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**RECEIVED**  
**JUN 17 2021**  
**DEPARTMENT OF**  
**ENVIRONMENTAL MANAGEMENT**  
**OFFICE OF LAND QUALITY**

June 10, 2021

Ms. Alys Hopkins  
Indiana Department of Environmental Management  
Office of Land Quality - Solid Waste Permits  
100 N. Senate Avenue  
MC 65-45, Rm. 1154  
Indianapolis, IN 46204-2251

Subject: 2021 Semi-Annual Ground Water Monitoring Report  
Georgia-Pacific Consumer Products, LLC  
Process Residual Lagoons, Permit 45-UP-03  
Gary, Indiana

Dear Ms. Hopkins:

The enclosed report summarizes results of the Semi-Annual Ground Water Monitoring conducted on April 22, 2021 at the Georgia-Pacific, LLC (GP) Closed Process Residual Lagoons in Gary, Indiana. The preparer of the report, Tetra Tech, is duly authorized to sign the enclosed document on behalf of GP, the permittee, in accordance with 329 IAC 10-11-3(b). The information provided in the report is consistent with the requirements of Section D in the July 28, 2010 Revised Closure/Post-Closure Plan Approval letter from the Indiana Department of Environmental Management (IDEM).

Results of the groundwater monitoring indicated several statistically significant trends observed, however only one exceeded background tolerance concentrations: chloride at B-3R. A description of the groundwater monitoring program, sampling procedures, and statistical analysis are included in the report.

Upgradient monitoring well B-7 continues to contain light non-aqueous phase liquid (LNAPL). The source of the LNAPL was previously determined to be an off-site facility north of the site. During the Semi-Annual Ground Water Monitoring event the LNAPL layer extended to the bottom of the screen and B-7 was unable to be sampled.

Please contact me at [jiholmes@gapac.com](mailto:jiholmes@gapac.com) or 404.652.7461 if you have any questions or comments regarding the enclosed groundwater monitoring report.

Sincerely,

Jim Holmes  
Senior Remediation Project Manager

Enclosed: 2021 Semi-Annual Ground Water Monitoring Report  
45\_UP\_03\_GP\_Gary\_EDD.txt

cc: Troy Weaver, Geologist, IDEM  
Diane Poe, Administrative Assistant, IDEM  
[olqdata@idem.in.gov](mailto:olqdata@idem.in.gov)

# **2021 Semi-Annual Groundwater Monitoring Report**

Georgia-Pacific LLC  
Closed Process Residual Lagoons  
Permit Number 45-UP-03  
Gary, Indiana 46404



**June 10, 2021**

# 2021 Semi-Annual Groundwater Monitoring Report

Georgia-Pacific LLC  
Closed Process Residual Lagoons  
Permit Number 45-UP-03  
Gary, Indiana 46404

Prepared for:

Georgia-Pacific LLC  
133 Peachtree Street, NE  
Atlanta, Georgia 30303

Prepared by:

Tetra Tech  
710 Avis Drive, Suite 100  
Ann Arbor, MI 48108

**June 10, 2021**

*In accordance with 329 IAC 10-11-3(d), I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further certify that I am authorized to submit this information.*



---

Daniel Sopoci, CHMM  
Program Manager  
Tetra Tech



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Ben Giese  
Project Manager  
Tetra Tech

## TABLE OF CONTENTS

<b>1. INTRODUCTION .....</b>	<b>1</b>
1.1 Site Description .....	2
1.2 Guidance Documents.....	2
<b>2. GROUNDWATER MONITORING PROGRAM .....</b>	<b>3</b>
2.1 Groundwater Elevations and Flow Direction .....	3
2.2 Monitoring Well Sampling Procedures .....	3
2.3 Laboratory Analysis.....	4
<b>3. GROUNDWATER DATA EVALUATION .....</b>	<b>5</b>
3.1 Statistical Trend Analysis of Data Sets .....	5
3.2 Statistical Comparison to Background Levels .....	5
<b>4. SUMMARY AND RECOMMENDATIONS.....</b>	<b>7</b>
<b>5. REFERENCES .....</b>	<b>8</b>

### TABLES

Table 1	Static Groundwater Level Measurements and Elevations
Table 2	Summary of Analytical Results
Table 3	Trend Analysis Summary

### FIGURES

Figure 1	Site Location
Figure 2	Site Layout
Figure 3	Potentiometric Surface Map – April 2021

### APPENDICES

Appendix A	Groundwater Sampling Field Forms
Appendix B	Laboratory Report and Chain of Custody Documents
Appendix C	Statistical Analysis

## 1. INTRODUCTION

On behalf of Georgia-Pacific LLC (GP), Tetra Tech Inc. completed semi-annual groundwater monitoring at the closed process residual lagoons (Site), permit number 45-UP-03, on April 22, 2021. The lagoons operated from 1969 to 1983 to remove paper residuals from wastewater generated at the former GP mill located a quarter-mile east of the site. The site includes two 6.5-acre lagoons and 13 acres of surrounding land. The July 28, 2010 *Approval of Revised Closure/Post-Closure* (Approval) prepared by the Indiana Department of Environmental Management (IDEM) approved the *Revised Closure/Post-Closure Plan* submitted on April 21, 2010 and June 7, 2010. The Approval outlines General Requirements (Section A), Reporting Requirements (Section B), Closure and Post-Closure Requirements (Section C), and Groundwater Monitoring Requirements (Section D) for the Site.

The lagoons were capped in December of 2010 with final seeding completed in May of 2011 as detailed in the August 10, 2011 *Closure Documentation Report*. In a September 13, 2012 letter, the IDEM acknowledged completion of closure requirements and the beginning of ten-year post-closure period starting January 13, 2012. Post-closure operational requirements are outlined in the Approval, 329 IAC 10-31, and the Revised Closure/Post-Closure Plan; and include maintaining security and access control, semi-annual groundwater monitoring, preparation of a semi-annual groundwater monitoring report with statistical analysis, and maintenance (mowing) of the final cover.

The *Ground Water Monitoring Program Implementation and Alternative Source Demonstration Report*, dated March 17, 2009, and the *Waste Characterization Addendum*, dated March 15, 2010, determined that an alternative upgradient source is responsible for increases in Phase I and background parameters in groundwater monitoring wells on the Site. The IDEM acknowledged in requirement D18 of the Approval that requirements D14, D15, and D16 have been adequately satisfied.

This report summarizes remaining monitoring requirements at the Site, which include maintaining monitoring devices, evaluating the potentiometric surface of groundwater, semi-annual groundwater monitoring, statistical analysis, and reporting. As discussed herein, a statistical analysis of April 2021 groundwater data identified more than one statistically significant trend (or downward pH trend), however, all but one of the current trending parameters are within background tolerance limits. Therefore, further confirmation sampling or

implementation of a Phase II monitoring program are not warranted. GP will continue with semi-annual Phase I groundwater monitoring.

## **1.1 Site Description**

The closed north lagoon and the closed south lagoon are approximately 6.5 acres each and are surrounded by an additional 13 acres of property. The adjoining properties to the Site include the Grand Calumet River to the south, wetland and railroad property to the east, Clark Road and Industrial Highway to the west, and a scrapyard to the north. The Gary Municipal Airport is located to the west beyond Industrial Highway (**Figure 1**).

Access to the Site is restricted by a fence surrounding the entire property. The north and south lagoons are sloped such that surface water flows radially into ditches that surround each former lagoon, which is conveyed to a sedimentation basin on the southwest portion of the Site. A total of 29 passive gas vents are installed throughout the Site, and six groundwater monitoring wells are located around the perimeter of the lagoons, which are used to monitor groundwater on a semi-annual basis (**Figure 2**).

## **1.2 Guidance Documents**

The following documents provide guidance regarding current post-closure operational requirements:

- January 1999, *Closure Plan for the Gary Lagoon Closure Project*, prepared by STS Consultants, Ltd. (now AECOM);
- March 2009, *Ground Water Monitoring Program Implementation and Alternative Source Demonstration Report*, prepared by AECOM;
- July 2010, *Revised Post-Closure Plan for Gary Lagoons*, prepared by AECOM;
- July 28, 2010 *Approval of Revised Closure/Post-Closure Plan*, prepared by IDEM; and
- May 2017, *Revised Groundwater Monitoring, Sampling & Analysis Plan*, prepared by EarthCon Consultants, Inc.

## 2. GROUNDWATER MONITORING PROGRAM

Semi-annual groundwater monitoring is conducted in April and October in accordance with the 2010 Approval and includes an evaluation of static groundwater elevations and collection of samples from six groundwater wells (B-1R, B-3R, B-4, B-5, B-7 and B-9R). All wells are installed in the Calumet Aquifer in unconsolidated sand and fine gravels and are constructed of 2" diameter PVC pipe with a 10 foot long, 10-slot screen at the base of the well. Background monitoring wells hydraulically upgradient of the lagoons are B-1R, B-4, and B-7. Downgradient monitoring wells hydraulically downgradient of the lagoons are B-3R, B-5, and B-9R.

As noted in the previous reports, the east wetland piezometer has been eliminated from water level measurements as approved by IDEM in an email dated January 9, 2014.

### 2.1 Groundwater Elevations and Flow Direction

In April 2021, field personnel measured static water levels relative to mean sea-level at each groundwater monitoring well. All wells were gauged with a water-level interface probe accurate to 0.01 foot, with one exception: a light non-aqueous phase liquid (LNAPL) at monitoring well B-7 prevented the use of a water-level interface probe. This well was gauged with an oil-water interface probe but the well contained only LNAPL. Depth-to-water measurements were subtracted from top-of-casing elevations for each well to obtain groundwater surface elevations, provided in **Table 1**. Potentiometric surface contours are provided in **Figure 3** in accordance with requirement D5 of the 2010 IDEM Approval. Due to the presence of LNAPL in B-7, the water level was not used to generate the contours depicted in **Figure 3**. The static groundwater elevations indicate a northwest to southeast flow direction across the site, consistent with previous findings.

### 2.2 Monitoring Well Sampling Procedures

Monitoring wells are sampled semi-annually using low-flow techniques. Sampling equipment includes the use of a peristaltic pump and dedicated polyethylene tubing for each monitoring well. Water quality parameters consisting of temperature, specific conductance, dissolved oxygen, pH, turbidity, and oxidation-reduction potential (ORP) were recorded every three minutes as purged water passed through a YSI ProDSS water quality meter equipped with a flow-through cell. Samples were collected upon stabilization of the water quality parameters or upon purging three well volumes if stabilization was not achieved. A water-level interface probe was used to monitor drawdown during purging. During purging and stabilization, the drawdown was not allowed to exceed 0.33 feet during sampling. The water level probe was

decontaminated between each well. Groundwater sampling field forms with water quality parameters are provided in **Appendix A** in accordance with requirement D10 of the IDEM Approval. The samples were placed on ice in coolers for transport to the lab.

Field staff measured 8.31 feet of LNAPL in monitoring well B-7, compared to 6.55 feet of LNAPL observed in October 2020 and 2.45 feet of LNAPL observed in April 2020. Water was not detected in the well, therefore, a representative sample could not be collected from this location for laboratory analysis. The thickness of LNAPL will continue to be measured and recorded during future events.

### **2.3 Laboratory Analysis**

Groundwater samples were shipped to Pace Analytical Services, Inc. in Indianapolis, Indiana for analysis of the following parameters using the methods indicated:

- Sodium (dissolved) via 6010;
- Nitrogen (Nitrate-Nitrite) via 353.2;
- Anions: chloride and sulfate via 9056;
- Ammonia (as Nitrogen) via 4500;
- Total Polychlorinated biphenyls (PCB) via 8082;
- Total dissolved solids (TDS) via 2540C; and
- Chemical oxygen demand (COD) via 410.4.

Sample custody was maintained from sample collection to receipt at the laboratory. A copy of the laboratory reports and chain of custody documents are provided in **Appendix B** in accordance with requirement D10 of the IDEM Approval. The samples were received within temperature range and holding times.

Laboratory results are summarized in **Table 2**.



### 3. GROUNDWATER DATA EVALUATION

A statistical trend analysis of groundwater monitoring data included preparation of Mann-Kendall trend graphs to determine potential statistically significant increases over the background concentrations for each parameter in each well, and a comparison to background concentrations based on a data distribution evaluation using the Shapiro-Francia test in background wells B-1R, B-4, and B-7. The statistical analysis is summarized below.

#### 3.1 Statistical Trend Analysis of Data Sets

Mann-Kendall trend analyses using ProUCL v. 5.1 are presented in **Appendix C** for each parameter listed in Section 2.3, as well as temperature, specific conductance, and pH in accordance with requirement D9 of the IDEM Approval. Data from the replacement wells B-1R, B-3R, and B-9R are pooled with data from their former respective well, consistent with previous statistical evaluations.

Two well/parameter combinations were found to have statistically significant increasing trends at the 95% confidence level for upgradient background wells:

- Chloride data indicates an upward trend in B-4; and
- pH data indicates an upward trend in B-1R.

Five well/parameter combinations were found to have statistically significant trends at the 95% confidence level for downgradient wells:

- Chloride, sodium, and specific conductance data indicate upward trends in B-3R;
- pH data indicates a downward trend at B-3R; and
- pH data indicates an upward trend in B-9R.

A summary of the trend analysis results is presented in **Table 3**.

#### 3.2 Statistical Comparison to Background Levels

Shapiro-Francia tests of normality were performed (in ChemStat v. 6.4) on the merged specific conductance, pH, sodium, and nitrate datasets from background wells (B-1R, B-4, and B-7). None of the merged datasets were normally or lognormally distributed. Shapiro-Francia tests are performed where the number of samples are greater than 50. All datasets include more than 50 datapoints as of November 2018. Results are included in **Appendix C**.

Because none of the merged datasets were normally or lognormally distributed, a non-parametric tolerance interval test was performed on the background sodium, specific conductance, and nitrate datasets per EPA (2009) using ChemStat v. 6.4. A two-tailed parametric tolerance interval test was performed on the background pH dataset to allow for calculation of an upper and lower background limit. The maximum background chloride (227 mg/L), sodium (256 mg/L) and specific conductance (3,000 µS/cm) were identified, as were the tolerance limits for background pH (4.73 – 8.97). These maxima and pH range were compared to the April 2021 values representing a statistical trend in downgradient wells B-3R and B-9R.

The April 2021 values in B-3R for sodium (190 mg/L) and specific conductance (2,789 µS/cm) were below the maximum background concentrations and the B-3R pH (6.95) was within the range of background pH values. The B-3R chloride value (307 mg/L) was above the maximum background concentration of 227 mg/L. The chloride concentration at B-3R was within the historical range of detections over the previous nine years at his location. The pH measured in B-9R (6.87), although statistically increasing, was neutral and within the range of background pH values.

Location	Parameter	Units	April 2021 Concentration	Background (Tolerance)	Statistical Exceedance	Confidence Level
B-3R	Sodium	mg/L	190	256	No	95%
B-3R	Specific conductance	uS/cm	2,789	3,000	No	95%
B-3R	pH	Standard units	6.95	4.73 – 8.97	No	95%
B-3R	Chloride	mg/L	307	227	Yes	95%
B-9R	pH	Standard units	6.87	4.73 – 8.97	No	95%

Though more than one statistically significant trend was found in a single well, none of the April 2021 values are outside the background range while also exhibiting an increasing trend, with the exception of chloride in B-3R.

#### **4. SUMMARY AND RECOMMENDATIONS**

Results of the April 22, 2021 semi-annual groundwater monitoring event indicate more than one statistically significant trend in downgradient locations B-3R and B-9R but only one of the current values exceeds background concentrations (chloride in B-3R). Therefore, IDEM Office of Land Quality notification, confirmation groundwater monitoring, or implementation of a Phase II monitoring program are not recommended at this time.

Continued Phase I groundwater monitoring is recommended on a semi-annual basis at the Site.

## 5. REFERENCES

The following documents are referenced in this report:

AECOM, 2009. Ground Water Monitoring Program Implementation and Alternative Source Demonstration Report (GWMP-ASD).

AECOM, 2010. Revised Post-Closure Plan for Gary Lagoons.

ASTM, 2012. "Standard Guide for Developing Appropriate Statistical Approaches for Groundwater Detection Monitoring Programs," ASTM Designation D6312-98.

EarthCon, 2017. Revised Groundwater Monitoring, Sampling & Analysis Plan, May 2017.

STS Consultants,Ltd, 1999. Closure Plan for the Gary Lagoon Closure Project, January, 1999. (STS Consultants is now AECOM)

US EPA, 2009. Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities – Unified Guidance, EPA 530/R-09-007, March 2009.

## TABLES

**Table 1**  
**Static Groundwater Level Measurements and Elevations**  
**April 22, 2021**  
**Closed Process Residual Lagoons**  
**Gary, Indiana**

Well Number & Data	B-1 / B-1R (West)	B-3 / B-3R (East)	B-4 (North)	B-5 (South)	B-7 (Northwest)	B-9 / B-9R (South-Southeast)	East Wetland Piezometer
Ground Surface Elevation (ft amsl)	598.48	600.70	590.97	593.22	593.45	601.11	597.92
Top of PVC Casing Elevation (ft amsl)	600.71	603.35	593.52	595.53	595.91	603.55	587.56
Well Depth (Feet from TOC) <sup>A</sup>	21.17	35.20	17.40	19.05	17.99	31.00	--

Date	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)
5/4/06	14.55	585.98	16.23	585.26	7.64	585.75	11.49	583.88	--	--	--	--	--	--
5/25/06	14.51	586.02	16.22	585.27	7.54	585.85	11.46	583.91	--	--	--	--	--	--
6/14/06	14.48	586.05	16.21	585.28	7.68	585.71	11.37	584.00	--	--	--	--	--	--
9/14/06	12.61	587.92	14.44	587.05	6.12	587.27	9.29	586.08	--	--	--	--	--	--
10/27/06	13.51	587.02	15.63	585.86	7.07	586.32	10.40	584.97	--	--	--	--	--	--
11/8/06	13.86	586.67	15.90	585.59	7.35	586.04	10.82	584.55	9.14	586.70	21.12	582.61	--	--
11/15/06	--	--	15.81	585.68	--	--	10.82	584.55	--	--	21.24	582.49	--	--
12/11/06	13.55	586.98	--	--	6.78	586.61	--	--	8.88	586.96	--	--	--	--
12/12-13/06	15.47	585.06	15.58	585.91	6.89	586.50	10.27	585.10	8.78	587.06	20.70	583.03	--	--
3/13/07	13.59	586.94	15.49	586.00	6.72	586.67	10.73	584.64	8.83	587.01	20.96	582.77	--	--
6/7/07	14.11	586.42	15.79	585.70	7.60	585.79	11.11	584.26	9.47	586.37	20.42	583.31	--	--
6/19/07	14.71	585.82	16.26	585.23	7.77	585.62	11.39	583.98	9.92	585.92	19.91	583.82	--	--
8/14/07	15.55	584.98	17.04	584.45	8.57	584.82	11.33	584.04	10.72	585.12	19.75	583.98	2.86	584.70
9/24/07	15.26	585.27	17.13	584.36	8.39	585.00	12.21	583.16	10.60	585.24	20.84	582.89	3.72	583.84
10/25/07	15.85	584.68	17.59	583.90	8.55	584.84	13.03	582.34	10.90	584.94	21.51	582.22	4.10	583.46
11/7/07	16.04	584.49	18.99	582.50	8.60	584.79	13.21	582.16	11.20	584.64	21.59	582.14	5.24	582.32
10/28/10	14.35	586.18	16.03	585.46	8.06	585.33	12.98	582.39	--	--	18.42	585.31	--	--
4/26/11	13.22	587.12	15.85	584.46	6.65	586.66	9.11	586.34	8.40	587.24	21.11	585.44	3.79	583.77
10/21/11	14.45	585.89	16.78	583.53	7.42	585.89	9.93	585.52	10.00	585.64	21.10	585.45	--	--
4/18/12	14.57	585.77	16.40	583.91	7.70	585.61	12.20	583.25	10.70	584.94	21.40	585.15	--	--
10/8/12	16.55	583.79	17.70	582.61	9.65	583.66	13.24	582.21	12.35	583.29	21.48	585.07	--	--
4/29/13	13.15	587.19	17.27	583.04	7.03	586.28	9.89	585.56	17.44	578.20	17.46	589.09	--	--
10/2/13	15.13	585.21	15.86	584.45	8.84	584.47	11.91	583.54	12.31	583.33	20.68	585.87	--	--
4/16/14	13.08	587.26	15.79	584.52	7.00	586.31	10.10	585.35	9.17	586.47	21.26	585.29	--	--
10/20/14	13.44	586.90	16.35	583.96	7.38	585.93	10.35	585.10	9.33	586.31	21.79	584.76	--	--
4/27/15	--	--	16.55	583.76	7.45	585.86	10.95	584.50	9.50	586.14	--	--	--	--
10/15/15	14.02	586.76	16.17	584.14	7.52	585.79	11.18	584.27	12.84	582.80	19.21	584.35	--	--

**Notes are provided on Page 2.**

**Table 1 (Continued)**  
**Static Groundwater Level Measurements and Elevations**  
**April 22, 2021**  
**Closed Process Residual Lagoons**  
**Gary, Indiana**

Well Number & Data	B-1 / B-1R (West)	B-3 / B-3R (East)	B-4 (North)	B-5 (South)	B-7 (Northwest)	B-9 / B-9R (South-Southeast)	East Wetland Piezometer
Ground Surface Elevation (ft amsl)	598.48	600.70	590.97	593.22	593.45	601.11	597.92
Top of PVC Casing Elevation (ft amsl)	600.71	603.35	593.52	595.53	595.91	603.55	587.56
Well Depth (Feet from TOC) <sup>4</sup>	21.17	35.20	17.40	19.05	17.99	31.00	--

Date	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)	Depth to GW from TOC (ft)	Groundwater Elevation (ft amsl)
4/12/16	13.18	587.60	15.80	584.51	6.94	586.37	9.79	585.66	9.90	585.74	20.21	583.35	--	--
10/5/16	14.93	585.85	16.62	583.69	7.91	585.40	11.80	583.65	11.13	584.51	19.72	583.84	--	--
4/26/17	13.10	587.68	15.56	584.75	6.97	586.34	10.80	584.65	10.07	585.57	19.70	583.86	--	--
10/17/17	15.21	585.57	16.72	583.59	7.88	585.43	11.71	583.74	11.54	584.10	19.77	583.79	--	--
4/17/18	13.63	587.15	16.15	584.16	7.02	586.29	10.37	585.08	9.76	585.88	20.01	583.55	--	--
10/12/18	14.94	585.84	16.36	583.95	7.81	585.5	11.48	583.97	10.31	585.33	19.52	584.04	--	--
4/9/19	13.42	587.29	19.48	583.87	7.03	586.49	10.42	585.11	8.71	587.20	19.84	583.71	--	--
10/14/19	13.66	587.05	19.03	584.32	7.34	586.18	10.17	585.36	10.55	585.36	18.99	584.56	--	--
4/9/20	13.39	587.32	19.04	584.31	6.93	586.59	10.07	585.46	11.25	584.66	19.19	584.36	--	--
10/6/20	15.56	585.15	19.65	583.70	8.65	584.87	11.92	583.61	17.36	578.55	19.71	583.84	--	--
4/22/21	14.45	586.26	19.76	583.59	7.64	585.88	11.5	584.03	--	--	20.17	583.38	--	--

Notes:

1. Ground surface and top of PVC casing elevations were re-surveyed in June 2011 during closure activities. Monitoring wells B-1 and B-9 were replaced by B-1R and B-9R in October 2015 and surveyed. Monitoring well B-3 was replaced by B-3R in March 2019. All wells were resurveyed March 2019. Previous reference elevations are as follows:

	B-1	B-1R	B-2	B-3	B-4	B-5	B-7	B-9	B-9R
Ground Surface Elevation (2006-March 2019)	598.34	598.43	NA	598.08	590.63	593.25	593.22	600.33	601.17
Top-of -Casing Elevation (2006-2010)	600.34	600.53	602.27	601.49	593.39	595.37	595.84	606.55	603.73
Top-of -Casing Elevation (2011-2018)	600.34	600.78	NA	600.31	593.31	595.45	595.64	606.55	603.56

2. ft amsl = Elevation referenced to feet above mean sea level using the National Geodetic Vertical Datum of 1929 (NGVD29)

3. TOC = Top of PVC Casing

4. ft = feet

5. -- = No measurement taken

**Table 2**  
**Summary of Analytical Results**  
**April 22, 2021**  
**Closed Process Residual Lagoons**  
**Gary, Indiana**

Parameter	Matrix	Units	Method	B-1R (West)	B-3R (East)	B-4 (North)	B-5 (South)	B-7 (Northwest)	B-9R (South- Southeast)	DUP-1 (B-9R)	Field Blank
Chemical Oxygen Demand	Water	mg/L	EPA 410.4	40.9	87.3	23.5	68	--	67.2	69	11
Chloride	Water	mg/L	EPA 9056	28.8	307	21.4	52.7	--	261	197	<0.25
Nitrogen, Ammonia	Water	mg/L	SM 4500- NH3 G	2.5	25.9	<0.10	2.7	--	19.9	20.3	<0.10
Nitrogen, Nitrate	Water	mg/L	EPA 353.2	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10	<0.10
Nitrogen, Nitrite	Water	mg/L	EPA 353.2	<0.10	<0.10	<0.10	<0.10	--	<0.10	<0.10	<0.10
Sodium, Dissolved	Water	mg/L	EPA 6010	34.7	190	18.7	54.2	--	142	142	<1.0
Sulfate	Water	mg/L	EPA 9056	1,810	468	214	750	--	1,110	916	<0.25
Total Dissolved Solids	Water	mg/L	SM 2540C	2,310	1,790	703	2,400	--	2,060	236	12
PCB, Total (Aroclor)	Water	ug/L	EPA 8082	<0.095	<0.095	<0.095	<0.095	--	<0.10	<0.095	<0.10
PCB-1016 (Aroclor 1016)	Water	ug/L	EPA 8082	<0.095	<0.095	<0.095	<0.095	--	<0.10	<0.095	<0.10
PCB-1221 (Aroclor 1221)	Water	ug/L	EPA 8082	<0.095	<0.095	<0.095	<0.095	--	<0.10	<0.095	<0.10
PCB-1232 (Aroclor 1232)	Water	ug/L	EPA 8082	<0.095	<0.095	<0.095	<0.095	--	<0.10	<0.095	<0.10
PCB-1242 (Aroclor 1242)	Water	ug/L	EPA 8082	<0.095	<0.095	<0.095	<0.095	--	<0.10	<0.095	<0.10
PCB-1248 (Aroclor 1248)	Water	ug/L	EPA 8082	<0.095	<0.095	<0.095	<0.095	--	<0.10	<0.095	<0.10
PCB-1254 (Aroclor 1254)	Water	ug/L	EPA 8082	<0.095	<0.095	<0.095	<0.095	--	<0.10	<0.095	<0.10
PCB-1260 (Aroclor 1260)	Water	ug/L	EPA 8082	<0.095	<0.095	<0.095	<0.095	--	<0.10	<0.095	<0.10
Field Temperature	Water	C°	--	12	12.3	9.7	9.9	--	12	--	--
Field Specific Conductance	Water	ms/cm	--	2.312	2.789	0.966	2.478	--	2.655	--	--
Dissolved Oxygen	Water	mg/L	--	0	0.11	0.03	0	--	0.01	--	--
Field pH	Water	S.U.	--	6.87	6.95	6.77	6.65	--	6.87	--	--
Redox	Water	mV	--	-325.7	-162.4	-65.9	-396.2	--	-154.6	--	--
Turbidity	Water	NTU	--	2.71	0	35.36	53.79	--	56.46	--	--

Notes:

1. PCB = Polychlorinated biphenyl
2. mg/L = Milligrams per liter
3. ug/L = Micrograms per liter
4. C = Degrees celcius

5. mS/cm = Millisiemens per centimeter
6. S.U. = Standard units
7. mV = millivolts
8. NTU = Nephelometric turbidity units

9. B-7 was not sampled due to lack of water in well (free product only).



**Table 3**  
**Trend Analysis Summary**  
**April 2021**  
**Closed Process Residual Lagoons**  
**Gary, Indiana**

Parameter	Monitoring Well	Trend	Upgradient/ Downgradient
Ammonia	B-1R	Decreasing	Upgradient
	B-4	Decreasing	Upgradient
	B-5	Decreasing	Downgradient
	B-9R	Decreasing	Downgradient
Chloride	B-1R	Decreasing	Upgradient
	B-3R	Increasing	Downgradient
	B-4	Increasing	Upgradient
	B-5	Decreasing	Downgradient
	B-9R	Decreasing	Downgradient
Chemical Oxygen Demand	B-1R	Decreasing	Upgradient
	B-5	Decreasing	Downgradient
	B-9R	Decreasing	Downgradient
Polychlorinated Biphenyls, Total	B-1R	Decreasing	Upgradient
	B-3R	Decreasing	Downgradient
	B-4	Decreasing	Upgradient
	B-5	Decreasing	Downgradient
	B-9	Decreasing	Upgradient
pH	B-1R	Increasing	Upgradient
	B-3R	Decreasing	Downgradient
	B-9R	Increasing	Downgradient
Sodium	B-3R	Increasing	Downgradient
	B-5	Decreasing	Downgradient
	B-9R	Decreasing	Downgradient
Specific Conductance	B-3R	Increasing	Downgradient
	B-9R	Decreasing	Downgradient
Sulfate	B-3R	Decreasing	Downgradient
Temperature	B-9R	Decreasing	Downgradient

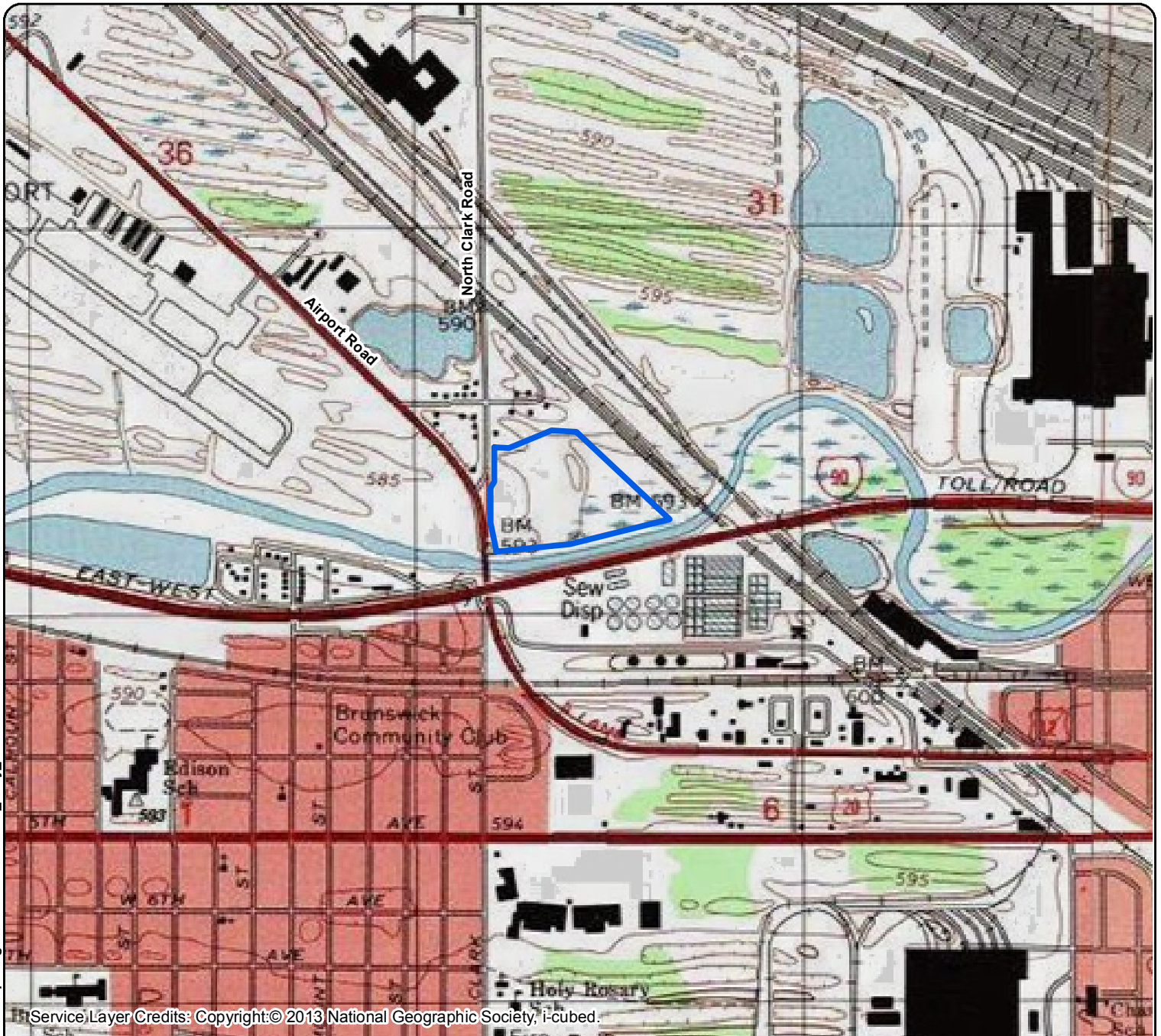
**Table 3**  
**Trend Analysis Summary**  
**April 2021**  
**Closed Process Residual Lagoons**  
**Gary, Indiana**

Parameter	Monitoring Well	Trend	Upgradient/ Downgradient
Total Dissolved Solids	B-1R	Decreasing	Upgradient
	B-5	Decreasing	Downgradient
	B-9R	Decreasing	Downgradient


Notes:

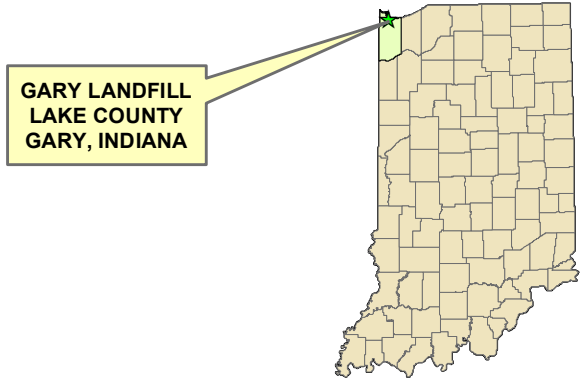
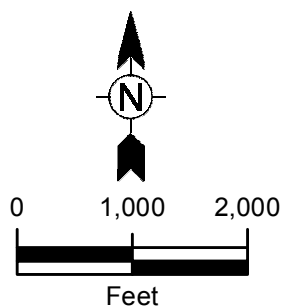
1. Parameters/Wells that indicated insufficient statistical evidence of a significant trend are not included.
2. Shaded trends indicate an upward statistical trend (or downward trend for pH) identified using Mann-Kendall trend analysis with ProUCL v. 5.1.

## FIGURES



Service Layer Credits: Copyright © 2013 National Geographic Society, i-cubed.

 Approximate Site Boundary



 **TETRA TECH**  
 www.tetrattech.com  
 710 AVIS DRIVE, SUITE 100  
 ANN ARBOR, MI 48108  
 PHONE: 734.213.2204

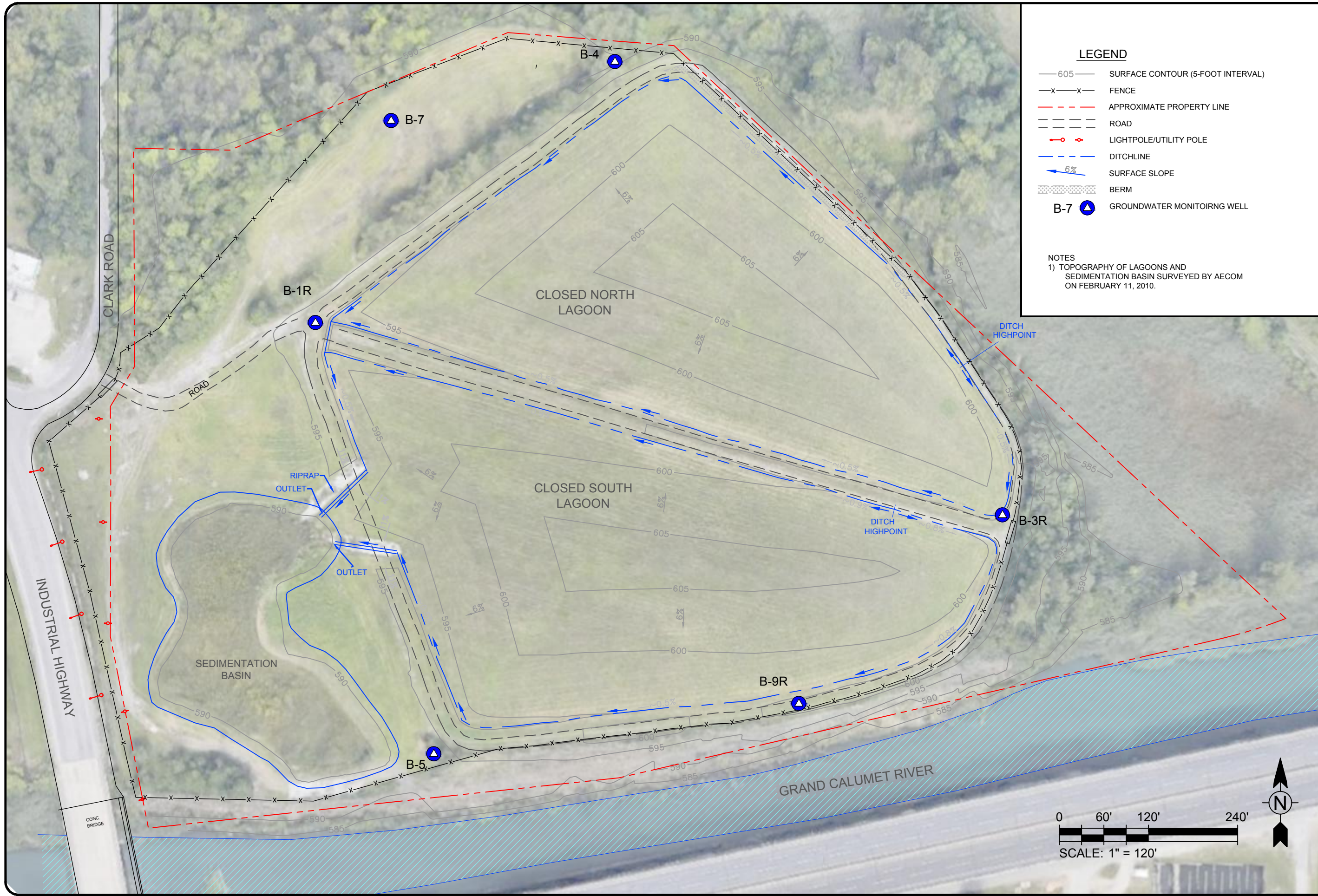
GARY LANDFILL  
 AIRPORT ROAD AND NORTH CLARK ROAD  
 GARY, INDIANA 46406

**SITE LOCATION**

Project No: 117-4124SMP0600  
 Designed by: MTG  
 Checked by: DS

**FIGURE**  
**1**

Bar Measures 1 inch



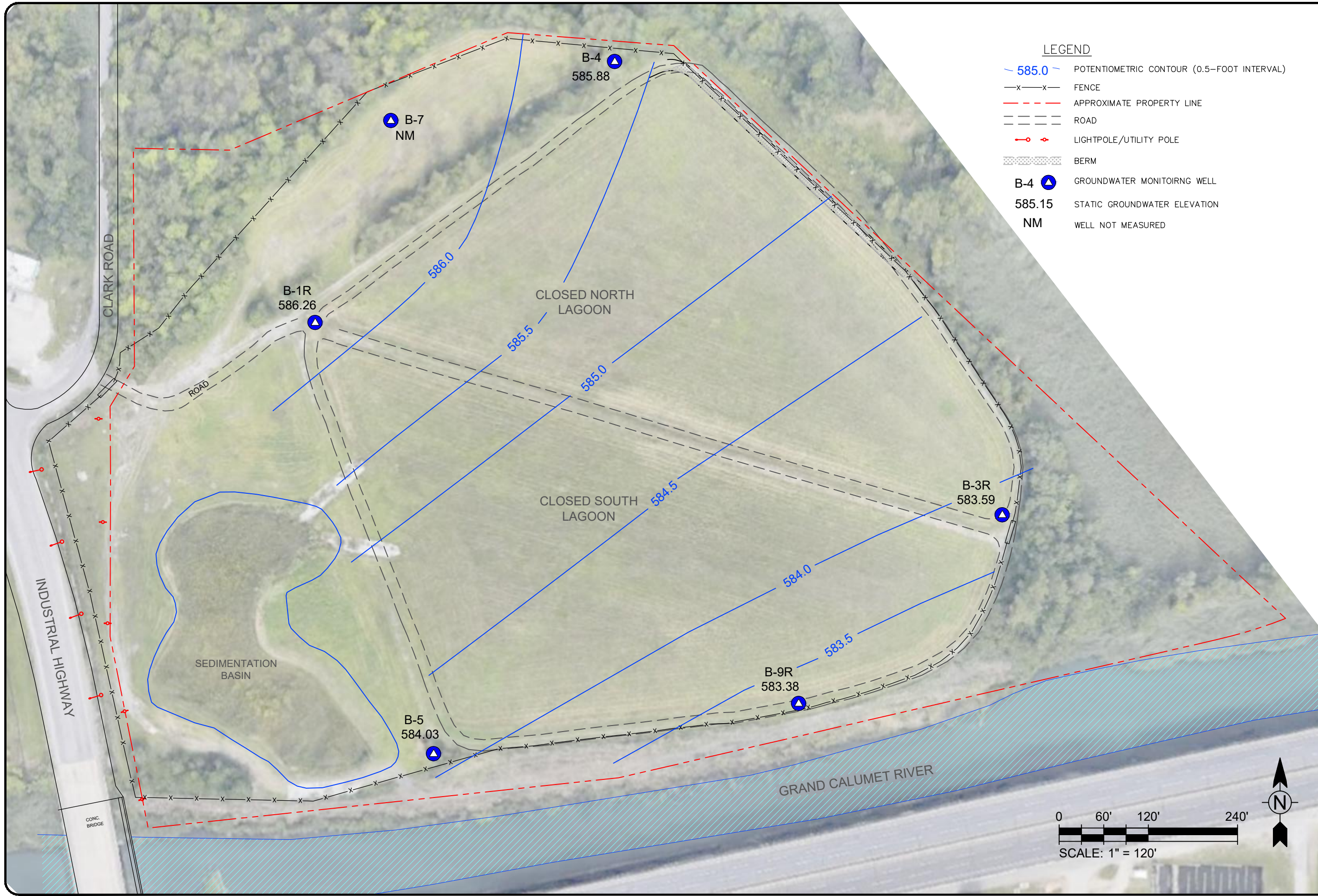
MARK	DATE	DESCRIPTION	BY

GEORGIA-PACIFIC LLC  
CLOSED PROCESS RESIDUAL LAGOONS  
AIRPORT ROAD AND NORTH CLARK ROAD  
GARY, INDIANA

**SITE LAYOUT**

Project No.: 117-4124SMP0600  
Designed By: DRS  
Drawn By: DRS  
Checked By: AMG

**FIGURE 2**



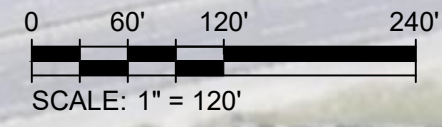
- LEGEND**
- 585.0 POTENTIOMETRIC CONTOUR (0.5-FOOT INTERVAL)
  - x—x— FENCE
  - - - - - APPROXIMATE PROPERTY LINE
  - - - - - ROAD
  - ○ LIGHTPOLE/UTILITY POLE
  - ▨ BERM
  - B-4 ▲ GROUNDWATER MONITORING WELL
  - 585.15 STATIC GROUNDWATER ELEVATION
  - NM WELL NOT MEASURED

MARK	DATE	DESCRIPTION	BY

GEORGIA-PACIFIC LLC  
 CLOSED PROCESS RESIDUAL LAGOONS  
 AIRPORT ROAD AND NORTH CLARK ROAD  
 GARY, INDIANA

**POTENTIOMETRIC SURFACE MAP**  
**APRIL 2021**

Project No.: 117-4124SMP0600  
 Designed By: DRS  
 Drawn By: JMM  
 Checked By: DRS



## **APPENDICES**

**APPENDIX A**  
**GROUND WATER SAMPLING FIELD FORMS**









**Tetra Tech**

**WATER QUALITY DATA SHEET**

710 Avis Drive, Suite 100, Ann Arbor, MI 48108 (734) 213-2204

**SAMPLE LOCATION:** GP Gary, IN

**SAMPLE ID NUMBER:** B-5

**Client:** Georgia-Pacific **Project Name:** Gary Closed Lagoons **Project No.:** 117-4124SMP0610

**Personnel:** BWG

**Date:** 4-22-21

**Weather:** 32°F, Fair, W winds 7 mph

**Purge Method:** Low-Flow Techniques

Other

**Field Instruments:** Pegasus Peristaltic Pump & 451 ProDS5 **Flow Cell:** FA04591

**Screen / Pump Interval:** 9-19' / 14'

**Initial Depth to Water:** 11.50

**General Comments:**

**Free Product:** Yes- inches NO free product

Time	Depth to H <sub>2</sub> O (feet)	Pump Rate (mL/min)	Temp (C°)	Specific Conductance		O <sub>2</sub> (mg/l)	pH (S.U.)	Redox (mV)	Turb (NTU)	Visual and Olfactory Observations / Notes
				Value	Units					
<b>Parameter Stabilization Ranges</b>										
				3%	3%	ms/cm	10%	0.1	10mv	10%
0915	11.57	180	9.8	2.375	ms/cm	0.81	6.57	-539.9	8.03	MOSTLY CLEAR, NO ODOUR;
0918	11.57	180	9.8	2.407	"	0.27	6.61	-513.8	10.37	"
0924	11.57	180	9.8	2.430	"	0.16	6.63	-451.3	9.65	"
0924	11.57	180	9.8	2.444	"	0.12	6.63	-431.2	8.41	"
0927	11.57	180	9.8	2.459	"	0.09	6.64	-419.0	30.35	CLEAR, w/ BACK & WHITE FLAKES
0930	11.57	180	9.8	2.469	"	0.05	6.64	-409.0	39.60	" SLIGHT ODOUR
0933	11.57	180	9.9	2.476	"	0.03	6.64	-399.8	27.32	"
0936	11.57	180	9.9	2.479	"	0.01	6.65	-396.8	55.50	CLEAR, SOME WHITE FLAKES
0939	11.57	180	9.9	2.479	"	0.01	6.65	-395.7	57.56	"
0942	11.57	180	9.9	2.478	"	0.00	6.65	-396.2	53.79	"

**Sample Taken at:** 09:46 **Filter Used?** NO **CAPACITY**  
**Amount Purged:** 1.25 gallon(s) **Water Clear?** YES **Dissolved Metals Field Filtered**

All measurements to Nearest Hundredth of a Foot (0.01 feet).						Vol=pi(r) <sup>2</sup> *h				1 liter = .264 gallons		1 gallon = 231 inches <sup>3</sup>	
Well diameter gallon per ft:										1 liter = 61.02 inches <sup>3</sup>		1 inch = 2.54 cm	
1/8 inch	3/16 inch	1/4 inch	3/8 inch	1/2 inch	5/8 inch	3/4 inch	1 inch	2 inch	4 inch				
0.0006	0.0014	0.0025	0.0057	0.0102	0.0159	0.0229	0.0408	0.1632	0.6528				



**Tetra Tech** **WATER QUALITY DATA SHEET**  
 710 Avis Drive, Suite 100, Ann Arbor, MI 48108 (734) 213-2204  
**SAMPLE LOCATION:** GP Gary, IN **SAMPLE ID NUMBER:** B-9R

**Client:** Georgia-Pacific **Project Name:** Gary Closed Lagoons **Project No.:** 117-4124SMP0610

**Personnel:** BWG **Date:** 4-22-20

**Weather:** 36°F, Partly Sunny, W winds 7 mph

**Purge Method:** Low-Flow Techniques **Other**

**Field Instruments:** Pegasus Peristaltic Pump & YSI Pro DSS **Flow Cell:** FA04591

**Screen / Pump Interval:** 21-31' / 26' **Initial Depth to Water:** 20.17

**General Comments:** **Free Product:** Yes- inches NO free product

Time	Depth to H <sub>2</sub> O (feet)	Pump Rate (mL/min)	Temp (C°)	Specific Conductance		O <sub>2</sub> (mg/l)	pH (S.U.)	Redox (mV)	Turb (NTU)	Visual and Olfactory Observations / Notes
				Value	Units					
<b>Parameter Stabilization Ranges</b>										
				3%	3%	ms/cm	10%	0.1	10mv	10%
1033	20.22	150	11.3	2.714	ns/cm	0.63	6.85	-153.3	2.09	MOSTLY CLEAR, NO ODOOR;
1036	20.22	150	11.5	2.722	"	0.45	6.82	-166.1	0.73	"
1039	20.23	150	11.7	2.737	"	0.28	6.82	-164.4	0.31	"
1042	20.23	150	11.8	2.763	"	0.20	6.82	-177.1	3.38	"
1045	20.23	150	11.9	2.762	"	0.16	6.82	-146.3	7.40	"
1048	20.24	200	11.9	2.749	"	0.13	6.83	-164.9	16.79	" INCREASED FLOW RATE;
1051	20.24	200	11.9	2.742	"	0.10	6.82	-167.5	26.99	"
1054	20.24	200	12.0	2.726	"	0.06	6.84	-176.1	57.35	"
1057	20.24	200	12.1	2.754	"	0.05	6.84	-182.6	55.08	"
1100	20.24	200	12.0	2.743	"	0.04	6.83	-156.5	60.17	"
1103	20.24	200	12.1	2.725	"	0.03	6.83	-156.1	50.51	"
1106	20.24	200	12.0	2.720	"	0.02	6.84	-150.1	55.72	"
1109	20.24	200	11.9	2.705	"	0.01	6.86	-147.8	57.43	"
1112	20.24	200	12.0	2.695	"	0.01	6.87	-154.6	56.46	"

**Sample Taken at:** 11 : 15 **Filter Used?**  Y **CAPACITY**  
**Amount Purged:** 1.75 gallon(s) **Water Clear?**  Y **Dissolved Metals Field Filtered?**  Y

All measurements to Nearest Hundredth of a Foot (0.01 feet). Vol = π(r)<sup>2</sup>h

Well diameter gallon per ft:	1 liter = .264 gallons	1 gallon = 231 inches <sup>3</sup>
1/8 inch	1 liter = 61.02 inches <sup>3</sup>	1 inch = 2.54 cm
0.0006		
0.0014		
0.0025		
0.0057		
0.0102		
0.0159		
0.0229		
0.0408		
0.1632		
0.6528		

**APPENDIX B**  
**LABORATORY REPORT AND CHAIN OF CUSTODY DOCUMENTS**

May 07, 2021

Ben Giese  
Tetra Tech  
710 Avis Drive  
Suite 100  
Ann Arbor, MI 48108

RE: Project: Georgia Pacific - Gary  
Pace Project No.: 50285629

Dear Ben Giese:

Enclosed are the analytical results for sample(s) received by the laboratory on April 23, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Indianapolis

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

Sincerely,



Heather Patterson  
heather.patterson@pacelabs.com  
(317)228-3100  
Project Manager

Enclosures

cc: Marco Capodivacca, Tetra Tech  
Daniel Sopoci, Tetra Tech



## REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.



## CERTIFICATIONS

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

---

### **Pace Analytical Services Indianapolis**

7726 Moller Road, Indianapolis, IN 46268

Illinois Accreditation #: 200074

Indiana Drinking Water Laboratory #: C-49-06

Kansas/TNI Certification #: E-10177

Kentucky UST Agency Interest #: 80226

Kentucky WW Laboratory ID #: 98019

Michigan Drinking Water Laboratory #9050

Ohio VAP Certified Laboratory #: CL0065

Oklahoma Laboratory #: 9204

Texas Certification #: T104704355

Wisconsin Laboratory #: 999788130

USDA Soil Permit #: P330-19-00257

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50285629001	B-1R	Water	04/22/21 13:15	04/23/21 08:40
50285629002	B-3R	Water	04/22/21 12:15	04/23/21 08:40
50285629003	B-4	Water	04/22/21 14:35	04/23/21 08:40
50285629004	B-5	Water	04/22/21 09:45	04/23/21 08:40
50285629005	B-9R	Water	04/22/21 11:15	04/23/21 08:40
50285629006	FB-01	Water	04/22/21 12:30	04/23/21 08:40
50285629007	DUP-01	Water	04/22/21 08:00	04/23/21 08:40

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50285629001	B-1R	EPA 8082	KAV	9	PASI-I
		EPA 9056	HBS	2	PASI-I
		EPA 6010	RAM	1	PASI-I
		SM 2540C	WZE	1	PASI-I
		EPA 410.4	SWJ	1	PASI-I
		EPA 353.2	GWA	2	PASI-I
50285629002	B-3R	SM 4500-NH3 G	MMS	1	PASI-I
		EPA 8082	KAV	9	PASI-I
		EPA 9056	HBS	2	PASI-I
		EPA 6010	RAM	1	PASI-I
		SM 2540C	WZE	1	PASI-I
		EPA 410.4	SWJ	1	PASI-I
50285629003	B-4	EPA 353.2	GWA	2	PASI-I
		SM 4500-NH3 G	MMS	1	PASI-I
		EPA 8082	KAV	9	PASI-I
		EPA 9056	HBS	2	PASI-I
		EPA 6010	RAM	1	PASI-I
		SM 2540C	WZE	1	PASI-I
50285629004	B-5	EPA 410.4	SWJ	1	PASI-I
		EPA 353.2	GWA	2	PASI-I
		SM 4500-NH3 G	MMS	1	PASI-I
		EPA 8082	KAV	9	PASI-I
		EPA 9056	HBS	2	PASI-I
		EPA 6010	RAM	1	PASI-I
50285629005	B-9R	SM 2540C	WZE	1	PASI-I
		EPA 410.4	SWJ	1	PASI-I
		EPA 353.2	GWA	2	PASI-I
		SM 4500-NH3 G	MMS	1	PASI-I
		EPA 8082	KAV	9	PASI-I
		EPA 9056	HBS	2	PASI-I
50285629006	FB-01	EPA 6010	RAM	1	PASI-I
		SM 2540C	WZE	1	PASI-I
		EPA 410.4	SWJ	1	PASI-I
		EPA 353.2	GWA	2	PASI-I
		SM 4500-NH3 G	MMS	1	PASI-I
		EPA 8082	KAV	9	PASI-I
		EPA 9056	HBS	2	PASI-I

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6010	RAM	1	PASI-I
		SM 2540C	WZE	1	PASI-I
		EPA 410.4	SWJ	1	PASI-I
		EPA 353.2	GWA	2	PASI-I
		SM 4500-NH3 G	MMS	1	PASI-I
<b>50285629007</b>	<b>DUP-01</b>	EPA 8082	KAV	9	PASI-I
		EPA 9056	HBS	2	PASI-I
		EPA 6010	RAM	1	PASI-I
		SM 2540C	WZE	1	PASI-I
		EPA 410.4	SWJ	1	PASI-I
		EPA 353.2	GWA	2	PASI-I
		SM 4500-NH3 G	MMS	1	PASI-I

PASI-I = Pace Analytical Services - Indianapolis

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>50285629001</b>	<b>B-1R</b>					
EPA 9056	Chloride	28.8	mg/L	2.5	05/06/21 21:58	
EPA 9056	Sulfate	1810	mg/L	25.0	05/06/21 22:14	
EPA 6010	Sodium, Dissolved	34.7	mg/L	1.0	05/05/21 09:10	
SM 2540C	Total Dissolved Solids	2310	mg/L	40.0	04/27/21 16:47	
EPA 410.4	Chemical Oxygen Demand	40.9	mg/L	10.0	04/29/21 13:39	
SM 4500-NH3 G	Nitrogen, Ammonia	2.5	mg/L	0.10	05/04/21 11:46	
<b>50285629002</b>	<b>B-3R</b>					
EPA 9056	Chloride	307	mg/L	25.0	05/07/21 00:48	
EPA 9056	Sulfate	468	mg/L	25.0	05/07/21 00:48	
EPA 6010	Sodium, Dissolved	190	mg/L	1.0	05/05/21 09:13	
SM 2540C	Total Dissolved Solids	1790	mg/L	40.0	04/27/21 16:48	
EPA 410.4	Chemical Oxygen Demand	87.3	mg/L	10.0	04/29/21 13:39	
SM 4500-NH3 G	Nitrogen, Ammonia	25.9	mg/L	0.20	05/04/21 15:47	
<b>50285629003</b>	<b>B-4</b>					
EPA 9056	Chloride	21.4	mg/L	2.5	05/07/21 01:04	
EPA 9056	Sulfate	214	mg/L	2.5	05/07/21 01:04	
EPA 6010	Sodium, Dissolved	18.7	mg/L	1.0	05/05/21 09:15	
SM 2540C	Total Dissolved Solids	703	mg/L	10.0	04/27/21 16:48	
EPA 410.4	Chemical Oxygen Demand	23.5	mg/L	10.0	04/29/21 13:39	
<b>50285629004</b>	<b>B-5</b>					
EPA 9056	Chloride	52.7	mg/L	2.5	05/07/21 01:35	
EPA 9056	Sulfate	750	mg/L	25.0	05/07/21 01:50	
EPA 6010	Sodium, Dissolved	54.2	mg/L	1.0	05/05/21 09:17	
SM 2540C	Total Dissolved Solids	2400	mg/L	40.0	04/27/21 16:48	
EPA 410.4	Chemical Oxygen Demand	68.0	mg/L	10.0	04/29/21 13:39	
SM 4500-NH3 G	Nitrogen, Ammonia	2.7	mg/L	0.10	05/04/21 11:55	
<b>50285629005</b>	<b>B-9R</b>					
EPA 9056	Chloride	261	mg/L	25.0	05/07/21 02:52	
EPA 9056	Sulfate	1110	mg/L	25.0	05/07/21 02:52	
EPA 6010	Sodium, Dissolved	142	mg/L	1.0	05/05/21 09:23	
SM 2540C	Total Dissolved Solids	2060	mg/L	40.0	04/27/21 16:48	
EPA 410.4	Chemical Oxygen Demand	67.2	mg/L	10.0	04/29/21 13:39	
SM 4500-NH3 G	Nitrogen, Ammonia	19.9	mg/L	0.10	05/04/21 11:57	
<b>50285629006</b>	<b>FB-01</b>					
SM 2540C	Total Dissolved Solids	12	mg/L	10.0	04/27/21 16:49	PL
EPA 410.4	Chemical Oxygen Demand	11.0	mg/L	10.0	04/29/21 13:39	
<b>50285629007</b>	<b>DUP-01</b>					
EPA 9056	Chloride	197	mg/L	25.0	05/07/21 03:38	
EPA 9056	Sulfate	916	mg/L	25.0	05/07/21 03:38	
EPA 6010	Sodium, Dissolved	142	mg/L	1.0	05/05/21 09:27	
SM 2540C	Total Dissolved Solids	236	mg/L	10.0	04/27/21 17:13	
EPA 410.4	Chemical Oxygen Demand	69.0	mg/L	10.0	04/29/21 13:39	
SM 4500-NH3 G	Nitrogen, Ammonia	20.3	mg/L	0.20	05/04/21 15:51	

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### ANALYTICAL RESULTS

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Sample: B-1R	Lab ID: 50285629001	Collected: 04/22/21 13:15	Received: 04/23/21 08:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB RV Waters</b>								
Analytical Method: EPA 8082 Preparation Method: EPA 3510								
Pace Analytical Services - Indianapolis								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:30	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:30	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:30	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:30	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:30	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:30	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:30	11096-82-5	
PCB, Total (Aroclor)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:30	1336-36-3	N2
<b>Surrogates</b>								
Tetrachloro-m-xylene (S)	69	%	10-115	1	05/06/21 00:25	05/06/21 22:30	877-09-8	
<b>9056 IC Anions</b>								
Analytical Method: EPA 9056								
Pace Analytical Services - Indianapolis								
Chloride	28.8	mg/L	2.5	10		05/06/21 21:58	16887-00-6	
Sulfate	1810	mg/L	25.0	100		05/06/21 22:14	14808-79-8	
<b>6010 MET ICP, Dissolved</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Pace Analytical Services - Indianapolis								
Sodium, Dissolved	34.7	mg/L	1.0	1	05/05/21 08:42	05/05/21 09:10	7440-23-5	
<b>2540C Total Dissolved Solids</b>								
Analytical Method: SM 2540C								
Pace Analytical Services - Indianapolis								
Total Dissolved Solids	2310	mg/L	40.0	1		04/27/21 16:47		
<b>410.4 COD</b>								
Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Pace Analytical Services - Indianapolis								
Chemical Oxygen Demand	40.9	mg/L	10.0	1	04/29/21 11:19	04/29/21 13:39		
<b>353.2 Nitrogen, NO2/NO3 unpres</b>								
Analytical Method: EPA 353.2								
Pace Analytical Services - Indianapolis								
Nitrogen, Nitrate	ND	mg/L	0.10	1		04/23/21 13:37	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		04/23/21 13:37	14797-65-0	
<b>4500 Ammonia Water</b>								
Analytical Method: SM 4500-NH3 G								
Pace Analytical Services - Indianapolis								
Nitrogen, Ammonia	2.5	mg/L	0.10	1		05/04/21 11:46	7664-41-7	

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## ANALYTICAL RESULTS

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Sample: B-3R	Lab ID: 50285629002	Collected: 04/22/21 12:15	Received: 04/23/21 08:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB RV Waters</b>								
Analytical Method: EPA 8082 Preparation Method: EPA 3510								
Pace Analytical Services - Indianapolis								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:45	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:45	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:45	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:45	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:45	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:45	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:45	11096-82-5	
PCB, Total (Aroclor)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:45	1336-36-3	N2
<b>Surrogates</b>								
Tetrachloro-m-xylene (S)	64	%	10-115	1	05/06/21 00:25	05/06/21 22:45	877-09-8	
<b>9056 IC Anions</b>								
Analytical Method: EPA 9056								
Pace Analytical Services - Indianapolis								
Chloride	307	mg/L	25.0	100		05/07/21 00:48	16887-00-6	
Sulfate	468	mg/L	25.0	100		05/07/21 00:48	14808-79-8	
<b>6010 MET ICP, Dissolved</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Pace Analytical Services - Indianapolis								
Sodium, Dissolved	190	mg/L	1.0	1	05/05/21 08:42	05/05/21 09:13	7440-23-5	
<b>2540C Total Dissolved Solids</b>								
Analytical Method: SM 2540C								
Pace Analytical Services - Indianapolis								
Total Dissolved Solids	1790	mg/L	40.0	1		04/27/21 16:48		
<b>410.4 COD</b>								
Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Pace Analytical Services - Indianapolis								
Chemical Oxygen Demand	87.3	mg/L	10.0	1	04/29/21 11:19	04/29/21 13:39		
<b>353.2 Nitrogen, NO2/NO3 unpres</b>								
Analytical Method: EPA 353.2								
Pace Analytical Services - Indianapolis								
Nitrogen, Nitrate	ND	mg/L	0.10	1		04/23/21 13:39	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		04/23/21 13:39	14797-65-0	
<b>4500 Ammonia Water</b>								
Analytical Method: SM 4500-NH3 G								
Pace Analytical Services - Indianapolis								
Nitrogen, Ammonia	25.9	mg/L	0.20	2		05/04/21 15:47	7664-41-7	

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### ANALYTICAL RESULTS

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Sample: B-4	Lab ID: 50285629003	Collected: 04/22/21 14:35	Received: 04/23/21 08:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB RV Waters</b>								
Analytical Method: EPA 8082 Preparation Method: EPA 3510								
Pace Analytical Services - Indianapolis								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:59	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:59	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:59	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:59	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:59	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:59	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:59	11096-82-5	
PCB, Total (Aroclor)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 22:59	1336-36-3	N2
<b>Surrogates</b>								
Tetrachloro-m-xylene (S)	50	%	10-115	1	05/06/21 00:25	05/06/21 22:59	877-09-8	
<b>9056 IC Anions</b>								
Analytical Method: EPA 9056								
Pace Analytical Services - Indianapolis								
Chloride	21.4	mg/L	2.5	10		05/07/21 01:04	16887-00-6	
Sulfate	214	mg/L	2.5	10		05/07/21 01:04	14808-79-8	
<b>6010 MET ICP, Dissolved</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Pace Analytical Services - Indianapolis								
Sodium, Dissolved	18.7	mg/L	1.0	1	05/05/21 08:42	05/05/21 09:15	7440-23-5	
<b>2540C Total Dissolved Solids</b>								
Analytical Method: SM 2540C								
Pace Analytical Services - Indianapolis								
Total Dissolved Solids	703	mg/L	10.0	1		04/27/21 16:48		
<b>410.4 COD</b>								
Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Pace Analytical Services - Indianapolis								
Chemical Oxygen Demand	23.5	mg/L	10.0	1	04/29/21 11:19	04/29/21 13:39		
<b>353.2 Nitrogen, NO2/NO3 unpres</b>								
Analytical Method: EPA 353.2								
Pace Analytical Services - Indianapolis								
Nitrogen, Nitrate	ND	mg/L	0.10	1		04/23/21 13:41	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		04/23/21 13:41	14797-65-0	
<b>4500 Ammonia Water</b>								
Analytical Method: SM 4500-NH3 G								
Pace Analytical Services - Indianapolis								
Nitrogen, Ammonia	ND	mg/L	0.10	1		05/04/21 15:49	7664-41-7	

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## ANALYTICAL RESULTS

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Sample: B-5	Lab ID: 50285629004	Collected: 04/22/21 09:45	Received: 04/23/21 08:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB RV Waters</b>								
Analytical Method: EPA 8082 Preparation Method: EPA 3510								
Pace Analytical Services - Indianapolis								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:14	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:14	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:14	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:14	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:14	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:14	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:14	11096-82-5	
PCB, Total (Aroclor)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:14	1336-36-3	N2
<b>Surrogates</b>								
Tetrachloro-m-xylene (S)	52	%	10-115	1	05/06/21 00:25	05/06/21 23:14	877-09-8	
<b>9056 IC Anions</b>								
Analytical Method: EPA 9056								
Pace Analytical Services - Indianapolis								
Chloride	52.7	mg/L	2.5	10		05/07/21 01:35	16887-00-6	
Sulfate	750	mg/L	25.0	100		05/07/21 01:50	14808-79-8	
<b>6010 MET ICP, Dissolved</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Pace Analytical Services - Indianapolis								
Sodium, Dissolved	54.2	mg/L	1.0	1	05/05/21 08:42	05/05/21 09:17	7440-23-5	
<b>2540C Total Dissolved Solids</b>								
Analytical Method: SM 2540C								
Pace Analytical Services - Indianapolis								
Total Dissolved Solids	2400	mg/L	40.0	1		04/27/21 16:48		
<b>410.4 COD</b>								
Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Pace Analytical Services - Indianapolis								
Chemical Oxygen Demand	68.0	mg/L	10.0	1	04/29/21 11:19	04/29/21 13:39		
<b>353.2 Nitrogen, NO2/NO3 unpres</b>								
Analytical Method: EPA 353.2								
Pace Analytical Services - Indianapolis								
Nitrogen, Nitrate	ND	mg/L	0.10	1		04/23/21 13:43	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		04/23/21 13:43	14797-65-0	
<b>4500 Ammonia Water</b>								
Analytical Method: SM 4500-NH3 G								
Pace Analytical Services - Indianapolis								
Nitrogen, Ammonia	2.7	mg/L	0.10	1		05/04/21 11:55	7664-41-7	

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### ANALYTICAL RESULTS

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Sample: B-9R	Lab ID: 50285629005	Collected: 04/22/21 11:15	Received: 04/23/21 08:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB RV Waters</b>								
Analytical Method: EPA 8082 Preparation Method: EPA 3510								
Pace Analytical Services - Indianapolis								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.10	1	05/06/21 00:25	05/06/21 23:28	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.10	1	05/06/21 00:25	05/06/21 23:28	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.10	1	05/06/21 00:25	05/06/21 23:28	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.10	1	05/06/21 00:25	05/06/21 23:28	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.10	1	05/06/21 00:25	05/06/21 23:28	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.10	1	05/06/21 00:25	05/06/21 23:28	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.10	1	05/06/21 00:25	05/06/21 23:28	11096-82-5	
PCB, Total (Aroclor)	ND	ug/L	0.10	1	05/06/21 00:25	05/06/21 23:28	1336-36-3	N2
<b>Surrogates</b>								
Tetrachloro-m-xylene (S)	69	%	10-115	1	05/06/21 00:25	05/06/21 23:28	877-09-8	
<b>9056 IC Anions</b>								
Analytical Method: EPA 9056								
Pace Analytical Services - Indianapolis								
Chloride	261	mg/L	25.0	100		05/07/21 02:52	16887-00-6	
Sulfate	1110	mg/L	25.0	100		05/07/21 02:52	14808-79-8	
<b>6010 MET ICP, Dissolved</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Pace Analytical Services - Indianapolis								
Sodium, Dissolved	142	mg/L	1.0	1	05/05/21 08:42	05/05/21 09:23	7440-23-5	
<b>2540C Total Dissolved Solids</b>								
Analytical Method: SM 2540C								
Pace Analytical Services - Indianapolis								
Total Dissolved Solids	2060	mg/L	40.0	1		04/27/21 16:48		
<b>410.4 COD</b>								
Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Pace Analytical Services - Indianapolis								
Chemical Oxygen Demand	67.2	mg/L	10.0	1	04/29/21 11:19	04/29/21 13:39		
<b>353.2 Nitrogen, NO2/NO3 unpres</b>								
Analytical Method: EPA 353.2								
Pace Analytical Services - Indianapolis								
Nitrogen, Nitrate	ND	mg/L	0.10	1		04/23/21 13:45	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		04/23/21 13:45	14797-65-0	
<b>4500 Ammonia Water</b>								
Analytical Method: SM 4500-NH3 G								
Pace Analytical Services - Indianapolis								
Nitrogen, Ammonia	19.9	mg/L	0.10	1		05/04/21 11:57	7664-41-7	

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## ANALYTICAL RESULTS

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Sample: <b>FB-01</b>	Lab ID: <b>50285629006</b>	Collected: 04/22/21 12:30	Received: 04/23/21 08:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB RV Waters</b>								
Analytical Method: EPA 8082 Preparation Method: EPA 3510								
Pace Analytical Services - Indianapolis								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:43	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:43	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:43	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:43	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:43	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:43	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:43	11096-82-5	
PCB, Total (Aroclor)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:43	1336-36-3	N2
<b>Surrogates</b>								
Tetrachloro-m-xylene (S)	68	%	10-115	1	05/06/21 00:25	05/06/21 23:43	877-09-8	
<b>9056 IC Anions</b>								
Analytical Method: EPA 9056								
Pace Analytical Services - Indianapolis								
Chloride	ND	mg/L	0.25	1		05/07/21 03:07	16887-00-6	
Sulfate	ND	mg/L	0.25	1		05/07/21 03:07	14808-79-8	
<b>6010 MET ICP, Dissolved</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Pace Analytical Services - Indianapolis								
Sodium, Dissolved	ND	mg/L	1.0	1	05/05/21 08:42	05/05/21 09:25	7440-23-5	
<b>2540C Total Dissolved Solids</b>								
Analytical Method: SM 2540C								
Pace Analytical Services - Indianapolis								
Total Dissolved Solids	<b>12</b>	mg/L	10.0	1		04/27/21 16:49		PL
<b>410.4 COD</b>								
Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Pace Analytical Services - Indianapolis								
Chemical Oxygen Demand	<b>11.0</b>	mg/L	10.0	1	04/29/21 11:19	04/29/21 13:39		
<b>353.2 Nitrogen, NO2/NO3 unpres</b>								
Analytical Method: EPA 353.2								
Pace Analytical Services - Indianapolis								
Nitrogen, Nitrate	ND	mg/L	0.10	1		04/23/21 13:47	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		04/23/21 13:47	14797-65-0	
<b>4500 Ammonia Water</b>								
Analytical Method: SM 4500-NH3 G								
Pace Analytical Services - Indianapolis								
Nitrogen, Ammonia	ND	mg/L	0.10	1		05/04/21 11:59	7664-41-7	

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## ANALYTICAL RESULTS

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Sample: DUP-01	Lab ID: 50285629007	Collected: 04/22/21 08:00	Received: 04/23/21 08:40	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>8082 GCS PCB RV Waters</b>								
Analytical Method: EPA 8082 Preparation Method: EPA 3510								
Pace Analytical Services - Indianapolis								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:57	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:57	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:57	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:57	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:57	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:57	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:57	11096-82-5	
PCB, Total (Aroclor)	ND	ug/L	0.095	1	05/06/21 00:25	05/06/21 23:57	1336-36-3	N2
<b>Surrogates</b>								
Tetrachloro-m-xylene (S)	69	%	10-115	1	05/06/21 00:25	05/06/21 23:57	877-09-8	
<b>9056 IC Anions</b>								
Analytical Method: EPA 9056								
Pace Analytical Services - Indianapolis								
Chloride	197	mg/L	25.0	100		05/07/21 03:38	16887-00-6	
Sulfate	916	mg/L	25.0	100		05/07/21 03:38	14808-79-8	
<b>6010 MET ICP, Dissolved</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Pace Analytical Services - Indianapolis								
Sodium, Dissolved	142	mg/L	1.0	1	05/05/21 08:42	05/05/21 09:27	7440-23-5	
<b>2540C Total Dissolved Solids</b>								
Analytical Method: SM 2540C								
Pace Analytical Services - Indianapolis								
Total Dissolved Solids	236	mg/L	10.0	1		04/27/21 17:13		
<b>410.4 COD</b>								
Analytical Method: EPA 410.4 Preparation Method: EPA 410.4								
Pace Analytical Services - Indianapolis								
Chemical Oxygen Demand	69.0	mg/L	10.0	1	04/29/21 11:19	04/29/21 13:39		
<b>353.2 Nitrogen, NO2/NO3 unpres</b>								
Analytical Method: EPA 353.2								
Pace Analytical Services - Indianapolis								
Nitrogen, Nitrate	ND	mg/L	0.10	1		04/23/21 13:49	14797-55-8	
Nitrogen, Nitrite	ND	mg/L	0.10	1		04/23/21 13:49	14797-65-0	
<b>4500 Ammonia Water</b>								
Analytical Method: SM 4500-NH3 G								
Pace Analytical Services - Indianapolis								
Nitrogen, Ammonia	20.3	mg/L	0.20	2		05/04/21 15:51	7664-41-7	

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

QC Batch:	619128	Analysis Method:	EPA 9056
QC Batch Method:	EPA 9056	Analysis Description:	9056 IC Anions
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

METHOD BLANK: 2852572 Matrix: Water  
Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	0.25	05/06/21 17:53	
Sulfate	mg/L	ND	0.25	05/06/21 17:53	

LABORATORY CONTROL SAMPLE: 2852573

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1.2	1.3	104	80-120	
Sulfate	mg/L	2.5	2.7	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2852574 2852575

Parameter	Units	50285629001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	28.8	12.5	12.5	43.7	43.7	119	119	80-120	0	15	
Sulfate	mg/L	1810	250	250	1900	1900	36	36	80-120	0	15	M3

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**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL DATA**

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

QC Batch:	618934	Analysis Method:	EPA 6010
QC Batch Method:	EPA 3010	Analysis Description:	6010 MET Dissolved
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

METHOD BLANK: 2851679 Matrix: Water

Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sodium, Dissolved	mg/L	ND	1.0	05/05/21 09:00	

LABORATORY CONTROL SAMPLE: 2851680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sodium, Dissolved	mg/L	10	9.7	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2851681 2851682

Parameter	Units	2851681		2851682		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		50285355041 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Sodium, Dissolved	mg/L	51700 ug/L	10	10	61.8	62.0	101	103	75-125	0	20	

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### QUALITY CONTROL DATA

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

QC Batch: 619148

Analysis Method: EPA 8082

QC Batch Method: EPA 3510

Analysis Description: 8082 GCS PCB Mod

Laboratory: Pace Analytical Services - Indianapolis

Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

METHOD BLANK: 2852768

Matrix: Water

Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.10	05/06/21 22:02	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.10	05/06/21 22:02	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.10	05/06/21 22:02	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.10	05/06/21 22:02	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.10	05/06/21 22:02	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.10	05/06/21 22:02	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.10	05/06/21 22:02	
Tetrachloro-m-xylene (S)	%	63	10-115	05/06/21 22:02	

LABORATORY CONTROL SAMPLE: 2852769

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	5	4.4	88	44-154	
PCB-1260 (Aroclor 1260)	ug/L	5	4.4	88	37-156	
Tetrachloro-m-xylene (S)	%			75	10-115	

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### QUALITY CONTROL DATA

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

QC Batch: 617631

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Indianapolis

Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

METHOD BLANK: 2845841

Matrix: Water

Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	10.0	04/27/21 16:45	

LABORATORY CONTROL SAMPLE: 2845842

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	300	260	87	80-120	

SAMPLE DUPLICATE: 2845843

Parameter	Units	50285587001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	317	331	4	10	

SAMPLE DUPLICATE: 2845844

Parameter	Units	50285587003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	316	307	3	10	

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**QUALITY CONTROL DATA**

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

QC Batch:	618042	Analysis Method:	EPA 410.4
QC Batch Method:	EPA 410.4	Analysis Description:	410.4 COD
		Laboratory:	Pace Analytical Services - Indianapolis
Associated Lab Samples:	50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007		

METHOD BLANK:	2847587	Matrix:	Water
Associated Lab Samples:	50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007		

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chemical Oxygen Demand	mg/L	ND	10.0	04/29/21 13:39	

LABORATORY CONTROL SAMPLE: 2847588						
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chemical Oxygen Demand	mg/L	50	49.2	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2847589												2847590	
Parameter	Units	50285618001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Chemical Oxygen Demand	mg/L	10.4	50	50	62.8	60.3	105	100	90-110	4	20		

MATRIX SPIKE SAMPLE: 2847591											
Parameter	Units	50285629001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers				
Chemical Oxygen Demand	mg/L	40.9	50	84.8	88	90-110	M0				

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### QUALITY CONTROL DATA

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

QC Batch:	617122	Analysis Method:	EPA 353.2
QC Batch Method:	EPA 353.2	Analysis Description:	353.2 Nitrate + Nitrite, Unpres.
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

METHOD BLANK: 2843893 Matrix: Water  
Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006, 50285629007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Nitrate	mg/L	ND	0.10	04/23/21 13:34	
Nitrogen, Nitrite	mg/L	ND	0.10	04/23/21 13:34	

LABORATORY CONTROL SAMPLE: 2843894

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate	mg/L	1	1.1	105	90-110	
Nitrogen, Nitrite	mg/L	1	0.94	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2843895 2843896

Parameter	Units	50285630006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Nitrate	mg/L	ND	1	1	0.97	0.97	96	97	90-110	1	20	
Nitrogen, Nitrite	mg/L	ND	1	1	0.86	0.86	86	86	90-110	0	20	M3

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2843898 2843899

Parameter	Units	50285630010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Nitrate	mg/L	ND	1	1	1.1	1.1	105	105	90-110	0	20	
Nitrogen, Nitrite	mg/L	ND	1	1	0.93	0.93	92	92	90-110	0	20	

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

QC Batch: 618724 Analysis Method: SM 4500-NH3 G  
 QC Batch Method: SM 4500-NH3 G Analysis Description: 4500 Ammonia  
 Laboratory: Pace Analytical Services - Indianapolis  
 Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006

METHOD BLANK: 2850625 Matrix: Water  
 Associated Lab Samples: 50285629001, 50285629002, 50285629003, 50285629004, 50285629005, 50285629006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	05/04/21 11:05	

LABORATORY CONTROL SAMPLE: 2850626

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.2	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2850627 2850628

Parameter	Units	50286004001		50286004002		50286004003		50286004004		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Nitrogen, Ammonia	mg/L	2.3	5	5	5	7.4	5	7.5	5	102	103	90-110	0	20

MATRIX SPIKE SAMPLE: 2850629

Parameter	Units	50285590007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5.1	5	9.7	93	90-110	

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**QUALITY CONTROL DATA**

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

QC Batch: 618725	Analysis Method: SM 4500-NH3 G
QC Batch Method: SM 4500-NH3 G	Analysis Description: 4500 Ammonia
	Laboratory: Pace Analytical Services - Indianapolis

Associated Lab Samples: 50285629007

METHOD BLANK: 2850631 Matrix: Water

Associated Lab Samples: 50285629007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	05/04/21 12:01	

LABORATORY CONTROL SAMPLE: 2850632

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.1	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2850633 2850634

Parameter	Units	2850633		2850634		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		50285689003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, Ammonia	mg/L	6.1	5	5	10.9	10.9	96	96	90-110	0	20

MATRIX SPIKE SAMPLE: 2850635

Parameter	Units	50285571007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	ND	5	5.1	102	90-110	

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## QUALIFIERS

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

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### DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

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

M3 Matrix spike recovery was outside laboratory control limits due to matrix interferences.

N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

PL The minimum mass of dried residue of 2.5 mg could not be obtained using the routine sample volume of 100 mL.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50285629001	B-1R	EPA 3510	619148	EPA 8082	619297
50285629002	B-3R	EPA 3510	619148	EPA 8082	619297
50285629003	B-4	EPA 3510	619148	EPA 8082	619297
50285629004	B-5	EPA 3510	619148	EPA 8082	619297
50285629005	B-9R	EPA 3510	619148	EPA 8082	619297
50285629006	FB-01	EPA 3510	619148	EPA 8082	619297
50285629007	DUP-01	EPA 3510	619148	EPA 8082	619297
50285629001	B-1R	EPA 9056	619128		
50285629002	B-3R	EPA 9056	619128		
50285629003	B-4	EPA 9056	619128		
50285629004	B-5	EPA 9056	619128		
50285629005	B-9R	EPA 9056	619128		
50285629006	FB-01	EPA 9056	619128		
50285629007	DUP-01	EPA 9056	619128		
50285629001	B-1R	EPA 3010	618934	EPA 6010	618935
50285629002	B-3R	EPA 3010	618934	EPA 6010	618935
50285629003	B-4	EPA 3010	618934	EPA 6010	618935
50285629004	B-5	EPA 3010	618934	EPA 6010	618935
50285629005	B-9R	EPA 3010	618934	EPA 6010	618935
50285629006	FB-01	EPA 3010	618934	EPA 6010	618935
50285629007	DUP-01	EPA 3010	618934	EPA 6010	618935
50285629001	B-1R	SM 2540C	617631		
50285629002	B-3R	SM 2540C	617631		
50285629003	B-4	SM 2540C	617631		
50285629004	B-5	SM 2540C	617631		
50285629005	B-9R	SM 2540C	617631		
50285629006	FB-01	SM 2540C	617631		
50285629007	DUP-01	SM 2540C	617631		
50285629001	B-1R	EPA 410.4	618042	EPA 410.4	618057
50285629002	B-3R	EPA 410.4	618042	EPA 410.4	618057
50285629003	B-4	EPA 410.4	618042	EPA 410.4	618057
50285629004	B-5	EPA 410.4	618042	EPA 410.4	618057
50285629005	B-9R	EPA 410.4	618042	EPA 410.4	618057
50285629006	FB-01	EPA 410.4	618042	EPA 410.4	618057
50285629007	DUP-01	EPA 410.4	618042	EPA 410.4	618057
50285629001	B-1R	EPA 353.2	617122		
50285629002	B-3R	EPA 353.2	617122		
50285629003	B-4	EPA 353.2	617122		
50285629004	B-5	EPA 353.2	617122		
50285629005	B-9R	EPA 353.2	617122		
50285629006	FB-01	EPA 353.2	617122		
50285629007	DUP-01	EPA 353.2	617122		
50285629001	B-1R	SM 4500-NH3 G	618724		
50285629002	B-3R	SM 4500-NH3 G	618724		
50285629003	B-4	SM 4500-NH3 G	618724		
50285629004	B-5	SM 4500-NH3 G	618724		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Georgia Pacific - Gary

Pace Project No.: 50285629

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50285629005	B-9R	SM 4500-NH3 G	618724		
50285629006	FB-01	SM 4500-NH3 G	618724		
50285629007	DUP-01	SM 4500-NH3 G	618725		

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**SAMPLE CONDITION UPON RECEIPT FORM**

Date/Time and Initials of person examining contents: BC 10:22 4-23-21

- 1. Courier:  FED EX  UPS  CLIENT  PACE  USPS  OTHER \_\_\_\_\_
- 2. Custody Seal on Cooler/Box Present:  Yes  No  
(If yes)Seals Intact:  Yes  No (leave blank if no seals were present)
- 3. Thermometer: 1 2 3 4 5 6 **A B C D E F**
- 4. Cooler Temperature: 1.4 / 1.4  
Temp should be above freezing to 6°C (Initial/Corrected)

- 5. Packing Material:  Bubble Wrap  Bubble Bags  
 None  Other \_\_\_\_\_
- 6. Ice Type:  Wet  Blue  None
- 7. If temp. is over 6°C or under 0°C, was the PM notified?:  Yes  No

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
USDA Regulated Soils? (HI, ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		✓	All containers needing acid/base pres. Have been CHECKED?: exceptions: VOA, coliform, LLHg, O&G, and any container with a septum cap or preserved with HCl.	✓		
Short Hold Time Analysis (48 hours or less)? Analysis: <u>Nitrate-Nitrite</u>	✓		Circle: <u>HNO3 (&lt;2)</u> <u>H2SO4 (&lt;2)</u> NaOH (>10) NaOH/ZnAc (>9) Any non-conformance to pH recommendations will be noted on the container count form			
Time 5035A TC placed in Freezer or Short Holds To Lab Time: <u>10:42</u>			Residual Chlorine Check (SVOC 625 Pest/PCB 608)	Present	Absent	N/A ✓
Rush TAT Requested (4 days or less):		✓	Residual Chlorine Check (Total/Amenable/Free Cyanide)			✓
Custody Signatures Present?	✓		Headspace Wisconsin Sulfide?			✓
Containers Intact?:	✓		Headspace in VOA Vials (>6mm): See Container Count form for details	Present	Absent	No VOA Vials Sent ✓
Sample Label (IDs/Dates/Times) Match COC?: Except TCs, which only require sample ID	✓		Trip Blank Present?		✓	
Extra labels on Terracore Vials? (soils only)		✓	Trip Blank Custody Seals?:			✓

COMMENTS:

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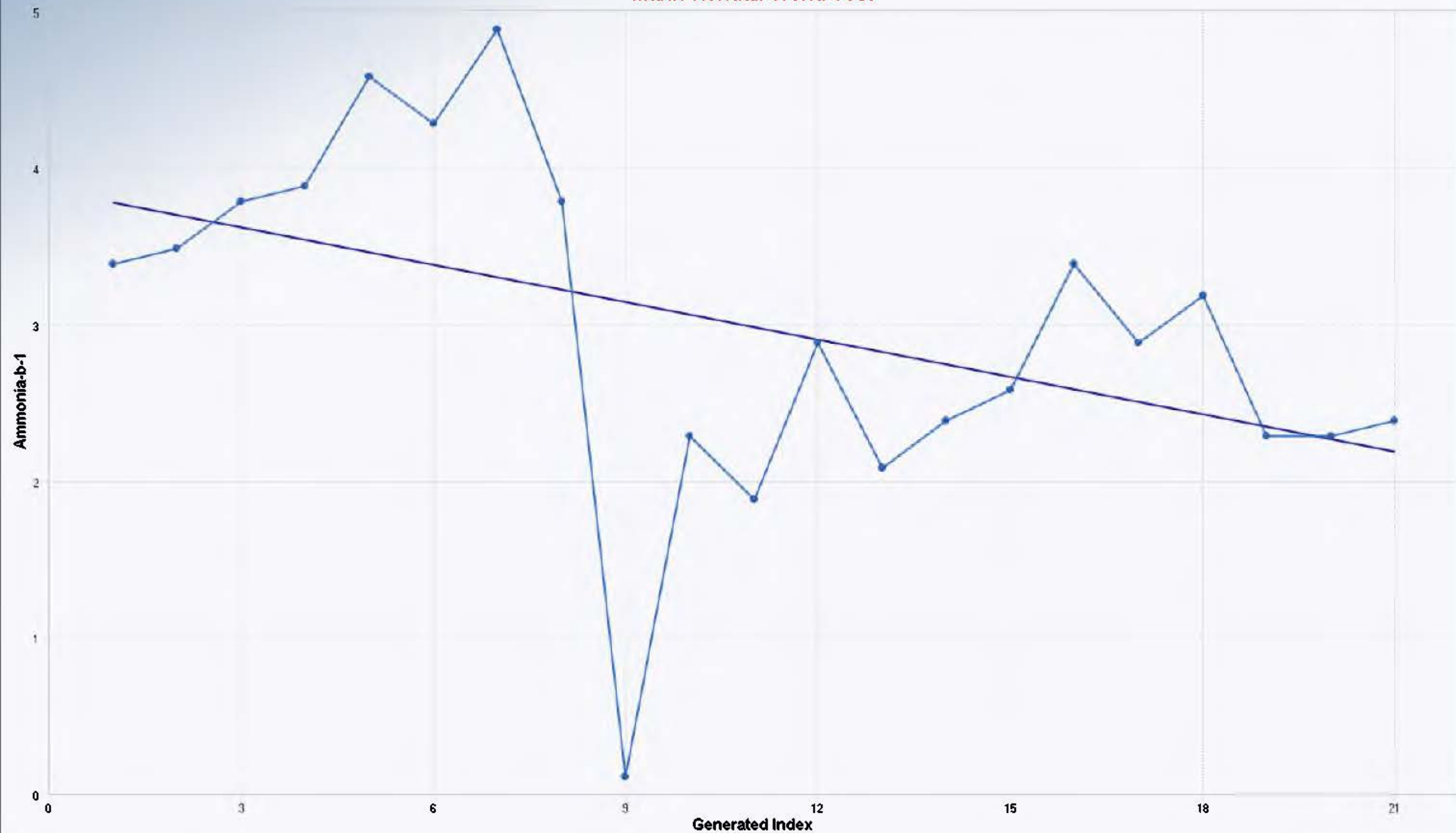
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**APPENDIX C**  
**STATISTICAL ANALYSIS**

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

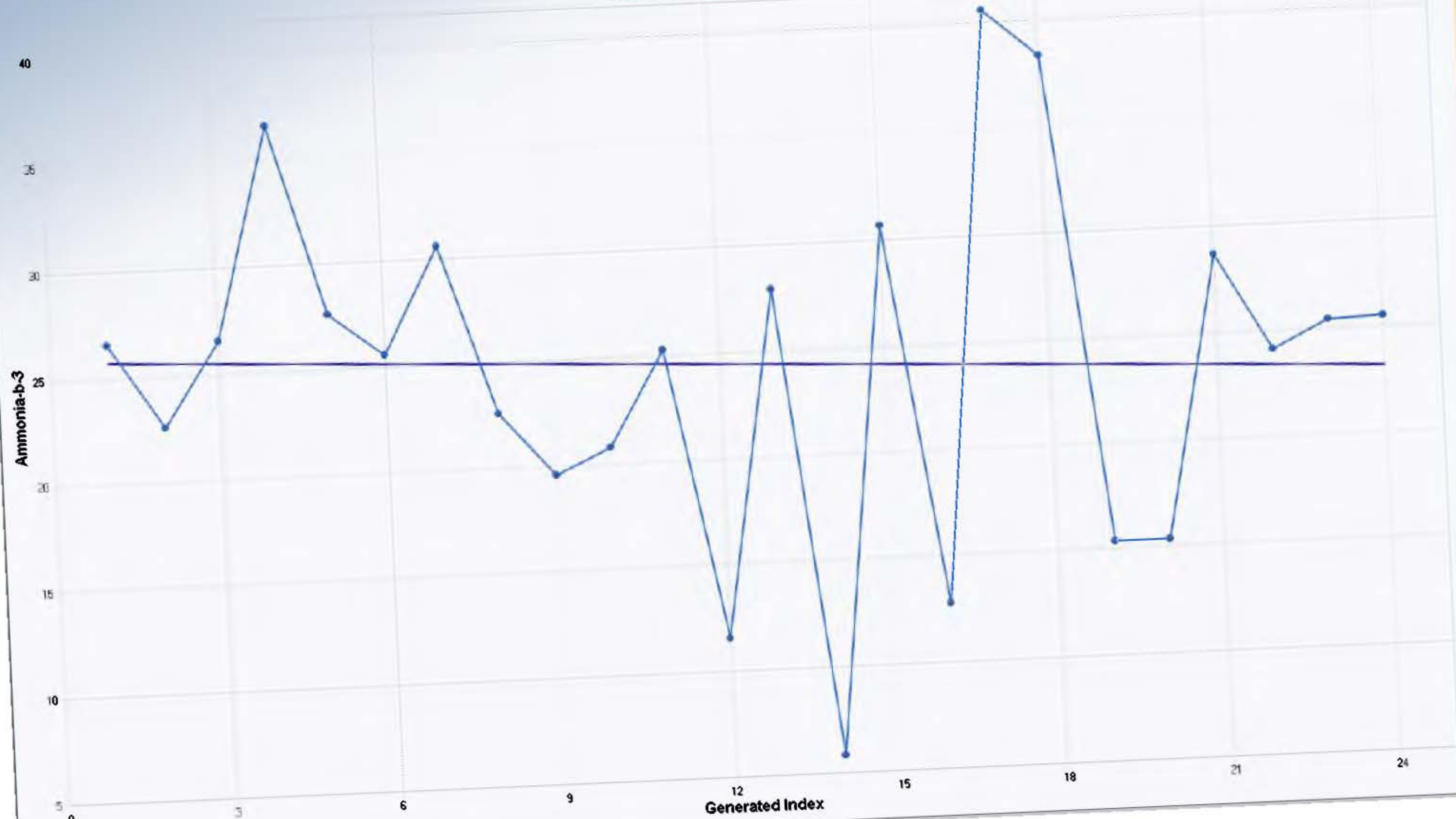
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0000
Standardized Value of S	-1.8182
M-K Test Value (S)	-61
Tabulated p-value	0.0370
Approximate p-value	0.0345

## OLS Regression Line (Blue)

OLS Regression Slope	-0.0796
OLS Regression Intercept	3.9766

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test

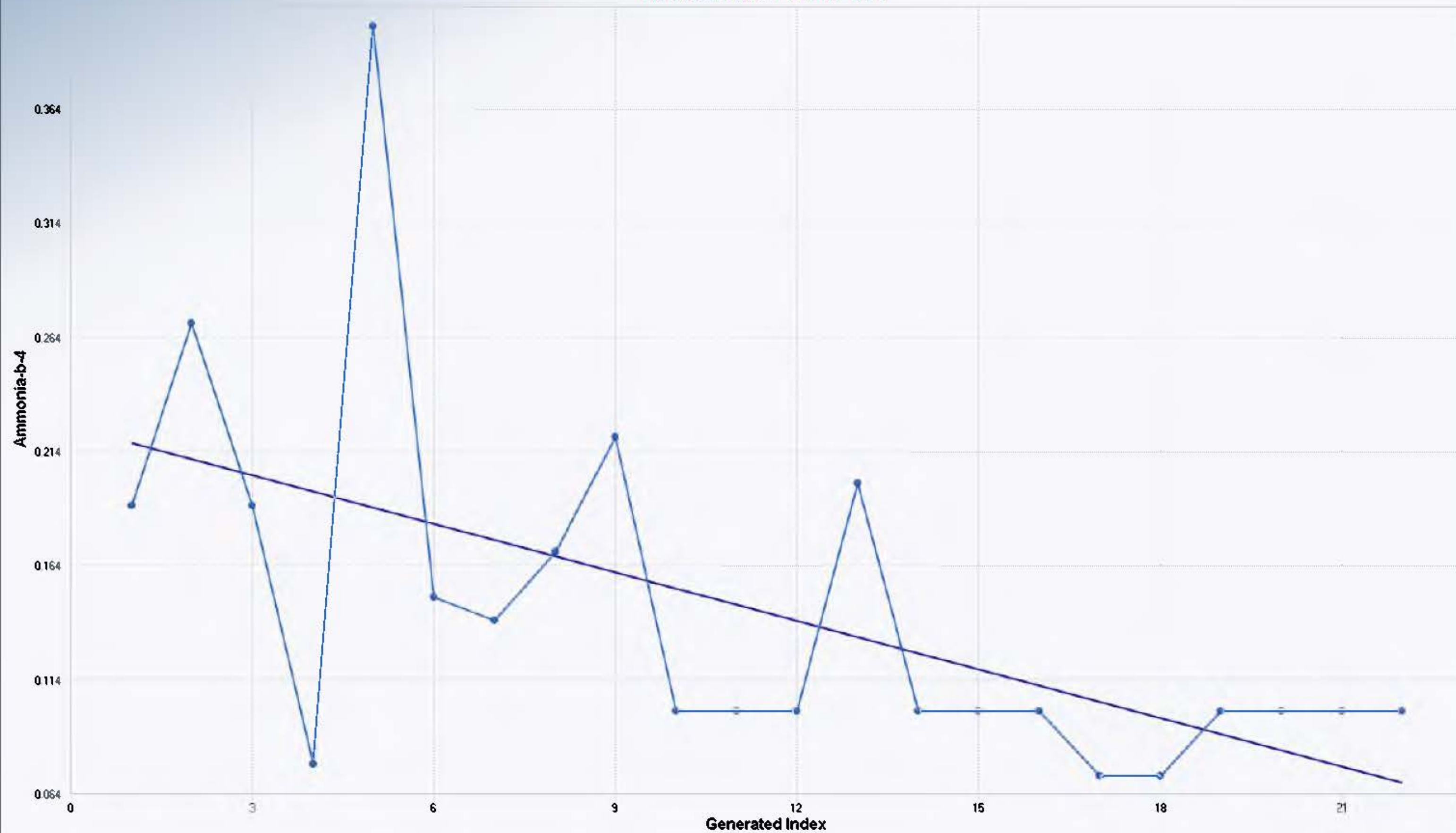


n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2782
Standardized Value of S	-0.3972
M-K Test Value (S)	-17
Apprx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3456

<b>OLS Regression Line (Blue)</b>	
OLS Regression Slope	-0.1113
OLS Regression Intercept	26.2460

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

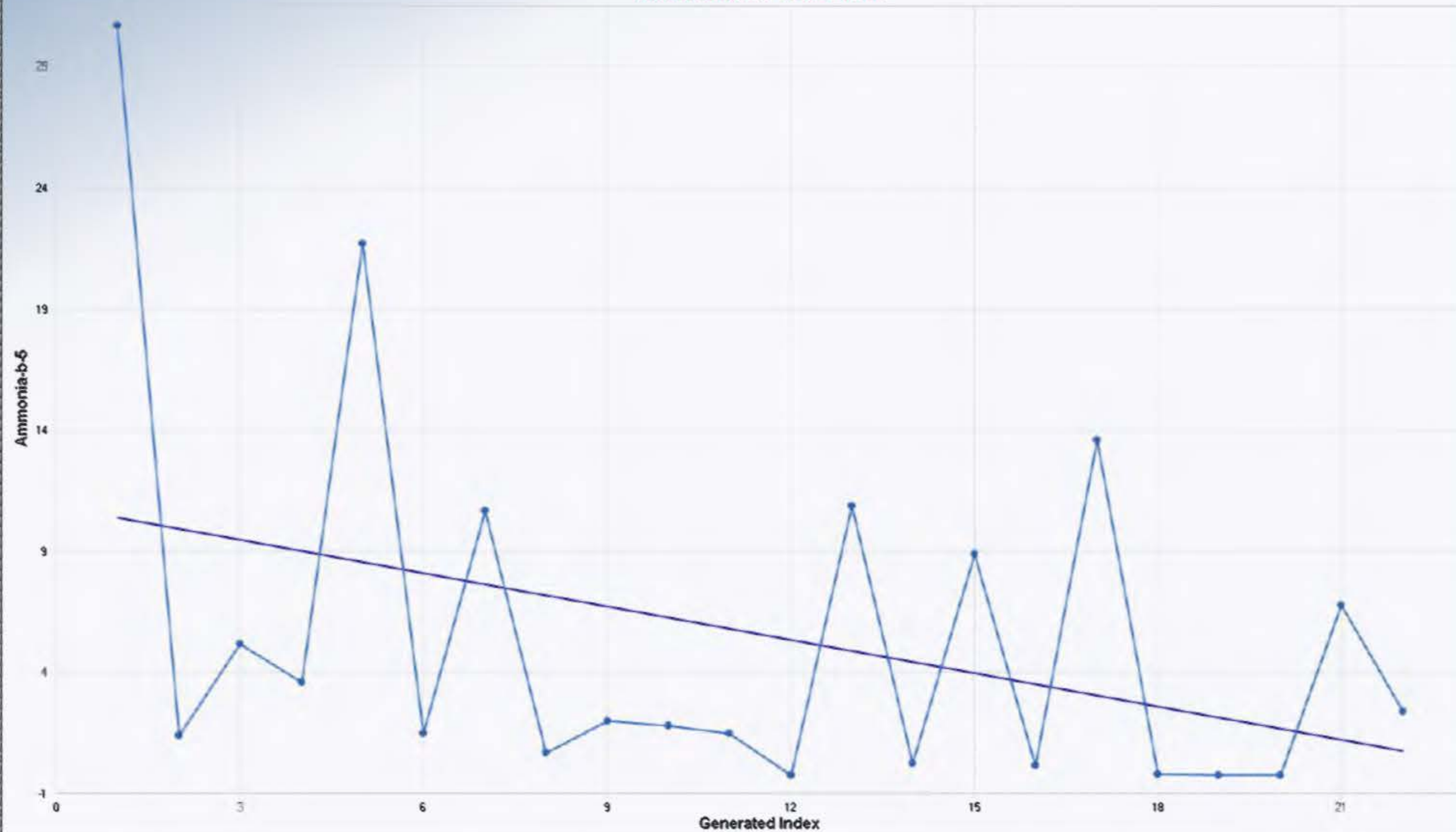
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.6254
Standardized Value of S	-2.8847
M-K Test Value (S)	98
Tabulated p-value	0.0020
Approximate p-value	0.0020

## OLS Regression Line (Blue)

OLS Regression Slope	-0.0071
OLS Regression Intercept	0.2249

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

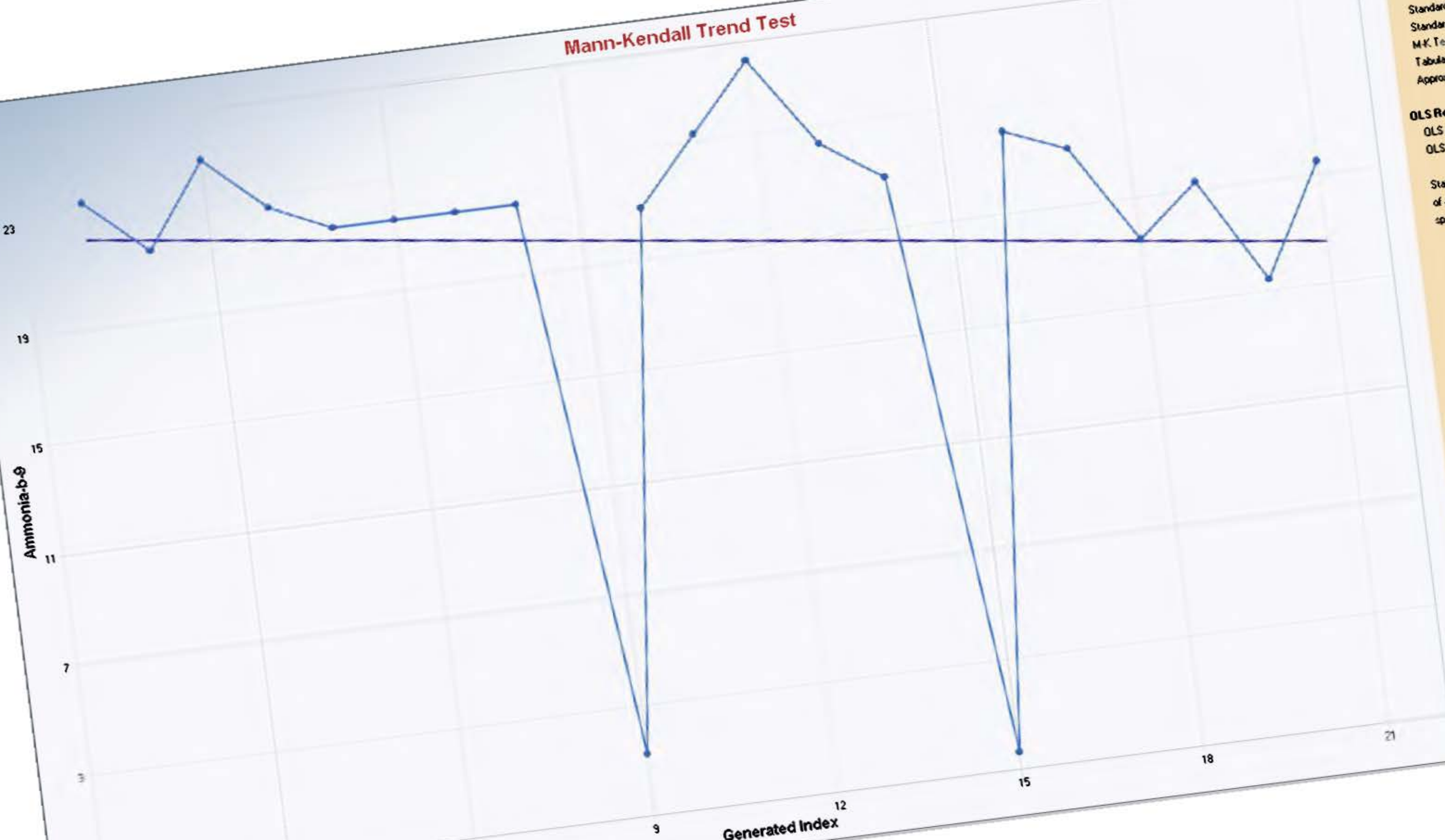
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.3977
Standardized Value of S	-1.8080
M-K Test Value (S)	65
Tabulated p-value	0.0359
Approximate p-value	0.0353

## OLS Regression Line (Blue)

OLS Regression Slope	-0.4585
OLS Regression Intercept	11.1670

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



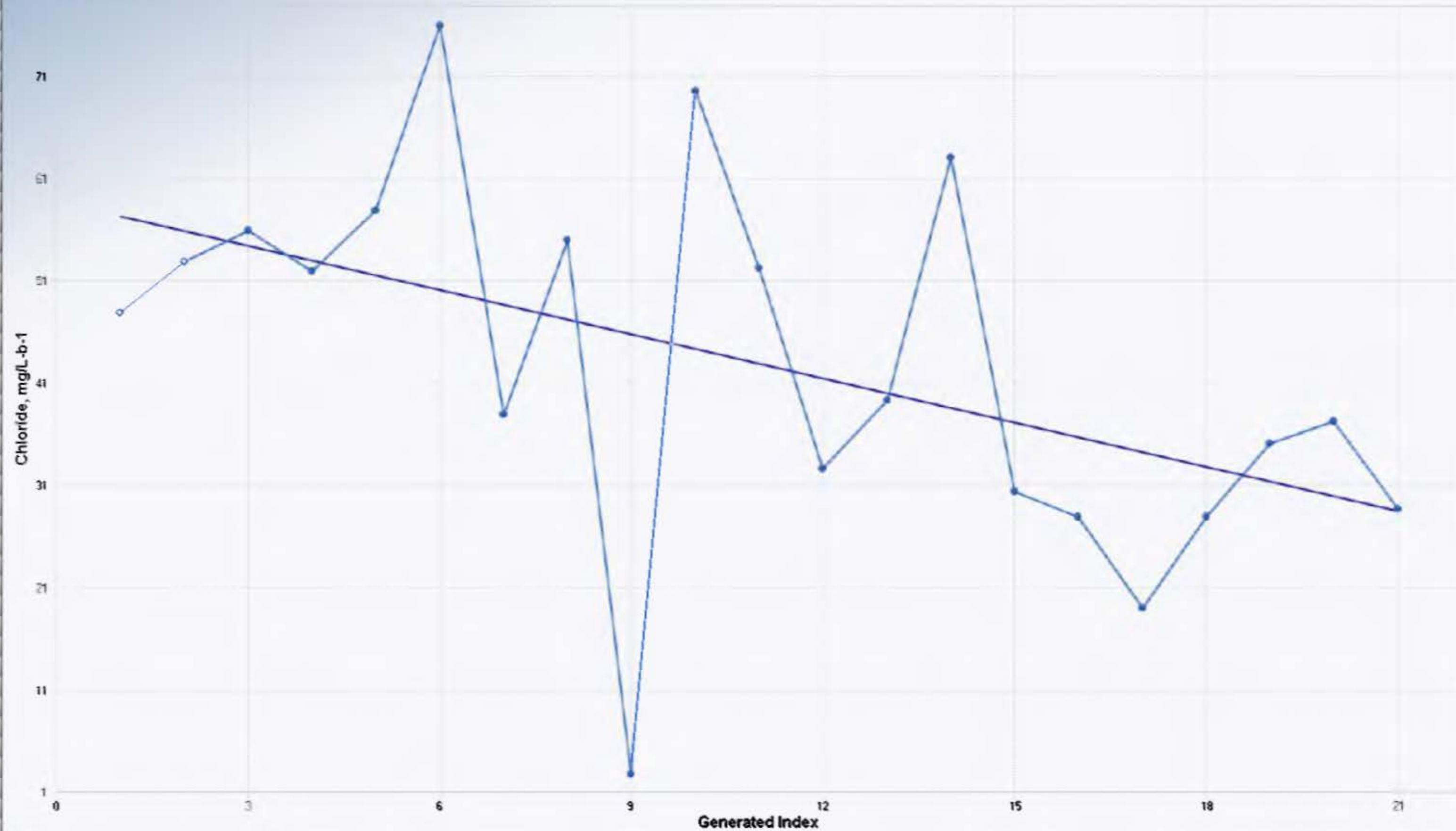
Standard Deviation of S	-2.6181
Standardized Value of S	.87
M-K Test Value (S)	0.0050
Tabulated p-value	0.0050
Approximate p-value	0.0044

OLS Regression Line (Blue)	
OLS Regression Slope	-0.2827
OLS Regression Intercept	22.9338

Statistically significant evidence of a decreasing trend at the specified level of significance.



# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.1009
Standardized Value of S	-2.2960
M-K Test Value (S)	-77
Tabulated p-value	0.0110
Approximate p-value	0.0108

## OLS Regression Line (Blue)

OLS Regression Slope	-1.4425
OLS Regression Intercept	59.8624

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



**Mann-Kendall Trend Analysis**

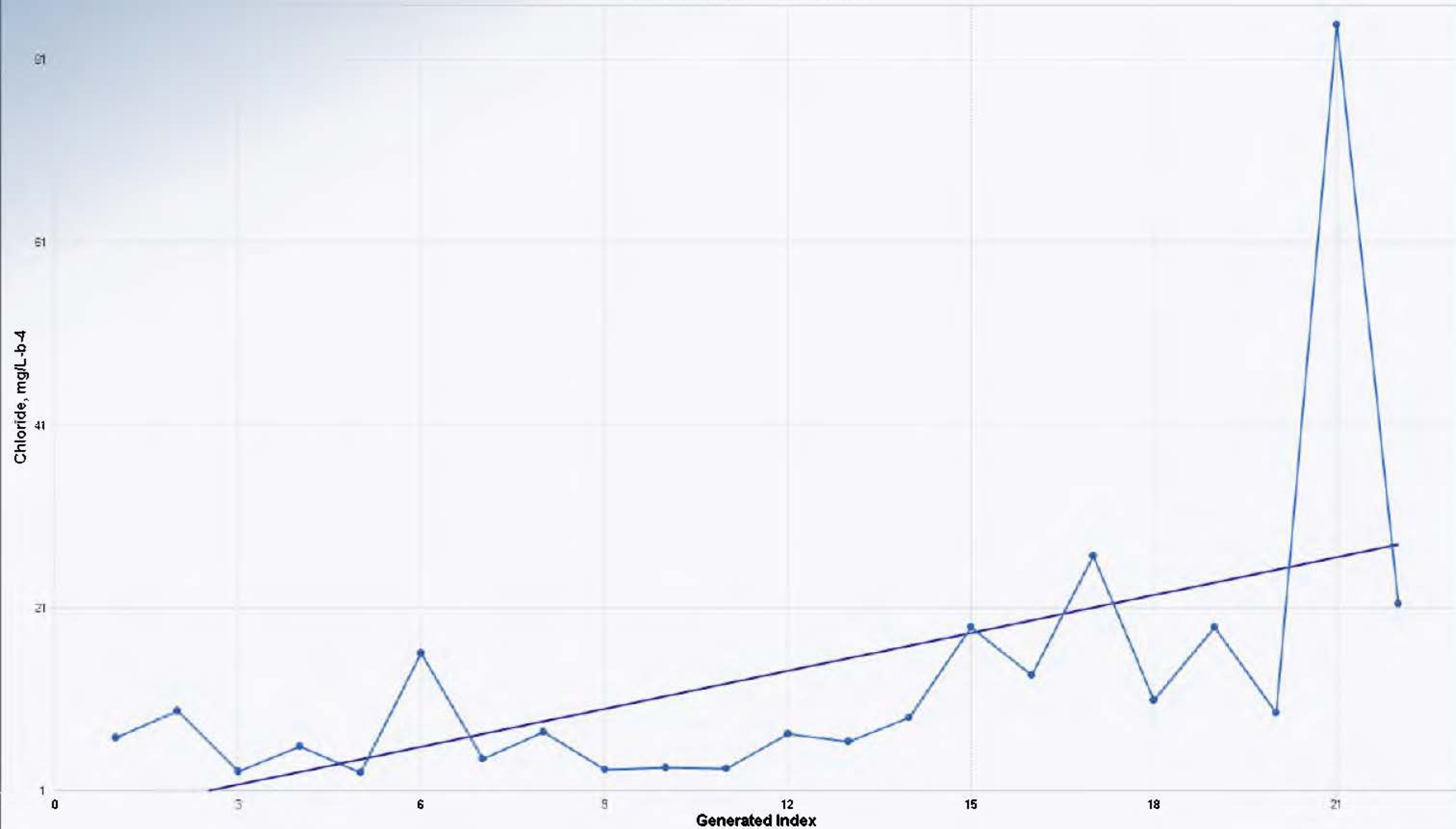
n	17
Confidence Coefficient	0.95
Level of Significance	0.05
Standard Deviation of S	1.0
Standardized Value of S	1.0
M-K Test Value (S)	1.0
Apprx. Critical Value (0.05)	1.0
Approximate p-value	0.1

**OLS Regression Line (Blue)**

OLS Regression Slope	8.22
OLS Regression Intercept	116.84

Statistically significant evidence of an increasing trend at the specified level of significance.

# Mann-Kendall Trend Test

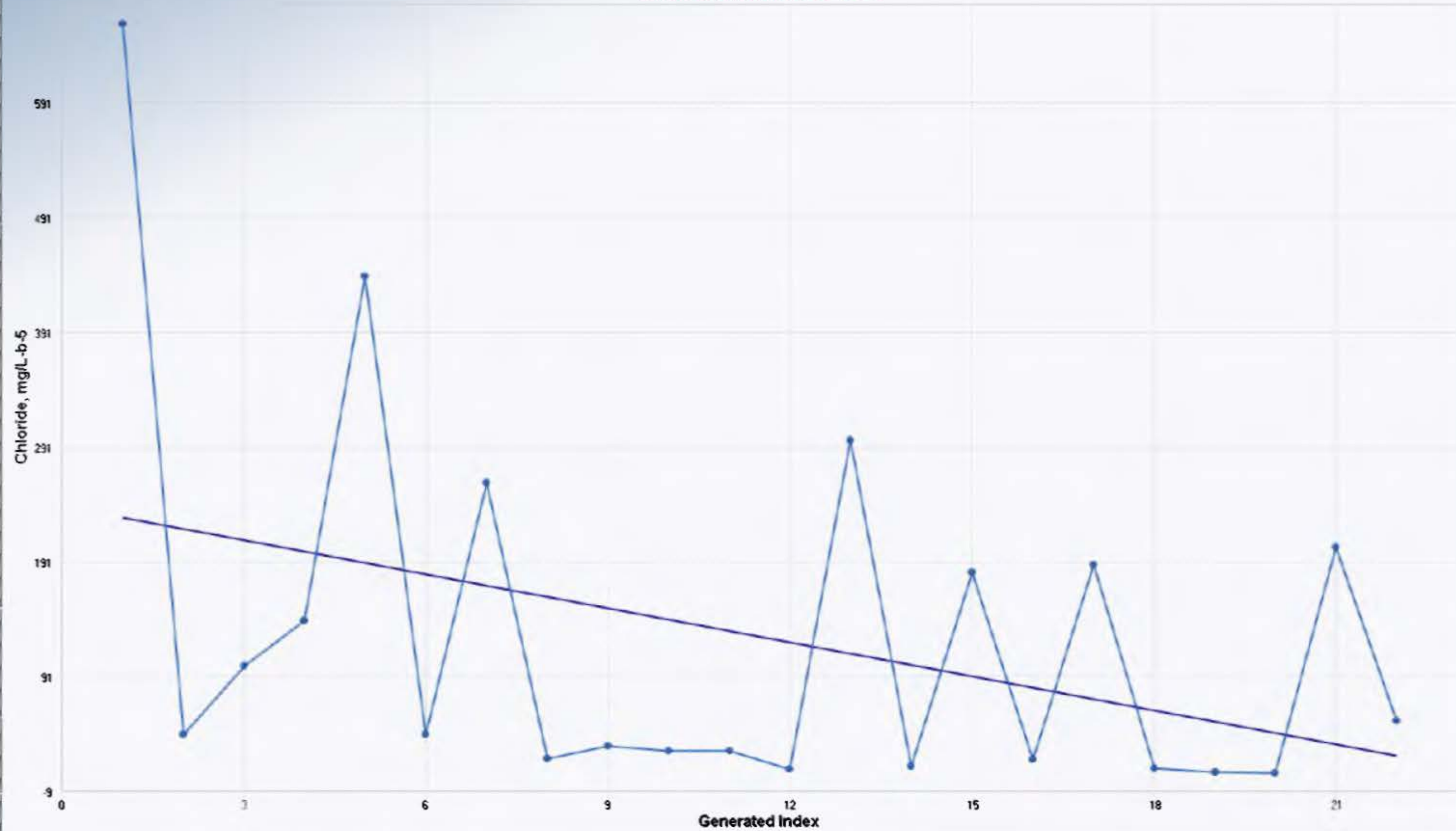


Mann-Kendall Trend Analysis	
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4636
Standardized Value of S	3.1018
M-K Test Value (S)	111
Tabulated p-value	0.0010
Approximate p-value	0.0010

OLS Regression Line (Blue)	
OLS Regression Slope	1.3888
OLS Regression Intercept	-2.6481

Statistically significant evidence of an increasing trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

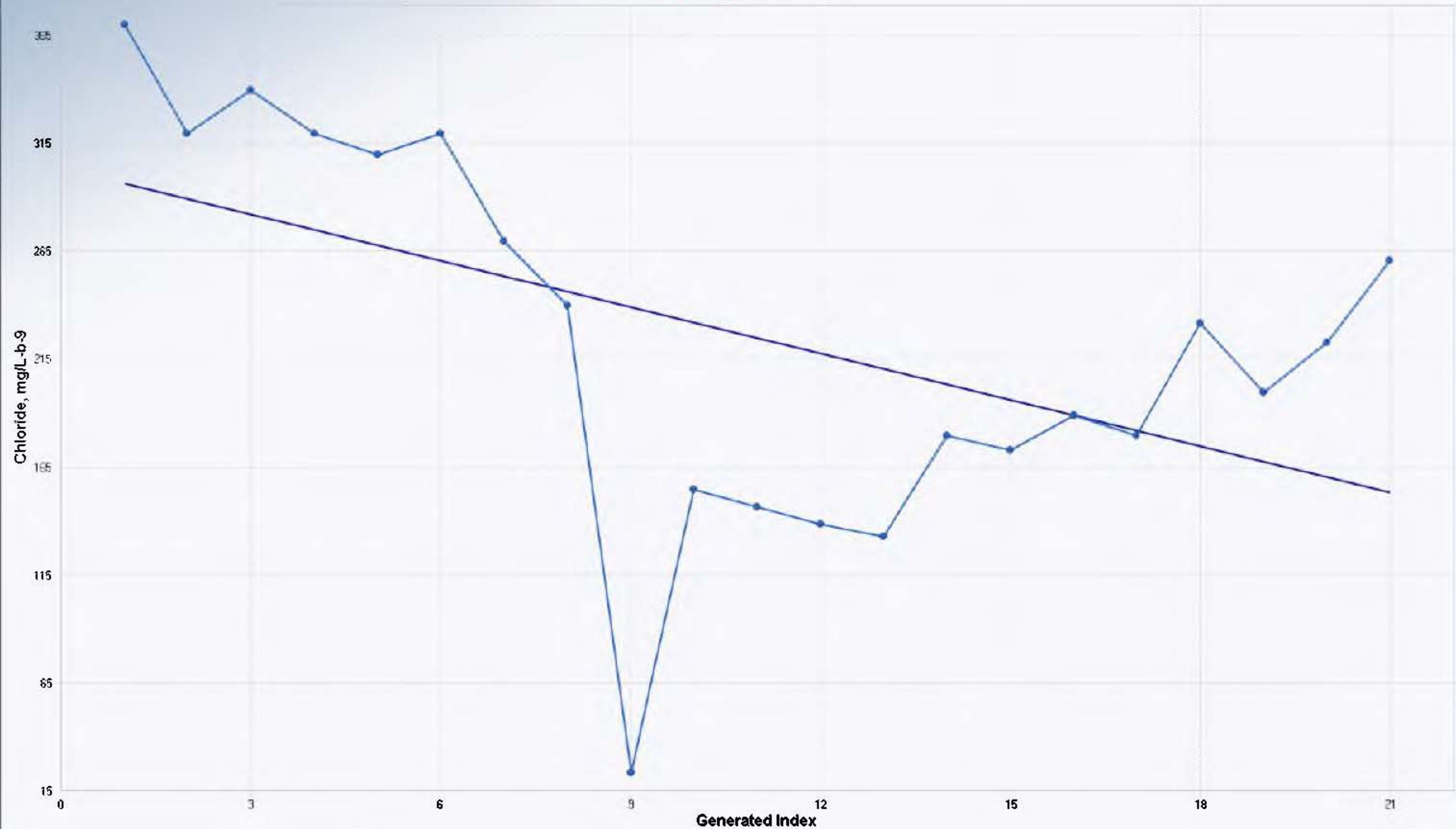
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4495
Standardized Value of S	-2.1157
MK Test Value (S)	76
Tabulated p-value	0.0150
Approximate p-value	0.0172

## OLS Regression Line (Blue)

OLS Regression Slope	-9.8778
OLS Regression Intercept	239.9169

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



Mann-Kendall Trend Analysis	
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0454
Standardized Value of S	-1.9670
M-K Test Value (S)	-66
Tabulated p-value	0.0240
Approximate p-value	0.0246

OLS Regression Line (Blue)	
OLS Regression Slope	-7.1429
OLS Regression Intercept	303.6190

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test

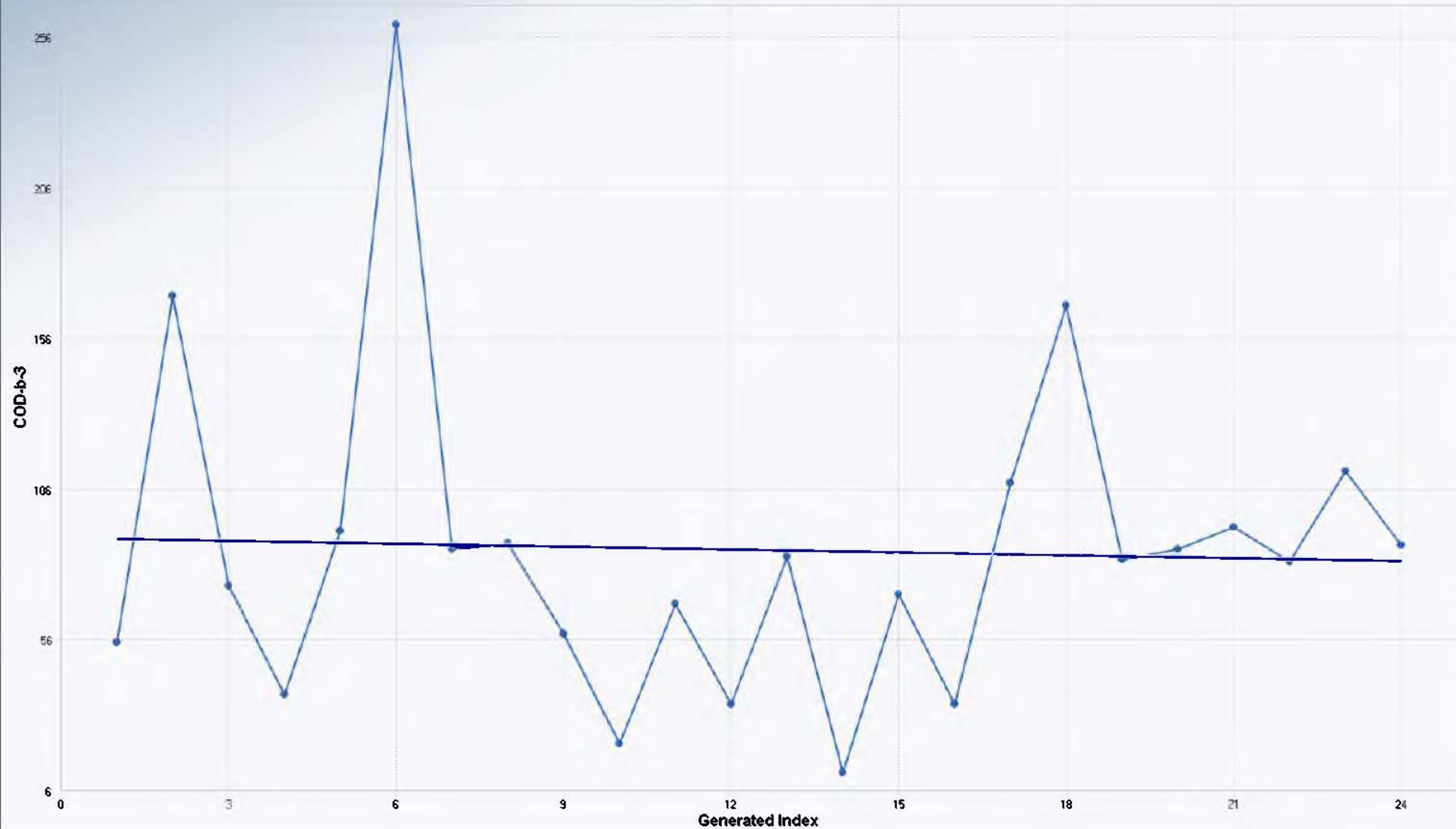


Standard Deviation of S	-1.9024
Standardized Value of S	64
M-K Test Value (S)	0.0280
Tabulated p-value	0.0286
Approximate p-value	0.0286

<b>OLS Regression Line (Blue)</b>	
OLS Regression Slope	-8.7379
OLS Regression Intercept	263.4029

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test

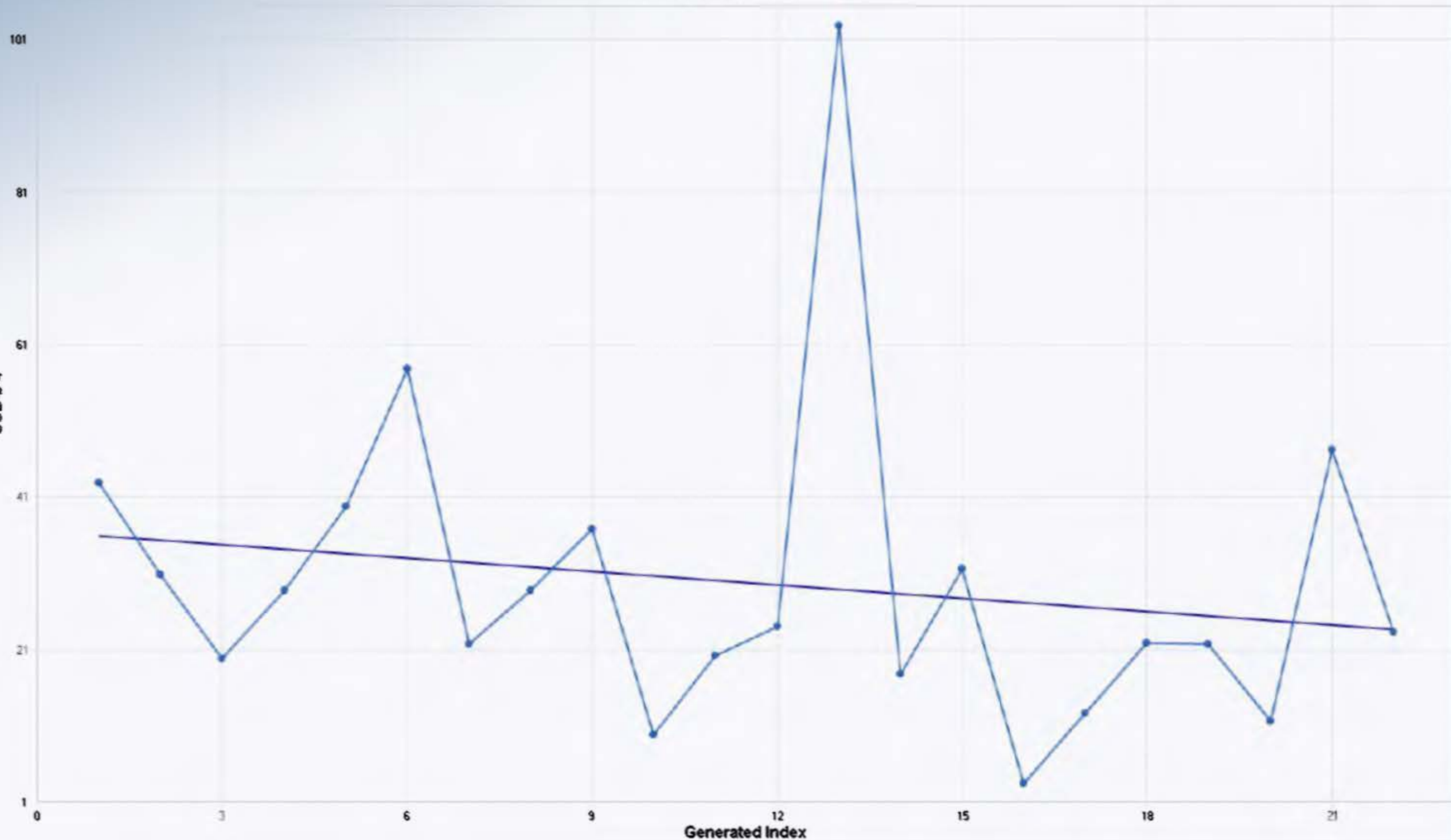


Mann-Kendall Trend Analysis	
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.3154
Standardized Value of S	0.6697
M-K Test Value (S)	28
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2515

OLS Regression Line (Blue)	
OLS Regression Slope	-0.3228
OLS Regression Intercept	90.0478

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



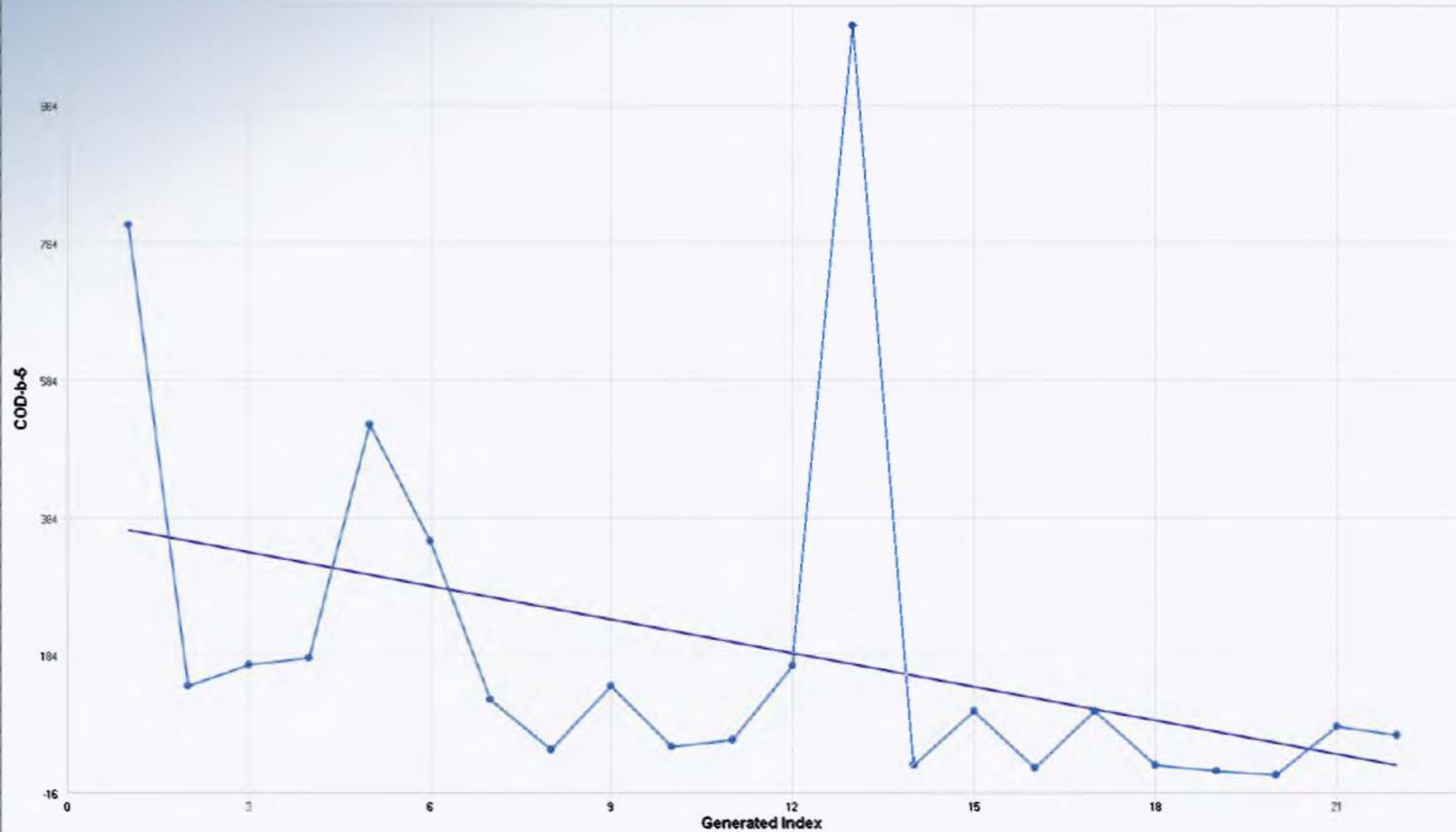
Mann-Kendall Trend Analysis	
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4354
Standardized Value of S	-1.3546
M-K Test Value (S)	-49
Tabulated p-value	0.0890
Approximate p-value	0.0878

OLS Regression Line (Blue)	
OLS Regression Slope	-0.5906
OLS Regression Intercept	36.6727

Insufficient statistical evidence of a significant trend at the specified level of significance.



# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

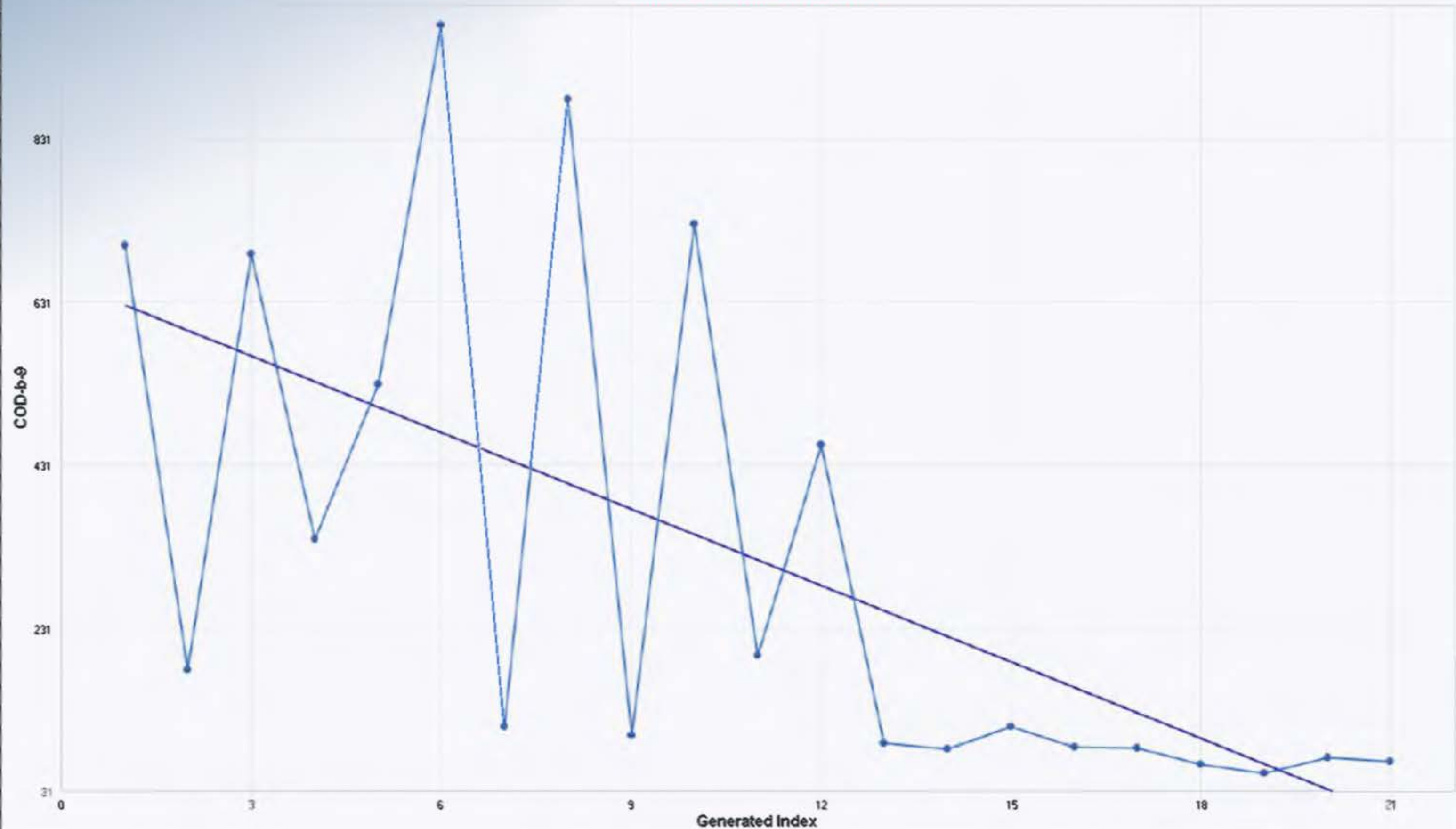
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4354
Standardized Value of S	-3.1042
M-K Test Value (S)	-111
Tabulated p-value	0.0010
Approximate p-value	0.0010

## OLS Regression Line (Blue)

OLS Regression Slope	-16.3094
OLS Regression Intercept	383.3351

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test

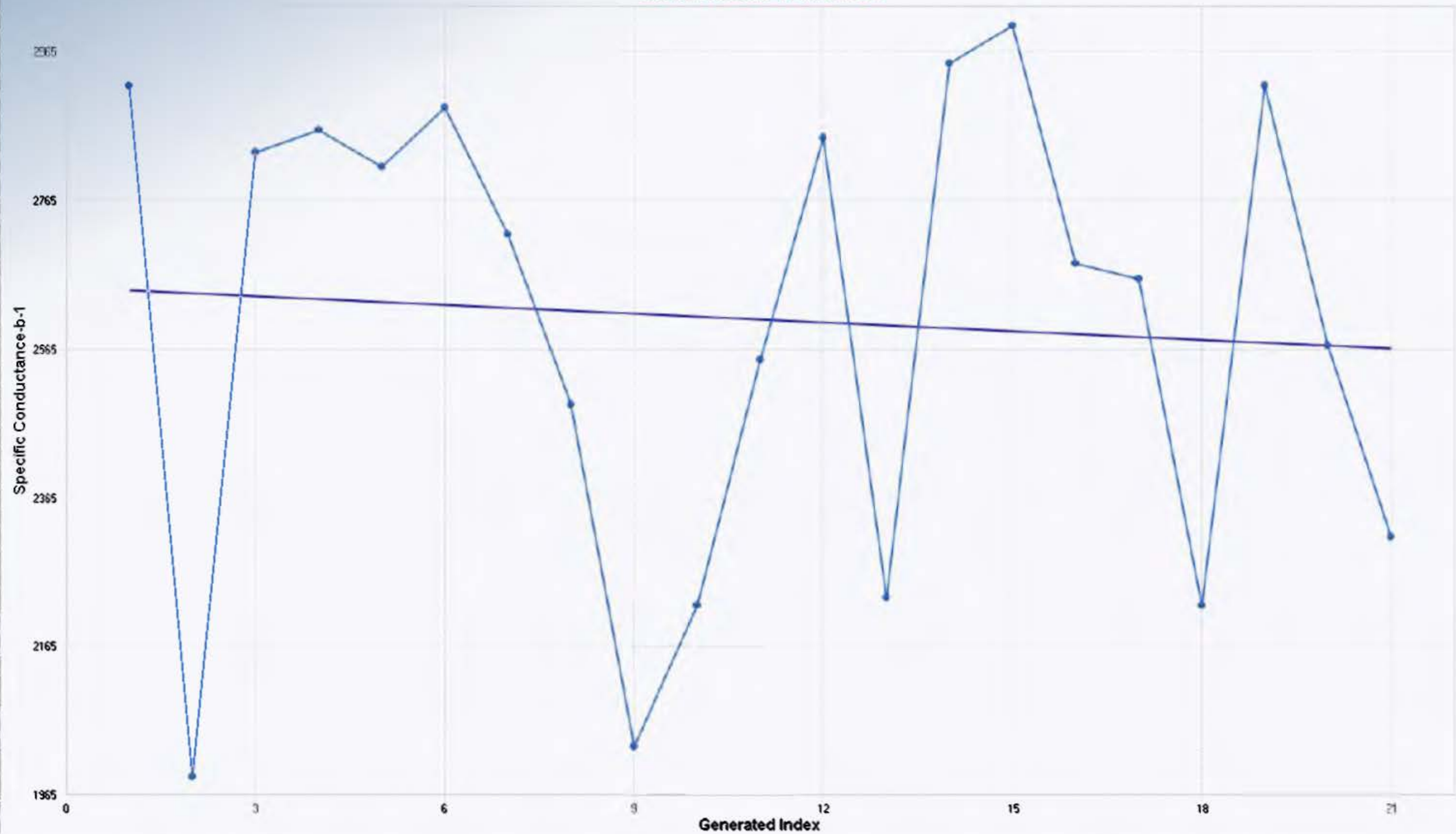


Mann-Kendall Trend Analysis	
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.1009
Standardized Value of S	-3.9274
M-K Test Value (S)	-131
Tabulated p-value	0.0000
Approximate p-value	0.0000

OLS Regression Line (Blue)	
OLS Regression Slope	-31.2829
OLS Regression Intercept	657.9876

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

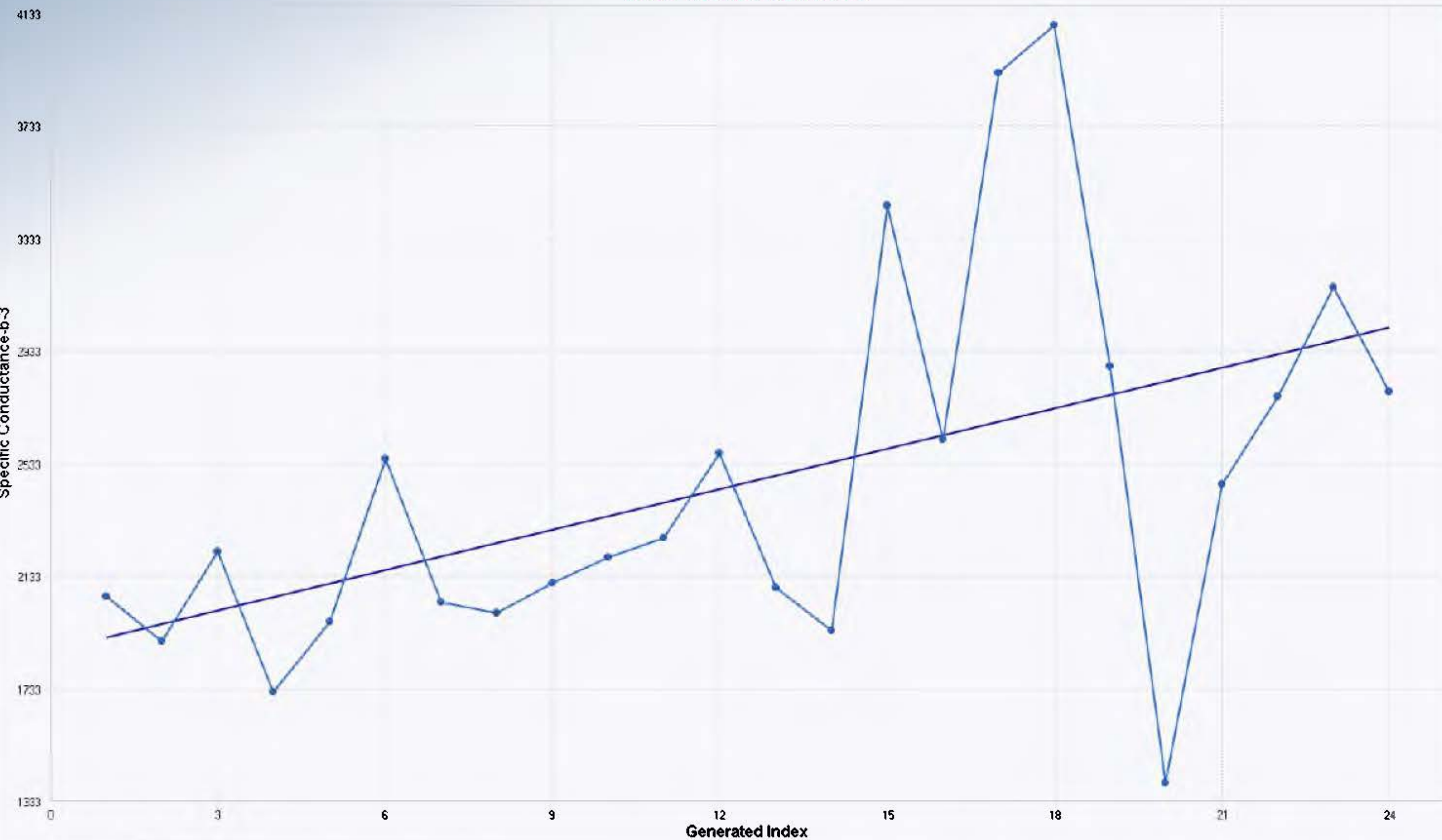
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0857
Standardized Value of S	-0.4534
M-K Test Value (S)	-16
Tabulated p-value	0.3270
Approximate p-value	0.3251

## OLS Regression Line (Blue)

OLS Regression Slope	-3.9481
OLS Regression Intercept	2,648.2857

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test

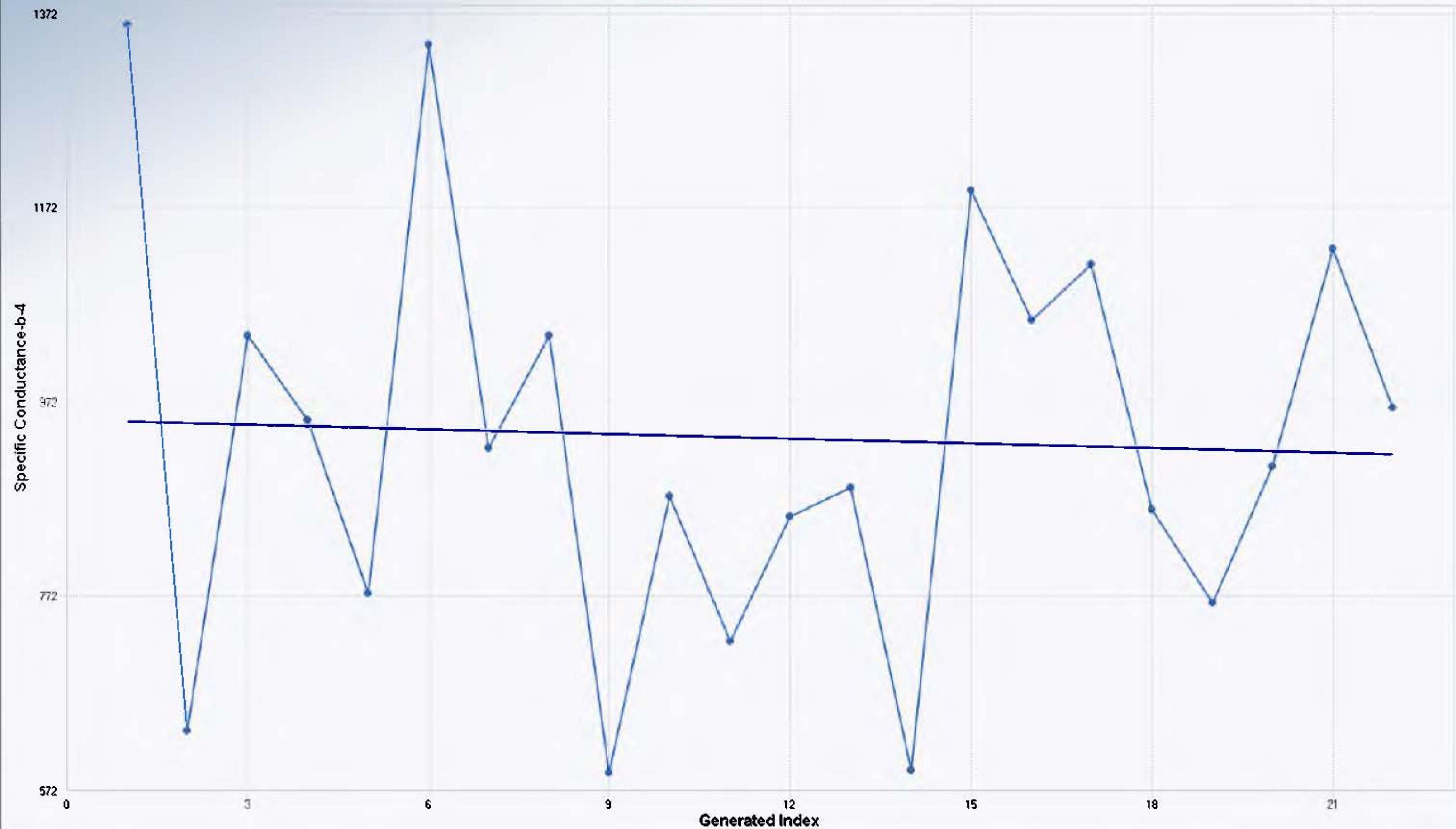


Mann-Kendall Trend Analysis	
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.3154
Standardized Value of S	3.0013
M-K Test Value (S)	122
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0013

OLS Regression Line (Blue)	
OLS Regression Slope	47.9030
OLS Regression Intercept	1,967.0036

Statistically significant evidence of an increasing trend at the specified level of significance.

# Mann-Kendall Trend Test

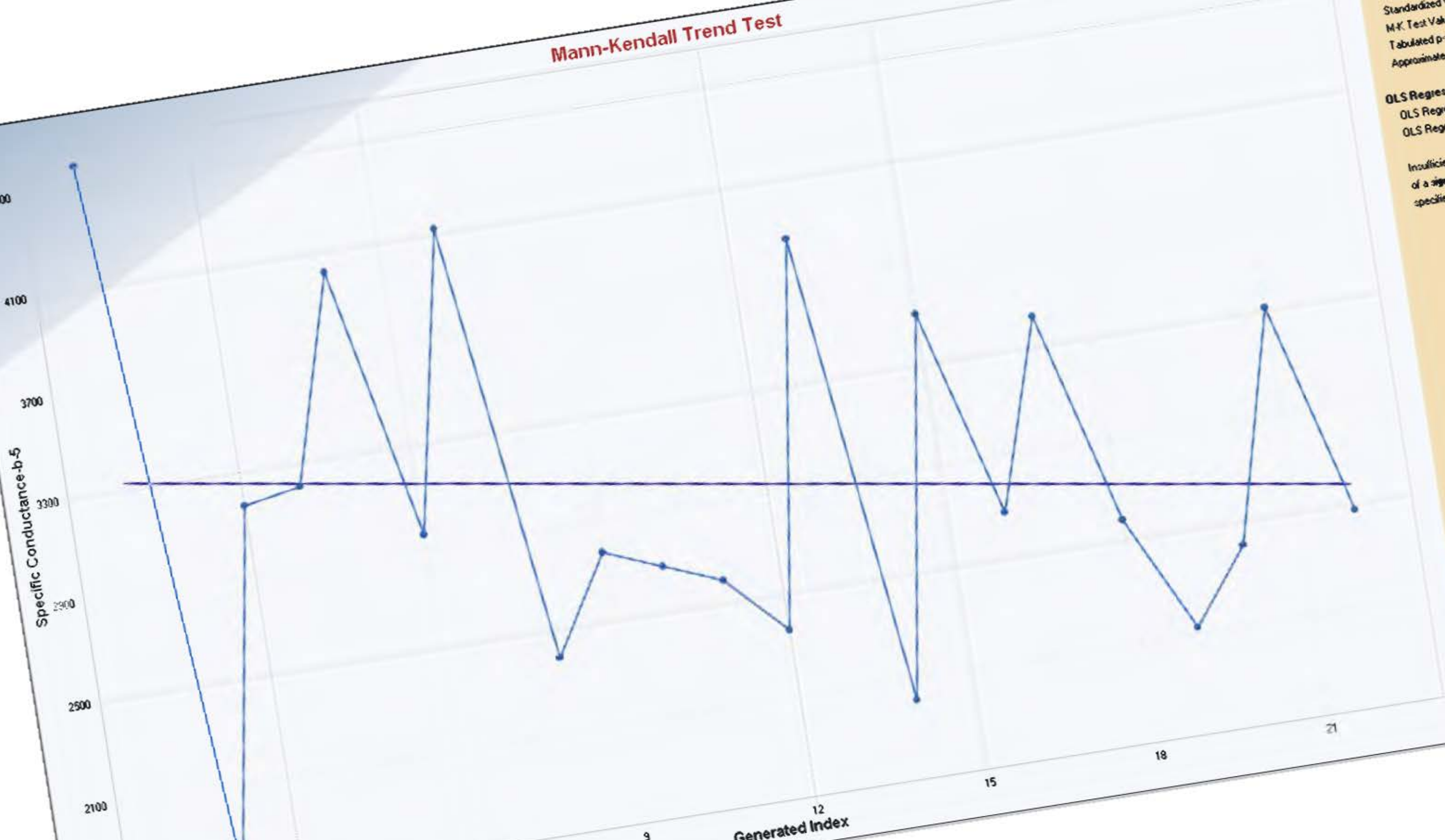


Mann-Kendall Trend Analysis	
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4495
Standardized Value of S	0.0282
M-K Test Value (S)	2
Tabulated p-value	0.4780
Approximate p-value	0.4887

OLS Regression Line (Blue)	
OLS Regression Slope	-1.6335
OLS Regression Intercept	954.0130

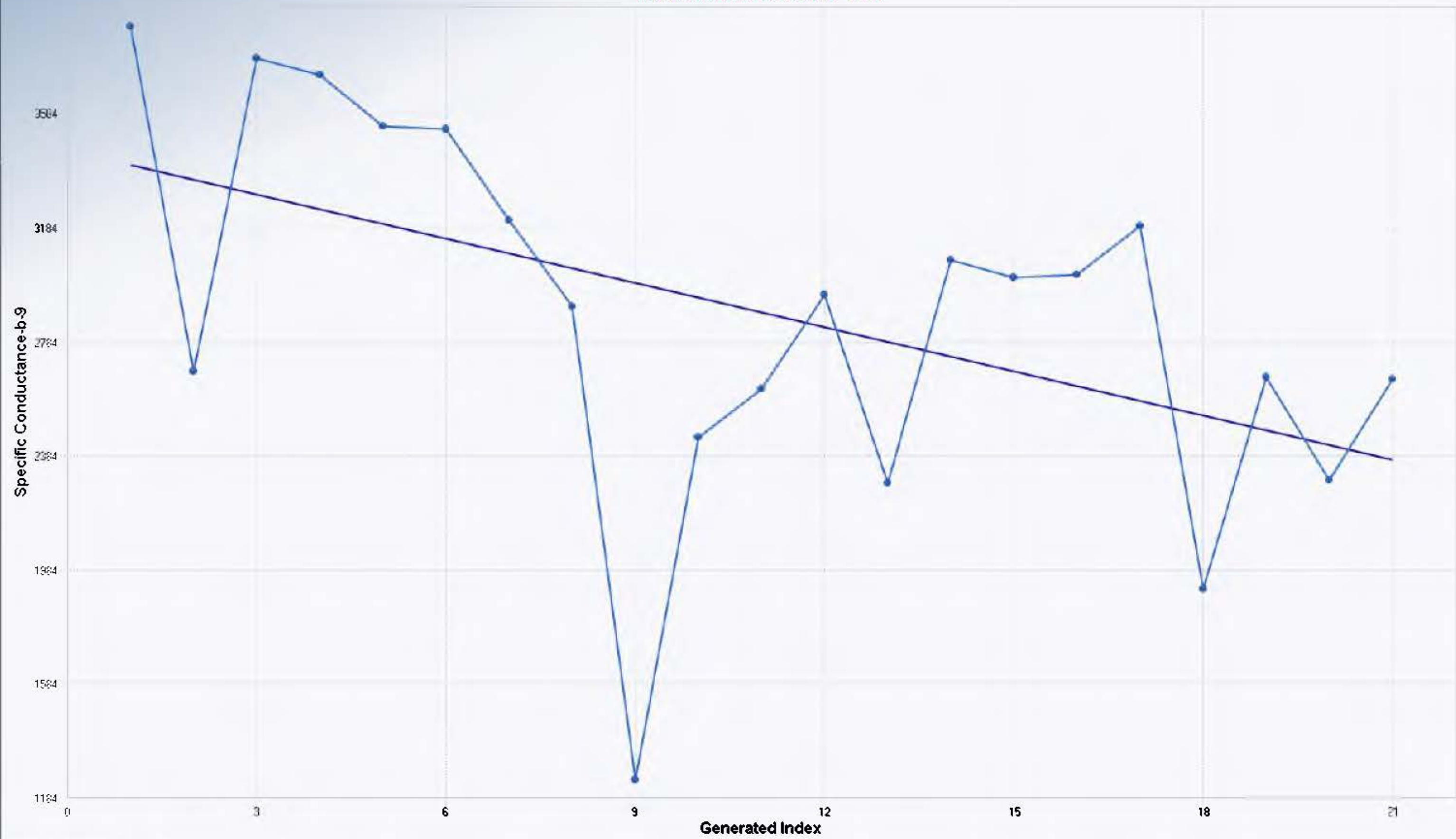
Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



Standardized Value	50
M-K Test Value (S)	0.0580
Tabulated p-value	0.0604
Approximate p-value	
<b>OLS Regression Line (Blue)</b>	
OLS Regression Slope	-35.7719
OLS Regression Intercept	3,365.3766
Insufficient statistical evidence of a significant trend at the specified level of significance.	

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

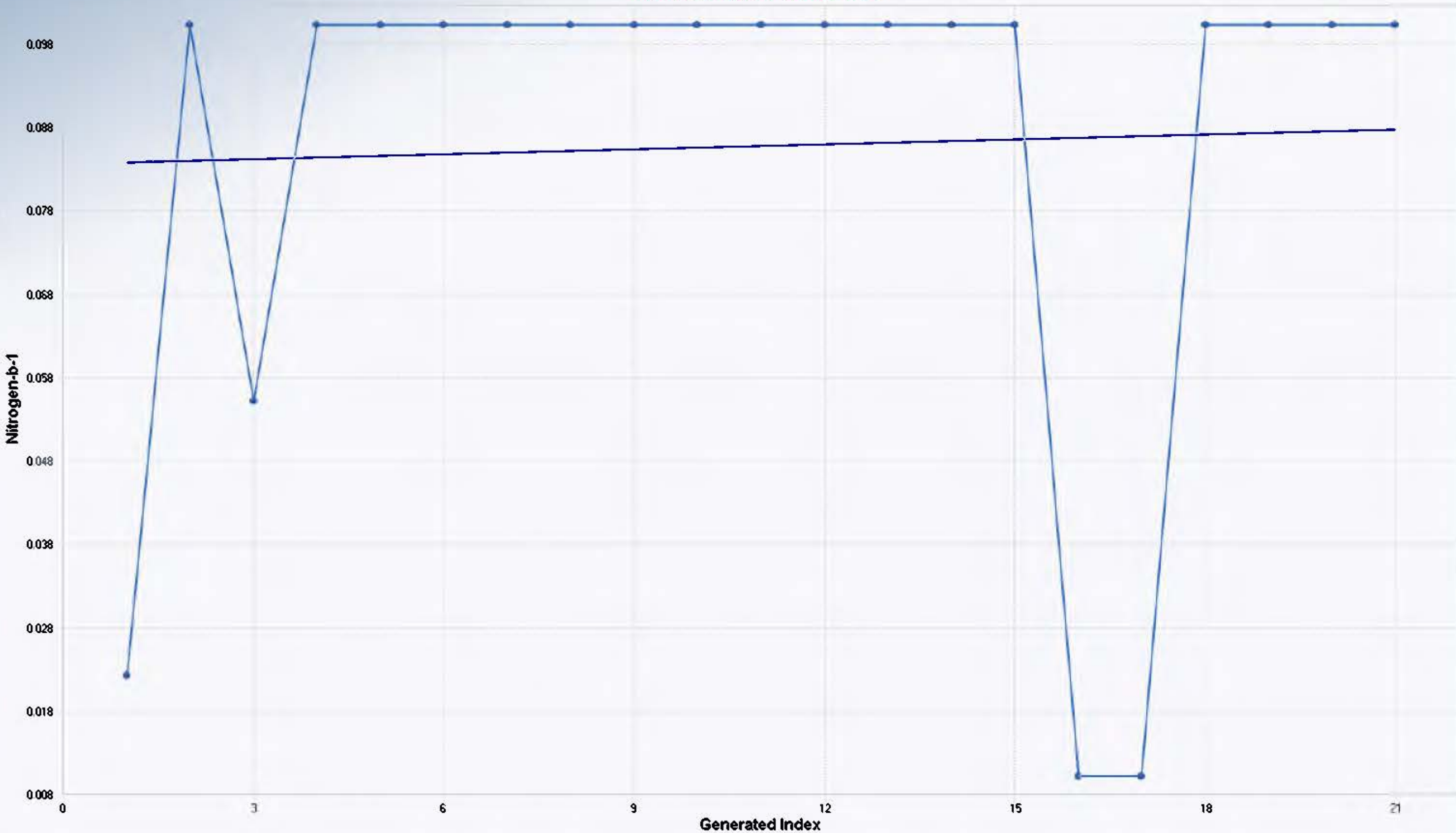
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.1160
Standardized Value of S	-2.5667
M-K Test Value (S)	-86
Tabulated p-value	0.0050
Approximate p-value	0.0051

## OLS Regression Line (Blue)

OLS Regression Slope	.515844
OLS Regression Intercept	3,455.2857

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	22.5019
Standardized Value of S	0.4444
M-K Test Value (S)	11
Tabulated p-value	0.3940
Approximate p-value	0.3284

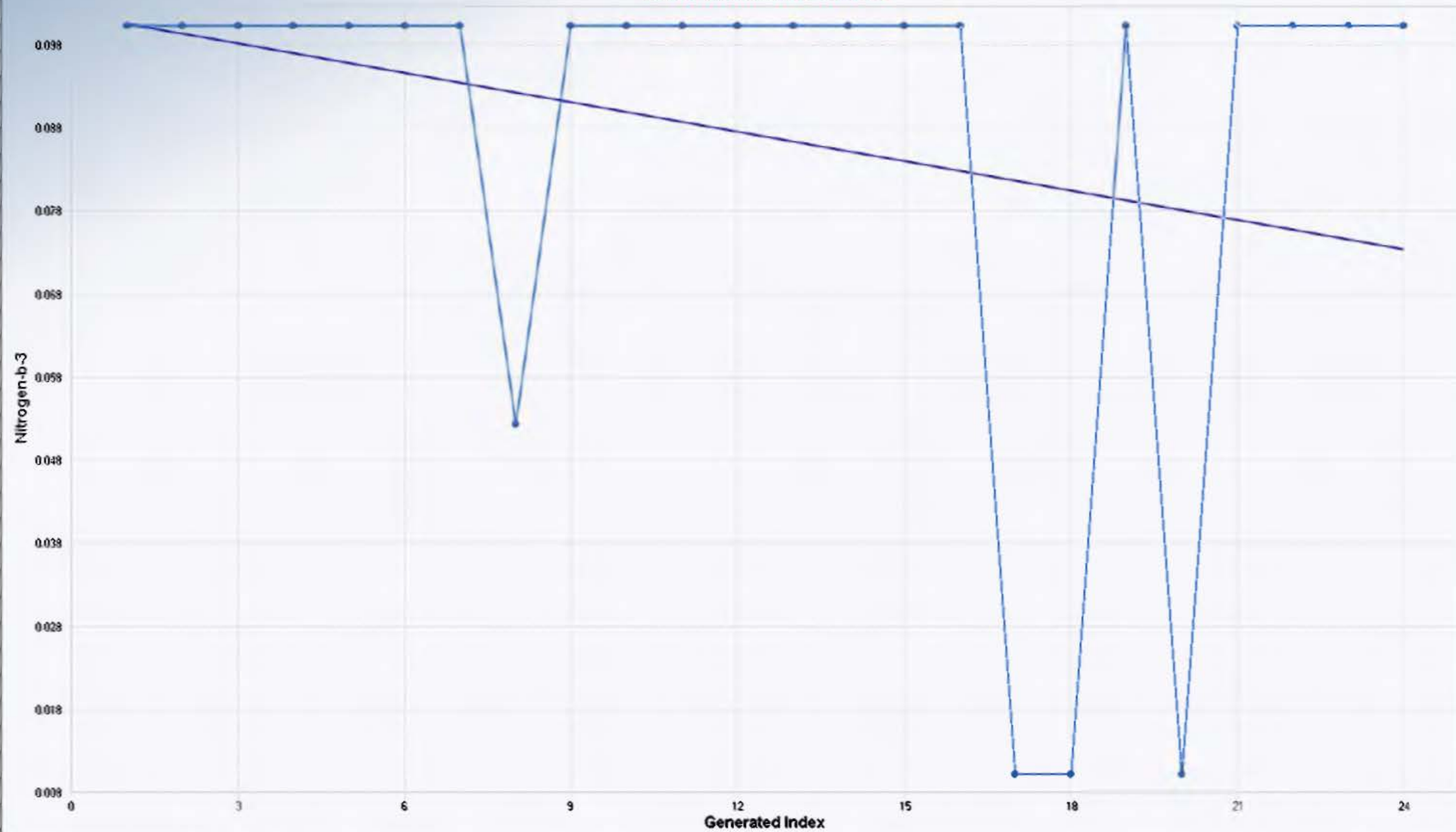
## OLS Regression Line (Blue)

OLS Regression Slope	0.0002
OLS Regression Intercept	0.0834

Insufficient statistical evidence of a significant trend at the specified level of significance.



# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

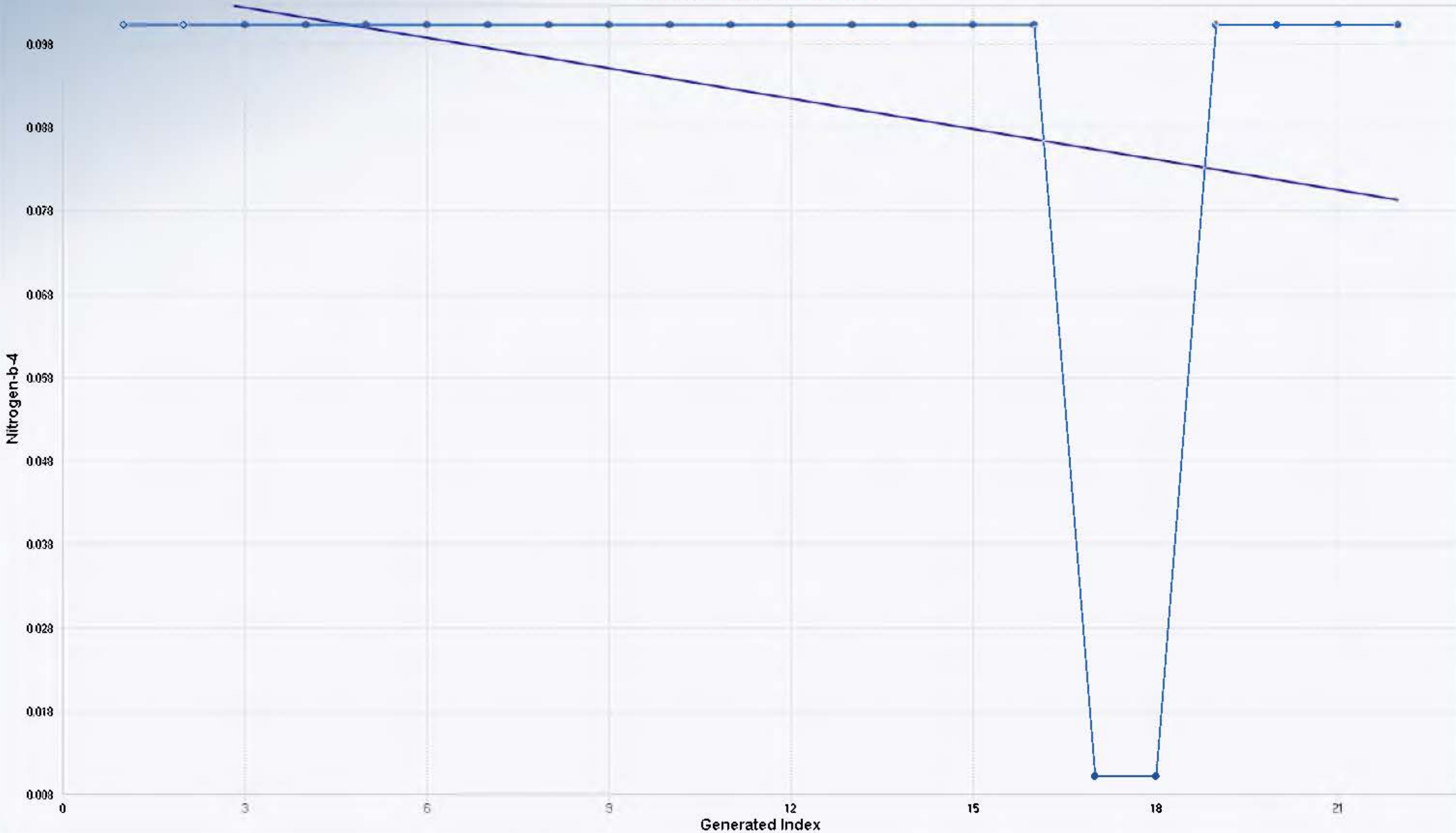
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	25.9165
Standardized Value of S	-1.0804
M-K Test Value (S)	29
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1400

## OLS Regression Line (Blue)

OLS Regression Slope	-0.0012
OLS Regression Intercept	0.1015

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test

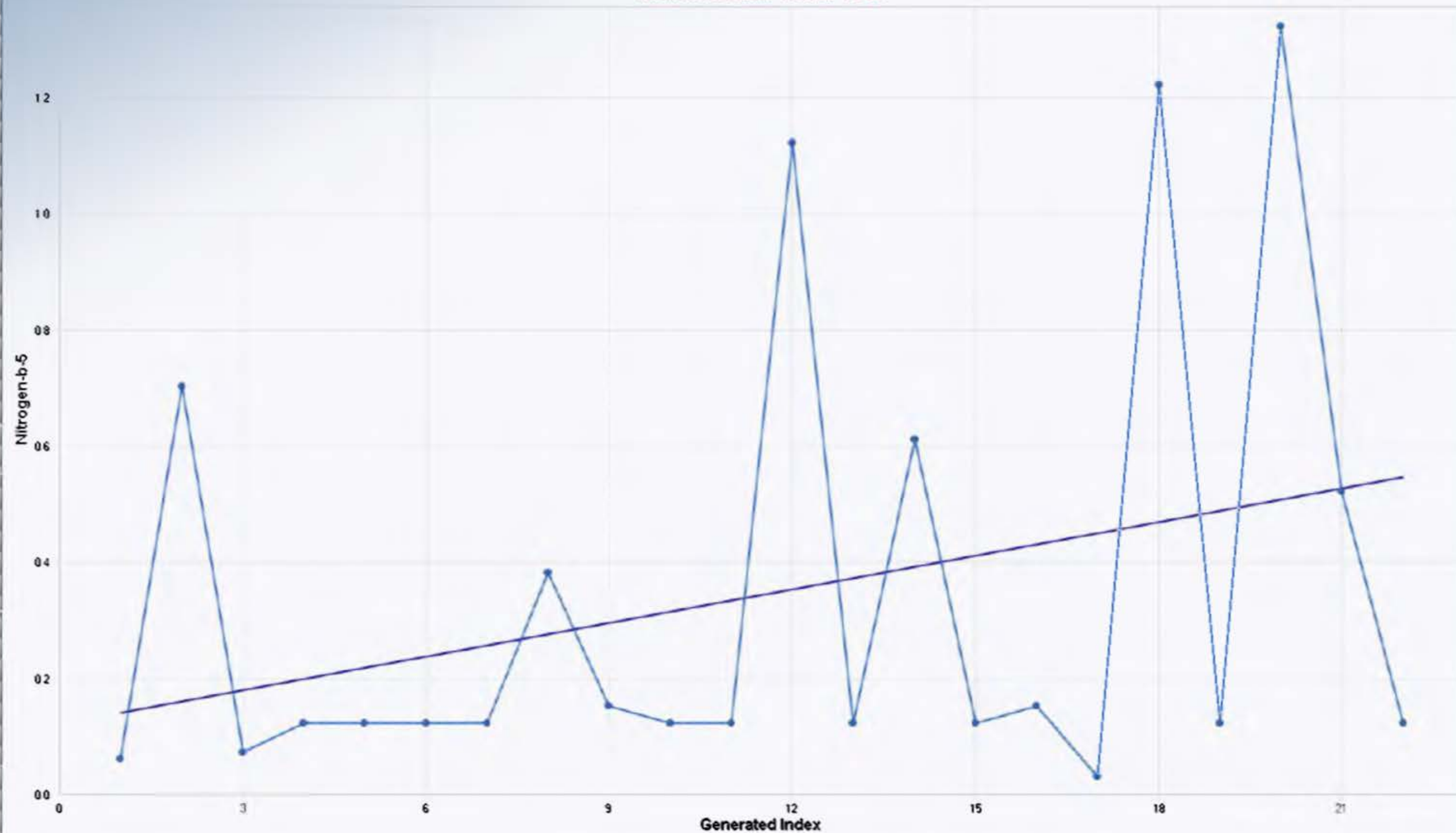


Mann-Kendall Trend Analysis	
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	17.5119
Standardized Value of S	-1.3134
M-K Test Value (S)	-24
Tabulated p-value	0.2520
Approximate p-value	0.0945

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0012
OLS Regression Intercept	0.1058

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

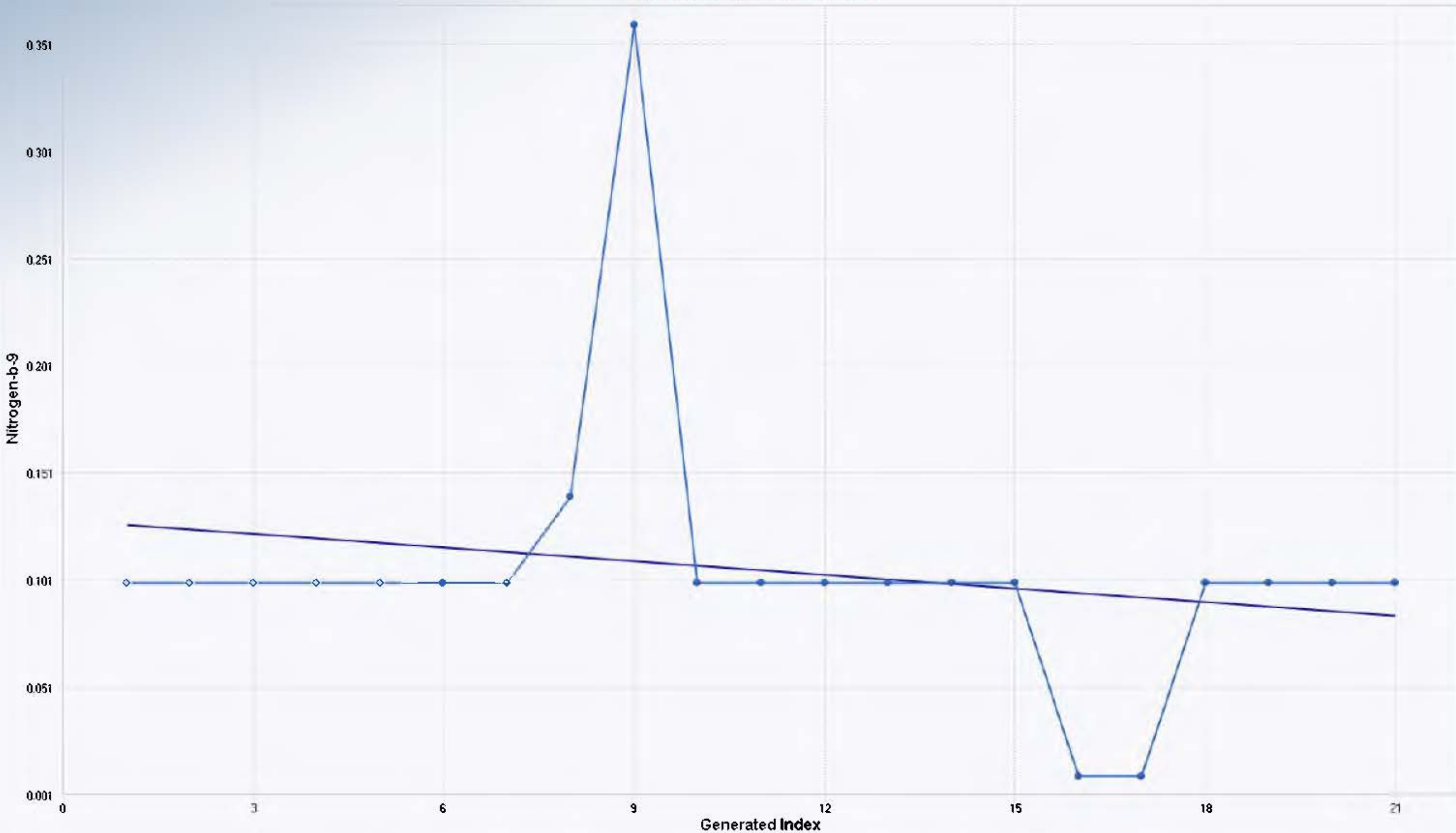
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.6403
Standardized Value of S	1.5458
M-K Test Value (S)	53
Tabulated p-value	0.0720
Approximate p-value	0.0611

## OLS Regression Line (Blue)

OLS Regression Slope	0.0193
OLS Regression Intercept	0.1005

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

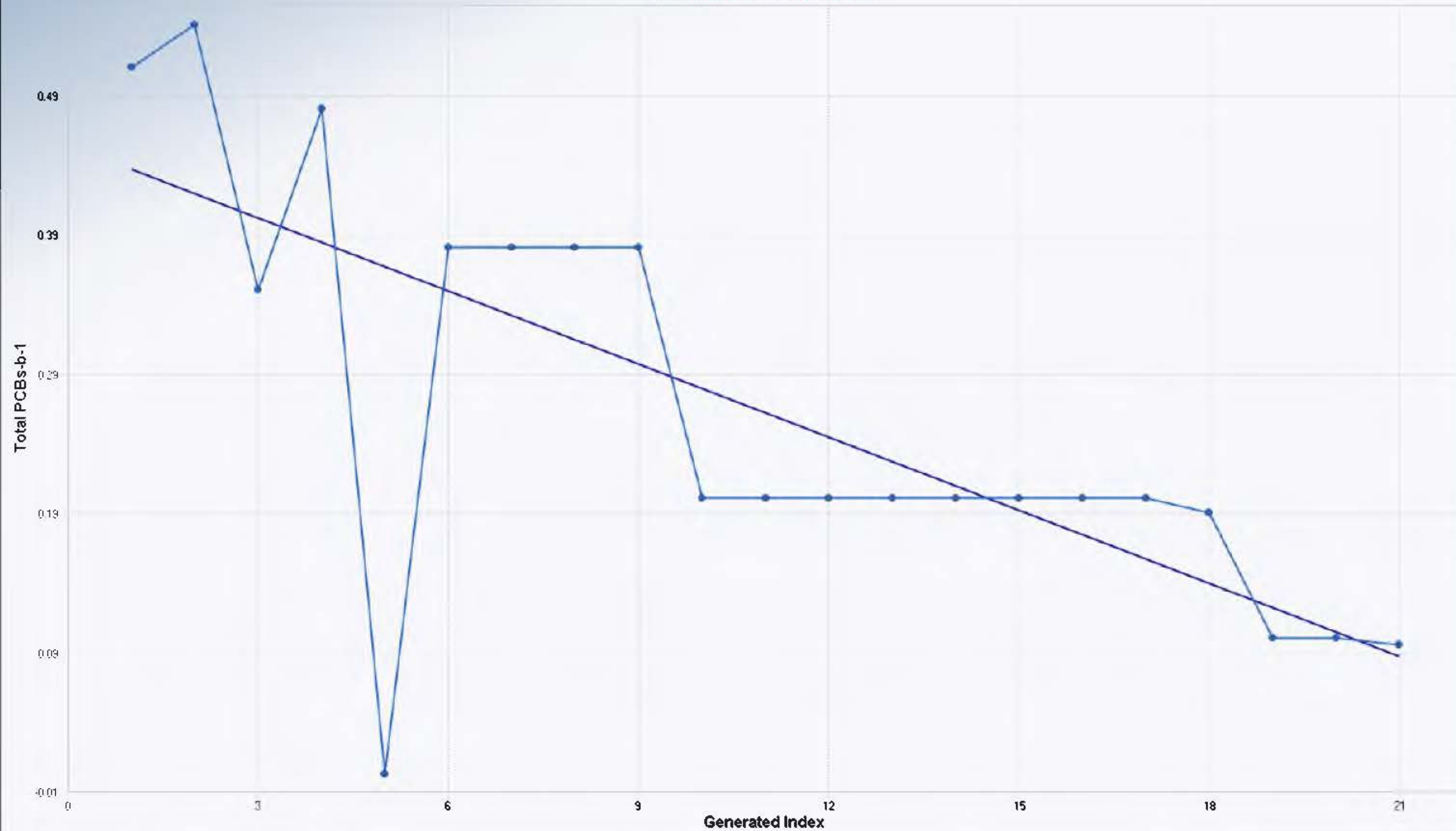
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	22.5019
Standardized Value of S	-1.1555
M-K Test Value (S)	-27
Tabulated p-value	0.2280
Approximate p-value	0.1240

## OLS Regression Line (Blue)

OLS Regression Slope	-0.0021
OLS Regression Intercept	0.1290

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test

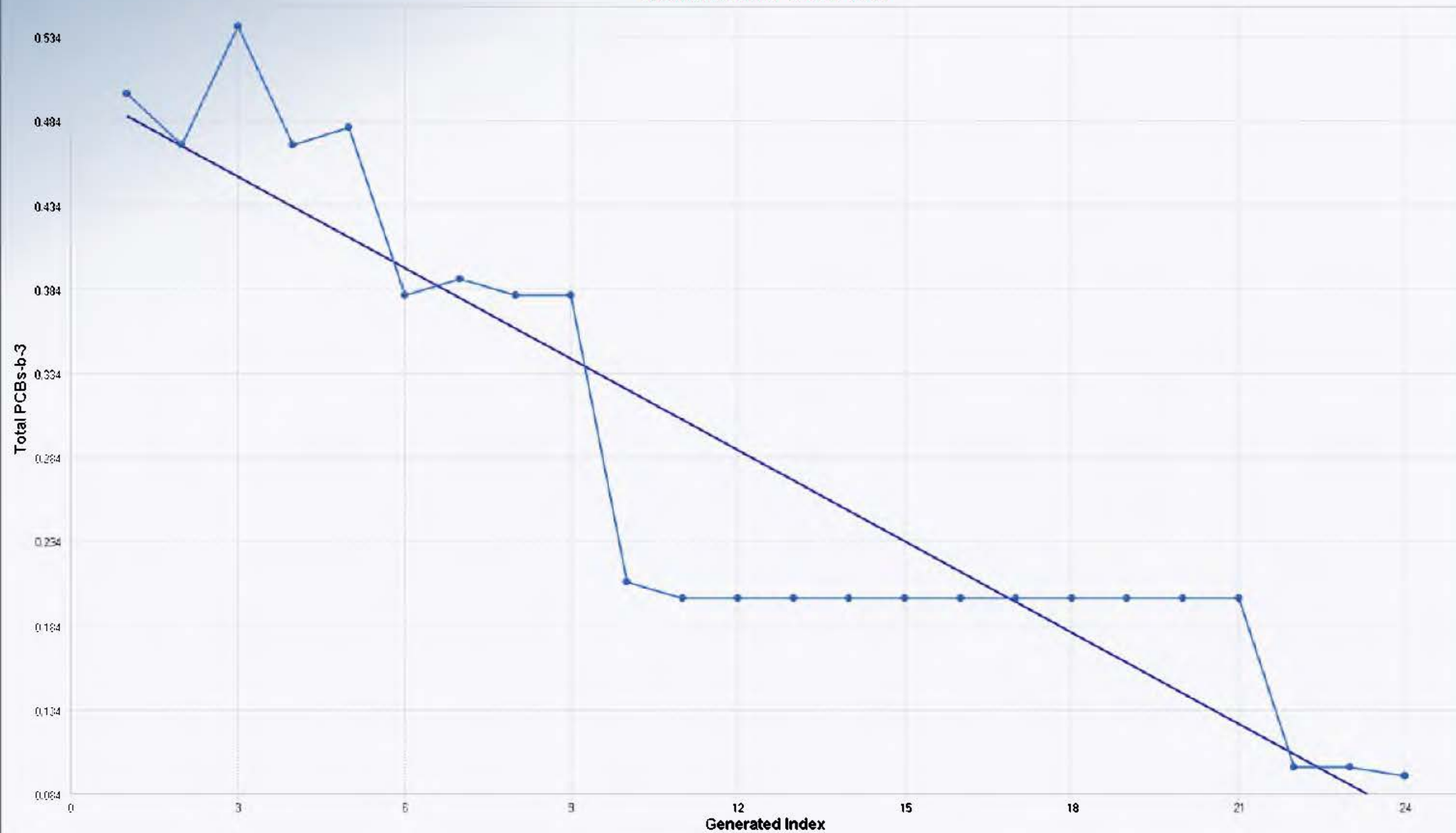


Mann-Kendall Trend Analysis	
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	31.9635
Standardized Value of S	-4.0671
M-K Test Value (S)	-131
Tabulated p-value	0.0000
Approximate p-value	0.0000

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0175
OLS Regression Intercept	0.4538

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

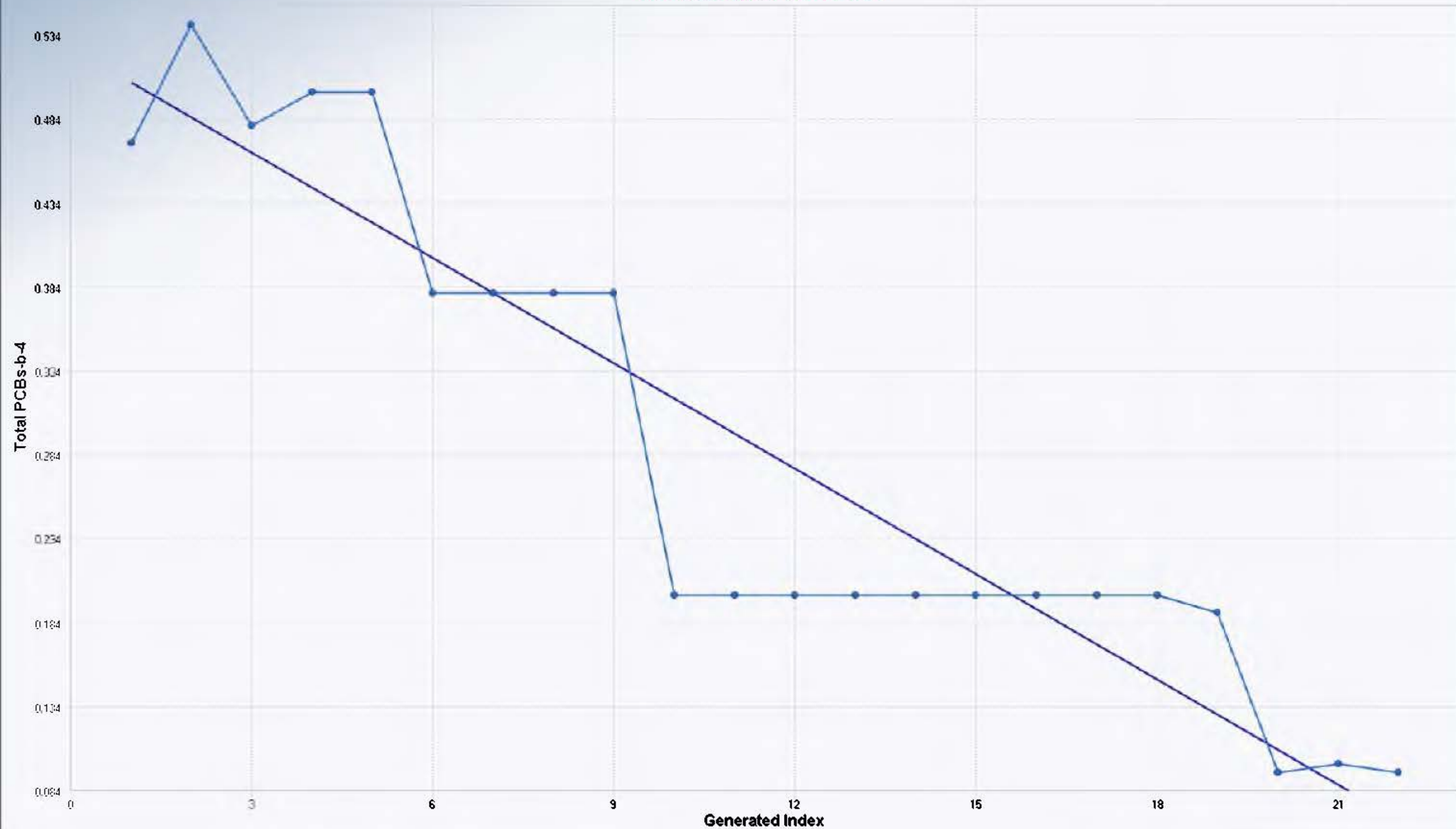
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	38.1401
Standardized Value of S	-5.3749
M-K Test Value (S)	206
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

## OLS Regression Line (Blue)

OLS Regression Slope	-0.0181
OLS Regression Intercept	0.5050

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

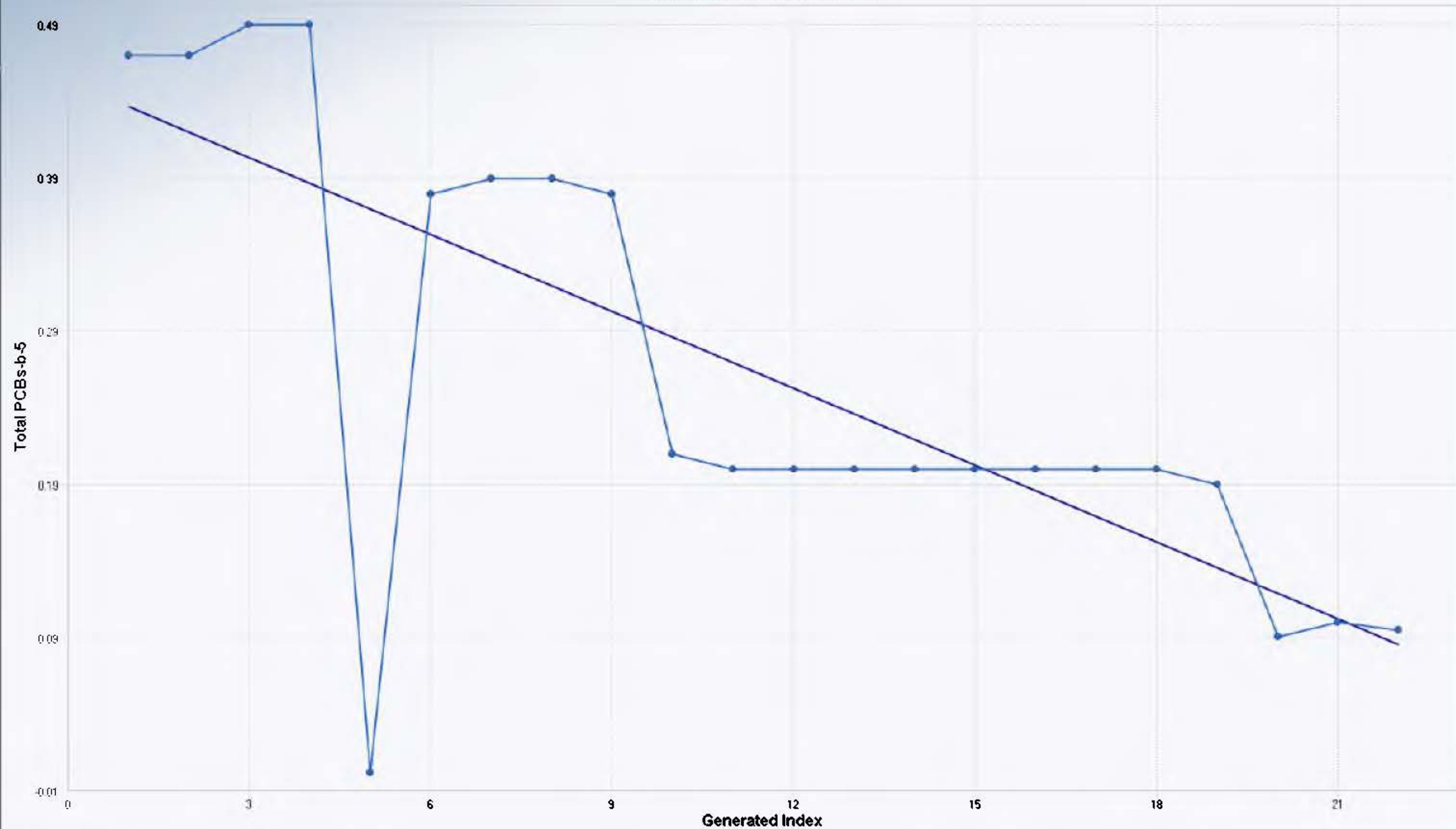
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.9853
Standardized Value of S	-5.0610
M-K Test Value (S)	-173
Tabulated p-value	0.0000
Approximate p-value	0.0000

## OLS Regression Line (Blue)

OLS Regression Slope	-0.0209
OLS Regression Intercept	0.5269

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



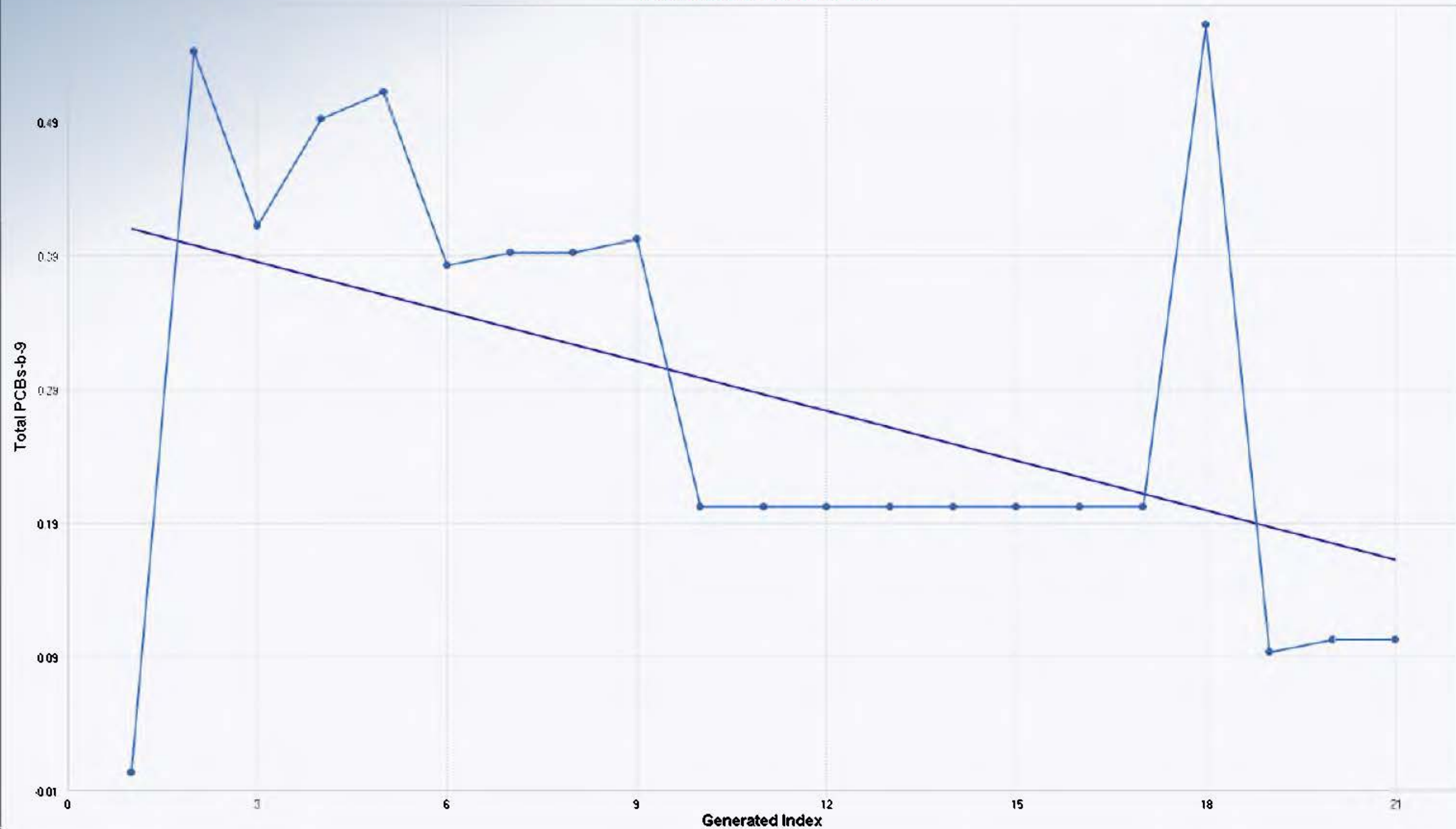
Mann-Kendall Trend Analysis	
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	34.4722
Standardized Value of S	-4.2933
M-K Test Value (S)	-149
Tabulated p-value	0.0000
Approximate p-value	0.0000

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0167
OLS Regression Intercept	0.4533

Statistically significant evidence of a decreasing trend at the specified level of significance.



# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

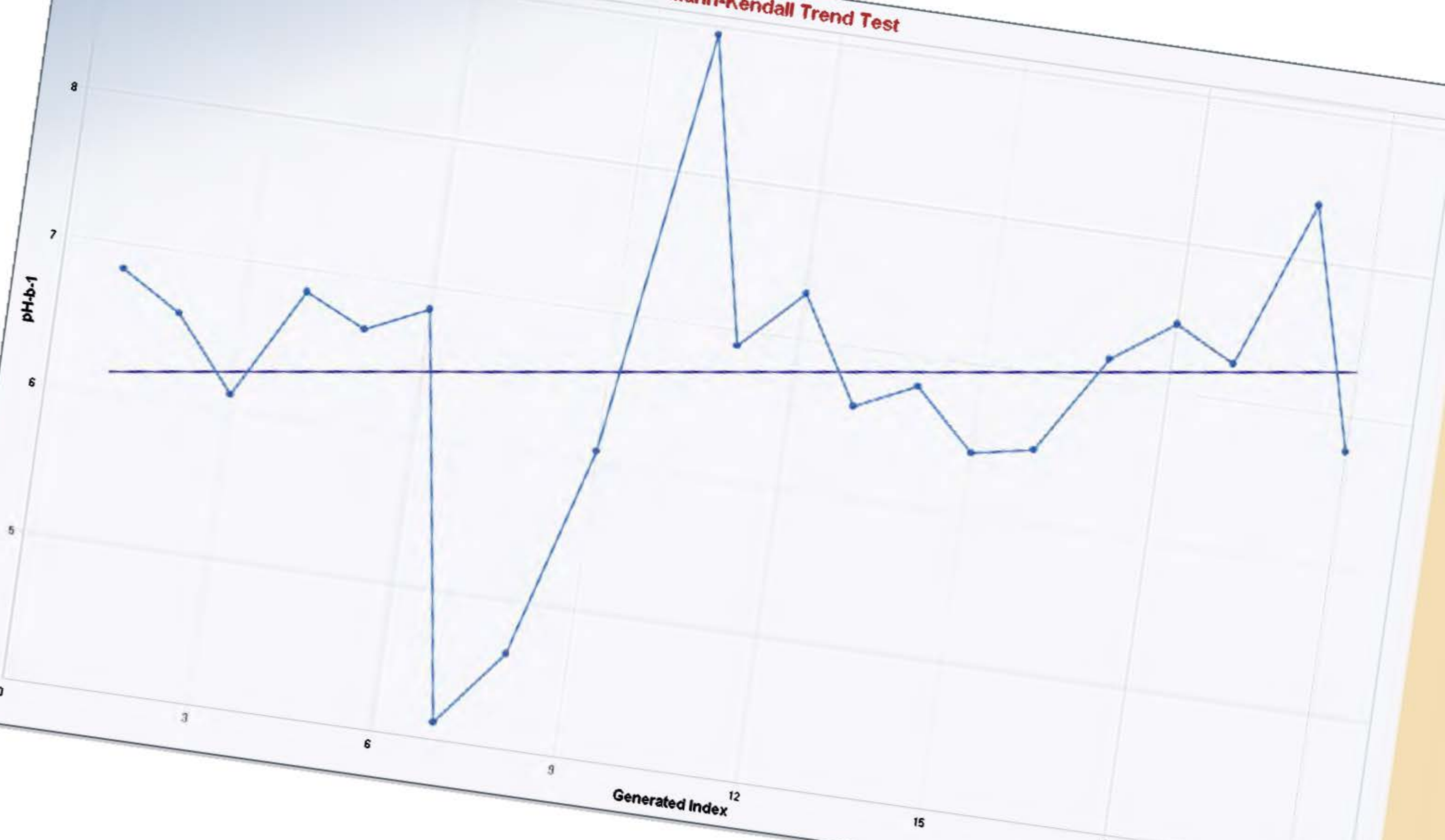
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	32.0832
Standardized Value of S	-2.7117
M-K Test Value (S)	-88
Tabulated p-value	0.0040
Approximate p-value	0.0033

## OLS Regression Line (Blue)

OLS Regression Slope	-0.0124
OLS Regression Intercept	0.4200

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



**Mann-Kendall Trend Analysis**

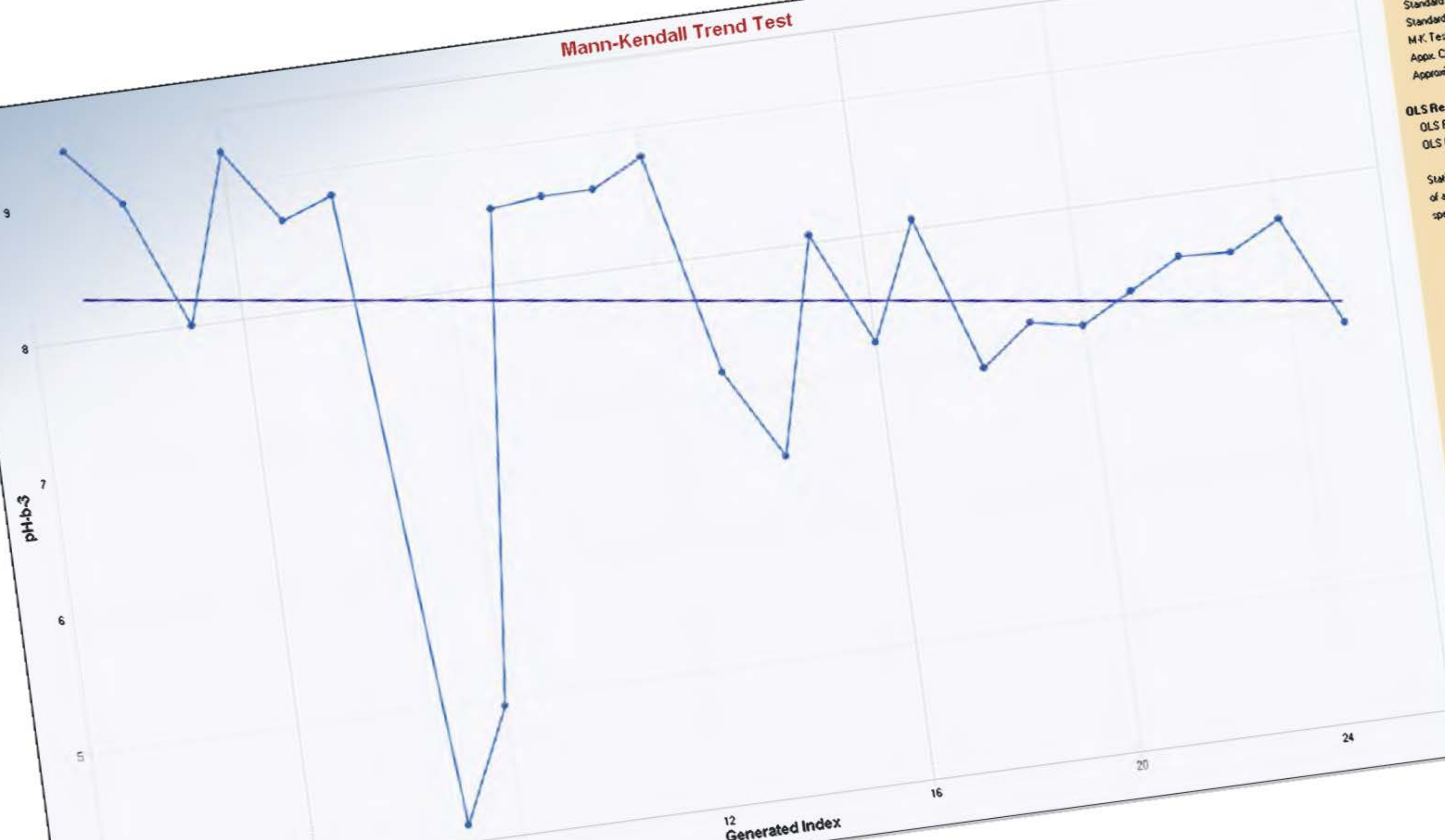
n	22
Confidence Coefficient	0.95
Level of Significance	0.05
Standard Deviation of S	0.33
Standardized Value of S	1.51
M-K Test Value (S)	6.176
Tabulated p-value	0.00
Approximate p-value	0.00

**OLS Regression Line (Blue)**

OLS Regression Slope	0.05
OLS Regression Intercept	6.176

Statistically significant evidence of an increasing trend at the specified level of significance.

# Mann-Kendall Trend Test

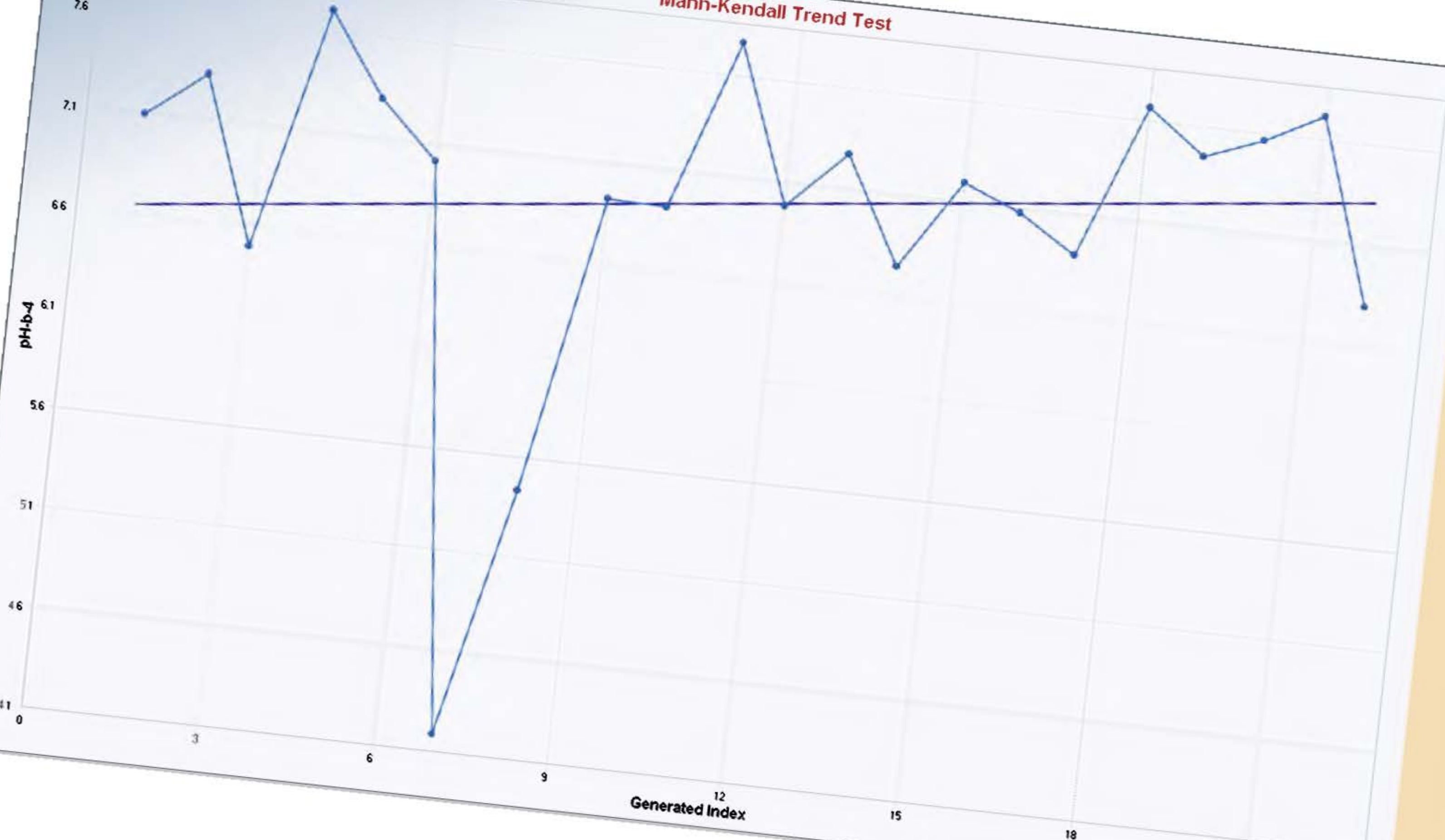


Standard Deviation	2.4765
Standardized Value of S	-1.07
M-K Test Value (S)	-1.6449
Appx. Critical Value (0.05)	0.0066
Approximate p-value	

<b>OLS Regression Line (Blue)</b>	
OLS Regression Slope	-0.0512
OLS Regression Intercept	8.3846

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

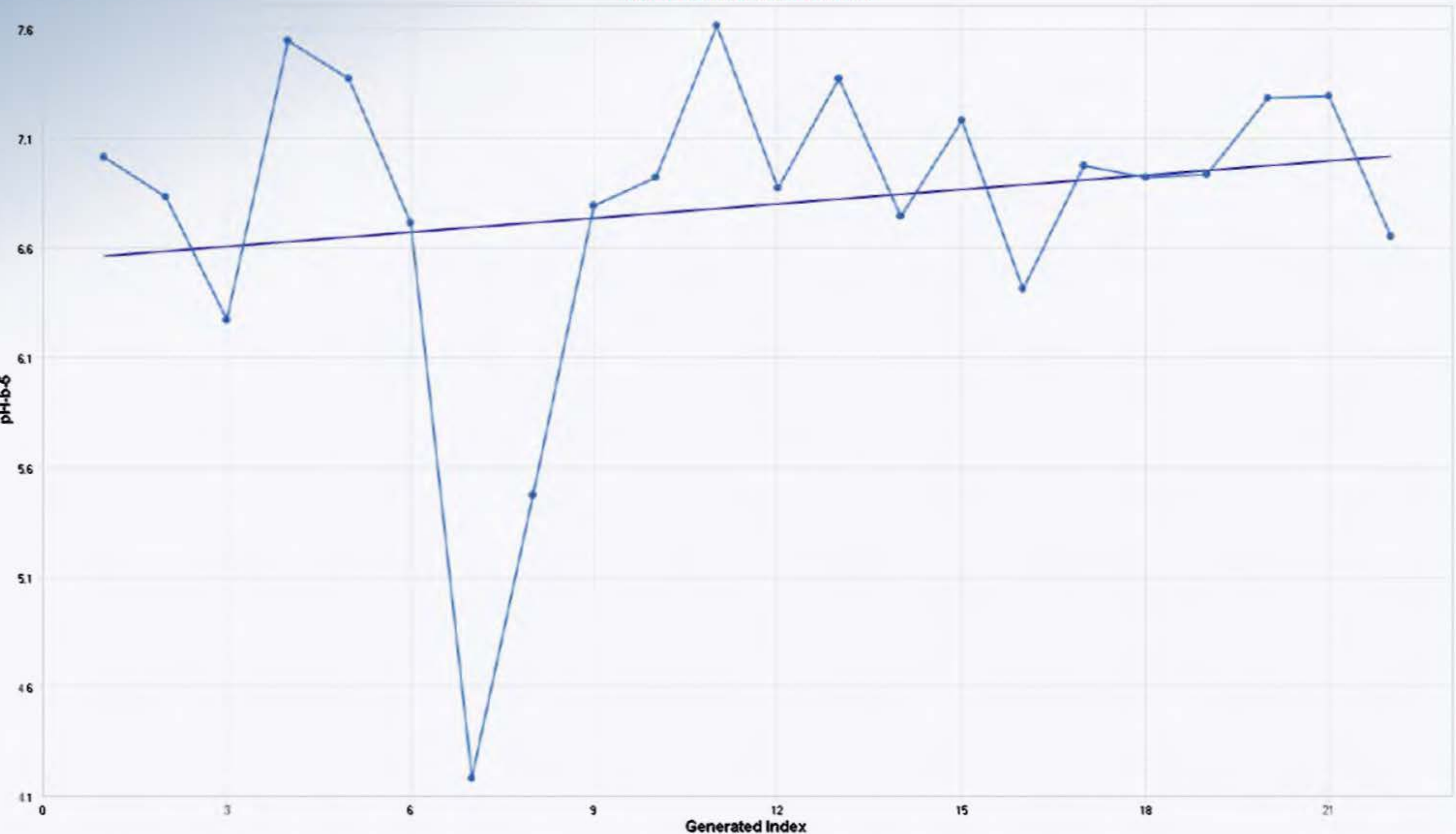
n	0
Confidence Coefficient	0
Level of Significance	0
Standard Deviation of S	35.4
Standardized Value of S	0.7
M-K Test Value (S)	0.21
Tabulated p-value	0.21
Approximate p-value	0.21

## OLS Regression Line (Blue)

OLS Regression Slope	0.032
OLS Regression Intercept	6.584

Insufficient statistical evidence of a significant trend at the specified level of significance.

### Mann-Kendall Trend Test



#### Mann-Kendall Trend Analysis

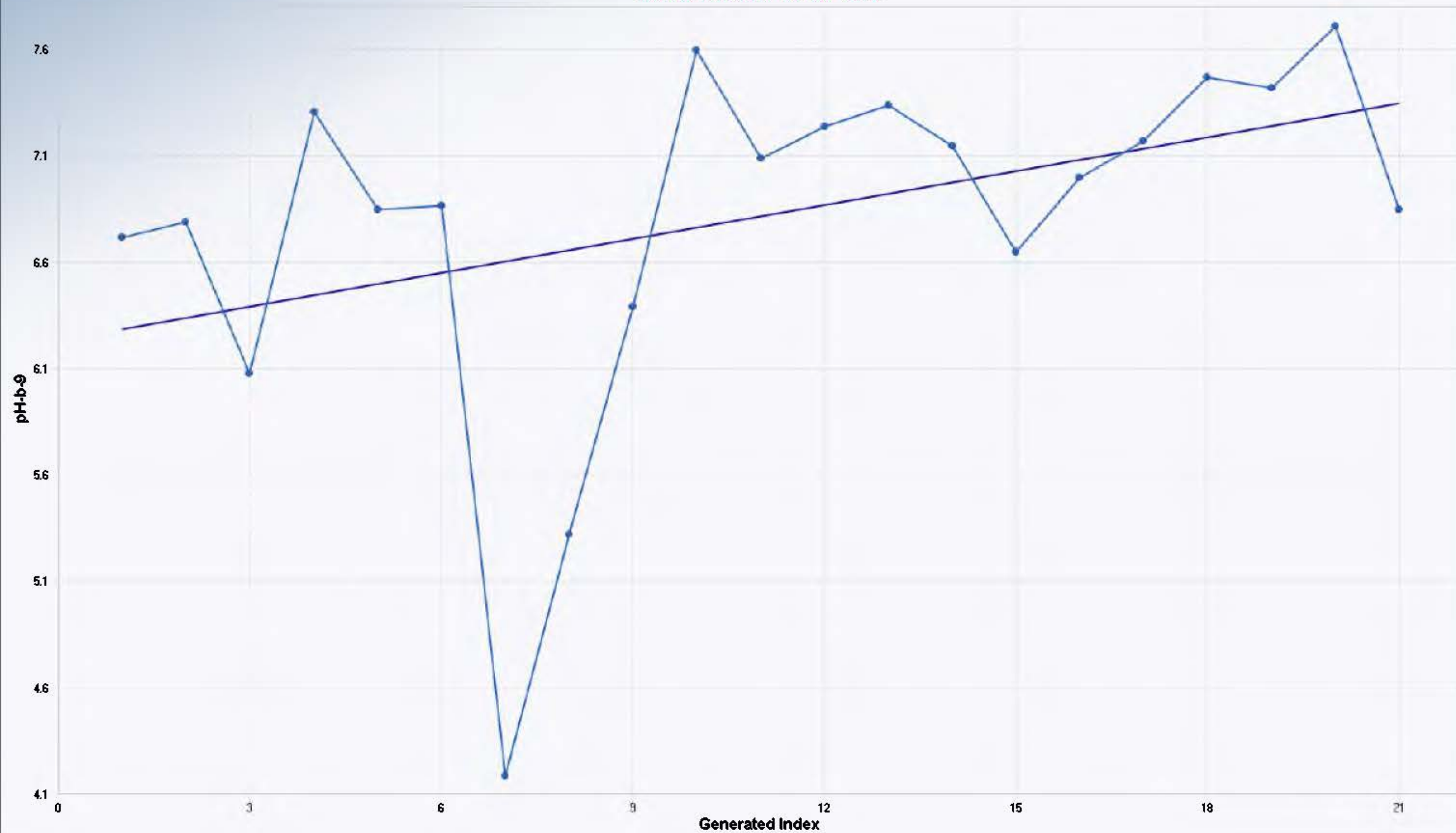
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4354
Standardized Value of S	0.5644
M-K Test Value (S)	21
Tabulated p-value	0.2890
Approximate p-value	0.2862

#### OLS Regression Line (Blue)

OLS Regression Slope	0.0218
OLS Regression Intercept	6.5361

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

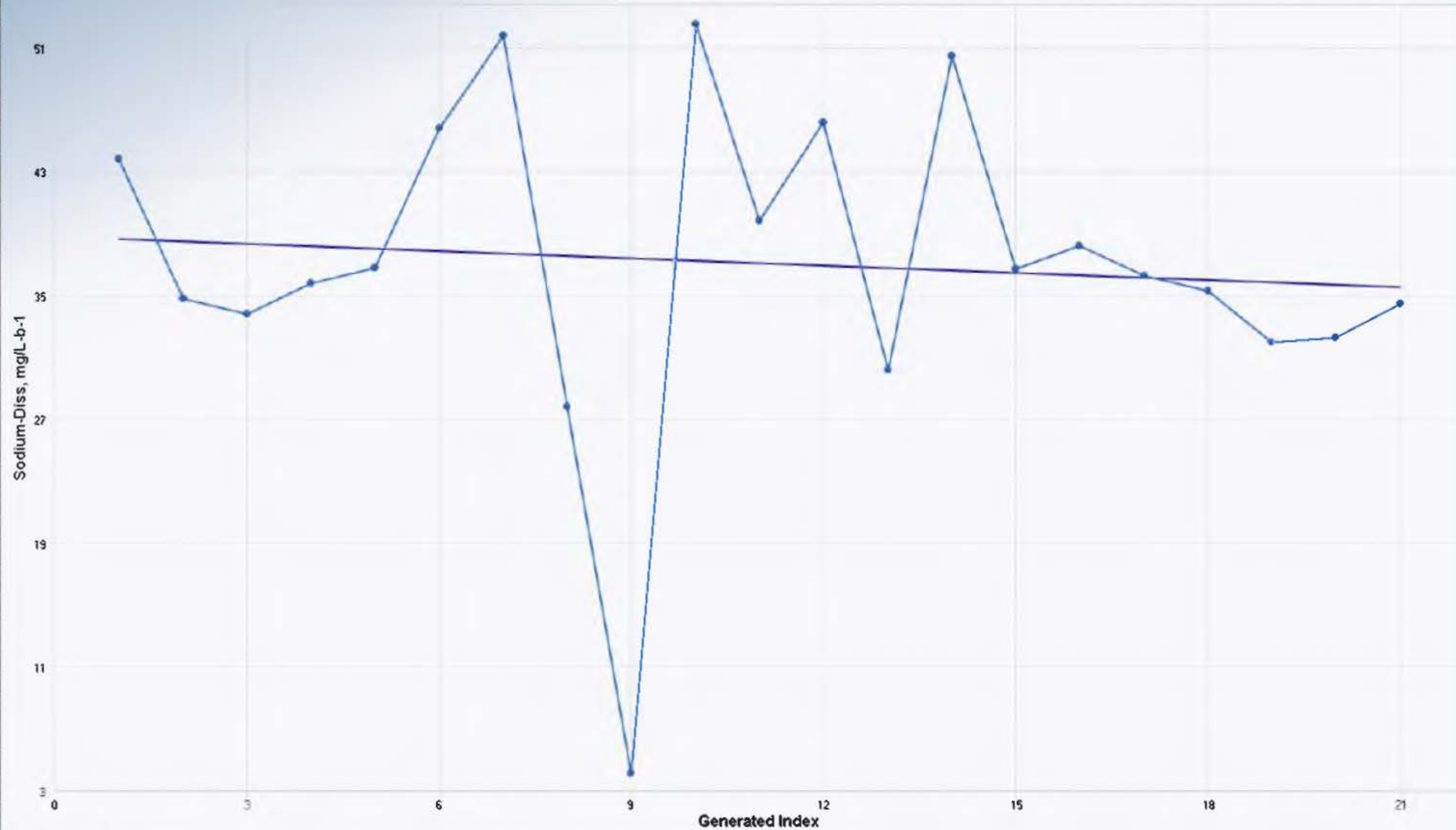
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.1009
Standardized Value of S	2.3564
M-K Test Value (S)	79
Tabulated p-value	0.0090
Approximate p-value	0.0092

## OLS Regression Line (Blue)

OLS Regression Slope	0.0531
OLS Regression Intercept	6.2558

Statistically significant evidence of an increasing trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

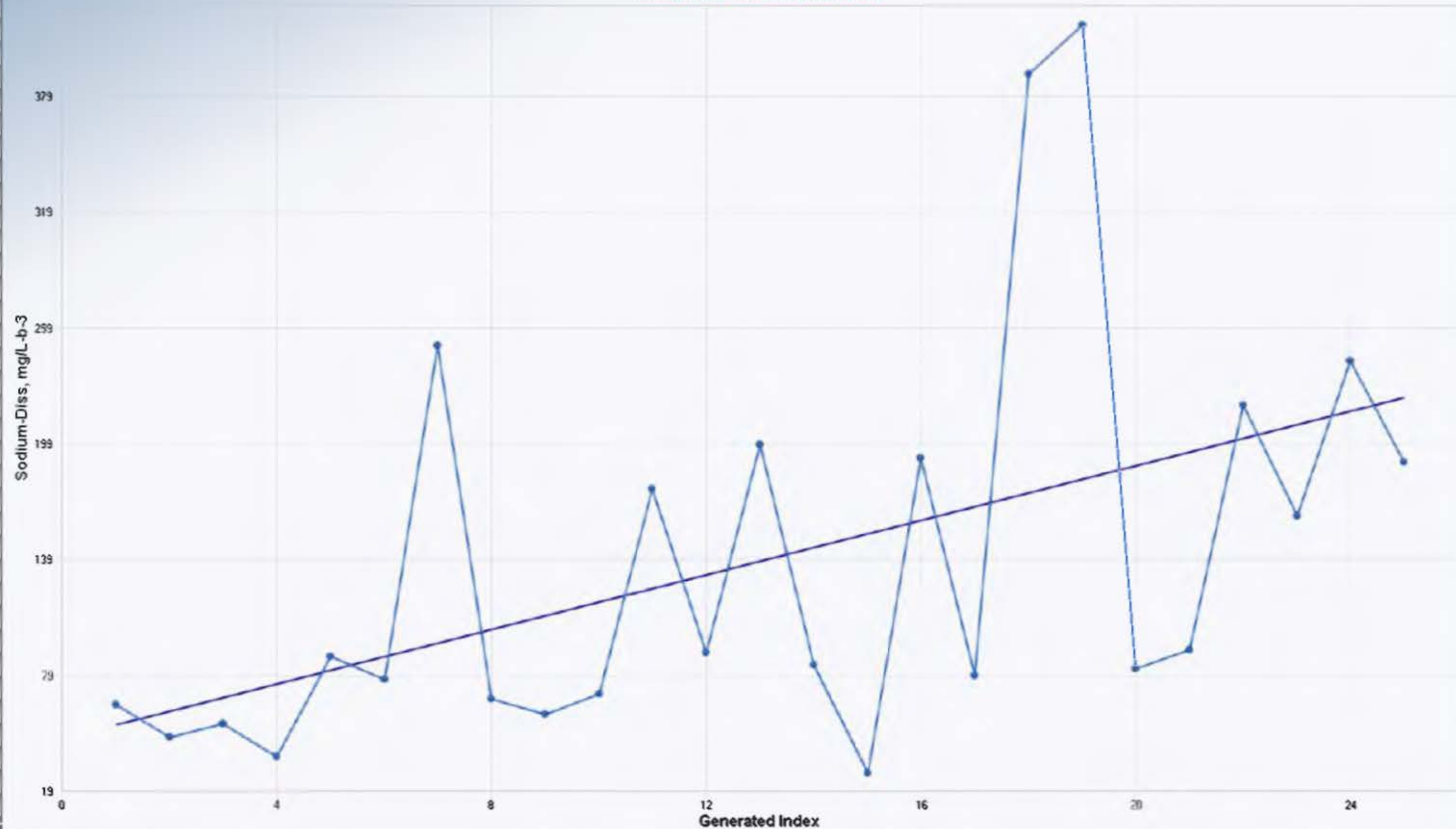
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.1160
Standardized Value of S	-0.8153
M-K Test Value (S)	28
Tabulated p-value	0.2100
Approximate p-value	0.2074

## OLS Regression Line (Blue)

OLS Regression Slope	-0.1571
OLS Regression Intercept	39.0286

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



Mann-Kendall Trend Analysis	
n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.8174
Standardized Value of S	3.0595
M-K Test Value (S)	132
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0011

OLS Regression Line (Blue)	
OLS Regression Slope	7.0798
OLS Regression Intercept	46.3220

Statistically significant evidence of an increasing trend at the specified level of significance.

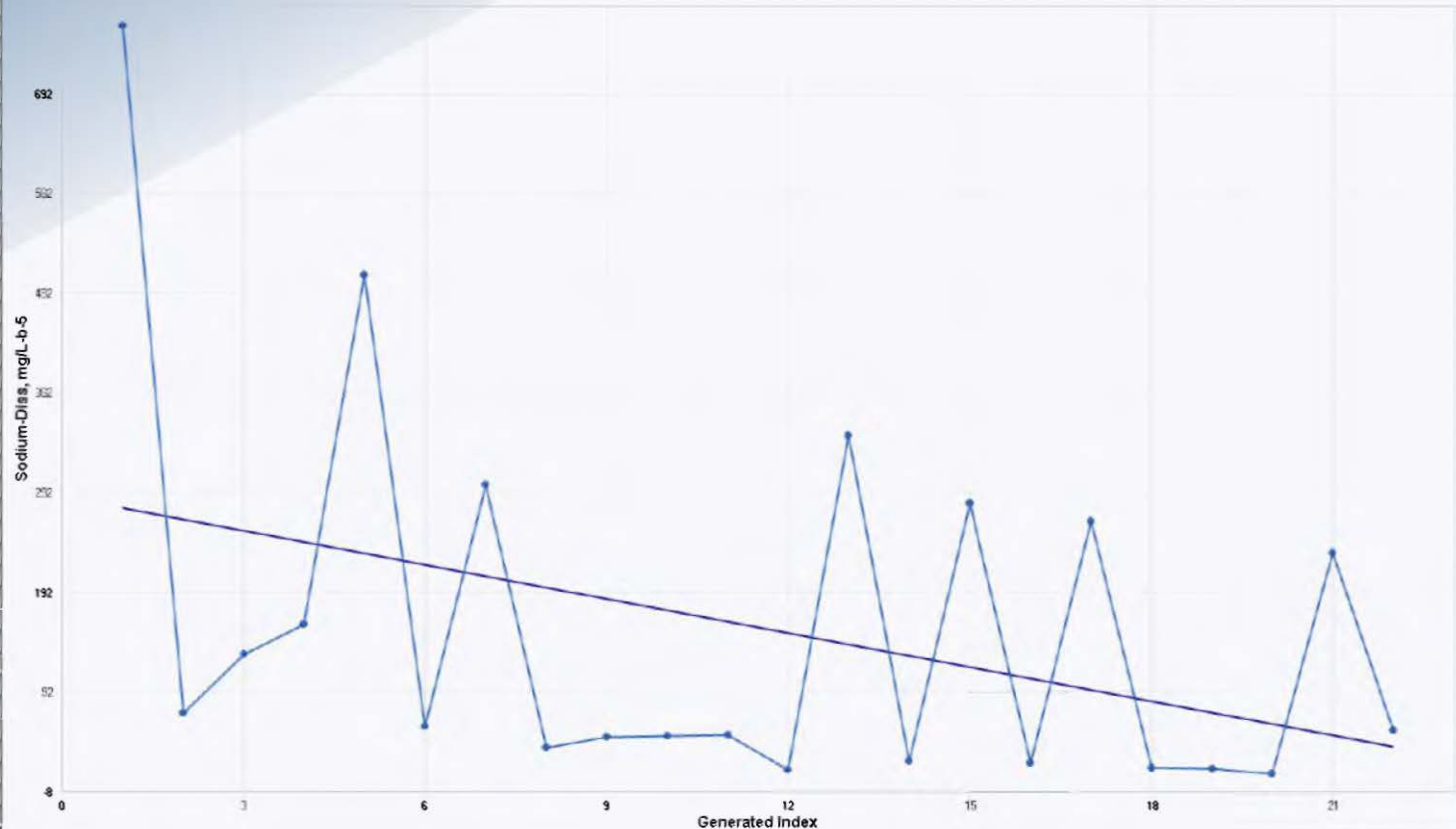


# Mann-Kendall Trend Test



Mann-Kendall Trend Analysis	
n	30
Confidence Coefficient	0.95
Level of Significance	0.05
Standard Deviation of S	3.0
Standardized Value of S	0.0
M-K Test Value (S)	0.0
Tabulated p-value	0.0
Approximate p-value	0.1
OLS Regression Line (Blue)	
OLS Regression Slope	0.39
OLS Regression Intercept	4.764
Insufficient statistical evidence of a significant trend at the specified level of significance.	

# Mann-Kendall Trend Test

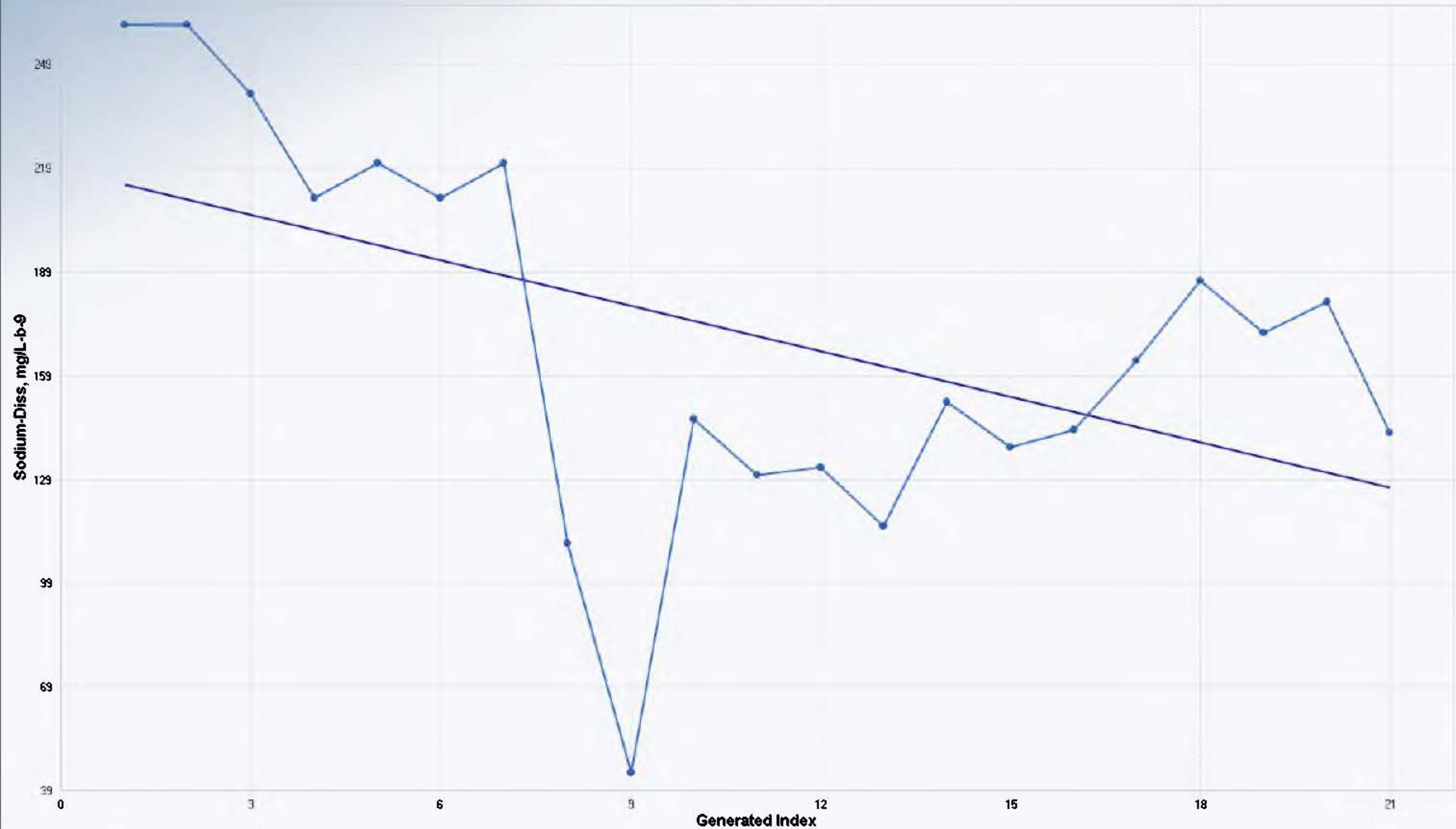


Mann-Kendall Trend Analysis	
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4636
Standardized Value of S	-2.2558
M-K Test Value (S)	-81
Tabulated p-value	0.0110
Approximate p-value	0.0120

OLS Regression Line (Blue)	
OLS Regression Slope	-11.3862
OLS Regression Intercept	287.8909

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test

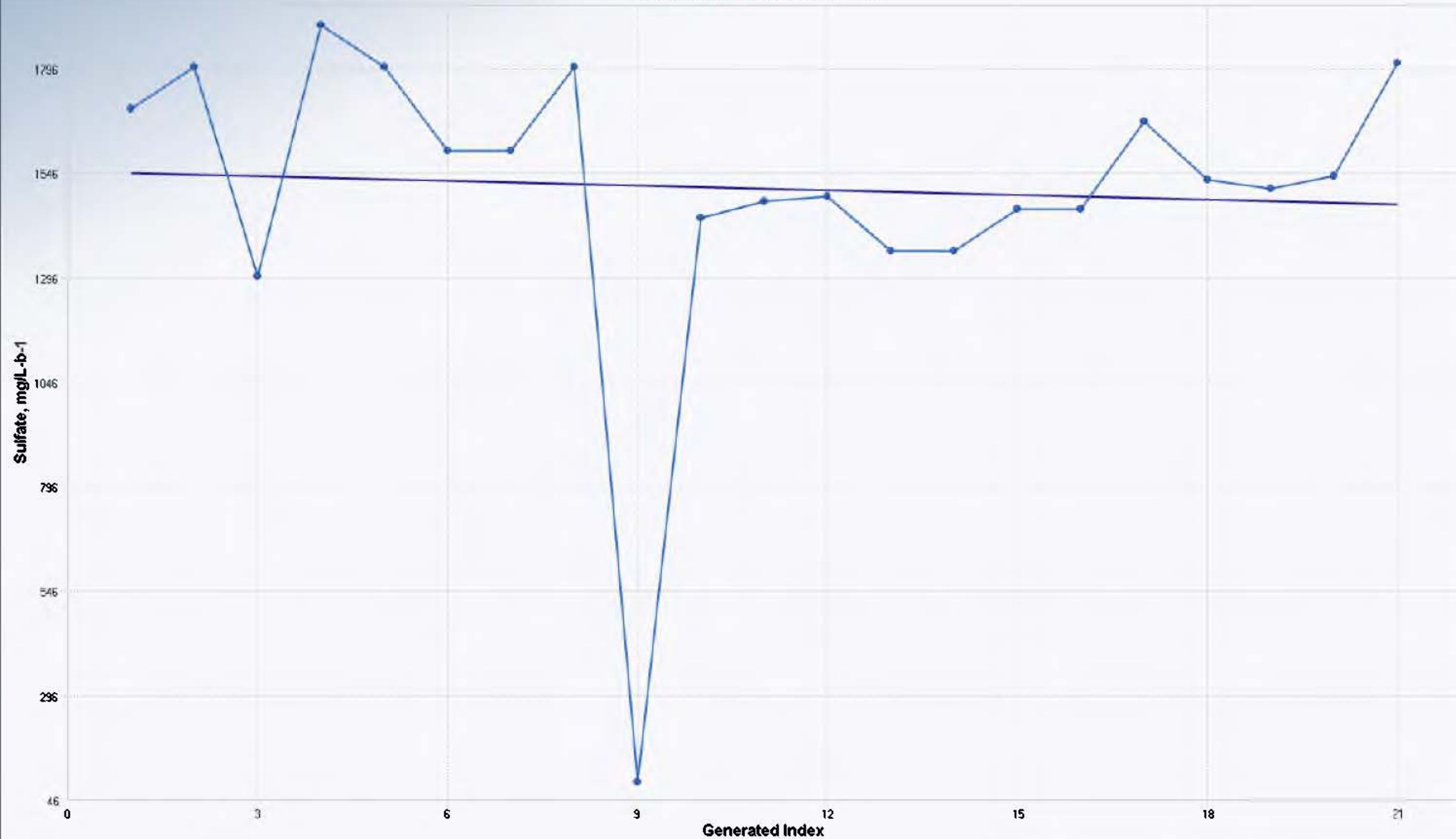


Mann-Kendall Trend Analysis	
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0706
Standardized Value of S	-1.6933
M-K Test Value (S)	-57
Tabulated p-value	0.0490
Approximate p-value	0.0452

OLS Regression Line (Blue)	
OLS Regression Slope	-4.3818
OLS Regression Intercept	218.2476

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



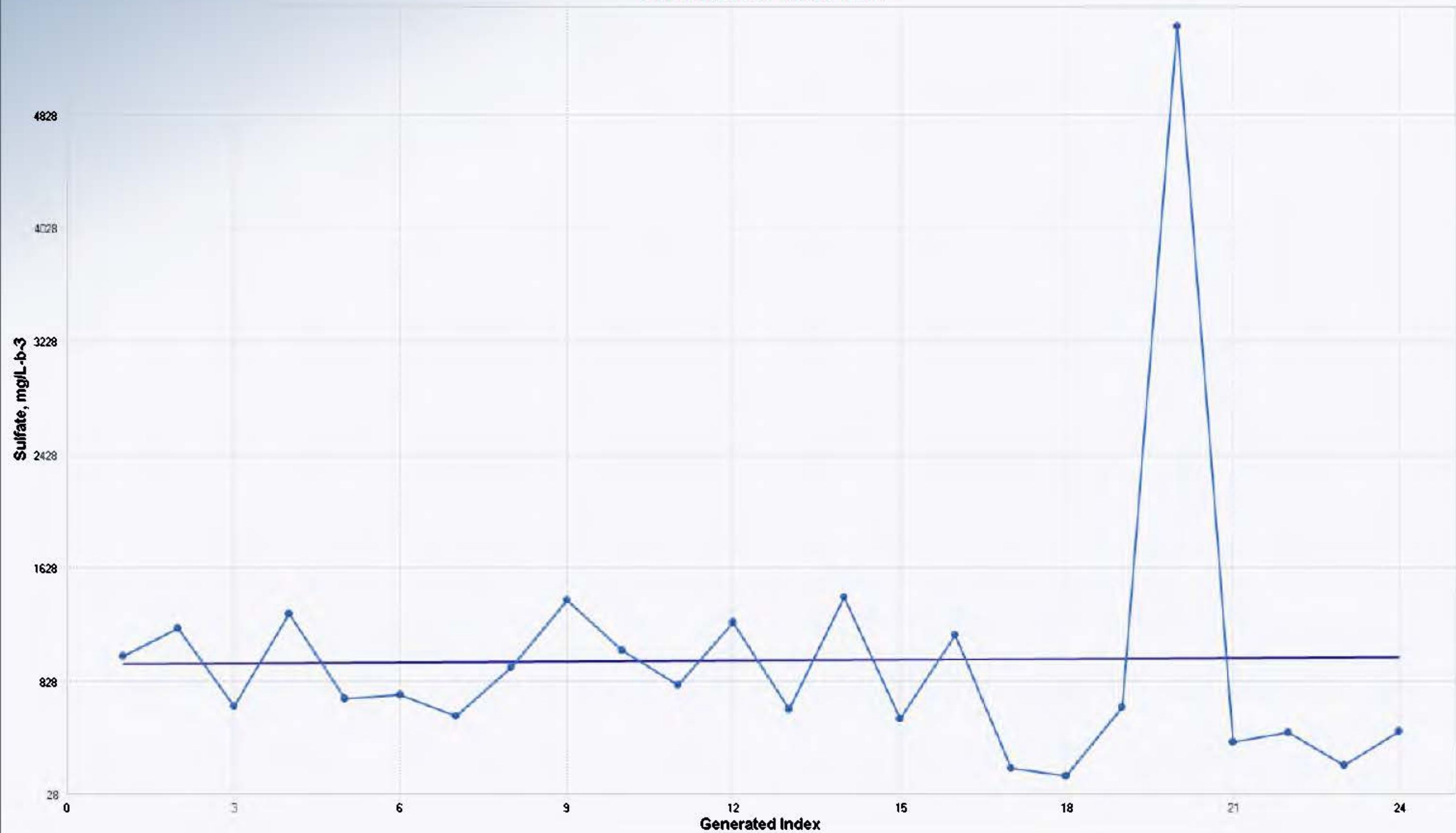
Mann-Kendall Trend Analysis	
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0151
Standardized Value of S	-0.4543
M-K Test Value (S)	-16
Tabulated p-value	0.3270
Approximate p-value	0.3248

OLS Regression Line (Blue)	
OLS Regression Slope	-3.7948
OLS Regression Intercept	1,551.3143

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

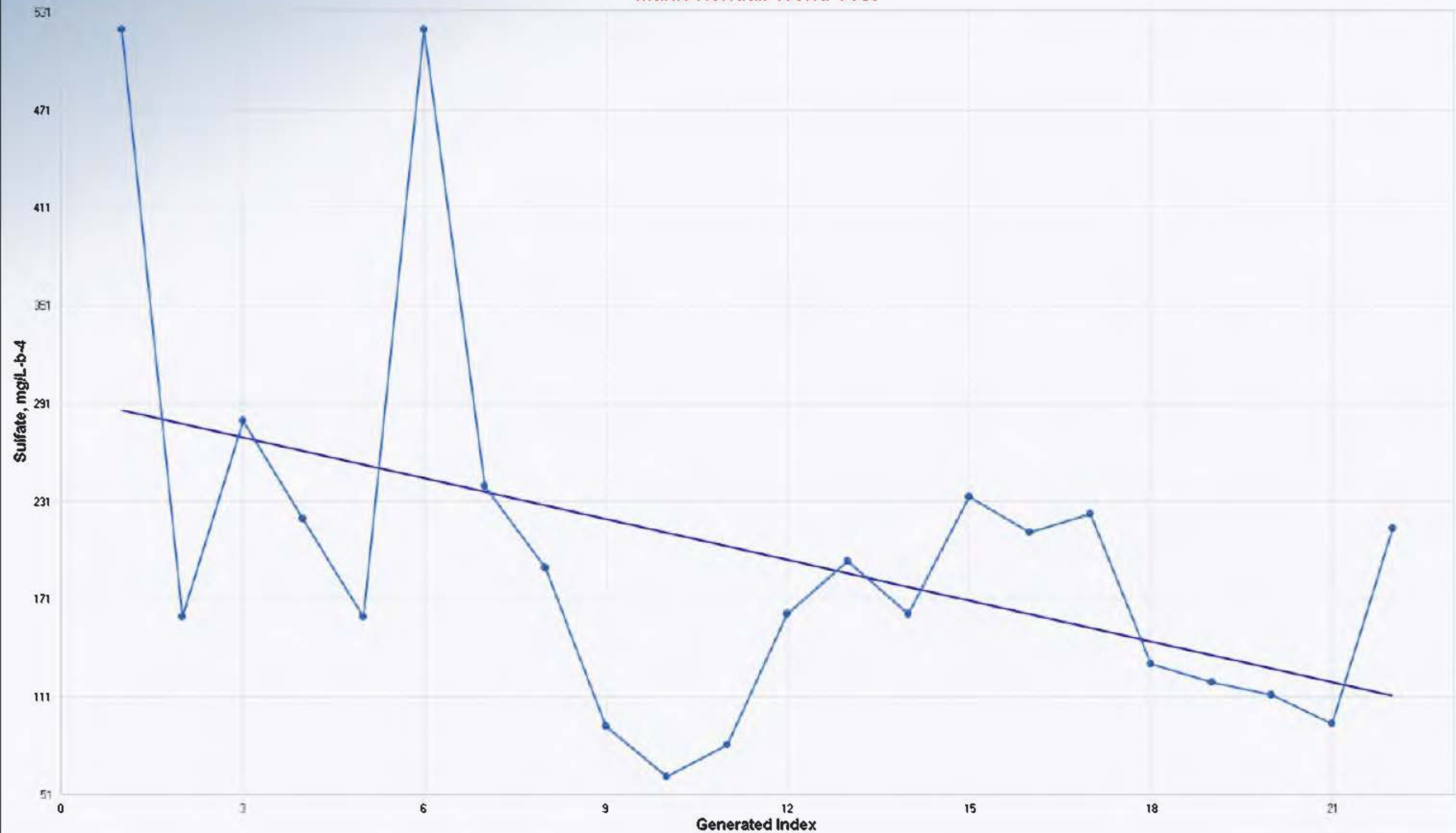
n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.3154
Standardized Value of S	-1.9595
M-K Test Value (S)	-80
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0250

## OLS Regression Line (Blue)

OLS Regression Slope	2.1004
OLS Regression Intercept	946.3696

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test

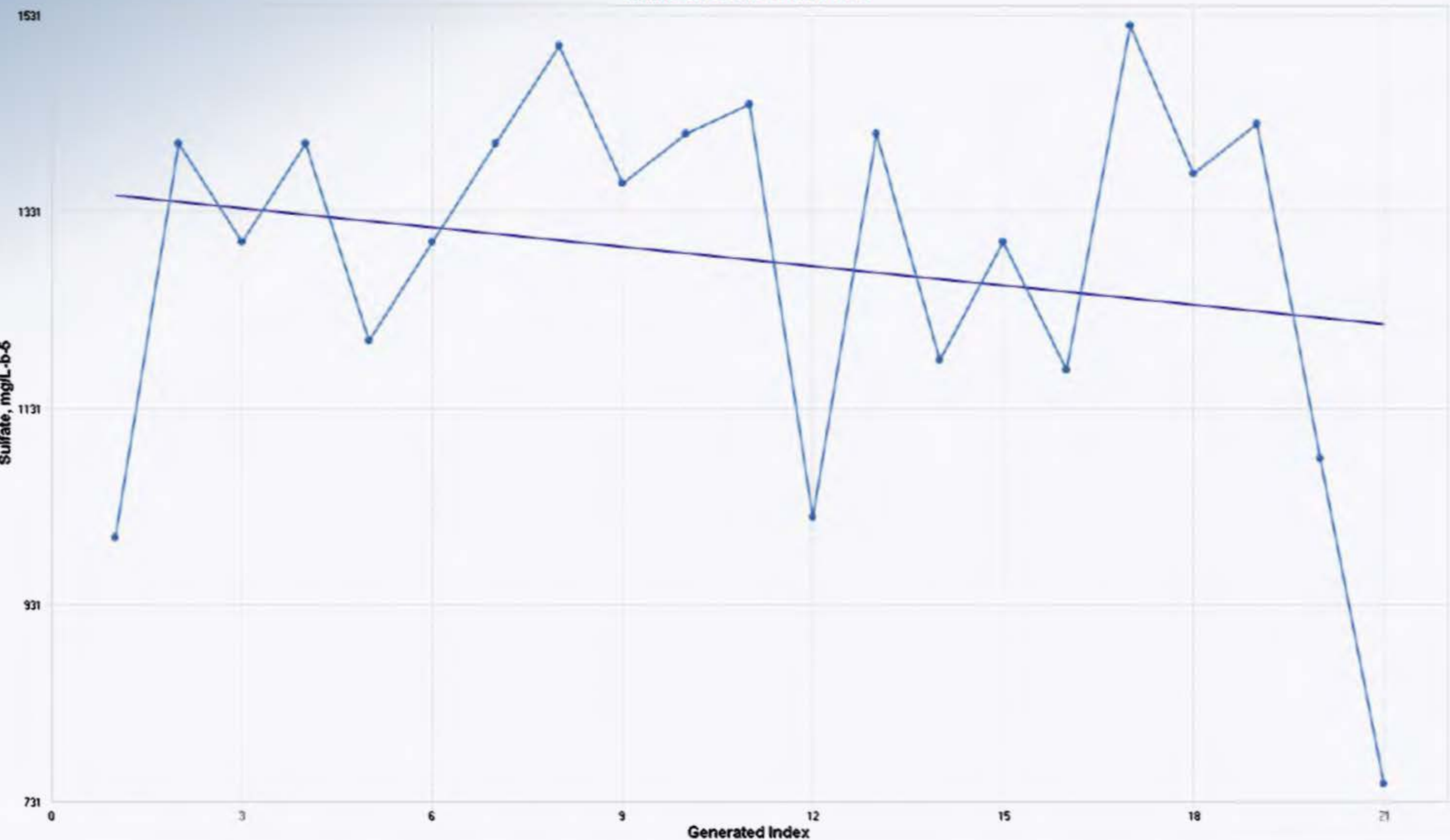


Mann-Kendall Trend Analysis	
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4213
Standardized Value of S	-1.6092
M-K Test Value (S)	58
Tabulated p-value	0.0510
Approximate p-value	0.0538

OLS Regression Line (Blue)	
OLS Regression Slope	-8.3538
OLS Regression Intercept	295.4182

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test

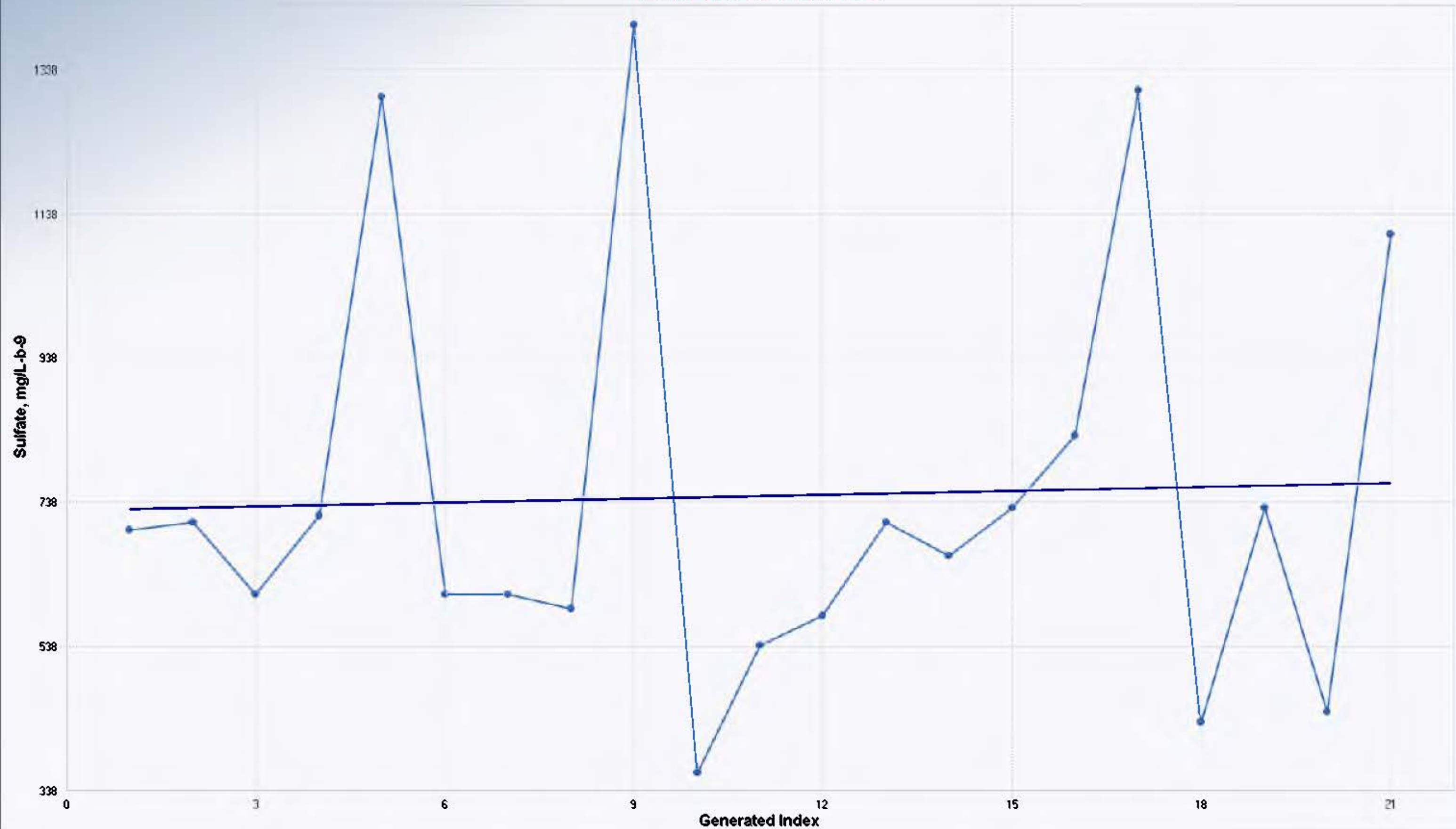


Mann-Kendall Trend Analysis	
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	32.9899
Standardized Value of S	-0.1212
M-K Test Value (S)	.5
Tabulated p-value	0.4640
Approximate p-value	0.4517

OLS Regression Line (Blue)	
OLS Regression Slope	-6.5065
OLS Regression Intercept	1,353.9524

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



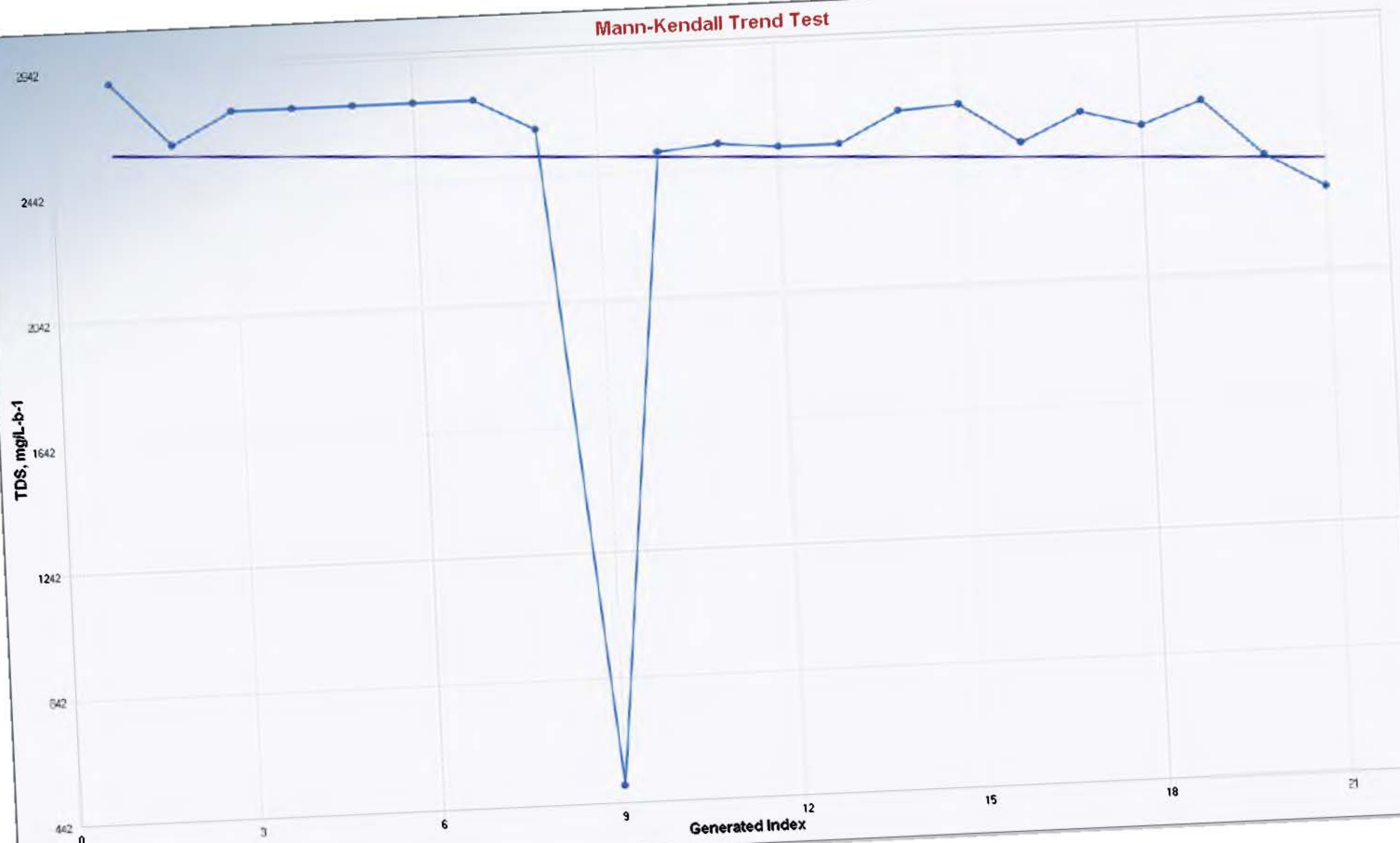
Mann-Kendall Trend Analysis	
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0606
Standardized Value of S	0.3025
M-K Test Value (S)	11
Tabulated p-value	0.3940
Approximate p-value	0.3811

OLS Regression Line (Blue)	
OLS Regression Slope	1.8208
OLS Regression Intercept	727.6381

Insufficient statistical evidence of a significant trend at the specified level of significance.



# Mann-Kendall Trend Test

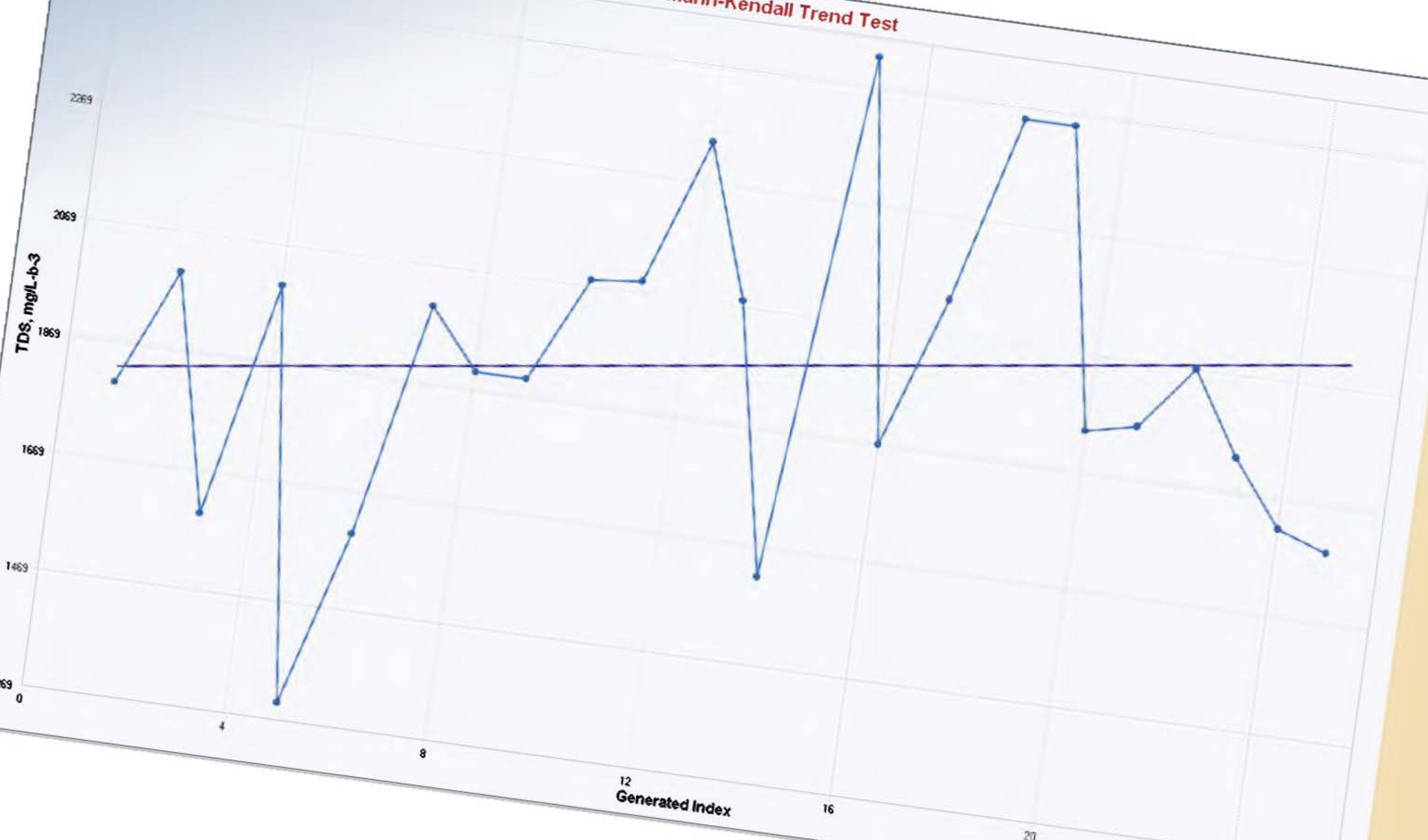


n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	32.7363
Standardized Value of S	-2.9936
M-K Test Value (S)	99
Tabulated p-value	0.0010
Approximate p-value	0.0014

<b>OLS Regression Line (Blue)</b>	
OLS Regression Slope	-8.5065
OLS Regression Intercept	2,580.2381

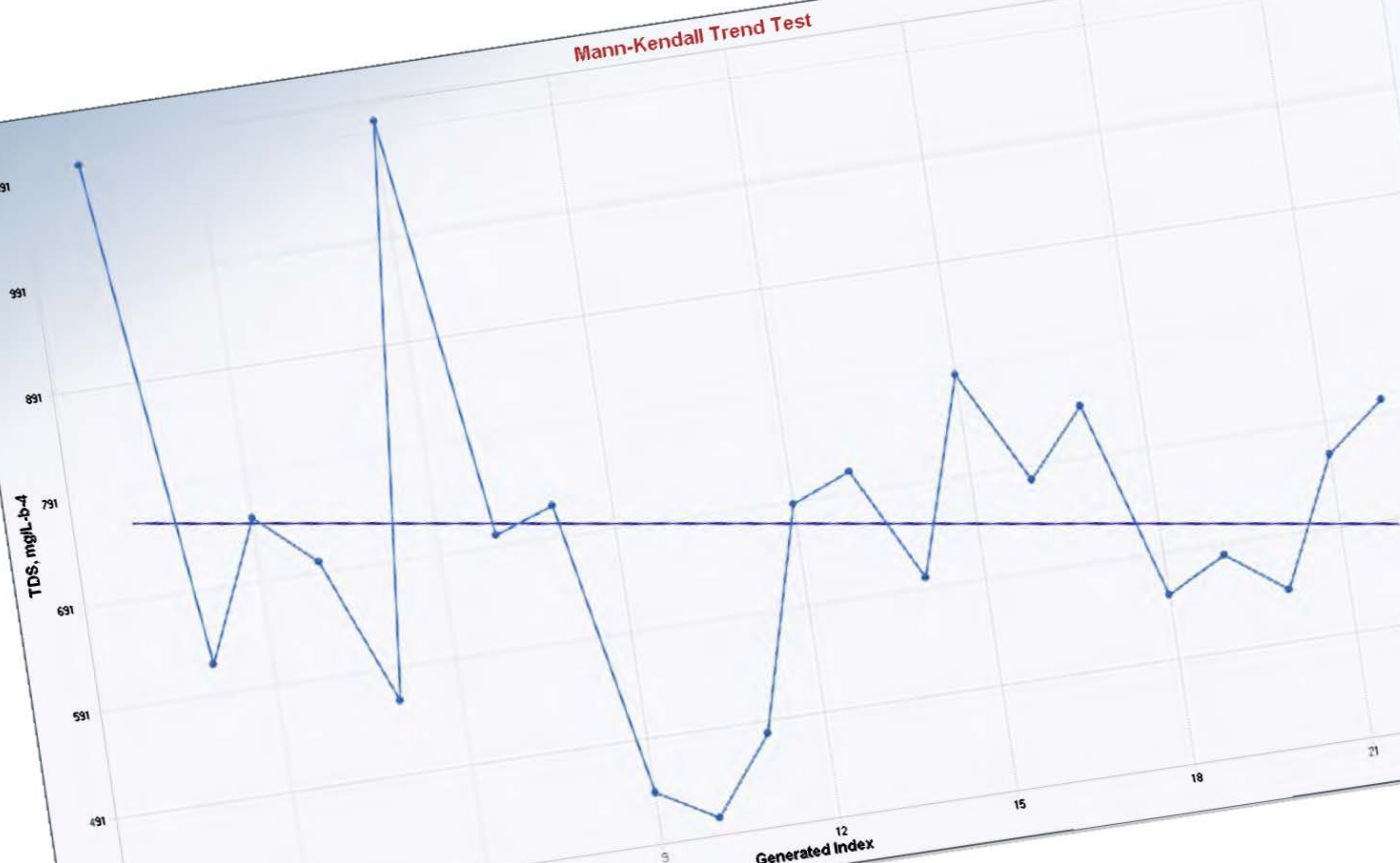
Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



Mann-Kendall Trend Analysis	
n	24
Confidence Coefficient	0.95
Level of Significance	0.05
Standard Deviation of S	42.0
Standardized Value of S	1.6
M-K Test Value (S)	1.6
Appx. Critical Value (0.05)	1.6
Approximate p-value	0.1
OLS Regression Line (Blue)	
OLS Regression Slope	11.82
OLS Regression Intercept	1,815.900
Insufficient statistical evidence of a significant trend at the specified level of significance.	

# Mann-Kendall Trend Test

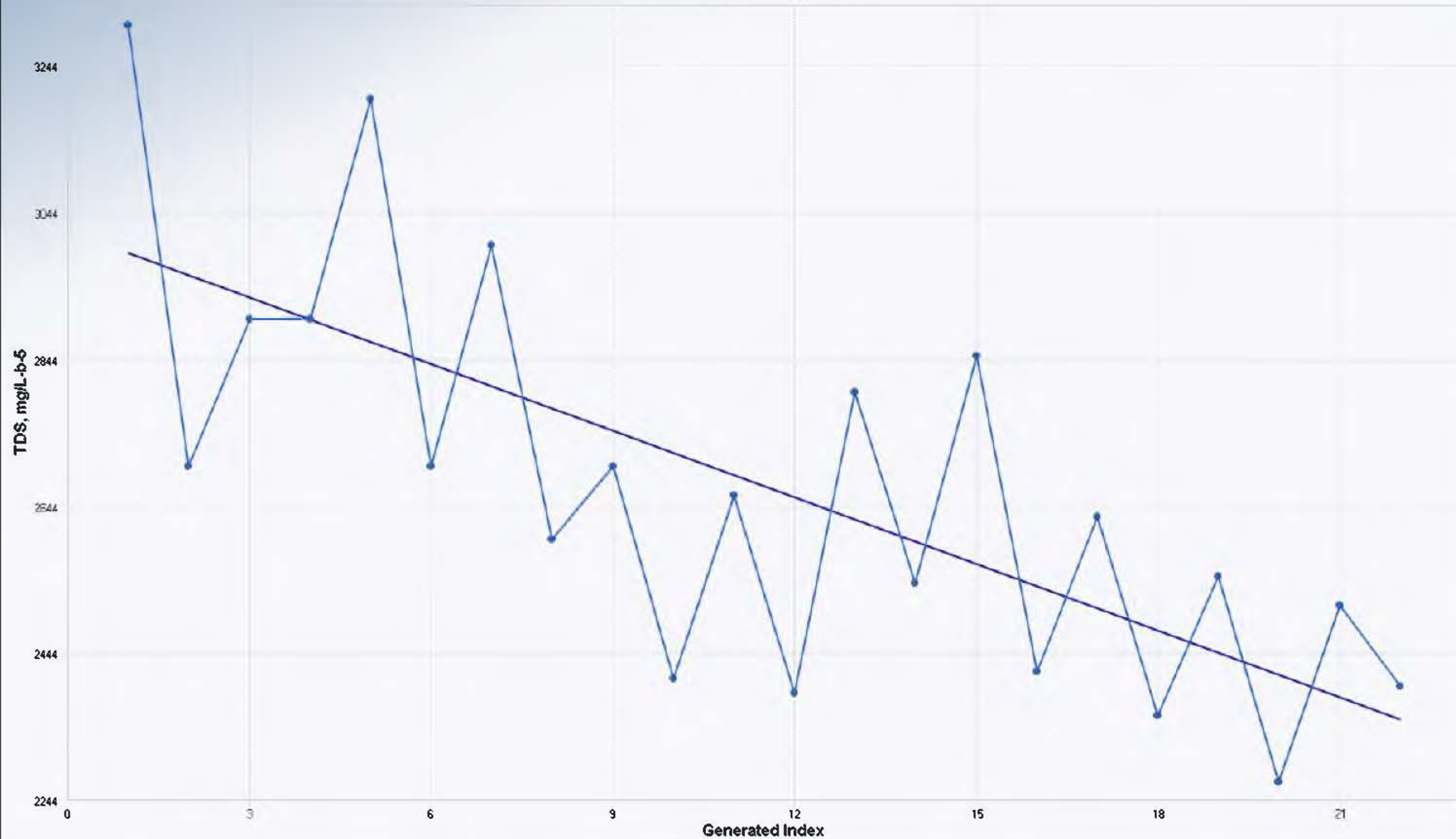


Standardized Value of S 39  
M-K Test Value (S) 0.1440  
Tabulated p-value 0.1418  
Approximate p-value

OLS Regression Line (Blue)  
OLS Regression Slope -8.4032  
OLS Regression Intercept 769.8182

Insufficient statistical evidence  
of a significant trend at the  
specified level of significance.

# Mann-Kendall Trend Test

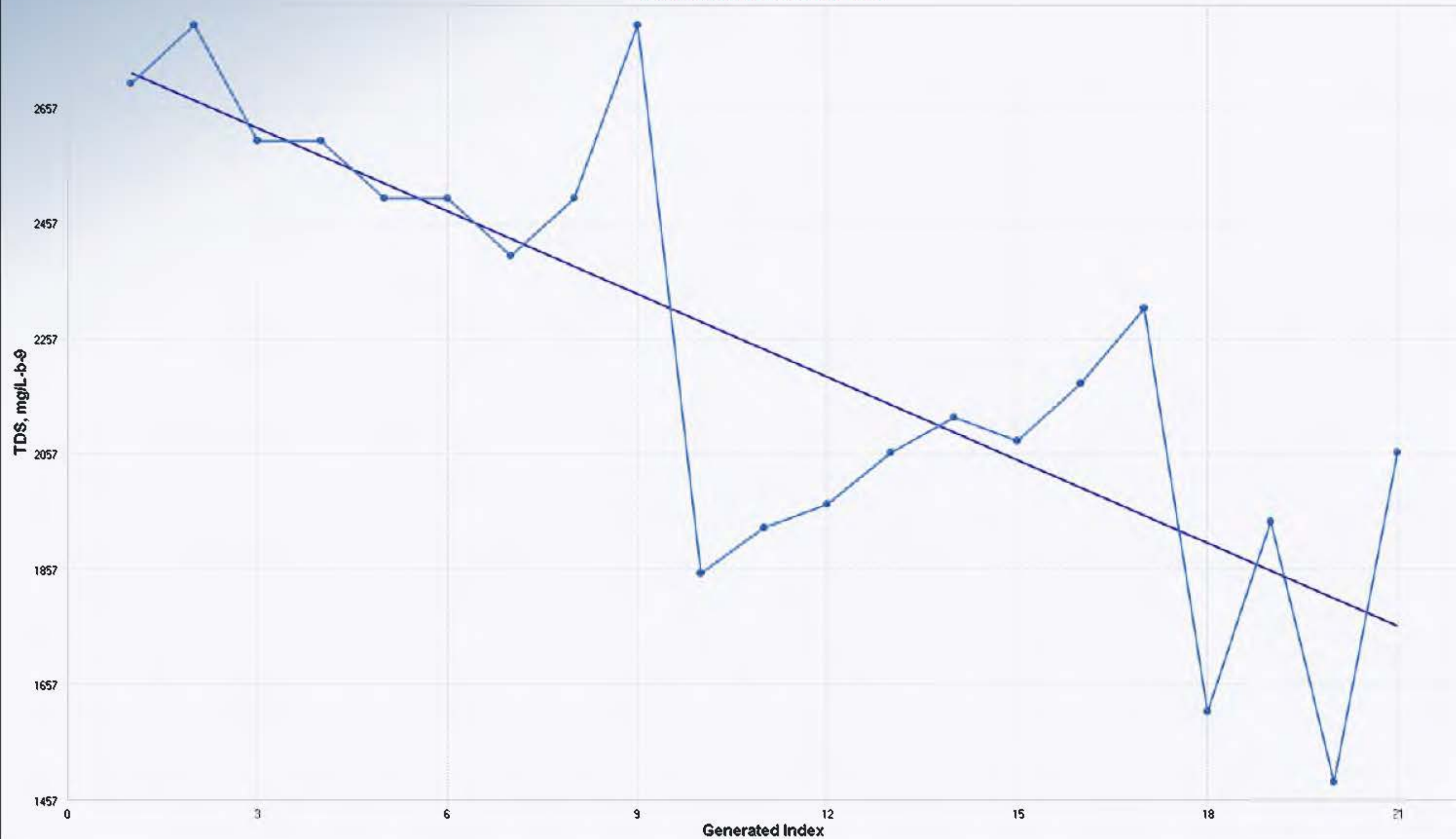


Mann-Kendall Trend Analysis	
n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.3977
Standardized Value of S	-3.5595
M-K Test Value (S)	-127
Tabulated p-value	0.0000
Approximate p-value	0.0002

OLS Regression Line (Blue)	
OLS Regression Slope	-30.2259
OLS Regression Intercept	3,019.8701

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test



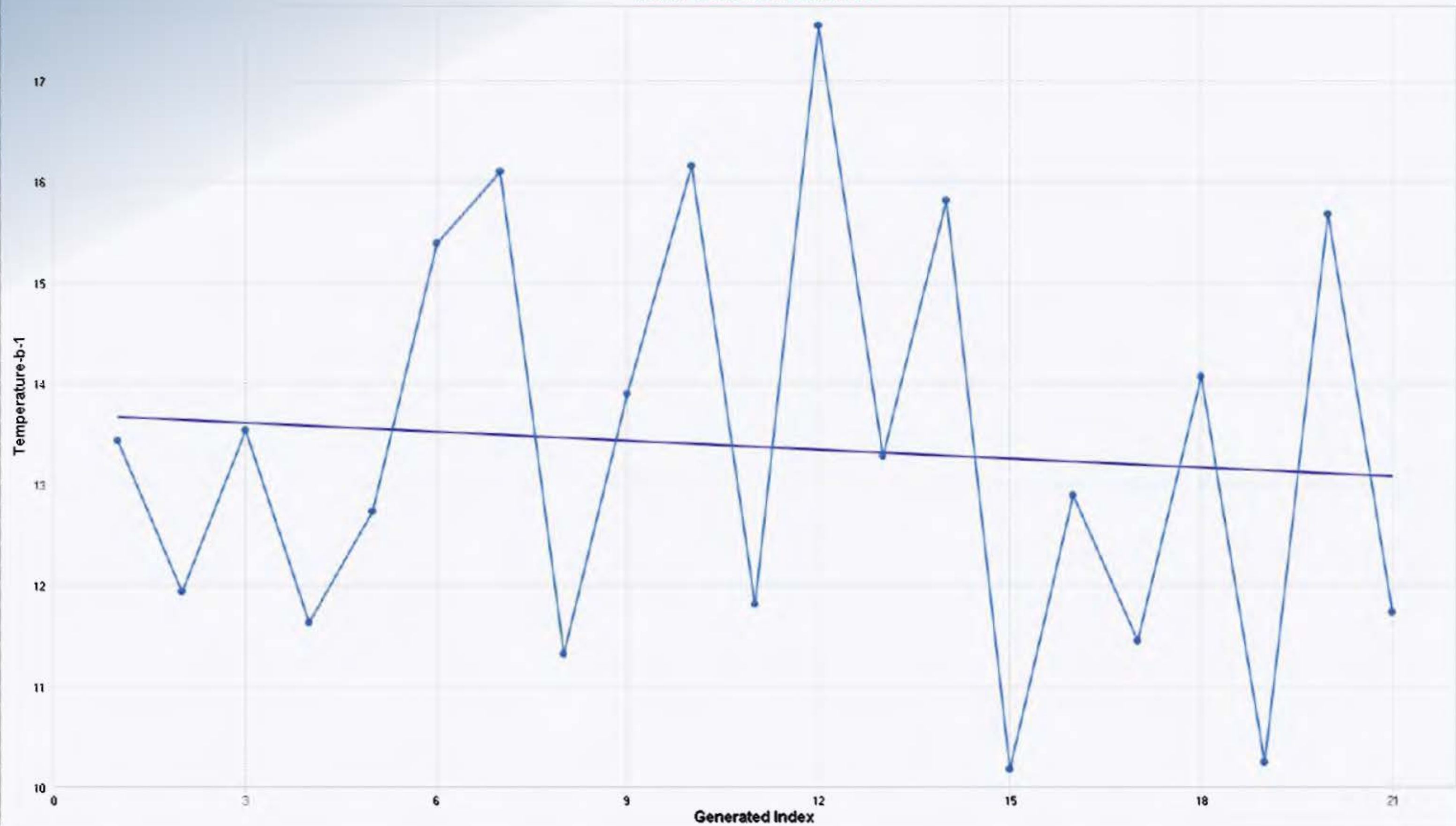
Mann-Kendall Trend Analysis	
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0151
Standardized Value of S	-3.4227
M-K Test Value (S)	-114
Tabulated p-value	0.0000
Approximate p-value	0.0003

OLS Regression Line (Blue)	
OLS Regression Slope	-47.9481
OLS Regression Intercept	2,765.5238

Statistically significant evidence of a decreasing trend at the specified level of significance.

# Mann-Kendall Trend Test

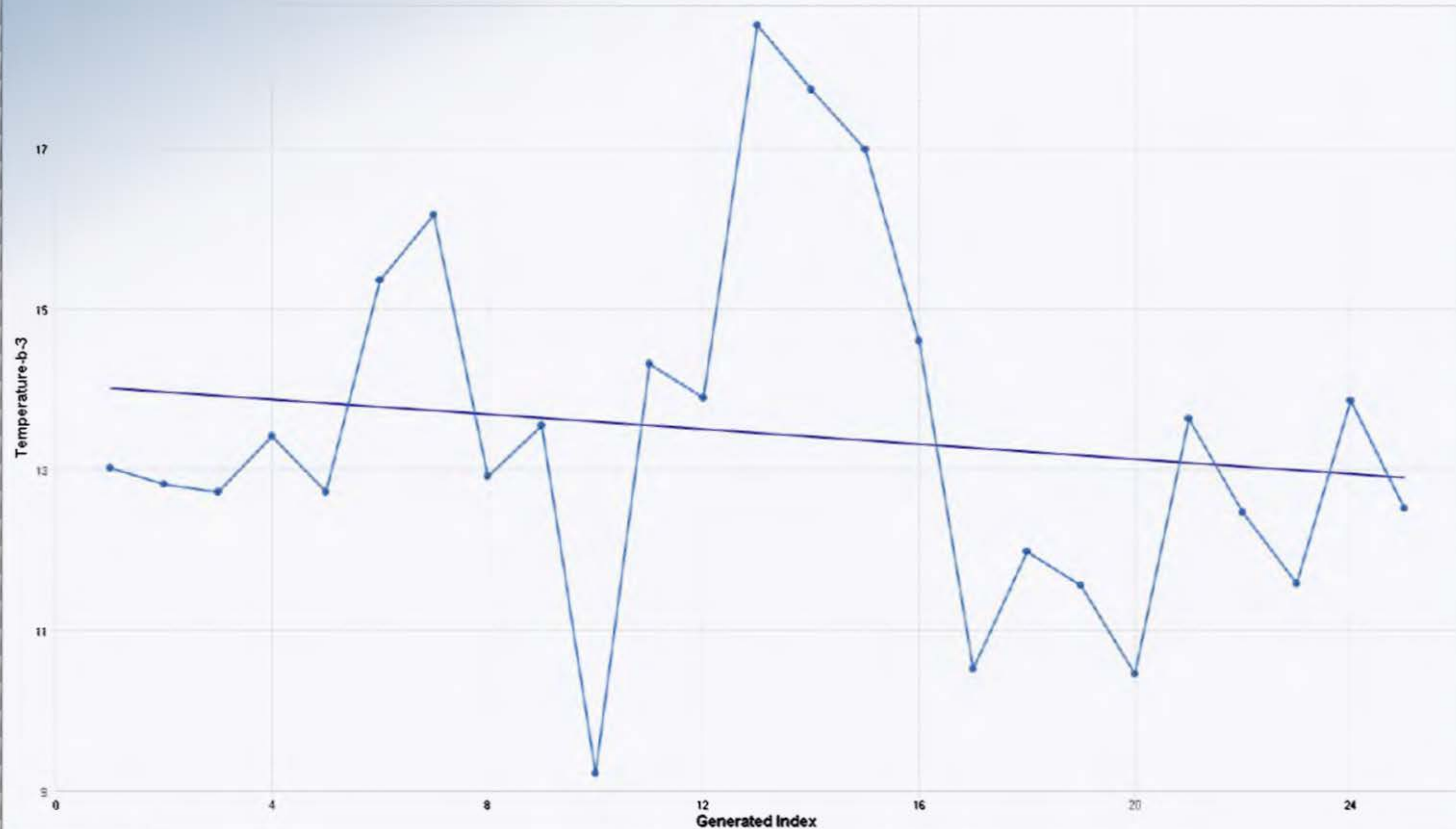


Mann-Kendall Trend Analysis	
n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.1160
Standardized Value of S	-0.3322
M-K Test Value (S)	-12
Tabulated p-value	0.3710
Approximate p-value	0.3699

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0294
OLS Regression Intercept	13.9623

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test

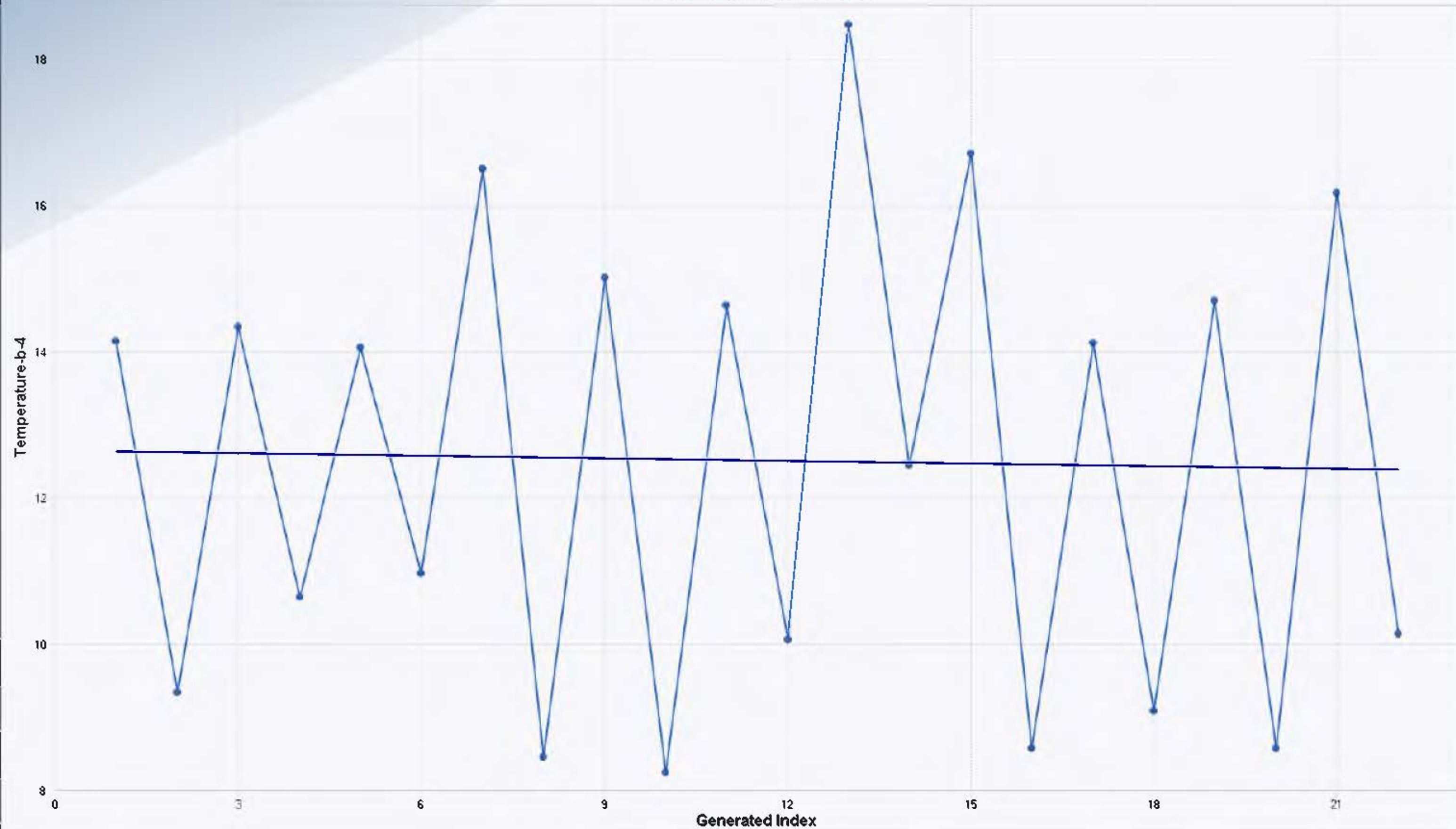


Mann-Kendall Trend Analysis	
n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.8058
Standardized Value of S	-0.7008
M-K Test Value (S)	-31
Appx. Critical Value (0.05)	-1.6443
Approximate p-value	0.2417

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0467
OLS Regression Intercept	13.8502

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test



## Mann-Kendall Trend Analysis

n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4636
Standardized Value of S	0.0564
M-K Test Value (S)	3
Tabulated p-value	0.4780
Approximate p-value	0.4775

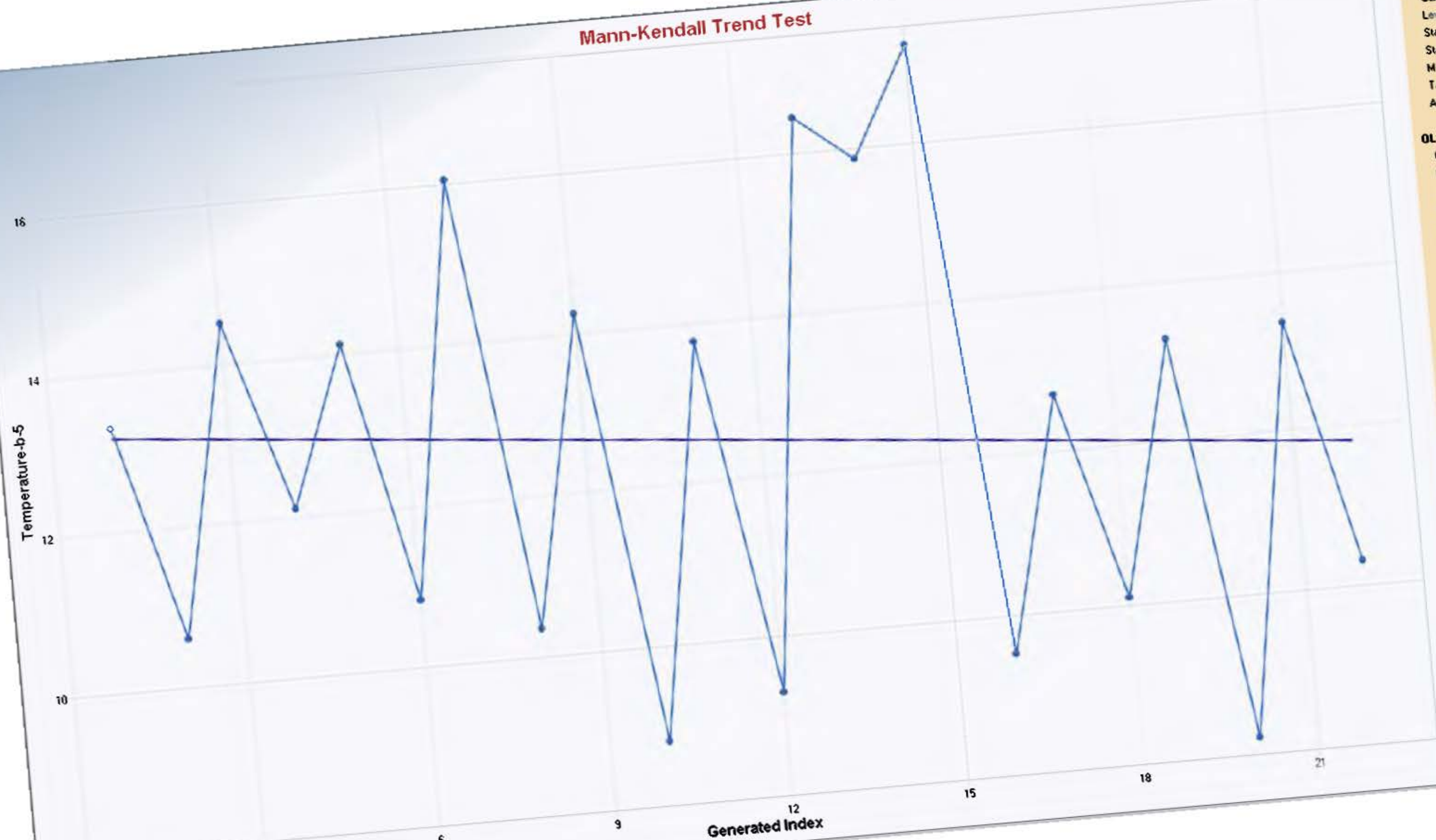
## OLS Regression Line (Blue)

OLS Regression Slope	-0.0123
OLS Regression Intercept	12.2145

Insufficient statistical evidence of a significant trend at the specified level of significance.



# Mann-Kendall Trend Test



Level of Significance	0.0500
Standard Deviation of S	35.4636
Standardized Value of S	-0.7895
M-K Test Value (S)	29
Tabulated p-value	0.2170
Approximate p-value	0.2149

OLS Regression Line (Blue)	
OLS Regression Slope	-0.0654
OLS Regression Intercept	12.8427

Insufficient statistical evidence of a significant trend at the specified level of significance.

# Mann-Kendall Trend Test

Temperature-b.9

18

16

14



Generated Index

12

15

18

21

Standardized Value of S	-82
M-K Test Value (S)	0.0070
Tabulated p-value	0.0072
Approximate p-value	

OLS Regression Line (Blue)	
OLS Regression Slope	-0.1017
OLS Regression Intercept	15.6759

Statistically significant evidence of a decreasing trend at the specified level of significance.

## Shapiro-Francia Test of Normality

Parameter: Chloride

Background Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Number of Measurements = 62

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
1	2.9	-2.17009	4.70929	-6.29326
2	3	-1.86629	8.19234	-11.8921
3	3.1	-1.67466	10.9968	-17.0836
4	3.3	-1.53007	13.3379	-22.1328
5	3.4	-1.41183	15.3312	-26.933
6	3.5	-1.31058	17.0488	-31.5201
7	4.4	-1.22123	18.5402	-36.8935
8	5.8	-1.1455	19.8524	-43.5374
9	6.3	-1.07138	21.0002	-50.2871
10	6.7	-1.00271	22.0057	-57.0052
11	7.2	-0.938476	22.8864	-63.7623
12	7.4	-0.877897	23.6571	-70.2587
13	9	-0.820379	24.3301	-77.6421
14	9.5	-0.765456	24.9161	-84.9139
15	9.7	-0.712751	25.4241	-91.8276
16	10.8	-0.665079	25.8664	-99.0105
17	11	-0.615839	26.2457	-105.785
18	13.6	-0.568052	26.5683	-113.51
19	16	-0.521527	26.8403	-121.855
20	16	-0.476105	27.067	-129.472
21	18.8	-0.431644	27.2533	-137.587
22	18.9	-0.388022	27.4039	-144.921
23	19	-0.345126	27.523	-151.478
24	19.1	-0.305481	27.6163	-157.313
25	19.4	-0.263715	27.6859	-162.429
26	21.4	-0.222403	27.7353	-167.188
27	21.6	-0.181468	27.7683	-171.108
28	26.6	-0.140835	27.7881	-174.854
29	28	-0.100433	27.7982	-177.666
30	28	-0.0601949	27.8018	-179.352
31	28.8	-0.0200544	27.8022	-179.93
32	30.5	0.0200544	27.8026	-179.318
33	32.7	0.0601949	27.8062	-177.349
34	34.5	0.100433	27.8163	-173.885
35	35.2	0.140835	27.8362	-168.927
36	37.2	0.181468	27.8691	-162.177
37	37.3	0.222403	27.9185	-153.881
38	38	0.263715	27.9881	-143.86
39	39.4	0.305481	28.0814	-131.824
40	48	0.345126	28.2005	-115.258
41	52	0.388022	28.3511	-95.0806
42	52.3	0.431644	28.5374	-72.5056
43	53	0.476105	28.7641	-47.272
44	53	0.521527	29.0361	-19.6311
45	53.1	0.568052	29.3588	10.5325
46	55	0.615839	29.738	44.4036
47	56	0.665079	30.1803	81.6481
48	58	0.712751	30.6884	122.988
49	63.1	0.765456	31.2743	171.288
50	68	0.820379	31.9473	227.074
51	69.6	0.877897	32.718	288.175
52	76	0.938476	33.5987	359.499
53	84.7	1.00271	34.6042	444.429
54	86	1.07138	35.752	536.568

55	105	1.1455	37.0642	656.845
56	131	1.22123	38.5556	816.826
57	140	1.31058	40.2732	1000.31
58	140	1.41183	42.2665	1197.96
59	141	1.53007	44.6076	1413.7
60	144	1.67466	47.4121	1654.85
61	145	1.86629	50.8951	1925.47
62	227	2.17009	55.6044	2418.08

---

Data Set Standard Deviation = 46.5631

Numerator = 5.8471e+006

Denominator = 7.35397e+006

W Statistic = 0.795094 = 5.8471e+006 / 7.35397e+006

**5% Critical value of 0.964 exceeds 0.795094**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.947 exceeds 0.795094**  
**Evidence of non-normality at 99% level of significance**

## Shapiro-Francia Test of Normality

Parameter: Specific Conductance

Background Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Number of Measurements = 59

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
1	1	-2.14441	4.59848	-2.14441
2	1	-1.83843	7.97829	-3.98283
3	1	-1.64485	10.6838	-5.62768
4	1	-1.50626	12.9526	-7.13394
5	1	-1.38517	14.8713	-8.51912
6	591	-1.28155	16.5137	-765.916
7	593	-1.19522	17.9423	-1474.68
8	633	-1.11232	19.1795	-2178.78
9	725	-1.03643	20.2537	-2930.2
10	765	-0.970094	21.1948	-3672.32
11	775	-0.903992	22.012	-4372.91
12	814	-0.841621	22.7203	-5057.99
13	854	-0.785774	23.3378	-5729.04
14	861	-0.729003	23.8692	-6356.71
15	875	-0.67449	24.3242	-6946.89
16	884	-0.624956	24.7147	-7499.35
17	906	-0.573953	25.0442	-8019.35
18	924	-0.524401	25.3191	-8503.9
19	953	-0.478914	25.5485	-8960.31
20	963	-0.431644	25.7348	-9375.98
21	966	-0.385321	25.8833	-9748.2
22	1040	-0.342466	26.0006	-10104.4
23	1040	-0.297612	26.0892	-10413.9
24	1056	-0.253347	26.1533	-10681.4
25	1114	-0.212137	26.1983	-10917.7
26	1130	-0.168741	26.2268	-11108.4
27	1190	-0.125661	26.2426	-11257.9
28	1340	-0.0853288	26.2499	-11372.3
29	1360	-0.0426257	26.2517	-11430.3
30	1440	0	26.2517	-11430.3
31	1560	0.0426257	26.2535	-11363.8
32	1600	0.0853288	26.2608	-11227.2
33	1620	0.125661	26.2766	-11023.7
34	1650	0.168741	26.3051	-10745.2
35	1800	0.212137	26.3501	-10363.4
36	1850	0.253347	26.4142	-9894.71
37	1990	0.297612	26.5028	-9302.46
38	2030	0.342466	26.6201	-8607.25
39	2030	0.385321	26.7686	-7825.05
40	2220	0.431644	26.9549	-6866.8
41	2220	0.478914	27.1843	-5803.61
42	2230	0.524401	27.4592	-4634.2
43	2230	0.573953	27.7887	-3354.29
44	2312	0.624956	28.1792	-1909.39
45	2490	0.67449	28.6342	-229.906
46	2550	0.729003	29.1656	1629.05
47	2570	0.785774	29.7831	3648.49
48	2660	0.841621	30.4914	5887.2
49	2680	0.903992	31.3086	8309.9
50	2720	0.970094	32.2497	10948.6
51	2810	1.03643	33.3239	13860.9
52	2830	1.11232	34.5611	17008.8
53	2850	1.19522	35.9897	20415.2
54	2860	1.28155	37.6321	24080.4

55	2890	1.38517	39.5508	28083.6
56	2920	1.50626	41.8196	32481.8
57	2920	1.64485	44.5251	37284.8
58	2950	1.83843	47.9049	42708.2
59	3000	2.14441	52.5034	49141.4

---

Data Set Standard Deviation = 913.623

Numerator = 2.41488e+009

Denominator = 2.54185e+009

W Statistic = 0.950047 = 2.41488e+009 / 2.54185e+009

**5% Critical value of 0.962 exceeds 0.950047**

**Evidence of non-normality at 95% level of significance**

1% Critical value of 0.945 is less than 0.950047

Data is normally distributed at 99% level of significance

# Shapiro-Francia Test of Normality

Parameter: pH

Background Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Number of Measurements = 59

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m^2)</b>	<b>sum(mx)</b>
1	4.16	-2.14441	4.59848	-8.92073
2	4.22	-1.83843	7.97829	-16.6789
3	4.36	-1.64485	10.6838	-23.8504
4	4.74	-1.50626	12.9526	-30.9901
5	5.41	-1.38517	14.8713	-38.4839
6	5.48	-1.28155	16.5137	-45.5068
7	5.6	-1.19522	17.9423	-52.2
8	6.17	-1.11232	19.1795	-59.0631
9	6.2	-1.03643	20.2537	-65.4889
10	6.4	-0.970094	21.1948	-71.6975
11	6.47	-0.903992	22.012	-77.5464
12	6.51	-0.841621	22.7203	-83.0253
13	6.59	-0.785774	23.3378	-88.2036
14	6.69	-0.729003	23.8692	-93.0806
15	6.71	-0.67449	24.3242	-97.6064
16	6.72	-0.624956	24.7147	-101.806
17	6.76	-0.573953	25.0442	-105.686
18	6.76	-0.524401	25.3191	-109.231
19	6.77	-0.478914	25.5485	-112.473
20	6.87	-0.431644	25.7348	-115.439
21	6.87	-0.385321	25.8833	-118.086
22	6.87	-0.342466	26.0006	-120.439
23	6.89	-0.297612	26.0892	-122.489
24	6.9	-0.253347	26.1533	-124.237
25	6.9	-0.212137	26.1983	-125.701
26	6.9	-0.168741	26.2268	-126.865
27	6.93	-0.125661	26.2426	-127.736
28	6.95	-0.0853288	26.2499	-128.329
29	6.95	-0.0426257	26.2517	-128.625
30	6.96	0	26.2517	-128.625
31	6.99	0.0426257	26.2535	-128.327
32	7	0.0853288	26.2608	-127.73
33	7	0.125661	26.2766	-126.85
34	7	0.168741	26.3051	-125.669
35	7	0.212137	26.3501	-124.184
36	7	0.253347	26.4142	-122.411
37	7	0.297612	26.5028	-120.328
38	7.05	0.342466	26.6201	-117.913
39	7.07	0.385321	26.7686	-115.189
40	7.17	0.431644	26.9549	-112.094
41	7.25	0.478914	27.1843	-108.622
42	7.26	0.524401	27.4592	-104.815
43	7.26	0.573953	27.7887	-100.648
44	7.27	0.624956	28.1792	-96.1045
45	7.3	0.67449	28.6342	-91.1808
46	7.35	0.729003	29.1656	-85.8226
47	7.41	0.785774	29.7831	-80
48	7.43	0.841621	30.4914	-73.7467
49	7.54	0.903992	31.3086	-66.9306
50	7.56	0.970094	32.2497	-59.5967
51	7.63	1.03643	33.3239	-51.6887
52	7.64	1.11232	34.5611	-43.1906
53	7.67	1.19522	35.9897	-34.0233
54	7.68	1.28155	37.6321	-24.181

55	7.69	1.38517	39.5508	-13.529
56	7.74	1.50626	41.8196	-1.87053
57	7.95	1.64485	44.5251	11.206
58	8.48	1.83843	47.9049	26.7959
59	9.04	2.14441	52.5034	46.1813

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Data Set Standard Deviation = 0.907078

Numerator = 2132.72

Denominator = 2505.56

W Statistic = 0.851192 = 2132.72 / 2505.56

**5% Critical value of 0.962 exceeds 0.851192**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.945 exceeds 0.851192**  
**Evidence of non-normality at 99% level of significance**



## Shapiro-Francia Test of Normality

Parameter: Sodium

Background Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Number of Measurements = 62

<b>i</b>	<b>x(i)</b>	<b>m(i)</b>	<b>sum(m<sup>2</sup>)</b>	<b>sum(mx)</b>
1	4.2	-2.17009	4.70929	-9.11438
2	4.4	-1.86629	8.19234	-17.3261
3	4.43	-1.67466	10.9968	-24.7448
4	4.81	-1.53007	13.3379	-32.1044
5	5.55	-1.41183	15.3312	-39.9401
6	5.69	-1.31058	17.0488	-47.3973
7	5.9	-1.22123	18.5402	-54.6025
8	5.9	-1.1455	19.8524	-61.361
9	6	-1.07138	21.0002	-67.7893
10	6.6	-1.00271	22.0057	-74.4072
11	6.78	-0.938476	22.8864	-80.77
12	6.9	-0.877897	23.6571	-86.8275
13	7.2	-0.820379	24.3301	-92.7343
14	7.8	-0.765456	24.9161	-98.7048
15	8.81	-0.712751	25.4241	-104.984
16	9.12	-0.665079	25.8664	-111.05
17	9.2	-0.615839	26.2457	-116.715
18	9.8	-0.568052	26.5683	-122.282
19	10	-0.521527	26.8403	-127.498
20	10.9	-0.476105	27.067	-132.687
21	11	-0.431644	27.2533	-137.435
22	11.6	-0.388022	27.4039	-141.936
23	13	-0.345126	27.523	-146.423
24	13	-0.305481	27.6163	-150.394
25	15	-0.263715	27.6859	-154.35
26	18.7	-0.222403	27.7353	-158.509
27	19.3	-0.181468	27.7683	-162.011
28	20	-0.140835	27.7881	-164.828
29	24	-0.100433	27.7982	-167.238
30	28	-0.0601949	27.8018	-168.924
31	30.4	-0.0200544	27.8022	-169.533
32	32.2	0.0200544	27.8026	-168.888
33	32.5	0.0601949	27.8062	-166.931
34	34	0.100433	27.8163	-163.517
35	34.7	0.140835	27.8362	-158.63
36	35	0.181468	27.8691	-152.278
37	35.1	0.222403	27.9185	-144.472
38	35.5	0.263715	27.9881	-135.11
39	36	0.305481	28.0814	-124.113
40	36.5	0.345126	28.2005	-111.516
41	36.9	0.388022	28.3511	-97.1975
42	37	0.431644	28.5374	-81.2267
43	38	0.476105	28.7641	-63.1347
44	38.4	0.521527	29.0361	-43.1081
45	39	0.568052	29.3588	-20.954
46	40	0.615839	29.738	3.67954
47	41.4	0.665079	30.1803	31.2138
48	44	0.712751	30.6884	62.5748
49	46	0.765456	31.2743	97.7858
50	46.4	0.820379	31.9473	135.851
51	50.7	0.877897	32.718	180.361
52	52	0.938476	33.5987	229.161
53	52.7	1.00271	34.6042	282.004
54	55.3	1.07138	35.752	341.252

55	57.4	1.1455	37.0642	407.003
56	67	1.22123	38.5556	488.826
57	78.5	1.31058	40.2732	591.706
58	84.2	1.41183	42.2665	710.583
59	85	1.53007	44.6076	840.638
60	91.1	1.67466	47.4121	993.2
61	118	1.86629	50.8951	1213.42
62	256	2.17009	55.6044	1768.97

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Data Set Standard Deviation = 37.9947

Numerator = 3.12924e+006

Denominator = 4.89651e+006

W Statistic = 0.639076 = 3.12924e+006 / 4.89651e+006

**5% Critical value of 0.964 exceeds 0.639076**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.947 exceeds 0.639076**  
**Evidence of non-normality at 99% level of significance**

## Non-Parametric Tolerance Interval

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Background measurements (n) = 62

Maximum Background Concentration = 227

Minimum Coverage = 95.5%

Average Coverage = 98.4127%

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Location	Date	Value	Significant
B-3/3R	10/27/2010	97	FALSE
B-3/3R	4/26/2011	77	FALSE
B-3/3R	10/21/2011	130	FALSE
B-3/3R	4/18/2012	72	FALSE
B-3/3R	10/8/2012	190	FALSE
B-3/3R	4/29/2013	180	FALSE
<b>B-3/3R</b>	<b>10/2/2013</b>	<b>420</b>	<b>TRUE</b>
B-3/3R	4/17/2014	140	FALSE
B-3/3R	10/20/2014	130	FALSE
B-3/3R	4/27/2015	120	FALSE
<b>B-3/3R</b>	<b>10/15/2015</b>	<b>265</b>	<b>TRUE</b>
B-3/3R	4/12/2016	148	FALSE
<b>B-3/3R</b>	<b>10/5/2016</b>	<b>339</b>	<b>TRUE</b>
B-3/3R	12/13/2016	175	FALSE
B-3/3R	4/26/2017	26.4	FALSE
<b>B-3/3R</b>	<b>10/18/2017</b>	<b>312</b>	<b>TRUE</b>
B-3/3R	4/17/2018	129	FALSE
<b>B-3/3R</b>	<b>10/12/2018</b>	<b>696</b>	<b>TRUE</b>
<b>B-3/3R</b>	<b>12/18/2018</b>	<b>646</b>	<b>TRUE</b>
B-3/3R	3/5/2019	77	FALSE
B-3/3R	4/10/2019	91.7	FALSE
<b>B-3/3R</b>	<b>10/14/2019</b>	<b>348</b>	<b>TRUE</b>
B-3/3R	4/9/2020	180	FALSE
<b>B-3/3R</b>	<b>10/6/2020</b>	<b>299</b>	<b>TRUE</b>
<b>B-3/3R</b>	<b>4/22/2021</b>	<b>307</b>	<b>TRUE</b>

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## Non-Parametric Tolerance Interval

Parameter: Specific Conductance

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 6.0241%

Background measurements (n) = 59

Maximum Background Concentration = 3000

Minimum Coverage = 95.1%

Average Coverage = 98.3333%

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Location	Date	Value	Significant
B-3/3R	10/27/2010	2060	FALSE
B-3/3R	10/21/2011	1900	FALSE
B-3/3R	4/18/2012	2220	FALSE
B-3/3R	10/8/2012	1720	FALSE
B-3/3R	4/29/2013	1970	FALSE
B-3/3R	10/2/2013	2550	FALSE
B-3/3R	4/17/2014	2040	FALSE
B-3/3R	10/20/2014	2000	FALSE
B-3/3R	4/27/2015	2110	FALSE
B-3/3R	10/15/2015	2200	FALSE
B-3/3R	4/12/2016	2270	FALSE
B-3/3R	10/5/2016	2570	FALSE
B-3/3R	12/13/2016	2090	FALSE
B-3/3R	4/26/2017	1940	FALSE
<b>B-3/3R</b>	<b>10/18/2017</b>	<b>3450</b>	<b>TRUE</b>
B-3/3R	4/17/2018	2620	FALSE
<b>B-3/3R</b>	<b>10/12/2018</b>	<b>3920</b>	<b>TRUE</b>
<b>B-3/3R</b>	<b>12/18/2018</b>	<b>4090</b>	<b>TRUE</b>
B-3/3R	3/5/2019	2880	FALSE
B-3/3R	4/10/2019	1400	FALSE
B-3/3R	10/14/2019	2460	FALSE
B-3/3R	4/9/2020	2770	FALSE
<b>B-3/3R</b>	<b>10/6/2020</b>	<b>3160</b>	<b>TRUE</b>
B-3/3R	4/22/2021	2789	FALSE

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# Parametric Tolerance Interval Analysis

Parameter: pH

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

## USEPA 1989 Guidance Tolerance Limit Formula (Two-Tailed)

Background observations = 59

Background mean = 6.84983

Background standard deviation = 0.907078

Two-sided normal tolerance factor (K) at 95% confidence = 2.333

Upper tolerance limit = 8.96604

Lower tolerance limit = 4.73362

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Location	Date	Value	Significant
B-3/3R	10/27/2010	9.42	TRUE
	4/26/2011	8.99	TRUE
	10/21/2011	8.04	FALSE
	4/18/2012	9.27	TRUE
	10/8/2012	8.71	FALSE
	4/29/2013	8.85	FALSE
	10/2/2013	4.17	TRUE
	4/17/2014	4.99	FALSE
	10/20/2014	8.6	FALSE
	4/27/2015	8.64	FALSE
	10/15/2015	8.64	FALSE
	4/12/2016	8.83	FALSE
	10/5/2016	7.19	FALSE
	12/13/2016	6.52	FALSE
	4/26/2017	8.1	FALSE
	10/18/2017	7.26	FALSE
	4/17/2018	8.11	FALSE
	10/12/2018	6.97	FALSE
	12/18/2018	7.25	FALSE
	3/5/2019	7.18	FALSE
	4/10/2019	7.38	FALSE
	10/14/2019	7.58	FALSE
	4/9/2020	7.56	FALSE
	10/6/2020	7.76	FALSE
	4/22/2021	6.95	FALSE

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## Non-Parametric Tolerance Interval

Parameter: Sodium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 0%

Background measurements (n) = 62

Maximum Background Concentration = 256

Minimum Coverage = 95.5%

Average Coverage = 98.4127%

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Location	Date	Value	Significant
B-3/3R	10/27/2010	64	FALSE
B-3/3R	4/26/2011	47	FALSE
B-3/3R	10/21/2011	54	FALSE
B-3/3R	4/18/2012	37	FALSE
B-3/3R	10/8/2012	89	FALSE
B-3/3R	4/29/2013	77	FALSE
B-3/3R	10/2/2013	250	FALSE
B-3/3R	4/17/2014	67	FALSE
B-3/3R	10/20/2014	59	FALSE
B-3/3R	4/27/2015	69.8	FALSE
B-3/3R	10/15/2015	176	FALSE
B-3/3R	4/12/2016	90.8	FALSE
B-3/3R	10/5/2016	199	FALSE
B-3/3R	12/13/2016	84.4	FALSE
B-3/3R	4/26/2017	28.9	FALSE
B-3/3R	10/18/2017	192	FALSE
B-3/3R	4/17/2018	79.1	FALSE
<b>B-3/3R</b>	<b>10/12/2018</b>	<b>391</b>	<b>TRUE</b>
<b>B-3/3R</b>	<b>12/18/2018</b>	<b>416</b>	<b>TRUE</b>
B-3/3R	3/5/2019	82.6	FALSE
B-3/3R	4/10/2019	92.4	FALSE
B-3/3R	10/14/2019	219	FALSE
B-3/3R	4/9/2020	162	FALSE
B-3/3R	10/6/2020	242	FALSE
B-3/3R	4/22/2021	190	FALSE

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