a	n/a	n/a	n/a	n/a	133^	n/a
	10/9/2018	0.03	58.1	233	<0.5	6.35	109	684
	4/4/2019	0.0314	62	267	<0.5	6.57	123	849
	10/21/2019	0.0354	69.2	257	<0.5	6.56	101	778
	4/28/2020	0.0257	87.1	371	<0.5	6.53	129	960
10/27/2020	0.0243	45.7	198	<0.5	6.33	87.5	598	
4/28/2021	0.0271	43.2	189	<0.5	6.9	82.8	677	
MW-17	6/14/2016	0.74	38	263	<0.2	5.84	28.2	714
	7/26/2016	0.362	80.1	432	0.441	5.79	<0.2	1010
	9/27/2016	0.0289	97.6	518	0.255	5.75	48	1220
	11/29/2016	0.0354	54.5	394	<0.5	5.63	51.6	1040
	1/24/2017	0.0267	91.6	494	<0.5	5.62	55.2	1110
	3/28/2017	0.037	61.6	417	<0.5	5.85	55.9	987
	6/22/2017	0.0285	118	544	<0.5	6.13	47.9	1250
	8/15/2017	0.0228	188	926	<0.5	6.06	52	1620
	10/10/2017	0.0198	226	957	<0.5	5.05	87.4	1980
	4/26/2018	0.0224	60.5	386	<0.5	6.3	78.5	905
	10/9/2018	0.0243	27.8	153	<0.5	6.67	38.4	379
	4/4/2019	0.028	69.6	350	<0.5	6.08	37.8	697
	10/22/2019	0.0195	137	806	<0.5	6.21	96.4	1810
	4/28/2020	0.0227	156	706	<0.5	5.83	55.2	1210
	10/27/2020	0.0237	162	640	<0.5	5.4	41.1	1340
4/28/2021	0.0314	156	798	<0.5	5.8	26.1	1500	

n/a - indicates constituent not sampled during the event

█ - indicates verification resampling results used as a replacement for original value

^ - verification resampling result

+ - indicates confirmed result with ASD

\* - data removed during previous update

\*\* - data removed during current update

## **Appendix C**

### **Statistical Evaluation of Background Data**

## **Control Charts and Prediction Limits**

# Shewhart-Cusum Control Chart / Rank Sum

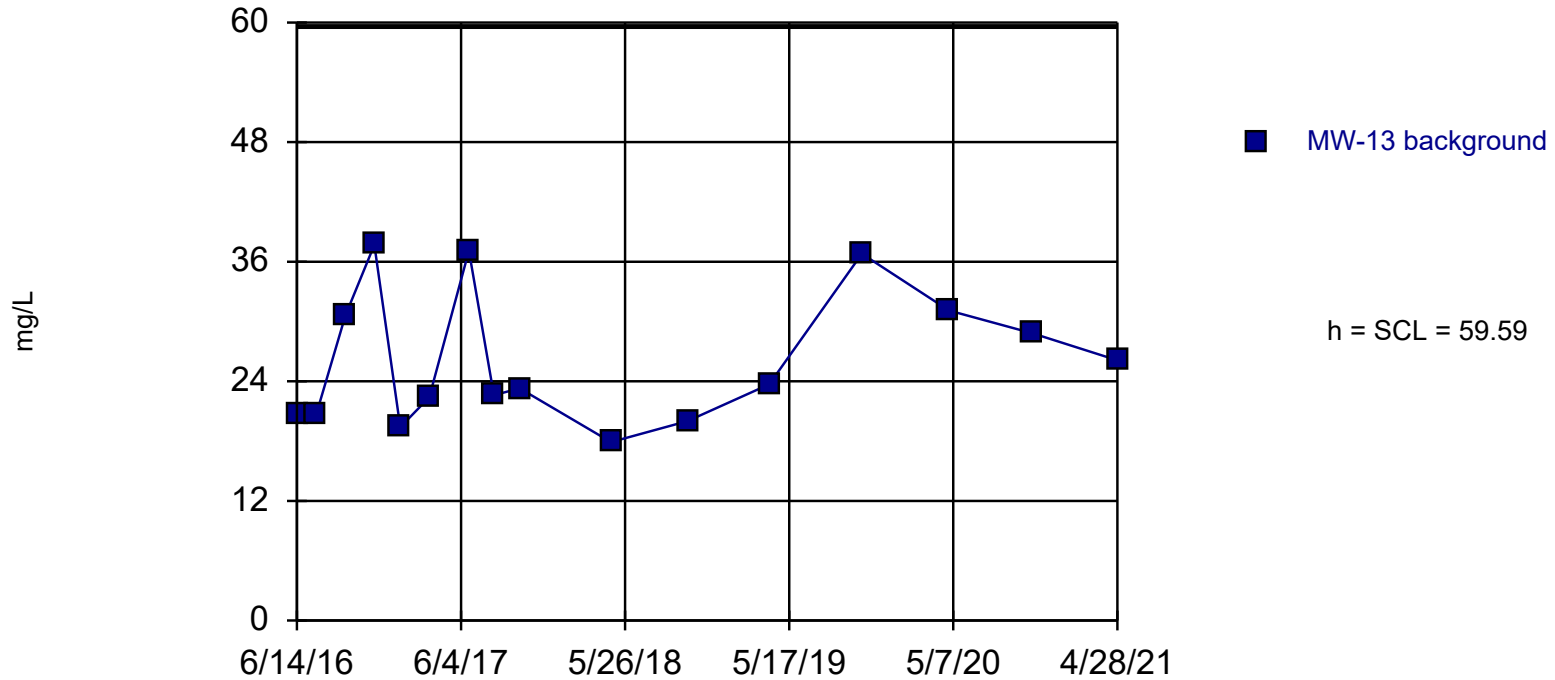
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks    Printed 12/28/2021, 10:10 AM

<u>Constituent</u>	<u>Well</u>	<u>Sig.</u>	<u>h</u>	<u>SCL</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Method</u>
Calcium (mg/L)	MW-13	No	59.59	59.59	16	0	No	Param Intra
Chloride (mg/L)	MW-13	No	120.1	120.1	15	0	No	Param Intra
Fluoride (mg/L)	MW-13	No	PL=...	n/a	16	81.25	No	NP Intra PL (NDs)
pH (SU)	MW-13	No	7.7...	7.7...	16	0	No	Param Intra
Sulfate (mg/L)	MW-13	No	195.2	195.2	16	6.25	No	Param Intra
Total Dissolved Solids (mg/L)	MW-13	No	631.9	631.9	16	0	No	Param Intra
Calcium (mg/L)	MW-14	No	141.2	141.2	14	0	No	Param Intra
Chloride (mg/L)	MW-14	No	440.9	440.9	15	0	No	Param Intra
Fluoride (mg/L)	MW-14	No	PL=...	n/a	16	75	No	NP Intra PL (NDs)
pH (SU)	MW-14	No	7.5...	7.5...	16	0	x^4	Param Intra
Sulfate (mg/L)	MW-14	No	841.2	841.2	15	0	sqrt(x)	Param Intra
Total Dissolved Solids (mg/L)	MW-14	No	1940	1940	15	0	No	Param Intra
Calcium (mg/L)	MW-15	No	37.94	37.94	16	0	sqrt(x)	Param Intra
Chloride (mg/L)	MW-15	No	197.6	197.6	16	0	No	Param Intra
Fluoride (mg/L)	MW-15	No	PL=0.5	n/a	16	87.5	No	NP Intra PL (NDs)
pH (SU)	MW-15	No	7.5...	7.5...	16	0	x^4	Param Intra
Sulfate (mg/L)	MW-15	No	49.99	49.99	16	0	No	Param Intra
Total Dissolved Solids (mg/L)	MW-15	No	482.6	482.6	16	0	No	Param Intra
Calcium (mg/L)	MW-17	No	396.5	396.5	16	0	No	Param Intra
Chloride (mg/L)	MW-17	No	1728	1728	16	0	No	Param Intra
Fluoride (mg/L)	MW-17	No	PL=0.5	n/a	16	87.5	No	NP Intra PL (NDs)
pH (SU)	MW-17	No	7.7...	7.7...	16	0	No	Param Intra
Sulfate (mg/L)	MW-17	No	168	168	16	6.25	No	Param Intra
Total Dissolved Solids (mg/L)	MW-17	No	3264	3264	16	0	No	Param Intra



## Control Chart

MW-13



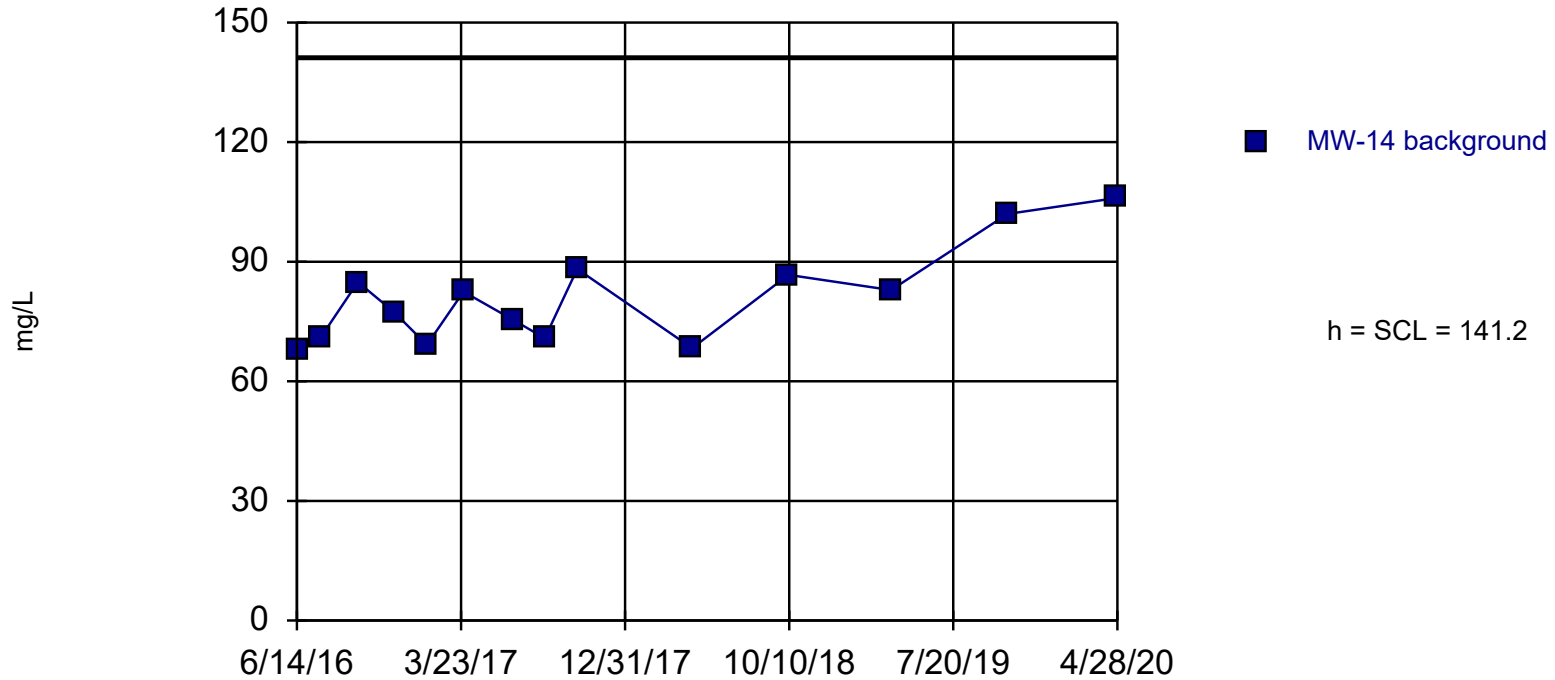
Background Data Summary: Mean=26.18, Std. Dev.=6.682, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8874, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Calcium Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-14



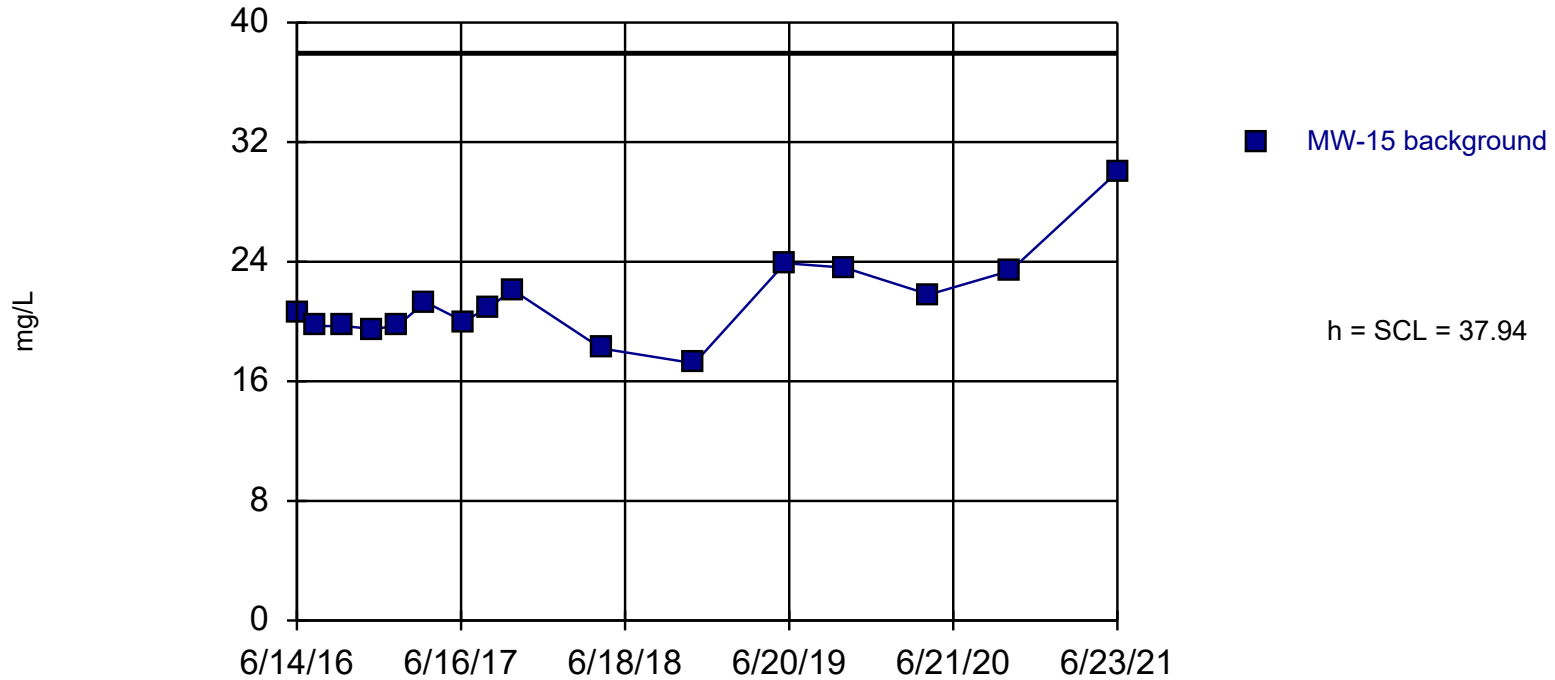
Background Data Summary: Mean=80.96, Std. Dev.=12.04, n=14. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8921, critical = 0.874. Report alpha = 0. Dates ending 4/28/2020 used for control stats. Standardized h=5, SCL=5.

Constituent: Calcium Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-15



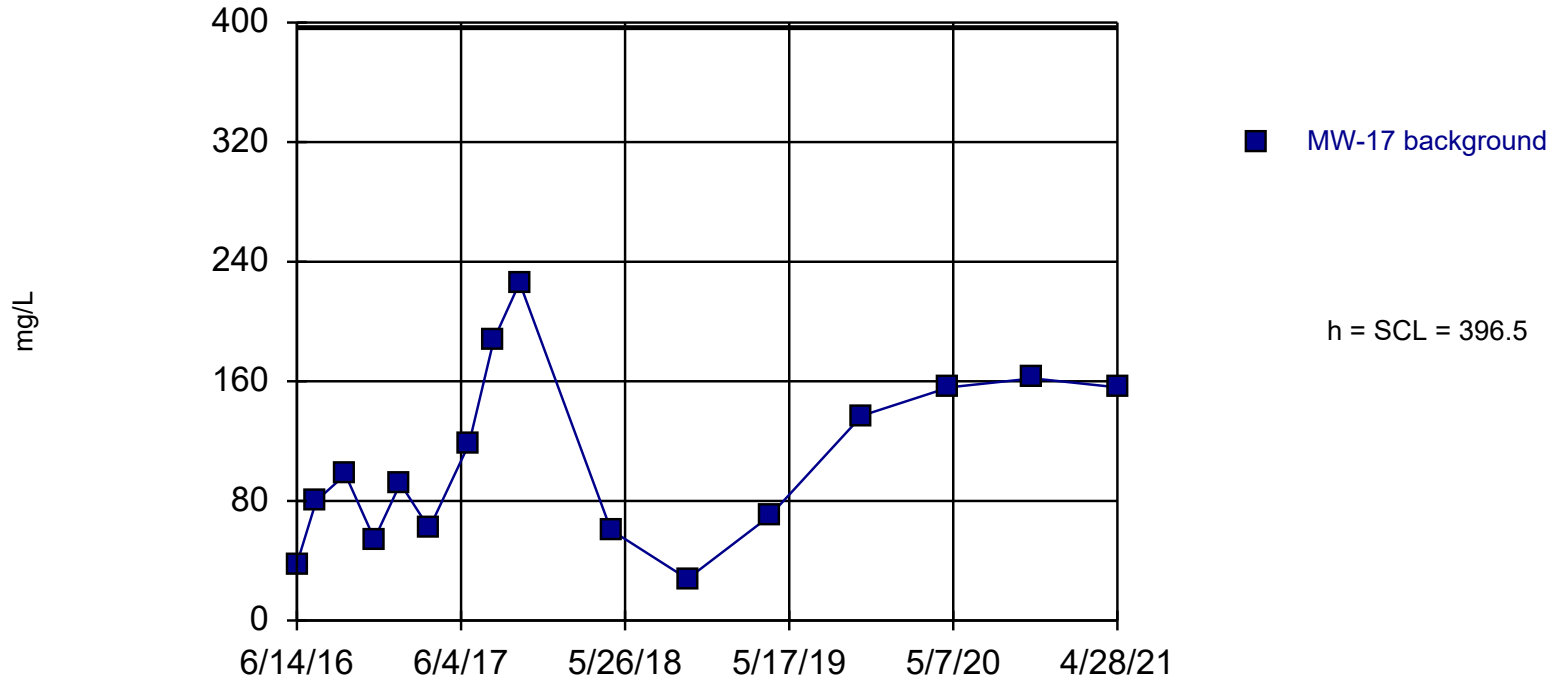
Background Data Summary (based on square root transformation): Mean=4.61, Std. Dev.=0.3099, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8969, critical = 0.887. Report alpha = 0. Dates ending 6/23/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Calcium Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-17



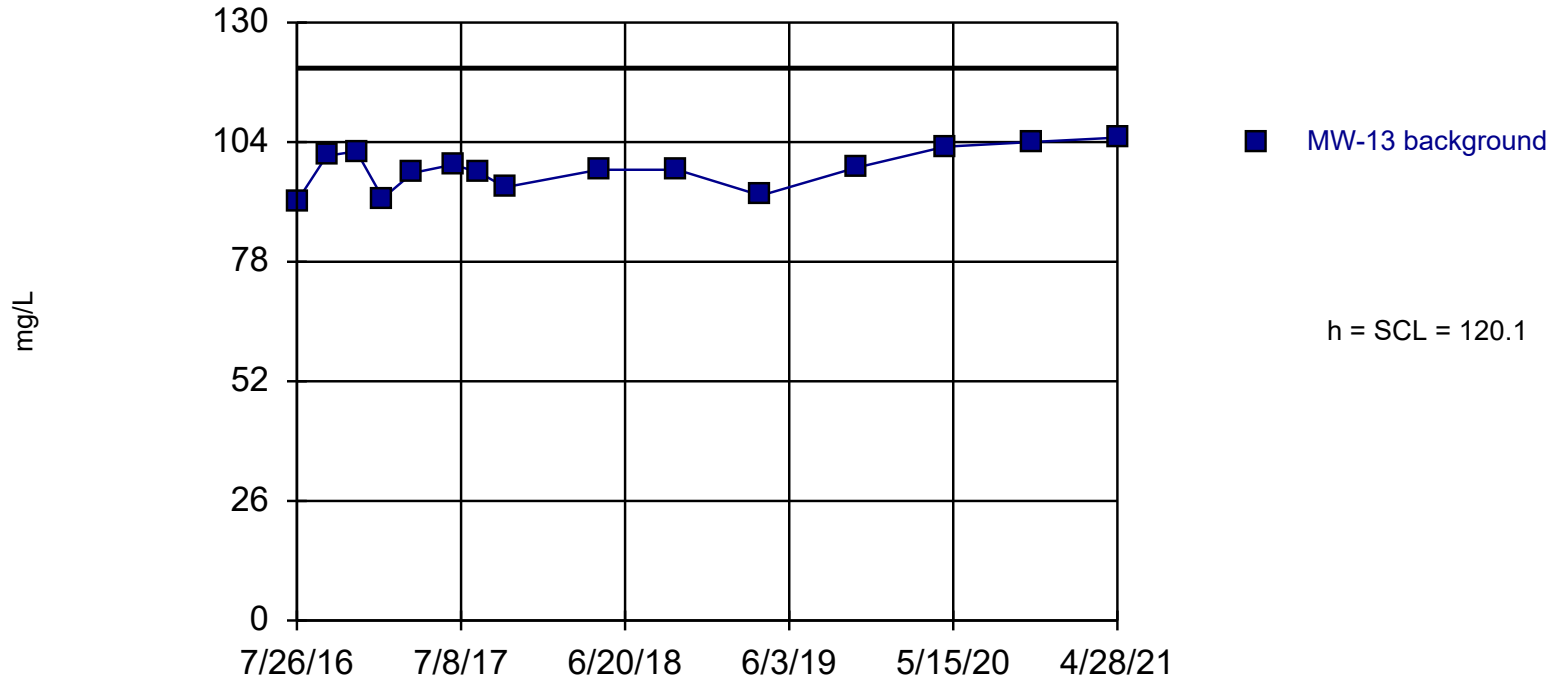
Background Data Summary: Mean=107.8, Std. Dev.=57.75, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9499, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Calcium Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-13



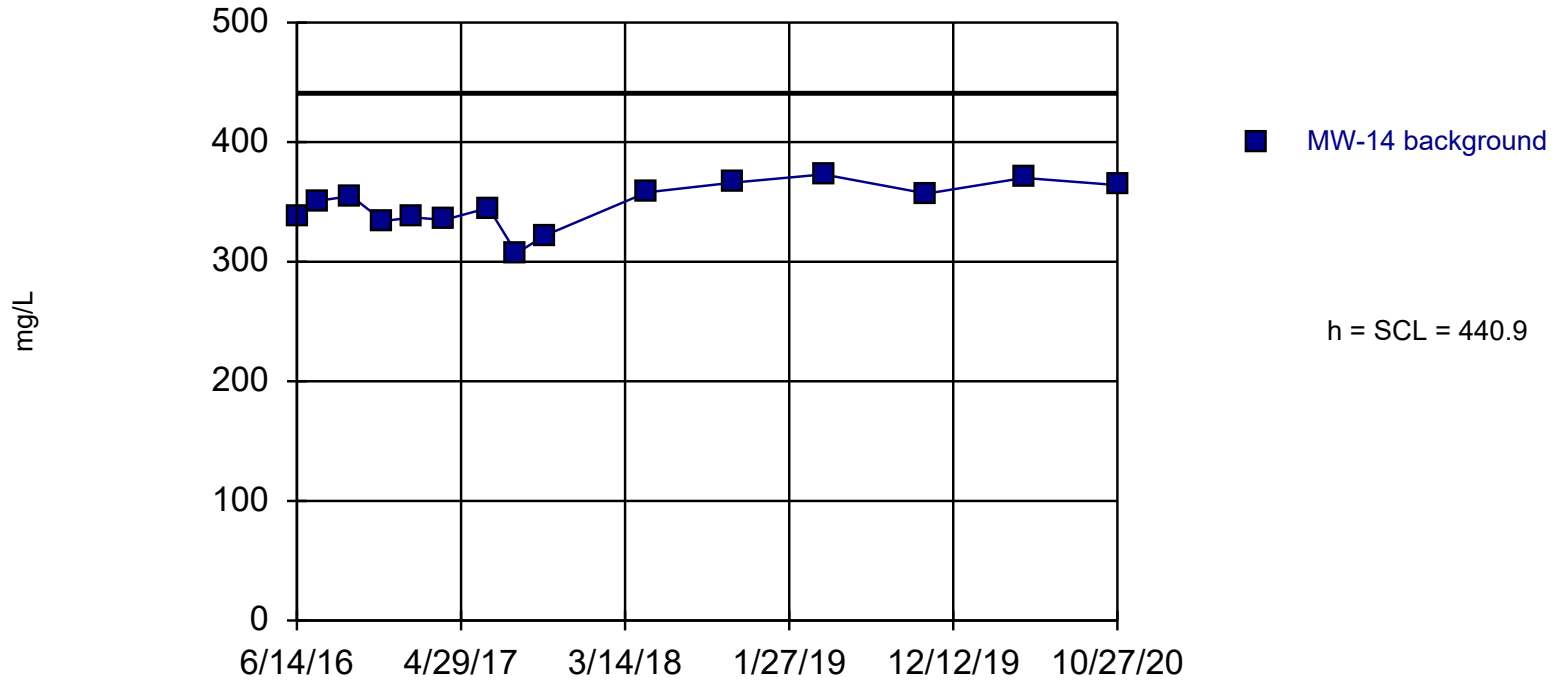
Background Data Summary: Mean=98.18, Std. Dev.=4.38, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9494, critical = 0.881. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-14



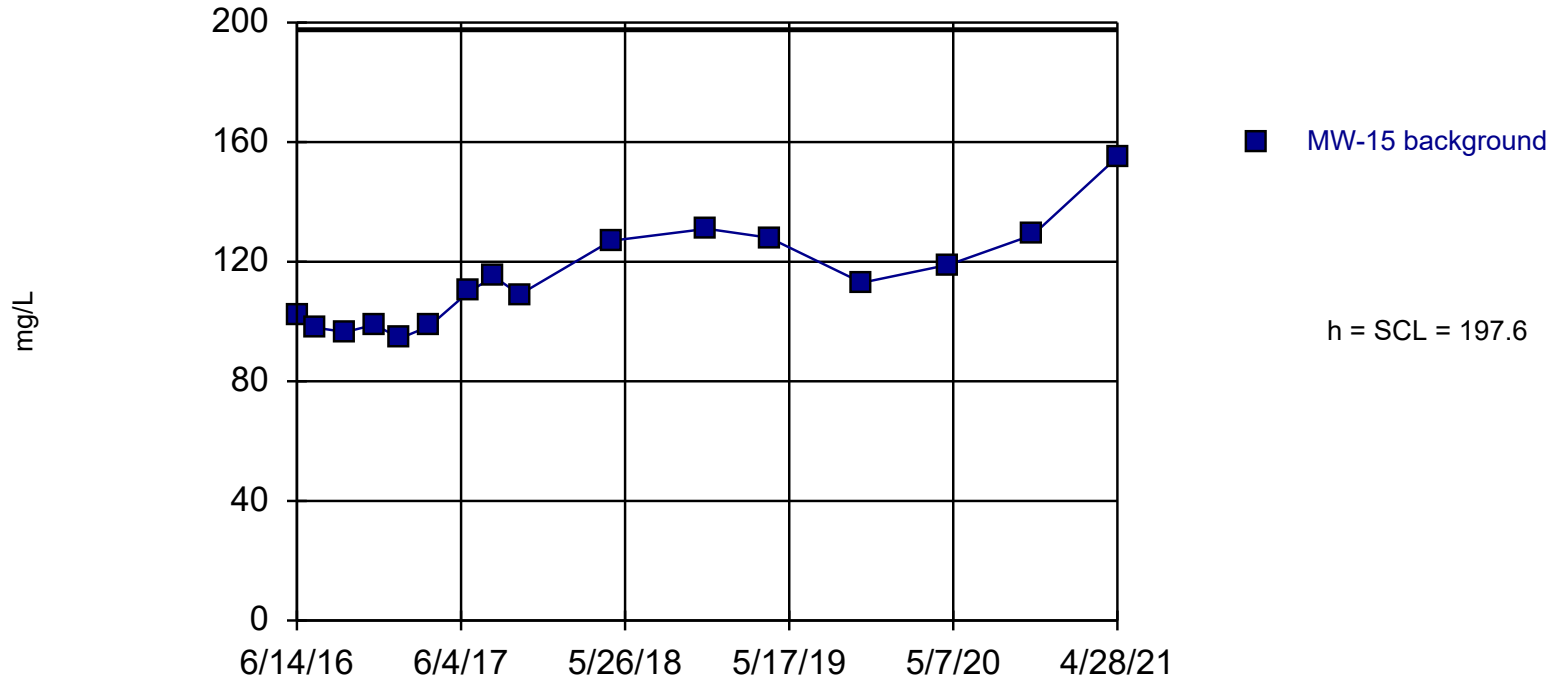
Background Data Summary: Mean=347.4, Std. Dev.=18.7, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9535, critical = 0.881. Report alpha = 0. Dates ending 10/27/2020 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-15



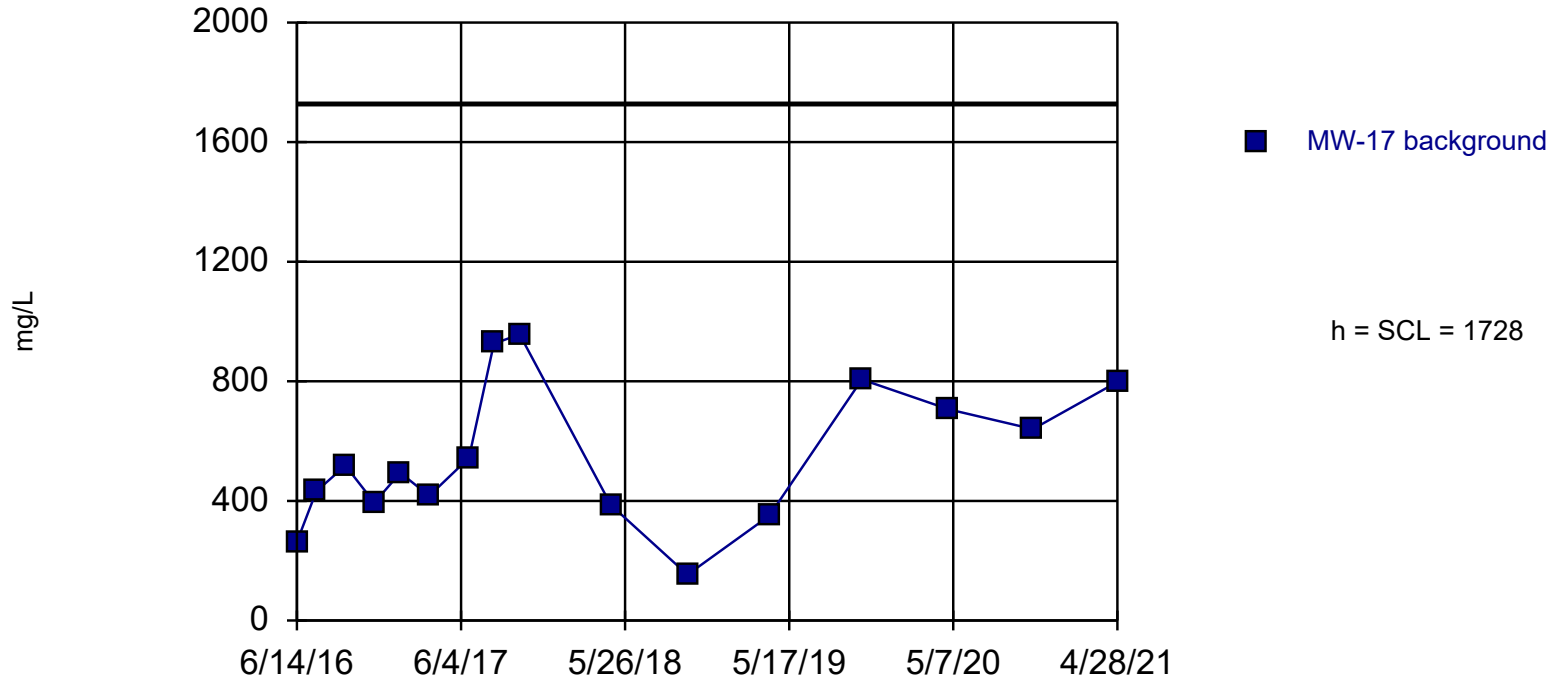
Background Data Summary: Mean=114, Std. Dev.=16.72, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9096, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Chloride Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-17



Background Data Summary: Mean=549, Std. Dev.=235.7, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9592, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

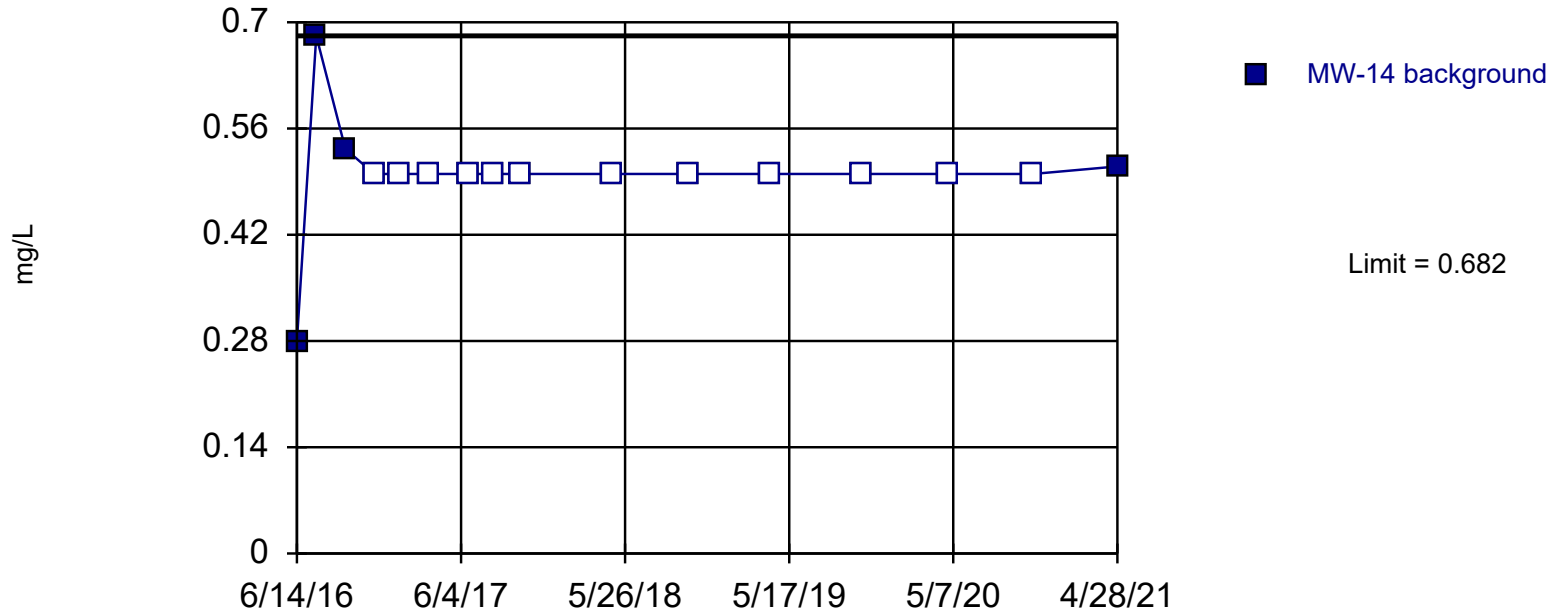
Constituent: Chloride Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks





## Prediction Limit Intrawell Non-parametric, MW-14



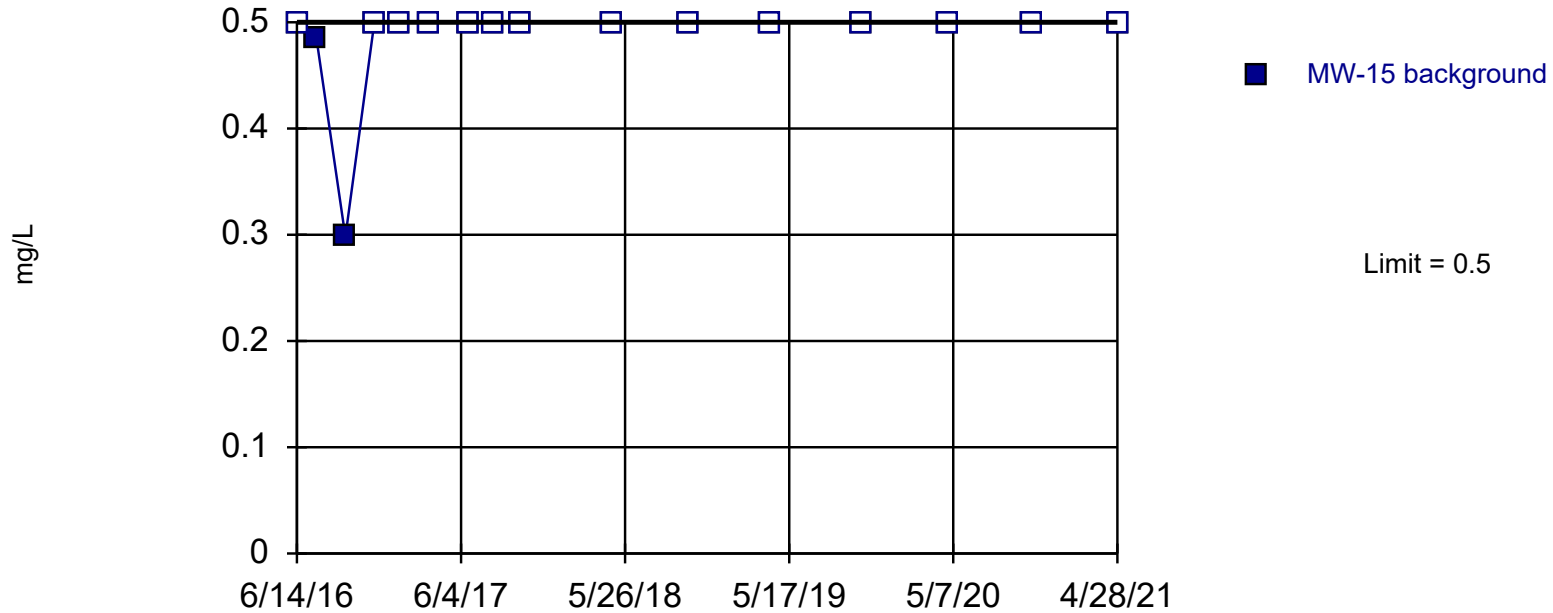
Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 16 background values. 75% NDs. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value. Seasonality was not detected with 95% confidence.

Constituent: Fluoride Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Prediction Limit

### Intrawell Non-parametric, MW-15



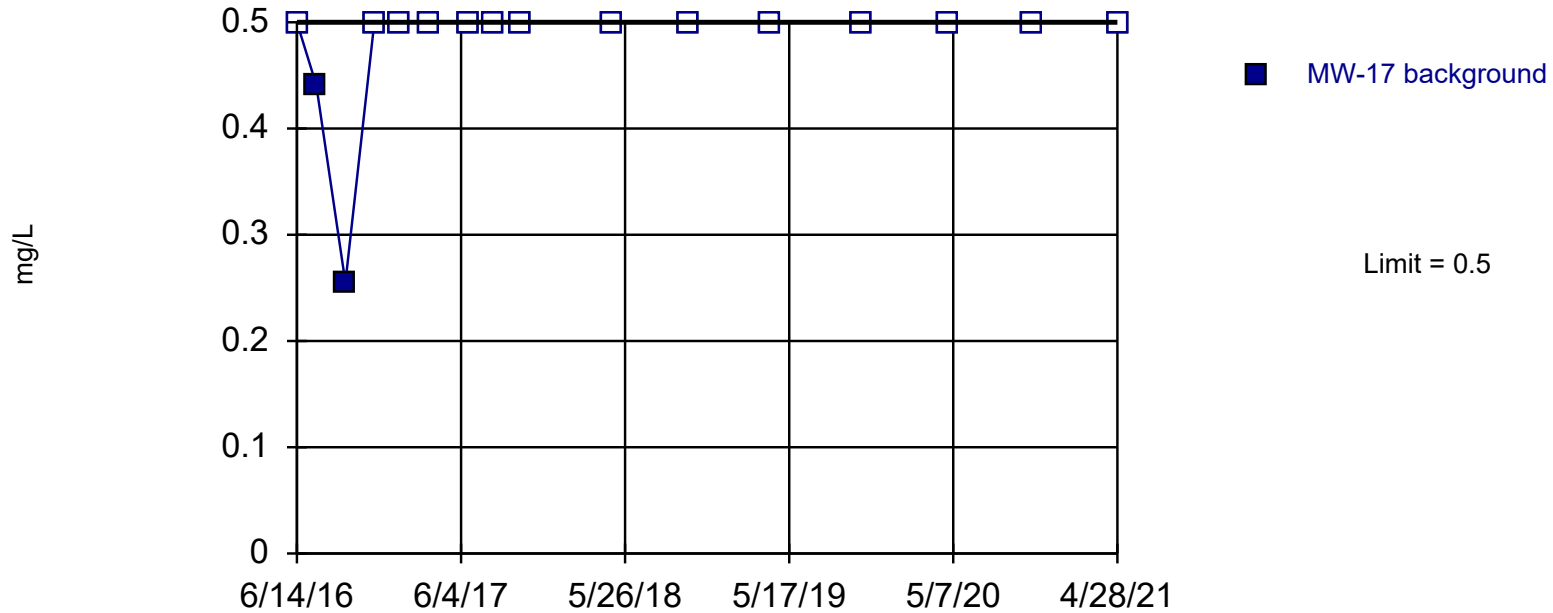
Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 16 background values. 87.5% NDs. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value. Seasonality was not detected with 95% confidence.

Constituent: Fluoride Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Prediction Limit

### Intrawell Non-parametric, MW-17



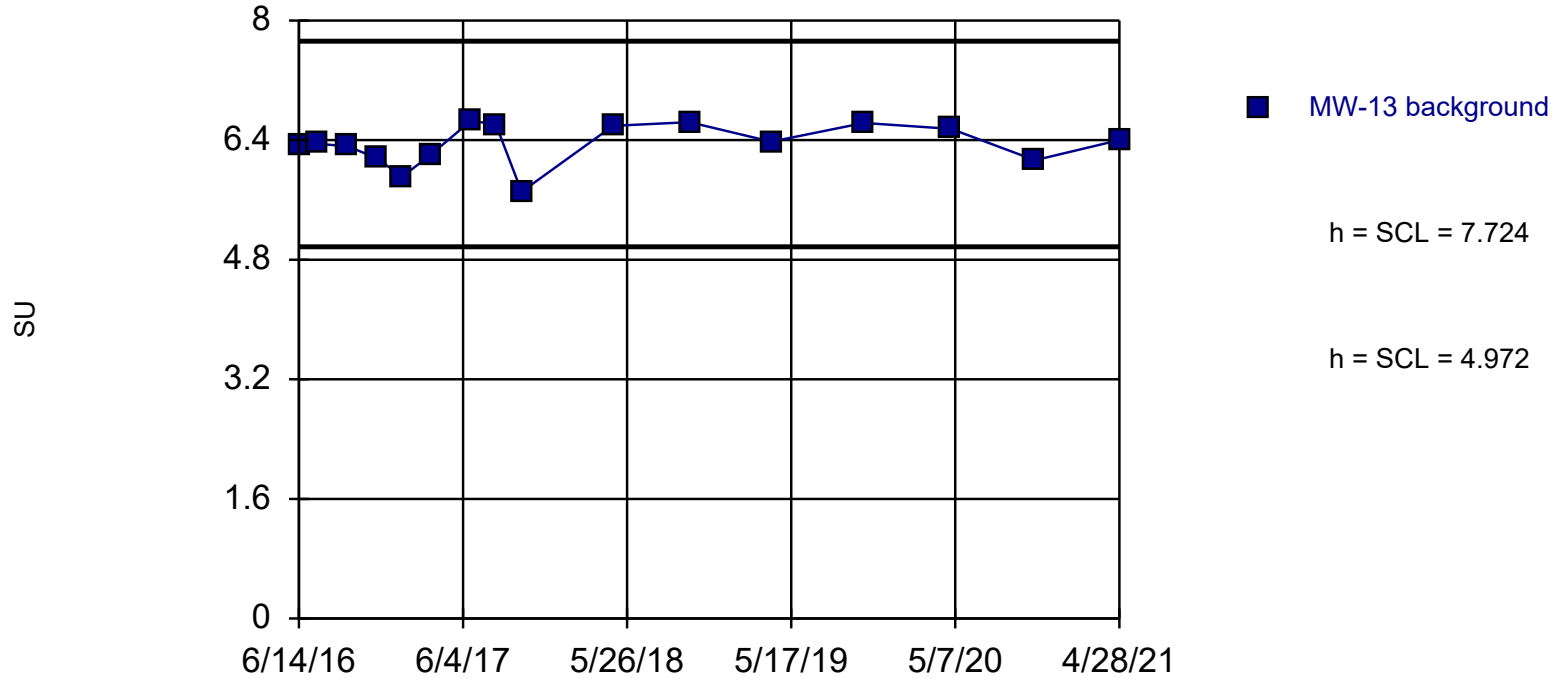
Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. Limit is highest of 16 background values. 87.5% NDs. Well-constituent pair annual alpha = 0.01287. Individual comparison alpha = 0.006456 (1 of 2). Assumes 1 future value. Seasonality was not detected with 95% confidence.

Constituent: Fluoride Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-13

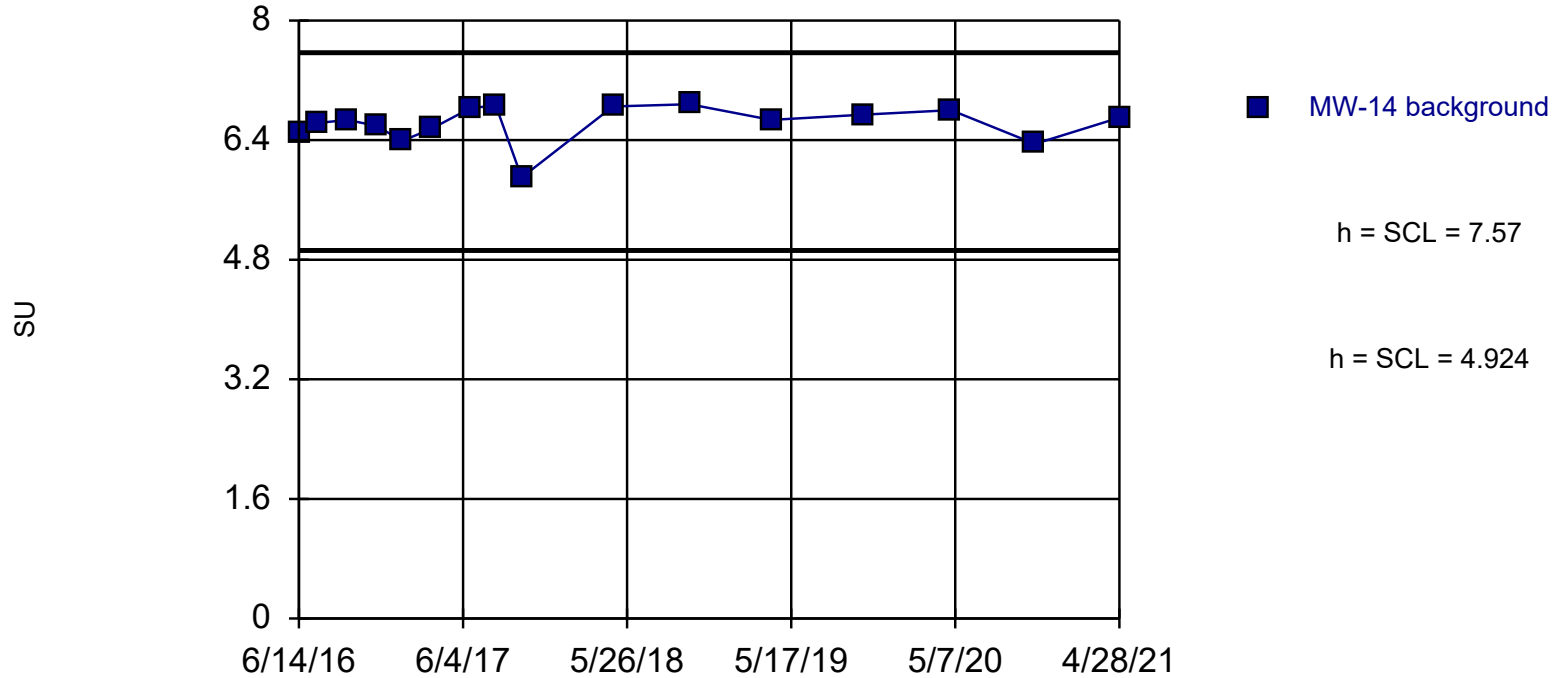


Background Data Summary: Mean=6.348, Std. Dev.=0.2752, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9107, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: pH Analysis Run 12/28/2021 10:09 AM View: BER Control Chart  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-14



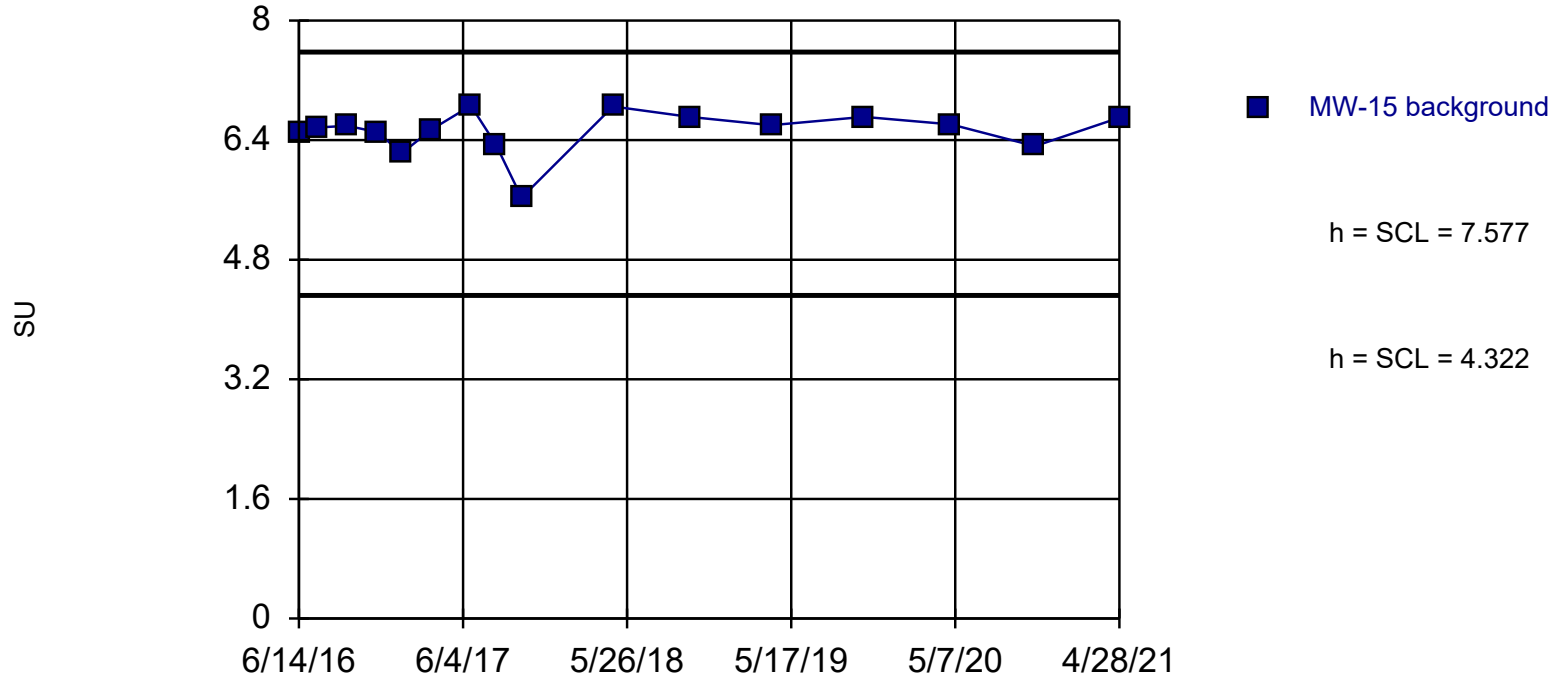
Background Data Summary (based on  $x^4$  transformation): Mean=1936, Std. Dev.=269.6, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @ $\alpha = 0.05$ , calculated = 0.8958, critical = 0.887. Report  $\alpha = 0$ . Dates ending 4/28/2021 used for control stats. Standardized  $h=5$ , SCL=5.

Constituent: pH Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-15



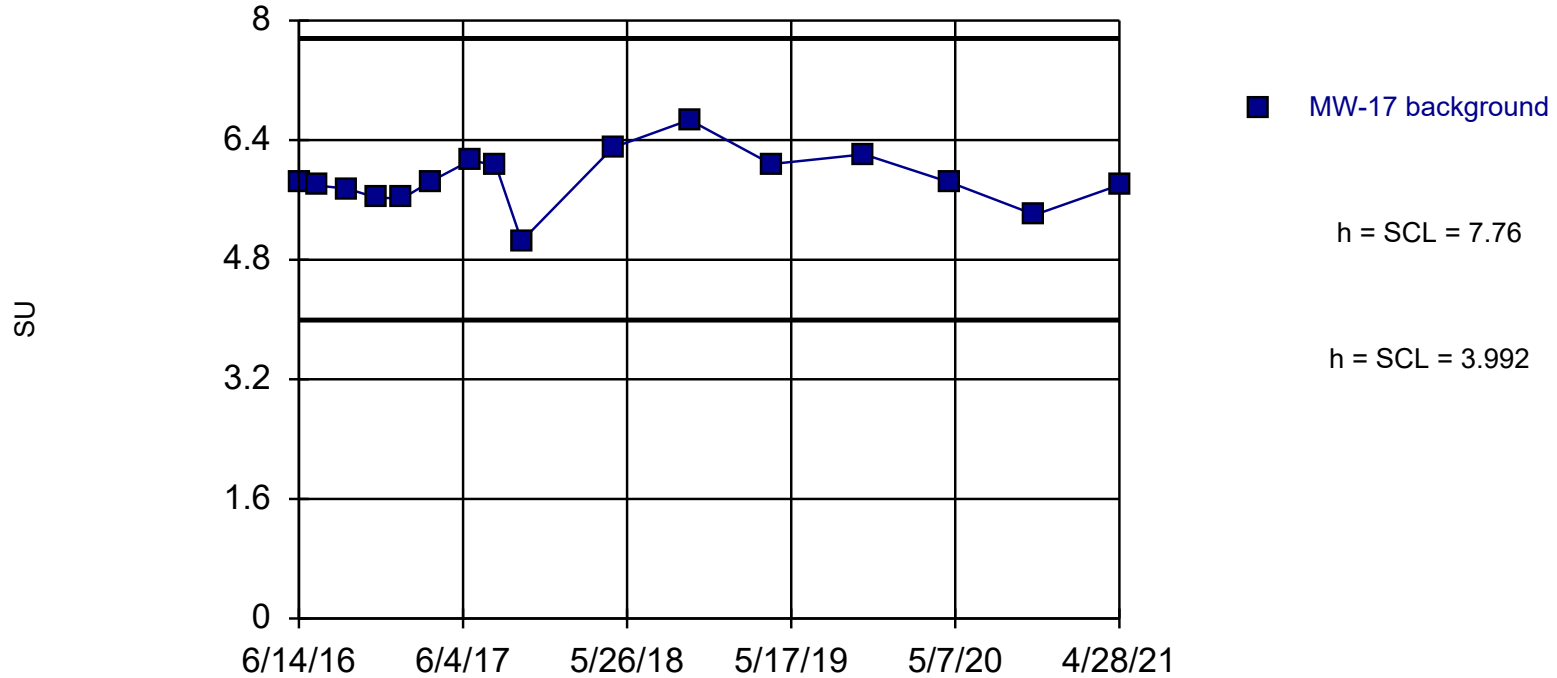
Background Data Summary (based on  $x^4$  transformation): Mean=1823, Std. Dev.=294.8,  $n=16$ . Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @ $\alpha = 0.05$ , calculated = 0.8946, critical = 0.887. Report  $\alpha = 0$ . Dates ending 4/28/2021 used for control stats. Standardized  $h=5$ ,  $SCL=5$ .

Constituent: pH Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-17



Background Data Summary: Mean=5.876, Std. Dev.=0.3768, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9721, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

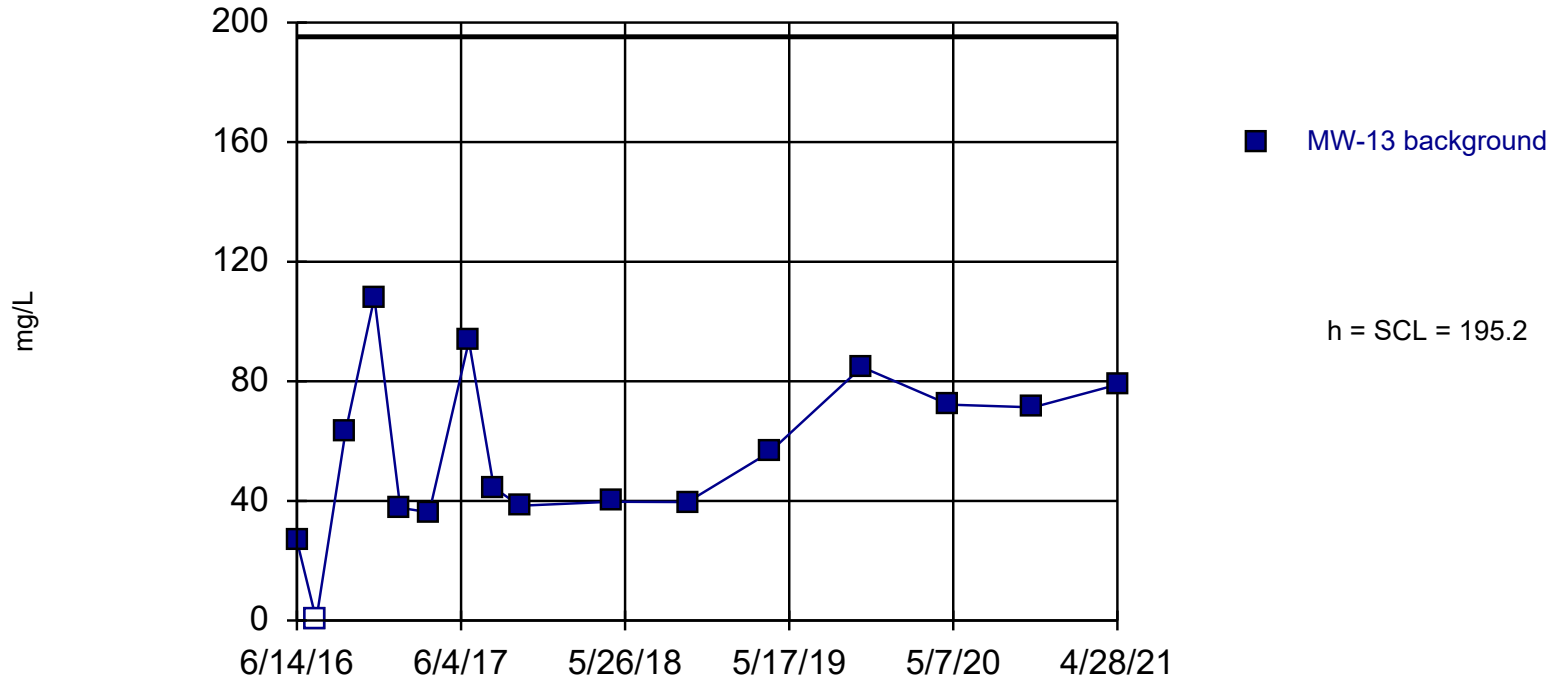
Constituent: pH Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



## Control Chart

MW-13



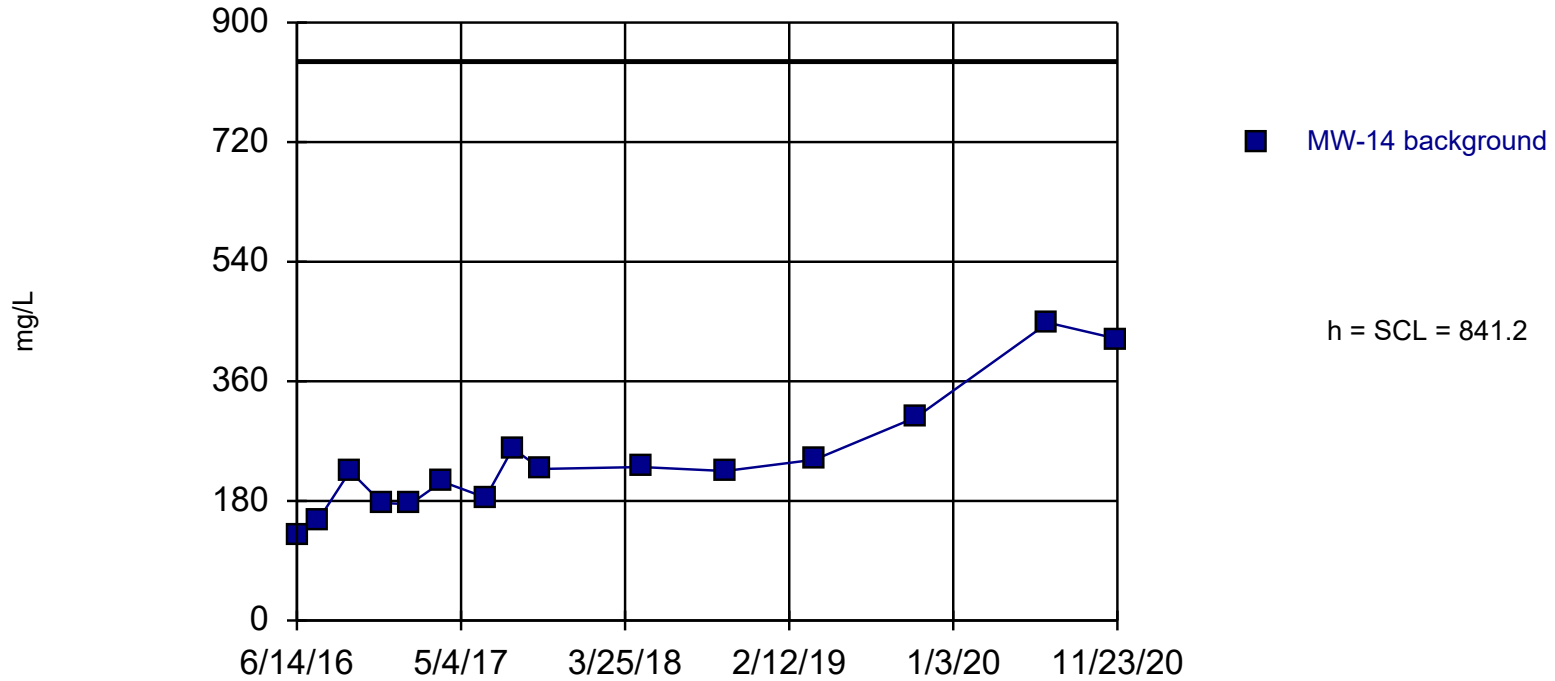
Background Data Summary: Mean=55.67, Std. Dev.=27.91, n=16, 6.25% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.969, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Sulfate Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-14

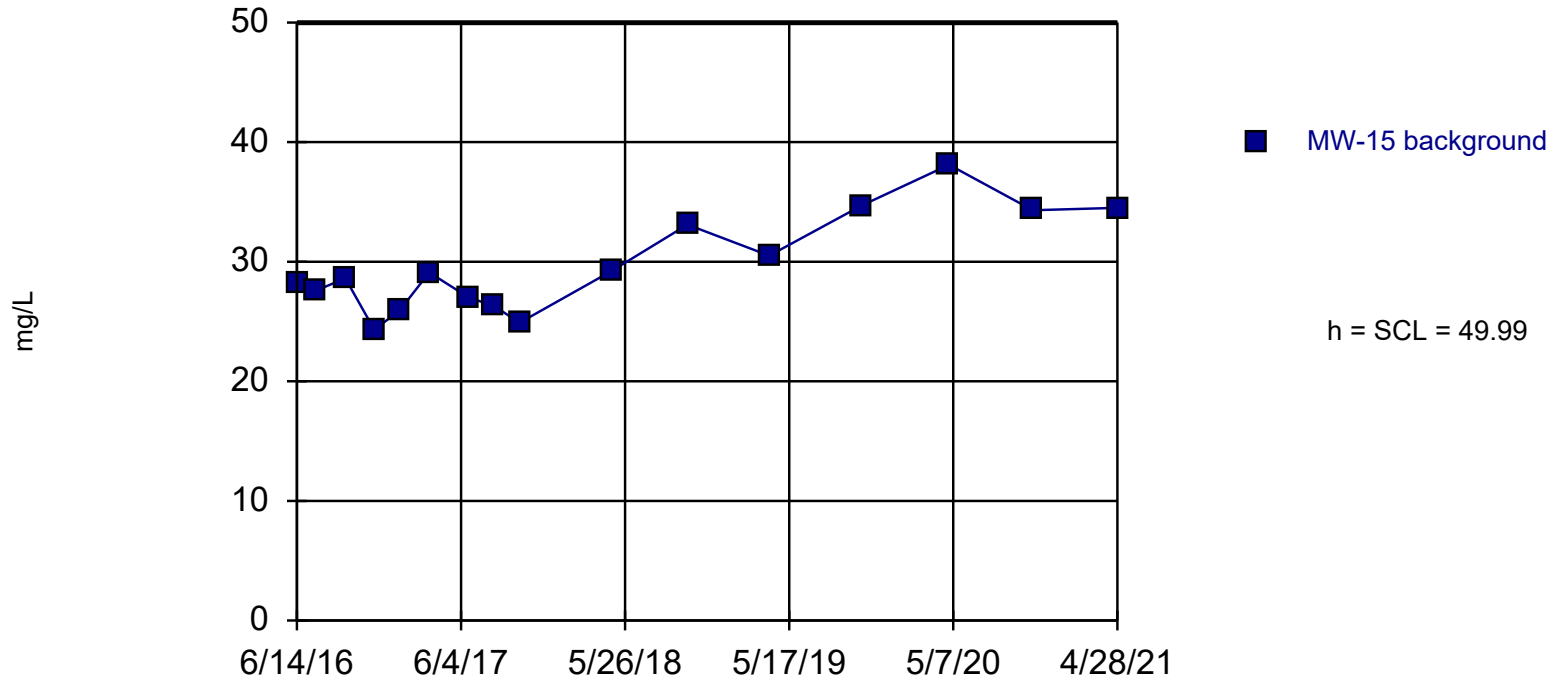


Background Data Summary (based on square root transformation): Mean=15.29, Std. Dev.=2.743, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9051, critical = 0.881. Report alpha = 0. Dates ending 11/23/2020 used for control stats. Standardized h=5, SCL=5.

Constituent: Sulfate    Analysis Run 12/28/2021 10:09 AM    View: BER Control Chart  
 Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

## Control Chart

MW-15



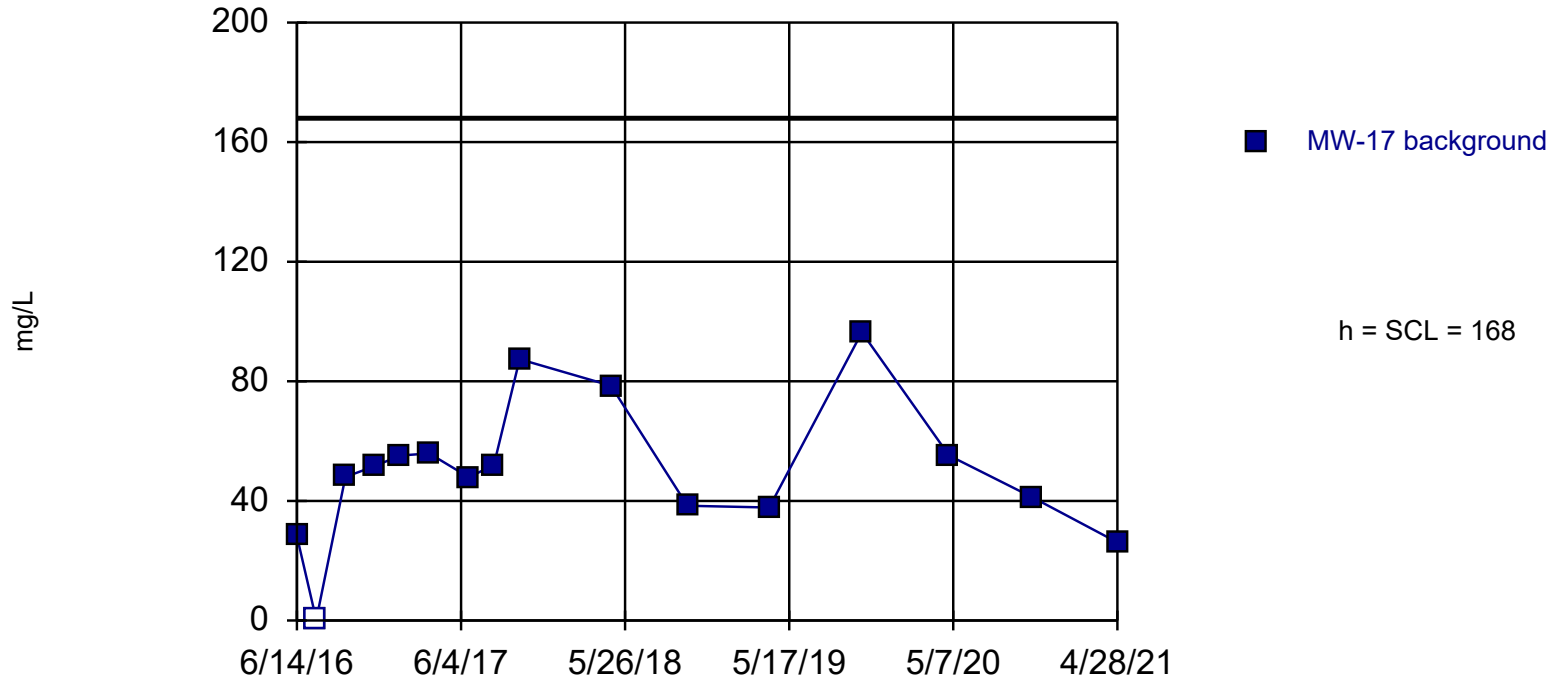
Background Data Summary: Mean=29.78, Std. Dev.=4.042, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9351, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Sulfate Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-17



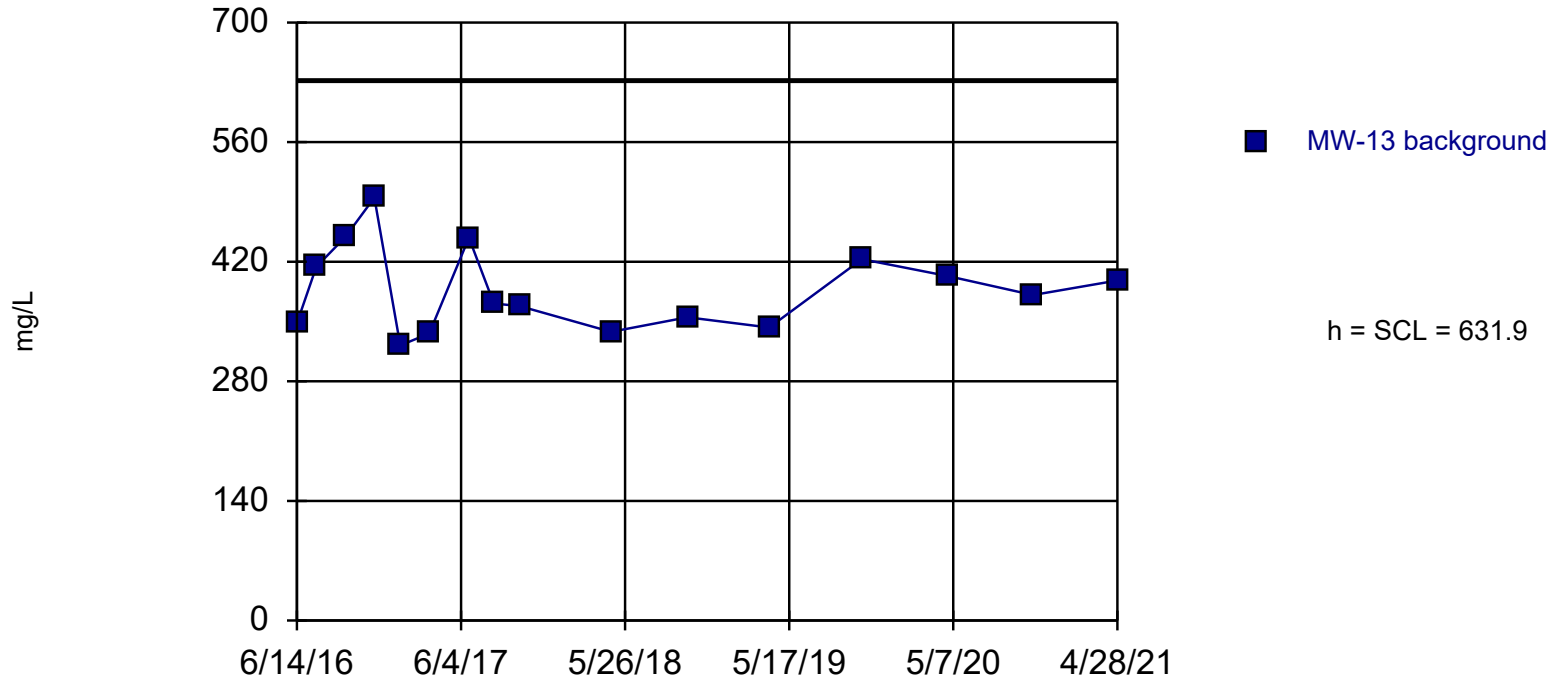
Background Data Summary: Mean=49.99, Std. Dev.=23.6, n=16, 6.25% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9512, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Sulfate Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-13



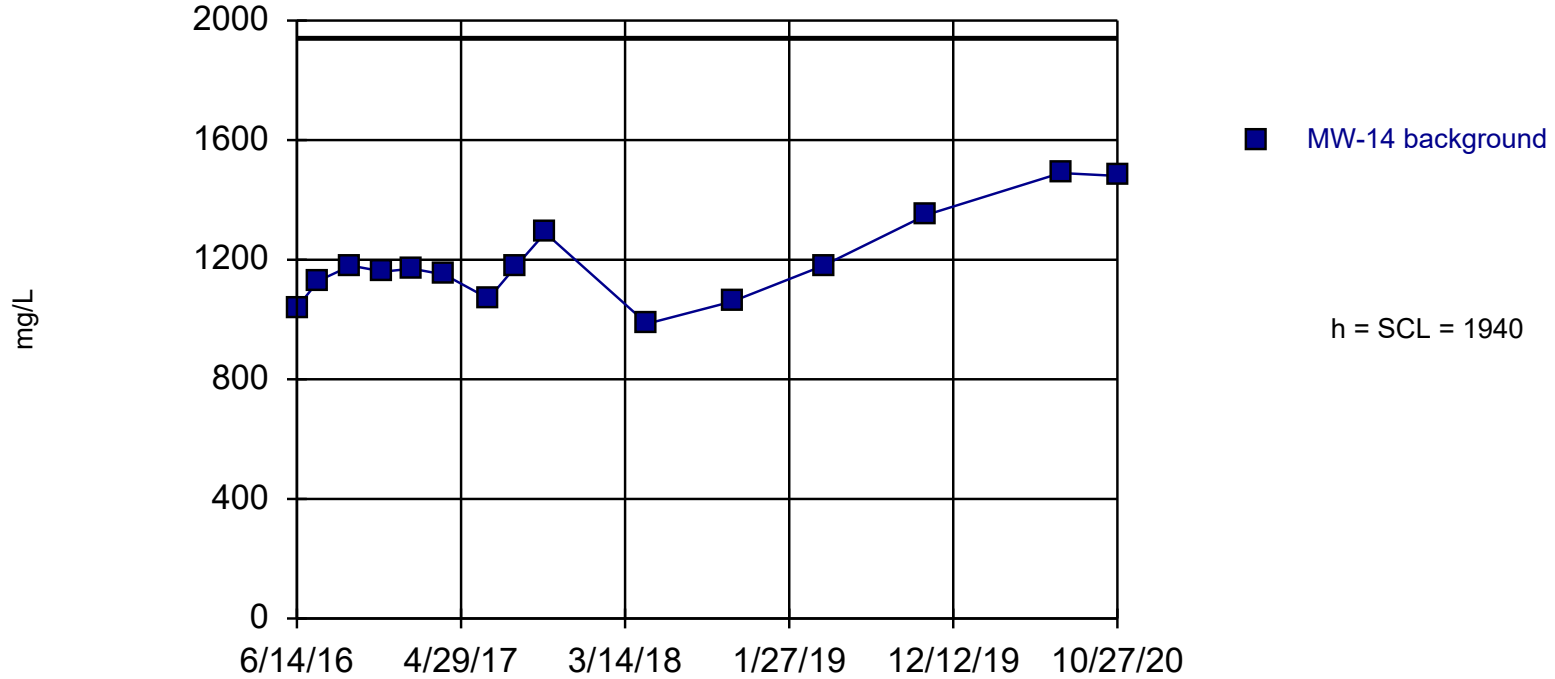
Background Data Summary: Mean=387, Std. Dev.=48.98, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9431, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids Analysis Run 12/28/2021 10:09 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### Control Chart

MW-14

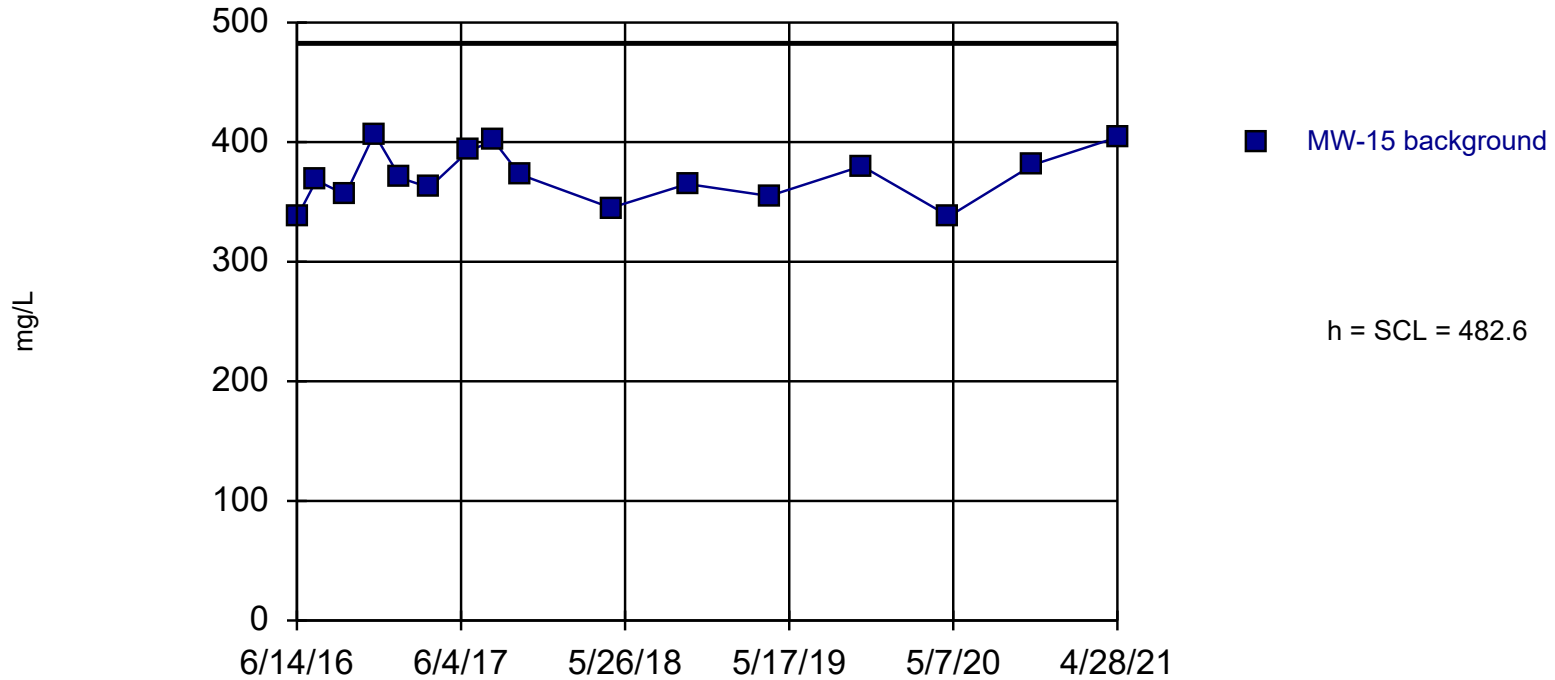


Background Data Summary: Mean=1194, Std. Dev.=149.2, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8979, critical = 0.881. Report alpha = 0. Dates ending 10/27/2020 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids    Analysis Run 12/28/2021 10:10 AM    View: BER Control Chart  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

## Control Chart

MW-15



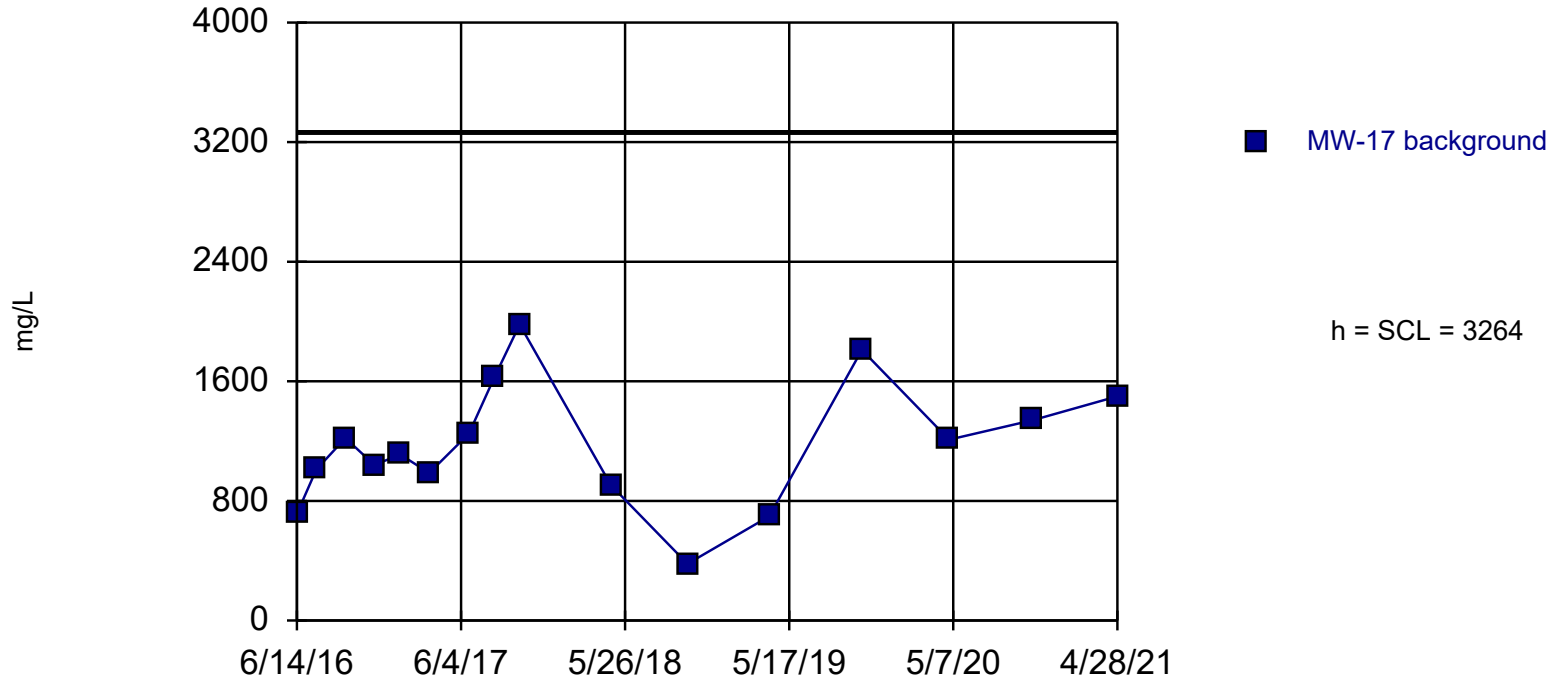
Background Data Summary: Mean=370.9, Std. Dev.=22.34, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9549, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids Analysis Run 12/28/2021 10:10 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Control Chart

MW-17



Background Data Summary: Mean=1173, Std. Dev.=418.2, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9847, critical = 0.887. Report alpha = 0. Dates ending 4/28/2021 used for control stats. Standardized h=5, SCL=5.

Constituent: Total Dissolved Solids Analysis Run 12/28/2021 10:10 AM View: BER Control Chart

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

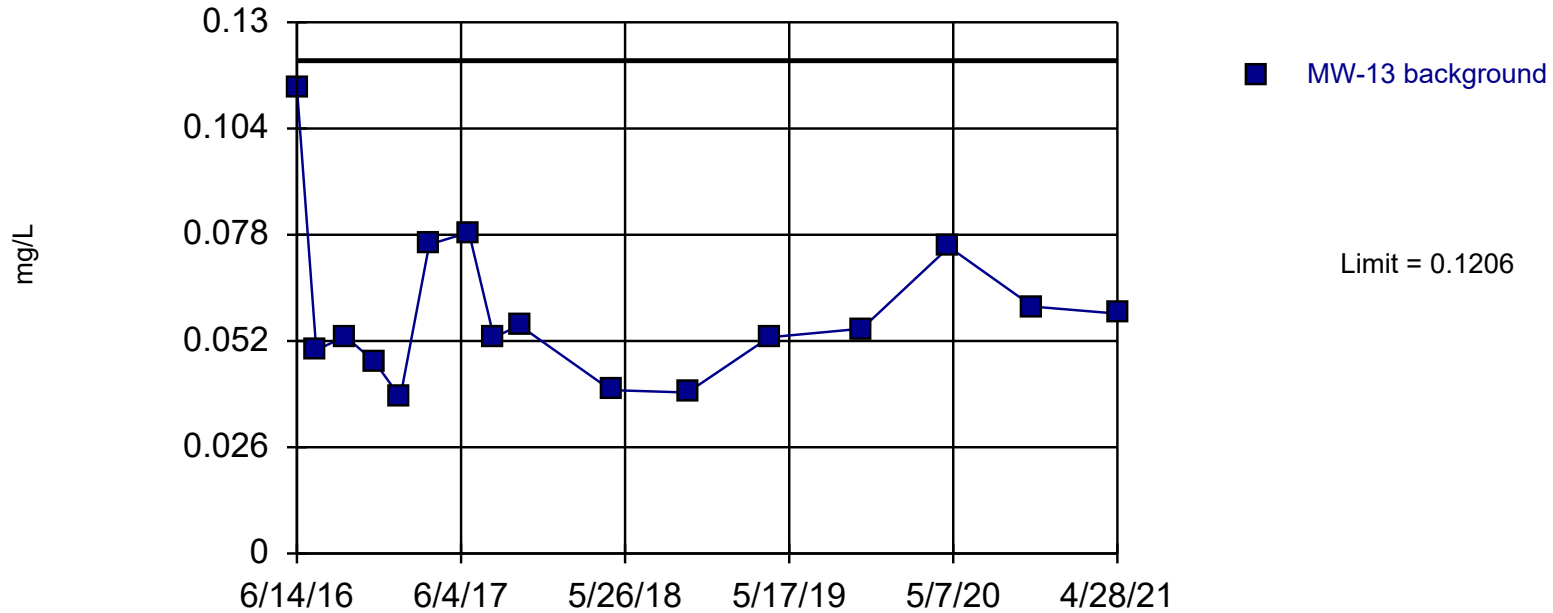


# Prediction Limit

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks Printed 12/28/2021, 10:02 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bq N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-13	0.1206	n/a	1 future	n/a	16	0	sqrt(x)	0.000...	Param Intra 1 of 2
Boron (mg/L)	MW-14	0.6019	n/a	1 future	n/a	15	0	No	0.000...	Param Intra 1 of 2
Boron (mg/L)	MW-15	0.06659	n/a	1 future	n/a	16	0	No	0.000...	Param Intra 1 of 2
Boron (mg/L)	MW-17	0.362	n/a	1 future	n/a	15	0	n/a	0.007533	NP Intra (normality) ...

## Prediction Limit Intrawell Parametric, MW-13

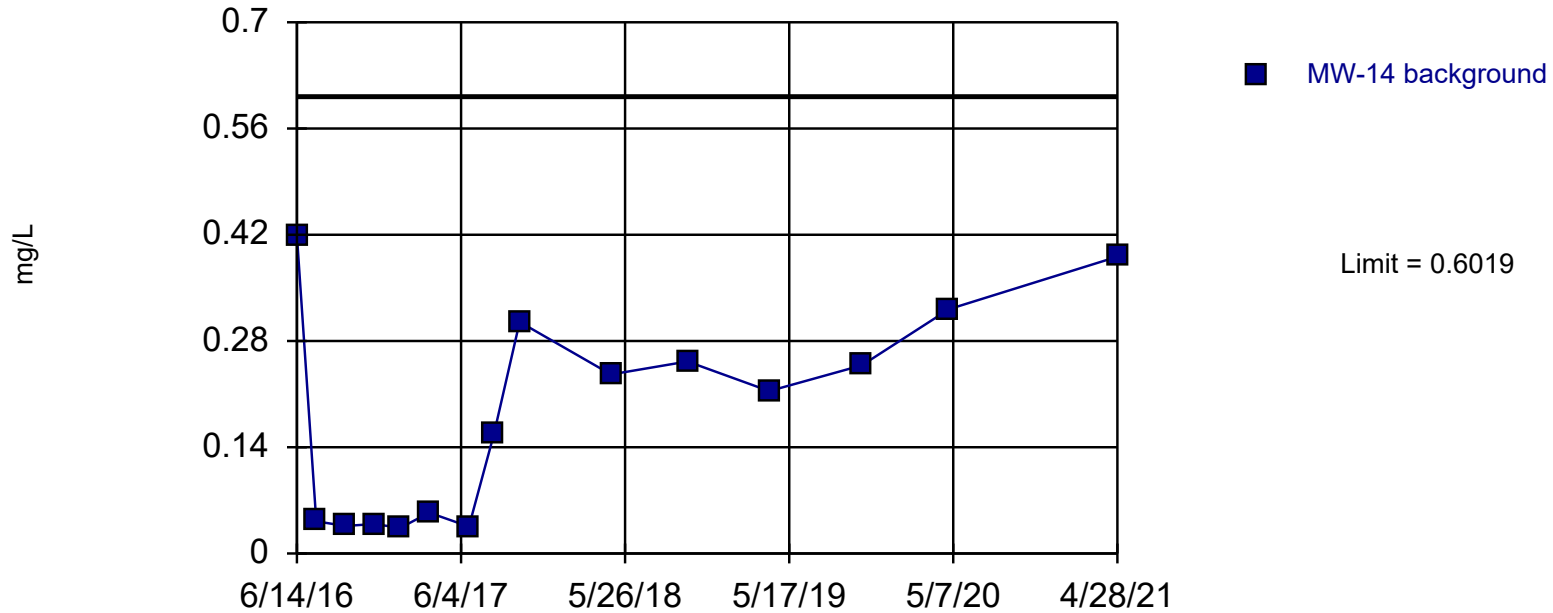


Background Data Summary (based on square root transformation): Mean=0.2406, Std. Dev.=0.03654, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8931, critical = 0.844. Kappa = 2.919 (c=15, w=21, 1 of 2, event alpha = 0.05132). Report alpha = 0.0001672. Assumes 1 future value.

Constituent: Boron Analysis Run 12/28/2021 10:01 AM View: BER Prediction Limit

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Prediction Limit Intrawell Parametric, MW-14

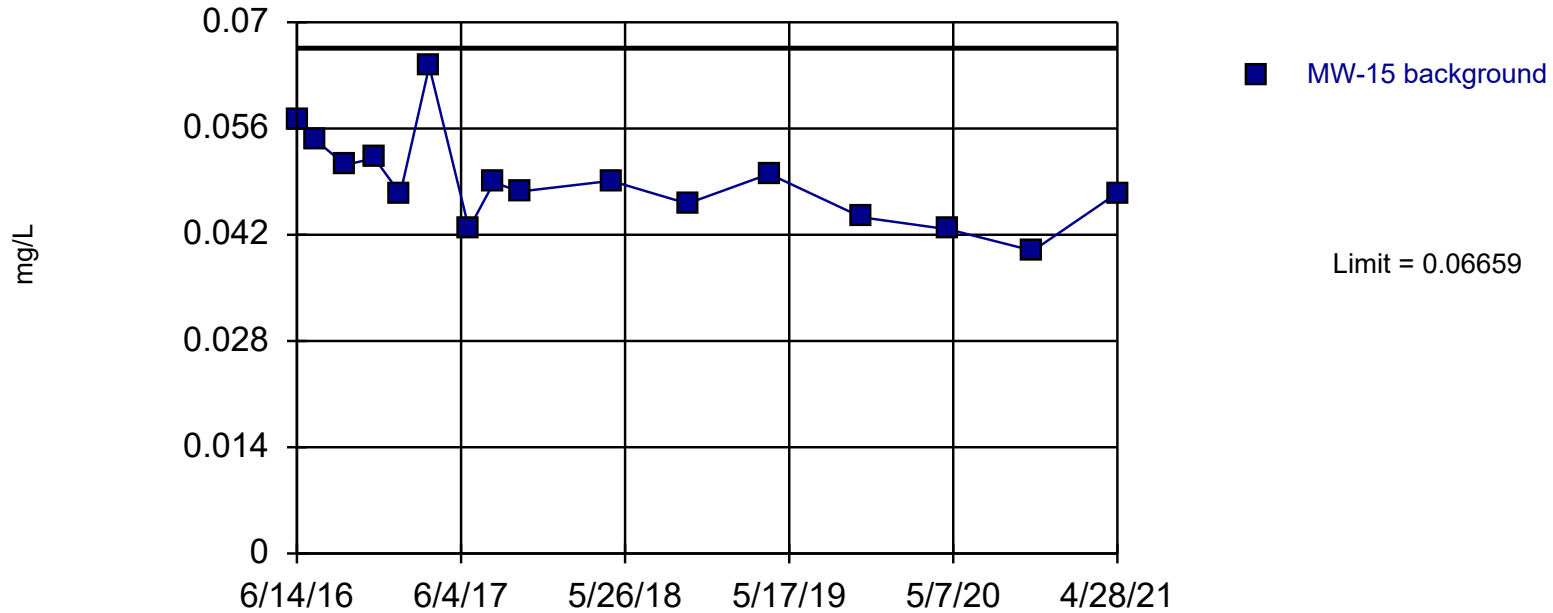


Background Data Summary: Mean=0.1857, Std. Dev.=0.1387, n=15. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8773, critical = 0.835. Kappa = 3 (c=15, w=21, 1 of 2, event alpha = 0.05132). Report alpha = 0.0001672. Assumes 1 future value.

Constituent: Boron Analysis Run 12/28/2021 10:01 AM View: BER Prediction Limit

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

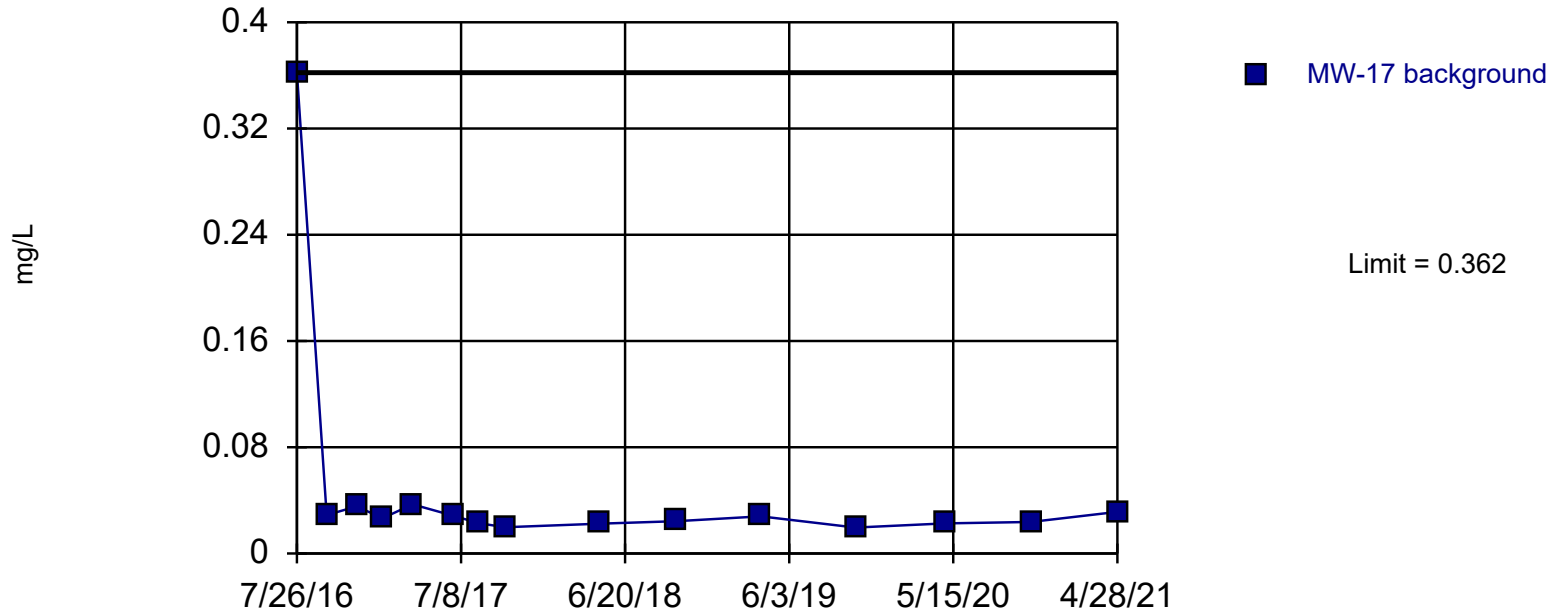
## Prediction Limit Intrawell Parametric, MW-15



Background Data Summary: Mean=0.04909, Std. Dev.=0.005995, n=16. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9456, critical = 0.844. Kappa = 2.919 (c=15, w=21, 1 of 2, event alpha = 0.05132). Report alpha = 0.0001672. Assumes 1 future value.

Constituent: Boron Analysis Run 12/28/2021 10:01 AM View: BER Prediction Limit  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Prediction Limit Intrawell Non-parametric, MW-17



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 15 background values. Well-constituent pair annual alpha = 0.01501. Individual comparison alpha = 0.007533 (1 of 2). Assumes 1 future value. Seasonality was not detected with 95% confidence.

Constituent: Boron Analysis Run 12/28/2021 10:01 AM View: BER Prediction Limit

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## **Outlier Analysis**

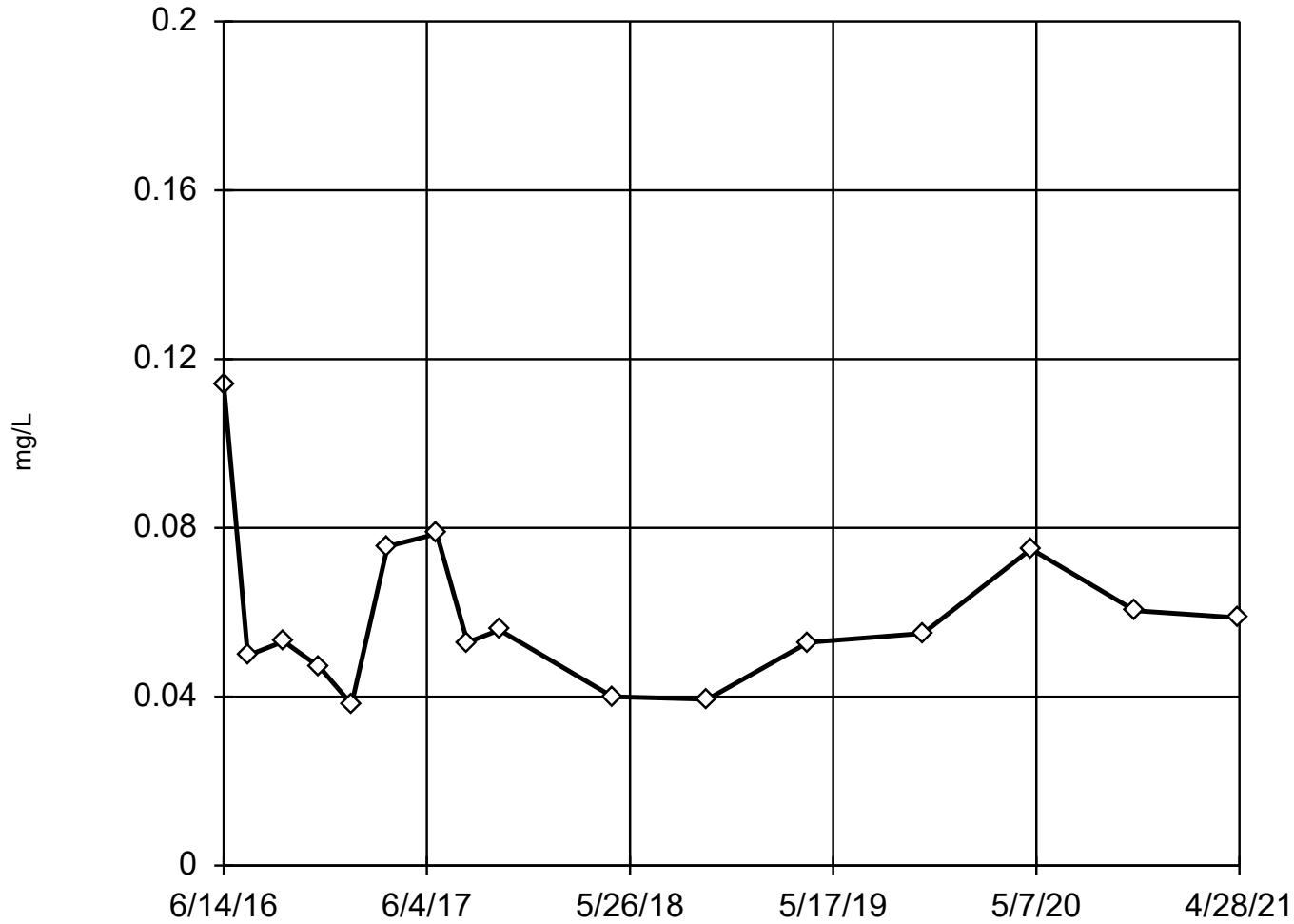
# Outlier Analysis

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks Printed 12/16/2021, 3:50 PM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Date(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Boron (mg/L)	MW-13	No	n/a	n/a	EPA 1989	0.05	16	0.05915	0.01912	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-13	No	n/a	n/a	EPA 1989	0.05	16	26.18	6.682	ln(x)	ShapiroWilk
<b>Chloride (mg/L)</b>	<b>MW-13</b>	<b>Yes</b>	<b>75.8</b>	<b>6/14/2016</b>	<b>Dixon's</b>	<b>0.05</b>	<b>16</b>	<b>96.78</b>	<b>7.015</b>	<b>normal</b>	<b>ShapiroWilk</b>
Fluoride (mg/L)	MW-13	n/a	n/a	n/a	NP (nrm)	NaN	16	0.4862	0.06236	unknown	ShapiroWilk
pH (SU)	MW-13	No	n/a	n/a	EPA 1989	0.05	16	6.348	0.2752	normal	ShapiroWilk
Sulfate (mg/L)	MW-13	No	n/a	n/a	Dixon's	0.05	16	55.67	27.91	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-13	No	n/a	n/a	EPA 1989	0.05	16	387	48.98	normal	ShapiroWilk
Boron (mg/L)	MW-14	No	n/a	n/a	NP (nrm)	NaN	16	0.2052	0.155	unknown	ShapiroWilk
Calcium (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	16	85.96	17.99	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	16	349.5	19.92	normal	ShapiroWilk
Fluoride (mg/L)	MW-14	n/a	n/a	n/a	NP (nrm)	NaN	16	0.5003	0.07426	unknown	ShapiroWilk
<b>pH (SU)</b>	<b>MW-14</b>	<b>Yes</b>	<b>5.9</b>	<b>10/10/2017</b>	<b>Dixon's</b>	<b>0.05</b>	<b>16</b>	<b>6.62</b>	<b>0.2507</b>	<b>normal</b>	<b>ShapiroWilk</b>
Sulfate (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	16	259.8	116.1	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-14	No	n/a	n/a	EPA 1989	0.05	16	1215	165.5	ln(x)	ShapiroWilk
Boron (mg/L)	MW-15	No	n/a	n/a	EPA 1989	0.05	16	0.04909	0.005995	normal	ShapiroWilk
<b>Calcium (mg/L)</b>	<b>MW-15</b>	<b>Yes</b>	<b>30</b>	<b>6/23/2021</b>	<b>Dixon's</b>	<b>0.05</b>	<b>16</b>	<b>21.34</b>	<b>2.976</b>	<b>normal</b>	<b>ShapiroWilk</b>
Chloride (mg/L)	MW-15	No	n/a	n/a	EPA 1989	0.05	16	114	16.72	normal	ShapiroWilk
Fluoride (mg/L)	MW-15	n/a	n/a	n/a	NP (nrm)	NaN	16	0.4865	0.05039	unknown	ShapiroWilk
<b>pH (SU)</b>	<b>MW-15</b>	<b>Yes</b>	<b>5.63</b>	<b>10/10/2017</b>	<b>Dixon's</b>	<b>0.05</b>	<b>16</b>	<b>6.516</b>	<b>0.2945</b>	<b>normal</b>	<b>ShapiroWilk</b>
Sulfate (mg/L)	MW-15	No	n/a	n/a	EPA 1989	0.05	16	29.78	4.042	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-15	No	n/a	n/a	EPA 1989	0.05	16	370.9	22.34	normal	ShapiroWilk
<b>Boron (mg/L)</b>	<b>MW-17</b>	<b>Yes</b>	<b>0.362</b>	<b>7/26/2016</b>	<b>Dixon's</b>	<b>0.05</b>	<b>15</b>	<b>0.04887</b>	<b>0.08678</b>	<b>normal</b>	<b>ShapiroWilk</b>
Calcium (mg/L)	MW-17	No	n/a	n/a	EPA 1989	0.05	16	107.8	57.75	normal	ShapiroWilk
Chloride (mg/L)	MW-17	No	n/a	n/a	EPA 1989	0.05	16	549	235.7	normal	ShapiroWilk
Fluoride (mg/L)	MW-17	n/a	n/a	n/a	NP (nrm)	NaN	16	0.481	0.06204	unknown	ShapiroWilk
pH (SU)	MW-17	No	n/a	n/a	EPA 1989	0.05	16	5.876	0.3768	normal	ShapiroWilk
Sulfate (mg/L)	MW-17	No	n/a	n/a	Dixon's	0.05	16	49.99	23.6	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-17	No	n/a	n/a	Dixon's	0.05	16	1173	418.2	normal	ShapiroWilk

## EPA Screening (suspected outliers for Dixon's Test)

MW-13



n = 16

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 0.05915, std. dev.  
0.01912, critical Tn 2.443

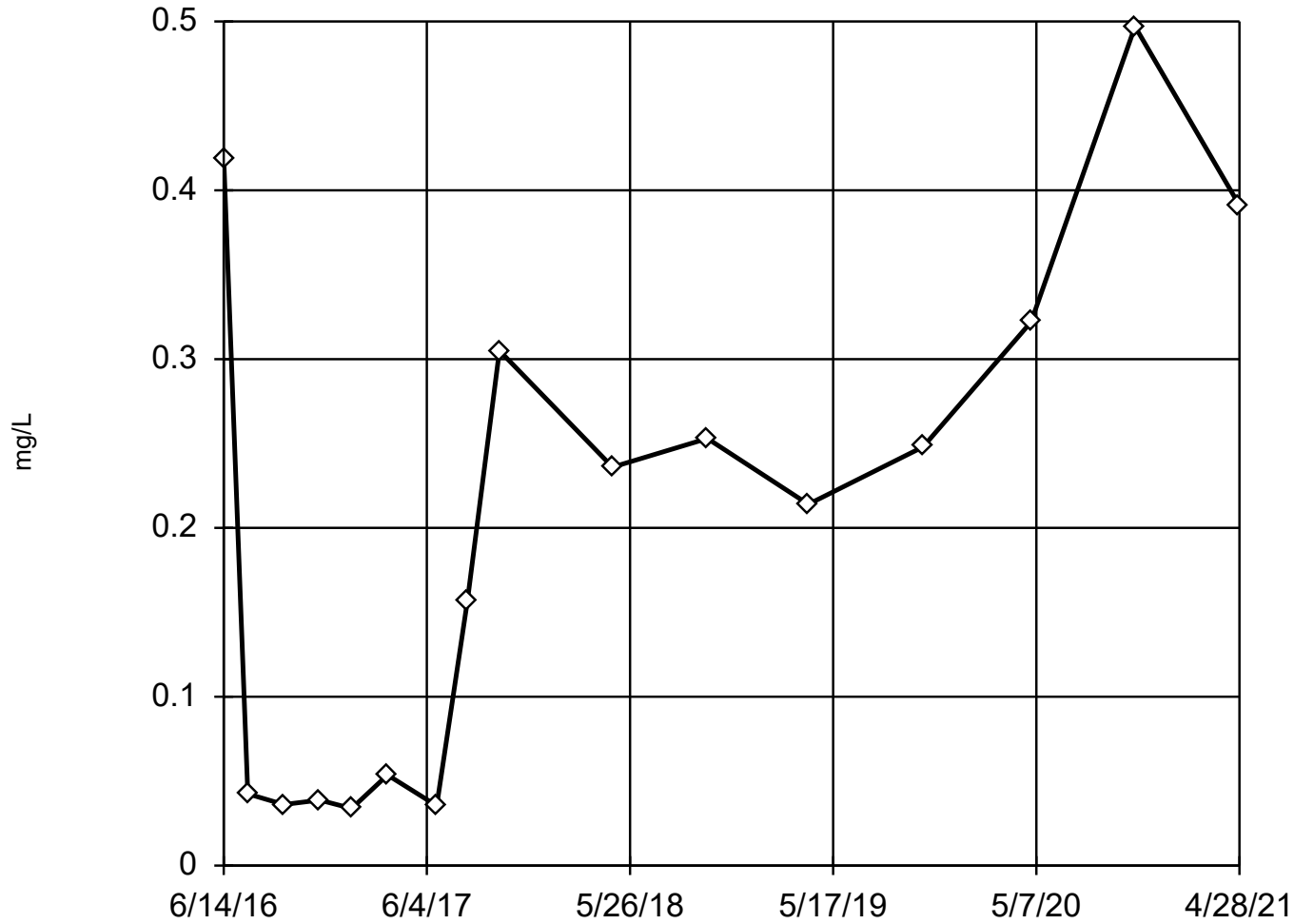
Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9306  
Critical = 0.906 (after  
natural log transforma-  
tion)  
The distribution was found  
to be log-normal.

Constituent: Boron Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



## Tukey's Outlier Screening

MW-14



n = 16

No outliers found.  
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

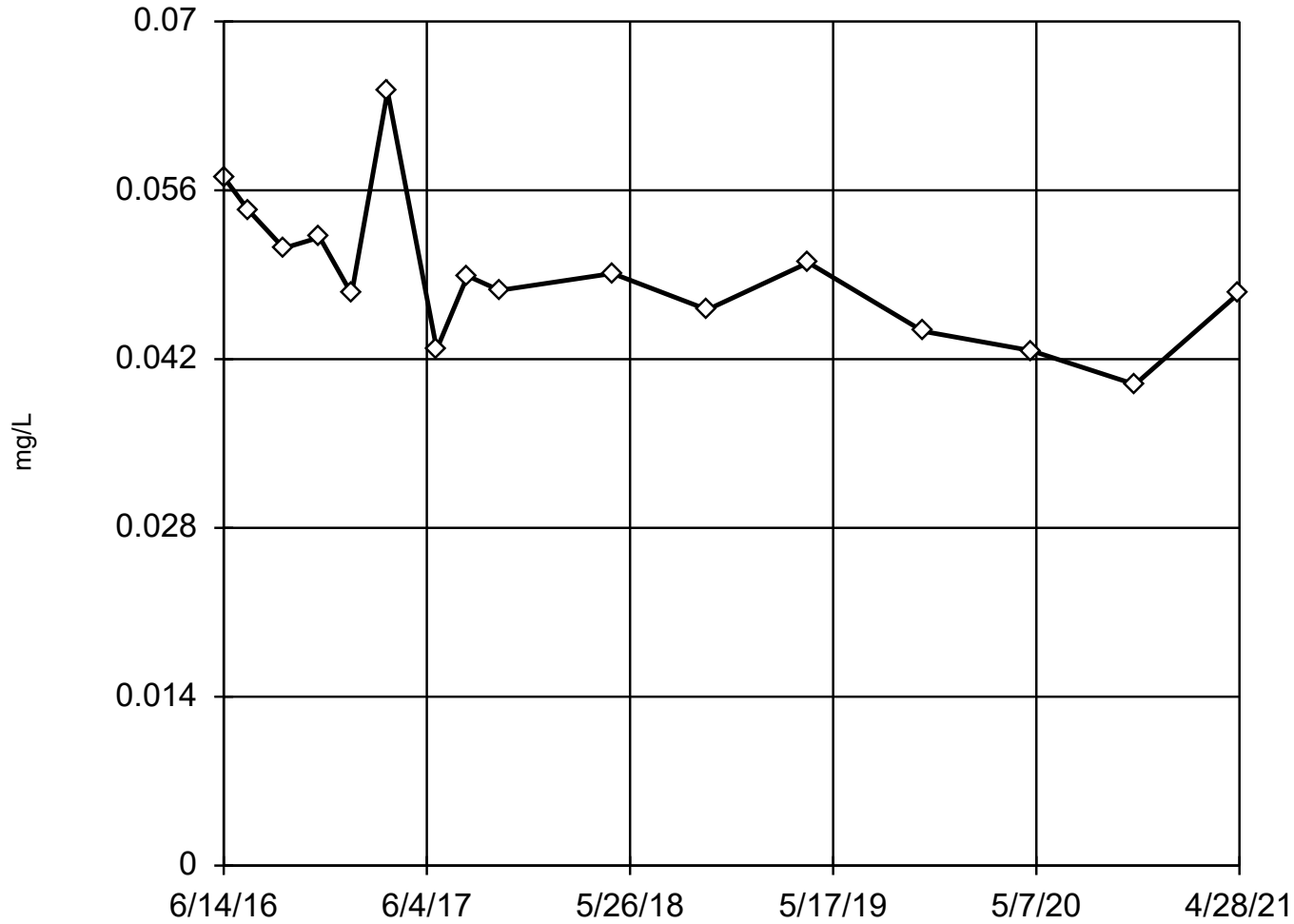
Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 1.132, low cutoff = -0.7779, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### EPA Screening (suspected outliers for Dixon's Test)

MW-15



n = 16

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 0.04909, std. dev.  
0.005995, critical Tn  
2.443

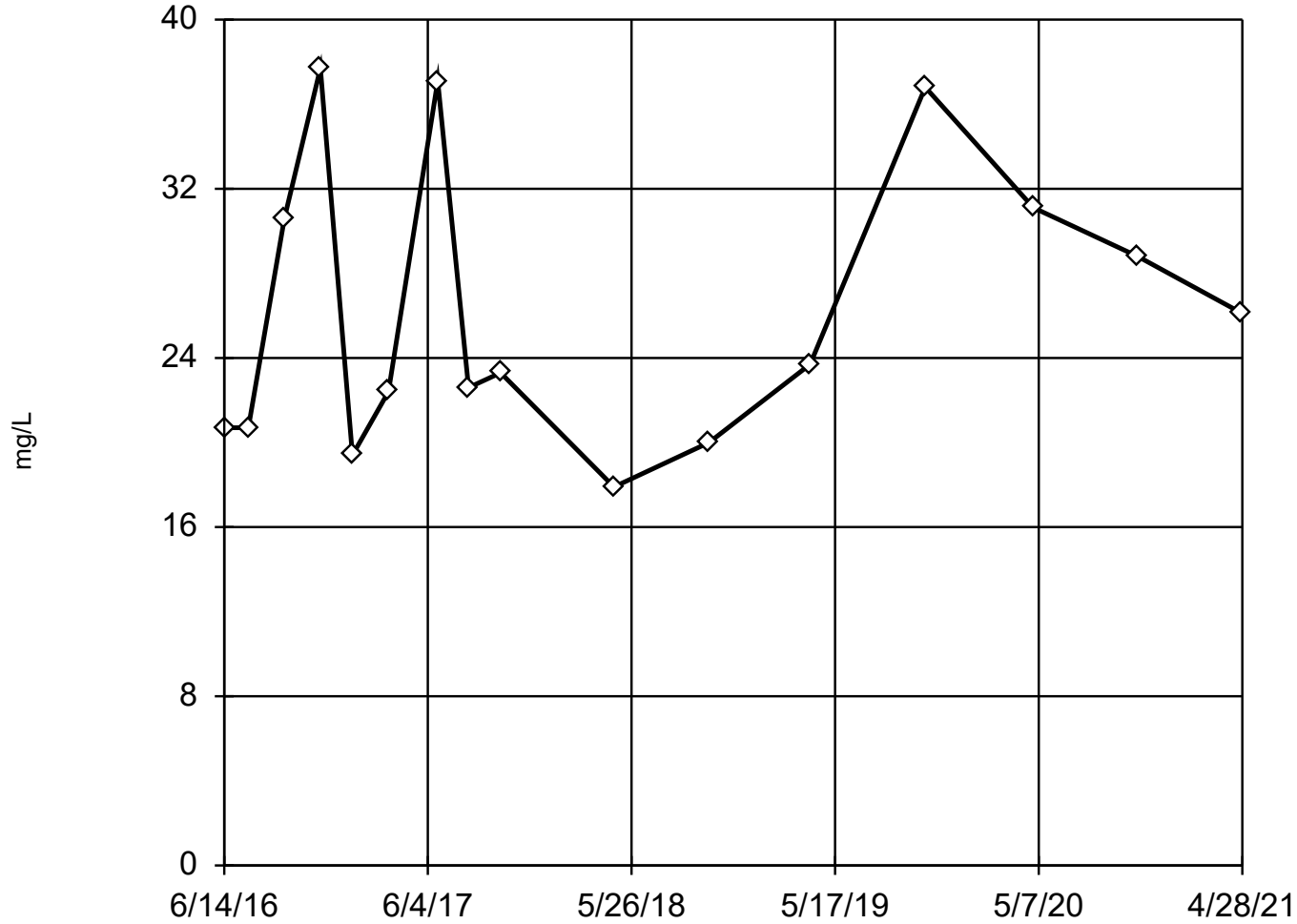
Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9456  
Critical = 0.906  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Boron Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



### EPA Screening (suspected outliers for Dixon's Test)

MW-13



n = 16

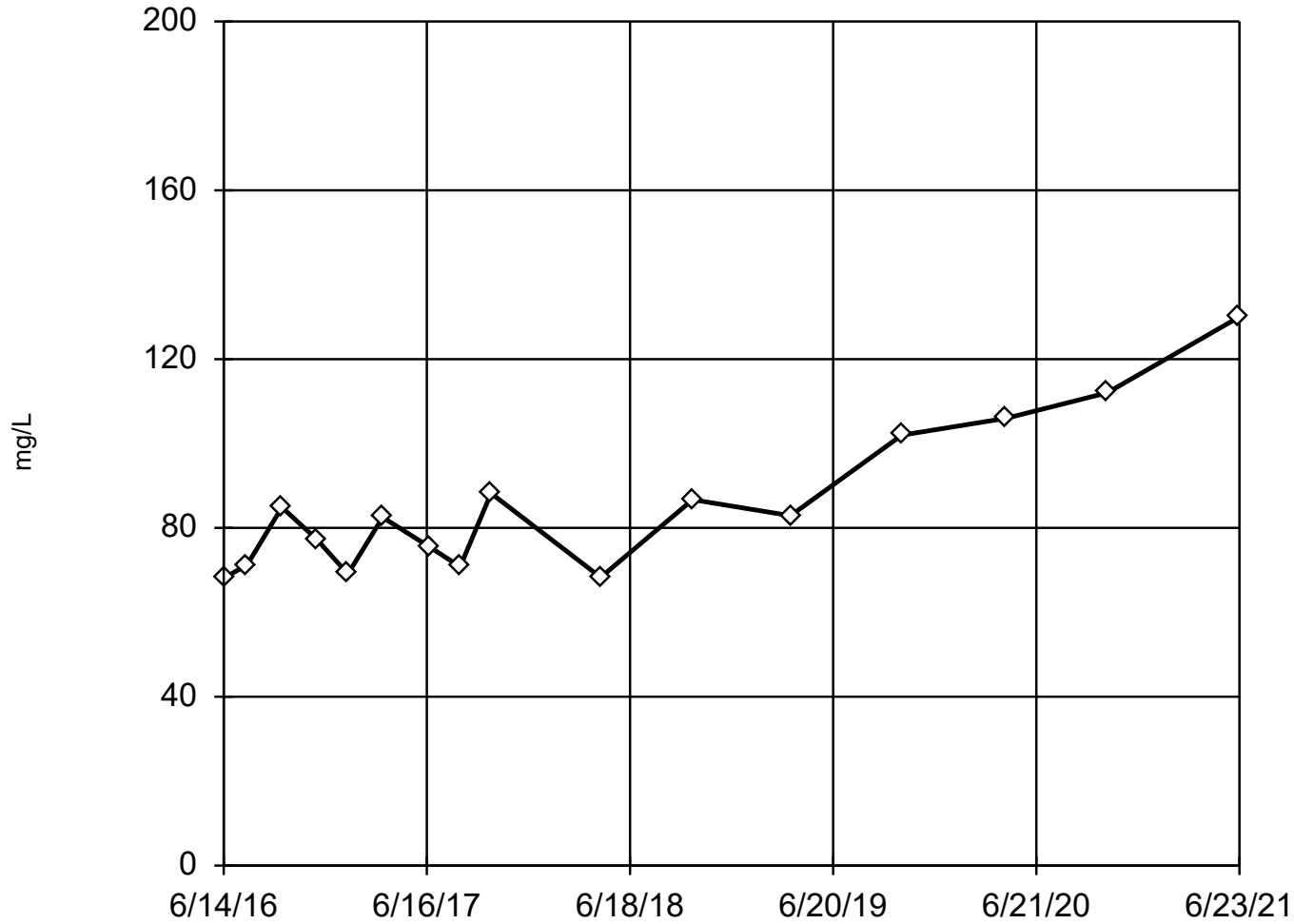
Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 26.18, std. dev.  
6.682, critical Tn 2.443

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9198  
Critical = 0.906 (after  
natural log transforma-  
tion)  
The distribution was found  
to be log-normal.

Constituent: Calcium    Analysis Run 12/16/2021 3:49 PM    View: Outlier  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

## EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 16

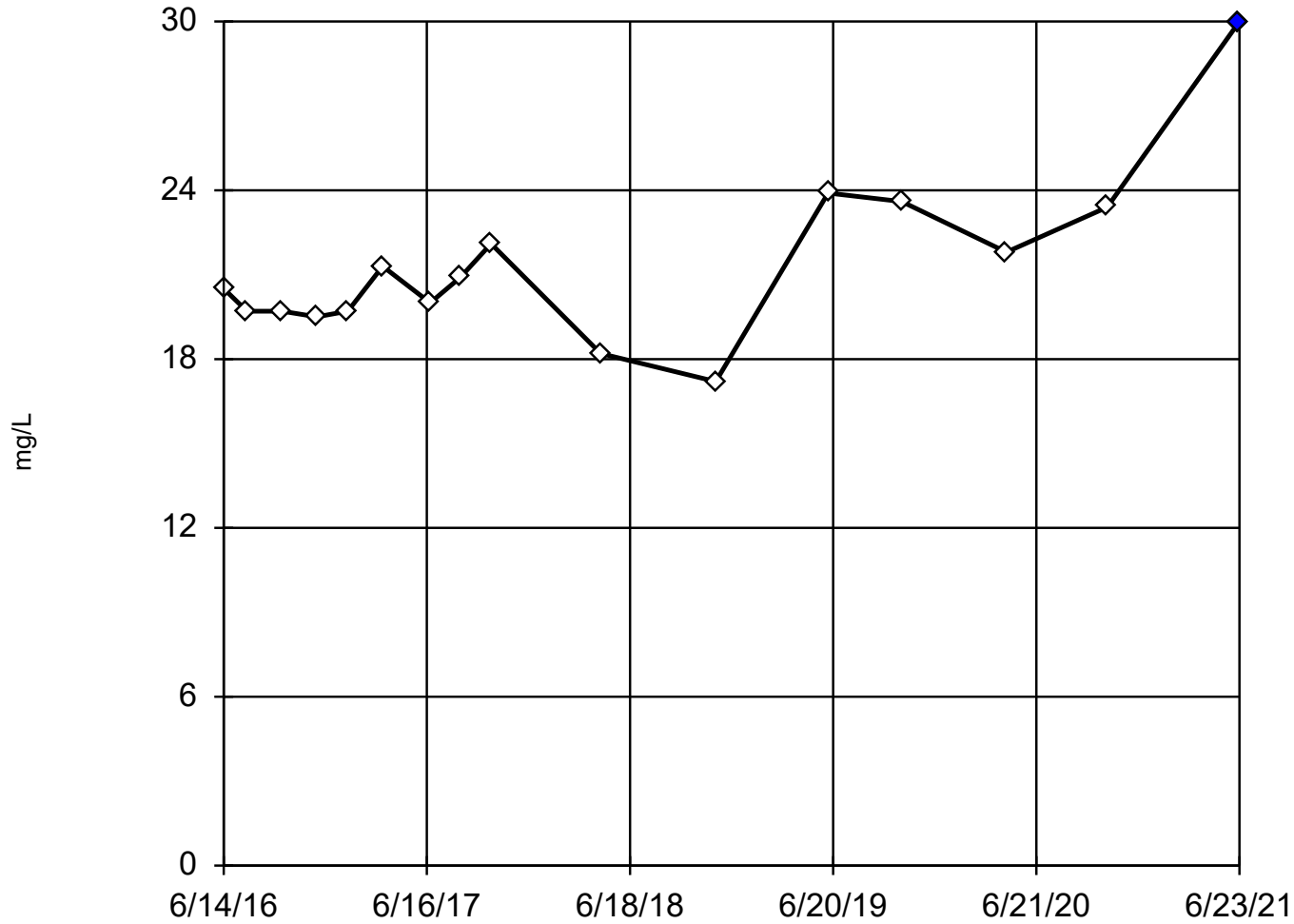
Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 85.96, std. dev.  
17.99, critical Tn 2.443

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9083  
Critical = 0.906 (after  
natural log transforma-  
tion)  
The distribution was found  
to be log-normal.

Constituent: Calcium Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Dixon's Outlier Test

MW-15



n = 16

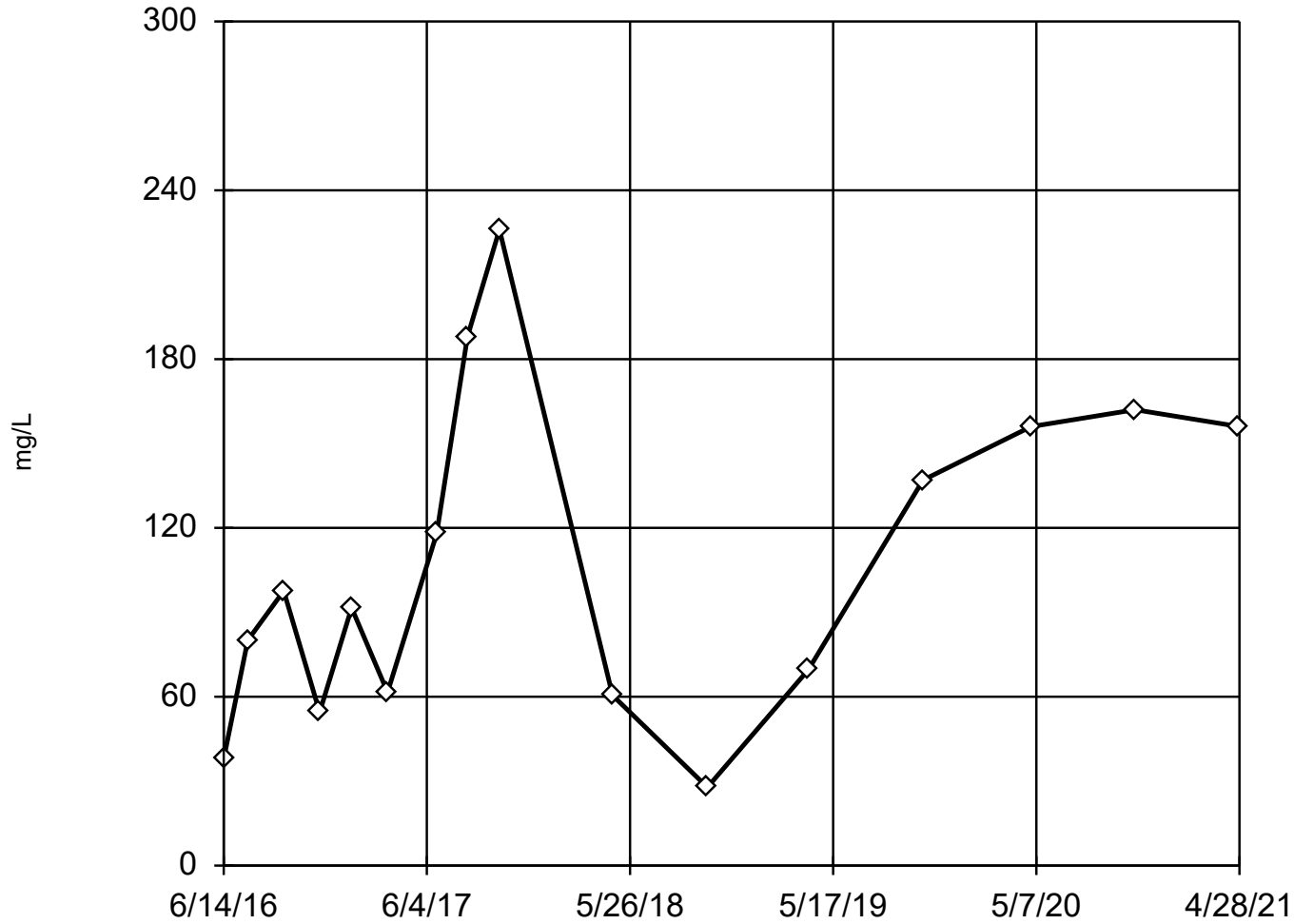
Statistical outlier is drawn as solid.  
Testing for 1 high outlier.  
Mean = 21.34.  
Std. Dev. = 2.976.  
30: c = 0.6095  
tab1 = 0.507.  
Alpha = 0.05.

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.959  
Critical = 0.901  
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Calcium Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## EPA Screening (suspected outliers for Dixon's Test)

MW-17



n = 16

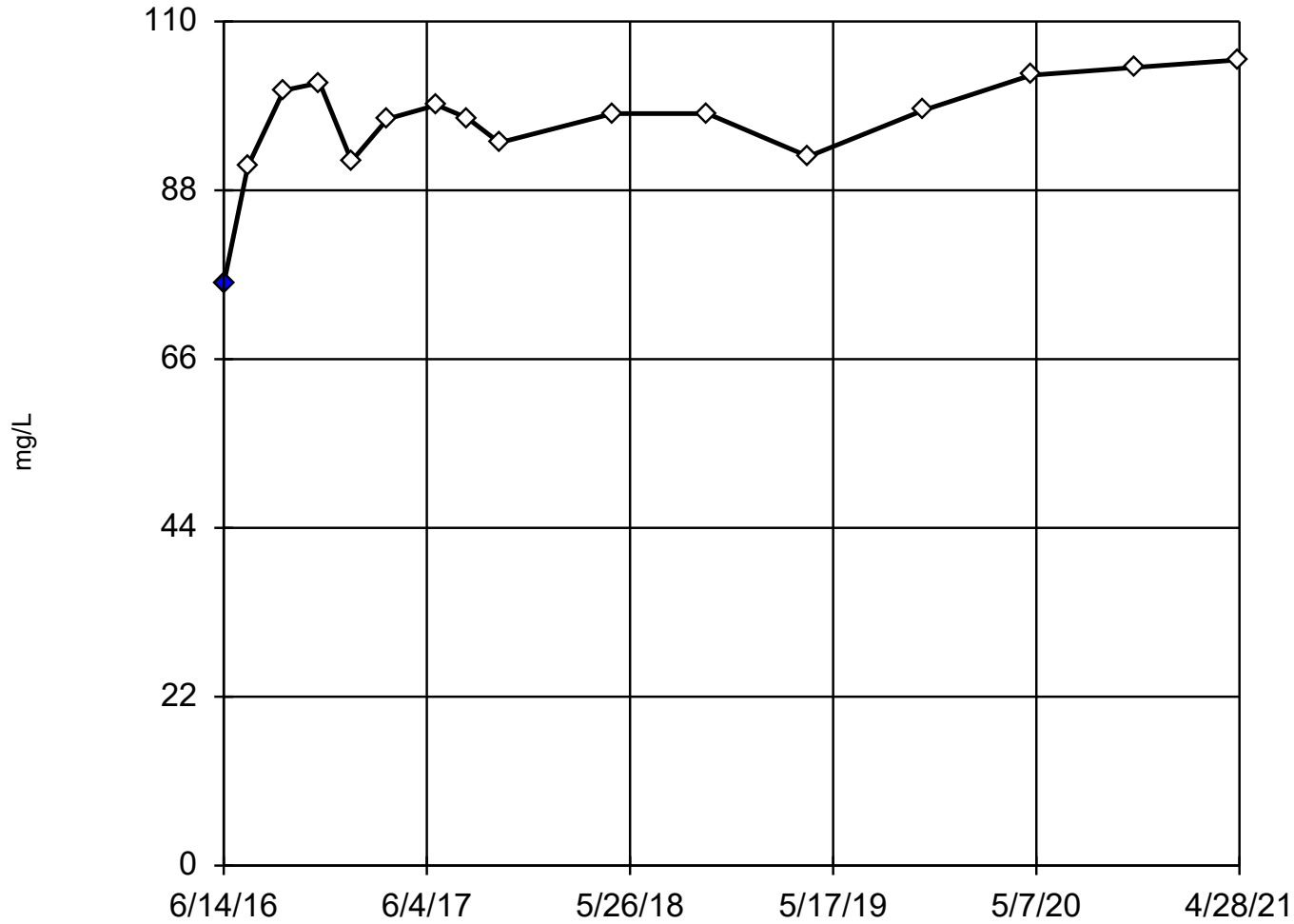
Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 107.8, std. dev.  
57.75, critical Tn 2.443

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9499  
Critical = 0.906  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Calcium Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### Dixon's Outlier Test

MW-13



n = 16

Statistical outlier is drawn as solid.  
Testing for 1 low outlier.  
Mean = 96.78.  
Std. Dev. = 7.015.  
75.8: c = 0.5882  
tab1 = 0.507.  
Alpha = 0.05.

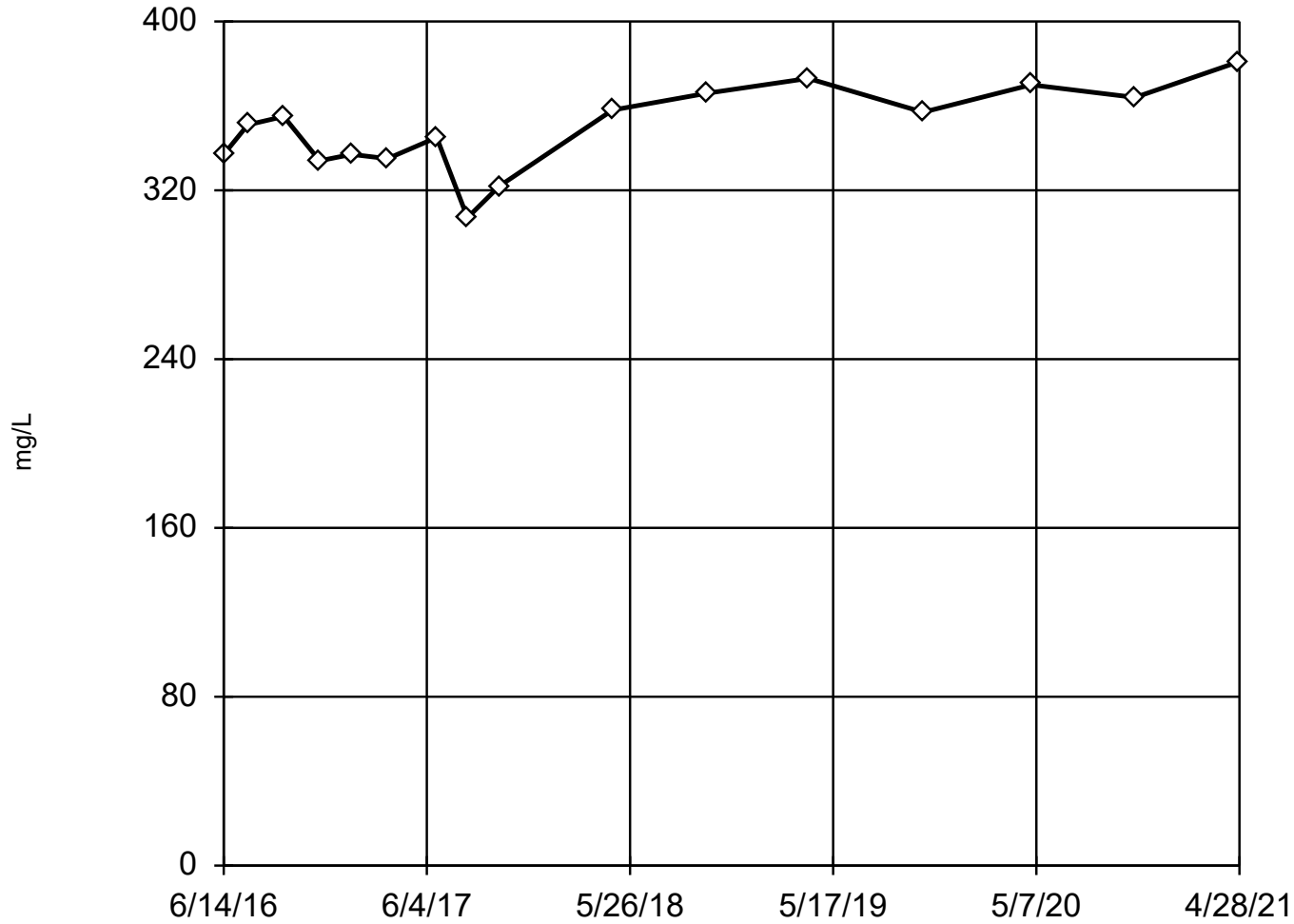
Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9494  
Critical = 0.901  
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Chloride Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



### EPA Screening (suspected outliers for Dixon's Test)

MW-14



n = 16

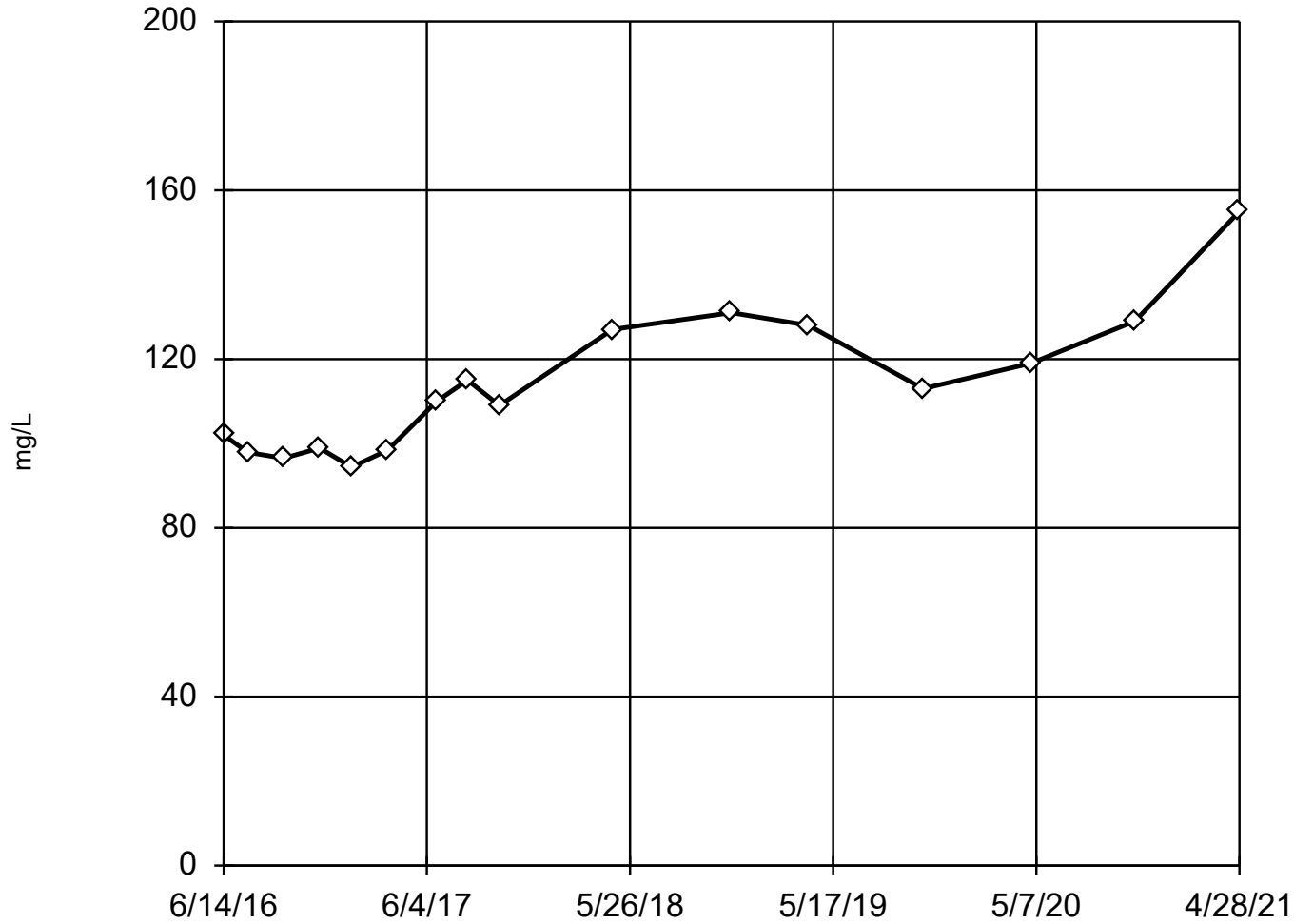
Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 349.5, std. dev.  
19.92, critical Tn 2.443

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9723  
Critical = 0.906  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Chloride Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## EPA Screening (suspected outliers for Dixon's Test)

MW-15



n = 16

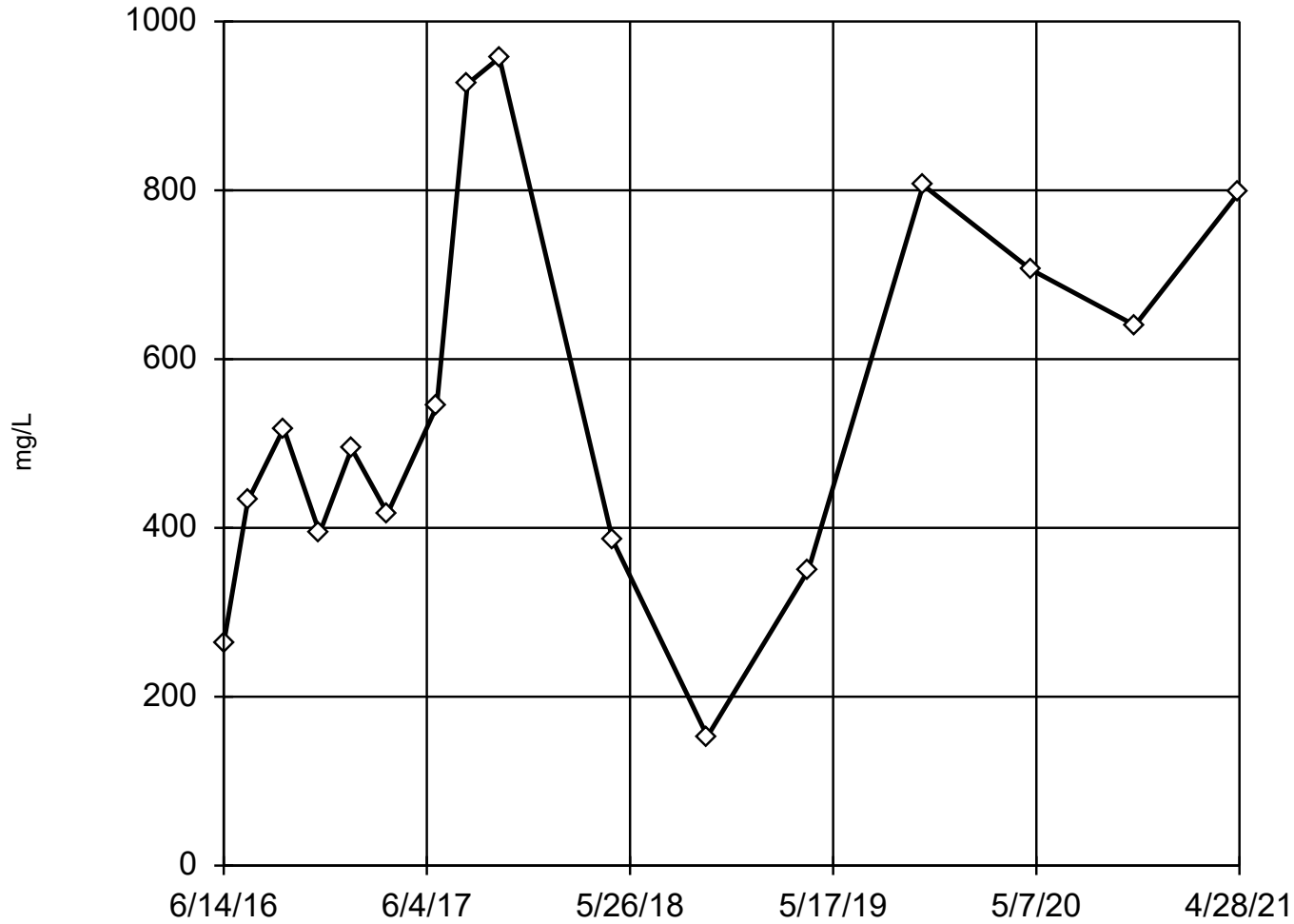
Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 114, std. dev. 16.72,  
critical Tn 2.443

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9096  
Critical = 0.906  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Chloride Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### EPA Screening (suspected outliers for Dixon's Test)

MW-17



n = 16

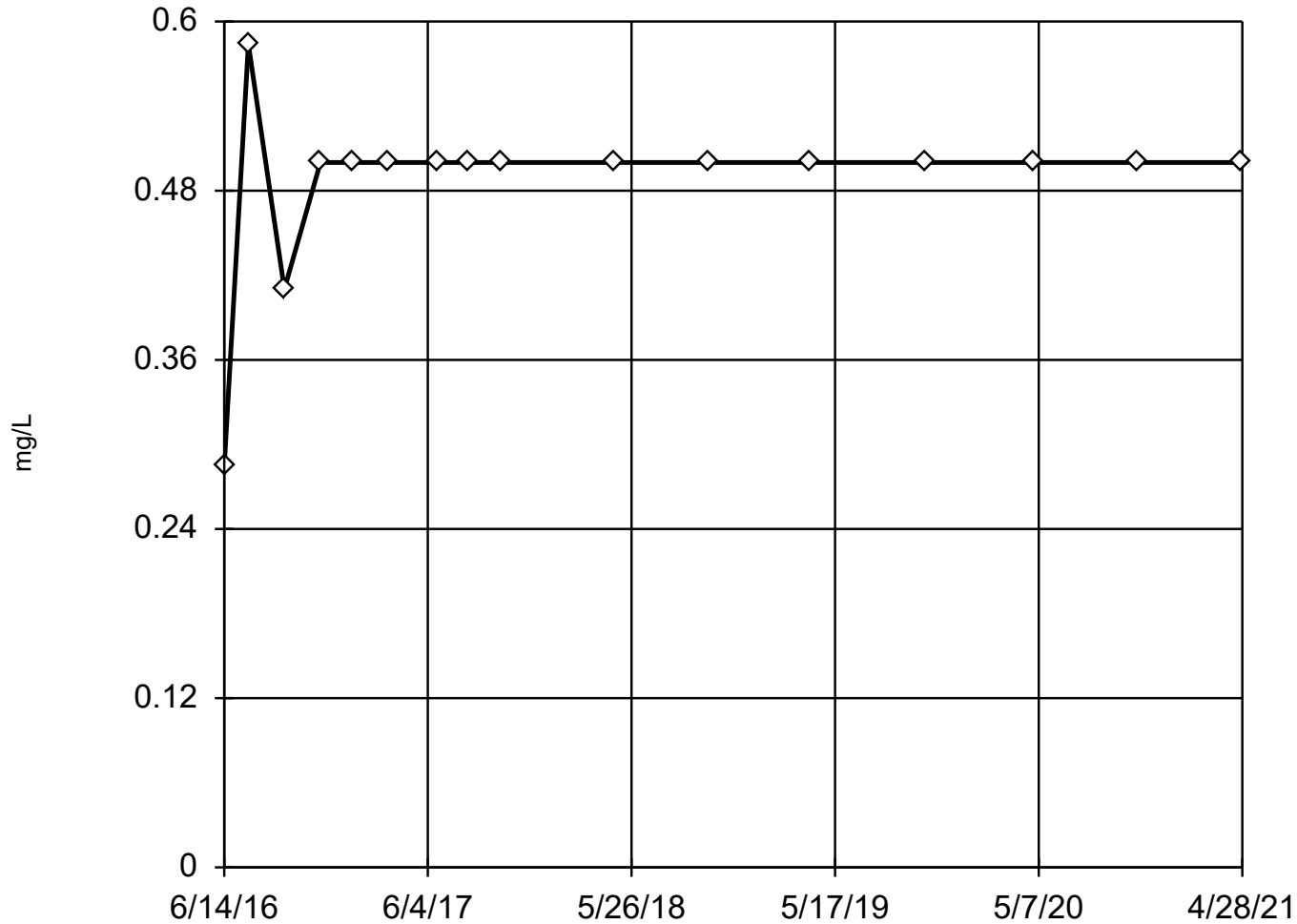
Dixon's will not be run.  
No suspect values identified or unable to establish suspect values.  
Mean 549, std. dev. 235.7, critical Tn 2.443

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9592  
Critical = 0.906  
The distribution was found to be normally distributed.

Constituent: Chloride    Analysis Run 12/16/2021 3:49 PM    View: Outlier  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

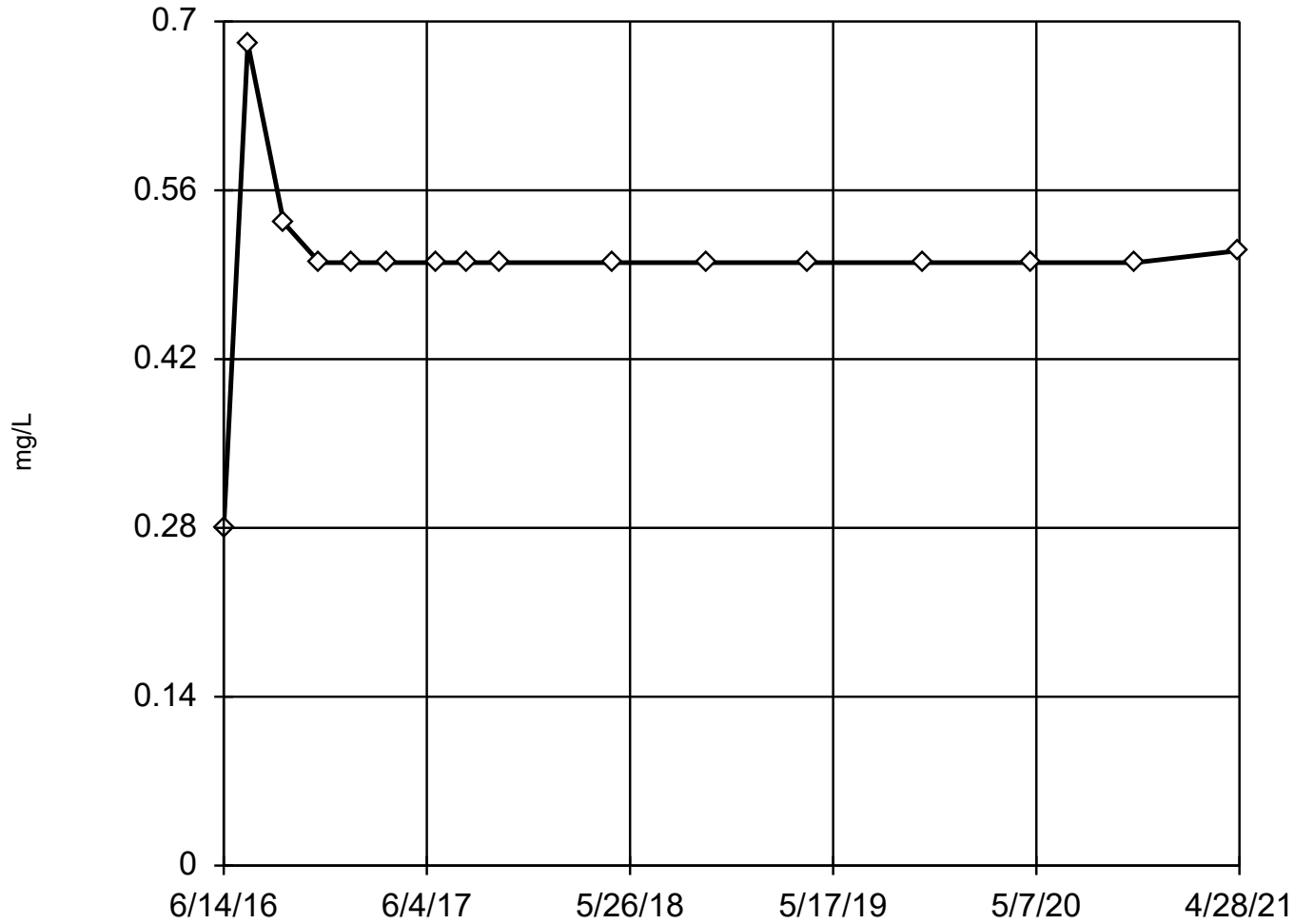
### Tukey's Outlier Screening

MW-13



# Tukey's Outlier Screening

MW-14



n = 16

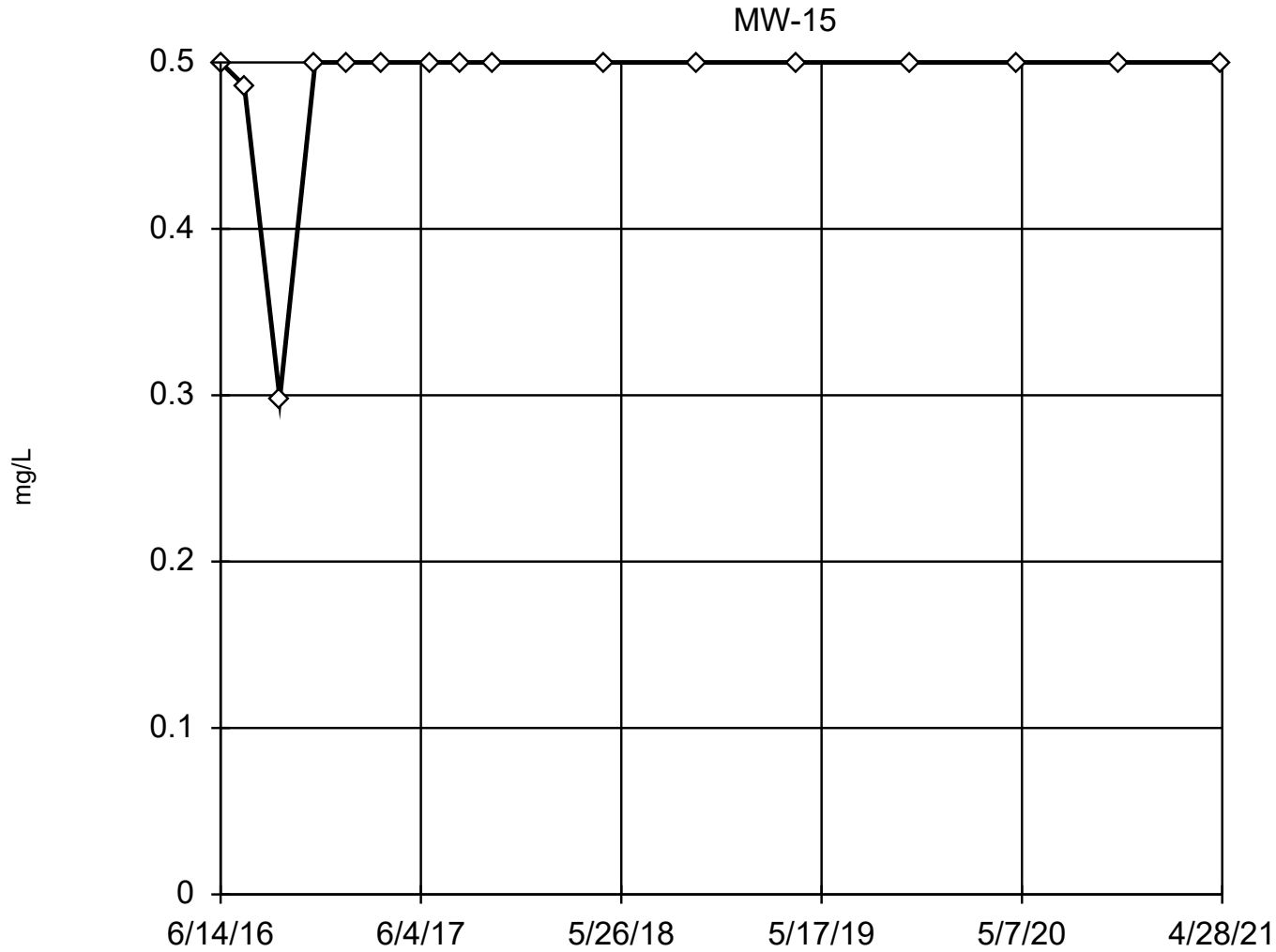
No outliers found.  
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

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

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

Constituent: Fluoride Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Tukey's Outlier Screening



n = 16

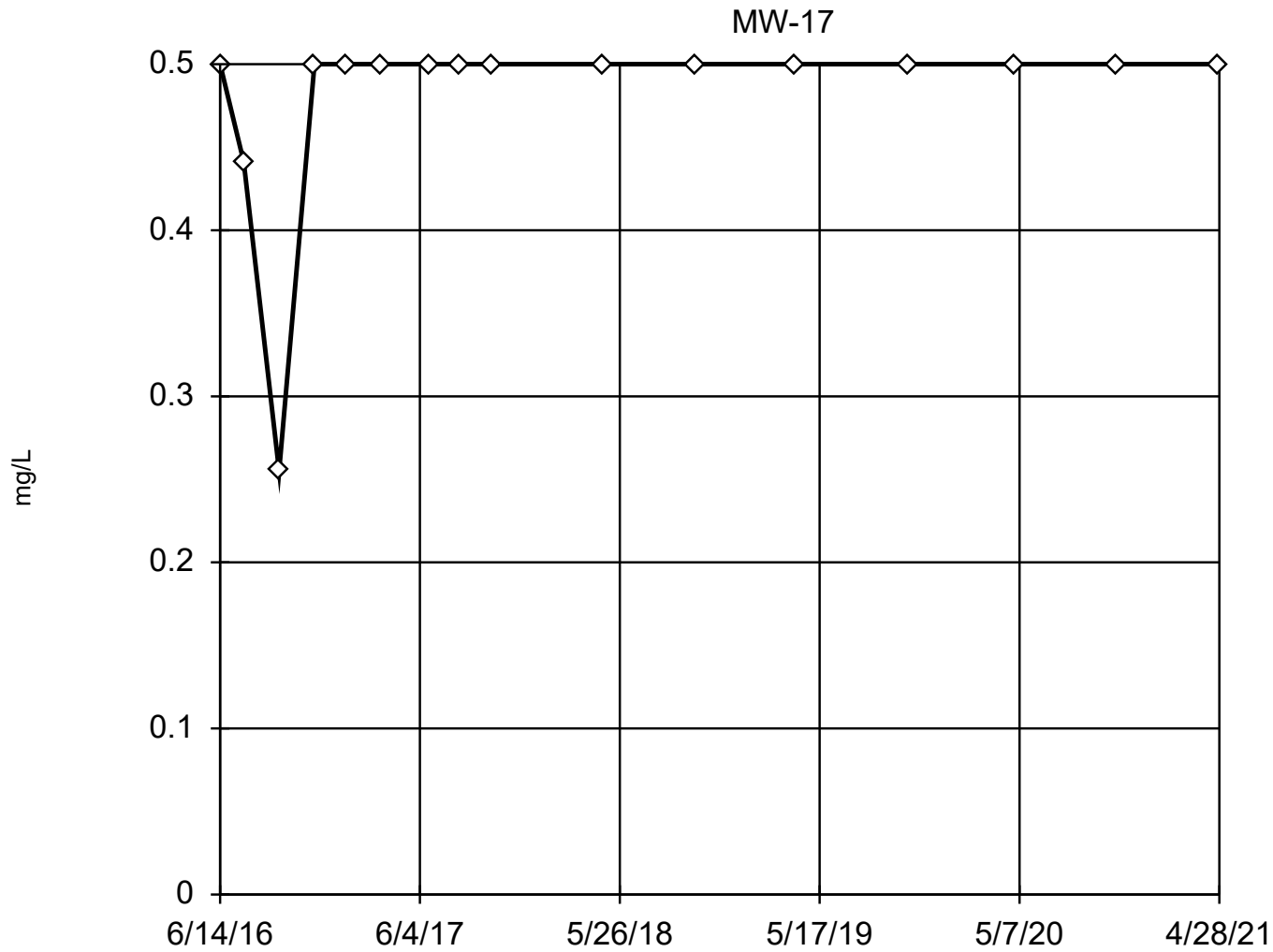
No outliers found.  
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

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

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

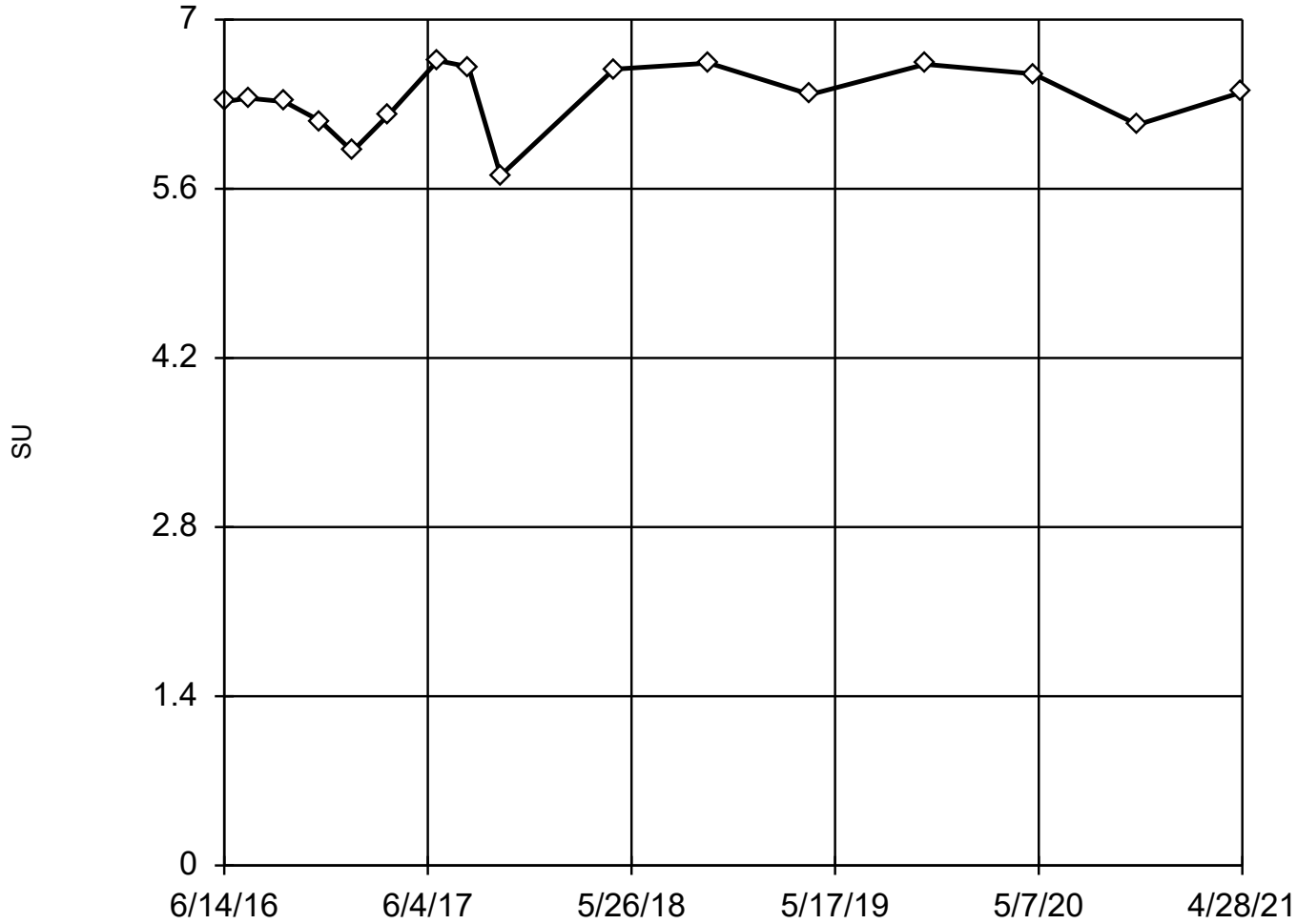
Constituent: Fluoride Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Tukey's Outlier Screening



### EPA Screening (suspected outliers for Dixon's Test)

MW-13



n = 16

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 6.348, std. dev.  
0.2752, critical Tn 2.443

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9107  
Critical = 0.906  
The distribution was found  
to be normally distrib-  
uted.

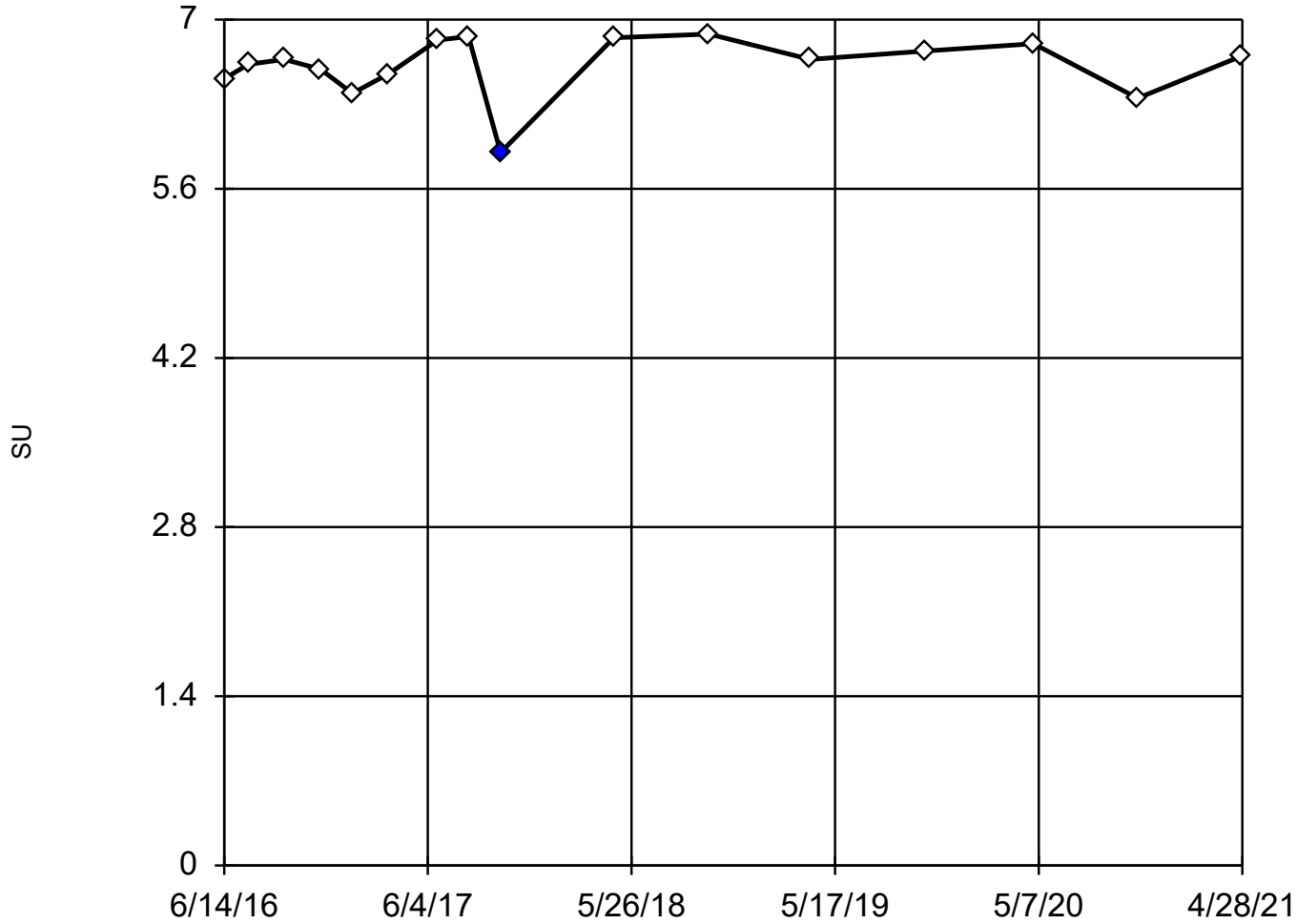
Constituent: pH Analysis Run 12/16/2021 3:49 PM View: Outlier

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



### Dixon's Outlier Test

MW-14



n = 16

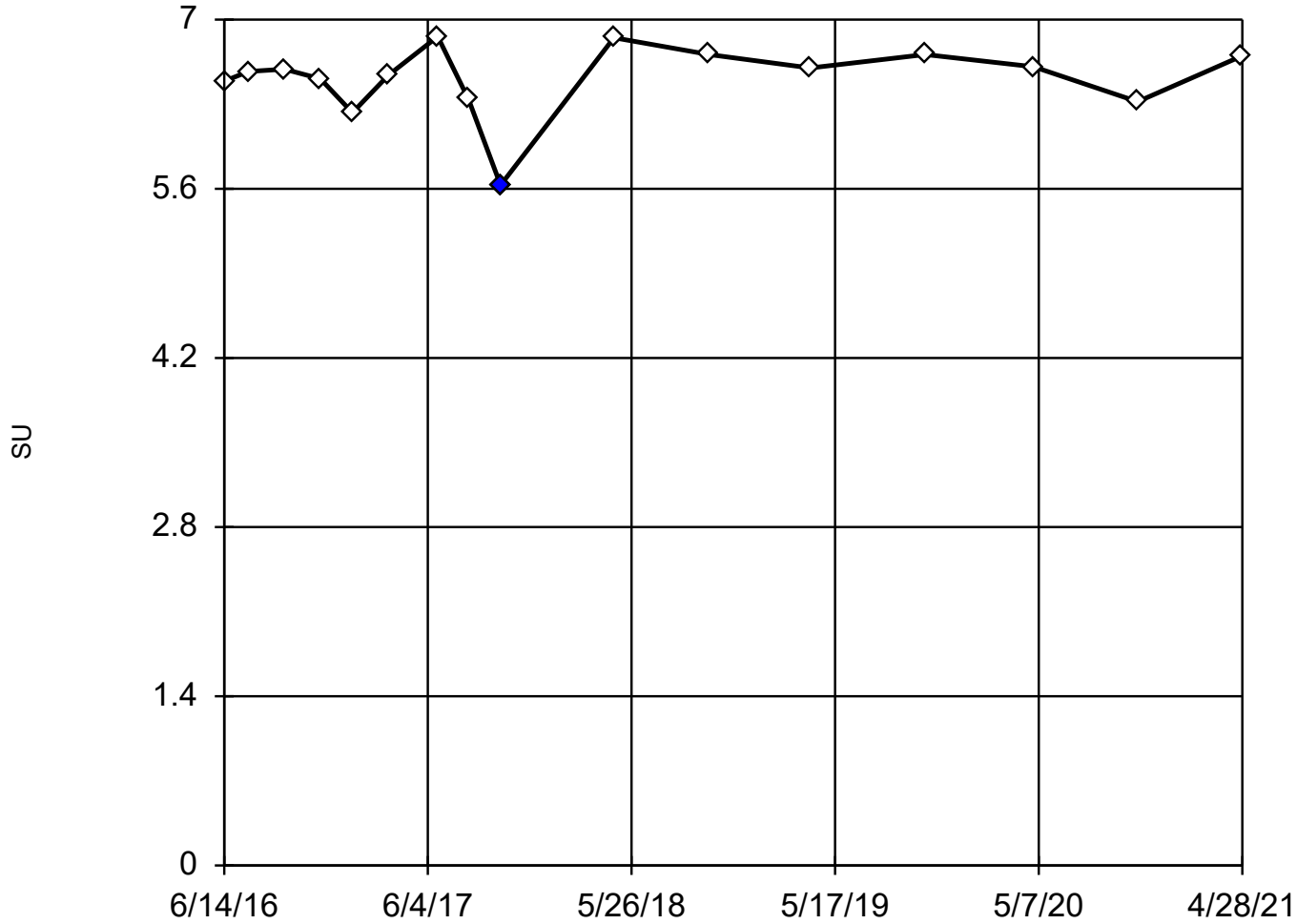
Statistical outlier is drawn as solid.  
Testing for 1 low outlier.  
Mean = 6.62.  
Std. Dev. = 0.2507.  
5.9: c = 0.5158  
tab1 = 0.507.  
Alpha = 0.05.

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9398  
Critical = 0.901  
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: pH Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### Dixon's Outlier Test

MW-15



n = 16

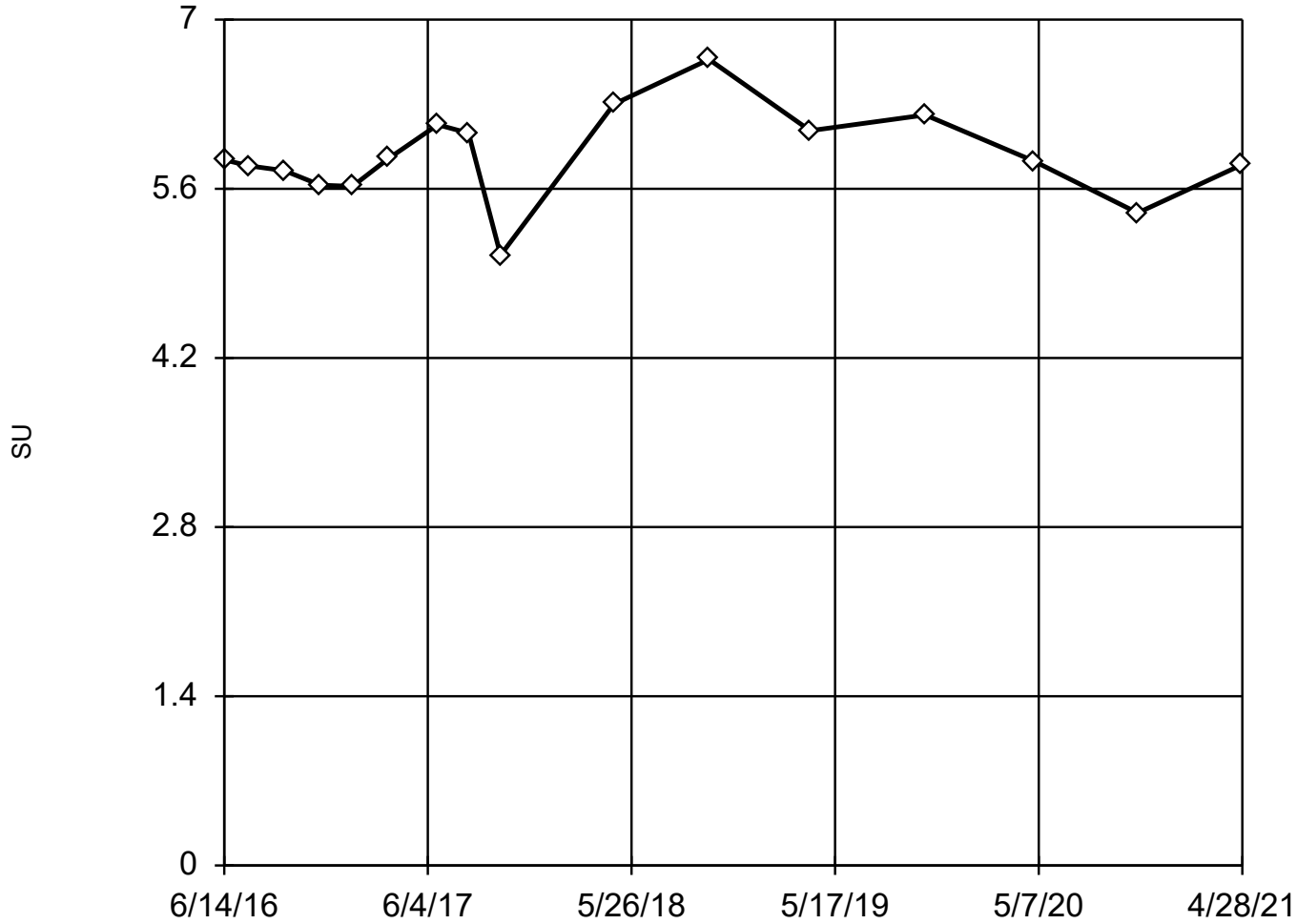
Statistical outlier is drawn as solid.  
Testing for 1 low outlier.  
Mean = 6.516.  
Std. Dev. = 0.2945.  
5.63: c = 0.6389  
tab1 = 0.507.  
Alpha = 0.05.

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9594  
Critical = 0.901  
The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: pH Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### EPA Screening (suspected outliers for Dixon's Test)

MW-17



n = 16

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 5.876, std. dev.  
0.3768, critical Tn 2.443

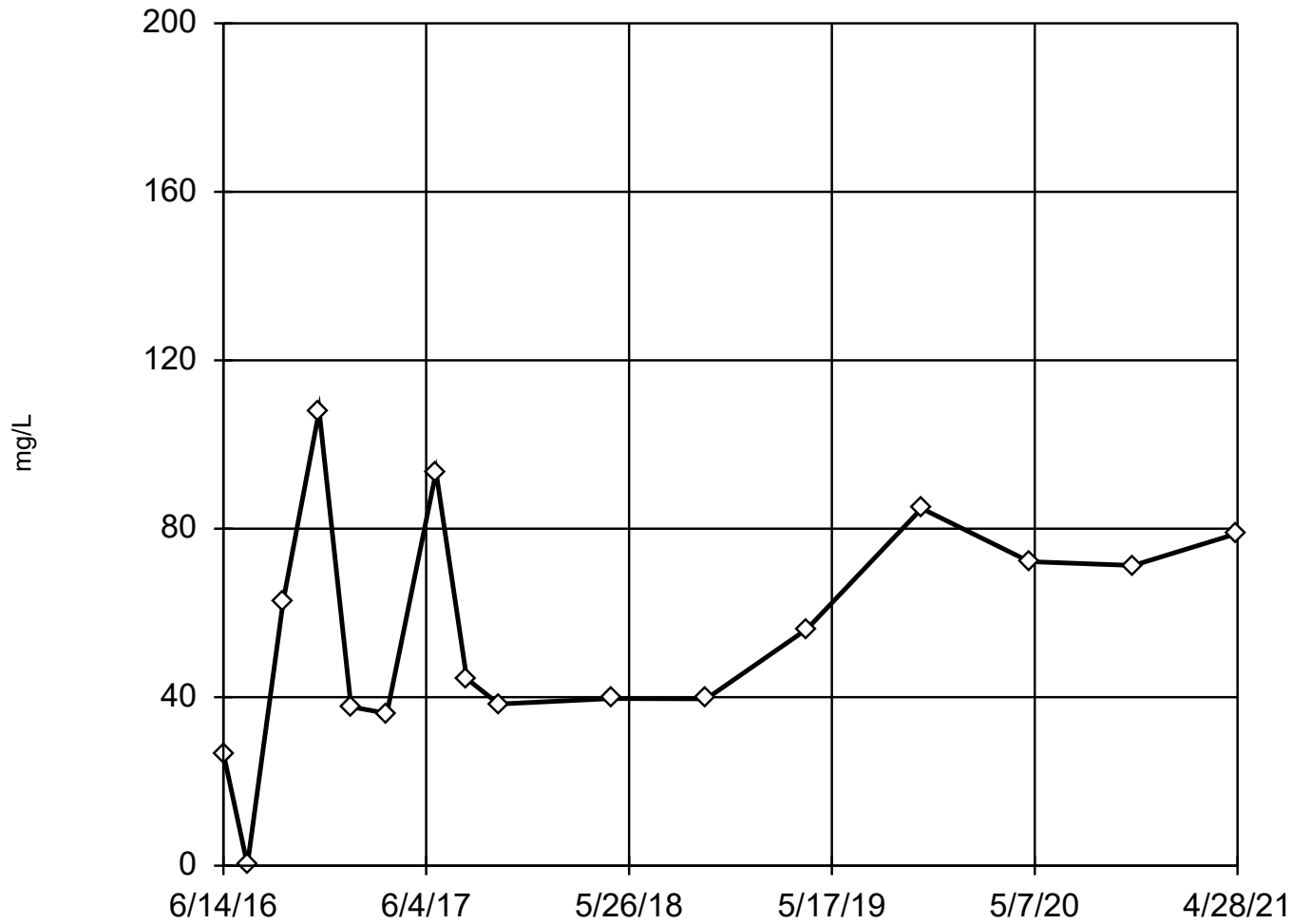
Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9721  
Critical = 0.906  
The distribution was found  
to be normally distrib-  
uted.

Constituent: pH Analysis Run 12/16/2021 3:49 PM View: Outlier

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Dixon's Outlier Test

MW-13



n = 16

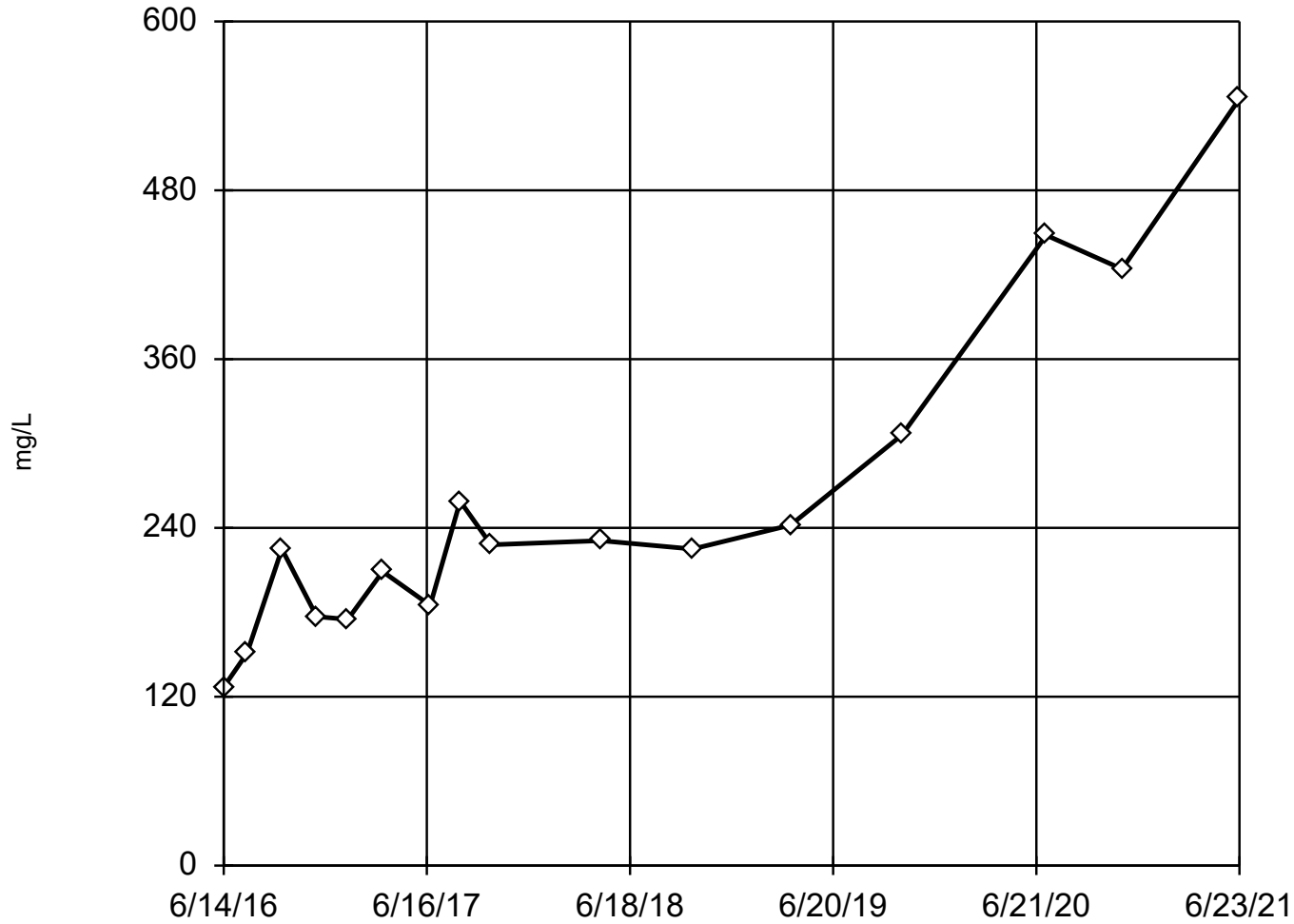
No statistical outliers.  
Testing for 1 low outlier.  
Mean = 55.67.  
Std. Dev. = 27.91.  
<0.2: c = 0.4255  
tab1 = 0.507.  
Alpha = 0.05.

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.925  
Critical = 0.901  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Sulfate Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### EPA Screening (suspected outliers for Dixon's Test)

MW-14

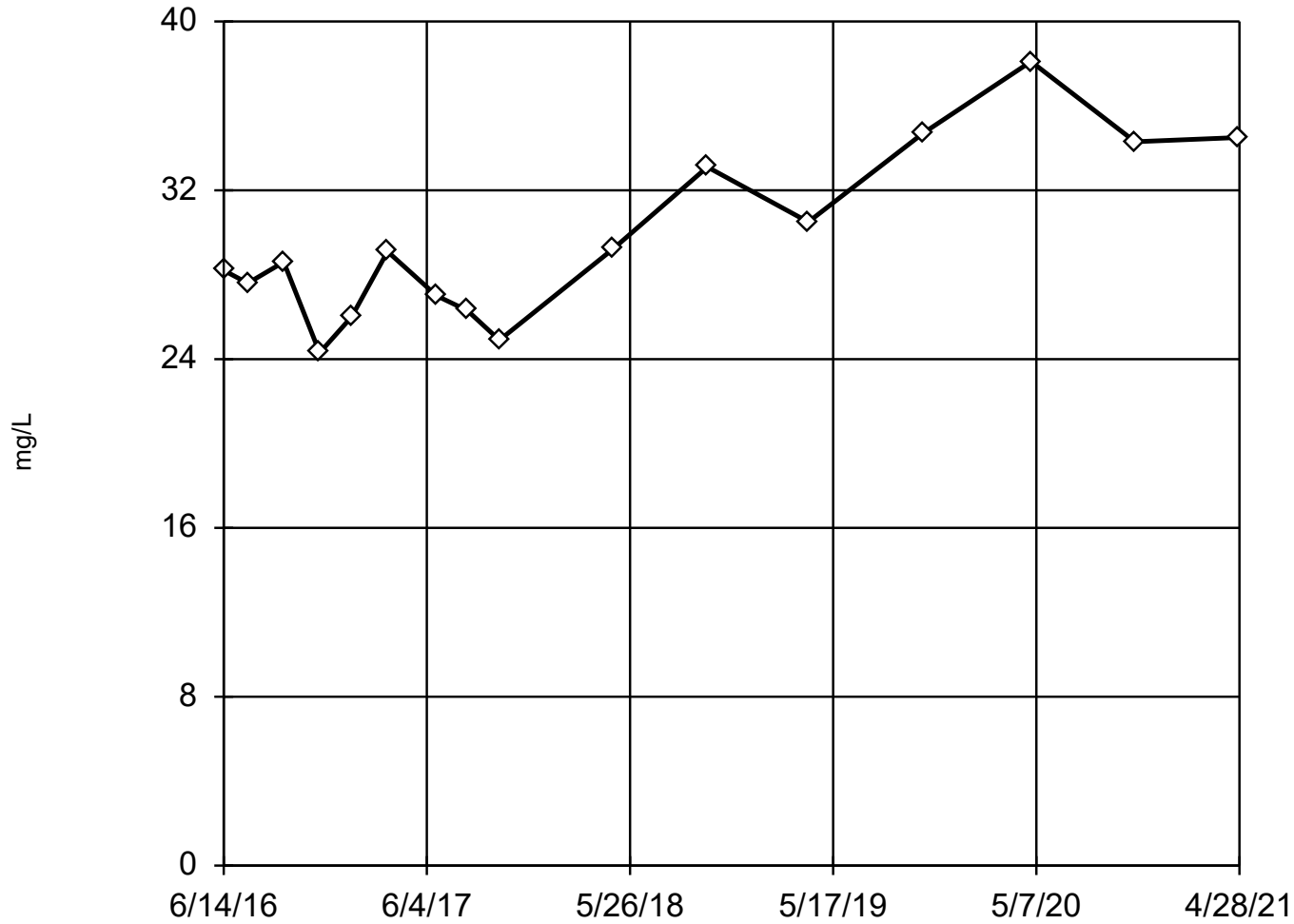


n = 16  
Dixon's will not be run.  
No suspect values identified or unable to establish suspect values.  
Mean 259.8, std. dev. 116.1, critical Tn 2.443  
  
Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9381  
Critical = 0.906 (after natural log transformation)  
The distribution was found to be log-normal.

Constituent: Sulfate    Analysis Run 12/16/2021 3:49 PM    View: Outlier  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

### EPA Screening (suspected outliers for Dixon's Test)

MW-15



n = 16

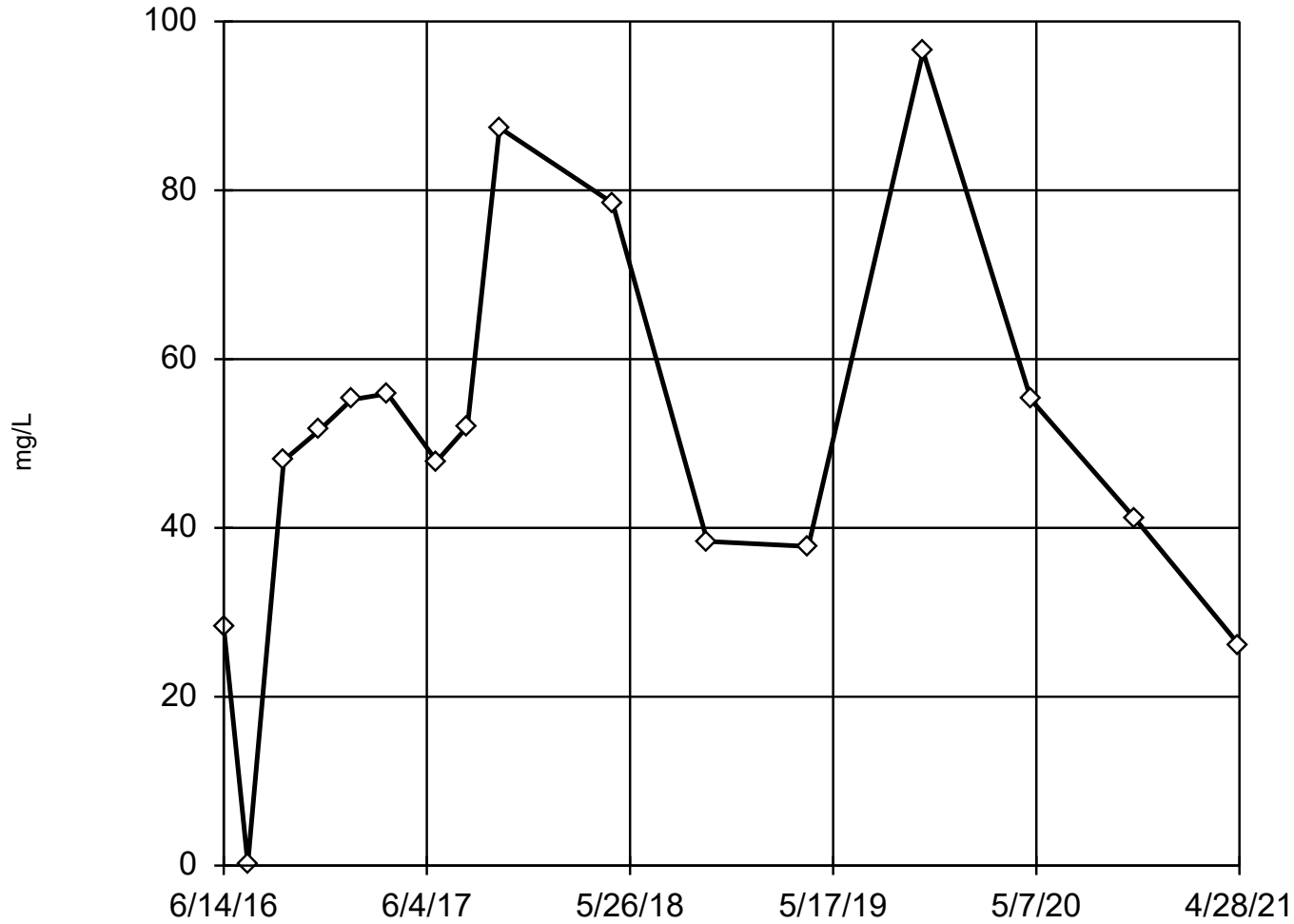
Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 29.78, std. dev.  
4.042, critical Tn 2.443

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9351  
Critical = 0.906  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Sulfate Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Dixon's Outlier Test

MW-17



n = 16

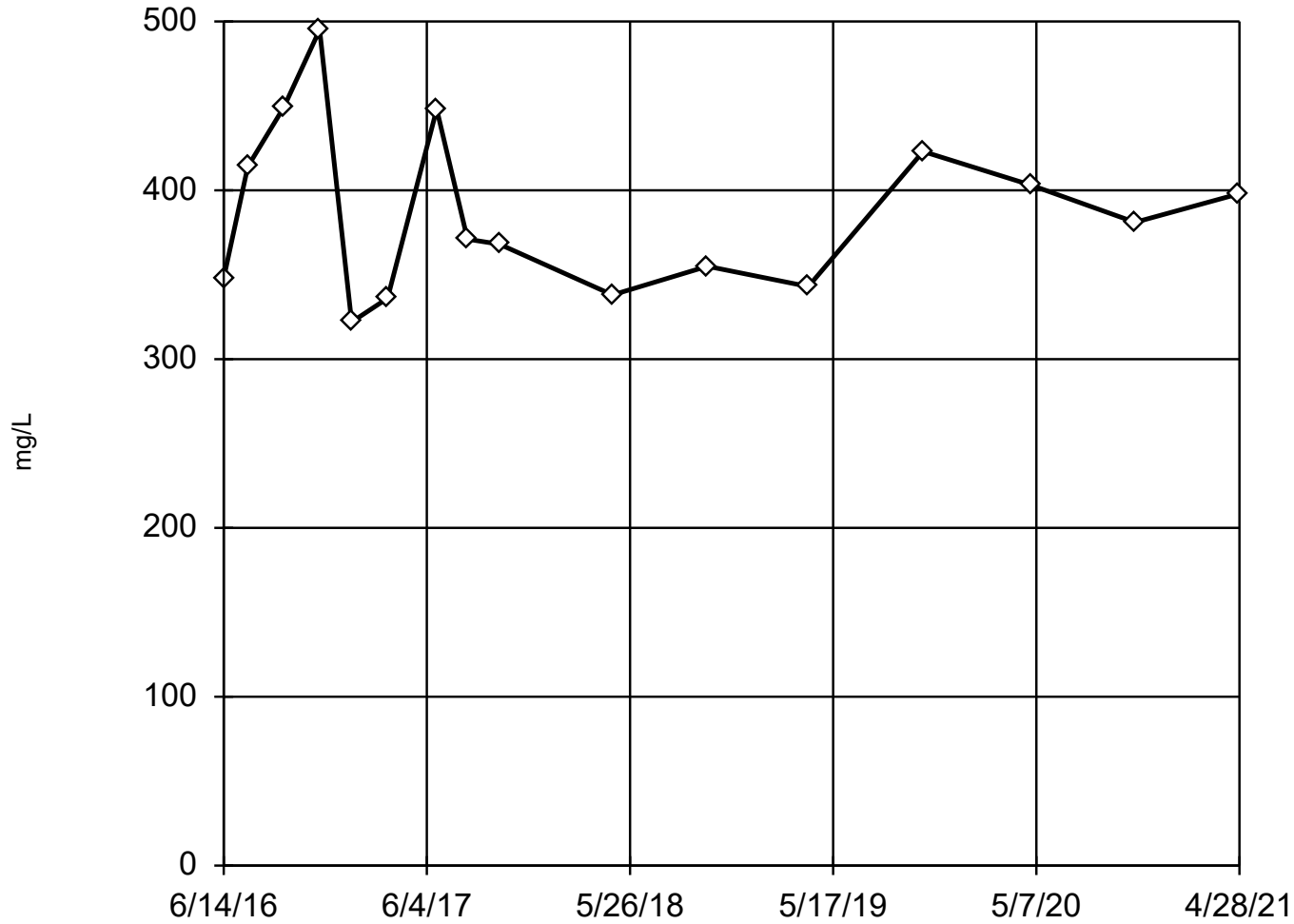
No statistical outliers.  
Testing for 1 low outlier.  
Mean = 49.99.  
Std. Dev. = 23.6.  
<0.2: c = 0.3576  
tab1 = 0.507.  
Alpha = 0.05.

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.906  
Critical = 0.901  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Sulfate Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### EPA Screening (suspected outliers for Dixon's Test)

MW-13



n = 16

Dixon's will not be run.  
No suspect values identified or unable to establish suspect values.  
Mean 387, std. dev. 48.98, critical Tn 2.443

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9431  
Critical = 0.906  
The distribution was found to be normally distributed.

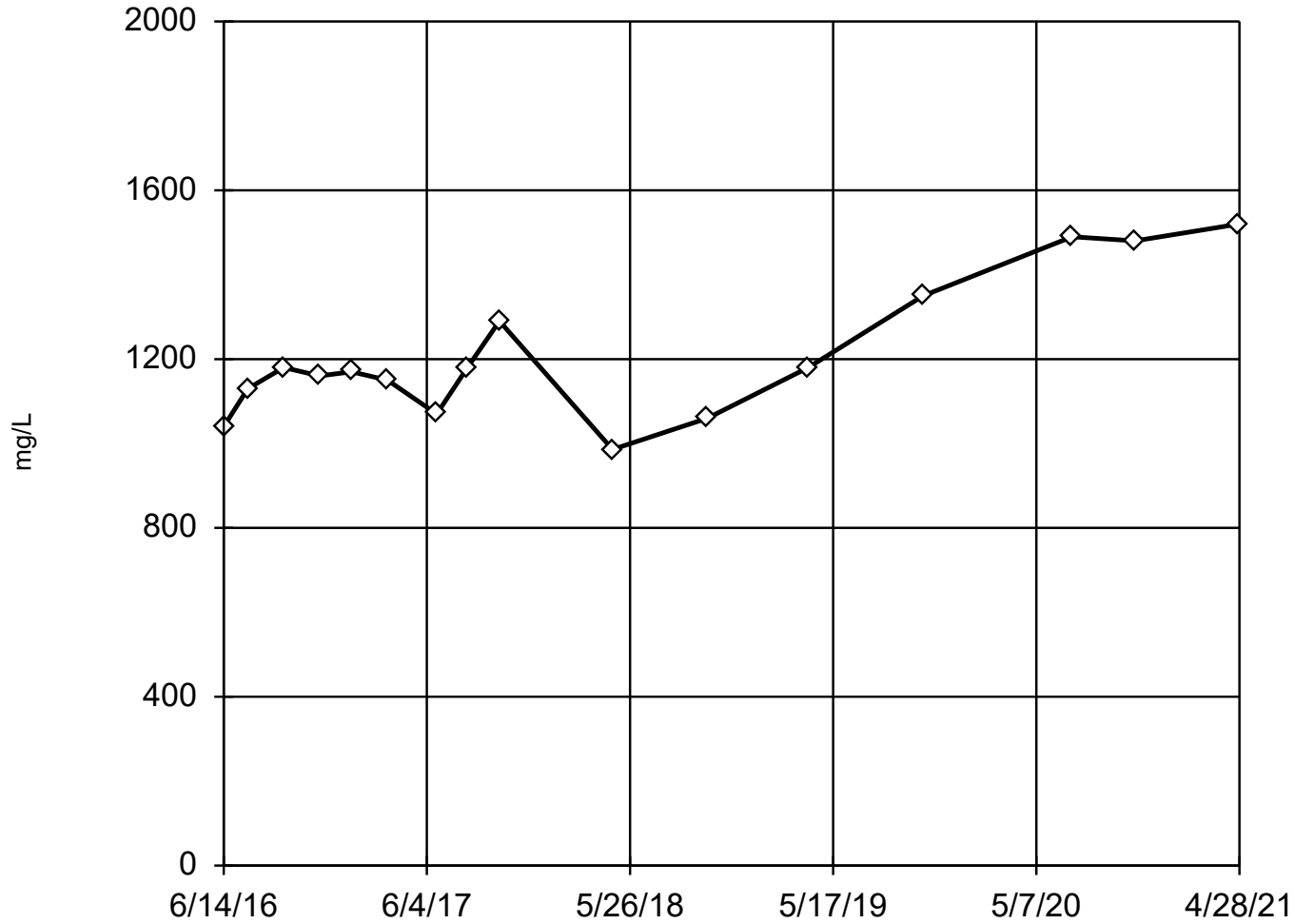
Constituent: Total Dissolved Solids Analysis Run 12/16/2021 3:49 PM View: Outlier

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



### EPA Screening (suspected outliers for Dixon's Test)

MW-14

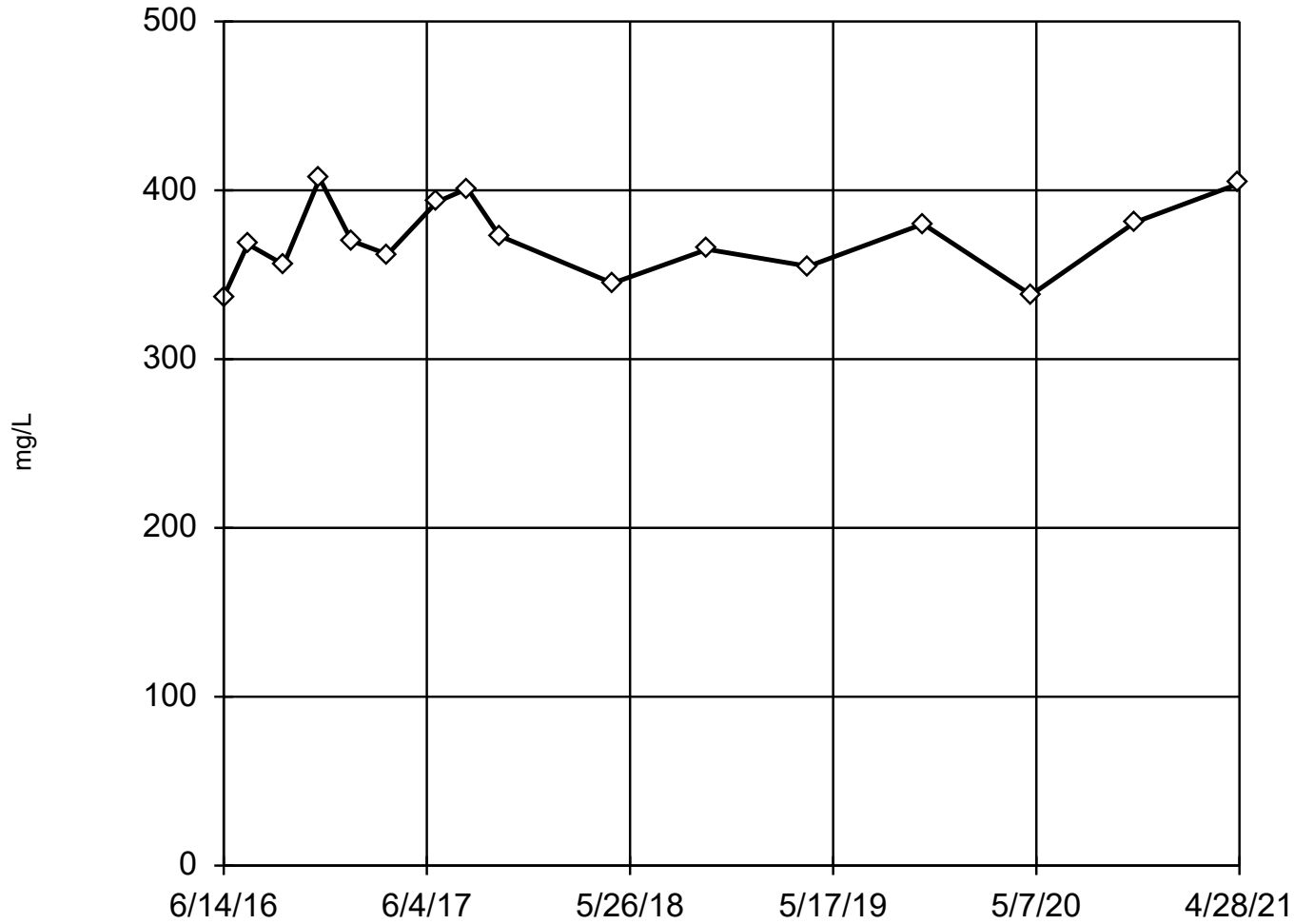


n = 16  
Dixon's will not be run.  
No suspect values identified or unable to establish suspect values.  
Mean 1215, std. dev. 165.5, critical Tn 2.443  
Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9164  
Critical = 0.906 (after natural log transformation)  
The distribution was found to be log-normal.

Constituent: Total Dissolved Solids Analysis Run 12/16/2021 3:49 PM View: Outlier  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### EPA Screening (suspected outliers for Dixon's Test)

MW-15



n = 16

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 370.9, std. dev.  
22.34, critical Tn 2.443

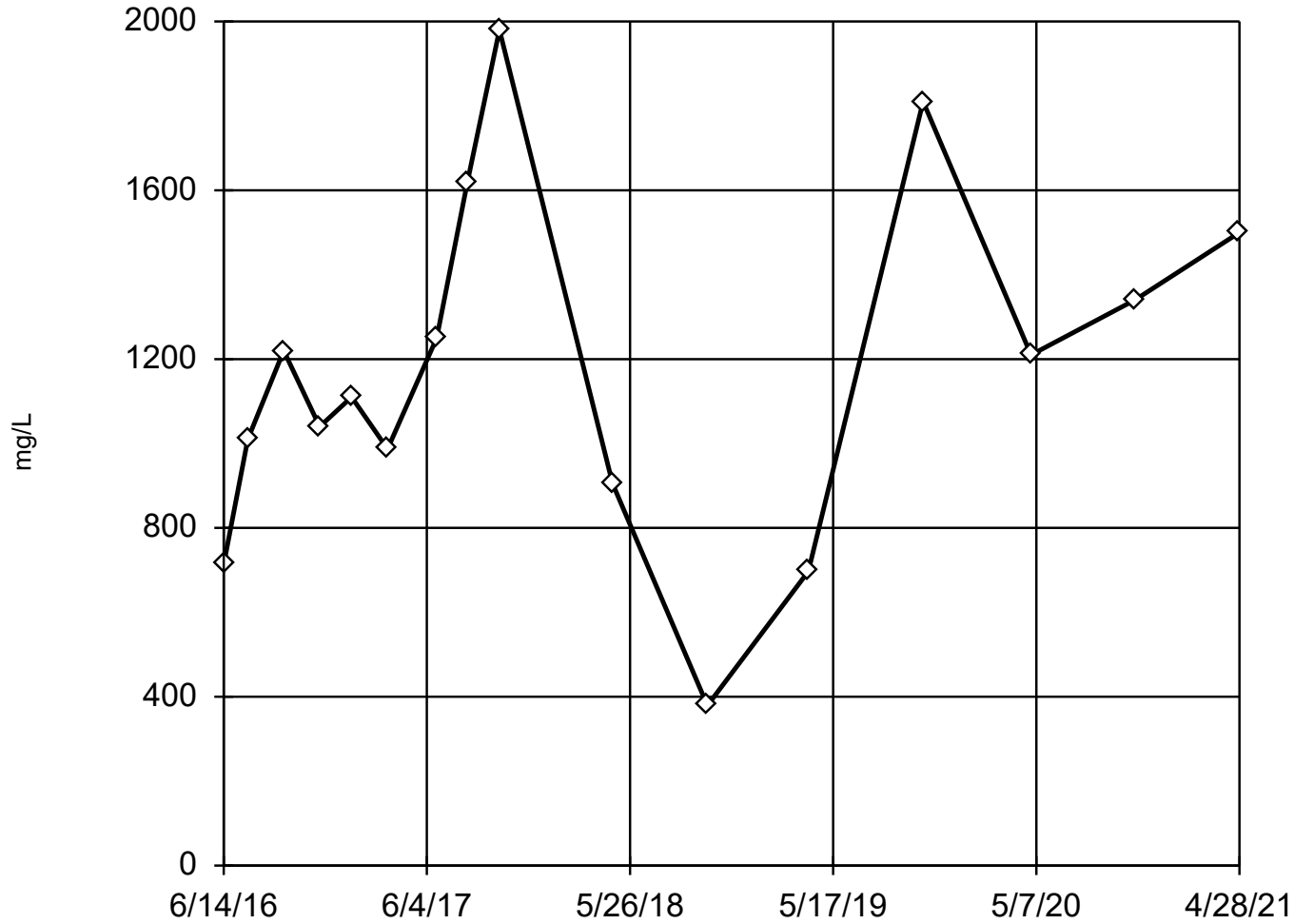
Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9549  
Critical = 0.906  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Total Dissolved Solids Analysis Run 12/16/2021 3:49 PM View: Outlier

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### Dixon's Outlier Test

MW-17



n = 16

No statistical outliers.  
Testing for 1 low outlier.  
Mean = 1173.  
Std. Dev. = 418.2.  
379: c = 0.2699  
tab1 = 0.507.  
Alpha = 0.05.

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9562  
Critical = 0.901  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Total Dissolved Solids Analysis Run 12/16/2021 3:49 PM View: Outlier

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## **Trend Test**

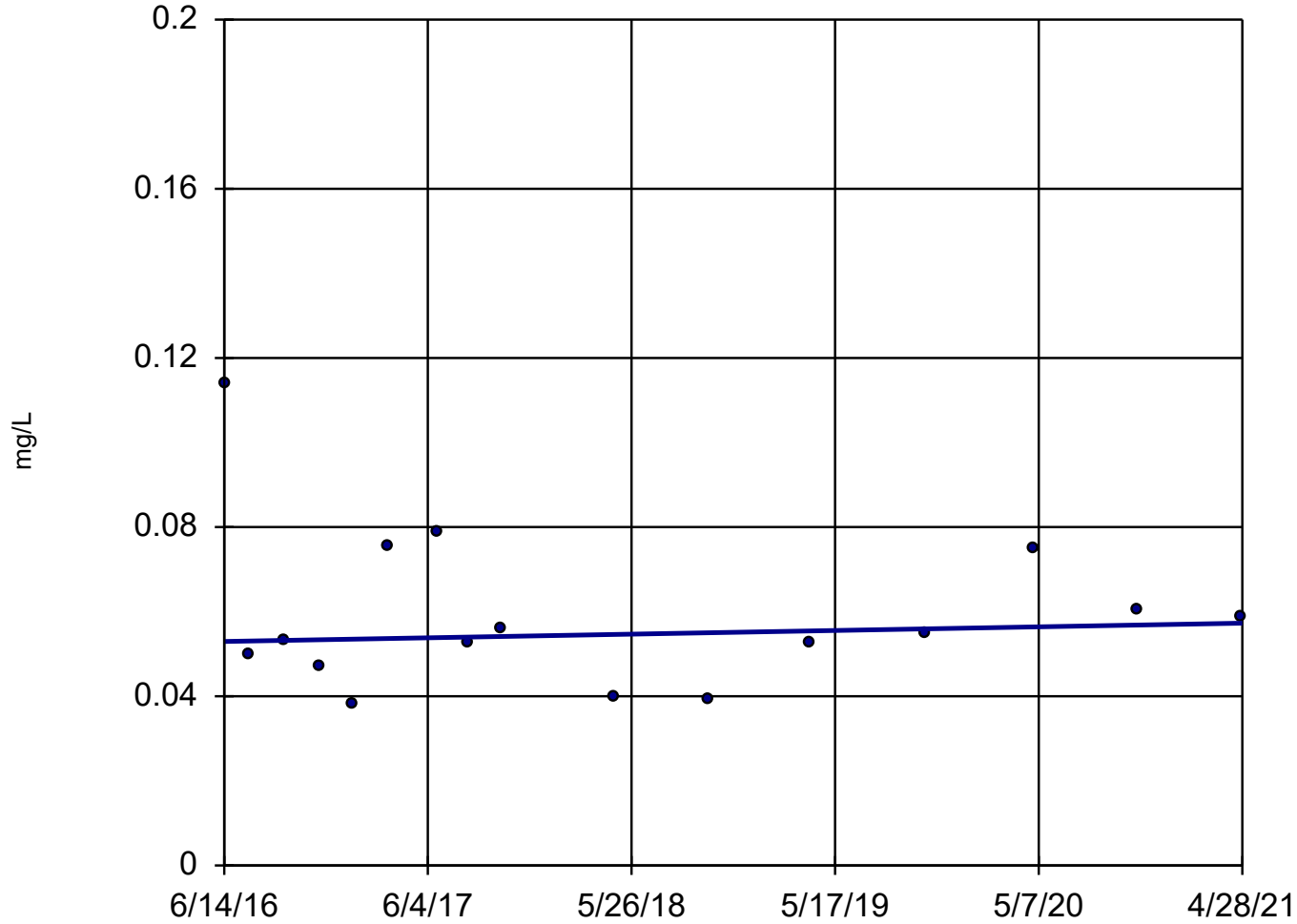
# Trend Test

Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks    Printed 12/28/2021, 10:03 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-13	0.000...	7	53	No	16	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-13	1.089	21	53	No	16	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-13	1.532	42	48	No	15	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-13	0	14	53	No	16	81.25	n/a	n/a	0.02	NP
pH (SU)	MW-13	0.02261	15	53	No	16	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-13	9.653	44	53	No	16	6.25	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-13	0.2454	0	53	No	16	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-14	0.07062	45	48	No	15	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-14	7.143	41	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-14	7.149	40	48	No	15	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-14	0	0	53	No	16	75	n/a	n/a	0.02	NP
pH (SU)	MW-14	0.03518	21	53	No	16	0	n/a	n/a	0.02	NP
<b>Sulfate (mg/L)</b>	<b>MW-14</b>	<b>50.36</b>	<b>78</b>	<b>48</b>	<b>Yes</b>	<b>15</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.02</b>	<b>NP</b>
Total Dissolved Solids (mg/L)	MW-14	73.44	44	48	No	15	0	n/a	n/a	0.02	NP
<b>Boron (mg/L)</b>	<b>MW-15</b>	<b>-0.00...</b>	<b>-64</b>	<b>-53</b>	<b>Yes</b>	<b>16</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.02</b>	<b>NP</b>
Calcium (mg/L)	MW-15	0.9906	49	53	No	16	0	n/a	n/a	0.02	NP
<b>Chloride (mg/L)</b>	<b>MW-15</b>	<b>9.575</b>	<b>78</b>	<b>53</b>	<b>Yes</b>	<b>16</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.02</b>	<b>NP</b>
Fluoride (mg/L)	MW-15	0	23	53	No	16	87.5	n/a	n/a	0.02	NP
pH (SU)	MW-15	0.02831	19	53	No	16	0	n/a	n/a	0.02	NP
<b>Sulfate (mg/L)</b>	<b>MW-15</b>	<b>1.992</b>	<b>64</b>	<b>53</b>	<b>Yes</b>	<b>16</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.02</b>	<b>NP</b>
Total Dissolved Solids (mg/L)	MW-15	3.248	16	53	No	16	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-17	-0.00...	-39	-48	No	15	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-17	18.98	43	53	No	16	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-17	70.95	30	53	No	16	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-17	0	23	53	No	16	87.5	n/a	n/a	0.02	NP
pH (SU)	MW-17	0.02829	12	53	No	16	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-17	2.333	13	53	No	16	6.25	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-17	89.22	28	53	No	16	0	n/a	n/a	0.02	NP

# Sen's Slope Estimator

MW-13



n = 16

Slope = 0.0008886  
units per year.

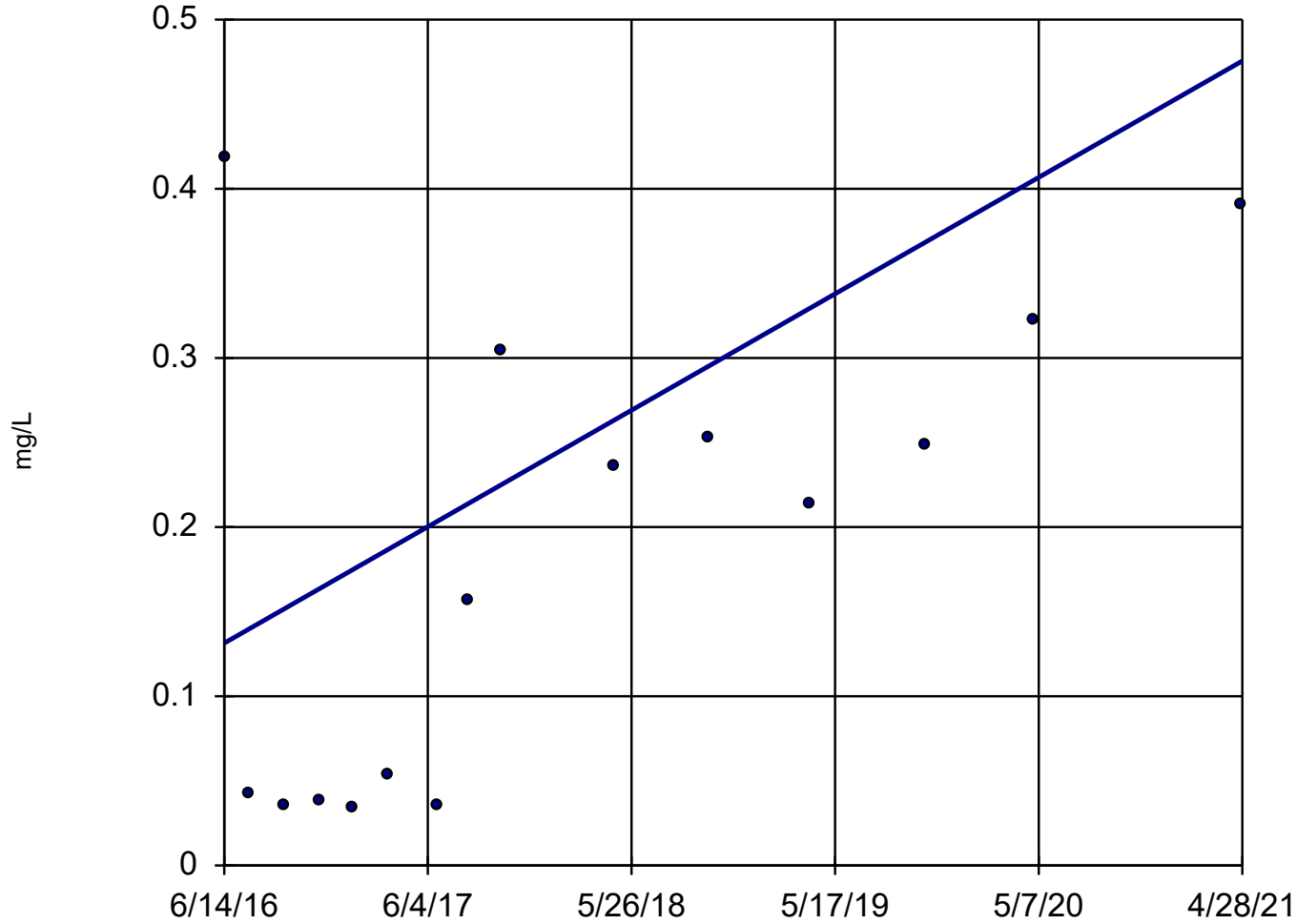
Mann-Kendall  
statistic = 7  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Boron Analysis Run 12/28/2021 10:02 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-14

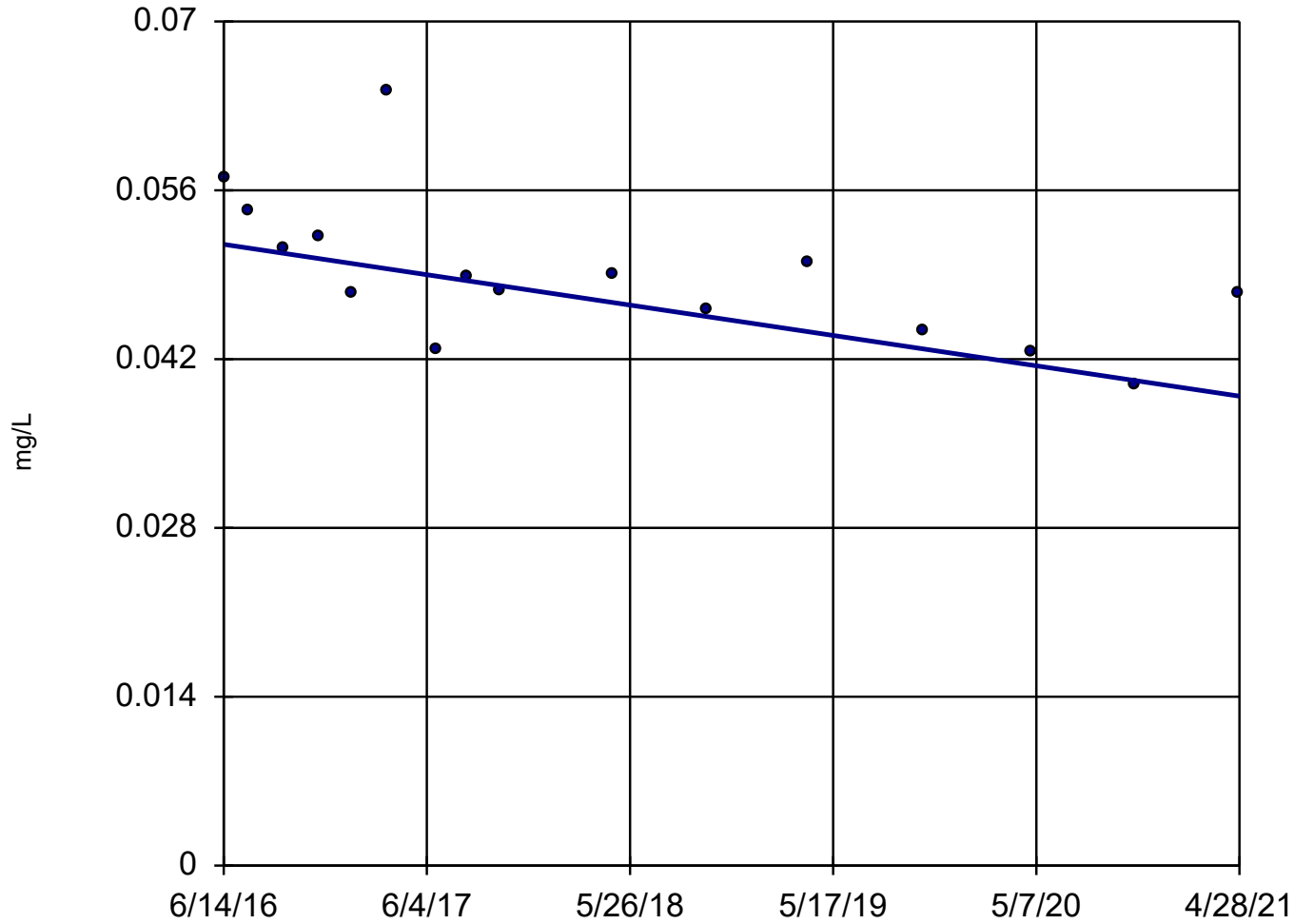


n = 15  
Slope = 0.07062  
units per year.  
Mann-Kendall  
statistic = 45  
critical = 48  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Boron Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-15



n = 16

Slope = -0.002583  
units per year.

Mann-Kendall  
statistic = -64  
critical = -53

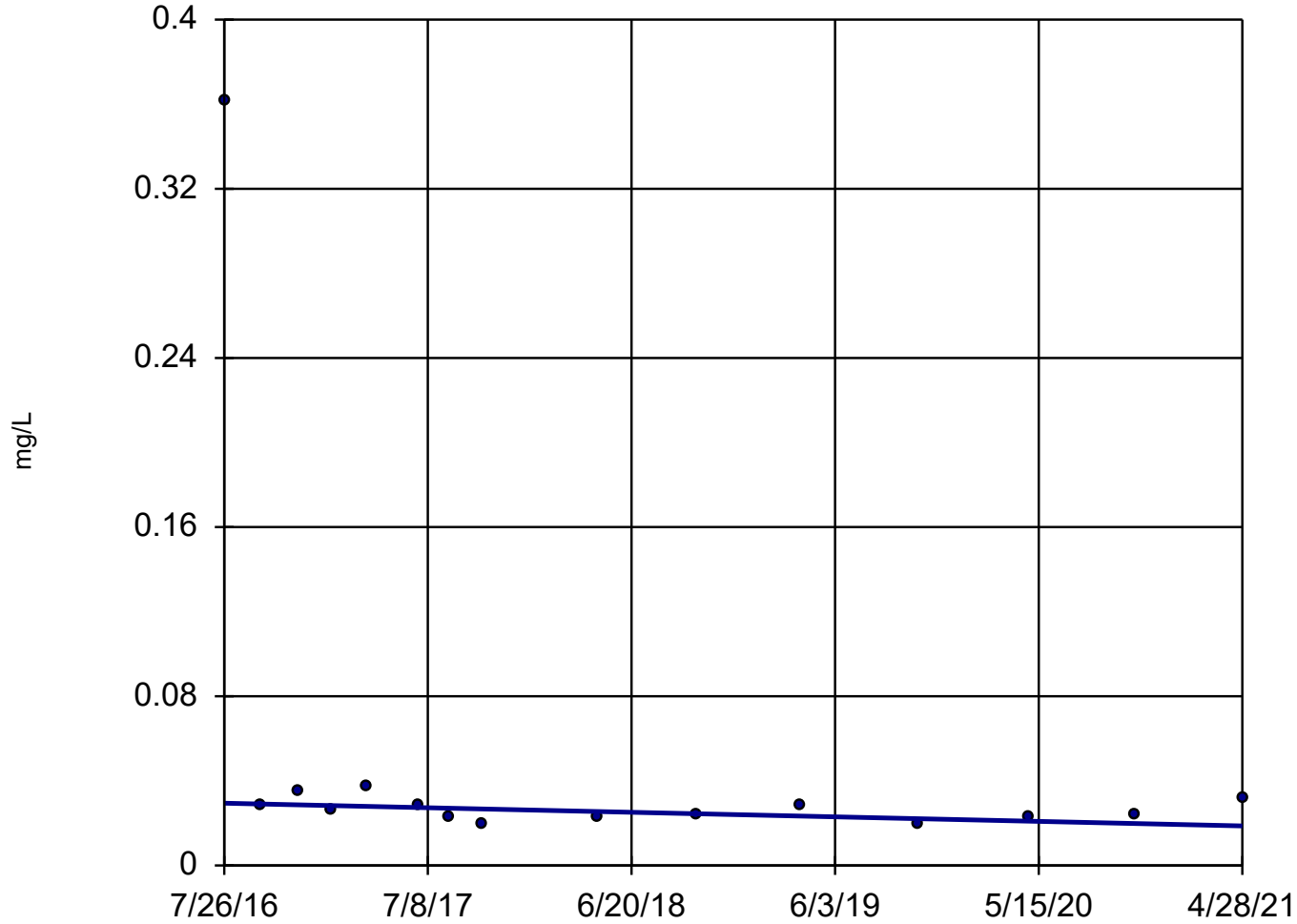
Decreasing trend  
significant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Boron Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



# Sen's Slope Estimator

MW-17

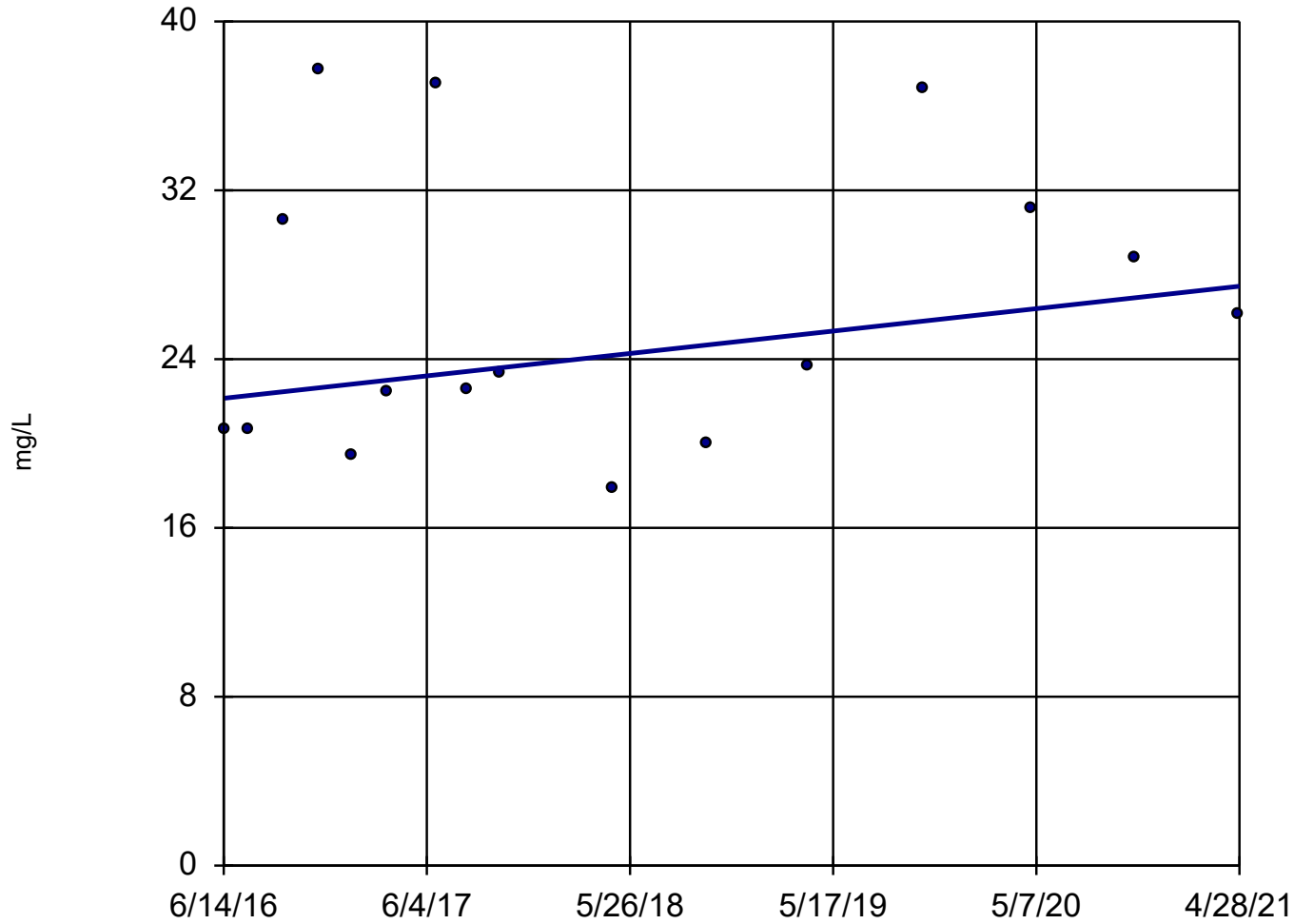


n = 15  
Slope = -0.002263 units per year.  
Mann-Kendall statistic = -39  
critical = -48  
Trend not significant at 98% confidence level (α = 0.01 per tail).

Constituent: Boron Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator

MW-13



n = 16

Slope = 1.089  
units per year.

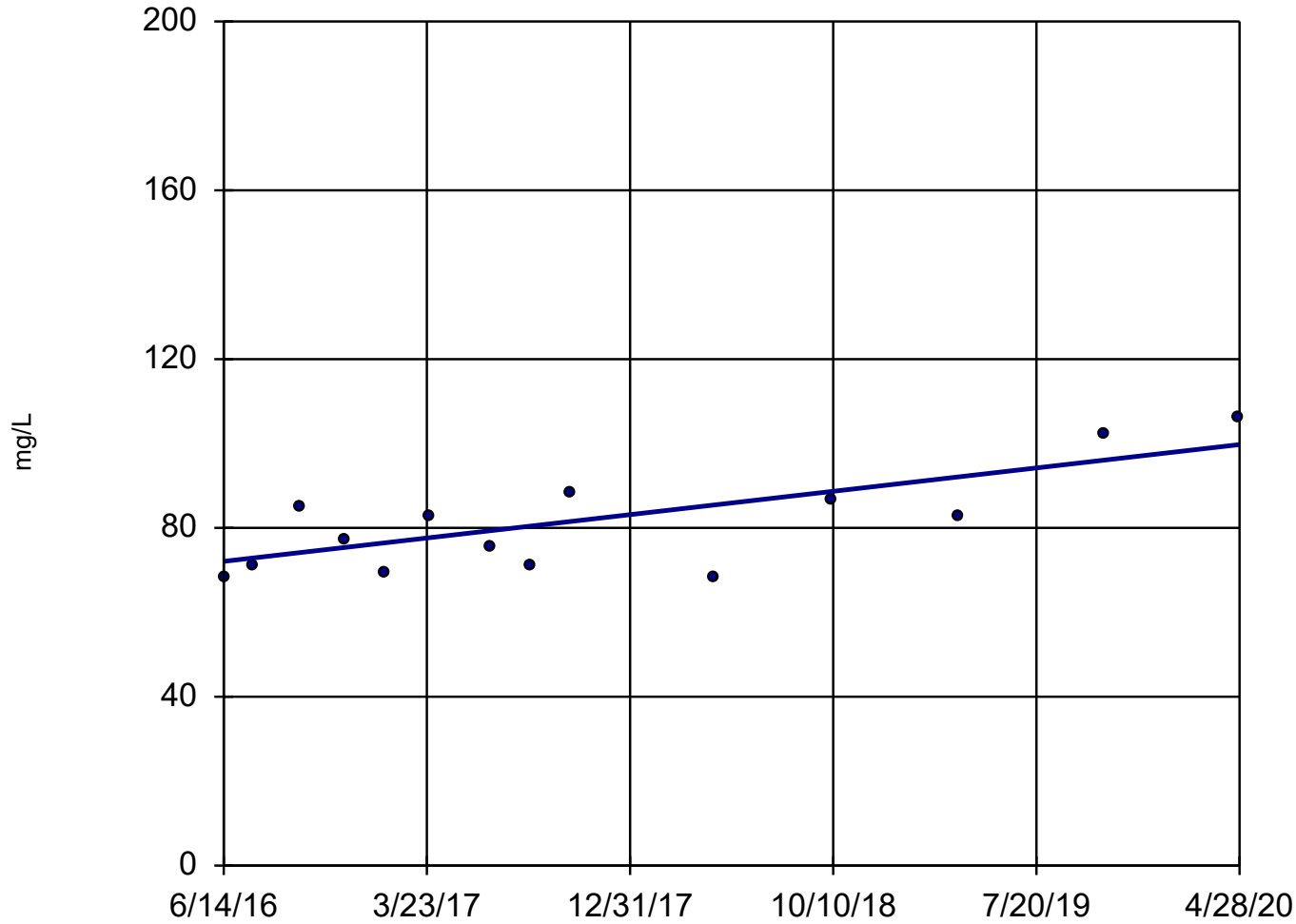
Mann-Kendall  
statistic = 21  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Calcium    Analysis Run 12/28/2021 10:03 AM    View: Trend Test  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

# Sen's Slope Estimator

MW-14



n = 14

Slope = 7.143  
units per year.

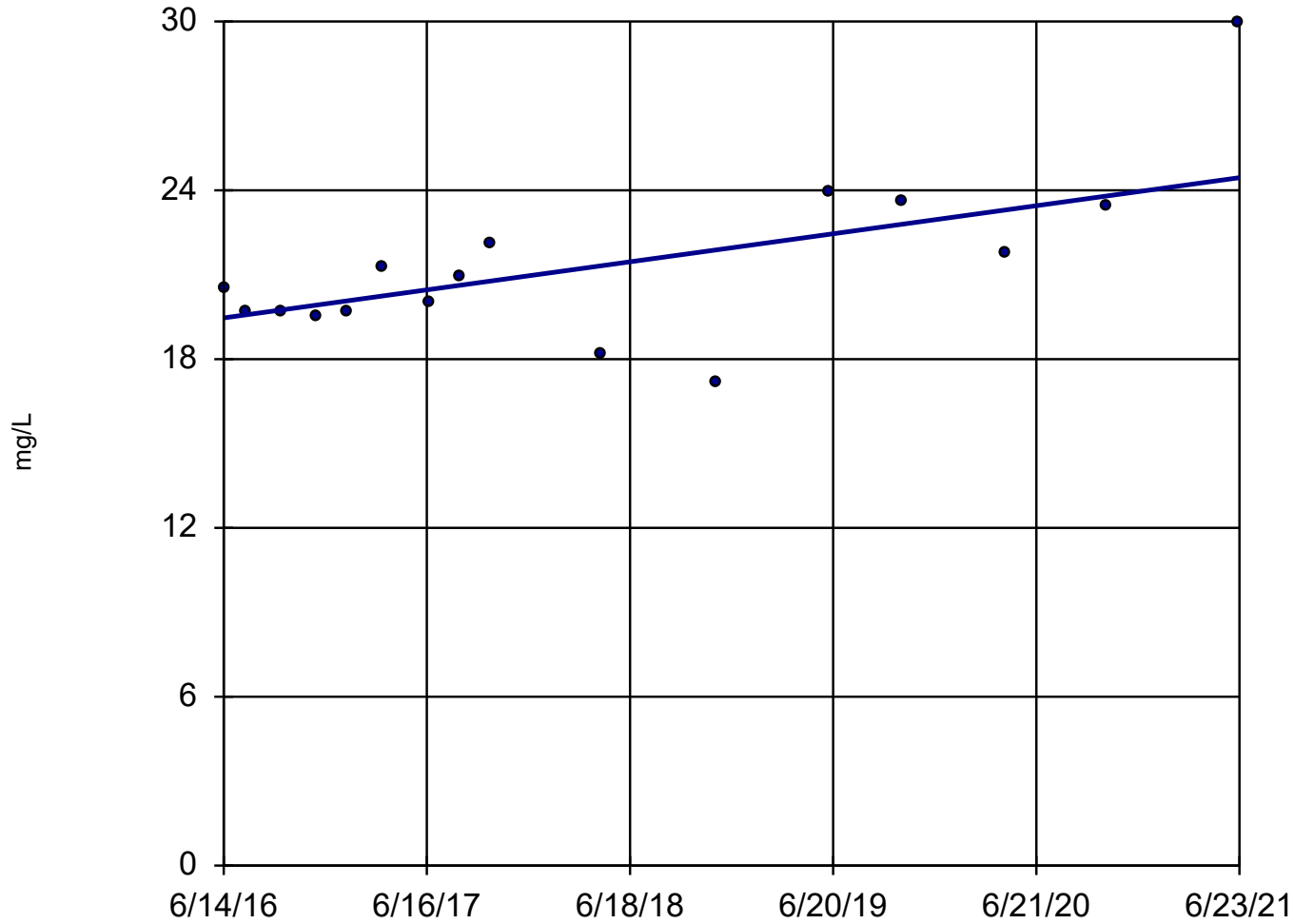
Mann-Kendall  
statistic = 41  
critical = 44

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Calcium Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-15



n = 16

Slope = 0.9906  
units per year.

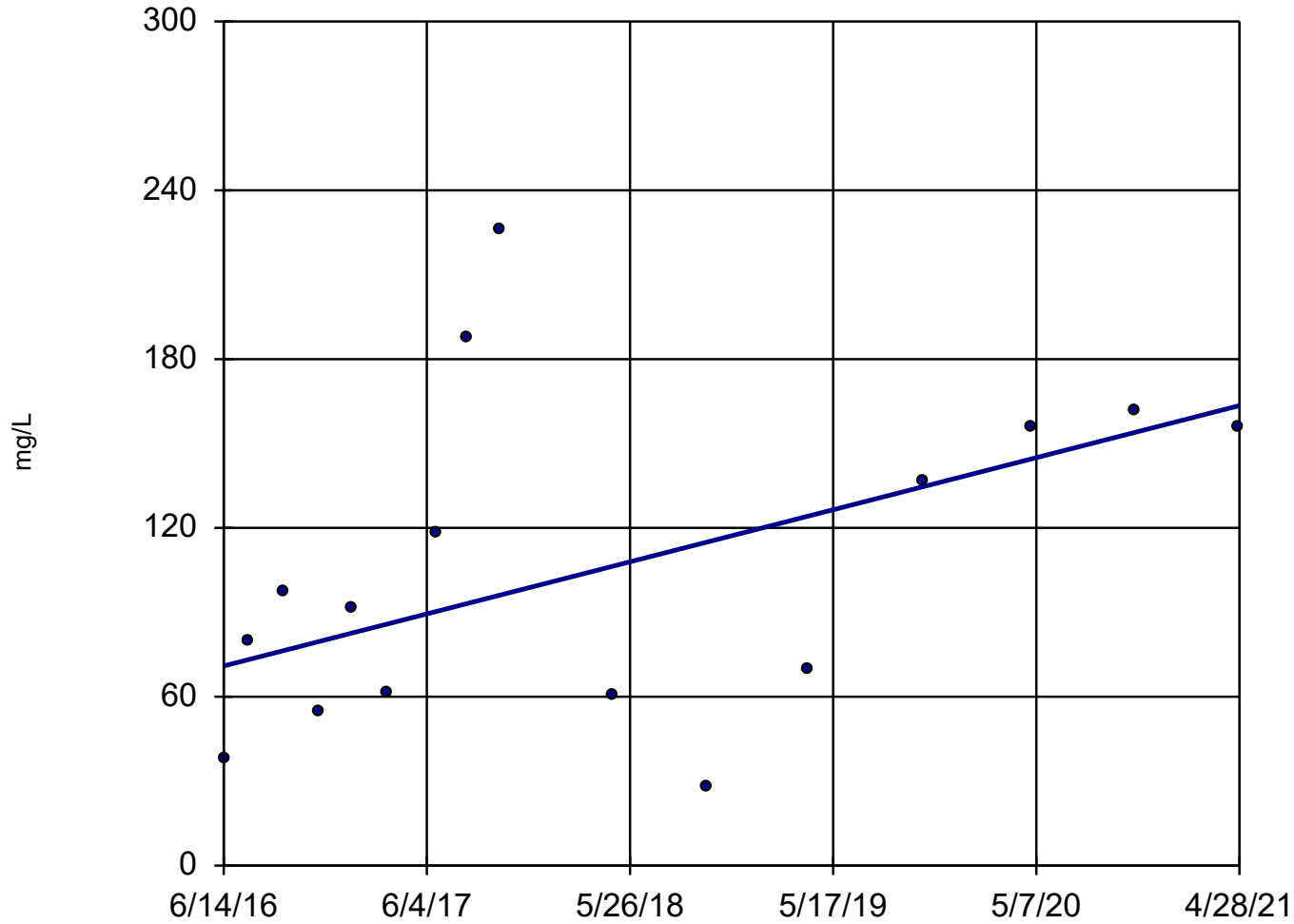
Mann-Kendall  
statistic = 49  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Calcium    Analysis Run 12/28/2021 10:03 AM    View: Trend Test  
Twin Oaks Power Station CCR LF    Client: Major Oak Power    Data: Twin Oaks

# Sen's Slope Estimator

MW-17



n = 16

Slope = 18.98  
units per year.

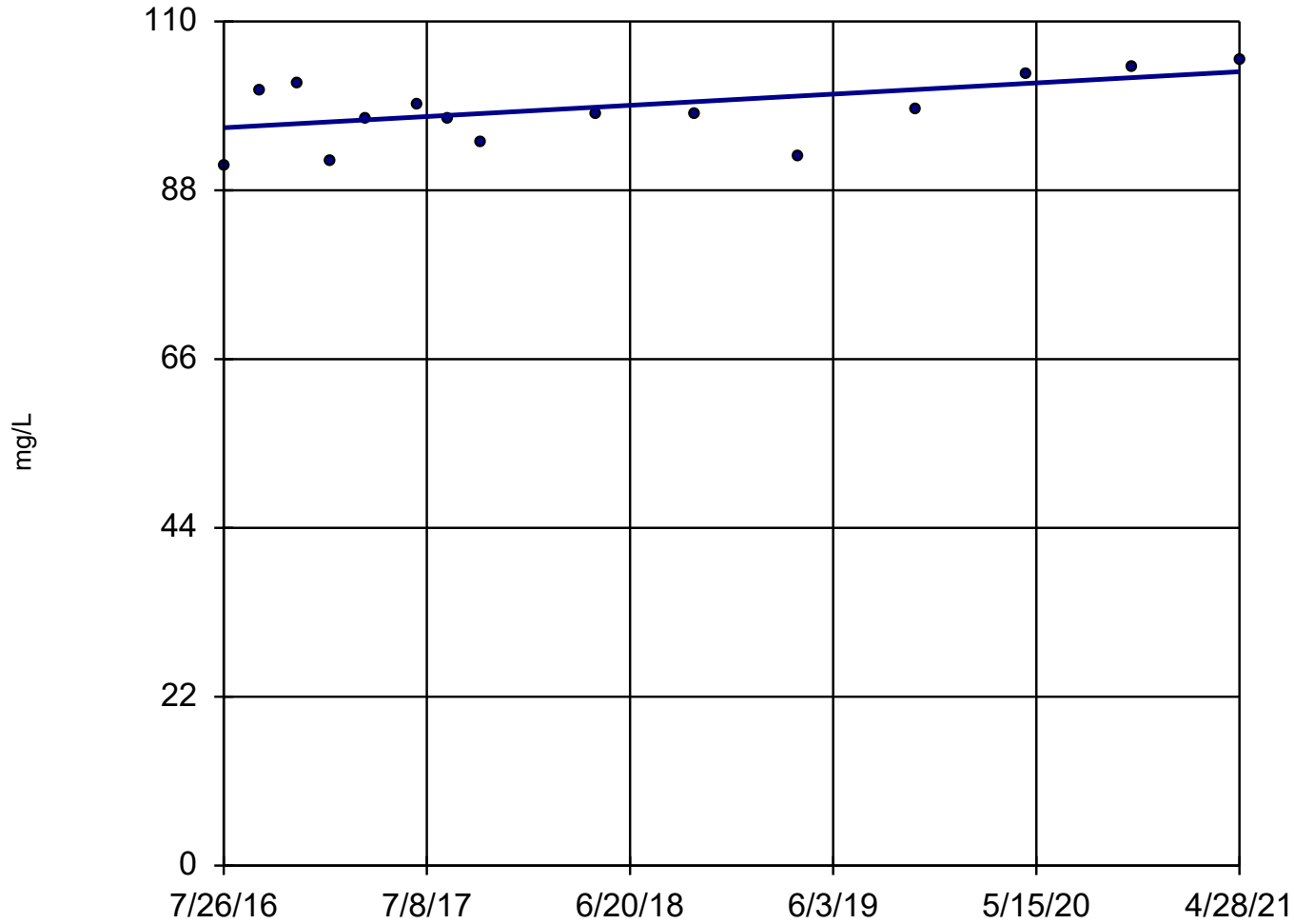
Mann-Kendall  
statistic = 43  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Calcium Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator

MW-13



n = 15

Slope = 1.532  
units per year.

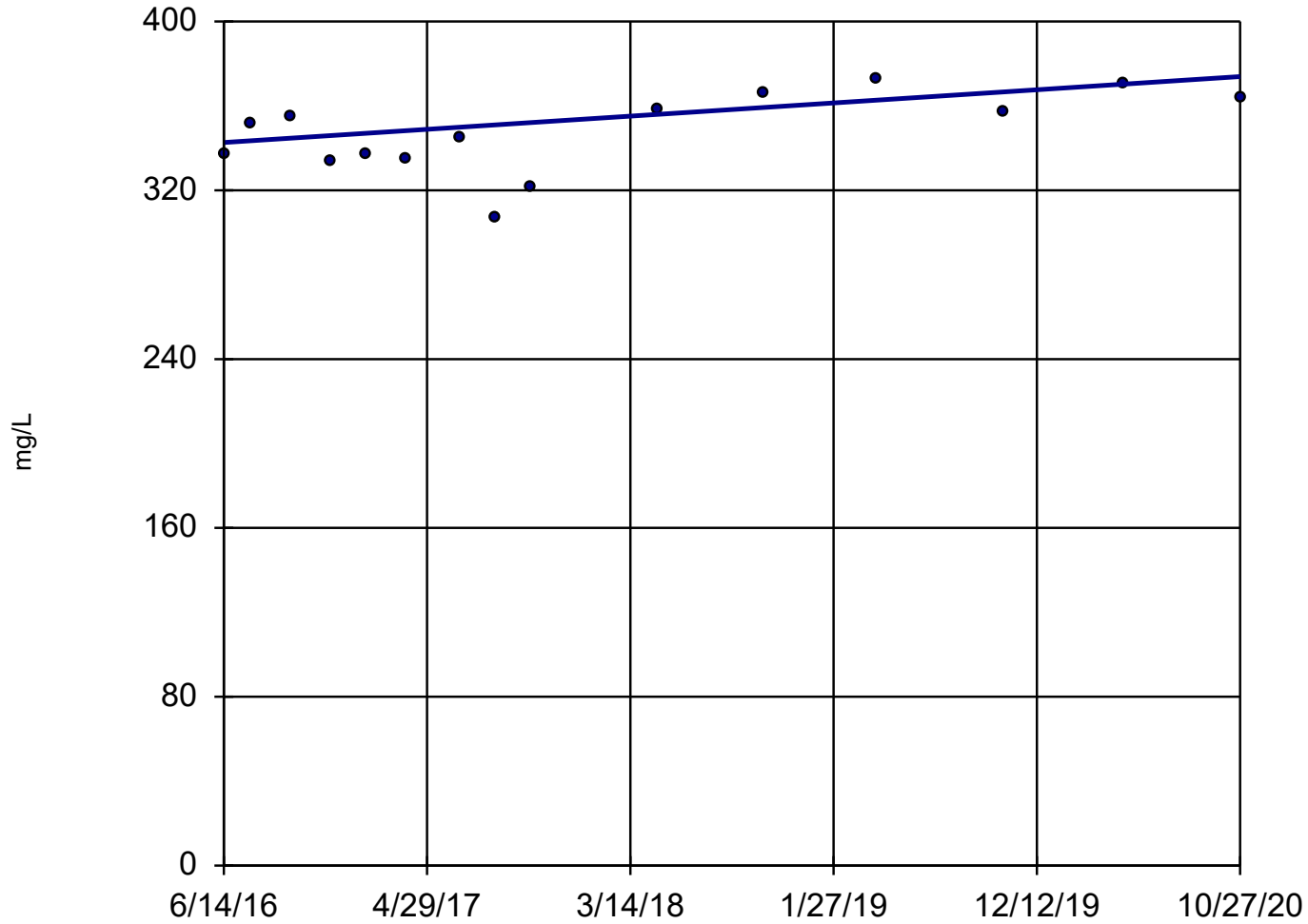
Mann-Kendall  
statistic = 42  
critical = 48

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Chloride Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-14



n = 15

Slope = 7.149  
units per year.

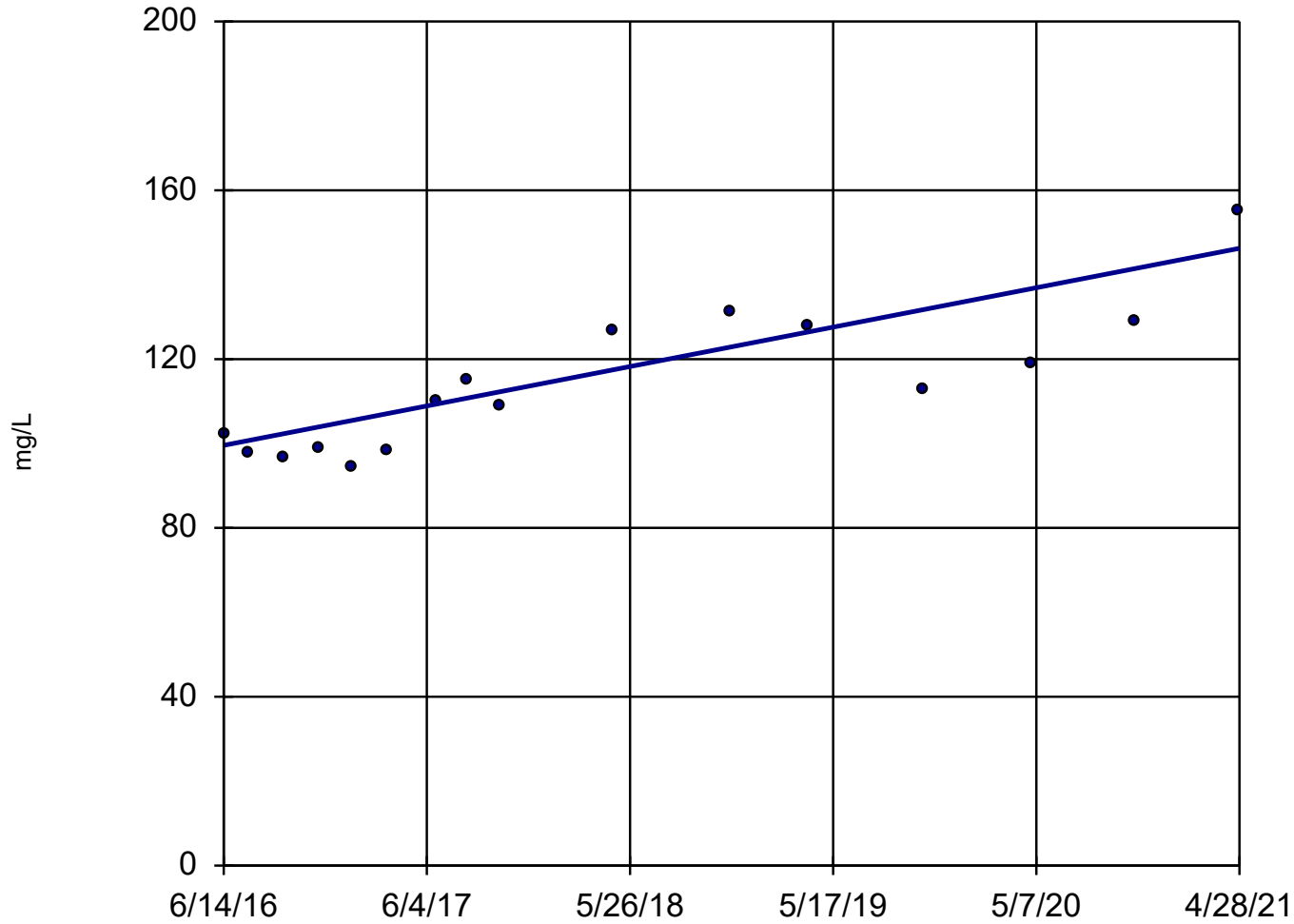
Mann-Kendall  
statistic = 40  
critical = 48

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Chloride Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator

MW-15



n = 16

Slope = 9.575  
units per year.

Mann-Kendall  
statistic = 78  
critical = 53

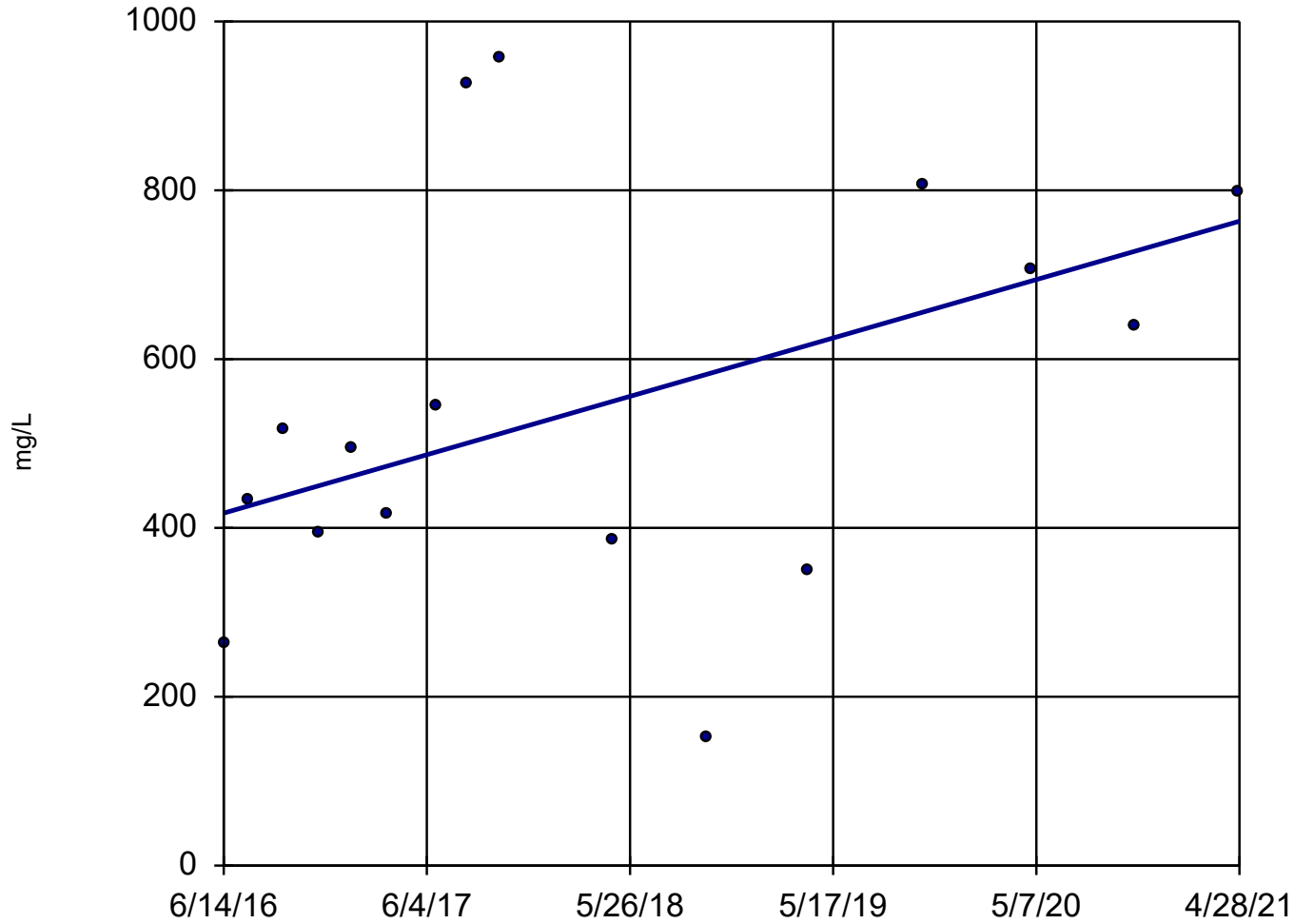
Increasing trend  
significant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Chloride Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



# Sen's Slope Estimator

MW-17



n = 16

Slope = 70.95  
units per year.

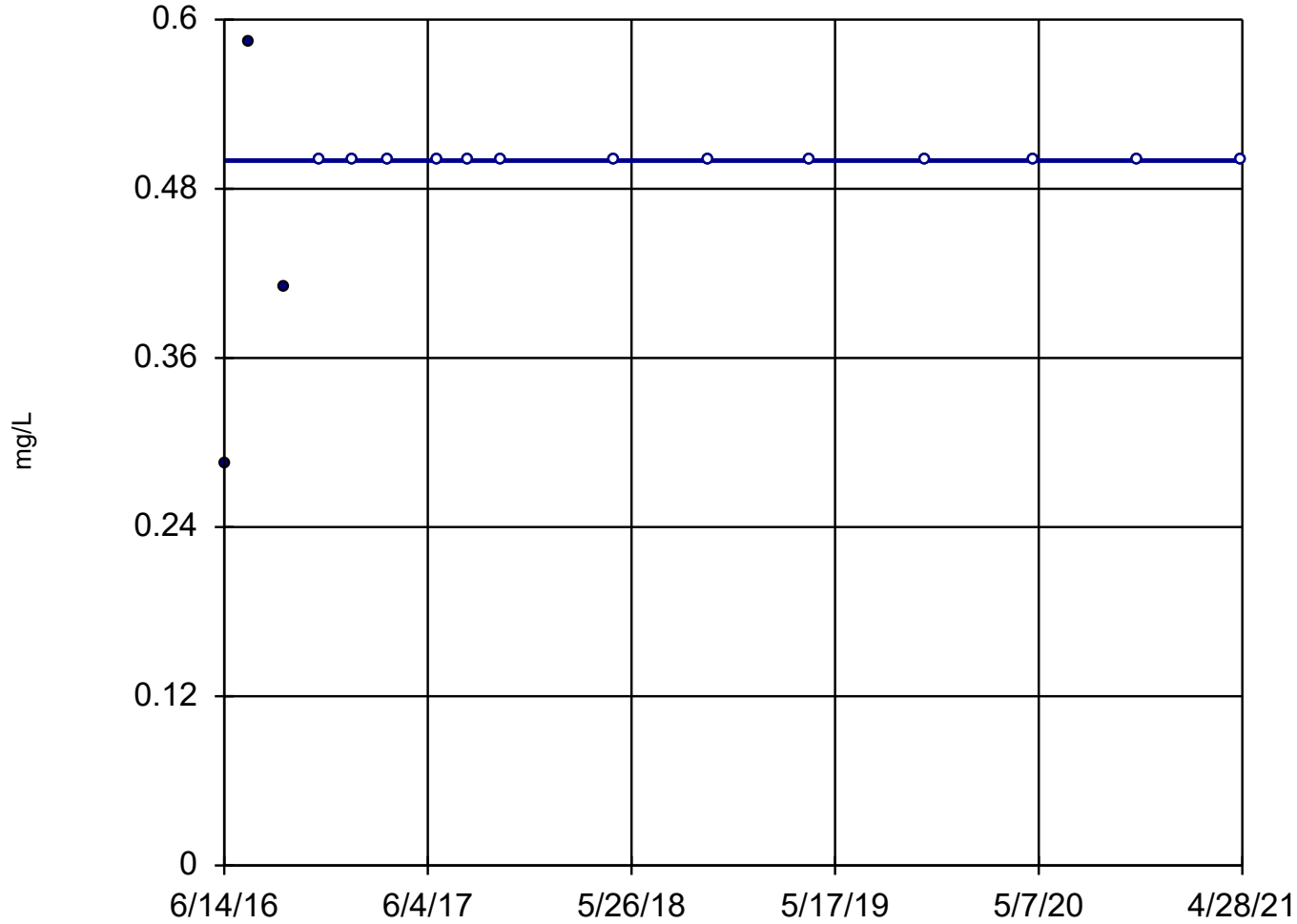
Mann-Kendall  
statistic = 30  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Chloride Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator

MW-13



n = 16

Slope = 0  
units per year.

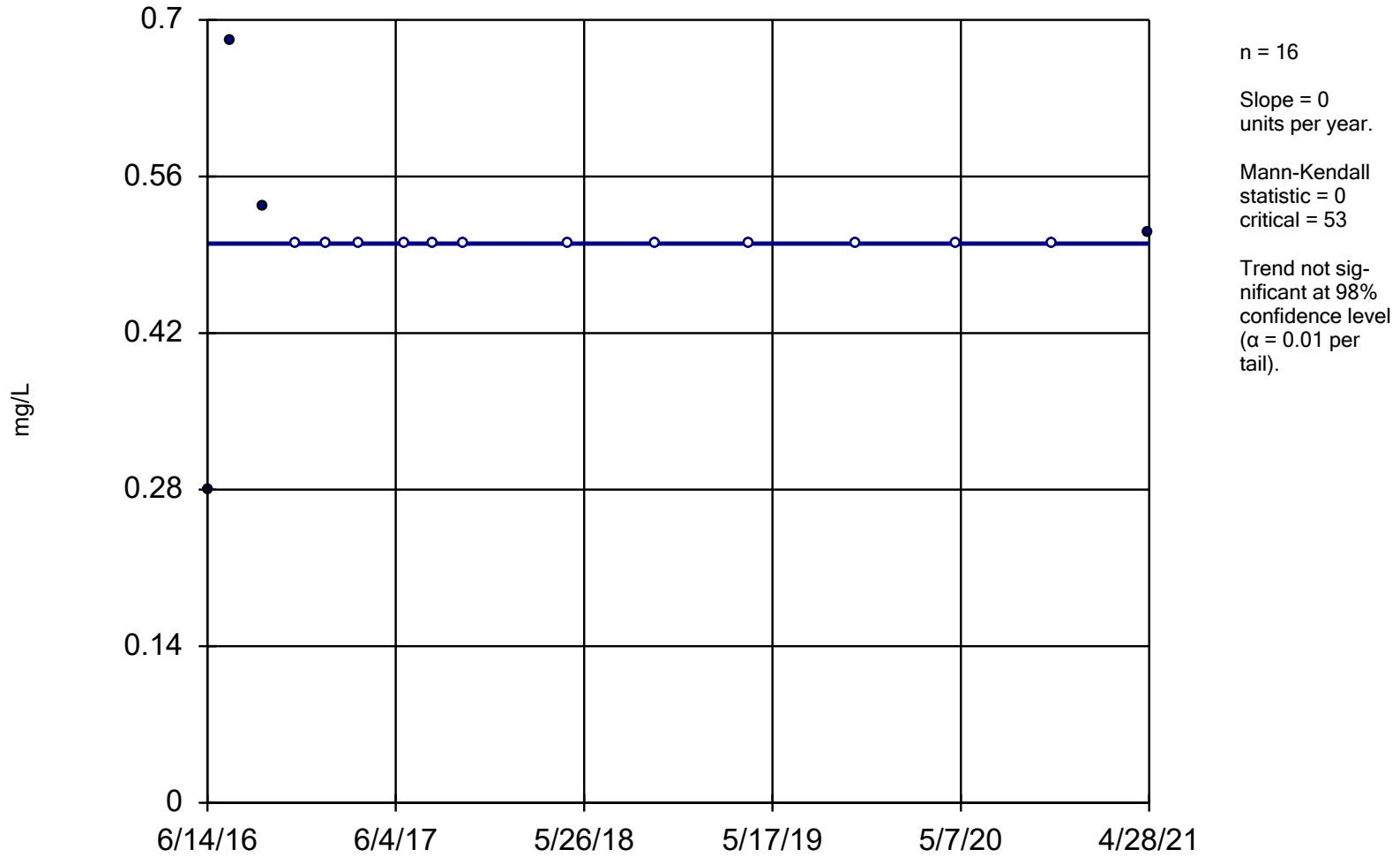
Mann-Kendall  
statistic = 14  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Fluoride Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

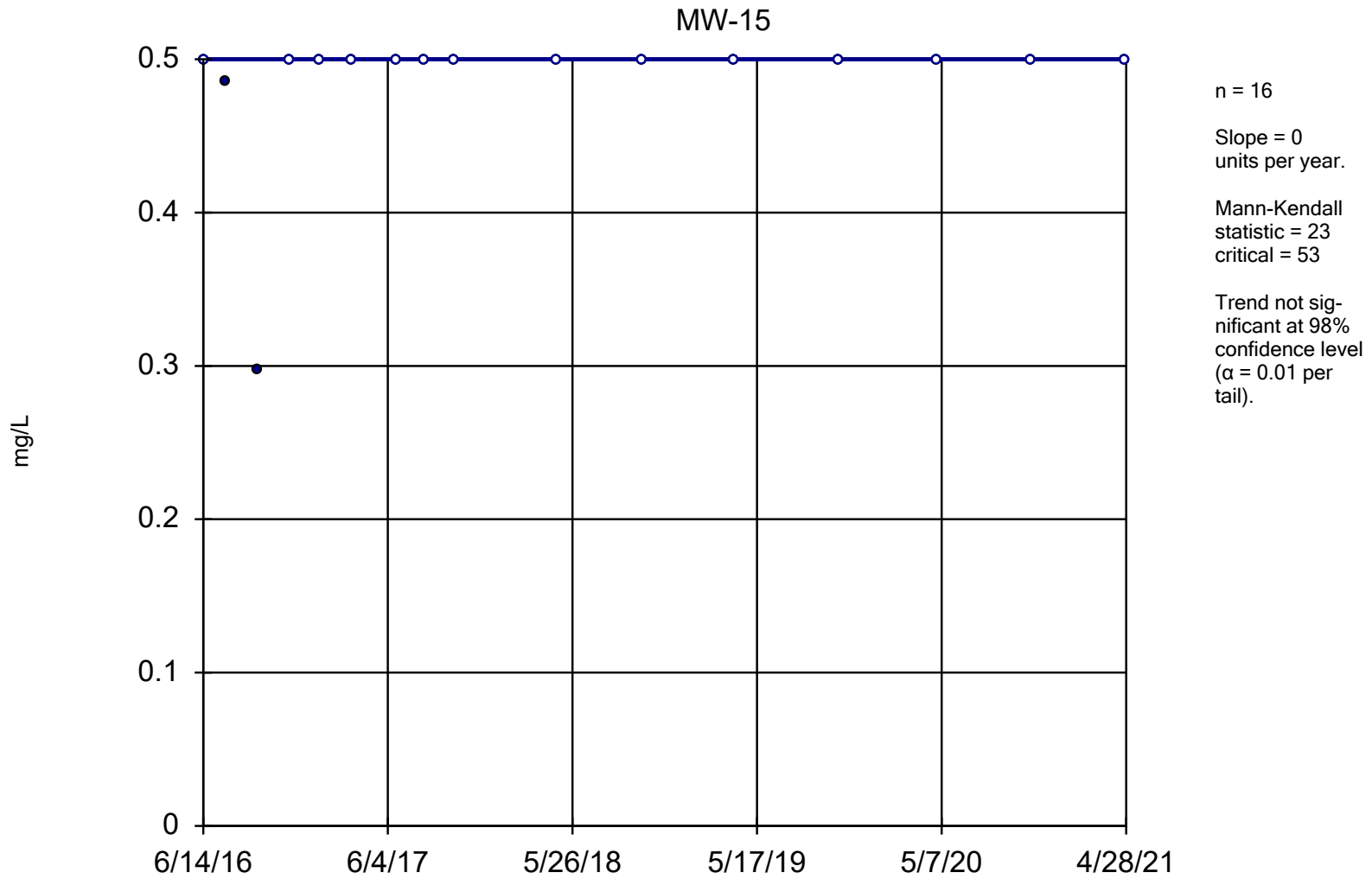
## Sen's Slope Estimator

MW-14



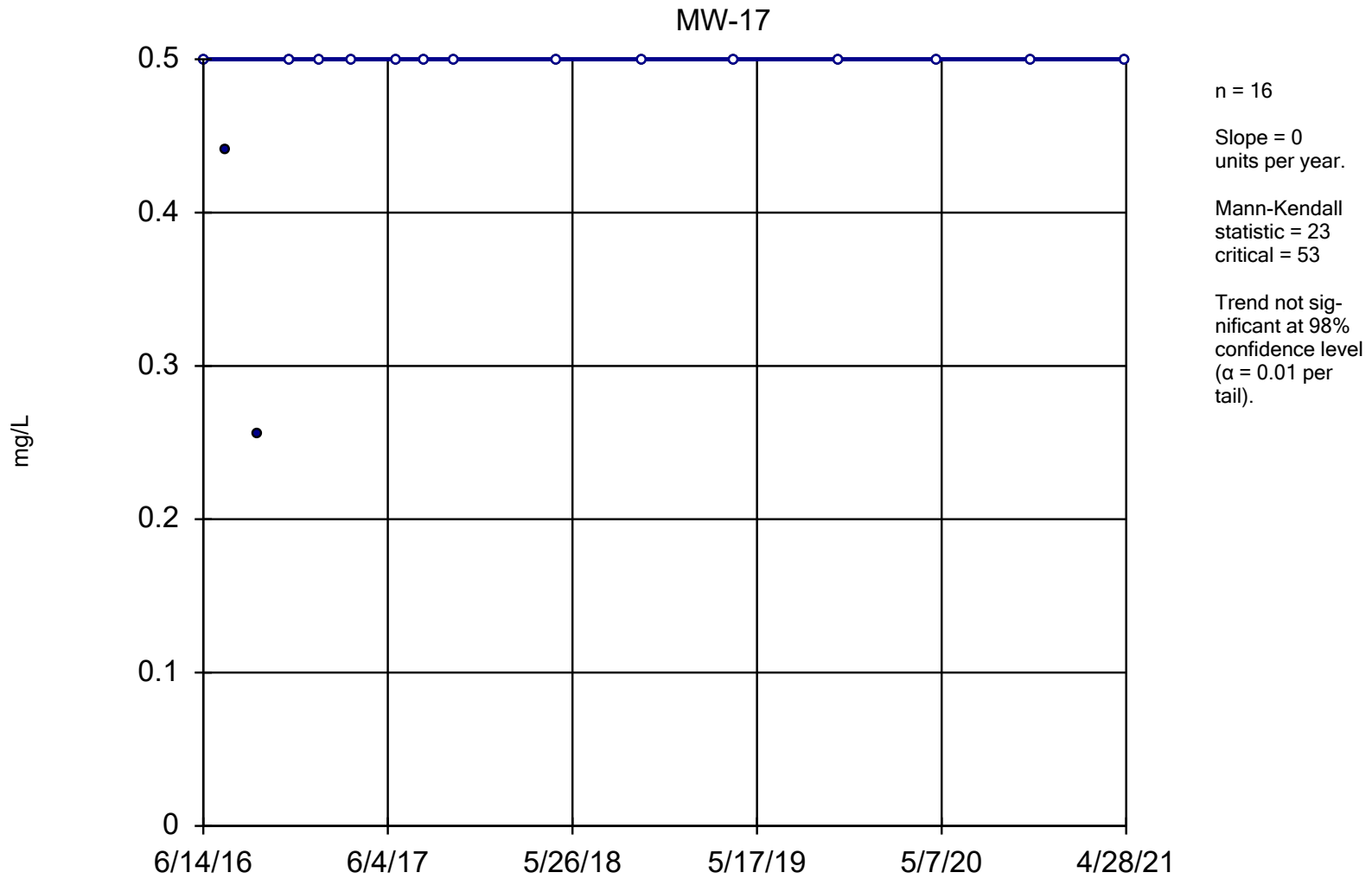
Constituent: Fluoride Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator



Constituent: Fluoride Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

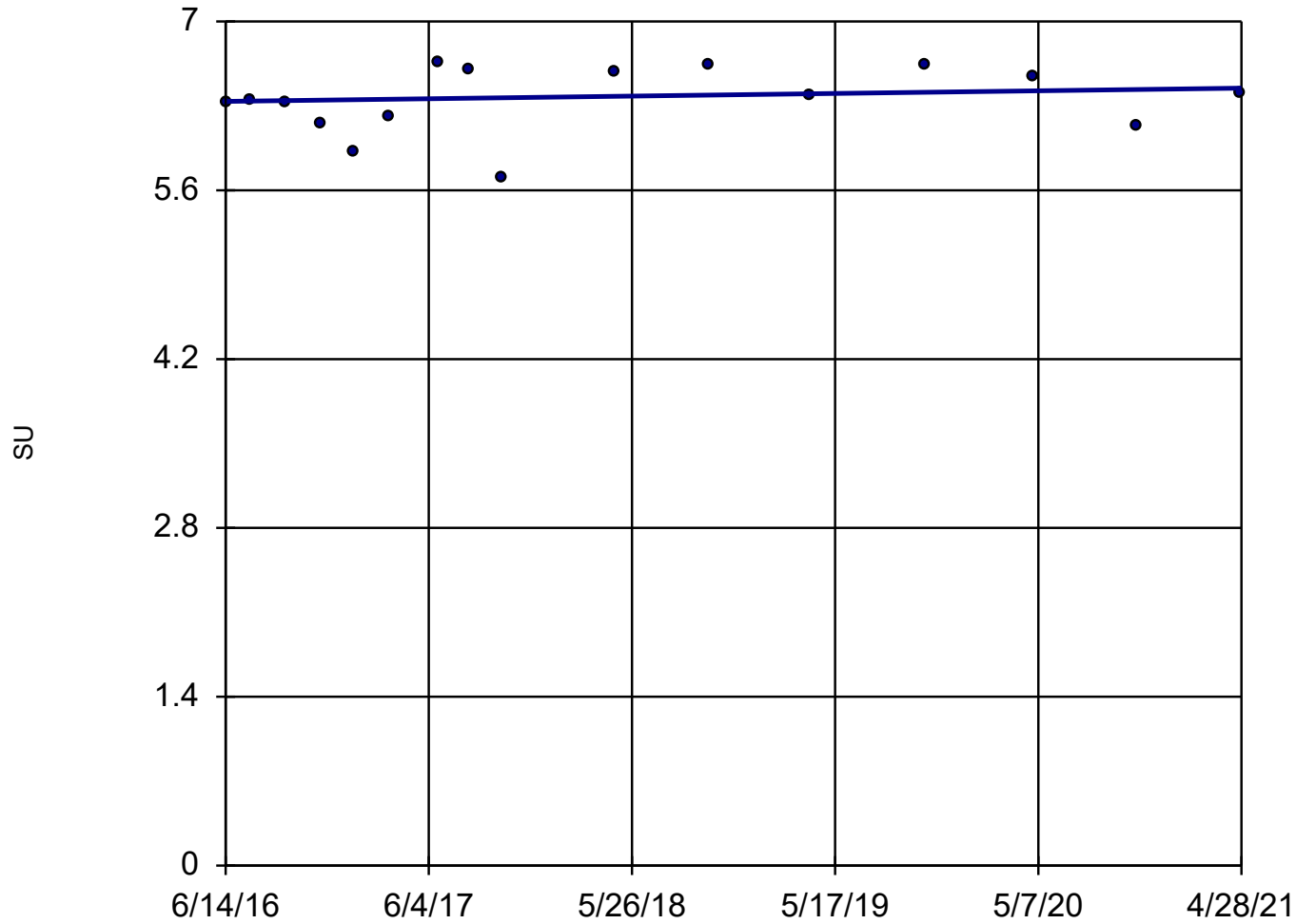
### Sen's Slope Estimator



Constituent: Fluoride Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-13



n = 16

Slope = 0.02261  
units per year.

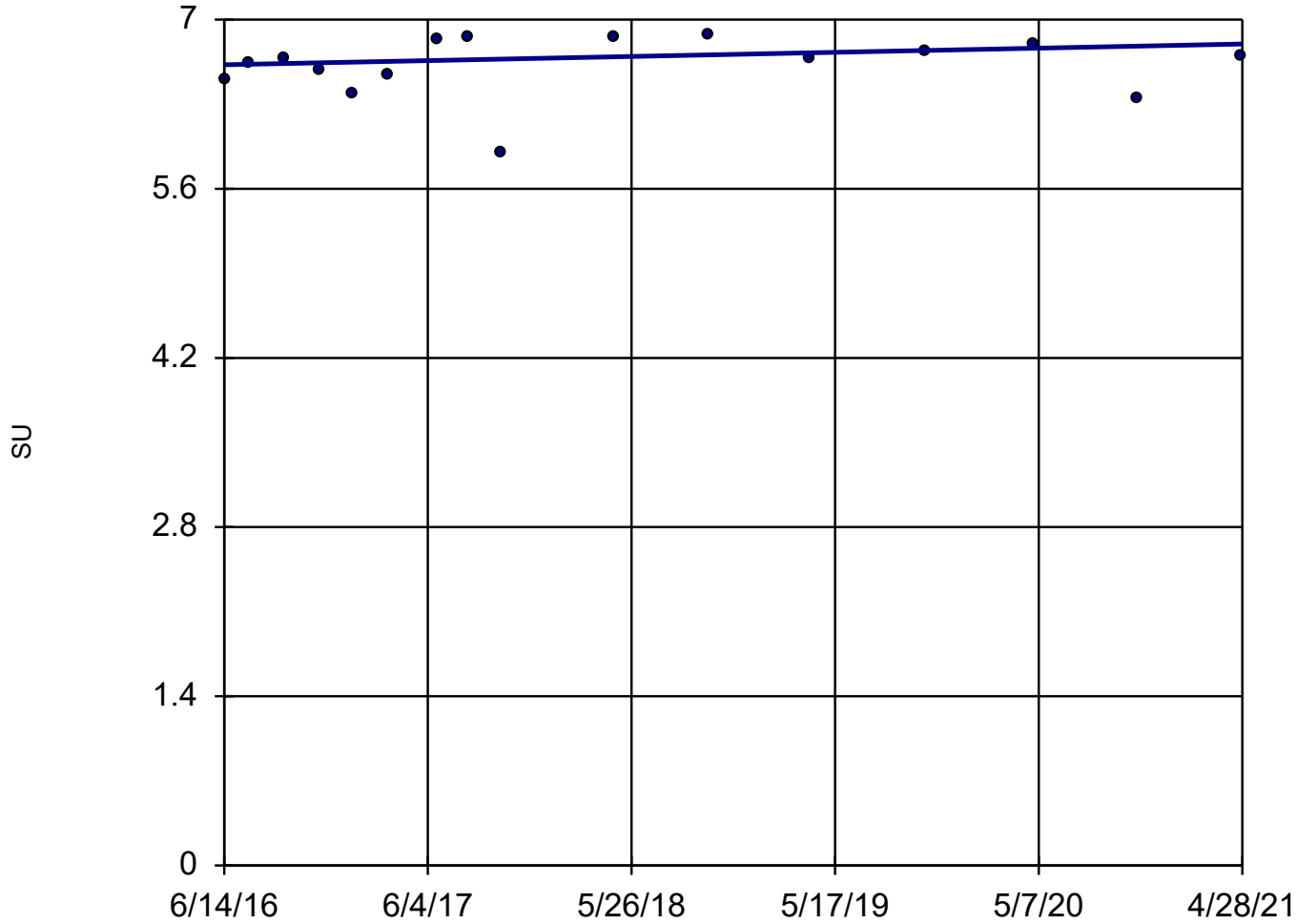
Mann-Kendall  
statistic = 15  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: pH Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-14

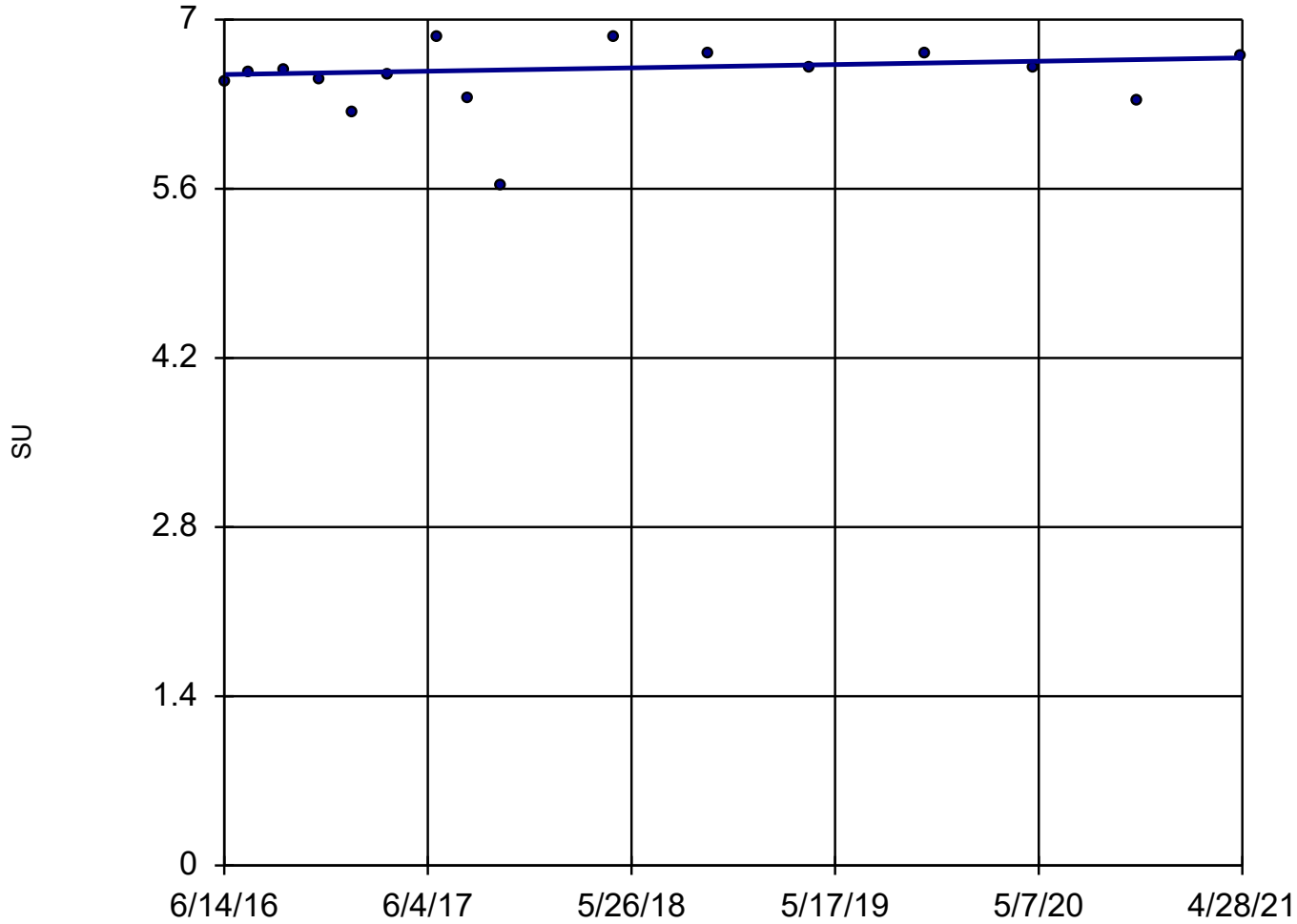


n = 16  
Slope = 0.03518  
units per year.  
Mann-Kendall  
statistic = 21  
critical = 53  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: pH Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-15



n = 16

Slope = 0.02831  
units per year.

Mann-Kendall  
statistic = 19  
critical = 53

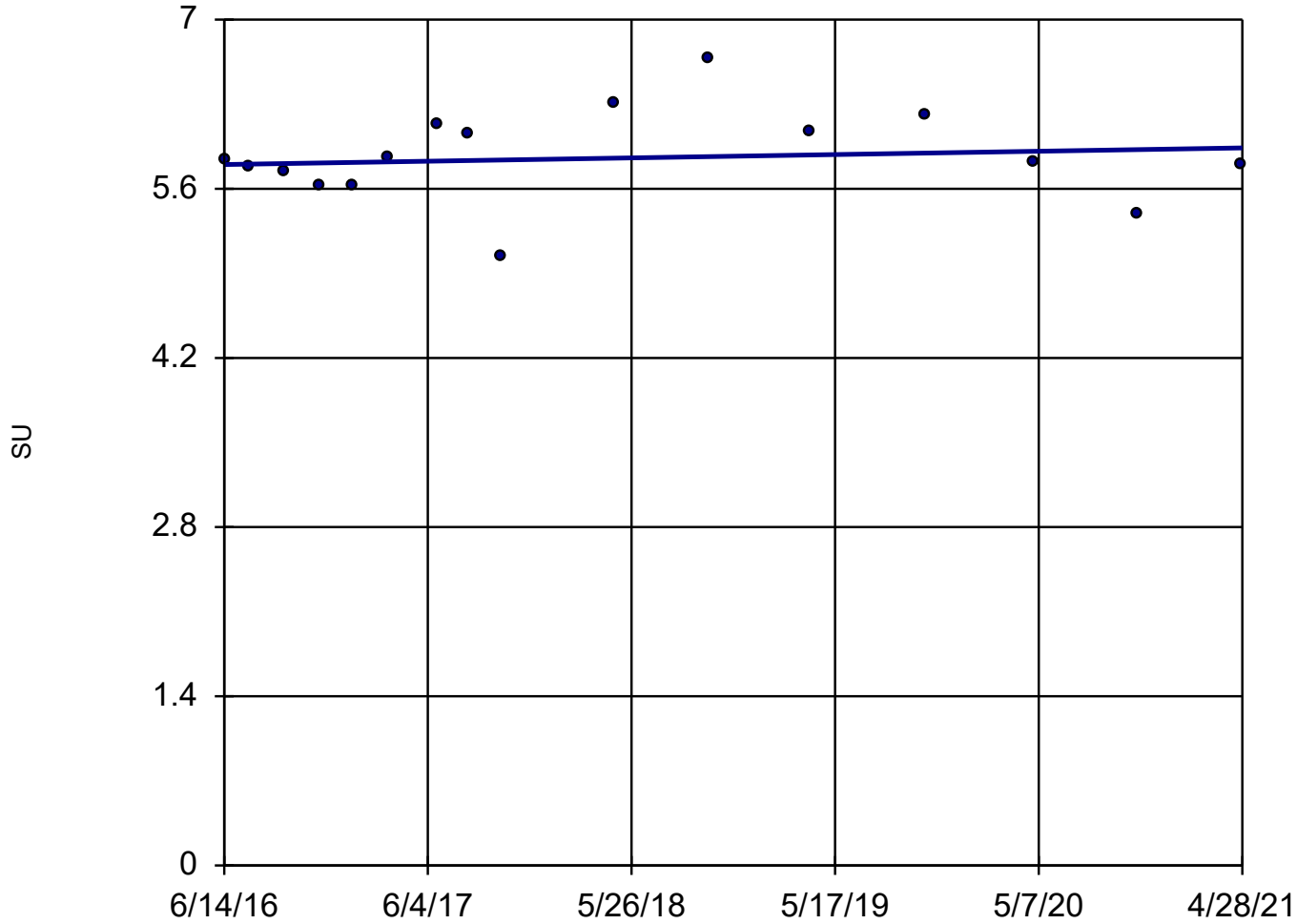
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: pH Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



# Sen's Slope Estimator

MW-17

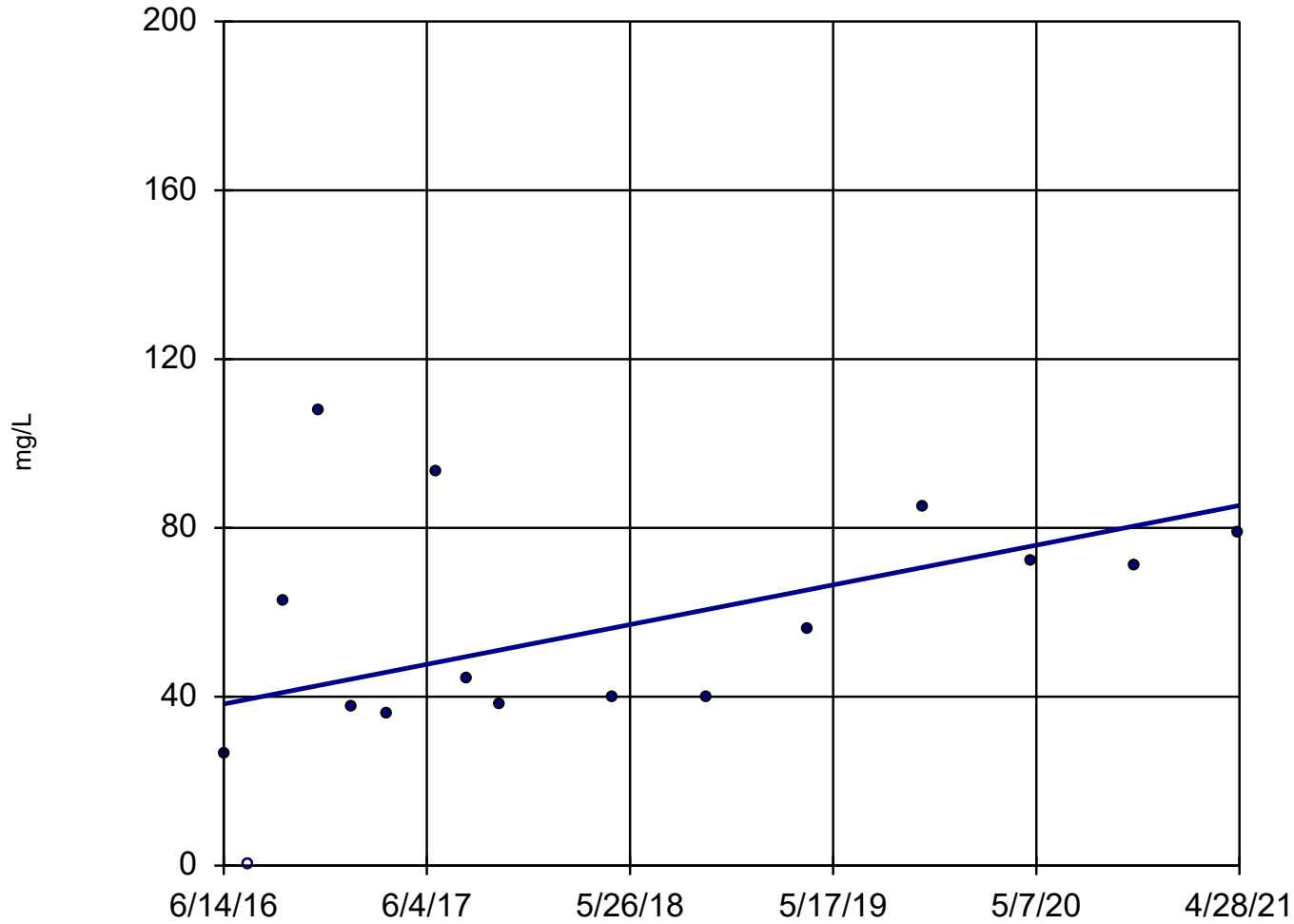


n = 16  
Slope = 0.02829  
units per year.  
Mann-Kendall  
statistic = 12  
critical = 53  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: pH Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator

MW-13



n = 16

Slope = 9.653  
units per year.

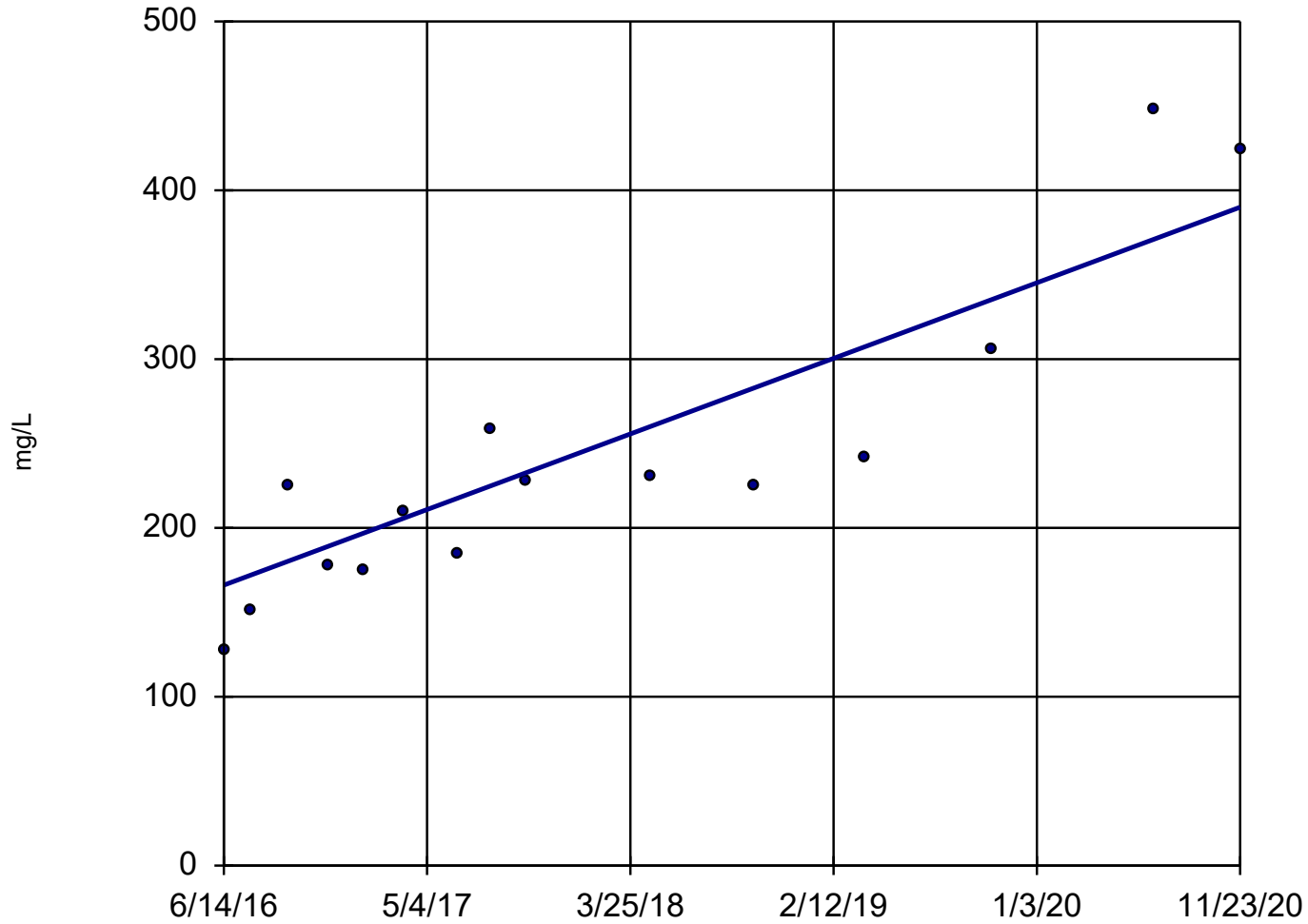
Mann-Kendall  
statistic = 44  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Sulfate Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator

MW-14



n = 15

Slope = 50.36  
units per year.

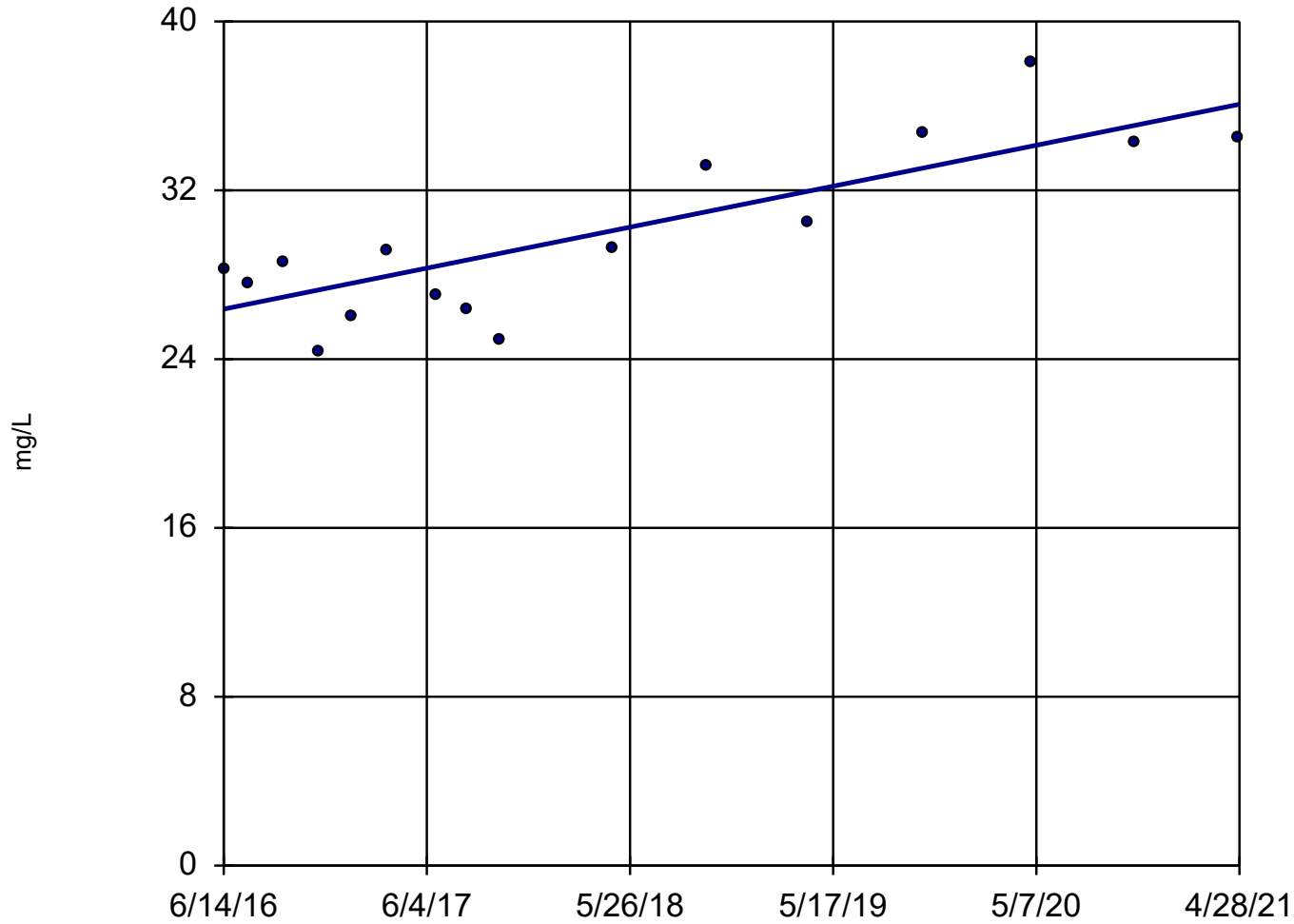
Mann-Kendall  
statistic = 78  
critical = 48

Increasing trend  
significant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Sulfate Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

# Sen's Slope Estimator

MW-15

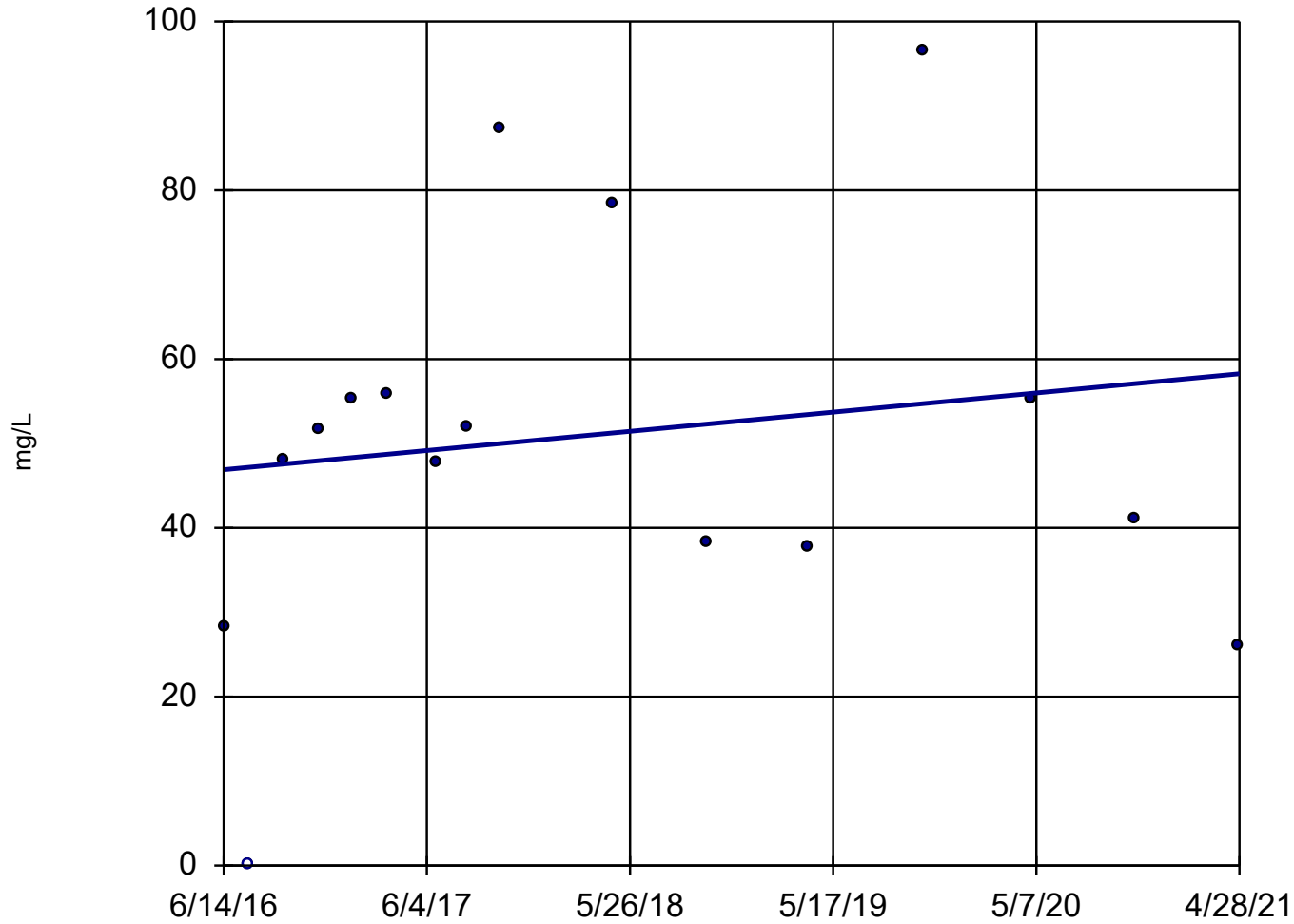


n = 16  
Slope = 1.992 units per year.  
Mann-Kendall statistic = 64  
critical = 53  
Increasing trend significant at 98% confidence level ( $\alpha = 0.01$  per tail).

Constituent: Sulfate Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator

MW-17



n = 16

Slope = 2.333  
units per year.

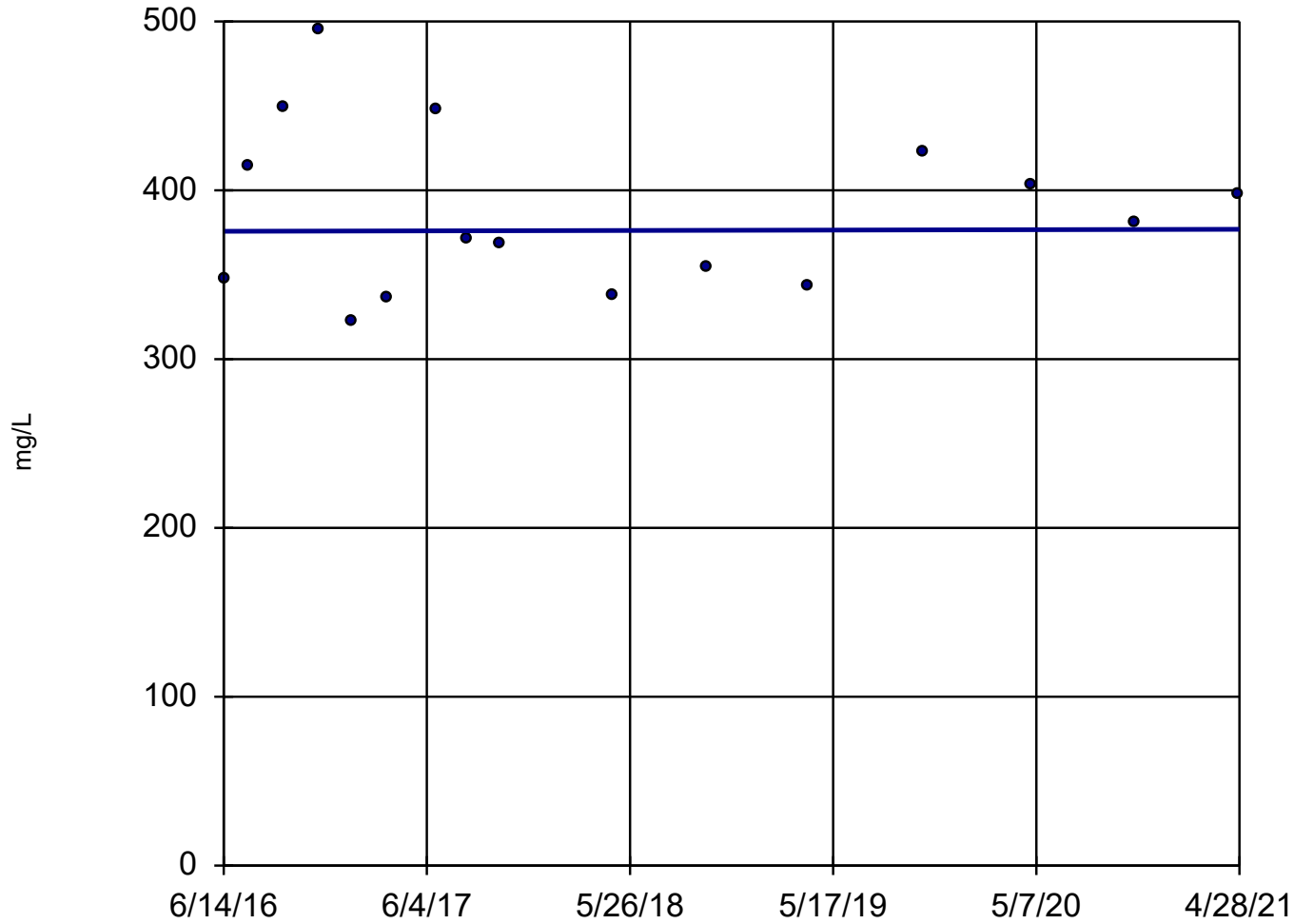
Mann-Kendall  
statistic = 13  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Sulfate Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator

MW-13



n = 16

Slope = 0.2454  
units per year.

Mann-Kendall  
statistic = 0  
critical = 53

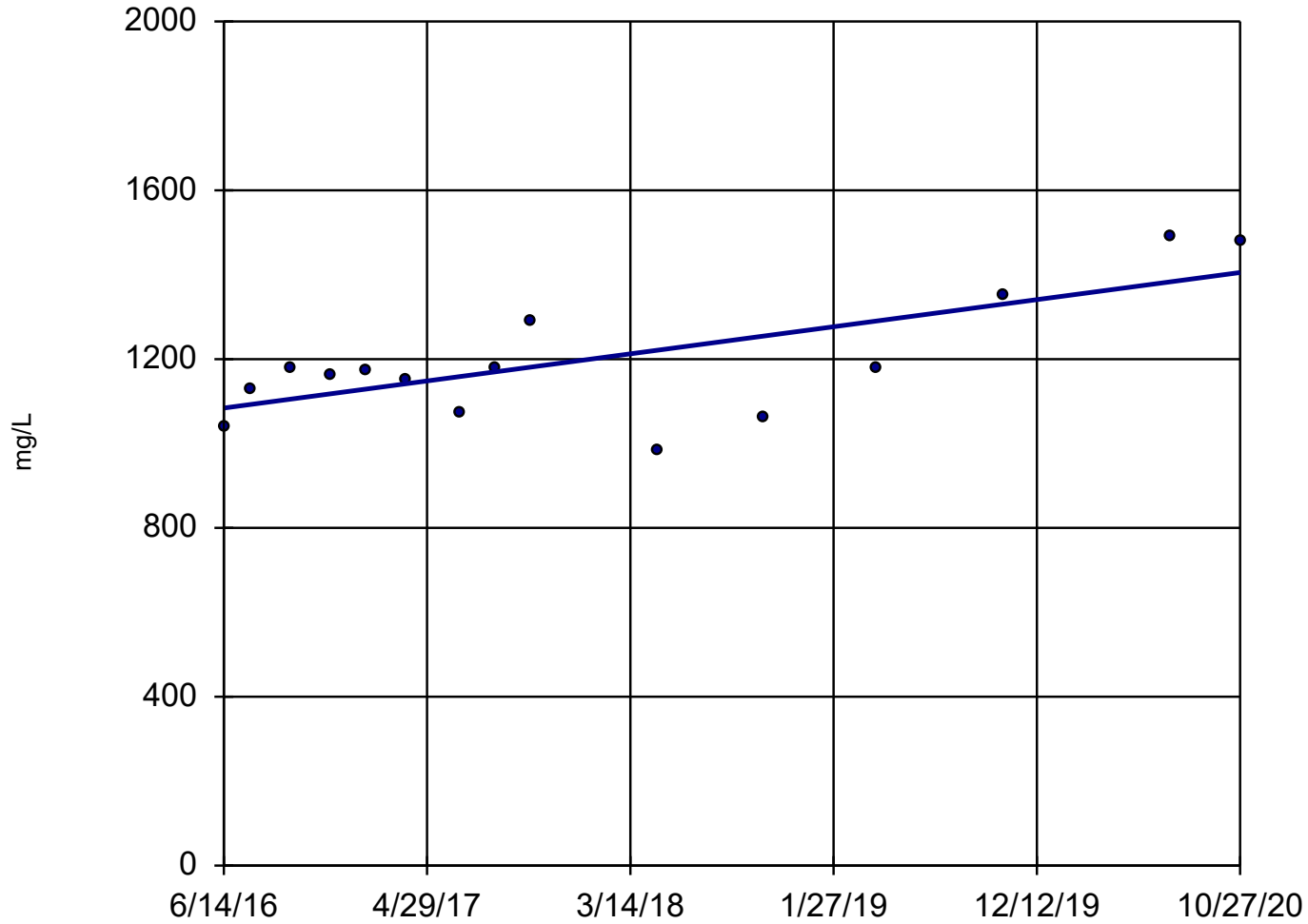
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Total Dissolved Solids Analysis Run 12/28/2021 10:03 AM View: Trend Test

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

### Sen's Slope Estimator

MW-14

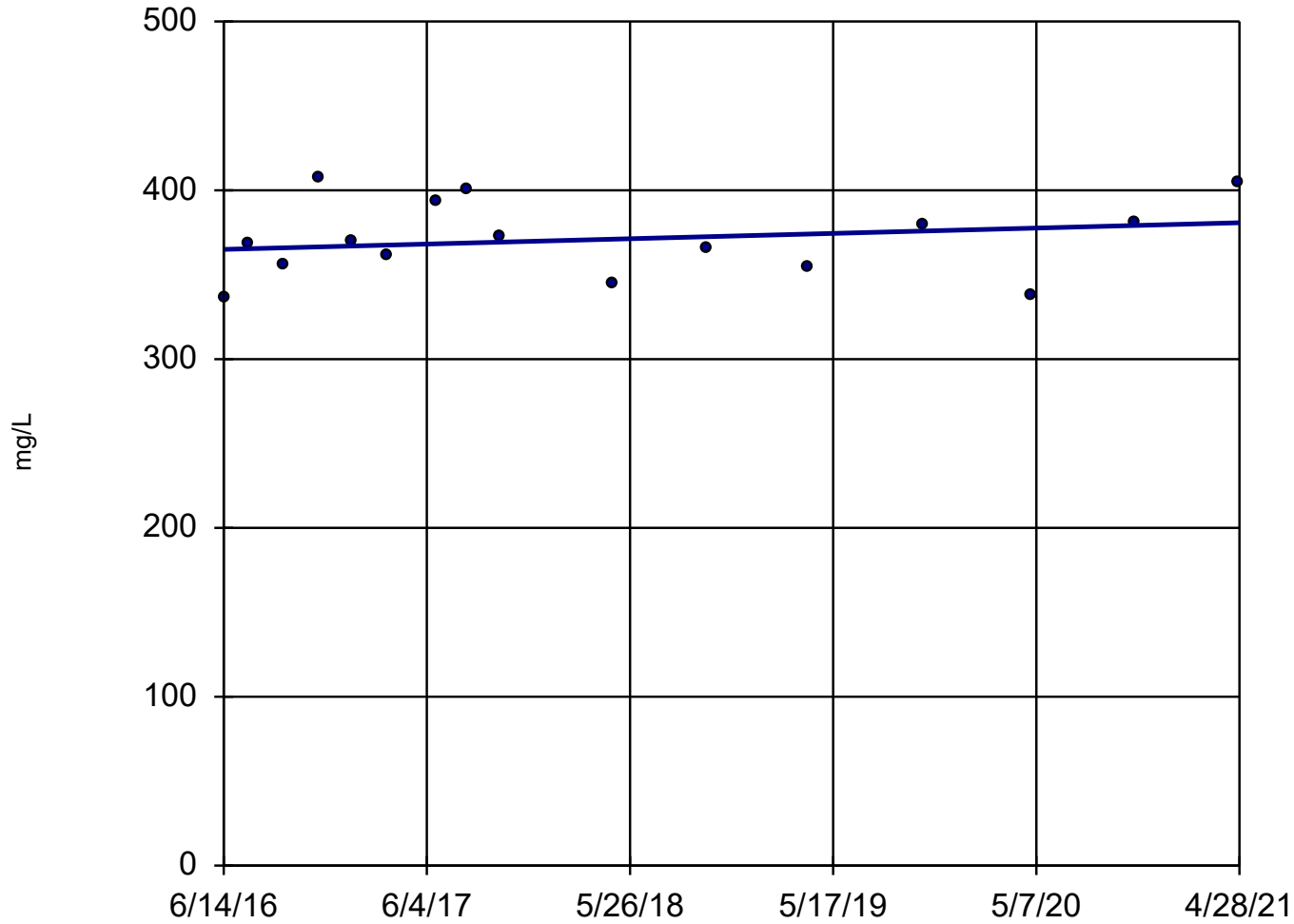


n = 15  
Slope = 73.44  
units per year.  
Mann-Kendall  
statistic = 44  
critical = 48  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Total Dissolved Solids Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks

## Sen's Slope Estimator

MW-15



n = 16

Slope = 3.248  
units per year.

Mann-Kendall  
statistic = 16  
critical = 53

Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

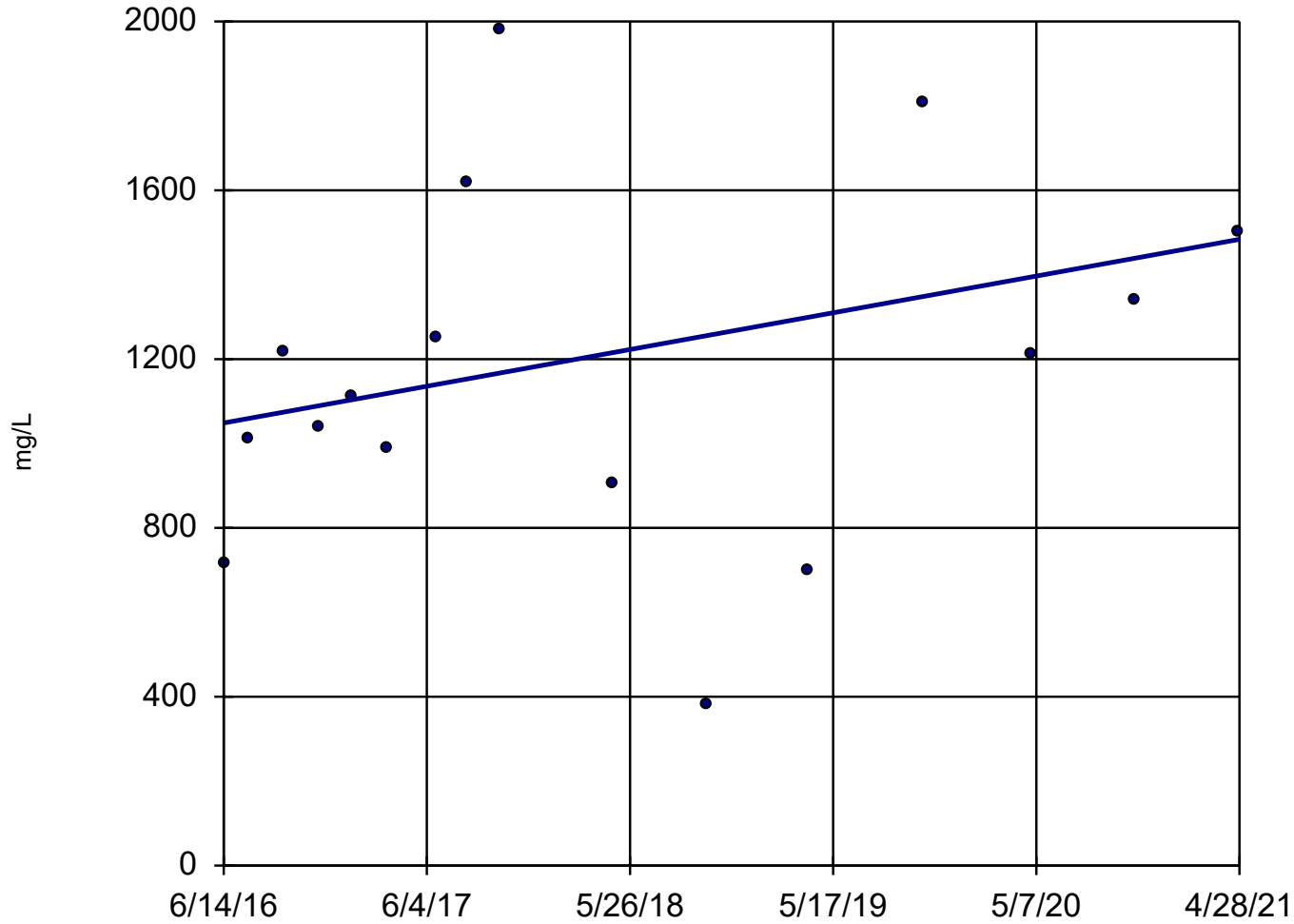
Constituent: Total Dissolved Solids Analysis Run 12/28/2021 10:03 AM View: Trend Test

Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks



# Sen's Slope Estimator

MW-17



n = 16  
Slope = 89.22  
units per year.  
Mann-Kendall  
statistic = 28  
critical = 53  
Trend not sig-  
nificant at 98%  
confidence level  
( $\alpha = 0.01$  per  
tail).

Constituent: Total Dissolved Solids Analysis Run 12/28/2021 10:03 AM View: Trend Test  
Twin Oaks Power Station CCR LF Client: Major Oak Power Data: Twin Oaks