Swan Hills Treatment Centre

2025 Groundwater Monitoring Report

Veolia Canada Waste Services Inc.

Project number: 60757940

March 30, 2026

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Executive Summary

AECOM Canada ULC (AECOM) was retained to conduct the annual groundwater monitoring event in 2025 at the Swan Hills Treatment Centre (the Site). The groundwater monitoring report is completed on an annual basis and submitted to Alberta Environment and Protected Areas (EPA).

The groundwater monitoring sampling program follows the requirements outlined in EPA's Approval No. 1744-03-00.

Three depth intervals are monitored. The shallow and intermediate intervals monitor groundwater in the surficial till deposits. The sandstone interval monitors the groundwater in the Paskapoo Formation between 50 and 90 metres below ground surface (mBGS).

The groundwater flow in the shallow and intermediate intervals is generally to the east at an estimated velocity of 0.014 metres per year (m/yr) for the shallow till and 0.022 m/yr for the deeper till (intermediate interval wells). The groundwater flow in the sandstone interval is generally to the south. The flow velocity in 2025 is 16.26 m/yr.

Based on the 2025 groundwater monitoring, the following conclusions can be made:

- Petroleum hydrocarbon (BTEX, PHC F1) concentrations were below the laboratory detection limit for all wells sampled in 2025, with the exception of 01(R)-SH, which had results at or above the detection limit but below applicable guidelines for benzene, toluene, ethylbenzene and F1 (C6-C10)
- Polychlorinated Biphenyl (PCB) Aroclor and total PCB concentrations were below the laboratory detection limit for all wells sampled in 2025
- Adsorbable Organic Halogen (AOX) results were below the laboratory detection limit for all select wells tested
- Twelve of the wells completed in the till interval (shallow and intermediate wells) have Total Dissolved Solids (TDS) concentrations above the Alberta Tier II Potable Groundwater Guidelines. For all 12 wells these concentrations are consistent with baseline and/or historical observations, as well as expected TDS concentrations for a till lithology.
- Manganese concentrations exceeding the Alberta Tier II Potable Groundwater Guideline were observed in all monitoring wells except 01(2R)-SS, 03-SH, 03-IN, 05-SH, 12(R)-SS, 13(R)-SS, 16-SH, and 17-SH. Manganese concentrations have been measured since the 1990s and have typically exceeded the guideline in both up-gradient and down-gradient wells; therefore, it is likely naturally occurring. Manganese concentrations above the Alberta Tier II Potable Guideline for Commercial/Industrial Land Use (0.02 milligrams per litre; mg/L) in till are of little concern since this source is not capable of supporting a potable water supply.
- Elevated iron and manganese concentrations may be a result of biological activity. Orange and black residues and/or oxidation was noted on several bladder pumps and tubing during well maintenance in May 2014. Iron reducing bacteria (IRB) tests from 2015 confirmed the presence of anaerobic iron related and enteric bacteria in monitoring wells 01A-SH, 01A-IN, 04-IN, 04-SS, 07-SH, 07-IN, and 16-SH.
- The elevated chloride concentrations in 07-SH may be caused by infiltration of run-off containing road salt from the adjacent parking lot and road. Increasing chloride trends are observed in 07-SH in 2025, although the concentration is less than last year's result and is below the guideline in 2025 (205 mg/L). Monitoring well 07-SH is located in a low-lying area adjacent to a road. 01A-SH had elevated chloride concentrations and was decommissioned in January 2025. It's replacement 01(R)-SH had a chloride concentration an order of magnitude below the guideline in 2025. Monitoring well 17-SH had an increase in chloride concentration in 2015 compared to historical results, but the level is well below the guideline and has been falling in the following years. Monitoring wells 05-SH and 08-SH have increasing trends but both are an order of magnitude below the guideline.
- In connection to the 2022 Annual Groundwater Monitoring Report (AECOM, 2023a), a groundwater monitoring well network condition report and sandstone groundwater monitoring well replacement plan was developed by AECOM (AECOM, 2023b), which summarized well network maintenance recommendations based on 2022 field observations and outlines the sandstone wells needing replacement with locations and rationales provided. Veolia and AECOM carried out this program in 2025 by abandoning dry or damaged wells and installing new monitoring wells. Further details can be found in the *2025 Groundwater Monitoring Well Network - Well Replacement Program* report (AECOM, 2025). A summary of the activities are:

  - In January and February 2025, wells 01A-SH and 01A-SS were decommissioned and replaced with 01(R)-SH and 01(2R)-SS. Wells 14-SH, 14-IN and 14-SS (and associated piezometers) were decommissioned and replaced with 14(R)-SH, 14(R)-IN and 14(R)-SS (and associated new piezometers). Well 12-SS was decommissioned and replaced with 12(R)-SS. These wells were included in the 2025 sampling program.
  - In November 2025, the following wells were decommissioned: 07-SS (no replacement drilled), 08-SH, 08-IN and 08-SS plus associated piezometers (replaced with 08(R)-SH and 08(R)-IN) and associated new piezometers), 13-SH (replaced with 13(R)-SH), 15-SS and 15(R)-SS (current sampling well is 15(2R)-SS). These new wells will be included in the 2026 sampling program.
  - In December 2025, a survey of the wells and piezometers on site was conducted by AECOM personnel. Due to technical issues, the following wells and piezometers were unable to be surveyed: 13 series (except for 13-SH), 15-SH, 15-IN, 15-IN_Pz, 16 series and 17 series.
- Monitoring well 01A-IN:
  - The TDS and major ion groundwater chemistry of 01A-IN appears to be affected by rain and surface water infiltration
  - High Dissolved Organic Carbon (DOC) concentrations may be a result of the composition of the engineered fill, as well as activity at the ERT Fire Training Pad. The high DOC probably results in anaerobic conditions in the monitoring well. It is noted that no Aroclor PCBs or petroleum hydrocarbons were detected in this well, thus the elevated DOC concentrations are from other compounds.

The following recommendations are made based on the above conclusions and observations made during the fieldwork:

- If dry piezometers are encountered, the water level in the corresponding well should be measured with clean equipment to verify if the well is dry or if the piezometer is compromised
- Review of road salt use at and around the Site and implement alternative measures to address chloride increases at selected locations. Sample surface water in the road ditches upgradient of the Site to investigate the source of the chloride concentration increase in well 07-SH.
- Alberta Environment and Protected Areas have recommended that dioxins and furans should be sampled for in select shallow wells for three years (2022, 2023 and 2024) as part of the annual monitoring program. As three years of data have been collected and the results are two to three orders of magnitude below the applicable guideline, the monitoring frequency is adjusted to once every five years. The next dioxin and furan sampling event will occur in 2029.
- Conduct groundwater monitoring in the fall of 2026 with the sampling event performed a minimum of one week after the purging event to allow monitoring wells to sufficiently recover.

Table of Contents

1. Introduction 1
1.1 Background Information 1
1.2 Facility Description 1
2. Site Characterization 2
2.1 Regional Setting 2
2.1.1 Topography and Climate 2
2.1.2 Regional Geology 2
2.1.3 Regional Hydrogeology 2
2.1.3.1 Regional Surface and Groundwater Use 3
2.2 Local Setting 3
2.2.1 Local Geology 3
2.2.2 Local Hydrogeology 4
2.3 Surface Water Drainage 5
3. Groundwater Monitoring Field Program 6
3.1 Monitoring and Sampling Methodologies 6
3.1.1 Groundwater Level Measurements 6
3.1.2 Purging and Sampling 7
3.1.2.1 Equipment 7
3.1.2.2 Well Maintenance 7
3.1.2.3 Purging 7
3.1.2.4 Sampling 7
3.2 Summary of Changes 7
3.3 Quality Assurance and Quality Control 7
3.4 Regulatory Guidelines 8
3.5 Statistics 9
3.5.1 Rosner's/Dixon Outlier Test 9
3.5.2 Sen's Slope/Mann-Kendall Trend Analysis 9
4. Groundwater Monitoring Results and Interpretation 11
4.1 Groundwater Level Measurements 11
4.1.1 Groundwater Flow 11
4.1.2 Hydrographs 12
4.2 Field Parameters 12
4.3 Analytical Results 13
4.3.1 Quality Assurance and Quality Control (QA/QC) 13
4.3.2 Statistics 14
4.3.3 Piper Plot 14
4.3.4 Specific Parameter Results 15
4.3.4.1 pH 15
4.3.4.2 Total Dissolved Solids (TDS) 15
4.3.4.3 Dissolved Iron 15
4.3.4.4 Dissolved Manganese 16
4.3.4.5 Dissolved Metals 16
4.3.4.6 Petroleum Hydrocarbons (BTEX, PHC F1) 16
4.3.4.7 Polychlorinated Biphenyls Aroclors 17
4.3.4.8 Adsorbable Organic Halogen 17
4.3.5 Other Significant Trends 17

4.3.5.1 Chloride 17
4.3.5.2 Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC) 17
4.4 Interpretation 17
4.4.1 01(R)-SH, 01A-SH and 01A-IN 17
4.4.2 Dissolved Iron 19
5. Conclusions 20
6. Recommendations 21
7. References 22

Tables

Table A: Groundwater Report Record Breakdown 3
Table B: Hydraulic Conductivities 4
Table C: Groundwater Level Measurement 6
Table D: Sen's Slope/Mann-Kendall Trends Affected by Identified Outliers 14
Table E: Dissolved Iron Results Above the Alberta Tier II Potable Groundwater Guideline 16

Appendices

Appendix A. Figures
Appendix B. Water Well Drilling Report
Appendix C. Borehole Logs
Appendix D. Tables
Appendix E. Photographic Log
Appendix F. Laboratory Test Results
Appendix G. Statistical Output
App G1 Outlier Test Output – Shallow
App G2 Outlier Test Output – Intermediate
App G3 Outlier Test Output - Sandstone
App G4 Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Shallow
App G5 Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Intermediate
App G6 Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Sandstone
App G7 Sen's Slope/Mann-Kendall Trend Analysis Output – Outliers Removed - Shallow
App G8 Sen's Slope/Mann-Kendall Trend Analysis Output – Outliers Removed - Sandstone

1. Introduction

1.1 Background Information

AECOM Canada ULC (AECOM) was retained to conduct the annual groundwater monitoring event in 2025 at the Swan Hills Treatment Centre (the Site). The Site is operated by Veolia North America, LLC. ("Veolia") under Alberta Environment and Protected Areas (EPA) Approval No. 1744-03-00. The approval was issued to SUEZ Canada Waste Services Inc. (now owned and operated by Veolia) on December 15, 2019 and expires December 14, 2029. The groundwater monitoring report is completed on an annual basis and submitted to EPA.

Baseline data was collected by Stanley Associates Engineering Ltd. between 1985 and September 11, 1987 (the opening date of the facility; Worley Parsons, 2012). Groundwater has been sampled and analyzed in September on an annual basis since then (1989 to 1991 – Stanley Associates Engineering Ltd., 1992 – Integrated Environments Ltd., 1993-2005 – Komex, 2005 to 2012 – Worley Parsons, and 2013 to 2024 – AECOM). This report presents a summary of the groundwater monitoring activities that were completed at the Site in 2025.

1.2 Facility Description

The Site is located northeast of Swan Hills, Alberta (the Town); approximately 9 kilometres (km) north on Highway 33 and 8 km east on Chrystina Lake Road. It is in the west half of Section 06, Township 67, Range 8, West of the 5th Meridian. Water bodies near the Site include Chrystina Lake; approximately 1.5 km to the northwest. The location of the site is illustrated on **Figure 1.0** (**Appendix A**).

The Site's Operating Agreement with Alberta Infrastructure allows for a total of 1,500 tonnes of commercial waste (300 tonnes of high-level Polychlorinated Biphenyl (PCB) waste from facilities across Canada, and 1,200 tonnes of Alberta Biomedical and Pharmaceutical waste) to be processed each fiscal year (April – March). Waste streams that have no alternate option for disposal or waste from special projects must be approved by Alberta Infrastructure through a change order. The Site destroys hazardous waste in several ways. Treatment process includes high temperature incineration; physical/chemical treatment (for the treatment of inorganic liquids such as acids and bases) and stabilization/solidification (for the stabilization of treatment residues before placement in the Site's engineered landfill).

2. Site Characterization

2.1 Regional Setting

The regional setting of the area was determined using the following information sources:

- The Ecological Framework of Canada (1999): ecozones.ca (accessed on December 19, 2013)
- Tokarsky, O. (1977): Hydrogeology of the Whitecourt area, Alberta, Alberta Research Council, Report 76-3
- Carlson, V.A. and Green, R. (1977): Bedrock Topography of the Whitecourt Area, NTS 83J, Alberta, Alberta Research Council, scale 1:250,000
- Prior, G.J., et al. (2013): Bedrock Geology of Alberta, Alberta Geological Survey Map 600, ISBN 978-1-4601-0096-7
- St-Onge, D.A. (1975): Surficial Geology Whitecourt, Alberta, Map 1367A, Geological Survey of Canada.

This information was used to define the climate, topography, regional and local geology and hydrogeology in the region of interest.

2.1.1 Topography and Climate

The Site is near the Town of Swan Hills in northern Alberta. The surface topography in the region ranges from 915 to 1220 metres above sea level (mASL). The elevation generally decreases to the east and southeast. The elevation at the Site is approximately 1,080 mASL. The regional topography is illustrated on **Figure 2.0** (**Appendix A**).

The physiographic region near the Site is the Western Alberta Upland region of the Boreal Plains ecozone. The vegetation consists of mixed forests of coniferous (lodgepole pine, white spruce, and fir) and deciduous (aspen, poplar, and birch) trees. The mean annual temperature is approximately 1.5 degrees Celsius (°C).

The region's mean annual precipitation is approximately 450 to 600 millimetres (mm).

2.1.2 Regional Geology

Till, colluvium, and fluvial deposits are the predominant surficial deposits in the area. The till is categorized as hummocky moraine deposits and is typically less than 15 metres (m) thick, and up to 30 m where preglacial buried valleys exist (Tokarsky, 1977). Fluvial deposits exist adjacent to the rivers in the area, such as the Coutts River east of the Site. No existing buried channels were identified within a 5-km radius of the Site, as shown in **Figure 3.0** (**Appendix A**), according to data obtained from Alberta Geological Survey (AGS, 2005).

Bedrock underlies the surficial till deposits. The bedrock stratigraphy consists of the Tertiary-aged Paskapoo Formation, the Tertiary-Cretaceous-aged Scollard Formation, and the Cretaceous-aged Battle River/Whitemud Formation. The Paskapoo Formation consists of continental interbedded mudstones and sandstones. The Scollard Formation consists of continental interbedded fine-grained sandstones and mudstone. The Battle River and Whitemud Formations consist of continental mudstone, shale, and coal.

2.1.3 Regional Hydrogeology

Shallow aquifers may exist in till, in sand and gravel deposits in preglacial valleys, and in fluvial deposits. There are no preglacial valleys or extensive fluvial deposits proximal to the Site. Tokarsky (1977) assigned probable average yields for the regional geology. Quaternary deposits (primarily till) are mapped to have probable yields of 1 to 5 Imperial gallons per minute (Igpm) or 0.1 to 0.4 litres per second (L/s). Bedrock aquifers occur predominantly in the sandstone intervals. The Paskapoo Formation aquifers are mapped to have probable yields of 1 to 5 Igpm (4.5 to 22.7 L/min) and possible yields of 5 to 25 Igpm (22.7 to 113.7 L/min). The fine-grained sandstones of the Scollard Formations have possible average yields of less than 1 Igpm (4.5 L/min). The Battle River/Whitemud Formation aquifers are mapped to have possible average yields of 1 to 5 Igpm (4.5 to 22.7 L/min). This information indicates that the best aquifers are likely to occur in the sandstones of the Paskapoo Formation. Tokarsky (1977) also indicates that Paskapoo Formation sandstones may be lenticular and will, therefore, have a limited lateral extent.

2.1.3.1 Regional Surface and Groundwater Use

Surface water bodies near the Site are Chrystina Lake, approximately 1.5 km northeast of the Site, and the Coutts River, approximately 0.4 km to the north and 1.6 km to the east of the Site.

Water Well Drilling Reports within an approximate 5 km radius of the Site were searched using EPA's Groundwater Information Centre (GIC) database. The summary report is displayed in **Appendix B** and the relative locations provided by the GIC are illustrated on **Figure 4.0** (**Appendix A**).

For the area of interest, a total of 29 records were obtained from the search. **Table A** is a summary of these wells:

Table A: Groundwater Report Record Breakdown

Type of Well	Number of Records
Industrial Water Well	12
Observation Well/Test Holes/Investigation	8
Unknown	1
Pump Test	4
Decommissioned	8

A review of the water well records show no domestic water users within 5 km of the Site. There are three main well owners: Alberta Special Waste Management, Alberta Environment, and C.E. Moell & Associates. These wells were either installed as part of the original site investigation (C.E. Moell & Associates) or as potential supply wells for the plant (Alberta Special Waste Management).

Seven of the eighteen industrial well records are abandoned test holes. A pump test was conducted on four of the industrial wells (Alberta Environment Water Well ID: 354695, 354696, 354697, and 2097625). All four pump tests are conducted on a sandstone unit with depths ranging between 55.17 metres below ground surface (mBGS) and 75.90 mBGS (Paskapoo Formation) and resulting recommended pump rates are 227.30 litres per minute (L/min) (Well ID 354695), 27.28 L/min (Well ID 354696), and 54.55 L/min (Well ID 354697) and 68.19 L/min (Well ID 2097625).The Swan Hills Treatment Centre, at the time of the 2025 sampling event was using two water supply wells. 89-3 is located on the east side of the Site with a production interval of 56.7 m to 66.1 m. 22-1 is located on the east side of Site (approximately 20 m east of 89-3) with a production interval of 61.3 m to 74.9 m. **Figure 5.0, Appendix A**).

None of the above water wells were field verified to determine their current existence and use.

2.2 Local Setting

2.2.1 Local Geology

Lithology records from the Water Well Drilling Reports (**Section 2.1.3.1**), and replacement wells drilled in 2014 and 2025 were used to confirm the local stratigraphy. The stratigraphy at the Site typically consists of 10 m to 15 m of till overlying the Paskapoo Formation. The stratigraphy of the Paskapoo Formation proximal to the Site consists of: interbedded shale, mudstone, and sandstone (thin beds) between 15 mBGS and 50 mBGS; sandstone between 50 mBGS and 70 mBGS; and shale or siltstone at 70 mBGS on the west side of the site(Worley Parsons, 2012, 2013; **Appendix C**) and shale and siltstone from 50 mBGS to 100 mBGS on the south and west side of the site. A geologic cross-section for the vicinity of the Site and borehole locations is provided in **Figures 5.2** and **5.3,** (**Appendix A**). Three replacement shallow piezometers, two replacement intermediate piezometers, one replacement intermediate well, and two replacement sandstone wells were drilled, completed, developed, and recovery tested between May and July of 2014. In January and February 2025, two shallow wells were decommissioned and re-drilled, one intermediate well was decommissioned and re-drilled, and three sandstone wells were decommissioned and re-drilled. The 2014 and 2025 borehole logs are presented in **Appendix C**. The lithology encountered during drilling is consistent with the general lithology description above.

2.2.2 Local Hydrogeology

The till and a sandstone unit within the Paskapoo Formation are monitored at the Site. Two depth intervals are monitored within the till deposit at 14 locations around the Site (**Figure 5.0, Appendix A**): the shallow interval (SH) is between approximately 1 and 5 mBGS; and the intermediate interval (IN) is between approximately 5 and 13 mBGS. The sandstone (SS) is monitored at 10 of the 14 locations at a depth between approximately 56 and 90 mBGS. Till deposits are typically characterized as aquitards; groundwater does not flow at sufficient rates through these deposits to be a useful aquifer. The typical hydraulic conductivity of till ranges between $1x10^{-6}$ metres per second (m/s) and $1x10^{-12}$ m/s (Freeze and Cherry, 1979). The till is deposited on top of approximately 30 m of shale that is part of the Paskapoo Formation. Shale is typically considered an aquiclude with hydraulic conductivities ranging between $1x10^{-9}$ m/s to $1x10^{-13}$ m/s (Freeze and Cherry, 1979). Sandstone units within the Paskapoo Formation are potential aquifers. The typical hydraulic conductivity of sandstone ranges between $1x10^{-6}$ m/s and $1x10^{-10}$ m/s (Freeze and Cherry, 1979).

Pump test data from three of the water wells in the reconnaissance reports from AEP's GIC database (354695, 354696, and 354697) was analyzed in 2013 using Waterloo Hydrogeologic's Aquifer Test Pro Version 2010.1 to determine the hydraulic conductivity (AECOM, 2014). All three wells (**Appendix B**) are located in the northeast quarter of 06-67-08-W5 (the same section as the Site; **Figure 4.0, Appendix A**).

Recovery tests were conducted on the 2014 replacement wells after the development of each well. The resulting hydraulic conductivities from the GIC wells and the wells drilled in 2014 are reported in **Table B**.

Table B: Hydraulic Conductivities

Well	Lithology	Hydraulic Conductivity – Geometric Mean (m/s)
05-SH	Till (Shallow)	7.6×10^{-7}
06-SH	Till (Shallow)	9.6×10^{-8}
13-SH	Till (Shallow)	1.1×10^{-8}
06(R)IN	Till (Intermediate)	2.2×10^{-7}
11-IN	Till (Intermediate)	4.0×10^{-9}
13-IN	Till (Intermediate)	2.6×10^{-9}
07(R)SS	Sandstone	8.6×10^{-6}
15(2R)SS	Sandstone	1.7×10^{-6}
89-3	Sandstone	2.2×10^{-5}
354695	Sandstone	1.83×10^{-4}
354696	Sandstone	Proximal to the well: 1.98×10^{-6} Influence of a recharge source: 1.23×10^{-5}
354697	Sandstone	Proximal to the well: 8.19×10^{-6} Influence of a recharge source: 4.68×10^{-5}

Monitoring well 06(R)IN was drilled to and completed at a shallower depth (6 mBGS) than 11-IN and 13-IN (~9 mBGS) and has a hydraulic conductivity similar to the shallow wells that are drilled to and completed at approximately 3 mBGS. The hydraulic conductivities from the recovery tests in the shallow and intermediate wells are typical of till. The hydraulic conductivities from 07(R)SS and 15(2R)SS have conductivities typical of sandstone. Well 89-3 is a production water well and shows a higher hydraulic conductivity that may be a result of the well being pumped and developed over a long period of time. These values are consistent with 354696 and 354697, but lower than 354695 which intersected a thicker sandstone interval.

The geometric mean of the hydraulic conductivities for each of the units are as follows:

- Shallow till – 9.3 x 10^{-8} m/s
- Intermediate till – 1.3 x 10^{-8} m/s
- Sandstone – 3.2 x 10^{-5} m/s

2.3 Surface Water Drainage

The storm water management system at the Site is designed to collect and retain any surface water that falls on the site during precipitation events. The system is separated from the process water management system to prevent any contamination of clean surface runoff. Careful management of this separation increases the options available for treatment or re-use within the Swan Hills Treatment Centre. A figure detailing the surface water drainage patterns on the site can be found on **Figure 6.0** (**Appendix A**).

There are three drainage zones on plant site:

- The north zone, which extends from the front gate to the south side of the Cold Storage Building #1, drains into the North Retention Pond. Also draining into the North Retention Pond is the treated discharge from the Rotating Biological Contactor (Domestic Wastewater).
- The south zone, which extends from the south side of the Stabilization plant to the Process Make-up Pond and South Retention Pond #1, drains to the Process Make-up Pond/South Retention Pond #1.
- A second south zone collects run off from the unpaved, southern portion of the plant site that extends from the Process Make-up Pond to the south fence line and directs it into South Retention Pond #2.

The North Retention Pond is connected to South Retention Pond #1 via overland piping system. South Retention Pond #1 can be transferred to the Process Make-up Pond or to South Retention Pond #2 when necessary. Precipitation, therefore, is managed on site and re-circulated as process water as required. The North Retention Pond, South Retention Pond #1 and Process Make-up Pond are all lined with high-density polyethylene liners. South Retention Pond #2 has a compacted clay liner.

In addition to the above-mentioned drainage areas, there is a South Drainage Area located east of South Retention Pond #2 and the South Borrow Pit and 2023 Borrow Pit located south of South Retention Pond #2, all three are unlined.

3. Groundwater Monitoring Field Program

There are 14 active monitoring locations (01A, 03 through 08, and 11 through 17; **Figure 5.0, Appendix A**), and four decommissioned locations (01, 02, 09, and 10; **Figure 5.1, Appendix A**). The decommissioning details are reported in the Komex 1997 report (Worley Parsons, 2012). At 9 of the 14 locations, all three intervals, shallow, intermediate, and sandstone, are monitored (01(R), 04, 05, 07, 11, 12, 13, 14, and 15); the shallow and intermediate intervals are monitored at the five remaining locations (03, 06, 08, 16, and 17). All wells have stainless steel screens and steel casing (Worley Parsons, 2012, 2013).

3.1 Monitoring and Sampling Methodologies

3.1.1 Groundwater Level Measurements

Piezometers were installed for the shallow and intermediate intervals at all monitoring locations to facilitate water level measurements and prevent cross contamination in the wells. **Table C** summarizes the 2025 groundwater level monitoring activities, as well as the lithology that the wells were completed in. Static water levels were measured prior to purging activities at each monitoring location using a Solinst water level meter. The water level meter was decontaminated using distilled deionized water between measurements. Well and piezometer stick-ups were also measured and recorded. Total depths were measured in May 2014 during the groundwater monitoring well maintenance program.

Table C: Groundwater Level Measurement

Monitoring Location	Measured in Piezometer	Measured in Well	Lithology
01(R), 01A, 01(2R)	SH, IN	SS	SH/IN: Till SS: Shale
03	SH, IN	-	SH/IN: Till
04	SH	IN[1], SS	SH/IN: Till SS: Sandstone
05	SH	IN[1], SS	SH/IN: Till SS: Sandstone
06	SH, IN	-	SH/IN: Till
07	-	SH[1], IN[1], SS	SH/IN: Till SS: Sandstone
08	-	SH[2], IN[1], SS	SH/IN: Till SS: Sandstone
11	IN	SH[1], SS	SH/IN: Till SS: Sandstone
12	SH, IN	SS	SH/IN: Till SS: Shale
13	SH, IN	SS	SH/IN: Till SS: Sandstone
14(R)	SH, IN[3]	SS	SH/IN: Till SS: Shale
15	IN	SH[2], SS	SH/IN: Till SS: Sandstone
16	SH, IN	-	SH/IN: Till
17	SH, IN	-	SH/IN: Till

[1] Piezometer compromised or blocked
[2] Piezometer dry/damaged
[3] Data collection error – no water level information available for 14-IN

3.1.2 Purging and Sampling

3.1.2.1 Equipment

Each well is equipped with a dedicated bladder pump (stainless steel body and Teflon bladder), two lines of tubing that extend from the pump to the surface (a gas line to drive the bladder pump and a Teflon-lined sample delivery line), and stainless-steel security cable. The tubing is affixed to the bottom of a well cap; the cap is equipped with a quick coupler for the gas line (M-Style ¼ inch male quick connector) and a push connector for 3/8 inch Teflon-lined sample tubing (adaptors enable the use of ¼ inch tubing). The cap also contains an access opening for water level measurements.

Compressed nitrogen gas is used to inflate and deflate the bladder pump. Generally, the gas does not meet the sample water; however, contact may occur due to deterioration of the pump and tubing assemblage. Nitrogen is used because it is an inert gas and minimizes the impact to the sample if leaks occur in the system (Worley Parsons, 2012, 2013). A Solinst Electronic Control Unit – Model 464 (capable of driving up to 250 pounds per square inch; psi) was used to drive the bladder pumps during purging and sampling.

3.1.2.2 Well Maintenance

In 2025, maintenance was performed on the following well: 11-SS. The bladder pump was suspected to be situated above the water level in the well and was lowered further down the well. It is noted that a sample was able to be collected in 2025 from 11-SS.

3.1.2.3 Purging

Well purging took place from September 2 to 4, 2025. Shallow, intermediate and sandstone wells were purged until dry or three well volumes were collected. Purged water was collected in a 20 litre (L) bucket to measure volume then poured on the ground adjacent to the monitoring location. Purging operations are summarized in **Table 1.0** (**Appendix D**).

3.1.2.4 Sampling

Well sampling was conducted from September 17 and 18, 2025. Samples were collected from all wells that were purged except for 14(R)-SH and 16-IN (31 wells). While 14(R)-SH and 16-IN were purged and water levels taken during the purging event, a sample was unable to be obtained during the sampling event. 14(R)-SH was noted as a potential pump issue, while water levels did not recover sufficiently in 16-IN. The sampling program is outlined in **Table 2.0** (**Appendix D**). Samples were collected from the dedicated sampling spouts on each well and were filtered and preserved according to laboratory specifications. Field parameters (temperature, pH, and electrical conductivity) were measured at each location at the time of sampling using a YSI Pro DSS Meter. The probes on the meter were decontaminated with distilled deionized water after each measurement. The samples were placed in coolers with ice and delivered to ALS Environmental Laboratory (ALS) in Edmonton, Alberta with a completed chain of custody form on September 19, 2025.

3.2 Summary of Changes

There was one change in the 2025 monitoring program compared to the 2024 monitoring program: dioxins and furans were not tested at select shallow wells. With the monitoring frequency for these parameters reduced to once every five years, the next sampling event for dioxins and furans will occur in 2029.

3.3 Quality Assurance and Quality Control

Quality Assurance and Quality Control (QA/QC) are procedures that are implemented to identify and prevent errors in the groundwater chemistry data. QA/QC procedures are executed by the person collecting samples, the laboratory that analyzes the samples, and the person interpreting and analyzing the results.

Three types of errors are associated with groundwater sampling and analysis: false positive errors, false negative errors, and undetermined errors. False positive errors include leaching from well materials, contaminated sample containers or laboratory derived contamination. False negative errors include volatile losses during sample collection and chemical reactions that occur in the sample between collection and analysis. Undetermined errors include transcription and extraction errors.

In the field, equipment is cleaned between wells with deionized water and a new pair of nitrile gloves are worn for sampling at each well. Sample QA/QC included:

- Duplicate samples, a minimum of one per 10 samples
- Field blank – one per day
- Trip blank
- Spiked samples (polychlorinated biphenyls; PCBs)

Field blanks consist of deionized water that is provided by the laboratory and is poured into sample bottles under field conditions. The purpose of these blanks is to test for field contamination sources, as well as laboratory derived contamination. Trip blanks consist of sample bottles filled with deionized water in the laboratory. These bottles remain sealed and are stored with the other samples. Trip blanks test for cross contamination during storage and transport, in particular cross contamination caused by the vaporization of volatiles. Spiked samples are prepared in a laboratory and contain a known concentration of a single parameter. Spiked samples can be used as an indicator of the accuracy of the analytical results.

Duplicates submitted to the laboratory for the 2025 groundwater monitoring event included: 25-SH (duplicate of 05-SH), 27-SH (duplicate of 07-SH), and 31-SH (duplicate of 11-SH) for all analytes, 25-SS (duplicate of 05-SS) for all analytes except hydrocarbons; and 32-SH (duplicate of 12-SH) for AOX. If the data is over five times the laboratory reporting limit (LRL), the Relative Percent Difference (RPD) is calculated and compared to the alert criteria obtained from the *Guidance Manual For Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment – Volume 1 Analytical Methods* (CCME, 2016).

The Relative Percent Difference (RPD) is a measure of the variability between two duplicate analyses and is calculated using the following equation:

$$RPD = \left(\frac{sample\ result - duplicate\ result}{mean\ of\ sample\ and\ duplicate\ results}\right) x100$$

If one or both of the results are less than five times the LRL, the difference between the parent sample and duplicate sample result is calculated, and that result is compared to two times the LRL. The LRL is two times the detection limit of each parameter. The duplicate field results are considered acceptable if the RPD is less than the alert criteria. Hardness and TDS are not included in RPD calculations as they are calculated values. RPDs were not calculated for petroleum hydrocarbon (PHC) and PCB results as none of the sample and duplicate results were above the detection limits.

The two field blanks and a trip blank submitted to the laboratory for this sampling event were labelled “10-SH”, “20-SH” and “Trip Blank”, respectively.

Two spiked samples were prepared by ALS, labelled 51-SH and 52-SH.

The laboratory QA/QC data is located with the Certificate of Analysis in **Appendix F**. A review of the laboratory QA/QC data was conducted, and the laboratory analytical results are considered accurate and reliable.

3.4 Regulatory Guidelines

The results of the 2025 groundwater monitoring were compared to the Alberta Environment Tier 2 Groundwater Remediation Guidelines for Commercial/Industrial Land Use (June 2024). These are a set of groundwater quality guidelines derived specifically for the protection of ecological receptors and for human health. They set specific criteria according to land and water uses and are derived using toxicological data. The groundwater samples from each well were compared to the potable or aquatic life pathway. The aquatic life (fine-grained for the shallow and intermediate wells that are completed in the till and coarse-grained for sandstone wells) guideline was used where a monitoring well is within 300 m of a water body; this criterion applies only to 08 well series location which has a creek approximately 280 m to the north. The remaining wells were compared to the potable water pathway because the

sandstone interval is a possible domestic use aquifer and the hydraulic conductivity of the shale between the till and the sandstone has not been used to eliminate this pathway. For instances where an aquatic life guideline did not exist or was higher than the potable water guideline, the potable water guideline was used.

The Canadian Drinking Water Aesthetic Objective (AO) and Maximum Acceptable Concentration (MAC) Guidelines (September 2022) are also shown on all analytical results tables in **Appendix D** for reference.

3.5 Statistics

Statistical analysis of the historical data for each well sampled in 2025 was conducted to identify statistically significant increasing and decreasing trends in parameter concentrations. The program used to complete the analysis was ProUCL Version 5.2 from the United States Environmental Protection Agency (USEPA, 2022). A minimum of four data points is needed to conduct statistical analysis on parameters. Statistical analysis was performed on data sets containing 50% or greater data above the detection limit.

Parameters included in the statistical analysis are:

- Major ions:
  - Bicarbonate (HCO_3), calcium (Ca), magnesium (Mg), and sodium (Na)
- Indicators:
  - pH (Lab), chloride (Cl), sulphate (SO_4), total dissolved solids (TDS), total organic carbon (TOC) and dissolved organic carbon (DOC)
- Dissolved metals:
  - Arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), mercury (Hg), nickel (Ni), and zinc (Zn)

3.5.1 Rosner's/Dixon Outlier Test

A Rosner's or Dixon Outlier test was applied to all current and historical data to identify data points that do not appear to fit the distribution of the rest of the data set within a 95% significance level (i.e. there is only a 1 in 20 chance that the interpretation is wrong). Dixon's Outlier Test is performed on data sets with less than or equal to 25 data points. Rosner's Outlier test is performed on data sets with greater than 25 data points. Identified outliers are then checked for data transcription errors or any other irregularities.

An outlier is considered a data point that is outside of the characteristic distribution of the data set; an outlier test determines if the data point is statistically different from the distribution of the data set (Sanitas Technologies, 2009). An outlier may be a result of an error including cross-contamination, analytical error, or an outlier may be an accurate representation of the sample.

USEPA guidance directs that "statistical outliers should not be removed or altered unless independent evidence of an error exists" (Sanitas Technologies, 2009). Identified outliers were checked for possible transcription errors.

3.5.2 Sen's Slope/Mann-Kendall Trend Analysis

The Sen's Slope/Mann-Kendall trend analysis was performed on data sets with a minimum of four data points and if 50% or more of the data set was above the detection limit. This is a nonparametric test (i.e., normal distribution is not assumed) that estimates the trend (slope) of the results over time (i.e., increasing, decreasing, or not significant). The analysis was completed using a 95% confidence level (i.e., there is a 5% chance that the output trend is incorrect).

Statistical values shown in the output that should be noted include:

- n = the number of data points analyzed.
- Slope = rate of increase or decrease of the parameter per year.

- Mann-Kendal statistic = the magnitude of the increasing or decreasing trend. If the Mann-Kendall statistic is a large positive number, measurements taken later in time tend to be larger than those measurements taken earlier. The opposite is true for a large, negative Mann-Kendall statistic.
- α = the probability of making an estimation error. This is an alternative way to indicate the confidence level (i.e., a 95% confidence level is equivalent to α = 0.05).

This trend analysis was conducted on all complete data sets. Identified outliers in 2025 were examined for any transcription or lab errors and examined within the context of spatially and temporally proximal results. If the 2025 outlier was determined to be a valid data point, it was not removed from the data set. Historical outliers previously examined within the context of spatially and temporally proximal results and identified to affect the overall trend of the data set were removed and trend analysis run again. The resulting trends were compared.

4. Groundwater Monitoring Results and Interpretation

In May 2014 during well maintenance, it was determined that the well labels for 15-SH and 15-IN had been switched at some point in time. The labels were corrected and since 2014 the results reflect the corrected labels, however, because it is unknown when the mislabelling occurred, the historical results have not been changed or altered.

4.1 Groundwater Level Measurements

Static groundwater levels measured during the September 2025 groundwater monitoring are summarized in **Table 3.1** (**Appendix D**) and the historical static groundwater measurements are presented in **Table 4.1** (**Appendix D**).

4.1.1 Groundwater Flow

Groundwater levels were measured in the piezometers or groundwater monitoring well and groundwater elevations were calculated for the shallow and intermediate intervals (glacial till lithology) (**Table 3.1, Appendix D**). Groundwater elevations were calculated using ground and top of casing elevations surveyed in November 2025 for the majority of wells, with some wells using data from a July 2014 survey. Groundwater contour maps were created for the shallow and intermediate intervals (**Figures 7.0** and **8.0**, respectively, **Appendix A**). Groundwater levels in the sandstone aquifer were measured in nine wells (01(2R)-SS, 04-SS, 05-SS, 07(R)SS, 11-SS, 12(R)-SS, 13(R)SS, 14(R)-SS and 15(2R)-SS. All remaining sandstone wells are historically dry (08-SS). The historically dry wells have a completed depth above the current groundwater level and are most likely too shallow to intersect the groundwater level in the sandstone aquifer. A groundwater contour map for the sandstone wells was created (**Figure 9.0** in **Appendix A**).

The horizontal groundwater flow in the shallow and intermediate intervals is generally to the east (consistent with the 2011 to 2024 groundwater flow). The groundwater flow direction in the sandstone interval is generally to the southwest in the northern portion of site and to the south in the southern portion of site.

The horizontal gradient is calculated for the shallow and intermediate till intervals from the groundwater elevations recorded in the corresponding piezometers at locations 08 and 07 as they are positioned approximately parallel to the groundwater flow direction. These gradients are 0.016 metres per metre (m/m) for the shallow wells and 0.018 m/m for the intermediate wells. The horizontal gradient in the sandstone interval is calculated between the groundwater elevations recorded in the corresponding wells at the locations 04 and 12(R)-SS with a gradient of 0.14 m/m.

The average linear groundwater velocity can be calculated from the following equation;

$$V = \frac{Kdh}{ndl}$$

Where
V = average linear velocity in m/s
K = hydraulic conductivity in m/s
dh = head difference between two monitoring wells in the same aquifer
dl = distance between the two monitoring wells
n = effective porosity

For the shallow and intermediate till, the effective porosity will be assumed to be 34%[1]. For the sandstone, the effective porosity will be assumed to be 37%[2]. On the basis of the hydraulic conductivities (Section 2.2.2), horizontal gradients and assumed effective porosities, the average linear groundwater velocities for the units are:

- Shallow till – 0.14 m/yr
- Intermediate till – 0.021 m/yr
- Sandstone –381 m/yr

[1] Silty till from Hazel, C.R. 1973.
[2] Medium sandstone from Hazel, C.R. 1973.

4.1.2 Hydrographs

Hydrographs showing the groundwater elevation through time in all wells (including decommissioned wells) are shown on **Figures 10.1** to **10.17** (**Appendix A**). The shallow and intermediate hydrographs show that the groundwater elevation in these intervals is variable; this is expected in shallow aquifers that are affected by the water table and seasonal precipitation. Exceptions to this include 04-IN and 14-IN. 04-IN usually has water punctuated by sporadic dry years in 2003, 2004, 2006, and 2013 (**Figure 10.4, Appendix A**). The piezometer at this location was observed to be dry in 2014; however, the well was not dry, indicating that poor wellbore integrity may be the cause of some of the dry observations. Well 14-IN has been consistently dry since 1993 (with the exception of 2007), while the shallow interval (14-SH) is not dry thus indicating the possibility of a perched water table or poor wellbore integrity (**Figure 10.14, Appendix A)**.

The sandstone hydrographs show that 01A-SS, 12-SS, and 14-SS are historically dry (**Figure 10.1, 10.12, and 10.14, Appendix A**), and 08-SS and 11-SS are often dry (**Figures 10.8 and 10.11, Appendix A**). 01A-SS, 12-SS and 14-SS were decommissioned and replaced with 01(2R)-SS, 12(R)-SS and 14(R)-SS respectively – all of which had water in 2025. The hydrographs for the rest of the sandstone wells (04-SS, 05-SS, 07(R)SS, 13(R)SS, and 15(2R)SS) show that the water levels are relatively stable, punctuated by periodic dry years (**Figures 10.4, 10.5, 10.7, 10.13, and 10.15, Appendix A**). Dry measurements may occur when the water level drops below the top of the pump. Low water levels may be a result of a completion that is too shallow, borehole and completion integrity, drawdown caused by groundwater withdrawal from water production wells in the area (e.g., 89-3), drought at the recharge location, or any combination of these factors.

4.2 Field Parameters

Field parameters, including pH, electrical conductivity (EC), and temperature, were measured during groundwater sampling on September 17 and 18, 2025. The historical field parameter measurements are reported in **Table 4.2** (**Appendix D**); the 2025 field parameter measurements are reported in **Table 3.2** (**Appendix D**) and are summarized below:

Shallow Wells

- Field pH ranged from 6.12 (01(R)-SH) to 7.56 (08-SH) with a geometric mean of 6.87
- The temperature ranged from 8.20°C (04-SH) to 13.80°C (13-SH) with a geometric mean of 10.11°C
- EC ranged from 101 µS /cm (13-SH) to 1,466 µS/cm (07-SH) with a geometric mean of 714 µS/cm

Intermediate Wells

- Field pH ranged from 6.50 (01A-IN) to 7.49 (08-IN) with a geometric mean of 7.00
- The temperature ranged from 7.30°C (05-IN and 08-IN) to 10.50°C (13-IN) with a geometric mean of 8.38°C
- EC ranged from 556 µS /cm (13-IN) to 1,129 µS /cm (05-IN) with a geometric mean of 779 µS /cm

Sandstone Wells

- Field pH ranged from 6.68 (11-SS) to 8.45 (14(R)SS) with a geometric mean of 7.34
- The temperature ranged from 8.40°C (01(2R)SS) to 20.40°C (89-3) with a geometric mean of 10.26°C. The high temperature from 89-3 was not used in the calculation of the geometric mean.
- EC ranged from 349 µS/cm (89-3) to 879 µS/cm (12(R)SS) with a geometric mean of 585 µS/cm.

Note that 89-3 was sampled from a tap in the pumphouse, hence, the temperature measured is not a true indication of the temperature of the water in the aquifer.

4.3 Analytical Results

Laboratory analytical reports are presented in **Appendix F**.

The 2025 analytical laboratory results are reported with applicable assessment guidelines and QA/QC results in the following tables located in **Appendix D**:

Table 3.3 Routine Water Analysis (Indicators, Major Ions, etc.)
Table 3.4 Dissolved Metals
Table 3.5 Organics and Petroleum Hydrocarbons
Table 3.6 Polychlorinated Biphenyls Aroclors
Table 3.7 Adsorbable Organic Halogen
Table 3.8 QA/QC Results

Historical analytical results (1985 to 2025) are reported in the following tables located in **Appendix D**:

Table 4.3 Routine Water Analysis
Table 4.4 Dissolved Metals
Table 4.5 Organics and Petroleum Hydrocarbons
Table 4.6 Polychlorinated Biphenyls Aroclors

Baseline data collected at the original monitoring wells between 1985 and September 1987 are reported in the following tables located in **Appendix D**:

Table 5.1 Routine Water Analysis
Table 5.2 Dissolved Metals
Table 5.3 Organics

Time series graphs of indicators (TDS, chloride, sulphate, and TOC/DOC) and major ions (calcium, magnesium, sodium, and bicarbonate) for all wells sampled in 2025 are presented on **Figures 12.1 to 12.33** and **Figures 13.1 to 13.33**, respectively (**Appendix A**).

Figures 11.1 to 11.3 (**Appendix A**) and **Table 6.0** (**Appendix D**) summarize the individual parameters that exceeded the Alberta Tier 2 Guidelines at each monitoring well in 2025. **Figures 14.1 and 14.2** (**Appendix A**) present the time series data for the monitoring wells with a pH or iron result historically above the Alberta Tier 2 Potable Guidelines.

Analytical results that exceeded guidelines are highlighted in the analytical tables in **Appendix D** and are summarized in **Section 4.3.4**.

4.3.1 Quality Assurance and Quality Control (QA/QC)

Calculated RPD values were within the applicable alert criteria for all samples where calculated. The absolute differences did not exceed 2x the LRL for all samples where calculated. The QA/QC results are presented on **Table 3.8** in **Appendix D**.

The field blank is collected to ensure there is no contamination due to the conditions at the time of sampling or resulting from the procedure and equipment used to collect the samples. All parameters are expected to have concentrations below the detection limit (**Tables 3.4** to **3.7 Appendix D**). The analytical results reported for the trip blank taken on September 18, 2025 (labelled “Trip Blank”) are consistent with distilled water concentrations. The field blank results are consistent with distilled water concentrations.

Spiked samples were used as an additional test for laboratory accuracy. Two spiked samples were prepared by ALS (**Appendix F**) and submitted to ALS for PCB analysis. The details of ALS spiked samples and the sample name are as follows:

Two samples were spiked with 0.001 mg/L (+/-0.00003 based on the laboratory QA/QC procedures) of Aroclor 1260 and Aroclor 1254 and labelled 51-SH and 52-SH, respectively.

The spiked aroclors were the only aroclors detected for each sample. The results from ALS were:

- 51-SH – Aroclor 1260: 0.000536 mg/L
- 52-SH – Aroclor 1254: 0.000512 mg/L,

The PCB spiked sample results are within the range of acceptable values based on the prepared concentrations, therefore, PCB concentrations for sampled monitoring wells are considered reliable.

The analytical laboratory's QA/QC report was reviewed, and the laboratory data has been assessed to be reliable. The laboratory's QA/QC report is included with the analytical data in **Appendix F**.

4.3.2 Statistics

Statistical analysis of the historical data for each well sampled in 2025 was conducted to determine data outliers and statistical trends in the data over time. All statistical analysis was performed using ProUCL software. The results of the Rosner's/Dixon Outlier test are summarized in **Table 7.1** (**Appendix D**) and the ProUCL output is located in **Appendix G**. The results of the Sen's Slope/Mann-Kendall trend analysis are summarized in **Table 7.2** (**Appendix D**) and the ProUCL output is in **Appendix G**. **Table D** shows the wells where outliers were removed and the resulting trend analysis outcome:

Table D: Sen's Slope/Mann-Kendall Trends Affected by Identified Outliers

Monitoring Well	Parameter	Trend – All Data	Trend – Outlier(s) Removed
05-SH	Zinc	Decreasing	Decreasing
06-SH	Manganese	Increasing	Increasing
08-SH	Calcium	Increasing	Increasing
15-SH	TDS	Increasing	Increasing
17-SH	Copper	Decreasing	Decreasing
13(R)SS	Bicarbonate	Decreasing	Decreasing

"EPA guidance directs that statistical outliers should not be removed or altered unless independent evidence of an error exists" (Sanitas Technologies, 2009). This practice was continued with outliers identified in ProUCL, therefore, the outliers (**Table 7.1, Appendix D**) were examined within the context of spatially and temporally proximal results. The observations from this examination are reported in **Table 7.3** (**Appendix D**).

4.3.3 Piper Plot

A piper plot indicates similarities in geochemistry between water samples. The plot identifies similarities by grouping major chemical cations and anions onto a common plot. The plots were created using Grapher by Golden Software (Golden Software, 2023).

Separate piper plots were created for the shallow, intermediate, and sandstone intervals (**Figures 15.1, 15.2, and 15.3,** respectively**, Appendix A**). **Figure 15.1** (**Appendix A**) shows that the groundwater from all shallow interval monitoring wells is calcium bicarbonate type. 07-SH has a high chloride concentration (206 mg/L) compared to the other wells. **Figure 15.2** (**Appendix A**) shows that the groundwater from all the intermediate samples is calcium bicarbonate type. All the intermediate interval samples have very little chloride and have a range of sulphate concentrations (<0.30 mg/L in 01A-IN to 118 mg/L in 05-IN). **Figure 15.3** (**Appendix A**) shows that the groundwater

from the eight sandstone wells that were sampled (including 89-3) are calcium bicarbonate type, except for 01(2R)-SS and 12(2)-SS, which show a sodium cation and a bicarbonate anion.

4.3.4 Specific Parameter Results

4.3.4.1 pH

All pH results for 2025 were within the guideline apart from 01(R)-SH with a value of 6.12 (lab pH of 6.26), 06-SH with a value of 6.27 and 11-SH with a value of 6.34.

Since 2018, pH results for 01A-SH have been below the Tier 2 Potable Water guideline of 6.5 to 8.5. 01A-SH is now decommissioned, with 01(R)-SH drilled in January 2025 and first sampled in September 2025. The pH time series graph showing pH values for 01-SH (active from 1985 to 1992), 01A-SH (active from 1993 to 2024) and now 01(R)-SH (active 2025) is shown in **Figure 14.1** (**Appendix A**). The pH for 01-SH [Decommissioned] ranges between approximately 7.00 and 8.00 including the baseline data. pH values from 01A-SH [Decommissioned] have been more variable and periodically less than the 6.5 guideline. The Mann-Kendall trend analysis is conducted using laboratory pH data, to be consistent with historical analysis. The Mann-Kendall trend analysis conducted on the combined 01-SH [Decommissioned] and 01A-SH [Decommissioned] and 01(R)-SH data shows a decreasing trend for pH. The Mann-Kendall trend for pH in 01-IN [Decommissioned] and 01A-IN is also decreasing (2025 lab pH is 7.14) while all other monitoring wells have increasing or not significant trends.

4.3.4.2 Total Dissolved Solids (TDS)

The 2025 TDS concentration exceeded the Alberta Tier 2 Potable Guideline (500 mg/L) in:

- Seven shallow monitoring wells (01(R)-SH, 03-SH, 05-SH, 06-SH, 07-SH, 11-SH and 13-SH)
  - Concentrations ranged between 558 mg/L (03-SH) and 1020 mg/L (01(R)-SH)
- Five intermediate monitoring wells (01A-IN, 03-IN, 05-IN, 06(R)IN and 14(R)-IN)
  - Concentrations ranged between 507 mg/L (01A-IN) and 748 mg/L (05-IN)
- Two sandstone monitoring wells (01(2R)-SS and 12(R)-SS)
  - Concentrations ranged between 588 mg/L (01(2R)-SS) and 602 mg/L (12(R)-SS).

The 2025 TDS concentration exceeded the Alberta Tier 2 Aquatic Life Guideline (500 mg/L) in:

- One intermediate well (08-IN)
  - Concentration is 523 mg/L.

The TDS concentrations in the shallow and intermediate wells are typical of groundwater from till deposits. Furthermore, these wells have historical results, apart from well 08-IN, that exceed the TDS guideline (**Table 4.3, Appendix D**) and the TDS guideline is meant for treated potable water. The TDS exceedances in the sandstone wells was only found in two of the newly installed wells, which may indicate disturbance groundwater chemistry by the drilling and installation of a well at these locations.

4.3.4.3 Dissolved Iron

Figure 14.2 (**Appendix A**) and **Table 3.3** (**Appendix D**) presents the monitoring wells with dissolved iron concentrations that exceed the Alberta Tier 2 Potable Guideline (0.3 mg/L) in 2025. The results above the guideline are summarized in **Table E** below:

Table E: Dissolved Iron Results Above the Alberta Tier II Potable Groundwater Guideline

Monitoring Well	Well Location	Dissolved Iron (mg/L)	Mann-Kendall Trend
01(R)-SH	Adjacent to the ERT Fire Training Pad and the Process Make-Up Pond and South Pond	180	Not Significant
01A-IN	Adjacent to the ERT Fire Training Pad and the Process Make-Up Pond and South Pond	4.0	Not Significant
04-SS	Outside fenceline adjacent to Central Receiving Facility and Heated Storage Building	0.93	Not Significant
11-IN	Outside fenceline adjacent to Landfill Cell A1	0.39	Not Significant
89-3	Outside fenceline, east next to entrance road	1.76	Not Significant

The 2025 iron concentrations ranged from below the detection limit to 180 mg/L (01(R)-IN). The 2025 Mann-Kendall Trend analysis (**Appendix G**) identified increasing iron concentration trends in two intermediate wells: 06(R)IN and 12-IN.

During well maintenance performed in May 2014 a reddish-orange film was observed on several bladder pumps and tubing while others showed signs of oxidation (**Photographs 1 and 2, respectively, Appendix E**). This indicated the presence of iron reducing bacteria (IRB) in the wells which could result in elevated iron concentrations in the groundwater samples. Other possible sources may include: natural iron concentrations in the groundwater, oxidation of the stainless-steel casing, or contamination from rusting steel casing protectors. Well 01(R)-SH is a newly drilled well (January 2025) and has the highest iron concentration of all wells exceeding the guideline. The iron concentration in this well should be examined in 2026 to determine if this is an anomaly.

4.3.4.4 Dissolved Manganese

The 2025 dissolved manganese concentration exceeded the Alberta Tier 2 Potable Guideline for Commercial/Industrial Land Use (0.02 mg/L) in all of the monitoring wells except 01(2R)-SS, 03-SH, 03-IN, 05-SH, 12(R)-SS, 13(R)SS, 16-SH and 17-SH. Manganese concentrations have been measured since the 1990s and have typically exceeded the guideline in both up-gradient and down-gradient wells (**Table 4.3**, **Appendix D**). Manganese concentrations above the Alberta Tier 2 Potable Guideline for Commercial/Industrial Land Use (0.02 mg/L) in till are of little concern since this groundwater source (clay till) is not capable of supporting a potable water supply.

Furthermore, during well maintenance performed in May 2014, a black residue was observed on several bladder pumps and tubing; the residue may be a result of manganese oxidation by IRB and may contribute to the elevated manganese concentrations (**Photos 3 and 4, Appendix E**).

4.3.4.5 Dissolved Metals

Table 3.4 (**Appendix D**) shows that all groundwater samples in 2025 had concentrations below the applicable Tier 2 guideline, except for 01A(R)-SH with an arsenic concentration of 0.0188 mg/L and 12(R)-SS with a concentration of 0.0102 mg/L, both which exceeded the guideline of 0.01 mg/L. Both wells were drilled in 2025; concentrations will be examined in 2026 to determine if exceedances remain. 01A-IN has also historically exceeded for arsenic; in 2025 the concentration was below the guideline (0.00342 mg/L). Historical results show that arsenic has previously exceeded guidelines in this well in 1999, 2001 to 2010, 2013, 2014, 2019 and 2024.

All of the groundwater samples tested for mercury in 2025 had concentrations below the laboratory detection limit (0.000005 mg/L).

4.3.4.6 Petroleum Hydrocarbons (BTEX, PHC F1)

Table 3.5 (**Appendix D**) shows that all groundwater samples in 2025 had concentrations below the laboratory detection limit, with the exception of 01(R)-SH, which had results at or above the detection limit but below applicable guidelines for benzene, toluene, ethylbenzene and PHC F1 (C_6-C_{10}).

4.3.4.7 Polychlorinated Biphenyls Aroclors

Table 3.6 (**Appendix D**) shows that all groundwater samples in 2025 had a total PCB concentration below the detection limit (0.000030 mg/L) and Alberta Tier 2 Potable Water Guideline (0.0094 mg/L). Furthermore, all of the tested Aroclor concentrations were below the laboratory detection limit (0.000010 mg/L).

4.3.4.8 Adsorbable Organic Halogen

Table 3.7 (**Appendix** D) shows that all groundwater samples tested for adsorbable organic halogens (AOX) in 2025 had concentrations below the detection limit (0.010 mg/L).

4.3.5 Other Significant Trends

4.3.5.1 Chloride

The chloride concentration for monitoring wells 01(R)-SH, 05-SH, 07-SH, 08-SH and 17-SH have increasing Mann Kendall trends (**Table 7.2**, **Appendix D**; and **Appendix G**); individual time series chloride graphs can be found on **Figures 12.1, 12.8, 12.11, 12.13, 12.16, and 12.22** (**Appendix A**). The chloride concentrations in all these wells are below the Alberta Tier 2 Potable Groundwater Guideline for Commercial/Industrial Land Use (250 mg/L) both in 2025 and historically. Monitoring well 07-SH has a 2025 chloride concentration that is elevated (two orders of magnitude) above the other wells (207 mg/L).

In 2025, the chloride concentration at 07-IN was 0.70 mg/L. Chloride has historically been low or below the detection limit for 07-IN (**Figure 12.14, Appendix A**). Monitoring well series 07 is located on the northeast side of the Site, proximal and topographically below a parking lot. The location of the monitoring well and the presence of chloride in the shallow groundwater, but not the intermediate groundwater, indicates that the source of the chloride could have been a result of de-icing salt placed on the parking lot and road in the winter.

The chloride concentration in 17-SH has ranged between less than the detection limit of 0.5 mg/L and 2.52 mg/L from 1994 to 2014. Since 2014, the chloride concentration has been an order of magnitude higher. From 2014 to present, the lowest concentration occurred in 2021 (6.17 mg/L) and the highest concentration occurred in 2015 (21.8 mg/L). In 2025, the chloride concentration was 8.00 mg/L. 17-SH is located on the Southeast side of the Site, adjacent to landfill cells B2 and B3.

4.3.5.2 Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC)

TOC was analyzed until approximately 2006 when the analysis was changed to DOC. The historical results are reported in **Table 4.5** (**Appendix D**) and are graphed in **Figures 12.1 to 12.33** (**Appendix A**).

The TOC and DOC concentrations are typically <15 mg/L in most of the wells. Monitoring wells with higher DOC concentrations in 2025 are:

- 01(R)-SH – 172 mg/L
- 01A-IN – 21.6 mg/L

Well 01(R)-SH was drilled in January 2025 (replacing 01A-SH, which is now decommissioned) and first sampled in September 2025. Historically, the TOC concentration in 01A-SH and 01A-IN had an increase in 1993 (**Figure 12.1 and 12.2, Appendix A**) when those wells were first installed (**Table 4.5, Appendix D**). The TOC and DOC results have been elevated above baseline levels since that time.

4.4 Interpretation

4.4.1 01(R)-SH, 01A-SH and 01A-IN

Many of the groundwater chemistry changes observed for well location 01 occurred when this monitoring location was replaced by 01A in 1993. **Figures 5.2 and 5.3** (**Appendix A**) show that monitoring well location 01 and 01A were located in approximately the same east-west location, with 01A located south of 01. The decommissioning of 01 coincided with the construction of the F.B. & D. Kiln Facility. Monitoring well 01A-SH was decommissioned in January 2025 and replaced with 01(R)-SH, located to the west of 01A and 01.

The 2025 and the historical results at 01(R)-SH/01A-SH show:

- A TDS concentration in 2025 of 1020 mg/L in 01(R)-SH. Historically, TDS concentrations at 01A-SH were significantly lower than the typical TDS for the shallow wells on the Site, with a concentration of 202 mg/L in 2024. TDS shows a decreasing Mann Kendall trend (**Table 7.2, Appendix D;** and **Appendix G**)
- Elevated TOC and DOC concentrations in 01A-SH (1993 to 2024) and 01(R)-SH in 2025 (**Figure 12.1, Appendix A**)
- A laboratory pH of 6.26 in 2025, with a decreasing pH trend (**Table 7.2, Appendix D;** and **Appendix G**)
- Elevated iron concentration (180 mg/L in 2025), with a trend that is not significant (**Table 7.2, Appendix D;** and **Appendix G**)
- Results above the laboratory detection limits for benzene, toluene, ethylbenzene and PHC F1 (C6-C10).

Similarly, the results for 01A-IN show:

- A more typical TDS concentration (507 mg/L in 2025), with a decreasing trend (**Table 7.2, Appendix D;** and **Appendix G**)
- Elevated TOC and DOC concentrations in 01A-IN since 1993 (**Figure 12.2, Appendix A**)
- A more neutral pH (7.14), with a decreasing trend (**Table 7.2, Appendix D;** and **Appendix G**)
- An elevated iron concentration (4.0 mg/L in 2025), with a trend that is not significant (**Figure 14.2, Appendix A; Table 7.2, Appendix D;** and **Appendix G**).

These monitoring wells are completed in engineered fill, not natural clay till, and are adjacent to the ERT Fire Training Pad, the Process Make-Up Pond and the South Pond on the west side of the Site (**Figure 5.0, Appendix A**). The shallow and intermediate wells sample groundwater that is influenced by the water table. The amount of infiltration of surface water and rainwater may be impacted by the following factors: the engineered fill at this location may have a higher infiltration rate than the natural till, and the proximal ponds contain rainwater and surface run-off water. A greater amount of surface and rainwater infiltration is supported by the TDS concentrations in 01A-SH and 01A-IN. Rainwater typically has a very low TDS concentration and monitoring location 01A has a much lower TDS concentration in the shallow interval than in the intermediate interval. The TDS concentration in 01(R)-SH in 2025 is closer to that of the other wells on site and may be reflect impact from drilling and well installation process.

The source of the elevated TOC and DOC concentrations in 01(R)-SH, 01A-SH and 01A-IN is unknown, however, possible sources may include fires and firefighting materials used at the ERT Fire Training Pad nearby, the composition of the engineered fill, or materials and construction processes used to build the F.B.& D. Kiln Facility between 1994 and 1995. The presence of elevated TOC and DOC in these wells may result in anaerobic conditions when carbon is aerobically decayed (Langmuir, 1997). 01(R)-SH had results above the detection limit but below applicable guidelines for benzene, toluene, ethylbenzene and F1 (C6-C10).

A sulphur odour was observed while purging and sampling 01A-SH from 2013 to the last sampling event in 2024 prior to decommissioning. The results of the sulphate reducing bacteria (SRB) test in 2015 indicated the presence of aggressive, anaerobic sulphate reducing bacteria in 01A-SH. Sulphate reducing bacteria produce hydrogen sulphide (H_2S) (Langmuir, 1997), which accounts for the sulphur odour and lower pH. In 2025, no sulfur odour was noted at 01(R)-SH while purging or sampling.

4.4.2 Dissolved Iron

Elevated iron concentrations were observed at seven of the groundwater monitoring wells in 2018 and 2021, eleven in both 2019 and 2020, five wells in 2022, two wells in 2023 and three wells in 2024. In 2025, elevated iron concentrations were noted for five groundwater wells (**Section 4.3.4.3**). The highest iron concentrations in 2025 were observed in 01(R)-SH (180 mg/L) and 01A-IN (4.00 mg/L).

Concentrations in 01A-IN have periodically spiked above 20 mg/L in 2003 (29.6 mg/L), 2006 (32.8 mg/L), 2009 (26.9 mg/L), 2013 (33.8 mg/L), and 2014 (29.9 mg/L). The iron concentration in 01A-SH has been relatively consistent (**Figure 14.2** in **Appendix A**) since the well was first sampled in 1993, ranging between 0.06 mg/L (2004) and 6.79 mg/L (1996; **Table 4.3, Appendix D**). Although these concentrations are lower than those observed in 01A-IN, they are still higher than other concentrations observed at the site (**Table F** in **Section 4.3.4.3**). During well maintenance activities in May 2014, a reddish-orange film was observed on the pump and tubing in 01A-SH and on the tubing in 01A-IN. During the 2015 Groundwater Monitoring Program, nine samples were collected for an IRB test and an SRB test. The number of days until a reaction occurs in the solution can determine whether the water contains aggressive (many) bacteria or not aggressive (few) bacteria. All IRB and SRB reactions occurred within the first day of sampling; therefore, all samples contain aggressive iron related bacteria. These bacteria are the likely cause of the elevated iron concentrations seen in the monitoring wells. In 2025, the cause of the high concentration of iron in newly drilled well 01(R)-SH (which is an order of magnitude higher than concentrations seen in 01(A)-IN) may be from the ground disturbance of drilling and installing a new monitoring well at this location. 2026 results will be examined to see if this exceedance remains.

5. Conclusions

The 2025 Groundwater Monitoring Program was conducted as outlined in Approval No. 1744-03-00. Based on the results of the monitoring program, the following conclusions are made:

- Petroleum hydrocarbon (BTEX, PHC F1) concentrations were below the laboratory detection limit for all wells sampled in 2025, with the exception of 01(R)-SH, which had results at or above the detection limit but below applicable guidelines for benzene, toluene, ethylbenzene and PHC F1 (C_6-C_{10}). 2026 results will be examined to determine if detectable concentrations remain.
- PCB Aroclor and total PCB concentrations were below the laboratory detection limit for all wells sampled in 2025, therefore, the groundwater at the Site is not impacted by PCB.
- Twelve of the wells completed in the till interval (shallow and intermediate wells) have TDS concentrations above the Alberta Tier 2 Potable Groundwater Guidelines, however, these concentrations are consistent with baseline and/or historical observations, as well as expected TDS concentrations for a till lithology.
- Manganese concentrations exceeding the Alberta Tier 2 Potable Groundwater Guideline were observed in all monitoring wells except 01(2R)-SS, 03-SH, 03-IN, 05-SH, 12(R)-SS, 13(R)-SS, 16-SH, and 17-SH. Manganese concentrations have been measured since the 1990s and have typically exceeded the guideline in both up-gradient and down-gradient wells; therefore, it is likely naturally occurring. Manganese concentrations above the Alberta Tier 2 Potable Guideline for Commercial/Industrial Land Use (0.02 mg/L) in till are of little concern since this groundwater source (clay till) is not capable of supporting a potable water supply.
- Elevated iron and manganese concentrations may be a result of biological activity. Orange and black residues and/or oxidation was noted on several bladder pumps and tubing during well maintenance in May 2014. IRB tests from 2015 confirmed the presence of anaerobic iron related and enteric bacteria in monitoring wells 01A-SH (decommissioned) 01A-IN, 04-IN, 04-SS, 07-SH, 07-IN, and 16-SH.
- The elevated chloride concentrations in 07-SH may be caused by infiltration of run-off containing road salt from the adjacent parking lot and road. Increasing chloride trends are observed in 07-SH, although the concentration is still below the guideline in 2025 (205 mg/L). Monitoring well 07-SH is located in a low-lying area adjacent to a road and parking lot. Well 01(A)-SH had elevated chloride concentrations and was decommissioned in January 2025. It's replacement 01(R)-SH, had a chloride concentration an order of magnitude below the guideline in 2025. Monitoring well 17-SH had an increase in chloride concentration in 2015 compared to historical results, but the level is well below the guideline and has been falling in the following years. Monitoring wells 05-SH and 08-SH have increasing trends
- Well Series 01A:
    - The TDS and major ion groundwater chemistry of 01A-IN appears to be affected by rain and surface water infiltration
    - High DOC concentrations may be a result of the composition of the engineered fill, as well as activity at the ERT Fire Training Pad. The high DOC probably results in anaerobic conditions in the monitoring well. It is noted that no Aroclor PCBs or petroleum hydrocarbons were detected in this well, thus the elevated DOC concentrations are from other compounds.
    - Sulphur odour and reduced pH in 01A-SH (decommissioned) indicates the presence of sulphur reducing bacteria that is confirmed by the results of the SRB test conducted in 2015. No sulfur smell was noted in the replacement well 01(R)-SH during the groundwater monitoring and sampling event.
    - Petroleum hydrocarbon results above the detection limit at 01(R)-SH for benzene, toluene, ethylbenzene and F1 (C6-C10) may be caused by activity at the ERT Fire Training Pad.

  Replacement wells drilled in November 2025 after the 2025 groundwater monitoring program was completed include: 08(R)-SH, 08(R)-IN and 13(R)-SH. These wells will be included in the 2026 groundwater monitoring program.

6. Recommendations

The current groundwater monitoring program should continue to be followed as dictated by Approval No. 1744-03-00. Based on the results of the 2025 groundwater monitoring program the following additional recommendations are identified:

- If dry piezometers are encountered, the water level in the corresponding well should be measured with clean equipment to verify if the well is dry or if the piezometer is compromised
- Alberta Environment and Protected Areas has recommended that dioxins and furans should be sampled for in select shallow wells for three years (2022, 2023 and 2024) as part of the annual monitoring program. As three years of data has been collected and the results are two to three orders of magnitude below the applicable guideline, the monitoring frequency is adjusted to once every five years. The next dioxin and furan sampling event will occur in 2029.
- Review of road salt use at and around the Site and consider alternative measures to address chloride increases at selected locations. Sample surface water in the road ditches upgradient of the Site to investigate the source of the chloride concentration increase in well 07-SH.
- Conduct groundwater monitoring in the fall of 2026 with the sampling event performed a minimum of one week after the purging event to allow monitoring wells to sufficiently recover.

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Appendix A

Figures

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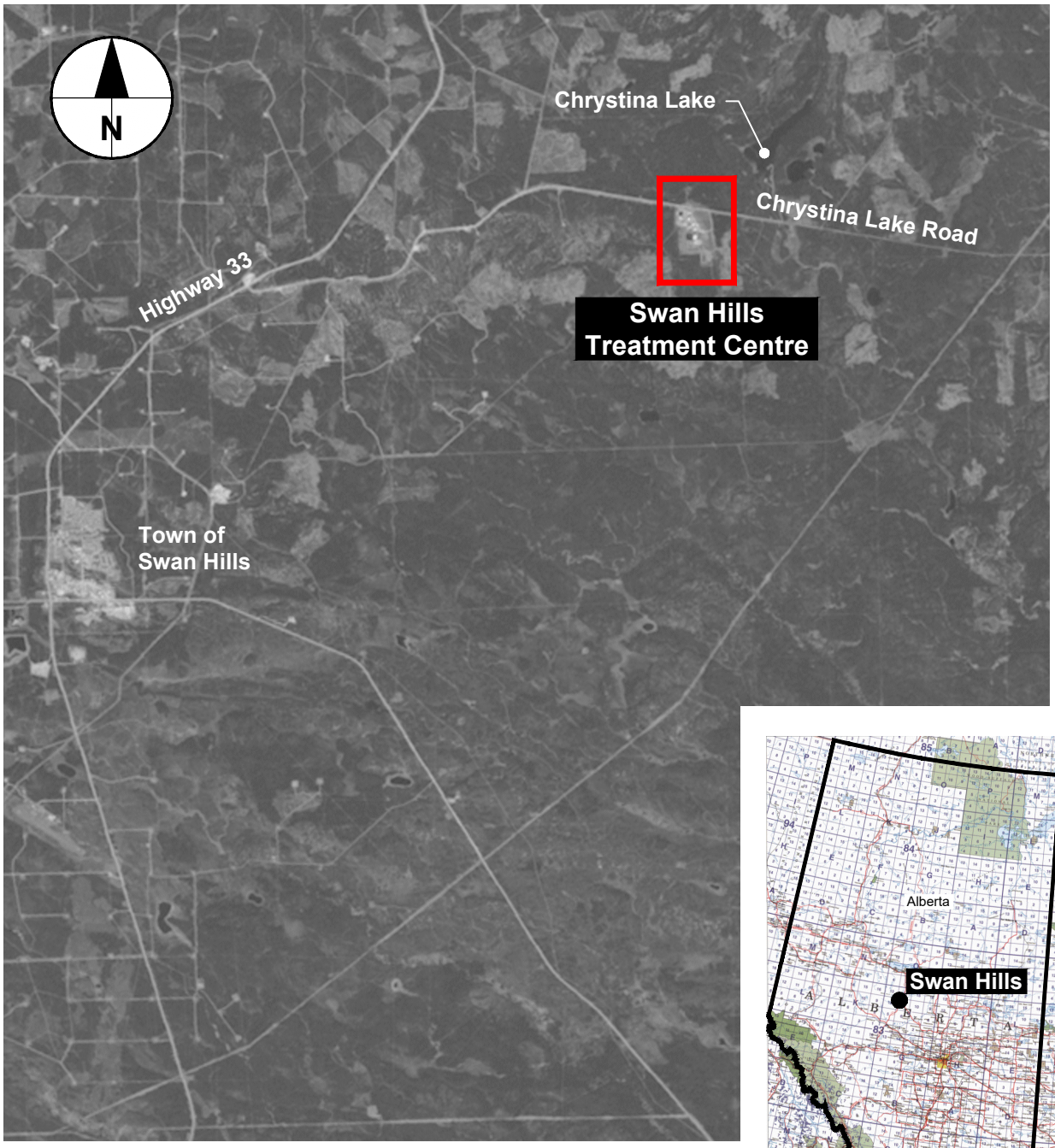


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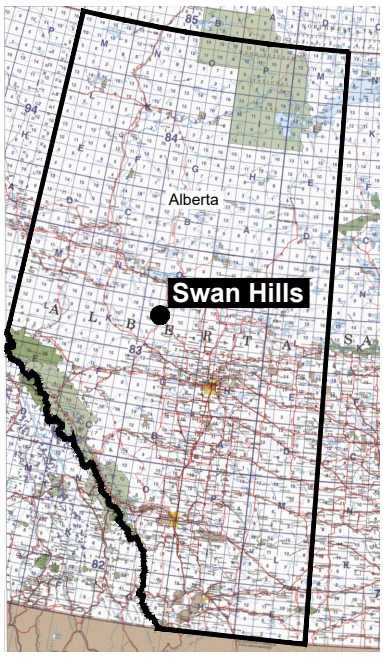


IMAGE SOURCE: Natural Resources Canada

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KEY PLAN

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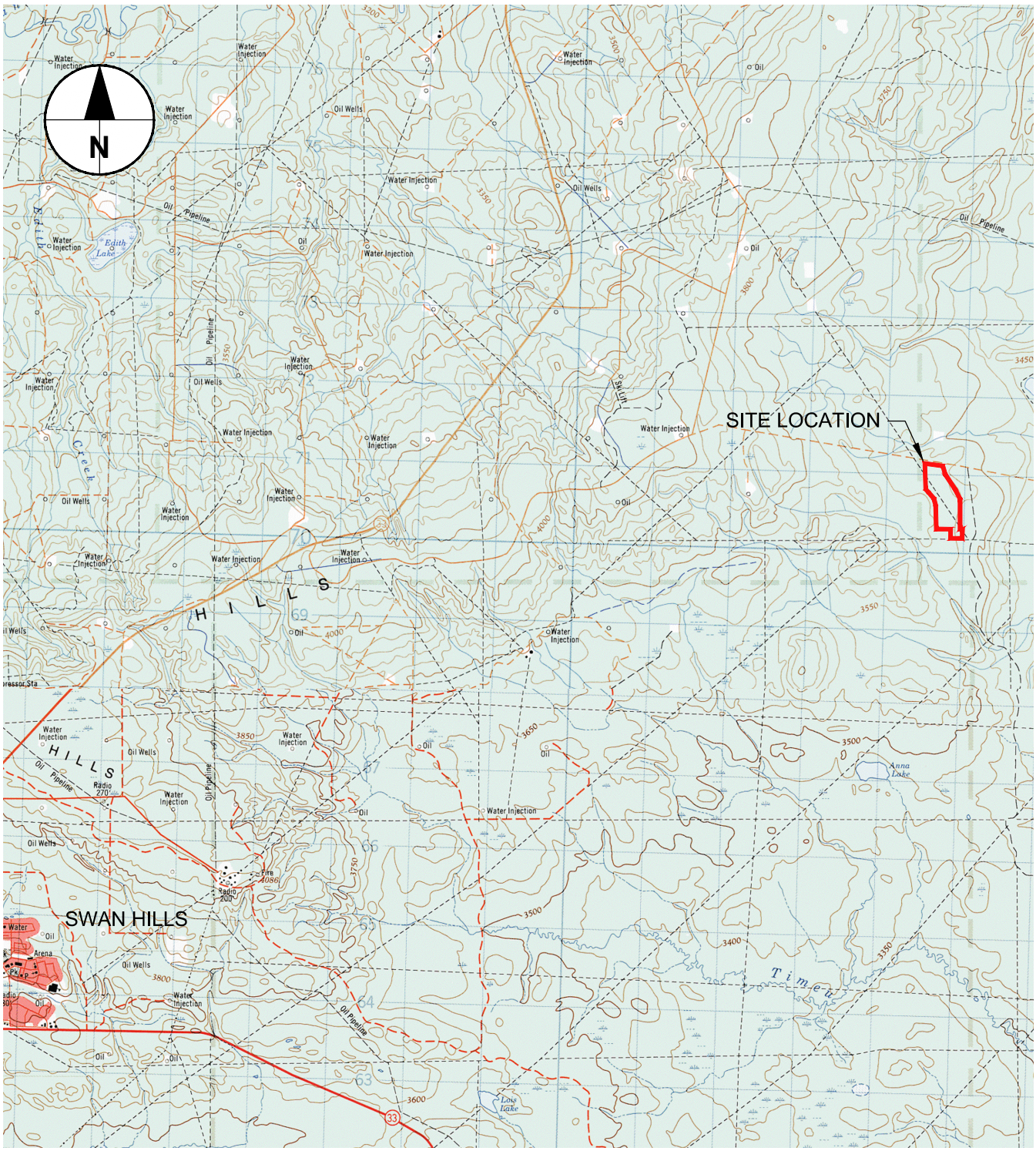
2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

Site Location

AECOM

Figure 1.0

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NOTES:

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BEDROCK TOPOGRAPHY OF THE WHITECOURT AREA,
NTS 83J, ALBERTA RESEARCH COUNCIL,
SCALE 1:250,000

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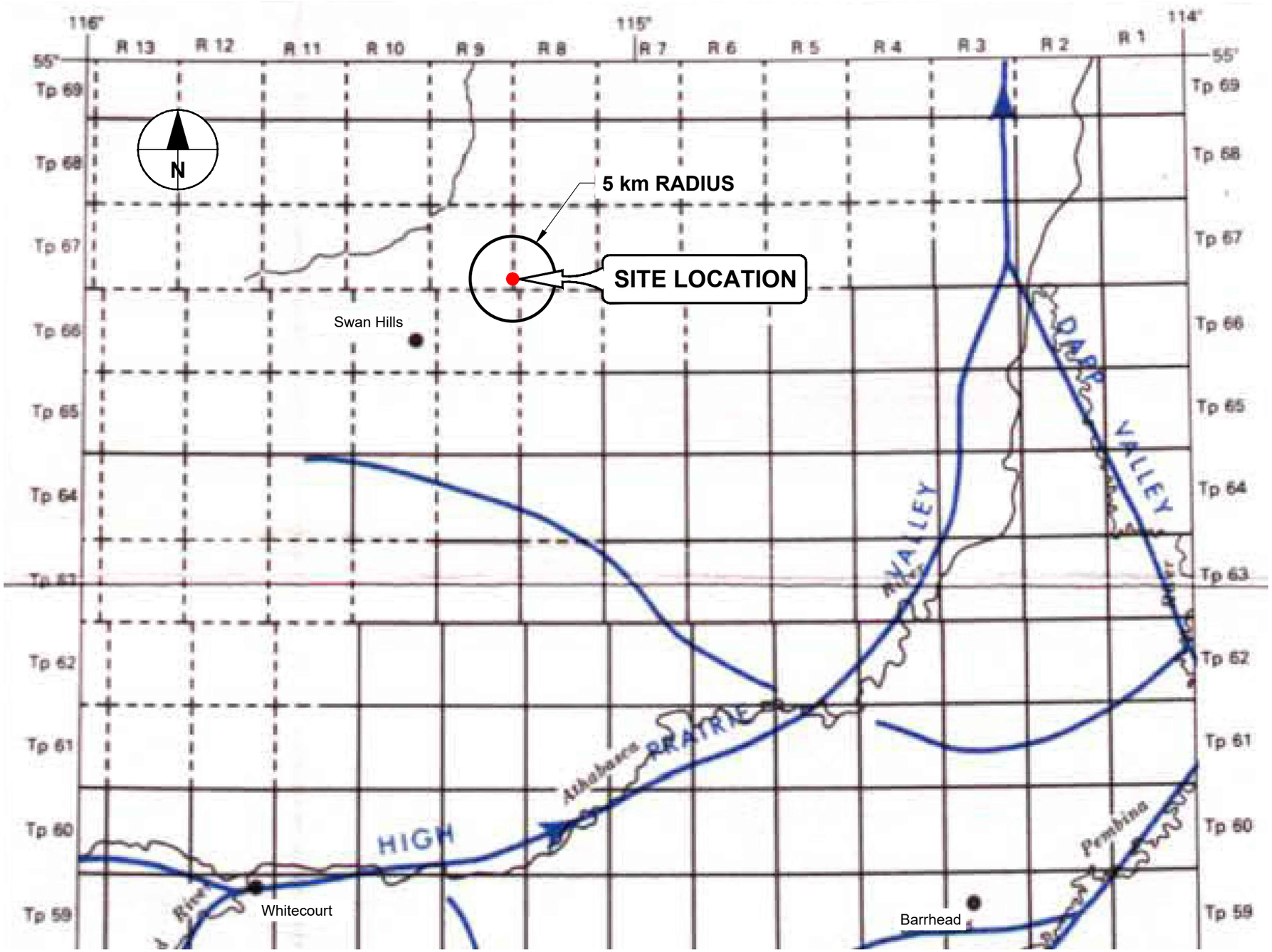
2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

Topography

AECOM

Figure 2.0

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SOURCE:
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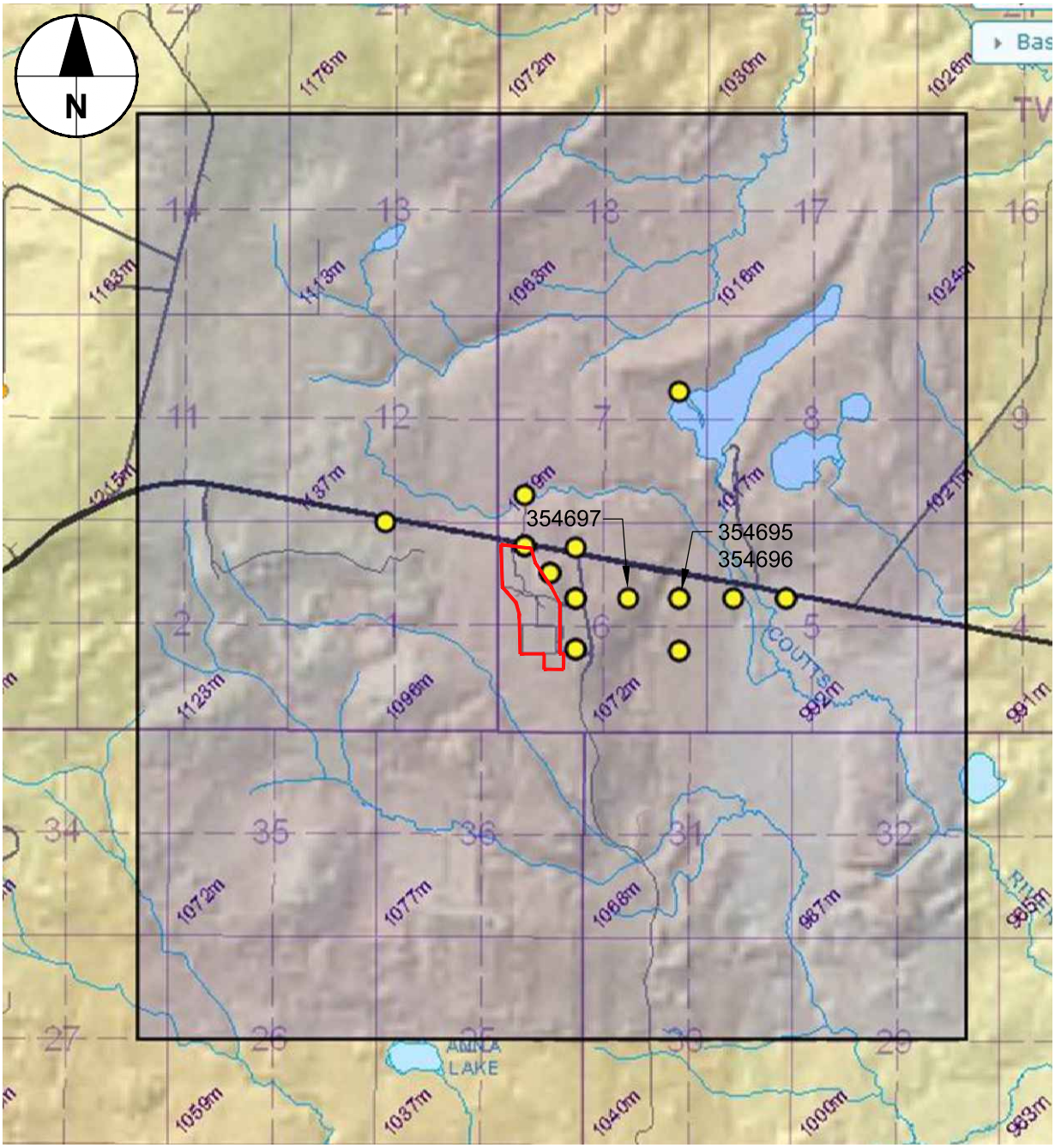
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2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

Buried Bedrock Valleys

AECOM

Figure 3.0



LEGEND:

SITE BOUNDARY

SELECTED GROUNDWATER WELL

0 1250 2500 m

1:50000

NOTES:

1. INFORMATION FROM ALBERTA ENVIRONMENT'S WATER WELL INFORMATION DATABASE

Issue Status: FINAL

2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

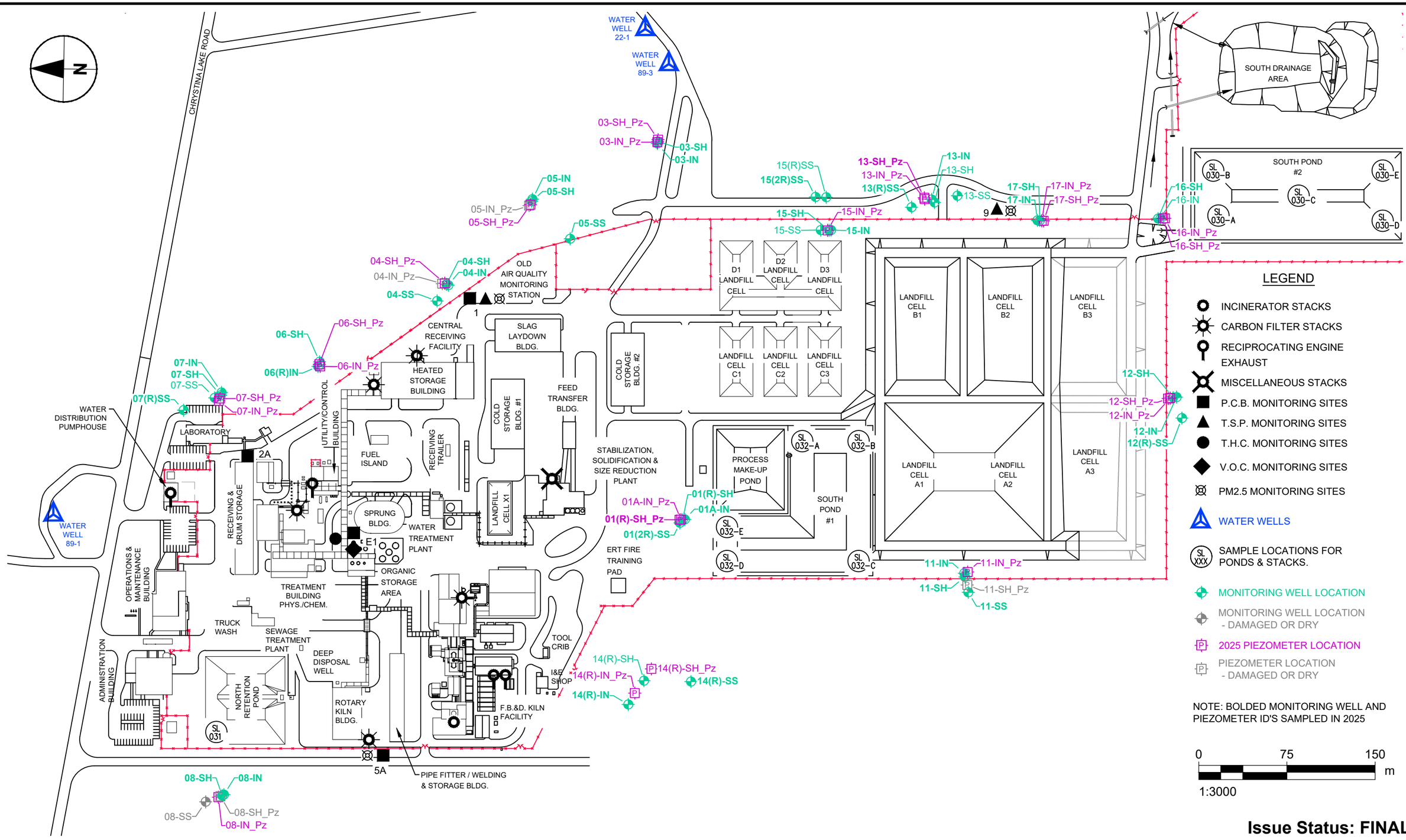
Historical Groundwater Users

AECOM

Figure 4.0

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LEGEND

- INCINERATOR STACKS
- CARBON FILTER STACKS
- RECIPROCATING ENGINE EXHAUST
- MISCELLANEOUS STACKS
- P.C.B. MONITORING SITES
- T.S.P. MONITORING SITES
- T.H.C. MONITORING SITES
- V.O.C. MONITORING SITES
- PM2.5 MONITORING SITES
- WATER WELLS
- SL XXX — SAMPLE LOCATIONS FOR PONDS & STACKS.
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION - DAMAGED OR DRY
- 2025 PIEZOMETER LOCATION
- PIEZOMETER LOCATION - DAMAGED OR DRY

NOTE: BOLDED MONITORING WELL AND PIEZOMETER ID'S SAMPLED IN 2025

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Issue Status: FINAL

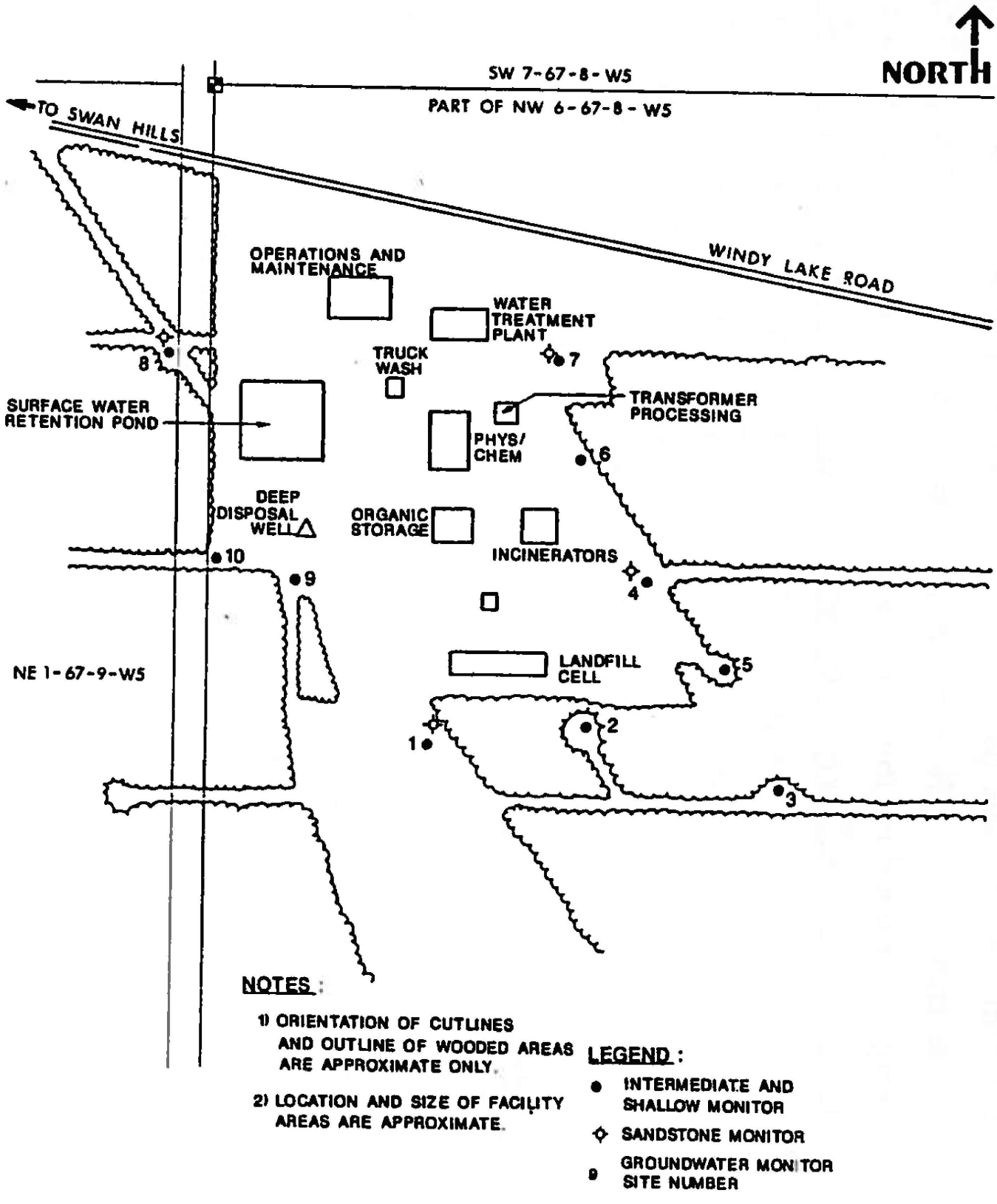
2025 Groundwater Monitoring Report
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VEOLIA
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Groundwater Monitoring Well Locations

AECOM

Figure 5

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NOTE: MODIFIED FROM STANLEY (1987)

Issue Status: FINAL

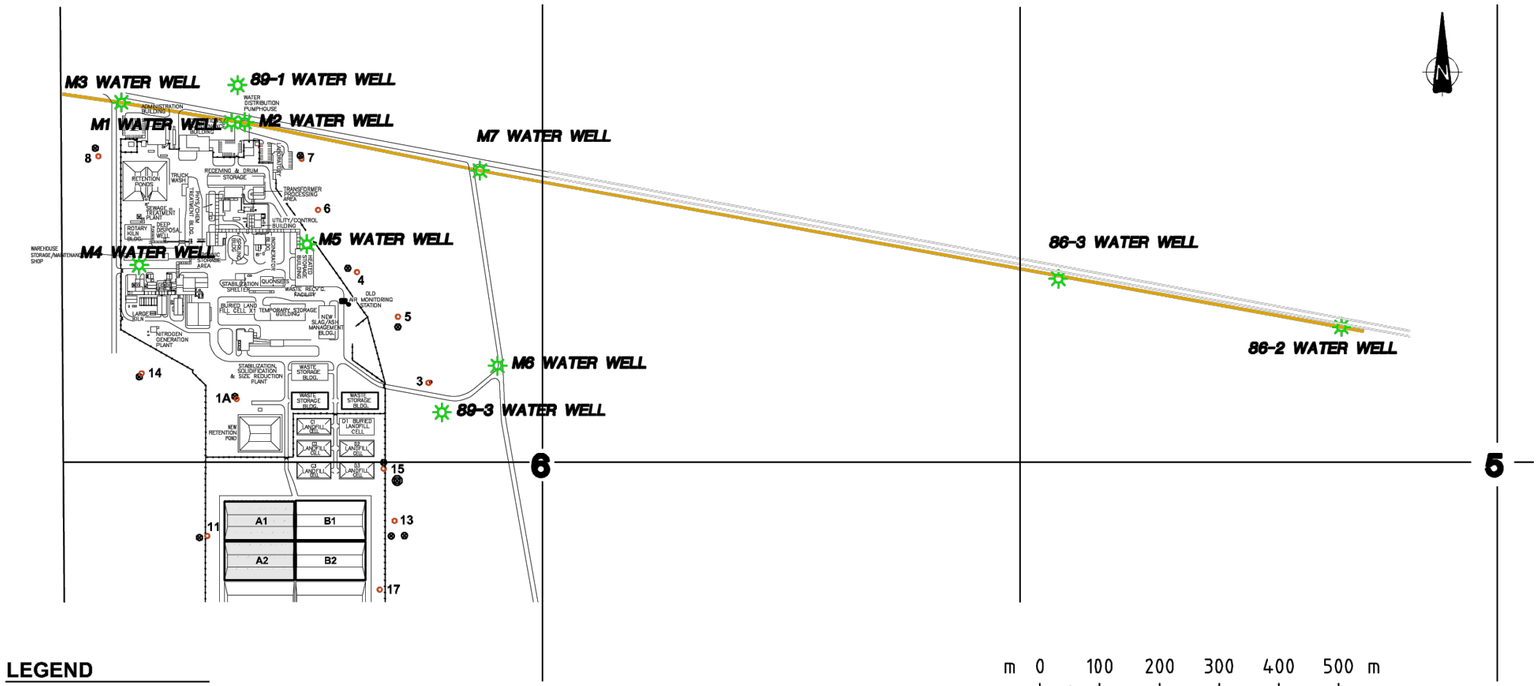
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1987 Groundwater Monitoring Well Locations

AECOM

Figure 5.1

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LEGEND

- LANDFILL CELLS CAPPED FOR CLOSURE
- B1 ACTIVE LANDFILL CELLS
- SANDSTONE MONITORING WELL
- SHALLOW AND INTERMEDIATE TILL MONITORING WELL SITE
- SANDSTONE MONITORING WELL (AWAITING SURVEY OF LOCATION AND ELEVATION)
- WATER WELL (locations approximate)
- LINEATION OF LOCAL GEOLOGIC CROSS-SECTION

SOURCE:
Figure 2.4B - Lineation of Local Geologic Cross-Section. 2012 Groundwater, Surface Water, Sediment and Fish Tissue Monitoring - Swan Hills Treatment Centre, Worley Parsons, March 2013.

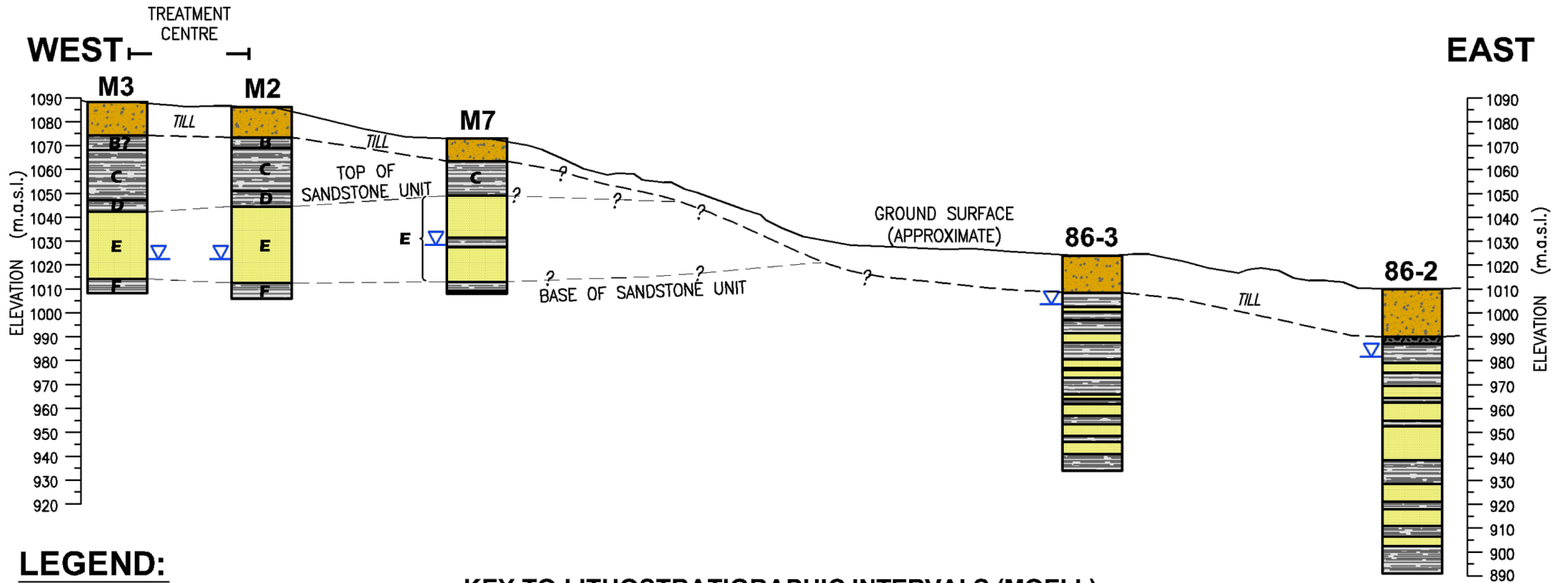
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2025 Groundwater Monitoring Report
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VEOLIA
Project No.: 60757940 Date: 2026-03-30

Cross-Section Location

AECOM

Figure 5.2



LEGEND:

- TILL
- GRAVEL
- SANDSTONE
- SHALE
- WATER TABLE ELEVATION

KEY TO LITHOSTRATIGRAPHIC INTERVALS (MOELL)

B	UPPER GREY-GREEN SHALE
C	BROWN SHALE
D	LOWER GREY-GREEN SHALE
E	SANDSTONE
F	SHALE WITH MINOR SANDSTONE

VERT. SCALE 1 : 2,500

0 25 50 75 100 125m

0 100 200 300 400 500m

HOR. SCALE 1 : 10,000

(4x VERT. EXAGG.)

SOURCE:
Figure 2.4A - Local Geologic Cross-Section. 2012 Groundwater, Surface Water, Sediment and Fish Tissue Monitoring - Swan Hills Treatment Centre, Worley Parsons, March 2013.

Issue Status: FINAL

ANSI B 279.4mm x 431.8mm
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Designer: ____
Project Management Initials: ____
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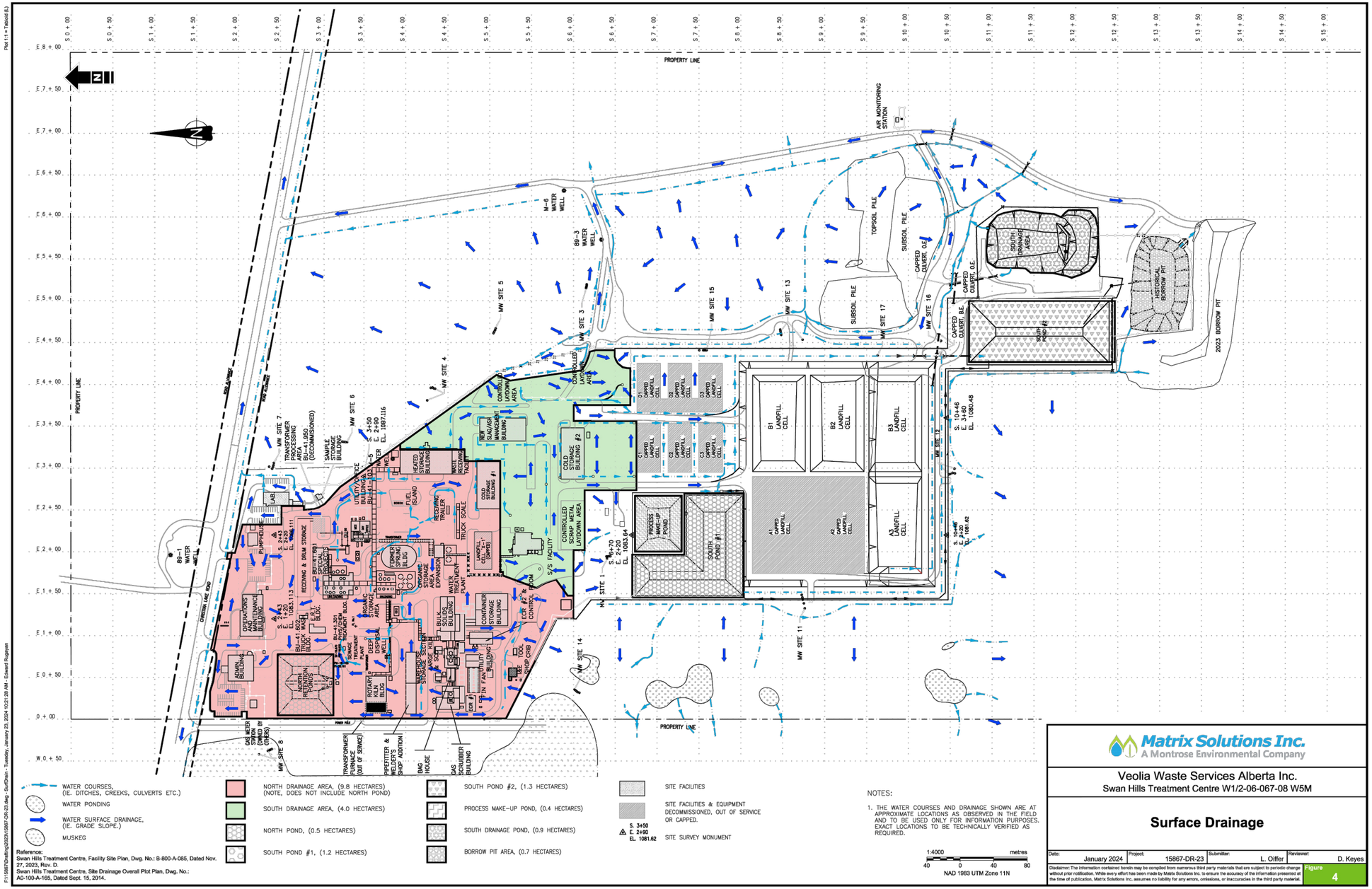
2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

Geologic Cross-Section

AECOM

Figure 5.3

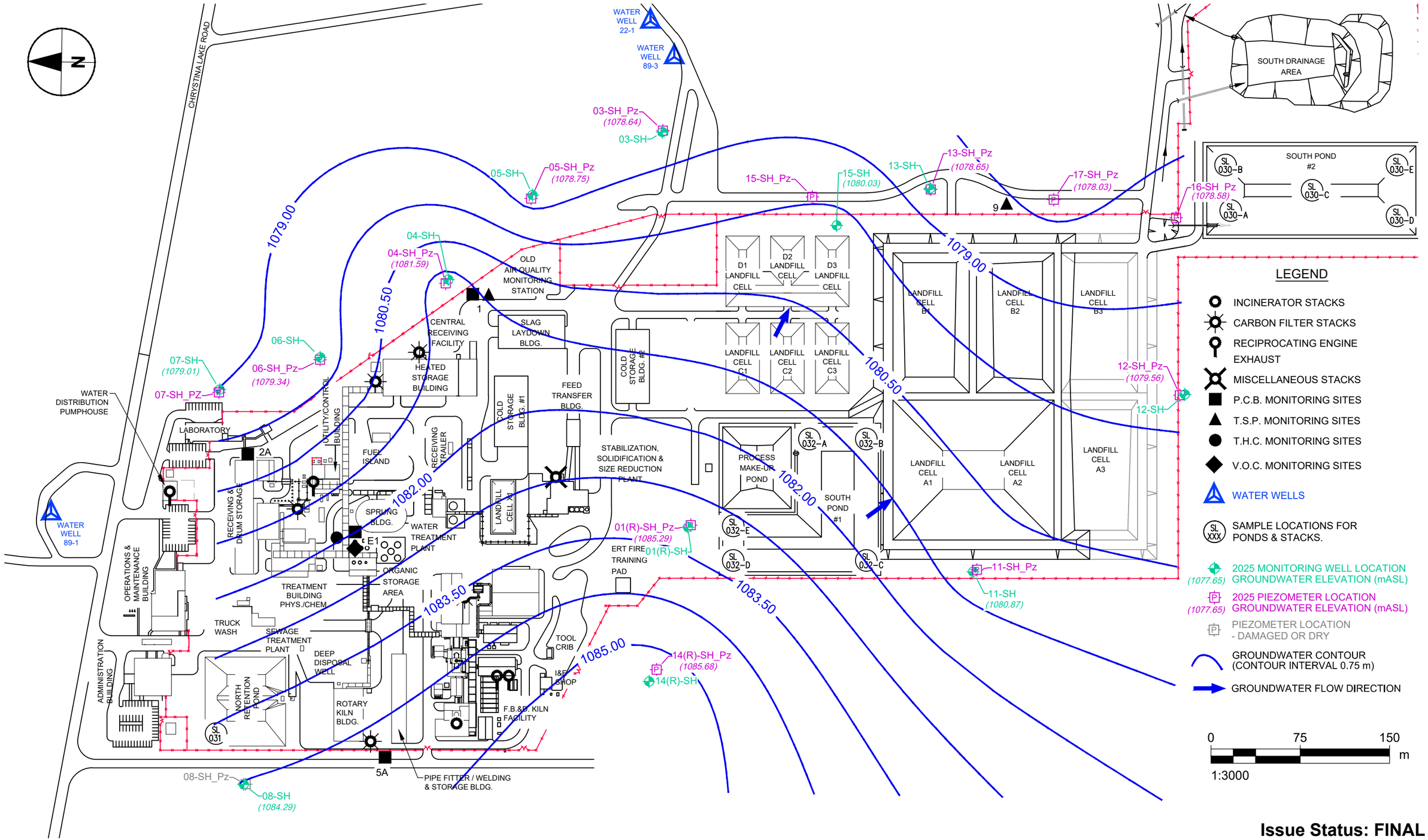
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Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm



SOURCE:
Drawing No.: A0-100-A-165 - Site Drainage Overall Plot Plan. Swan Hills Treatment Centre General Site, Swan Hills Treatment Centre, September 15, 2014.

Issue Status: FINAL

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm
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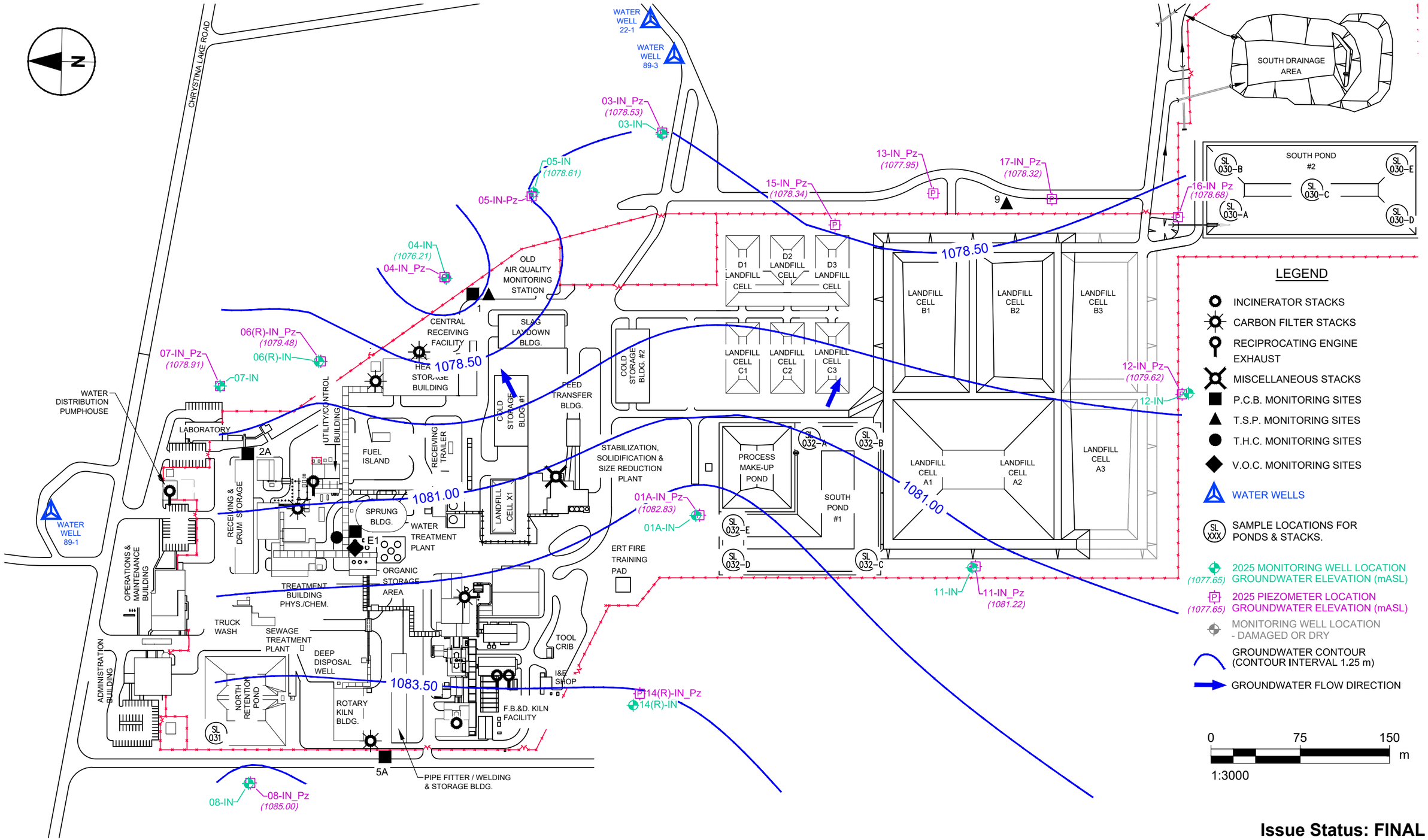
2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

September 2025 Groundwater Flow
Shallow Piezometers

AECOM

Figure 7.0

ANSI B 279.4mm x 431.8mm
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Checked: ____
Designer: ____
Project Management Initials: ____
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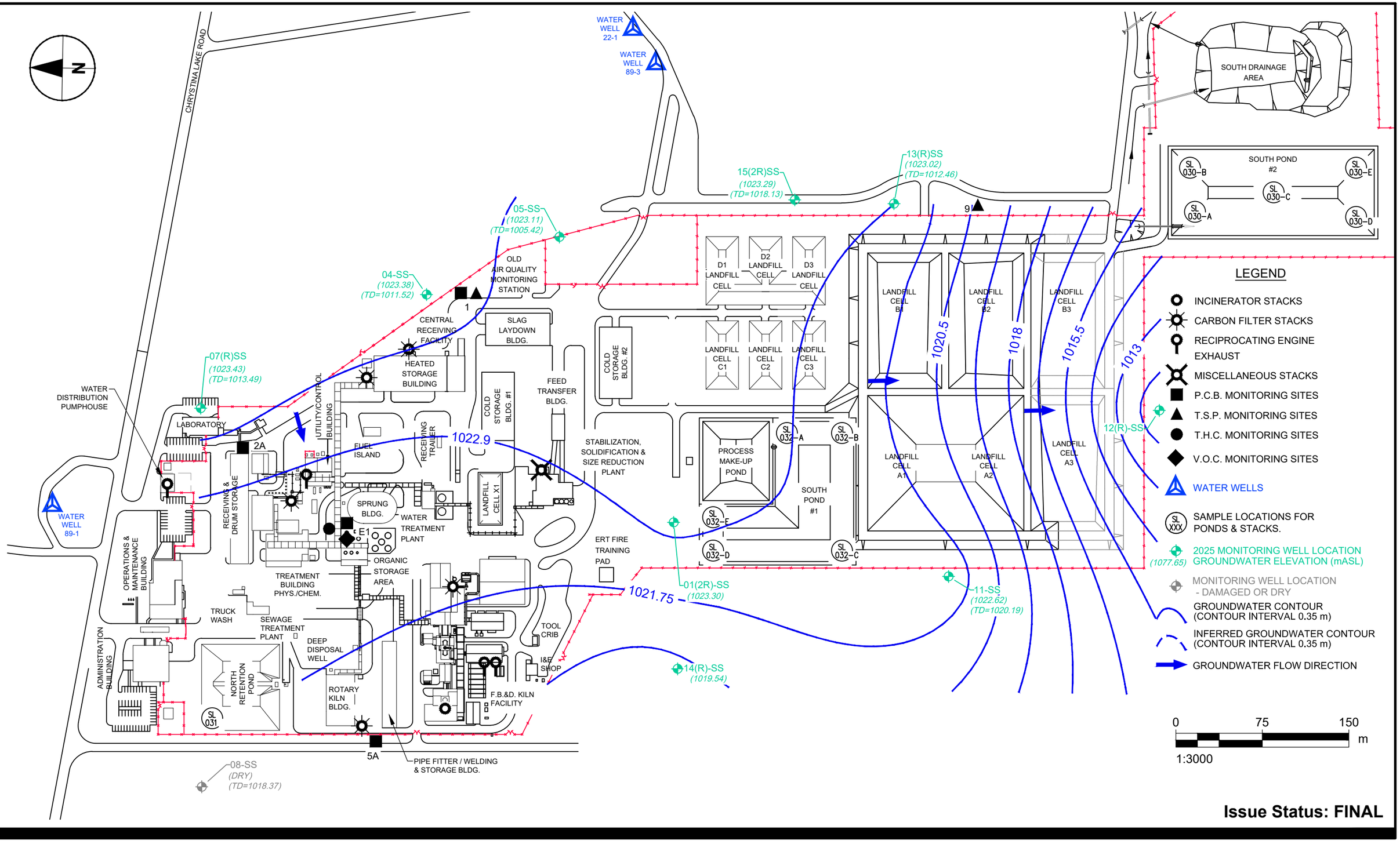
2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

September 2025 Groundwater Flow
Intermediate Piezometers

AECOM

Figure 8.0

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm
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Issue Status: FINAL

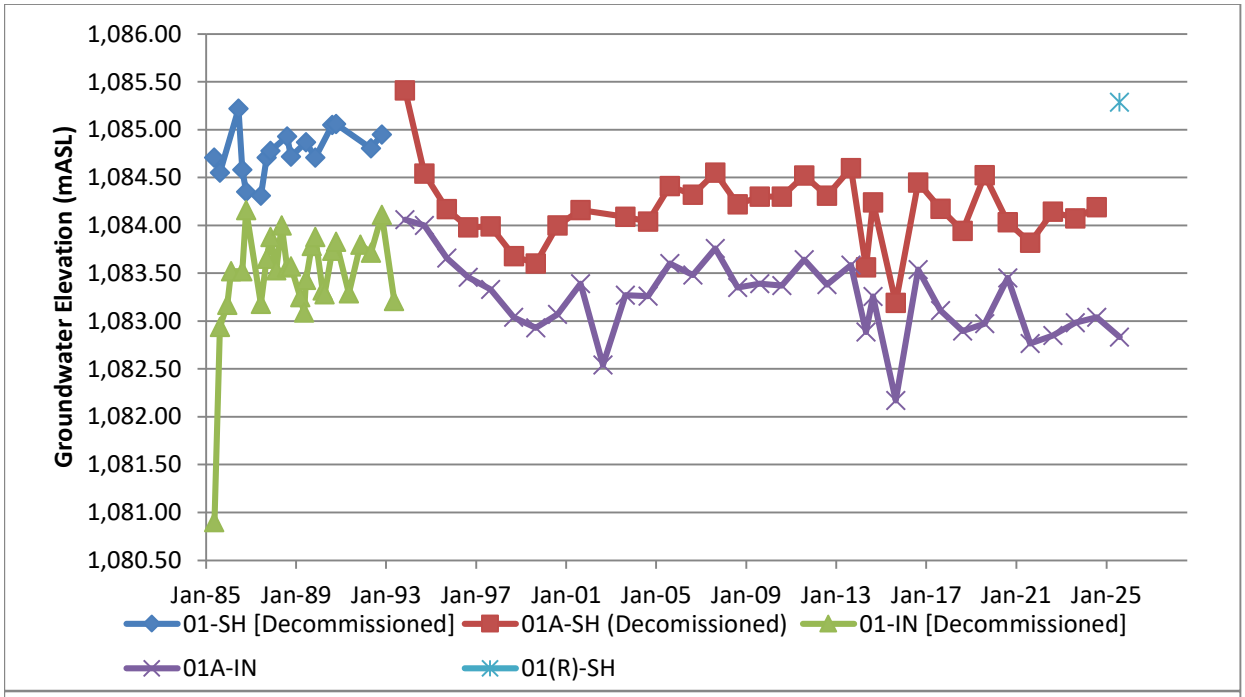
2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

September 2025 Groundwater Flow
Sandstone Wells

AECOM

Figure 9.0

Figure 10.1
VEOLIA, Swan Hills Treatment Centre
Well Series 01(R) and 01A Hydrographs



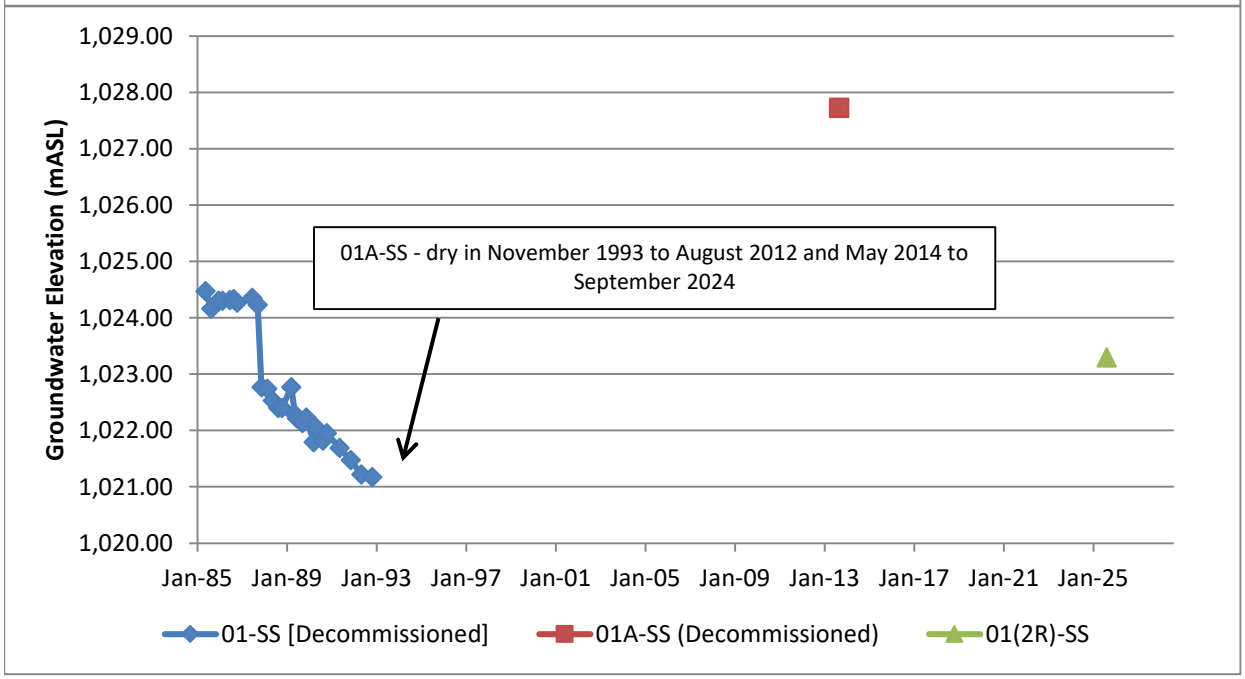


Figure 10.2
VEOLIA, Swan Hills Treatment Centre
Well Series 02 (Decommissioned) Hydrograph

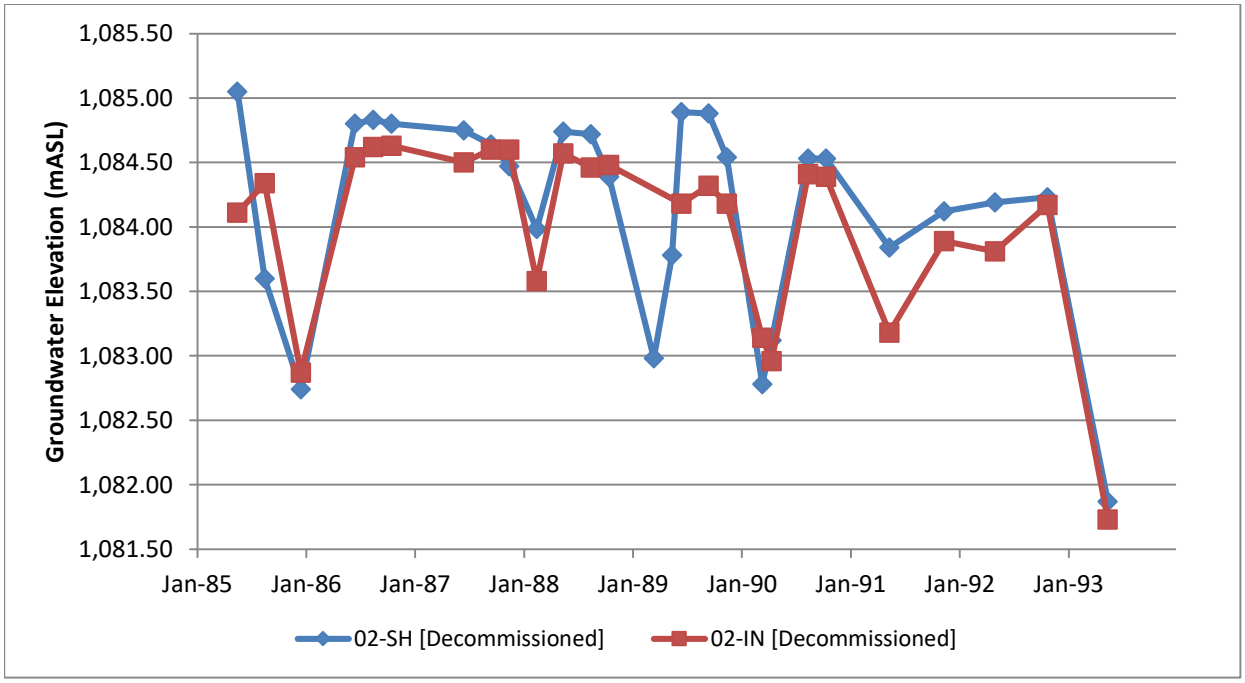


Figure 10.3
VEOLIA, Swan Hills Treatment Centre
Well Series 03 Hydrograph

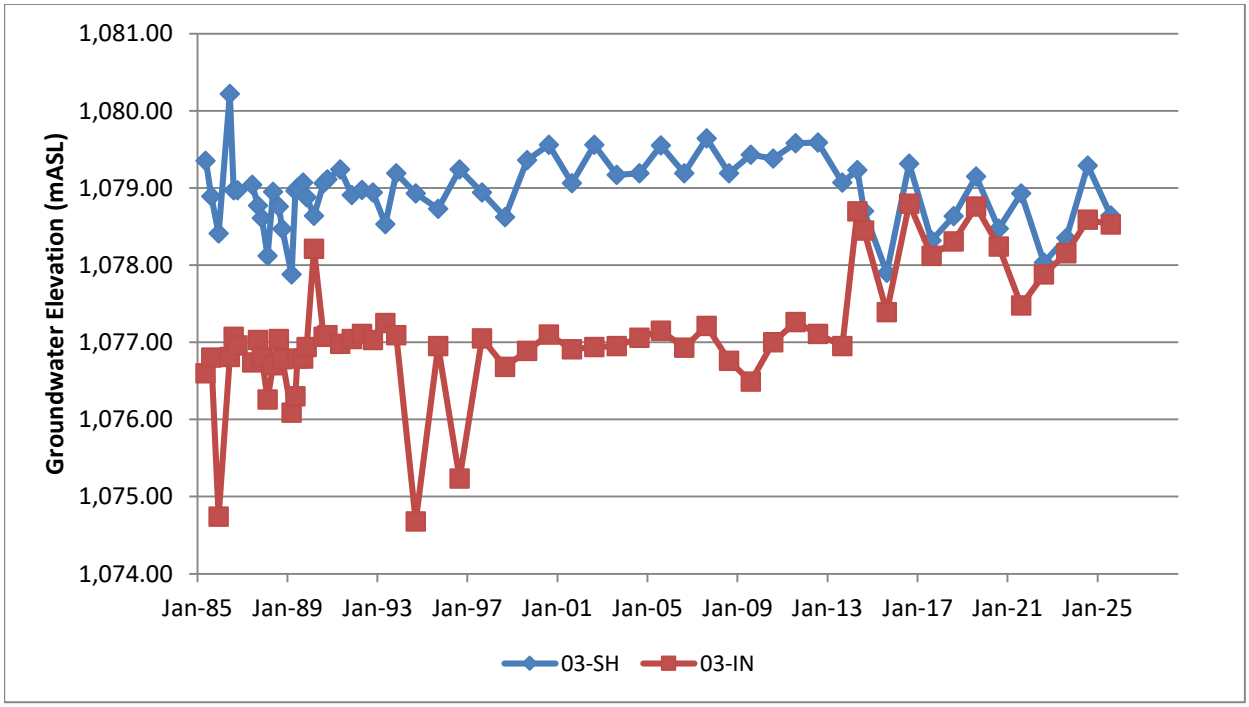


Figure 10.4
VEOLIA, Swan Hills Treatment Centre
Well Series 04 Hydrographs

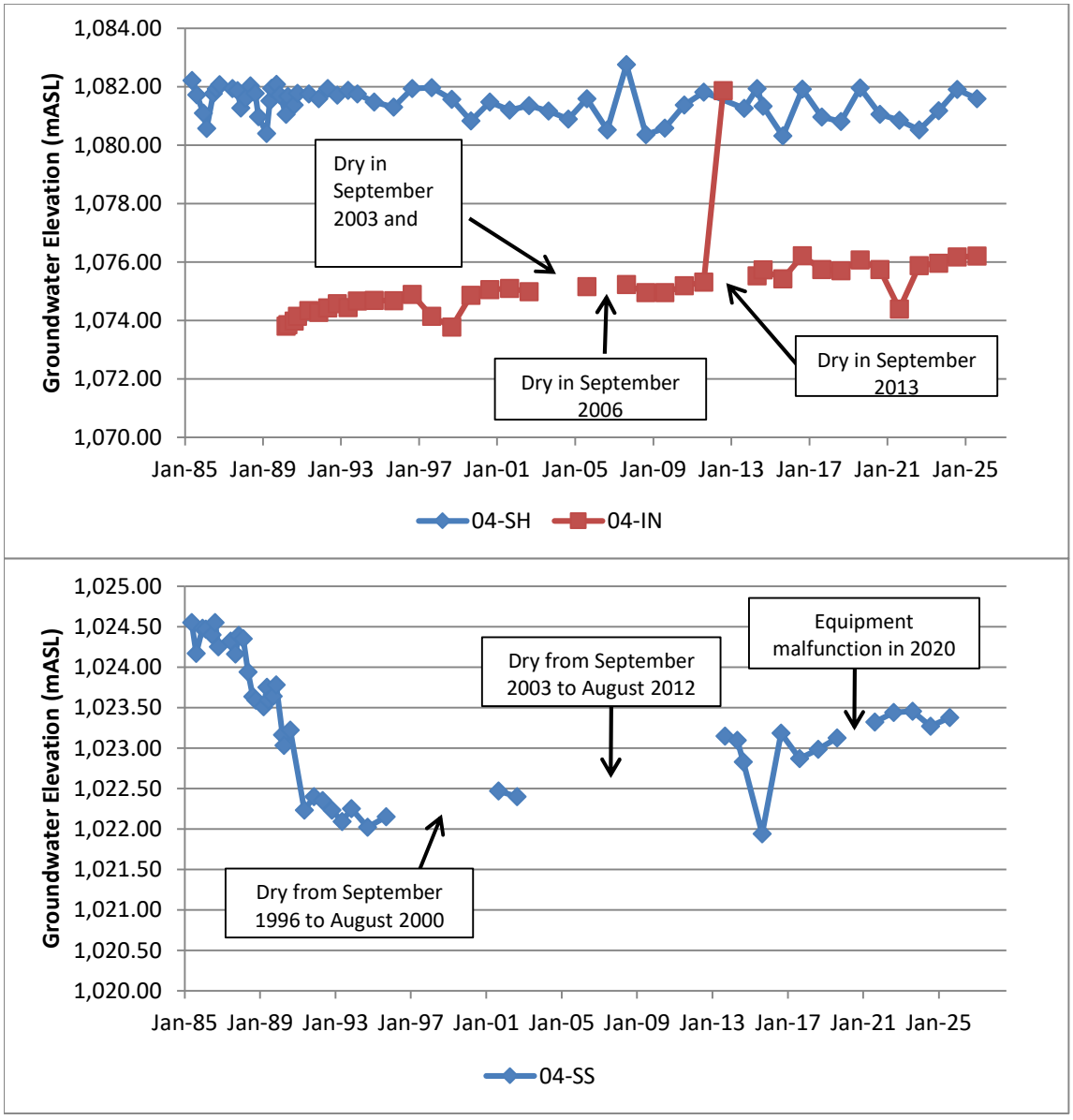
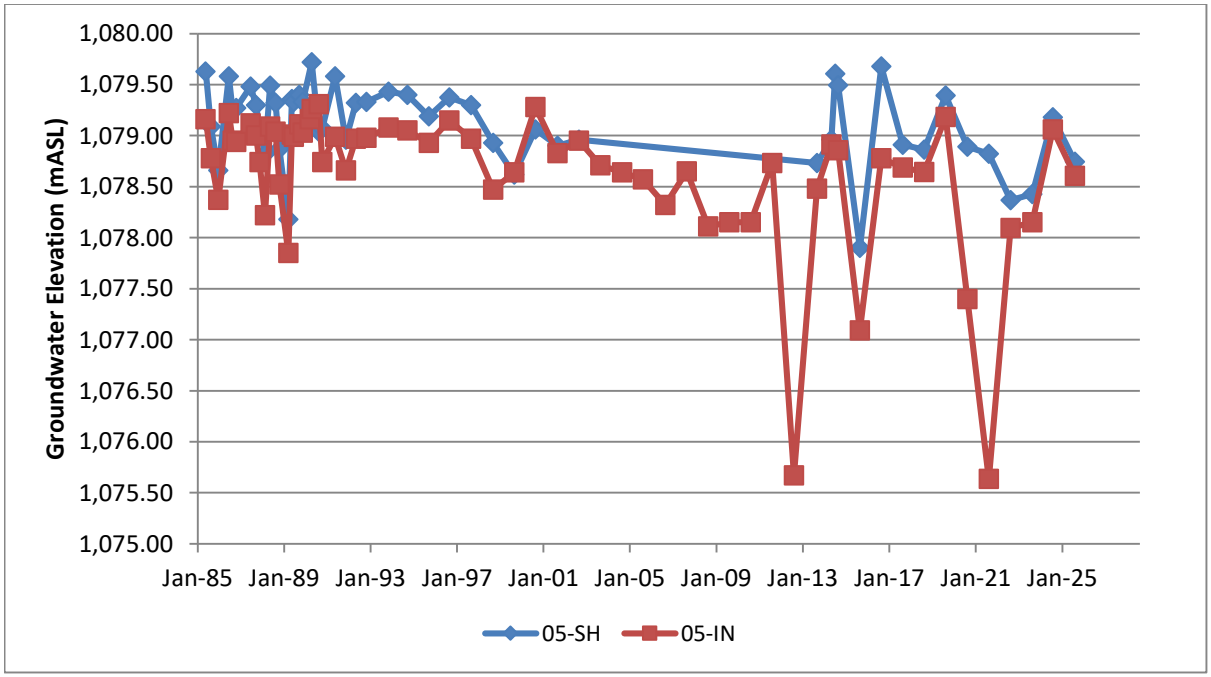


Figure 10.5
VEOLIA, Swan Hills Treatment Centre
Well Series 05 Hydrographs



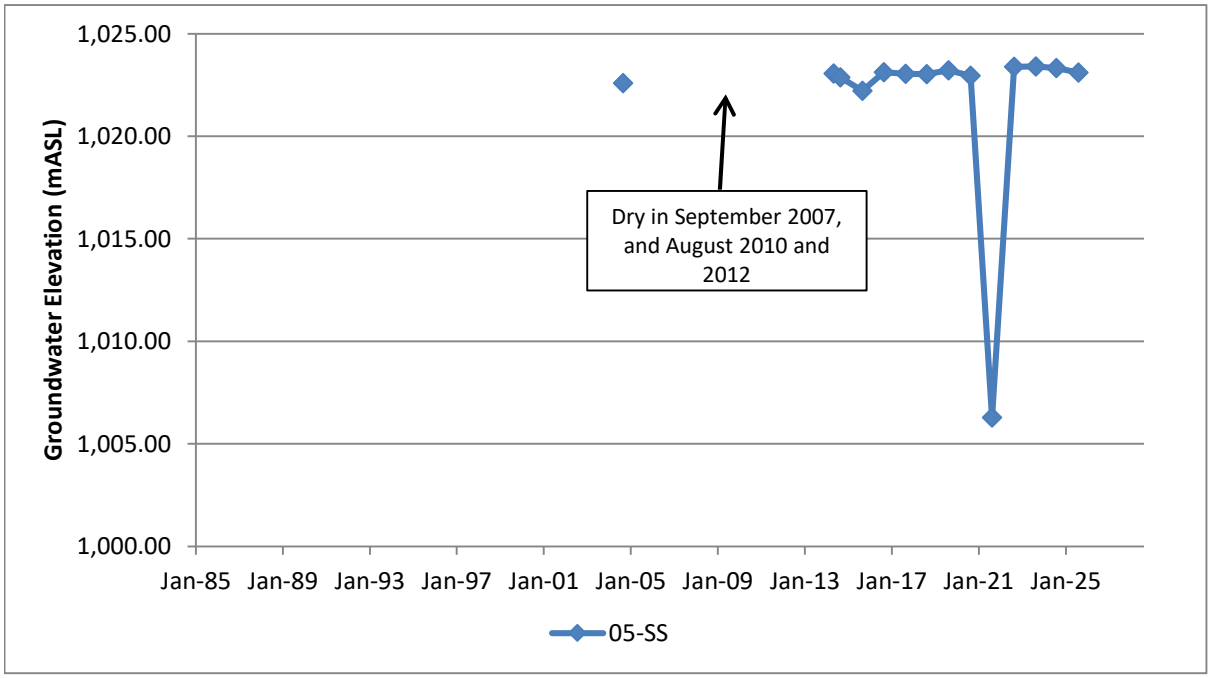


Figure 10.6
VEOLIA, Swan Hills Treatment Centre
Well Series 06 Hydrograph

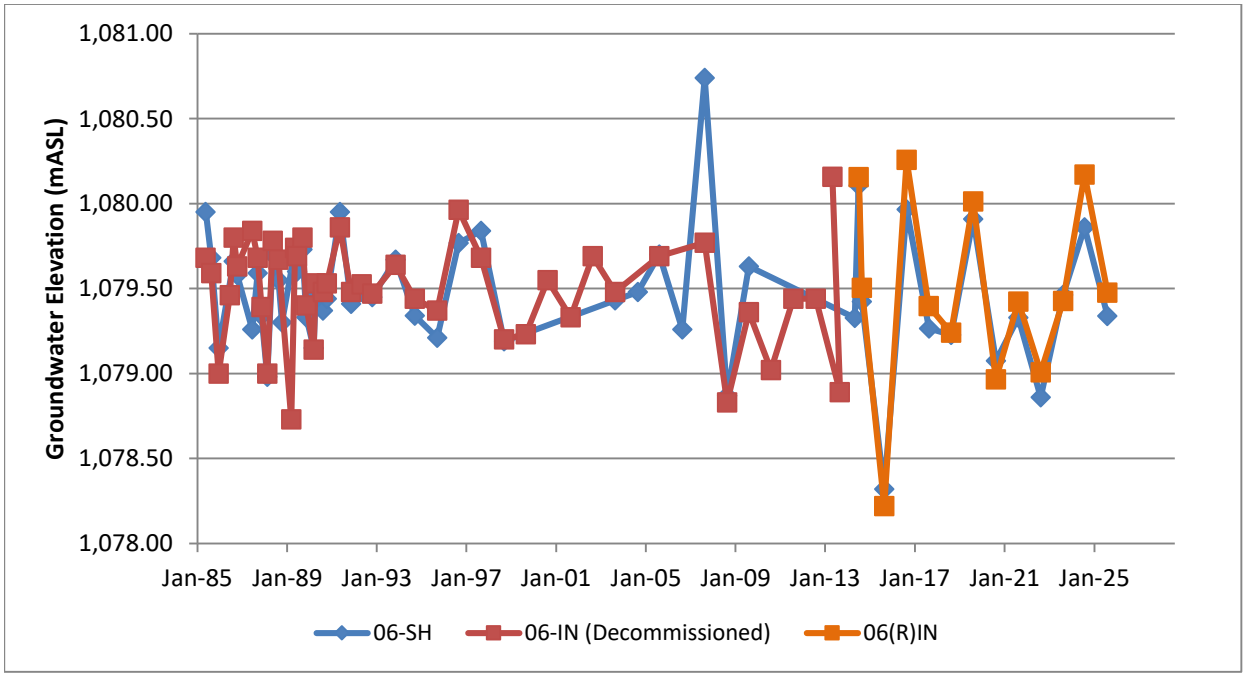
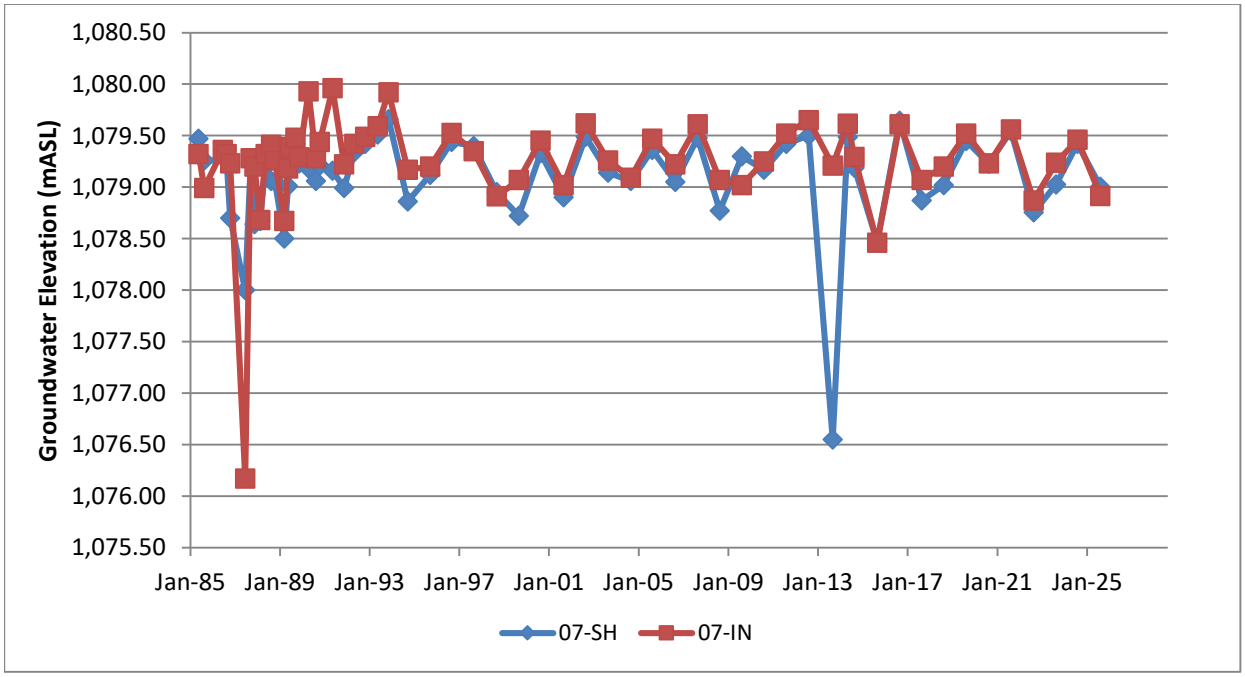
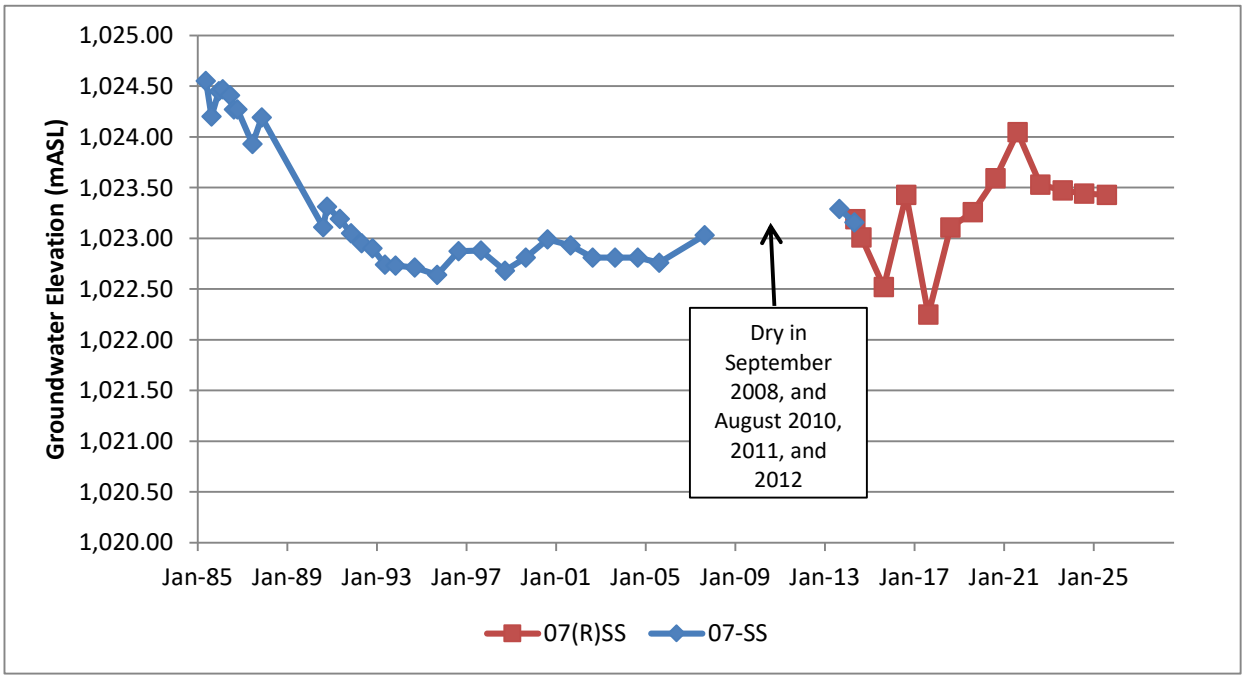


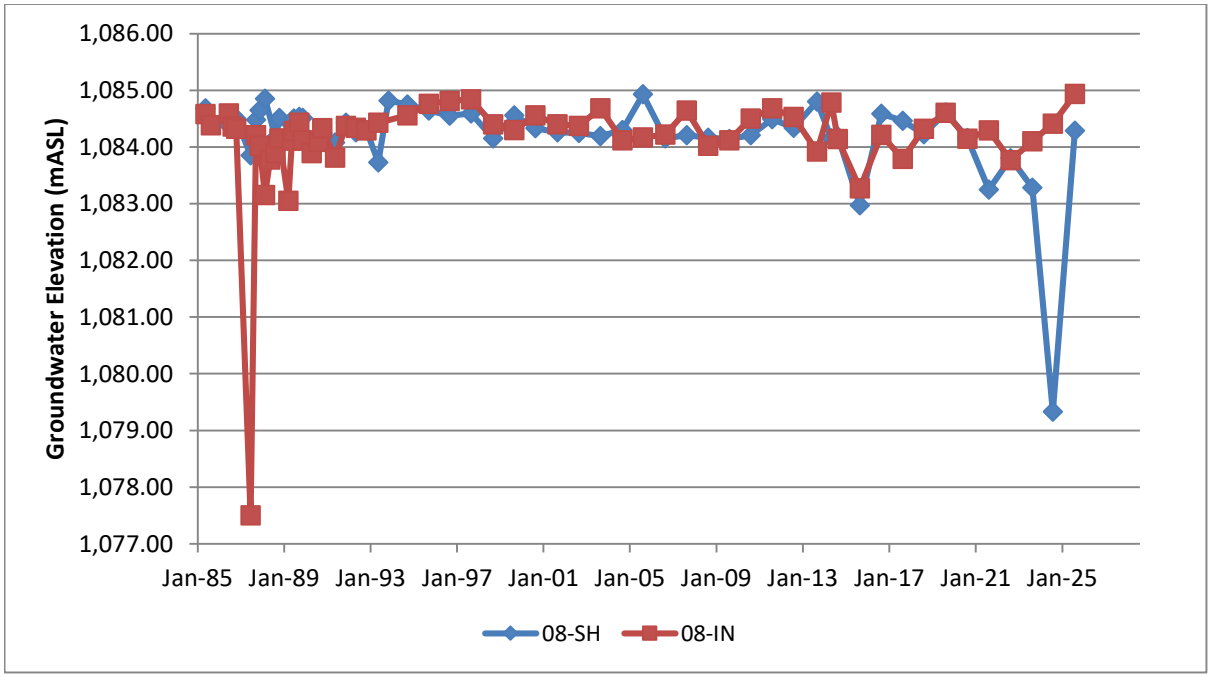
Figure 10.7
VEOLIA, Swan Hills Treatment Centre
Well Series 07 Hydrographs





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Figure 10.8
VEOLIA, Swan Hills Treatment Centre
Well Series 08 Hydrographs



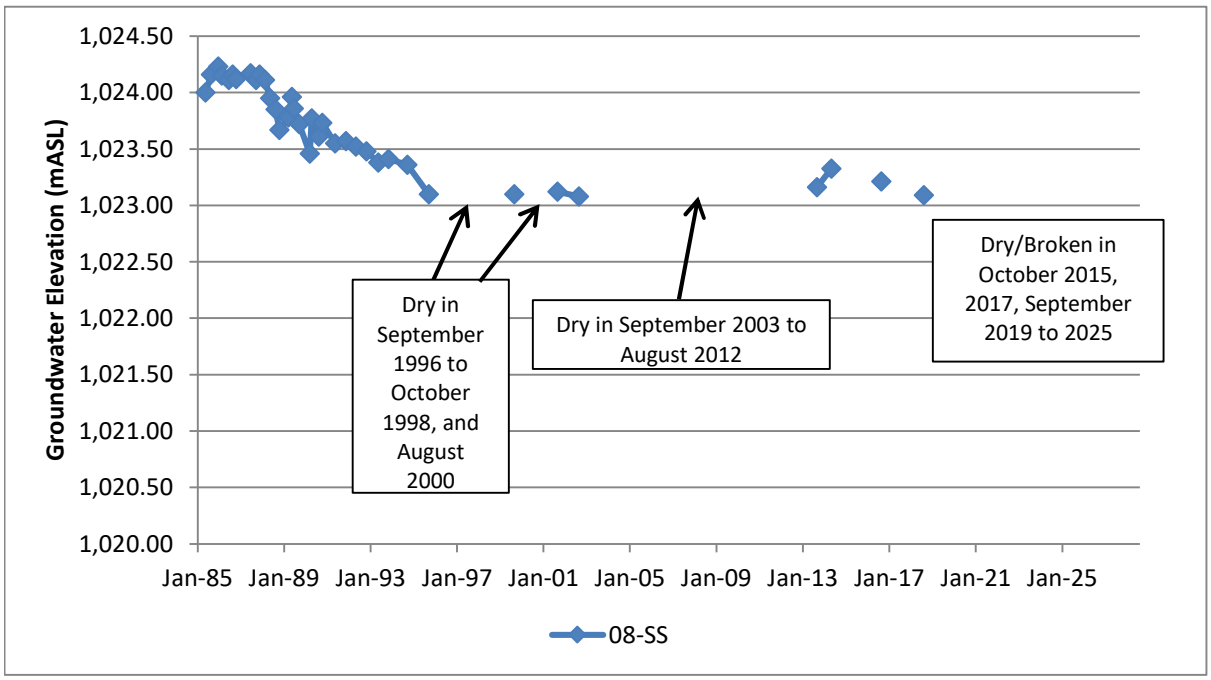


Figure 10.9
VEOLIA, Swan Hills Treatment Centre
Well Series 09 (Decommissioned) Hydrograph

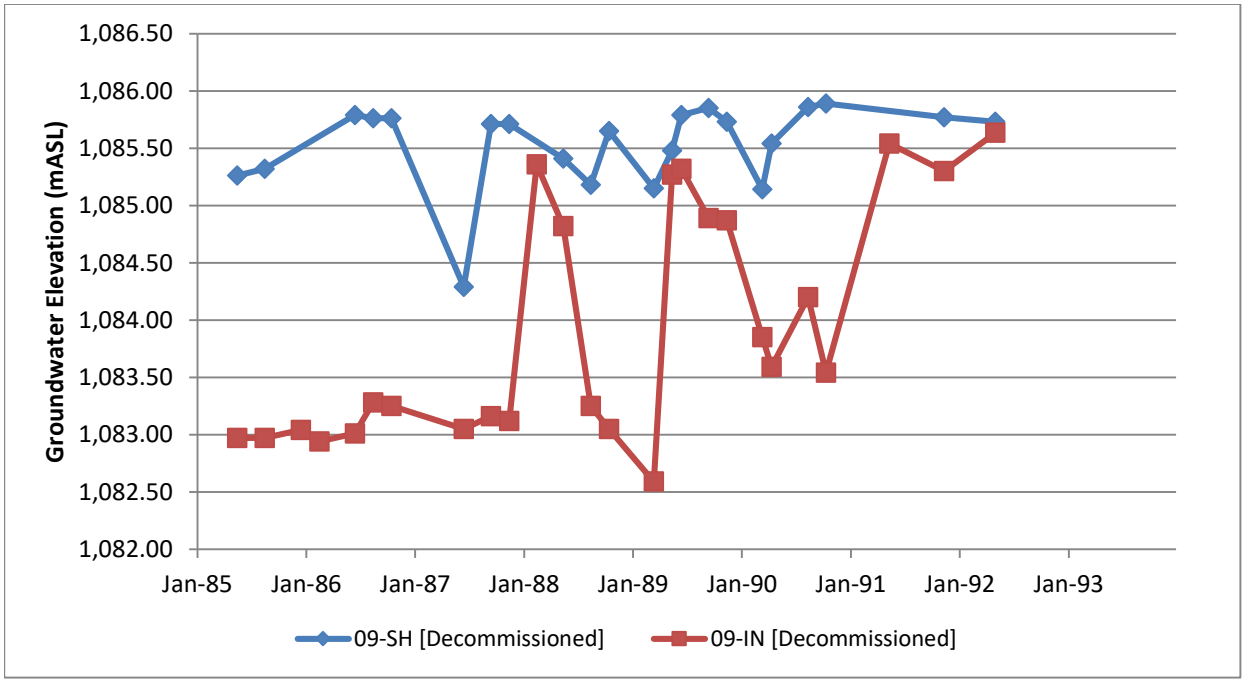


Figure 10.10
VEOLIA, Swan Hills Treatment Centre
Well Series 10 (Decommissioned) Hydrograph

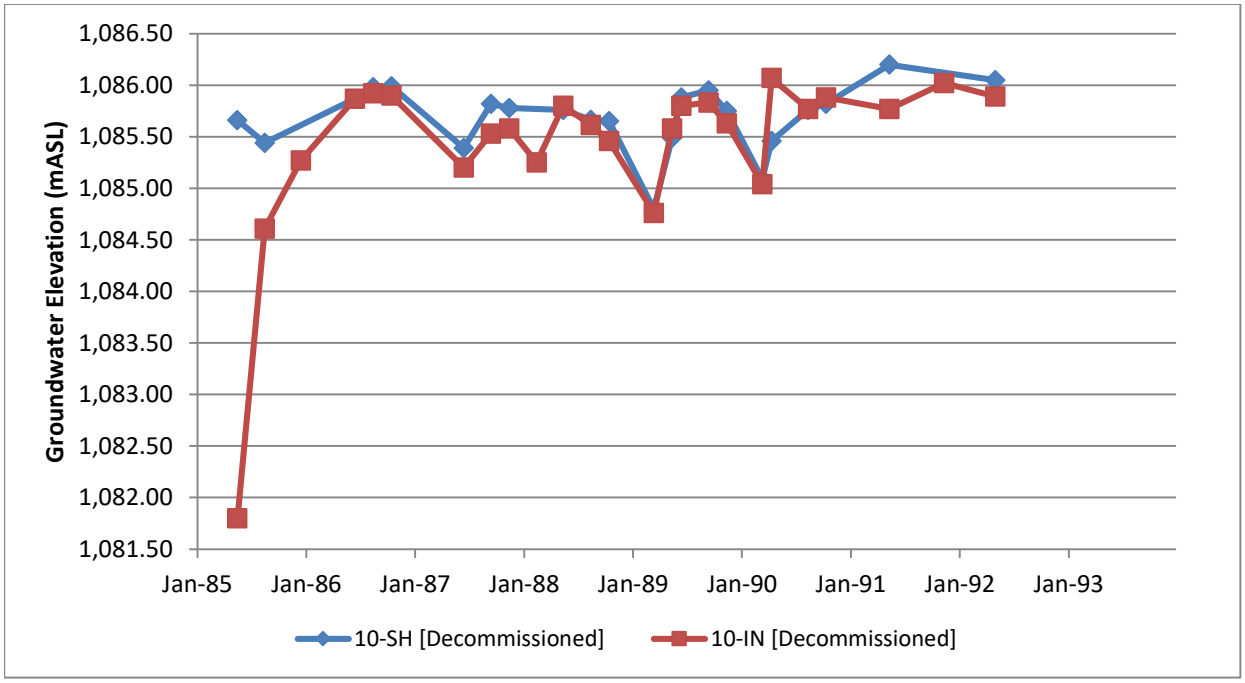
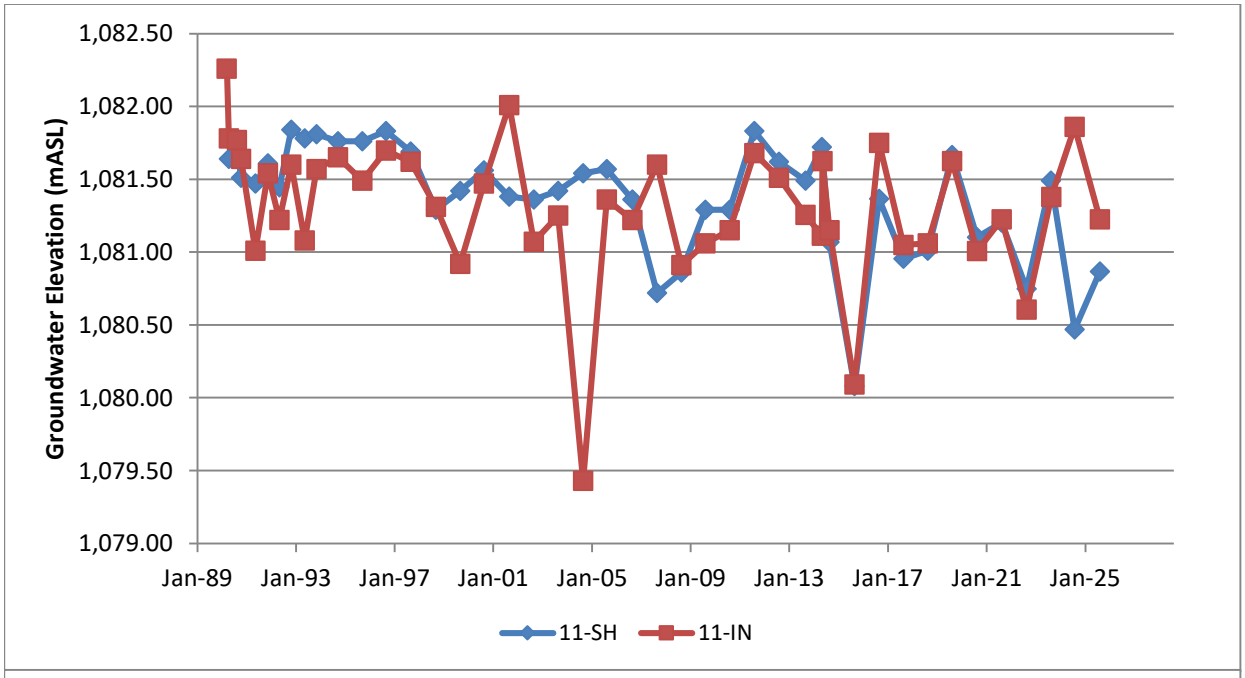


Figure 10.11
VEOLIA, Swan Hills Treatment Centre
Well Series 11 Hydrographs



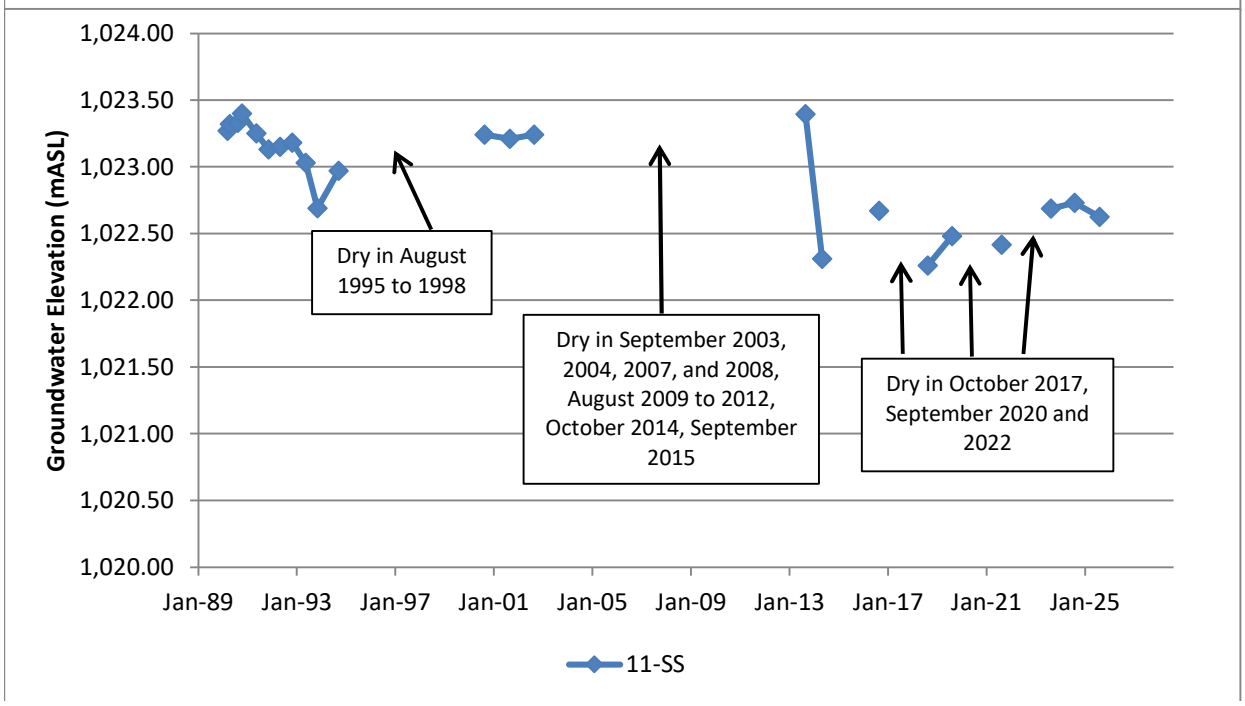


Figure 10.12
VEOLIA, Swan Hills Treatment Centre
Well Series 12 Hydrographs

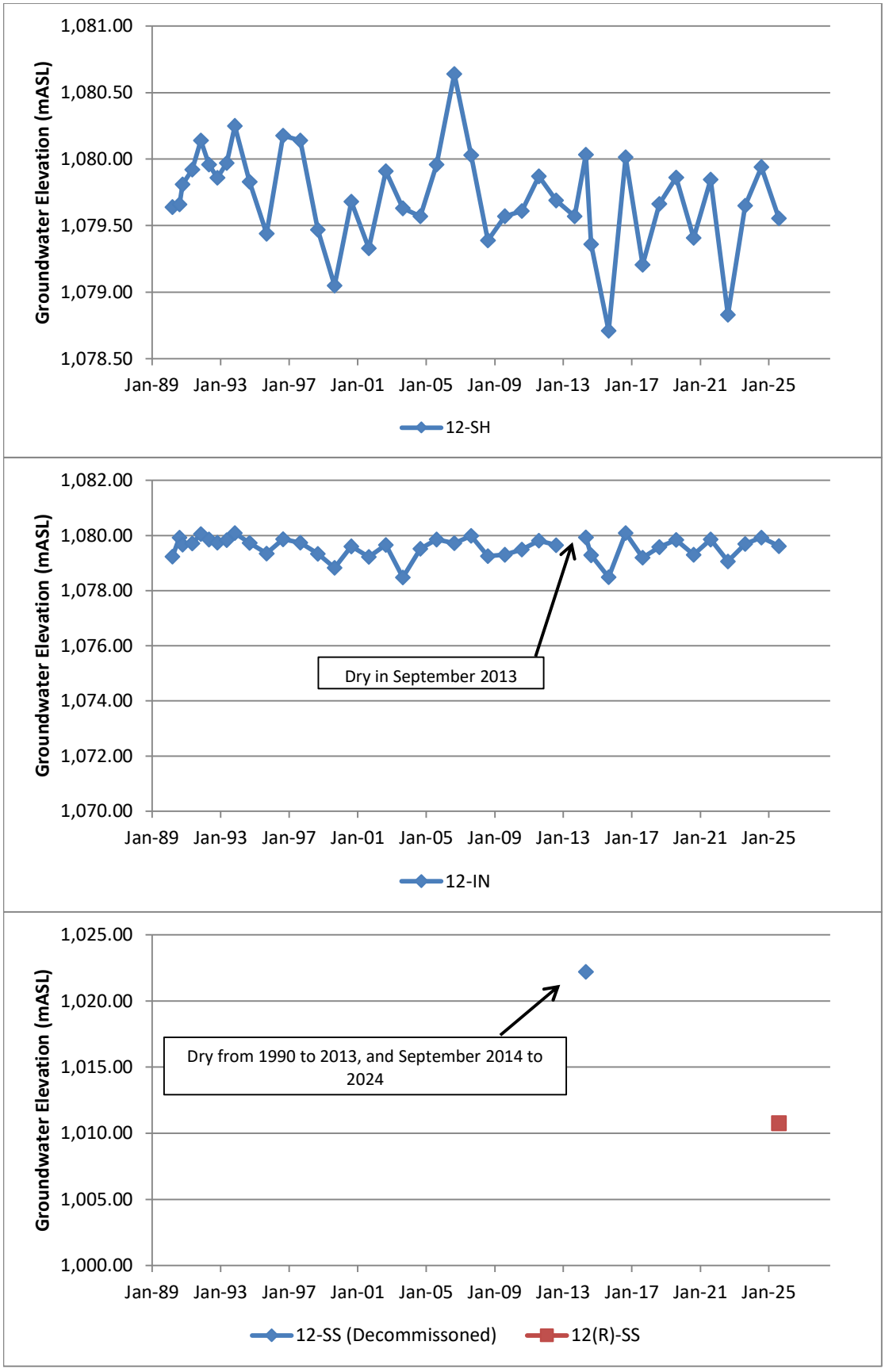
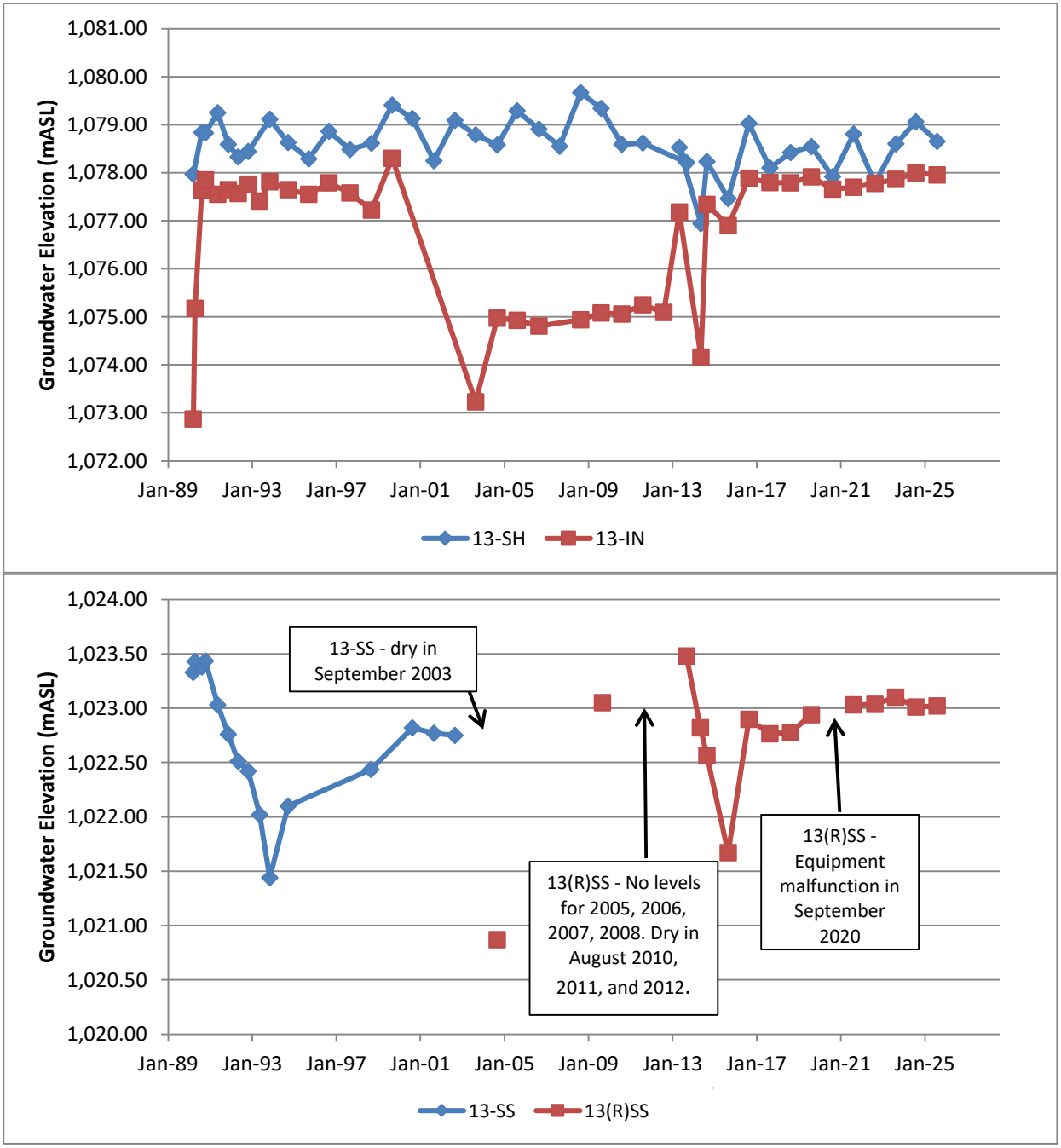
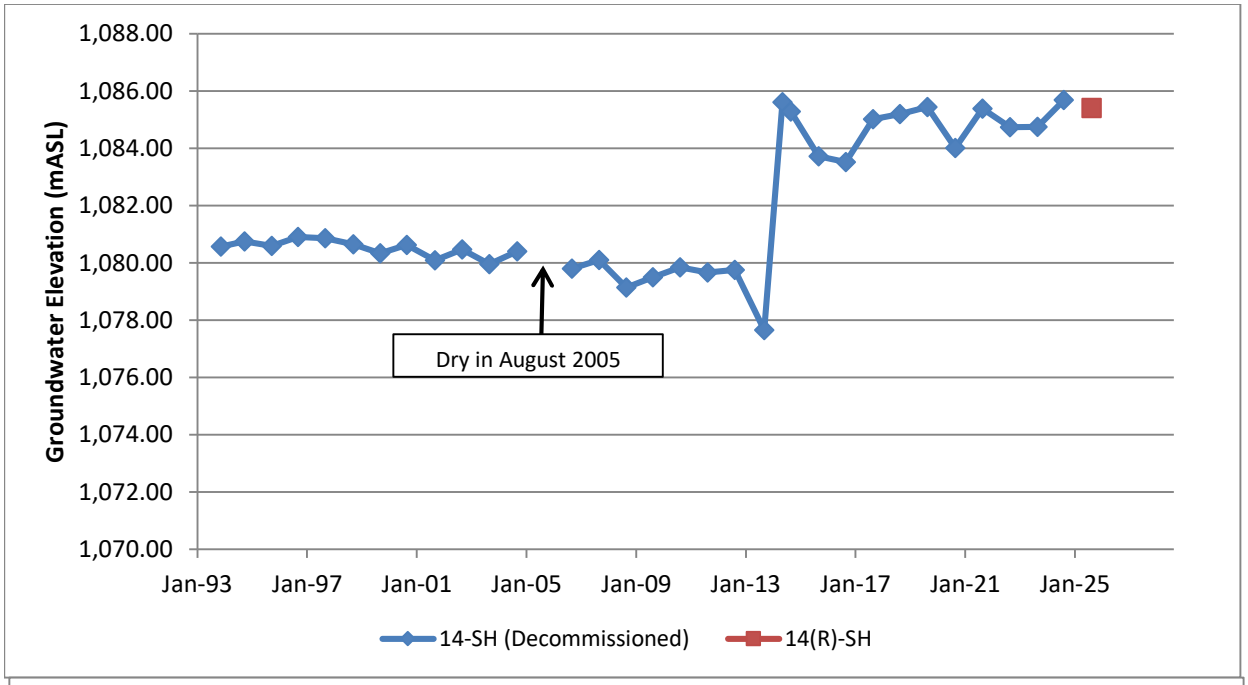


Figure 10.13
VEOLIA, Swan Hills Treatment Centre
Well Series 13 Hydrographs



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Figure 10.14
VEOLIA, Swan Hills Treatment Centre
Well Series 14 Hydrographs



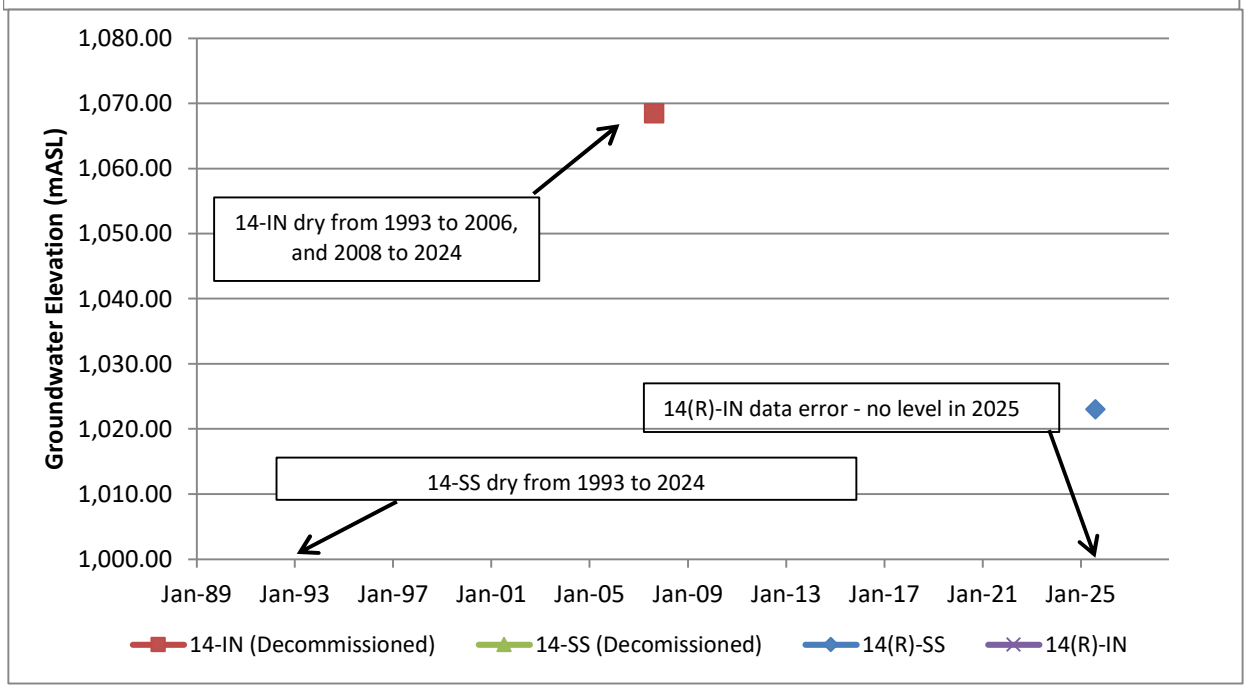
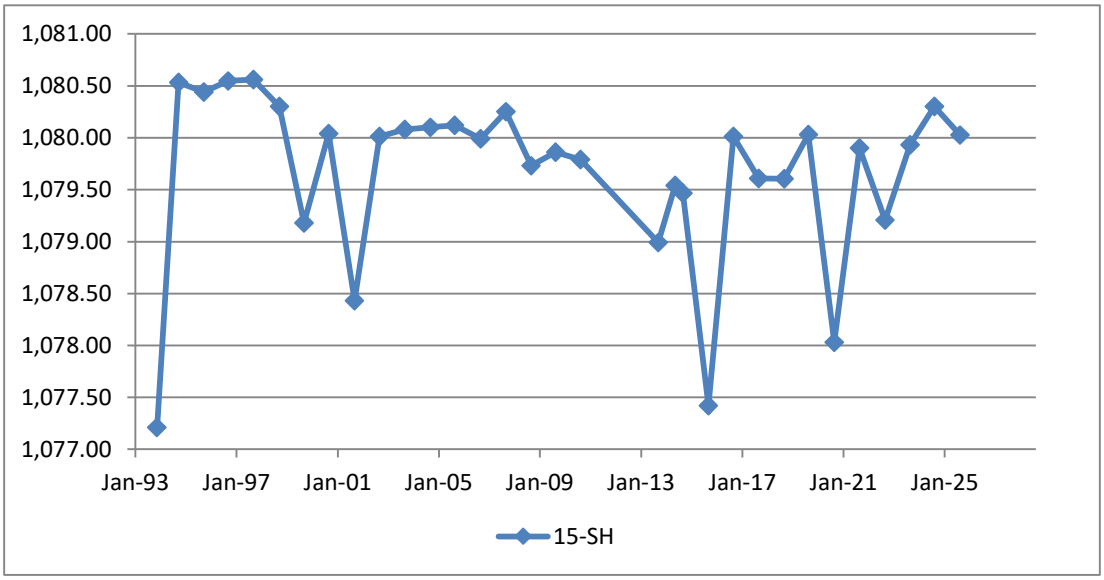
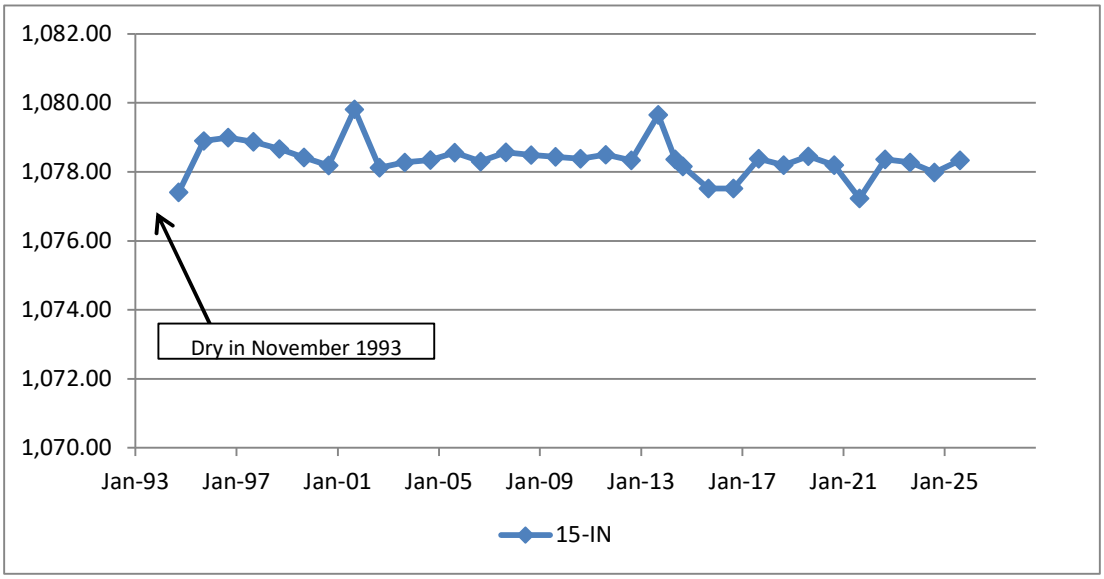


Figure 10.15
VEOLIA, Swan Hills Treatment Centre
Well Series 15 Hydrographs





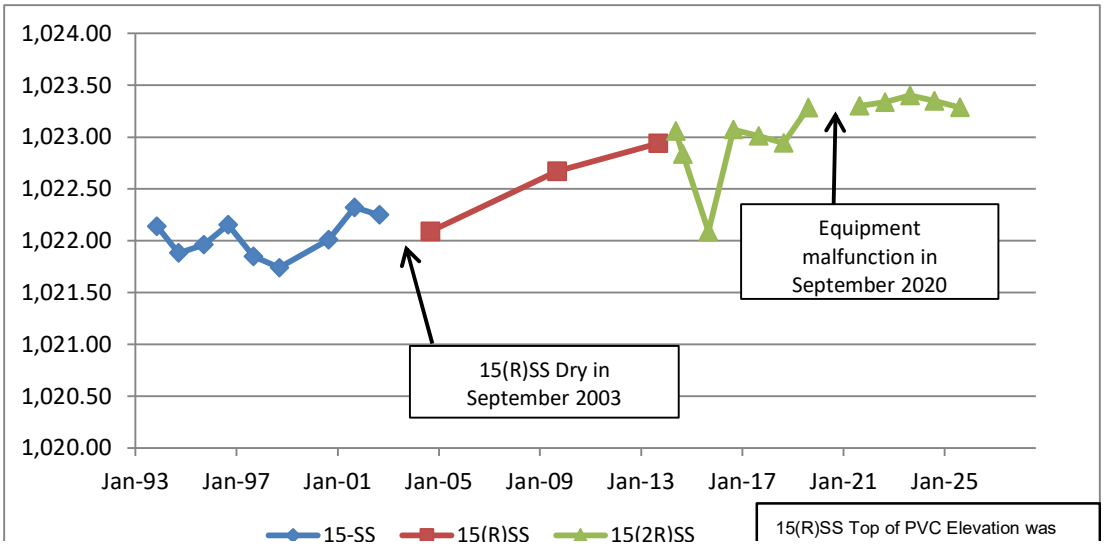


Figure 10.16
VEOLIA, Swan Hills Treatment Centre
Well Series 16 Hydrographs

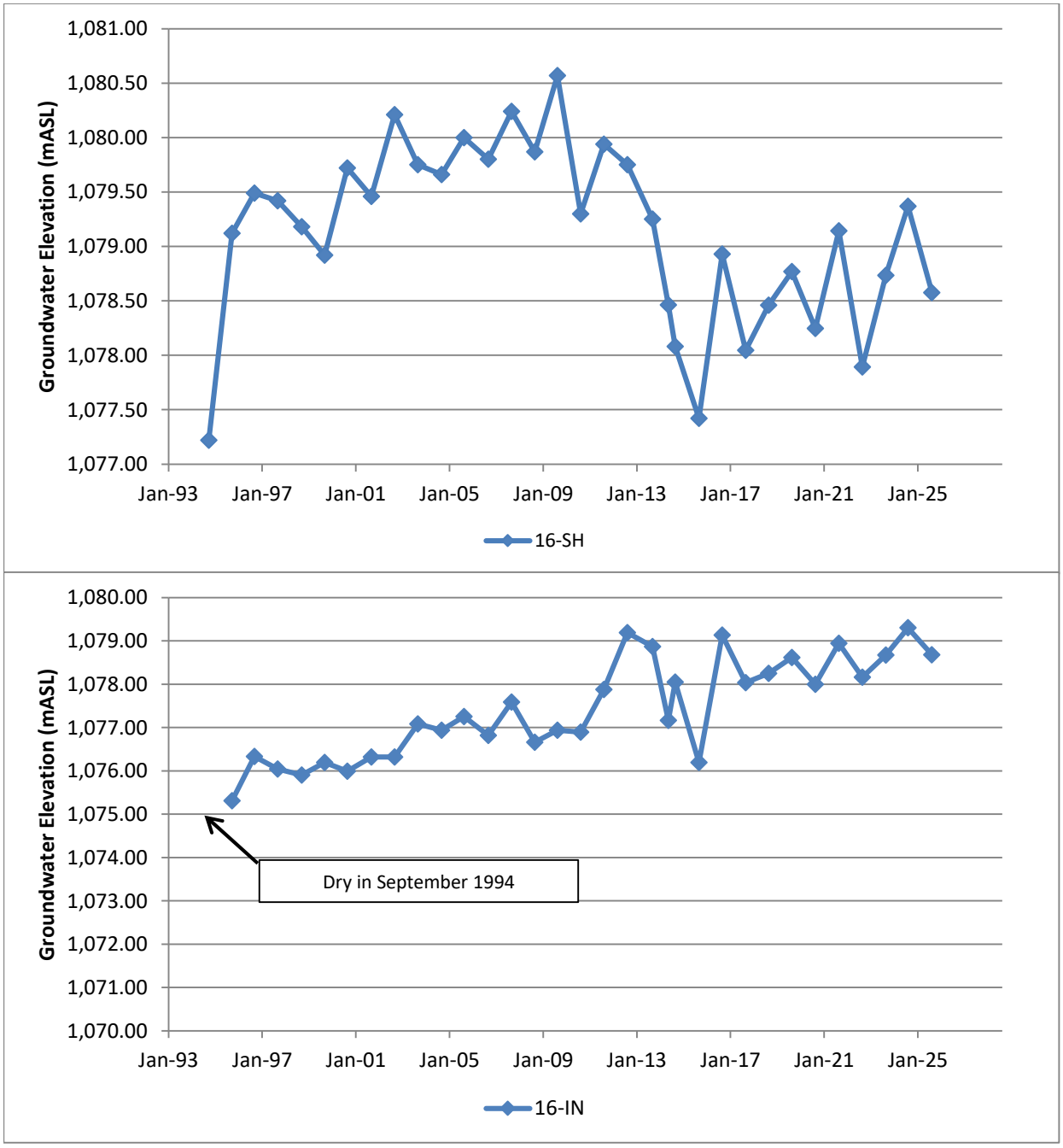
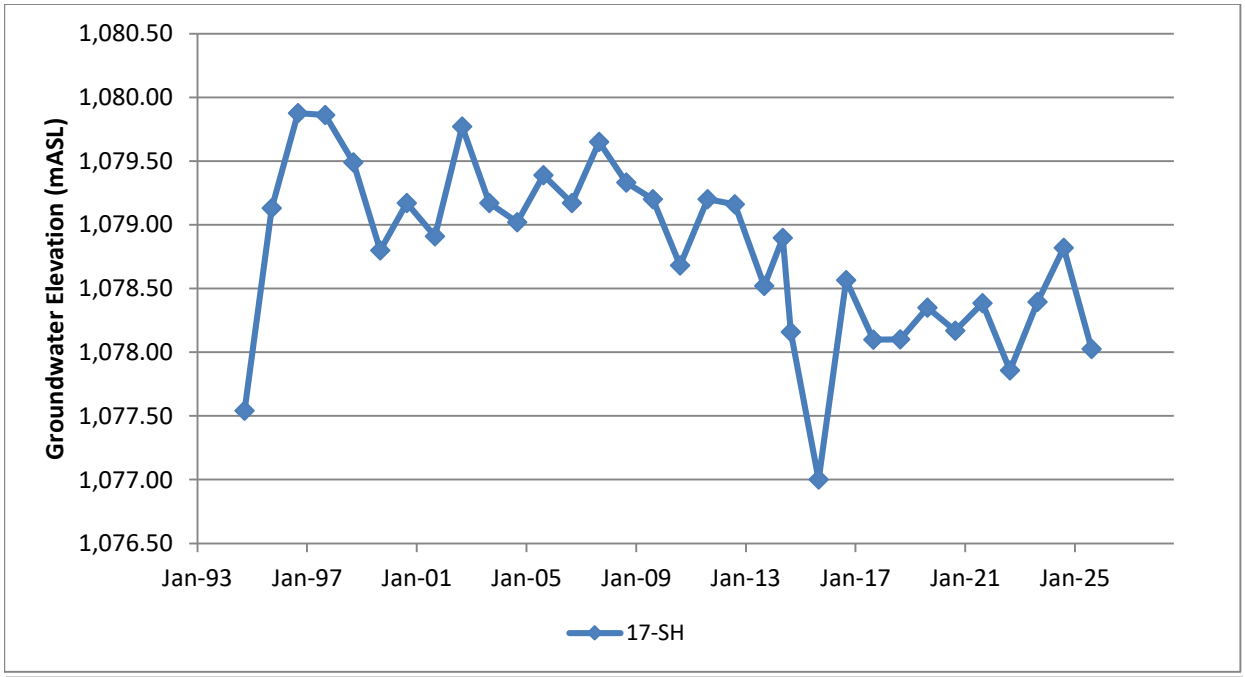
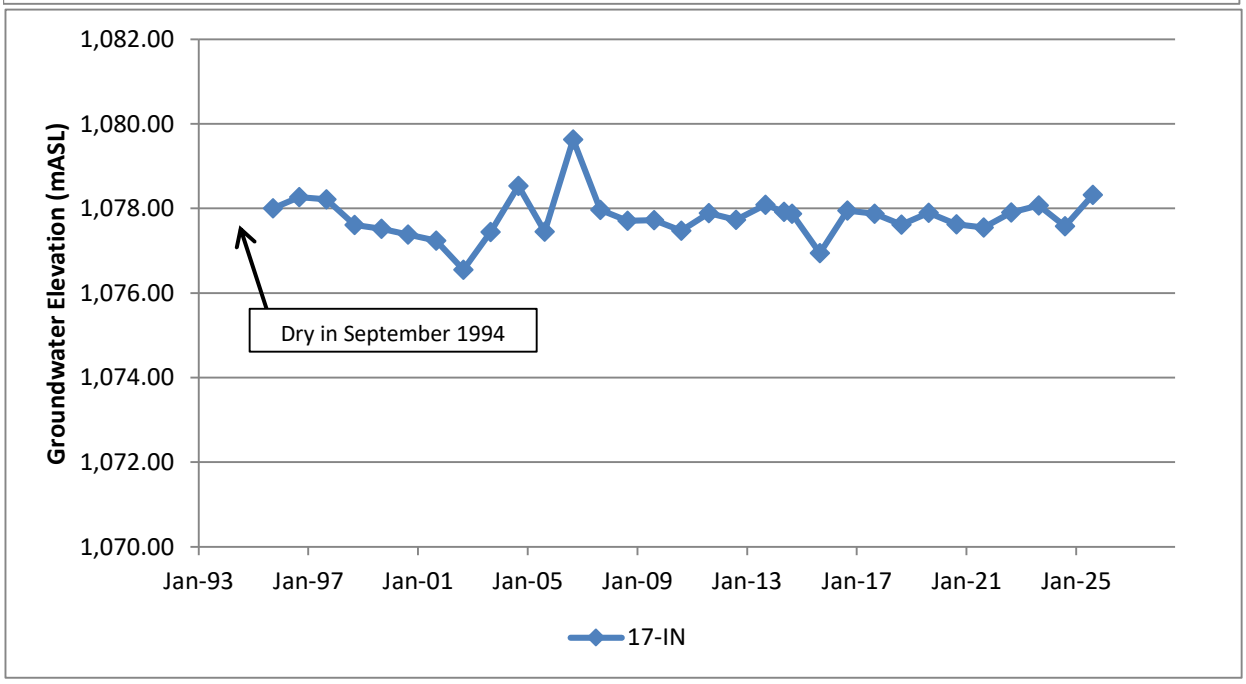
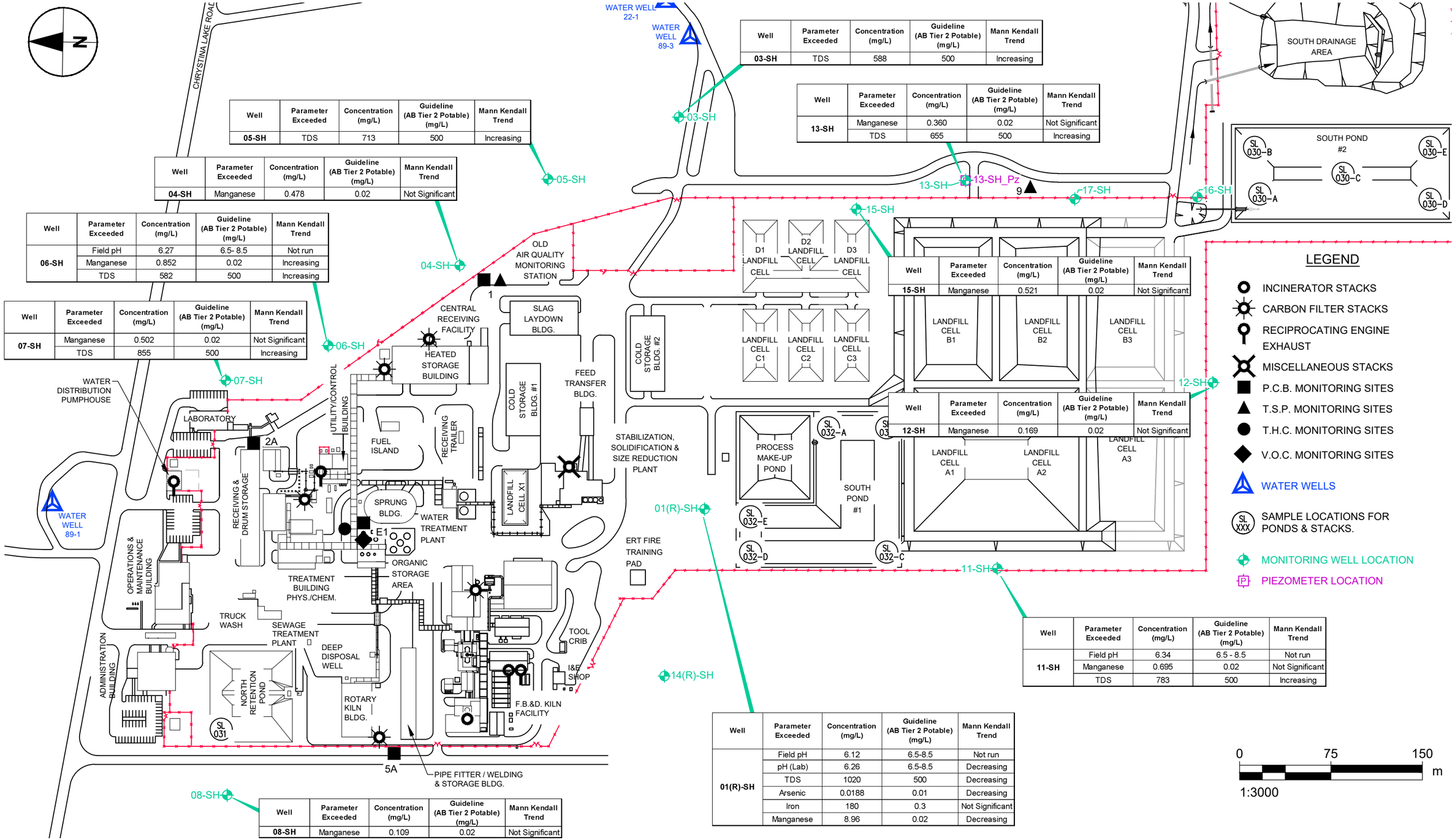


Figure 10.17
VEOLIA, Swan Hills Treatment Centre
Well Series 17 Hydrographs







Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
03-SH	TDS	588	500	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
13-SH	Manganese	0.360	0.02	Not Significant
	TDS	655	500	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
05-SH	TDS	713	500	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
04-SH	Manganese	0.478	0.02	Not Significant

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
06-SH	Field pH	6.27	6.5- 8.5	Not run
	Manganese	0.852	0.02	Increasing
	TDS	582	500	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
07-SH	Manganese	0.502	0.02	Not Significant
	TDS	855	500	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
15-SH	Manganese	0.521	0.02	Not Significant

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
12-SH	Manganese	0.169	0.02	Not Significant

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
11-SH	Field pH	6.34	6.5 - 8.5	Not run
	Manganese	0.695	0.02	Not Significant
	TDS	783	500	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
01(R)-SH	Field pH	6.12	6.5-8.5	Not run
	pH (Lab)	6.26	6.5-8.5	Decreasing
	TDS	1020	500	Decreasing
	Arsenic	0.0188	0.01	Decreasing
	Iron	180	0.3	Not Significant
	Manganese	8.96	0.02	Decreasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
08-SH	Manganese	0.109	0.02	Not Significant

LEGEND

- INCINERATOR STACKS
- CARBON FILTER STACKS
- RECIPROCATING ENGINE EXHAUST
- MISCELLANEOUS STACKS
- P.C.B. MONITORING SITES
- T.S.P. MONITORING SITES
- T.H.C. MONITORING SITES
- V.O.C. MONITORING SITES
- WATER WELLS
- SAMPLE LOCATIONS FOR PONDS & STACKS.
- MONITORING WELL LOCATION
- PIEZOMETER LOCATION

0 75 150 m

1:3000

Issue Status: FINAL

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm

Last saved by: KURIANS(2026-03-19) Last Plotted: 2026-03-30
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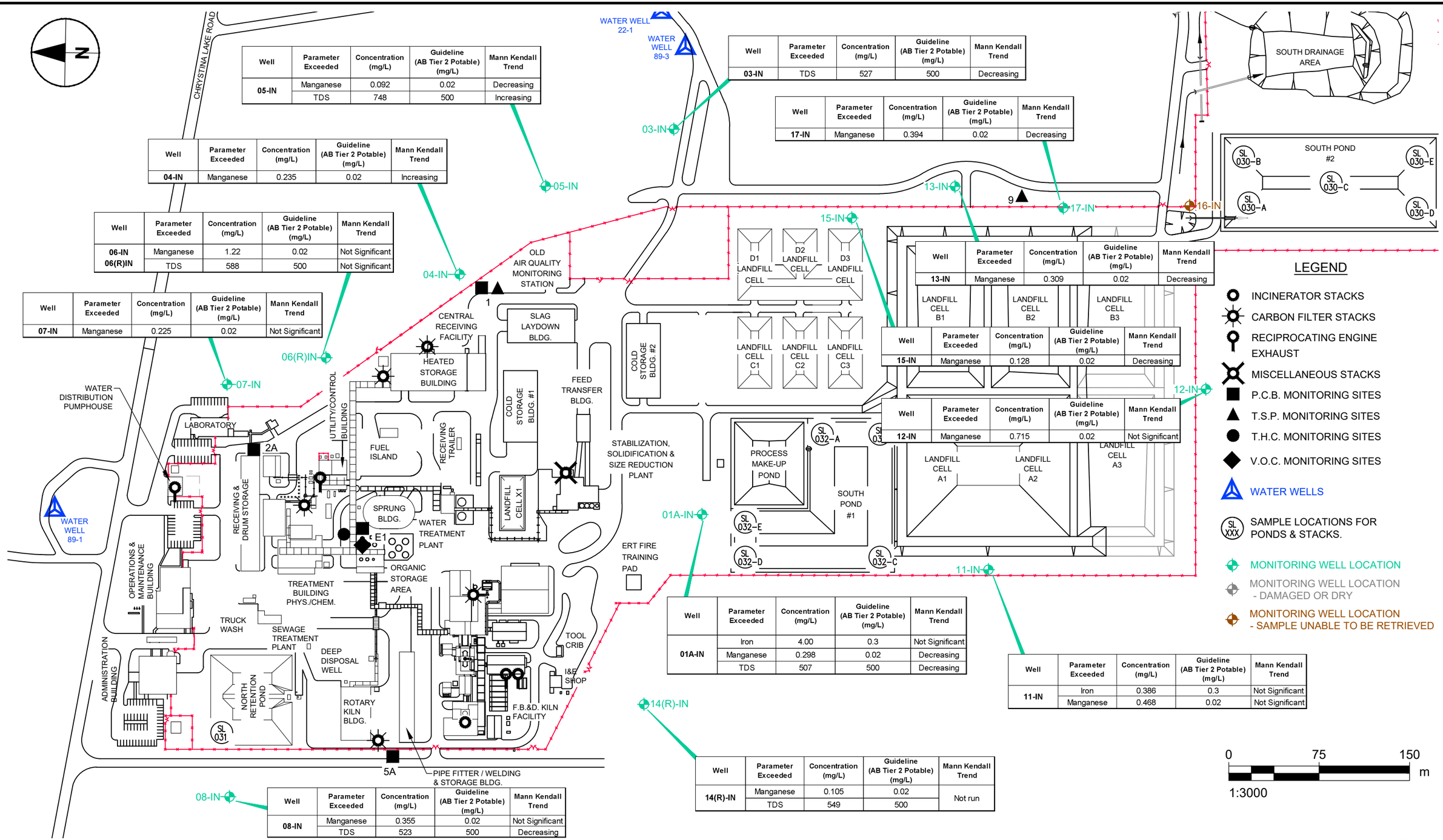
2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

2025 Alberta Tier 2 Potable Groundwater Exceedances
Shallow Interval Wells

AECOM

Figure 11.1

Project Management Initials: ____ Designer: ____
Checked: ____ Approved: ____
ANSI B 279.4mm x 431.8mm
Last saved by: KURIANS(2026-03-19) Last Plotted: 2026-03-30
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Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
05-IN	Manganese	0.092	0.02	Decreasing
	TDS	748	500	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
04-IN	Manganese	0.235	0.02	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
06-IN 06(R)IN	Manganese	1.22	0.02	Not Significant
	TDS	588	500	Not Significant

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
07-IN	Manganese	0.225	0.02	Not Significant

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
08-IN	Manganese	0.355	0.02	Not Significant
	TDS	523	500	Decreasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
03-IN	TDS	527	500	Decreasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
17-IN	Manganese	0.394	0.02	Decreasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
13-IN	Manganese	0.309	0.02	Decreasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
15-IN	Manganese	0.128	0.02	Decreasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
12-IN	Manganese	0.715	0.02	Not Significant

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
01A-IN	Iron	4.00	0.3	Not Significant
	Manganese	0.298	0.02	Decreasing
	TDS	507	500	Decreasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
14(R)-IN	Manganese	0.105	0.02	Not run
	TDS	549	500	

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
11-IN	Iron	0.386	0.3	Not Significant
	Manganese	0.468	0.02	Not Significant

LEGEND

- INCINERATOR STACKS
- CARBON FILTER STACKS
- RECIPROCATING ENGINE EXHAUST
- MISCELLANEOUS STACKS
- P.C.B. MONITORING SITES
- T.S.P. MONITORING SITES
- T.H.C. MONITORING SITES
- V.O.C. MONITORING SITES
- WATER WELLS
- SAMPLE LOCATIONS FOR PONDS & STACKS. (SL XXX)
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION - DAMAGED OR DRY
- MONITORING WELL LOCATION - SAMPLE UNABLE TO BE RETRIEVED

0 75 150 m

1:3000

Issue Status: FINAL

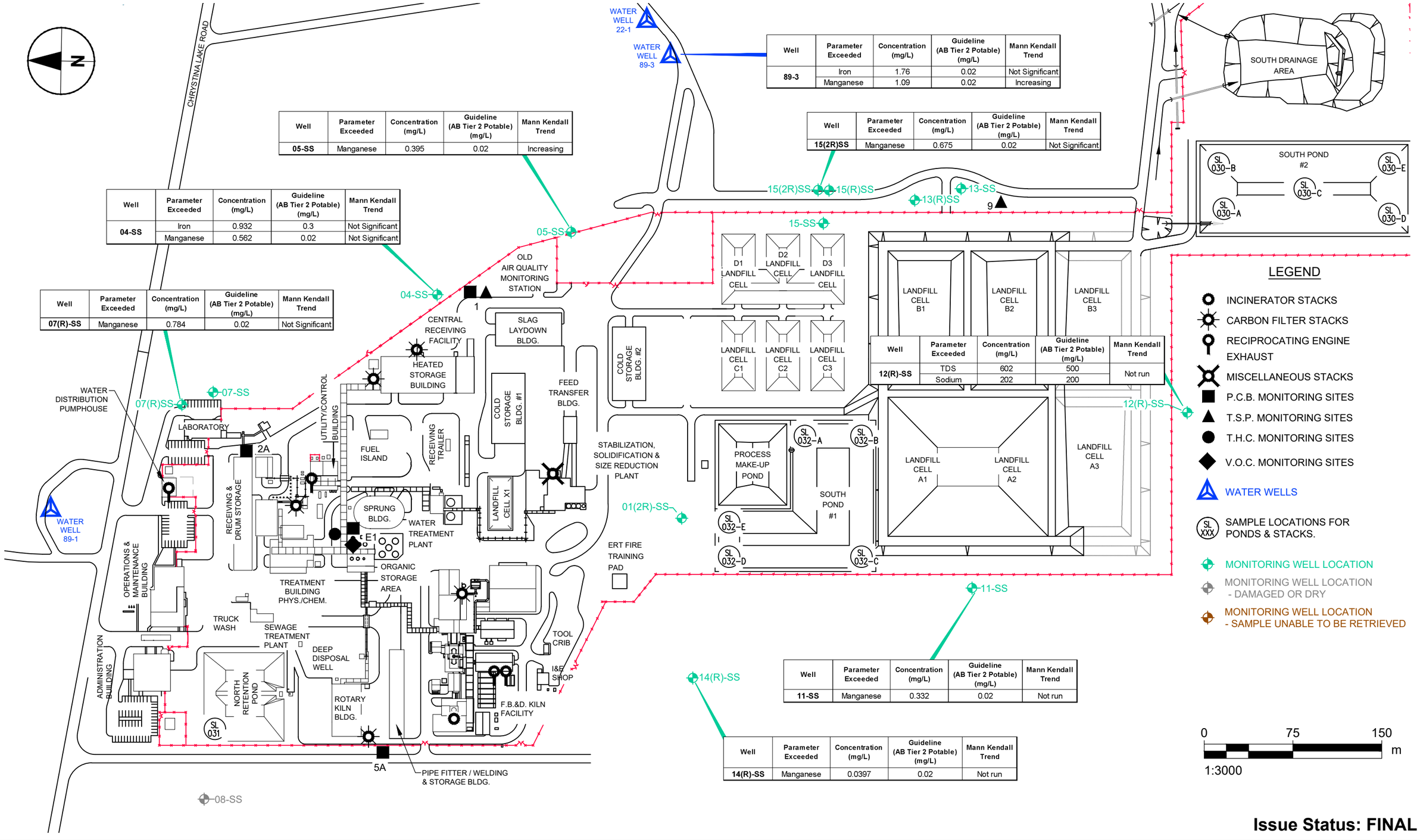
2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

2025 Alberta Tier 2 Potable Groundwater Exceedances
Intermediate Interval Wells

AECOM

Figure 11.2

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm
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Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
89-3	Iron	1.76	0.02	Not Significant
	Manganese	1.09	0.02	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
05-SS	Manganese	0.395	0.02	Increasing

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
15(2R)SS	Manganese	0.675	0.02	Not Significant

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
04-SS	Iron	0.932	0.3	Not Significant
	Manganese	0.562	0.02	Not Significant

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
07(R)-SS	Manganese	0.784	0.02	Not Significant

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
12(R)-SS	TDS	602	500	Not run
	Sodium	202	200	

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
11-SS	Manganese	0.332	0.02	Not run

Well	Parameter Exceeded	Concentration (mg/L)	Guideline (AB Tier 2 Potable) (mg/L)	Mann Kendall Trend
14(R)-SS	Manganese	0.0397	0.02	Not run

LEGEND

- INCINERATOR STACKS
- CARBON FILTER STACKS
- RECIPROCATING ENGINE EXHAUST
- MISCELLANEOUS STACKS
- P.C.B. MONITORING SITES
- T.S.P. MONITORING SITES
- T.H.C. MONITORING SITES
- V.O.C. MONITORING SITES
- WATER WELLS
- SAMPLE LOCATIONS FOR PONDS & STACKS.
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION - DAMAGED OR DRY
- MONITORING WELL LOCATION - SAMPLE UNABLE TO BE RETRIEVED

0 75 150 m

1:3000

Issue Status: FINAL

2025 Groundwater Monitoring Report
Swan Hills Treatment Centre
VEOLIA
Project No.: 60757940 Date: 2026-03-30

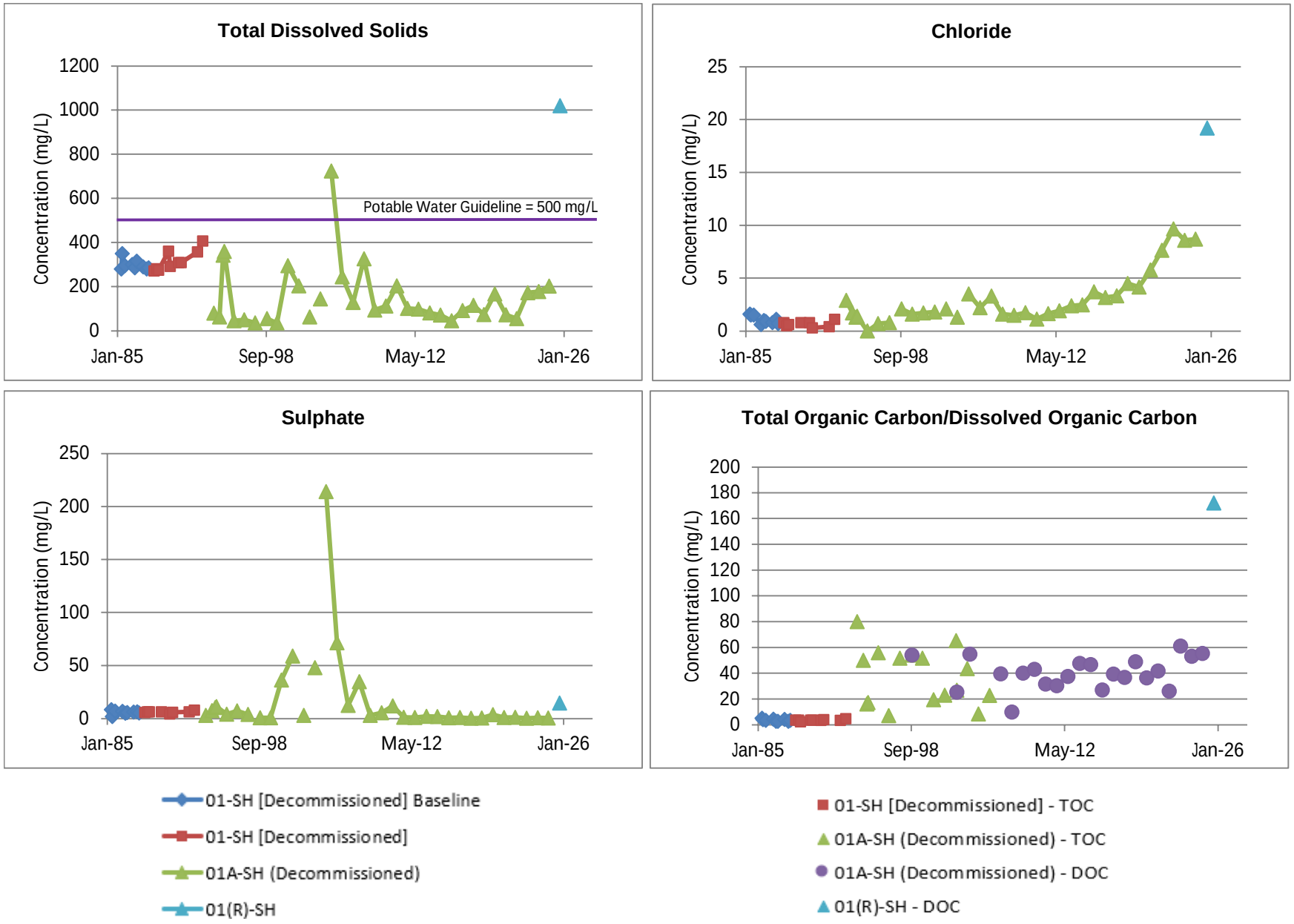
2025 Alberta Tier 2 Potable Groundwater Exceedances
Sandstone Interval Wells

AECOM

Figure 11.3

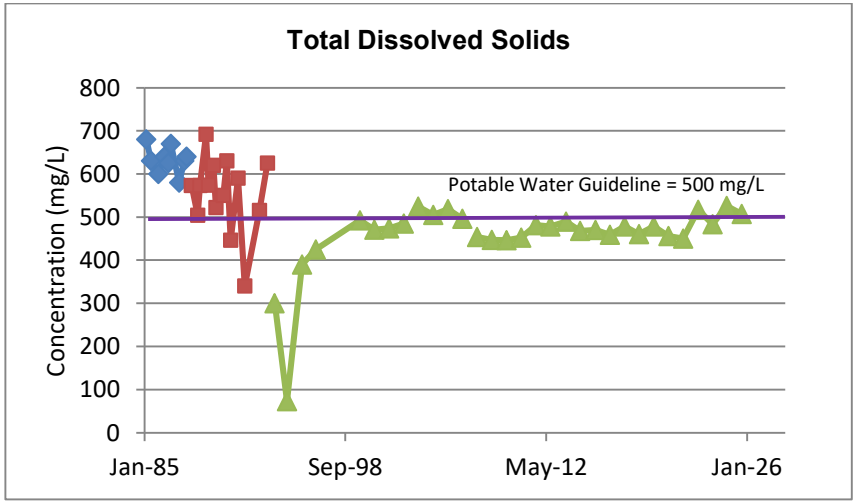
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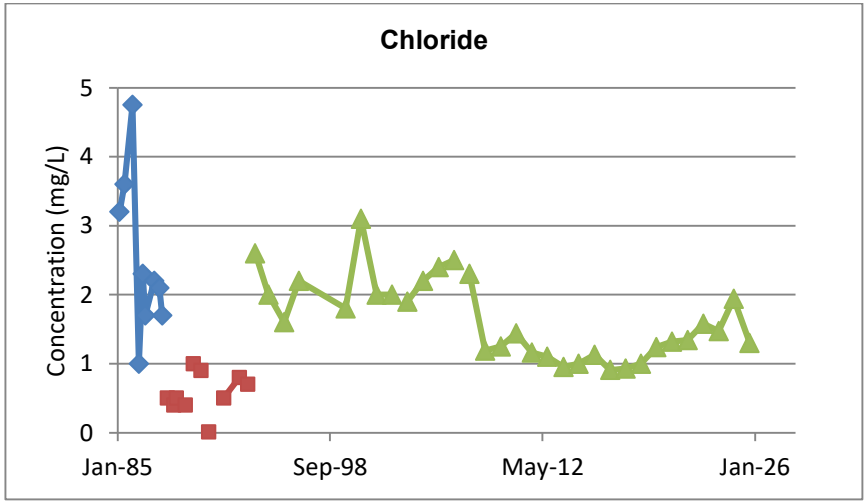
Figure 12.1
VEOLIA, Swan Hills Treatment Centre
01-SH, 01A-SH and 01(R)-SH - Indicators

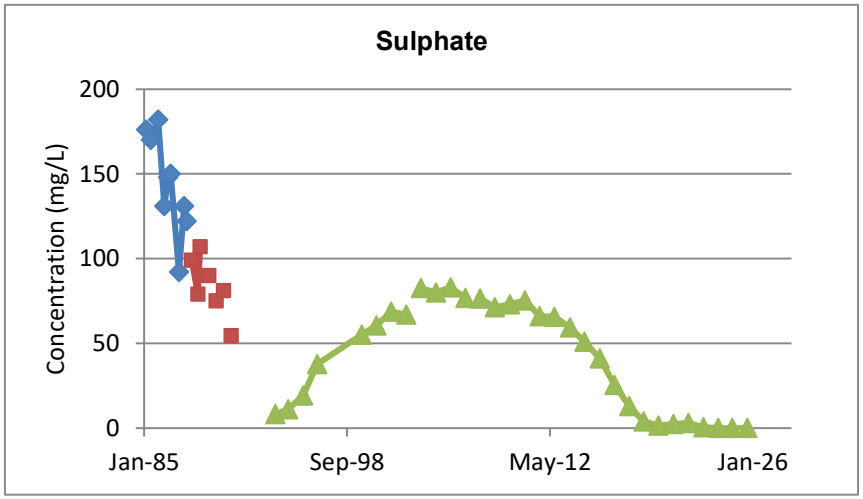


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Figure 12.2
VEOLIA, Swan Hills Treatment Centre
01-IN and 01A-IN - Indicators







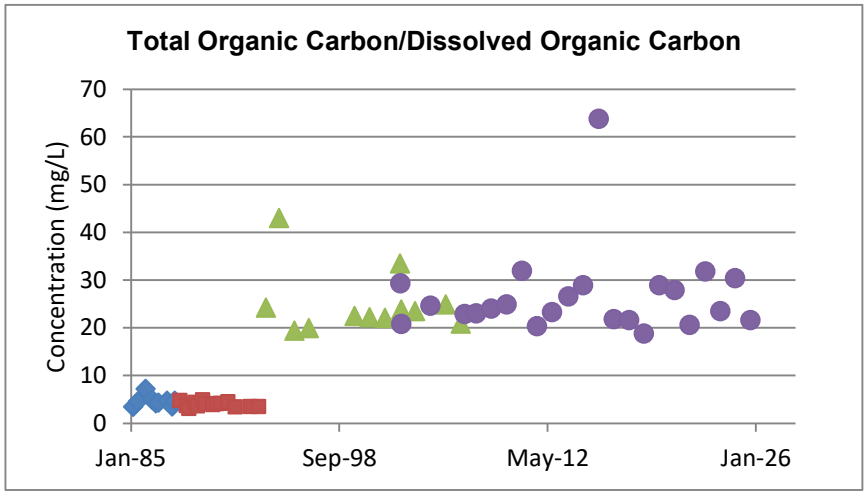
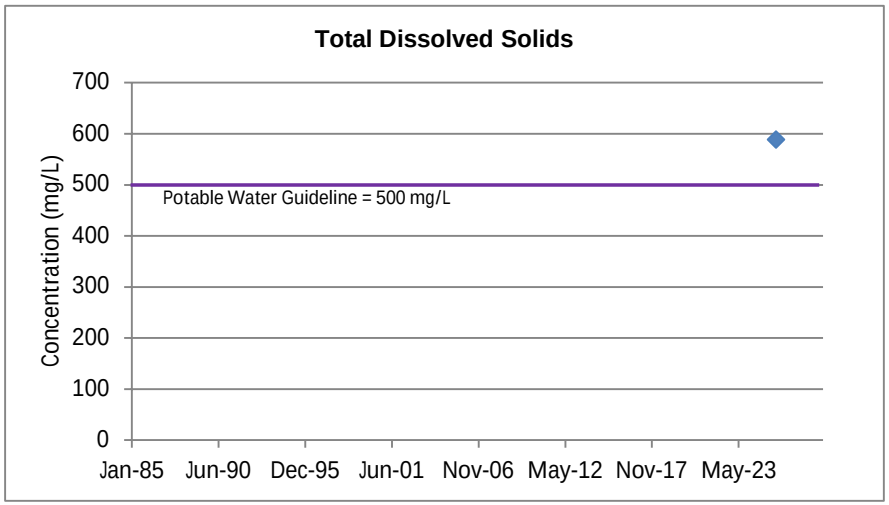
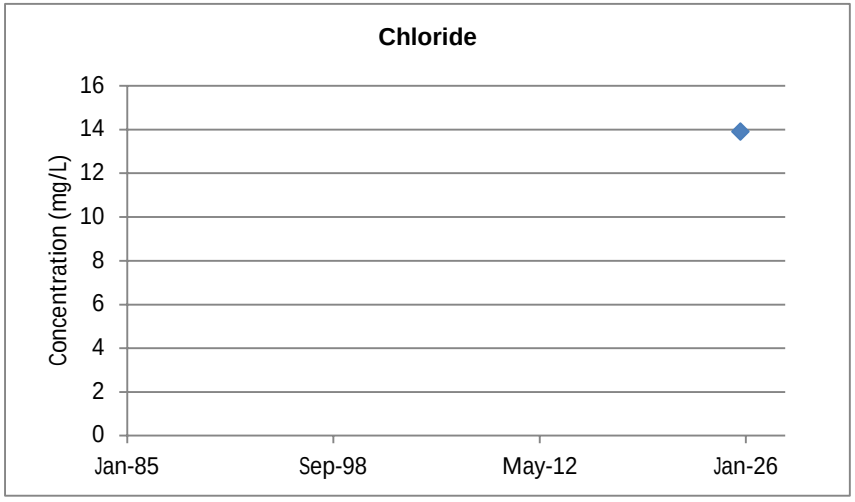


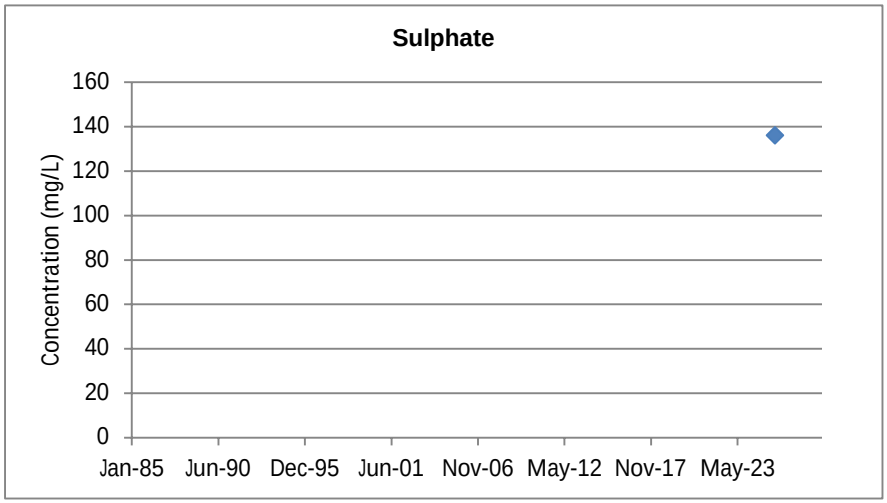


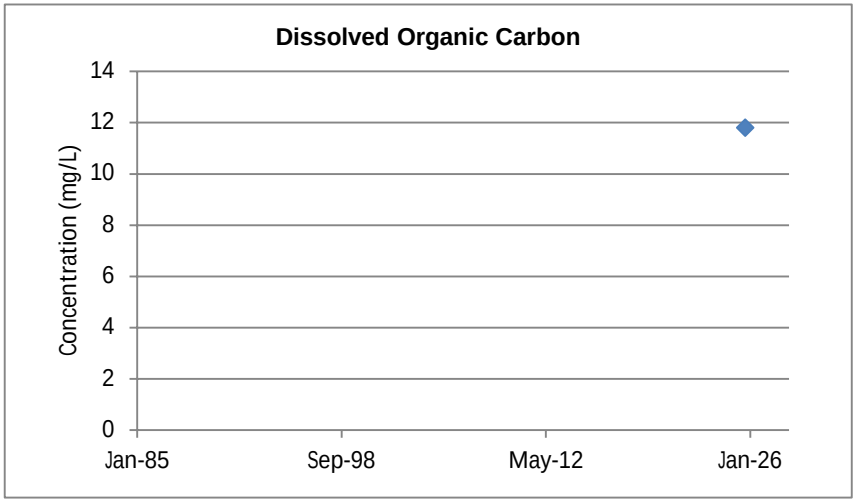


Figure 12.3
VEOLIA, Swan Hills Treatment Centre
01(2R)-SS - Indicators





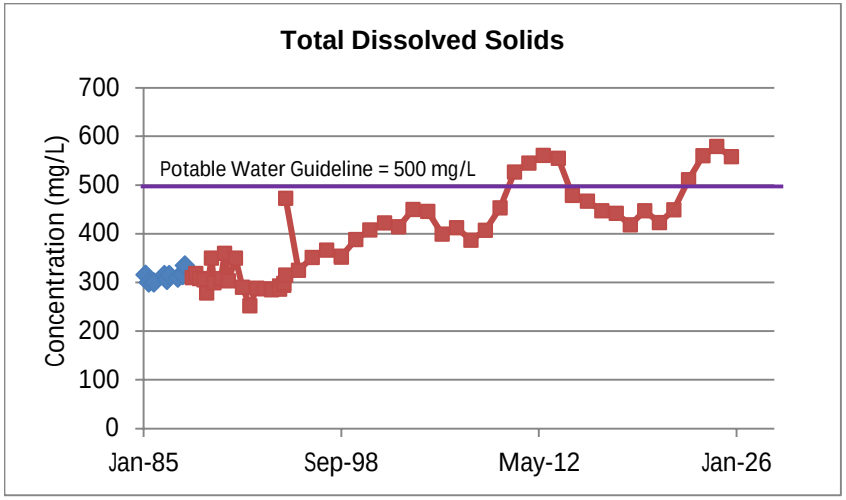


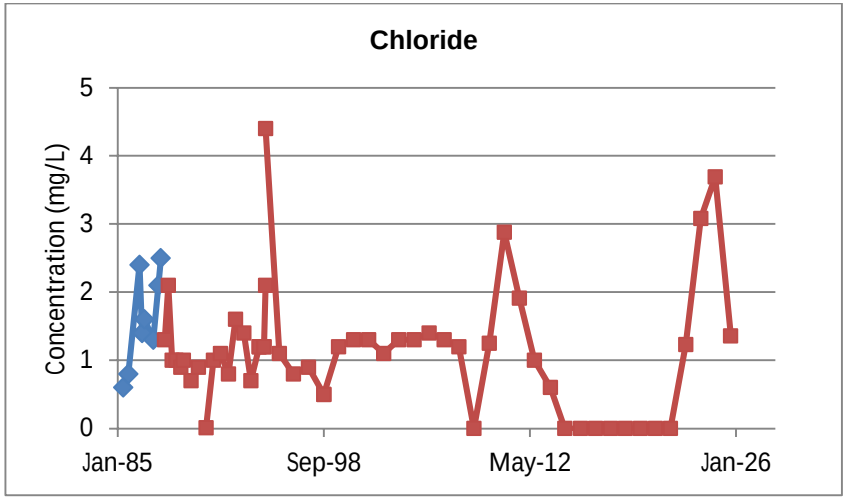


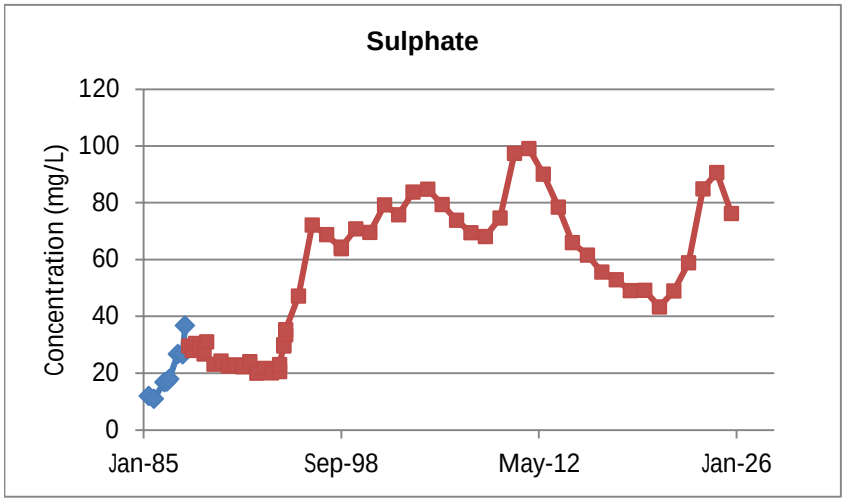
◆01(2R)-SS

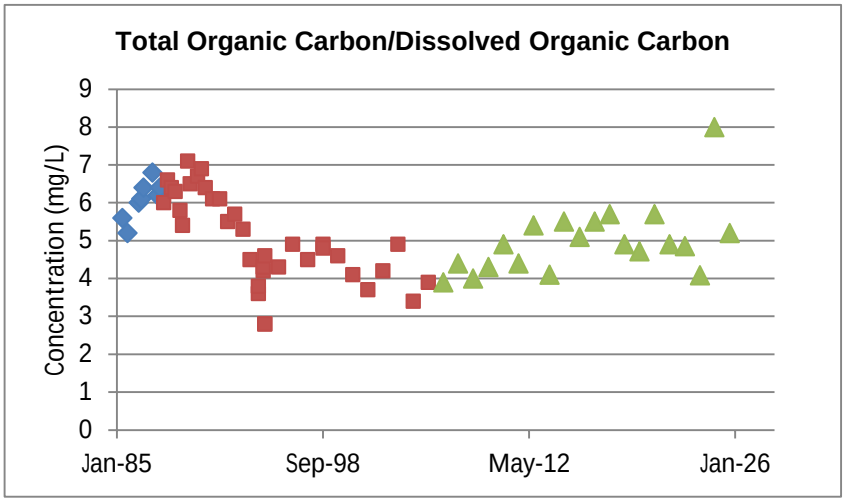
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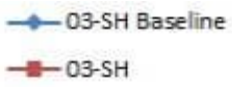
Figure 12.4
VEOLIA, Swan Hills Treatment Centre
03-SH - Indicators

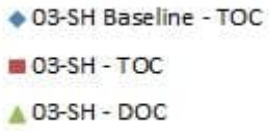






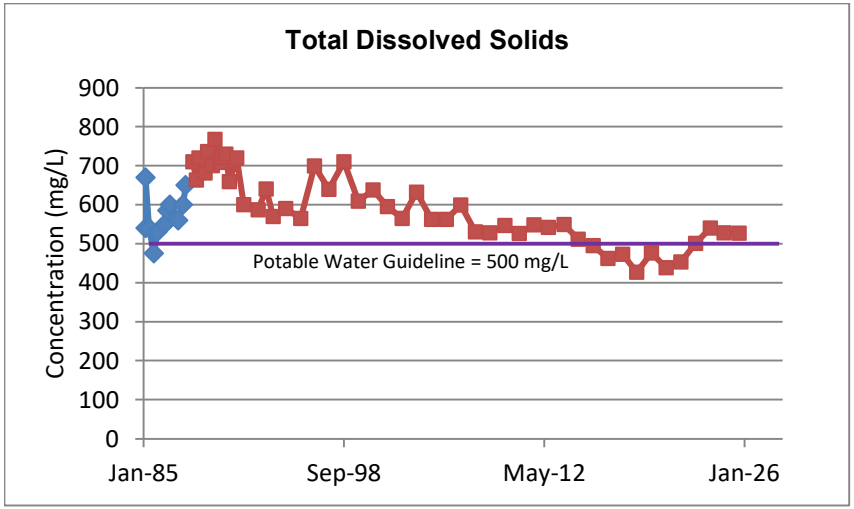


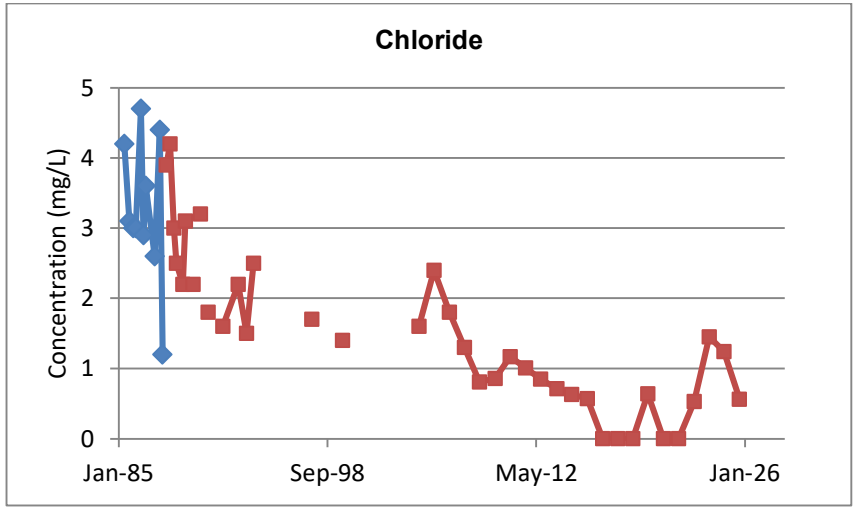


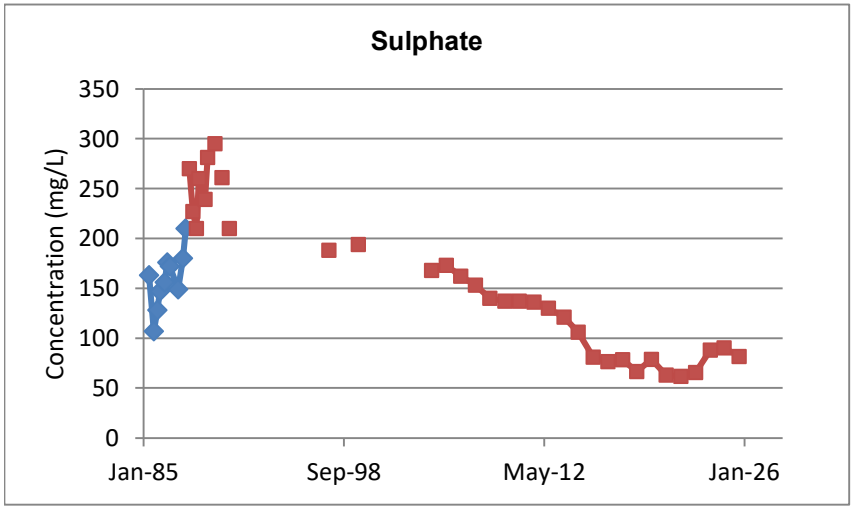


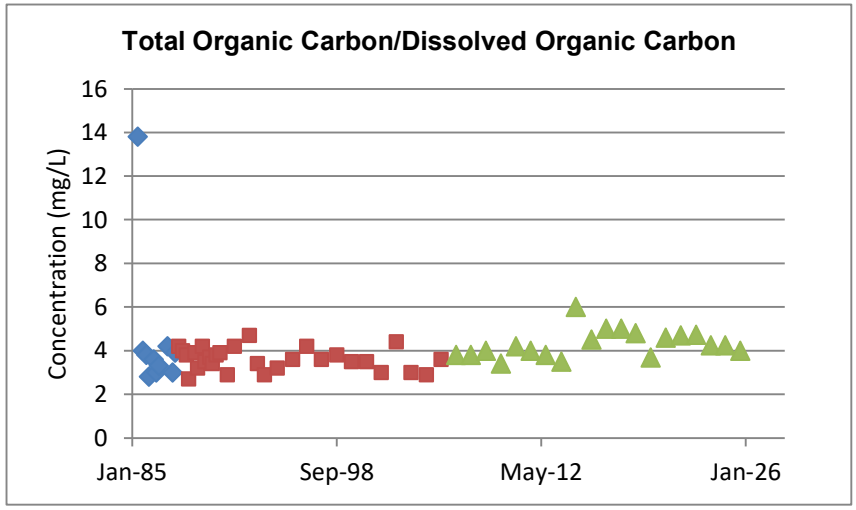
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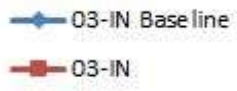
Figure 12.5
VEOLIA, Swan Hills Treatment Centre
03-IN - Indicators

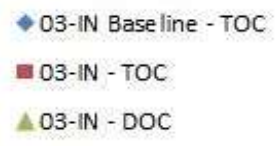






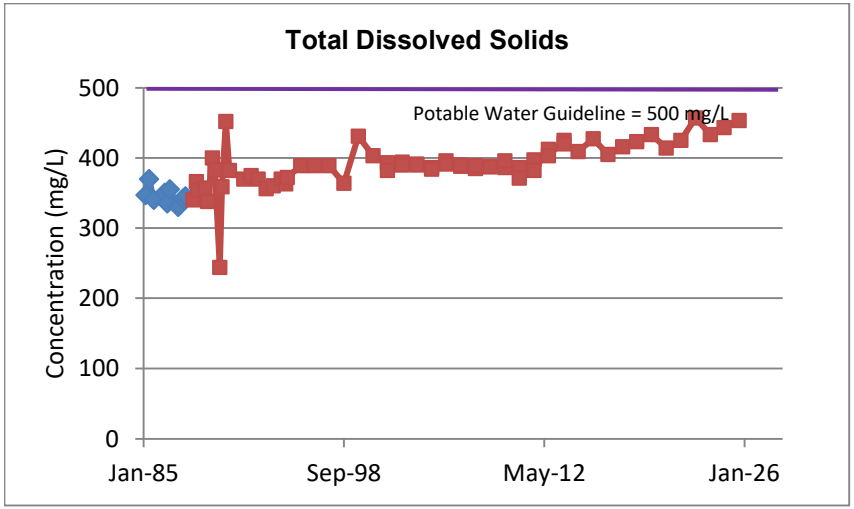


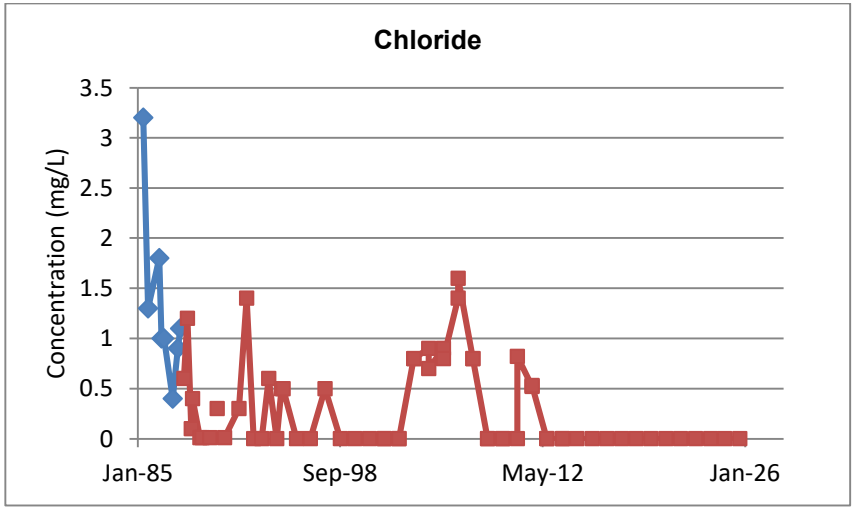


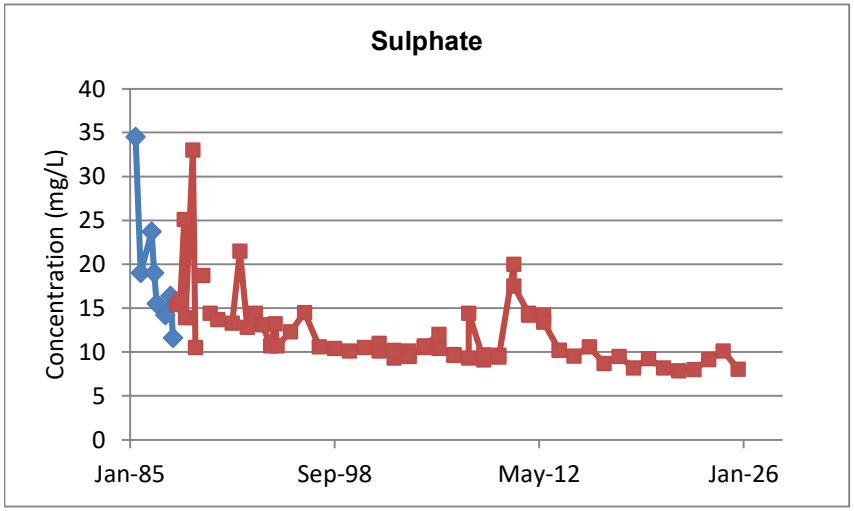


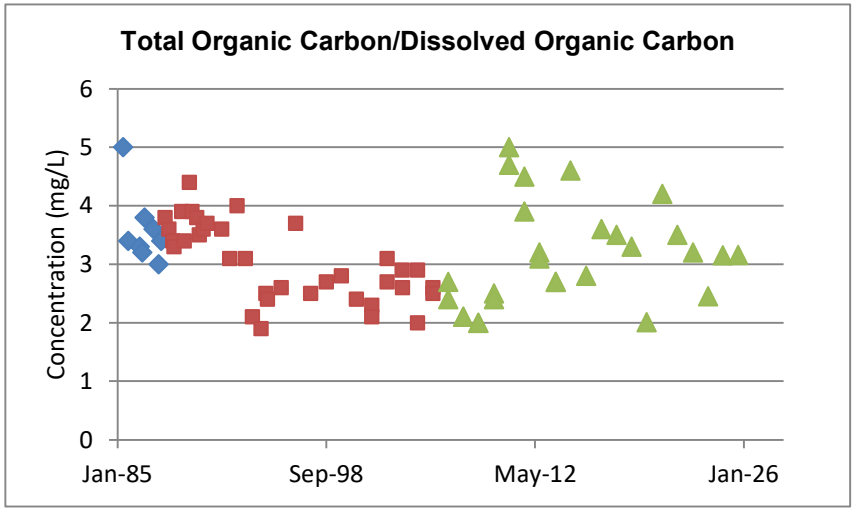
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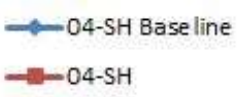
Figure 12.6
VEOLIA, Swan Hills Treatment Centre
04-SH - Indicators

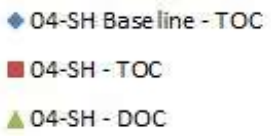






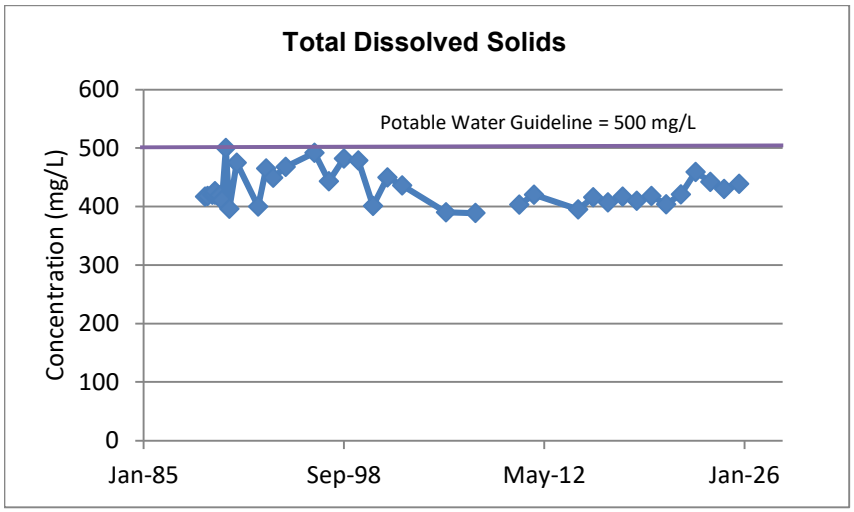


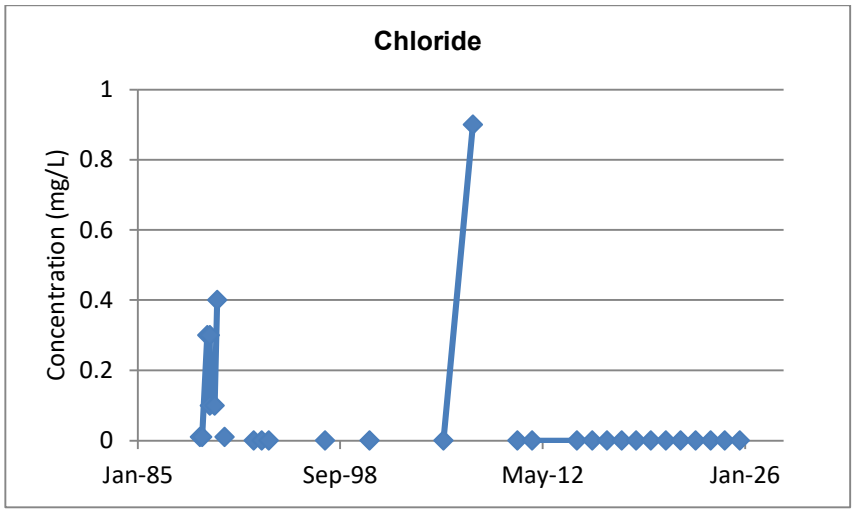


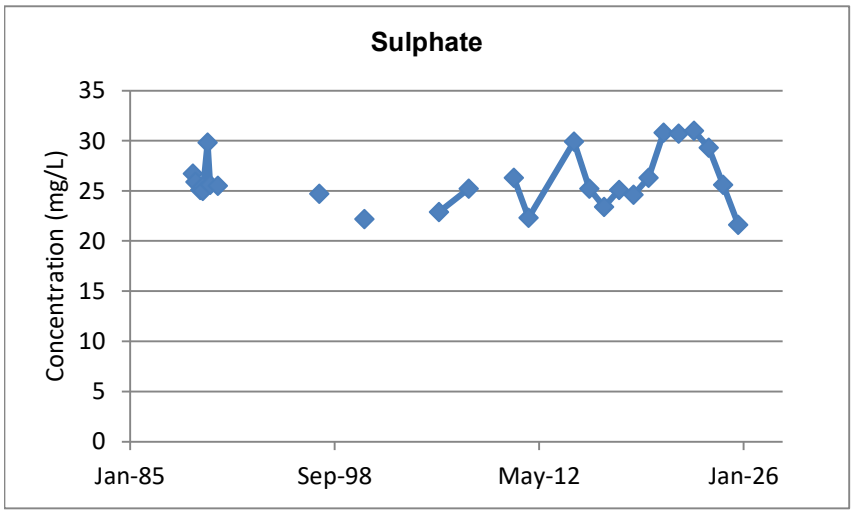


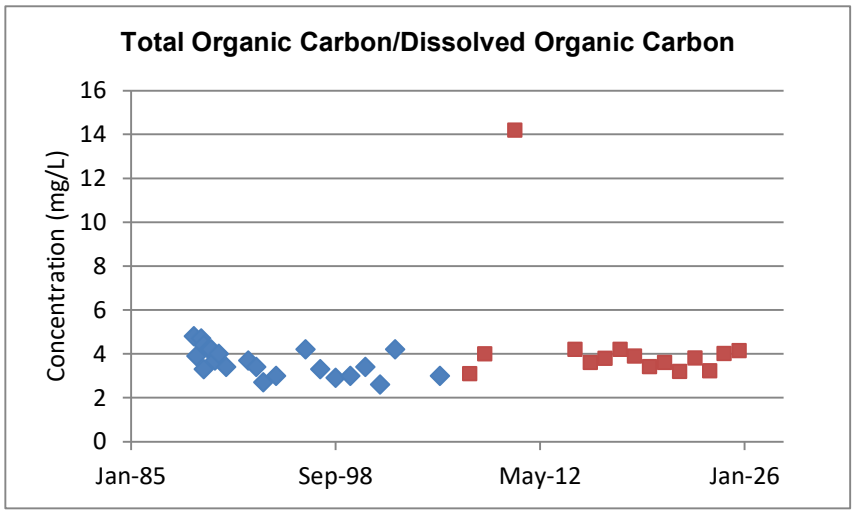
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Figure 12.7
VEOIA, Swan Hills Treatment Centre
04-IN - Indicators

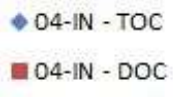






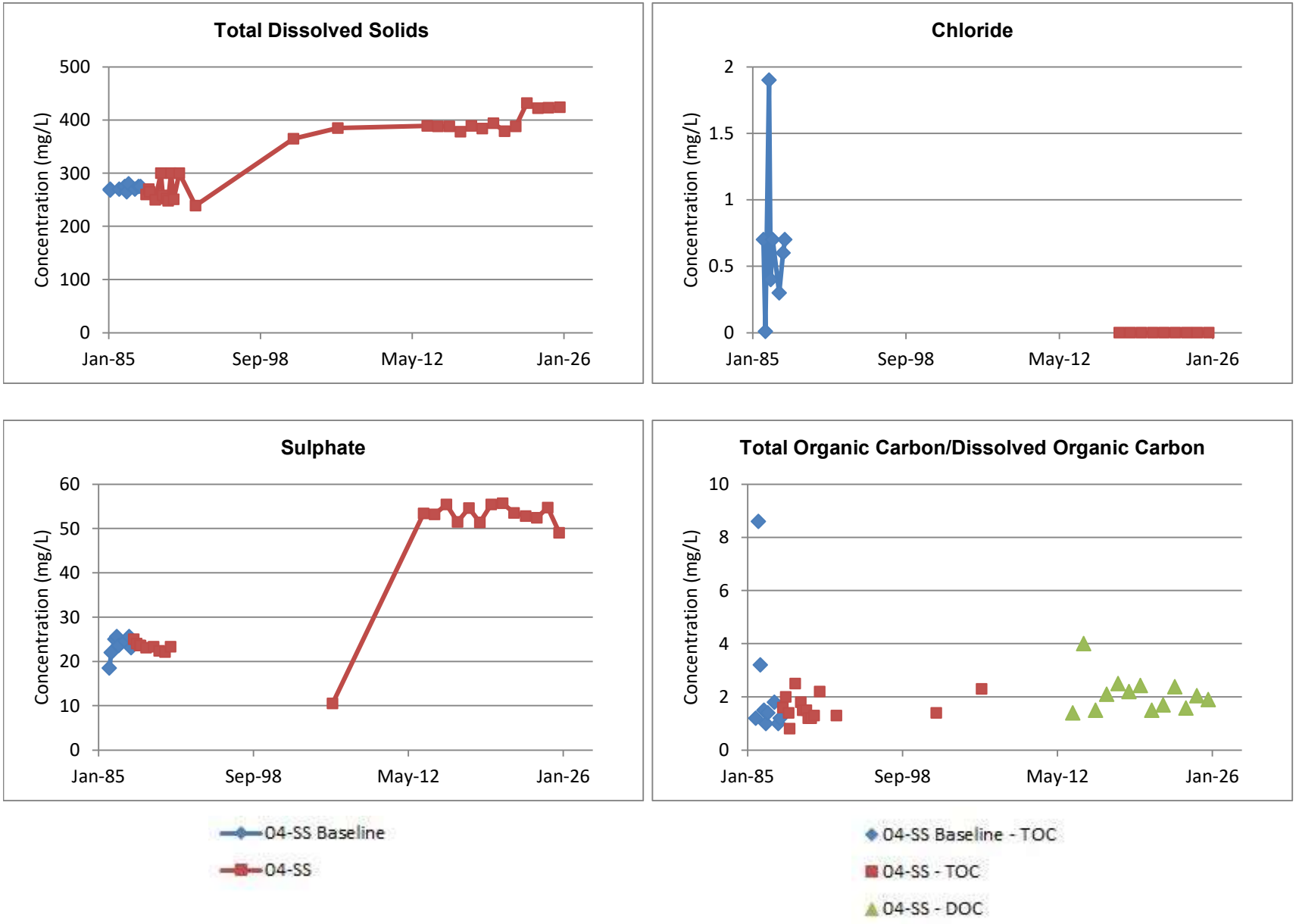






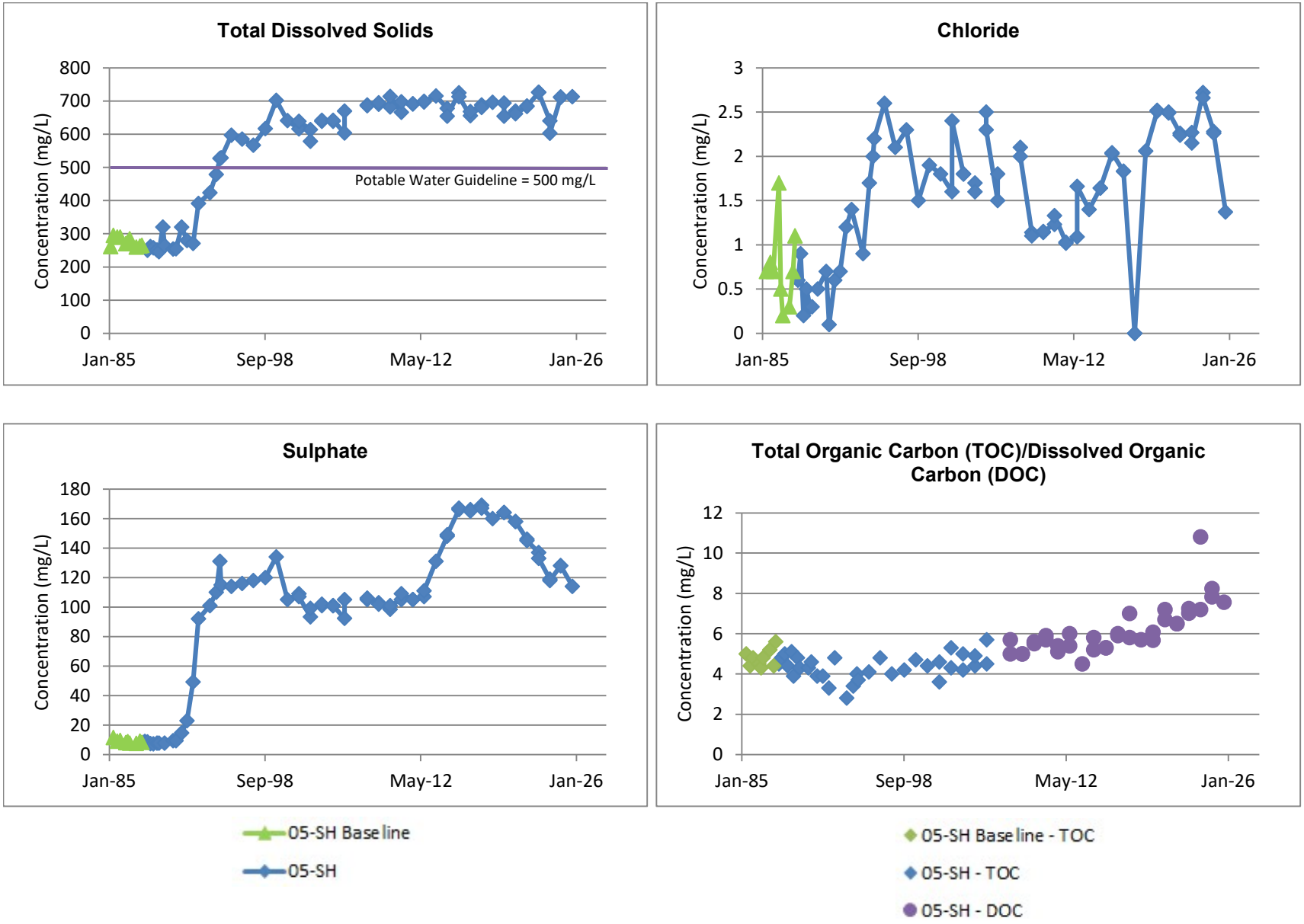
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Figure 12.8
VEOLIA, Swan Hills Treatment Centre
04-SS - Indicators



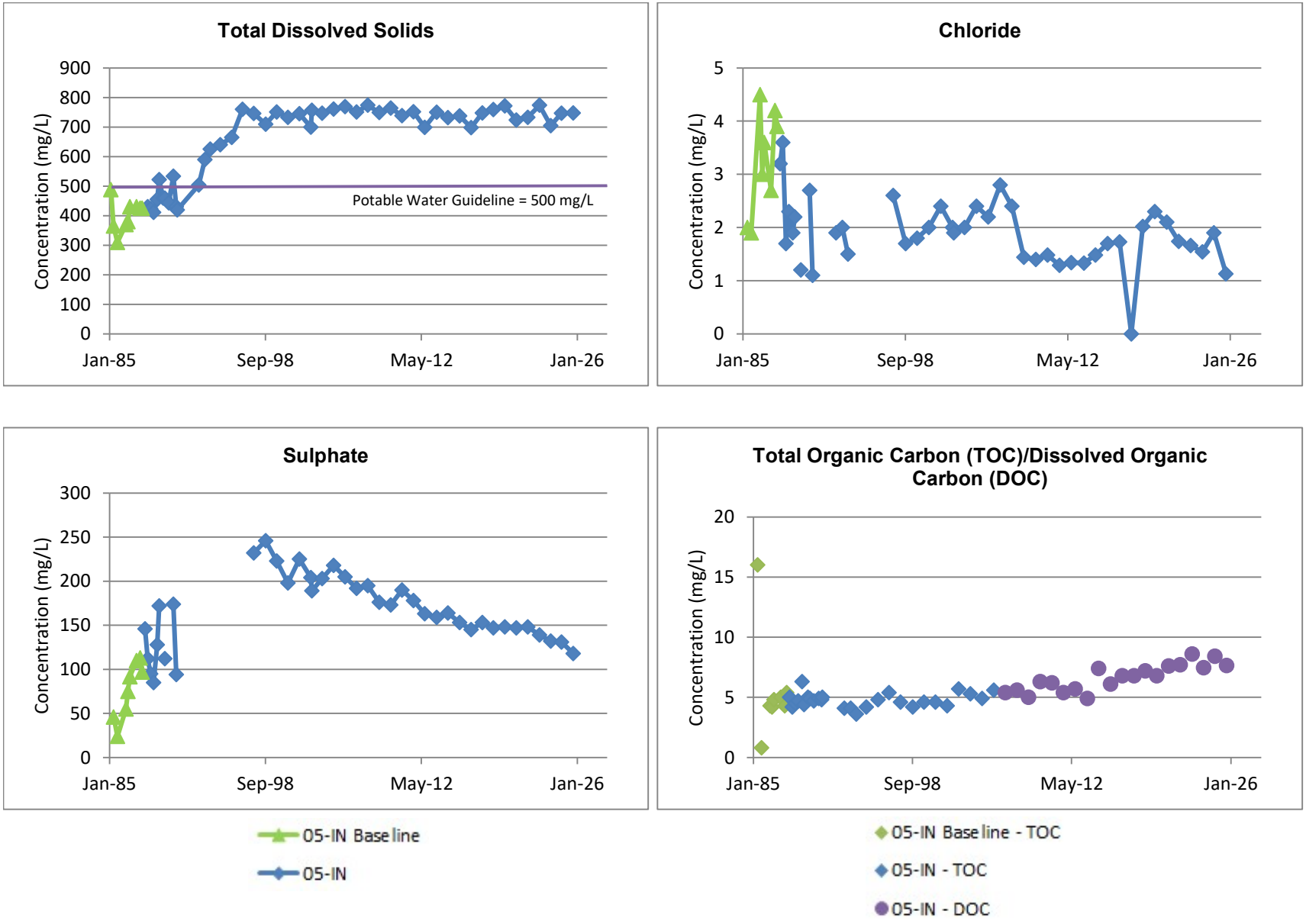
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Figure 12.9
VEOLIA, Swan Hills Treatment Centre
05-SH - Indicators



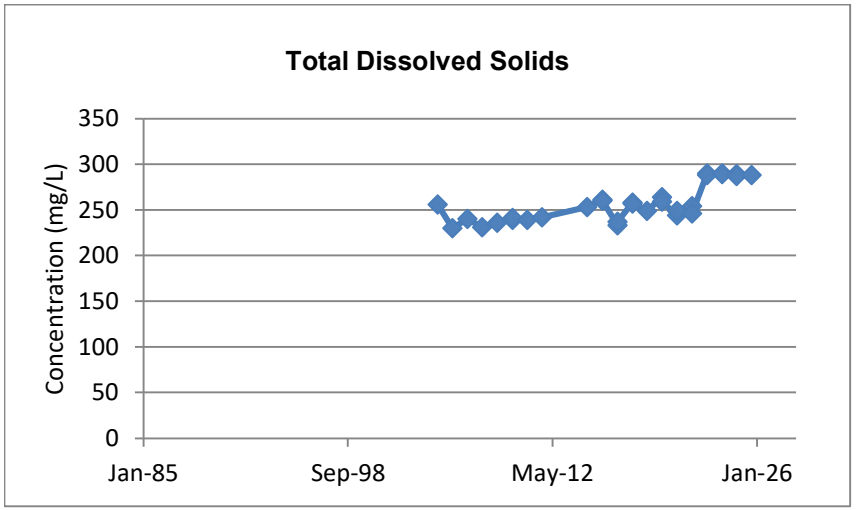
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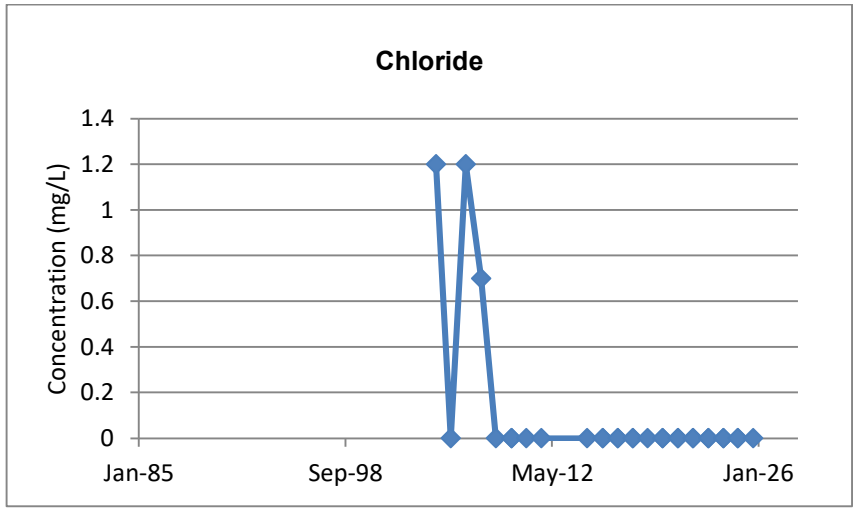
Figure 12.10
VEOLIA, Swan Hills Treatment Centre
05-IN - Indicators

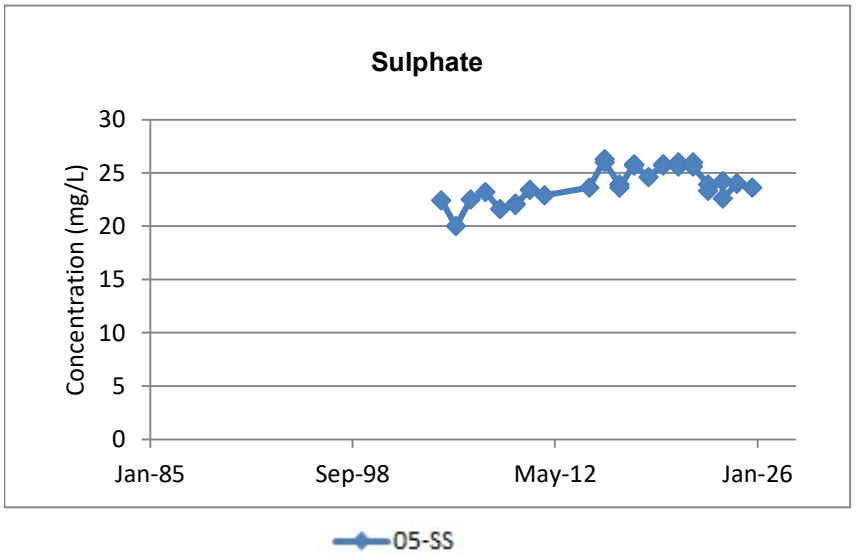


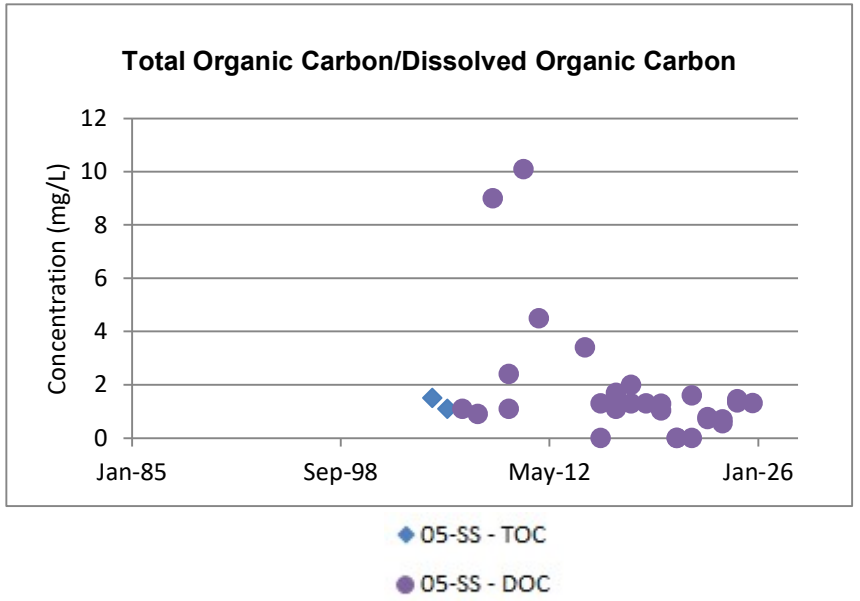
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Figure 12.11
VEOLIA, Swan Hills Treatment Centre
05-SS - Indicators



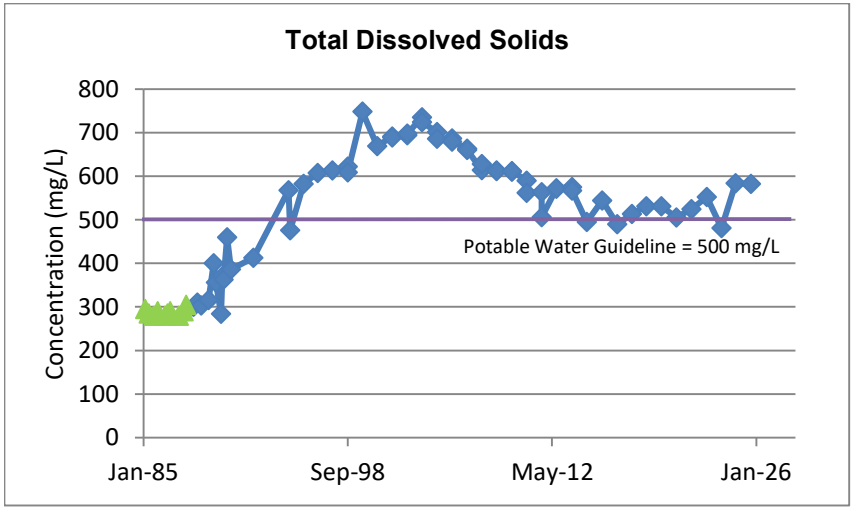


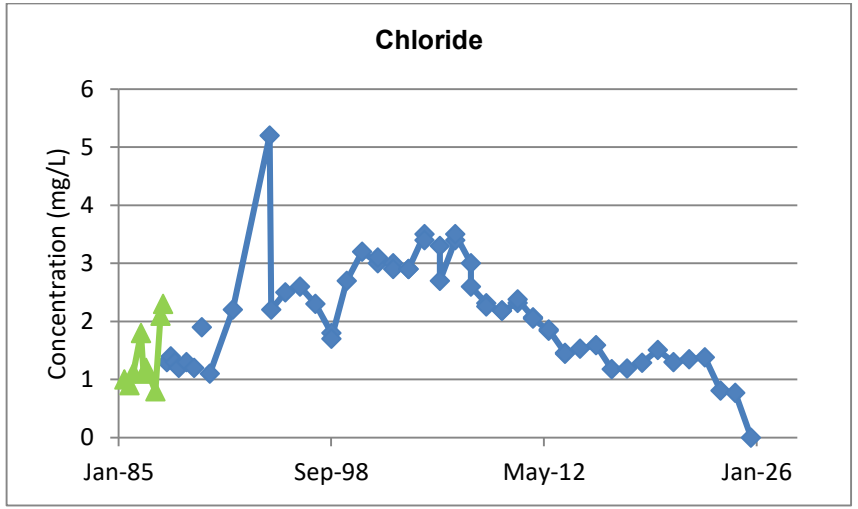


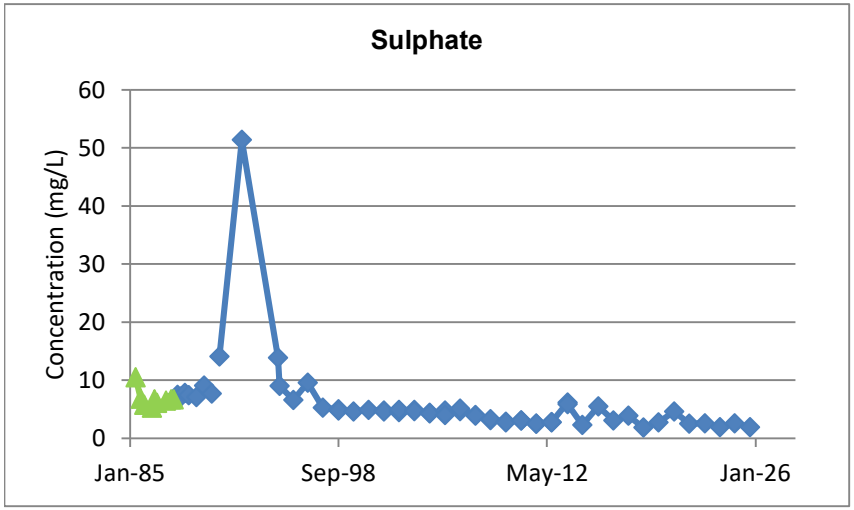


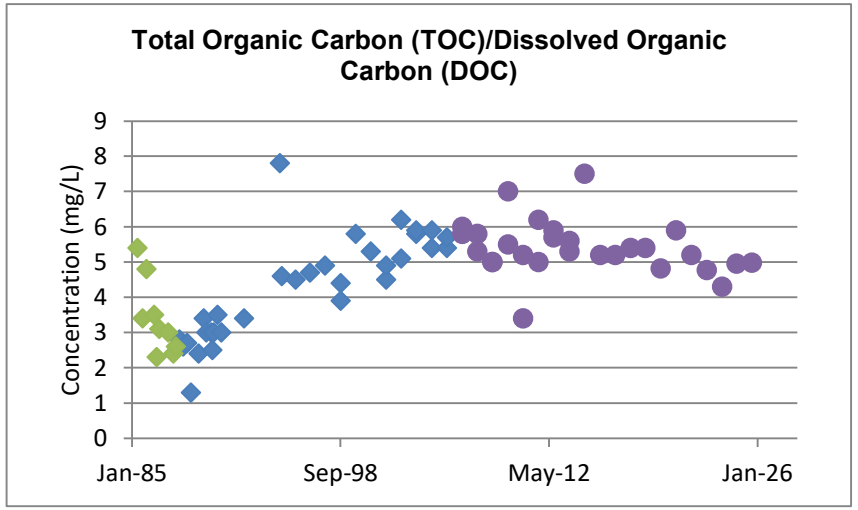
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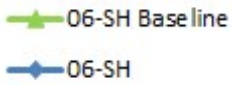
Figure 12.12
VEOLIA, Swan Hills Treatment Centre
06-SH - Indicators

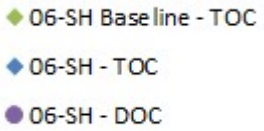






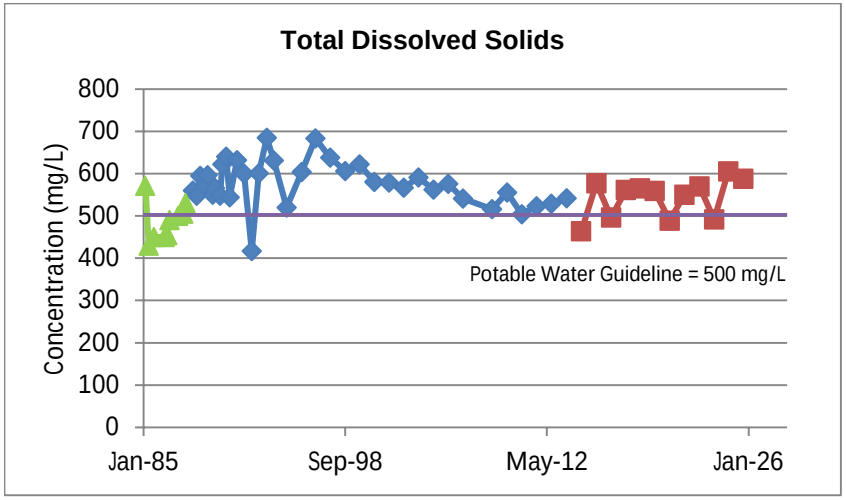


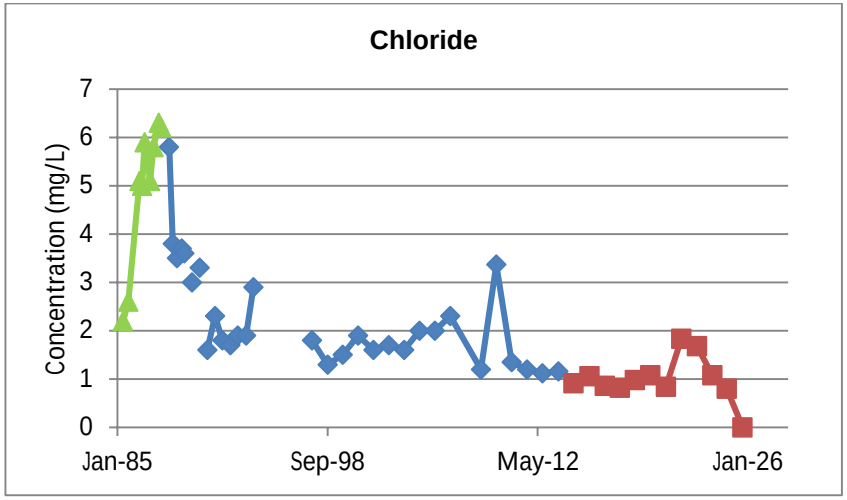


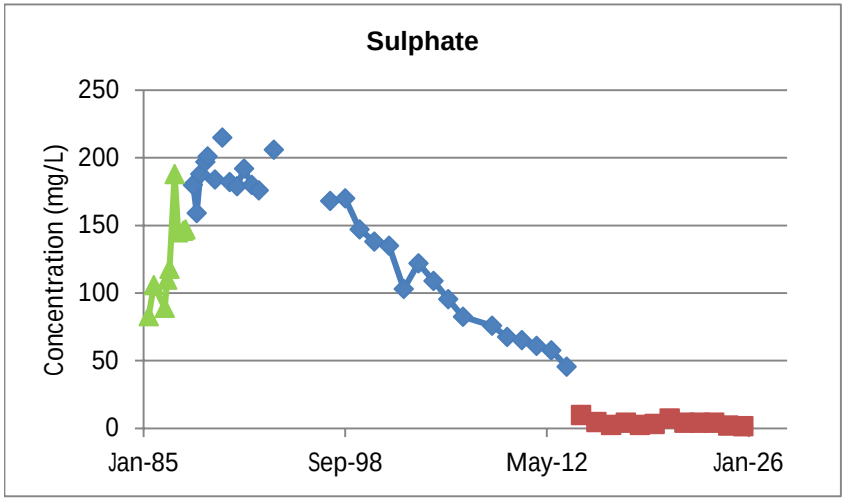


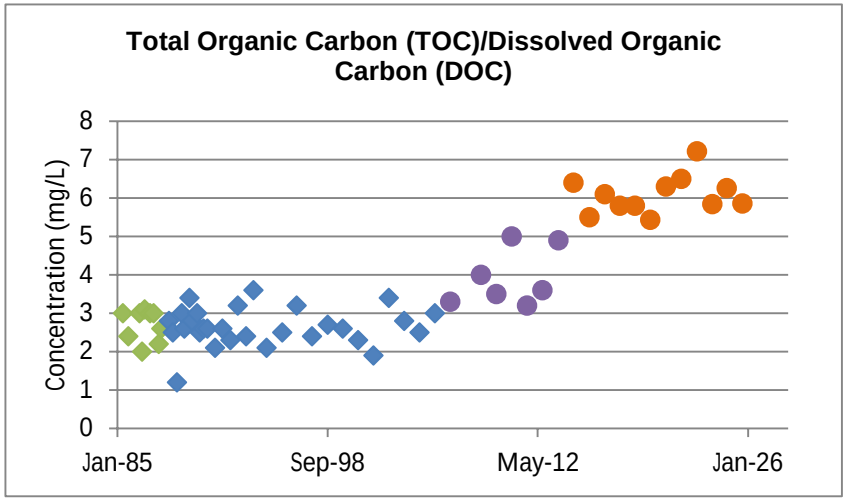
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Figure 12.13
VEOLIA, Swan Hills Treatment Centre
06-IN and 06(R)IN - Indicators

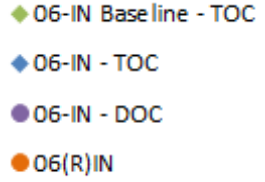






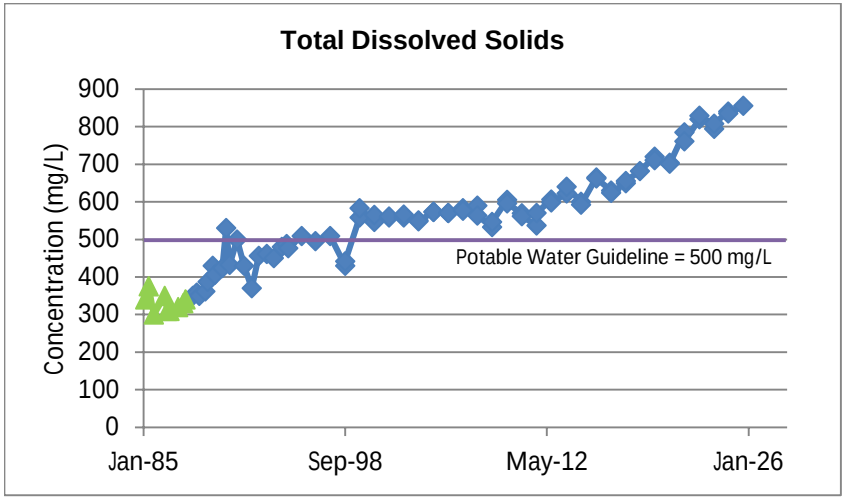


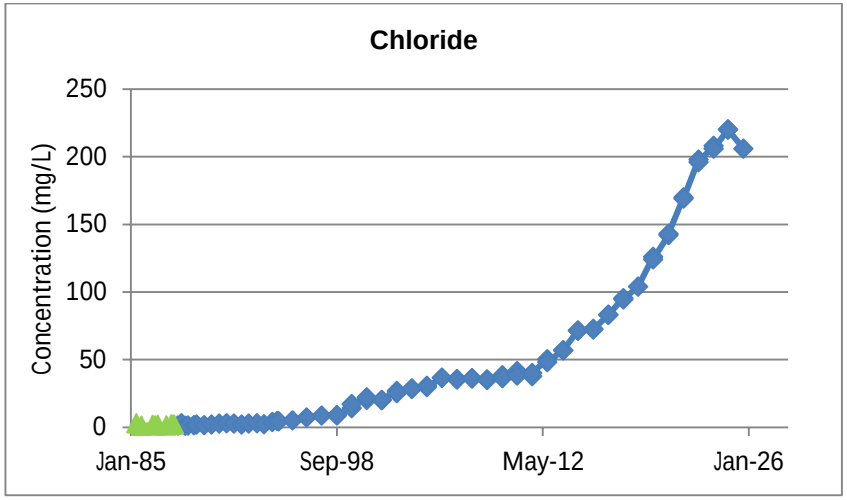


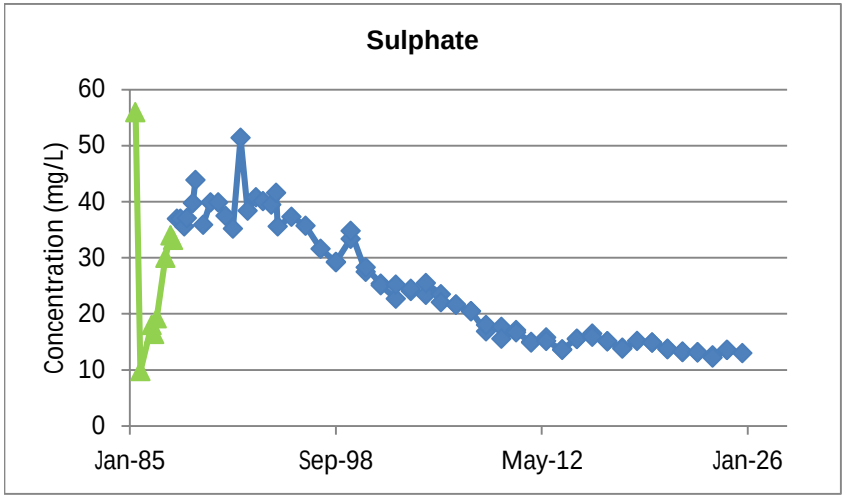


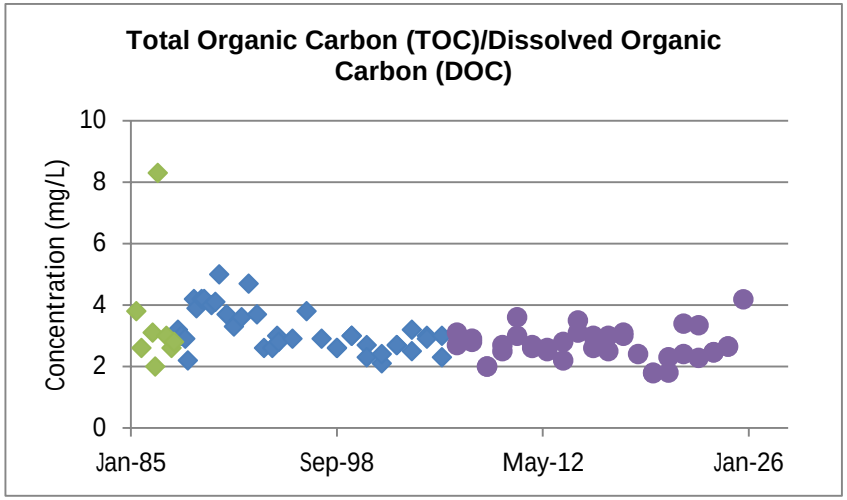
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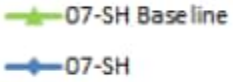
Figure 12.14
VEOLIA, Swan Hills Treatment Centre
07-SH - Indicators

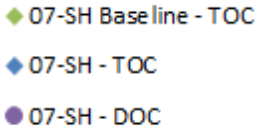






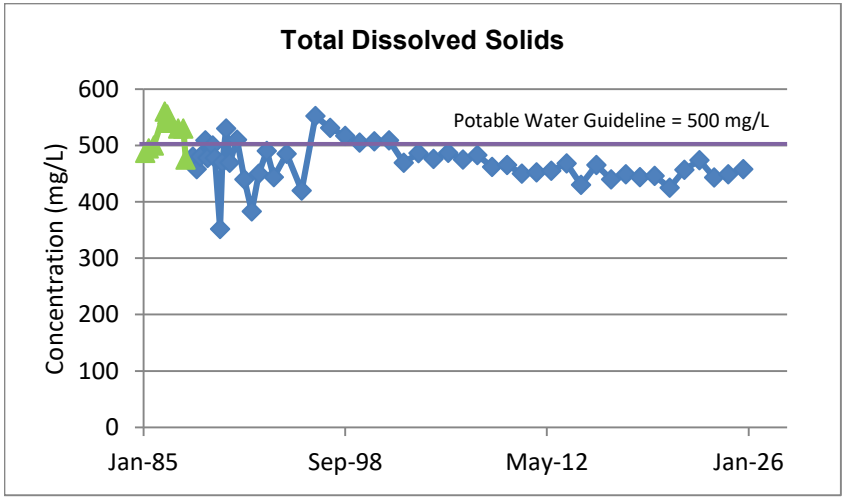


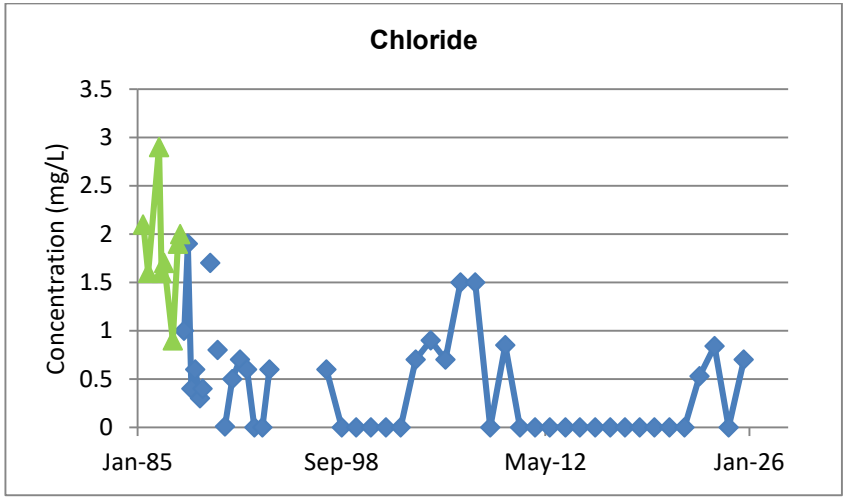


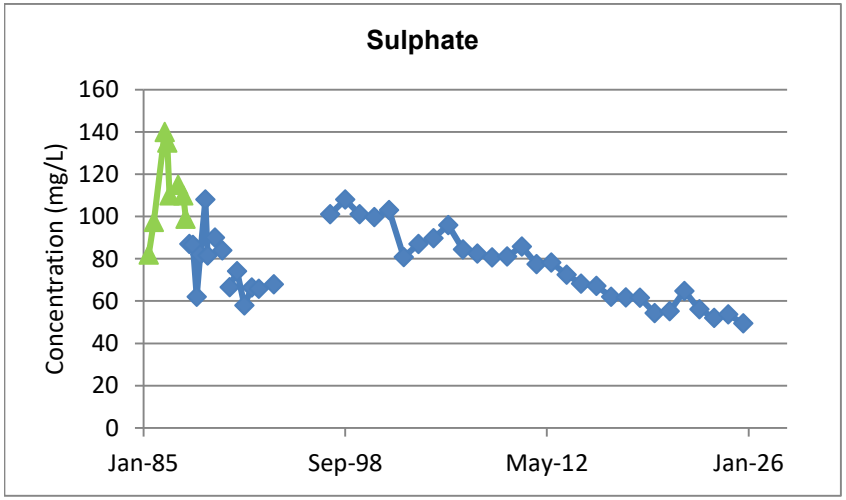


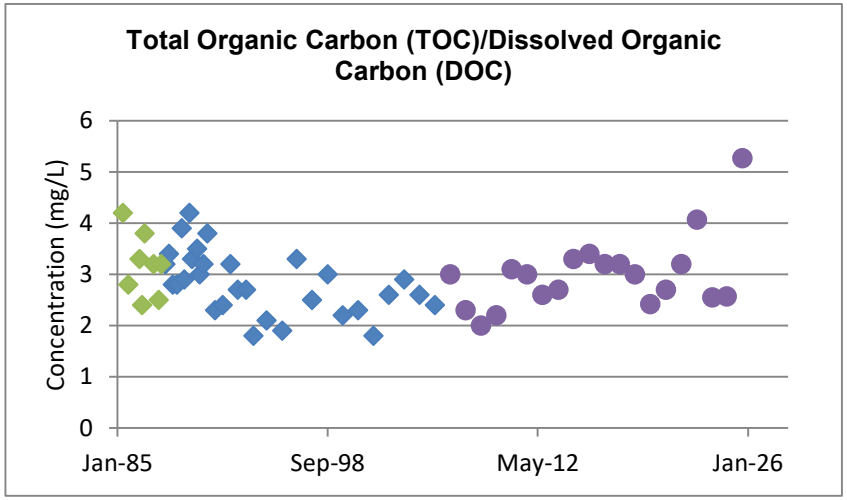
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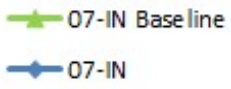
Figure 12.15
VEOLIA, Swan Hills Treatment Centre
07-IN - Indicators

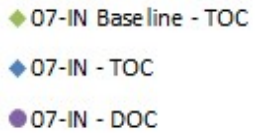








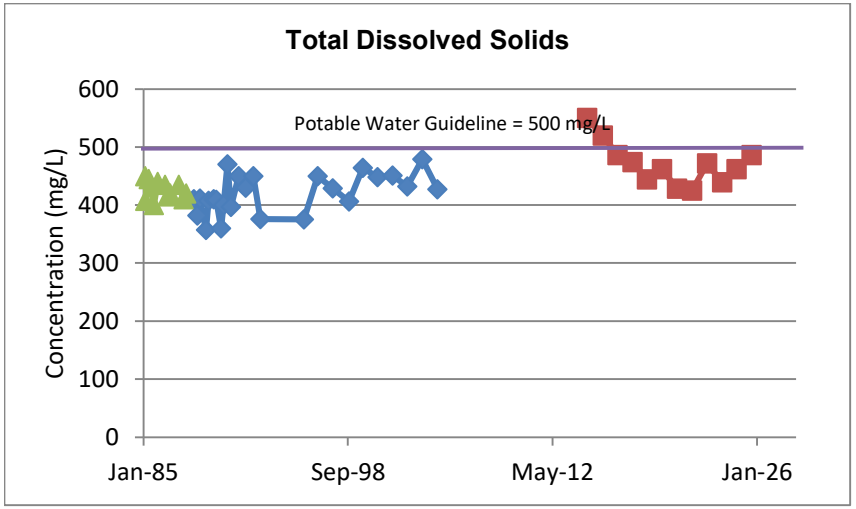


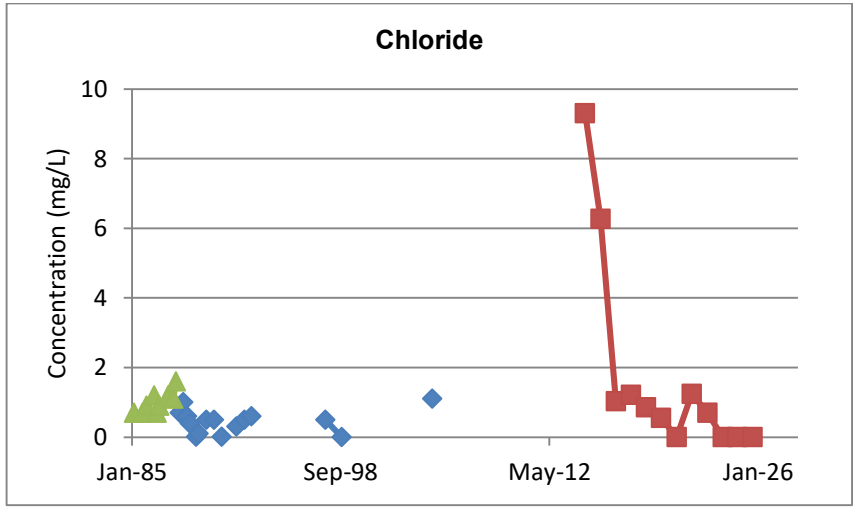


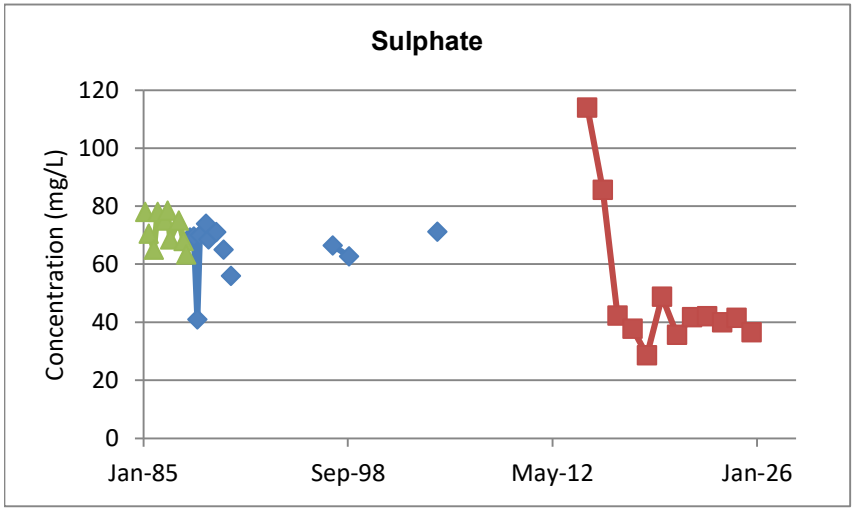
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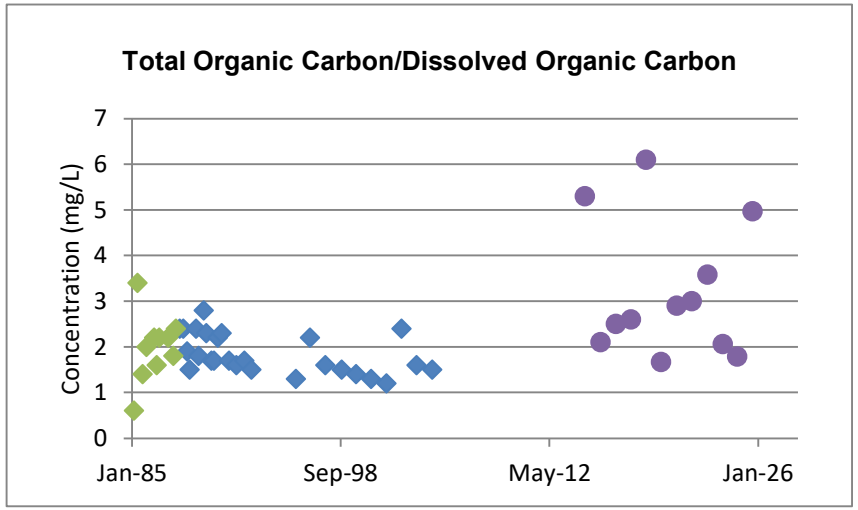
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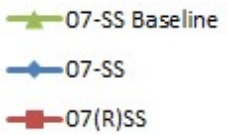
Figure 12.16
VEOLIA, Swan Hills Treatment Centre
07-SS and 07(R)SS - Indicators

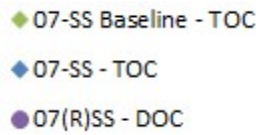






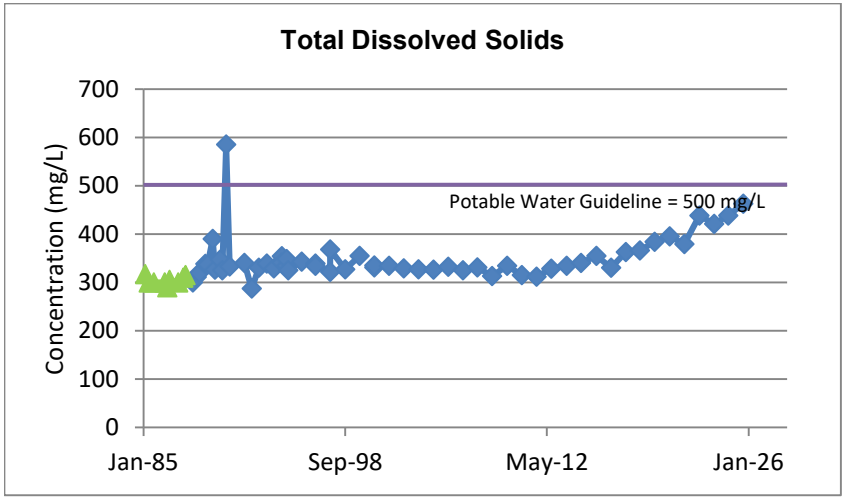


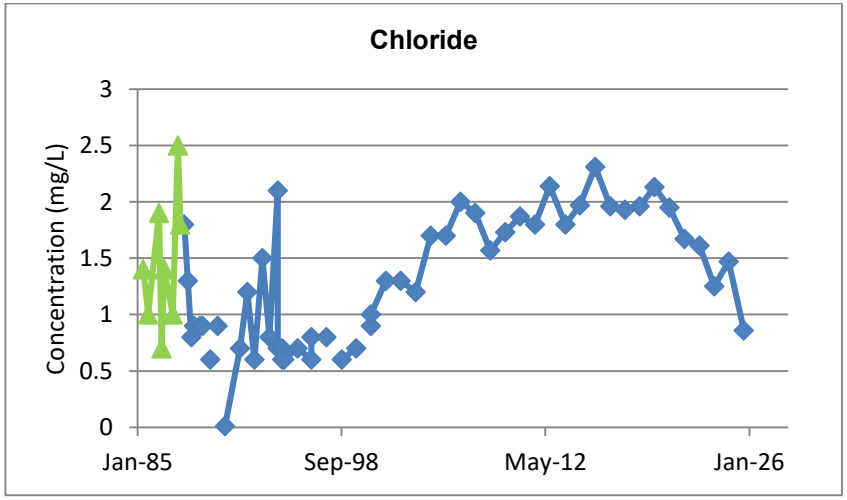


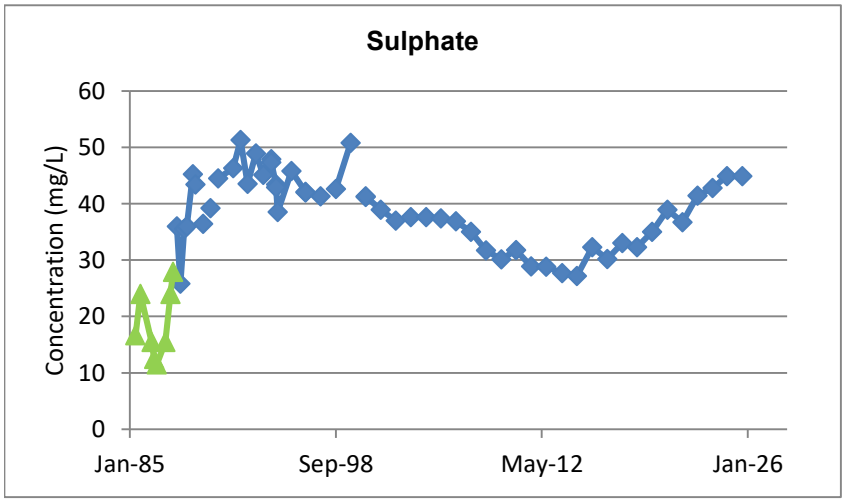


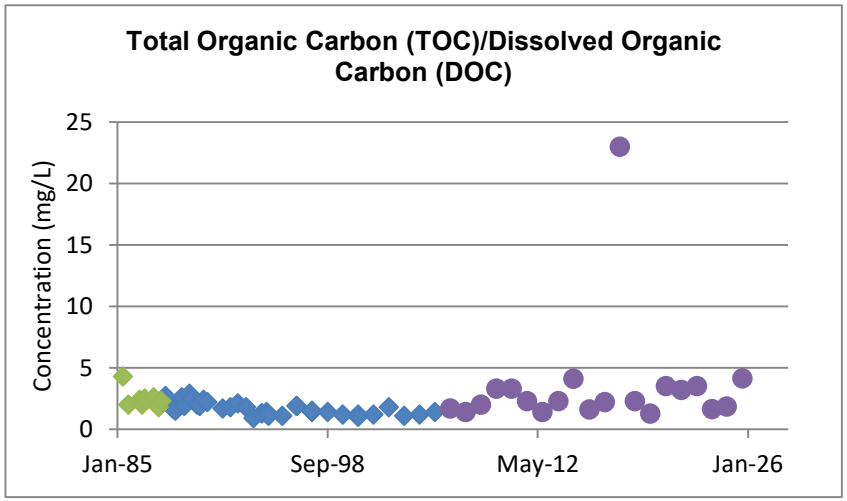
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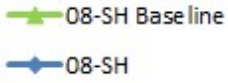
Figure 12.17
VEOLIA, Swan Hills Treatment Centre
08-SH - Indicators

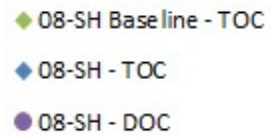






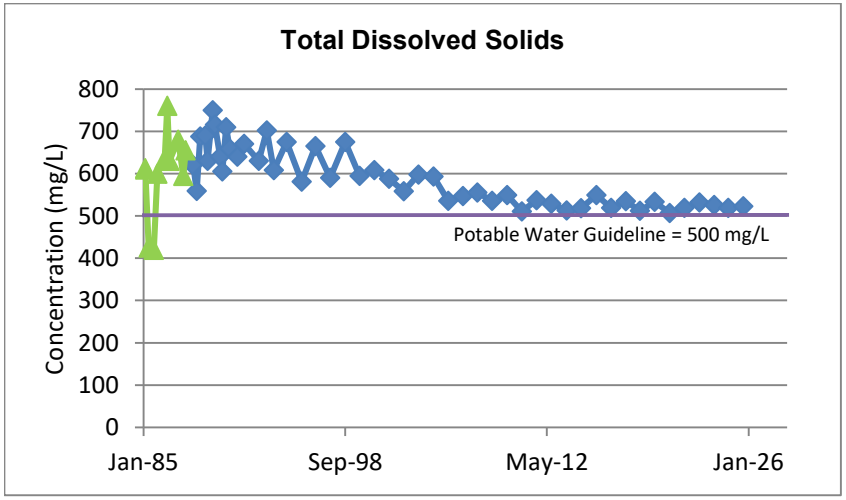


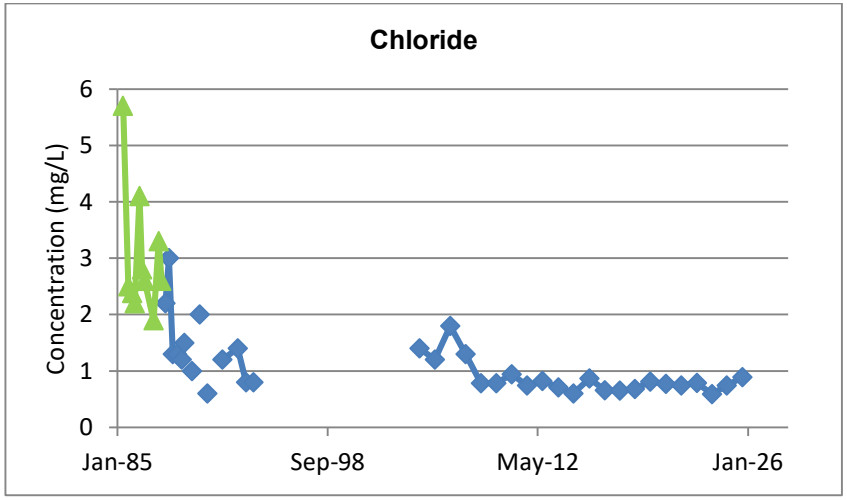


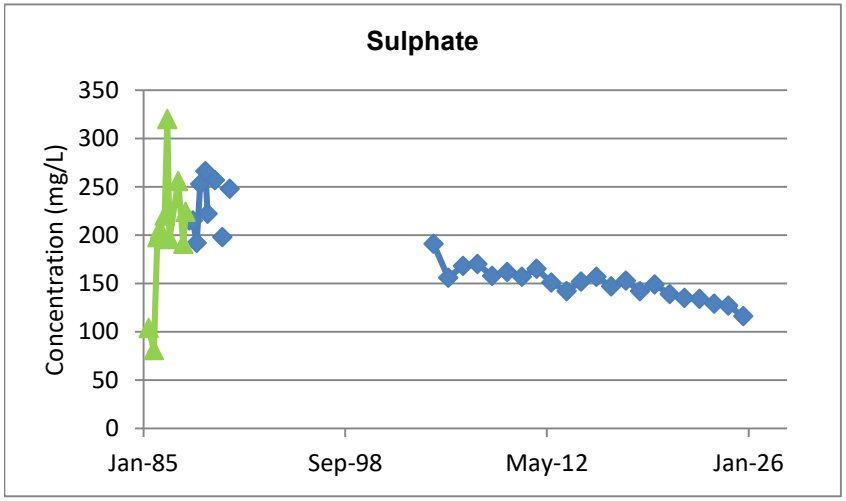


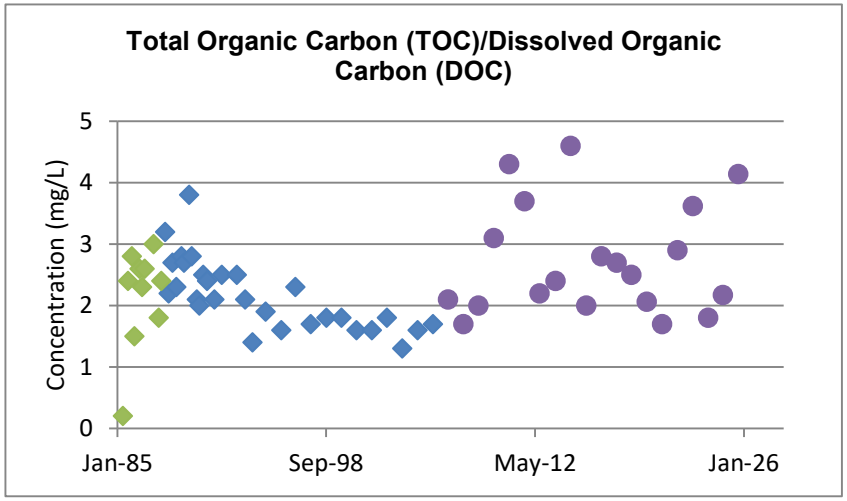
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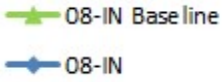
Figure 12.18
VEOLIA, Swan Hills Treatment Centre
08-IN - Indicators

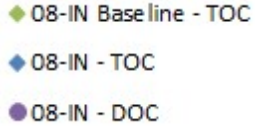






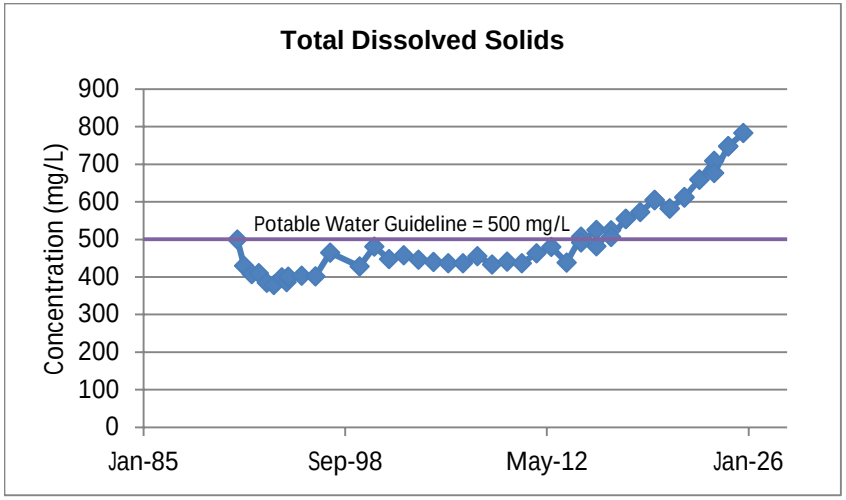


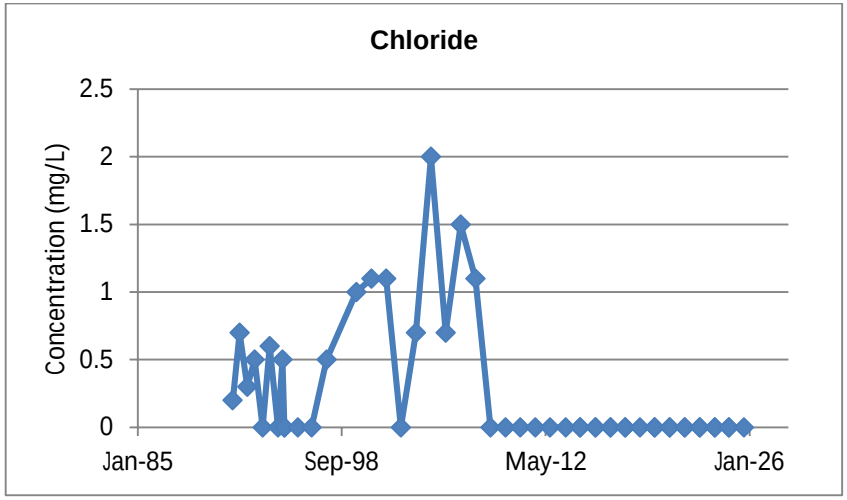


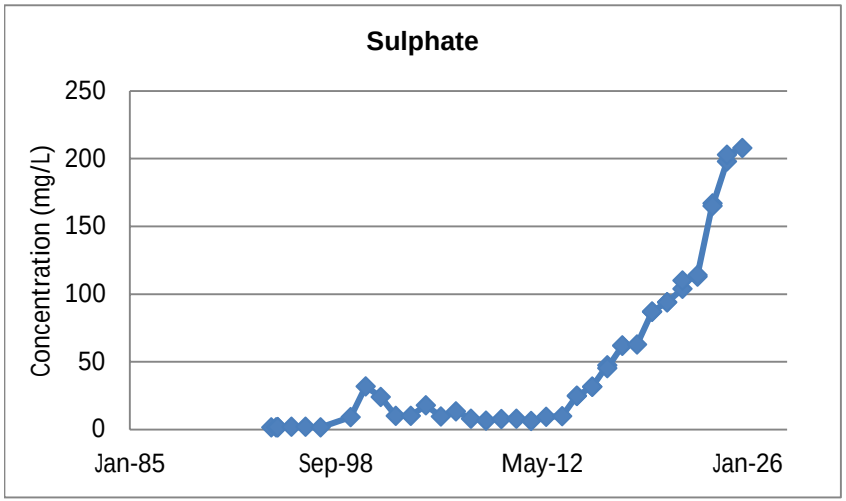


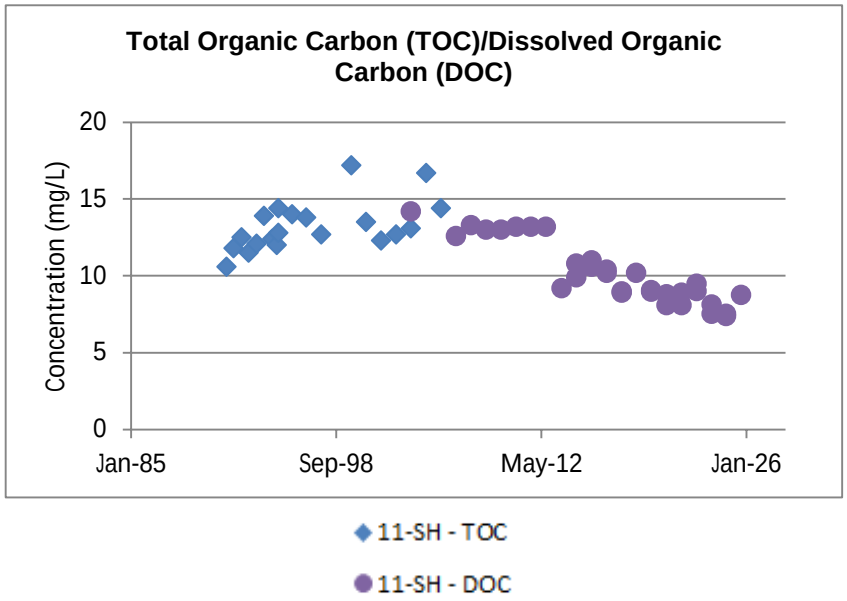
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Figure 12.19
VEOLIA, Swan Hills Treatment Centre
11-SH - Indicators



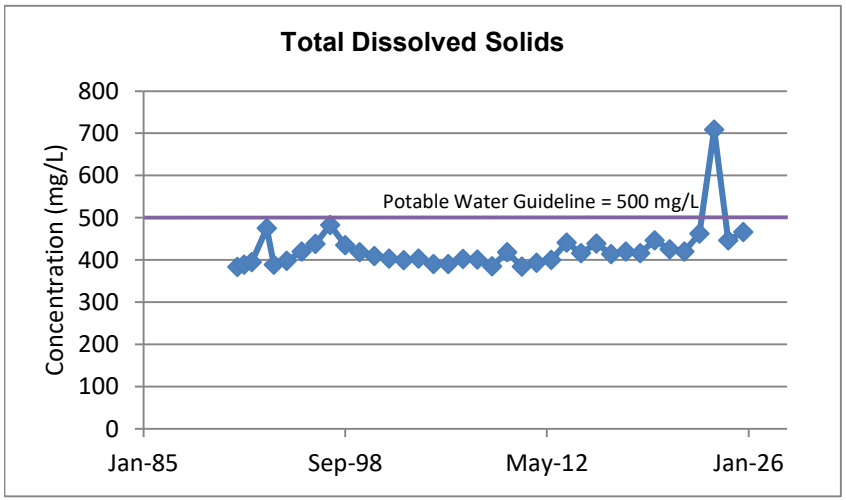


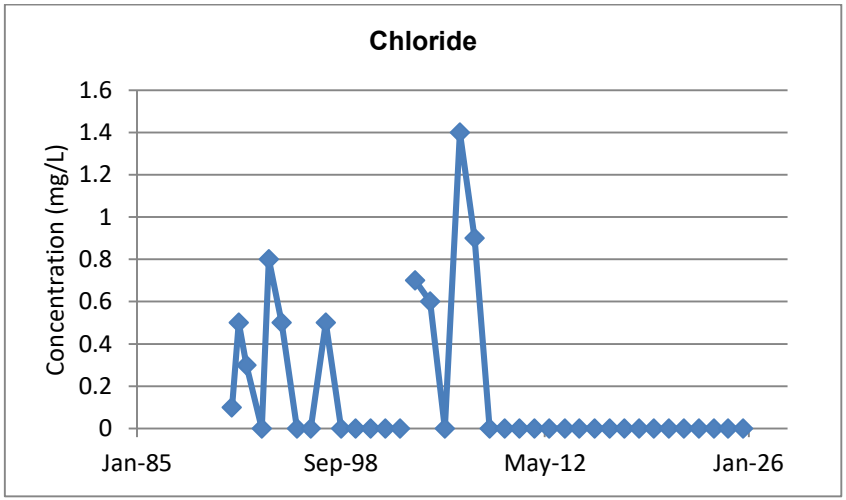


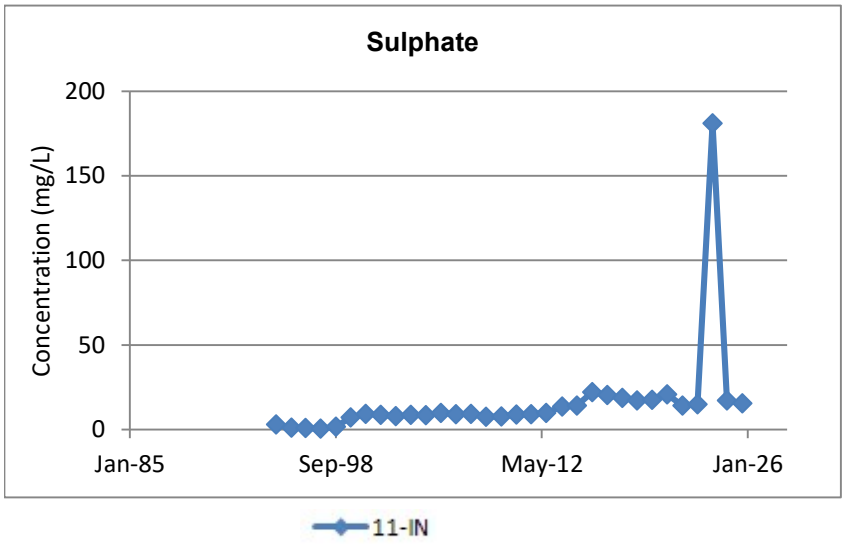


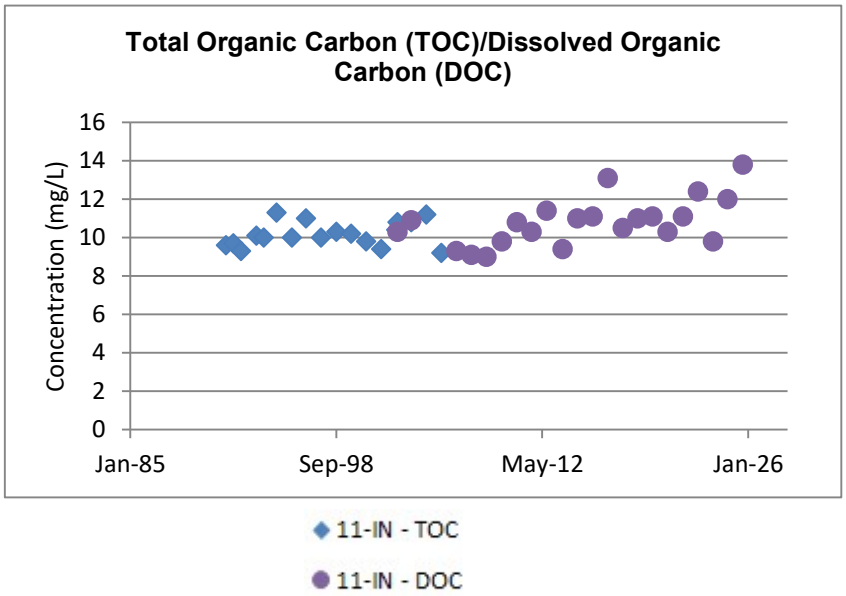
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Figure 12.20
VEOLIA, Swan Hills Treatment Centre
11-IN - Indicators



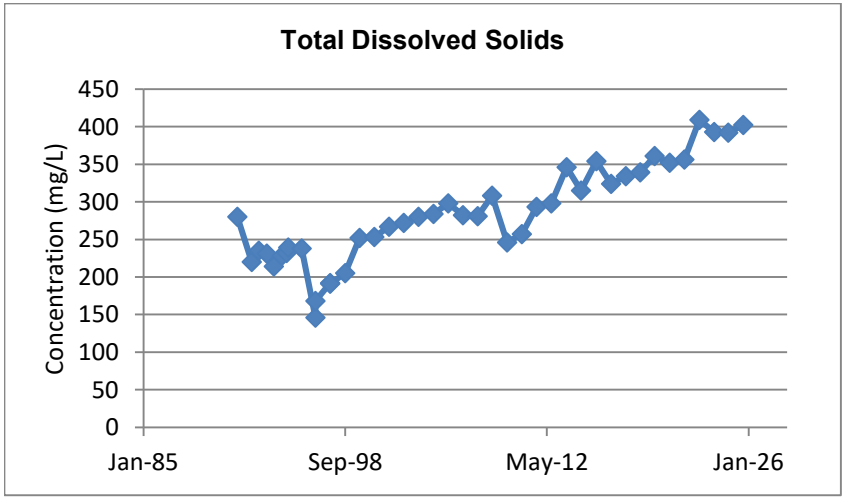


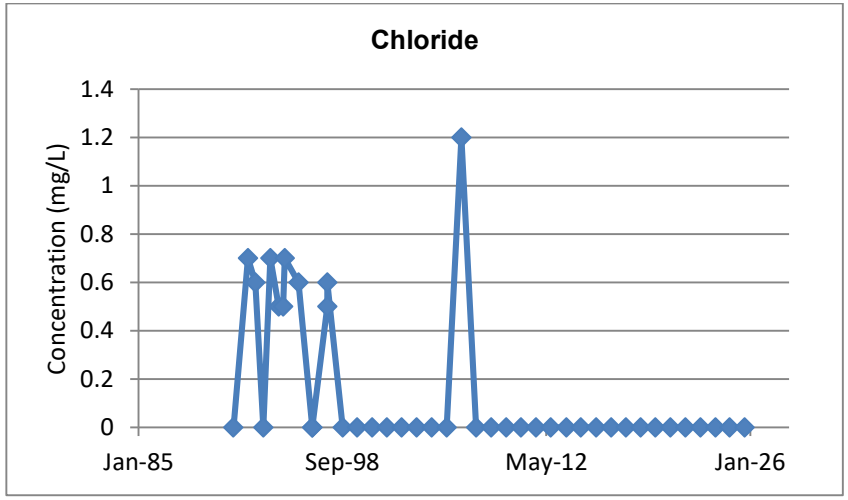


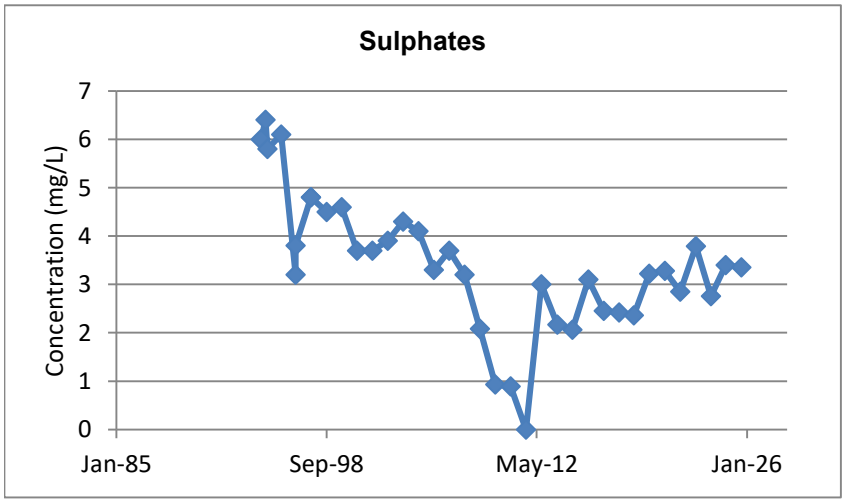


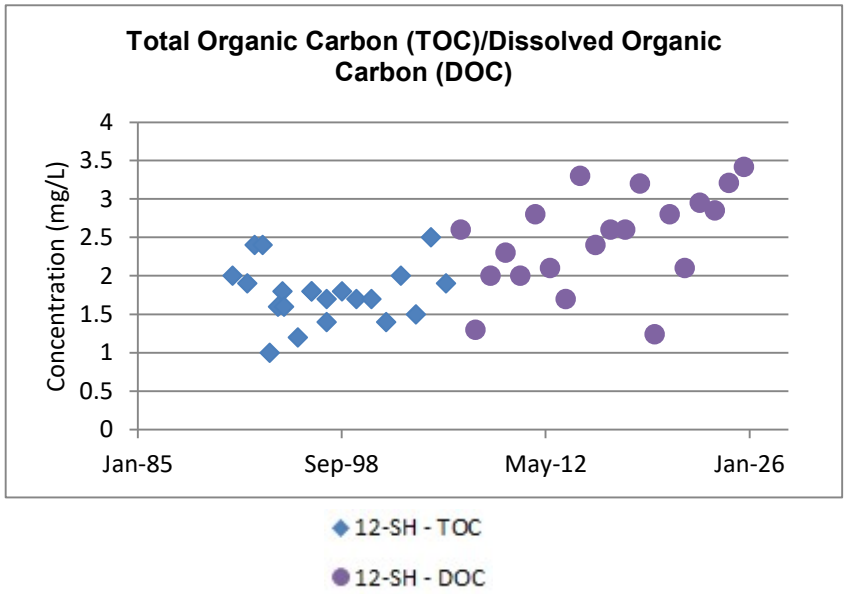
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Figure 12.21
VEOLIA, Swan Hills Treatment Centre
12-SH - Indicators



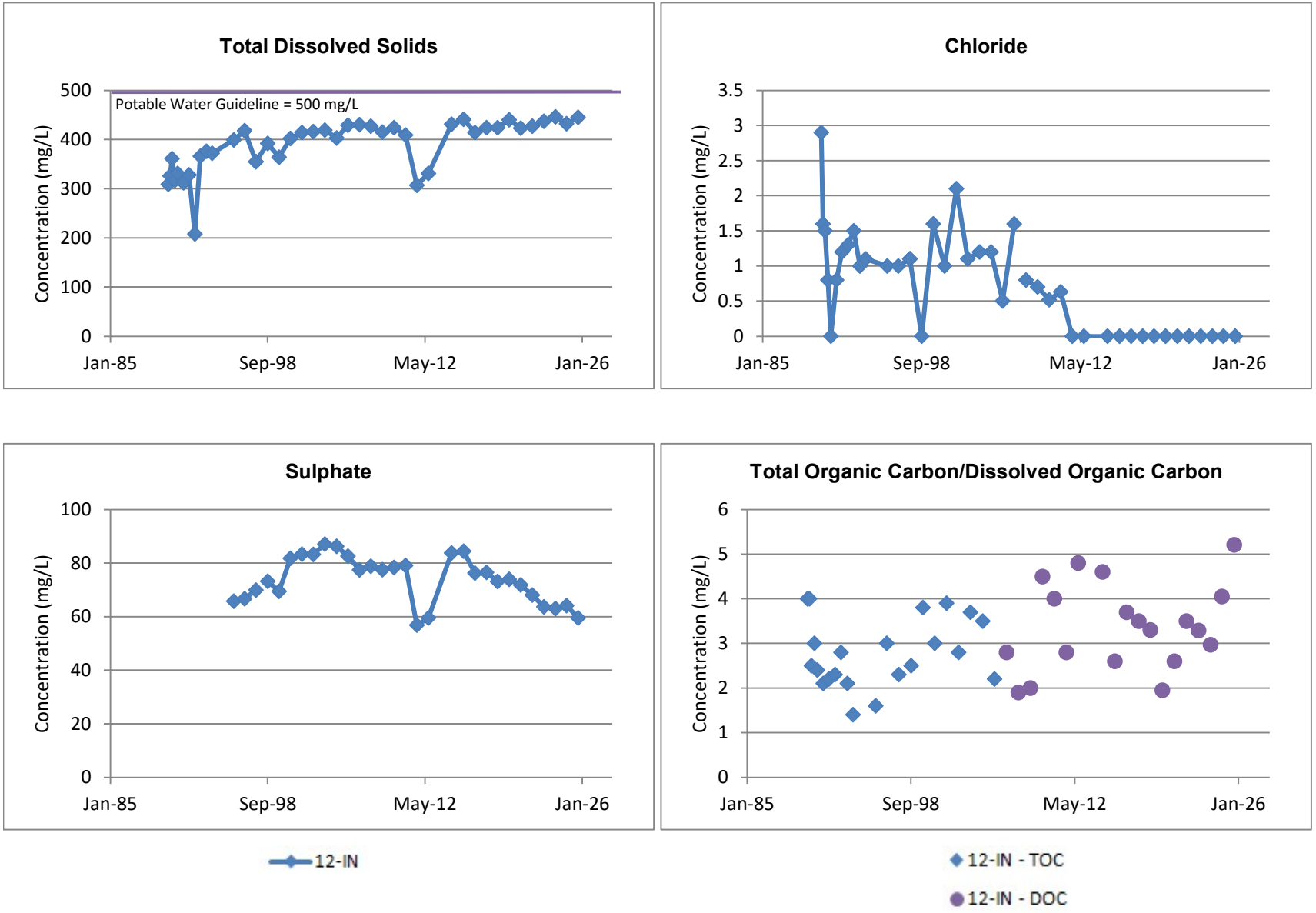






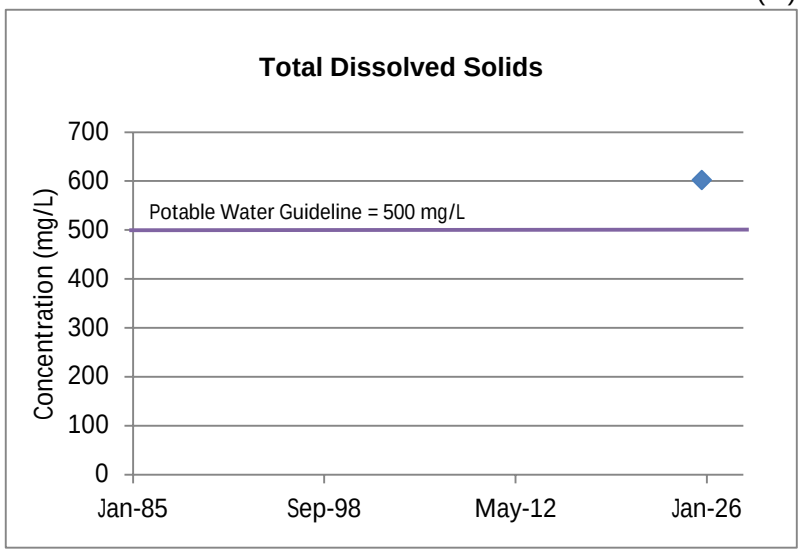
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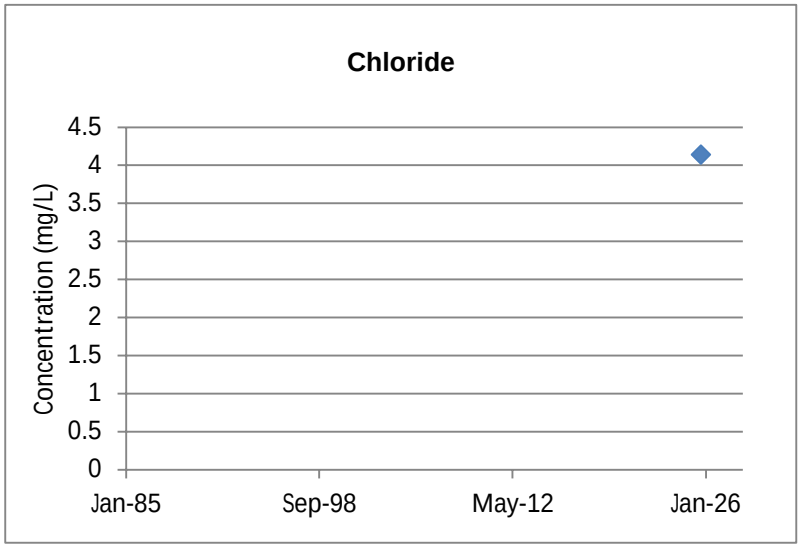
Figure 12.22
VEOLIA, Swan Hills Treatment Centre
12-IN - Indicators

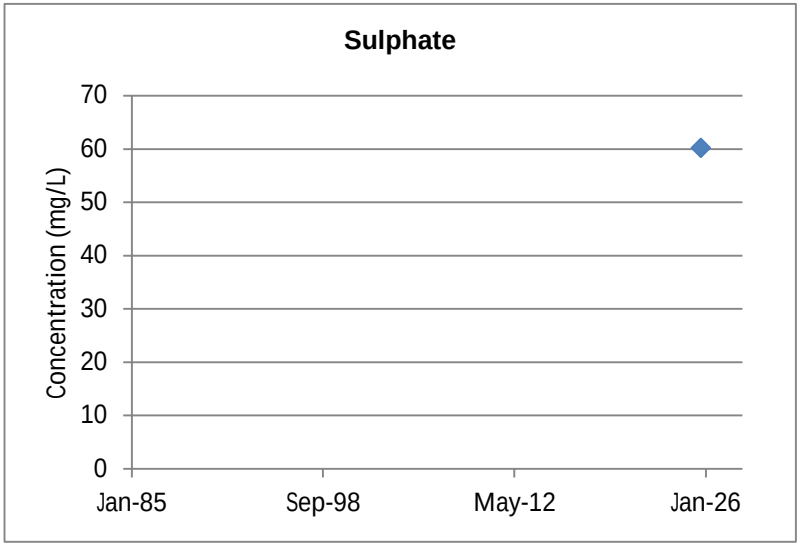


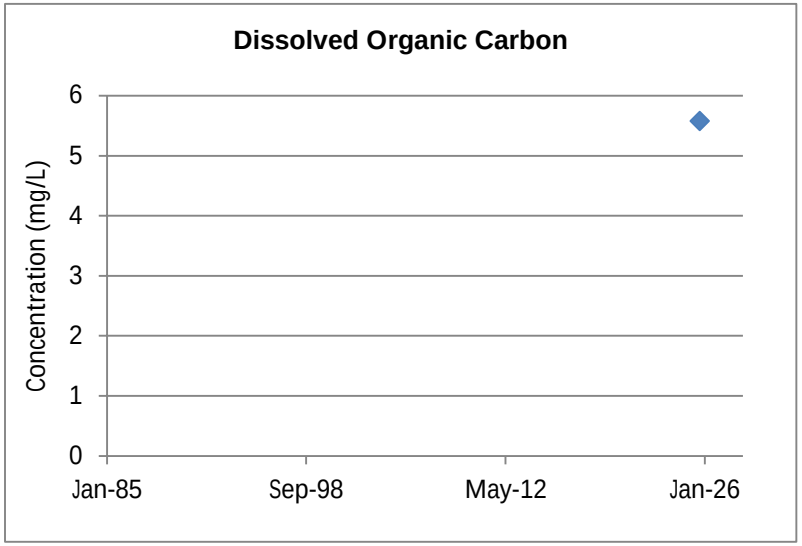
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Figure 12.23
VEOLIA, Swan Hills Treatment Centre
12(R)-SS - Indicators





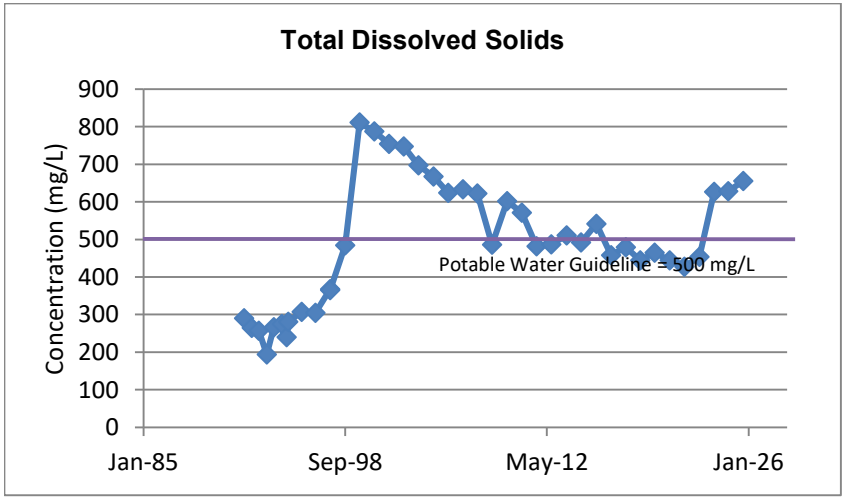


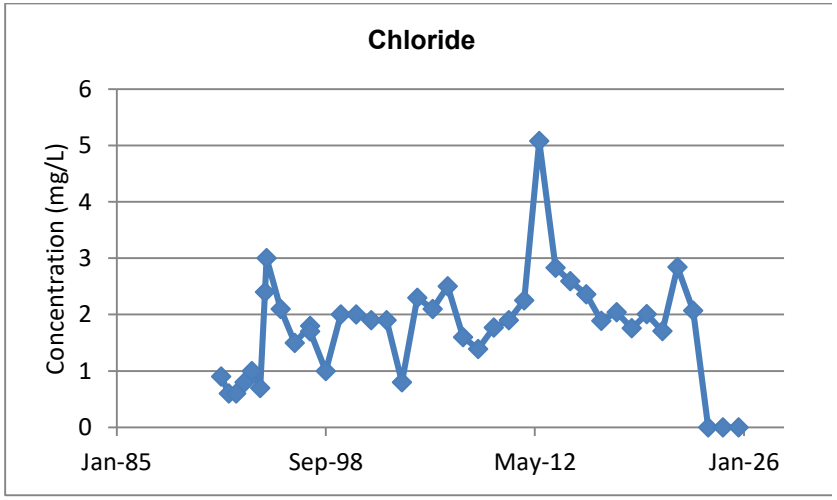


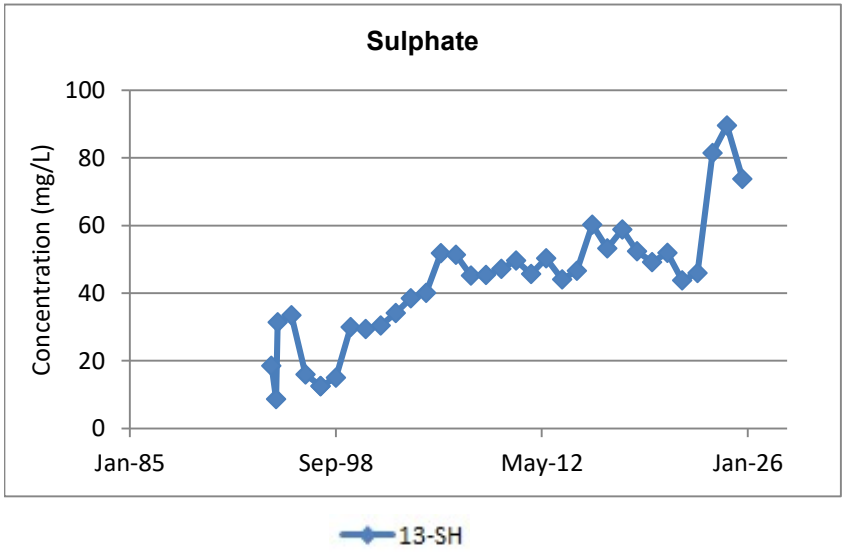
12(R)-SS

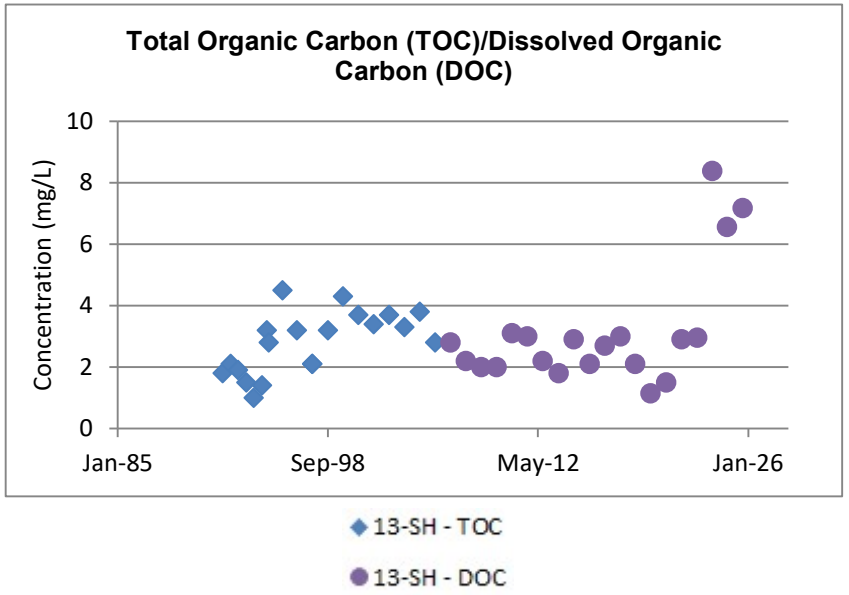
AECOM

Figure 12.24
VEOLIA, Swan Hills Treatment Centre
13-SH - Indicators



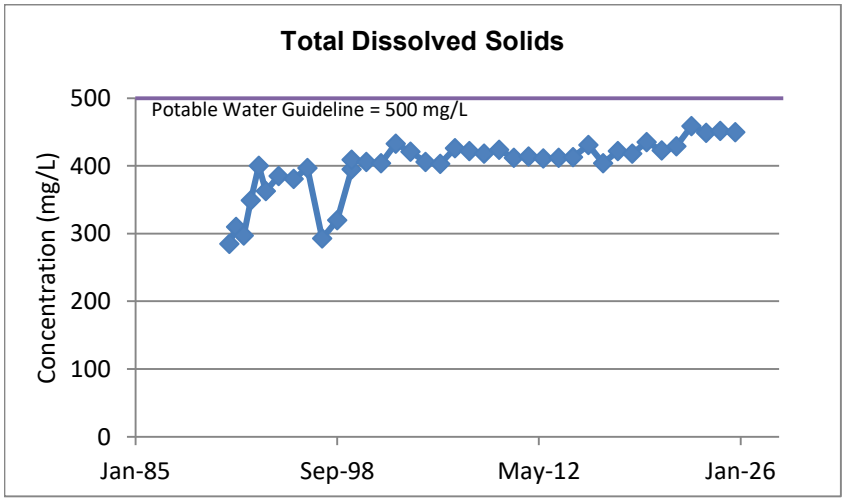


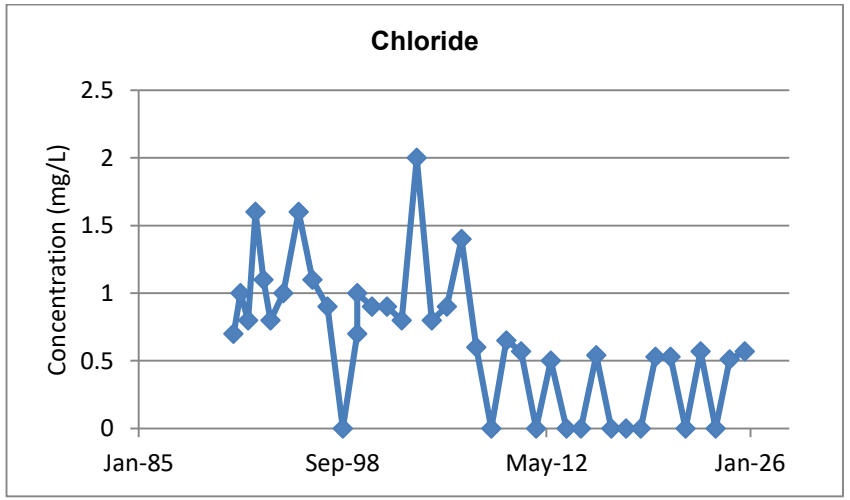


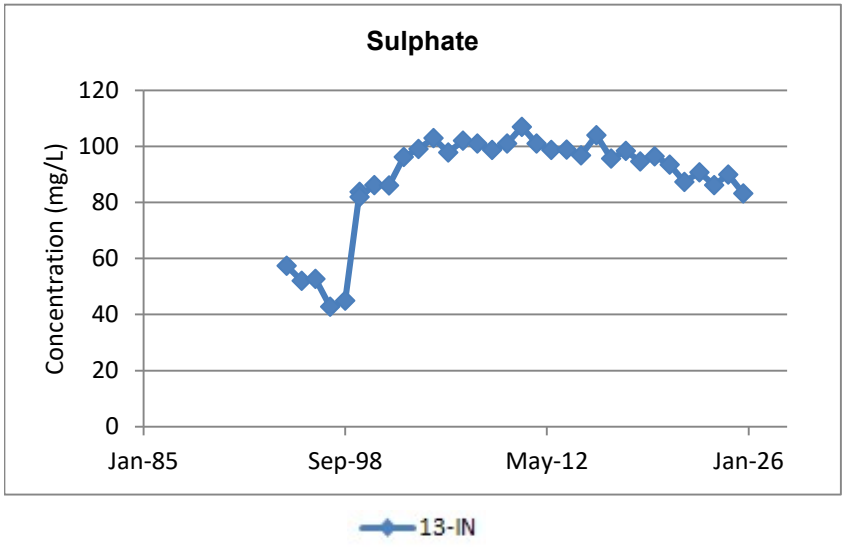


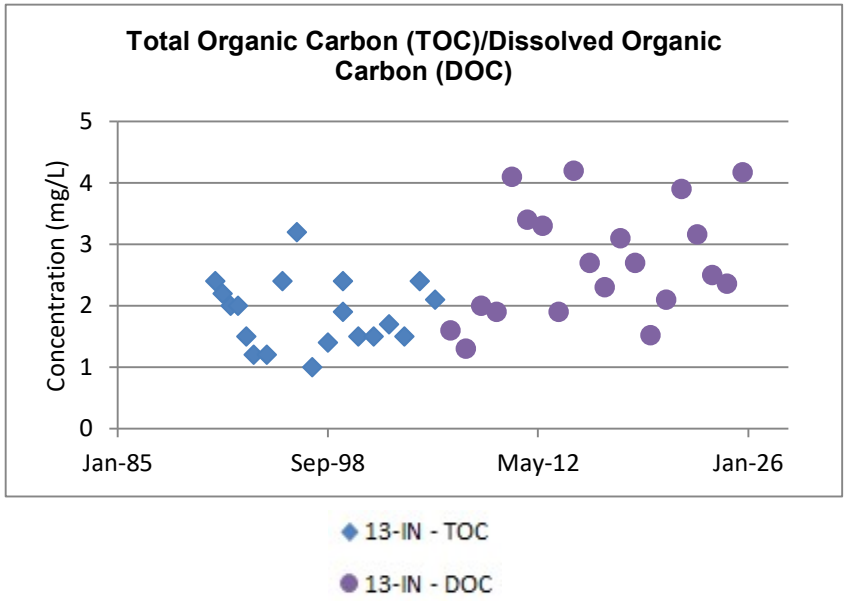
AECOM

Figure 12.25
VEOLIA, Swan Hills Treatment Centre
13-IN - Indicators



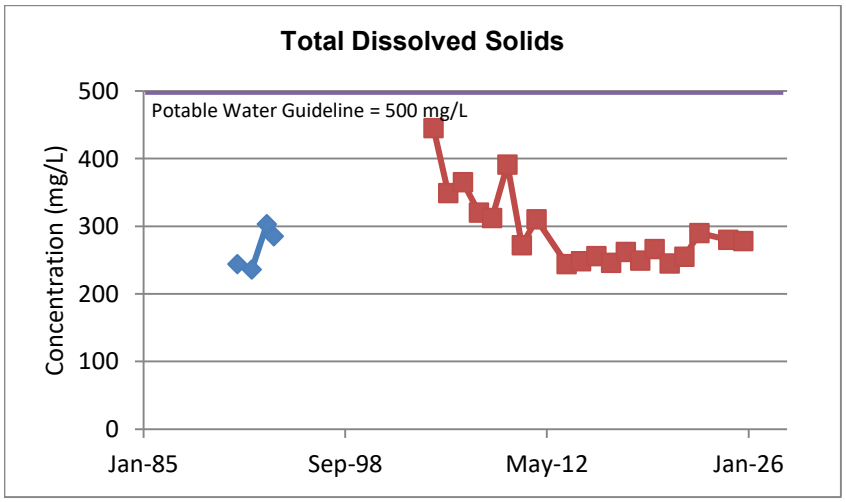


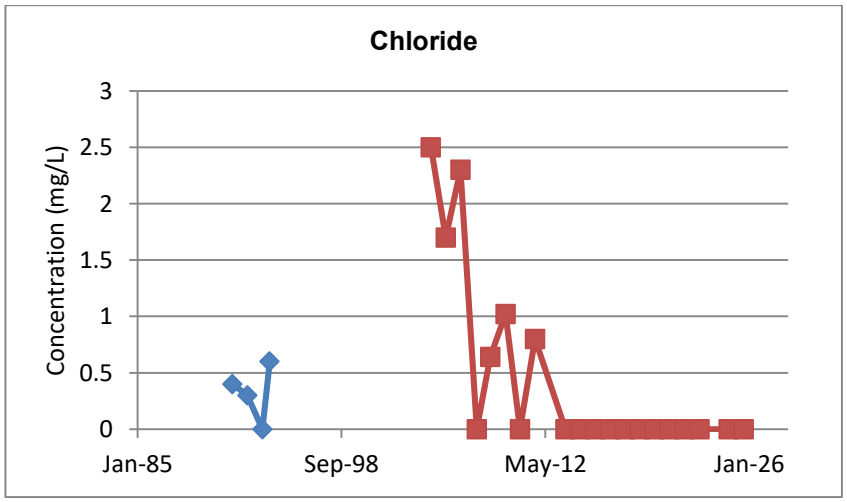


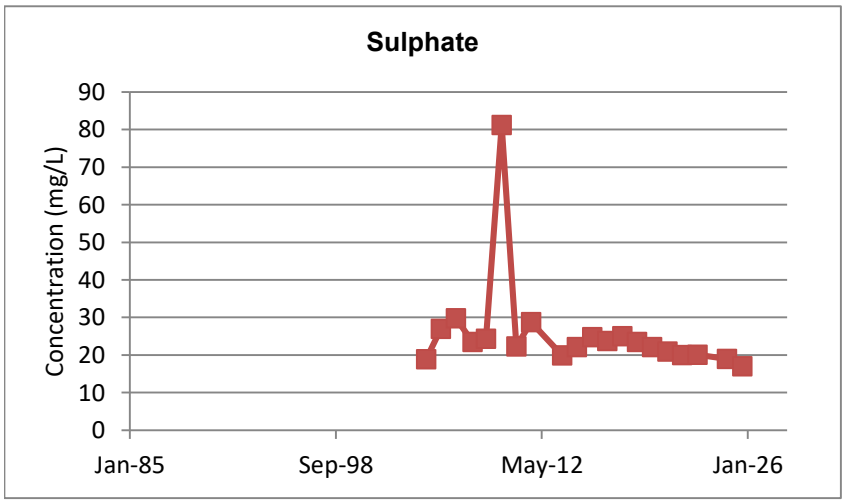


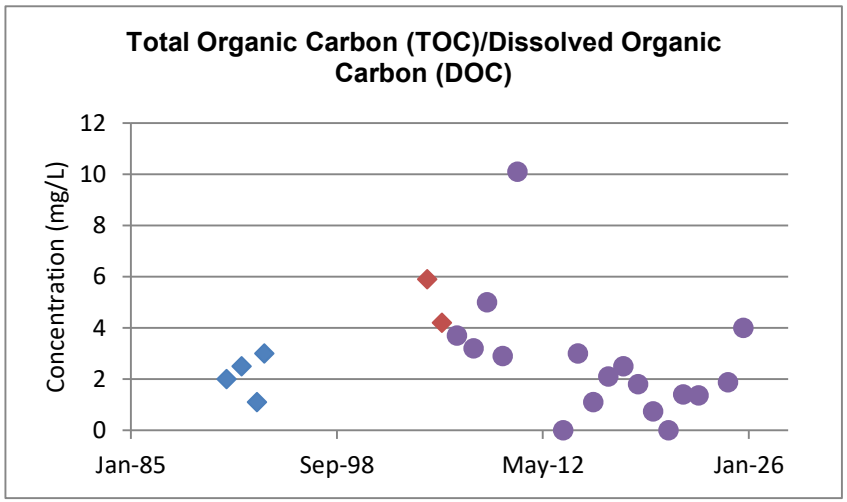
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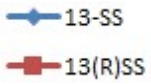
Figure 12.26
VEOLIA, Swan Hills Treatment Centre
13-SS and 13(R)SS - Indicators

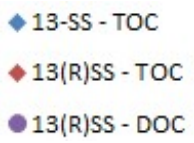






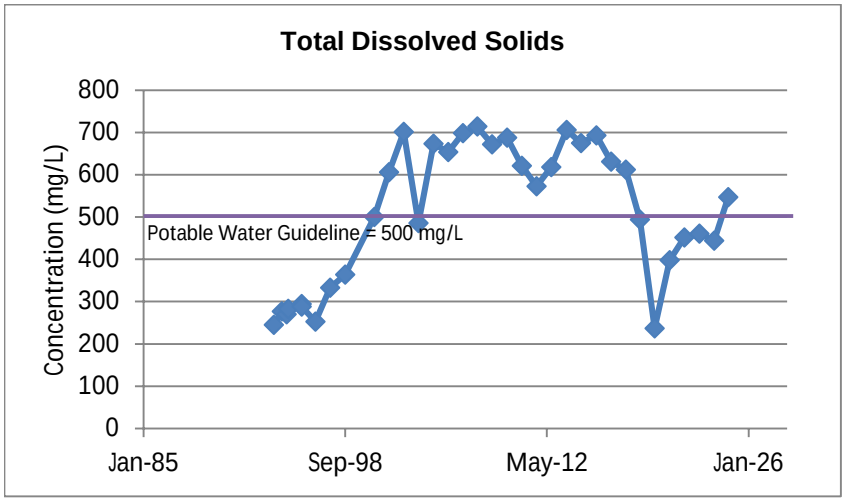


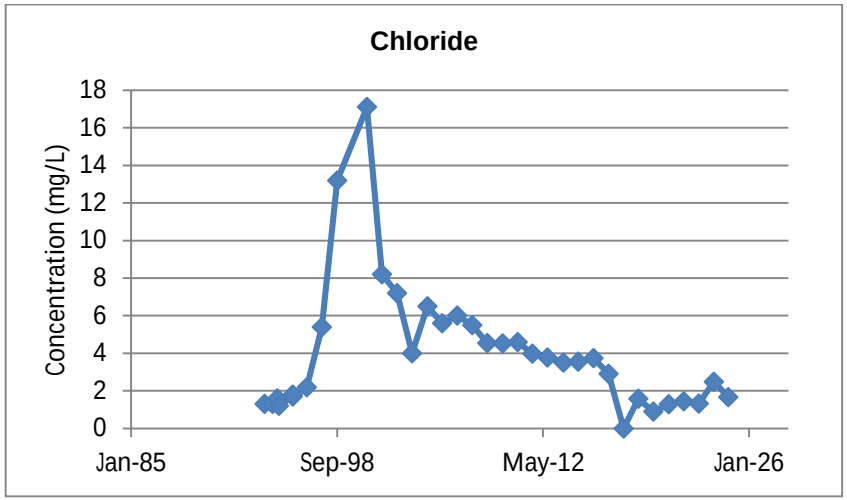


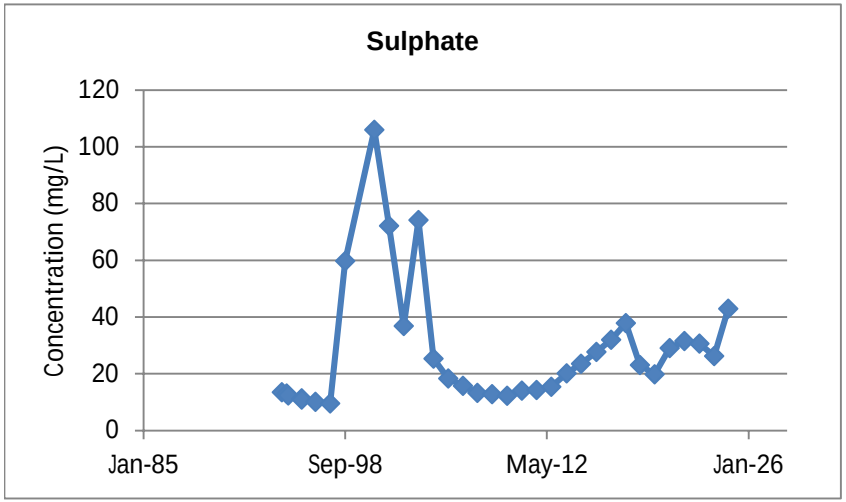


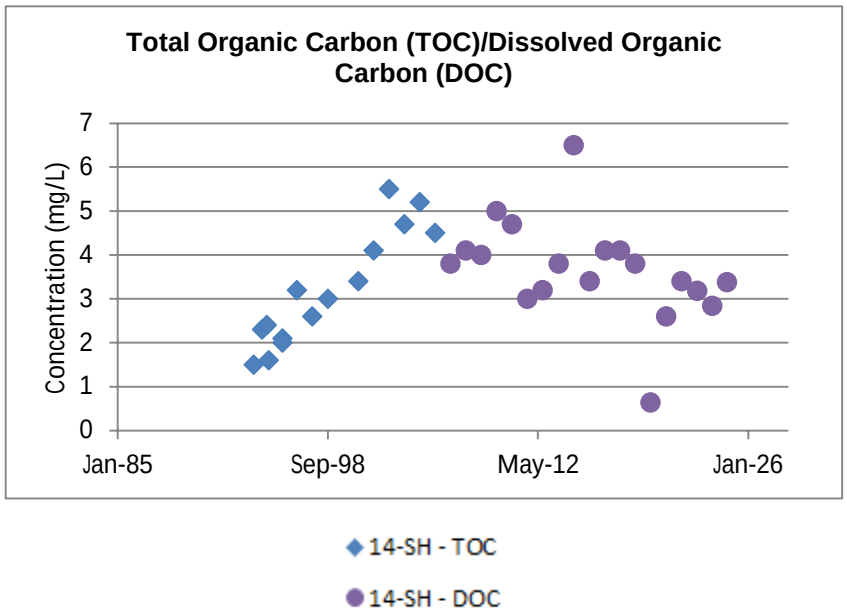
AECOM

Figure 12.27
VEOLIA, Swan Hills Treatment Centre
14-SH - Indicators



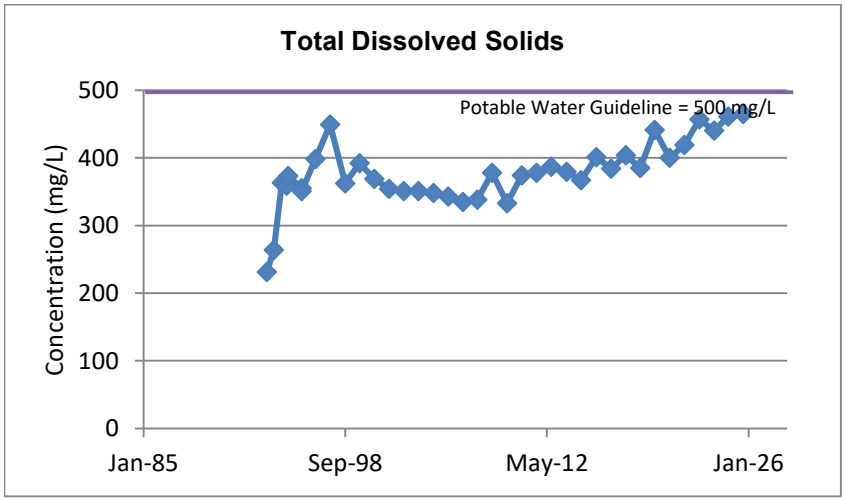


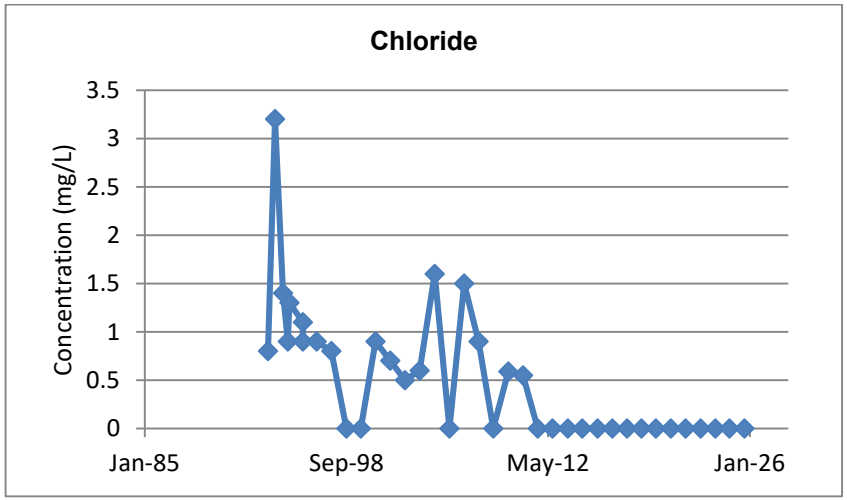


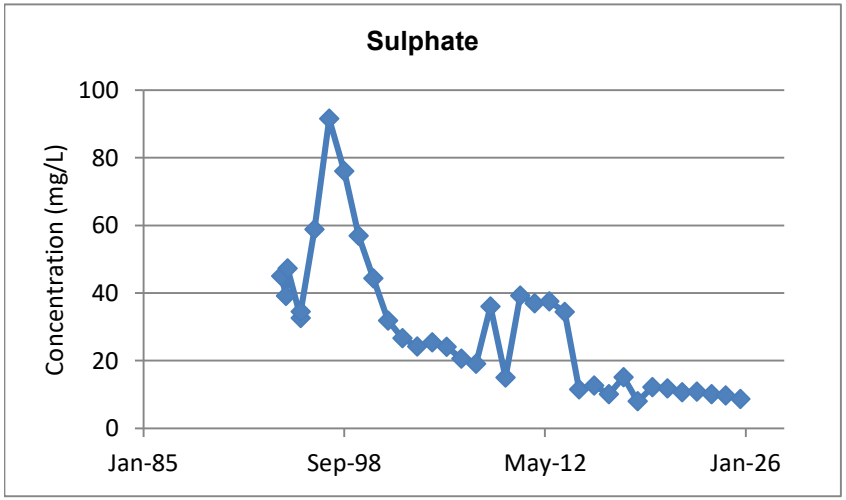


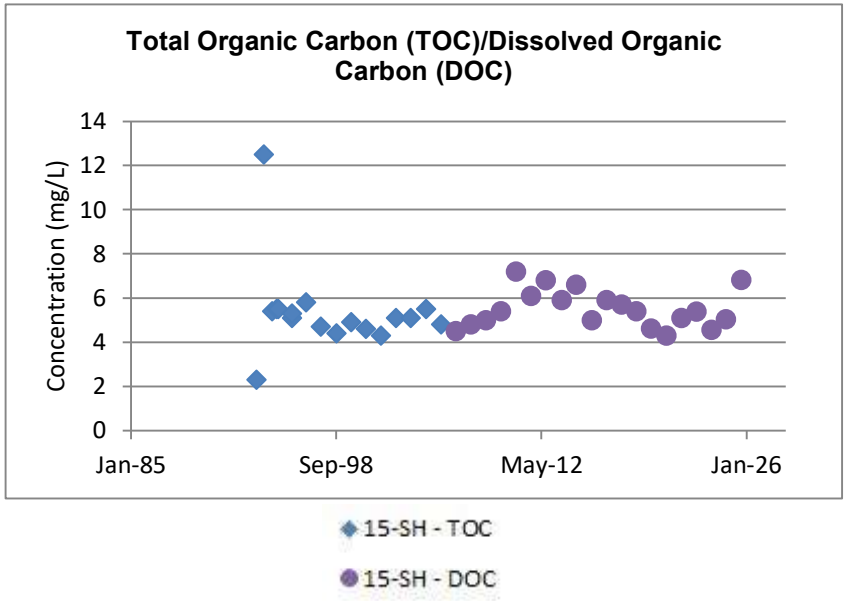
AECOM

Figure 12.28
VEOLIA, Swan Hills Treatment Centre
15-SH - Indicators



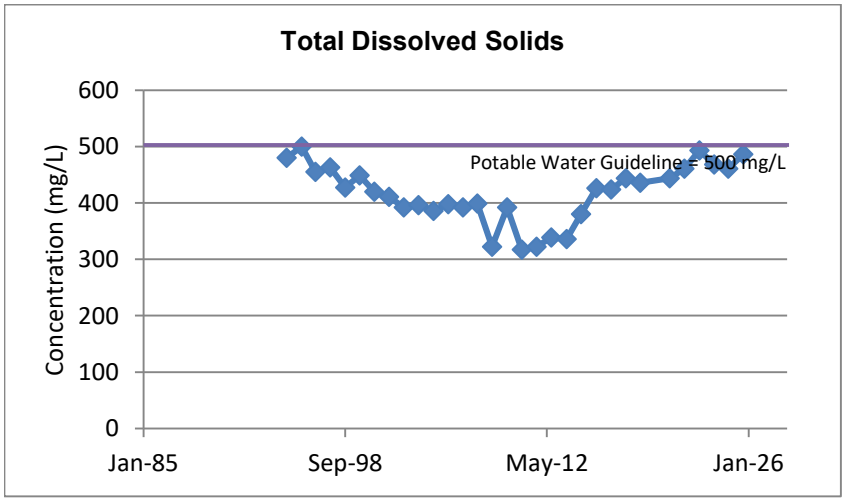


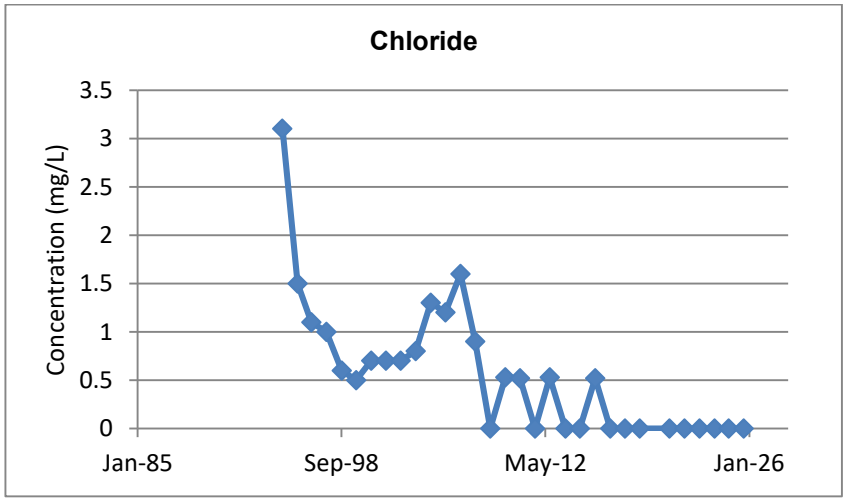


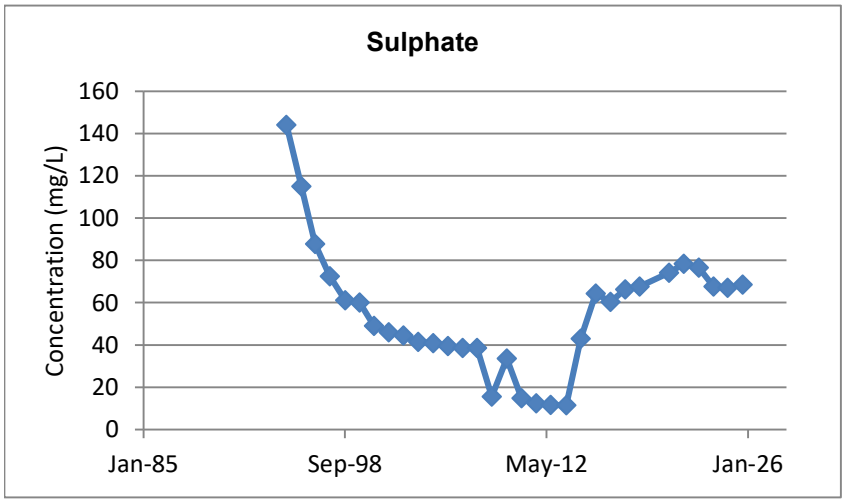


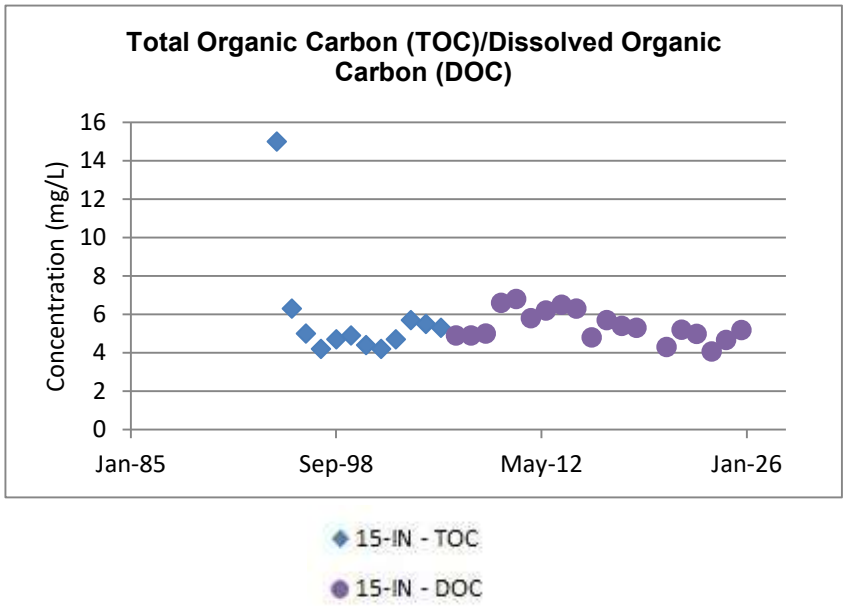
AECOM

Figure 12.29
VEOLIA, Swan Hills Treatment Centre
15-IN - Indicators



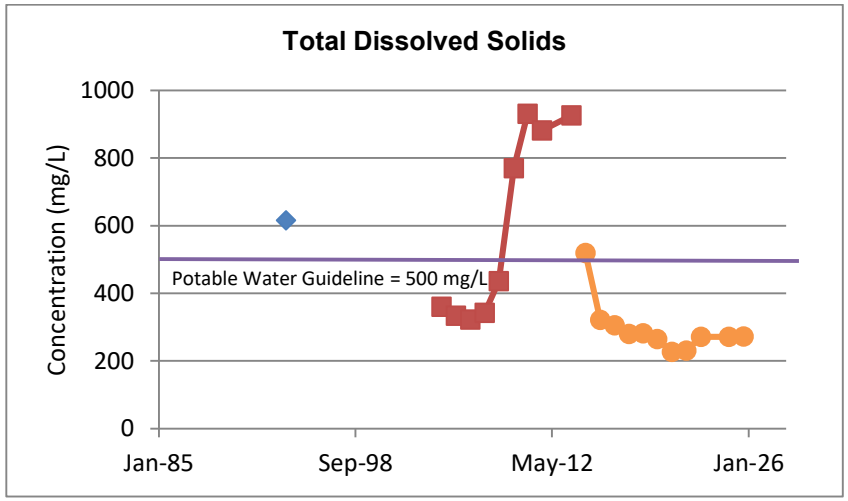


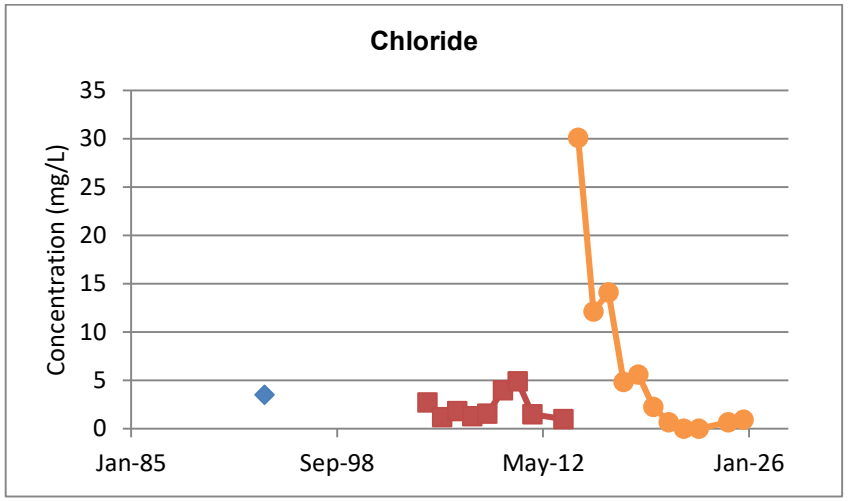


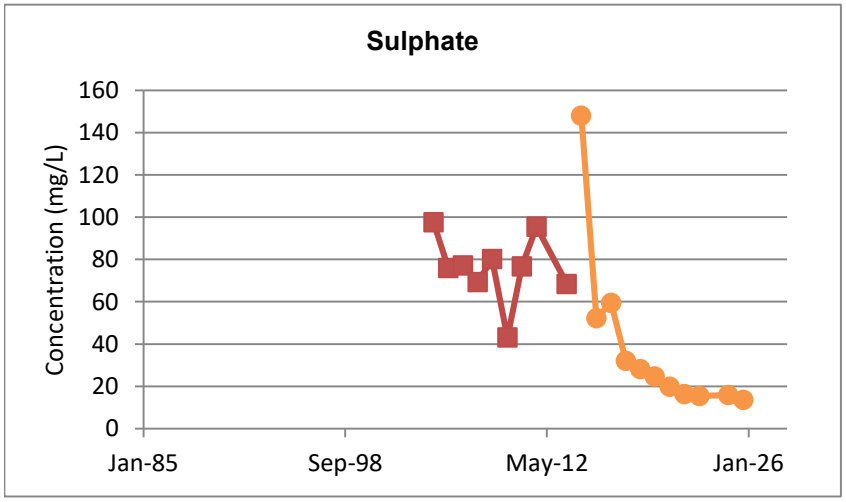


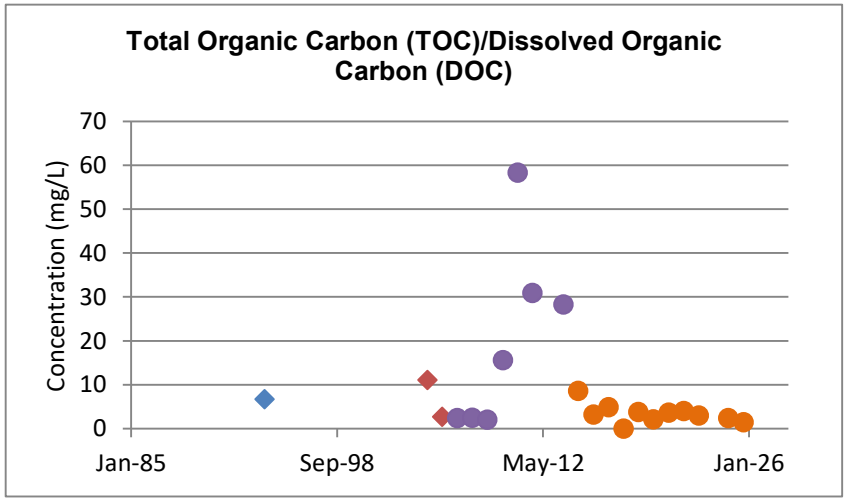
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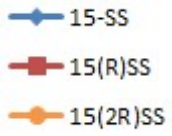
Figure 12.30
VEOLIA, Swan Hills Treatment Centre
15-SS, 15(R)SS, and 15(2R)SS - Indicators

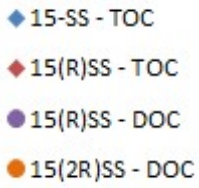






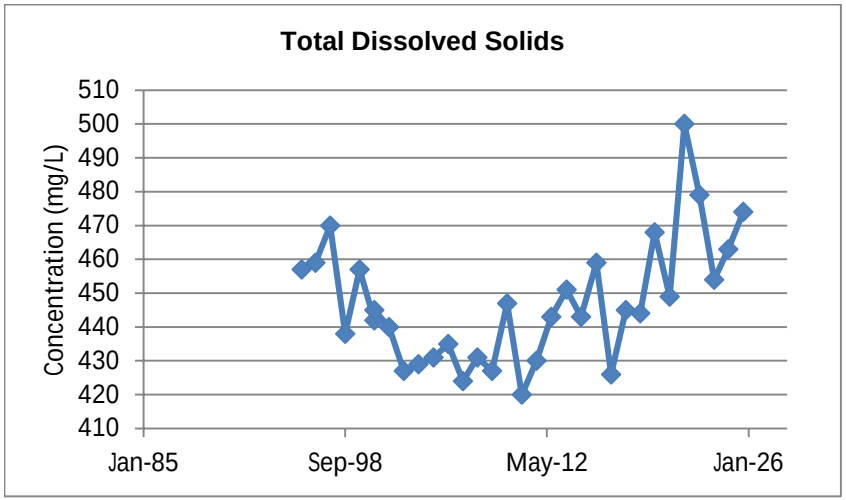


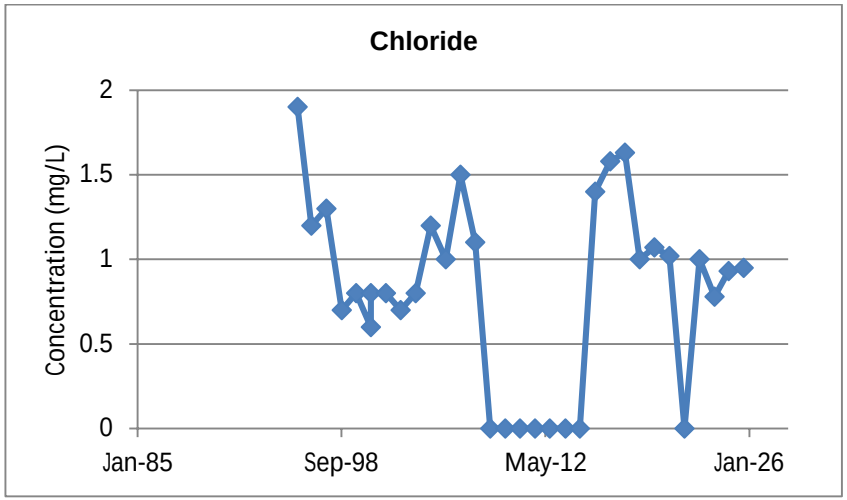


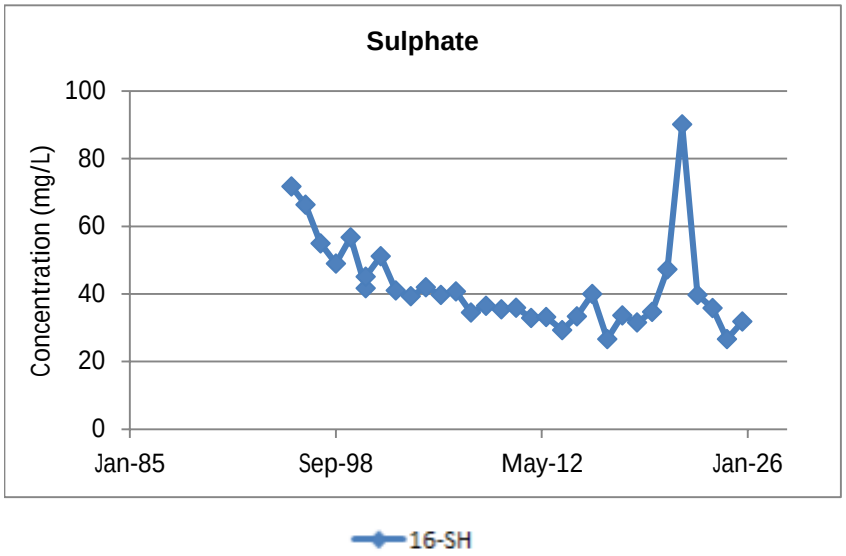


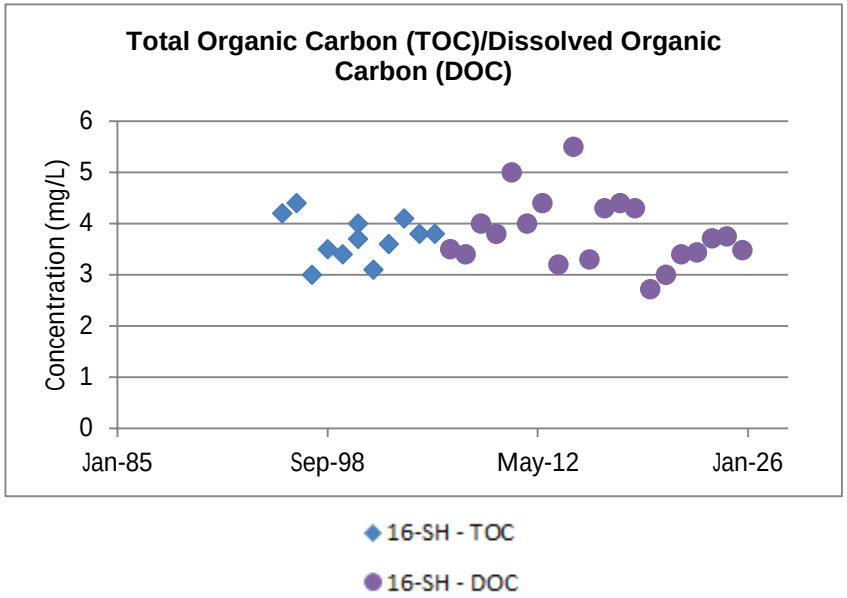
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Figure 12.31
VEOLIA, Swan Hills Treatment Centre
16-SH - Indicators



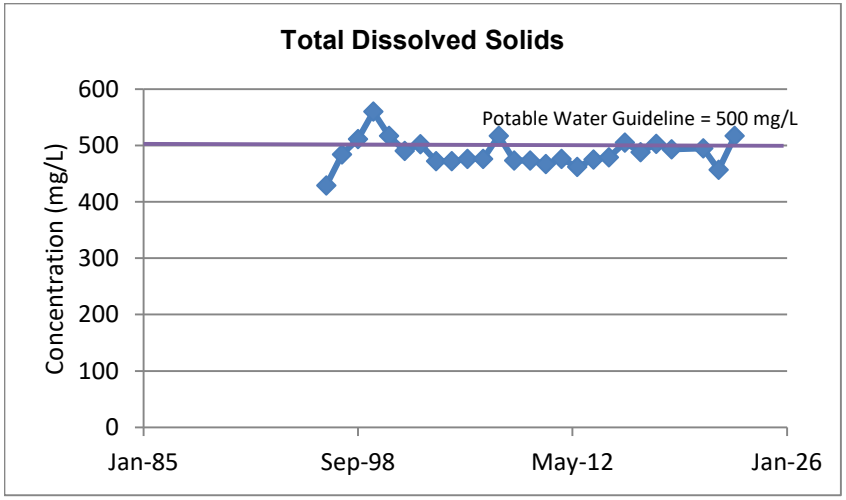


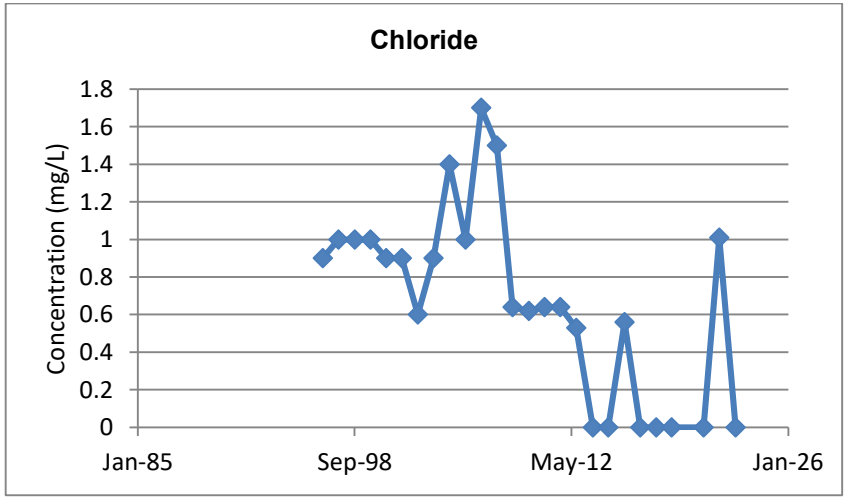


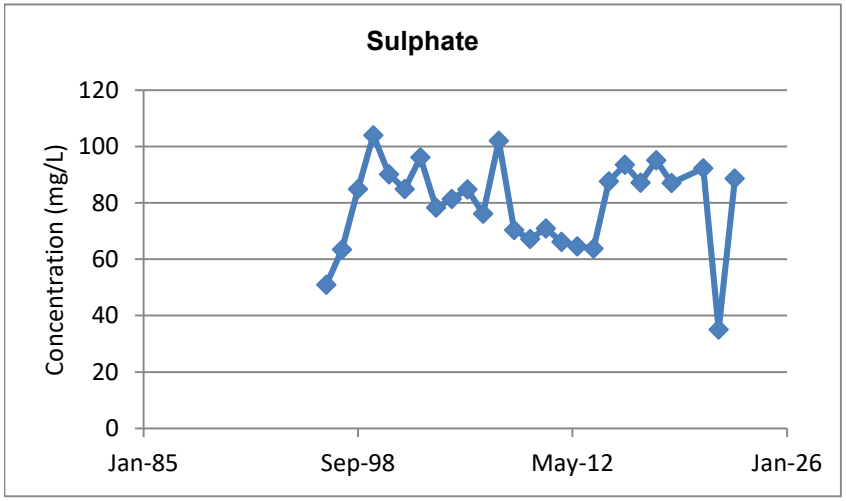


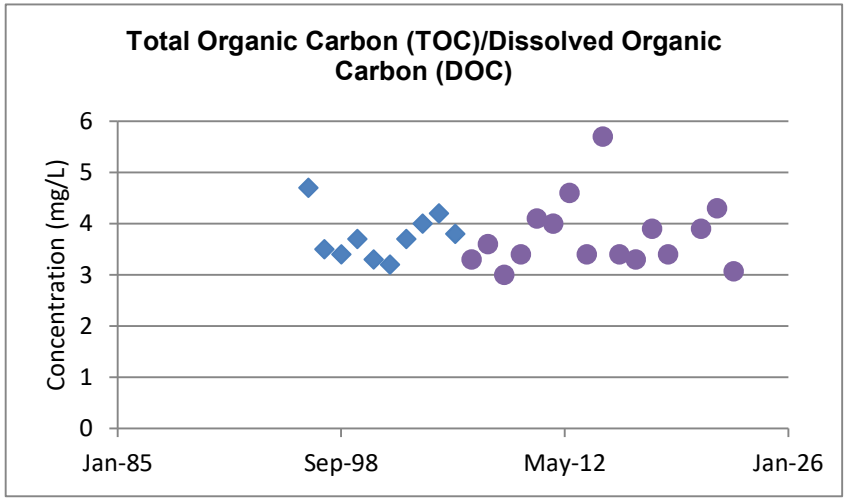
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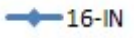
Figure 12.32
VEOLIA, Swan Hills Treatment Centre
16-IN - Indicators

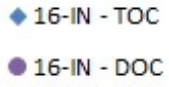






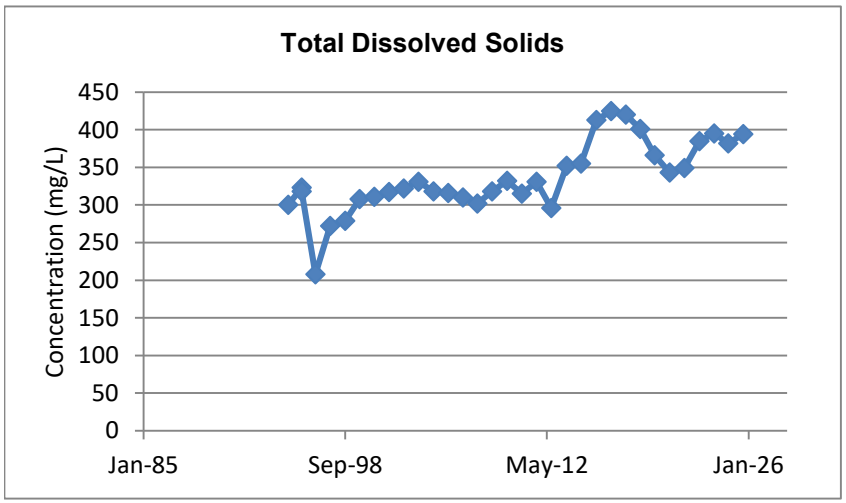


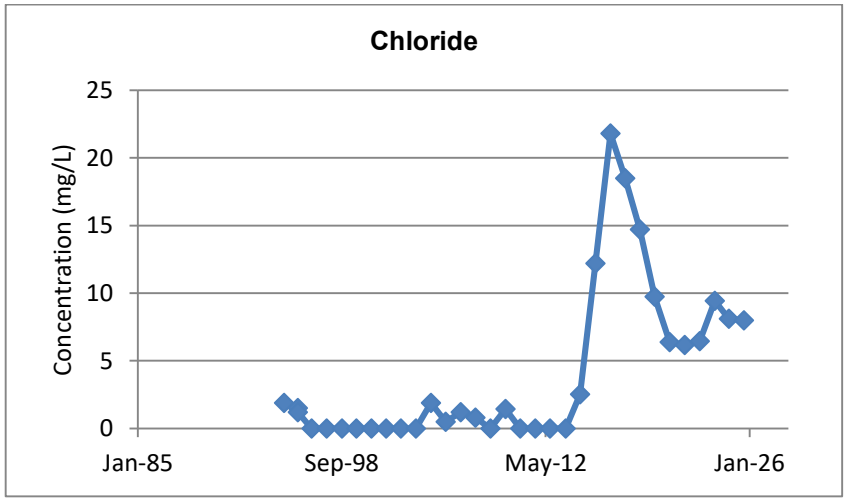


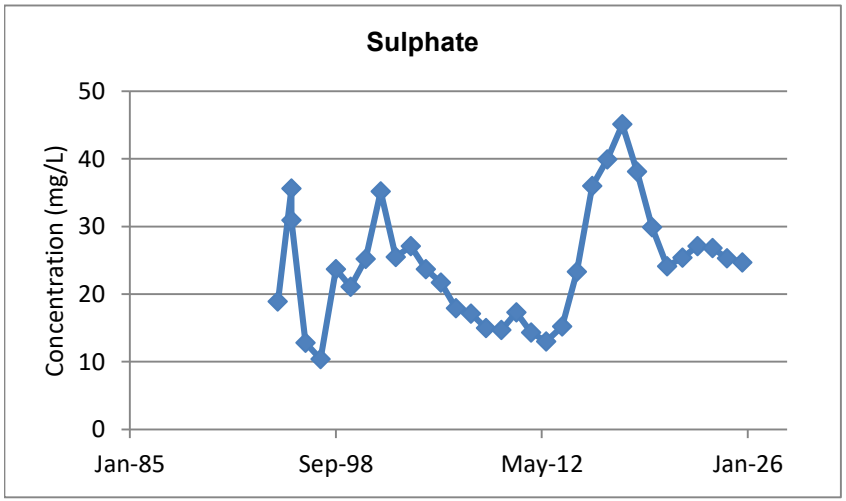


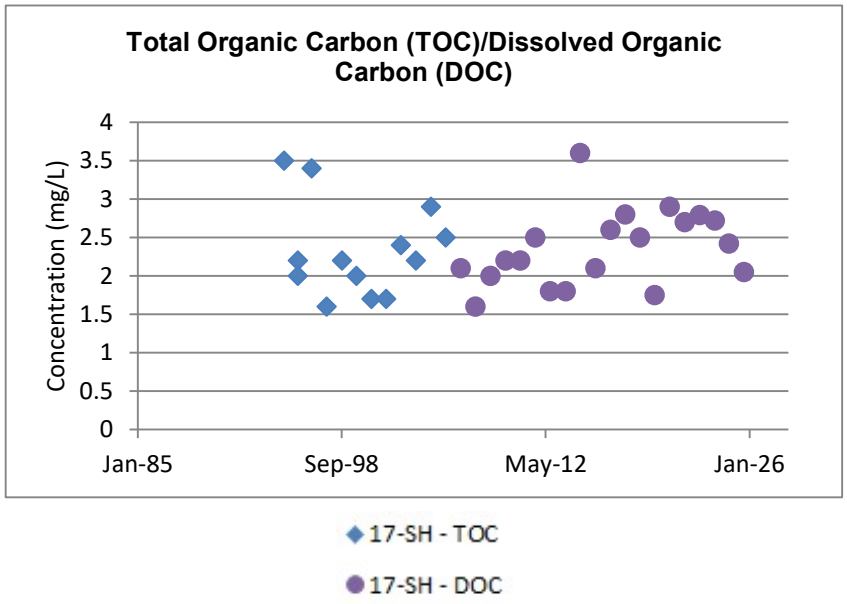
AECOM

Figure 12.33
VEOLIA, Swan Hills Treatment Centre
17-SH - Indicators



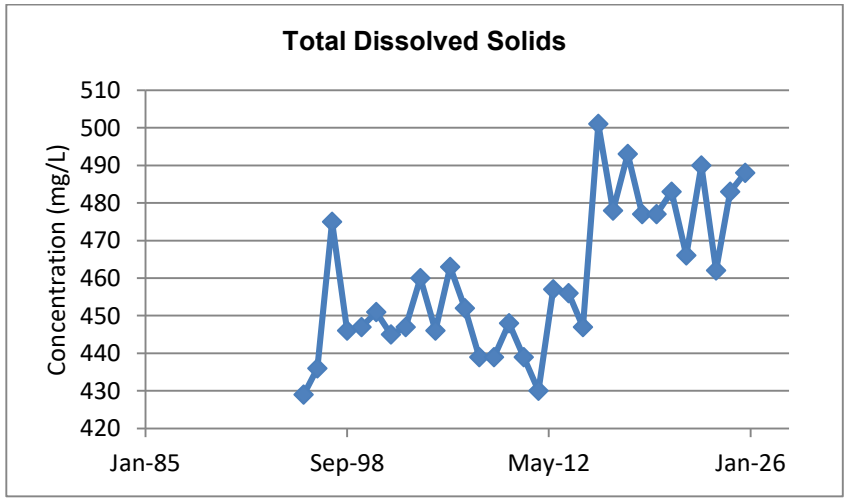


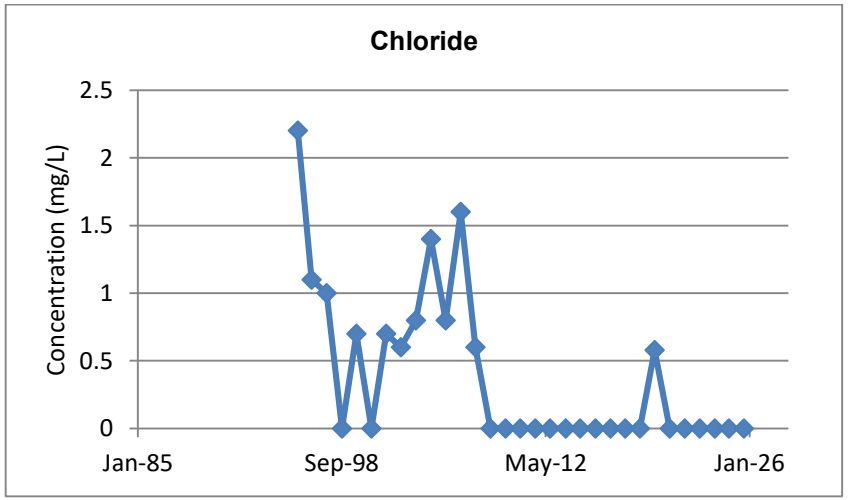


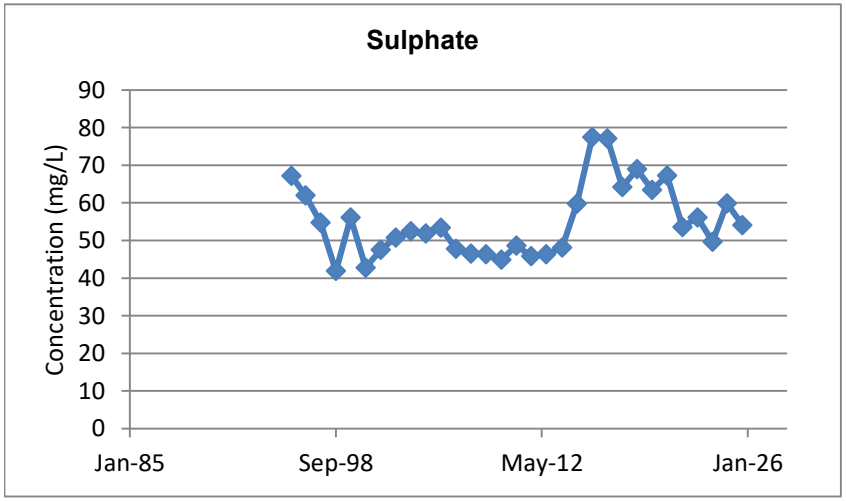


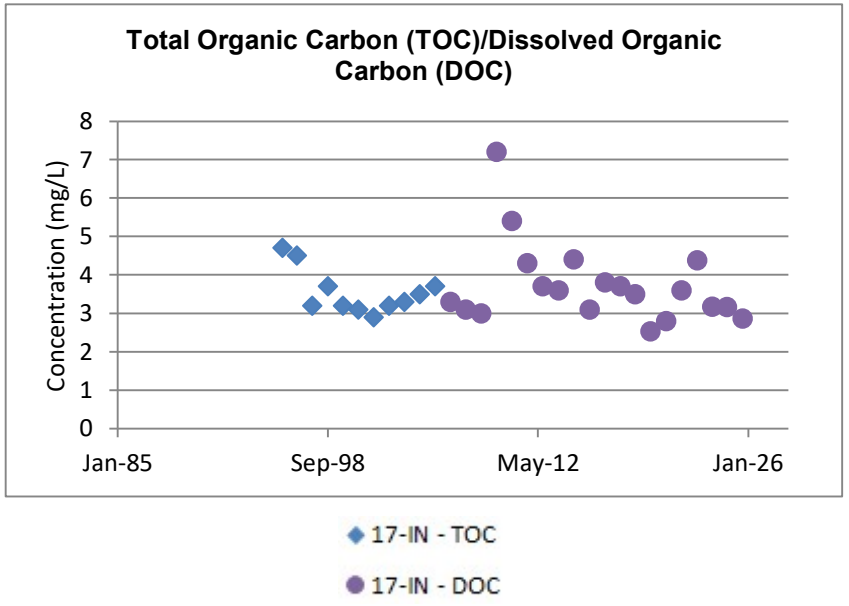
AECOM

Figure 12.34
VEOLIA, Swan Hills Treatment Centre
17-IN - Indicators



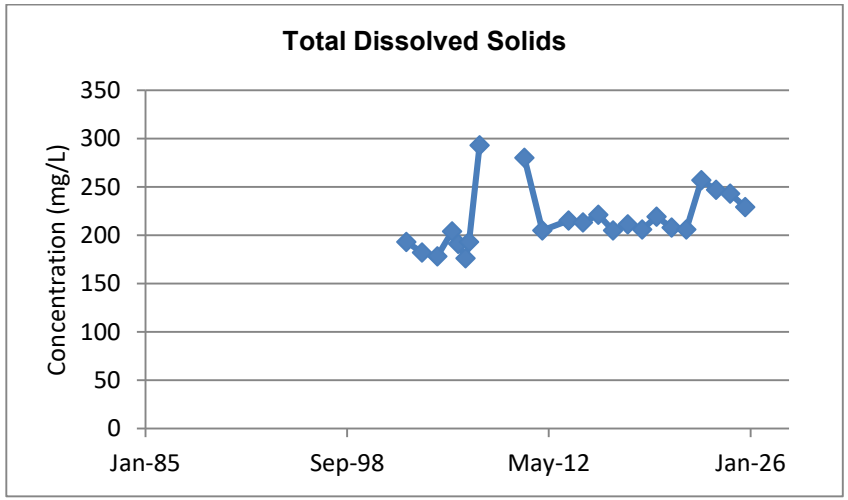


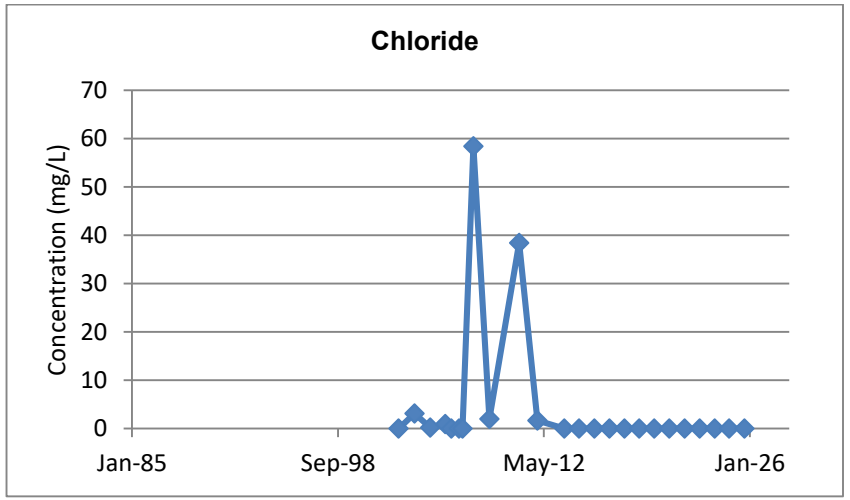


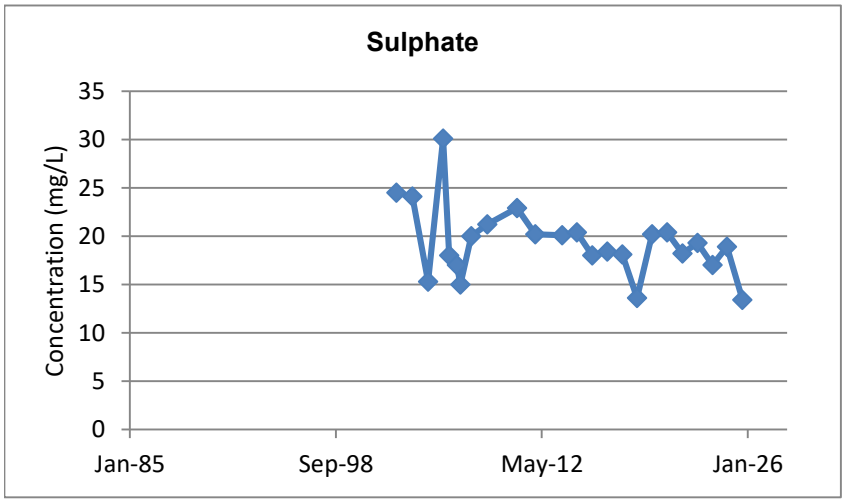


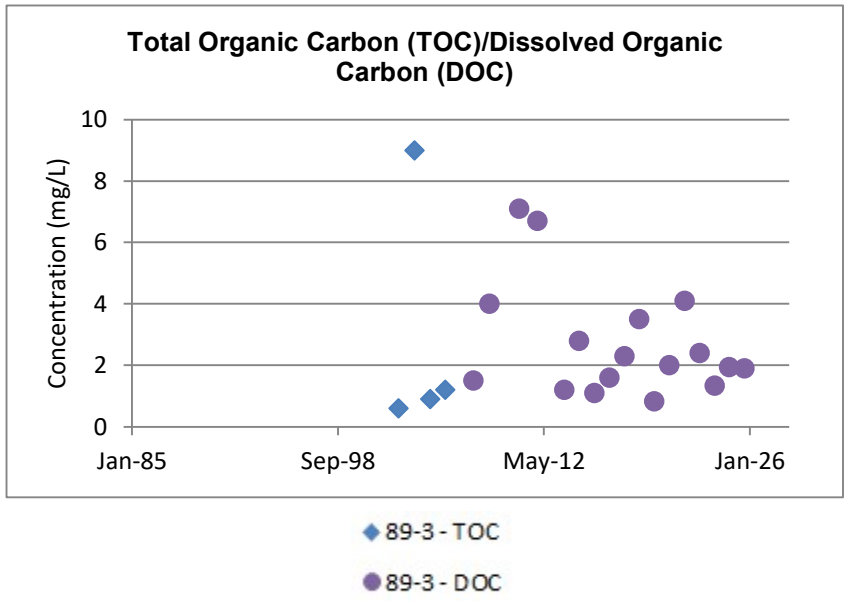
AECOM

Figure 12.35
VEOLIA, Swan Hills Treatment Centre
89-3 - Indicators



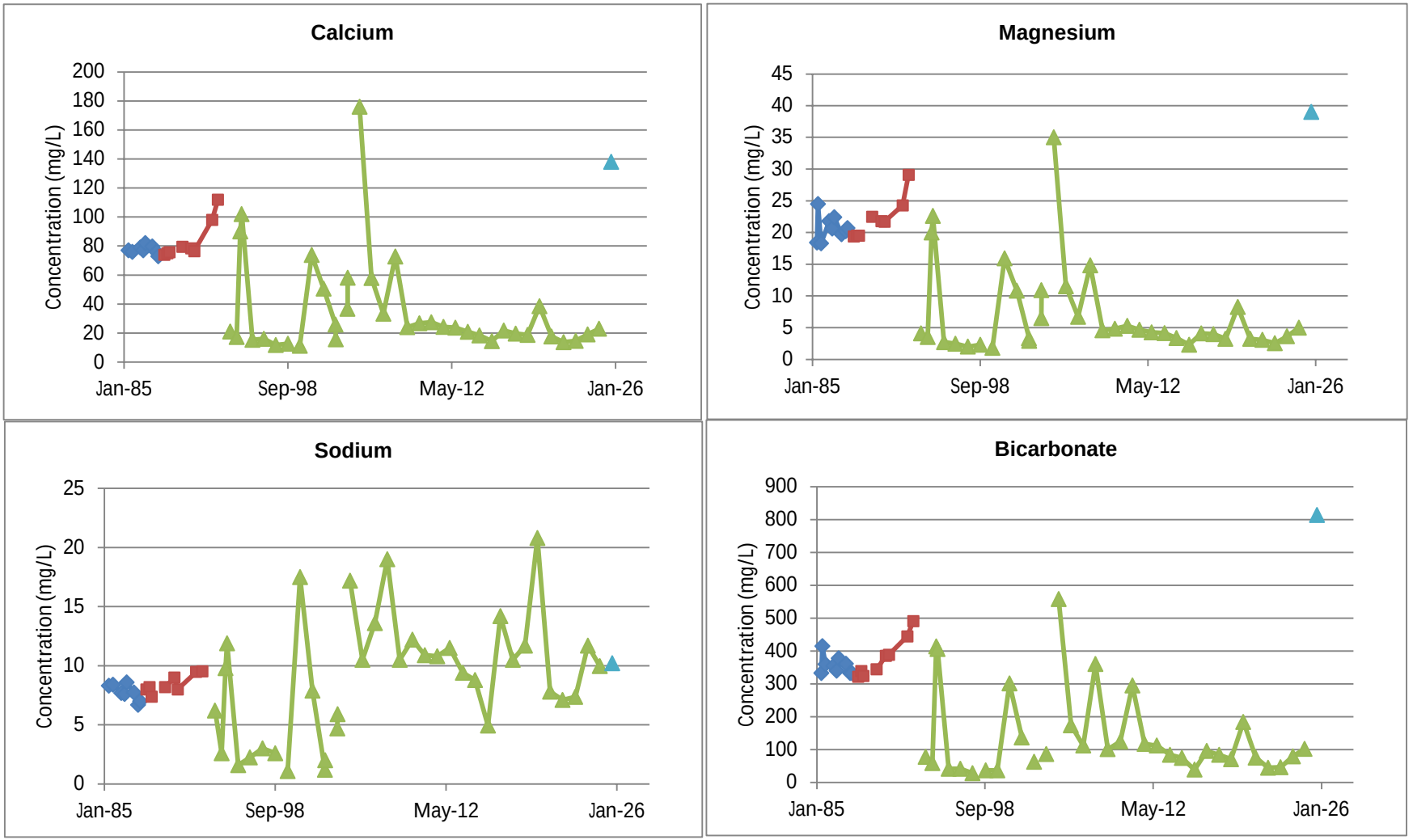






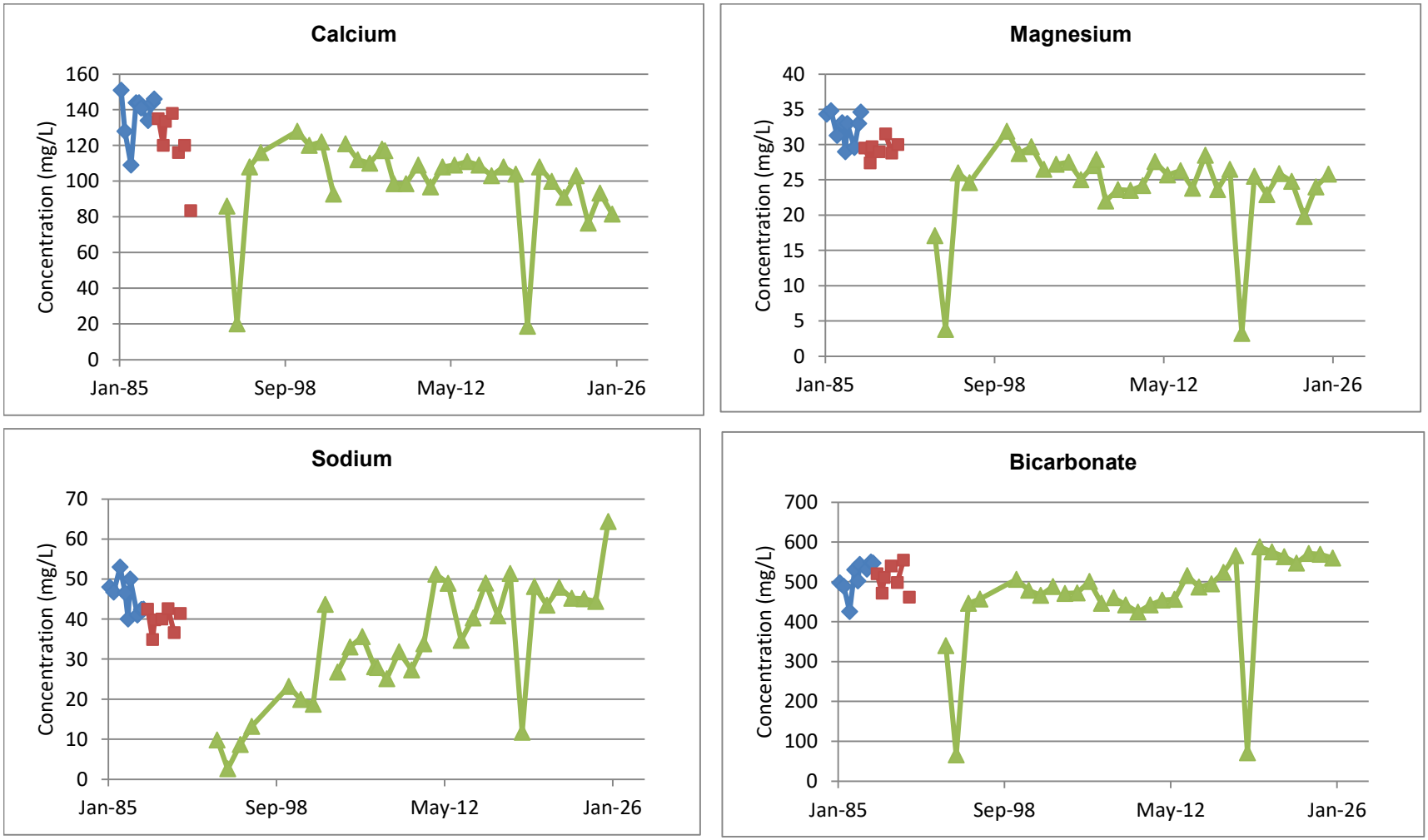
AECOM

Figure 13.1
VEOLIA, Swan Hills Treatment Centre
01-SH, 01A-SH and 01(R)-SH - Major Ions



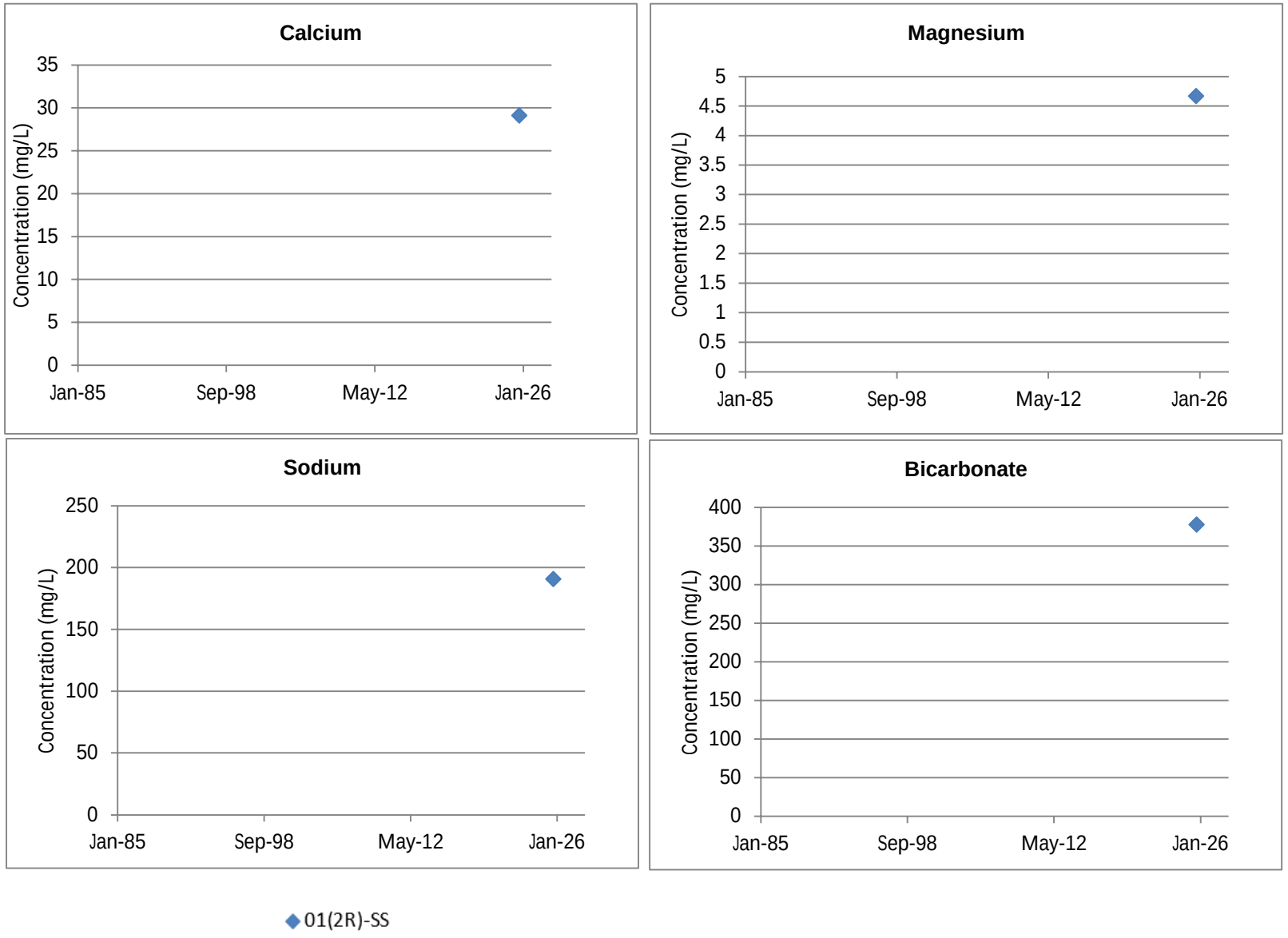
AECOM

Figure 13.2
VEOLIA, Swan Hills Treatment Centre
01-IN and 01A-IN - Major Ions



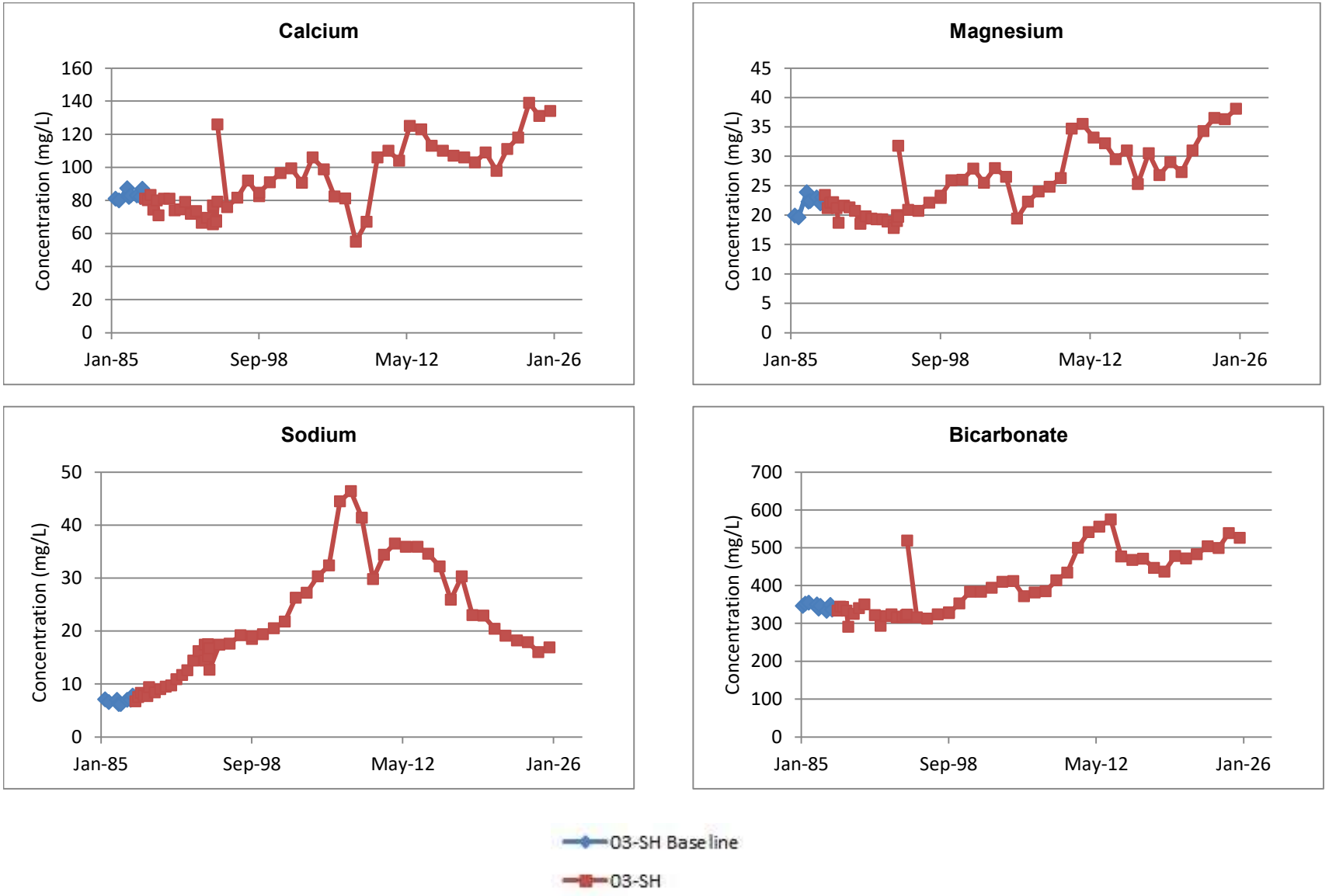
AECOM

Figure 13.3
VEOLIA, Swan Hills Treatment Centre
01(2R)-SS - Major Ions



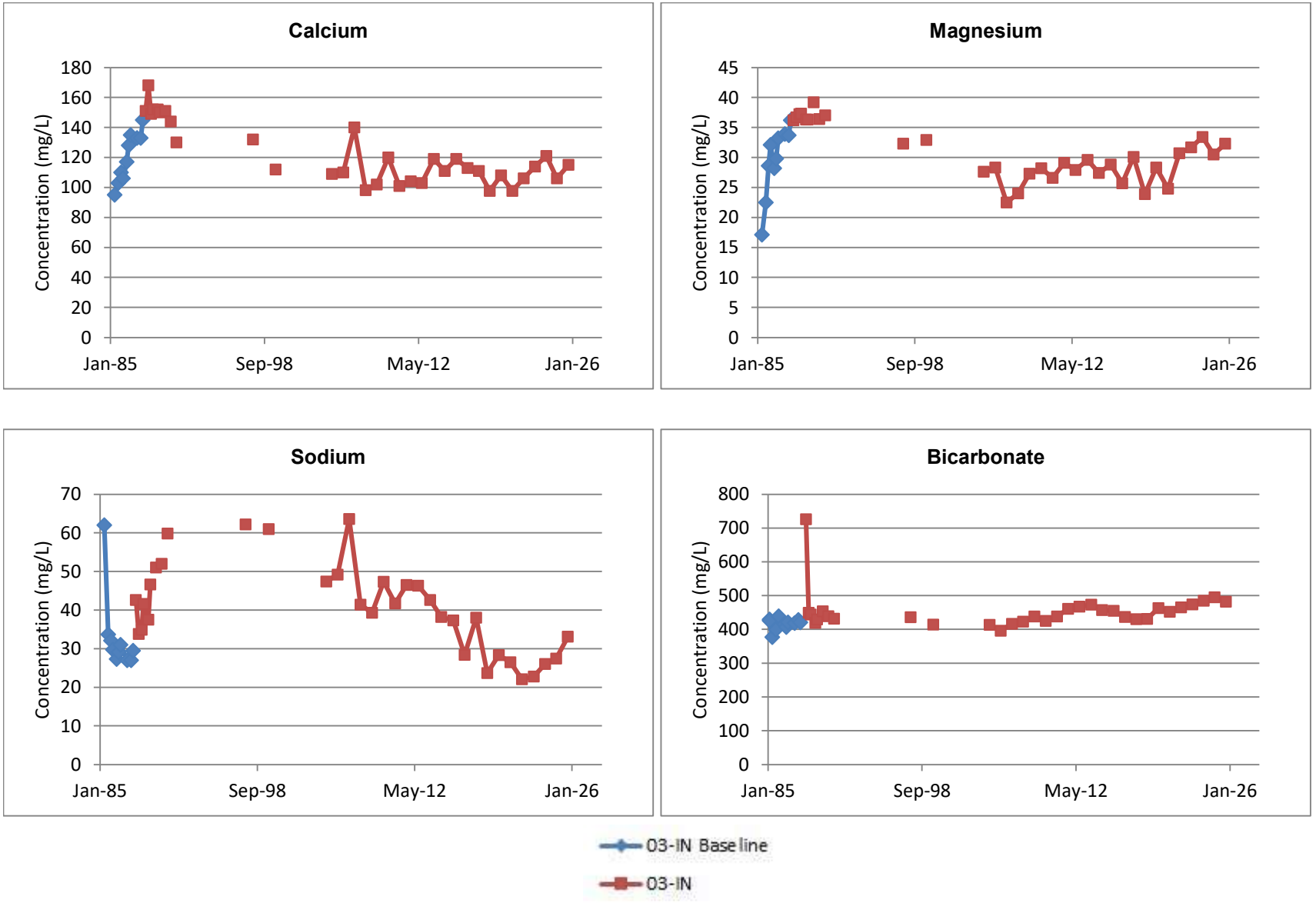
AECOM

Figure 13.4
VEOLIA, Swan Hills Treatment Centre
03-SH - Major Ions



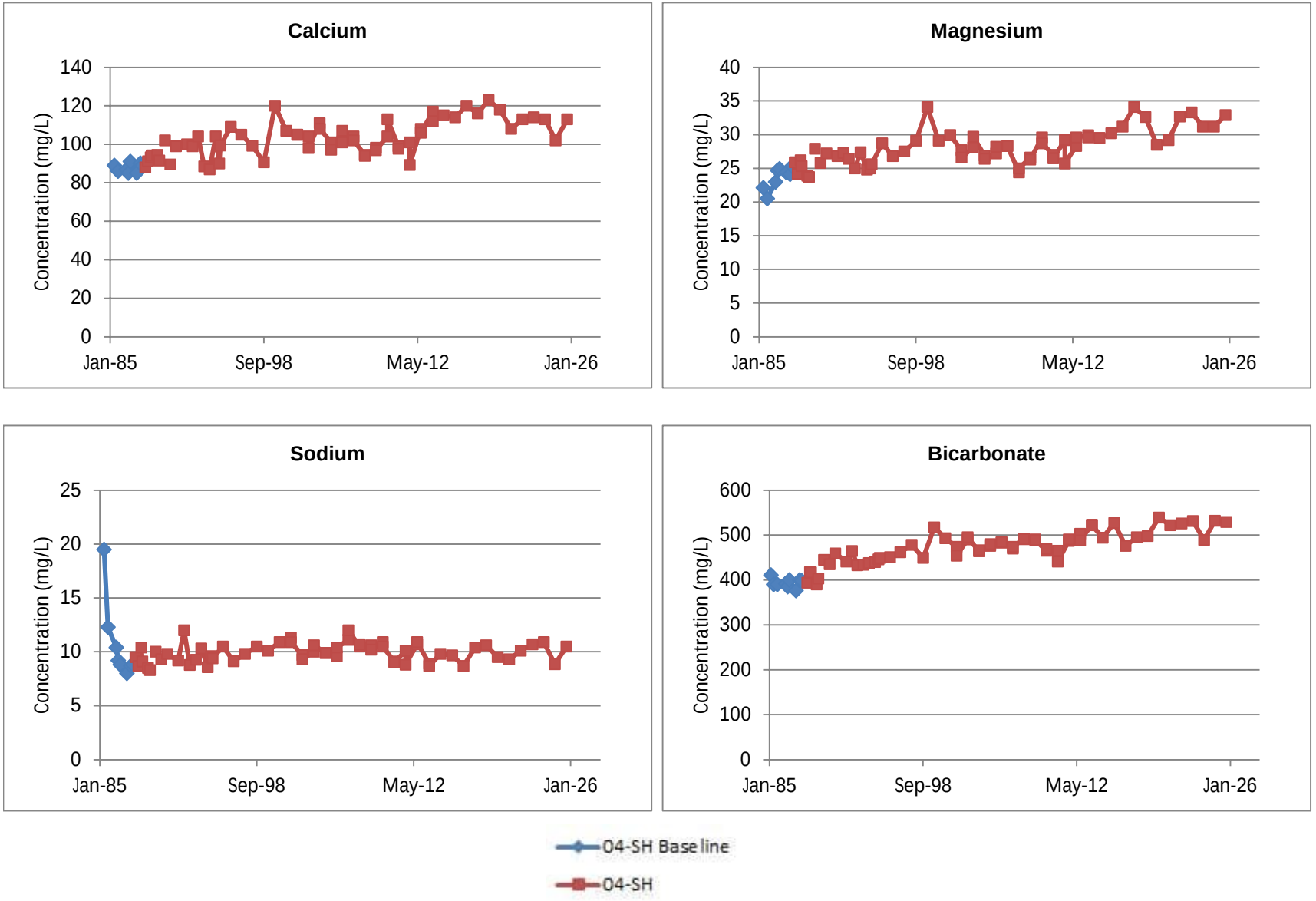
AECOM

Figure 13.5
VEOLIA, Swan Hills Treatment Centre
03-IN - Major Ions



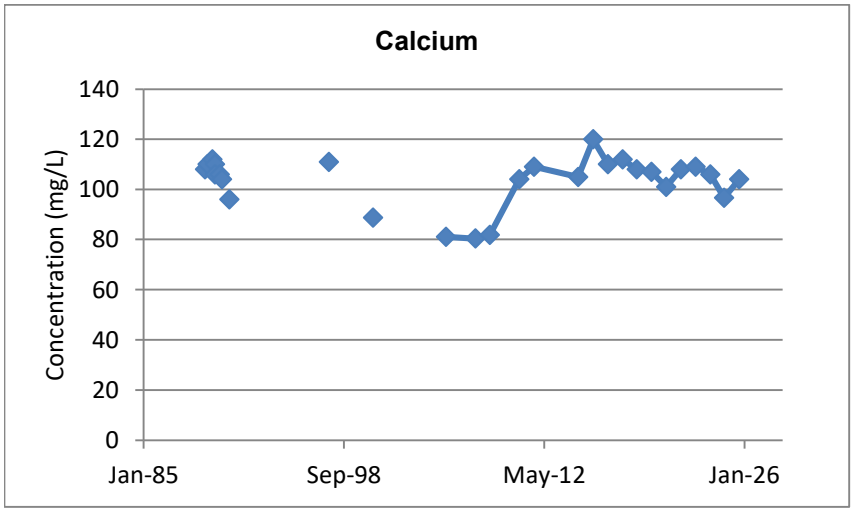
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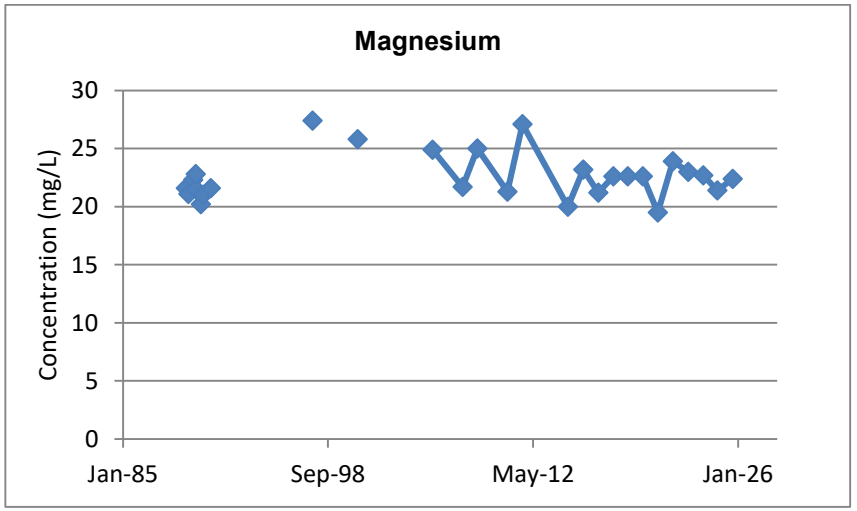
Figure 13.6
VEOLIA, Swan Hills Treatment Centre
04-SH - Major Ions

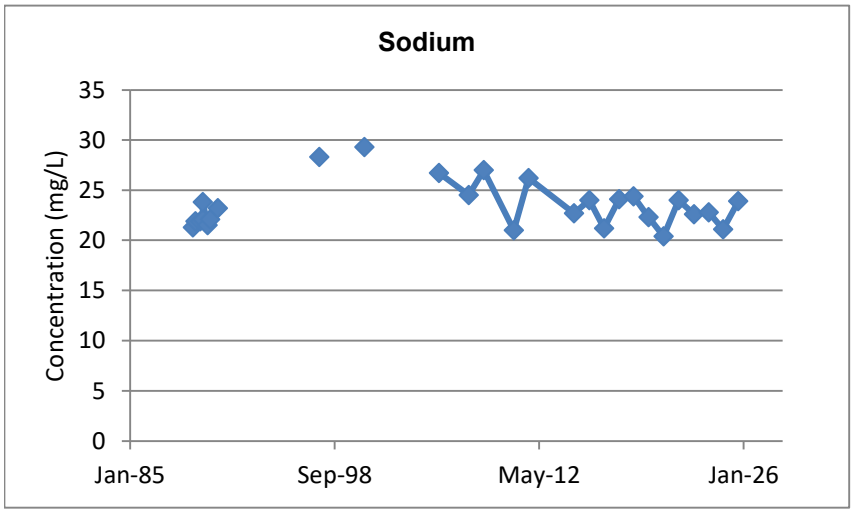


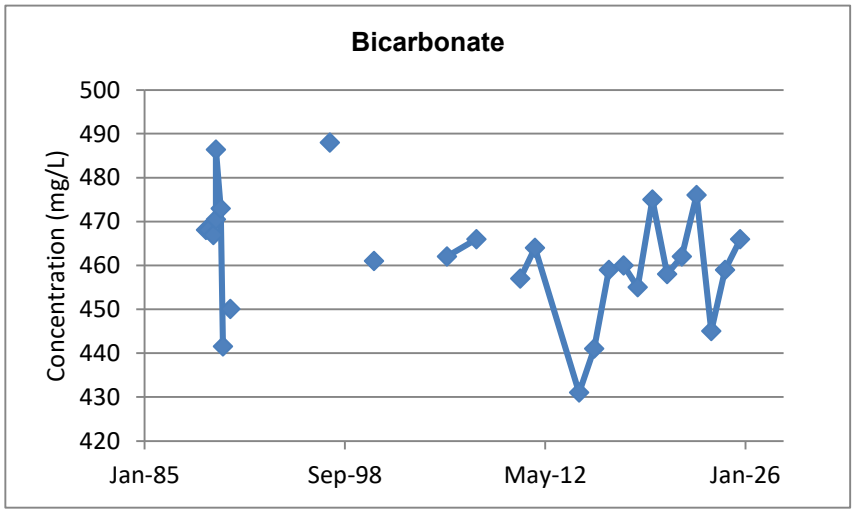
AECOM

Table 13.7
VEOLIA, Swan Hills Treatment Centre
04-IN - Major Ions





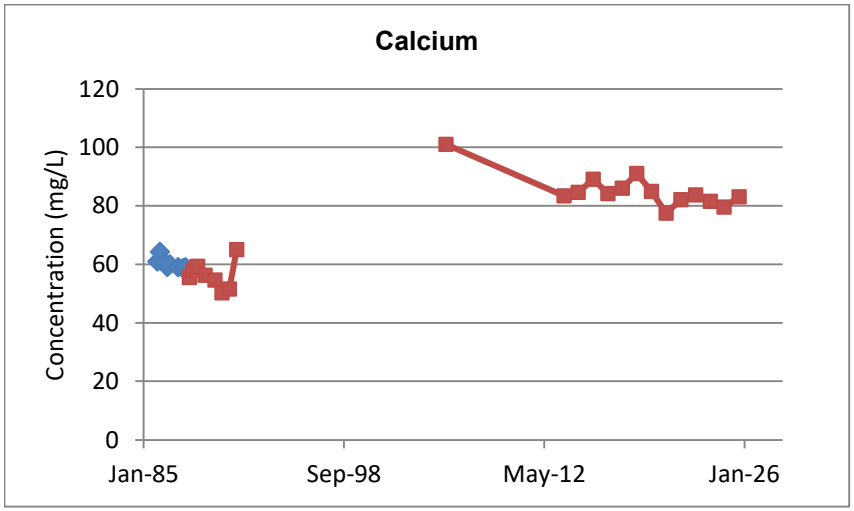


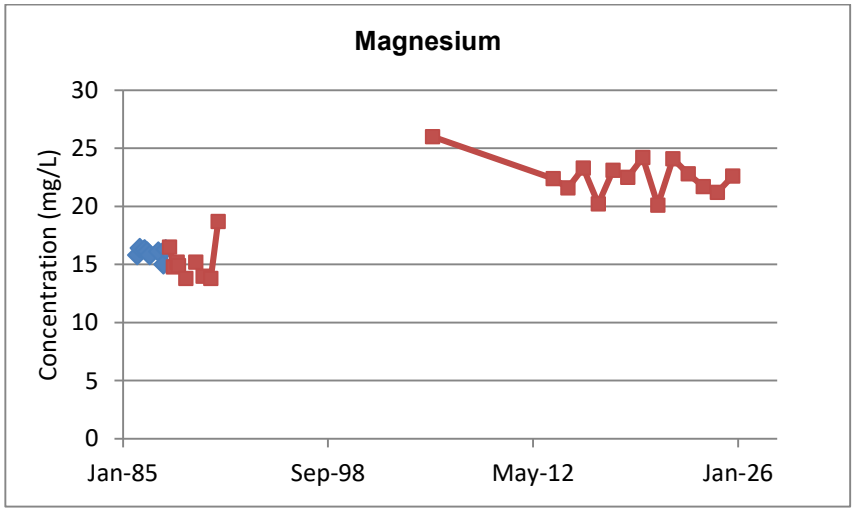


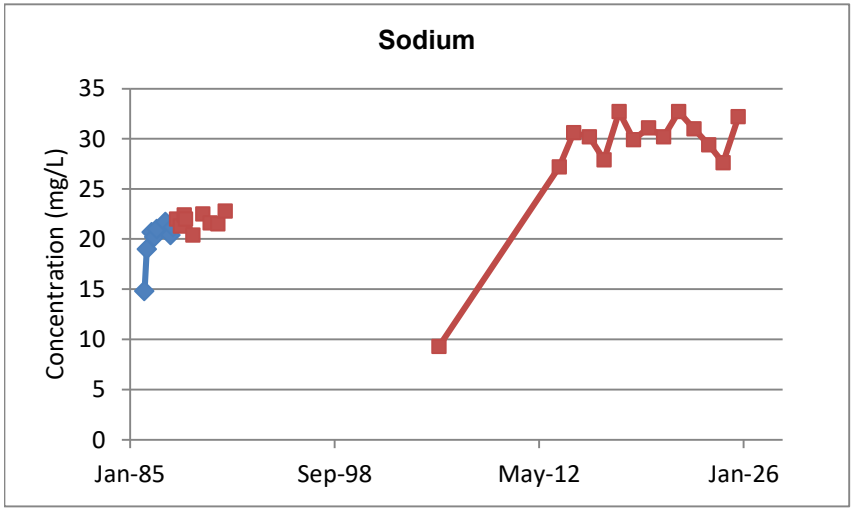
04-IN

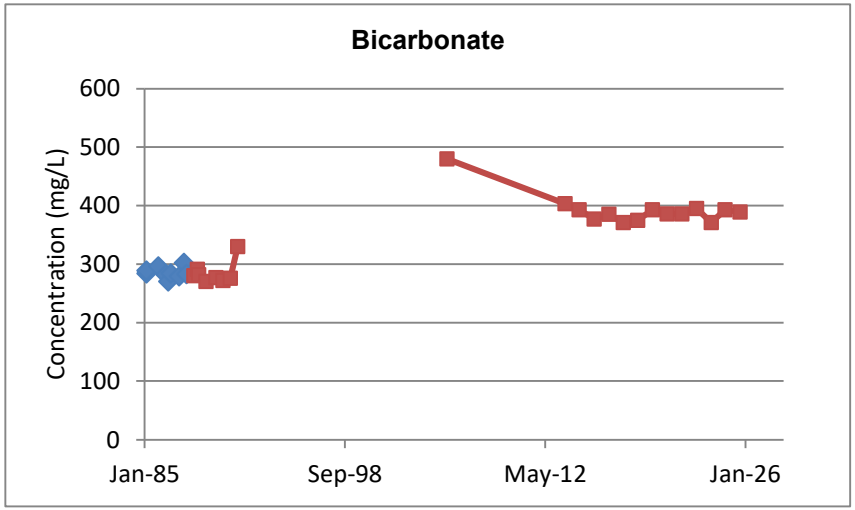
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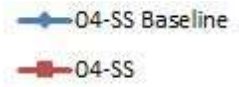
Table 13.8
VEOLIA, Swan Hills Treatment Centre
04-SS - Major Ions





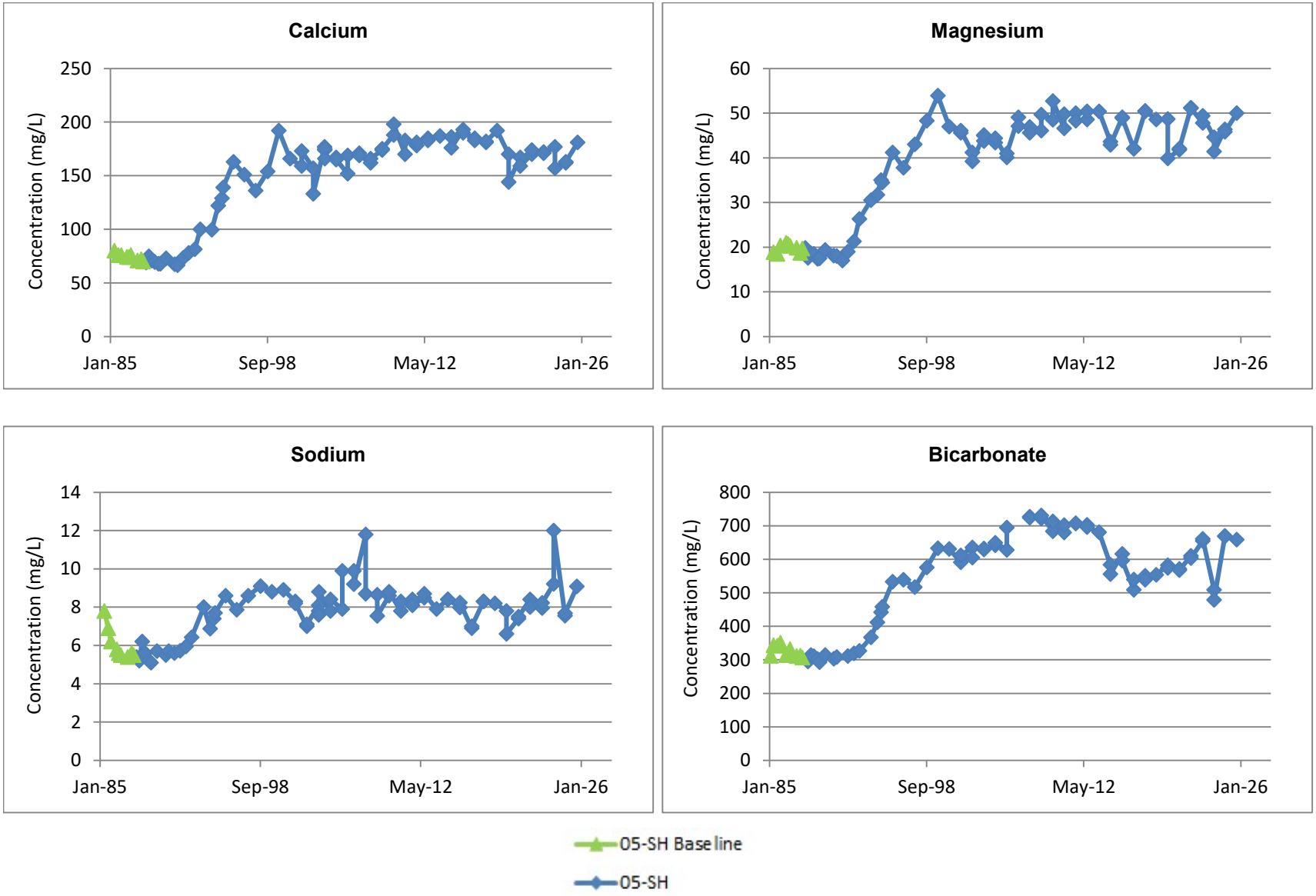






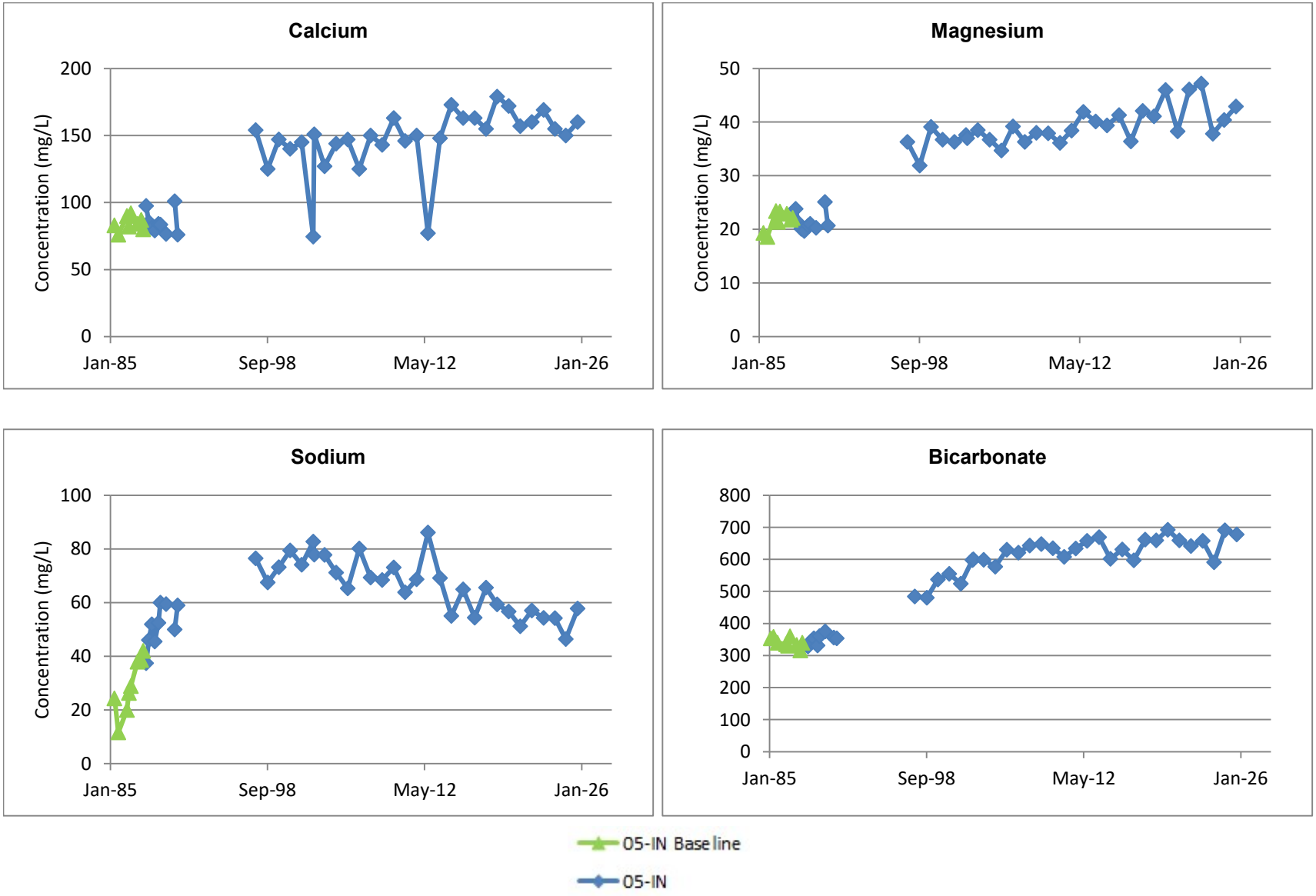
AECOM

Figure 13.9
VEOLIA, Swan Hills Treatment Centre
05-SH - Major Ions



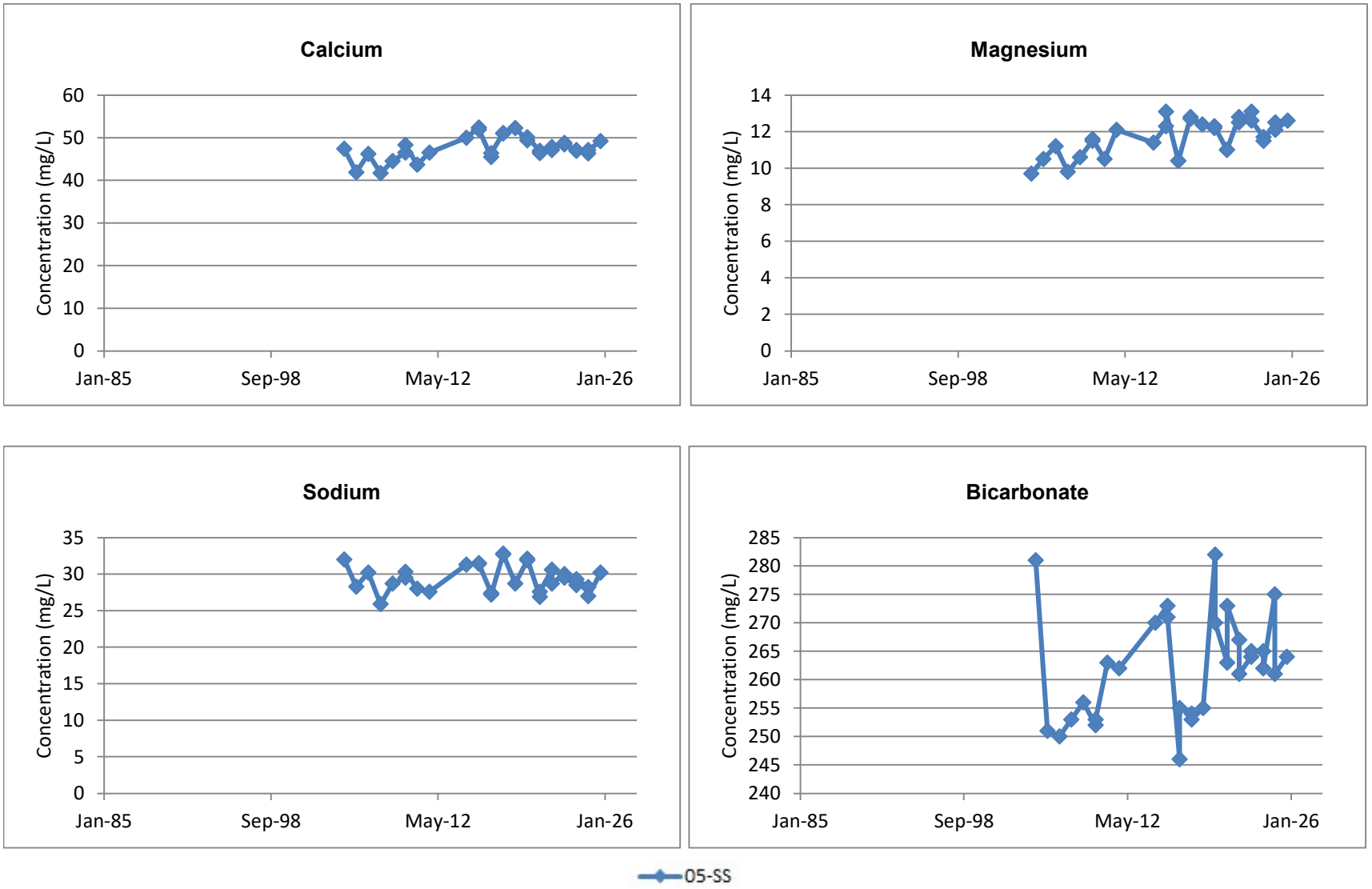
AECOM

Figure 13.10
VEOLIA, Swan Hills Treatment Centre
05-IN - Major Ions



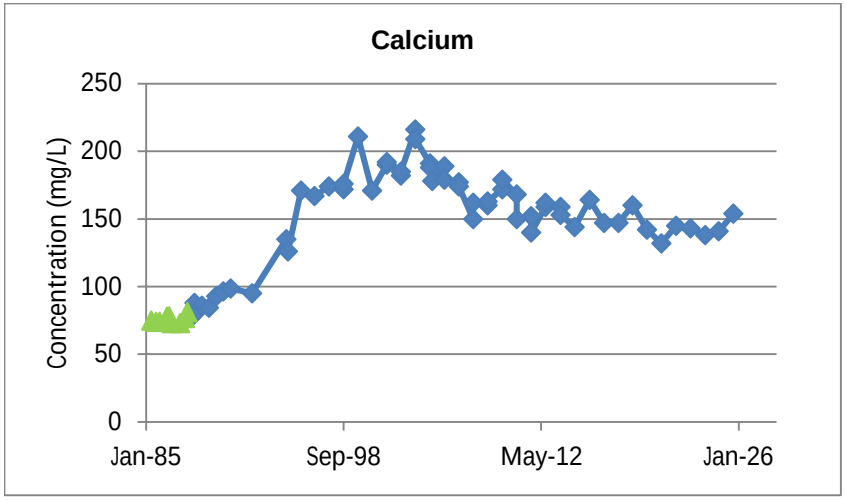
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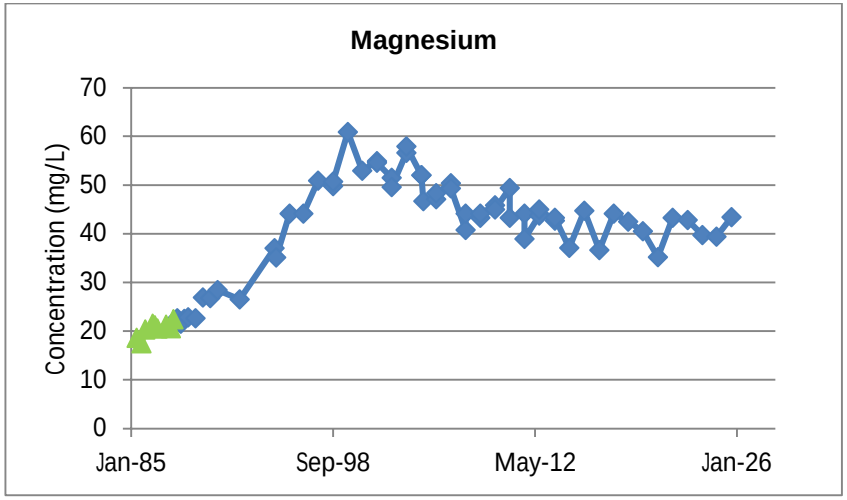
Figure 13.11
VEOLIA, Swan Hills Treatment Centre
05-SS - Major Ions

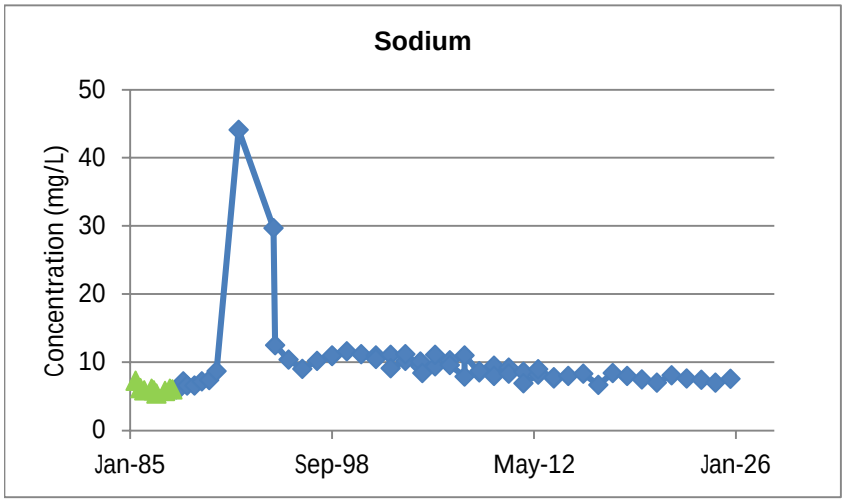


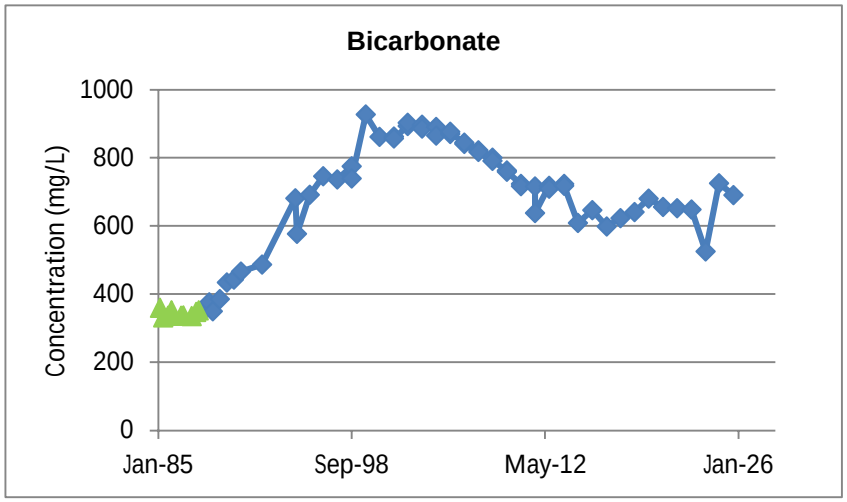
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Figure 13.12
VEOLIA, Swan Hills Treatment Centre
06-SH - Major Ions







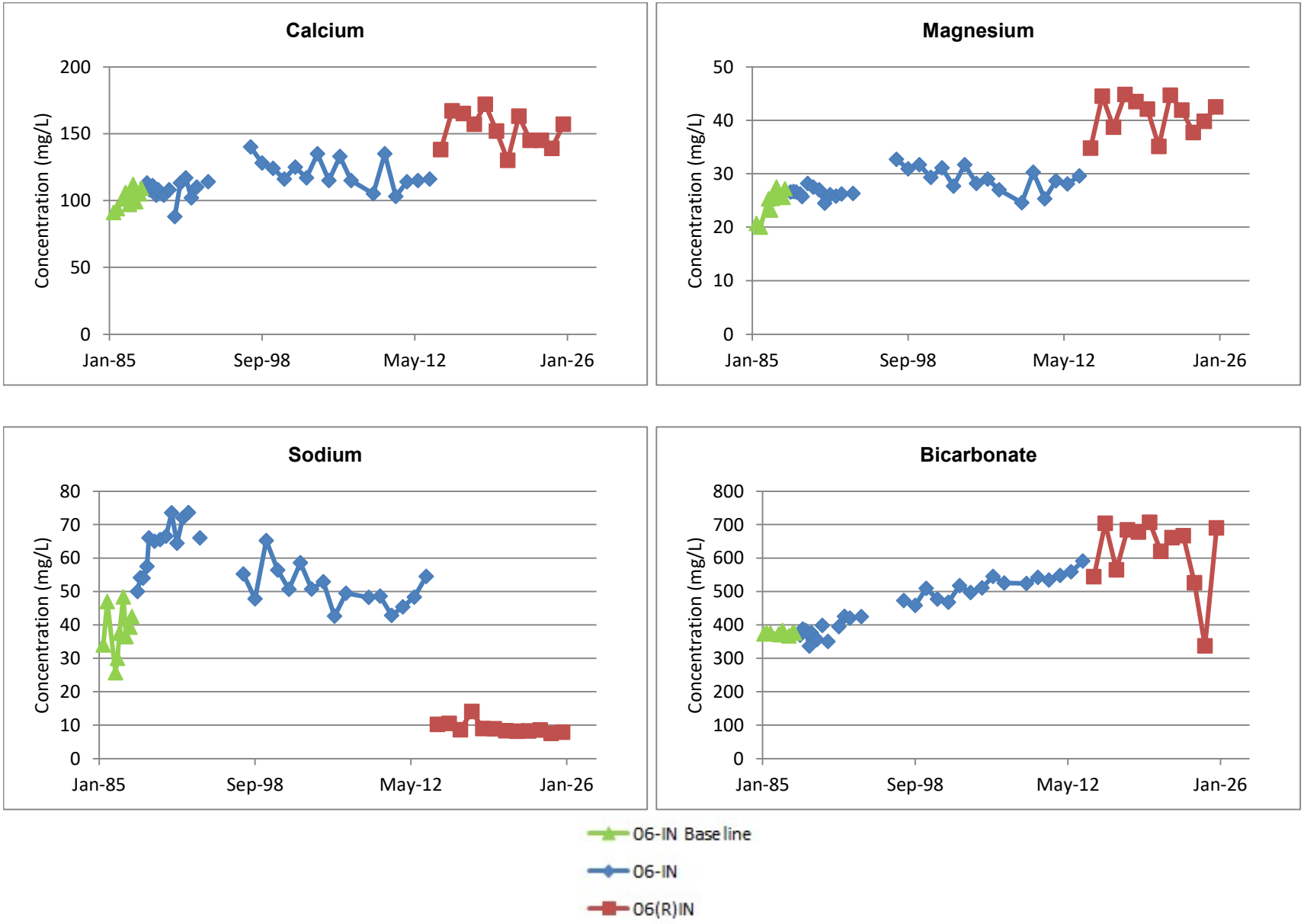


06-SH Baseline

06-SH

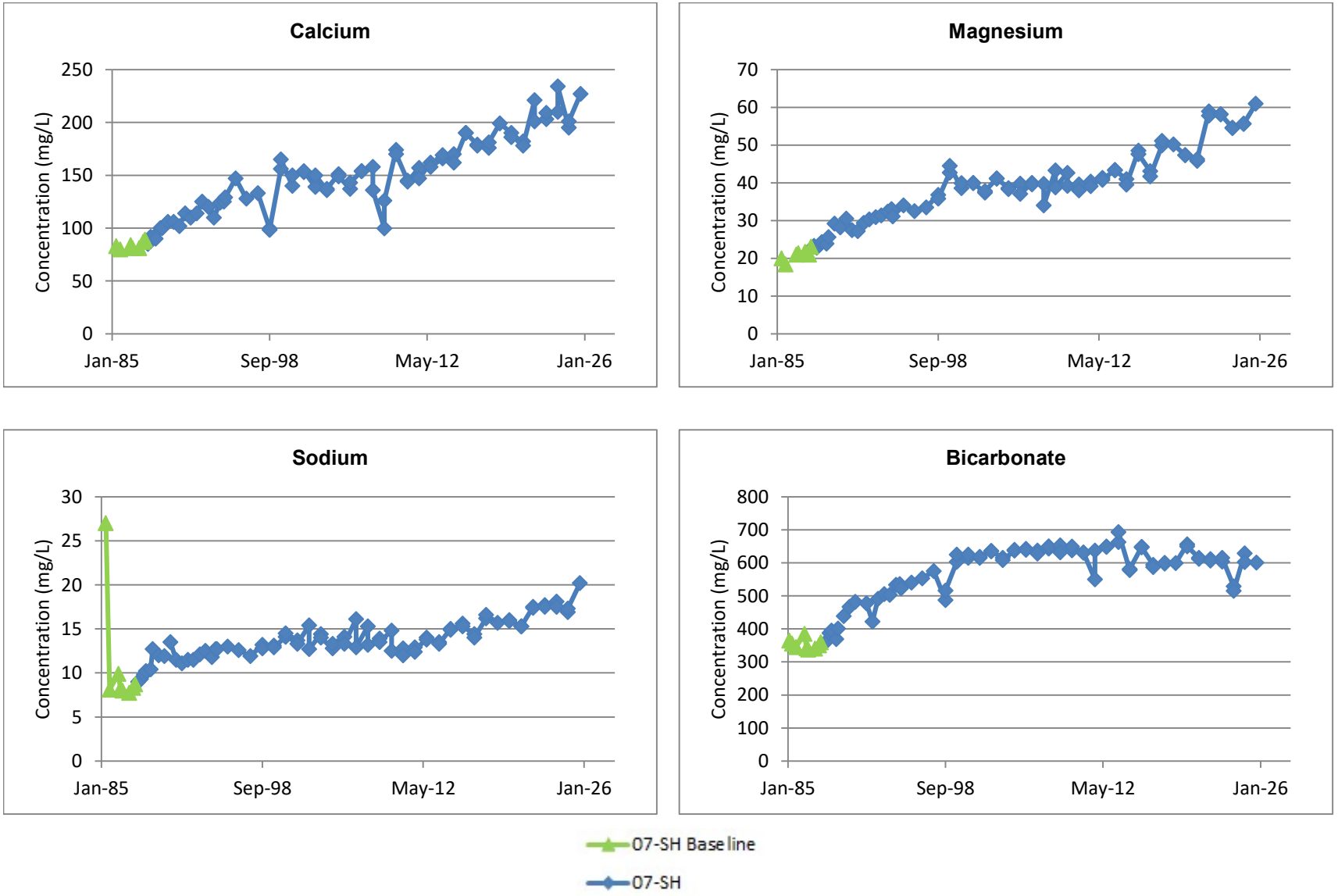
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Figure 13.13
VEOLIA, Swan Hills Treatment Centre
06-IN and 06(R)IN - Major Ions



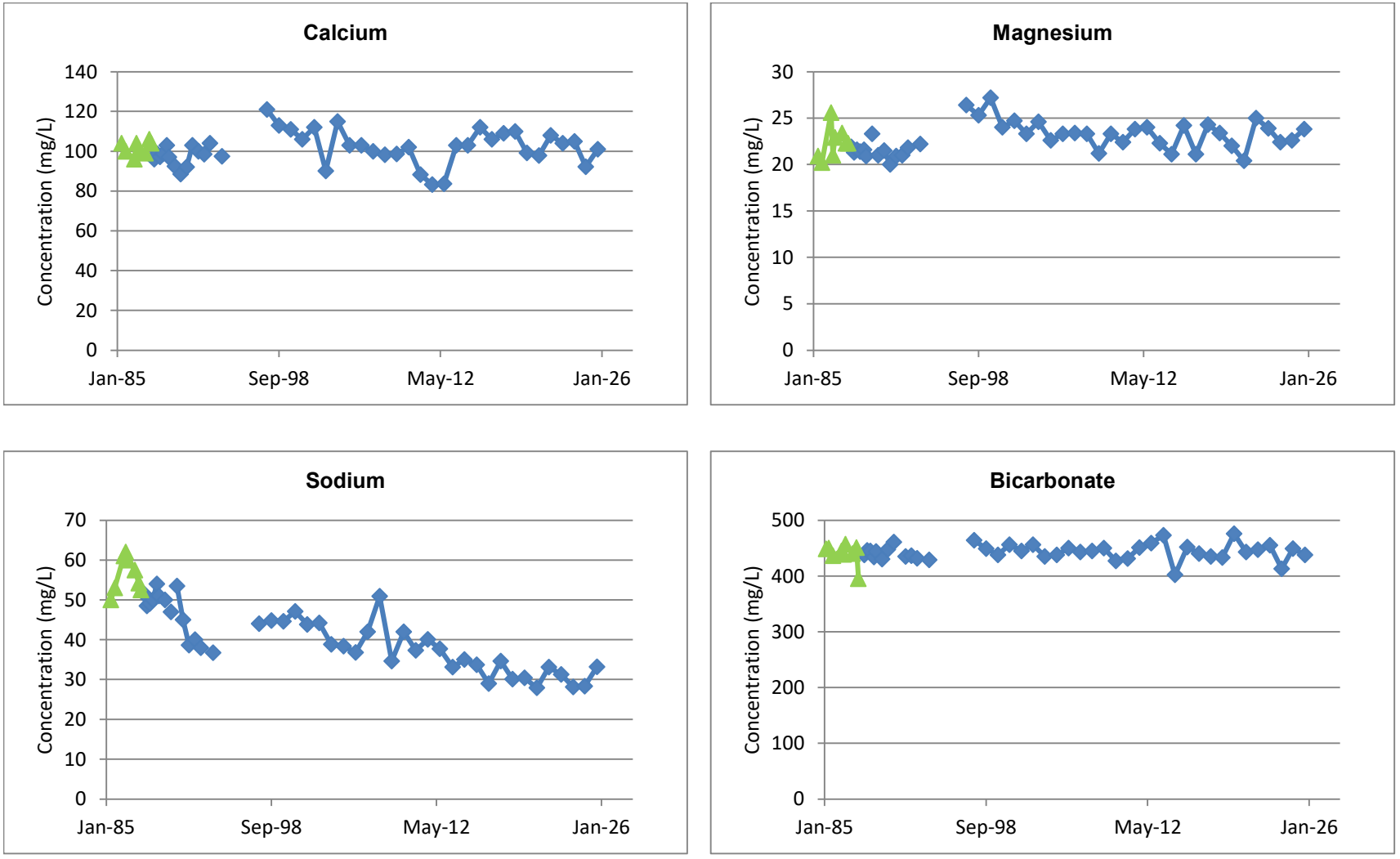
AECOM

Figure 13.14
VEOLIA, Swan Hills Treatment Centre
07-SH - Major Ions



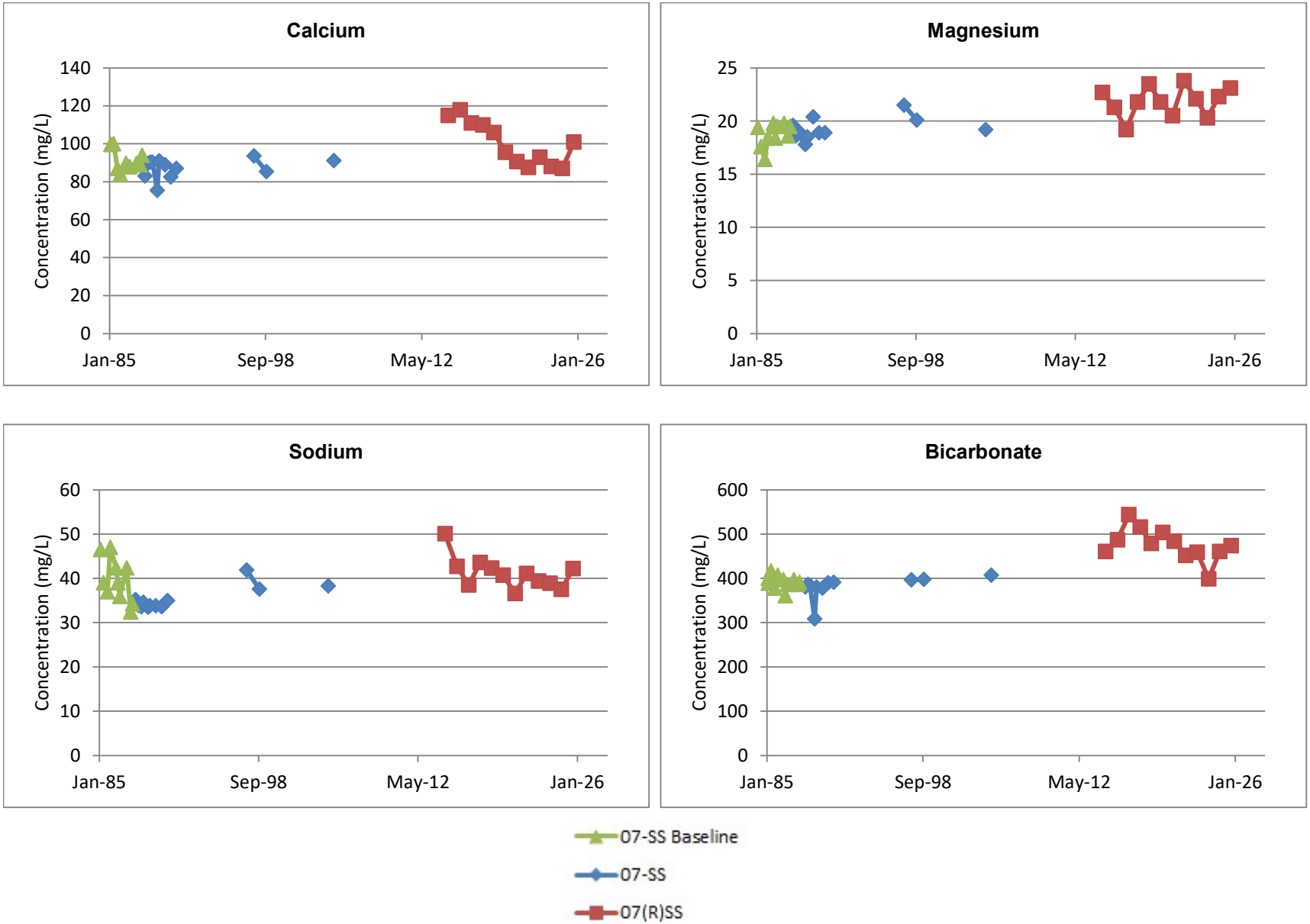
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Figure 13.15
VEOLIA, Swan Hills Treatment Centre
07-IN - Major Ions



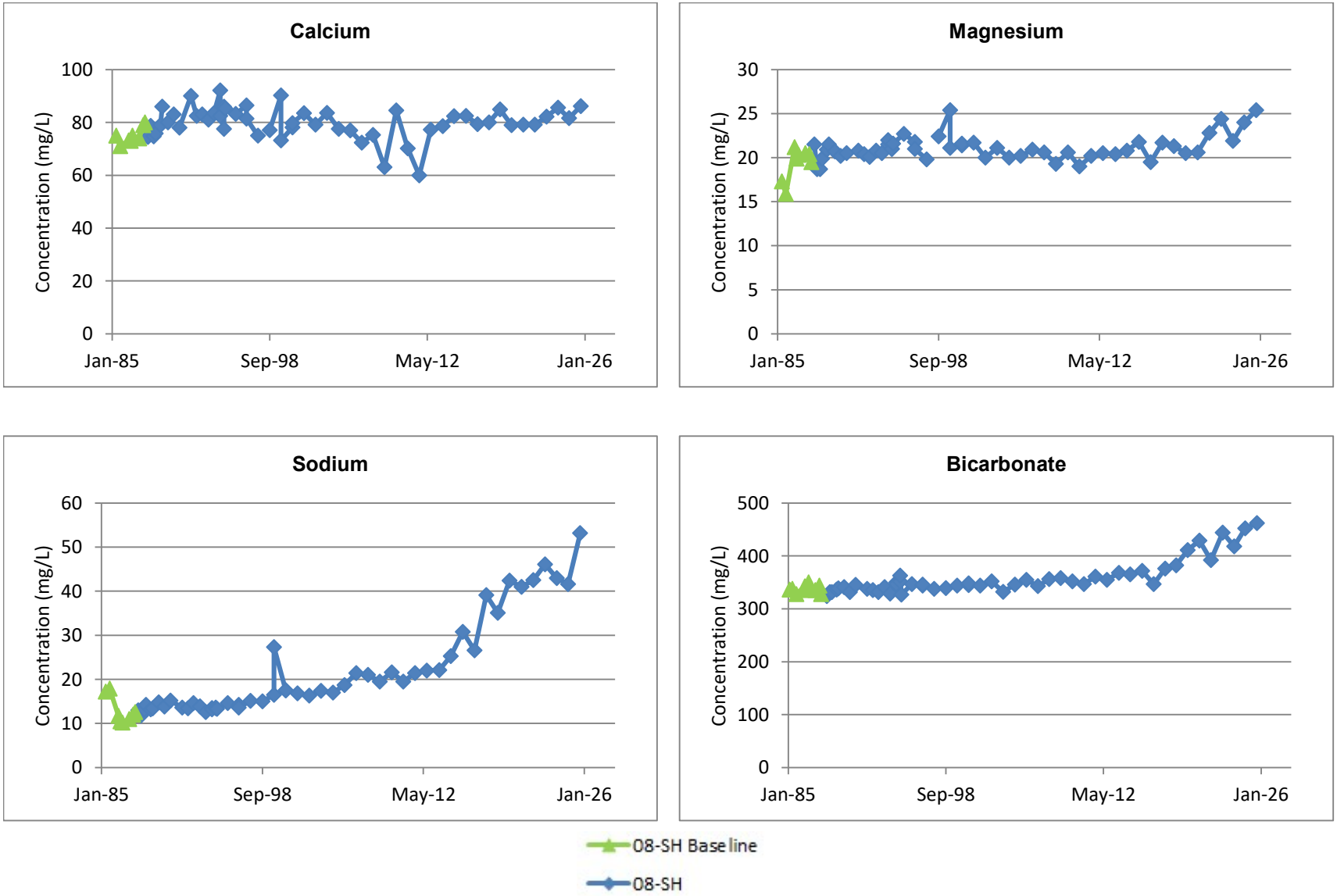
AECOM

Figure 13.16
VEOLIA, Swan Hills Treatment Centre
07-SS and 07(R)SS - Major Ions



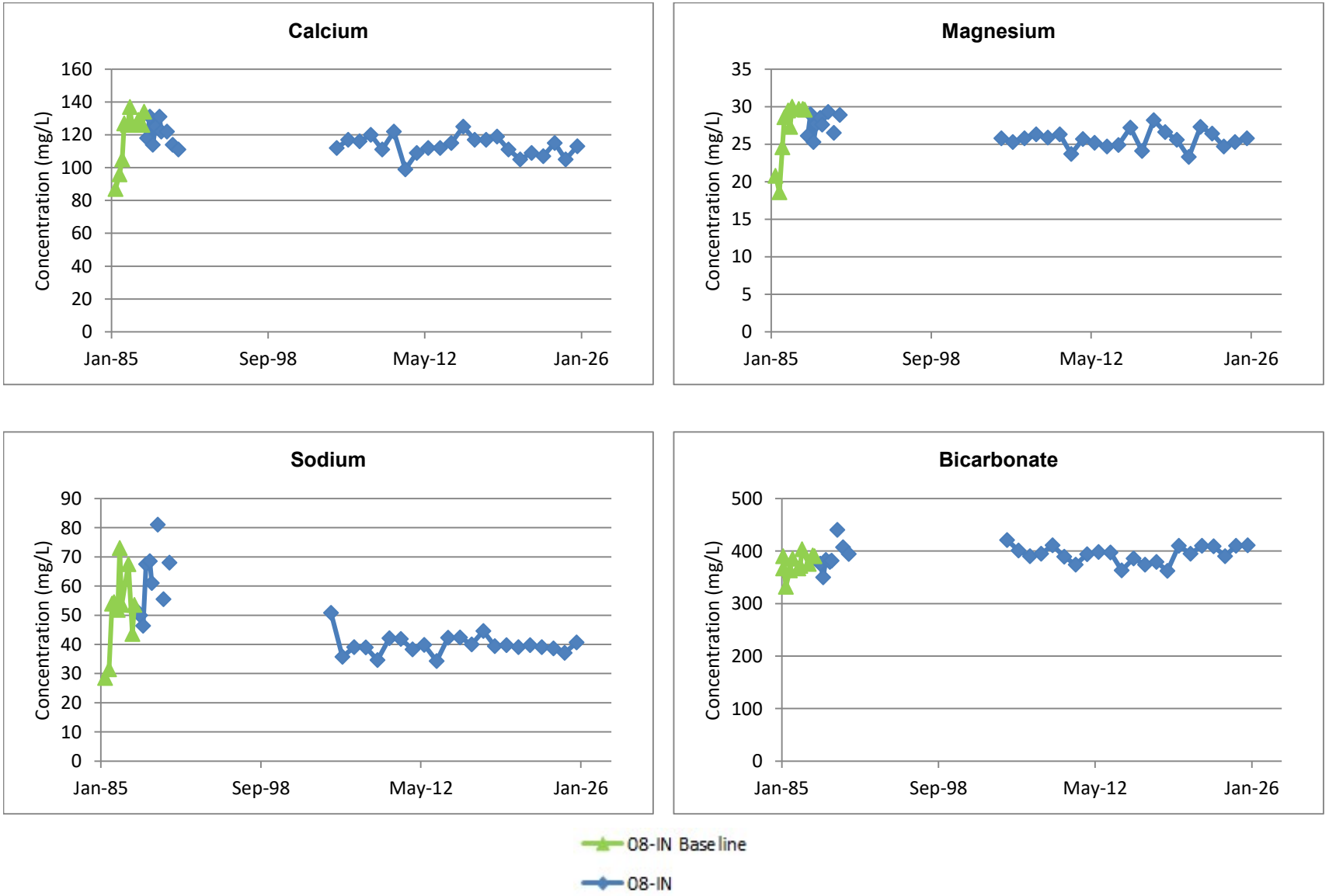
AECOM

Figure 13.17
VEOLIA, Swan Hills Treatment Centre
08-SH - Major Ions



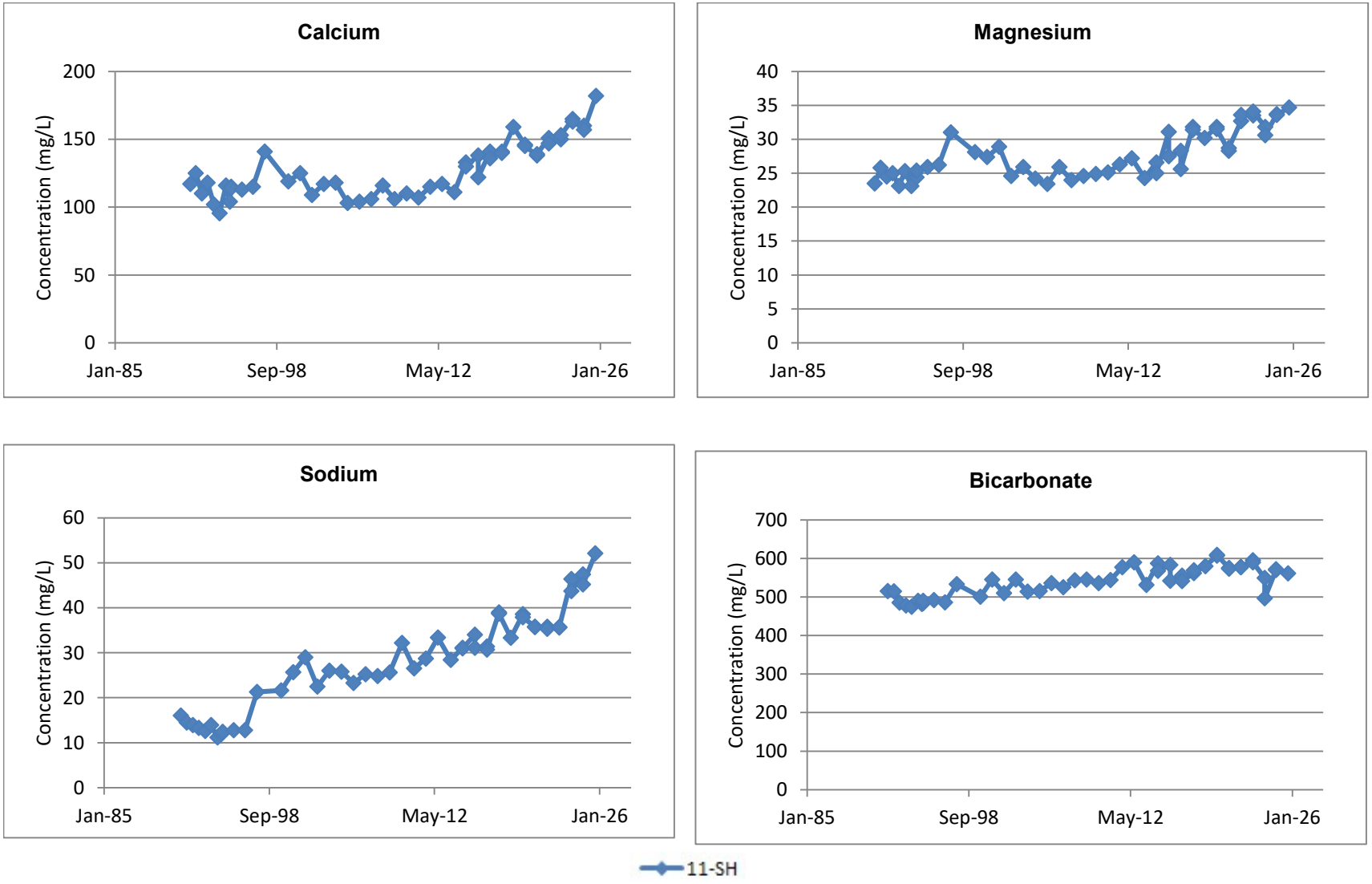
AECOM

Figure 13.18
VEOLIA, Swan Hills Treatment Centre
08-IN - Major Ions



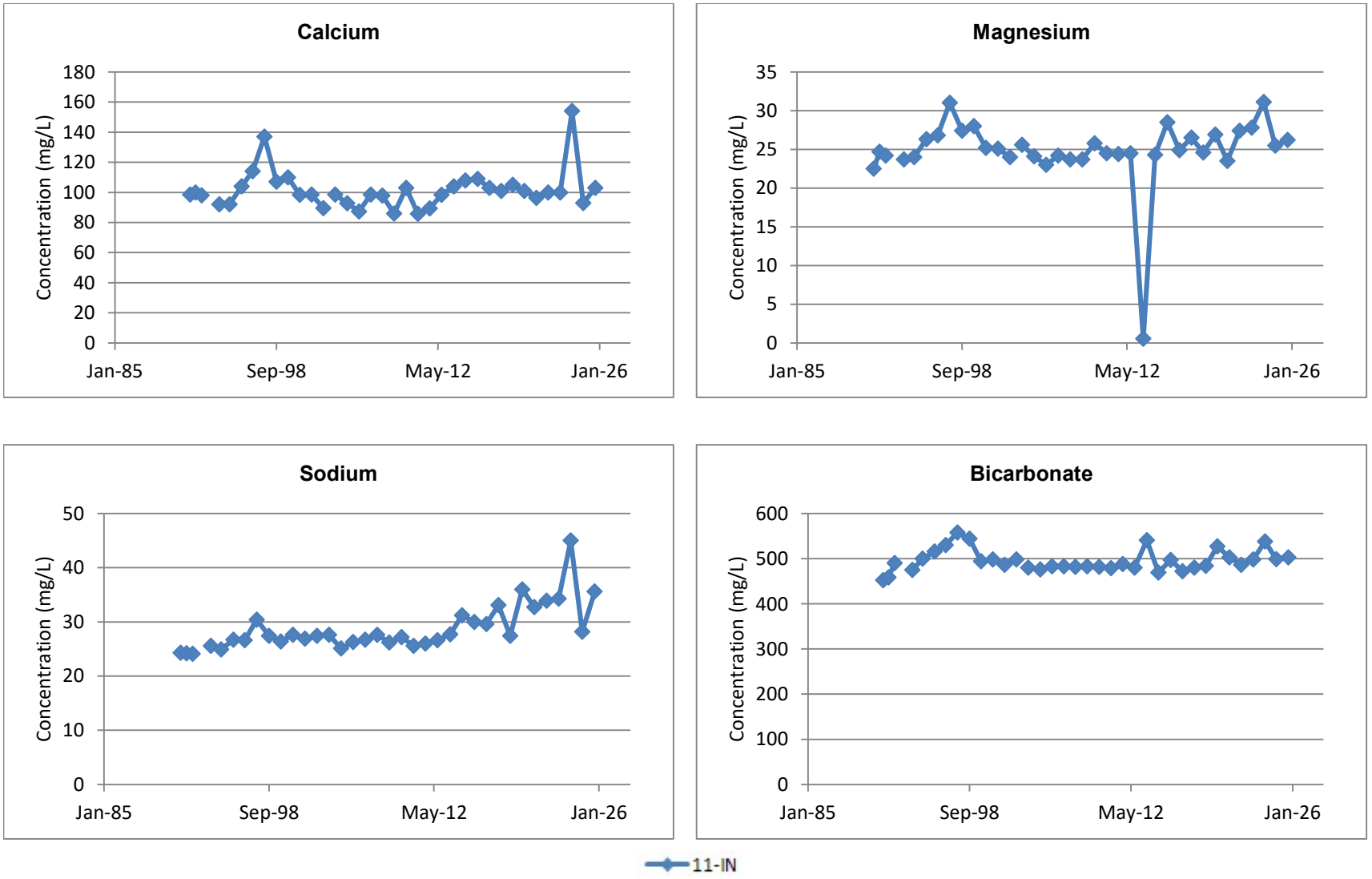
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Figure 13.19
VEOLIA, Swan Hills Treatment Centre
11-SH - Major Ions



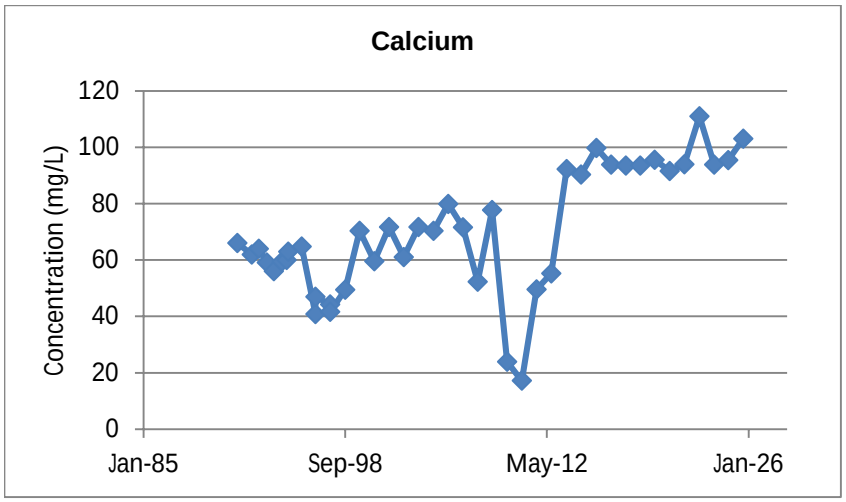
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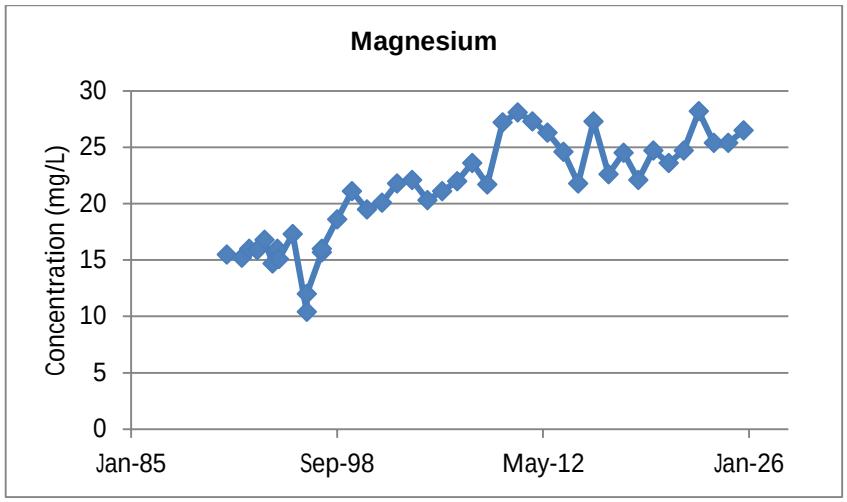
Figure 13.20
VEOLIA, Swan Hills Treatment Centre
11-IN - Major Ions

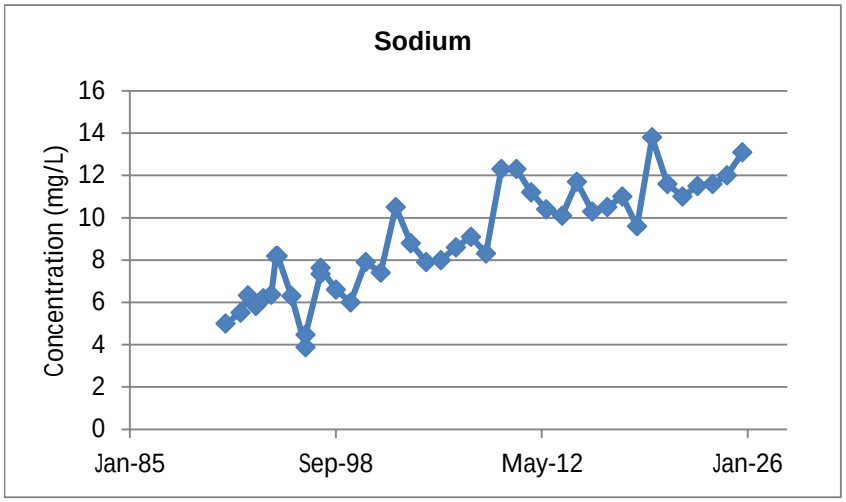


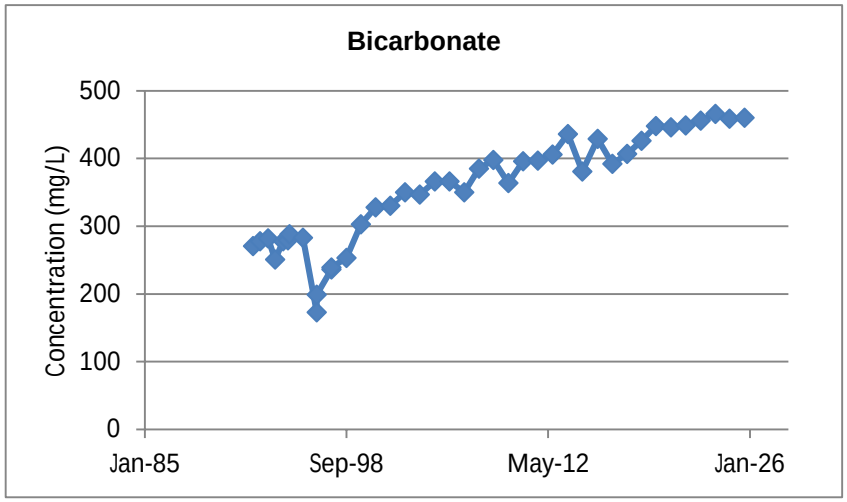
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Figure 13.21
VEOLIA, Swan Hills Treatment Centre
12-SH - Major Ions





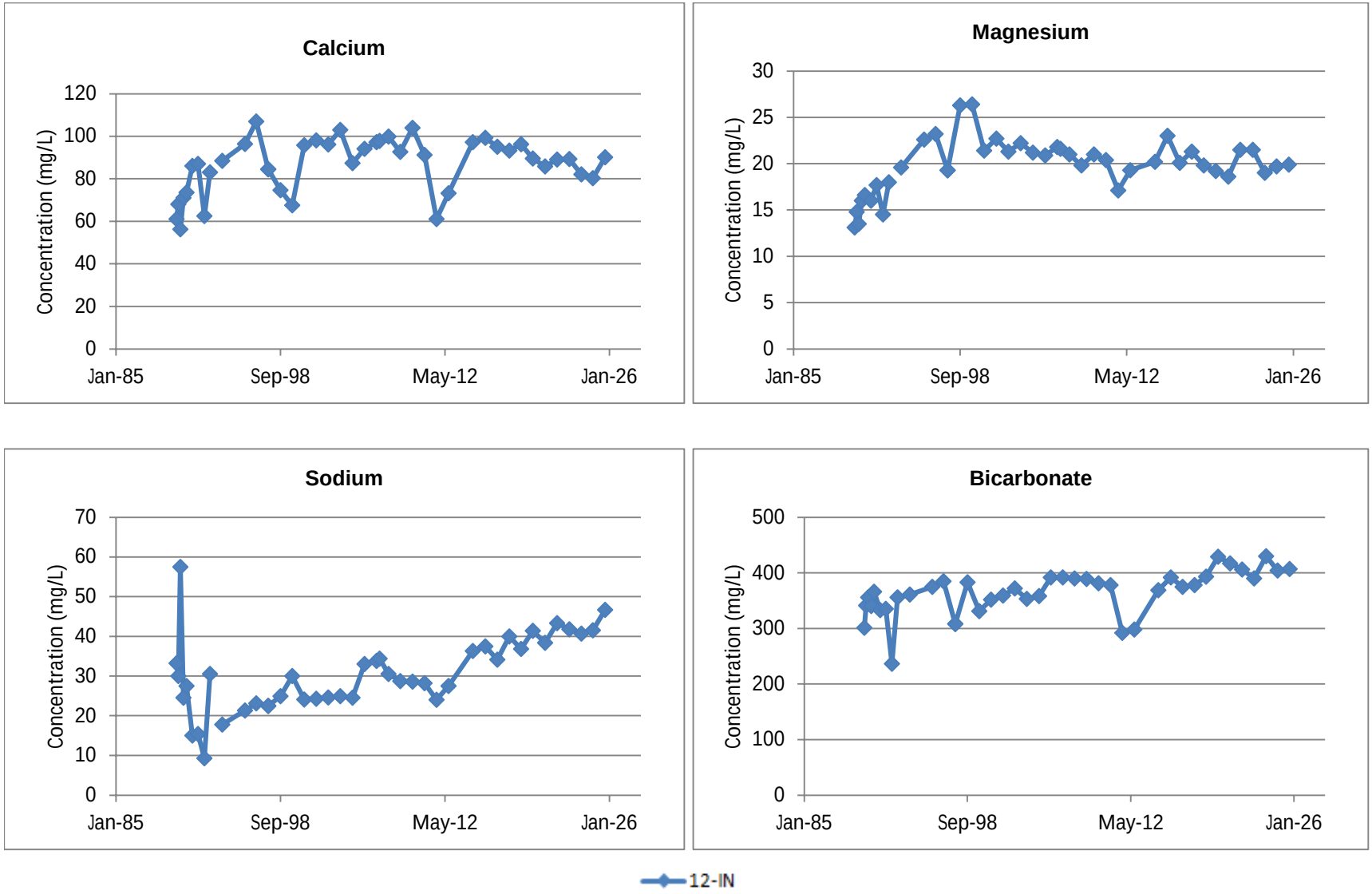




12-SH

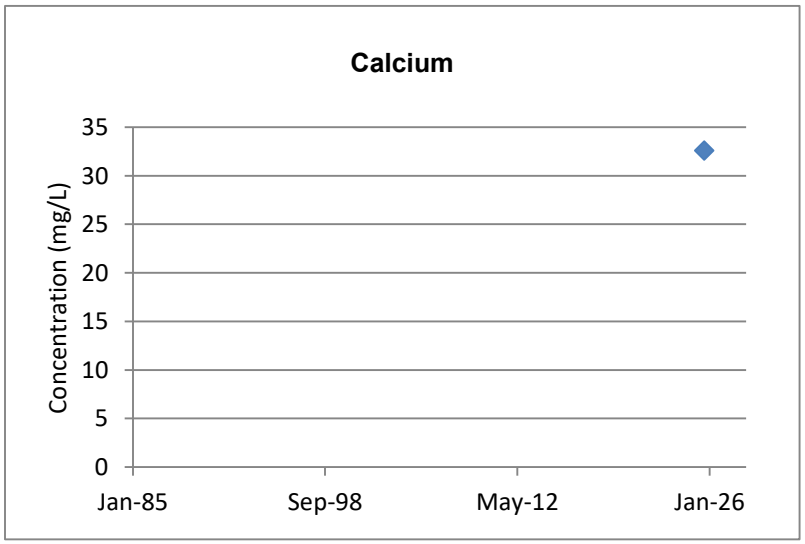
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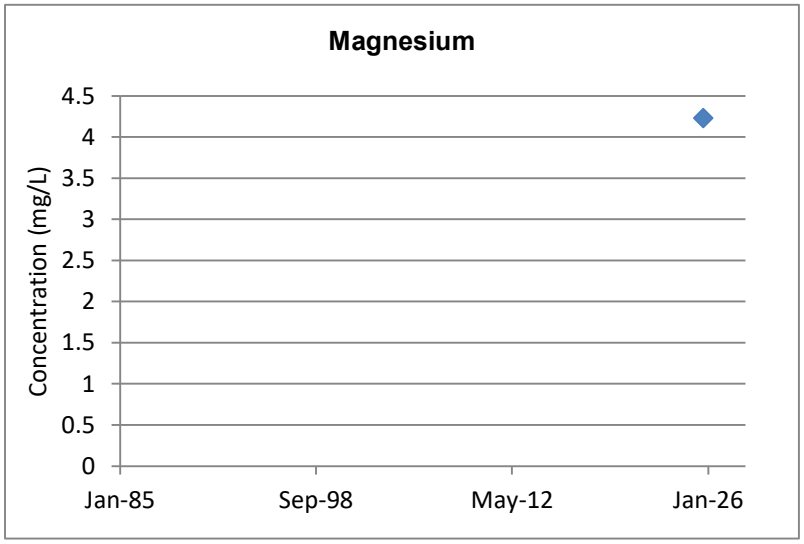
Figure 13.22
VEOLIA, Swan Hills Treatment Centre
12-IN - Major Ions

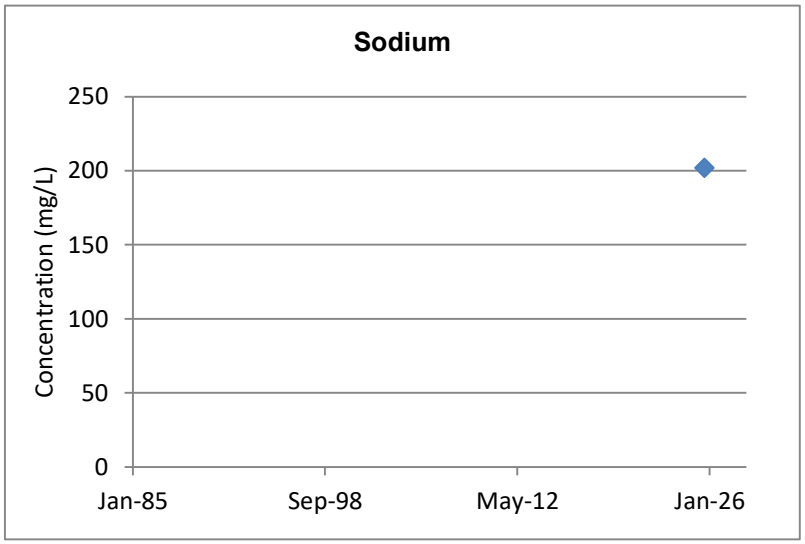


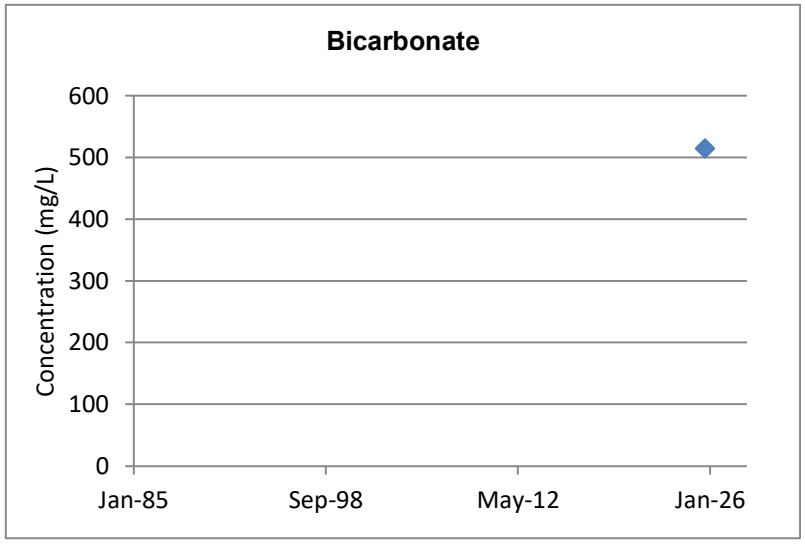
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Figure 13.23
VEOLIA, Swan Hills Treatment Centre
12(R)-SS - Major Ions





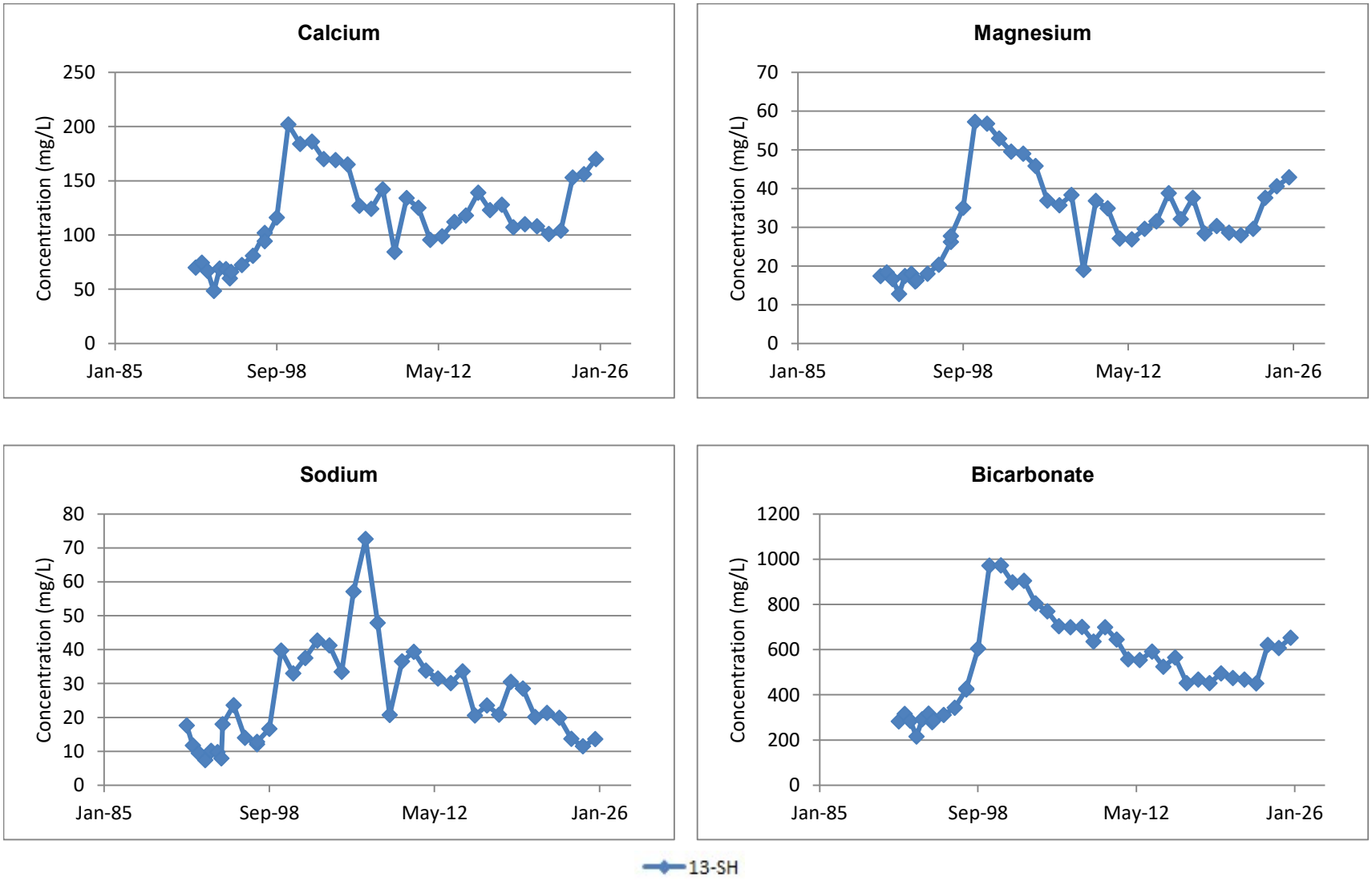




12(R)-SS

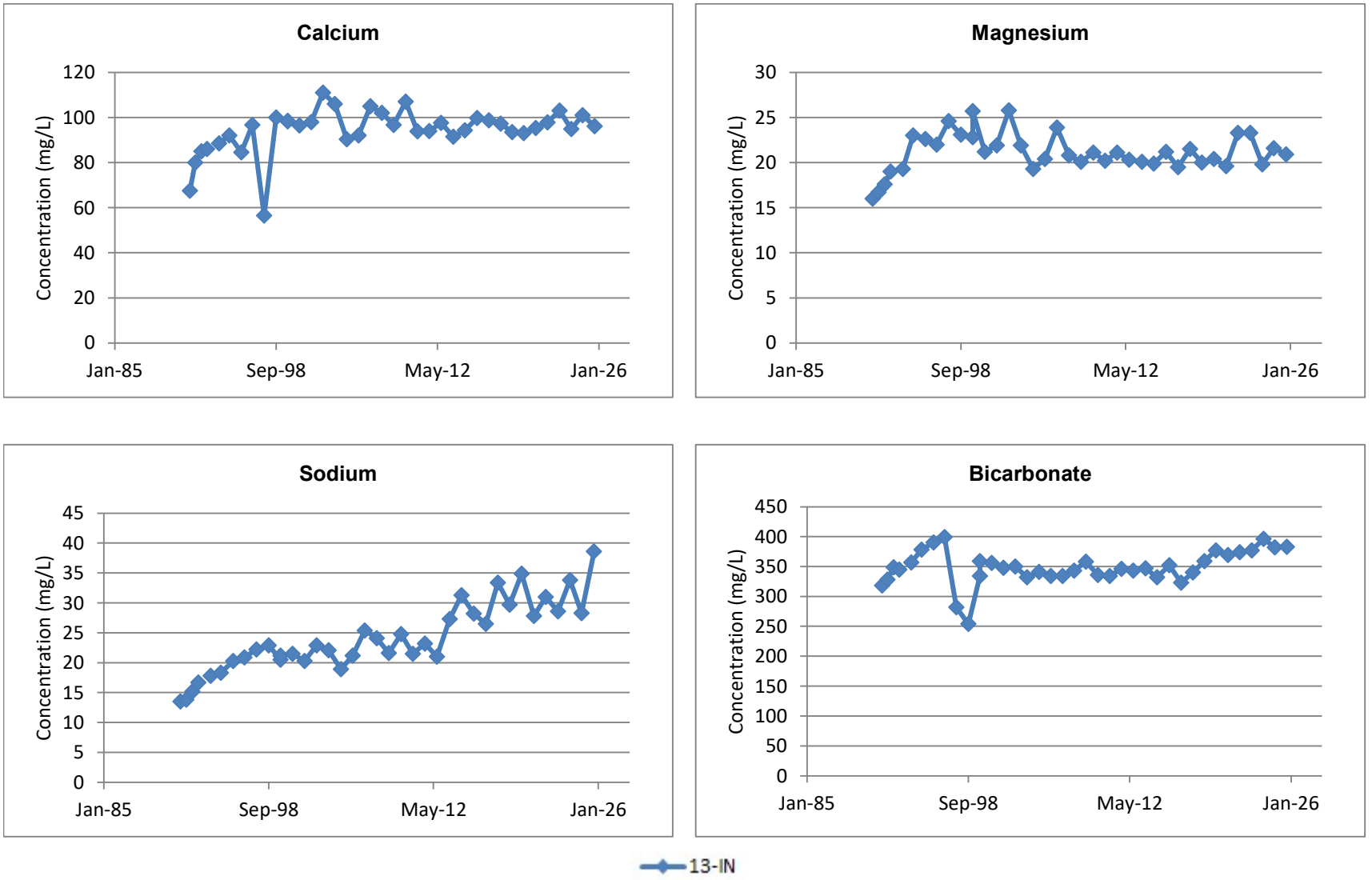
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Figure 13.24
VEOLIA, Swan Hills Treatment Centre
13-SH - Major Ions



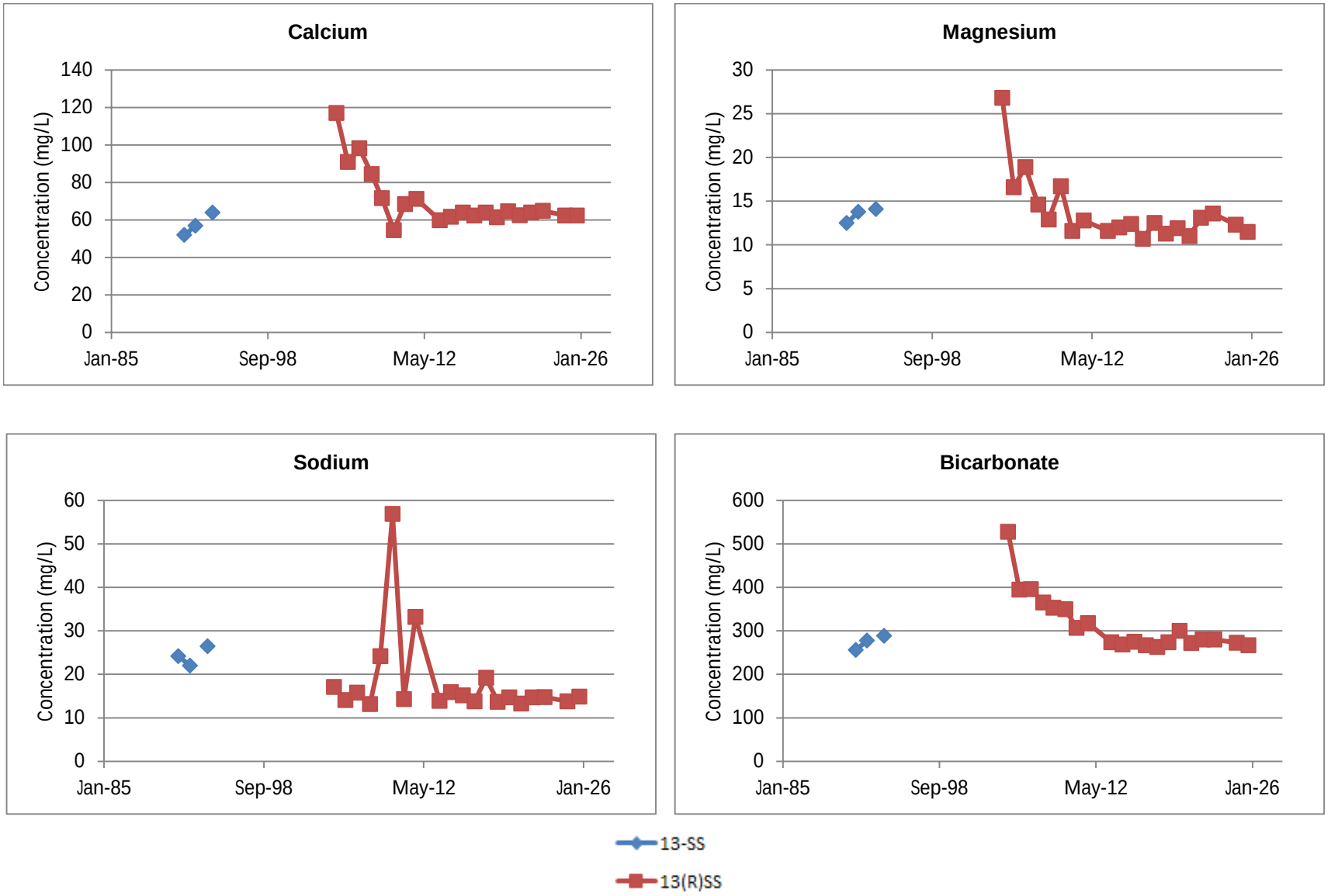
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Figure 13.25
VEOLIA, Swan Hills Treatment Centre
13-IN - Major Ions



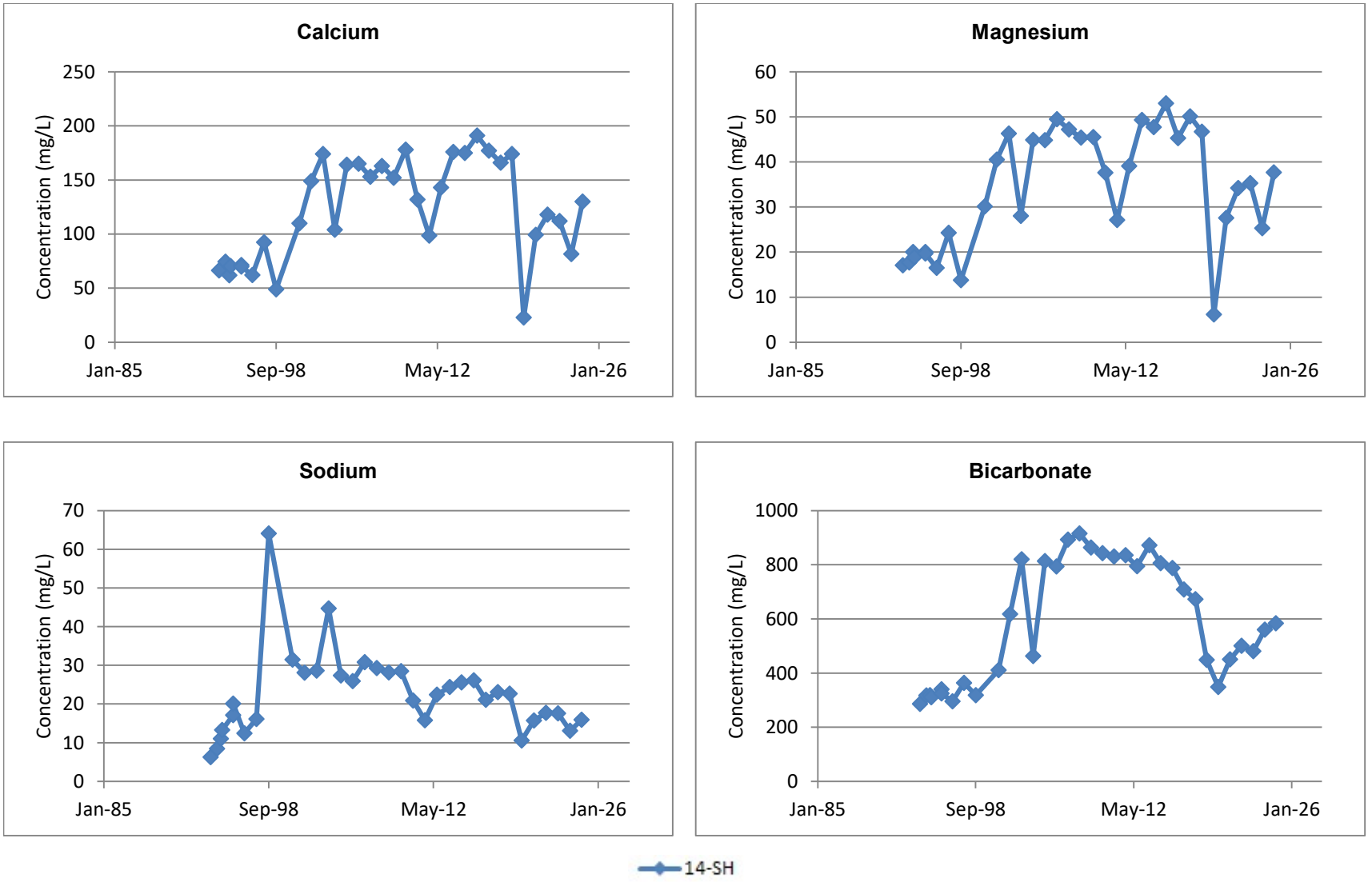
AECOM

Figure 13.26
VEOLIA, Swan Hills Treatment Centre
13-SS and 13(R)SS - Major Ions



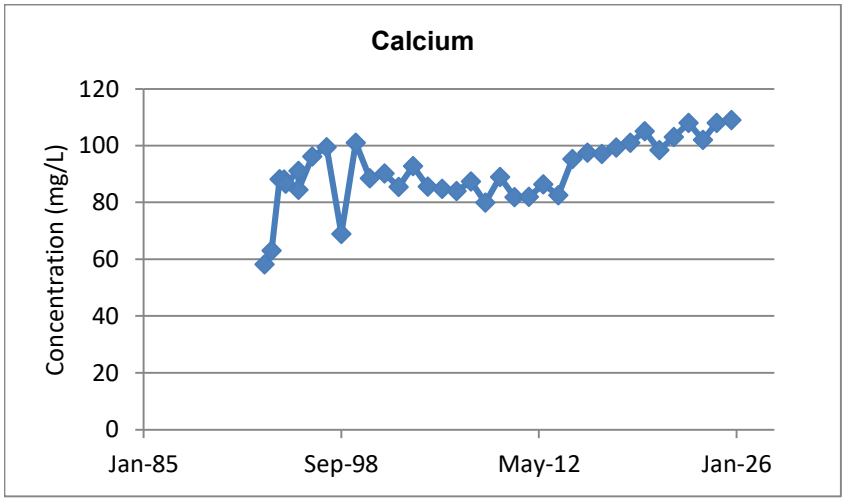
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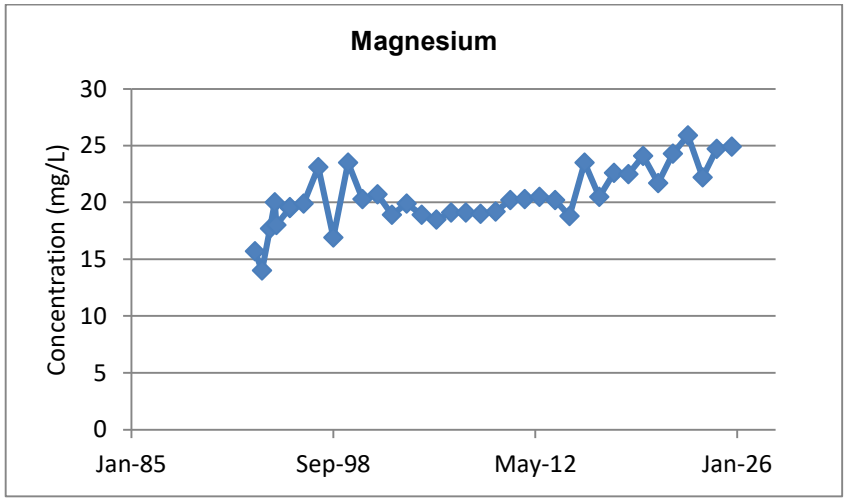
Figure 13.27
VEOLIA, Swan Hills Treatment Centre
14-SH - Major Ions

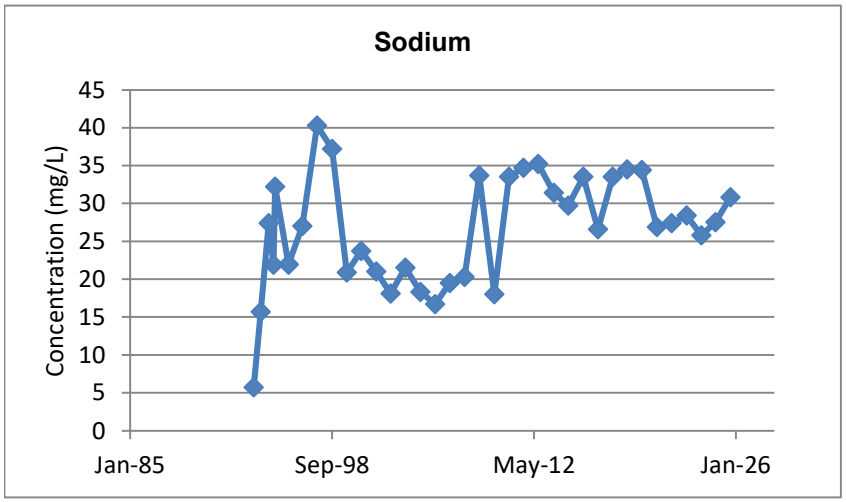


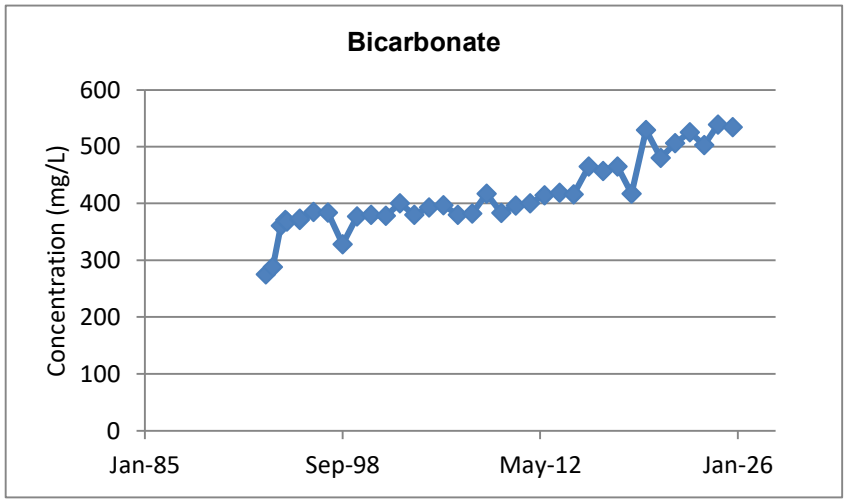
AECOM

Figure 13.28
VEOLIA, Swan Hills Treatment Centre
15-SH - Major Ions





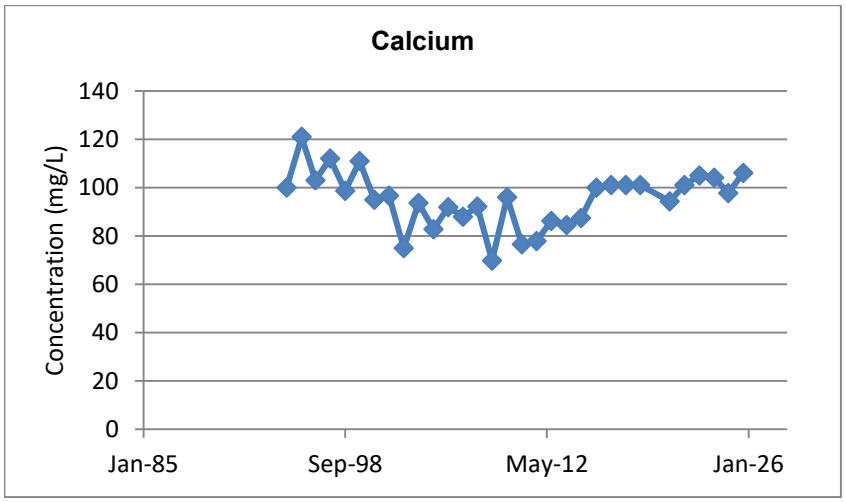


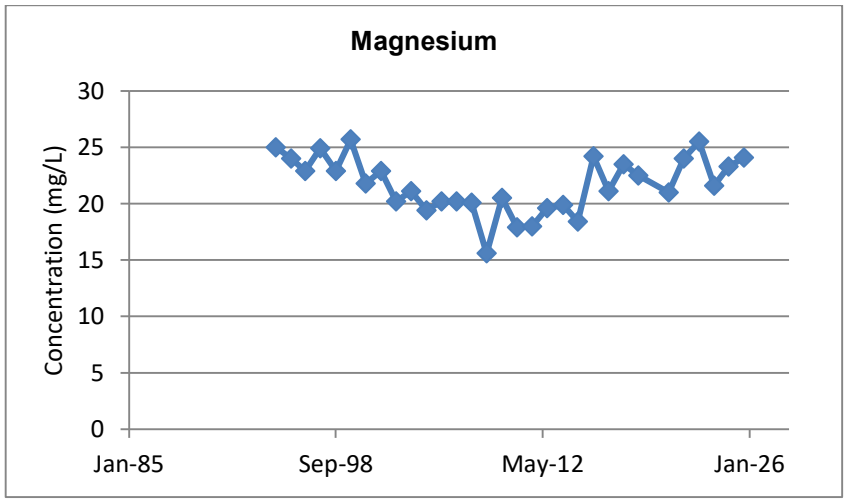


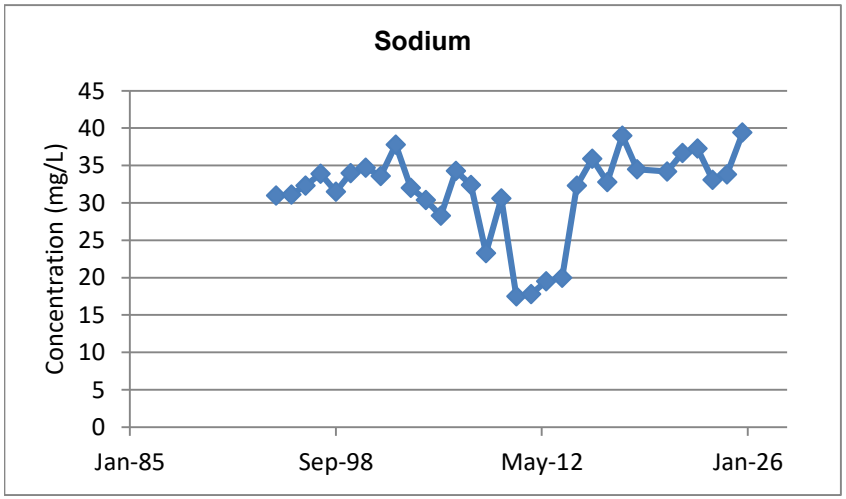
15-SH

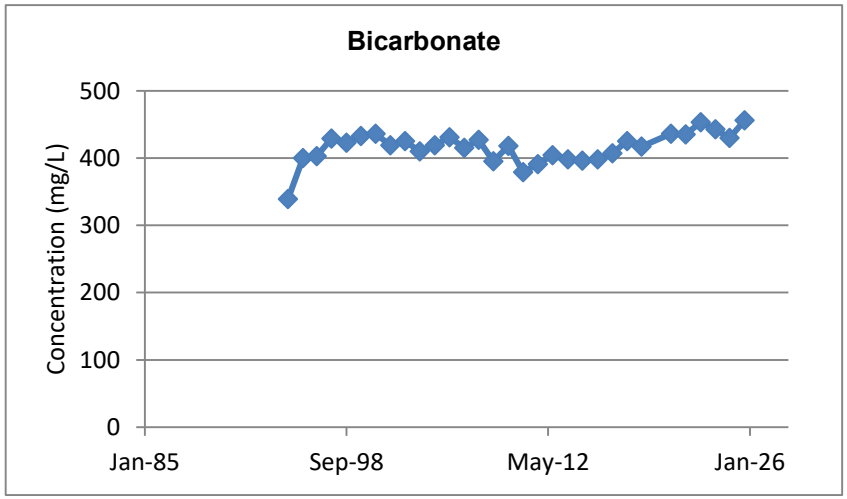
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Figure 13.29
VEOLIA, Swan Hills Treatment Centre
15-IN - Major Ions





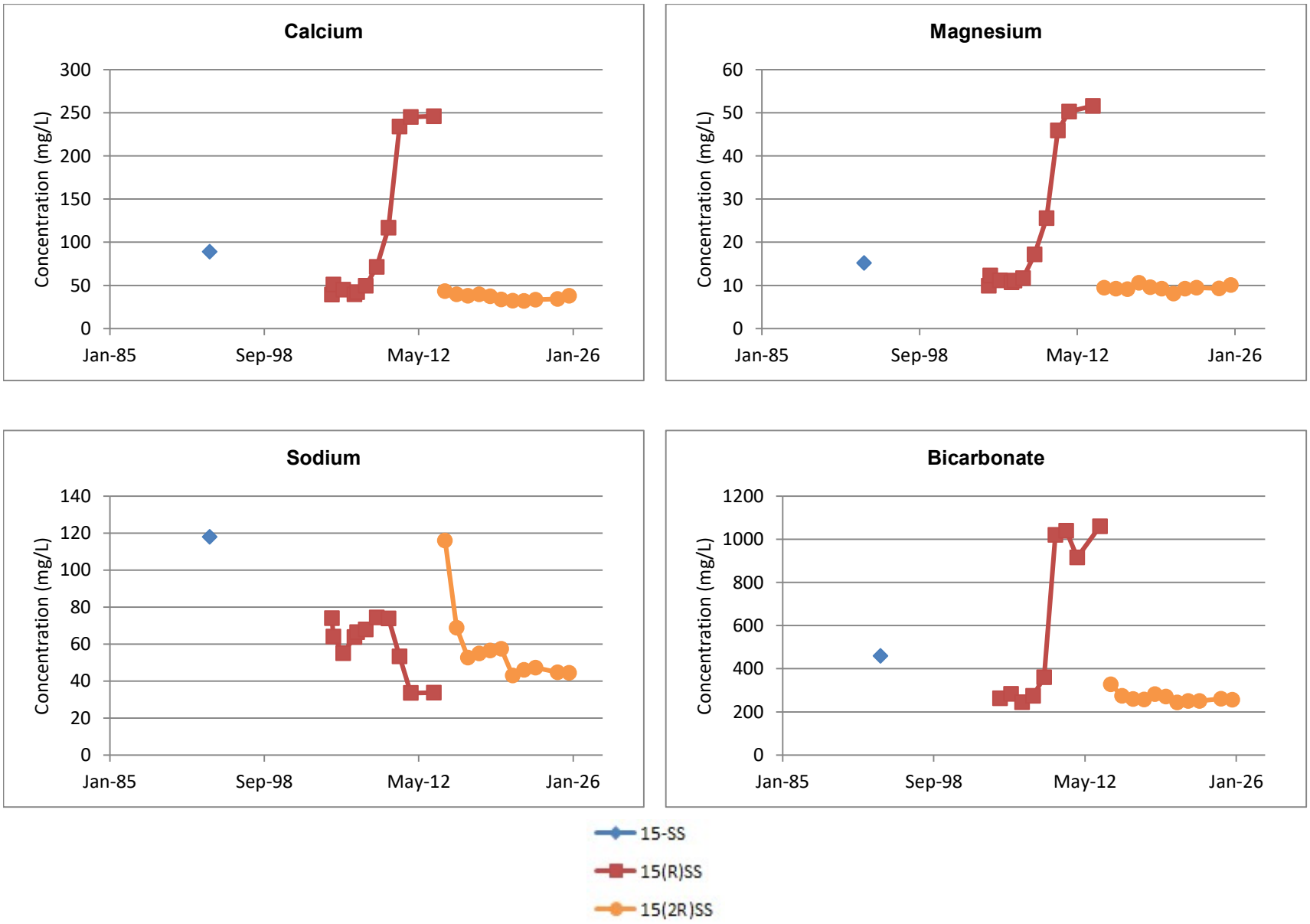




15-IN

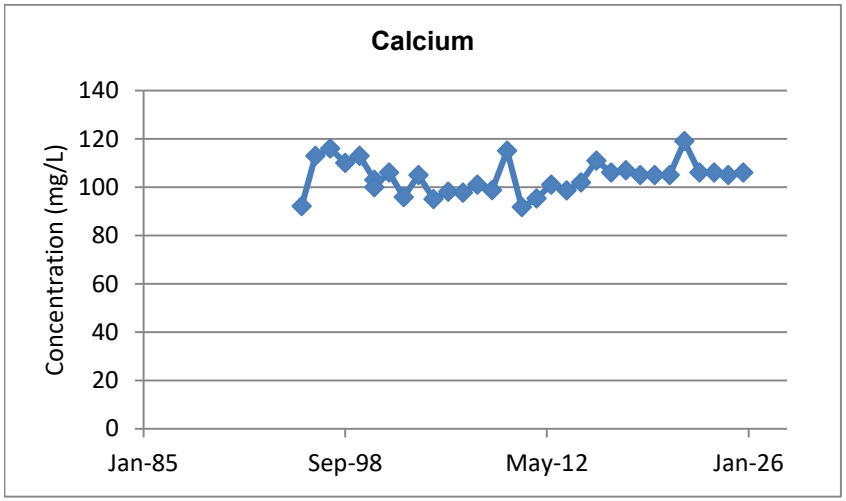
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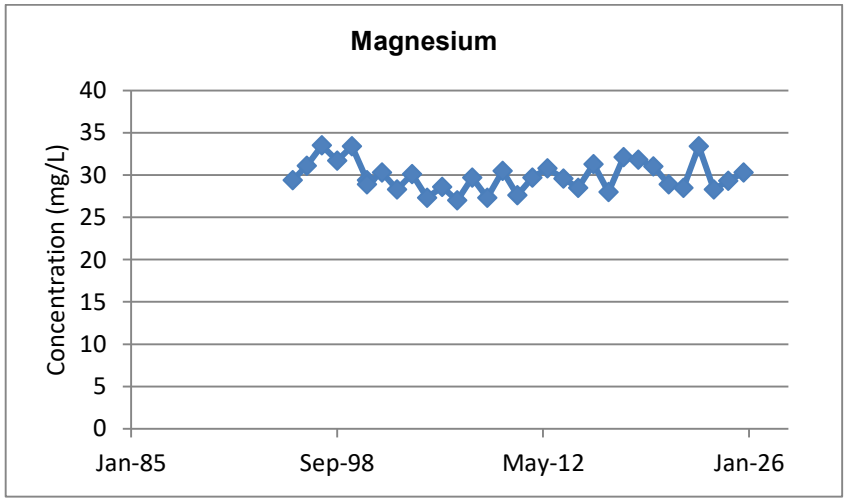
Figure 13.30
VEOLIA, Swan Hills Treatment Centre
15-SS, 15(R)SS, and 15(2R)SS - Major Ions

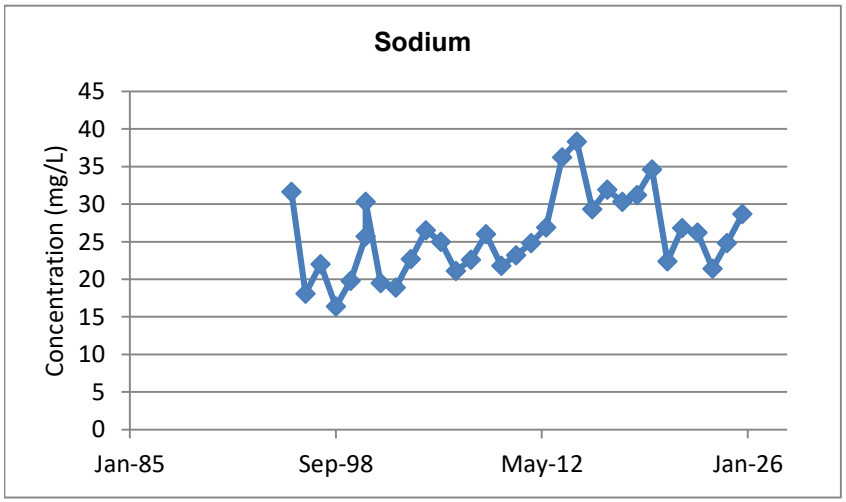


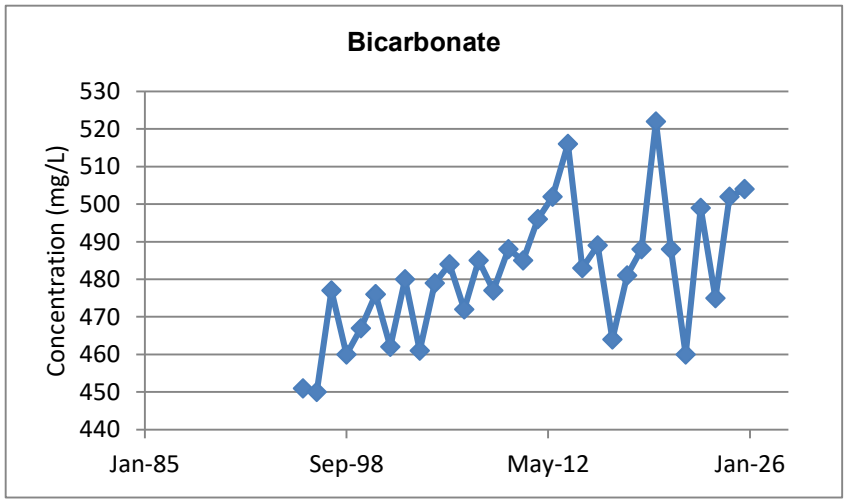
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Figure 13.31
VEOLIA, Swan Hills Treatment Centre
16-SH - Major Ions





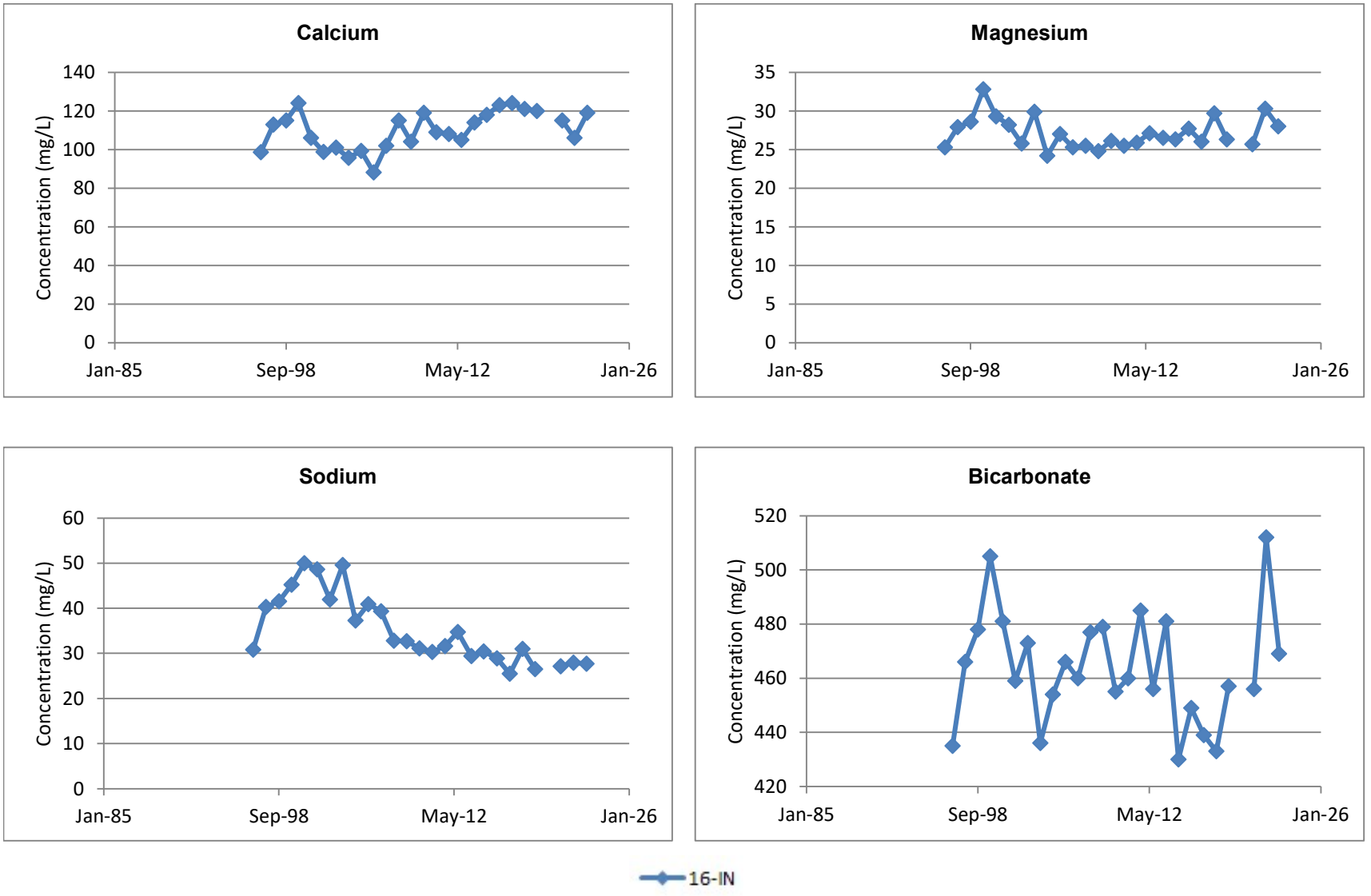




16-SH

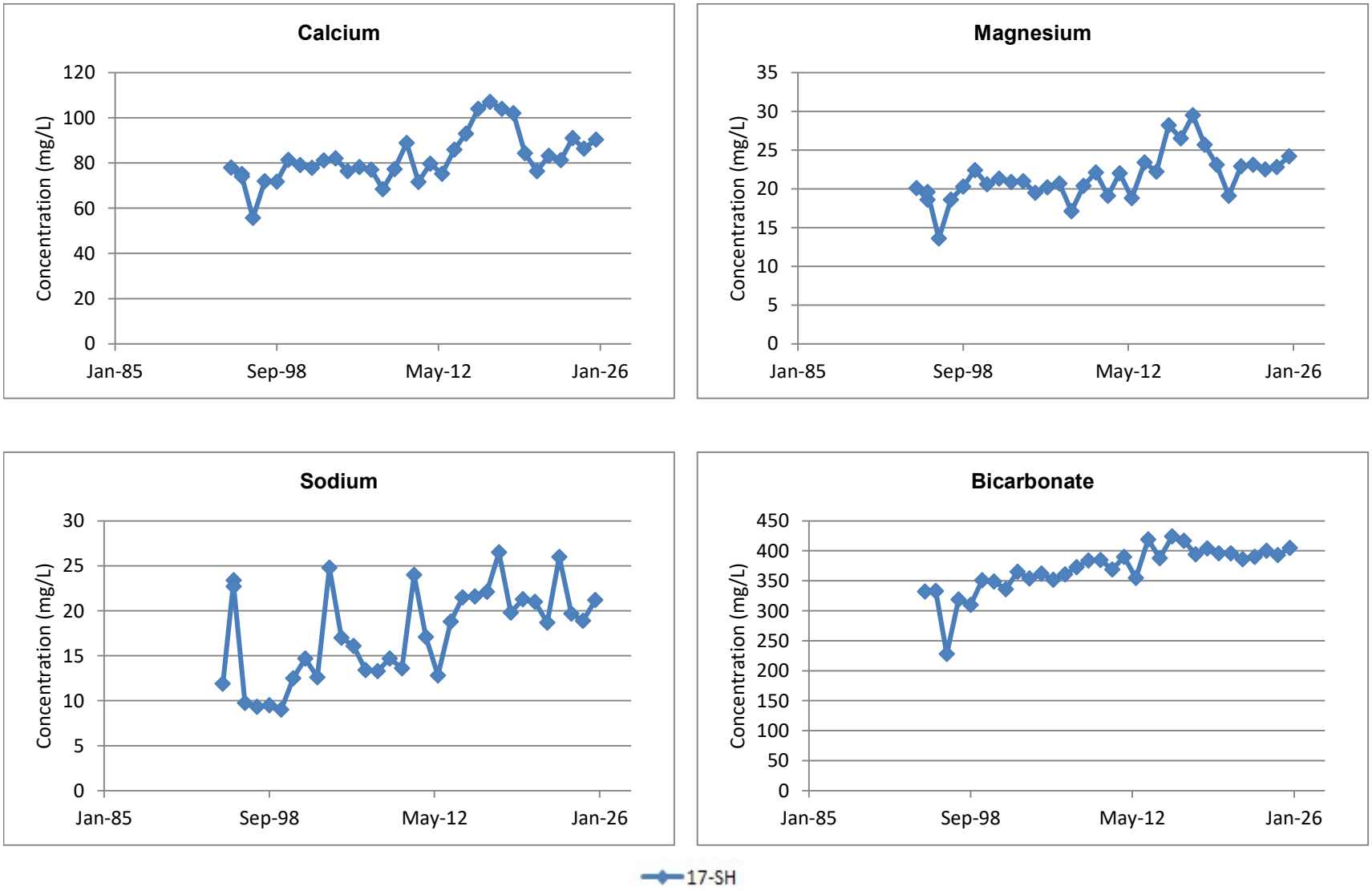
AECOM

Figure 13.32
VEOLIA, Swan Hills Treatment Centre
16-IN - Major Ions



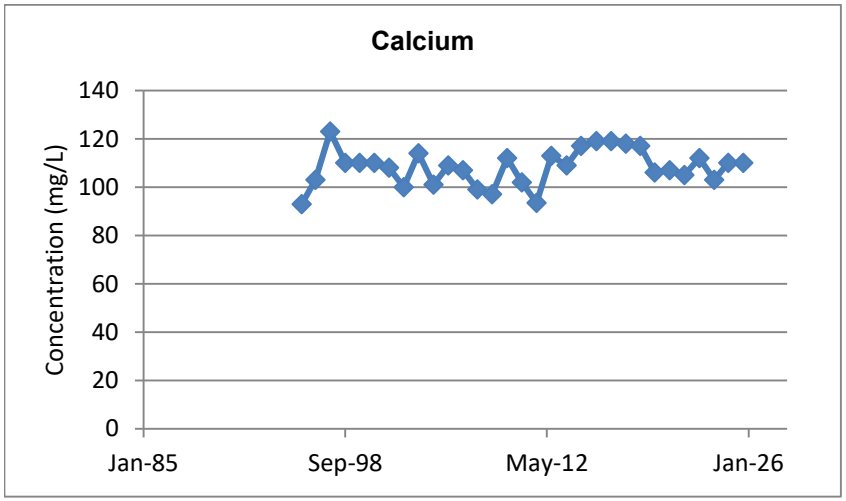
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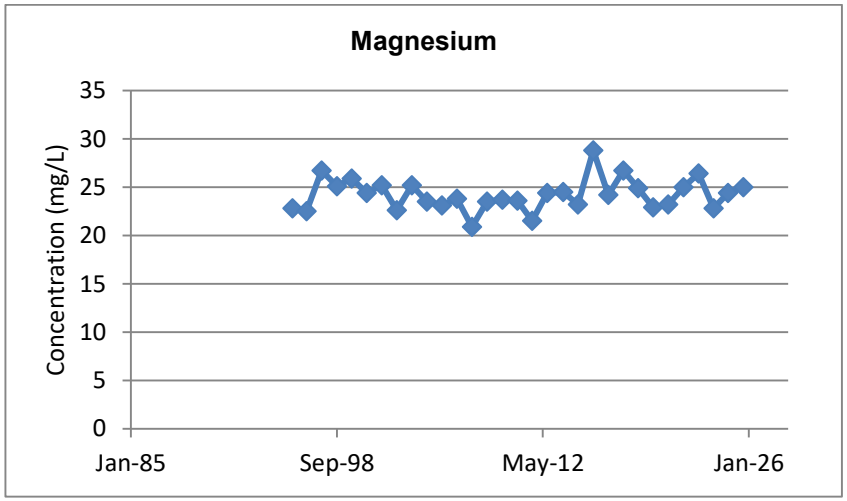
Figure 13.33
VEOLIA, Swan Hills Treatment Centre
17-SH - Major Ions

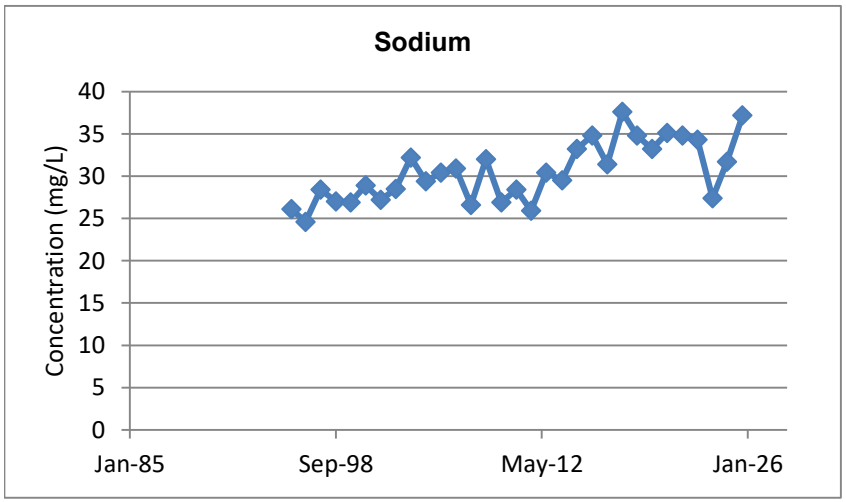


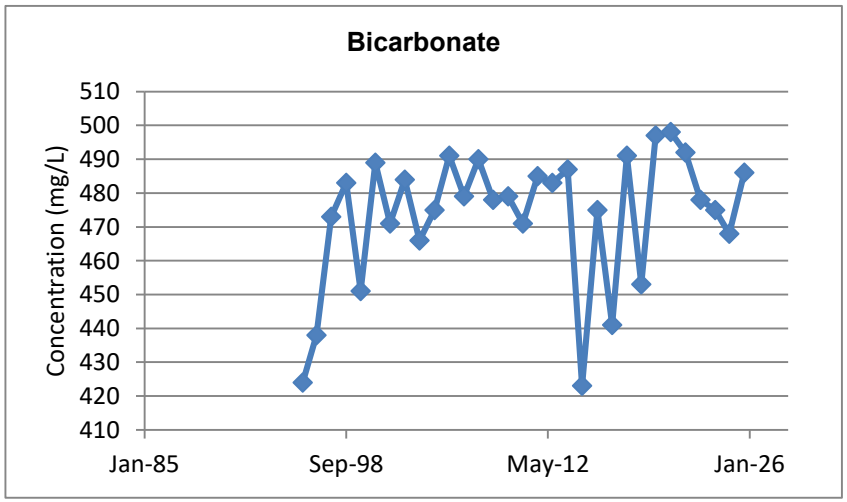
AECOM

Figure 13.34
VEOLIA, Swan Hills Treatment Centre
17-IN - Major Ions





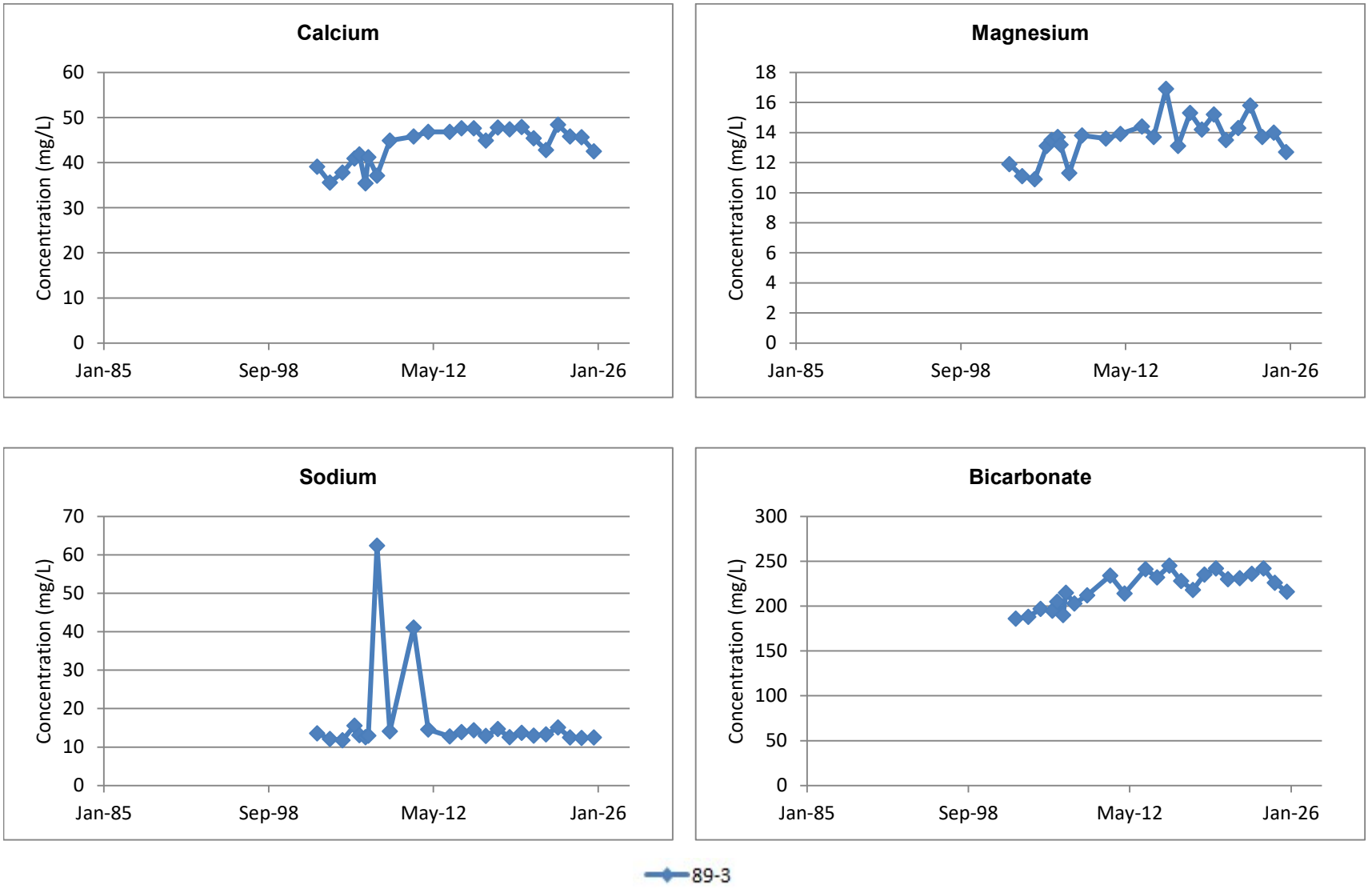




17-IN

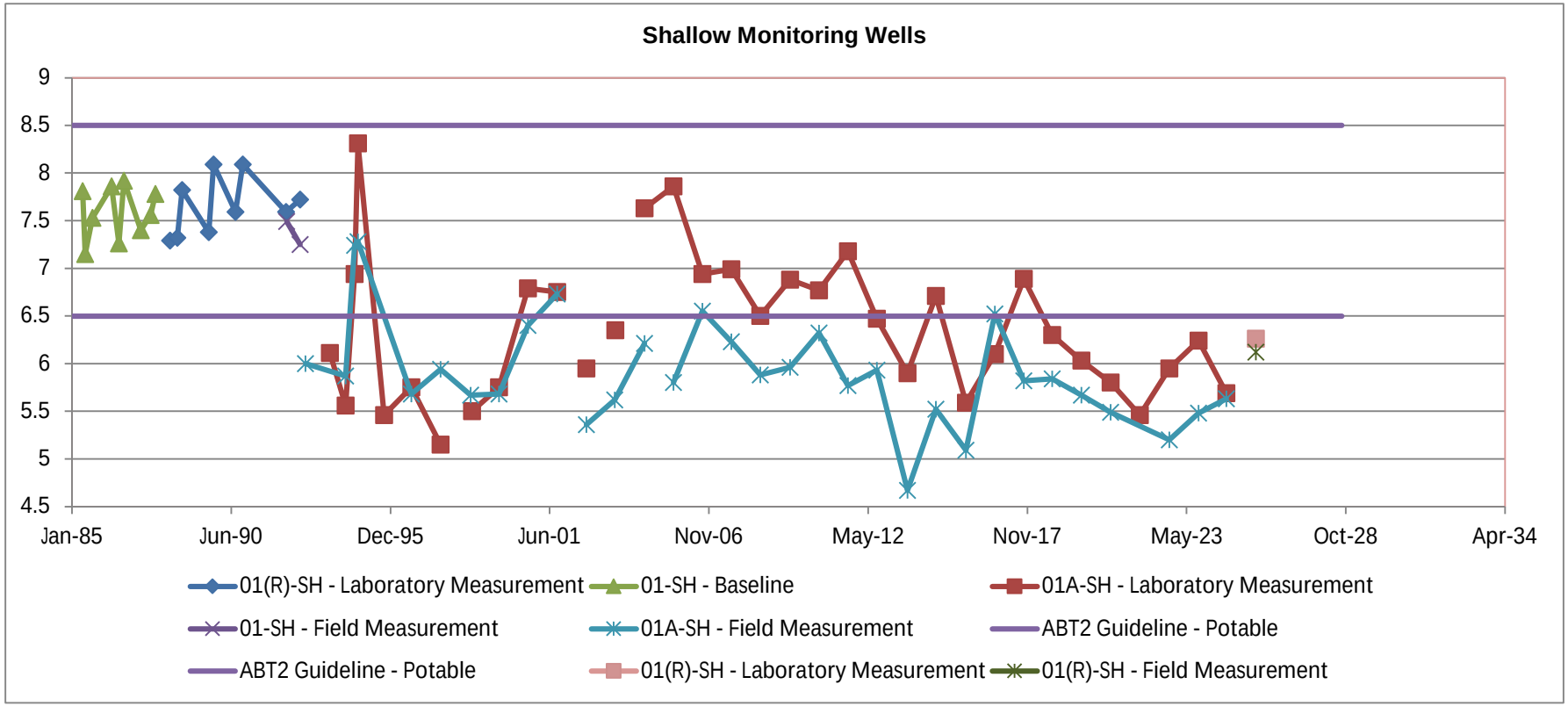
AECOM

Figure 13.35
VEOLIA, Swan Hills Treatment Centre
89-3 - Major Ions



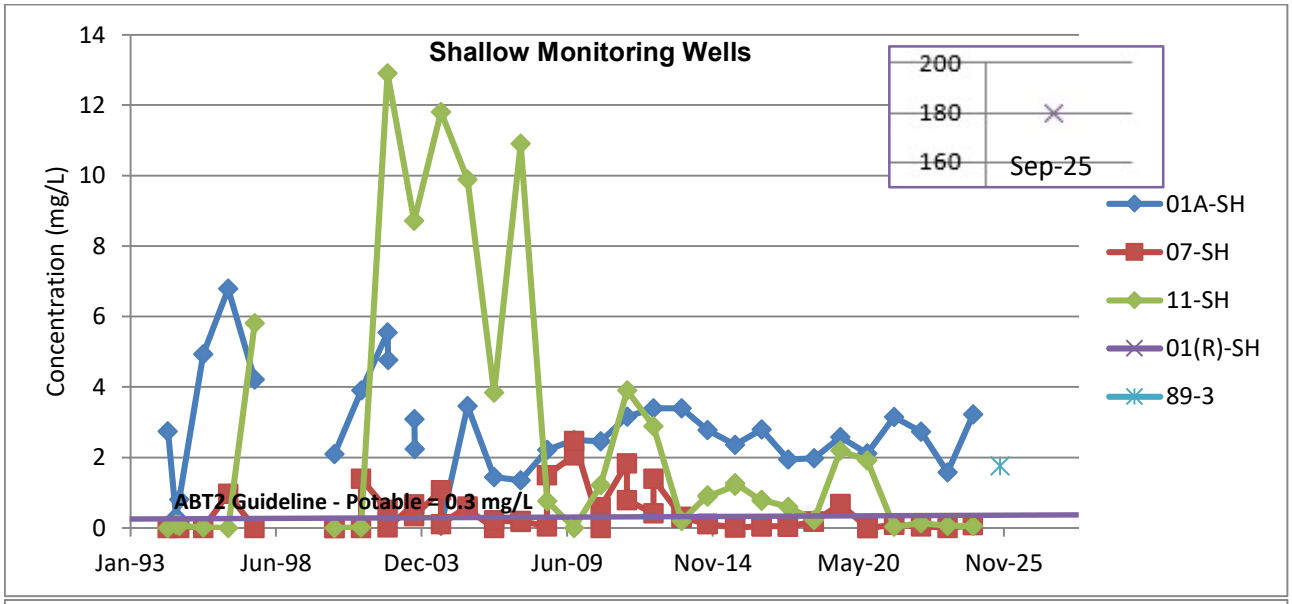
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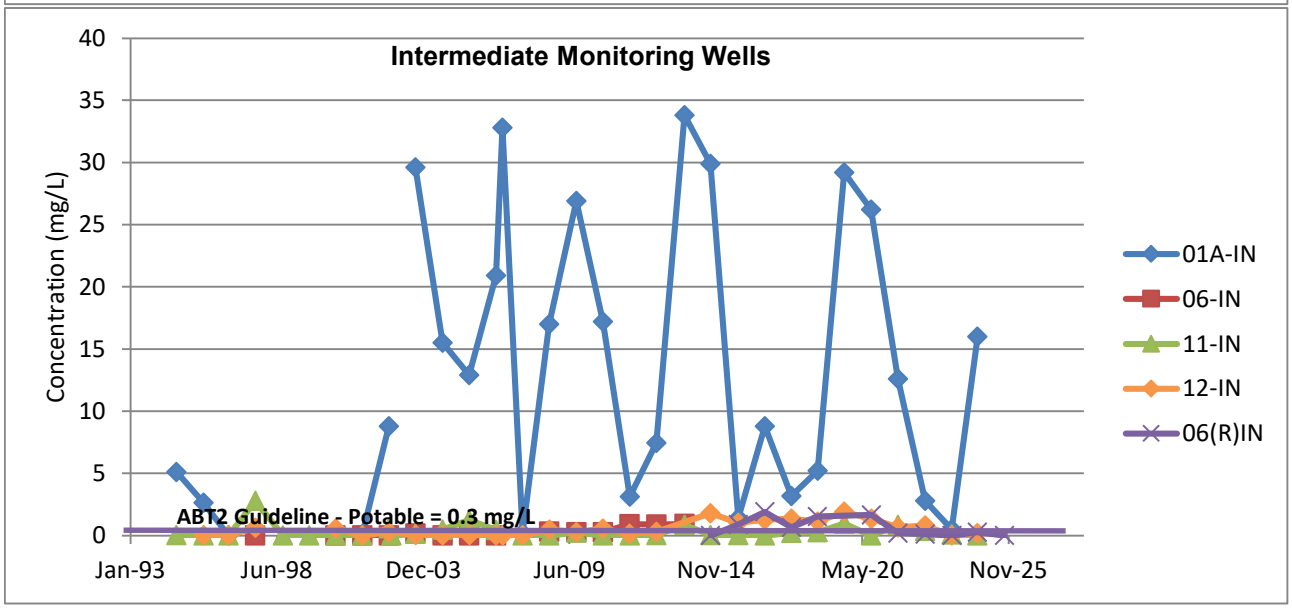
Figure 14.1
VEOLIA, Swan Hills Treatment Centre
pH Results

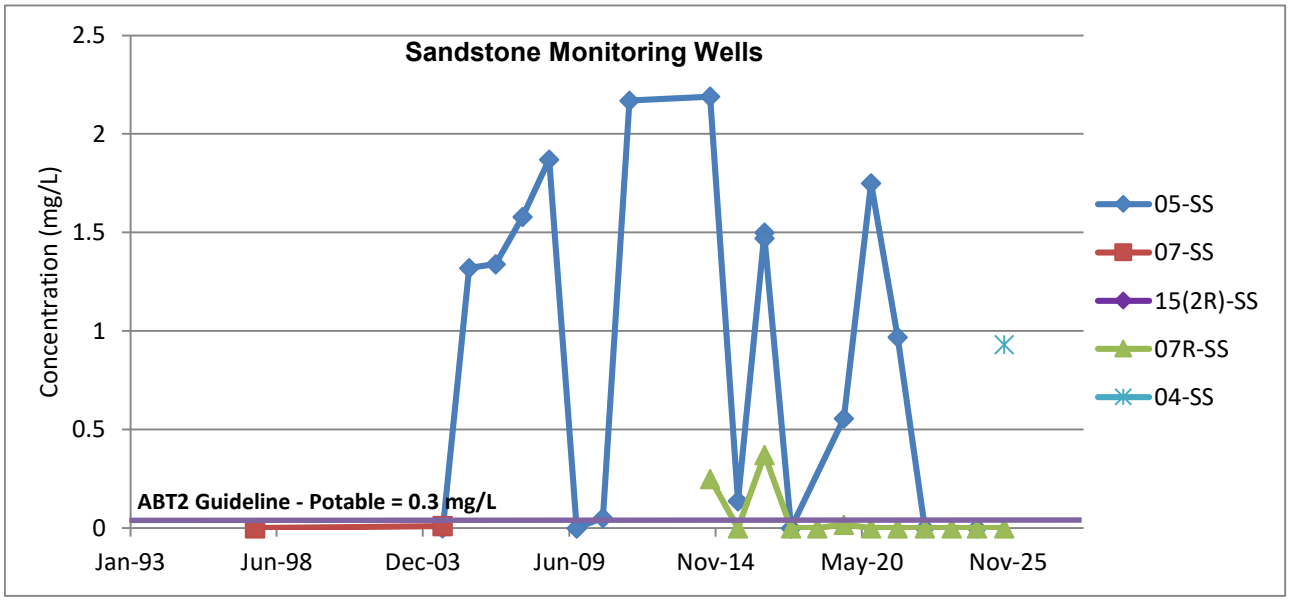


AECOM

Figure 14.2
VEOLIA, Swan Hills Treatment Centre
Dissolved Iron Concentrations







Appendix B

Water Well Drilling Report

Reconnaissance Report

View in Imperial

Export to Excel

Groundwater Wells

Please click the water Well ID to generate the Water Well Drilling Report.

GIC Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (m)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (m)	TEST RATE (L/min)	SC_DIA (cm)
351361	NW	6	67	8	5	MCALLISTER WATERWELLS LTD.	1990-01-11	73.15	New Well	Observation		4		ALTA SPECIAL WASTE MGMT	54.56	4.55	5.08
351362	NW	6	67	8	5	MCALLISTER WATERWELLS LTD.	1990-01-12	67.06	New Well	Observation		4		ALTA SPECIAL WASTE MGMT	0.00	0.00	5.08
351363	NW	6	67	8	5	MCALLISTER WATERWELLS LTD.	1990-01-13	70.10	New Well	Observation		3		ALTA SPECIAL WASTE MGMT			5.08
353065	10	19	66	8	5	OIL EXPLORATORY	1965-09-02	2,495.40	Test Hole	Industrial				TAURUS OIL CO LTD			0.00
353704	8	6	67	8	5	HI-RATE DRILLING 1985 LTD.	1989-12-17	78.94	New Well	Industrial		5		ALTA SPECIAL WASTE MGMT			17.78
353705	8	6	67	8	5	HI-RATE DRILLING 1985 LTD.	1989-12-19	73.15	Test Hole-Decommissioned	Industrial		10		ALTA SPECIAL WASTE MGMT			0.00
353706	13	6	67	8	5	HI-RATE DRILLING 1985 LTD.	1989-12-16	83.82	Test Hole-Decommissioned	Industrial		8		ALTA SPECIAL WASTE MGMT	64.62	4.55	17.78
354695	9	6	67	8	5	MCALLISTER HOLDINGS LTD.	1985-05-10	68.28	New Well	Industrial		8	27	ALTA SPECIAL WASTE MGMT	51.21	200.03	14.12
354696	9	6	67	8	5	MCALLISTER HOLDINGS LTD.	1985-05-19	67.06	New Well	Industrial		14	27	ALTA SPECIAL WASTE MGMT	47.24	27.28	14.12
354697	10	6	67	8	5	MCALLISTER HOLDINGS LTD.	1985-05-20	75.90	Reconditioned	Industrial		9	27	ALTA SPECIAL WASTE MGMT	61.26	54.55	14.12
356324	13	6	67	8	5	HI-RATE DRILLING 1985 LTD.	1989-10-11	532.79	New Well	Industrial		5		ALTA SPECIAL WASTE MGMT	370.00	112.29	0.00
358227	11	6	67	8	5	HI-RATE DRILLING 1985 LTD.	1989-12-19	73.15	Test Hole-Decommissioned	Industrial		10		ALTA SPECIAL WASTE MGMT #4			0.00
358228	11	6	67	8	5	HI-RATE DRILLING 1985 LTD.	1989-12-20	78.94	New Well	Industrial		5		ALTA SPECIAL WASTE MGMT #3			17.78
368538	6	6	67	8	5	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-12-02	152.10	Test Hole	Observation		29		ALTA ENV #2239E	0.00	13.64	14.12
395324	11	5	67	8	5	MCALLISTER WATERWELLS LTD.		121.92	New Well	Industrial		19		ALTA SPECIAL WASTE MGMT CORP	32.00	181.84	17.78
395325	11	5	67	8	5	MCALLISTER WATERWELLS LTD.	1986-06-23	29.87	New Well-Decommissioned	Industrial		7		ALTA SPECIAL WASTE MGMT CORP	1.83		14.12
395326	12	5	67	8	5	MCALLISTER WATERWELLS LTD.		91.44	New Well	Industrial		18		ALTA SPECIAL WASTE MGMT CORP	20.73	227.30	27.31
395328	6	6	67	8	5	ALBERTA ENVIRONMENT	1983-12-09	64.31	New Well	Investigation		8		ALTA ENV/SOILS BR#2240			0.00
395329	6	6	67	8	5	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1982-12-22	48.16	New Well	Investigation		6		ALTA ENV/SOILS BR#2241	0.00	2.27	14.12
395330	11	6	67	8	5	BIG QUILL DRILLING LTD.	1983-05-19	90.83	New Well	Investigation		8		C.E. MOELL & ASSOC #2	50.90	31.82	14.12

Reconnaissance Report

View in Imperial

Export to Excel

GIC Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (m)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (m)	TEST RATE (L/min)	SC_DIA (cm)
395331	13	6	67	8	5	BIG QUILL DRILLING LTD.	1983-05-25	90.83	New Well-Decommissioned	Investigation		11		C.E. MOELL & ASSOC#TH3	0.00	9.09	0.00
395332	13	6	67	8	5	ALBERTA ENVIRONMENT	1983-12-14	46.02	New Well	Investigation		5		ALTA ENV/SOILS#SWAN HILLS2242E			0.00
395333	13	6	67	8	5	GERALD MCGINN DRILLING LTD.	1988-03-23	81.38	New Well	Industrial		15		ALTA SPECIAL WASTE SYSTEMS	62.48	68.19	14.12
395334	14	6	67	8	5	BIG QUILL DRILLING LTD.	1983-05-18	90.83	Test Hole-Decommissioned	Industrial		7		C.E. MOELL & ASSOC#1	46.33	27.28	0.00
395335	4	7	67	8	5	MCALLISTER DRILLING LTD.	1986-06-12	73.15	Test Hole-Decommissioned	Industrial		6		ALTA SPECIAL WASTE MGMT CORP#1	15.54	18.18	14.12
395339	14	1	67	9	5	UNKNOWN DRILLER	1980-03-03	15.24	Flowing Shot Hole	Industrial				CHEVRON STANDARD LTD #849			0.00
395341	10	10	67	9	5	UNKNOWN DRILLER	1975-01-19	0.00	Spring	Unknown	1			ARC			0.00
1025506	9	7	67	8	5	ACCESS WATERWELLS INC.	2013-02-25	103.63	Dry Hole-Decommissioned	Industrial		21		HUSKY ENERGY			14.12
2097625	11	6	67	8	5	MAHAR DRILLING LTD.	2022-04-12	76.20	New Well	Industrial		10	15	SUEZ SWAN HILLS TREATMENT CENTER	55.20	68.19	

Water Well Drilling Report

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

View in Imperial | Export to Excel

GOWN ID

GIC Well ID 354697
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/06/18

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
ALTA SPECIAL WASTE MGMT	SWAN HILLS				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	10	6	67	8	5				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.772356 Longitude -115.205840

How Location Obtained
Map

Elevation m

How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Industrial

Type of Work
Reconditioned

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
3.66		Brown Till
11.28		Gray Till
15.85		Gray Shale
29.57		Brown Shale
34.75		Brownish Gray Shale
41.15		Gray Shale
71.32		Gray Shaly Sandstone & Coal
73.76		Gray Sandstone
75.90		Brownish Green Shale

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 54.55 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
1985/05/20	54.55	61.26

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
75.90 m		1985/05/19	1985/05/20

Borehole

Diameter (cm)	From (m)	To (m)
0.00	0.00	75.90

Surface Casing (if applicable)
Steel
Size OD : 14.12 cm
Wall Thickness : 0.478 cm
Bottom at : 66.75 m

Well Casing/Liner
Size OD : 0.00 cm
Wall Thickness : 0.000 cm
Top at : 0.00 m
Bottom at : 0.00 m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)

Perforated by

Annular Seal Sand Pack
Placed from 0.00 m to 66.14 m
Amount

Other Seals

Type	At (m)

Screen Type Stainless Steel
Size OD : 10.16 cm

From (m)	To (m)	Slot Size (cm)
66.75	73.15	0.051

Attachment Attached To Casing
Top Fittings Coupler
Bottom Fittings Plug

Pack
Type Artificial
Grain Size 12:20
Amount 544.00 Kilograms

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MCALLISTER HOLDINGS LTD.

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

View in Imperial | Export to Excel

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GOWN ID

GIC Well ID 354697
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/06/18

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
ALTA SPECIAL WASTE MGMT	SWAN HILLS				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	10	6	67	8	5				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.772356 Longitude -115.205840
How Location Obtained: Map

Elevation m
How Elevation Obtained: Not Obtained

Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate 54.55 L/min
Recommended Pump Intake Depth (From TOC) 0.00 m
Pump Installed
Depth m
Type
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth m
Gas
Depth m
Well Disinfected Upon Completion
Geophysical Log Taken
Remedial Action Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well

INITIAL DRILLER REPORT NOT HELD @ GIC.

Yield Test

Taken From Ground Level
Depth to water level

Measurement in Metric

Test Date	Start Time	Static Water Level
1985/05/20	12:00 AM	61.26 m

Method of Water Removal

Type Pump
Removal Rate 54.55 L/min
Depth Withdrawn From 70.71 m

If water removal period was < 2 hours, explain why

Pumping (m)	Elapsed Time Minutes:Sec	Recovery (m)
61.28	0:00	67.14
63.09	0:30	65.71
0.00	1:00	64.90
64.25	1:30	64.30
64.61	2:00	63.90
65.11	3:00	63.35
65.45	4:00	63.01
65.68	5:00	62.82
65.88	6:00	62.65
66.01	7:00	62.52
66.12	8:00	62.42
66.22	9:00	62.34
66.30	10:00	62.28
66.45	12:00	62.17
66.62	15:00	62.06
66.74	18:00	61.97
66.80	20:00	61.93
66.92	25:00	61.85
67.02	30:00	61.79
67.07	35:00	61.73
67.11	40:00	61.71
67.19	50:00	61.66
67.24	60:00	61.63
67.28	75:00	61.61
67.30	90:00	61.59
67.31	105:00	61.58
67.31	120:00	61.57

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MCALLISTER HOLDINGS LTD.

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

View in Imperial | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 354696
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/06/18

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
ALTA SPECIAL WASTE MGMT	10909 JASPER AVE, EDMONTON				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	9	6	67	8	5				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.772356 Longitude -115.199586
How Location Obtained: Map

Elevation m
How Elevation Obtained: Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Industrial

Type of Work
New Well

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
3.05		Brown Till
9.75		Gray Till
19.81		Brown Shale
24.38		Gray Shale
35.66		Brownish Gray Sandstone
42.67		Brown Sandstone & Shale Ledges
46.63		Brown Shale
48.77		Brownish Gray Sandstone
52.12		Brown Sandstone
52.73		Gray Shale
63.40		Gray Sandstone
65.53		Gray Shale
66.75		Gray Sandstone
67.06		Gray Shale

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 27.28 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
1985/05/19	27.28	47.24

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
67.06 m		1985/05/17	1985/05/19

Borehole

Diameter (cm)	From (m)	To (m)
0.00	0.00	67.06

Surface Casing (if applicable)
Steel
Size OD : 14.12 cm
Wall Thickness : 0.478 cm
Bottom at : 55.17 m

Well Casing/Liner
Size OD : 0.00 cm
Wall Thickness : 0.000 cm
Top at : 0.00 m
Bottom at : 0.00 m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)

Perforated by

Annular Seal Unknown
Placed from 0.00 m to 54.56 m
Amount

Other Seals

Type	At (m)

Screen Type Stainless Steel
Size OD : 10.16 cm

From (m)	To (m)	Slot Size (cm)
55.17	61.57	0.064

Attachment Attached To Casing
Top Fittings Coupler
Bottom Fittings Plug

Pack
Type Artificial
Grain Size 12-20
Amount 680.00 Kilograms

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MCALLISTER HOLDINGS LTD.

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

View in Imperial | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 354696
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/06/18

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
ALTA SPECIAL WASTE MGMT	10909 JASPER AVE, EDMONTON				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	9	6	67	8	5				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.772356 Longitude -115.199586
How Location Obtained: Map

Elevation m
How Elevation Obtained: Not Obtained

Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate 27.28 L/min
Recommended Pump Intake Depth (From TOC) 0.00 m
Pump Installed
Depth m
Type
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth m
Well Disinfected Upon Completion
Gas
Depth m
Geophysical Log Taken Electric
Remedial Action Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD
Additional Comments on Well

Yield Test

Taken From Ground Level
Measurement in Metric

Test Date	Start Time	Static Water Level
1985/05/19	12:00 AM	47.24 m

Method of Water Removal

Type Pump
Removal Rate 27.28 L/min
Depth Withdrawn From 64.92 m

If water removal period was < 2 hours, explain why

Depth to water level

Pumping (m)	Elapsed Time Minutes:Sec	Recovery (m)
47.11	0:00	53.46
48.42	0:30	52.58
0.00	1:00	51.92
0.00	1:30	51.21
50.34	2:00	50.65
51.06	3:00	0.00
51.60	4:00	49.15
51.99	5:00	48.74
0.00	6:00	48.46
52.51	7:00	48.26
52.69	8:00	48.12
52.83	9:00	48.02
52.94	10:00	47.94
53.10	12:00	47.48
53.26	15:00	47.75
53.35	18:00	47.69
53.40	20:00	47.66
53.49	25:00	47.60
53.56	30:00	47.56
53.61	35:00	47.56
53.65	40:00	47.50
53.72	50:00	47.46
53.77	60:00	47.43
53.82	75:00	47.39
53.87	90:00	47.37
53.90	105:00	47.35
53.91	120:00	47.33

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MCALLISTER HOLDINGS LTD.

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

View in Imperial | Export to Excel

GOWN ID

GIC Well ID 354695
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/06/18

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
ALTA SPECIAL WASTE MGMT	10909 JASPER AVE, EDMONTON				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	9	6	67	8	5				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.772356 Longitude -115.199586
How Location Obtained
Not Verified

Elevation m
How Elevation Obtained
Not Obtained

Drilling Information

Method of Drilling
Rotary

Proposed Well Use
Industrial

Type of Work
New Well

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
1.22		Brown Till
9.75		Gray Till
21.34		Brown Shale
25.91		Greenish Gray Shale
33.53		Green Shale
48.77		Brown Sandstone
67.06		Brownish Gray Sandstone
68.28		Gray Sandstone

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 227.30 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
1985/05/10	200.03	51.21

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
68.28 m		1985/05/10	1985/05/10

Borehole

Diameter (cm)	From (m)	To (m)
0.00	0.00	68.28

Surface Casing (if applicable)
Steel
Size OD : 14.12 cm
Wall Thickness : 0.478 cm
Bottom at : 61.87 m

Well Casing/Liner
Size OD : 0.00 cm
Wall Thickness : 0.000 cm
Top at : 0.00 m
Bottom at : 0.00 m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)

Perforated by

Annular Seal Other
Placed from 0.00 m to 60.96 m
Amount

Other Seals

Type	At (m)

Screen Type Stainless Steel
Size OD : 10.16 cm

From (m)	To (m)	Slot Size (cm)

Attachment Attached To Casing
Top Fittings Coupler
Bottom Fittings Plug

Pack
Type Artificial
Grain Size 12:20
Amount 544.00 Kilograms

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MCALLISTER HOLDINGS LTD.

Copy of Well report provided to owner

Date approval holder signed

Water Well Drilling Report

View in Imperial | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 354695
GoA Well Tag No.
Drilling Company Well ID
Date Report Received 1985/06/18

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
ALTA SPECIAL WASTE MGMT	10909 JASPER AVE, EDMONTON				

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	9	6	67	8	5				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.772356 Longitude -115.199586
How Location Obtained
Not Verified

Elevation m
How Elevation Obtained
Not Obtained

Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate 227.30 L/min
Recommended Pump Intake Depth (From TOC) 0.00 m
Pump Installed Depth m
Type Make H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS) Depth m
Gas Depth m
Remedial Action Taken
Well Disinfected Upon Completion
Geophysical Log Taken Electric
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD

Additional Comments on Well
Seal Type: Sand pack on outside.

Yield Test

Taken From Ground Level
Measurement in Metric

Test Date	Start Time	Static Water Level
1985/05/10	12:00 AM	51.21 m

Method of Water Removal

Type Pump
Removal Rate 200.03 L/min
Depth Withdrawn From 66.75 m

If water removal period was < 2 hours, explain why

Depth to water level

Pumping (m)	Elapsed Time Minutes:Sec	Recovery (m)
51.48	0:00	54.72
53.95	0:30	52.30
54.20	1:00	52.12
54.27	1:30	52.06
54.30	2:00	52.03
54.35	3:00	51.99
54.38	4:00	51.95
54.41	5:00	51.93
54.44	6:00	51.91
54.46	7:00	51.89
54.47	8:00	51.87
54.49	9:00	51.85
54.50	10:00	51.84
54.52	12:00	51.81
54.53	15:00	51.78
54.56	18:00	51.75
54.56	20:00	51.75
54.55	25:00	51.73
54.57	30:00	51.71
54.57	35:00	51.70
54.59	40:00	51.69
54.60	50:00	51.67
54.60	60:00	51.66
54.60	75:00	51.64
54.60	90:00	51.63
54.61	105:00	51.63
54.60	120:00	51.62

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
UNKNOWN NA DRILLER

Certification No
1

Company Name
MCALLISTER HOLDINGS LTD.

Copy of Well report provided to owner
Date approval holder signed

Water Well Drilling Report

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

View in Imperial | Export to Excel

GIC Well ID 2097625
GoA Well Tag No. A5619
Drilling Company Well ID
Date Report Received 2022/06/05

GOWN ID

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
SUEZ SWAN HILLS TREATMENT CENTER		SWAN HILLS	ALBERTA	CANADA	

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	11	6	67	8	5				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.772107 Longitude -115.212365
How Location Obtained: Map

Elevation m
How Elevation Obtained: Not Obtained

Drilling Information

Method of Drilling
Rotary - Air

Type of Work
New Well

Proposed Well Use
Industrial

Formation Log

Measurement in Metric

Depth from ground level (m)	Water Bearing	Lithology Description
7.32		Brown Rocky Clay
12.19		Green Shale
31.09		Brown Shale
38.10		Green Shale
44.20		Brown Sandstone
45.72		Gray Sandstone
63.40		Brown Sandstone
65.84	Yes	Gray Sandstone
74.37	Yes	Gray Mixed Shale & Sandstone
76.20		Green Shale

Yield Test Summary

Measurement in Metric

Recommended Pump Rate 68.19 L/min

Test Date	Water Removal Rate (L/min)	Static Water Level (m)
2022/04/13	68.19	55.20

Well Completion

Measurement in Metric

Total Depth Drilled	Finished Well Depth	Start Date	End Date
76.20 m	74.98 m	2022/04/11	2022/04/12

Borehole

Diameter (cm)	From (m)	To (m)
20.32	0.00	76.20

Surface Casing (if applicable)
Size OD : cm
Wall Thickness : cm
Bottom at : m

Well Casing/Liner
Plastic
Size OD : 15.24 cm
Wall Thickness : 0.991 cm
Top at : 0.00 m
Bottom at : 61.26 m

Perforations

From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval(cm)

Perforated by

Annular Seal Bentonite Granular
Placed from 0.00 m to 59.44 m
Amount 60.00 Bags

Other Seals

Type	At (m)

Screen Type Stainless Steel
Size OD : 12.70 cm

From (m)	To (m)	Slot Size (cm)
61.26	74.98	0.025

Attachment Attached To Casing
Top Fittings Threaded
Bottom Fittings Plug

Pack
Type Artificial
Grain Size 10/20
Amount 25.00 Bags

Contractor Certification

Name of Journeyman responsible for drilling/construction of well
MATTHEW MAHAR

Certification No
11510NQ

Company Name
MAHAR DRILLING LTD.

Copy of Well report provided to owner
Yes

Date approval holder signed
2022/06/05

Water Well Drilling Report

View in Imperial | Export to Excel

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

GOWN ID

GIC Well ID 2097625
GoA Well Tag No. A5619
Drilling Company Well ID
Date Report Received 2022/06/05

Well Identification and Location

Measurement in Metric

Owner Name	Address	Town	Province	Country	Postal Code
SUEZ SWAN HILLS TREATMENT CENTER		SWAN HILLS	ALBERTA	CANADA	

Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description
	11	6	67	8	5				

Measured from Boundary of
m from
m from

GPS Coordinates in Decimal Degrees (NAD 83)
Latitude 54.772107 Longitude -115.212365
How Location Obtained: Map

Elevation m
How Elevation Obtained: Not Obtained

Additional Information

Measurement in Metric

Distance From Top of Casing to Ground Level: 50.80 cm
Is Artesian Flow
Rate L/min
Is Flow Control Installed
Describe

Recommended Pump Rate: 68.19 L/min
Recommended Pump Intake Depth (From TOC): 65.84 m
Pump Installed: Yes
Type: Submersible
Depth: 65.84 m
Make: FRANKLIN
H.P.: Other
Model (Output Rating): 2HP 15 GPM

Did you Encounter Saline Water (>4000 ppm TDS)
Depth m
Gas
Depth m
Well Disinfected Upon Completion: Yes
Geophysical Log Taken
Remedial Action Taken
Submitted to ESRD
Sample Collected for Potability
Submitted to ESRD
Additional Comments on Well

Yield Test

Taken From Top of Casing
Measurement in Metric

Test Date	Start Time	Static Water Level
2022/04/13	11:00 AM	55.20 m

Method of Water Removal

Type: Pump
Removal Rate: 68.19 L/min
Depth Withdrawn From: 65.84 m

If water removal period was < 2 hours, explain why

Depth to water level

Pumping (m)	Elapsed Time Minutes:Sec	Recovery (m)
55.20	0:00	59.44
57.00	1:00	56.75
58.22	2:00	55.90
59.22	3:00	55.63
59.44	4:00	55.53
59.44	5:00	55.44
	6:00	55.38
	7:00	55.32
	8:00	55.29
	9:00	55.26
	10:00	55.26
	12:00	55.23
	14:00	55.23
	16:00	55.20
59.44	120:00	55.20

Water Diverted for Drilling

Water Source	Amount Taken	Diversion Date & Time
SHOP WELL	5455.31 L	2022/04/06 10:00 AM

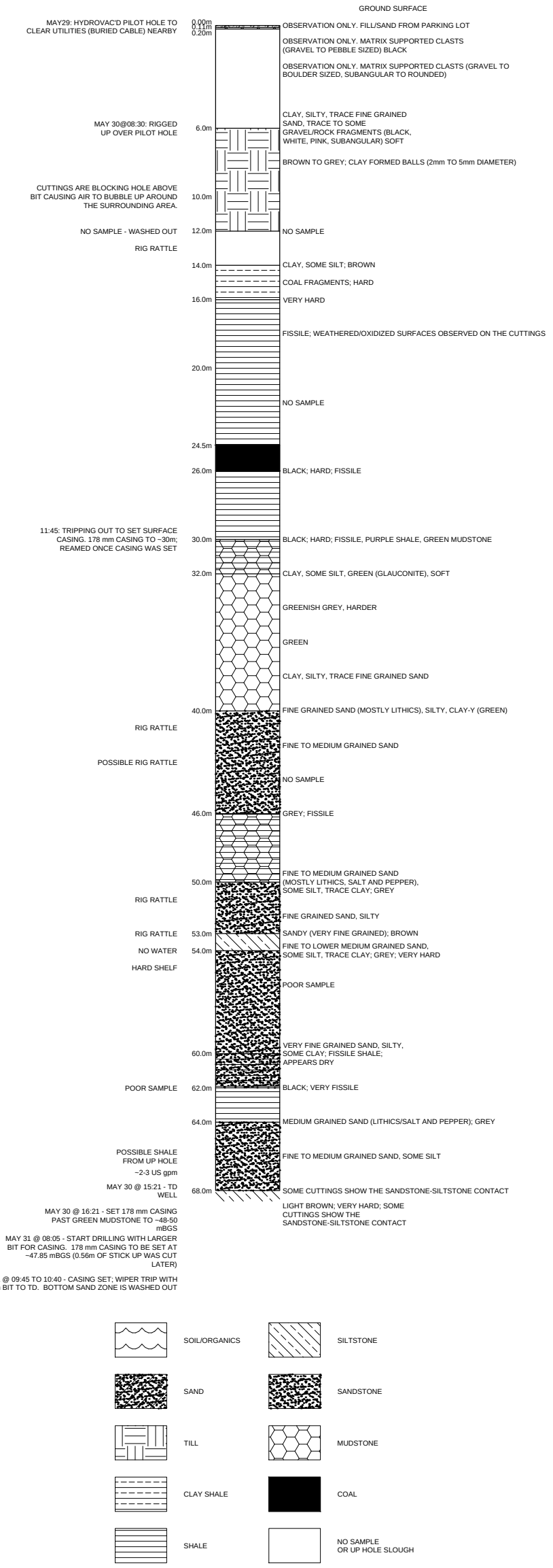
Contractor Certification

Name of Journeyman responsible for drilling/construction of well: MATTHEW MAHAR
Certification No: 11510NQ
Company Name: MAHAR DRILLING LTD.
Copy of Well report provided to owner: Yes
Date approval holder signed: 2022/06/05

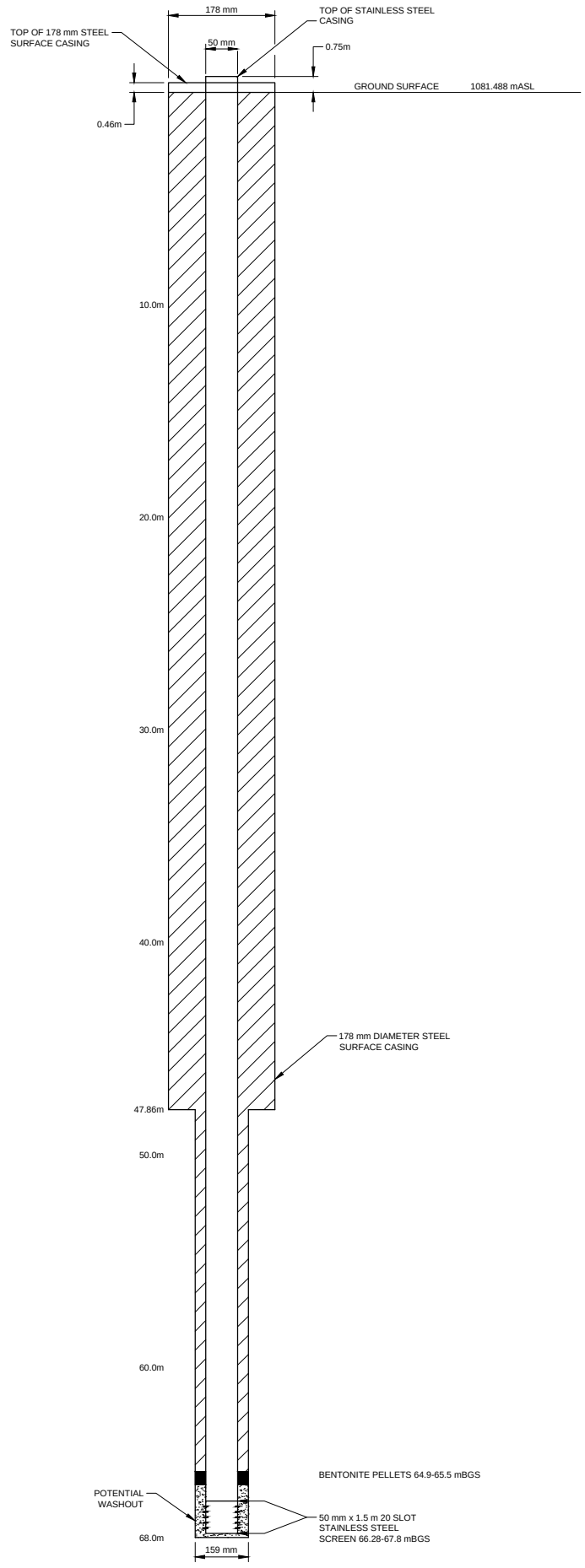
Appendix C

Borehole Logs

SOIL DESCRIPTION



WELL CONSTRUCTION DETAILS



m SCALE 1:150
0 1.5 3 4.5

NAD83 UTM Zone 11: 6071291.690, 614684.690

Issue Status: FINAL

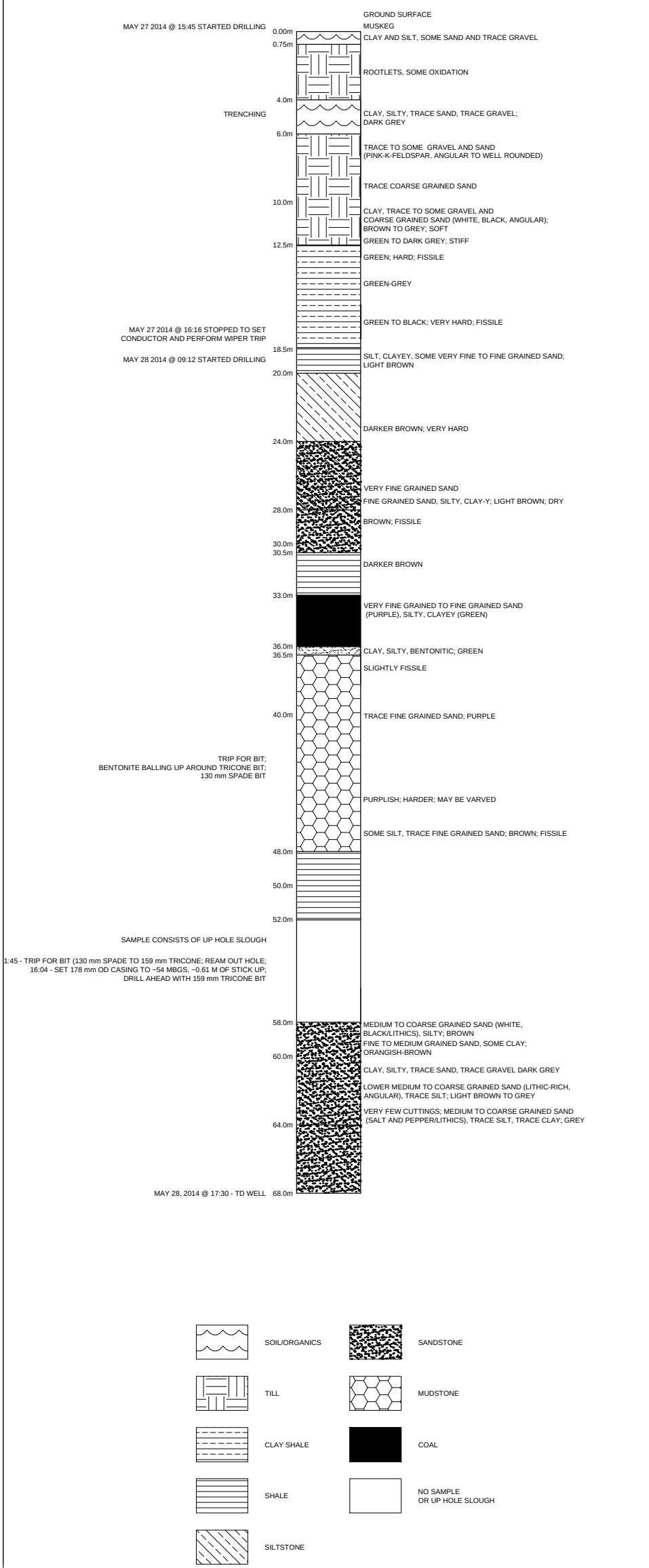
Swan HillsTreatment Centre Well Maintenance
Groundwater Monitoring
SENA Waste Services Inc. - Swan Hills, Alberta
Project No.: 60320044 Date: 2015/06/24

Groundwater Monitoring Well 07(R)SS
Strip Log And Completion

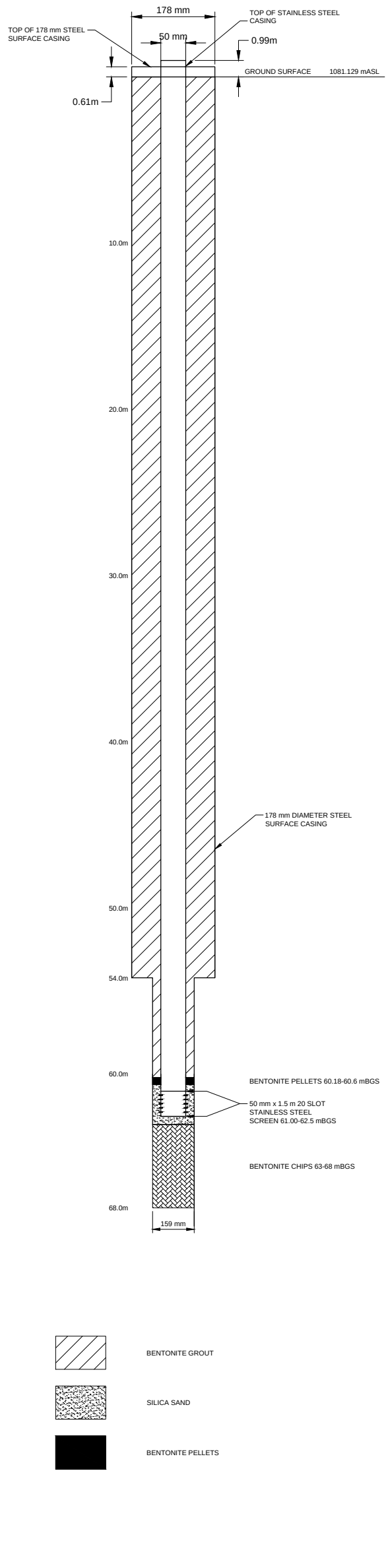
AECOM

Borehole Log

SOIL DESCRIPTION



WELL CONSTRUCTION DETAILS



0 1.5 3 4.5 m SCALE 1:150

NAD83 UTM Zone 11: 6070775.640, 614873.810

Issue Status: FINAL

Swan HillsTreatment Centre Well Maintenance
Groundwater Monitoring
SENA Waste Services Inc. - Swan Hills, Alberta
Project No.: 60320044 Date: 2015/06/24

Groundwater Monitoring Well 15(2R)SS
Strip Log And Completion

AECOM

Borehole Log

PROJECT: Groundwater Monitoring Well Maintenance	CLIENT: SENA Solid Waste Holdings Inc.	TESTHOLE NO.: **05-SH_Piezometer**
LOCATION: Swan Hills Treatment Centre	COORDINATES: UTM N 6073467.547 E 615148.045	PROJECT NO.: 60320044
CONTRACTOR: AECOM	METHOD: 4" Hand Auger	ELEVATION (m): 1079.856

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	MW-5SH	USC	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0		OB		TOPSOIL- organic, silty, rootlets, humid				
		SICL		CLAY - silty, some sand, trace gravel sizes, brown, damp, firm, low plasticity, trace oxidation - hit rocks - medium to fine grained sand pockets/lenses, trace of some gravel				
1				CLAY - trace gravel, trace silty sand, trace coal, trace oxidation, brown, damp, firm, medium plasticity				1079
				- some sand, moist				
2		CI						1078
				CLAY - some silt, grey, damp, stiff, medium plasticity, some oxidation				
3		CI						1077
4								1076
5								1075
6								1074
7								1073
8								1072
9								1071
10								1070

LOG OF TESTHOLE AUGER BOREHOLE LOGS.GPJ UMA_COC.GDT PRINT: 9/4/14 By:

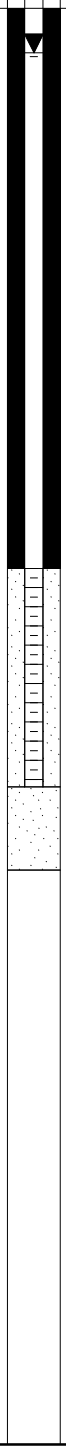
AECOM

LOGGED BY: BB	COMPLETION DEPTH: 3.10 m
REVIEWED BY:	COMPLETION DATE: 7/10/2014
PROJECT ENGINEER:	Page 1 of 1

PROJECT: Groundwater Monitoring Well Maintenance	CLIENT: SENA Solid Waste Holdings Inc.	TESTHOLE NO.: **06(R)IN**
LOCATION: Swan Hills Treatment Centre	COORDINATES: UTM N 6073647.288 E 615012.123	PROJECT NO.: 60320044
CONTRACTOR: Calibre Drilling Ltd.	METHOD: 4" Solid Stem	ELEVATION (m): 1080.468

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND



DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0	OB		TOPSOIL - black				
			TILL - clay, silty, trace sand, brown, damp, organic matter (roots)				1080
1	SICL		- sandy lenses (very thin), light brown, oxidation around roots				
			TILL - trace coarse sand, trace gravel >2mm <5mm diameter, moist				1079
2							
							1078
3			- trace gravel sub angular to sub rounded (~1cm diameter), oxidized very fine sand pockets (~5mm diameter), trace coal - water on outside of auger				
							1077
4	CI		- clay, silty, trace sand, dark grey, moist, stiff, oxidized pockets, oxidized silty pockets (~5mm diameter), light brown very fine sand pockets (2-5mm diameter)				
							1076
5							
			- some gravel 0.5-1.5 cm, elongated diameter sub angular to sub rounded				1075
			- trace oxidized silty pockets, trace green glauconitic pockets (~2mm-5mm)				
6							
							1074
7							
							1073
8							
							1072
9							
							1071
10							

LOG OF TESTHOLE AUGER BOREHOLE LOGS.GPJ UMA_COC.GDT PRINT: 9/4/14 By:

AECOM

LOGGED BY: JS	COMPLETION DEPTH: 6.00 m
REVIEWED BY:	COMPLETION DATE: 7/22/2014
PROJECT ENGINEER:	Page 1 of 1

PROJECT: Groundwater Monitoring Well Maintenance	CLIENT: SENA Solid Waste Holdings Inc.	TESTHOLE NO.: **06-SH_Piezometer**
LOCATION: Swan Hills Treatment Centre	COORDINATES: UTM N 6073646.246 E 615013.946	PROJECT NO.: 60320044
CONTRACTOR: Calibre Drilling Ltd.	METHOD: 4" Solid Stem	ELEVATION (m): 1080.289

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	06-SHPVC	USC	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0		OB		TOPSOIL TILL - clay and silt, trace subrounded gravel (~5mm diameter), dark brown, damp, soft to firm, trace organic matter, trace oxidation				1080
1								1079
		CI		- some oxidized pockets of very fine sand				
2								1078
				- some coal, light brown silt pockets, trace gravel up to 1 cm diameter, trace sand, some oxidation				
3								1077
4								1076
5								1075
6								1074
7								1073
8								1072
9								1071
10								

LOG OF TESTHOLE AUGER BOREHOLE LOGS.GPJ UMA_COC.GDT PRINT: 9/4/14 By:

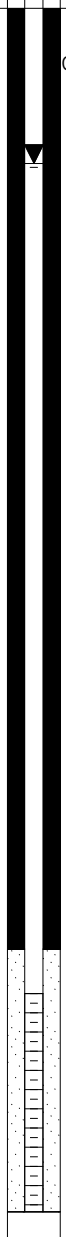
AECOM

LOGGED BY: JS	COMPLETION DEPTH: 3.00 m
REVIEWED BY:	COMPLETION DATE: 7/22/2014
PROJECT ENGINEER:	Page 1 of 1

PROJECT: Groundwater Monitoring Well Maintenance	CLIENT: SENA Solid Waste Holdings Inc.	TESTHOLE NO.: **11-IN_Piezometer**
LOCATION: Swan Hills Treatment Centre	COORDINATES: UTM N 6073097.121 E 614835.518	PROJECT NO.: 60320044
CONTRACTOR: Calibre Drilling Ltd.	METHOD: 4" Solid Stem	ELEVATION (m): 1082.705

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND



DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0	OB		TOPSOIL - organic, black, moist, trace rootlets				
	CI-CH		CLAY - some silt, some organics, damp, soft, brown, medium to high plasticity				
			CLAY - trace sand, some silt, trace to rare gravel, grey, no oxidation, firm, medium plasticity, moist				1082
1							
							1081
2							
							1080
3							
							1079
4			- Water on outide of auger sample				
	CI						1078
5							
			- trace gravel, trace coal, occational green inclusions 5mm diameter, rare to occational 5mm diameter sand pockets, damp, trace oxidation, dry				1077
6							
			- stiff to firm				1076
7							
							1075
8							
							1074
9							
							1073
10							

AECOM

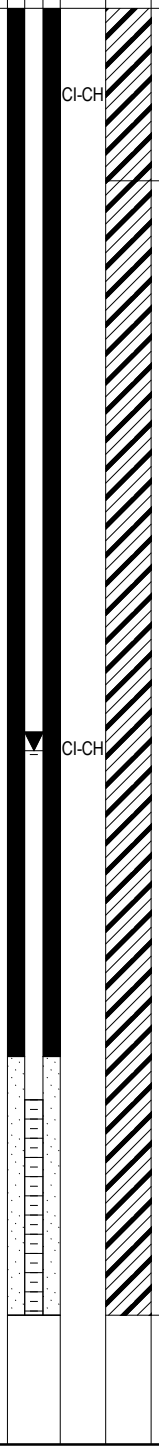
LOGGED BY: BB	COMPLETION DEPTH: 8.38 m
REVIEWED BY:	COMPLETION DATE: 5/27/2014
PROJECT ENGINEER:	Page 1 of 1

LOG OF TESTHOLE AUGER BOREHOLE LOGS.GPJ UMA_COC.GDT PRINT: 9/4/14 By:

PROJECT: Groundwater Monitoring Well Maintenance	CLIENT: SENA Solid Waste Holdings Inc.	TESTHOLE NO.: **13-IN**
LOCATION: Swan Hills Treatment Centre	COORDINATES: UTM N 6073131.719 E 615151.57	PROJECT NO.: 60320044
CONTRACTOR: Calibre Drilling Ltd.	METHOD: 4" Solid Stem	ELEVATION (m): 1079.338

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND



DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0	CI-CH		CLAY - some silt, brown, moist, soft, medium to high plasticity				1079
1			CLAY - some silt, trace sand, trace to rare coal, grey, soft to firm, medium to high plasticity				1078
2							1077
3			- water on outside of auger sample - silty, trace gravel, occasional green mclusions glacinite (2 - 5mm diameter), medium plasticity				1076
4							1075
5	CI-CH						1074
6			- some sand, trace gravel				1073
7							1072
8							1071
9							1070
10							

LOG OF TESTHOLE AUGER BOREHOLE LOGS.GPJ UMA_COC.GDT PRINT: 9/4/14 By:

AECOM

LOGGED BY: BB	COMPLETION DEPTH: 9.10 m
REVIEWED BY:	COMPLETION DATE: 5/28/2014
PROJECT ENGINEER:	Page 1 of 1

PROJECT: Groundwater Monitoring Well Maintenance	CLIENT: SENA Solid Waste Holdings Inc.	TESTHOLE NO.: **13-SH_Piezometer**
LOCATION: Swan Hills Treatment Centre	COORDINATES: UTM N 6073132.023 E 615152.641	PROJECT NO.: 60320044
CONTRACTOR: Calibre Drilling Ltd.	METHOD: 4" Solid Stem	ELEVATION (m): 1079.378

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	13-SH	USC	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0				CLAY - some silt, brown, moist, soft, low to medium plasticity				1079
1		CI-CH		some silt, trace sand, trace coal, grey, damp, soft to firm, low to medium plasticity				1078
2								1077
3								1076
4								1075
5								1074
6								1073
7								1072
8								1071
9								1070
10								

LOG OF TESTHOLE AUGER BOREHOLE LOGS.GPJ UMA_COC.GDT PRINT: 9/4/14 By:

AECOM

LOGGED BY: BB	COMPLETION DEPTH: 3.00 m
REVIEWED BY:	COMPLETION DATE: 5/28/2014
PROJECT ENGINEER:	Page 1 of 1

PROJECT: Groundwater Monitoring Well Maintenance	CLIENT: SENA Solid Waste Holdings Inc.	TESTHOLE NO.: **15-SH**
LOCATION: Swan Hills Treatment Centre	COORDINATES:	PROJECT NO.: 60320044
CONTRACTOR: AECOM	METHOD: 4" Hand Auger	ELEVATION (m):

SAMPLE TYPE ■ GRAB ▯ SHELBY TUBE ▩ SPLIT SPOON ▬ BULK ▨ NO RECOVERY ◧ CORE

DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	DEPTH (m)
0	OB		TOPSOIL - dark brown to black, oxidation, roots, humid to dry				0
	CI		TILL - clay, silty, some sand (light brown), some cobbles sub rounded to rounded (4 - 8cm diameter), dark brown with oxidation, humid, roots - trace gravel, sandy medium grained - some cobbles, some large sandy pockets (medium to coarse grained), trace coal, brown, humid and damp, organics, mottled oxidation				
1			- backfilled with cuttings and bentonite pellets on July 24, 2014				1
2							2
3							3
4							4
5							5
6							6
7							7
8							8
9							9
10							

LOG OF TESTHOLE AUGER BOREHOLE LOGS.GPJ UMA_COC.GDT PRINT: 9/4/14 By:

AECOM

LOGGED BY: JS	COMPLETION DEPTH: 1.00 m
REVIEWED BY:	COMPLETION DATE: 7/24/2014
PROJECT ENGINEER:	Page 1 of 1

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0		FILL (Clay) - some sand, trace to some silt, trace gravel, low to medium plastic, firm, moist to wet, some fine sand/silt laminations, trace to some organics with black lamination/layers, trace wood pieces, dark brown to grey to black					0
3		PEAT (Organic) - trace to some clay and silt, rootlets, fibrous, wood pieces, wet, soft, dark brown to black					3
		CLAY (Till) - some sand, some silt, trace gravel, medium plastic, firm, moist, trace fine sand/silt laminations, brown					
10							10

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	Page 1 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
13		CLAY SHALE (Bedrock) - silty, trace fine sand, low to medium plastic, very stiff to hard, greenish grey					13

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
20							20
21							21
22							22
23							23
24							24
25							25
26							26
27							27
28							28
29							29
30							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	Page 3 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
30							30
31							31
32							32
33							33
34							34
35							35
36							36
37							37
38							38
39							39
40							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	Page 4 of 11

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
40							40
41		SILTSTONE (Bedrock) - trace fine sand, trace clay, hard, damp, grey					41
42							42
43							43
44							44
45							45
46		CLAY SHALE (Bedrock) - silty, trace fine sand, low to medium plastic, very stiff to hard, greenish grey with brown layers					46
47							47
48							48
49							49
50							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	Page 5 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
50							50
51							51
52							52
53							53
54							54
55							55
56							56
57							57
58							58
59							59
60							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
60							60
61							61
62							62
63							63
64							64
65							65
66							66
67							67
68							68
69							69
70							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
70							70
71							71
72							72
73							73
74							74
75							75
76						Backfilled to 76.2 m with Bentonite Chips 50 mm steel pipe installed to 76.2 m, and slotted from 74.7 m to 76.2 m	76
77							77
78							78
79							79
80							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	Page 8 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
80							80
81							81
82							82
83							83
84							84
85							85
86							86
87							87
88							88
89							89
90							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	Page 9 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
90							90
91							91
92							92
93							93
94							94
95							95
96							96
97							97
98							98
99							99
100							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01(2R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
100						End of hole at 100.3 m	100
101							101
102							102
103							103
104							104
105							105
106							106
107							107
108							108
109							109
110							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 100.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-10
PROJECT MANAGER: Michael Steed	Page 11 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01-SH**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0		FILL (Clay) - some sand, trace silt, trace gravel, low to medium plastic, firm, moist to wet, some fine sand/silt laminations, trace to some organics, rootlets, trace wood pieces, dark brown to grey to black					0
3		PEAT (Organic) - trace to some clay and silt, rootlets, fibrous, wood pieces, wet, soft, dark brown to black					3
		FILL (Clay) - some silt, some fine sand, low to medium plastic, soft, wet, trace fine sand/silt laminations, dark grey				50 mm steel pipe installed to 4.3 m, and slotted from 2.8 m to 4.3 m End of hole at 4.3 m No free water or slough upon drilling completion	
10							10

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 4.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-11
PROJECT MANAGER: Michael Steed	Page 1 of 1

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **01-SH_PZ**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0		FILL (Clay) - some sand, trace silt, trace gravel, low to medium plastic, firm, moist, some fine sand and silt laminations, trace organics, rootlets, trace wood pieces, dark brown/grey					0
1							1
2							2
3		PEAT - organics, rootlets, fibrous, wood pieces, some clay and silt, wet, dark brown to black				50 mm steel pipe installed to 4.3 m, and slotted from 2.8 m to 4.3 m	3
4						End of hole at 4.3 m No free water or slough upon drilling completion	4
5							5
6							6
7							7
8							8
9							9
10							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 4.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-11
PROJECT MANAGER: Michael Steed	Page 1 of 1

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0		CLAY (Till) - some sand, trace/some silt, trace gravel, medium plastic, firm, moist, dark brown to grey					0
1							1
2							2
3							3
4							4
5							5
6							6
7							7
8							8
9							9
10							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	Page 1 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
10							10
11		CLAY SHALE (Bedrock) - silty, trace to some fine sand, low to medium plastic, vey stiff to hard, damp, greenish grey					11
12							12
13							13
14							14
15							15
16							16
17							17
18							18
19							19
20							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	Page 2 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
20		CLAY (Till) - sandy, some silt, trace gravel, medium plastic, firm to stiff, moist, trace silt laminations, brown					20
21							21
22							22
23							23
24							24
25							25
26							26
27							27
28							28
29							29
30							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	Page 3 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
30							30
31						increasing sand content	31
32							32
33							33
34							34
35							35
36							36
37							37
37.5		SAND - medium to fine grained, some silt, trace clay, compact, grey					
38							38
38.5		CLAY SHALE (Bedrock) - silty, trace fine sand, low to medium plastic, very stiff to hard, damp, greenish grey					
39							39
40							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	Page 4 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
40							40
41							41
42							42
43							43
44							44
45							45
46							46
47							47
48							48
49							49
50							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
50							50
51							51
52							52
53							53
54							54
55							55
56							56
57							57
58							58
59							59
60							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
60							60
61							61
62							62
63							63
64							64
65							65
66							66
67							67
68							68
69							69
70							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
70							70
71							71
72							72
73							73
74							74
75							75
76							76
77							77
78							78
79							79
80							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
80							80
81							81
82							82
83							83
84							84
85							85
86							86
87							87
88							88
89							89
90							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	Page 9 of 11

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
90						50 mm steel pipe installed to 90.2 m, and slotted from 87.2 m to 90.2 m	90
91							91
92							92
93							93
94							94
95							95
96							96
97		COAL - hard, black					97
98		CLAY SHALE (Bedrock) - silty, trace fine sand, low to medium plastic, very stiff to hard, damp, greenish grey					98
99							99
100							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	Page 10 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **12(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Wet Rotary	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
100							100
		COAL - hard, black					
101							101
102							102
103							103
		CLAY SHALE (Bedrock) - silty, trace fine sand, low to medium plastic, very stiff to hard, damp, greenish grey					
104							104
105							105
106		COAL - hard, black					106
		CLAY SHALE (Bedrock) - silty, some fine sand, medium plastic, very stiff to hard, dark brown					
107							107
108							108
109							109
						End of hole at 109.7 m	
110							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 109.70 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-1-22
PROJECT MANAGER: Michael Steed	Page 11 of 11

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0		FILL (Clay) - some sand, trace to some silt, trace gravel, medium plastic, firm to stiff, moist, trace cobbles, occassional black (organic) laminations, trace rootlets, brown with trace black layers					0
3		CLAY (Till) - some sand, trace silt, trace gravel and cobbles, medium plastic, firm to stiff, moist, trace fine sand/silt laminations, brown to dark brown					3
10							10

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	Page 1 of 10

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
13		CLAY SHALE (Bedrock) - Silty, trace to some fine sand, low to medium plastic, very stiff to hard, damp, greenish grey					

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	Page 2 of 10

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
20							20
21							21
22							22
23							23
24							24
25							25
26							26
27							27
28							28
29							29
30							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
30							30
31							31
32							32
33							33
34							34
35							35
36							36
37							37
38							38
39							39
40							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
40							40
41							41
42							42
43							43
44							44
45							45
46							46
47							47
48						increasing silt content	48
49							49
50							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	Page 5 of 10

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
50							50
51							51
52							52
53							53
54							54
55							55
56							56
57		COAL					57
58		CLAY SHALE (Bedrock) - Silty, trace sand, low to medium plastic, very stiff to hard, dark grey					58
59							59
60							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	Page 6 of 10

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
60							60
61							61
62							62
63							63
64							64
65							65
66							66
67							67
68							68
69							69
70							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
70							70
71							71
72							72
73							73
74							74
75							75
76							76
77							77
78							78
79							79
80							

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
80							80
81							81
82							82
83							83
84							84
85							85
86							86
87							87
88							88
89						slough / falling material 50 mm steel pipe installed to 89.3 m, and slotted from 86.3 m to 89.3 m.	89
90		COAL - hard, black					

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	Page 9 of 10

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)SS**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Mud Rotary and Air	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
90		CLAY SHALE (Bedrock) - Silty, trace to some fine sand, low to medium plastic, very stiff to hard, dark grey					90
91						End of hole at 91.5 m	91
92							92
93							93
94							94
95							95
96							96
97							97
98							98
99							99
100							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 91.50 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-25
PROJECT MANAGER: Michael Steed	Page 10 of 10

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)-INT**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0		FILL (Clay) - some sand, trace to some silt, trace gravel, medium plastic, firm to stiff, moist, trace cobbles, occassional black (organic) laminations, trace rootlets, brown with trace black layers					0
1							1
2							2
3		CLAY (Till) - some sand, trace silt, trace gravel and cobbles, medium plastic, firm to stiff, moist, trace fine sand/silt laminations, brown to dark brown					3
4							4
5							5
6							6
7							7
8							8
9							9
10							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 12.95 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-12
PROJECT MANAGER: Michael Steed	Page 1 of 2

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)-INT**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
10							10
11							11
12		CLAY SHALE (Bedrock) - Silty, trace fine sand, medium plastic, very stiff to hard, damp, greenish grey				50 mm steel pipe installed to 12.5 m, and slotted from 11.0 m to 12.5 m End of hole at 12.95 m	12
13							13
14							14
15							15
16							16
17							17
18							18
19							19
20							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 12.95 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-12
PROJECT MANAGER: Michael Steed	Page 2 of 2

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)-INT_PZ**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0		FILL (Clay) - some sand, some silt, trace gravel and cobbles, medium plastic, firm to stiff, moist, occassional black (organic) laminations, trace rootlets, brown with trace black layers					0
3		CLAY (Till) - some sand, trace silt, trace gravel, medium plastic, firm to stiff, moist, trace fine sand/silt laminations, mottled brown					3
10							10

AECOM

LOGGED BY: Patrick Eckel | COMPLETION DEPTH: 12.95 m

REVIEWED BY: Carter Mackie | COMPLETION DATE: 2025-2-13

PROJECT MANAGER: Michael Steed |

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)-INT_PZ**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
10							10
11							11
12							12
		CLAY SHALE (Bedrock) - silty, trace fine sand, medium plastic, very stiff to hard, damp, greenish grey				50 mm PVC installed to 12.5 m, and slotted from 11.0 m to 12.5 m End of hole at 12.95 m No free water	
13							13
14							14
15							15
16							16
17							17
18							18
19							19
20							

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 12.95 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-13
PROJECT MANAGER: Michael Steed	Page 2 of 2

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)-SH**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0		FILL (Clay) - some sand, trace to some silt, trace gravel and cobbles, medium plastic, firm, moist, trace fine sand/silt laminations, occassional black/organic laminations, trace rootlets, brown/dark brown					0
3		CLAY (Till) - some sand and silt, trace gravel, medium plastic, moist, firm, trace fine sand/silt laminations, dark brown					3
5						50 mm Steel Pipe installed to 5.3 m, and slotted from 3.8 m to 5.3 m End of hole No free water or sloughing upon drilling completion	5
10							10

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 5.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-13
PROJECT MANAGER: Michael Steed	Page 1 of 1

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

PROJECT: 2025 Swan Hills Well Replacement	CLIENT: Veolia Canada Waste Services Inc.	TESTHOLE NO: **14(R)-SH_PZ**
LOCATION: Swan Hills Treatment Centre		PROJECT NO.: 60737170
CONTRACTOR: Calibre Drilling Ltd.	METHOD: Solid Stem Auger	ELEVATION (m):

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

BACKFILL TYPE: BENTONITE | GRAVEL | SLOUGH | GROUT | CUTTINGS | SAND

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	⊗ Vapour Concentration ⊗ (ppm) 100 1000 10000	COMMENTS	DEPTH (m)
0		FILL (Clay) - some sand, trace to some silt, trace gravel and cobbles, medium plastic, firm, moist, trace fine sand/silt laminations, occassional black organic laminations, trace rootlets, brown to dark brown					0
3		CLAY (Till) - some sand and silt, trace gravel, medium plastic, moist, firm, trace fine sand/silt laminations, dark brown					3
5						50 mm PVC pipe installed to 5.3 m, and slotted from 3.8 m to 5.3 m End of hole No free water or slough upon drilling completion	5
10							10

AECOM

LOGGED BY: Patrick Eckel	COMPLETION DEPTH: 5.30 m
REVIEWED BY: Carter Mackie	COMPLETION DATE: 2025-2-13
PROJECT MANAGER: Michael Steed	Page 1 of 1

CRIMSON ENVIRONMENTAL LOG <25 PPM SWAN HILL_60737170_GINT_LOGS_2025_02_26.GPJ UMA_COC.GDT PRINT: 25-5-16 By:

Appendix D

Tables

Table 1.0
VEOLIA, Swan Hills Treatment Centre
2025 Purging Summary

Monitoring Location	Monitoring Well	Date	Approx. Well Volume (L)	Approx. 3 Well Volumes (L)	Approx. Purge Volume (L)	Comments
MW-01A	01(R)-SH	3-Sep-2025	6	17	10	Colour: brown/yellow tint, foamy
	01A-IN	3-Sep-2025	16	49	16	Purged to dry; Colour: clear
	01(2R)-SS	3-Sep-2025	20	61	21	Purged to dry; Colour: silty brown but became clear
MW-03	03-SH	2-Sep-2025	5	16	9	Purged to dry; Colour: clear
	03-IN	2-Sep-2025	13	39	13	Purged to dry; Colour: clear
MW-04	04-SH	2-Sep-2025	8	23	15	Purged to dry; Colour: clear
	04-IN	3-Sep-2025	4	13	8	Purged to dry; Colour: clear
	04-SS	3-Sep-2025	24	71	23	Purged to dry; Colour: clear
MW-05	05-SH	2-Sep-2025	4	11	10	Purged to dry; Colour: clear
	05-IN	2-Sep-2025	7	20	10	Purged to dry; Colour: clear
	05-SS	2-Sep-2025	23	70	8	Ran out of nitrogen; Colour: clear
MW-06	06-SH	3-Sep-2025	5	14	8	Purged to dry; Colour: clear
	06(R)IN	3-Sep-2025	6	17	10	Purged to dry; Colour: clear
MW-07	07-SH	3-Sep-2025	6	18	15	Purged to dry; Colour: clear
	07-IN	3-Sep-2025	15	45	16	Purged to dry; Colour: clear
	07(R)SS	3-Sep-2025	17	50	13	Colour: clear
MW-08	08-SH	3-Sep-2025	2	7	5	Purged to dry; Colour: clear.
	08-IN	3-Sep-2025	10	31	10	Purged to dry; Colour: clear
	08-SS	3-Sep-2025	-	-	-	Well broken/historically dry
MW-11	11-SH	3-Sep-2025	4	11	14	Purged to dry; Colour: clear.
	11-IN	3-Sep-2025	14	41	25	Purged to dry; Colour: clear
	11-SS	3-Sep-2025	5	14	5	Lowered pump in 2025, able to purge. Colour: clear
MW-12	12-SH	4-Sep-2025	6	18	16	Purged to dry; Colour: clear
	12-IN	4-Sep-2025	13	39	8	Purged to dry; Colour: clear
	12(R)-SS	4-Sep-2025	35	104	18	Purged to dry; Colour: clear
MW-13	13-SH	2-Sep-2025	2	6	2	Purged to dry; *Pneumatic pump switched to piezometer in 2023
	13-IN	2-Sep-2025	16	47	16	Purged to dry; Colour: clear
	13(R)SS	2-Sep-2025	17	51	35	Purged to dry; Colour: clear
MW-14	14(R)-SH	3-Sep-2025	7	20	12	Purged to dry; Colour: clear
	14(R)-IN	3-Sep-2025	-	-	-	Well purged but data collection error, no purge data available
	14(R)-SS	3-Sep-2025	43	129	-	Pump malfunction, unable to purge
MW-15	15-SH	3-Sep-2025	5	16	16	Purged to dry; Colour: clear.
	15-IN	3-Sep-2025	13	39	20	Purged to dry; Colour: clear
	15(2R)SS	2-Sep-2025	3	8	10	Colour: clear
MW-16	16-SH	2-Sep-2025	8	24	16	Colour: clear
	16-IN	2-Sep-2025	17	50	17	Purged to dry; Colour: clear
MW-17	17-SH	3-Sep-2025	4	13	12	Colour: slightly silty
	17-IN	3-Sep-2025	14	41	23	Purged to dry; Colour: clear.

Notes:
1: "-" = Value not recorded

Table 2.0
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Sampling Program

Parameter	Interval		
	Shallow	Intermediate	Sandstone
Routine Water Analysis (pH, calcium, magnesium, sodium, potassium, chloride, nitrate, sulphate, total dissolved solids, and electrical conductivity)[1]	x	x	x
Dissolved Metals (arsenic, cadmium, chromium, copper, nickel, lead, mercury, and zinc)[1]	x	x	x
Dissolved Organic Carbon (DOC)	x	x	x
Polychlorinated Biphenyls Arcolors (Aroclor 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268; Total PCBs)[1]	x	x	x
BTEX, F1[1]	x		
Adsorbable Organic Halogen	x[2]		
Dioxins and Furans	x[2,3]		

Notes:

1: Specific parameters outlined in Alberta Environment Approval No. 1744-03-00

2: Tested on select shallow monitoring wells

3: Dioxins and Furans testing reduced to once every 5 years, next sampling event will occur in 2029

Table 3.1
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Levels and Elevations

Monitoring Location	Ground Elevation (Piezometer)[1]	Ground Elevation (Well)[1]	Stick-up (Piezometer)	Stick-up (Well)	Date Measured	Static Water Level (Piezometer)	Static Water Level (Piezometer)	Static Water Level (Well)	Static Water Level (Well)	Groundwater Elevation (Piezometer)	Groundwater Elevation (Well)	Comments
	(masl)	(masl)	(m)	(m)	(dd-mmm-yyyy)	(mTOC)	(mBGS)	(mTOC)	(mBGS)	(masl)	(masl)	
01(R)-SH	1086.482	1086.569	0.59	N/M	3-Sep-2025	1.79	1.20	N/A	N/A	1,085.29	N/A	*Clear*
01A-IN	1086.194	1,086.222	0.96	N/M	3-Sep-2025	4.32	3.36	N/A	N/A	1,082.83	N/A	*Clear*
01(2R)-SS	N/A	1086.542	N/A	1.00	3-Sep-2025	N/A	N/A	64.24	63.24	N/A	1,023.30	*Clear*
03-SH	1079.404	1079.491	0.85	N/M	2-Sep-2025	1.61	0.76	N/A	N/A	1,078.64	N/A	*Clear*
03-IN	1079.548	1079.634	0.91	N/M	2-Sep-2025	1.94	1.02	N/A	N/A	1,078.53	N/A	*Clear*
04-SH	1082.785	1082.448	0.76	N/M	2-Sep-2025	1.96	1.20	N/A	N/A	1,081.59	N/A	*Clear*
04-IN	1082.574	1082.712	N/M	0.63	3-Sep-2025	N/A	N/A	7.13	6.51	N/A	1,076.21	*Clear*
04-SS	N/A	1082.832	N/A	1.19	3-Sep-2025	N/A	N/A	60.64	59.46	N/A	1,023.38	*Clear*
05-SH	1079.839	1079.683	1.14	N/M	2-Sep-2025	2.24	1.09	N/A	N/A	1,078.75	N/A	*Clear*
05-IN	1079.739	1079.893	N/M	1.35	2-Sep-2025	N/A	N/A	2.63	1.29	N/A	1,078.61	*Clear*
05-SS	N/A	1084.925	N/A	0.89	2-Sep-2025	N/A	N/A	62.71	61.82	N/A	1,023.11	*Clear*
06-SH	1080.314	1080.104	1.01	N/M	3-Sep-2025	1.98	0.98	N/A	N/A	1,079.34	N/A	*Clear*
06(R)IN	1080.58	1080.502	1.14	N/M	3-Sep-2025	2.24	1.11	N/A	N/A	1,079.48	N/A	*Clear*
07-SH	1079.703	1079.574	N/M	0.93	3-Sep-2025	N/A	N/A	1.49	0.57	N/A	1,079.01	*Clear*
07-IN[2]	-	1079.379	N/M	0.78	3-Sep-2025	N/A	N/A	1.25	0.47	N/A	1,078.91	*Clear. Piezometer not located for survey Dec.9th, 2025*
07(R)SS	N/A	1081.479	N/A	0.72	3-Sep-2025	N/A	N/A	58.77	58.05	N/A	1,023.43	*Clear*
08-SH	1085.76	1085.707	N/M	1.49	3-Sep-2025	N/A	N/A	2.90	1.42	N/A	1,084.29	*Piezo damaged*
08-IN	1085.77	1085.704	N/M	1.56	3-Sep-2025	N/A	N/A	2.33	0.77	N/A	1,084.93	*Clear. Water level measured from well in 2025.*
08-SS[3]	N/A	*1,084.181*	N/A	N/M	3-Sep-2025	N/A	N/A	Dry	Dry	N/A	Dry	*Well damaged, dry*
11-SH	1082.741	1082.462	N/M	1.04	3-Sep-2025	N/A	N/A	2.92	1.87	N/A	1,080.87	*Piezo blocked, Clear*
11-IN	1082.525	1082.59	1.15	N/M	3-Sep-2025	2.45	1.30	N/A	N/A	1,081.22	N/A	*Clear*
11-SS	N/A	1082.413	N/A	0.66	3-Sep-2025	N/A	N/A	60.45	59.79	N/A	1,022.62	*Clear*
12-SH	1080.39	1080.348	0.88	N/M	4-Sep-2025	1.72	0.84	N/A	N/A	1,079.56	N/A	*Clear*
12-IN	1080.387	1080.124	1.04	N/M	4-Sep-2025	1.81	0.77	N/A	N/A	1,079.62	N/A	*Clear*
12(R)-SS	N/A	1080.792	N/A	0.83	4-Sep-2025	N/A	N/A	70.88	70.05	N/A	1,010.74	*Clear*
13-SH	1079.416	1079.486	1.11	N/M	2-Sep-2025	1.88	0.76	N/A	N/A	1,078.65	N/A	*Pneumatic pump relocated to piezometer in 2024, samples now taken from piezometer*
13-IN	*1,079.338*	*1,079.077*	0.95	N/M	2-Sep-2025	2.33	1.38	N/A	N/A	1,077.95	N/A	*Clear*
13(R)SS	N/A	*1,080.004*	N/A	1.14	2-Sep-2025	N/A	N/A	58.12	56.99	N/A	1,023.02	*Clear*
14(R)-SH	1086.225	1086.406	0.94	N/M	3-Sep-2025	1.94	1.00	N/A	N/A	1,085.40	N/A	*Well blocked, no sample*
14(R)-IN	1086.418	1086.372	---	---	3-Sep-2025	---	---	---	---	---	---	*No water level data - data collection error*
14(R)-SS	N/A	1086.596	N/A	0.76	3-Sep-2025	N/A	N/A	67.82	67.06	N/A	1,019.54	*Clear*
15-SH	1081.233	*1,081.264*	N/M	1.27	3-Sep-2025	N/A	N/A	2.51	1.24	N/A	1,080.03	*Clear*
15-IN	*1,081.298*	*1,081.293*	0.95	N/M	3-Sep-2025	3.90	2.96	N/A	N/A	1,078.34	N/A	*Clear*
15(2R)SS	N/A	1081.106	N/A	1.05	2-Sep-2025	N/A	N/A	58.86	57.82	N/A	1,023.29	*Clear*
16-SH	*1,079.888*	*1,079.900*	0.71	N/M	2-Sep-2025	2.02	1.31	N/A	N/A	1,078.58	N/A	*Clear*
16-IN	*1,079.850*	*1,079.790*	0.88	N/M	2-Sep-2025	2.05	1.17	N/A	N/A	1,078.68	N/A	*No water retrieved for sample*
17-SH	*1,079.309*	*1,079.324*	1.20	N/M	3-Sep-2025	2.49	1.28	N/A	N/A	1,078.03	N/A	*Clear*
17-IN	*1,079.382*	*1,079.251*	0.98	N/M	3-Sep-2025	2.04	1.06	N/A	N/A	1,078.32	N/A	*Clear*

NOTES:

N/M	Not Measured
N/A	Not Applicable
mBGS	metres Below Ground Surface
mTOC	metres below Top of Casing
masl	metres above sea level
---	No data collected
Note [1]	All wells and piezometers surveyed by AECOM on Dec 9 and 10, 2025, except for 13-IN, 13(R)-SS, 15-SH (well), 15-IN, 16-SH, 16-IN, 17-SH and 17-IN due to equipment issues. Ground elevation data for these series is from a previous survey and shown in *italics*
Note [2]	07-IN piezometer not surveyed on Dec 9, 2025 as piezometer was unable to be located.
Note [3]	08-SS not surveyed on Dec 9, 2025 as well is damaged. Elevation is from previous survey.

Table 3.2
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date	Electrical Conductivity	Field pH	Temperature	NTU	Sample Comment
	(dd-mmm-yyyy)	(µS/cm)		(°C)	(NTU)	
01(R)-SH	18-Sep-2025	1330	6.12	10.60	55.0	Clear
01A-IN	18-Sep-2025	765	6.50	8.30	91.2	Clear
01(2R)-SS	18-Sep-2025	816	7.67	8.40	555	Clear
03-SH	17-Sep-2025	877	7.08	10.80	0.50	Clear
03-IN	17-Sep-2025	846	6.80	10.30	0.62	Clear
04-SH	17-Sep-2025	742	7.12	8.20	0.32	Clear
04-IN	17-Sep-2025	708	6.95	8.40	1.60	Clear
04-SS	17-Sep-2025	663	6.85	10.40	6.07	Clear
05-SH	17-Sep-2025	1095	6.89	9.50	1.98	Clear
05-IN	17-Sep-2025	1129	6.85	7.30	0.90	Clear
05-SS	17-Sep-2025	442	7.04	9.80	2.66	Clear
06-SH	18-Sep-2025	927	6.27	11.20	16.80	Clear
06(R)IN	18-Sep-2025	937	6.63	7.60	56.80	Clear
07-SH	18-Sep-2025	1466	6.88	8.40	3.72	Clear
07-IN	18-Sep-2025	709	7.26	8.60	2.51	Clear
07(R)SS	18-Sep-2025	740	7.39	9.50	6.90	Clear
08-SH	18-Sep-2025	713	7.56	9.9	11.20	Clear
08-IN	18-Sep-2025	793	7.49	7.30	1.83	Clear
08-SS	18-Sep-2025	---	---	---	---	Dry
11-SH	18-Sep-2025	1101	6.34	10.10	5.19	Clear
11-IN	18-Sep-2025	719	7.10	9.00	11.80	Clear
11-SS	18-Sep-2025	505	6.68	11.00	8.41	Clear
12-SH	18-Sep-2025	644	7.14	9.20	0.87	Clear
12-IN	18-Sep-2025	705	6.87	7.80	1.85	Clear
12(R)-SS	18-Sep-2025	879	7.75	9.70	3.99	Clear
13-SH	17-Sep-2025	100.5	6.73	13.80	5.22	Clear
13-IN	17-Sep-2025	556	7.25	10.50	1.05	Clear
13(R)SS	17-Sep-2025	429	6.82	11.90	0.27	Clear
14(R)-SH	18-Sep-2025	---	---	---	---	Well blocked, unable to sample
14(R)-IN	18-Sep-2025	850	7.18	7.60	8.75	Clear
14(R)-SS	18-Sep-2025	587	8.45	9.20	95.7	Clear
15-SH	18-Sep-2025	381	6.90	9.30	3.68	Clear
15-IN	18-Sep-2025	752	7.08	8.50	11.80	Clear
15(2R)SS	17-Sep-2025	409	7.59	13.30	0.85	Clear
16-SH	17-Sep-2025	800	6.93	11.40	4.02	Clear
16-IN	17-Sep-2025	---	---	---	---	Dry
17-SH	18-Sep-2025	628	7.20	10.20	13.90	Clear
17-IN	18-Sep-2025	786	7.09	8.40	5.86	Clear
89-3	18-Sep-2025	349	7.11	20.40	15.10	Clear

Table 3.3
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Monitoring Analytical Results: Routine Water (Major Ions, Indicators, etc.)

AECOM

				GENERAL					INDICATORS					CATIONS AND ANIONS								NITROGEN PARAMETERS		
Monitoring Well	Date (dd-mmm-yy)	Lab File	Sample Name	Field pH	Electrical Conductivity (µS/cm)	Lab pH	Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]				7.0-10.5	---	7.0-10.5	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---
Canadian Drinking Water MAC Guidelines 2022[2]				---	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	1	10	---
Laboratory Detection Limit				2	0.1	0.5	2	0.5	0.3	0.01	0.0001	1	0.05	0.005	0.05	0.05	1	1	1	0.02	0.01	0.02	0.05	0.050
Alberta Tier 2 Potable Groundwater Guideline[3]				6.5 - 8.5	---	6.5 - 8.5	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	1.0	10	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]				6.5 - 8.5	---	6.5 - 8.5	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	Variable	3	---
01(R)-SH	18-Sep-25	EO2508465-001	01(R)-SH	**6.12**	1230	**6.26**	505	667	19.2	14.6	**180**	**8.96**	**1020**	138	39.0	5.45	10.2	814	<0.6	<0.3	0.681	<0.010	<0.020	<0.0500
01A-IN	18-Sep-25	EO2508465-002	01A-IN	6.50	801	7.14	310	459	1.30	<0.30	**4.00**	**0.298**	**507**	81.6	25.8	3.79	64.4	560	<0.6	<0.3	0.152	<0.010	0.194	0.194
01(2R)-SS	18-Sep-25	EO2508465-003	01(2R)-SS	7.67	905	8.18	91.9	310	13.9	136	0.014	0.0103	**588**	29.1	4.67	5.15	191	378	<0.6	<0.3	0.590	<0.010	<0.020	<0.0500
03-SH	17-Sep-25	EO2508465-004	03-SH	7.08	886	7.57	491	431	1.36	76.2	<0.010	0.00088	**558**	134	38.1	1.35	16.9	526	<0.6	<0.3	0.323	<0.010	<0.020	<0.0500
03-IN	17-Sep-25	EO2508465-005	03-IN	6.80	851	7.74	420	395	0.56	81.6	<0.010	0.00183	**527**	115	32.3	3.57	33.1	482	<0.6	<0.3	0.233	<0.010	0.046	<0.0500
04-SH	17-Sep-25	EO2508465-006	04-SH	7.12	762	7.62	418	434	<0.50	8.02	<0.010	**0.478**	453	113	32.9	2.56	10.5	529	<0.6	<0.3	0.251	<0.010	<0.020	<0.0500
04-IN	17-Sep-25	EO2508465-007	04-IN	6.95	718	7.52	352	382	<0.50	21.6	0.010	**0.234**	439	104	22.4	5.40	23.9	466	<0.6	<0.3	0.218	0.013	0.063	0.0760
04-SS	17-Sep-25	EO2508465-008	04-SS	6.85	671	7.36	300	319	<0.50	49.0	**0.932**	**0.562**	424	83.1	22.6	4.74	32.2	389	<0.6	<0.3	0.108	<0.010	0.169	0.169
05-SH	17-Sep-25	EO2508465-010	05-SH	6.89	1110	7.53	658	540	1.37	114	<0.010	0.00075	**713**	181	50.0	1.04	9.08	659	<0.6	<0.3	0.223	<0.010	<0.020	<0.0500
05-IN	17-Sep-25	EO2508465-011	05-IN	6.86	1160	7.60	576	556	1.13	118	<0.010	**0.092**	**748**	160	42.9	3.20	57.8	678	<0.6	<0.3	0.202	<0.010	0.042	<0.0500
05-SS	17-Sep-25	EO2508465-012	05-SS	7.04	444	7.50	175	216	<0.50	23.6	0.034	**0.395**	288	49.2	12.6	4.19	30.2	264	<0.6	<0.3	0.178	<0.010	0.196	0.196
06-SH	18-Sep-25	EO2508465-014	06-SH	**6.27**	953	7.32	563	566	<0.50	1.91	0.040	**0.852**	**582**	154	43.4	1.68	7.57	690	<0.6	<0.3	0.197	<0.010	<0.020	<0.0500
06(R)IN	18-Sep-25	EO2508465-015	06-IN	6.63	966	7.48	567	566	<0.50	1.60	<0.010	**1.22**	**588**	157	42.5	2.54	7.93	690	<0.6	<0.3	0.204	<0.010	<0.020	<0.0500
07-SH	18-Sep-25	EO2508465-016	07-SH	6.88	1510	7.55	818	493	206	13.0	<0.010	**0.502**	**855**	227	61.0	3.12	20.2	601	<0.6	<0.3	0.196	<0.010	<0.020	<0.0500
07-IN	18-Sep-25	EO2508465-018	07-IN	7.26	720	7.96	350	359	0.70	49.4	0.022	**0.225**	458	101	23.8	5.57	33.2	438	<0.6	<0.3	0.229	<0.010	0.090	0.0900
07(R)SS	18-Sep-25	EO2508465-019	07-SS	7.39	733	7.95	347	389	<0.50	36.5	<0.010	**0.784**	486	101	23.1	5.98	42.2	474	<0.6	<0.3	0.136	<0.010	0.193	0.193
08-SH	18-Sep-25	EO2508465-020	08-SH	7.56	742	7.88	320	379	0.86	44.9	<0.010	**0.109**	463	86.2	25.4	2.52	53.2	462	<0.6	<0.3	0.248	<0.010	<0.020	<0.0500
08-IN	18-Sep-25	EO2508465-021	08-IN	7.49	803	7.77	388	337	0.89	116	<0.010	**0.355**	**523**	113	25.8	4.00	40.7	411	<0.6	<0.3	0.247	<0.010	0.045	<0.0500
11-SH	18-Sep-25	EO2508465-022	11-SH	**6.34**	1130	7.44	597	460	<0.50	208	0.040	**0.695**	**783**	182	34.7	2.49	52.1	561	<0.6	<0.3	0.203	<0.010	0.064	0.0640
11-IN	18-Sep-25	EO2508465-024	11-IN	7.10	746	7.85	365	412	<0.50	15.4	**0.386**	**0.468**	466	103	26.2	3.89	35.6	503	<0.6	<0.3	0.319	0.024	0.051	0.0750
11-SS	18-Sep-25	EO2508465-045	11-SS	6.68	476	8.04	120	237	<0.50	25.0	0.063	**0.332**	317	37.9	6.13	5.99	65.8	289	<0.6	<0.3	0.063	<0.010	<0.020	<0.0500
12-SH	18-Sep-25	EO2508465-025	12-SH	7.14	663	7.91	366	377	<0.50	3.35	<0.010	**0.169**	402	103	26.5	1.98	13.1	460	<0.6	<0.3	0.396	<0.010	<0.020	<0.0500
12-IN	18-Sep-25	EO2508465-027	12-IN	6.87	694	7.92	307	334	<0.50	59.5	0.023	**0.715**	445	90.1	19.9	4.00	46.7	407	<0.6	<0.3	0.234	<0.010	<0.020	<0.0500
12(R)-SS	18-Sep-25	EO2508465-028	12(R)-SS	7.75	893	8.53	98.8	435	4.14	60.2	<0.010	0.00336	**602**	32.6	4.23	4.80	**202**	515	7.9	<0.3	0.418	<0.010	0.101	0.101
13-SH[5]	17-Sep-25	EO2508465-029	13-SH	6.73	1010	7.46	601	535	<0.50	73.8	0.019	**0.360**	**655**	170	42.9	1.75	13.6	653	<0.6	<0.3	0.129	<0.010	<0.020	<0.0500
13-IN	17-Sep-25	EO2508465-030	13-IN	7.25	701	7.80	326	314	0.57	83.2	0.038	**0.309**	450	96.1	20.9	3.95	38.6	383	<0.6	<0.3	0.200	<0.010	0.032	<0.0500
13(R)SS	17-Sep-25	EO2508465-031	13(R)-SS	6.82	425	7.75	203	219	<0.50	17.0	<0.010	0.00152	278	62.4	11.5	3.72	14.9	267	<0.6	<0.3	0.172	<0.010	0.190	0.190
14(R)-SH[6]	18-Sep-25	---	14(R)-SH	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14(R)-IN	18-Sep-25	EO2508465-032	14(R)-IN	7.18	867	7.80	477	501	2.32	17.3	<0.010	**0.105**	**549**	132	35.9	2.91	27.7	611	<0.6	<0.3	0.234	<0.010	<0.020	<0.0500
14(R)-SS	18-Sep-25	EO2508465-033	14(R)-SS	8.45	600	8.68	45.1	274	14.1	29.6	0.018	**0.0397**	390	14.8	1.98	3.04	140	315	9.6	<0.3	0.695	<0.010	<0.020	<0.0500
15-SH	18-Sep-25	EO2508465-034	15-SH	6.90	770	7.92	375	438	<0.50	8.66	<0.010	**0.521**	465	109	24.9	3.48	30.8	534	<0.6	<0.3	0.237	<0.010	0.117	0.117
15-IN	18-Sep-25	EO2508465-035	15-IN	7.08	779	7.94	364	374	<0.50	68.5	<0.010	**0.128**	486	106	24.1	4.47	39.4	456	<0.6	<0.3	0.173	<0.010	0.038	<0.0500
15(2R)SS	17-Sep-25	EO2508465-036	15-SS	6.93	414	8.36	136	213	0.93	13.6	<0.010	**0.675**	272	38.0	10.1	3.36	44.5	256	2.3	<0.3	0.229	<0.010	0.240	0.240
16-SH	17-Sep-25	EO2508465-037	16-SH	6.93	768	7.91	389	413	0.95	31.9	<0.010	0.00054	474	106	30.3	3.36	28.7	504	<0.6	<0.3	0.249	<0.010	0.120	0.120
16-IN[6]	17-Sep-25	---	16-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
17-SH	18-Sep-25	EO2508465-038	17-SH	7.20	646	8.01	325	332	8.00	24.7	<0.010	0.00266	394	90.3	24.2	1.87	21.2	405	<0.6	<0.3	0.282	<0.010	<0.020	<0.0500
17-IN	18-Sep-25	EO2508465-039	17-IN	7.09	786	7.99	378	398	<0.50	54.1	<0.010	**0.394**	488	110	25.0	4.66	37.2	486	<0.6	<0.3	0.173	<0.010	0.130	0.130
89-3	18-Sep-25	EO2508465-040	89-3	7.11	350	7.69	158	177	<0.50	13.4	**1.76**	**1.09**	229	42.5	12.7	2.72	12.5	216	<0.6	<0.3	0.168	<0.010	<0.020	<0.0500
Trip Blank	18-Sep-25	EO2508465-046	TRIP BLANK	N/A	<2.0	5.84	<0.50	<2.0	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.050	<0.0050	<0.050	<0.050	<1.2	<0.6	<0.3	<0.020	<0.010	<0.020	<0.0500
Field Blank 1	17-Sep-25	EO2508465-041	10-SH	N/A	<2.0	5.95	<0.50	<2.0	<0.50	<0.30	<0.010	<0.00010	1.1	<0.050	<0.0050	<0.050	<0.050	<1.2	<0.6	<0.3	<0.020	<0.010	<0.020	<0.0500
Field Blank 2	18-Sep-25	EO2508465-042	20-SH	N/A	<2.0	5.77	<0.50	<2.0	<0.50	<0.30	<0.010	0.00017	1.6	<0.050	<0.0050	<0.050	<0.050	<1.2	<0.6	<0.3	<0.020	<0.010	<0.020	<0.0500

NOTES:

1: Health Canada Guidelines for Canadian Drinking Water Quality, September 2022 - Aesthetic Objective (AO)

2: Health Canada Guidelines for Canadian Drinking Water Quality, September 2022 - Maximum Acceptable Concentration (MAC)

3: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guideline Values for Commercial/Industrial - All Water Uses - Potable

Monitoring Well	Monitoring Well compared to Alberta Tier 2 Potable Groundwater Remediation Guideline for Commercial/Industrial Sites
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guideline Values for Commercial/Industrial - All Water Uses - Aquatic Life

Monitoring Well	Monitoring Well compared to Alberta Tier 2 Aquatic Life Groundwater Remediation Guideline for Commercial/Industrial Sites - Fine Grain Guidelines = Coarse Grain Guidelines for Routine Parameters (Fine Grain for SH and IN wells, Coarse Grain for SS wells)
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

5: 13-SH: Pneumatic pump moved from well to piezometer in 2023 due to frost heave in well, sample taken from piezometer in 2024 and 2025

6: 14(R)-SH and 16-IN: No sample collected in 2025 event.

Detection Limit is greater than the guideline

--- Guideline Row: No guideline for that parameter

--- Results: Parameter was not analyzed

Sulphate Guideline Aquatic life (Environmental Quality Guidelines for Alberta Surface Waters (March 2018))

Hardness (mg/L)	Guideline (mg/L)
0-30	128
31-75	218
76-180	309
181-250	429
>250	Need to be determined based on site water
N/A:	Not applicable

Nitrite-N Guideline Aquatic life (Environmental Quality Guidelines for Alberta Surface Waters (March 2018))

Chloride (mg/L)	Maximum Nitrate as N (mg/L
<2	0.06
2-4	0.12
4-6	0.18
6-8	0.24
8-10	0.30
>10	0.60

Table 3.4
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Monitoring Analytical Results: Dissolved Metals

AECOM

Monitoring Well	Date (dd-mmm-yy)	Lab File	Sample Name	DISSOLVED METALS															
				Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Uranium (mg/L)	Zinc (mg/L)
king Water AO Guidelines 2022[1]				**0.1**	**---**	**---**	**---**	**---**	**---**	**---**	**1.0**	**---**	**---**	**---**	**---**	**---**	**---**	**5.0**
ing Water MAC Guidelines 2022[2]				**2.9**	**0.006**	**0.010**	**2.0**	**5**	**0.007**	**0.05**	**2**	**0.005**	**0.001**	**---**	**0.05**	**---**	**0.02**	**---**
ratory Detection Limit				**0.0010**	**0.00010**	**0.00010**	**0.00010**	**0.010**	**0.0000050**	**0.00050**	**0.00020**	**0.000050**	**0.0000050**	**0.00050**	**0.000050**	**0.000010**	**0.000010**	**0.0010**
Potable Groundwater Guideline[3]				**---**	**0.006**	**0.01**	**1**	**5**	**0.005**	**---**	**1**	**0.01**	**0.001**	**---**	**0.05**	**---**	**0.02**	**5**
uatic Life Groundwater Guideline[4]				**Variable (pH<6.5) 0.05 (pH>6.5) [5]**	**---**	**0.005**	**---**	**1.5**	**0.00037 [6]**	**0.0089 [7]**	**0.007**	**0.007 [8]**	**0.000005**	**Variable [9]**	**0.002**	**0.0001**	**0.015**	**0.03**
01(R)-SH	18-Sep-25	EO2508465-001	01(R)-SH	0.0854	0.00036	**0.0188**	0.458	0.016	0.0000733	0.00442	0.00073	0.000131	<0.0000050	0.0626	0.000948	<0.000010	0.000503	0.0162
01A-IN	18-Sep-25	EO2508465-002	01A-IN	0.0013	<0.00010	0.00342	0.360	0.127	0.0000118	<0.00050	0.00164	0.000059	<0.0000050	0.00061	0.000076	<0.000010	0.000377	0.0036
01(2R)-SS	18-Sep-25	EO2508465-003	01(2R)-SS	0.0152	0.00050	0.00111	0.113	0.137	0.0000161	<0.00050	0.00344	0.000105	<0.0000050	0.00727	0.000332	<0.000010	0.00649	0.0028
03-SH	17-Sep-25	EO2508465-004	03-SH	0.0072	0.00010	0.00021	0.441	0.030	0.0000390	0.00128	0.00073	<0.000050	<0.0000050	0.00178	0.000068	<0.000010	0.00474	0.0020
03-IN	17-Sep-25	EO2508465-005	03-IN	0.0022	<0.00010	0.00018	0.107	0.067	0.0000050	0.00073	0.00081	0.000059	<0.0000050	0.00089	0.000066	<0.000010	0.00399	0.0060
04-SH	17-Sep-25	EO2508465-006	04-SH	<0.0010	<0.00010	0.00014	0.222	0.092	0.0000363	0.00090	0.00052	<0.000050	<0.0000050	0.00164	<0.000050	<0.000010	0.00803	0.0017
04-IN	17-Sep-25	EO2508465-007	04-IN	0.0012	<0.00010	0.00295	0.0692	0.224	0.000100	0.00089	0.00036	<0.000050	<0.0000050	0.00149	0.000059	<0.000010	0.00782	0.0020
04-SS	17-Sep-25	EO2508465-008	04-SS	0.0016	<0.00010	0.00051	0.108	0.028	0.0000425	<0.00050	0.00058	<0.000050	<0.0000050	0.00192	<0.000050	0.000022	0.000188	0.0049
05-SH	17-Sep-25	EO2508465-010	05-SH	0.0015	<0.00010	0.00019	0.112	0.031	0.0000131	0.00361	0.00070	<0.000050	<0.0000050	0.00077	0.000164	<0.000010	0.00688	0.0012
05-IN	17-Sep-25	EO2508465-011	05-IN	<0.0010	<0.00010	0.00064	0.0644	0.053	0.0000184	0.00205	0.00161	<0.000050	<0.0000050	0.00122	<0.000050	<0.000010	0.00803	0.0028
05-SS	17-Sep-25	EO2508465-012	05-SS	<0.0010	<0.00010	0.00020	0.109	0.023	0.0000155	<0.00050	0.00285	<0.000050	<0.0000050	0.00136	<0.000050	<0.000010	0.000106	0.0790
06-SH	18-Sep-25	EO2508465-014	06-SH	0.0383	0.00016	0.00056	0.654	0.043	0.0000152	<0.00050	0.00062	0.000096	<0.0000050	0.00558	<0.000050	<0.000010	0.00524	0.0031
06(R)IN	18-Sep-25	EO2508465-015	06-IN	0.0012	<0.00010	0.00059	0.605	0.056	0.0000373	<0.00050	0.00223	<0.000050	<0.0000050	0.0148	0.000073	0.000158	0.00609	0.0048
07-SH	18-Sep-25	EO2508465-016	07-SH	<0.0010	<0.00010	<0.00010	0.975	0.067	0.0000372	<0.00050	0.00037	<0.000050	<0.0000050	0.00255	<0.000050	<0.000010	0.00352	0.0027
07-IN	18-Sep-25	EO2508465-018	07-IN	0.0016	<0.00010	0.00203	0.139	0.212	0.0000718	0.00053	0.00071	<0.000050	<0.0000050	0.00234	<0.000050	<0.000010	0.00607	0.0182
07(R)SS	18-Sep-25	EO2508465-019	07-SS	0.0014	<0.00010	0.00044	0.0970	0.038	0.0000098	<0.00050	0.00094	<0.000050	<0.0000050	0.00130	<0.000050	<0.000010	0.000400	0.0043
08-SH	18-Sep-25	EO2508465-020	08-SH	0.0165	0.00020	0.00107	0.216	0.065	0.0000541	0.00066	0.00142	<0.000050	<0.0000050	0.00267	<0.000050	<0.000010	0.00609	0.0054
08-IN	18-Sep-25	EO2508465-021	08-IN	0.0011	<0.00010	<0.00010	0.0648	0.192	0.0000328	0.00135	0.00326	<0.000050	<0.0000050	0.00454	0.000064	<0.000010	0.00323	0.0079
11-SH	18-Sep-25	EO2508465-022	11-SH	0.0061	<0.00010	0.00010	0.114	0.132	0.0000404	<0.00050	0.00251	<0.000050	<0.0000050	0.00404	<0.000050	<0.000010	0.00274	0.0088
11-IN	18-Sep-25	EO2508465-024	11-IN	<0.0010	<0.00010	0.00044	0.300	0.250	0.0000072	<0.00050	0.00069	<0.000050	<0.0000050	0.00221	0.000076	<0.000010	0.00285	0.0036
11-SS	18-Sep-25	EO2508465-045	11-SS	0.0013	<0.00010	0.00046	0.0613	0.046	0.0000218	<0.00050	0.00134	<0.000050	<0.0000050	0.00323	<0.000050	<0.000010	0.000033	0.0053
12-SH	18-Sep-25	EO2508465-025	12-SH	<0.0010	<0.00010	0.00055	0.430	0.039	0.0000363	<0.00050	0.00164	<0.000050	<0.0000050	0.00062	<0.000050	<0.000010	0.00605	0.0039
12-IN	18-Sep-25	EO2508465-027	12-IN	0.0257	<0.00010	0.00385	0.158	0.131	0.0000562	<0.00050	0.161	0.000646	<0.0000050	0.00705	<0.000050	<0.000010	0.00226	0.225
12(R)-SS	18-Sep-25	EO2508465-028	12(R)-SS	0.0074	0.00067	**0.0102**	0.0765	0.229	0.0000102	0.00165	0.00200	<0.000050	<0.0000050	0.00236	0.000531	<0.000010	0.00328	0.0040
13-SH[10]	17-Sep-25	EO2508465-029	13-SH	0.0048	0.00023	0.00047	0.274	0.050	0.0000619	0.00093	0.00121	<0.000050	<0.0000050	0.00349	0.000082	<0.000010	0.00364	0.0041
13-IN	17-Sep-25	EO2508465-030	13-IN	0.0043	<0.00010	0.00025	0.150	0.110	<0.0000050	<0.00050	0.00091	<0.000050	<0.0000050	0.00238	<0.000050	<0.000010	0.00267	0.0037
13(R)SS	17-Sep-25	EO2508465-031	13-SS	0.0017	<0.00010	0.00046	0.0785	0.016	0.0000153	<0.00050	0.00044	<0.000050	<0.0000050	<0.00050	<0.000050	<0.000010	0.000364	0.0035
14(R)-SH[11]	18-Sep-25	---	14(R)-SH	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14(R)-IN	18-Sep-25	EO2508465-032	14(R)-IN	0.0015	0.00012	0.00044	0.166	0.077	0.0000250	0.00215	0.00793	<0.000050	<0.0000050	0.00410	0.000217	0.000039	0.00808	0.0089
14(R)-SS	18-Sep-25	EO2508465-033	14(R)-SS	0.0263	0.00089	0.00295	0.0315	0.098	0.0000210	<0.00050	0.00070	<0.000050	<0.0000050	0.0122	0.00120	<0.000010	0.00597	0.0043
15-SH	18-Sep-25	EO2508465-034	15-SH	0.0085	<0.00010	0.00019	0.549	0.178	0.0000221	<0.00050	0.00212	<0.000050	<0.0000050	0.00821	0.000077	<0.000010	0.00192	0.0056
15-IN	18-Sep-25	EO2508465-035	15-IN	0.0035	<0.00010	0.00017	0.153	0.261	0.0000215	<0.00050	0.00417	0.000120	<0.0000050	0.00354	0.000091	<0.000010	0.00434	0.0040
15(2R)SS	17-Sep-25	EO2508465-036	15-SS	0.0015	<0.00010	0.00311	0.0389	0.026	<0.0000050	<0.00050	0.00040	<0.000050	<0.0000050	0.00069	<0.000050	<0.000010	0.00103	0.0032
16-SH	17-Sep-25	EO2508465-037	16-SH	0.0010	<0.00010	0.00013	0.167	0.082	0.0000063	0.00152	0.00109	<0.000050	<0.0000050	0.00089	0.00112	<0.000010	0.00896	0.0021
16-IN[11]	17-Sep-25	---	16-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
17-SH	18-Sep-25	EO2508465-038	17-SH	<0.0010	<0.00010	0.00013	0.296	0.067	0.0000156	<0.00050	0.00138	<0.000050	<0.0000050	0.00126	0.000073	<0.000010	0.00467	0.0032
17-IN	18-Sep-25	EO2508465-039	17-IN	0.0012	<0.00010	0.00017	0.0759	0.272	0.0000441	<0.00050	0.00240	<0.000050	<0.0000050	0.00289	0.000074	<0.000010	0.00440	0.0050
89-3	18-Sep-25	EO2508465-040	89-3	<0.0010	<0.00010	0.00193	0.117	0.017	0.0000055	<0.00050	0.00037	<0.000050	<0.0000050	0.00066	<0.000050	<0.000010	0.000865	0.0088
QA/QC																		
Trip Blank	18-Sep-25	EO2508465-046	TRIP BLANK	<0.0010	<0.00010	<0.00010	<0.00010	<0.010	<0.0000050	<0.00050	<0.00020	<0.000050	<0.0000050	<0.00050	<0.000050	<0.000010	<0.000010	<0.0010
Field Blank 1	17-Sep-25	EO2508465-041	10-SH	<0.0010	<0.00010	<0.00010	<0.00010	<0.010	<0.0000050	<0.00050	0.00031	<0.000050	<0.0000050	<0.00050	<0.000050	<0.000010	<0.000010	<0.0010
Field Blank 2	18-Sep-25	EO2508465-042	20-SH	<0.0010	<0.00010	<0.00010	<0.00010	<0.010	<0.0000050	<0.00050	<0.00020	<0.000050	<0.0000050	<0.00050	<0.000050	<0.000010	<0.000010	<0.0010

NOTES:

1: Health Canada Guidelines for Canadian Drinking Water Quality, September 2022 - Aesthetic Objective (AO)

2: Health Canada Guidelines for Canadian Drinking Water Quality, September 2022 - Maximum Acceptable Concentration (MAC)

3: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guidline Values for Commercial/Industrial - All Water Uses - Potable

Monitoring We	Monitoring Well compared to Alberta Tier 2 Potable Groundwater Remediation Guideline for Commercial/Industrial Sites
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guideline Values for Commercial/Industrial - All Water Uses - Aquatic Life

Monitoring We	Monitoring Well compared to Alberta Tier 2 Aquatic Life Groundwater Remediation Guideline for Commercial/Industrial Sites - Fine Grain Guidelines = Coarse Grain Guidelines for Routine Parameters (Fine Grain for SH and IN wells, Coarse Grain for SS wells)
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

5: Aluminum Guideline: Environmental Quality Guidelines for Alberta Surface Waters (March 2018) - Table 1.1. Aluminum guidelines for protection of aquatic life at varying pH. - Long-term (Chronic)

6: Cadmium Guideline: Environmental Quality Guidelines for Alberta Surface Waters (March 2018) - Table 1.3. Metals guidelines for Protection of Aquatic Life at varying hardness. - Long-term (Chronic)

7: Chromium (trivalent)

8: Lead Guideline: Environmental Quality Guidelines for Alberta Surface Waters (March 2018) - Table 1.3. Metals guidelines for Protection of Aquatic Life at varying hardness. - Long-term (Chronic)

9: Nickel Guideline: Environmental Quality Guidelines for Alberta Surface Waters (March 2018) - Table 1.3. Metals guidelines for Protection of Aquatic Life at varying hardness. - Long-term (Chronic) - 08-SH=0.13 mg/L; 08-IN=0.16 mg/L

10: 13-SH: Pneumatic pump moved from well to piezometer in 2023 due to frost heave in well, sample taken from piezometer in 2024 and 2025

11: 14(R)-SH and 16-IN: No sample collected in 2025 event.

Detection Limit is greater than the guideline

--- Guideline Row: No guideline for that parameter

--- Results: Parameter was not analyzed

Table 3.5
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons

AECOM

				ORGANICS	BTEX						PHC	
Monitoring Well	Date (dd-mmm-yy)	Lab File	Sample Name	Dissolved Organic Carbon (DOC) (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	m&p-Xylene (mg/L)	o-Xylene (mg/L)	Xylenes-Total (mg/L)	F1 (C6-C10) (mg/L)	F1 (C6-C10) - BTEX (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]				---	---	0.024	0.0016	---	---	0.02	---	---
Canadian Drinking Water MAC Guidelines 2022[2]				---	0.005	0.06	0.14	---	---	0.09	---	---
Laboratory Detection Limit				0.50	0.00050	0.00050	0.00050	0.00040	0.00030	0.00050	0.10	0.10
Alberta Tier 2 Potable Groundwater Guideline[3]				---	0.0050	0.024	0.0016	---	---	0.020	---	2.2
Alberta Tier 2 Aquatic Life Groundwater Guideline (Fine/Coarse)[4]				---	3.6/0.074	12000/0.021	---/41	---	---	---/2.9	---	---/9.8
01(R)-SH	18-Sep-25	EO2508465-001	01(R)-SH	172	0.00093	0.011	0.00108	<0.00040	<0.00030	<0.00050	0.10	<0.10
01A-IN	18-Sep-25	EO2508465-002	01A-IN	21.6	---	---	---	---	---	---	---	---
01(2R)-SS	18-Sep-25	EO2508465-003	01(2R)-SS	11.8	---	---	---	---	---	---	---	---
03-SH	17-Sep-25	EO2508465-004	03-SH	5.20	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
03-IN	17-Sep-25	EO2508465-005	03-IN	3.99	---	---	---	---	---	---	---	---
04-SH	17-Sep-25	EO2508465-006	04-SH	3.16	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
04-IN	17-Sep-25	EO2508465-007	04-IN	4.15	---	---	---	---	---	---	---	---
04-SS	17-Sep-25	EO2508465-008	04-SS	1.90	---	---	---	---	---	---	---	---
05-SH	17-Sep-25	EO2508465-010	05-SH	7.56	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
05-IN	17-Sep-25	EO2508465-011	05-IN	7.64	---	---	---	---	---	---	---	---
05-SS	17-Sep-25	EO2508465-012	05-SS	1.31	---	---	---	---	---	---	---	---
06-SH	18-Sep-25	EO2508465-014	06-SH	4.98	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
06(R)IN	18-Sep-25	EO2508465-015	06-IN	5.86	---	---	---	---	---	---	---	---
07-SH	18-Sep-25	EO2508465-016	07-SH	4.19	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
07-IN	18-Sep-25	EO2508465-018	07-IN	5.27	---	---	---	---	---	---	---	---
07(R)SS	18-Sep-25	EO2508465-019	07-SS	4.97	---	---	---	---	---	---	---	---
08-SH	18-Sep-25	EO2508465-020	08-SH	4.13	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
08-IN	18-Sep-25	EO2508465-021	08-IN	4.14	---	---	---	---	---	---	---	---
11-SH	18-Sep-25	EO2508465-022	11-SH	8.77	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
11-IN	18-Sep-25	EO2508465-024	11-IN	13.8	---	---	---	---	---	---	---	---
11-SS	18-Sep-25	EO2508465-045	11-SS	1.23	---	---	---	---	---	---	---	---
12-SH	18-Sep-25	EO2508465-025	12-SH	3.42	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
12-IN	18-Sep-25	EO2508465-027	12-IN	5.21	---	---	---	---	---	---	---	---
12(R)-SS	18-Sep-25	EO2508465-028	12(R)-SS	5.58	---	---	---	---	---	---	---	---
13-SH[5]	17-Sep-25	EO2508465-029	13-SH	7.18	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
13-IN	17-Sep-25	EO2508465-030	13-IN	4.17	---	---	---	---	---	---	---	---
13(R)SS[6]	17-Sep-25	EO2508465-031	13-SS	4.00	---	---	---	---	---	---	---	---
14(R)-SH	18-Sep-25	---	14(R)-SH	---	---	---	---	---	---	---	---	---
14(R)-IN	18-Sep-25	EO2508465-032	14(R)-IN	5.70	---	---	---	---	---	---	---	---
14(R)-SS	18-Sep-25	EO2508465-033	14(R)-SS	10.0	---	---	---	---	---	---	---	---
15-SH	18-Sep-25	EO2508465-034	15-SH	6.82	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
15-IN	18-Sep-25	EO2508465-035	15-IN	5.19	---	---	---	---	---	---	---	---
15(2R)SS[6]	17-Sep-25	EO2508465-036	15-SS	1.42	---	---	---	---	---	---	---	---
16-SH	17-Sep-25	EO2508465-037	16-SH	3.48	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
16-IN[6]	17-Sep-25	---	16-IN	---	---	---	---	---	---	---	---	---
17-SH	18-Sep-25	EO2508465-038	17-SH	2.05	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
17-IN	18-Sep-25	EO2508465-039	17-IN	2.86	---	---	---	---	---	---	---	---
89-3	18-Sep-25	EO2508465-040	89-3	1.90	---	---	---	---	---	---	---	---
QA/QC												
Trip Blank	18-Sep-25	EO2508465-046	TRIP BLANK	<0.50	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
Field Blank 1	17-Sep-25	EO2508465-041	10-SH	1.07	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10
Field Blank 2	18-Sep-25	EO2508465-042	20-SH	1.56	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10

NOTES:

1: Health Canada Guidelines for Canadian Drinking Water Quality, September 2022 - Aesthetic Objective (AO)

2: Health Canada Guidelines for Canadian Drinking Water Quality, September 2022 - Maximum Acceptable Concentration (MAC)

3: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guidline Values for Commercial/Industrial - All Water Uses - Potable

Monitoring We	Monitoring Well compared to Alberta Tier 2 Potable Groundwater Remediation Guideline for Commercial/Industrial Sites
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guidline Values for Commercial/Industrial - All Water Uses - Aquatic Life

Monitoring We	Monitoring Well compared to Alberta Tier 2 Aquatic Life Groundwater Remediation Guideline for Commercial/Industrial Sites - Fine Grain for SH and IN wells, Coarse Grain for SS wells
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

5: 13-SH: Pneumatic pump moved from well to piezometer in 2023 due to frost heave in well, sample taken from piezometer in 2024 and 2025

6: 14(R)-SH and 16-IN: No sample collected in 2025 event.

Detection Limit is greater than the guideline

--- Guideline Row: No guideline for that parameter

--- Results: Parameter was not analyzed

Table 3.6
VEOLIA, Swan Hill Treatment Centre
2025 Groundwater Monitoring Analytical Results: Polychlorinated Biphenyls Aroclors

				POLYCHLORINATED BIPHENYLS AROCLORS									
Monitoring Well	Date (dd-mmm-yy)	Lab File	Sample Name	Aroclor 1016 (mg/L)	Aroclor 1221 (mg/L)	Aroclor 1232 (mg/L)	Aroclor 1242 (mg/L)	Aroclor 1248 (mg/L)	Aroclor 1254 (mg/L)	Aroclor 1260 (mg/L)	Aroclor 1262 (mg/L)	Aroclor 1268 (mg/L)	Total PCBs (mg/L)
Laboratory Detection Limit				**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000030**
Alberta Tier 2 Potable Groundwater Guideline[1]				---	---	---	---	---	---	---	---	---	**0.000094**
Alberta Tier 2 Aquatic Life Groundwater Guideline[2]				---	---	---	---	---	---	---	---	---	---
01(R)-SH	18-Sep-25	EO2508465-001	01(R)-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
01A-IN	18-Sep-25	EO2508465-002	01A-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
01(2R)-SS	18-Sep-25	EO2508465-003	01(2R)-SS	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
03-SH	17-Sep-25	EO2508465-004	03-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
03-IN	17-Sep-25	EO2508465-005	03-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
04-SH	17-Sep-25	EO2508465-006	04-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
04-IN	17-Sep-25	EO2508465-007	04-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
04-SS	17-Sep-25	EO2508465-008	04-SS	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
05-SH	17-Sep-25	EO2508465-010	05-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
05-IN	17-Sep-25	EO2508465-011	05-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
05-SS	17-Sep-25	EO2508465-012	05-SS	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
06-SH	18-Sep-25	EO2508465-014	06-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
06(R)IN	18-Sep-25	EO2508465-015	06-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
07-SH	18-Sep-25	EO2508465-016	07-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
07-IN	18-Sep-25	EO2508465-018	07-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
07(R)SS	18-Sep-25	EO2508465-019	07-SS	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
08-SH	18-Sep-25	EO2508465-020	08-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
08-IN	18-Sep-25	EO2508465-021	08-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
11-SH	18-Sep-25	EO2508465-022	11-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
11-IN	18-Sep-25	EO2508465-024	11-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
11-SS	18-Sep-25	EO2508465-045	11-SS	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
12-SH	18-Sep-25	EO2508465-025	12-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
12-IN	18-Sep-25	EO2508465-027	12-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
12(R)-SS	18-Sep-25	EO2508465-028	12(R)-SS	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
13-SH[5]	17-Sep-25	EO2508465-029	13-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
13-IN	17-Sep-25	EO2508465-030	13-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
13(R)SS[6]	17-Sep-25	EO2508465-031	13-SS	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
14(R)-SH	18-Sep-25	---	14(R)-SH	---	---	---	---	---	---	---	---	---	---
14(R)-IN	18-Sep-25	EO2508465-032	14(R)-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
14(R)-SS	18-Sep-25	EO2508465-033	14(R)-SS	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
15-SH	18-Sep-25	EO2508465-034	15-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
15-IN	18-Sep-25	EO2508465-035	15-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
15(2R)SS[6]	17-Sep-25	EO2508465-036	15-SS	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
16-SH	17-Sep-25	EO2508465-037	16-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
16-IN[6]	17-Sep-25	---	16-IN	---	---	---	---	---	---	---	---	---	---
17-SH	18-Sep-25	EO2508465-038	17-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
17-IN	18-Sep-25	EO2508465-039	17-IN	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
89-3	18-Sep-25	EO2508465-040	89-3	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
QA/QC													
Trip Blank	18-Sep-25	EO2508465-046	TRIP BLANK	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
Field Blank 1	17-Sep-25	EO2508465-041	10-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
Field Blank 2	18-Sep-25	EO2508465-042	20-SH	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030
Spiked Sample 1[5]	18-Sep-25	EO2508465-043	51-SH	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.0000560	0.000536	<0.000050	<0.000050	0.000536
Spiked Sample 2[6]	18-Sep-25	EO2508465-044	52-SH	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000512	<0.0000610	<0.000050	<0.000050	0.000512

NOTES:

1: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guidline Values for Commercial/Industrial - All Water Uses - Potable

Monitoring Well	Monitoring Well compared to Alberta Tier 2 Potable Groundwater Remediation Guideline for Commercial/Industrial Sites
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

2: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guidline Values for Commercial/Industrial - All Water Uses - Aquatic Life

Monitoring Well	Monitoring Well compared to Alberta Tier 2 Aquatic Life Groundwater Remediation Guideline for Commercial/Industrial Sites - Fine Grain for SH and IN wells, Coarse Grain for SS wells
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

3: 13-SH: Pneumatic pump moved from well to piezometer in 2023 due to frost heave in well, sample taken from piezometer in 2024 and 2025
4: 14(R)-SH and 16-IN: No sample collected in 2025 event.
5: ALS spiked sample - 51-SH - Aroclor 1242, 1254, 1260 = 0.001 mg/L, detection limit adjusted due to sample matrix effects
6: ALS spiked sample - 52-SH - Aroclor 1242, 1254, 1260 = 0.001 mg/L, detection limit adjusted due to sample maxtrix effects
Detection Limit is greater than the guideline
--- Guideline Row: No guideline for that parameter
--- Results: Parameter was not analyzed

Table 3.7
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Monitoring Analytical Results: Adsorbable Organic Halogen

Monitoring Well	Date (dd-mmm-yy)	Lab File	Sample Name	Adsorbable Organic Halogen (AOX) (mg/L)
Alberta Tier 2 Potable Groundwater Guideline[1]				---
Alberta Tier 2 Aquatic Life Groundwater Guideline[2]				---
03-SH	17-Sep-25	EO2508465-004	03-SH	<0.010
08-SH	18-Sep-25	EO2508465-020	08-SH	<0.010
12-SH	18-Sep-25	EO2508465-025	12-SH	<0.010
13-SH[3]	17-Sep-25	EO2508465-029	13-SH	<0.010
15-SH	18-Sep-25	EO2508465-034	15-SH	<0.010
16-SH	17-Sep-25	EO2508465-037	16-SH	<0.010
17-SH	18-Sep-25	EO2508465-038	17-SH	<0.010

NOTES:

1: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guideline Values for Commercial/Industrial - All Water Uses - Potable

Monitoring Well	Monitoring Well compared to Alberta Tier 2 Potable Groundwater Remediation Guideline for Commercial/Industrial Sites
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

2: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guideline Values fc

Monitoring Well	Monitoring Well compared to Alberta Tier 2 Aquatic Life Groundwater Remediation Guideline for Commercial/Industrial Sites - Fine Grain Guidelines = Coarse Grain Guidelines for Routine Parameters (Fine Grain for SH and IN wells, Coarse Grain for SS wells)
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

3: 13-SH: Pneumatic pump moved from well to piezometer in 2023 due to frost heave in well, sample taken from piezometer in 2024 and 2025

Detection Limit is greater than the guideline

--- Guideline Row: No guideline for that parameter

--- Results: Parameter was not analyzed

Table 3.8
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Monitoring QA/QC Results

				GENERAL			INDICATORS				CATIONS AND ANIONS							
Monitoring Well	Date (dd-mmm-yy)	Lab File	Sample Name	Electrical Conductivity (µS/cm)	Lab pH	Total Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)
Lowest Detection Limit				**2.0**	**0.10**	**2.0**	**0.50**	**0.30**	**0.010**	**0.00010**	**0.050**	**0.0050**	**0.050**	**0.050**	**1.0**	**1.0**	**1.0**	**0.020**
Alert Criteria (%)				**20**	**0.6 ***	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
Laboratory Reporting Limit (LRL)				**4.0**	**0.20**	**4.0**	**1.0**	**0.60**	**0.020**	**0.00020**	**0.10**	**0.01**	**0.1**	**0.1**	**2.0**	**2.0**	**2.0**	**0.040**
2x LRL				**8.0**	**0.40**	**8.0**	**2.0**	**1.2**	**0.040**	**0.00040**	**0.20**	**0.020**	**0.20**	**0.20**	**4.0**	**4.0**	**4.0**	**0.080**
5x LRL				**20.0**	**1.0**	**20**	**5.0**	**3.0**	**0.10**	**0.0010**	**0.50**	**0.050**	**0.50**	**0.50**	**10**	**10**	**10**	**0.20**
05-SH	17-Sep-25	EO2508465-010	05-SH	1110	7.53	540	1.37	114	<0.010	0.00075	181	50.0	1.04	9.08	659	<0.6	<0.3	0.223
(Duplicate)	17-Sep-25	EO2508465-009	25-SH	1120	7.44	536	1.37	114	<0.010	0.00083	180	49.3	1.02	9.04	654	<0.6	<0.3	0.233
RPD [1]				0.9%	n/c	0.7%	---	0%	---	---	0.6%	1.4%	1.9%	0.4%	0.8%	---	---	4.4%
Difference [2]				---	---	---	0.00	---	---	0.00008	---	---	---	---	---	---	---	---
05-SS	17-Sep-25	EO2508465-012	05-SS	444	7.50	216	<0.50	23.6	0.034	0.395	49.2	12.6	4.19	30.2	264	<0.6	<0.3	0.178
(Duplicate)	17-Sep-25	EO2508465-013	25-SS	433	7.46	213	<0.50	20.3	0.035	0.382	48.9	12.2	4.04	29.1	260	<0.6	<0.3	0.178
RPD				2.5%	n/c	1.4%	---	15.0%	---	3.3%	0.6%	3.2%	3.6%	3.7%	1.5%	---	---	---
Difference [2]				---	---	---	---	---	0.00	---	---	---	---	---	---	---	---	0.00
07-SH	18-Sep-25	EO2508465-016	07-SH	1510	7.55	493	206	13.0	<0.010	0.502	227	61.0	3.12	20.2	601	<0.6	<0.3	0.196
(Duplicate)	18-Sep-25	EO2508465-017	27-SH	1500	7.49	493	211	12.2	0.014	0.499	228	59.7	3.09	19.8	601	<0.6	<0.3	0.187
RPD				0.7%	n/c	0.0%	2.4%	6%	---	0.6%	0.4%	2.2%	1.0%	2.0%	0.0%	---	---	---
Difference [2]				---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0090
11-SH	18-Sep-25	EO2508465-022	11-SH	1130	7.44	460	<0.50	208	0.040	0.695	182	34.7	2.49	52.1	561	<0.6	<0.3	0.203
(Duplicate)	18-Sep-25	EO2508465-023	31-SH	1150	7.45	458	<0.50	213	0.032	0.692	180	34.9	2.51	51.2	559	<0.6	<0.3	0.201
RPD				1.8%	n/c	0.4%	---	2.4%	---	0.4%	1.1%	0.6%	0.8%	1.7%	0.4%	---	---	1.0%
Difference [2]				---	---	---	---	---	0.0080	---	---	---	---	---	---	---	---	---
12-SH	18-Sep-25	EO2508465-025	12-SH	663	7.91	377	<0.50	3.35	<0.010	0.169	103	26.5	1.98	13.1	460	<0.6	<0.3	0.396
(Duplicate)	18-Sep-25	EO2508465-026	32-SH	650	7.92	378	<0.50	3.34	<0.010	0.166	103	26.2	1.95	12.9	461	<0.6	<0.3	0.407
RPD				2.0%	n/c	0.3%	---	0.3%	---	1.8%	0.0%	1.1%	1.5%	1.5%	0.2%	---	---	2.7%
Difference [2]				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Notes:

1: Alert Criteria - Tables 6-1 to 6-16 Guidance Manual For Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment – Volume 1 Analytical Methods (CCME, 2016)

2: LRL = Laboratory Reporting Limit = 2 x detection limit

3: RPD - Relative Percent Difference, calculated when data is over 5x LRL, then compared to alert criteria

4: Difference - absolute value (sample value - duplicate value)
- Only calculated when one or both results are less than five times the LRL

"---" - Value not able to be calculated because one or both values below detection limit

n/c - RPD not calculated for pH

Exceeds Alert Criteria

Exceeds 2x LRL

* Not a percentage

Table 3.8
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Monitoring QA/QC Results

AECOM

				NITROGEN PARAMETERS			DISSOLVED METALS														ORGANICS
Monitoring Well	Date (dd-mmm-yy)	Lab File	Sample Name	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Uranium (mg/L)	Zinc (mg/L)	Dissolved Organic Carbon (DOC) (mg/L)
Lowest Detection Limit				**0.010**	**0.020**	**0.0500**	**0.0010**	**0.00010**	**0.00010**	**0.00010**	**0.010**	**0.0000050**	**0.00050**	**0.00020**	**0.000050**	**0.0000050**	**0.00050**	**0.000050**	**0.000010**	**0.000010**	**0.0010**	**0.50**
Alert Criteria (%)				**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
Laboratory Reporting Limit (LRL)				**0.020**	**0.040**	**0.10**	**0.0020**	**0.00020**	**0.00020**	**0.00020**	**0.020**	**0.000010**	**0.00100**	**0.00040**	**0.00010**	**0.000010**	**0.0010**	**0.00010**	**0.000020**	**0.000020**	**0.0020**	**1.0**
2x LRL				**0.040**	**0.080**	**0.20**	**0.0040**	**0.00040**	**0.00040**	**0.00040**	**0.040**	**0.000020**	**0.0020**	**0.00080**	**0.00020**	**0.000020**	**0.0020**	**0.00020**	**0.000040**	**0.000040**	**0.0040**	**2.0**
5x LRL				**0.10**	**0.20**	**0.50**	**0.010**	**0.0010**	**0.0010**	**0.0010**	**0.10**	**0.000050**	**0.0050**	**0.0020**	**0.00050**	**0.000050**	**0.0050**	**0.00050**	**0.00010**	**0.00010**	**0.010**	**5.0**
05-SH	17-Sep-25	EO2508465-010	05-SH	<0.010	<0.020	<0.0500	0.0015	<0.00010	0.00019	0.112	0.031	0.0000131	0.00361	0.00070	<0.000050	<0.0000050	0.00077	0.000164	<0.000010	0.00688	0.0012	7.56
(Duplicate)	17-Sep-25	EO2508465-009	25-SH	<0.010	<0.020	<0.0500	0.0017	<0.00010	0.00019	0.112	0.032	0.0000097	0.00330	0.00070	<0.000050	<0.0000050	0.00078	0.000202	<0.000010	0.00687	0.0014	8.30
RPD [1]				---	---	---	---	---	---	0.0%	---	---	---	---	---	---	---	---	---	---	0.1%	---	9.3%
Difference [2]				---	---	---	0.0002	---	0.00	---	0.0010	0.000003	0.00031	0.00	---	---	0.00001	0.000038	---	---	---	0.0002	---
05-SS	17-Sep-25	EO2508465-012	05-SS	<0.010	0.196	0.196	<0.0010	<0.00010	0.00020	0.109	0.023	0.0000155	<0.00050	0.00285	<0.000050	<0.0000050	0.00136	<0.000050	<0.000010	0.000106	0.0790	1.31
(Duplicate)	17-Sep-25	EO2508465-013	25-SS	<0.010	0.195	0.195	0.0011	<0.00010	0.00018	0.110	0.023	0.0000155	<0.00050	0.00295	<0.000050	<0.0000050	0.00149	<0.000050	<0.000010	0.000103	0.0752	1.14
RPD				---	---	---	---	---	---	0.9%	---	---	---	3.4%	---	---	---	---	---	---	2.9%	4.9%	---
Difference [2]				---	0.001	0.001	---	---	0.00	---	0.00	0.00	---	---	---	---	0.00013	---	---	---	---	---	0.17
07-SH	18-Sep-25	EO2508465-016	07-SH	<0.010	<0.020	<0.0500	<0.0010	<0.00010	<0.00010	0.975	0.067	0.0000372	<0.00050	0.00037	<0.000050	<0.0000050	0.00255	<0.000050	<0.000010	0.00352	0.0027	4.19
(Duplicate)	18-Sep-25	EO2508465-017	27-SH	<0.010	<0.020	<0.0500	0.0019	<0.00010	<0.00010	0.966	0.069	0.0000189	<0.00050	0.00096	<0.000050	<0.0000050	0.00259	<0.000050	<0.000010	0.00356	0.0049	4.04
RPD				---	---	---	---	---	---	0.9%	---	---	---	---	---	---	---	---	---	---	1.1%	---	---
Difference [2]				---	---	---	---	---	---	---	0.0020	0.0000183	---	0.000590	---	---	0.00004	---	---	---	---	0.00220	0.15
11-SH	18-Sep-25	EO2508465-022	11-SH	<0.010	0.064	0.0640	0.0061	<0.00010	0.00010	0.114	0.132	0.0000404	<0.00050	0.00251	<0.000050	<0.0000050	0.00404	<0.000050	<0.000010	0.00274	0.0088	8.77
(Duplicate)	18-Sep-25	EO2508465-023	31-SH	<0.010	0.063	0.0630	0.0085	<0.00010	0.00012	0.114	0.133	0.0000404	<0.00050	0.00155	<0.000050	<0.0000050	0.00446	0.000065	<0.000010	0.00270	0.0043	9.50
RPD				---	---	---	---	---	---	0.0%	0.8%	---	---	---	---	---	---	---	---	---	1.5%	---	8.0%
Difference [2]				---	0.001	0.001	0.0024	---	0.000020	---	---	0.00	---	0.00096	---	---	0.00042	---	---	---	---	0.00450	---
12-SH	18-Sep-25	EO2508465-025	12-SH	<0.010	<0.020	<0.0500	<0.0010	<0.00010	0.00055	0.430	0.039	0.0000363	<0.00050	0.00164	<0.000050	<0.0000050	0.00062	<0.000050	<0.000010	0.00605	0.0039	3.42
(Duplicate)	18-Sep-25	EO2508465-026	32-SH	<0.010	<0.020	<0.0500	<0.0010	<0.00010	0.00055	0.429	0.037	0.0000178	<0.00050	0.00154	<0.000050	<0.0000050	0.00062	<0.000050	<0.000010	0.00597	0.0048	2.98
RPD				---	---	---	---	---	---	0.2%	---	---	---	---	---	---	---	---	---	---	1.3%	---	---
Difference [2]				---	---	---	---	---	0.0	---	0.002	0.000019	---	0.00010	---	---	0.00	---	---	---	---	0.0009	0.44

Notes:

1: Alert Criteria - Tables 6-1 to 6-16 Guidance Manual For Environmental S

2: LRL = Laboratory Reporting Limit = 2 x detection limit

3: RPD - Relative Percent Difference, calculated when data is over 5x LRL,

4: Difference - absolute value (sample value - duplicate value)
- Only calculated when one or both results are less than five times the LRL

"---" - Value not able to be calculated because one or both values below detection limit

n/c - RPD not calculated for pH

Exceeds Alert Criteria

Exceeds 2x LRL

* Not a percentage

Table 3.8
VEOLIA, Swan Hills Treatment Centre
2025 Groundwater Monitoring QA/QC Results

				BTEX						PHC		PCB AROCLORS										
Monitoring Well	Date (dd-mmm-yy)	Lab File	Sample Name	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	m&p-Xylene (mg/L)	o-Xylene (mg/L)	Xylenes-Total (mg/L)	F1 (C6-C10) (mg/L)	F1 (C6-C10) - BTEX (mg/L)	Aroclor 1016 (mg/L)	Aroclor 1221 (mg/L)	Aroclor 1232 (mg/L)	Aroclor 1242 (mg/L)	Aroclor 1248 (mg/L)	Aroclor 1254 (mg/L)	Aroclor 1260 (mg/L)	Aroclor 1262 (mg/L)	Aroclor 1268 (mg/L)	Total PCBs (mg/L)	Adsorbable Organic Halide (AOX) (mg/L)
Lowest Detection Limit				**0.00050**	**0.00050**	**0.00050**	**0.00040**	**0.00030**	**0.00050**	**0.10**	**0.025**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000010**	**0.000030**	**10**
Alert Criteria (%)				**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**60**	**30**
Laboratory Reporting Limit (LRL)				**0.0010**	**0.0010**	**0.0010**	**0.0008**	**0.0006**	**0.0010**	**0.20**	**0.05**	**0.000020**	**0.000020**	**0.000020**	**0.000020**	**0.000020**	**0.000020**	**0.000020**	**0.000020**	**0.000020**	**0.00006**	**0.010**
2x LRL				**0.0020**	**0.0020**	**0.0020**	**0.0016**	**0.0012**	**0.0020**	**0.40**	**0.10**	**0.000040**	**0.000040**	**0.000040**	**0.000040**	**0.000040**	**0.000040**	**0.000040**	**0.000040**	**0.000040**	**0.00012**	**0.020**
5x LRL				**0.0050**	**0.0050**	**0.0050**	**0.0040**	**0.0030**	**0.0050**	**1.0**	**0.25**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.00010**	**0.00030**	**0.050**
05-SH	17-Sep-25	EO2508465-010	05-SH	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	---
(Duplicate)	17-Sep-25	EO2508465-009	25-SH	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	---
RPD [1]				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Difference [2]				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
05-SS	17-Sep-25	EO2508465-012	05-SS	---	---	---	---	---	---	---	---	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	---
(Duplicate)	17-Sep-25	EO2508465-013	25-SS	---	---	---	---	---	---	---	---	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	---
RPD				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Difference [2]				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
07-SH	18-Sep-25	EO2508465-016	07-SH	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	---
(Duplicate)	18-Sep-25	EO2508465-017	27-SH	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	---
RPD				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Difference [2]				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
11-SH	18-Sep-25	EO2508465-022	11-SH	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	---
(Duplicate)	18-Sep-25	EO2508465-023	31-SH	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000030	---
RPD				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Difference [2]				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12-SH	18-Sep-25	EO2508465-025	12-SH	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10	---	---	---	---	---	---	---	---	---	---	<0.010
(Duplicate)	18-Sep-25	EO2508465-026	32-SH	<0.00050	<0.00050	<0.00050	<0.00040	<0.00030	<0.00050	<0.10	<0.10	---	---	---	---	---	---	---	---	---	---	<0.010
RPD				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Difference [2]				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Notes:

1: Alert Criteria - Tables 6-1 to 6-16 Guidance Manual For Environmental S

2: LRL = Laboratory Reporting Limit = 2 x detection limit

3: RPD - Relative Percent Difference, calculated when data is over 5x LRL,

4: Difference - absolute value (sample value - duplicate value)
- Only calculated when one or both results are less than five times the LRL

"---" - Value not able to be calculated because one or both values below detection limit

n/c - RPD not calculated for pH

Exceeds Alert Criteria

Exceeds 2x LRL

* Not a percentage

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
01-SH [Decommissioned]	N/M	1,086.38	N/M	N/M	15-May-1985	1.67	N/M	1,084.71	
					15-Aug-1985	1.83	N/M	1,084.55	
					15-Jun-1986	1.16	N/M	1,085.22	
					15-Aug-1986	1.80	N/M	1,084.58	
					15-Oct-1986	2.03	N/M	1,084.35	
					15-Jun-1987	2.07	N/M	1,084.31	
					15-Sep-1987	1.67	N/M	1,084.71	
					15-Nov-1987	1.60	N/M	1,084.78	
					15-Aug-1988	1.45	N/M	1,084.93	
					15-Oct-1988	1.66	N/M	1,084.72	
					15-Jun-1989	1.51	N/M	1,084.87	
					15-Nov-1989	1.67	N/M	1,084.71	
					15-Aug-1990	1.33	N/M	1,085.05	
					15-Oct-1990	1.32	N/M	1,085.06	
					15-May-1991	N/M	N/M	N/M	*Frozen*
					15-Nov-1991	N/M	N/M	N/M	*Frozen*
					05-May-1992	1.58	N/M	1,084.81	
					29-Oct-1992	1.43	N/M	1,084.95	
					18-May-1993	N/M	N/M	N/M	*Frozen*
					10-Nov-1993	N/M	N/M	N/M	*Decommissioned*
01A-SH [Decommissioned]	N/M	1,087.20	N/M	5.18	10-Nov-1993	1.79	N/M	1,085.41	
					21-Sep-1994	2.66	N/M	1,084.54	
					20-Sep-1995	3.03	N/M	1,084.17	
					04-Sep-1996	3.22	N/M	1,083.98	
					05-Sep-1997	3.21	N/M	1,083.99	
					16-Sep-1998	3.52	N/M	1,083.68	
					09-Sep-1999	3.60	N/M	1,083.60	
					28-Aug-2000	3.20	N/M	1,084.00	
					07-Sep-2001	3.04	N/M	1,084.16	
					04-Sep-2002	N/M	N/M	< 0.00	*Dry*
					03-Sep-2003	3.11	N/M	1,084.09	
					08-Sep-2004	3.16	N/M	1,084.04	
					26-Aug-2005	2.79	N/M	1,084.41	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	2.88	N/M	1,084.32	
					06-Sep-2007	2.65	N/M	1,084.55	
					04-Sep-2008	2.98	N/M	1,084.22	
					25-Aug-2009	2.90	N/M	1,084.30	
					23-Aug-2010	2.90	N/M	1,084.30	
					22-Aug-2011	2.68	N/M	1,084.52	
					22-Aug-2012	2.89	N/M	1,084.31	
			0.99		19-Sep-2013	2.60	1.62	1,084.60	
	1,086.250	1,087.243	0.99	5.23	22-May-2014	3.68	2.69	1,083.56	
			1.01	5.23	10-Sep-2014	3.02	2.01	1,084.24	
			0.94	5.23	16-Sep-2015	4.01	3.06	1,083.19	
			0.94	5.23	14-Sep-2016	2.74	1.80	1,084.45	
			0.92	5.23	12-Sep-2017	2.99	2.08	1,084.17	*Yellowish*
			0.93	5.23	06-Sep-2018	3.23	2.31	1,083.94	*Yellowish*
			0.99	5.23	04-Sep-2019	2.71	1.73	1,084.53	
			0.80	5.23	09-Sep-2020	3.03	2.22	1,084.03	
			0.99	5.23	08-Sep-2021	3.41	2.43	1,083.82	
			1.01	5.23	13-Sep-2022	3.12	2.11	1,084.14	*Yellowish, Sulphur odor*
			1.00	5.23	13-Sep-2023	3.17	2.17	1,084.07	
			0.99	5.23	27-Aug-2024	3.05	2.06	1,084.19	*Decommissioned in 2025*
01(R)-SH	1086.482	1087.125	N/M	N/M	3-Sep-2025	1.79	1.20	1,085.29	
01-IN [Decommissioned]	N/M	1,086.11	N/M	N/M	15-May-1985	5.21	N/M	1,080.90	
					15-Aug-1985	3.17	N/M	1,082.94	
					15-Dec-1985	2.94	N/M	1,083.17	
					15-Feb-1986	2.59	N/M	1,083.52	
					15-Aug-1986	2.59	N/M	1,083.52	
					15-Oct-1986	1.95	N/M	1,084.16	
					15-Jun-1987	2.93	N/M	1,083.18	
					15-Sep-1987	2.46	N/M	1,083.65	
					15-Nov-1987	2.23	N/M	1,083.88	
					15-Feb-1988	2.58	N/M	1,083.53	
					15-May-1988	2.11	N/M	1,084.00	
					15-Aug-1988	2.55	N/M	1,083.56	
					15-Oct-1988	2.54	N/M	1,083.57	
					15-Mar-1989	2.86	N/M	1,083.25	
					15-May-1989	3.02	N/M	1,083.09	
					15-Jun-1989	2.68	N/M	1,083.43	
					15-Sep-1989	2.33	N/M	1,083.79	
					15-Nov-1989	2.23	N/M	1,083.88	
					15-Mar-1990	2.79	N/M	1,083.32	
					15-Apr-1990	2.83	N/M	1,083.28	
					15-Aug-1990	2.38	N/M	1,083.74	
					15-Oct-1990	2.28	N/M	1,083.83	
					15-May-1991	2.82	N/M	1,083.29	
					15-Nov-1991	2.31	N/M	1,083.80	
					05-May-1992	2.40	N/M	1,083.72	
					29-Oct-1992	2.00	N/M	1,084.11	
					18-May-1993	2.90	N/M	1,083.21	
					10-Nov-1993	N/M	N/M	N/M	*Decommissioned*
01A-IN	N/M	1,087.27	N/M	11.27	10-Nov-1993	3.21	N/M	1,084.06	
					21-Sep-1994	3.27	N/M	1,084.00	
					20-Sep-1995	3.61	N/M	1,083.66	
					04-Sep-1996	3.81	N/M	1,083.46	
					05-Sep-1997	3.94	N/M	1,083.33	
					15-Sep-1998	4.23	N/M	1,083.04	*Damaged*
					09-Sep-1999	4.34	N/M	1,082.93	
					28-Aug-2000	4.20	N/M	1,083.07	
					07-Sep-2001	3.88	N/M	1,083.39	
					04-Sep-2002	4.73	N/M	1,082.54	
					03-Sep-2003	4.00	N/M	1,083.27	
					08-Sep-2004	4.01	N/M	1,083.26	
					26-Aug-2005	3.67	N/M	1,083.60	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	3.79	N/M	1,083.48	
					06-Sep-2007	3.51	N/M	1,083.76	
					04-Sep-2008	3.92	N/M	1,083.35	
					25-Aug-2009	3.88	N/M	1,083.39	
					23-Aug-2010	3.90	N/M	1,083.37	
					22-Aug-2011	3.63	N/M	1,083.64	
					22-Aug-2012	3.89	N/M	1,083.38	
			1.02		19-Sep-2013	3.69	2.67	1,083.59	
	1,086.262	1,087.295	1.03	11.14	22-May-2014	4.41	3.38	1,082.88	
			1.04	11.14	10-Sep-2014	4.04	3.00	1,083.26	
			1.02	11.14	16-Sep-2015	5.11	4.09	1,082.17	
			1.02	11.14	14-Sep-2016	3.74	2.72	1,083.54	
			0.99	11.14	12-Sep-2017	4.14	3.15	1,083.11	*Yellowish*
			0.96	11.14	06-Sep-2018	4.32	3.37	1,082.90	*Yellowish*
			1.03	11.14	04-Sep-2019	4.32	3.29	1,082.97	
			1.02	11.14	09-Sep-2020	3.83	2.81	1,083.45	*Sulphur odour, white flakes present*
			1.03	11.14	08-Sep-2021	4.53	3.50	1,082.76	
			1.02	11.14	13-Sep-2022	4.44	3.41	1,082.85	*Brown tint*
			1.03	11.14	13-Sep-2023	4.31	3.28	1,082.98	
			1.00	11.14	27-Aug-2024	4.22	3.22	1,083.04	
					3-Sep-2025	4.32	3.36	1,082.83	
01-SS [Decommissioned]	N/M	1,086.11	N/M	N/M	15-May-1985	61.64	N/M	1,024.47	
					15-Aug-1985	61.95	N/M	1,024.16	
					15-Dec-1985	61.81	N/M	1,024.30	
					15-Feb-1986	61.81	N/M	1,024.30	
					15-Jun-1986	61.80	N/M	1,024.31	
					15-Aug-1986	61.78	N/M	1,024.33	
					15-Oct-1986	61.84	N/M	1,024.27	
					15-Jun-1987	61.76	N/M	1,024.35	
					15-Sep-1987	61.88	N/M	1,024.23	
					15-Nov-1987	63.34	N/M	1,022.77	
					15-Feb-1988	63.37	N/M	1,022.74	
					15-May-1988	63.58	N/M	1,022.53	
					15-Aug-1988	63.71	N/M	1,022.40	
					15-Oct-1988	63.71	N/M	1,022.40	
					15-Mar-1989	63.34	N/M	1,022.77	
					15-May-1989	63.83	N/M	1,022.28	
					15-Jun-1989	63.90	N/M	1,022.21	
					15-Sep-1989	63.98	N/M	1,022.13	
					15-Nov-1989	63.88	N/M	1,022.23	
					15-Mar-1990	64.32	N/M	1,021.79	
					15-Apr-1990	64.05	N/M	1,022.06	
					15-Aug-1990	64.29	N/M	1,021.82	
					15-Oct-1990	64.16	N/M	1,021.95	
					15-May-1991	64.42	N/M	1,021.69	
					15-Nov-1991	64.64	N/M	1,021.48	
					05-May-1992	64.89	N/M	1,021.22	

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
					29-Oct-1992	64.94	N/M	1,021.17	
					18-May-1993	N/M	N/M	N/M	*Pump Lines Frozen*
					10-Nov-1993	N/M	N/M	N/M	*Decommissioned*
01A-SS [Decommissioned]	N/M	1,087.40	N/M	60.50	10-Nov-1993	N/M	N/M	< 0.00	*Dry*
					21-Sep-1994	N/M	N/M	< 0.00	*Dry*
					20-Sep-1995	N/M	N/M	< 0.00	*Dry*
					05-Sep-1996	N/M	N/M	< 0.00	*Dry*
					15-Sep-1998	N/M	N/M	< 0.00	*Dry*
					28-Aug-2000	N/M	N/M	< 0.00	*Dry*
					07-Sep-2001	N/M	N/M	< 0.00	*Dry*
					06-Sep-2002	N/M	N/M	< 0.00	*Dry*
					03-Sep-2003	N/M	N/M	< 0.00	*Dry*
					08-Sep-2004	N/M	N/M	< 0.00	*Dry*
					25-Aug-2005	N/M	N/M	< 0.00	*Dry*
					06-Sep-2006	N/M	N/M	< 0.00	*Dry*
					29-Aug-2007	N/M	N/M	< 0.00	*Dry*
					04-Sep-2008	N/M	N/M	< 0.00	*Dry*
					25-Aug-2009	N/M	N/M	< 0.00	*Dry*
					23-Aug-2010	N/M	N/M	< 0.00	*Well Dry*
					22-Aug-2011	N/M	N/M	< 0.00	*Dry*
					22-Aug-2012	N/M	N/M	< 0.00	*Dry*
			0.79		19-Sep-2013	59.68	58.89	1,027.73	*Dry*
	1,086.256	1,087.087	0.83	60.50	22-May-2014	N/M	N/M	< 0.00	*Dry; Measured in the well*
			0.73	60.50	10-Sep-2014	N/M	N/M	< 0.00	*Dry; Measured in the well*
			N/M	60.50	16-Sep-2015	N/M	N/M	< 0.00	*Dry*
			0.83	60.50	14-Sep-2016	N/M	N/M	< 0.00	*Dry*
			0.83	60.50	12-Sep-2017	N/M	N/M	< 0.00	*Dry*
			0.83	60.50	06-Sep-2018	N/M	N/M	< 0.00	*Dry*
			0.83	60.50	04-Sep-2019	N/M	N/M	< 0.00	*Dry*
			0.83	60.50	09-Sep-2020	NM	N/M	< 0.00	*Dry*
			0.83	60.50	08-Sep-2021	NM	N/M	<0.00	*Dry*
			0.83	60.50	13-Sep-2022	NM	N/M	<0.00	*Dry*
			0.83	60.50	13-Sep-2023	NM	N/M	<0.00	*Dry*
			0.83	60.50	27-Aug-2024	NM	N/M	<0.00	*Decommissioned in 2025*
01(2R)-SS	1086.542				3-Sep-2025	64.24	63.24	1,023.30	
02-SH [Decommissioned]	N/M	1,086.42	N/M	N/M	15-May-1985	1.37	N/M	1,085.05	
					15-Aug-1985	2.82	N/M	1,083.60	
					15-Dec-1985	3.68	N/M	1,082.74	
					15-Jun-1986	1.62	N/M	1,084.80	
					15-Aug-1986	1.59	N/M	1,084.83	
					15-Oct-1986	1.62	N/M	1,084.80	
					15-Jun-1987	1.67	N/M	1,084.75	
02-SH [Decommissioned]					15-Sep-1987	1.78	N/M	1,084.64	
					15-Nov-1987	1.95	N/M	1,084.47	
					15-Feb-1988	2.44	N/M	1,083.99	
					15-May-1988	1.68	N/M	1,084.74	
					15-Aug-1988	1.70	N/M	1,084.72	
					15-Oct-1988	2.03	N/M	1,084.39	
					15-Mar-1989	3.44	N/M	1,082.98	
					15-May-1989	2.64	N/M	1,083.78	
					15-Jun-1989	1.53	N/M	1,084.89	
					15-Sep-1989	1.54	N/M	1,084.88	
					15-Nov-1989	1.88	N/M	1,084.54	
					15-Mar-1990	3.64	N/M	1,082.78	
					15-Apr-1990	3.30	N/M	1,083.12	
					15-Aug-1990	1.89	N/M	1,084.53	
					15-Oct-1990	1.89	N/M	1,084.53	
					15-May-1991	2.58	N/M	1,083.84	
					15-Nov-1991	2.30	N/M	1,084.12	
					04-May-1992	2.23	N/M	1,084.19	
					28-Oct-1992	2.19	N/M	1,084.23	
					18-May-1993	4.55	N/M	1,081.87	
					10-Nov-1993	N/M	N/M	N/M	*Decommissioned*
02-IN [Decommissioned]	N/M	1,086.38	N/M	N/M	15-May-1985	2.27	N/M	1,084.11	
					15-Aug-1985	2.04	N/M	1,084.34	
					15-Dec-1985	3.51	N/M	1,082.87	
					15-Jun-1986	1.84	N/M	1,084.54	
					15-Aug-1986	1.76	N/M	1,084.62	
					15-Oct-1986	1.75	N/M	1,084.63	
					15-Jun-1987	1.88	N/M	1,084.50	
					15-Sep-1987	1.78	N/M	1,084.60	
					15-Nov-1987	1.78	N/M	1,084.60	
					15-Feb-1988	2.80	N/M	1,083.58	
					15-May-1988	1.81	N/M	1,084.57	
					15-Aug-1988	1.92	N/M	1,084.46	
					15-Oct-1988	1.90	N/M	1,084.48	
					15-Jun-1989	2.20	N/M	1,084.18	
					15-Sep-1989	2.06	N/M	1,084.32	
					15-Nov-1989	2.20	N/M	1,084.18	
					15-Mar-1990	3.24	N/M	1,083.14	
					15-Apr-1990	3.42	N/M	1,082.96	
					15-Aug-1990	1.97	N/M	1,084.41	
					15-Oct-1990	1.99	N/M	1,084.39	
					15-May-1991	3.20	N/M	1,083.18	
					15-Nov-1991	2.49	N/M	1,083.89	
					04-May-1992	2.57	N/M	1,083.81	
					28-Oct-1992	2.21	N/M	1,084.17	
					18-May-1993	4.65	N/M	1,081.73	
					10-Nov-1993	N/M	N/M	N/M	*Decommissioned*
03-SH	N/M	1,080.61	N/M	3.00	15-May-1985	1.26	N/M	1,079.35	
					15-Aug-1985	1.72	N/M	1,078.89	
					15-Dec-1985	2.20	N/M	1,078.41	
					15-Jun-1986	0.39	N/M	1,080.22	
					15-Aug-1986	1.64	N/M	1,078.97	
					15-Oct-1986	1.64	N/M	1,078.97	
					15-Jun-1987	1.57	N/M	1,079.04	
					15-Sep-1987	1.84	N/M	1,078.77	
					15-Nov-1987	2.00	N/M	1,078.61	
					15-Feb-1988	2.49	N/M	1,078.12	
					15-May-1988	1.66	N/M	1,078.95	
					15-Aug-1988	1.85	N/M	1,078.76	
					15-Oct-1988	2.14	N/M	1,078.47	
					15-Mar-1989	2.73	N/M	1,077.88	
					15-May-1989	1.65	N/M	1,078.96	
					15-Jun-1989	1.61	N/M	1,079.00	
					15-Sep-1989	1.54	N/M	1,079.07	
					15-Nov-1989	1.73	N/M	1,078.88	
					15-Mar-1990	1.97	N/M	1,078.64	
					15-Aug-1990	1.55	N/M	1,079.06	
					15-Oct-1990	1.50	N/M	1,079.11	
					15-May-1991	1.37	N/M	1,079.24	
					15-Nov-1991	1.70	N/M	1,078.91	
					04-May-1992	1.64	N/M	1,078.98	
					28-Oct-1992	1.67	N/M	1,078.94	
					18-May-1993	2.08	N/M	1,078.53	
					10-Nov-1993	1.42	N/M	1,079.19	
					21-Sep-1994	1.68	N/M	1,078.93	
					20-Sep-1995	1.88	N/M	1,078.73	
					04-Sep-1996	1.37	N/M	1,079.24	
					04-Sep-1997	1.67	N/M	1,078.94	
					15-Sep-1998	1.99	N/M	1,078.62	*Resurveyed in Fall 1998*
					09-Sep-1999	1.25	N/M	1,079.36	
					28-Aug-2000	1.05	N/M	1,079.56	
					06-Sep-2001	1.55	N/M	1,079.06	
					06-Sep-2002	1.05	N/M	1,079.56	
					03-Sep-2003	1.44	N/M	1,079.17	
					09-Sep-2004	1.42	N/M	1,079.19	
					25-Aug-2005	1.06	N/M	1,079.55	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.42	N/M	1,079.19	
					05-Sep-2007	0.97	N/M	1,079.64	
					03-Sep-2008	1.42	N/M	1,079.19	
					25-Aug-2009	1.18	N/M	1,079.43	
					23-Aug-2010	1.23	N/M	1,079.38	
					22-Aug-2011	1.03	N/M	1,079.58	
					22-Aug-2012	1.02	N/M	1,079.59	
			0.59		19-Sep-2013	1.54	0.95	1,079.07	
	1,079.444	1,080.106	0.66	2.90	21-May-2014	0.87	0.21	1,079.23	
			0.59	2.90	09-Sep-2014	1.34	0.74	1,078.70	
			0.77	4.45	15-Sep-2015	2.43	1.66	1,077.90	
			0.77	4.45	13-Sep-2016	0.89	0.13	1,079.32	
			0.52	2.90	12-Sep-2017	1.65	1.12	1,078.32	*Clear*
			0.70	2.90	06-Sep-2018	1.50	0.81	1,078.64	*Clear*
			0.79	2.90	03-Sep-2019	1.09	0.30	1,079.15	*Clear*

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
			0.84	2.90	08-Sep-2020	1.81	0.97	1,078.47	*Clear*
			0.79	2.90	07-Sep-2021	1.31	0.52	1,078.93	*Clear*
			0.84	2.90	13-Sep-2022	2.25	1.41	1,078.03	*Clear*
			0.84	2.90	12-Sep-2023	1.75	0.92	1,078.53	
			0.84	2.90	26-Aug-2024	0.99	0.15	1,079.29	
			0.85	2.90	2-Sep-2025	1.61	0.76	1,078.64	
03-IN	N/M	1,078.74	N/M	6.00	15-May-1985	2.14	N/M	1,076.60	
					15-Aug-1985	1.94	N/M	1,076.80	
					15-Dec-1985	4.00	N/M	1,074.74	
					15-Jun-1986	1.93	N/M	1,076.81	
					15-Aug-1986	1.67	N/M	1,077.07	
					15-Oct-1986	1.78	N/M	1,076.96	
					15-Jun-1987	2.00	N/M	1,076.74	
					15-Sep-1987	1.71	N/M	1,077.03	
					15-Nov-1987	1.94	N/M	1,076.80	
					15-Feb-1988	2.48	N/M	1,076.26	
					15-May-1988	2.04	N/M	1,076.70	
					15-Aug-1988	1.70	N/M	1,077.04	
					15-Oct-1988	1.96	N/M	1,076.78	
					15-Mar-1989	2.65	N/M	1,076.09	
					15-May-1989	2.44	N/M	1,076.30	
					15-Jun-1989	1.95	N/M	1,076.79	
					15-Sep-1989	1.95	N/M	1,076.79	
					15-Nov-1989	1.80	N/M	1,076.94	
					15-Mar-1990	0.53	N/M	1,078.21	
					15-Aug-1990	1.67	N/M	1,077.07	
					15-Oct-1990	1.65	N/M	1,077.09	
					15-May-1991	1.76	N/M	1,076.98	
					15-Nov-1991	1.70	N/M	1,077.04	
					04-May-1992	1.63	N/M	1,077.11	
					28-Oct-1992	1.71	N/M	1,077.03	
					18-May-1993	1.49	N/M	1,077.25	
					10-Nov-1993	1.65	N/M	1,077.09	
					21-Sep-1994	4.06	N/M	1,074.68	
					20-Sep-1995	1.79	N/M	1,076.95	
					04-Sep-1996	3.51	N/M	1,075.23	
					04-Sep-1997	1.69	N/M	1,077.05	
					15-Sep-1998	2.06	N/M	1,076.68	*Resurveyed in Fall 1998*
					09-Sep-1999	1.85	N/M	1,076.89	
					28-Aug-2000	1.64	N/M	1,077.10	
					06-Sep-2001	1.83	N/M	1,076.91	
					04-Sep-2002	1.80	N/M	1,076.94	
					03-Sep-2003	1.79	N/M	1,076.95	
					09-Sep-2004	1.68	N/M	1,077.06	
					25-Aug-2005	1.59	N/M	1,077.15	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.81	N/M	1,076.93	
					05-Sep-2007	1.53	N/M	1,077.21	
					03-Sep-2008	1.98	N/M	1,076.76	
					25-Aug-2009	2.25	N/M	1,076.49	
					23-Aug-2010	1.74	N/M	1,077.00	
					22-Aug-2011	1.48	N/M	1,077.26	
					23-Aug-2012	1.63	N/M	1,077.11	
			0.68		19-Sep-2013	1.79	1.11	1,076.95	
	1,079.547	1,080.264	0.72	5.79	21-May-2014	1.57	0.85	1,078.70	
			0.68	5.79	09-Sep-2014	1.79	1.10	1,078.45	
			0.85	8.59	15-Sep-2015	3.02	2.16	1,077.39	
			0.85	8.59	13-Sep-2016	1.60	0.75	1,078.80	
			0.55	5.79	12-Sep-2017	1.97	1.43	1,078.12	*Clear*
			0.79	5.79	06-Sep-2018	2.02	1.24	1,078.31	*Clear*
			0.93	5.79	03-Sep-2019	1.72	0.79	1,078.76	*Cloudy*
			0.95	5.79	08-Sep-2020	2.25	1.31	1,078.24	*Clear*
			0.93	5.79	07-Sep-2021	3.00	2.07	1,077.48	*Clear*
			0.71	5.79	13-Sep-2022	2.38	1.67	1,077.88	*Clear*
			0.89	5.79	12-Sep-2023	2.11	1.22	1,078.33	
			0.92	5.79	26-Aug-2024	1.88	0.96	1,078.59	
			0.91	5.79	2-Sep-2025	1.94	1.02	1,078.53	
04-SH	N/M	1,083.33	N/M	4.00	15-May-1985	1.12	N/M	1,082.21	
					15-Aug-1985	1.61	N/M	1,081.72	
					15-Dec-1985	2.24	N/M	1,081.09	
					15-Feb-1986	2.76	N/M	1,080.57	
					15-Jun-1986	1.57	N/M	1,081.76	
					15-Aug-1986	1.41	N/M	1,081.92	
					15-Oct-1986	1.26	N/M	1,082.07	
					15-Jun-1987	1.40	N/M	1,081.93	
					15-Sep-1987	1.47	N/M	1,081.86	
					15-Nov-1987	2.06	N/M	1,081.27	
					15-Feb-1988	1.72	N/M	1,081.61	
					15-May-1988	1.30	N/M	1,082.03	
					15-Aug-1988	1.56	N/M	1,081.77	
					15-Oct-1988	2.36	N/M	1,080.97	
					15-Mar-1989	2.93	N/M	1,080.40	
					15-May-1989	1.82	N/M	1,081.51	
					15-Jun-1989	1.39	N/M	1,081.94	
					15-Sep-1989	1.25	N/M	1,082.08	
					15-Nov-1989	1.62	N/M	1,081.71	
					15-Mar-1990	2.28	N/M	1,081.05	
					15-Apr-1990	1.66	N/M	1,081.67	
					15-Aug-1990	1.96	N/M	1,081.37	
					15-Oct-1990	1.56	N/M	1,081.77	
					15-May-1991	1.58	N/M	1,081.75	
					15-Nov-1991	1.75	N/M	1,081.58	
					04-May-1992	1.40	N/M	1,081.93	
					28-Oct-1992	1.62	N/M	1,081.71	
					18-May-1993	1.46	N/M	1,081.87	
					10-Nov-1993	1.58	N/M	1,081.75	
					21-Sep-1994	1.86	N/M	1,081.47	
					20-Sep-1995	2.03	N/M	1,081.30	
					04-Sep-1996	1.40	N/M	1,081.93	
					04-Sep-1997	1.37	N/M	1,081.96	
					15-Sep-1998	1.77	N/M	1,081.56	
					09-Sep-1999	2.50	N/M	1,080.83	
					28-Aug-2000	1.86	N/M	1,081.47	
					06-Sep-2001	2.14	N/M	1,081.19	
					04-Sep-2002	1.98	N/M	1,081.35	
					03-Sep-2003	2.17	N/M	1,081.16	
					08-Sep-2004	2.44	N/M	1,080.89	
					25-Aug-2005	1.75	N/M	1,081.58	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	2.81	N/M	1,080.52	
					05-Sep-2007	0.58	N/M	1,082.75	
					03-Sep-2008	2.98	N/M	1,080.35	
					25-Aug-2009	2.75	N/M	1,080.58	
					23-Aug-2010	1.96	N/M	1,081.37	
					22-Aug-2011	1.52	N/M	1,081.81	
					23-Aug-2012	N/M	N/M	N/M	*Blocked at 1.42 m*
			0.66		19-Sep-2013	2.07	1.41	1,081.26	
	1,082.563	1,083.252	0.69	4.63	21-May-2014	1.32	0.63	1,081.94	
			0.67	4.63	11-Sep-2014	1.91	1.24	1,081.33	
			0.65	5.65	15-Sep-2015	2.90	2.26	1,080.31	
			0.65	5.65	13-Sep-2016	1.29	0.65	1,081.92	
			0.56	4.63	12-Sep-2017	2.16	1.61	1,080.96	*Clear*
			0.65	4.63	07-Sep-2018	2.40	1.76	1,080.81	*Clear*
			0.99	4.63	05-Sep-2019	1.60	0.61	1,081.95	*Clear*
			0.75	4.63	10-Sep-2020	2.25	1.51	1,081.06	*Clear*
			0.99	4.63	08-Sep-2021	2.71	1.72	1,080.85	*Clear*
			0.67	4.63	13-Sep-2022	2.71	2.04	1,080.52	*Clear*
			0.64	4.63	13-Sep-2023	2.08	1.44	1,081.13	
			0.72	4.63	27-Aug-2024	1.39	0.67	1,081.90	
			0.76	4.63	2-Sep-2025	1.96	1.20	1,081.59	
04-IN	N/M	1,083.65	N/M	17.00	15-Mar-1990	9.85	N/M	1,073.80	
					15-Apr-1990	9.80	N/M	1,073.85	
					15-Aug-1990	9.67	N/M	1,073.98	
					15-Oct-1990	9.51	N/M	1,074.14	
					15-May-1991	9.32	N/M	1,074.33	
					15-Nov-1991	9.38	N/M	1,074.27	
					04-May-1992	9.22	N/M	1,074.43	
					28-Oct-1992	9.08	N/M	1,074.57	
					18-May-1993	9.21	N/M	1,074.44	
					10-Nov-1993	8.99	N/M	1,074.66	
					21-Sep-1994	8.97	N/M	1,074.68	
					20-Sep-1995	8.98	N/M	1,074.67	
					04-Sep-1996	8.77	N/M	1,074.89	
					04-Sep-1997	9.51	N/M	1,074.14	
					15-Sep-1998	9.88	N/M	1,073.77	

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
					09-Sep-1999	8.79	N/M	1,074.86	
					28-Aug-2000	8.60	N/M	1,075.05	
					06-Sep-2001	8.56	N/M	1,075.09	
					04-Sep-2002	8.67	N/M	1,074.98	
					03-Sep-2003	N/M	N/M	< 0.00	*Dry*
					09-Sep-2004	N/M	N/M	< 0.00	*Dry*
					25-Aug-2005	8.50	N/M	1,075.15	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	N/M	N/M	< 0.00	*Dry*
					05-Sep-2007	8.42	N/M	1,075.23	
					03-Sep-2008	8.70	N/M	1,074.95	
					25-Aug-2009	8.70	N/M	1,074.95	
					23-Aug-2010	8.46	N/M	1,075.19	
					22-Aug-2011	8.34	N/M	1,075.31	
					23-Aug-2012	1.79	N/M	1,081.86	*Possible Data Entry Error*
			0.66		19-Sep-2013	N/M	N/M	< 0.00	*Dry*
	1,082.457	1,083.160	0.70	9.25	21-May-2014	7.63	6.93	1,075.53	*Measured in the well*
			0.61	9.25	11-Sep-2014	7.34	6.72	1,075.73	*Measured in the well*
			0.57	8.85	15-Sep-2015	7.96	7.38	1,075.42	*Piezometer*
			0.57	8.85	13-Sep-2016	7.17	6.60	1,076.21	
			0.56	9.25	12-Sep-2017	7.27	6.72	1,075.74	*Clear*
			0.54	9.25	07-Sep-2018	7.30	6.76	1,075.70	*Clear*
			0.61	9.25	05-Sep-2019	7.00	6.39	1,076.06	*Dry*
			0.63	9.25	10-Sep-2020	7.35	6.72	1,075.74	*Measured in the well*
			0.61	9.25	08-Sep-2021	8.67	8.07	1,074.39	*Clear*
			0.67	9.25	13-Sep-2022	7.26	6.59	1,075.87	*Measured in sampling well*
			0.63	9.25	13-Sep-2023	7.21	6.58	1,075.88	
			0.67	9.25	27-Aug-2024	6.95	6.29	1,076.17	
			0.63	9.25	3-Sep-2025	7.13	6.51	1,076.21	*Measured in well*
04-SS	N/M	1,084.04	N/M	72.00	15-May-1985	59.49	N/M	1,024.55	
					15-Aug-1985	59.87	N/M	1,024.17	
					15-Dec-1985	59.56	N/M	1,024.48	
					15-Feb-1986	59.57	N/M	1,024.47	
					15-Jun-1986	59.64	N/M	1,024.40	
					15-Aug-1986	59.49	N/M	1,024.55	
					15-Oct-1986	59.79	N/M	1,024.25	
					15-Jun-1987	59.72	N/M	1,024.32	
					15-Sep-1987	59.88	N/M	1,024.16	
					15-Nov-1987	59.65	N/M	1,024.39	
					15-Feb-1988	59.69	N/M	1,024.35	
					15-May-1988	60.10	N/M	1,023.94	
					15-Aug-1988	60.41	N/M	1,023.64	
					15-Oct-1988	60.45	N/M	1,023.59	
					15-Mar-1989	60.53	N/M	1,023.51	
					15-May-1989	60.29	N/M	1,023.75	
					15-Jun-1989	60.45	N/M	1,023.59	
					15-Sep-1989	60.40	N/M	1,023.64	
					15-Nov-1989	60.26	N/M	1,023.78	
					15-Mar-1990	60.88	N/M	1,023.16	
					15-Apr-1990	61.01	N/M	1,023.03	
					15-Aug-1990	60.82	N/M	1,023.22	
					15-May-1991	61.81	N/M	1,022.23	
					15-Nov-1991	61.64	N/M	1,022.40	
					04-May-1992	61.69	N/M	1,022.35	
					28-Oct-1992	61.81	N/M	1,022.23	
					18-May-1993	61.95	N/M	1,022.09	
					10-Nov-1993	61.79	N/M	1,022.25	
					21-Sep-1994	62.02	N/M	1,022.02	
					20-Sep-1995	61.89	N/M	1,022.15	
					05-Sep-1996	N/M	N/M	< 0.00	*Dry*
					04-Sep-1997	N/M	N/M	< 0.00	*Dry*
					15-Sep-1998	N/M	N/M	< 0.00	*Dry*
					28-Aug-2000	N/M	N/M	< 0.00	*Dry*
					06-Sep-2001	61.57	N/M	1,022.47	
					04-Sep-2002	61.64	N/M	1,022.40	
					03-Sep-2003	N/M	N/M	< 0.00	*Dry*
					08-Sep-2004	N/M	N/M	N/M	
					25-Aug-2005	N/M	N/M	N/M	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	N/M	N/M	< 0.00	*Dry*
					29-Aug-2007	N/M	N/M	< 0.00	*Dry*
					03-Sep-2008	N/M	N/M	< 0.00	*Dry*
					25-Aug-2009	N/M	N/M	< 0.00	*Dry*
					23-Aug-2010	N/M	N/M	< 0.00	*Well Dry*
					22-Aug-2011	N/M	N/M	< 0.00	*Dry*
					23-Aug-2012	N/M	N/M	< 0.00	*Dry*
			0.99	71.08	25-Sep-2013	60.90	59.91	1,023.15	
	1,082.849	1,084.045	1.20	71.33	21-May-2014	60.95	59.75	1,023.09	*Measured in the well*
			1.09	71.33	11-Sep-2014	61.11	60.02	1,022.83	*Measured in the well*
			N/M	72.5*	16-Sep-2015	62.11	60.91	1,021.94	*Measured in the well*
			1.20	72.50	14-Sep-2016	60.87	59.67	1,023.18	
			0.92	71.33	12-Sep-2017	60.90	59.98	1,022.87	*Clear*
			1.03	71.33	07-Sep-2018	60.89	59.86	1,022.99	*Clear*
			1.15	71.33	05-Sep-2019	60.871	59.725	1023.124	*Clear*
			1.10	71.33	10-Sep-2020	N/M	N/M	N/M	*Could not get accurate water level reading due to equipment malfunction*
			1.15	71.33	09-Sep-2021	60.68	59.53	1023.319	*Clear*
			1.19	71.33	13-Sep-2022	60.60	59.41	1,023.439	*Clear*
			1.11	71.33	13-Sep-2023	60.59	59.48	1,023.369	
			1.06	71.33	27-Aug-2024	60.64	59.58	1,023.269	
			1.19	71.33	3-Sep-2025	60.64	59.46	1,023.376	
05-SH	N/M	1,080.82	N/M	3.00	15-May-1985	1.19	N/M	1,079.63	
					15-Aug-1985	1.73	N/M	1,079.09	
					15-Dec-1985	2.16	N/M	1,078.66	
					15-Jun-1986	1.24	N/M	1,079.58	
					15-Aug-1986	1.58	N/M	1,079.24	
					15-Oct-1986	1.55	N/M	1,079.27	
					15-Jun-1987	1.34	N/M	1,079.48	
					15-Sep-1987	1.52	N/M	1,079.30	
					15-Nov-1987	1.75	N/M	1,079.07	
					15-Feb-1988	2.00	N/M	1,078.82	
					15-May-1988	1.33	N/M	1,079.49	
					15-Aug-1988	1.50	N/M	1,079.32	
					15-Oct-1988	1.95	N/M	1,078.87	
					15-Mar-1989	2.64	N/M	1,078.18	
					15-May-1989	1.46	N/M	1,079.36	
					15-Jun-1989	1.49	N/M	1,079.33	
					15-Sep-1989	1.42	N/M	1,079.40	
					15-Nov-1989	1.49	N/M	1,079.33	
					15-Apr-1990	1.10	N/M	1,079.72	
					15-Aug-1990	1.78	N/M	1,079.04	
					15-Oct-1990	1.75	N/M	1,079.07	
					15-May-1991	1.24	N/M	1,079.58	
					15-Nov-1991	1.86	N/M	1,078.96	
					04-May-1992	1.50	N/M	1,079.32	
					28-Oct-1992	1.49	N/M	1,079.33	
					18-May-1993	N/M	N/M	N/M	*Frozen*
					10-Nov-1993	1.39	N/M	1,079.43	
					21-Sep-1994	1.42	N/M	1,079.40	
					20-Sep-1995	1.63	N/M	1,079.19	
					04-Sep-1996	1.45	N/M	1,079.38	
					04-Sep-1997	1.52	N/M	1,079.30	
					16-Sep-1998	1.89	N/M	1,078.93	
					09-Sep-1999	2.20	N/M	1,078.62	
					28-Aug-2000	1.76	N/M	1,079.06	
					06-Sep-2001	1.92	N/M	1,078.90	
					04-Sep-2002	1.86	N/M	1,078.96	
					03-Sep-2003	N/M	N/M	N/M	*Blocked*
					08-Sep-2004	N/M	N/M	N/M	*Blocked*
					25-Aug-2005	N/M	N/M	N/M	*Blocked*
					07-Sep-2005	N/M	N/M	N/M	*Blocked*
					05-Sep-2007	N/M	N/M	N/M	*Blocked*
					05-Sep-2008	N/M	N/M	N/M	*Blocked*
					25-Aug-2009	N/M	N/M	N/M	*Blocked*
					23-Aug-2010	N/M	N/M	N/M	*No water level because could not get tape down*
					22-Aug-2011	N/M	N/M	N/M	*Dry*
					23-Aug-2012	N/M	N/M	N/M	*Blocked at 1.0 m*
			1.27		19-Sep-2013	2.09	0.82	1,078.73	
	1079.580*	1081.142*	1.562*	2.52	21-May-2014	2.18	0.62	1,078.96	*Measured in the well**
	1,079.856	1,080.761	0.90	2.52	24-Jul-2014	1.16	0.25	1,079.61	*New piezometer - Drilled July 22, 2014*
			0.93	2.52	10-Sep-2014	1.29	0.36	1,079.49	
			0.86	4.03	15-Sep-2015	2.82	1.96	1,077.90	
			0.86	4.03	13-Sep-2016	1.04	0.18	1,079.68	
			0.89	2.52	12-Sep-2017	1.83	0.95	1,078.91	*Clear*
			1.05	2.52	07-Sep-2018	2.04	0.99	1,078.86	*Clear*
			1.11	2.52	05-Sep-2019	1.57	0.46	1,079.39	*Clear*

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
			1.07	2.52	09-Sep-2020	2.03	0.97	1,078.89	*Clear*
			1.11	2.52	07-Sep-2021	2.14	1.03	1,078.82	*Clear*
			1.01	2.52	13-Sep-2022	2.49	1.49	1,078.37	*Clear*
			0.93	2.52	13-Sep-2023	2.33	1.40	1,078.45	
			1.13	2.52	27-Aug-2024	1.80	0.67	1,079.18	
			1.14	2.52	2-Sep-2025	2.24	1.09	1,078.75	
05-IN	N/M	1,080.90	N/M	6.00	15-May-1985	1.74	N/M	1,079.16	
					15-Aug-1985	2.12	N/M	1,078.78	
					15-Dec-1985	2.53	N/M	1,078.37	
					15-Jun-1986	1.68	N/M	1,079.22	
					15-Aug-1986	1.95	N/M	1,078.95	
					15-Oct-1986	1.96	N/M	1,078.94	
					15-Jun-1987	1.78	N/M	1,079.12	
					15-Sep-1987	1.90	N/M	1,079.00	
					15-Nov-1987	2.16	N/M	1,078.74	
					15-Feb-1988	2.68	N/M	1,078.22	
					15-May-1988	1.81	N/M	1,079.09	
					15-Aug-1988	1.86	N/M	1,079.04	
					15-Oct-1988	2.38	N/M	1,078.52	
					15-Mar-1989	3.05	N/M	1,077.85	
					15-May-1989	1.89	N/M	1,079.01	
					15-Jun-1989	1.91	N/M	1,078.99	
					15-Sep-1989	1.79	N/M	1,079.11	
					15-Nov-1989	1.87	N/M	1,079.03	
					15-Mar-1990	1.74	N/M	1,079.16	
					15-Apr-1990	1.64	N/M	1,079.26	
					15-Aug-1990	1.59	N/M	1,079.31	
					15-Oct-1990	2.16	N/M	1,078.74	
					15-May-1991	1.91	N/M	1,078.99	
					15-Nov-1991	2.24	N/M	1,078.66	
					04-May-1992	1.93	N/M	1,078.97	
					28-Oct-1992	1.92	N/M	1,078.98	
					18-May-1993	N/M	N/M	N/M	*Frozen*
					10-Nov-1993	1.82	N/M	1,079.08	
					21-Sep-1994	1.85	N/M	1,079.05	
					20-Sep-1995	1.97	N/M	1,078.93	
					04-Sep-1996	1.75	N/M	1,079.15	
					04-Sep-1997	1.93	N/M	1,078.97	
					16-Sep-1998	2.43	N/M	1,078.47	
					09-Sep-1999	2.26	N/M	1,078.64	
					28-Aug-2000	1.62	N/M	1,079.28	
					06-Sep-2001	2.07	N/M	1,078.83	
					04-Sep-2002	1.95	N/M	1,078.95	
					03-Sep-2003	2.19	N/M	1,078.71	
					08-Sep-2004	2.26	N/M	1,078.64	
					25-Aug-2005	2.33	N/M	1,078.57	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	2.58	N/M	1,078.32	
					05-Sep-2007	2.25	N/M	1,078.65	
					05-Sep-2008	2.79	N/M	1,078.11	
					25-Aug-2009	2.75	N/M	1,078.15	
					23-Aug-2010	2.75	N/M	1,078.15	
					22-Aug-2011	2.17	N/M	1,078.73	
					23-Aug-2012	5.23	N/M	1,075.67	*Possible Data Entry Error*
			1.22		19-Sep-2013	2.42	1.20	1,078.48	
	1,079.755	1,080.889	1.13	5.48	21-May-2014	1.98	0.84	1,078.91	
			1.20	5.48	10-Sep-2014	2.10	0.90	1,078.86	
			1.13	7.23	15-Sep-2015	3.79	2.66	1,077.09	
			1.13	7.23	13-Sep-2016	2.10	0.98	1,078.78	
			1.14	5.48	12-Sep-2017	2.26	1.12	1,078.69	*Clear*
			1.22	5.48	07-Sep-2018	2.39	1.17	1,078.64	*Clear*
			1.31	5.48	05-Sep-2019	1.93	0.63	1,079.18	*Clear*
			0.82	5.48	09-Sep-2020	3.23	2.41	1,077.40	*Measured in sampling well*
			1.31	5.48	07-Sep-2021	2.49	1.18	1,075.64	*Clear*
			1.21	5.48	13-Sep-2022	2.87	1.66	1,078.15	*Measured in sampling well*
			1.31	5.48	13-Sep-2023	2.74	1.43	1,078.33	
			1.37	5.48	27-Aug-2024	2.12	0.75	1,079.06	
			1.35	5.48	2-Sep-2025	2.63	1.29	1,078.61	*Measured in sampling well*
05-SS	N/M	1,086.38	N/M	N/M	10-Sep-2004	63.80	N/M	1,022.58	
					25-Aug-2005	N/M	N/M	N/M	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2007	N/M	N/M	< 0.00	*Dry*
					04-Sep-2008	N/M	N/M	N/M	
					17-Sep-2009	N/M	N/M	N/M	
					23-Aug-2010	N/M	N/M	< 0.00	*Well Dry*
					23-Aug-2012	N/M	N/M	< 0.00	*Dry*
					19-Sep-2013	N/M	N/M	N/M	*Equipment blocking WL measurement*
	1,085.120	1,086.020	0.90	79.70	20-May-2014	62.97	62.07	1,023.05	*Measured in the well*
			0.84	79.70	11-Sep-2014	63.10	62.26	1,022.86	*Measured in the well*
			N/M	80.6*	16-Sep-2015	63.80	62.90	1,022.22	*Measured in the well*
			0.90	80.60	14-Sep-2016	62.90	62.00	1,023.13	
			0.83	79.70	13-Sep-2017	62.91	62.09	1,023.03	*Clear*
			0.76	79.70	07-Sep-2018	62.86	62.09	1,023.03	*Clear*
			0.86	79.70	05-Sep-2019	62.77	61.92	1,023.20	*Clear*
			0.60	79.70	10-Sep-2020	62.78	62.18	1,022.94	*Clear*
			0.86	79.70	08-Sep-2021	62.72	61.86	1,006.28	*Clear*
			0.84	79.70	13-Sep-2022	62.59	61.74	1,023.38	*Clear*
			0.90	79.70	13-Sep-2023	62.62	61.72	1,023.40	
			0.83	79.70	27-Aug-2024	62.63	61.80	1,023.32	
			0.89	79.70	2-Sep-2025	62.71	61.82	1,023.11	
06-SH	N/M	1,081.17	N/M	3.00	15-May-1985	1.22	N/M	1,079.95	
					15-Aug-1985	1.49	N/M	1,079.68	
					15-Dec-1985	2.02	N/M	1,079.15	
					15-Aug-1986	1.51	N/M	1,079.66	
					15-Oct-1986	1.59	N/M	1,079.58	
					15-Jun-1987	1.91	N/M	1,079.26	
					15-Sep-1987	1.58	N/M	1,079.59	
					15-Nov-1987	1.83	N/M	1,079.34	
					15-Feb-1988	2.19	N/M	1,078.98	
					15-May-1988	1.47	N/M	1,079.70	
					15-Aug-1988	1.62	N/M	1,079.55	
					15-Oct-1988	1.87	N/M	1,079.30	
					15-May-1989	1.44	N/M	1,079.73	
					15-Jun-1989	1.57	N/M	1,079.60	
					15-Sep-1989	1.44	N/M	1,079.73	
					15-Nov-1989	1.84	N/M	1,079.33	
					15-Mar-1990	2.02	N/M	1,079.15	
					15-Apr-1990	1.71	N/M	1,079.46	
					15-Aug-1990	1.80	N/M	1,079.37	
					15-Oct-1990	1.73	N/M	1,079.44	
					15-May-1991	1.22	N/M	1,079.95	
					15-Nov-1991	1.76	N/M	1,079.41	
					04-May-1992	1.69	N/M	1,079.48	
					28-Oct-1992	1.72	N/M	1,079.45	
					18-May-1993	N/M	N/M	N/M	*Frozen*
					10-Nov-1993	1.50	N/M	1,079.67	
					21-Sep-1994	1.83	N/M	1,079.34	
					20-Sep-1995	1.96	N/M	1,079.21	
					04-Sep-1996	1.40	N/M	1,079.77	
					04-Sep-1997	1.33	N/M	1,079.84	
					15-Sep-1998	1.98	N/M	1,079.19	
					09-Sep-1999	N/M	N/M	N/M	*Blocked*
					28-Aug-2000	N/M	N/M	N/M	*Blocked*
					06-Sep-2001	N/M	N/M	N/M	*Blocked*
					04-Sep-2002	N/M	N/M	N/M	*Blocked*
					03-Sep-2003	1.74	N/M	1,079.43	
					08-Sep-2004	1.69	N/M	1,079.48	
					25-Aug-2005	1.47	N/M	1,079.70	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.91	N/M	1,079.26	
					05-Sep-2007	0.43	N/M	1,080.74	
					03-Sep-2008	2.30	N/M	1,078.87	
					25-Aug-2009	1.54	N/M	1,079.63	
					23-Aug-2010	N/M	N/M	N/M	
					02-Aug-2011	N/M	N/M	N/M	*Frost Jacked*
					23-Aug-2012	N/M	N/M	N/M	
			1.42		19-Sep-2013	N/M	N/M	N/M	*Piezometer Damaged*
	1080.211*	1081.591*	1.38*	3.16	20-May-2014	2.26	0.88	1,079.33	*Measured in the well**
	1,080.289	1,081.288	1.00	3.16	24-Jul-2014	1.18	0.18	1,080.11	*New piezometer - Drilled July 22, 2014*
			0.94	3.16	11-Sep-2014	1.81	0.87	1,079.42	
			1.00	4.17	15-Sep-2015	2.97	1.97	1,078.32	
			1.00	4.17	13-Sep-2016	1.32	0.32	1,079.97	
			0.91	3.16	12-Sep-2017	1.93	1.02	1,079.27	*Clear*
			0.94	3.16	07-Sep-2018	2.01	1.06	1,079.23	*Clear*
			0.99	3.16	05-Sep-2019	1.37	0.38	1,079.91	*Clear*

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
			0.94	3.16	09-Sep-2020	2.15	1.21	1,079.08	*Clear*
			0.99	3.16	08-Sep-2021	1.95	0.96	1,079.33	*Clear*
			0.99	3.16	13-Sep-2022	2.42	1.43	1,078.86	*Slightly cloudy*
			1.02	3.16	13-Sep-2023	1.83	0.81	1,079.48	
			0.99	3.16	27-Aug-2024	1.42	0.43	1,079.86	
			1.01	3.16	3-Sep-2025	1.98	0.98	1,079.34	
06-IN [Decommissioned]	N/M	1,081.19	N/M	6.00	15-May-1985	1.51	N/M	1,079.68	
					15-Aug-1985	1.60	N/M	1,079.59	
					15-Dec-1985	2.19	N/M	1,079.00	
					15-Jun-1986	1.73	N/M	1,079.46	
					15-Aug-1986	1.39	N/M	1,079.80	
					15-Oct-1986	1.56	N/M	1,079.63	
					15-Jun-1987	1.35	N/M	1,079.84	
					15-Sep-1987	1.51	N/M	1,079.68	
					15-Nov-1987	1.80	N/M	1,079.39	
					15-Feb-1988	2.19	N/M	1,079.00	
					15-May-1988	1.41	N/M	1,079.78	
					15-Aug-1988	1.52	N/M	1,079.67	
					15-Mar-1989	2.46	N/M	1,078.73	
					15-May-1989	1.45	N/M	1,079.74	
					15-Jun-1989	1.50	N/M	1,079.69	
					15-Sep-1989	1.39	N/M	1,079.80	
					15-Nov-1989	1.79	N/M	1,079.40	
					15-Mar-1990	2.05	N/M	1,079.14	
					15-Apr-1990	1.66	N/M	1,079.53	
					15-Aug-1990	1.71	N/M	1,079.48	
					15-Oct-1990	1.66	N/M	1,079.53	
					15-May-1991	1.33	N/M	1,079.86	
					15-Nov-1991	1.71	N/M	1,079.48	
					04-May-1992	1.67	N/M	1,079.53	
					28-Oct-1992	1.72	N/M	1,079.47	
					18-May-1993	N/M	N/M	N/M	*Frozen*
					10-Nov-1993	1.55	N/M	1,079.64	
					21-Sep-1994	1.75	N/M	1,079.44	
					20-Sep-1995	1.82	N/M	1,079.37	
					04-Sep-1996	1.23	N/M	1,079.96	
					04-Sep-1997	1.51	N/M	1,079.68	
					15-Sep-1998	1.99	N/M	1,079.20	
					09-Sep-1999	1.96	N/M	1,079.23	
					28-Aug-2000	1.64	N/M	1,079.55	
					06-Sep-2001	1.86	N/M	1,079.33	
					04-Sep-2002	1.50	N/M	1,079.69	
					03-Sep-2003	1.71	N/M	1,079.48	
					08-Sep-2004	N/M	N/M	N/M	*Blocked*
					25-Aug-2005	1.50	N/M	1,079.69	
					07-Sep-2005	N/M	N/M	N/M	
					05-Sep-2007	1.42	N/M	1,079.77	
					03-Sep-2008	2.36	N/M	1,078.83	
					25-Aug-2009	1.83	N/M	1,079.36	
					23-Aug-2010	2.17	N/M	1,079.02	
					22-Aug-2011	1.75	N/M	1,079.44	*Pump leaking*
					23-Aug-2012	1.75	N/M	1,079.44	
			1.17		19-Sep-2013	2.30	1.13	1,078.89	
	1,080.57	1,081.74	1.17	5.27	20-May-2013	1.59	0.41	1,080.16	*Well Decommissioned July 22, 2014*
06(R)IN	1080.468*	1081.189*	0.721*	5.27	24-Jul-2014	1.03	0.31	1,080.16	*Measured in well* - Drilled July 22, 2014*
	1,080.570	1,081.473	1.16	5.27	11-Sep-2014	2.22	1.07	1,079.50	
			1.17	5.07	15-Sep-2015	3.53	2.35	1,078.22	
			1.17	5.07	13-Sep-2016	1.49	0.31	1,080.26	
			1.11	5.27	11-Sep-2017	2.28	1.17	1,079.40	*Cloudy brown/grey*
			1.10	5.27	07-Sep-2018	2.42	1.33	1,079.24	*Cloudy brown/grey*
			1.15	5.27	05-Sep-2019	1.71	0.56	1,080.01	*Cloudy brown/grey*
			0.94	5.27	10-Sep-2020	2.55	1.60	1,078.97	*Cloudy brown/grey*
			1.15	5.27	08-Sep-2021	2.30	1.15	1,079.42	*Cloudy brown/grey*
			1.19	5.27	13-Sep-2022	2.76	1.56	1,079.01	*Cloudy brown/grey*
			1.09	5.27	13-Sep-2023	2.05	0.96	1,079.61	
			1.12	5.27	27-Aug-2024	1.53	0.41	1,080.17	
			1.14	5.27	3-Sep-2025	2.24	1.11	1,079.48	
07-SH	N/M	1,080.42	N/M	4.00	15-May-1985	0.95	N/M	1,079.47	
					15-Aug-1985	1.16	N/M	1,079.26	
					15-Aug-1986	1.16	N/M	1,079.26	
					15-Oct-1986	1.72	N/M	1,078.70	
					15-Jun-1987	2.42	N/M	1,078.00	
					15-Sep-1987	1.19	N/M	1,079.23	
					15-Nov-1987	1.78	N/M	1,078.64	
					15-Feb-1988	1.75	N/M	1,078.67	
					15-May-1988	1.14	N/M	1,079.28	
					15-Aug-1988	1.36	N/M	1,079.06	
					15-Oct-1988	1.37	N/M	1,079.06	
					15-Mar-1989	1.92	N/M	1,078.50	
					15-May-1989	1.41	N/M	1,079.01	
					15-Jun-1989	1.09	N/M	1,079.33	
					15-Sep-1989	1.00	N/M	1,079.42	
					15-Nov-1989	1.19	N/M	1,079.23	
					15-Apr-1990	1.24	N/M	1,079.18	
					15-Aug-1990	1.36	N/M	1,079.06	
					15-Oct-1990	1.21	N/M	1,079.21	
					15-May-1991	1.26	N/M	1,079.16	
					15-Nov-1991	1.43	N/M	1,078.99	
					04-May-1992	1.08	N/M	1,079.34	
					28-Oct-1992	1.00	N/M	1,079.42	
					18-May-1993	0.91	N/M	1,079.51	
					10-Nov-1993	0.76	N/M	1,079.66	
					21-Sep-1994	1.56	N/M	1,078.86	
					20-Sep-1995	1.30	N/M	1,079.12	
					04-Sep-1996	0.98	N/M	1,079.44	
					03-Sep-1997	1.02	N/M	1,079.40	
					15-Sep-1998	1.47	N/M	1,078.95	
					09-Sep-1999	1.70	N/M	1,078.72	
					28-Aug-2000	1.09	N/M	1,079.33	
					06-Sep-2001	1.52	N/M	1,078.90	
					04-Sep-2002	0.93	N/M	1,079.49	
					03-Sep-2003	1.28	N/M	1,079.14	
					08-Sep-2004	1.36	N/M	1,079.06	
					25-Aug-2005	1.06	N/M	1,079.36	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.37	N/M	1,079.05	
					05-Sep-2007	0.94	N/M	1,079.48	
					03-Sep-2008	1.65	N/M	1,078.77	
					25-Aug-2009	1.12	N/M	1,079.30	
					23-Aug-2010	1.25	N/M	1,079.17	
					22-Aug-2011	1.00	N/M	1,079.42	
					23-Aug-2012	0.92	N/M	1,079.50	
			0.66		19-Sep-2013	3.87	3.21	1,076.55	
	1,079.670	1,080.399	0.73	4.61	20-May-2014	0.91	0.19	1,079.49	
			0.58	4.61	11-Sep-2014	1.06	0.48	1,079.19	
			0.88	5.92	15-Sep-2015	2.09	1.21	1,078.47	
			0.88	5.92	13-Sep-2016	0.91	0.03	1,079.64	
			0.80	4.61	11-Sep-2017	1.60	0.80	1,078.87	*Clear*
			0.76	4.61	05-Sep-2018	1.42	0.65	1,079.02	*Clear*
			0.86	4.61	05-Sep-2019	1.08	0.22	1,079.45	*Clear*
			0.85	4.61	10-Sep-2020	1.30	0.44	1,079.23	*Clear*
			0.86	4.61	08-Sep-2021	0.99	0.13	1,079.54	*Clear*
			0.65	4.61	13-Sep-2022	1.56	0.91	1,078.76	*Clear*
			0.58	4.61	13-Sep-2023	1.22	0.64	1,079.03	
			0.77	4.61	28-Aug-2024	1.06	0.31	1,079.46	
			0.93	4.61	3-Sep-2025	1.49	0.57	1,079.01	*Measured in sampling well*
07-IN	N/M	1,080.77	N/M	9.00	15-May-1985	1.45	N/M	1,079.32	
					15-Aug-1985	1.78	N/M	1,078.99	
					15-Jun-1986	1.41	N/M	1,079.36	
					15-Aug-1986	1.45	N/M	1,079.32	
					15-Oct-1986	1.54	N/M	1,079.23	
					15-Jun-1987	4.60	N/M	1,076.17	
					15-Sep-1987	1.49	N/M	1,079.28	
					15-Nov-1987	1.57	N/M	1,079.20	
					15-Feb-1988	2.09	N/M	1,078.68	
					15-May-1988	1.45	N/M	1,079.32	
					15-Aug-1988	1.36	N/M	1,079.41	
					15-Oct-1988	1.51	N/M	1,079.26	
					15-Mar-1989	2.10	N/M	1,078.67	
					15-May-1989	1.59	N/M	1,079.18	
					15-Jun-1989	1.38	N/M	1,079.39	
					15-Sep-1989	1.29	N/M	1,079.48	
					15-Nov-1989	1.48	N/M	1,079.29	
					15-Apr-1990	0.84	N/M	1,079.93	

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
					15-Aug-1990	1.49	N/M	1,079.28	
					15-Oct-1990	1.33	N/M	1,079.44	
					15-May-1991	0.81	N/M	1,079.96	
					15-Nov-1991	1.55	N/M	1,079.22	
					04-May-1992	1.35	N/M	1,079.42	
					28-Oct-1992	1.28	N/M	1,079.49	
					18-May-1993	1.18	N/M	1,079.59	
					10-Nov-1993	0.85	N/M	1,079.92	
					21-Sep-1994	1.60	N/M	1,079.17	
					20-Sep-1995	1.57	N/M	1,079.20	
					04-Sep-1996	1.24	N/M	1,079.53	
					03-Sep-1997	1.42	N/M	1,079.35	
					15-Sep-1998	1.86	N/M	1,078.91	
					09-Sep-1999	1.70	N/M	1,079.07	
					28-Aug-2000	1.32	N/M	1,079.45	
					06-Sep-2001	1.75	N/M	1,079.02	
					04-Sep-2002	1.15	N/M	1,079.62	
					03-Sep-2003	1.51	N/M	1,079.26	
					08-Sep-2004	1.68	N/M	1,079.09	
					25-Aug-2005	1.30	N/M	1,079.47	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.55	N/M	1,079.22	
					05-Sep-2007	1.16	N/M	1,079.61	
					03-Sep-2008	1.70	N/M	1,079.07	
					25-Aug-2009	1.75	N/M	1,079.02	
					23-Aug-2010	1.52	N/M	1,079.25	
					22-Aug-2011	1.25	N/M	1,079.52	
					23-Aug-2012	1.12	N/M	1,079.65	
			0.87		19-Sep-2013	1.56	0.69	1,079.21	
	1,079.778	1,080.718	0.94	9.06	20-May-2014	1.10	0.16	1,079.62	
			0.86	9.06	11-Sep-2014	1.35	0.49	1,079.29	
			0.96	10.61	15-Sep-2015	2.28	1.32	1,078.46	
			0.96	10.61	13-Sep-2016	1.13	0.17	1,079.61	
			0.87	9.06	11-Sep-2017	1.58	0.71	1,079.07	*Clear*
			0.90	9.06	05-Sep-2018	1.47	0.58	1,079.20	*Cloudy*
			0.95	9.06	05-Sep-2019	1.21	0.26	1,079.52	*Clear*
			0.97	9.06	10-Sep-2020	1.52	0.55	1,079.23	*Clear*
			0.95	9.06	08-Sep-2021	1.17	0.22	1,079.56	*Clear*
			0.85	9.06	13-Sep-2022	1.76	0.91	1,078.87	*Slightly cloudy*
			0.85	9.06	13-Sep-2023	1.48	0.63	1,079.15	
			0.75	9.06	28-Aug-2024	1.06	0.31	1,079.46	
			0.78	9.06	3-Sep-2025	1.25	0.47	1,078.91	*Measured in sampling well*
07-SS [Decommissioned]	N/M	1,080.51	N/M	67.00	15-May-1985	55.96	N/M	1,024.55	
					15-Aug-1985	56.31	N/M	1,024.20	
					15-Dec-1985	56.06	N/M	1,024.45	
					15-Feb-1986	56.04	N/M	1,024.47	
					15-Jun-1986	56.10	N/M	1,024.41	
					15-Aug-1986	56.24	N/M	1,024.27	
					15-Oct-1986	56.24	N/M	1,024.27	
					15-Jun-1987	56.58	N/M	1,023.93	
					15-Nov-1987	56.32	N/M	1,024.19	
					15-Aug-1990	57.40	N/M	1,023.11	
					15-Oct-1990	57.20	N/M	1,023.31	
					15-May-1991	57.32	N/M	1,023.19	
					15-Nov-1991	57.46	N/M	1,023.05	
					04-May-1992	57.56	N/M	1,022.95	
					28-Oct-1992	57.61	N/M	1,022.90	
					18-May-1993	57.77	N/M	1,022.74	
					10-Nov-1993	57.78	N/M	1,022.73	
					21-Sep-1994	57.80	N/M	1,022.71	
					20-Sep-1995	57.87	N/M	1,022.64	
					04-Sep-1996	57.64	N/M	1,022.87	
					03-Sep-1997	57.63	N/M	1,022.88	
					04-Oct-1998	57.83	N/M	1,022.68	
					09-Sep-1999	57.70	N/M	1,022.81	
					28-Aug-2000	57.52	N/M	1,022.99	
					06-Sep-2001	57.58	N/M	1,022.93	
					04-Sep-2002	57.70	N/M	1,022.81	
					03-Sep-2003	57.70	N/M	1,022.81	
					08-Sep-2004	57.70	N/M	1,022.81	
					25-Aug-2005	57.75	N/M	1,022.76	
					05-Sep-2007	57.48	N/M	1,023.03	
					03-Sep-2008	N/M	N/M	< 0.00	*Dry*
					25-Aug-2009	N/M	N/M	N/M	
					23-Aug-2010	N/M	N/M	< 0.00	*Well Dry*
					22-Aug-2011	N/M	N/M	< 0.00	*Dry*
					23-Aug-2012	N/M	N/M	< 0.00	*Dry*
			0.73	66.88	19-Sep-2013	57.22	56.48	1,023.29	
	1,079.593	1,080.382	NM	NM	20-May-2014	57.23	N/M	1,023.16	*Decommissioned in 2025*
07(R)SS	1,081.488	1,082.234	0.75	68.00	03-Jun-2014	59.05	58.30	1,023.19	*Measured in the well - Drilled May 30, 2014*
			0.69	68.00	11-Sep-2014	59.17	58.48	1,023.01	*Measured in the well*
			0.89	68.75	15-Sep-2015	59.86	58.96	1,022.52	*Measured in the well*
			0.89	68.75	14-Sep-2016	58.95	58.06	1,023.43	
			0.66	68.00	11-Sep-2017	59.90	59.24	1,022.25	*Clear*
			0.65	68.00	05-Sep-2018	59.03	58.38	1,023.11	*Clear*
			0.74	68.00	05-Sep-2019	58.97	58.23	1,023.26	*Clear*
			0.70	68.00	10-Sep-2020	58.60	57.90	1,023.59	*Clear*
			0.74	68.00	09-Sep-2021	58.18	57.44	1,024.05	*Clear*
			0.75	68.00	14-Sep-2022	58.71	57.96	1,023.53	*Clear*
			0.70	68.00	13-Sep-2023	58.72	58.02	1,023.47	
			0.72	68.00	28-Aug-2024	58.77	58.05	1,023.44	
			0.72	68.00	3-Sep-2025	58.77	58.05	1,023.43	
08-SH	N/M	1,086.10	N/M	4.00	15-May-1985	1.42	N/M	1,084.68	
					15-Aug-1985	1.68	N/M	1,084.42	
					15-Jun-1986	1.72	N/M	1,084.38	
					15-Aug-1986	1.55	N/M	1,084.55	
					15-Oct-1986	1.60	N/M	1,084.50	
					15-Jun-1987	2.25	N/M	1,083.85	
					15-Sep-1987	1.62	N/M	1,084.48	
					15-Nov-1987	1.45	N/M	1,084.65	
					15-Feb-1988	1.25	N/M	1,084.85	
					15-Aug-1988	1.94	N/M	1,084.16	
					15-Oct-1988	1.59	N/M	1,084.51	
					15-May-1989	1.84	N/M	1,084.26	
					15-Jun-1989	1.60	N/M	1,084.50	
					15-Sep-1989	1.57	N/M	1,084.53	
					15-Nov-1989	1.59	N/M	1,084.51	
					15-Apr-1990	2.15	N/M	1,083.95	
					15-Aug-1990	1.89	N/M	1,084.21	
					15-Oct-1990	1.85	N/M	1,084.25	
					15-May-1991	2.02	N/M	1,084.08	
					15-Nov-1991	1.67	N/M	1,084.43	
					05-May-1992	1.84	N/M	1,084.26	
					28-Oct-1992	1.80	N/M	1,084.30	
					18-May-1993	2.37	N/M	1,083.73	
					10-Nov-1993	1.28	N/M	1,084.82	
					21-Sep-1994	1.35	N/M	1,084.75	
					20-Sep-1995	1.46	N/M	1,084.64	
					05-Sep-1996	1.55	N/M	1,084.55	
					05-Sep-1997	1.51	N/M	1,084.59	
					15-Sep-1998	1.95	N/M	1,084.15	
					09-Sep-1999	1.54	N/M	1,084.56	
					28-Aug-2000	1.77	N/M	1,084.33	
					06-Sep-2001	1.84	N/M	1,084.26	
					05-Sep-2002	1.85	N/M	1,084.25	
					04-Sep-2003	1.91	N/M	1,084.19	
					09-Sep-2004	1.80	N/M	1,084.30	
					26-Aug-2005	1.17	N/M	1,084.93	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.95	N/M	1,084.15	
					05-Sep-2007	1.89	N/M	1,084.21	
					03-Sep-2008	1.94	N/M	1,084.16	
					25-Aug-2009	1.96	N/M	1,084.14	
					23-Aug-2010	1.89	N/M	1,084.21	
					23-Aug-2011	1.61	N/M	1,084.49	*H2O blocked*
					22-Aug-2012	1.76	N/M	1,084.34	
			1.36		19-Sep-2013	1.30	0.47	1,084.80	
	1,084.795	1,086.124	1.33	3.92	20-May-2014	1.97	0.64	1,084.15	
			1.30	3.92	09-Sep-2014	1.91	0.61	1,084.18	
			1.31	3.92	15-Sep-2015	3.14	1.83	1,082.97	
			1.72	3.92	13-Sep-2016	1.99	0.27	1,084.53	
			1.31	3.92	11-Sep-2017	1.64	0.33	1,084.46	*Clear*
			1.22	3.92	05-Sep-2018	1.79	0.57	1,084.22	*Clear*
			1.43	3.92	05-Sep-2019	1.62	0.19	1,084.61	*Clear*
			1.39	3.92	09-Sep-2020	2.03	0.64	1,084.16	*Clear*

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
			1.43	3.92	07-Sep-2021	2.97	1.55	1,083.25	*Clear*
			1.47	3.92	13-Sep-2022	2.46	0.99	1,083.80	*Clear*
			2.02	3.92	12-Sep-2023	2.84	0.83	1,083.97	
			1.44	3.92	27-Aug-2024	1.89	0.45	1,079.33	
			1.49	3.92	3-Sep-2025	2.90	1.42	1,084.29	*Measured in sampling well*
08-IN	N/M	1,086.04	N/M	7.00	15-May-1985	1.46	N/M	1,084.58	
					15-Aug-1985	1.66	N/M	1,084.38	
					15-Jun-1986	1.45	N/M	1,084.59	
					15-Aug-1986	1.68	N/M	1,084.36	
					15-Oct-1986	1.72	N/M	1,084.32	
					15-Jun-1987	N/M	N/M	N/M	*Dry*
					15-Sep-1987	1.83	N/M	1,084.21	
					15-Nov-1987	2.02	N/M	1,084.02	
					15-Feb-1988	2.89	N/M	1,083.15	
					15-May-1988	2.26	N/M	1,083.78	
					15-Aug-1988	2.15	N/M	1,083.89	
					15-Oct-1988	1.89	N/M	1,084.15	
					15-Mar-1989	2.99	N/M	1,083.05	
					15-May-1989	1.93	N/M	1,084.11	
					15-Jun-1989	1.76	N/M	1,084.28	
					15-Sep-1989	1.61	N/M	1,084.43	
					15-Nov-1989	1.92	N/M	1,084.12	
					15-Apr-1990	2.15	N/M	1,083.89	
					15-Aug-1990	1.95	N/M	1,084.09	
					15-Oct-1990	1.71	N/M	1,084.33	
					15-May-1991	2.23	N/M	1,083.81	
					15-Nov-1991	1.67	N/M	1,084.37	
					05-May-1992	1.71	N/M	1,084.34	
					28-Oct-1992	1.75	N/M	1,084.29	
					18-May-1993	1.61	N/M	1,084.43	
					10-Nov-1993	N/M	N/M	N/M	
					21-Sep-1994	1.48	N/M	1,084.56	
					20-Sep-1995	1.28	N/M	1,084.76	
					05-Sep-1996	1.23	N/M	1,084.81	
					05-Sep-1997	1.20	N/M	1,084.84	
					15-Sep-1998	1.64	N/M	1,084.40	
					09-Sep-1999	1.74	N/M	1,084.30	
					28-Aug-2000	1.48	N/M	1,084.56	
					06-Sep-2001	1.64	N/M	1,084.40	
					05-Sep-2002	1.67	N/M	1,084.37	
					04-Sep-2003	1.36	N/M	1,084.68	
					09-Sep-2004	1.92	N/M	1,084.12	
					26-Aug-2005	1.87	N/M	1,084.17	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.82	N/M	1,084.22	
					05-Sep-2007	1.40	N/M	1,084.64	
					03-Sep-2008	2.02	N/M	1,084.02	
					25-Aug-2009	1.92	N/M	1,084.12	
					23-Aug-2010	1.54	N/M	1,084.50	
					23-Aug-2011	1.36	N/M	1,084.68	*H2O blocked*
					22-Aug-2012	1.51	N/M	1,084.53	
			1.17		19-Sep-2013	2.12	0.96	1,083.92	
	1,084.798	1,085.771	1.22	7.00	20-May-2014	1.24	0.02	1,084.78	
			0.97	7.00	09-Sep-2014	1.63	0.66	1,084.14	
			1.04	8.45	15-Sep-2015	2.57	1.53	1,083.27	
			1.45	8.45	13-Sep-2016	2.13	0.68	1,084.12	
			0.93	7.00	11-Sep-2017	1.94	1.01	1,083.79	*Clear*
			1.06	7.00	05-Sep-2018	1.54	0.48	1,084.32	*Clear*
			1.14	7.00	05-Sep-2019	1.33	0.19	1,084.61	*Clear*
			1.13	7.00	09-Sep-2020	1.78	0.66	1,084.14	*Clear*
			1.14	7.00	07-Sep-2021	1.64	0.50	1,084.30	*Clear*
			1.16	7.00	13-Sep-2022	2.19	1.03	1,083.77	*Clear*
			1.30	7.00	12-Sep-2023	2.00	0.70	1,084.10	
			1.14	7.00	27-Aug-2024	1.53	0.39	1,084.41	
			1.56	7.00	3-Sep-2025	2.33	0.77	1,084.93	*Measured in sampling well*
08-SS	N/M	1,085.60	N/M	65.00	15-May-1985	61.60	N/M	1,024.00	
					15-Aug-1985	61.44	N/M	1,024.16	
					15-Dec-1985	61.37	N/M	1,024.23	
					15-Feb-1986	61.45	N/M	1,024.15	
					15-Jun-1986	61.49	N/M	1,024.11	
					15-Aug-1986	61.44	N/M	1,024.16	
					15-Oct-1986	61.48	N/M	1,024.12	
					15-Jun-1987	61.43	N/M	1,024.17	
					15-Sep-1987	61.49	N/M	1,024.11	
					15-Nov-1987	61.44	N/M	1,024.16	
					15-Feb-1988	61.49	N/M	1,024.11	
					15-May-1988	61.65	N/M	1,023.95	
					15-Aug-1988	61.75	N/M	1,023.85	
					15-Oct-1988	61.93	N/M	1,023.67	
					15-Mar-1989	61.82	N/M	1,023.78	
					15-May-1989	61.64	N/M	1,023.96	
					15-Jun-1989	61.74	N/M	1,023.86	
					15-Sep-1989	61.88	N/M	1,023.72	
					15-Mar-1990	62.14	N/M	1,023.46	
					15-Apr-1990	61.83	N/M	1,023.77	
					15-Aug-1990	61.99	N/M	1,023.61	
					15-Oct-1990	61.87	N/M	1,023.73	
					15-May-1991	62.05	N/M	1,023.55	
					15-Nov-1991	62.03	N/M	1,023.57	
					05-May-1992	62.08	N/M	1,023.52	
					28-Oct-1992	62.12	N/M	1,023.48	
					18-May-1993	62.22	N/M	1,023.38	
					10-Nov-1993	62.19	N/M	1,023.41	
					21-Sep-1994	62.24	N/M	1,023.36	
					20-Sep-1995	62.50	N/M	1,023.10	
					05-Sep-1996	N/M	N/M	< 0.00	*Dry*
					05-Sep-1997	N/M	N/M	< 0.00	*Dry*
					04-Oct-1998	N/M	N/M	< 0.00	*Dry*
					09-Sep-1999	62.50	N/M	1,023.10	
					28-Aug-2000	N/M	N/M	< 0.00	*Dry*
					06-Sep-2001	62.48	N/M	1,023.12	
					05-Sep-2002	62.52	N/M	1,023.08	
					04-Sep-2003	N/M	N/M	< 0.00	*Dry*
					09-Sep-2004	N/M	N/M	< 0.00	*Dry*
					26-Aug-2005	N/M	N/M	< 0.00	*Dry*
					05-Sep-2007	N/M	N/M	< 0.00	*Dry*
					03-Sep-2008	N/M	N/M	< 0.00	*Dry*
					25-Aug-2009	N/M	N/M	< 0.00	*Dry*
					23-Aug-2010	N/M	N/M	< 0.00	*Well Dry*
					23-Aug-2011	N/M	N/M	< 0.00	*Dry*
					22-Aug-2012	N/M	N/M	< 0.00	*Dry*
			1.50	66.58	19-Sep-2013	62.44	60.94	1,023.16	
	1,084.181	1,085.769	1.59	65.81	20-May-2014	62.44	60.86	1,023.33	
			1.52	65.81	09-Sep-2014	N/M	N/M	< 0.00	*Dry*
			N/M	N/M	15-Sep-2015	N/M	N/M	N/M	*Dry and Damaged*
			1.54	63.88	13-Sep-2016	62.51	60.97	1,023.21	*Well damaged, cannot purge*
			1.59	65.81	11-Sep-2017	N/M	N/M	N/M	*Well damaged, blocked at 25.879 mTOC*
			1.50	65.81	05-Sep-2018	62.59	61.09	1,023.09	*Well damaged, blocked at 37.5 mTOC*
			1.16	65.81	07-Sep-2021	N/M	N/M	N/M	*Dry and Damaged*
			N/M	65.81	13-Sep-2022	N/M	N/M	N/M	*Dry and Damaged*
			N/M	65.81	12-Sep-2023	N/M	N/M	N/M	*Dry and Damaged*
			N/M	65.81	27-Aug-2024	N/M	N/M	N/M	*Dry and Damaged*
			N/M	65.81	3-Sep-2025	N/M	N/M	N/M	*Dry and Damaged*
09-SH [Decommissioned]	N/M	1,087.07	N/M	N/M	15-May-1985	1.81	N/M	1,085.26	
					15-Aug-1985	1.75	N/M	1,085.32	
					15-Jun-1986	1.28	N/M	1,085.79	
					15-Aug-1986	1.31	N/M	1,085.76	
					15-Oct-1986	1.31	N/M	1,085.76	
					15-Jun-1987	2.78	N/M	1,084.29	
					15-Sep-1987	1.36	N/M	1,085.71	
					15-Nov-1987	1.36	N/M	1,085.71	
					15-May-1988	1.66	N/M	1,085.41	
					15-Aug-1988	1.89	N/M	1,085.18	
					15-Oct-1988	1.42	N/M	1,085.65	
					15-Mar-1989	1.92	N/M	1,085.15	
					15-May-1989	1.59	N/M	1,085.48	
					15-Jun-1989	1.28	N/M	1,085.79	
					15-Sep-1989	1.22	N/M	1,085.85	
					15-Nov-1989	1.34	N/M	1,085.73	
					15-Mar-1990	1.93	N/M	1,085.14	
					15-Apr-1990	1.53	N/M	1,085.54	
					15-Aug-1990	1.21	N/M	1,085.86	
					15-Oct-1990	1.18	N/M	1,085.89	
					15-May-1991	N/M	N/M	N/M	*Frozen*
					15-Nov-1991	1.30	N/M	1,085.77	

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
					05-May-1992	1.34	N/M	1,085.73	
					28-Oct-1992	N/M	N/M	N/M	*Decommissioned*
09-IN [Decommissioned]	N/M	1,087.10	N/M	N/M	15-May-1985	4.13	N/M	1,082.97	
					15-Aug-1985	4.13	N/M	1,082.97	
					15-Dec-1985	4.06	N/M	1,083.04	
					15-Feb-1986	4.16	N/M	1,082.94	
					15-Jun-1986	4.09	N/M	1,083.01	
					15-Aug-1986	3.82	N/M	1,083.28	
					15-Oct-1986	3.85	N/M	1,083.25	
					15-Jun-1987	4.05	N/M	1,083.05	
					15-Sep-1987	3.94	N/M	1,083.16	
					15-Nov-1987	3.98	N/M	1,083.12	
					15-Feb-1988	1.74	N/M	1,085.36	
					15-May-1988	2.28	N/M	1,084.82	
					15-Aug-1988	3.85	N/M	1,083.25	
					15-Oct-1988	4.05	N/M	1,083.05	
					15-Mar-1989	4.51	N/M	1,082.59	
					15-May-1989	1.83	N/M	1,085.27	
					15-Jun-1989	1.78	N/M	1,085.32	
					15-Sep-1989	2.21	N/M	1,084.89	
					15-Nov-1989	2.23	N/M	1,084.87	
					15-Mar-1990	3.25	N/M	1,083.85	
					15-Apr-1990	3.51	N/M	1,083.59	
					15-Aug-1990	2.90	N/M	1,084.20	
					15-Oct-1990	3.56	N/M	1,083.54	
					15-May-1991	1.56	N/M	1,085.54	
					15-Nov-1991	1.80	N/M	1,085.30	
					05-May-1992	1.47	N/M	1,085.64	
					28-Oct-1992	N/M	N/M	N/M	*Decommissioned*
10-SH [Decommissioned]	N/M	1,087.39	N/M	N/M	15-May-1985	1.73	N/M	1,085.66	
					15-Aug-1985	1.95	N/M	1,085.44	
					15-Jun-1986	1.52	N/M	1,085.87	
					15-Aug-1986	1.41	N/M	1,085.98	
					15-Oct-1986	1.40	N/M	1,085.99	
					15-Jun-1987	2.00	N/M	1,085.39	
					15-Sep-1987	1.57	N/M	1,085.82	
					15-Nov-1987	1.61	N/M	1,085.78	
					15-May-1988	1.63	N/M	1,085.76	
					15-Aug-1988	1.73	N/M	1,085.67	
					15-Oct-1988	1.74	N/M	1,085.65	
					15-Mar-1989	2.59	N/M	1,084.80	
					15-May-1989	1.90	N/M	1,085.49	
					15-Jun-1989	1.51	N/M	1,085.88	
					15-Sep-1989	1.44	N/M	1,085.95	
					15-Nov-1989	1.64	N/M	1,085.75	
					15-Mar-1990	2.30	N/M	1,085.09	
					15-Apr-1990	1.93	N/M	1,085.46	
					15-Aug-1990	1.63	N/M	1,085.76	
10-SH [Decommissioned]					15-Oct-1990	1.57	N/M	1,085.82	
					15-May-1991	1.19	N/M	1,086.20	
					15-Nov-1991	N/M	N/M	N/M	*Frozen*
					05-May-1992	1.34	N/M	1,086.05	
					28-Oct-1992	N/M	N/M	N/M	*Decommissioned*
10-IN [Decommissioned]	N/M	1,087.34	N/M	N/M	15-May-1985	5.54	N/M	1,081.80	
					15-Aug-1985	2.73	N/M	1,084.61	
					15-Dec-1985	2.07	N/M	1,085.27	
					15-Jun-1986	1.47	N/M	1,085.87	
					15-Aug-1986	1.42	N/M	1,085.92	
					15-Oct-1986	1.44	N/M	1,085.90	
					15-Jun-1987	2.14	N/M	1,085.20	
					15-Sep-1987	1.81	N/M	1,085.53	
					15-Nov-1987	1.76	N/M	1,085.58	
					15-Feb-1988	2.09	N/M	1,085.25	
					15-May-1988	1.54	N/M	1,085.80	
					15-Aug-1988	1.73	N/M	1,085.62	
					15-Oct-1988	1.88	N/M	1,085.46	
					15-Mar-1989	2.58	N/M	1,084.76	
					15-May-1989	1.76	N/M	1,085.58	
					15-Jun-1989	1.54	N/M	1,085.80	
					15-Sep-1989	1.51	N/M	1,085.83	
					15-Nov-1989	1.71	N/M	1,085.63	
					15-Mar-1990	2.30	N/M	1,085.04	
					15-Apr-1990	1.27	N/M	1,086.07	
					15-Aug-1990	1.57	N/M	1,085.77	
					15-Oct-1990	1.46	N/M	1,085.88	
					15-May-1991	1.57	N/M	1,085.77	
					15-Nov-1991	1.32	N/M	1,086.02	
					05-May-1992	1.45	N/M	1,085.89	
					28-Oct-1992	N/M	N/M	N/M	*Decommissioned*
11-SH	N/M	1,084.16	N/M	4.00	15-Apr-1990	2.52	N/M	1,081.64	
					15-Aug-1990	2.41	N/M	1,081.75	
					15-Oct-1990	2.65	N/M	1,081.51	
					15-May-1991	2.69	N/M	1,081.47	
					15-Nov-1991	2.55	N/M	1,081.61	
					05-May-1992	2.72	N/M	1,081.45	
					29-Oct-1992	2.32	N/M	1,081.84	
					18-May-1993	2.38	N/M	1,081.78	
					10-Nov-1993	2.35	N/M	1,081.81	
					21-Sep-1994	2.40	N/M	1,081.76	
					20-Sep-1995	2.40	N/M	1,081.76	
					05-Sep-1996	2.33	N/M	1,081.83	
					05-Sep-1997	2.47	N/M	1,081.69	
					15-Sep-1998	2.87	N/M	1,081.29	
					09-Sep-1999	2.74	N/M	1,081.42	
					28-Aug-2000	2.60	N/M	1,081.56	
					06-Sep-2001	2.78	N/M	1,081.38	
					05-Sep-2002	2.80	N/M	1,081.36	
					03-Sep-2003	2.74	N/M	1,081.42	
					08-Sep-2004	2.62	N/M	1,081.54	
					26-Aug-2005	2.59	N/M	1,081.57	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	2.80	N/M	1,081.36	
					06-Sep-2007	3.44	N/M	1,080.72	
					04-Sep-2008	3.30	N/M	1,080.86	
					25-Aug-2009	2.87	N/M	1,081.29	
					23-Aug-2010	2.87	N/M	1,081.29	
					23-Aug-2011	2.33	N/M	1,081.83	
					22-Aug-2012	2.54	N/M	1,081.62	
			1.14		19-Sep-2013	2.67	1.53	1,081.49	
	1,082.708	1,083.847	1.14	4.06	22-May-2014	2.13	0.99	1,081.72	
	1082.685*	1083.702*	0.907*	4.06	10-Sep-2014	2.52	1.62	1,081.07	*Measured in the well**
			0.95	5.08	16-Sep-2015	3.58	2.63	1,080.08	
			0.95	5.08	14-Sep-2016	2.35	1.34	1,081.37	
			0.76	4.06	12-Sep-2017	2.52	1.75	1,080.96	*Clear*
			0.93	4.06	06-Sep-2018	2.63	1.70	1,081.01	*Clear*
			0.95	4.06	04-Sep-2019	1.99	1.04	1,081.67	*Clear*
			0.96	4.06	08-Sep-2020	2.57	1.61	1,081.10	*Measured in the sampling well*
			0.95	4.06	08-Sep-2021	2.46	1.51	1,081.20	*Clear*
			1.01	4.06	12-Sep-2022	2.97	1.96	1,080.75	*Measured in the sampling well*
			1.02	4.06	12-Sep-2023	2.23	1.22	1,081.49	
			1.06	4.06	27-Aug-2024	3.30	2.24	1,080.47	
			1.04	4.06	3-Sep-2025	2.92	1.87	1,080.87	*Measured in the sampling well*
11-IN	N/M	1,084.25	N/M	9.00	15-Mar-1990	1.99	N/M	1,082.26	
					15-Apr-1990	2.47	N/M	1,081.78	
					15-Aug-1990	2.48	N/M	1,081.77	
					15-Oct-1990	2.61	N/M	1,081.64	
					15-May-1991	3.24	N/M	1,081.01	
					15-Nov-1991	2.71	N/M	1,081.54	
					05-May-1992	3.03	N/M	1,081.22	
					29-Oct-1992	2.65	N/M	1,081.60	
					18-May-1993	3.17	N/M	1,081.08	
					10-Nov-1993	2.68	N/M	1,081.57	
					21-Sep-1994	2.60	N/M	1,081.65	
					20-Sep-1995	2.76	N/M	1,081.49	
					05-Sep-1996	2.55	N/M	1,081.70	
					05-Sep-1997	2.63	N/M	1,081.62	
					16-Sep-1998	2.94	N/M	1,081.31	
					09-Sep-1999	3.33	N/M	1,080.92	
					28-Aug-2000	2.78	N/M	1,081.47	
					06-Sep-2001	2.24	N/M	1,082.01	
					05-Sep-2002	3.18	N/M	1,081.07	
					03-Sep-2003	3.00	N/M	1,081.25	
					08-Sep-2004	4.82	N/M	1,079.43	
					26-Aug-2005	2.89	N/M	1,081.36	

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	3.03	N/M	1,081.22	
					06-Sep-2007	2.65	N/M	1,081.60	
					04-Sep-2008	3.34	N/M	1,080.91	
					25-Aug-2009	3.19	N/M	1,081.06	
					23-Aug-2010	3.10	N/M	1,081.15	
					23-Aug-2011	2.57	N/M	1,081.68	
					22-Aug-2012	2.74	N/M	1,081.51	
			1.27		19-Sep-2013	3.00	1.73	1,081.26	
	1082.771*	1083.645*	0.87	8.80	22-May-2014	2.53	1.66	1,081.11	*Measured in the well**
	1,082.705	1,083.876	1.17	8.80	30-May-2014	2.25	1.08	1,081.62	
			1.10	8.80	10-Sep-2014	2.65	1.56	1,081.15	
			1.09	8.80	16-Sep-2015	3.70	2.61	1,080.09	
			1.09	8.80	14-Sep-2016	2.08	0.96	1,081.75	
			1.05	8.80	12-Sep-2017	2.71	1.66	1,081.05	*Slightly yellow*
			1.03	8.80	06-Sep-2018	2.67	1.64	1,081.06	
			1.10	8.80	04-Sep-2019	2.18	1.08	1,081.63	
			1.05	8.80	08-Sep-2020	2.75	1.70	1,081.01	
			1.10	8.80	08-Sep-2021	2.58	1.48	1,081.22	
			1.12	8.80	13-Sep-2022	3.21	2.10	1,080.61	*Clear*
			1.14	8.80	13-Sep-2023	2.47	1.32	1,081.38	
			1.12	8.80	27-Aug-2024	1.97	0.85	1,081.86	
			1.15	8.80	3-Sep-2025	2.45	1.30	1,081.22	
11-SS	N/M	1,084.04	N/M	62.00	15-Mar-1990	60.77	N/M	1,023.27	
					15-Apr-1990	60.72	N/M	1,023.32	
					15-Aug-1990	60.71	N/M	1,023.33	
					15-Oct-1990	60.64	N/M	1,023.40	
					15-May-1991	60.79	N/M	1,023.25	
					15-Nov-1991	60.91	N/M	1,023.13	
					05-May-1992	60.89	N/M	1,023.15	
					29-Oct-1992	60.86	N/M	1,023.18	
					18-May-1993	61.01	N/M	1,023.03	
					10-Nov-1993	61.35	N/M	1,022.69	
					21-Sep-1994	61.07	N/M	1,022.97	
					20-Sep-1995	N/M	N/M	< 0.00	*Dry*
					05-Sep-1996	N/M	N/M	< 0.00	*Dry*
					05-Sep-1997	N/M	N/M	< 0.00	*Dry*
					15-Sep-1998	N/M	N/M	< 0.00	*Dry*
					28-Aug-2000	60.80	N/M	1,023.24	
					06-Sep-2001	60.83	N/M	1,023.21	
					05-Sep-2002	60.80	N/M	1,023.24	
					03-Sep-2003	N/M	N/M	< 0.00	*Dry*
					08-Sep-2004	N/M	N/M	< 0.00	*Dry*
					25-Aug-2005	N/M	N/M	N/M	
					05-Sep-2007	N/M	N/M	< 0.00	*Dry*
					04-Sep-2008	N/M	N/M	< 0.00	*Dry*
					25-Aug-2009	N/M	N/M	< 0.00	*Dry*
					23-Aug-2010	N/M	N/M	< 0.00	*Well Dry*
					23-Aug-2011	N/M	N/M	< 0.00	*Dry*
					22-Aug-2012	N/M	N/M	< 0.00	*Dry*
			0.46	62.82	19-Sep-2013	60.65	60.18	1,023.39	
	1,082.557	1,083.117	0.56	62.37	22-May-2014	60.81	60.25	1,022.31	*Measured in the well*
			0.45	62.37	10-Sep-2014	N/M	N/M	< 0.00	*Dry*
			N/M	N/M	16-Sep-2015	N/M	N/M	N/M	*Dry (could not open lock)*
			0.78	62.87	14-Sep-2016	60.67	59.89	1,022.67	*Pump re-installed, could not purge or sample*
			0.44	62.37	12-Sep-2017	N/M	N/M	N/M	*Dry*
			0.55	62.37	06-Sep-2018	60.84	60.30	1,022.26	*Could not purge*
			0.58	62.37	04-Sep-2019	61.87	61.29	1,021.26	*Could not purge*
			---	62.37	08-Sep-2020	N/M	N/M	---	*Insufficient water*
			0.58	62.37	---	60.72	60.14	1,022.42	
			N/M	62.37	12-Sep-2022	N/M	N/M	< 0.00	*Dry*
			0.65	62.37	12-Sep-2023	60.52	59.87	1,022.69	
			0.61	62.37	27-Aug-2024	60.43	59.82	1,022.73	
			0.66	62.37	3-Sep-2025	60.45	59.79	1,022.62	*Pump lowered - able to purge and sample*
12-SH	N/M	1,081.25	N/M	3.00	15-Mar-1990	1.61	N/M	1,079.64	
					15-Aug-1990	1.59	N/M	1,079.66	
					15-Oct-1990	1.44	N/M	1,079.81	
					15-May-1991	1.33	N/M	1,079.92	
					15-Nov-1991	1.11	N/M	1,080.14	
					05-May-1992	1.29	N/M	1,079.96	
					29-Oct-1992	1.39	N/M	1,079.86	
					18-May-1993	1.28	N/M	1,079.97	
					10-Nov-1993	1.00	N/M	1,080.25	
					21-Sep-1994	1.42	N/M	1,079.83	
					20-Sep-1995	1.81	N/M	1,079.44	
					05-Sep-1996	1.07	N/M	1,080.18	
					05-Sep-1997	1.11	N/M	1,080.14	
					16-Sep-1998	1.78	N/M	1,079.47	
					09-Sep-1999	2.20	N/M	1,079.05	
					28-Aug-2000	1.57	N/M	1,079.68	
					06-Sep-2001	1.92	N/M	1,079.33	
					04-Sep-2002	1.34	N/M	1,079.91	
					04-Sep-2003	1.62	N/M	1,079.63	
					09-Sep-2004	1.68	N/M	1,079.57	
					25-Aug-2005	1.29	N/M	1,079.96	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	0.61	N/M	1,080.64	
					07-Sep-2007	1.22	N/M	1,080.03	
					26-Aug-2008	1.86	N/M	1,079.39	
					25-Aug-2009	1.68	N/M	1,079.57	
					23-Aug-2010	1.64	N/M	1,079.61	
					23-Aug-2011	1.38	N/M	1,079.87	*H2O blocked*
					22-Aug-2012	1.56	N/M	1,079.69	
			0.79		19-Sep-2013	1.68	0.87	1,079.57	
	1,080.384	1,081.243	0.86	3.52	22-May-2014	1.21	0.35	1,080.03	
			0.81	3.52	10-Sep-2014	1.83	1.02	1,079.36	
			0.87	3.52	16-Sep-2015	2.54	1.67	1,078.71	
					14-Sep-2016	1.24	0.37	1,080.01	
			0.81	3.52	12-Sep-2017	1.99	1.18	1,079.21	*Clear*
			0.87	3.52	06-Sep-2018	1.60	0.72	1,079.66	*Clear*
			0.87	3.52	04-Sep-2019	1.40	0.52	1,079.86	*Clear*
			0.88	3.52	08-Sep-2020	1.86	0.98	1,079.41	*Clear*
			0.87	3.52	07-Sep-2021	1.41	0.54	1,079.85	*Clear*
			0.78	3.52	12-Sep-2022	2.33	1.55	1,078.83	*Clear*
			0.70	3.52	12-Sep-2023	1.43	0.73	1,079.65	
			0.87	3.52	27-Aug-2024	1.31	0.44	1,079.94	
			0.88	3.52	4-Sep-2025	1.72	0.84	1,079.56	
12-IN	N/M	1,081.33	N/M	7.00	15-Mar-1990	2.10	N/M	1,079.23	
					15-Aug-1990	1.40	N/M	1,079.93	
					15-Oct-1990	1.66	N/M	1,079.67	
					15-May-1991	1.62	N/M	1,079.71	
					15-Nov-1991	1.28	N/M	1,080.05	
					05-May-1992	1.48	N/M	1,079.86	
					29-Oct-1992	1.59	N/M	1,079.74	
					18-May-1993	1.50	N/M	1,079.83	
					10-Nov-1993	1.24	N/M	1,080.09	
					21-Sep-1994	1.60	N/M	1,079.73	
					20-Sep-1995	1.98	N/M	1,079.35	
					05-Sep-1996	1.47	N/M	1,079.86	
					05-Sep-1997	1.59	N/M	1,079.74	
					16-Sep-1998	1.99	N/M	1,079.34	
					09-Sep-1999	2.50	N/M	1,078.83	
					28-Aug-2000	1.72	N/M	1,079.61	
					06-Sep-2001	2.11	N/M	1,079.22	
					04-Sep-2002	1.67	N/M	1,079.66	
					04-Sep-2003	2.85	N/M	1,078.48	
					09-Sep-2004	1.81	N/M	1,079.52	
					25-Aug-2005	1.47	N/M	1,079.86	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.61	N/M	1,079.72	
					07-Sep-2007	1.34	N/M	1,079.99	
					26-Aug-2008	2.08	N/M	1,079.25	
					25-Aug-2009	2.03	N/M	1,079.30	
					23-Aug-2010	1.84	N/M	1,079.49	
					23-Aug-2011	1.52	N/M	1,079.81	*H2O blocked*
					22-Aug-2012	1.68	N/M	1,079.65	
			0.94		19-Sep-2013	N/M	N/M	< 0.00	*Dry*
	1,080.362	1,081.311	0.95	7.47	22-May-2014	1.37	0.42	1,079.94	
			0.93	7.47	10-Sep-2014	2.01	1.08	1,079.29	
			1.08	7.47	16-Sep-2015	2.94	1.87	1,078.49	
			1.08	7.47	14-Sep-2016	1.35	0.27	1,080.09	
			0.84	7.47	12-Sep-2017	2.01	1.16	1,079.20	*Clear*
			0.97	7.47	06-Sep-2018	1.75	0.78	1,079.58	*Clear*
			1.05	7.47	04-Sep-2019	1.57	0.53	1,079.83	*Clear*
			1.05	7.47	08-Sep-2020	2.11	1.06	1,079.31	*Clear*

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
			1.05	7.47	07-Sep-2021	1.55	0.51	1,079.86	*Clear*
			0.96	7.47	12-Sep-2022	2.25	1.29	1,079.07	*Clear*
			0.92	7.47	12-Sep-2023	1.61	0.69	1,079.67	
			1.04	7.47	27-Aug-2024	1.47	0.43	1,079.93	
			1.04	7.47	4-Sep-2025	1.81	0.77	1,079.62	
12-SS [Decommissioned]	N/M	N/M	N/M	58.00	15-Mar-1990	N/M	N/M	< 0.00	*Dry*
					15-Aug-1990	N/M	N/M	N/M	
					15-Oct-1990	N/M	N/M	N/M	
					15-May-1991	N/M	N/M	N/M	
					15-Nov-1991	N/M	N/M	N/M	
					05-May-1992	N/M	N/M	N/M	
					29-Oct-1992	N/M	N/M	N/M	
					21-Sep-1994	N/M	N/M	N/M	
					20-Sep-1995	N/M	N/M	< 0.00	*Dry*
					05-Sep-1996	N/M	N/M	< 0.00	*Dry*
					05-Sep-1997	N/M	N/M	< 0.00	*Dry*
					16-Sep-1998	N/M	N/M	< 0.00	*Dry*
					28-Aug-2000	N/M	N/M	< 0.00	*Dry*
					06-Sep-2001	N/M	N/M	< 0.00	*Dry*
					04-Sep-2002	N/M	N/M	< 0.00	*Dry*
					04-Sep-2003	N/M	N/M	< 0.00	*Dry*
					09-Sep-2004	N/M	N/M	< 0.00	*Dry*
					25-Aug-2005	N/M	N/M	< 0.00	*Dry*
					06-Sep-2006	N/M	N/M	< 0.00	*Dry*
					07-Sep-2007	N/M	N/M	< 0.00	*Dry*
					27-Aug-2008	N/M	N/M	< 0.00	*Dry*
					25-Aug-2009	N/M	N/M	< 0.00	*Dry*
					23-Aug-2010	N/M	N/M	< 0.00	*Well Dry*
					23-Aug-2011	N/M	N/M	< 0.00	*Dry*
					22-Aug-2012	N/M	N/M	< 0.00	*Dry*
			0.96	57.96	19-Sep-2013	N/M	N/M	< 0.00	*Dry*
	1,080.053	1,081.087	1.03	57.89	22-May-2014	58.89	57.85	1,022.20	*Measured in the well*
			0.92	57.89	10-Sep-2014	N/M	N/M	< 0.00	*Dry*
			N/M	58.92*	16-Sep-2015	N/M	N/M	N/M	*Dry*
			1.03*	58.92	14-Sep-2016	N/M	N/M	N/M	*Dry*
			1.03	57.89	12-Sep-2017	N/M	N/M	N/M	*Dry*
			1.03	57.89	06-Sep-2018	N/M	N/M	N/M	*Dry*
			1.03*	57.89	04-Sep-2019	N/M	N/M	N/M	*Dry*
			---	57.89	08-Sep-2020	N/M	N/M	N/M	*Dry*
			1.03	57.89	07-Sep-2021	N/M	N/M	N/M	*Dry*
			N/M	57.89	12-Sep-2022	N/M	N/M	N/M	*Dry*
			N/M	57.89	12-Sep-2023	N/M	N/M	N/M	*Dry*
			N/M	57.89	27-Aug-2024	N/M	N/M	N/M	*Dry - Decommissioned 2025*
12(R)-SS	1080.792		0.83		4-Sep-2025	70.88	70.05	1,010.74	
13-SH	N/M	1,080.59	N/M	3.00	15-Mar-1990	2.62	N/M	1,077.97	
					15-Aug-1990	1.75	N/M	1,078.84	
					15-Oct-1990	1.76	N/M	1,078.83	
					15-May-1991	1.34	N/M	1,079.25	
					15-Nov-1991	2.00	N/M	1,078.59	
					04-May-1992	2.26	N/M	1,078.33	
					29-Oct-1992	2.15	N/M	1,078.44	
					18-May-1993	N/M	N/M	N/M	*Frozen*
					10-Nov-1993	1.48	N/M	1,079.11	
					21-Sep-1994	1.96	N/M	1,078.63	
					20-Sep-1995	2.30	N/M	1,078.29	
					04-Sep-1996	1.73	N/M	1,078.86	
					04-Sep-1997	2.11	N/M	1,078.48	
					16-Sep-1998	1.98	N/M	1,078.61	
					09-Sep-1999	1.18	N/M	1,079.41	
					28-Aug-2000	1.46	N/M	1,079.13	
					06-Sep-2001	2.34	N/M	1,078.25	
					04-Sep-2002	1.50	N/M	1,079.09	
					04-Sep-2003	1.80	N/M	1,078.79	
					09-Sep-2004	2.01	N/M	1,078.58	
					25-Aug-2005	1.30	N/M	1,079.29	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.68	N/M	1,078.91	
					05-Sep-2007	2.04	N/M	1,078.55	
					03-Sep-2008	0.92	N/M	1,079.67	
					25-Aug-2009	1.25	N/M	1,079.34	
					23-Aug-2010	2.00	N/M	1,078.59	
					22-Aug-2011	1.97	N/M	1,078.62	*Frost Jacked*
					22-Aug-2012	N/M	N/M	N/M	*Blocked at 1.0 m*
			1.67		26-Sep-2013	2.38	0.71	1,078.21	
	1079.048*	1080.784*	1.736*	2.80	21-May-2013	1.694*	0.518*	1,078.53	**Measured in the well*
	1,079.378	1,080.258	0.88	2.80	31-May-2014	3.32	2.44	1,076.94	*New piezometer drilled May 28, 2014*
			0.87	2.80	09-Sep-2014	2.02	1.14	1,078.23	
			0.86	4.04	15-Sep-2015	2.77	1.92	1,077.46	
			0.86	4.04	12-Sep-2016	1.21	0.35	1,079.03	
			0.87	2.80	13-Sep-2017	2.15	1.28	1,078.10	*Cloudy*
			0.91	2.80	06-Sep-2018	1.87	0.96	1,078.42	*Cloudy*
			0.99	2.80	05-Sep-2019	1.50	0.51	1,078.54	*Clear*
			1.07	2.80	08-Sep-2020	2.20	1.13	1,077.92	*Clear*
			0.99	2.80	08-Sep-2021	1.56	0.57	1,078.81	*Clear*
			1.02	2.80	12-Sep-2022	2.61	1.60	1,077.78	*Cloudy*
			1.00	2.80	13-Sep-2023	1.78	0.78	1,078.60	
			1.07	2.80	26-Aug-2024	1.40	0.32	1,079.06	
			1.11	2.80	2-Sep-2025	1.88	0.76	1,078.65	
13-IN	N/M	1,080.33	N/M	9.00	15-Mar-1990	7.46	N/M	1,072.87	
					15-Apr-1990	5.15	N/M	1,075.18	
					15-Aug-1990	2.69	N/M	1,077.64	
					15-Oct-1990	2.48	N/M	1,077.85	
					15-May-1991	2.78	N/M	1,077.55	
					15-Nov-1991	2.68	N/M	1,077.65	
					04-May-1992	2.77	N/M	1,077.57	
					29-Oct-1992	2.57	N/M	1,077.76	
					18-May-1993	2.92	N/M	1,077.41	
					10-Nov-1993	2.52	N/M	1,077.81	
					21-Sep-1994	2.68	N/M	1,077.65	
					20-Sep-1995	2.78	N/M	1,077.55	
					04-Sep-1996	2.54	N/M	1,077.79	
					04-Sep-1997	2.75	N/M	1,077.58	
					16-Sep-1998	3.11	N/M	1,077.22	
					09-Sep-1999	2.03	N/M	1,078.30	
					28-Aug-2000	N/M	N/M	N/M	*Blocked*
					06-Sep-2001	N/M	N/M	N/M	*Blocked*
					04-Sep-2002	N/M	N/M	N/M	*Blocked*
					04-Sep-2003	7.10	N/M	1,073.23	
					09-Sep-2004	5.36	N/M	1,074.97	
					25-Aug-2005	5.40	N/M	1,074.93	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	5.52	N/M	1,074.81	
					05-Sep-2007	N/M	N/M	N/M	*Blocked*
					05-Sep-2008	5.39	N/M	1,074.94	
					25-Aug-2009	5.25	N/M	1,075.08	
					23-Aug-2010	5.27	N/M	1,075.06	
					22-Aug-2011	5.08	N/M	1,075.25	
					22-Aug-2012	5.24	N/M	1,075.09	
			1.10		19-Sep-2013	N/M	N/M	N/M	*Peizometer compromised*
	1079.077*	1079.726*	0.649*	9.47	21-May-2013	2.546*	1.897*	1,077.18	**Measured in the well*
	1,079.338	1,080.230	0.89	9.47	31-May-2014	6.07	5.17	1,074.16	*New piezometer drilled May 28, 2014*
			0.87	9.47	09-Sep-2014	2.87	2.00	1,077.34	
			0.80	2.44	15-Sep-2015	3.24	2.44	1,076.90	
			0.80	2.44	12-Sep-2016	2.26	1.45	1,077.89	
			0.77	9.47	13-Sep-2017	2.32	1.54	1,077.80	*Clear*
			0.86	9.47	06-Sep-2018	2.41	1.55	1,077.79	*Clear*
			0.95	9.47	05-Sep-2019	2.11	1.16	1,077.92	*Clear*
			0.95	9.47	08-Sep-2020	2.37	1.42	1,077.66	*Clear*
			0.95	9.47	08-Sep-2021	2.58	1.64	1,077.70	*Clear*
			0.90	9.47	12-Sep-2022	2.46	1.56	1,077.78	*Clear*
			0.82	9.47	13-Sep-2023	2.30	1.48	1,077.86	
			0.89	9.47	26-Aug-2024	2.23	1.34	1,078.00	
			0.95	9.47	2-Sep-2025	2.33	1.38	1,077.95	
13-SS	N/M	1,080.12	N/M	N/M	15-Mar-1990	56.79	N/M	1,023.33	
					15-Apr-1990	56.69	N/M	1,023.43	
					15-Aug-1990	56.74	N/M	1,023.38	
					15-Oct-1990	56.69	N/M	1,023.44	
					15-May-1991	57.09	N/M	1,023.03	
					15-Nov-1991	57.36	N/M	1,022.76	
					04-May-1992	57.61	N/M	1,022.51	
					29-Oct-1992	57.70	N/M	1,022.42	
					18-May-1993	58.10	N/M	1,022.02	
					10-Nov-1993	58.68	N/M	1,021.44	
					21-Sep-1994	58.02	N/M	1,022.10	

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
					20-Sep-1995	N/M	N/M	N/M	*Damaged*
					05-Sep-1996	N/M	N/M	N/M	*Damaged*
					04-Sep-1997	N/M	N/M	N/M	*Damaged*
					04-Sep-1998	57.69	N/M	1,022.44	
					28-Aug-2000	57.30	N/M	1,022.82	
					06-Sep-2001	57.35	N/M	1,022.77	
					04-Sep-2002	57.37	N/M	1,022.75	
					04-Sep-2003	N/M	N/M	< 0.00	*Dry*
					09-Sep-2004	N/M	N/M	N/M	*Replaced by 13(R)SS*
			0.89	62.19	19-Sep-2013	56.64	55.74	1,023.48	
13(R)SS	N/M	N/M	N/M	62.00	10-Sep-2004	59.25	N/M	1,020.87	
					25-Aug-2005	N/M	N/M	N/M	
					08-Sep-2005	N/M	N/M	N/M	
					05-Sep-2007	5.27	N/M	1,074.85	*Possible Data Entry Error*
					04-Sep-2008	N/M	N/M	N/M	
					17-Sep-2009	57.07	N/M	1,023.05	
					23-Aug-2010	N/M	N/M	< 0.00	*Well Dry*
					23-Aug-2011	N/M	N/M	< 0.00	*Dry*
					23-Aug-2012	N/M	N/M	< 0.00	*Dry*
			1.19		19-Sep-2013	N/M	N/M	N/M	
	1,080.004	1,081.211	1.21	67.54	21-May-2014	58.39	57.18	1,022.82	*Measured in the well*
			1.12	67.54	09-Sep-2014	58.56	57.44	1,022.56	*Measured in the well*
			N/M	68.75*	16-Sep-2015	59.55	58.34	1,021.67	
			1.21*	68.75	13-Sep-2016	58.32	57.11	1,022.90	
			1.09	67.54	13-Sep-2017	58.33	57.24	1,022.77	*Clear*
			1.12	67.54	06-Sep-2018	58.35	57.23	1,022.78	*Clear*
			1.15	67.54	03-Sep-2019	58.22	57.06	1,022.94	*Clear*
			1.14	67.54	09-Sep-2020	N/M	N/M	N/M	*Could not get accurate water level reading due to equipment malfunction*
			1.15	67.54	08-Sep-2021	58.13	56.98	1,023.03	*Clear*
			1.13	67.54	12-Sep-2022	58.10	56.97	1,023.04	*Clear*
			1.14	67.54	12-Sep-2023	58.04	56.90	1,023.10	
			1.11	67.54	26-Aug-2024	58.10	56.99	1,023.01	
			1.14	67.54	2-Sep-2025	58.12	56.99	1,023.02	
14-SH [Decommissioned]	N/M	1,082.36	N/M	5.20	10-Nov-1993	1.80	N/M	1,080.56	
					21-Sep-1994	1.62	N/M	1,080.74	
					20-Sep-1995	1.77	N/M	1,080.59	
					05-Sep-1996	1.46	N/M	1,080.91	
					03-Sep-1997	1.51	N/M	1,080.85	
					15-Sep-1998	1.72	N/M	1,080.64	
					09-Sep-1999	2.03	N/M	1,080.33	
					28-Aug-2000	1.74	N/M	1,080.62	
					06-Sep-2001	2.28	N/M	1,080.08	
					05-Sep-2002	1.90	N/M	1,080.46	
					04-Sep-2003	2.41	N/M	1,079.95	
					09-Sep-2004	1.96	N/M	1,080.40	
					25-Aug-2005	N/M	N/M	< 0.00	*Dry*
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	2.57	N/M	1,079.79	
					05-Sep-2007	2.26	N/M	1,080.10	
					03-Sep-2008	3.22	N/M	1,079.14	
					25-Aug-2009	2.87	N/M	1,079.49	
					23-Aug-2010	2.52	N/M	1,079.84	
					23-Aug-2011	2.70	N/M	1,079.66	
					23-Aug-2012	2.61	N/M	1,079.75	
			1.41		19-Sep-2013	4.71	3.30	1,077.65	
	1,086.513	1,087.985	1.47	3.75	21-May-2014	2.38	0.91	1,085.60	
			1.43	3.75	09-Sep-2014	2.66	1.23	1,085.28	
			1.45	3.75	15-Sep-2015	4.24	2.79	1,083.72	
			1.45	3.75	13-Sep-2016	4.45	3.00	1,083.51	
			1.44	3.75	11-Sep-2017	2.94	1.50	1,085.01	*Clear*
			1.54	3.75	05-Sep-2018	2.87	1.33	1,085.19	*Yellowish*
			1.72	3.75	05-Sep-2019	2.80	1.07	1,085.44	*Yellowish*
			0.77	3.75	09-Sep-2020	3.28	2.51	1,084.00	
			1.72	3.75	07-Sep-2021	2.86	1.13	1,085.38	
			1.78	3.75	08-Sep-2021	3.56	1.79	1,084.73	*Yellowish*
			0.28	3.75	12-Sep-2023	2.05	1.77	1,084.74	*New Stickup*
			0.81	3.75	27-Aug-2024	1.65	0.84	1,085.68	*Decommissioned in 2025*
14(R)-SH	1086.225		0.94		3-Sep-2025	1.94	1.00	1,085.40	
14-IN [Decommissioned]	N/M	1,082.31	N/M	12.80	10-Nov-1993	N/M	N/M	< 0.00	*Dry*
					21-Sep-1994	N/M	N/M	< 0.00	*Dry*
					20-Sep-1995	N/M	N/M	< 0.00	*Dry*
					05-Sep-1996	N/M	N/M	< 0.00	*Dry*
					03-Sep-1997	N/M	N/M	< 0.00	*Dry*
					15-Sep-1998	N/M	N/M	< 0.00	*Dry*
					09-Sep-1999	N/M	N/M	< 0.00	*Dry*
					28-Aug-2000	N/M	N/M	< 0.00	*Dry*
					06-Sep-2001	N/M	N/M	< 0.00	*Dry*
					05-Sep-2002	N/M	N/M	< 0.00	*Dry*
					04-Sep-2003	N/M	N/M	< 0.00	*Dry*
					09-Sep-2004	N/M	N/M	N/M	
					25-Aug-2005	N/M	N/M	< 0.00	*Dry*
					08-Sep-2005	N/M	N/M	< 0.00	*Dry*
					07-Sep-2006	N/M	N/M	< 0.00	*Dry*
					05-Sep-2007	13.84	N/M	1,068.47	
					26-Aug-2008	N/M	N/M	< 0.00	*Dry*
					25-Aug-2009	N/M	N/M	< 0.00	*Dry*
					23-Aug-2010	N/M	N/M	< 0.00	*Dry*
					23-Aug-2011	N/M	N/M	< 0.00	*Dry*
					23-Aug-2012	N/M	N/M	< 0.00	*Dry*
			0.83		19-Sep-2013	N/M	N/M	< 0.00	*Dry*
	1,086.539	1,087.342	0.80	12.82	21-May-2014	N/M	N/M	< 0.00	*Dry*
			0.80	12.82	09-Sep-2014	N/M	N/M	< 0.00	*Dry*
			N/M	12.82	15-Sep-2015	N/M	N/M	< 0.00	*Dry*
			0.80	12.82	13-Sep-2016	N/M	N/M	< 0.00	*Dry*
			0.80	12.82	11-Sep-2017	N/M	N/M	< 0.00	*Dry*
			0.80	12.82	05-Sep-2018	N/M	N/M	< 0.00	*Dry*
			0.93	12.82	05-Sep-2019	N/M	N/M	< 0.00	*Dry*
			---	12.82	09-Sep-2020	N/M	N/M	< 0.00	*Dry*
			0.93	12.82	07-Sep-2021	N/M	N/M	N/M	*Dry*
			0.90	12.82	13-Sep-2022	N/M	N/M	N/M	*Dry*
			0.90	12.82	12-Sep-2023	N/M	N/M	N/M	*Dry*
			0.90	12.82	27-Aug-2024	N/M	N/M	N/M	*Dry- Decommissioned in 2025*
14(R)-IN	1086.418		N/M		3-Sep-2025	N/M	N/M	N/M	*No water level data due to data collection error*
14-SS [Decommissioned]	N/M	1,082.38	N/M	61.00	10-Nov-1993	N/M	N/M	< 0.00	*Dry*
					21-Sep-1994	N/M	N/M	< 0.00	*Dry*
					20-Sep-1995	N/M	N/M	< 0.00	*Dry*
					05-Sep-1996	N/M	N/M	< 0.00	*Dry*
					03-Sep-1997	N/M	N/M	< 0.00	*Dry*
					15-Sep-1998	N/M	N/M	< 0.00	*Dry*
					28-Aug-2000	N/M	N/M	< 0.00	*Dry*
					06-Sep-2001	N/M	N/M	< 0.00	*Dry*
					05-Sep-2002	N/M	N/M	< 0.00	*Dry*
					04-Sep-2003	N/M	N/M	< 0.00	*Dry*
					09-Sep-2004	N/M	N/M	< 0.00	*Dry*
					08-Sep-2005	N/M	N/M	< 0.00	*Dry*
					07-Sep-2006	N/M	N/M	< 0.00	*Dry*
					05-Sep-2007	N/M	N/M	< 0.00	*Dry*
					03-Sep-2008	N/M	N/M	< 0.00	*Dry*
					25-Aug-2009	N/M	N/M	< 0.00	*Dry*
					23-Aug-2010	N/M	N/M	< 0.00	*Well Dry*
					23-Aug-2011	N/M	N/M	< 0.00	*Dry*
					23-Aug-2012	N/M	N/M	< 0.00	*Dry*
			0.75	60.35	19-Sep-2013	N/M	N/M	< 0.00	*Dry*
	1,086.566	1,087.344	0.78	60.95	21-May-2014	N/M	N/M	< 0.00	*Dry*
			0.79	60.95	09-Sep-2014	N/M	N/M	< 0.00	*Dry*
			N/M	60.95*	15-Sep-2015	N/M	N/M	< 0.00	*Dry*
			0.78*	60.95*	13-Sep-2016	N/M	N/M	< 0.00	*Dry*
			0.78	60.95	11-Sep-2017	N/M	N/M	< 0.00	*Dry*
			0.78	60.95	05-Sep-2018	N/M	N/M	< 0.00	*Dry*
			0.78	60.95	05-Sep-2019	N/M	N/M	< 0.00	*Dry*
			---	60.95	09-Sep-2020	N/M	N/M	< 0.00	*Dry*
			0.78	60.95	07-Sep-2021	N/M	N/M	N/M	*Dry*
			0.82	60.95	13-Sep-2022	N/M	N/M	N/M	*Dry*
			0.82	60.95	12-Sep-2023	N/M	N/M	N/M	*Dry*
			0.82	60.95	27-Aug-2024	N/M	N/M	N/M	*Dry- Decommissioned in 2025*
14(R)-SS	1086.596		0.76		3-Sep-2025	67.82	67.06	1,019.54	
15-SH	N/M	1,082.26	N/M	5.18	10-Nov-1993	5.05	N/M	1,077.21	
					21-Sep-1994	1.73	N/M	1,080.53	
					20-Sep-1995	1.82	N/M	1,080.44	
					04-Sep-1996	1.71	N/M	1,080.55	
					04-Sep-1997	1.70	N/M	1,080.56	
					16-Sep-1998	1.96	N/M	1,080.30	

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
					09-Sep-1999	3.08	N/M	1,079.18	
					28-Aug-2000	2.22	N/M	1,080.04	
					07-Sep-2001	3.83	N/M	1,078.43	
					05-Sep-2002	2.25	N/M	1,080.01	
					03-Sep-2003	2.18	N/M	1,080.08	
					08-Sep-2004	2.16	N/M	1,080.10	
					26-Aug-2005	2.14	N/M	1,080.12	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	2.27	N/M	1,079.99	
					06-Sep-2007	2.01	N/M	1,080.25	
					04-Sep-2008	2.53	N/M	1,079.73	
					25-Aug-2009	2.40	N/M	1,079.86	
					23-Aug-2010	2.47	N/M	1,079.79	
					22-Aug-2011	N/M	N/M	N/M	*Blocked @1.0 m, replaced*
					22-Aug-2012	N/M	N/M	N/M	*Blocked at 0.82 m*
			1.15		19-Sep-2013	3.27	2.12	1,078.99	
	1,081.264	1,082.354	1.09	5.22	23-May-2014	2.82	1.72	1,079.54	*Measured in the well*
			1.04	5.22	10-Sep-2014	2.84	1.80	1,079.47	*Measured in the well*
			0.81	6.31	16-Sep-2015	4.65	3.84	1,077.42	*Measured in the well*
			0.81	6.31	14-Sep-2016	2.07	1.25	1,080.01	
			1.02	5.22	12-Sep-2017	2.67	1.66	1,079.61	*Clear*
			1.04	5.22	18-Sep-2018	2.69	1.66	1,079.61	*Clear*
			1.11	5.22	04-Sep-2019	2.35	1.23	1,080.03	*Clear*
			0.80	5.22	09-Sep-2020	4.04	3.24	1,078.03	*Measured in the sampling well*
			1.11	5.22	08-Sep-2021	2.48	1.36	1,079.90	*Measured in the sampling well*
			1.09	5.22	13-Sep-2022	3.15	2.06	1,079.21	*Measured in the sampling well*
			1.14	5.22	13-Sep-2023	2.47	1.33	1,079.93	*Measured in the sampling well*
			1.21	5.22	27-Aug-2024	2.17	0.96	1,080.30	*Measured in the sampling well*
			1.27	5.22	3-Sep-2025	2.51	1.24	1,080.03	*Measured in the sampling well*
15-IN	N/M	1,082.14	N/M	9.60	10-Nov-1993	N/M	N/M	< 0.00	*Dry*
					21-Sep-1994	4.73	N/M	1,077.41	
					20-Sep-1995	3.24	N/M	1,078.90	
					04-Sep-1996	3.14	N/M	1,079.00	
					04-Sep-1997	3.27	N/M	1,078.87	
					16-Sep-1998	3.47	N/M	1,078.67	
					09-Sep-1999	3.72	N/M	1,078.42	
					28-Aug-2000	3.95	N/M	1,078.19	
					06-Sep-2001	2.32	N/M	1,079.82	
					05-Sep-2002	4.02	N/M	1,078.12	
					03-Sep-2003	3.86	N/M	1,078.28	
					08-Sep-2004	3.79	N/M	1,078.35	
					26-Aug-2005	3.58	N/M	1,078.56	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	3.84	N/M	1,078.30	
					06-Sep-2007	3.57	N/M	1,078.57	
					04-Sep-2008	3.65	N/M	1,078.49	
					25-Aug-2009	3.70	N/M	1,078.44	
					23-Aug-2010	3.76	N/M	1,078.38	
					22-Aug-2011	3.64	N/M	1,078.50	
					22-Aug-2012	3.80	N/M	1,078.34	
			0.85		19-Sep-2013	2.48	1.64	1,079.66	
	1,081.298	1,082.191	0.89	9.25	23-May-2014	3.83	2.93	1,078.37	
			0.60	9.25	10-Sep-2014	3.74	3.14	1,078.16	
			0.84	9.25	16-Sep-2015	4.61	3.78	1,077.52	
			0.84	9.25	14-Sep-2016	4.61	3.78	1,077.52	
			0.80	9.25	12-Sep-2017	3.71	2.91	1,078.39	*Clear*
			0.79	9.25	06-Sep-2018	3.89	3.11	1,078.19	*Clear*
			0.90	9.25	04-Sep-2019	3.74	2.84	1,078.46	*Clear*
			0.73	9.25	09-Sep-2020	3.83	3.10	1,078.20	*Clear*
			0.90	9.25	08-Sep-2021	4.96	4.06	1,077.24	*Clear*
			0.93	9.25	13-Sep-2022	3.87	2.93	1,078.36	*Clear*
			0.92	9.25	13-Sep-2023	3.94	3.02	1,078.28	
			0.87	9.25	27-Aug-2024	4.19	3.32	1,077.98	
			0.95	9.25	3-Sep-2025	3.90	2.96	1,078.34	
15-SS [Decommissioned]	N/M	1,082.16	N/M	N/M	10-Nov-1993	60.02	N/M	1,022.14	
					21-Sep-1994	60.28	N/M	1,021.88	
					20-Sep-1995	60.20	N/M	1,021.96	
					04-Sep-1996	60.01	N/M	1,022.15	
					04-Sep-1997	60.31	N/M	1,021.85	
					16-Sep-1998	60.42	N/M	1,021.74	
					28-Aug-2000	60.15	N/M	1,022.01	
					06-Sep-2001	59.84	N/M	1,022.32	
					05-Sep-2002	59.91	N/M	1,022.25	
					03-Sep-2003	N/M	N/M	< 0.00	*Dry*
					08-Sep-2004	N/M	N/M	N/M	*Replaced by 15(R)SS*
			0.74	61.10	19-Sep-2013	N/M	N/M	< 0.00	*Dry- Decommissioned in 2025*
15(R)SS [Decommissioned]	N/M	N/M	N/M	62.50	10-Sep-2004	60.07	N/M	1,022.09	
					08-Sep-2005	N/M	N/M	N/M	
					04-Sep-2008	N/M	N/M	N/M	
					17-Sep-2009	59.49	N/M	1,022.67	
					23-Aug-2010	N/M	N/M	N/M	*No water level, could not get tape down*
					23-Aug-2011	N/M	N/M	N/M	*Dry*
					22-Aug-2012	N/M	N/M	N/M	*Dry*
				65.27	19-Sep-2013	59.22	N/M	1,022.94	*Decommissioned in 2025*
15(2R)SS	1,081.129	1,082.118	0.99	63.00	29-May-2014	59.06	58.07	1,023.06	*New well drilled May 27-29, 2014*
			0.99	62.34	11-Sep-2014	59.28	58.29	1,022.84	
			N/M	63.99*	16-Sep-2015	60.03	59.04	1,022.09	
			0.99*	63.99	13-Sep-2016	59.05	58.06	1,023.07	
			0.94	63.00	13-Sep-2017	59.06	58.12	1,023.01	*Clear*
			0.87	63.00	06-Sep-2018	59.06	58.19	1,022.94	*Clear*
			1.05	63.00	04-Sep-2019	58.89	57.85	1,023.28	*Clear*
			1.00	63.00	09-Sep-2020	N/M	N/M	N/M	*Could not get accurate water level reading due to equipment malfunction*
			1.05	63.00	08-Sep-2021	58.87	57.83	1,023.30	*Clear*
			1.01	63.00	12-Sep-2022	58.80	57.79	1,023.34	*Clear*
			1.04	63.00	13-Sep-2023	58.77	57.73	1,023.40	
			1.06	63.00	27-Aug-2024	58.84	57.78	1,023.35	
			1.05	63.00	2-Sep-2025	58.86	57.82	1,023.29	
16-SH	N/M	1,081.40	N/M	5.33	21-Sep-1994	4.18	N/M	1,077.22	
					20-Sep-1995	2.28	N/M	1,079.12	
					04-Sep-1996	1.91	N/M	1,079.49	
					03-Sep-1997	1.98	N/M	1,079.42	
					15-Sep-1998	2.22	N/M	1,079.18	
					09-Sep-1999	2.48	N/M	1,078.92	
					28-Aug-2000	1.68	N/M	1,079.72	
					06-Sep-2001	1.94	N/M	1,079.46	
					05-Sep-2002	1.19	N/M	1,080.21	
					04-Sep-2003	1.65	N/M	1,079.75	
					09-Sep-2004	1.74	N/M	1,079.66	
					25-Aug-2005	1.40	N/M	1,080.00	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.60	N/M	1,079.80	
					05-Sep-2007	1.16	N/M	1,080.24	
					03-Sep-2008	1.53	N/M	1,079.87	
					25-Aug-2009	0.83	N/M	1,080.57	
					23-Aug-2010	2.10	N/M	1,079.30	
					22-Aug-2011	1.46	N/M	1,079.94	
					22-Aug-2012	1.65	N/M	1,079.75	
			0.69		19-Sep-2013	2.15	1.46	1,079.25	
	1,079.888	1,080.637	0.75	5.33	23-May-2014	2.17	1.42	1,078.46	
			0.70	5.33	09-Sep-2014	2.50	1.81	1,078.08	
			0.69	6.01	15-Sep-2015	3.15	2.47	1,077.42	
			0.69	6.01	13-Sep-2016	1.64	0.96	1,078.93	
			0.64	5.33	12-Sep-2017	2.48	1.84	1,078.05	*Clear*
			0.63	5.33	06-Sep-2018	2.06	1.43	1,078.46	*Clear*
			0.71	5.33	04-Sep-2019	1.84	1.13	1,078.77	*Clear*
			0.72	5.33	08-Sep-2020	2.37	1.65	1,078.25	*Clear*
			0.71	5.33	07-Sep-2021	1.45	0.75	1,079.14	*Clear*
			0.73	5.33	12-Sep-2022	2.72	2.00	1,077.89	*Clear*
			0.71	5.33	13-Sep-2023	1.86	1.15	1,078.74	
			0.68	5.33	26-Aug-2024	1.20	0.52	1,079.37	
			0.71	5.33	2-Sep-2025	2.02	1.31	1,078.58	
16-IN	N/M	1,080.88	N/M	9.90	21-Sep-1994	N/M	N/M	< 0.00	*Dry*
					20-Sep-1995	5.57	N/M	1,075.31	
					04-Sep-1996	4.55	N/M	1,076.33	
					03-Sep-1997	4.84	N/M	1,076.04	
					15-Sep-1998	4.98	N/M	1,075.90	
					09-Sep-1999	4.69	N/M	1,076.19	
					28-Aug-2000	4.89	N/M	1,075.99	
					06-Sep-2001	4.56	N/M	1,076.32	
					05-Sep-2002	4.56	N/M	1,076.32	
					04-Sep-2003	3.80	N/M	1,077.08	
					09-Sep-2004	3.94	N/M	1,076.94	
					25-Aug-2005	3.63	N/M	1,077.25	

Table 4.1
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Levels and Elevations

AECOM

Monitoring Well	Ground Elevation	Top of Casing Elevation	Stickup	Total Depth of Well	Date Measured	Depth To Groundwater from Top of Casing	Depth To Groundwater from Ground Surface	Groundwater Surface Elevation	Comments
	(masl)	*(masl)*	*(m)*	*(mBGS)*	*(dd-mmm-yyyy)*	*(mTOC)*	*(mBGS)*	*(masl)*	
					08-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	4.06	N/M	1,076.82	
					05-Sep-2007	3.29	N/M	1,077.59	
					03-Sep-2008	4.22	N/M	1,076.66	
					25-Aug-2009	3.94	N/M	1,076.94	
					23-Aug-2010	3.99	N/M	1,076.89	
					22-Aug-2011	3.00	N/M	1,077.88	
					22-Aug-2012	1.69	N/M	1,079.19	
			0.85		19-Sep-2013	2.02	1.17	1,078.87	
	1,079.850	1,080.725	0.88	9.66	23-May-2014	3.56	2.68	1,077.17	
			0.82	9.66	09-Sep-2014	2.63	1.80	1,078.05	
			0.81	10.31	15-Sep-2015	4.47	3.66	1,076.19	
			0.81	10.31	13-Sep-2016	1.53	0.72	1,079.13	
			0.74	9.66	12-Sep-2017	2.56	1.81	1,078.04	*Clear*
			0.76	9.66	06-Sep-2018	2.35	1.60	1,078.25	*Clear*
			0.84	9.66	04-Sep-2019	2.01	1.17	1,078.62	*Clear*
			0.85	9.66	08-Sep-2020	2.64	1.79	1,078.00	*Clear*
			0.84	9.66	07-Sep-2021	1.74	0.90	1,078.95	*Clear*
			0.84	9.66	12-Sep-2022	2.53	1.69	1,078.16	*Clear*
			0.79	9.66	12-Sep-2023	1.97	1.18	1,078.67	
			0.82	9.66	26-Aug-2024	1.37	0.55	1,079.30	*No water retrieved for sample*
			0.88	9.66	2-Sep-2025	2.05	1.17	1,078.68	
17-SH	N/M	1,080.97	N/M	3.81	21-Sep-1994	3.43	N/M	1,077.54	
					20-Sep-1995	1.84	N/M	1,079.13	
					04-Sep-1996	1.09	N/M	1,079.88	
					03-Sep-1997	1.11	N/M	1,079.86	
					16-Sep-1998	1.48	N/M	1,079.49	
					09-Sep-1999	2.17	N/M	1,078.80	
					28-Aug-2000	1.80	N/M	1,079.17	
					06-Sep-2001	2.06	N/M	1,078.91	
					05-Sep-2002	1.20	N/M	1,079.77	
					03-Sep-2003	1.80	N/M	1,079.17	
					08-Sep-2004	1.95	N/M	1,079.02	
					26-Aug-2005	1.58	N/M	1,079.39	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	1.80	N/M	1,079.17	
					06-Sep-2007	1.32	N/M	1,079.65	
					04-Sep-2008	1.64	N/M	1,079.33	
					25-Aug-2009	1.77	N/M	1,079.20	
					23-Aug-2010	2.29	N/M	1,078.68	
					23-Aug-2011	1.77	N/M	1,079.20	
					22-Aug-2012	1.81	N/M	1,079.16	
			0.95		19-Sep-2013	2.45	1.50	1,078.52	
	1,079.309	1,080.325	1.02	3.81	23-May-2014	1.43	0.41	1,078.90	
			0.95	3.81	10-Sep-2014	2.10	1.15	1,078.16	
			0.99	3.81	16-Sep-2015	3.30	2.31	1,077.00	
			0.99	3.81	14-Sep-2016	1.73	0.74	1,078.57	
			0.96	3.81	12-Sep-2017	2.17	1.21	1,078.10	*Clear*
			0.98	3.81	06-Sep-2018	2.18	1.21	1,078.10	*Clear*
			1.06	3.81	04-Sep-2019	2.02	0.96	1,078.35	*Clear*
			1.15	3.81	09-Sep-2020	2.29	1.14	1,078.17	*Clear*
			1.06	3.81	08-Sep-2021	1.98	0.93	1,078.38	*Clear*
			1.20	3.81	13-Sep-2022	2.65	1.45	1,077.86	*Clear*
			1.10	3.81	13-Sep-2023	2.02	0.92	1,078.39	
			1.20	3.81	27-Aug-2024	1.69	0.49	1,078.82	
			1.20	3.81	3-Sep-2025	2.49	1.28	1,078.03	
17-IN	N/M	1,080.24	N/M	8.38	21-Sep-1994	N/M	N/M	< 0.00	*Dry*
					20-Sep-1995	2.24	N/M	1,078.00	
					04-Sep-1996	1.98	N/M	1,078.26	
					03-Sep-1997	2.03	N/M	1,078.21	
					16-Sep-1998	2.63	N/M	1,077.61	
					09-Sep-1999	2.72	N/M	1,077.52	
					28-Aug-2000	2.86	N/M	1,077.38	
					06-Sep-2001	3.00	N/M	1,077.24	
					05-Sep-2002	3.69	N/M	1,076.55	
					03-Sep-2003	2.80	N/M	1,077.44	
					08-Sep-2004	1.71	N/M	1,078.53	
					26-Aug-2005	2.79	N/M	1,077.45	
					07-Sep-2005	N/M	N/M	N/M	
					07-Sep-2006	0.61	N/M	1,079.63	
					06-Sep-2007	2.28	N/M	1,077.96	
					04-Sep-2008	2.53	N/M	1,077.71	
					25-Aug-2009	2.52	N/M	1,077.72	
					23-Aug-2010	2.77	N/M	1,077.47	
					23-Aug-2011	2.35	N/M	1,077.89	
					22-Aug-2012	2.51	N/M	1,077.73	
			0.84		19-Sep-2013	2.16	1.32	1,078.09	
	1,079.382	1,080.227	0.85	8.05	23-May-2014	2.31	1.46	1,077.92	
			0.86	8.05	10-Sep-2014	2.37	1.51	1,077.87	
			0.88	8.05	16-Sep-2015	3.32	2.44	1,076.94	
			0.88	8.05	14-Sep-2016	2.31	1.43	1,077.95	
			0.85	8.05	12-Sep-2017	2.36	1.51	1,077.87	*Clear*
			0.86	8.05	06-Sep-2018	2.63	1.77	1,077.61	*Clear*
			0.99	8.05	04-Sep-2019	2.48	1.49	1,077.90	*Clear*
			0.93	8.05	09-Sep-2020	2.69	1.76	1,077.62	*Clear*
			0.99	8.05	08-Sep-2021	2.82	1.83	1,077.55	*Clear*
			1.19	8.05	13-Sep-2022	2.67	1.48	1,077.90	*Clear*
			0.89	8.05	13-Sep-2023	2.20	1.31	1,078.07	*Cut down PZ, now locks.*
			0.96	8.05	27-Aug-2024	2.77	1.81	1,077.58	
			0.98	8.05	3-Sep-2025	2.04	1.06	1,078.32	

N/M	Data not available / not measured
mBGS	metres Below Ground Surface
mTOC	metres below Top of Casing
masl	metres above sea level
	Total depths in the first row for each well are taken from well installation information
*	Calculation found using previous years stickup value

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
01-SH [Decommissioned]	21-May-1992	482	7.49	3.5	
	04-Nov-1992	399	7.25	4.5	
01A-SH [Decommissioned]	13-Jan-1993	193	6	5	
	31-May-1994	151	5.87	6	
	22-Sep-1994	628	7.24	5	
	02-Nov-1994	637	7.28	6	
	04-Sep-1996	117	5.68	3.7	
	05-Sep-1997	123	5.94	6.7	
	16-Sep-1998	119	5.67	7.1	
	09-Sep-1999	133	5.68	8.2	
	06-Sep-2000	561	5.68	9.9	
	07-Sep-2001	311	5.68	10.1	
	04-Sep-2002	---	5.68	---	Dry
	11-Sep-2002	216	5.68	10	
	03-Sep-2003	312	5.68	12	
	08-Sep-2004	924	5.68	6	
	26-Aug-2005	---	5.68	---	Water level only
	07-Sep-2005	383	5.68	13.2	
	06-Sep-2006	307	5.68	8.9	
	06-Sep-2007	570	5.68	8.5	
	04-Sep-2008	173	5.68	8.6	
	10-Sep-2009	228	5.68	9.1	
	09-Sep-2010	437	5.68	9.3	Smells like rotten eggs
	08-Sep-2011	204	5.68	17.8	Re-chcked pH value after re-calibrating probe, Sulphur odour, yellowish
	06-Sep-2012	186.2	5.68	14.2	Yellow tint, sulphurous odour
	26-Sep-2013	182	5.68	10.3	Green tea-colored water; sulphur odour
	17-Sep-2014	373	5.68	8.6	Green tea-colored water; sulphur odour, low volume
	29-Sep-2015	187	5.68	10.7	Very limited sample and green tea color
	27-Sep-2016	198	5.68	5.3	Limited sample and green tea color
	27-Sep-2017	200	5.68	10.28	Limited sample and green tea color
	18-Sep-2018	794	5.68	3.55	Slightly yellow
	17-Sep-2019	134	5.68	8.23	Brown, sulphur odour
	21-Sep-2020	182	5.68	9.00	white flakes, sulphur odor
	22-Sep-2021	152	5.38	7.81	Brown/yellow tint before & after filtering, sulphur odour
	29-Sep-2022	88	5.20	7.49	Brown/yellow, sulphur odour
	28-Sep-2023	189	5.48	7.40	Limited water
	11-Sep-2024	163	5.63	8.90	Decommissioned 2025
01(R)-SH	18-Sep-2025	1330	6.12	10.60	
01-IN [Decommissioned]	16-May-1991	601	7.18	6	
	06-Nov-1991	667	7.63	5	
	04-Nov-1992	614	7.63	3.5	
	19-May-1993	523	7.25	3	
01A-IN	13-Jan-1993	398	6.97	3	
	22-Sep-1994	246	5.67	9	
	28-Sep-1995	592	6.92	5	
	04-Sep-1996	788	7.11	2	
	04-Sep-1998	788	7.11	2	
	15-Sep-1998	689	7.02	6.8	
	09-Sep-1999	1024	7.1	6.6	
	06-Sep-2000	693	6.55	5.8	
	07-Sep-2001	628	7.15	6.7	
	04-Sep-2002	922	6.22	6	
	11-Sep-2002	864	6.51	7	
	03-Sep-2003	816	6.85	5.6	
	08-Sep-2004	697	6.31	4.7	
	26-Aug-2005	---	---	---	Water level only
	07-Sep-2005	827	6.53	9.8	
	06-Sep-2006	841	6.76	6.5	
	06-Sep-2007	815	6.56	7.7	
	04-Sep-2008	742	6.91	6.9	
	10-Sep-2009	826	6.46	8.7	
	09-Sep-2010	849	6.81	7.6	Metallic odour
	08-Sep-2011	895	6.5	15.9	Metallic odour, yellowish
	06-Sep-2012	853	6.68	10.6	Yellow tint, hydrocarbon odour
	26-Sep-2013	816	5.54	7.1	Green tea-colored water
	17-Sep-2014	1052	6.81	8.3	Green tea-colored water
	29-Sep-2015	691	6.43	7.8	Cloudy light brown colored water
	27-Sep-2016	869	5.06	7.7	Cloudy light brown colored water
	27-Sep-2017	897	6.66	6.18	Slightly yellow
	18-Sep-2018	735	6.24	4.19	Slightly yellow
	17-Sep-2019	514	6.85	5.91	Brown tint
	21-Sep-2020	823	7.02	7.70	
	22-Sep-2021	826	6.57	7.32	Brown tint
	29-Sep-2022	550	6.81	6.40	Brown tint
	28-Sep-2023	749	6.86	8.10	
	11-Sep-2024	536	6.64	7.40	
	18-Sep-2025	765	6.50	8.30	
01-SS [Decommissioned]	16-May-1991	388	7.54	6.5	
	06-Nov-1991	488	7.65	5.5	
	04-Nov-1992	419	7.25	4.5	
01A-SS [Decommissioned]	07-Sep-2001	---	---	---	Dry
	06-Sep-2002	---	---	---	Dry
	08-Sep-2004	---	---	---	Dry
	26-Aug-2005	---	---	---	Dry
	07-Sep-2006	---	---	---	Dry
	29-Aug-2007	---	---	---	Dry
	04-Sep-2008	---	---	---	Dry
	10-Sep-2009	---	---	---	Dry
	09-Sep-2010	---	---	---	Dry
	09-Sep-2011	---	---	---	Dry
	22-Aug-2012	---	---	---	Dry
	26-Sep-2013	---	---	---	Dry
	17-Sep-2014	---	---	---	Dry
	29-Sep-2015	---	---	---	Dry
	27-Sep-2016	---	---	---	Dry
	27-Sep-2017	---	---	---	Dry
	18-Sep-2018	---	---	---	Dry
	17-Sep-2019	---	---	---	Dry
	21-Sep-2020	---	---	---	Dry
	22-Sep-2021	---	---	---	Dry
	29-Sep-2022	---	---	---	Dry
	28-Sep-2023	---	---	---	Dry

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
01(2R)-SS	18-Sep-2025	816	7.67	8.40	
02-SH [Decommissioned]	04-Nov-1991	257	7.7	4.5	
	12-May-1992	256	7.41	4	
	03-Nov-1992	254	7.38	4	
	19-May-1993	210	7.31	3	
02-IN [Decommissioned]	16-May-1991	407	7.3	6.5	
	04-Nov-1991	420	7.41	4	
	03-Nov-1992	419	6.93	3.5	
	19-May-1993	371	6.94	4	
03-SH	16-May-1991	312	7.5	6	
	04-Nov-1991	376	7.72	5	
	12-May-1992	394	7.28	3.5	
	03-Nov-1992	337	7.35	4	
	18-May-1993	383	7.6	3	
	10-Nov-1993	347	6.99	2	
	31-May-1994	555	7.21	8	
	21-Sep-1994	555	7.6	11	
	01-Nov-1994	551	7.62	7	
	28-Sep-1995	519	7.34	8	
	04-Sep-1996	600	7.46	5.9	
	04-Sep-1997	612	7.37	6.1	
	15-Sep-1998	643	7.42	7.1	
	09-Sep-1999	654	7.48	10.2	
	06-Sep-2000	635	7.32	9.1	
	06-Sep-2001	676	7.74	9.4	
	06-Sep-2002	821	7.59	8.3	
	03-Sep-2003	721	7.42	10.2	
	09-Sep-2004	590	6.86	5.6	
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	648	7.33	9.6	
	07-Sep-2006	744	7.66	9.8	
	05-Sep-2007	561	7.1	9.9	
	03-Sep-2008	606	7.42	8.6	
	09-Sep-2009	817	7.36	9.7	
	08-Sep-2010	934	7.46	8.9	
	07-Sep-2011	895	7.2	17.9	
	05-Sep-2012	937	7.34	10.1	Clear
	26-Sep-2013	408	5.58	11.2	
	16-Sep-2014	769	7.21	13.9	
	28-Sep-2015	705	7.09	10.0	From protector
	28-Sep-2016	791	6.98	9.1	
	27-Sep-2017	769	7.04	11.24	Clear
	18-Sep-2018	664	7.13	6.86	Clear
	17-Sep-2019	500	7.33	9.19	Clear
	22-Sep-2020	725	7.18	10.20	Clear
	22-Sep-2021	750	7.17	9.69	Clear
	29-Sep-2022	565	7.20	8.27	Clear
	29-Sep-2023	893	7.27	8.60	Clear
	10-Sep-2024	712	7.09	13.90	Clear
	17-Sep-2025	877	7.08	10.80	
03-IN	16-May-1991	640	7.1	6	
	04-Nov-1991	595	7.45	4	
	03-Nov-1992	587	7.02	4	
	18-May-1993	624	7.04	3	
	10-Nov-1993	549	6.72	4	
	21-Sep-1994	739	7.61	9	
	28-Sep-1995	821	6.96	6.5	
	04-Sep-1996	862	7.4	3.4	
	04-Sep-1997	837	7.33	5.9	
	15-Sep-1998	812	7.21	7	
	09-Sep-1999	842	7.27	7.2	
	06-Sep-2000	825	7.28	8.3	
	06-Sep-2001	817	7.42	6.1	
	04-Sep-2002	975	7.53	7.3	
	03-Sep-2003	838	7.65	9.9	
	09-Sep-2004	693	6.99	4.8	
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	818	7.37	7.8	
	07-Sep-2006	927	7.4	10.1	
	05-Sep-2007	709	7.12	8.6	
	03-Sep-2008	849	7.3	6.3	
	09-Sep-2009	868	7.25	8.1	
	08-Sep-2010	920	7.39	7.6	
	07-Sep-2011	882	7.02	13.2	
	05-Sep-2012	903	7.34	8.1	Clear
	26-Sep-2013	812	6.3	7.7	Clear
	16-Sep-2014	757	7.13	12.3	
	28-Sep-2015	767	7.77	7.7	From protector
	26-Sep-2016	830	7.01	7.0	
	27-Sep-2017	771	7.24	8.71	Clear
	18-Sep-2018	712	7.42	5.02	Clear
	17-Sep-2019	518	7.35	9.18	Clear
	22-Sep-2020	753	7.10	8.90	Clear
	22-Sep-2021	779	7.26	9.89	Clear
	29-Sep-2022	533	7.38	6.51	Clear
	29-Sep-2023	806	7.43	7.90	Clear
	10-Sep-2024	616	6.88	11.90	Clear
	17-Sep-2025	846	6.80	10.30	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
04-SH	05-Nov-1991	446	7.16	3	
	12-May-1992	424	7.33	4	
	03-Nov-1992	432	7.32	3	
	18-May-1993	404	7.57	2.5	
	10-Nov-1993	404	7	4	
	31-May-1994	587	7.01	5.5	
	21-Sep-1994	624	7.45	9	
	01-Nov-1994	621	7.45	7.5	
	28-Sep-1995	560	7.04	8	
	04-Sep-1996	648	7.17	4.4	
	03-Sep-1997	659	7.09	5.8	
	15-Sep-1998	644	7.13	7.5	
	09-Sep-1999	716	7.26	7.9	
	05-Sep-2000	630	6.99	9.2	
	06-Sep-2001	632	7.71	7.6	
	04-Sep-2002	761	7.04	7.9	
	03-Sep-2003	669	7.24	7.9	
	08-Sep-2004	610	6.86	5.6	
	25-Aug-2005	---	---	---	Water level only
	07-Sep-2005	627	7.07	10.8	
	07-Sep-2006	736	7.25	8.9	
	05-Sep-2007	544	6.18	8.7	
	03-Sep-2008	711	7.57	8.1	
	09-Sep-2009	708	7.39	8.9	
	08-Sep-2010	677	7.3	8.2	
	07-Sep-2011	659	7.17	11	
	05-Sep-2012	720	7.38	8.6	Clear
	26-Sep-2013	674	5.93	9	Clear
	17-Sep-2014	646	7.2	12.3	
	28-Sep-2015	669	8.46	8.0	Clear
	26-Sep-2016	798	6.95	7.8	Clear
	27-Sep-2017	772	7.08	7.93	Clear
	17-Sep-2018	689	6.28	5.76	Clear
	17-Sep-2019	483	7.07	7.34	Clear
	22-Sep-2020	760	7.18	8.80	Clear
	22-Sep-2021	749	7.18	10.56	Clear
	29-Sep-2022	498	7.16	7.18	Clear
	29-Sep-2023	736	7.15	6.70	Clear
	10-Sep-2024	540	7.06	10.70	Clear
	17-Sep-2025	742	7.12	8.20	
04-IN	15-May-1991	440	7.05	6.5	
	05-Nov-1991	386	7.21	3	
	03-Nov-1992	401	7.1	3.5	
	18-May-1993	423	7.55	4.5	
	10-Nov-1993	432	7.35	3	
	21-Sep-1994	644	7.7	7	
	04-Sep-1996	685	7.29	3.2	
	03-Sep-1997	699	7.31	5.1	
	15-Sep-1998	703	7.25	7.3	
	09-Sep-1999	580	7.75	8.2	
	05-Sep-2000	603	7.13	7.9	
	06-Sep-2001	634	7.66	7.1	
	04-Sep-2002	770	7.23	8.2	
	03-Sep-2003	---	---	---	Dry
	08-Sep-2004	---	---	---	Dry
	25-Aug-2005	---	---	---	Water level only, little water
	07-Sep-2005	662	7.2	11	
	07-Sep-2006	---	---	---	Dry
	05-Sep-2007	542	6.47	8.4	No PCB sample
	03-Sep-2008	---	---	---	Insufficient water for field parameters
	09-Sep-2009	---	---	---	Dry
	08-Sep-2010	718	7.72	8.3	
	07-Sep-2011	---	---	---	Not enough water
	05-Sep-2012	---	---	---	Insufficient water for field parameters
	26-Sep-2013	---	---	---	Dry
	17-Sep-2014	596	7.06	9	
	28-Sep-2015	649	8.18	5.5	Clear
	26-Sep-2016	739	6.91	8.1	Clear
	27-Sep-2017	724	7.08	6.96	Clear
	17-Sep-2018	666	6.94	4.63	Clear
	17-Sep-2019	439	7.16	6.55	Clear
	22-Sep-2020	722	7.04	7.6	Piezometer dry/damaged
	22-Sep-2021	732	7.11	9.01	Clear
	29-Sep-2022	453	7.23	5.41	Clear
	29-Sep-2023	697	7.22	5.70	Clear
	10-Sep-2024	456	7.02	6.50	Clear
	17-Sep-2025	708	6.95	8.40	
04-SS	03-Nov-1992	238	7.14	4	
	06-Sep-2001	563	7.86	12.6	
	04-Sep-2002	---	---	---	Dry
	03-Sep-2003	---	---	---	Dry
	08-Sep-2004	---	---	---	---
	07-Sep-2005	608	7.02	10.1	
	07-Sep-2006	---	---	---	Dry
	29-Aug-2007	---	---	---	Dry
	03-Sep-2008	---	---	---	Dry
	09-Sep-2009	---	---	---	Dry
	08-Sep-2010	---	---	---	Dry
	23-Aug-2012	---	---	---	Dry
	25-Sep-2013	575	5.06	7.8	Clear
	16-Sep-2014	598	6.8	6.4	
	28-Sep-2015	605	8.17	5.8	
	27-Sep-2016	682	6.97	4.6	
	26-Sep-2017	670	7.04	9.21	Clear
	17-Sep-2018	605	7.23	3.86	Clear
	17-Sep-2019	406	6.81	6.26	Clear
	22-Sep-2020	657	6.81	8.40	
	22-Sep-2021	667	7.08	7.13	
	29-Sep-2022	430	6.92	5.86	
	29-Sep-2023	---	---	---	Dry
	10-Sep-2024	439	6.96	8	Clear
	17-Sep-2025	663	6.85	10	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
05-SH	16-May-1991	293	7.41	5	
	04-Nov-1991	287	7.33	3	
	12-May-1992	361	7.45	3.5	
	03-Nov-1992	431	7.41	2.5	
	10-Nov-1993	456	7.31	2	
	31-May-1994	752	7.28	5.5	
	21-Sep-1994	833	7.35	8	
	01-Nov-1994	831	7.33	7	
	28-Sep-1995	788	7.1	5.5	
	04-Sep-1996	935	7.11	3.9	
	03-Sep-1997	849	7.27	4.9	
	16-Sep-1998	904	7.22	7.6	
	09-Sep-1999	1052	7.23	8.2	
	06-Sep-2000	995	7.04	7.6	
	06-Sep-2001	964	7.52	9.4	
	04-Sep-2002	1115	7.36	8.7	
	03-Sep-2003	1008	7.08	9.8	
	08-Sep-2004	817	6.33	4.8	
	25-Aug-2005	---	---	---	Blocked
	07-Sep-2005	890	6.86	10.4	
	07-Sep-2006	---	---	---	Blocked
	05-Sep-2007	914	6.82	9.7	
	05-Sep-2008	---	---	---	Insufficient water for field parameters
	09-Sep-2009	1127	7.03	10.7	
	08-Sep-2010	1138	7.35	9	
	07-Sep-2011	923	7.05	18	
	05-Sep-2012	1139	7.45	11.1	Clear
	26-Sep-2013	1041	6.59	8.9	Clear
	17-Sep-2014	955	6.94	12.6	
	28-Sep-2015	949	7.89	7.9	
	28-Sep-2016	1149	6.9	6.2	
	27-Sep-2017	1110	7.01	8.74	Clear
	17-Sep-2018	996	6.54	5.31	Clear
	17-Sep-2019	695	7.07	7.81	Clear
	22-Sep-2020	1107	6.85	7.90	
	22-Sep-2021	1097	6.93	8.29	
	29-Sep-2022	730	6.93	6.88	
	28-Sep-2023	930	7.12	8.60	
	10-Sep-2024	713	6.86	8.30	
	17-Sep-2025	1095	6.89	9.50	
05-IN	16-May-1991	293	7.41	5	
	06-Nov-1991	411	7.26	4	
	12-May-1992	514	7.76	4	
	03-Nov-1992	515	7.08	3	
	18-May-1993	583	7.55	2.5	
	10-Nov-1993	611	6.39	2	
	21-Sep-1994	730	7.79	6	
	28-Sep-1995	864	7.22	5	
	04-Sep-1996	1012	7.09	2.4	
	03-Sep-1997	939	7.08	3.9	
	16-Sep-1998	1001	7.11	6.8	
	09-Sep-1999	1115	7.25	6.4	
	06-Sep-2000	1050	7.05	7.6	
	06-Sep-2001	1040	7.45	5.9	
	04-Sep-2002	1248	7.28	5.7	
	03-Sep-2003	1087	7.27	7.9	
	08-Sep-2004	910	6.49	4	
	25-Aug-2005	---	---	---	Water level only
	07-Sep-2005	1105	6.89	9.8	
	07-Sep-2006	736	7.14	6.8	
	05-Sep-2007	952	6.94	9	
	05-Sep-2008	1130	7.31	7.6	
	09-Sep-2009	1174	7.01	9.1	
	08-Sep-2010	1191	7.16	6.7	
	07-Sep-2011	1145	7.02	14.5	
	05-Sep-2012	1189	7.13	7.5	Clear
	26-Sep-2013	1103	6.8	7	Clear
	17-Sep-2014	982	6.86	10.4	
	28-Sep-2015	1024	8.00	6.6	Clear
	28-Sep-2016	1233	6.20	5.5	Clear
	27-Sep-2017	1222	6.98	6.41	Clear
	17-Sep-2018	1092	6.19	4.00	Clear
	17-Sep-2019	692	7.12	6.77	Clear
	22-Sep-2020	1151	6.96	8.10	Pizeometer dry/damaged
	22-Sep-2021	1111	7.32	9.10	
	29-Sep-2022	761	6.96	6.46	
	28-Sep-2023	1183	7.02	7.90	
	10-Sep-2024	785	6.91	9.80	
	17-Sep-2025	1129	6.85	7.30	
05-SS	10-Sep-2004	398	6.4	3.6	
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	417	6.85	13.2	
	07-Sep-2007	515	6.79	5.8	
	04-Sep-2008	424	7.55	7.2	
	17-Sep-2009	420	7.28	6.5	
	09-Sep-2010	438	7.13	6.9	
	08-Sep-2011	429	6.68	11.2	
	05-Sep-2012	---	---	---	Table
	26-Sep-2013	---	---	---	Unable to sample - sampling tube is lealing in the well
	16-Sep-2014	412	6.93	6.3	
	28-Sep-2015	441	8.42	5.2	
	28-Sep-2016	479	6.95	4.2	
	27-Sep-2017	455	7.02	7.02	Clear
	17-Sep-2018	412	7.00	3.09	Clear
	17-Sep-2019	270	6.91	6.00	Clear
	23-Sep-2020	460	6.81	5.40	
	22-Sep-2021	444	7.09	6.76	
	29-Sep-2022	297	7.03	7.22	
	29-Sep-2023	443	7.56	5.70	
	10-Sep-2024	318	7.03	10.90	
	17-Sep-2025	442	7.04	9.80	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
06-SH	12-May-1992	474	7.3	5	
	21-Sep-1994	922	7.32	11	
	01-Nov-1994	911	7.3	7	
	28-Sep-1995	843	6.94	8	
	04-Sep-1996	873	7.12	2.4	
	03-Sep-1997	894	7.27	3.8	
	15-Sep-1998	862	7.19	6.6	
	09-Sep-1999	1153	6.85	9.6	Adjacent piezo 6SH blocked
	05-Sep-2000	1036	6.8	9	Adjacent piezo 6SH blocked
	06-Sep-2001	1084	6.95	8.7	Adjacent piezo 6SH blocked
	04-Sep-2002	1273	7	8.6	Adjacent piezo 6SH blocked
	03-Sep-2003	1171	6.74	8.1	
	08-Sep-2004	949	6.49	4.8	
	25-Aug-2005	---	---	---	Water level only
	07-Sep-2005	1103	6.67	11.4	
	07-Sep-2006	1144	7.02	9.9	
	05-Sep-2007	951	6.29	10.7	
	03-Sep-2008	997	6.96	8.6	
	09-Sep-2009	1045	7.02	10.6	
	08-Sep-2010	1028	7.07	9	
	07-Sep-2011	958	6.94	16.1	
	05-Sep-2012	990	7.06	10.2	Clear
	25-Sep-2013	918	6.4	8.8	Slightly cloudy
	17-Sep-2014	768	6.76	11.3	
	29-Sep-2015	766	7.35	9.3	Clear
	28-Sep-2016	969	6.68	6.6	Clear
	26-Sep-2017	958	6.81	9.10	Clear
	17-Sep-2018	837	7.07	6.63	Clear
	17-Sep-2018	837	7.07	6.63	Clear
	17-Sep-2019	609	6.89	8.97	Clear
	22-Sep-2020	913	6.9	10.80	
	22-Sep-2021	914	6.86	10.61	
	28-Sep-2022	707	6.79	12.23	Slightly cloudy
	29-Sep-2023	863	7.01	8.00	
	10-Sep-2024	632	6.78	9.50	
	18-Sep-2025	927	6.27	11.20	
06-IN [Decommissioned]	15-May-1991	544	7.21	6	
	05-Nov-1991	539	7.12	4	
	12-May-1992	593	7.4	4.5	
	03-Nov-1992	616	7.01	3	
	18-May-1993	560	7.74	2	
	10-Nov-1993	612	7.39	4	
	21-Sep-1994	756	7.79	10	
	28-Sep-1995	816	7.36	6	
	04-Sep-1996	1004	6.81	5.1	
	03-Sep-1997	1012	6.59	5	
	15-Sep-1998	989	6.89	6.8	
	09-Sep-1999	955	7.23	6.8	
	05-Sep-2000	835	7.01	8	
	06-Sep-2001	824	7.19	7.8	
	04-Sep-2002	1002	6.98	7.6	
	03-Sep-2003	928	7.4	8.5	
	08-Sep-2004	693	6.91	4.4	
	25-Aug-2005	---	---	---	Water level only
	07-Sep-2005	870	7	9.7	
	07-Sep-2006	933	7.35	8	
	05-Sep-2007	---	---	---	No sample, did not recover
	03-Sep-2008	875	7.64	6.3	
	09-Sep-2009	896	7.24	8.4	
	08-Sep-2010	852	7.54	7.8	
	07-Sep-2011	709	7.2	17.4	
	05-Sep-2012	864	7.4	8.1	Pump airlines leaking
	25-Sep-2013	863	6.62	7.1	Clear
06(R)IN	17-Sep-2014	735	6.95	10.3	Slightly silty
	29-Sep-2015	816	7.32	8.8	Slightly silty, light brown and sulphur odour
	28-Sep-2016	1010	6.85	5.8	Slightly silty
	26-Sep-2017	1032	7.37	7.0	Cloudy grey/brown
	17-Sep-2018	893	7.02	5.7	Cloudy grey/brown
	17-Sep-2019	607	7.13	7.6	Cloudy grey/brown
	22-Sep-2020	935	6.99	9.1	
	22-Sep-2021	940	7.03	7.9	
	28-Sep-2022	690	6.98	11.52	Cloudy grey/brown
	29-Sep-2023	883	7.09	7.70	
	10-Sep-2024	672	6.85	10.1	
	18-Sep-2025	937	6.63	7.6	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
07-SH	15-May-1991	487	7.17	9	
	05-Nov-1991	546	7.38	4	
	12-May-1992	670	7.1	5	
	03-Nov-1992	413	6.98	4	
	20-May-1993	501	7.14	2.5	
	10-Nov-1993	500	7.02	4.5	
	31-May-1994	744	6.98	5	
	21-Sep-1994	803	7.27	7	
	02-Nov-1994	793	7.21	7	
	28-Sep-1995	690	7.23	6	
	04-Sep-1996	741	6.98	4.1	
	03-Sep-1997	753	7.01	4	
	15-Sep-1998	786	6.99	7	
	09-Sep-1999	901	7.13	7.8	
	05-Sep-2000	930	6.59	9.1	
	06-Sep-2001	840	6.48	7.5	
	04-Sep-2002	1046	6.6	7.7	
	03-Sep-2003	936	7.15	8.8	
	08-Sep-2004	787	6.35	3.6	
	25-Aug-2005	---	---	---	Water level only
	07-Sep-2005	971	6.8	9.8	
	07-Sep-2006	1038	7.12	9.6	
	05-Sep-2007	888	6.21	10.6	
	03-Sep-2008	1063	7.36	11	
	09-Sep-2009	1055	7.14	8.3	
	08-Sep-2010	1050	7.14	7.7	
	07-Sep-2011	916	7.02	14	
	05-Sep-2012	1081	7.13	8.6	Clear
	26-Sep-2013	1035	6.4	7.2	Clear
	17-Sep-2014	900	6.99	11.6	
	29-Sep-2015	970	7.3	8.2	Clear
	27-Sep-2016	1221	6.77	7.0	Clear
	26-Sep-2017	1228	7.06	8.17	Clear
	17-Sep-2018	1107	7.42	6.01	Clear
	16-Sep-2019	783	6.97	9.05	Clear
	22-Sep-2020	1358	6.85	9.20	
	22-Sep-2021	1367	6.95	12.05	
	28-Sep-2022	789	6.61	8.20	
	29-Sep-2023	1439	7.02	8.40	
	10-Sep-2024	1034	6.77	8.90	
	18-Sep-2025	1466	6.88	8.40	
07-IN	15-May-1991	494	7.2	8	
	06-Nov-1991	520	7.34	5	
	12-May-1992	459	7.73	4.5	
	03-Nov-1992	458	6.93	4	
	20-May-1993	468	7.17	4	
	10-Nov-1993	470	7.22	3.5	
	21-Sep-1994	796	7.37	6	
	28-Sep-1995	607	7.41	5	
	04-Sep-1996	802	7.03	2.5	
	03-Sep-1997	812	7.09	3.7	
	15-Sep-1998	832	7.11	6.2	
	09-Sep-1999	800	7.11	8	
	05-Sep-2000	755	7.04	8.1	
	06-Sep-2001	712	7.44	6.2	
	04-Sep-2002	869	6.99	6.8	
	03-Sep-2003	753	7.33	6	
	08-Sep-2004	611	6.51	4.3	
	25-Aug-2005	---	---	---	Water level only
	07-Sep-2005	772	7.05	9.6	
	07-Sep-2006	816	7.39	8.7	
	05-Sep-2007	743	6.41	9.8	
	03-Sep-2008	763	7.41	7.1	
	09-Sep-2009	773	7.13	8.5	
	08-Sep-2010	795	7.34	7.5	
	07-Sep-2011	767	7.03	13.1	
	05-Sep-2012	798	7.23	7.8	Clear
	26-Sep-2013	728	6.63	6.6	Clear, slight slough odour
	17-Sep-2014	639	6.97	10.6	
	29-Sep-2015	640	7.69	7.6	Clear
	27-Sep-2016	789	7.13	5.3	Clear
	26-Sep-2017	783	7.19	8.76	Clear
	17-Sep-2018	680	7.44	5.02	Cloudy
	16-Sep-2019	487	7.24	8.04	Cloudy
	22-Sep-2020	772	6.97	6.3	
	22-Sep-2021	753	7.21	10.2	
	28-Sep-2022	519	7.16	8.13	Cloudy
	29-Sep-2023	720	7.25	7.60	
	10-Sep-2024	489	7.12	8.20	
	18-Sep-2025	709	7.26	8.60	
07-SS [Decommissioned]	15-May-1991	491	6.8	8	
	05-Nov-1991	480	7.74	4	
	14-May-1992	711	7.82	5.5	
	03-Nov-1992	458	6.99	3.5	
	28-Sep-1995	566	7.06	5	
	04-Sep-1996	607	8.11	2.3	
	03-Sep-1997	585	7.89	3.1	
	04-Oct-1998	839	7.21	4.8	
	09-Sep-1999	712	8.05	6.7	
	05-Sep-2000	697	7.64	8.1	
	06-Sep-2001	658	7.41	7.1	
	04-Sep-2002	793	6.99	6.6	
	03-Sep-2003	694	8.13	9.4	
	08-Sep-2004	544	6.88	2.8	Very little water
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	---	---	---	Dry
	05-Sep-2007	---	---	---	No sample, no water on purging
	03-Sep-2008	---	---	---	Damaged, dry
	09-Sep-2009	---	---	---	Dry
	08-Sep-2010	---	---	---	Dry
	23-Aug-2012	---	---	---	Dry
	26-Sep-2013	---	---	---	Decommissioned 2025

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
07(R)SS	16-Sep-2014	805	6.96	6.1	
	29-Sep-2015	712	7.54	7.4	Clear
	27-Sep-2016	904	7.04	4.7	Clear
	26-Sep-2017	802	7.21	8.79	Clear
	17-Sep-2018	668	7.12	5.16	Clear
	16-Sep-2019	509	7.28	9.03	Clear
	23-Sep-2020	740	6.89	5.30	
	22-Sep-2021	724	7.50	12.18	
	28-Sep-2022	515	7.11	9.08	
	29-Sep-2023	743	7.51	6.90	
	10-Sep-2024	488	7.28	8.40	
	18-Sep-2025	740	7.39	9.50	
08-SH	13-May-1992	511	7.56	4.5	
	03-Nov-1992	380	7.7	3.5	
	19-May-1993	320	7.24	2	
	12-Nov-1993	376	7.52	3	
	31-May-1994	621	7.01	6	
	22-Sep-1994	557	7.54	8	
	02-Nov-1994	548	7.57	7	
	28-Sep-1995	505	7.37	6.5	
	05-Sep-1996	556	7.43	3.8	
	05-Sep-1997	545	7.31	4.3	
	15-Sep-1998	576	7.33	6.3	
	09-Sep-1999	567	7.61	7.9	
	06-Sep-2000	528	7.36	7.4	
	06-Sep-2001	420	6.99	7.1	
	05-Sep-2002	723	6.77	7.1	
	04-Sep-2003	594	7.5	7	
	09-Sep-2004	436	7.17	4.4	Very little water
	26-Aug-2005	---	---	---	Water level only
	08-Sep-2005	540	7.33	9.7	
	07-Sep-2006	647	7.61	8.6	
	05-Sep-2007	470	7.39	9.5	
	03-Sep-2008	510	7.47	7.6	
	09-Sep-2009	579	7.37	7.8	
	08-Sep-2010	582	7.47	7.4	
	08-Sep-2011	565	7.22	13.3	
	05-Sep-2012	562	7.67	9.4	Clear
	26-Sep-2013	562	6.86	9.9	
	16-Sep-2014	995	7.49	11.2	
	29-Sep-2015	527	7.81	9.1	Clear
	27-Sep-2016	636	7.16	8.3	Clear
	26-Sep-2017	441	7.31	8.40	Clear
	17-Sep-2018	581	6.71	6.56	Clear
	16-Sep-2019	383	7.50	10.63	Clear
	22-Sep-2020	652	7.54	11.50	
	22-Sep-2021	545	7.94	14.40	
	28-Sep-2022	546	7.15	13.76	
	27-Sep-2023	805	6.45	12.20	
	11-Sep-2024	529	7.26	12.10	
	18-Sep-2025	713	7.56	9.90	
08-IN	17-May-1991	704	7.17	9	
	05-Nov-1991	559	8.08	3	
	03-Nov-1992	435	7.28	4.5	
	19-May-1993	602	6.95	4	
	12-Nov-1993	641	7.19	4	
	22-Sep-1994	809	7.26	7.5	
	28-Sep-1995	705	7.32	5	
	05-Sep-1996	890	7.14	1.9	
	05-Sep-1997	737	7.11	2.7	
	15-Sep-1998	789	7.17	6.3	
	09-Sep-1999	842	7.57	6.4	
	06-Sep-2000	785	7.42	6.6	
	06-Sep-2001	---	---	---	Not measured
	05-Sep-2002	997	6.59	5.7	
	04-Sep-2003	881	7.58	5.8	
	09-Sep-2004	795	7.15	5.2	
	26-Aug-2005	---	---	---	Water level only
	08-Sep-2005	822	7.17	8.2	
	07-Sep-2006	896	7.52	7.1	
	05-Sep-2007	710	7.29	8.9	
	03-Sep-2008	800	7.31	6	
	09-Sep-2009	861	7.35	7.5	
	08-Sep-2010	830	7.32	5.7	
	08-Sep-2011	822	6.95	12.9	
	05-Sep-2012	843	7.31	7.7	Clear
	26-Sep-2013	776	6.76	6.9	
	16-Sep-2014	853	7.24	10.5	Slightly cloudy, low volume
	29-Sep-2015	720	7.98	7.4	Clear
	27-Sep-2016	878	7.25	6.0	Clear
	26-Sep-2017	616	7.35	10.40	Clear
	17-Sep-2018	762	7.60	4.41	Clear
	16-Sep-2019	541	7.22	8.54	Clear
	22-Sep-2020	837	7.03	7.60	
	22-Sep-2021	819	7.44	10.09	
	28-Sep-2022	562	6.92	7.31	
	27-Sep-2023	793	6.96	11.00	
	11-Sep-2024	541	7.08	7.80	
	18-Sep-2025	793	7.49	7.30	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
08-SS	17-May-1991	438	6.95	7	
	03-Nov-1992	684	6.93	3.5	
	12-Nov-1993	371	7.03	6	
	22-Sep-1994	547	7.84	8	
	28-Sep-1995	497	7.44	4	
	04-Oct-1998	503	8.09	6.1	
	09-Sep-1999	555	8.23	6.2	
	06-Sep-2001	---	---	---	Insufficient water
	05-Sep-2002	---	---	---	Insufficient water
	04-Sep-2003	555	8.21	8.2	Dry
	09-Sep-2004	505	7.7	4	Dry
	26-Aug-2005	---	---	---	Dry
	08-Sep-2005	---	---	---	Dry
	05-Sep-2007	---	---	---	Dry
	03-Sep-2008	---	---	---	Dry
	09-Sep-2009	---	---	---	Dry
	08-Sep-2010	---	---	---	Dry
	22-Aug-2012	---	---	---	Dry
	26-Sep-2013	---	---	---	Not Sampled - Insufficient water
	16-Sep-2014	---	---	---	Dry
	29-Sep-2015	---	---	---	Dry and Damaged
	27-Sep-2016	---	---	---	Dry and Damaged
	26-Sep-2017	---	---	---	Dry and Damaged
	17-Sep-2018	---	---	---	Damaged
	16-Sep-2019	---	---	---	Damaged
	22-Sep-2020	---	---	---	Dry
	22-Sep-2021	---	---	---	Damaged
	28-Sep-2022	---	---	---	Damaged
	28-Sep-2023	---	---	---	Damaged
	11-Sep-2024	---	---	---	Damaged
	18-Sep-2025	---	---	---	Damaged
09-SH [Decommissioned]	06-Nov-1991	194	7.71	3.5	
	12-May-1992	411	7.79	4	
	31-Aug-1992	371	7.29	7	
09-IN [Decommissioned]	16-May-1991	556	7.2	7	
	06-Nov-1991	326	7.71	4	
	31-Aug-1992	566	6.99	6.5	
10-SH [Decommissioned]	17-May-1991	538	7.1	5	
	12-May-1992	629	6.86	3	
	01-Sep-1992	429	7.39	7.5	
10-IN [Decommissioned]	17-May-1991	360	7.03	4	
	06-Nov-1991	591	7.9	4	
	12-May-1992	546	7.24	4	
	01-Sep-1992	569	7.17	7.5	
11-SH	17-May-1991	523	6.95	5.5	
	04-Nov-1991	463	7.05	5	
	12-May-1992	611	6.8	3	
	04-Nov-1992	546	7.43	4.5	
	18-May-1993	488	6.9	3.5	
	11-Nov-1993	472	7.24	3	
	22-Sep-1994	672	7.33	7	
	02-Nov-1994	654	7.3	7	
	28-Sep-1995	617	7	6.5	
	05-Sep-1996	686	7.13	1.8	
	05-Sep-1997	653	7.11	4.1	
	15-Sep-1998	700	7.13	6	
	09-Sep-1999	742	7.18	8	
	06-Sep-2000	702	6.38	7.7	
	06-Sep-2001	593	7.52	7.5	
	05-Sep-2002	908	6.94	6.3	
	03-Sep-2003	786	7.34	7.4	
	08-Sep-2004	634	6.25	4.3	
	26-Aug-2005	---	---	---	Water level only
	07-Sep-2005	726	6.88	9.3	
	07-Sep-2006	748	7.31	8	
	06-Sep-2007	764	6.79	7.2	
	04-Sep-2008	727	7.25	6.5	Gas valve leaking at connection
	10-Sep-2009	760	6.63	10.7	
	09-Sep-2010	819	7.14	7	
	08-Sep-2011	812	6.9	14	
	06-Sep-2012	868	7.04	8.7	Clear
	26-Sep-2013	709	5.88	6.9	Yellowish-green colour
	17-Sep-2014	705	7.48	11.5	
	29-Sep-2015	766	6.75	7.2	Clear
	27-Sep-2016	937	6.58	6.4	Clear
	27-Sep-2017	945	6.90	6.17	Clear
	18-Sep-2018	863	5.37	4.88	Clear
	17-Sep-2019	585	6.78	6.40	Clear
	21-Sep-2020	1007	6.75	6.8	
	22-Sep-2021	949	6.98	6.9	
	29-Sep-2022	627	6.81	5.38	
	28-Sep-2023	1038	6.97	8.20	
	11-Sep-2024	727	6.83	7.30	
	18-Sep-2025	1101	6.34	10.10	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
11-IN	17-May-1991	470	7.01	8.5	
	04-Nov-1991	438	7.04	4	
	12-May-1992	510	7.54	4	
	18-May-1993	440	7.54	3	
	11-Nov-1993	430	7.02	4	
	22-Sep-1994	628	7.5	6	
	28-Sep-1995	605	7.18	5	
	05-Sep-1996	709	7.34	1.1	
	05-Sep-1997	681	7.21	2.9	
	16-Sep-1998	643	7.31	6.2	
	09-Sep-1999	721	7.32	7.3	
	06-Sep-2000	605	6.8	6.9	
	06-Sep-2001	512	7.31	5.9	
	05-Sep-2002	806	6.8	5.9	
	03-Sep-2003	668	7.64	10.9	
	08-Sep-2004	532	6.53	4.4	
	26-Aug-2005	---	---	---	Water level only
	07-Sep-2005	656	7.13	10.5	
	07-Sep-2006	703	7.27	8.7	
	06-Sep-2007	656	7.12	7	
	04-Sep-2008	529	7.37	6.3	
	10-Sep-2009	713	7.1	7.4	
	09-Sep-2010	715	7.28	7.2	
	08-Sep-2011	686	7.17	12.5	
	06-Sep-2012	702	7.32	7.6	Clear
	26-Sep-2013	688	5.7	6.5	Clear
	17-Sep-2014	674	7.61	8.2	
	29-Sep-2015	655	7.22	5.6	Clear
	27-Sep-2016	747	7.04	6.7	Clear
	27-Sep-2017	764	7.07	5.30	Clear
	18-Sep-2018	668	6.73	4.07	Clear
	17-Sep-2019	440	6.90	5.36	Clear
	21-Sep-2020	753	6.72	5.80	
	22-Sep-2021	692	7.10	7.33	
	29-Sep-2022	471	7.03	5.67	
	28-Sep-2023	1081	6.80	8.00	
	11-Sep-2024	486	7.15	7.10	
	18-Sep-2025	719	7.10	9.00	
11-SS	17-May-1991	325	7.01	7.5	
	12-May-1992	395	6.97	4.5	
	06-Sep-2001	---	---	---	Insufficient water
	05-Sep-2002	---	---	---	Insufficient water
	03-Sep-2003	---	---	---	Dry
	08-Sep-2004	---	---	---	Dry
	25-Aug-2005	---	---	---	Insufficient water
	07-Sep-2005	---	---	---	Dry
	05-Sep-2007	---	---	---	Dry
	04-Sep-2008	---	---	---	Dry
	10-Sep-2009	---	---	---	Dry
	09-Sep-2010	---	---	---	Dry
	22-Aug-2012	---	---	---	Dry
	26-Sep-2013	---	---	---	Unable to sample due to leak in air tube on well assembly.
	17-Sep-2014	---	---	---	Dry
	29-Sep-2015	---	---	---	Dry
	27-Sep-2016	---	---	---	Dry
	27-Sep-2017	---	---	---	Dry
	18-Sep-2018	---	---	---	Damaged
	17-Sep-2019	---	---	---	Damaged
	21-Sep-2020	---	---	---	Insufficient water
	22-Sep-2021	---	---	---	Dry
	29-Sep-2022	---	---	---	Dry
	28-Sep-2023	---	---	---	Dry
	11-Sep-2024	---	---	---	Dry
	18-Sep-2025	505	7	11	Pump lowered - sample retrieved
12-SH	17-May-1991	306	7.2	7.5	
	12-May-1992	328	6.93	4	
	04-Nov-1992	279	7.37	2.5	
	18-May-1993	278	6.82	4.5	
	11-Nov-1993	294	7.41	4	
	31-May-1994	412	7.42	7.5	
	22-Sep-1994	431	7.87	6.5	
	01-Nov-1994	451	7.8	7	
	28-Sep-1995	384	6.95	7	
	05-Sep-1996	422	7.54	4.1	
	05-Sep-1997	413	7.37	4	
	16-Sep-1998	431	7.43	6.1	
	09-Sep-1999	421	7.74	10	
	06-Sep-2000	448	7.4	9.4	
	06-Sep-2001	348	7.59	8	
	04-Sep-2002	553	7.81	9.1	
	04-Sep-2003	569	7.62	7.7	
	09-Sep-2004	408	7.11	4.3	
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	526	7.45	10.7	
	06-Sep-2006	553	7.6	9.3	
	07-Sep-2007	539	7.49	5.2	
	05-Sep-2008	554	7.4	8.5	
	10-Sep-2009	555	7.48	11	
	09-Sep-2010	559	7.84	8.7	
	07-Sep-2011	543	7.42	13.8	
	05-Sep-2012	590	7.57	9.7	Clear
	26-Sep-2013	561	6.42	10	
	17-Sep-2014	525	7.33	13.1	
	29-Sep-2015	538	7.45	8.4	Clear
	27-Sep-2016	638	7.1	9.2	Clear
	27-Sep-2017	624	7.39	9.81	Clear
	18-Sep-2018	563	6.72	6.59	Clear
	16-Sep-2019	471	7.40	9.16	Clear
	22-Sep-2020	622	7.37	7	
	22-Sep-2021	631	7.31	9.72	
	28-Sep-2022	485	7.35	10.49	
	28-Sep-2023	671	7.61	10.70	
	11-Sep-2024	459	7.22	7.30	
	18-Sep-2025	644	7.14	9.20	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
12-IN	17-May-1991	431	7.11	8	
	04-Nov-1991	368	7.37	5	
	12-May-1992	460	7.23	4	
	04-Nov-1992	459	7.48	4	
	18-May-1993	413	7.48	4.5	
	11-Nov-1993	427	6.91	4	
	21-Sep-1994	687	7.75	7	
	28-Sep-1995	502	6.97	7	
	05-Sep-1996	656	7.5	2.9	
	05-Sep-1997	621	7.37	3.8	
	16-Sep-1998	646	7.42	6.7	
	09-Sep-1999	539	7.59	7.6	
	06-Sep-2000	627	7.29	9.8	
	06-Sep-2001	474	7.65	8	
	04-Sep-2002	770	7.69	7.6	
	04-Sep-2003	707	7.72	8.3	
	08-Sep-2004	519	7.23	6.8	
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	710	7.18	10.6	
	06-Sep-2006	702	7.4	8.9	
	07-Sep-2007	682	7.45	8.5	
	05-Sep-2008	680	7.18	7.5	
	11-Sep-2009	709	7.15	9.5	
	09-Sep-2010	699	7.45	7.5	
	07-Sep-2011	511	7.31	11.9	
	06-Sep-2012	562	7.44	8.9	Clear
	26-Sep-2013	---	---	---	Unable to sample due to equipment attached to well and different fitting
	17-Sep-2014	567	7.15	11.8	
	29-Sep-2015	622	7.49	7.0	Clear
	27-Sep-2016	754	7.15	7.1	Clear
	27-Sep-2017	728	7.20	7.68	Clear
	18-Sep-2018	647	6.34	5.03	Clear
	16-Sep-2019	440	7.34	8.70	Clear
	22-Sep-2020	681	7.31	7.10	Clear
	22-Sep-2021	699	7.24	9.90	Clear
	28-Sep-2022	491	7.04	7.90	Clear
	28-Sep-2023	685	7.42	10.10	Clear
	11-Sep-2024	470	7.28	11.00	Clear
	18-Sep-2025	705	6.87	7.80	
12-SS [Decommissioned]	06-Sep-2001	---	---	---	Dry
	04-Sep-2002	---	---	---	Dry
	04-Sep-2003	---	---	---	Dry
	08-Sep-2004	---	---	---	Dry
	25-Aug-2005	---	---	---	Dry
	08-Sep-2005	---	---	---	Dry
	06-Sep-2006	---	---	---	Dry
	07-Sep-2007	---	---	---	Dry
	05-Sep-2008	---	---	---	Dry
	11-Sep-2009	---	---	---	Dry
	09-Sep-2010	---	---	---	Dry
	22-Aug-2012	---	---	---	Dry
	26-Sep-2013	---	---	---	Dry
	17-Sep-2014	---	---	---	Dry
	29-Sep-2015	---	---	---	Dry
	27-Sep-2016	---	---	---	Dry
	27-Sep-2017	---	---	---	Dry
	18-Sep-2018	---	---	---	Dry
	16-Sep-2019	---	---	---	Dry
	22-Sep-2020	---	---	---	Dry
	22-Sep-2021	---	---	---	Dry
	28-Sep-2022	---	---	---	Dry
	28-Sep-2023	---	---	---	Dry
	11-Sep-2024	---	---	---	Dry- Decommissioned 2025
12(R)-SS	18-Sep-2025	879	8	10	
13-SH	04-Nov-1991	399	7.65	4	
	12-May-1992	384	7.47	4	
	04-Nov-1992	379	6.69	2.5	
	18-May-1993	219	7.33	3	
	11-Nov-1993	311	7.25	3	
	31-May-1994	475	7.37	8	
	22-Sep-1994	433	7.75	10	
	01-Nov-1994	430	7.74	7	
	28-Sep-1995	485	7.31	9	
	04-Sep-1996	557	7.55	5.2	
	04-Sep-1997	531	7.33	5.1	
	16-Sep-1998	548	7.47	6	
	09-Sep-1999	1218	7.21	11.2	
	06-Sep-2000	1192	7.24	9.9	
	06-Sep-2001	1187	7.28	10.1	
	04-Sep-2002	1354	7.39	10.5	
	04-Sep-2003	1148	7.01	9.1	
	09-Sep-2004	868	6.89	6.4	
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	1028	7.02	11.3	
	07-Sep-2006	1038	7.23	11.5	
	05-Sep-2007	848	7.07	11.3	
	03-Sep-2008	938	7.16	10	Frost heave, can't close lid
	10-Sep-2009	1042	6.76	11.3	
	08-Sep-2010	948	7.23	9.1	
	07-Sep-2011	736	7.11	17.3	
	05-Sep-2012	807	7.35	12	Clear
	26-Sep-2013	721	5.81	12.5	Slightly cloudy
	16-Sep-2014	919	7.24	15.4	Slightly silty
	28-Sep-2015	815	7.31	10.0	Slightly cloudy
	26-Sep-2016	866	6.96	9.5	Slightly cloudy
	27-Sep-2017	835	7.11	9.91	Clear
	18-Sep-2018	711	6.98	6.95	Slightly cloudy
	16-Sep-2019	527	7.09	9.28	Slightly cloudy
	22-Sep-2020	795	7.29	9.4	
	21-Sep-2021	722	7.57	15.6	
	29-Sep-2022	570	7.51	12.11	Cloudy - brown tint
	27-Sep-2023	937	7.13	9.80	
	10-Sep-2024	780	6.88	14.10	
	17-Sep-2025	101	6.73	13.80	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
13-IN	17-May-1991	336	7.24	6	
	04-Nov-1991	488	7.58	4	
	12-May-1992	463	7.2	3.5	
	04-Nov-1992	473	6.99	3	
	18-May-1993	402	7.11	6	
	11-Nov-1993	377	6.88	4	
	22-Sep-1994	631	7.58	8	
	28-Sep-1995	564	7.64	7.5	
	04-Sep-1996	447	9.22	2.3	
	04-Sep-1997	457	7.84	3.7	
	16-Sep-1998	468	7.78	6.2	
	09-Sep-1999	694	7.33	6.3	
	06-Sep-2000	620	7.18	9	Adjacent piezo 13IN blocked
	06-Sep-2001	639	7.39	7.2	Adjacent piezo 13IN blocked
	04-Sep-2002	795	7.75	7.1	Adjacent piezo 13IN blocked
	04-Sep-2003	730	6.83	6.9	
	09-Sep-2004	531	6.87	3.9	
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	675	7.01	7.5	
	07-Sep-2006	715	7.36	8.1	
	05-Sep-2007	562	7.05	9.6	
	05-Sep-2008	688	7.59	6.7	New installation
	10-Sep-2009	687	6.95	8.4	
	08-Sep-2010	691	7.29	6	
	07-Sep-2011	526	7.01	12.7	
	05-Sep-2012	693	7.27	6.6	Clear
	26-Sep-2013	618	4.81	8.5	Clear
	16-Sep-2014	659	7.19	11	
	28-Sep-2015	660	7.27	8.3	Clear
	26-Sep-2016	731	7.05	5.6	Clear
	27-Sep-2017	717	7.16	5.85	Clear
	18-Sep-2018	643	6.68	4.03	Clear
	16-Sep-2019	440	7.09	6.65	Clear
	22-Sep-2020	715	7.12	6.2	
	21-Sep-2021	698	7.17	8.97	
	29-Sep-2022	462	7.18	6.04	
	27-Sep-2023	715	7.28	7.90	
	10-Sep-2024	488	7.19	9.90	
	17-Sep-2025	556	7.25	10.50	
13-SS	17-May-1991	300	8.05	6	
	13-May-1992	306	7.38	4.5	
	18-May-1993	312	7.65	4	
	11-Nov-1993	314	7.84	4.5	
	06-Sep-2001	---	---	---	Insufficient water
	04-Sep-2002	---	---	---	Insufficient water
	04-Sep-2003	---	---	---	Dry
	09-Sep-2004	---	---	---	Replaced by 13(R)-SS
13(R)SS	10-Sep-2004	675	6.47	3.5	
	08-Sep-2005	566	7.2	15.3	
	07-Sep-2006	640	7.44	6	
	04-Sep-2008	535	7.95	8	
	17-Sep-2009	644	7.57	6.3	
	09-Sep-2010	482	7.15	7	
	08-Sep-2011	---	---	---	Insufficient water for field parameters
	23-Aug-2012	---	---	---	Dry
	26-Sep-2013	410	6.48	12.4	Low Volume
	16-Sep-2014	423	7.13	7.6	
	28-Sep-2015	432	7.67	8.0	
	26-Sep-2016	457	7.01	12.5	
	27-Sep-2017	458	7.13	13.20	Clear
	18-Sep-2018	398	6.65	5.19	Clear
	16-Sep-2019	143	7.09	9.85	Clear
	22-Sep-2020	453	7.06	6.0	
	21-Sep-2021	469	6.91	11.7	
	29-Sep-2022	306	7.13	7.94	
	29-Sep-2023	---	---	---	Dry
	10-Sep-2024	315	6.96	11.1	
	17-Sep-2025	429	6.82	11.9	
14-SH [Decommissioned]	13-Jan-1993	329	7.37	4	
	31-May-1994	421	7.24	7	
	22-Sep-1994	530	7.41	9.5	
	02-Nov-1994	530	7.41	9.5	
	28-Sep-1995	488	7.2	8	
	05-Sep-1996	461	7.37	5.5	
	05-Sep-1997	493	7.24	4.8	
	15-Sep-1998	512	7.32	6.2	
	06-Sep-2000	862	7.12	8.8	
	06-Sep-2001	740	7.52	7.9	
	05-Sep-2002	976	5.71	8	
	04-Sep-2003	1106	7.18	8.7	
	09-Sep-2004	922	6.94	5.2	
	25-Aug-2005	---	---	---	Dry
	08-Sep-2005	1195	7.04	15.3	
	07-Sep-2006	1298	7.09	9.4	
	05-Sep-2007	1041	6.99	10.2	
	03-Sep-2008	1123	7.11	8.5	Frost heaved
	09-Sep-2009	1116	6.98	8.6	
	09-Sep-2010	1193	7.23	7.5	
	08-Sep-2011	856	6.94	17.4	
	05-Sep-2012	796	7.46	11.4	Clear
	26-Sep-2013	1044	6.03	10.4	Slightly cloudy
	16-Sep-2014	2179	7.03	9.7	
	29-Sep-2015	921	7.09	9.5	Clear
	27-Sep-2016	1166	6.72	8.0	Clear
	26-Sep-2017	1113	6.55	9.48	Clear
	17-Sep-2018	619	8.12	7.66	Slightly yellow
	16-Sep-2019	387	7.09	9.85	Slightly yellow
	22-Sep-2020	733	7.01	9.5	
	22-Sep-2021	531	7.12	9.4	
	28-Sep-2022	449	6.99	12.06	
	27-Sep-2023	898	6.87	11.30	
	11-Sep-2024	643	6.98	10.00	Decommissioned in 2025

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
14(R)-SH	18-Sep-2025	---	---	---	No sample in 2025
14-IN [Decommissioned]	06-Sep-2001	---	---	---	Dry
	05-Sep-2002	---	---	---	Dry
	04-Sep-2003	---	---	---	Dry
	09-Sep-2004	---	---	---	Not measured
	25-Aug-2005	---	---	---	Dry
	08-Sep-2005	---	---	---	Dry
	07-Sep-2006	---	---	---	Dry
	26-Aug-2008	---	---	---	Dry
	09-Sep-2009	---	---	---	Dry
	09-Sep-2010	---	---	---	Dry
	08-Sep-2011	---	---	---	Dry
	23-Aug-2012	---	---	---	Dry
	26-Sep-2013	---	---	---	Dry
	16-Sep-2014	---	---	---	Dry
	29-Sep-2015	---	---	---	Dry
	27-Sep-2016	---	---	---	Dry
	26-Sep-2017	---	---	---	Dry
	17-Sep-2018	---	---	---	Dry
	16-Sep-2019	---	---	---	Dry
	22-Sep-2020	---	---	---	Dry
	22-Sep-2021	---	---	---	Dry
	28-Sep-2022	---	---	---	Dry
	28-Sep-2023	---	---	---	Dry
	11-Sep-2024	---	---	---	Dry- Decommissioned in 2025
14(R)-IN	18-Sep-2025	850	7.18	7.60	
14-SS [Decommissioned]	06-Sep-2001	---	---	---	Dry
	05-Sep-2002	---	---	---	Dry
	04-Sep-2003	---	---	---	Dry
	09-Sep-2004	---	---	---	Dry
	08-Sep-2005	---	---	---	Dry
	07-Sep-2006	---	---	---	Dry
	05-Sep-2007	---	---	---	Dry
	26-Aug-2008	---	---	---	Dry
	09-Sep-2009	---	---	---	Dry
	09-Sep-2010	---	---	---	Dry
	23-Aug-2012	---	---	---	Dry
	26-Sep-2013	---	---	---	Dry
	16-Sep-2014	---	---	---	Dry
	29-Sep-2015	---	---	---	Dry
	27-Sep-2016	---	---	---	Dry
	26-Sep-2017	---	---	---	Dry
	17-Sep-2018	---	---	---	Dry
	16-Sep-2019	---	---	---	Dry
	22-Sep-2020	---	---	---	Dry
	22-Sep-2021	---	---	---	Dry
	28-Sep-2022	---	---	---	Dry
	28-Sep-2023	---	---	---	Dry
	11-Sep-2024	---	---	---	Dry
14(R)-SS	18-Sep-2025	587	8.45	9.20	
15-SH	12-Nov-1993	274	7.91	3	
	31-May-1994	536	7.22	5	
	22-Sep-1994	600	7.49	9	
	01-Nov-1994	547	7.38	8	
	28-Sep-1995	547	7.28	8	
	04-Sep-1996	639	7.01	4.4	
	04-Sep-1997	623	7.13	5.4	
	16-Sep-1998	656	7.17	6.1	
	09-Sep-1999	633	7.5	9.8	
	06-Sep-2000	699	6.66	7.4	
	07-Sep-2001	438	7.94	7.1	
	05-Sep-2002	703	6.75	6.8	
	03-Sep-2003	582	7.37	8.4	
	08-Sep-2004	487	6.41	5.2	
	26-Aug-2005	---	---	---	Water level only
	07-Sep-2005	574	6.89	10.5	
	06-Sep-2006	644	7.43	9.1	
	06-Sep-2007	559	7.16	7.2	
	04-Sep-2008	503	7.55	6.7	Frost heaved a little
	10-Sep-2009	589	6.9	9.6	
	09-Sep-2010	659	7.56	6.3	
	08-Sep-2011	620	7.3	9.8	
	06-Sep-2012	663	7.55	10.1	Clear
	26-Sep-2013	589	5.73	7.9	Clear
	17-Sep-2014	536	7.17	10.2	
	29-Sep-2015	610	7.7	7.0	Clear
	27-Sep-2016	706	6.83	7.9	Clear
	27-Sep-2017	710	7.12	7.70	Clear
	18-Sep-2018	635	7.19	5.52	Clear
	17-Sep-2019	446	7.16	7.84	Clear
	21-Sep-2020	696	6.97	7.80	
	22-Sep-2021	676	7.35	10.12	
	29-Sep-2022	491	7.17	7.15	
	28-Sep-2023	718	7.39	10.30	
	11-Sep-2024	532	7.03	9.00	
	18-Sep-2025	381	6.90	9.30	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
15-IN	22-Sep-1994	678	7.57	9	
	28-Sep-1995	649	7.46	6.5	
	04-Sep-1996	670	7.3	1.7	
	04-Sep-1997	694	7.39	2.9	
	16-Sep-1998	706	7.31	6.1	
	09-Sep-1999	692	7.61	6.6	
	06-Sep-2000	582	6.57	5.5	
	06-Sep-2001	474	7.75	5.5	
	05-Sep-2002	759	6.7	5.9	
	03-Sep-2003	644	7.43	7.6	
	08-Sep-2004	537	6.61	4	
	26-Aug-2005	---	---	---	Water level only
	07-Sep-2005	618	7.02	10.1	
	06-Sep-2006	694	7.65	7.1	
	06-Sep-2007	632	7.23	5.9	
	04-Sep-2008	460	7.41	7.6	
	10-Sep-2009	672	7.04	8.5	
	09-Sep-2010	590	7.2	8.1	
	08-Sep-2011	569	7.11	12.1	
	06-Sep-2012	607	7.22	10.2	Clear
	26-Sep-2013	521	5.7	9.8	Clear
	17-Sep-2014	546	7.22	8.8	
	29-Sep-2015	592	7.59	8.2	Clear
	27-Sep-2016	780	6.9	7.9	Clear
	27-Sep-2017	740	7.10	6.04	Clear
	18-Sep-2018	686	6.99	5.61	Clear
	17-Sep-2019	---	---	---	Dry- did not recover
	21-Sep-2020	755	7.03	6.2	
	22-Sep-2021	764	7.44	9.8	
	29-Sep-2022	514	7.23	7.07	
	28-Sep-2023	762	7.31	10.70	
	11-Sep-2024	492	7.08	7.50	
	18-Sep-2025	752	7.08	8.50	
15-SS	12-Nov-1993	579	7.86	5	
	05-Sep-2002	---	---	---	Insufficient water
	03-Sep-2003	---	---	---	Dry
	08-Sep-2004	---	---	---	Replaced by 15(R)-SS
15(R)SS	10-Sep-2004	581	6.4	4	
	08-Sep-2005	544	6.88	13.5	
	07-Sep-2006	547	8.46	11.3	
	07-Sep-2007	490	7.53	6	
	04-Sep-2008	683	9.16	8.95	
	17-Sep-2009	1157	7.56	5.7	
	09-Sep-2010	1594	7.57	6.6	Came out cloudy at first then clear, hydrogen sulphide smell
	08-Sep-2011	1394	7.68	14.2	
	06-Sep-2012	---	---	---	Insufficient water for field parameters
	26-Sep-2013	1324	7.82	10.1	Light yellow/green colour, sulphur odour
15(2R)SS	16-Sep-2014	771	7.36	5.6	Slightly silty (very fine)
	28-Sep-2015	520	7.77	6.4	
	26-Sep-2016	519	7.18	8.4	
	27-Sep-2017	481	7.43	8.36	Clear
	18-Sep-2018	448	7.03	4.81	Clear
	16-Sep-2019	305	7.64	8.52	Clear
	22-Sep-2020	429	7.3	6.20	
	22-Sep-2021	413	8.0	6.83	
	29-Sep-2022	281	7.66	8.02	
	29-Sep-2023	---	---	---	
	10-Sep-2024	333	7.73	13	
	17-Sep-2025	409	7.59	13	
16-SH	28-Sep-1995	651	7.18	7	
	05-Sep-1996	717	7	2.8	
	04-Sep-1997	727	6.99	4.1	
	15-Sep-1998	743	6.99	5.8	
	09-Sep-1999	756	7.39	9.3	
	06-Sep-2000	686	7.34	11.2	
	06-Sep-2001	458	7.5	7	
	05-Sep-2002	805	7.63	7.8	
	04-Sep-2003	730	7.42	7.1	
	09-Sep-2004	570	6.88	4.7	
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	724	7.18	12.4	
	07-Sep-2006	789	7.44	9.7	
	05-Sep-2007	598	7.21	8.7	
	03-Sep-2008	545	7.29	8.3	
	10-Sep-2009	753	7.02	9.3	
	08-Sep-2010	766	7.26	7.4	
	07-Sep-2011	706	7.03	13	
	05-Sep-2012	772	7.27	8.9	Clear
	26-Sep-2013	724	5.97	7.6	Clear
	16-Sep-2014	808	7.35	12	
	28-Sep-2015	1380	6.77	8.1	Clear
	26-Sep-2016	803	6.84	8.2	Clear
	27-Sep-2017	781	7.13	9.25	Clear
	18-Sep-2018	707	6.91	5.35	Clear
	16-Sep-2019	486	7.37	10.42	Clear
	22-Sep-2020	755	7.13	6.3	
	21-Sep-2021	798	7.34	10.6	
	28-Sep-2022	539	6.85	8.24	
	28-Sep-2023	715	7.39	10.30	
	10-Sep-2024	541	7.22	10.70	
	17-Sep-2025	800	6.93	11.40	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
16-IN	05-Sep-1996	684	7.36	1.6	
	04-Sep-1997	724	7.27	3.8	
	15-Sep-1998	729	7.31	6	
	09-Sep-1999	850	7.64	7.3	
	06-Sep-2000	728	7.5	6.8	
	06-Sep-2001	528	7.54	6.8	
	05-Sep-2002	856	7.61	6.8	
	04-Sep-2003	770	7.5	4.9	
	09-Sep-2004	608	7.01	4	
	25-Aug-2005	---	---	---	Water level only
	08-Sep-2005	789	7.21	12.3	
	07-Sep-2006	814	7.67	9.5	
	05-Sep-2007	662	7.24	8.5	
	03-Sep-2008	632	7.46	7.3	
	10-Sep-2009	772	7.12	8	
	08-Sep-2010	796	7.52	5.7	
	07-Sep-2011	734	7.2	11.9	
	05-Sep-2012	769	7.51	7.3	Clear
	26-Sep-2013	730	6.79	11.7	Clear, Low Volume
	16-Sep-2014	926	7.17	10.9	Low volume
	28-Sep-2015	810	7.5	8.2	Clear and limited sample
	26-Sep-2016	848	6.87	9.6	Clear and limited sample
	27-Sep-2017	846	7.14	8.65	Clear and limited sample
	18-Sep-2018	764	6.73	4.13	Clear
	16-Sep-2019	---	---	---	Dry- did not recover
	22-Sep-2020	810	7.32	5.7	
	21-Sep-2021	831	7.15	9.0	
	28-Sep-2022	558	7.040	7.140	
	28-Sep-2023	---	---	---	Dry- did not recover
	10-Sep-2024	---	---	---	Dry- did not recover
	17-Sep-2025	---	---	---	Dry- did not recover
17-SH	01-Nov-1994	511	7.64	7	
	28-Sep-1995	515	7.41	9	
	04-Sep-1996	512	7.04	5.2	
	04-Sep-1997	589	7.31	4.1	
	16-Sep-1998	557	7.09	5.6	
	09-Sep-1999	518	7.85	10.6	
	06-Sep-2000	490	6.77	10.1	
	06-Sep-2001	426	7.79	8.6	
	05-Sep-2002	658	6.93	9.3	
	03-Sep-2003	580	7.55	11.3	
	08-Sep-2004	460	6.74	6.4	
	26-Aug-2005	---	---	---	Water level only
	07-Sep-2005	485	7.28	11.2	
	06-Sep-2006	605	7.68	10	
	06-Sep-2007	537	7.19	8.5	
	04-Sep-2008	561	7.74	8.8	
	10-Sep-2009	591	7.5	11	
	09-Sep-2010	579	7.51	9	
	08-Sep-2011	564	7.28	12.4	
	06-Sep-2012	538	7.43	12.2	Clear
	26-Sep-2013	547	5.79	11.1	
	17-Sep-2014	540	7.32	13.6	
	29-Sep-2015	612	7.5	8.5	Clear
	27-Sep-2016	786	7.09	7.9	Clear
	27-Sep-2017	750	7.40	9.28	Clear
	18-Sep-2018	683	7.04	6.89	Clear
	17-Sep-2019	397	7.28	7.72	Clear
	21-Sep-2020	625	7.28	9.1	
	22-Sep-2021	613	7.43	9.6	
	29-Sep-2022	429	7.30	7.79	
	28-Sep-2023	671	7.61	10.70	
	11-Sep-2024	438	7.22	9.80	
	18-Sep-2025	628	7.20	10.20	
17-IN	28-Sep-1995	643	7.3	8	
	04-Sep-1996	692	7.14	3.4	
	04-Sep-1997	734	7.21	3.8	
	16-Sep-1998	721	7.22	6.1	
	09-Sep-1999	732	7.39	6.8	
	06-Sep-2000	569	6.46	5.6	
	06-Sep-2001	526	7.49	5.9	
	05-Sep-2002	830	6.8	5.8	
	03-Sep-2003	705	7.4	7.4	
	08-Sep-2004	597	6.73	4.4	
	26-Aug-2005	---	---	---	Water level only
	07-Sep-2005	676	6.94	8.7	
	06-Sep-2006	812	7.22	6.3	
	06-Sep-2007	724	7.18	7.2	
	04-Sep-2008	571	7.4	7.2	
	10-Sep-2009	771	7.45	10.7	
	09-Sep-2010	770	7.2	7.9	
	08-Sep-2011	704	7	10.6	
	06-Sep-2012	761	7.46	10.7	Clear
	26-Sep-2013	700	5.53	7.4	
	17-Sep-2014	667	7.02	11	
	29-Sep-2015	709	7.49	6.2	Clear to slightly cloudy
	27-Sep-2016	842	6.82	5.0	Clear to slightly cloudy
	27-Sep-2017	820	7.19	5.52	Clear
	18-Sep-2018	729	6.95	3.48	Clear
	17-Sep-2019	478	7.04	5.18	Clear
	21-Sep-2020	810	6.87	5.50	
	22-Sep-2021	784	7.09	7.18	
	29-Sep-2022	508	7.18	5.58	
	28-Sep-2023	777	7.20	7.70	
	11-Sep-2024	525	7.23	7.00	
	18-Sep-2025	786	7.09	8.40	

Table 4.2
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Field Parameters

Monitoring Well	Date (dd-mmm-yyyy)	Electrical Conductivity (µS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
M-5 [Decommissioned]	23-Sep-2002	634	6.96	7	
	17-Oct-2003	626	7.2	6.8	
	26-Oct-2004	392	7.93	4.5	
	25-Nov-2005	435	7.37	6.2	
	10-Sep-2009	561	6.8	11.7	
	28-Sep-2010	---	---	---	Well Offline
M-6	29-Sep-2010	353	6.7	8.3	
89-3	24-Sep-2002	432	7.15	4.4	
	14-Oct-2003	489	7.04	7.5	
	26-Oct-2004	351	7.01	4	
	25-Oct-2005	464	6.88	5.8	
	10-Sep-2009	---	---	---	Down for maintenance
	28-Aug-2010	496	6.92	8.8	
	26-Sep-2013	340	4.88	12	
	17-Sep-2014	405	6.73	7.8	Very slight reddish colour
	29-Sep-2015	355	7.41	22.0	Clear and sulphur odour
	27-Sep-2016	431	6.9	19.7	Clear and sulphur odour
	27-Sep-2017	414	6.94	23.79	Clear and sulphur odour
	18-Sep-2018	385	6.98	27.29	Clear and sulphur odour
	17-Sep-2019	290	7.28	10.60	Clear and sulphur odour
	21-Sep-2020	431	7.25	15.20	Clear and sulphur odour
	22-Sep-2021	412	7.11	21.58	Clear and sulphur odour
	29-Sep-2022	389	7.05	21.38	Clear and sulphur odour
	29-Sep-2023	378	7.24	17.70	Clear and sulphur odour
	11-Sep-2024	378	6.79	19.50	Clear and sulphur odour
	18-Sep-2025	349	7.11	20.40	Clear and sulphur odour

NOTES:
--- Parameter not measured

AECOM

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable[13]	0.0019	---	---
01-SH [Decommissioned]	15-May-1985	01-SH [DECOM]	492	7.81	---	---	268.2	273	---	1.6	8.4	---	---	280	77	18.4	1.75	8.3	332.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.014	0.02	---	---	---	---	---	---	---
	15-Jun-1985	01-SH [DECOM]	640	7.15	---	---	333.1	340	---	1.5	1.8	---	---	350	---	24.5	2.22	---	414.5	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	< 0.003	---	---	---	---	---	---	---
	15-Sep-1985	01-SH [DECOM]	539	7.53	---	---	265.3	295	---	1.5	6.9	---	---	295	76	18.3	2.05	8.4	359.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.037	---	---	---	---	---	---	---
	15-May-1986	01-SH [DECOM]	530	7.86	---	---	287.2	291	---	0.6	6.7	---	---	300	79	21.8	1.79	7.7	354.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.026	---	---	---	---	---	---	---
	15-Aug-1986	01-SH [DECOM]	534	7.26	---	---	277.3	279	---	1	4.9	---	---	285	77	20.6	1.78	7.6	340.1	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.005	---	---	---	---	---	---	---
	15-Oct-1986	01-SH [DECOM]	560	7.92	---	---	297.2	310	---	0.9	5.6	---	---	315	82	22.4	2.08	8.6	377.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.007	---	---	---	---	---	---	---
	15-May-1987	01-SH [DECOM]	538	7.4	---	---	280.3	296	---	0.8	6	---	---	290	79.7	19.7	1.85	7.75	360.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.049	---	---	---	---	---	---	---
	15-Sep-1987	01-SH [DECOM]	508	7.56	---	---	273.1	273	---	1.1	6.3	---	---	280	76	20.2	1.54	6.7	332.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.034	---	---	---	---	---	---	---
	15-Nov-1987	01-SH [DECOM]	609	7.78	---	---	267.7	273	---	0.7	5.2	---	---	285	73	20.7	1.68	7	332.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.05	---	---	---	---	---	---	---
	15-May-1988	01-SH [DECOM]	498	7.29	---	---	264.9	264	---	0.8	5.7	---	---	271	74	19.4	1.85	8	321.8	---	---	---	---	---	---	---	Table	---	---	< 0.003	0.039	---	---	---	---	---	---	---
	15-Aug-1988	01-SH [DECOM]	504	7.32	---	---	267	278	---	0.5	6.4	---	---	281	75	19.5	1.8	8.2	339	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.039	---	---	---	---	---	---	---
	15-Oct-1988	01-SH [DECOM]	491	7.82	---	---	269.8	266	---	0.6	6.3	---	---	274	75.8	19.5	1.83	7.4	324.3	---	---	---	---	---	---	---	< 0.0020	---	---	0.005	0.035	---	---	---	---	---	---	---
	15-Sep-1989	01-SH [DECOM]	529	7.38	---	---	---	---	---	---	---	---	---	360	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	01-SH [DECOM]	528	8.09	---	---	291.4	283	---	0.8	6.4	---	---	292	79.5	22.5	2.11	8.2	345	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.02	---	---	---	---	---	---	---
	15-Aug-1990	01-SH [DECOM]	581	7.59	---	---	286	316	---	0.8	4.2	---	---	309	78.5	21.8	2.11	9	385.2	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.034	---	---	---	---	---	---	---
	15-Nov-1990	01-SH [DECOM]	583	8.09	---	---	280.6	318.8	---	0.3	5.9	---	---	309	76.5	21.7	1.93	8	388.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.01	---	---	---	---	---	---	---
	12-May-1992	01-SH [DECOM]	640	7.59	---	---	345	365	---	0.4	6.4	---	---	357	98	24.3	2.12	9.48	444.9	---	---	---	---	---	---	0.99	< 0.0010	---	---	< 0.003	< 0.003	---	---	---	---	---	---	---
	04-Nov-1992	01-SH [DECOM]	606	7.72	---	---	---	403	---	1.1	7.8	---	---	407	112	29.1	2.19	9.54	491.3	---	---	---	---	---	---	1.03	< 0.0010	---	---	---	< 0.003	---	---	---	---	---	---	---
01A-SH [Decommissioned]	13-Nov-1993	01A-SH	164	6.11	---	---	69.6	63.9	---	2.9	2.9	---	---	80	21.1	4.1	3.7	6.2	77.9	---	---	---	---	---	---	---	0.01	---	---	0.012	0.022	---	---	---	---	---	---	---
	31-May-1994	01A-SH	129	5.56	---	---	---	48.4	< 0.1	1.7	7.5	2.74	0.634	63	17.3	3.5	1.08	2.6	59	< 0.5	< 0.5	---	---	---	---	1.1	< 0.001	---	---	0.007	< 0.003	0.007	---	---	---	---	---	---
	22-Sep-1994	01A-SH	627	6.94	---	---	---	340	0.1	1.3	10.3	0.31	0.844	342	90	20	3.45	9.8	414	0.5	0.5	---	---	---	---	0.94	< 0.001	---	---	0.018	0.018	0.018	---	---	---	---	---	---
	02-Nov-1994	01A-SH	650	8.31	---	---	---	339	3.2	1.4	11.3	0.81	0.816	359	102	22.6	3.46	11.9	406	3.8	< 0.5	---	---	---	---	1.07	< 0.001	---	---	0.008	0.005	0.008	---	---	---	---	---	---
	28-Sep-1995	01A-SH	83	5.46	---	---	49.4	33.9	< 0.1	< 0.5	4	4.93	0.163	45	15.3	2.7	0.6	1.6	41.3	< 0.5	< 0.5	---	---	---	---	---	< 0.001	---	---	---	0.007	---	---	---	---	---	---	---
	04-Sep-1996	01A-SH	101	5.75	---	---	50.4	34	< 0.1	0.7	7.1	6.79	0.227	50	16.1	2.47	0.49	2.26	41.5	< 0.5	< 0.5	---	---	---	---	---	0.001	---	---	---	< 0.003	< 0.003	---	---	---	---	---	---
	05-Sep-1997	01A-SH	84.6	5.15	---	---	37.7	23.2	< 0.1	0.8	3.8	4.21	0.122	36	11.8	1.99	0.17	3.01	28.3	< 0.5	< 0.5	---	---	---	---	---	< 0.001	---	---	---	0.02	0.02	---	---	---	---	---	---
	16-Sep-1998	01A-SH	---	---	---	---	---	---	---	---	---	---	---	---	12.6	2.3	< 0.2	2.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Oct-1998	01A-SH	86.2	5.5	---	---	---	30.3	< 0.1	2.1	0.8	---	---	55	---	---	---	---	37	< 0.5	< 0.5	---	---	---	---	---	< 0.001	---	---	---	0.006	---	---	---	---	---	---	---
	09-Sep-1999	01A-SH	87	5.75	---	---	36	30.2	< 0.1	1.6	0.8	---	---	35.6	11.3	1.8	0.9	1.1	36.9	< 0.5	< 0.5	---	0.665	0.783	---	1.18	---	---	---	---	< 0.003	< 0.003	---	---	---	---	---	---
	06-Sep-2000	01A-SH	518	6.79	---	---	250	247	< 0.1	1.7	36.2	2.1	0.083	295	73.8	15.9	1.3	17.5	301	< 0.5	< 0.5	---	5.74	5.79	---	1.01	0.004	---	---	0.009	< 0.003	0.009	---	---	---	---	---	---
	07-Sep-2001	01A-SH	317	6.75	---	---	170	112	< 0.5	1.8	58.9	3.9	0.148	203	50.6	10.8	1.4	7.9	137	< 0.5	< 0.5	---	---	---	---	1.08	< 0.001	---	---	< 0.003	0.009	0.009	---	---	---	---	---	---
	05-Sep-2002	01A-SH	---	---	---	---	---	---	---	---	---	5.55	0.162	---	25.8	3.3	0.8	1.2	---	---	---	---	---	---	---	---	---	---	---	---	---	2.04	---	---	---	1.4	---	---
	11-Sep-2002	01A-SH	112	5.95	---	---	51	51.3	< 0.5	2.1	3	4.77	0.009	62.6	15.7	2.9	0.6	2	62.6	< 0.5	< 0.5	---	1.16	1.13	---	0.97	---	---	---	< 0.003	0.166	0.166	---	---	---	---	---	---
	08-Oct-2002	01A-SH	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.54	1.18	---	---	---	---	---
	07-Sep-2003	01A-SH	242	6.35	---	---	120	70.8	< 0.5	1.3	47.9	3.09	0.136	144	36.7	6.5	0.7	4.7	86.4	< 0.5	< 0.5	---	2.45	2.7	---	1.1	---	---	---	< 0.003	0.005	0.005	---	---	---	---	---	---
	11-Sep-2003	01A-SH	---	---	---	---	---	---	---	---	---	2.24	0.182	---	58.2	10.9	1	5.9	---	---	---	---	---	---	---	---	---	---	---	< 0.003	0.006	0.006	---	---	---	---	29.9	---
	02-Dec-2003	01A-SH	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Sep-2004	01A-SH	1180	7.63	---	---	580	457	< 0.5	3.5	214	0.06	0.019	724	176	35	3.7	17.2	558	< 0.5	< 0.5	---	---	---	---	0.91	---	< 0.004	---	< 0.003	0.005	0.005	---	---	---	---	62.2	---
	07-Sep-2005	01A-SH	499	7.86	3.3	---	190	143	< 0.5	2.2	71.5	3.46	0.037	244	57.9	11.5	1.3	10.5	174	< 0.5	< 0.5	---	---	---	---	1.01	---	< 0.004	---	< 0.003	< 0.003	< 0.003	---	---	---	---	23.9	---
	07-Sep-2006	01A-SH	216	6.94	---	---	110	91.6	< 0.5	3.3	12.3	1.44	0.112	128	33.4	6.7	0.8	13.6	112	< 0.5	< 0.5	---	---	---	---	1.34	---	---	---	< 0.003	0.008	0.008	---	---	---	---	5.5	---
	06-Sep-2007	01A-SH	615	6.99	---	---	240	295	< 0.5	1.6	34.7	1.35	0.104	326	72.7	14.8	1.6	19	360	< 0.5	< 0.5	---	---	---	---	0.86	---	---	---	< 0.003	0.684	0.684	---	---	---	---	11.2	---
	04-Sep-2008	01A-SH	182	6.5	---	---	79	82	---	1.48	3	2.22	0.15	94	24.1	4.56	1	10.5	101	< 5	< 5	0.071	---	---	---	1.17	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	10-Sep-2009	01A-SH	229	6.88	---	---	86.6	101	---	1.73	5.52	2.5	0.0857	112	26.7	4.84	0.71	12.2	124	< 5.0	< 5.0	0.06	---	---	---	1.04	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	01A SH	474	6.77	---	---	90.1	242	---	1.13	11.8	2.46	0.09	203	27.4	5.26	0.64	10.9	295	< 5.0	< 5.0	0.186	---	---	44.7	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	01A-SH	197	7.18	---	---	79.8	95.8	---	1.64	1.2	3.16	0.0873	101	24.3	4.65	0.65	10.8	117	< 5.0	< 5.0	0.126	---	---	104	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	06-Sep-2012	01A-SH	193	6.47	---	76.8	76.7	92.1	---	1.9	0.96	3.4	0.0877	98.5	23.7	4.26	0.87	11.5	112	< 5.0	< 5.0	0.084	---	---	107	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	01A-SH	169	5.90	---	69.1	69.2	68.8	---	2.39	1.98	3.40	0.0871	80.70	20.9	4.14	0.51	9.4	83.9	< 5.0	< 5.0	0.064	---	---	121	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	01A-SH	143	6.71	---	---	59.5	61.2	---	2.48	1.80	2.78	0.0726	71.6	18.3	3.36	<0.50	8.8	74.7	< 5.0	<5.0	0.125	---	---	118	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	1.45	---
	29-Sep-2015	01A-SH	102	5.59	---	---	45.6	31.8	---	3.70	0.64	2.36	0.0755	45.7	14.5	2.29	0.490	4.95	38.8	<5.0	<5.0	0.084	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2016	01A-SH	180	6.10	---	---	71.3	78.3	---	3.17	0.90	2.80	0.0774	91.8	21.8	4.08	0.690	14.20	95.5	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	01A-SH	156	6.89	---	---	65.2	68.9	---	3.33	0.34	1.94	0.0820	115	19.6	3.96	<2.5	10.50	84.1	<5.0	<5.0	0.042	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	18-Sep-2018	01A-SH	134	6.30	---	---	60	58.0	---	4.50	0.43	1.98	0.0731	73.9	18.7	3.22	0.520	11.70	70.8	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	17-Sep-2019	01A-SH	273	6.03	---	---	130	151.0	---	4.16	3.68	2.58	0.0810	167	38.6	8.26	0.920	20.80	184.0	<5.0	<5.0	0.150	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	21-Sep-2020	01A-SH	182	5.80	---	---	57.5	61.7	---	5.77	0.87	2.12	0.0729	72.5	17.7	3.23	<0.50	7.80	75.3	<5.0	<5.0	0.066	---	---	105	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	01A-SH	120	5.46	---	---	47	36.9	---	7.64	1.07	3.15	0.0706	55.5	13.8	3.05	0.620	7.10	45.0	<5.0	<5.0	0.114	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	29-Sep-2022	01A-SH	119	5.95	---	---	47	37.8	---	9.66	0.31	2.73	0.0660	172	14.6	2.53	0.54	7.4	46.1	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	0.049	<0.0500	---	---	---	---	---	---
	28-Sep-2023	01A-SH	167	6.24	---	---	62.6	65	---	8.58	0.66	1.58	0.0835	178	19.1	3.62	0.642	11.7	79.3	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	0.047	<0.0500	---	---	---	---	---	---
	11-Sep-2024	01A-SH	198	5.69	---	---	78	84	---	8.68	0.46	3.22	0.082	202	23	4.99	0.87	10.0	102	<1.0	<1.0	0.029	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
01(R)-SH	18-Sep-2025	01(R)-SH	1230	6.26	---	---	505	667	---	19.2	14.6	180	8.96	1020	138	39.0	5.45	10.2	814	<0.6	<0.3	0.681	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
01-IN [Decommissioned]	15-Feb-1985	01-IN [DECOM]	1080	7.56	---	---	518.7	408	---	3.2	176	---	---	680	151	34.3	5.5	48	497.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.014	0.095	---	---	---	---	---	---	---
	15-Jun-1985	01-IN [DECOM]	1000	7.95	---	---	463.2	401	---	3.6	170	---	---	630	128	34.8	5.35	46.7	488.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.045	---	---	---	---	---	---	---
	15-Dec-1985	01-IN [DECOM]	1120	7.61	---	---	401.3	349	---	4.75	182	---	---	600	109	31.3	5.7	53	425.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.057	0.021	---	---	---	---	---	---	---
	15-May-1986	01-IN [DECOM]	996	7.7	---	---	496.2	435	---	1	131	---	---	640	144	33.1	5.55	46.5	530.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.184	---	---	---	---	---	---	---
	15-Aug-1986	01-IN [DECOM]	1035	7.71	---	---	479.4	412	---	2.3	148	---	---	625	144	29	5.1	40	502.2	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.004	---	---	---	---	---	---	---
	15-Oct-1986	01-IN [DECOM]	1040	8.1	---	---	488.3	446	---	1.7	150	---	---	670	141	33	5.45	50	543.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.012	---	---	---	---	---	---	---
	15-May-1987	01-IN [DECOM]	942	8.05	---	---	456.5	436	---	2.2	92	---	---	580	134	29.6	4.98	41	532	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.84	---	---	---	---	---	---	---
	15-Sep-1987	01-IN [DECOM]	982	7.75	---	---	495.8	451	---	2.1	131	---	---	630	144	33	5.26	42.4	549.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.66	---	---	---	---	---	---	---
	15-Nov-1987	01-IN [DECOM]	1000	7.85	---	---	507.4	449	---	1.7	122	---	---	640	146	34.6	5.25	42.5	547.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.74	---	---	---	---	---	---	---
	15-Mar-1988	01-IN [DECOM]	946	8.14	---	---	458.9	427	---	0.5	99	---	---	573	135	29.5	4.97	42.5	520.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.78	---	---	---	---	---	---	---
	15-Aug-1988	01-IN [DECOM]	943	7.99	---	---	412.8	387	---	0.4	79	---	---	504	120	27.4	4.7	34.9	471.8	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	1.63	---	---	---	---	---	---	---
	15-Oct-1988	01-IN [DECOM]	941	7.925	---	---	456	419	---	0.5	107	---	---	573	133.5	29.7	5	39.8	510.8	---	---	---	---	---	---	---	< 0.0020	---	---	---	0.007	2.04	---	---	---	---	---	---
	15-Mar-1989	01-IN [DECOM]	900	8.06	---	---	---	---	---	---	---	---	---	692	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1989	01-IN [DECOM]	941	7.51	---	---	464.4	443	---	0.4	90	---	---	574	138	29	5.24	40	540	---	---	---	---	---	---	---	< 0.0010	---	---	0.008	1.09	---	---	---	---	---	---	---
	15-Sep-1989	01-IN [DECOM]	931	7.31	---	---	---	---	---	---	---	---	---	620	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	01-IN [DECOM]	907	8.16	---	---	419.7	409	---	1	75	---	---	522	116	31.5	4.96	42.6	498.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	1.64	---	---	---	---	---	---	---
	15-May-1990	01-IN [DECOM]	914	8.14	---	---	418.5	455	---	0.9	81	---	---	550	120	28.8	5	36.6	554.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.72	---	---	---	---	---	---	---
	15-Aug-1990	01-IN [DECOM]	976	7.78	---	---	---	---	---	---	---	---	---	630	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	01-IN [DECOM]	947	8.08	---	---	332.2	378.4	---	0.01	54.5	---	---	446	83.5	30	5	41.4	461.3	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.48	---	---	---	---	---	---	---
	16-May-1991	01-IN [DECOM]	915	7.59	---	---	---	---	---	---	---	---	---	590	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Nov-1991	01-IN [DECOM]	521	7.18	---	---	---	---	---	0.5	---	---	---	340	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Nov-1992	01-IN [DECOM]	793	7.36	---	---	---	---	---	0.8	---	---	---	515	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-May-1993	01-IN [DECOM]	895	7.38	---	---	---	---	---	0.7	---	---	---	625	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [13]	0.0019	---	---
01A-IN	13-Nov-1993	01A-IN	545	7.49	---	---	285	279	---	2.6	8.1	---	---	300	86	17.1	6.6	9.8	340	---	---	---	---	---	---	1.08	0.003	---	---	0.005	0.119	---	---	---	---	---	---	---
	22-Sep-1994	01A-IN	147	**5.57**	---	---	65.6	53.8	0.1	2	11	**5.1**	**0.369**	73	20	3.8	0.68	2.6	65.6	0.5	0.5	---	---	---	---	1.06	---	---	---	< 0.003	0.003	0.003	---	---	---	0.01	---	---
	28-Sep-1995	01A-IN	636	6.91	---	---	377	366	< 0.1	1.6	19.2	**2.65**	**0.569**	390	108	26	3.3	8.7	446	< 0.5	< 0.5	---	---	---	---	1.03	---	---	---	0.008	0.008	---	---	---	---	< 0.01	---	---
	04-Sep-1996	01A-IN	749	6.96	---	---	391	375	< 0.1	2.2	37.6	< 0.01	**0.532**	425	116	24.6	2.88	13.2	457	< 0.5	< 0.5	---	---	---	---	1.01	---	---	---	0.004	0.031	0.035	---	---	---	< 0.005	---	---
	09-Sep-1999	01A-IN	832	7.21	---	---	450	415	< 0.1	1.8	55.1	---	---	492	128	31.9	2.9	23.2	506	< 0.5	< 0.5	---	9.5	10.1	---	1.06	---	---	---	0.005	0.007	0.012	---	---	---	< 0.01	---	---
	06-Sep-2000	01A-IN	803	7.26	---	---	420	393	< 0.1	3.1	60.5	0.02	**0.47**	471	120	28.7	3.4	19.9	479	< 0.5	< 0.5	---	9.2	9.31	---	1.01	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	---	---
	07-Sep-2001	01A-IN	766	7.49	---	---	430	382	< 0.5	2	68.7	0.09	**0.55**	474	122	29.7	3.5	18.7	466	< 0.5	< 0.5	---	---	---	---	1.03	---	---	---	< 0.003	0.006	0.006	---	---	---	< 0.01	---	---
	05-Sep-2002	01A-IN	853	7.06	---	---	340	400	< 0.5	2	67	**8.78**	**0.569**	485	92.8	26.5	3.5	43.7	488	< 0.5	< 0.5	---	9.45	8.8	---	0.93	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	18.5	---
	11-Sep-2002	01A-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.85	---	---	---	---	---
	08-Oct-2002	01A-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.36	1.7	---	---	---	---
	03-Sep-2003	01A-IN	822	7.3	---	---	410	386	< 0.5	1.9	82.5	**29.6**	**0.599**	**524**	121	27.2	3.2	26.8	471	< 0.5	< 0.5	---	9.49	10.6	---	1.11	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	25.5	---
	08-Sep-2004	01A-IN	870	7.37	---	---	390	387	< 0.5	2.2	79.9	**15.5**	**0.244**	**505**	112	27.5	3.3	33	472	< 0.5	< 0.5	---	---	---	---	1.05	---	---	---	< 0.003	0.006	0.006	---	---	---	< 0.01	23.7	---
	07-Sep-2005	01A-IN	835	7.72	224	---	380	411	< 0.5	2.4	83	**12.9**	**0.503**	**518**	110	25	3.1	35.6	501	< 0.5	< 0.5	---	---	---	---	0.96	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	0.032	22	---
	07-Sep-2006	01A-IN	788	7.22	---	---	400	365	< 0.5	2.5	76.8	**20.9**	**0.619**	496	118	27	3.3	28.1	446	< 0.5	< 0.5	---	---	---	---	1.13	---	---	---	0.003	0.066	0.069	---	---	---	---	25.8	---
	04-Dec-2006	01A-IN	---	---	---	---	---	---	---	---	---	**32.8**	**0.444**	---	117	27.9	3.3	27.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	27.3	---
	06-Sep-2007	01A-IN	807	7.28	---	---	340	377	< 0.5	2.3	76.3	0.18	**0.495**	454	98.5	22	2.9	25.1	460	< 0.5	< 0.5	---	---	---	---	0.86	---	---	---	< 0.003	0.023	0.023	---	---	---	---	20.7	---
	04-Sep-2008	01A-IN	775	7.5	---	---	343	362	---	1.19	71.3	**17**	**0.484**	447	98.6	23.6	3.07	31.8	442	< 5	< 5	0.125	---	---	---	0.949	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	10-Sep-2009	01A-IN	751	7.52	---	---	369	348	---	1.25	73	**26.9**	**0.548**	446	109	23.5	2.92	27.3	424	< 5.0	< 5.0	0.108	---	---	---	1.01	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	01A IN	786	7.6	---	---	341	363	---	1.44	75.3	**17.2**	**0.456**	452	96.8	24.2	2.85	33.8	442	< 5.0	< 5.0	0.154	---	---	94.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	01A-IN	789	7.75	---	---	383	372	---	1.16	66	**3.12**	**0.319**	481	108	27.6	3.4	51.2	454	< 5.0	< 5.0	0.151	---	---	113	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	06-Sep-2012	01A-IN	783	7.44	---	378	378	373	---	1.1	65.6	**7.45**	**0.278**	478	109	25.7	3.47	48.9	456	< 5.0	< 5.0	0.121	---	---	110	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	01A-IN	784	7.15	---	386	385	423	---	0.95	59.3	**33.8**	**0.466**	489	111	26.3	3.15	34.7	516	< 5.0	< 5.0	0.089	---	---	95.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	01A-IN	799	8.14	---	---	370	399	---	1.00	50.8	**29.9**	**0.485**	468	109	23.8	3.35	40.3	487	< 5.0	< 5.0	0.118	---	---	102	---	---	---	---	< 0.020	0.081	0.081	---	---	---	---	16.3	---
	29-Sep-2015	01A-IN	855	7.02	---	---	375	405	---	1.13	41.1	**1.40**	**0.322**	470	103	28.5	3.69	49.0	495	<5.0	<5.0	0.170	---	---	---	---	---	---	---	<0.010	0.047	0.047	---	---	---	---	---	---
	27-Sep-2016	01A-IN	809	7.27	---	---	367	429	---	0.91	25.3	**8.78**	**0.398**	459	108	23.6	3.33	40.8	524	<5.0	<5.0	0.070	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	01A-IN	756	8.12	---	---	369	464	---	0.93	12.9	**3.17**	**0.405**	478	104	26.5	3.64	51.4	566	<5.0	<5.0	0.088	---	---	---	---	---	---	---	<0.010	0.101	0.101	---	---	---	---	---	---
	18-Sep-2018	01A-IN	744	7.50	---	---	373	448	---	1.00	3.7	**5.22**	**0.372**	460	106	26.4	3.65	50.0	546	<5.0	<5.0	0.168	---	---	---	---	---	---	---	<0.010	0.098	0.098	---	---	---	---	---	---
	17-Sep-2019	01A-IN	748	7.12	---	---	375	482	---	1.24	1.4	**29.20**	**0.482**	478	108	25.5	3.66	48.1	588	<5.0	<5.0	0.147	---	---	---	---	---	---	---	0.016	0.211	0.227	---	---	---	---	---	---
	21-Sep-2020	01A-IN	823	7.59	---	---	344	471	---	1.32	2.2	**26.20**	**0.455**	456	99.9	22.9	3.25	43.5	575	<5.0	<5.0	0.112	---	---	92.9	---	---	---	---	---	---	---	---	---	---	---	---	---
	22-Sep-2021	01A-IN	732	7.09	---	---	334	461	---	1.34	2.9	**12.60**	**0.369**	450	90.9	25.9	3.62	47.9	563	<5.0	<5.0	0.150	---	---	---	---	---	---	---	<0.010	0.128	0.128	---	---	---	---	---	---
	29-Sep-2022	01A-IN	744	7.75	---	---	359	448	---	1.58	0.47	**2.79**	**0.402**	**517**	103	24.8	3.36	45.2	547	<1.0	<1.0	0.076	---	---	---	---	---	---	---	<0.010	0.560	0.560	---	---	---	---	---	---
	28-Sep-2023	01A-IN	803	8.23	---	---	272	468	---	1.47	<0.30	**0.501**	**0.25**	483	76.4	19.8	2.86	45.1	571	<1.0	<1.0	0.027	---	---	---	---	---	---	---	<0.010	0.173	0.173	---	---	---	---	---	---
	11-Sep-2024	01A-IN	753	7.01	---	---	332	466	---	1.94	<0.30	**16.0**	**0.490**	**526**	93	24.0	3.33	44.4	569	<1.0	<1.0	0.182	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	18-Sep-2025	01A-IN	801	7.14	---	---	310	459	---	1.30	<0.30	**4.00**	**0.298**	**507**	81.6	25.8	3.79	64.4	560	<0.6	<0.3	0.152	---	---	---	---	---	---	---	<0.010	0.194	0.194	---	---	---	---	---	---
01-SS [Decommissioned]	17-Feb-1985	01-SS [DECOM]	---	---	---	---	168.3	298	---	---	---	---	---	360	---	---	---	---	363.3	---	---	---	---	---	---	---	---	---	---	0.007	0.47	---	---	---	---	---	---	---
	15-Jun-1985	01-SS [DECOM]	580	7.49	---	---	135.8	268	---	1	36	---	---	340	43.6	6.5	7.3	78.6	326.7	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.006	---	---	---	---	---	---	---
	15-Jul-1985	01-SS [DECOM]	434	7.87	---	---	101.2	217	---	1.5	36.2	---	---	285	33.1	4.5	6.7	67	264	---	---	---	---	---	---	---	< 0.0020	---	---	0.008	0.053	---	---	---	---	---	---	---
	15-Dec-1985	01-SS [DECOM]	530	7.62	---	---	110.5	237	---	1.21	42.5	---	---	320	35	5.6	7.4	73	288.9	---	---	---	---	---	---	---	0.045	---	---	< 0.003	0.008	---	---	---	---	---	---	---
	15-May-1986	01-SS [DECOM]	584	7.65	---	---	154.9	286	---	0.6	35.2	---	---	350	48.8	8	7.25	75	348.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Aug-1986	01-SS [DECOM]	588	7.67	---	---	130.8	268	---	0.9	37.1	---	---	335	42.6	5.9	7	74	326.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.019	---	---	---	---	---	---	---
	15-Oct-1986	01-SS [DECOM]	560	8	---	---	148.3	276	---	0.9	30	---	---	340	46.8	7.6	7.4	68	336.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.003	---	---	---	---	---	---	---
	15-Feb-1987	01-SS [DECOM]	601	7.57	---	---	---	---	---	0.7	38.8	---	---	---	52	9.3	7.25	70	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1987	01-SS [DECOM]	579	7.87	---	---	172.9	290	---	1.3	32.3	---	---	350	55	8.6	7.55	70	353.5	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Nov-1987	01-SS [DECOM]	600	7.95	---	---	167.5	295	---	0.7	27	---	---	360	52	9.1	7.35	71.5	359.6	---	---	---	---	---	---	---	< 0.0020	---	---	0.009	0.53	---	---	---	---	---	---	---
	15-May-1988	01-SS [DECOM]	560	7.8	---	---	162.9	262	---	0.1	34.8	---	---	332	52.3	7.8	9.5	68	319.4	---	---	---	---	---	---	---	< 0.0010	---	---	0.1	0.31	---	---	---	---	---	---	---
(Duplicate)	15-May-1988	01-SS DUP	577	7.53	---	---	153.6	262	---	0.5	31.3	---	---	322	49.9	7	7.5	70	319.4	---	---	---	---	---	---	---	0.003	---	---	0.025	0.139	---	---	---	---	---	---	---
	15-Aug-1988	01-SS [DECOM]	569	7.76	---	---	164.3	286.9	---	0.3	32.1	---	---	339	53.2	7.6	7	64.3	349.7	---	---	---	---	---	---	---	< 0.0010	---	---	0.017	0.061	---	---	---	---	---	---	---
	15-Oct-1988	01-SS [DECOM]	576	7.84	---	---	163.6	274	---	0.5	41.9	---	---	340	52.9	7.61	6.9	63	334	---	---	---	---	---	---	---	< 0.0010	---	---	0.009	0.4	---	---	---	---	---	---	---
	15-Sep-1989	01-SS [DECOM]	578	7.62	---	---	---	---	---	---	---	---	---	360	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	01-SS [DECOM]	588	8.14	---	---	171.2	275	---	0.3	41.6	---	---	349	54.5	8.5	7.25	66.5	335.2	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.44	---	---	---	---	---	---	---
	15-Aug-1990	01-SS [DECOM]	612	7.87	---	---	176.7	309	---	0.4	29.2	---	---	357	56.7	8.5	7.25	66	376.7	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.236	---	---	---	---	---	---	---
	15-Nov-1990	01-SS [DECOM]	638	8.18	---	---	159.7	295.2	---	0.01	26.8	---	---	335	49.4	8.8	7	63	359.8	---	---	---	---	---	---	---	< 0.0010	---	---	0.04	0.31	---	---	---	---	---	---	---
	16-May-1991	01-SS [DECOM]	627	7.88	---	---	---	---	---	---	---	---	---	410	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Nov-1991	01-SS [DECOM]	576	7.97	---	---	---	---	---	0.2	---	---	---	370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Nov-1992	01-SS [DECOM]	477	7.93	---	---	---	---	---	< 0.01	---	---	---	310	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
01(2R)-SS	18-Sep-2025	01(2R)-SS	905	8.18	---	---	91.9	310	---	13.9	136	0.014	0.0103	**588**	29.1	4.67	5.15	191	378	<0.6	<0.3	0.590	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
02-SH [Decommissioned]	16-Feb-1985	02-SH [DECOM]	---	---	---	---	215.6	205	---	---	---	---	---	210	---	---	---	---	249.9	---	---	---	---	---	---	---	---	---	---	0.006	0.004	---	---	---	---	---	---	---
	18-Feb-1985	02-SH [DECOM]	---	---	---	---	193.1	206	---	---	---	---	---	202	---	---	---	---	251.1	---	---	---	---	---	---	---	---	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-May-1985	02-SH [DECOM]	391	7.91	---	---	203.9	209	---	0.4	4	---	---	215	59	13.7	0.97	4.3	254.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.004	---	---	---	---	---	---	---
	15-Sep-1985	02-SH [DECOM]	381	7.87	---	---	188.9	207	---	0.4	3.4	---	---	205	55	12.5	1.12	4.3	252.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Dec-1985	02-SH [DECOM]	410	7.72	---	---	202.6	202	---	0.6	4	---	---	210	57	14.6	1.05	3.9	246.2	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.006	---	---	---	---	---	---	---
	15-Feb-1986	02-SH [DECOM]	400	7.56	---	---	---	---	---	0.2	4	---	---	---	60.9	15.4	1.23	4.5	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-Jun-1986	02-SH [DECOM]	400	7.29	---	---	215.6	208	---	1.1	3.4	---	---	215	60.4	15.7	0.93	4.6	253.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.004	---	---	---	---	---	---	---
	15-Aug-1986	02-SH [DECOM]	414	7.11	---	---	213.8	210	---	0.5	5	---	---	220	60	15.5	1.43	5.4	256	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.027	---	---	---	---	---	---	---
	15-Oct-1986	02-SH [DECOM]	380	7.76	---	---	203.8	200	---	0.7	3.7	---	---	215	57	14.9	1	3.8	243.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.01	---	---	---	---	---	---	---
	15-May-1987	02-SH [DECOM]	381	7.84	---	---	200.1	202	---	0.2	3.7	---	---	210	55	15.2	1	4.1	246.2	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Sep-1987	02-SH [DECOM]	370	7.88	---	---	191	200	---	0.8	3.5	---	---	200	55	13	0.95	3.7	243.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.009	---	---	---	---	---	---	---
	15-Nov-1987	02-SH [DECOM]	375	7.71	---	---	202.6	202	---	1.2	4.3	---	---	215	56	15.2	0.98	4	246.2	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Feb-1988	02-SH [DECOM]	385	7.34	---	---	---	---	---	0.4	3.3	---	---	---	52.7	14.9	1.01	4.1	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	02-SH [DECOM]	380	8.02	---	---	200.4	205	---	0.7	4.1	---	---	210	56.5	14.4	1	4.2	250	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.024	---	---	---	---	---	---	---
	15-Aug-1988	02-SH [DECOM]	366	7.16	---	---	192.9	202.5	---	0.3	3.6	---	---	201	54.6	13.7	1	4.5	246.8	---	---	---	---	---	---	---	< 0.0010	---	---	0.034	0.04	---	---	---	---	---	---	---
	15-Nov-1988	02-SH [DECOM]	387	7.5	---	---	208.4	209	---	0.7	4.6	---	---	213	60	14.2	1.3	5	254.8	---	---	---	---	---	---	---	< 0.0010	---	---	0.023	0.076	---	---	---	---	---	---	---
	15-Mar-1989	02-SH [DECOM]	381	8.1	---	---	209	203	---	0.3	5.9	---	---	209	60.4	14.1	1	4.2	247.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.01	---	---	---	---	---	---	---
	15-May-1989	02-SH [DECOM]	407	7.65	---	---	218.4	209	---	0.3	10.6	---	---	222	62	15.4	1.04	5	254.8	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.017	---	---	---	---	---	---	---
	15-Sep-1989	02-SH [DECOM]	385	7.5	---	---	---	---	---	---	---	---	---	270	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	02-SH [DECOM]	366	8.29	---	---	197.2	192	---	0.3	7.5	---	---	199	53.2	15.6	1.08	4.2	234	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.011	---	---	---	---	---	---	---
	15-Mar-1990	02-SH [DECOM]	397	8.13	---	---	---	---	---	---	---	---	---	216	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	02-SH [DECOM]	415	7.89	---	---	208	215	---	0.5	11.4	---	---	222	58	15.3	1.02	4.8	262.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.005	---	---	---	---	---	---	---
	15-Aug-1990	02-SH [DECOM]	379	7.88	---	---	---	---	---	---	---	---	---	245	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	02-SH [DECOM]	394	7.91	---	---	194.7	216	---	0.01	3.7	---	---	210	55	13.9	1.12	4.5	263.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.005	---	---	---	---	---	---	---
	16-May-1991	02-SH [DECOM]	452	7.72	---	---	---	---	---	1	21.3	---	---	290	55	15.5	1.1	6	---	---	---	---	---	---	---	---	---	---	---	0.011	---	---	---	---	---	---	---	---
	04-Nov-1991	02-SH [DECOM]	351	7.91	---	---	---	191	---	0.3	5.1	---	---	200	57	13.5	1.02	4.25	233	---	---	---	---	---	---	---	< 0.0010	---	---	0.017	---	---	---	---	---	---	---	---
	12-May-1992	02-SH [DECOM]	362	8.25	---	---	189.7	199	---	0.6	4	---	---	495	54.8	12.8	0.96	4.03	242.6	---	---	---	---	---	---	0.98	< 0.0010	---	---	< 0.003	< 0.003	---	---	---	---	---	---	---
	03-Nov-1992	02-SH [DECOM]	370	7.74	---	---	---	199	---	< 0.01	7.4	---	---	204	56.3	14.2	1.05	4.12	242.6	---	---	---	---	---	---	1.01	< 0.0010	---	---	---	0.004	---	---	---	---	---	---	---
	19-May-1993	02-SH [DECOM]	327	7.64	---	---	185	198	---	< 0.50	4.5	---	---	195	51.6	13.7	0.89	4.02	241	---	---	---	---	---	---	0.96	< 0.0010	---	---	0.008	0.011	---	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			**---**	**7.0-10.5**	**---**	**---**	**---**	**---**	**---**	**250**	**500**	**0.3**	**0.02**	**500**	**---**	**---**	**---**	**200**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**0.05**	**---**	**---**
Canadian Drinking Water MAC Guidelines 2022[2]			**---**	**---**	**1.0**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**0.12**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**1.5**	**---**	**---**	**---**	**---**	**0.2**	**0.2**	**0.2**	**1**	**10**	**---**	**---**	**---**	**---**	**---**	**---**	**---**
Alberta Tier 2 Potable Groundwater Guideline[3]			**---**	**6.5 - 8.5**	**---**	**---**	**---**	**---**	**---**	**250**	**500**	**0.3**	**0.02**	**500**	**---**	**---**	**---**	**200**	**---**	**---**	**---**	**1.5**	**---**	**---**	**---**	**---**	**0.2**	**0.2**	**0.2**	**1.0**	**10**	**---**	**---**	**---**	**---**	**0.05**	**---**	**---**
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			**---**	**6.5 - 8.5**	**---**	**---**	**---**	**---**	**---**	**120**	**Variable**	**0.3**	**0.02**	**500**	**---**	**---**	**---**	**200**	**---**	**---**	**---**	**1.5**	**---**	**---**	**---**	**---**	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	**---**	**---**	**---**	**Variable[13]**	**0.0019**	**---**	**---**
02-IN [Decommissioned]	16-Feb-1985	02-IN [DECOM]	---	---	---	---	301.7	314	---	---	---	---	---	370	---	---	---	---	382.8	---	---	---	---	---	---	---	---	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	18-Feb-1985	02-IN [DECOM]	---	---	---	---	295.2	318	---	---	---	---	---	381	---	---	---	---	387.6	---	---	---	---	---	---	---	---	---	---	0.021	0.01	---	---	---	---	---	---	---
	15-May-1985	02-IN [DECOM]	585	8.01	---	---	255	309	---	2.1	24.3	---	---	340	76	15.8	4.36	24.9	376.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.054	0.024	---	---	---	---	---	---	---
	15-Sep-1985	02-IN [DECOM]	616	7.63	---	---	269.1	313	---	1.6	27.5	---	---	350	80	16.8	4.15	24.7	381.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.01	---	---	---	---	---	---	---
	15-Feb-1986	02-IN [DECOM]	640	7.55	---	---	---	---	---	0.9	36	---	---	---	86.1	21	4.02	27.5	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-Jun-1986	02-IN [DECOM]	660	7.67	---	---	314.3	319	---	1.9	40	---	---	385	89	22.3	3.91	27.5	388.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.032	---	---	---	---	---	---	---
	15-Aug-1986	02-IN [DECOM]	681	7.35	---	---	305.2	314	---	1.3	52.5	---	---	390	89	20.1	3.95	26.5	382.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.013	---	---	---	---	---	---	---
	15-Oct-1986	02-IN [DECOM]	660	7.96	---	---	303.5	320	---	1	48.5	---	---	400	86	21.5	3.9	27	390.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.003	---	---	---	---	---	---	---
	15-May-1987	02-IN [DECOM]	665	7.74	---	---	308.1	318	---	0.8	50.5	---	---	390	87	22	4	30	387.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Sep-1987	02-IN [DECOM]	661	7.88	---	---	307.3	325	---	1.5	48.8	---	---	390	89	20.6	3.8	27.6	396.2	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Nov-1987	02-IN [DECOM]	656	7.79	---	---	302.2	322	---	0.2	42.4	---	---	385	85	21.8	3.7	27.8	392.5	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.51	---	---	---	---	---	---	---
	15-Feb-1988	02-IN [DECOM]	653	7.67	---	---	---	---	---	0.8	49.4	---	---	---	83.5	21	3.78	28.6	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	02-IN [DECOM]	682	8.01	---	---	301.7	315	---	1.5	47	---	---	380	86.7	20.7	3.88	28.3	385	---	---	---	---	---	---	---	< 0.0010	---	---	0.038	0.011	---	---	---	---	---	---	---
	15-Aug-1988	02-IN [DECOM]	648	7.83	---	---	300.7	311.3	---	0.5	49.4	---	---	378	86.2	20.7	3.8	27.8	379.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.022	0.005	---	---	---	---	---	---	---
	15-Nov-1988	02-IN [DECOM]	666	7.87	---	---	304.3	318	---	0.6	74	---	---	409	87.8	20.6	3.9	28.3	387.6	---	---	---	---	---	---	---	< 0.0010	---	---	0.014	0.019	---	---	---	---	---	---	---
02-IN [Decommissioned]	15-Mar-1989	02-IN [DECOM]	656	7.57	---	---	299.8	313	---	0.4	49.7	---	---	386	86	20.6	3.83	27.2	381.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.01	---	---	---	---	---	---	---
	15-May-1989	02-IN [DECOM]	649	7.68	---	---	300.2	312	---	0.2	43.5	---	---	371	86	20.7	3.8	26.5	380.3	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.044	---	---	---	---	---	---	---
	15-Sep-1989	02-IN [DECOM]	643	7.42	---	---	---	---	---	---	---	---	---	430	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	02-IN [DECOM]	650	8.15	---	---	315.5	319	---	0.5	48.4	---	---	387	87.5	23.5	3.9	28.1	388.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.24	---	---	---	---	---	---	---
	15-Mar-1990	02-IN [DECOM]	643	8.16	---	---	---	---	---	---	---	---	---	360	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	02-IN [DECOM]	647	7.68	---	---	305.2	323	---	0.4	44.9	---	---	382	88.5	20.4	3.85	27.3	393.7	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.015	---	---	---	---	---	---	---
	15-Aug-1990	02-IN [DECOM]	657	7.65	---	---	---	---	---	---	---	---	---	430	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	02-IN [DECOM]	687	7.95	---	---	296	326.4	---	0.1	50.5	---	---	384	84.5	20.6	3.64	25.5	397.9	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.006	---	---	---	---	---	---	---
	16-May-1991	02-IN [DECOM]	662	7.72	---	---	---	---	---	---	---	---	---	430	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Nov-1991	02-IN [DECOM]	603	7.35	---	---	---	---	---	0.5	---	---	---	390	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Nov-1992	02-IN [DECOM]	576	7.34	---	---	---	---	---	0.6	---	---	---	374	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-May-1993	02-IN [DECOM]	605	7.53	---	---	---	---	---	< 0.50	---	---	---	410	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
03-SH	18-Feb-1985	03-SH	---	---	---	---	298.8	284	---	---	---	---	---	316	---	---	---	---	346.2	---	---	---	---	---	---	---	---	---	---	< 0.003	0.085	---	---	---	---	---	---	---
	15-May-1985	03-SH	516	7.86	---	---	284.4	289	---	0.6	12	---	---	300	81	19.9	1.23	7.1	352.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.041	---	---	---	---	---	---	---
	15-Sep-1985	03-SH	551	7.65	---	---	280.7	291	---	0.8	11	---	---	300	80	19.6	1.26	6.6	354.7	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.082	---	---	---	---	---	---	---
	15-Jun-1986	03-SH	570	7.32	---	---	316.6	287	---	2.4	16.8	---	---	315	87.3	23.9	1.08	7	349.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.13	---	---	---	---	---	---	---
	15-Aug-1986	03-SH	567	7.53	---	---	296.8	278	---	1.4	17	---	---	305	82	22.3	1.25	6.2	338.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.084	---	---	---	---	---	---	---
	15-Oct-1986	03-SH	550	7.91	---	---	299.7	284	---	1.6	18	---	---	315	83	22.4	1.21	6.2	346.2	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.113	---	---	---	---	---	---	---
	15-May-1987	03-SH	554	7.62	---	---	302.2	273	---	1.3	26.7	---	---	310	83	23	1.11	7	332.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.107	---	---	---	---	---	---	---
	15-Sep-1987	03-SH	560	7.76	---	---	295.6	286	---	2.1	26.6	---	---	315	82	22	1.21	7	348.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.044	---	---	---	---	---	---	---
	15-Nov-1987	03-SH	567	7.72	---	---	312.2	276	---	2.5	36.8	---	---	335	87	23	1.05	7.8	336.4	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.048	---	---	---	---	---	---	---
	15-Feb-1988	03-SH	558	7.26	---	---	---	---	---	1.3	29.5	---	---	---	81	23.4	1.08	6.7	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	03-SH	541	7.84	---	---	287.3	274	---	2.1	28	---	---	310	80.1	21.2	1.11	7.5	334	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.056	---	---	---	---	---	---	---
	15-Aug-1988	03-SH	554	8.09	---	---	299	282.5	---	1	30.4	---	---	318	83.2	22.1	1.2	8.3	344.4	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.064	---	---	---	---	---	---	---
	15-Nov-1988	03-SH	565	7.75	---	---	277.4	282	---	1	29.1	---	---	308	74.4	22.2	1.22	7.8	343.8	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.07	---	---	---	---	---	---	---
	15-Mar-1989	03-SH	546	8.26	---	---	287.3	274	---	0.9	26.7	---	---	305	80	21.2	1.05	7.7	334	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.147	---	---	---	---	---	---	---
	15-May-1989	03-SH	495	7.44	---	---	254.5	239	---	1	31	---	---	278	71	18.7	1	9.4	291.3	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.173	---	---	---	---	---	---	---
	15-Sep-1989	03-SH	532	7.81	---	---	---	---	---	---	---	---	---	350	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	03-SH	541	8.25	---	---	291.4	267	---	0.7	23.1	---	---	299	81	21.6	1.2	8.4	325.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.03	---	---	---	---	---	---	---
	15-May-1990	03-SH	545	7.94	---	---	290.2	279	---	0.9	24.2	---	---	308	81	21.3	1.06	9	340.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.054	---	---	---	---	---	---	---
	15-Aug-1990	03-SH	556	7.88	---	---	---	---	---	---	---	---	---	360	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	03-SH	538	8.1	---	---	270.2	287.2	---	0.01	22.4	---	---	303	74	20.7	1.18	9.5	350.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.04	---	---	---	---	---	---	---
	16-May-1991	03-SH	534	7.75	---	---	---	---	---	1	22.9	---	---	350	74.5	18.5	1.1	9.7	---	---	---	---	---	---	---	---	---	---	---	0.047	---	---	---	---	---	---	---	---
	04-Nov-1991	03-SH	505	7.95	---	---	---	264	---	1.1	22.2	---	---	290	79	19.8	1.11	10.9	322	---	---	---	---	---	---	---	< 0.0020	---	---	0.033	---	---	---	---	---	---	---	---
	12-May-1992	03-SH	529	8.27	---	---	259.4	241	---	0.8	24	---	---	252	71.8	19.4	1.03	11.7	293.8	---	---	---	---	---	---	1.07	0.002	---	---	< 0.003	< 0.003	---	---	---	---	---	---	---
	03-Nov-1992	03-SH	512	7.71	---	---	---	262	---	1.6	20	---	---	288	73.5	19.3	1.18	12.6	319.4	---	---	---	---	---	---	1.02	< 0.0010	---	---	---	0.13	---	---	---	---	---	---	---
	18-May-1993	03-SH	456	7.82	---	---	246	266	---	1.4	21.7	---	---	287	66.5	19.3	1.04	14.4	324	---	---	---	---	---	---	0.95	< 0.0010	---	---	< 0.003	0.499	---	---	---	---	---	---	---
	10-Nov-1993	03-SH	516	7.76	---	---	252	259	---	0.7	20.1	---	---	285	69.5	18.9	1.1	16.2	316	---	---	---	---	---	---	1.01	< 0.0010	---	---	< 0.003	1.06	---	---	---	---	---	---	---
	31-May-1994	03-SH	526	7.34	---	---	---	261	< 0.1	1.2	20.5	< 0.01	0.005	293	77	18.3	0.99	14.4	318	< 0.5	< 0.5	---	---	---	---	1.04	< 0.001	---	---	**1.53**	1.53	1.53	---	---	---	---	---	---
(Duplicate)	31-May-1994	03-SH DUP	530	7.41	---	---	---	260	< 0.1	1.2	23	< 0.01	< 0.001	286	65.5	17.8	1	17.4	317	< 0.5	< 0.5	---	---	---	---	0.95	< 0.001	---	---	**1.69**	1.69	1.69	---	---	---	---	---	---
	21-Sep-1994	03-SH	541	7.32	---	---	---	259	0.1	1.2	30	0.01	0.001	294	68	19	1.14	15.2	316	0.5	0.5	---	---	---	---	0.95	< 0.001	---	---	**1.34**	1.34	1.34	---	---	---	---	---	---
(Duplicate)	21-Sep-1994	03-SH DUP	543	7.47	---	---	---	263	0.1	1.2	29.5	0.01	0.001	298	67	20	1.17	17.5	321	0.5	0.5	---	---	---	---	0.96	0.001	---	---	**1.65**	1.65	1.65	---	---	---	---	---	---
	01-Nov-1994	03-SH	557	7.85	---	---	---	265	< 0.1	2.1	33.5	0.07	0.003	315	79.2	19.7	1.2	16.7	323	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	**1.32**	1.32	1.32	---	---	---	---	---	---
(Duplicate)	01-Nov-1994	03-SH DUP	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
(Duplicate)	02-Nov-1994	03-SH DUP	831	7.54	---	---	---	426	< 0.1	4.4	35.3	< 0.01	**0.157**	473	126	31.8	2.63	12.7	519	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	0.033	0.033	0.033	---	---	---	---	---	---
	28-Sep-1995	03-SH	541	7.45	---	---	276	259	< 0.1	1.1	47.1	< 0.01	0.007	325	75.9	20.9	1.1	17.4	316	< 0.5	< 0.5	---	---	---	---	1.01	< 0.001	---	---	---	0.765	---	---	---	---	---	---	---
	04-Sep-1996	03-SH	613	7.5	---	---	289	257	< 0.1	0.8	72.1	< 0.01	0.006	351	81.6	20.7	1.02	17.6	313	< 0.5	< 0.5	---	---	---	---	0.98	< 0.001	---	---	---	0.132	0.14	---	---	---	---	---	---
	04-Sep-1997	03-SH	606	7.62	---	---	321	266	< 0.1	0.9	68.8	< 0.01	< 0.001	366	92	22.1	1.03	19.2	324	< 0.5	< 0.5	---	---	---	---	1.07	< 0.001	---	---	---	0.04	0.04	---	---	---	---	---	---
	15-Sep-1998	03-SH	612	7.41	---	---	300	270	< 0.1	0.5	63.8	---	---	352	82.5	22.9	1.2	18.5	329	< 0.5	< 0.5	---	6.74	6.84	---	1.01	0.001	---	---	---	0.013	0.017	---	---	---	---	---	---
(Duplicate)	15-Sep-1998	03-SH DUP	610	7.49	---	---	310	268	< 0.1	0.5	64.4	---	---	354	84.7	23.3	1.1	19	327	< 0.5	< 0.5	---	6.72	7	---	1.04	0.001	---	---	---	0.018	0.023	---	---	---	---	---	---
	09-Sep-1999	03-SH	666	7.71	---	---	330	289	< 0.1	1.2	70.8	---	---	388	91	25.9	0.8	19.4	353	< 0.5	< 0.5	---	7.38	7.54	---	1.02	< 0.0010	---	< 0.001	---	1.19	1.2	---	---	---	---	---	---
	05-Sep-2000	03-SH	683	7.77	---	---	350	314	< 0.1	1.3	69.5	< 0.01	**0.028**	408	96.5	26	1.3	20.5	384	< 0.5	< 0.5	---	7.84	7.89	---	1.01	0.004	---	---	< 0.003	0.992	0.992	---	---	---	---	---	---
	06-Sep-2001	03-SH	692	7.96	---	---	360	315	< 0.5	1.3	79.2	< 0.01	0.005	422	99.3	27.9	1.4	21.8	384	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	< 0.003	0.416	0.416	---	---	---	---	---	---
	04-Sep-2002	03-SH	757	7.76	---	---	330	323	< 0.5	1.1	75.7	0.02	**0.081**	414	90.6	25.5	1.3	26.3	394	< 0.5	< 0.5	---	---	---	---	0.97	< 0.001	---	---	< 0.003	0.025	0.025	---	---	---	---	25.7	---
	03-Sep-2003	03-SH	743	7.76	---	---	380	336	< 0.5	1.3	83.7	0.03	0.019	450	106	28	1.4	27.2	410	< 0.5	< 0.5	---	---	---	---	1.04	---	< 0.004	---	< 0.003	0.024	0.024	---	---	---	---	27.7	---
	09-Sep-2004	03-SH	769	7.97	---	---	360	338	< 0.5	1.3	84.8	0.02	**0.148**	446	98.7	26.5	1.4	30.3	412	< 0.5	< 0.5	---	---	---	---	0.99	---	< 0.004	---	< 0.003	< 0.003	< 0.003	---	---	---	---	25.9	---
	08-Sep-2005	03-SH	664	8.14	0.6	---	290	305	< 0.5	1.4	79.4	< 0.01	**0.124**	399	82.4	19.4	1.1	32.4	372	< 0.5	< 0.5	---	---	---	---	0.92	---	< 0.004	---	< 0.003	0.088	0.088	---	---	---	---	22.1	---
	07-Sep-2006	03-SH	699	8.03	---	---	290	313	< 0.5	1.3	73.8	< 0.01	0.015	412	81.2	22.3	1.3	44.5	382	< 0.5	< 0.5	---	---	---	---	1	---	---	---	< 0.003	0.018	0.018	---	---	---	---	23.8	---
	05-Sep-2007	03-SH	691	8	---	---	240	315	< 0.5	1.2	69.4	< 0.06	**0.032**	387	55.1	24	1.8	46.4	385	< 0.5	< 0.5	---	---	---	---	0.87	---	---	---	< 0.003	0.014	0.014	---	---	---	---	19	---
	03-Sep-2008	03-SH	729	8	---	---	270	340	---	< 0.50	68.1	< 0.030	**0.0993**	407	67.1	24.8	1.49	41.4	414	< 5	< 5	0.38	---	---	---	0.879	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	03-SH	767	7.99	---	---	373	356	---	1.25	74.6	< 0.030	**0.189**	453	106	26.3	1.29	29.8	434	< 5.0	< 5.0	0.328	---	---	---	1.01	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	03-SH	893	7.78	---	---	418	410	---	2.88	97.4	< 0.030	**0.266**	**527**	110	34.7	1.45	34.4	500	< 5.0	< 5.0	0.402	---	---	95.7	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	03-SH	950	8.2	---	---	406	443	---	1.91	99.1	0.032	**0.145**	**545**	104	35.5	1.61	36.5	541	< 5.0	< 5.0	0.391	---	---	88.5	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	03-SH	948	8	---	448	449	456	---	1	90.1	< 0.030	**0.101**	**561**	125	33.2	1.7	35.9	556	< 5.0	< 5.0	0.372	---	---	95.8	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	03-SH	876	7.85	---	440	440	471	---	0.60	78.5	< 0.030	**0.162**	**555**	123	32.2	1.56	35.9	575	< 5.0	< 5.0	0.322	---	---	93.7	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	16-Sep-2014	03-SH	803	8.27	---	---	404	391	---	< 0.50	65.9	< 0.010	**0.054**	479	113	29.5	1.49	34.6	477	< 5.0	< 5.0	0.366	---	---	104	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	21.4	---
	28-Sep-2015	03-SH	760	8.18	---	---	402	384	---	<0.50	61.6	<0.010	**0.0713**	467	110	31.0	1.50	32.2	468	<5.0	<5.0	0.434	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	28-Sep-2016	03-SH	756	8.25	---	---	372	386	---	<0.50	55.6	<0.010	0.0127	447	107	25.3	1.43	25.9	471	<5.0	<5.0	0.364	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	03-SH	681	7.92	---	---	390	367	---	<0.50	52.9	<0.030	0.0095	442	106	30.5	1.50	30.3	447	<5.0	<5.0	0.346	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	18-Sep-2018	03-SH	670	8.18	---	---	368	358	---	<0.50	49.1	<0.010	0.0020	418	103	26.8	1.29	23.0	437	<5.0	<5.0	0.357	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	17-Sep-2019	03-SH	721	7.55	---	---	392	392	---	<0.50	49.2	<0.010	**0.0422**	447	109	29	1.51	22.9	478	<5.0	<5.0	0.44	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2020	03-SH	725	7.88	---	---	357	387	---	<0.50	43.3	0.012	0.0018	423	97.8	27.3	1.31	20.4	472	<5.0	<5.0	0.346	---	---	93.0	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	03-SH	731	7.67	---	---	405	396	---	<0.50	48.9	<0.030	<0.0050	449	111	31.0	1.34	19.1	483	<5.0	<5.0	0.314	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	29-Sep-2022	03-SH	776	8.01	---	---	436	413	---	1.23	58.9	<0.030	**0.0134**	**511**	118	34.3	1.39	18.2	504	<1.0	<1.0	0.242	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	29-Sep-2023	03-SH	838	8.15	---	---	497	409	---	3.08	84.9	<0.010	**0.026**	**560**	139	36.5	2.11	17.9	499	<1.0	<1.0	0.298	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	10-Sep-2024	03-SH	861	7.63	---	---	476	442	---	3.69	90.6	<0.010	0.006	**579**	131	36.3	1.31	16.0	539	<1.0	<1.0	0.334	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	17-Sep-2025	03-SH	886	7.57	---	---	491	431	---	1.36	76.2	<0.010	0.00088	**558**	134	38.1	1.35	16.9	526	<0.6	<0.3	0.323	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	**7.0-10.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.05**	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	**1.0**	---	---	---	---	---	---	---	**0.12**	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1**	**10**	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	**6.5 - 8.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1.0**	**10**	---	---	---	---	**0.05**	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	**6.5 - 8.5**	---	---	---	---	---	**120**	**Variable**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	---	---	---	**Variable[13]**	**0.0019**	---	---
03-IN	16-Feb-1985	03-IN	---	---	---	---	397.1	352	---	---	---	---	---	**540**	---	---	---	---	429.1	---	---	---	---	---	---	---	---	---	---	< 0.003	0.82	---	---	---	---	---	---
	18-Feb-1985	03-IN	---	---	---	---	526.5	349	---	---	---	---	---	**670**	---	---	---	---	425.4	---	---	---	---	---	---	---	---	---	---	< 0.003	0.28	---	---	---	---	---	---
	15-May-1985	03-IN	852	8.09	---	---	307.9	309	---	4.2	163	---	---	**540**	95	17.1	4.65	62	376.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.13	1.81	---	---	---	---	---	---
	15-Sep-1985	03-IN	788	7.64	---	---	350.1	328	---	3.1	107	---	---	475	103	22.5	3.7	33.7	399.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.04	0.36	---	---	---	---	---	---
	15-Dec-1985	03-IN	890	7.82	---	---	392.7	360	---	3	128	---	---	**530**	110	28.6	4.08	32.1	438.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.008	1.02	---	---	---	---	---	---
	15-Feb-1986	03-IN	820	7.96	---	---	---	---	---	3	147	---	---	---	106	32.1	4.25	29.7	---	---	---	---	---	---	---	---	**0.005**	---	---	---	---	---	---	---	---	---	---
	15-Jun-1986	03-IN	910	7.46	---	---	408.6	341	---	4.7	156	---	---	**550**	117	28.2	3.6	27.3	415.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.014	0.61	---	---	---	---	---	---
	15-Aug-1986	03-IN	959	7.73	---	---	442.7	334	---	2.9	176	---	---	**585**	128	29.8	3.95	29.1	407.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.67	---	---	---	---	---	---
	15-Oct-1986	03-IN	930	7.69	---	---	474.2	345	---	3.6	172	---	---	**600**	135	33.2	4	31	420.6	---	---	---	---	---	---	---	< 0.0020	---	---	0.09	0.27	---	---	---	---	---	---
	15-May-1987	03-IN	888	7.54	---	---	472	343	---	2.6	149	---	---	**560**	133	33.9	3.95	27	418.1	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.059	---	---	---	---	---	---
	15-Sep-1987	03-IN	920	7.7	---	---	471.2	351	---	4.4	180	---	---	**600**	133	33.7	3.9	27	427.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.016	---	---	---	---	---	---
	15-Nov-1987	03-IN	987	7.9	---	---	511.5	345	---	1.2	210	---	---	**650**	145	36.2	4.06	29.5	420.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.36	---	---	---	---	---	---
	15-Feb-1988	03-IN	1030	7.65	---	---	---	---	---	3.9	270	---	---	---	151	36.2	4.6	42.6	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---
	15-May-1988	03-IN	1010	8.01	---	---	535.6	350	---	4.2	227	---	---	**710**	168	36.7	4.25	33.8	726	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.21	---	---	---	---	---	---
	15-Aug-1988	03-IN	1030	8.29	---	---	525.6	368.4	---	3	210	---	---	**663**	149	37.2	4.3	34.9	449.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.094	---	---	---	---	---	---
	15-Oct-1988	03-IN	1100	7.85	---	---	533.5	364	---	2.5	260	---	---	**720**	152	37.3	4.45	41.6	443.7	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.12	---	---	---	---	---	---
	15-Mar-1989	03-IN	1030	8.09	---	---	529.4	344	---	2.2	239	---	---	**681**	152	36.3	4	37.5	419.3	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.21	---	---	---	---	---	---
	15-May-1989	03-IN	1070	7.31	---	---	524.4	352	---	3.1	281	---	---	**736**	150	36.3	4.45	46.6	429.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.43	---	---	---	---	---	---
	15-Sep-1989	03-IN	1050	7.92	---	---	---	---	---	---	---	---	---	**700**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	03-IN	1120	8.1	---	---	538.8	372	---	2.2	295	---	---	**767**	151	39.2	1.5	51	453.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.195	---	---	---	---	---	---
	15-Mar-1990	03-IN	1020	7.74	---	---	---	---	---	---	---	---	---	**708**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	03-IN	1110	7.93	---	---	509.8	360	---	3.2	261	---	---	**721**	144	36.4	4.44	52	438.8	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.246	---	---	---	---	---	---
	15-Aug-1990	03-IN	1120	7.7	---	---	---	---	---	---	---	---	---	**730**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	03-IN	1120	7.81	---	---	477.3	354	---	1.8	210	---	---	**659**	130	37	4.43	59.8	431.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.294	---	---	---	---	---	---
	16-May-1991	03-IN	1110	7.55	---	---	---	---	---	---	---	---	---	**720**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Nov-1991	03-IN	923	7.55	---	---	---	---	---	1.6	---	---	---	**600**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Nov-1992	03-IN	903	7.21	---	---	---	---	---	2.2	---	---	---	**587**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-May-1993	03-IN	903	7.44	---	---	---	---	---	1.5	---	---	---	**640**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Nov-1993	03-IN	877	7.08	---	---	---	---	---	2.5	---	---	---	**570**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Sep-1994	03-IN	903	7.14	---	---	---	---	---	---	---	---	---	**590**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-1995	03-IN	836	7.44	---	---	---	---	---	---	---	---	---	**565**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-1996	03-IN	1000	7.04	---	---	---	---	---	---	---	---	---	**699**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-1997	03-IN	990	7.43	---	---	463	358	< 0.1	1.7	188	< 0.01	**0.118**	**639**	132	32.3	4.16	62.2	436	< 0.5	< 0.5	---	---	---	---	1.08	---	---	---	---	---	0.09	---	---	---	---	---	---
	15-Sep-1998	03-IN	1010	7.24	---	---	---	---	---	---	---	---	---	**710**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Sep-1999	03-IN	983	7.63	---	---	420	339	< 0.1	1.4	194	---	---	**609**	112	32.9	3.7	61	414	< 0.5	< 0.5	---	10.9	11.1	---	1.02	---	---	---	< 0.003	0.076	0.076	---	---	---	---	---
	05-Sep-2000	03-IN	918	7.32	---	---	---	---	---	---	---	---	---	**638**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2001	03-IN	869	7.95	---	---	---	---	---	---	---	---	---	**595**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2002	03-IN	990	7.62	---	---	---	---	---	---	---	---	---	**565**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-2003	03-IN	910	7.94	---	---	---	---	---	---	---	---	---	**632**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Sep-2004	03-IN	928	7.93	---	---	390	339	< 0.5	1.6	168	0.02	0.005	**562**	109	27.6	3.8	47.4	413	< 0.5	< 0.5	---	---	---	---	0.96	---	---	---	< 0.003	0.125	0.125	---	---	---	---	---
	08-Sep-2005	03-IN	848	8.18	---	---	390	325	< 0.5	2.4	173	< 0.01	**0.062**	**562**	110	28.3	3.9	49.2	396	< 0.5	< 0.5	---	---	---	---	0.99	---	---	---	< 0.003	0.156	0.156	---	---	---	---	---
	07-Sep-2006	03-IN	899	7.94	---	---	440	341	< 0.5	1.8	162	0.03	**0.084**	**599**	140	22.5	4.3	63.6	416	< 0.5	< 0.5	---	---	---	---	1.14	---	---	---	< 0.003	0.07	0.07	---	---	---	63.9	---
	05-Sep-2007	03-IN	885	7.86	---	---	340	347	< 0.5	1.3	153	< 0.06	**0.035**	**530**	98.2	24	3.9	41.4	423	< 0.5	< 0.5	---	---	---	---	0.86	---	---	---	< 0.003	0.055	0.055	---	---	---	40.8	---
	03-Sep-2008	03-IN	882	7.9	---	---	367	359	---	0.81	140	< 0.030	0.0047	**528**	102	27.3	3.4	39.3	438	< 5	< 5	0.171	---	---	---	0.902	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---
	09-Sep-2009	03-IN	872	7.98	---	---	416	349	---	0.86	137	< 0.030	**0.198**	**547**	120	28.2	4.06	47.3	425	< 5.0	< 5.0	0.162	---	---	---	1.06	---	---	---	< 0.050	0.063	< 0.071	---	---	---	---	---
	08-Sep-2010	03-IN	906	7.88	---	---	362	359	---	1.17	137	< 0.030	**0.0326**	**526**	101	26.6	3.37	41.7	438	< 5.0	< 5.0	0.217	---	---	90.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---
	07-Sep-2011	03-IN	916	8.17	---	---	380	378	---	1.01	136	< 0.030	< 0.0050	**548**	104	29.1	3.98	46.5	461	< 5.0	< 5.0	0.219	---	---	93.1	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---
	05-Sep-2012	03-IN	908	7.99	---	372	372	383	---	0.85	130	< 0.030	< 0.0050	**542**	103	27.9	4.09	46.3	467	< 5.0	< 5.0	0.198	---	---	91.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---
	26-Sep-2013	03-IN	872	7.86	---	419	419	387	---	0.71	121	< 0.030	**0.0660**	**549**	119	29.6	3.75	42.6	473	< 5.0	< 5.0	0.160	---	---	100	---	---	---	---	< 0.050	0.064	< 0.071	---	---	---	---	---
	16-Sep-2014	03-IN	853	8.29	---	---	390	374	---	0.63	106	< 0.010	**0.3470**	**511**	111	27.4	3.55	38.2	457	< 5.0	< 5.0	0.188	---	---	98.2	---	---	---	---	< 0.020	<0 .050	< 0.054	---	---	---	27.5	---
	28-Sep-2015	03-IN	780	8.15	---	---	416	373	---	0.57	80.9	<0.010	**0.114**	495	119	28.8	3.78	37.3	455	<5.0	<5.0	0.251	---	---	---	---	---	---	---	<0.010	0.094	0.094	---	---	---	---	---
	28-Sep-2016	03-IN	794	8.19	---	---	387	358	---	<0.50	76.4	<0.010	**0.121**	462	113	25.7	3.25	28.4	437	<5.0	<5.0	0.210	---	---	---	---	---	---	---	<0.010	0.052	0.052	---	---	---	---	---
	27-Sep-2017	03-IN	700	8.02	---	---	401	353	---	<0.50	78.3	<0.030	**0.075**	473	111	30.1	3.79	38.0	430	<5.0	<5.0	0.188	---	---	---	---	---	---	---	<0.010	0.069	0.069	---	---	---	---	---
	18-Sep-2018	03-IN	698	8.13	---	---	342	354	---	<0.50	66.4	<0.010	0.001	427	98	23.9	2.83	23.7	431	<5.0	<5.0	0.232	---	---	---	---	---	---	---	<0.010	0.037	0.037	---	---	---	---	---
	17-Sep-2019	03-IN	743	7.55	---	---	386	380	---	0.64	78.7	<0.010	**0.068**	476	108	28.3	3.16	28.3	463	<5.0	<5.0	0.265	---	---	---	---	---	---	---	<0.010	0.052	0.052	---	---	---	---	---
	22-Sep-2020	03-IN	753	7.82	---	---	346	371	---	<0.50	63.0	<0.010	0.00843	438	97.7	24.8	3.17	26.5	452	<5.0	<5.0	0.237	---	---	---	---	---	---	---	<0.010	0.095	0.095	---	---	---	---	---
	22-Sep-2021	03-IN	749	7.73	---	---	391	381	---	<0.50	61.8	<0.030	<0.0050	453	106	30.7	2.85	22.1	465	<5.0	<5.0	0.224	---	---	---	---	---	---	---	<0.010	0.066	0.066	---	---	---	---	---
	29-Sep-2022	03-IN	752	8.11	---	---	415	389	---	0.53	65.5	<0.030	<0.0050	**501**	114	31.7	2.92	22.8	474	<1.0	<1.0	0.149	---	---	---	---	---	---	---	<0.010	0.067	0.0670	---	---	---	---	---
	29-Sep-2023	03-IN	815	8.23	---	---	440	397	---	1.45	88	<0.010	0.00131	**540**	121	33.4	3.16	26	485	<1.0	<1.0	0.21	---	---	---	---	---	---	---	<0.010	0.093	0.093	---	---	---	---	---
	10-Sep-2024	03-IN	813	7.65	---	---	390	406	---	1.24	90.2	<0.010	0.010	**528**	106	30.5	3.48	27.4	495	<1.0	<1.0	0.228	---	---	---	---	---	---	---	<0.010	0.030	<0.0500	---	---	---	---	---
	17-Sep-2025	03-IN	851	7.74	---	---	420	395	---	0.56	81.6	<0.010	0.00183	**527**	115	32.3	3.57	33.1	482	<0.6	<0.3	0.233	---	---	---	---	---	---	---	<0.010	0.046	<0.0500	---	---	---	---	---

AECOM

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable[13]	0.0019	---	---
04-SH	18-Feb-1985	04-SH	---	---	---	---	326.6	337	---	---	---	---	---	347	---	---	---	---	410.8	---	---	---	---	---	---	---	---	---	---	< 0.003	0.053	---	---	---	---	---	---	---
	15-May-1985	04-SH	601	7.92	---	---	313.5	320	---	3.2	34.5	---	---	370	89	22.1	2.28	19.5	390.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.017	0.43	---	---	---	---	---	---	---
	15-Sep-1985	04-SH	627	8.11	---	---	299.4	320	---	1.3	19	---	---	340	86	20.5	2.01	12.3	390.1	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.169	---	---	---	---	---	---	---
	15-Jun-1986	04-SH	640	7.37	---	---	311.9	322	---	1.8	23.7	---	---	350	86.9	23	2.2	10.4	392.5	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.17	---	---	---	---	---	---	---
	15-Aug-1986	04-SH	632	7.3	---	---	314.2	316	---	1	19	---	---	335	85	24.7	2.09	9.2	385.2	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.161	---	---	---	---	---	---	---
	15-Oct-1986	04-SH	610	7.99	---	---	330	328	---	1	15.5	---	---	355	91	24.9	2.2	8.8	399.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.26	---	---	---	---	---	---	---
	15-May-1987	04-SH	569	7.79	---	---	312.9	309	---	0.4	14.2	---	---	330	85	24.4	1.73	8	376.7	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.115	---	---	---	---	---	---	---
	15-Sep-1987	04-SH	606	7.76	---	---	324.8	328	---	0.9	16.4	---	---	342	90.2	24.1	2.03	8.7	400	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.07	---	---	---	---	---	---	---
	15-Nov-1987	04-SH	603	7.63	---	---	326.6	327	---	1.1	11.6	---	---	345	89	25.3	1.85	8.8	398.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.033	---	---	---	---	---	---	---
	15-Feb-1988	04-SH	617	7.25	---	---	---	---	---	0.6	15.4	---	---	---	88	25.9	2.25	9.5	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	04-SH	596	7.99	---	---	327.1	323	---	1.2	16	---	---	340	91.1	24.2	1.93	8.7	394	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.083	---	---	---	---	---	---	---
	15-Aug-1988	04-SH	637	8.09	---	---	340.8	342.5	---	0.1	25.1	---	---	366	93.2	26.2	1.9	10.4	417.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.052	---	---	---	---	---	---	---
	15-Sep-1988	04-SH	632	7.96	---	---	339.6	342	---	0.4	13.9	---	---	354	94.2	25.3	2.18	9.1	416.9	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.04	---	---	---	---	---	---	---
	15-Mar-1989	04-SH	613	8.11	---	---	334.6	320	---	0.01	33	---	---	357	94.5	23.9	2	8.5	390.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.035	---	---	---	---	---	---	---
	15-May-1989	04-SH	614	7.48	---	---	326.3	331	---	0.01	10.5	---	---	338	91.5	23.7	1.93	8.3	403.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.053	---	---	---	---	---	---	---
	15-Sep-1989	04-SH	646	7.38	---	---	---	---	---	---	---	---	---	400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	04-SH	665	8.15	---	---	369.8	365	---	0.01	18.7	---	---	383	102	27.9	2.17	10	444.9	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.02	---	---	---	---	---	---	---
	15-Mar-1990	04-SH	631	7.5	---	---	---	---	---	---	---	---	---	244	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	04-SH	652	8.18	---	---	329.9	357	---	0.3	14.4	---	---	359	89.5	25.8	2.14	9.3	435.2	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.039	---	---	---	---	---	---	---
	15-Aug-1990	04-SH	696	7.61	---	---	---	---	---	---	---	---	---	452	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	04-SH	688	7.93	---	---	359.5	376.8	---	0.01	13.7	---	---	382	99	27.2	2.19	9.8	459.3	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.024	---	---	---	---	---	---	---
	05-Nov-1991	04-SH	635	7.74	---	---	---	362	---	0.3	13.3	---	---	370	100	26.8	2.33	9.2	441	---	---	---	---	---	---	---	< 0.0010	---	---	0.037	---	---	---	---	---	---	---	---
	12-May-1992	04-SH	690	7.68	---	---	359.9	381	---	1.4	21.5	---	---	375	99	27.3	2.66	12	464.4	---	---	---	---	---	---	0.96	< 0.0010	---	---	< 0.003	0.035	---	---	---	---	---	---	---
	03-Nov-1992	04-SH	638	7.64	---	---	---	355	---	< 0.01	12.8	---	---	370	104	26.4	2.01	8.77	432.7	---	---	---	---	---	---	1.06	< 0.0010	---	---	---	0.029	---	---	---	---	---	---	---
	18-May-1993	04-SH	596	7.68	---	---	324	356	---	< 0.50	14.4	---	---	356	88.5	25	2.13	9.27	434	---	---	---	---	---	---	0.93	< 0.0010	---	---	< 0.003	0.023	---	---	---	---	---	---	---
	10-Nov-1993	04-SH	653	7.58	---	---	330	359	---	0.6	13.1	---	---	360	87	27.4	2.3	10.3	438	---	---	---	---	---	---	0.95	0.002	---	---	< 0.003	0.015	---	---	---	---	---	---	---
	31-May-1994	04-SH	653	7.12	---	---	---	361	< 0.1	< 0.5	10.7	< 0.01	**0.061**	370	104	24.8	2.04	8.58	440	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	0.018	0.018	0.018	---	---	---	---	---	---
	21-Sep-1994	04-SH	668	7.06	---	---	---	366	0.1	0.5	13.2	0.01	**0.128**	363	90	25	2.43	9.6	446	0.5	0.5	---	---	---	---	0.93	0.001	---	---	0.017	0.017	0.017	---	---	---	---	---	---
	01-Nov-1994	04-SH	675	7.41	---	---	---	368	< 0.1	0.5	10.7	< 0.01	**0.113**	372	99.3	25.6	2.47	9.4	449	< 0.5	< 0.5	---	---	---	---	0.99	< 0.001	---	---	0.019	0.019	0.019	---	---	---	---	---	---
	28-Sep-1995	04-SH	511	7.14	---	---	391	370	< 0.1	< 0.5	12.3	< 0.01	**0.069**	389	109	28.7	2.7	10.5	451	< 0.5	< 0.5	---	---	---	---	1.09	< 0.001	---	---	---	0.024	---	---	---	---	---	---	---
	04-Sep-1996	04-SH	692	7.2	---	---	373	379	< 0.1	< 0.5	14.5	< 0.01	**0.122**	389	105	26.8	2.12	9.13	462	< 0.5	< 0.5	---	---	---	---	1	< 0.001	---	---	---	0.02	0.02	---	---	---	---	---	---
	03-Sep-1997	04-SH	698	7.52	---	---	361	392	< 0.1	0.5	10.6	< 0.01	**0.295**	389	99.2	27.5	2.4	9.8	478	< 0.5	< 0.5	---	---	---	---	0.95	< 0.001	---	---	---	0.04	0.04	---	---	---	---	---	---
	15-Sep-1998	04-SH	651	7.58	---	---	350	368	< 0.1	< 0.5	10.4	---	---	364	90.7	29.1	2.2	10.5	449	< 0.5	< 0.5	---	7.58	7.44	---	0.98	0.001	---	---	---	0.062	0.065	---	---	---	---	---	---
	09-Sep-1999	04-SH	743	7.44	---	---	440	424	< 0.1	< 0.5	10.1	---	---	431	120	34.1	2.2	10.1	517	< 0.5	< 0.5	---	8.69	9.31	---	1.07	< 0.001	---	< 0.001	---	0.03	0.03	---	---	---	---	---	---
	05-Sep-2000	04-SH	705	7.6	---	---	390	404	< 0.1	< 0.5	10.5	< 0.01	**0.032**	403	107	29.1	2.7	10.9	493	< 0.5	< 0.5	---	8.31	8.26	---	0.99	0.003	---	---	< 0.003	0.018	0.018	---	---	---	---	---	---
	06-Sep-2001	04-SH	669	7.92	---	---	380	389	< 0.5	< 0.5	11	< 0.01	**0.092**	393	105	29.9	2.9	11.3	474	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	< 0.003	0.042	0.042	---	---	---	---	---	---
(Duplicate)	06-Sep-2001	04-SH DUP	649	8.1	---	---	390	372	< 0.5	< 0.5	10.1	< 0.01	**0.114**	382	105	29.9	2.7	10.9	454	< 0.5	< 0.5	---	---	---	---	1.08	< 0.001	---	---	< 0.003	0.047	0.047	---	---	---	---	---	---
	04-Sep-2002	04-SH	753	7.58	---	---	370	402	< 0.5	< 0.5	9.3	0.01	**0.329**	394	104	27.7	2.6	9.7	490	< 0.5	< 0.5	---	---	---	---	0.96	< 0.001	---	---	< 0.003	0.023	0.023	---	---	---	3.4	---	---
(Duplicate)	04-Sep-2002	04-SH DUP	756	7.88	---	---	350	405	< 0.5	< 0.5	10.2	0.02	**0.066**	390	98.1	26.6	2.5	9.3	495	< 0.5	< 0.5	---	---	---	---	0.91	0.001	---	---	< 0.003	0.021	0.021	---	---	---	3.3	---	---
	03-Sep-2003	04-SH	685	7.68	---	---	390	380	< 0.5	0.8	10.1	0.02	**0.171**	391	111	28.1	2.7	10	464	< 0.5	< 0.5	---	---	---	---	1.07	---	< 0.004	---	< 0.003	0.023	0.023	---	---	---	3.6	---	---
(Duplicate)	03-Sep-2003	04-SH DUP	693	7.73	---	---	390	382	< 0.5	0.8	9.5	0.03	0.009	390	108	29.7	2.7	10.6	466	< 0.5	< 0.5	---	---	---	---	1.06	---	< 0.004	---	< 0.003	0.019	0.019	---	---	---	3.4	---	---
	08-Sep-2004	04-SH	720	7.87	---	---	360	390	< 0.5	0.9	10.5	0.03	< 0.004	386	101	26.9	2.5	9.9	476	< 0.5	< 0.5	---	---	---	---	0.96	---	< 0.004	---	< 0.003	0.018	0.018	---	---	---	3.4	---	---
(Duplicate)	08-Sep-2004	04-SH DUP	730	7.95	---	---	350	393	< 0.5	0.7	10.7	0.02	< 0.004	384	97.2	26.4	2.4	9.9	480	< 0.5	< 0.5	---	---	---	---	0.93	---	< 0.004	---	< 0.003	0.017	0.017	---	---	---	3.5	---	---
	07-Sep-2005	04-SH	691	8.09	0.7	---	380	396	< 0.5	0.9	12	< 0.01	**0.053**	396	107	27.2	2.4	9.6	483	< 0.5	< 0.5	---	---	---	---	0.98	---	< 0.004	---	< 0.003	0.022	0.022	---	---	---	3.3	---	---
(Duplicate)	07-Sep-2005	04-SH DUP	694	8.13	0.3	---	370	397	< 0.5	0.8	10.4	0.02	**0.106**	391	101	28.2	2.4	10.4	484	< 0.5	< 0.5	---	---	---	---	0.96	---	< 0.004	---	< 0.003	0.021	0.021	---	---	---	3.8	---	---
	07-Sep-2006	04-SH	701	7.95	---	---	380	385	< 0.5	1.4	9.6	< 0.01	**0.022**	388	104	28.3	2.4	11.1	470	< 0.5	< 0.5	---	---	---	---	1.01	---	---	---	< 0.003	0.025	0.025	---	---	---	3.1	---	---
(Duplicate)	07-Sep-2006	04-SH DUP	711	7.96	---	---	370	389	< 0.5	1.6	9.7	0.02	0.012	390	102	28.3	2.6	12	474	< 0.5	< 0.5	---	---	---	---	1	---	---	---	< 0.003	0.023	0.023	---	---	---	3.2	---	---
	05-Sep-2007	04-SH	712	7.88	---	---	340	404	< 0.5	0.8	9.3	< 0.06	**0.031**	385	94.5	24.4	2.4	10.5	492	< 0.5	< 0.5	---	---	---	---	0.87	---	---	---	< 0.003	0.072	0.072	---	---	---	3	---	---
(Duplicate)	05-Sep-2007	04-SH DUP	715	8.05	---	---	340	402	< 0.5	0.8	14.4	< 0.06	**0.029**	389	94	25	2.5	10.7	491	< 0.5	< 0.5	---	---	---	---	0.87	---	---	---	< 0.003	0.023	0.023	---	---	---	3	---	---
	03-Sep-2008	04-SH	711	7.9	---	---	355	401	---	< 0.50	9.1	< 0.030	0.0181	388	98.2	26.6	2.76	10.6	490	< 5	< 5	0.219	---	---	---	0.926	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
(Duplicate)	03-Sep-2008	04-SH DUP	716	8.1	---	---	350	401	---	< 0.50	9.66	< 0.030	0.0176	387	96.9	26.3	2.62	10.2	489	< 5	< 5	0.22	---	---	---	0.913	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	04-SH	688	8.04	---	---	382	381	---	< 0.50	9.64	< 0.030	**0.0387**	386	104	29.6	2.94	10.9	465	< 5.0	< 5.0	0.198	---	---	---	1.04	---	---	---	< 0.050	0.069	< 0.071	---	---	---	---	---	---
(Duplicate)	09-Sep-2009	04-SH DUP	690	8.09	---	---	400	384	---	< 0.50	9.43	< 0.030	**0.151**	396	113	28.7	3	10.5	469	< 5.0	< 5.0	0.192	---	---	---	1.08	---	---	---	< 0.050	0.064	< 0.071	---	---	---	---	---	---
	08-Sep-2010	04 SH	717	7.75	---	---	358	381	---	< 0.50	20	< 0.030	0.0113	386	98.9	27	1.98	9.1	465	< 5.0	< 5.0	0.265	---	---	94.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	08-Sep-2010	SYLVITE 24	679	7.97	---	---	353	362	---	0.82	17.5	< 0.030	0.0117	371	97.7	26.5	2.15	9	441	< 5.0	< 5.0	0.266	---	---	98.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	04-SH	725	8.19	---	---	372	399	---	0.52	14.4	< 0.030	**0.319**	397	101	29.2	2.6	10.1	487	< 5.0	< 5.0	0.269	---	---	95.7	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	07-Sep-2011	ZIRCON 24	725	8.24	---	---	329	401	---	0.53	14.2	< 0.030	**0.0351**	382	89.2	25.7	2.24	8.8	490	< 5.0	< 5.0	0.265	---	---	83.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	04-SH	725	8.06	---	385	386	413	---	< 0.50	14.2	< 0.030	**0.301**	412	108	28.3	2.86	10.7	503	< 5.0	< 5.0	0.244	---	---	96.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	05-Sep-2012	SPINEL 22	712	8.12	---	386	387	400	---	< 0.50	13.4	< 0.030	**0.12**	403	106	29.6	2.86	10.9	488	< 5.0	< 5.0	0.226	---	---	99.8	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	04-SH	730	7.90	---	415	415	428	---	< 0.50	10.2	<0.030	**0.105**	425	117	29.9	2.16	8.9	523	< 5.0	< 5.0	0.235	---	---	99.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	26-Sep-2013	24-SH	731	7.82	---	401	402	428	---	< 0.50	10.2	0.105	**0.111**	420	112	29.6	2.15	8.7	522	< 5.0	< 5.0	0.222	---	---	96.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	04-SH	712	8.27	---	---	409	405	---	< 0.50	09.5	<0.010	**0.088**	409	115	29.5	2.25	9.8	494	< 5.0	< 5.0	0.251	---	---	104	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	3.25	---	---
	28-Sep-2015	04-SH	749	8.00	---	---	409	432	---	<0.50	10.6	<0.010	**0.0646**	427	114	30.2	2.56	9.66	527	<5.0	<5.0	0.288	---	---	---	---	---	---	---	<0.010	0.032	0.032	---	---	---	---	---	---
	26-Sep-2016	04-SH	748	8.02	---	---	428	390	---	<0.50	8.7	<0.010	**0.0833**	405	120	31.2	2.41	8.70	476	<5.0	<5.0	0.235	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	04-SH	679	7.81	---	---	430	406	---	<0.50	9.5	<0.030	**0.0519**	416	116	34.1	2.50	10.40	495	<5.0	<5.0	0.219	---	---	---	---	---	---	---	<0.010	0.031	<0.050	---	---	---	---	---	---
	17-Sep-2018	04-SH	694	7.90	---	---	441	408	---	<0.50	8.2	<0.010	**0.0851**	423	123	32.6	3.11	10.60	498	<5.0	<5.0	0.239	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	17-Sep-2019	04-SH	712	7.47	---	---	412	442	---	<0.50	9.2	<0.010	**0.2820**	433	118	28.5	2.52	9.5	539	<5.0	<5.0	0.291	---	---	---	---	---	---	---	<0.010	0.024	0.024	---	---	---	---	---	---
	22-Sep-2020	04-SH	760	7.68	---	---	390	428	---	<0.50	8.16	<0.010	**0.5240**	414	108	29.2	2.59	9.3	522	<5.0	<5.0	0.232	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	04-SH	754	7.67	---	---	417	431	---	<0.50	7.86	<0.030	**0.3810**	425	113	32.7	2.83	10.1	526	<5.0	<5.0	0.224	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	29-Sep-2022	04-SH	719	7.92	---	---	422	435	---	<0.50	7.98	<0.030	**0.144**	457	114	33.3	2.80	10.7	531	<1.0	<1.0	0.172	---	---	---	---	---	---	---	<0.010	0.023	<0.0500	---	---	---	---	---	---
	29-Sep-2023	04-SH	684	8.24	---	---	411	401	---	<0.50	9.11	<0.010	**0.0158**	433	113	31.2	2.82	10.9	489	<1.0	<1.0	0.205	---	---	---	---	---	---	---	<0.010	0.022	<0.0500	---	---	---	---	---	---
	10-Sep-2024	04-SH	723	7.61	---	---	383	436	---	<0.50	10.10	<0.010	**0.242**	443	102	31.2	2.32	8.9	532	<1.0	<1.0	0.241	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	17-Sep-2025	04-SH	762	7.62	---	---	418	434	---	<0.50	8.02	<0.010	**0.478**	453	113	32.9	2.56	10.5	529	<0.6	<0.3	0.251	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	**7.0-10.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.05**	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	**1.0**	---	---	---	---	---	---	---	**0.12**	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1**	**10**	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	**6.5 - 8.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1.0**	**10**	---	---	---	---	**0.05**	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	**6.5 - 8.5**	---	---	---	---	---	**120**	**Variable**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	---	---	---	**Variable[13]**	**0.0019**	---	---
04-IN	15-Mar-1989	04-IN	722	8.14	---	---	358.9	384	---	0.01	26.7	---	---	417	108	21.6	4.91	21.3	468.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.012	0.024	---	---	---	---	---	---	---
	15-May-1989	04-IN	736	7.39	---	---	361.8	384	---	0.01	25.9	---	---	418	110	21.1	5.16	21.9	468.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.033	---	---	---	---	---	---	---
	15-Sep-1989	04-IN	740	7.71	---	---	371.8	383	---	0.3	25.1	---	---	420	112	22.3	5.14	21.9	466.9	---	---	---	---	---	---	---	< 0.0010	---	---	0.01	0.117	---	---	---	---	---	---	---
	15-Nov-1989	04-IN	728	7.56	---	---	363.5	386	---	0.3	25.4	---	---	420	110	21.5	5.04	22.1	470.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.008	0.03	---	---	---	---	---	---	---
(Duplicate)	15-Nov-1989	04-IN DUP	727	8.17	---	---	358.8	399	---	0.1	25	---	---	426	106	22.8	5.3	23.8	486.4	---	---	---	---	---	---	---	< 0.0010	---	---	0.008	0.153	---	---	---	---	---	---	---
	15-Mar-1990	04-IN	702	8.25	---	---	348	388	---	0.1	29.8	---	---	419	106	20.2	4.82	21.5	473	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.043	---	---	---	---	---	---	---
	15-May-1990	04-IN	713	8.44	---	---	346.4	382	---	0.4	25.6	---	---	411	104	21	5.15	22.1	441.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.08	---	---	---	---	---	---	---
	15-Aug-1990	04-IN	765	7.6	---	---	---	---	---	---	---	---	---	500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	04-IN	748	8.03	---	---	328.9	369.2	---	0.01	25.5	---	---	396	96	21.6	4.86	23.2	450.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.13	---	---	---	---	---	---	---
	15-May-1991	04-IN	731	7.38	---	---	---	---	---	---	---	---	---	475	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Nov-1992	04-IN	612	7.3	---	---	---	---	---	0.00001	---	---	---	400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-May-1993	04-IN	705	7.86	---	---	---	---	---	< 0.50	---	---	---	465	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Nov-1993	04-IN	691	7.45	---	---	---	---	---	< 0.50	---	---	---	449	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Sep-1994	04-IN	720	7.81	---	---	---	---	---	---	---	---	---	468	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-1996	04-IN	735	7.31	---	---	---	---	---	---	---	---	---	492	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-1997	04-IN	733	7.44	---	---	390	400	< 0.1	< 0.5	24.7	< 0.01	**0.083**	443	111	27.4	6.56	28.3	488	< 0.5	< 0.5	---	---	---	---	1.08	---	---	---	---	---	0.153	---	---	---	---	---	---
	15-Sep-1998	04-IN	726	7.54	---	---	---	---	---	---	---	---	---	482	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Sep-1999	04-IN	715	7.71	---	---	---	---	---	---	---	---	---	479	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Sep-2000	04-IN	686	7.89	---	---	330	378	< 0.1	< 0.5	22.2	< 0.01	**0.044**	401	88.8	25.8	7.4	29.3	461	< 0.5	< 0.5	---	8.03	8.01	---	1	---	---	---	0.011	0.182	0.193	---	---	---	< 0.01	---	---
	06-Sep-2001	04-IN	676	8.11	---	---	---	---	---	---	---	---	---	450	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2002	04-IN	774	7.78	---	---	---	---	---	---	---	---	---	436	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	07-Sep-2005	04-IN	680	8.17	---	---	310	379	< 0.5	< 0.5	22.9	< 0.01	< 0.004	390	81.1	24.9	6.9	26.7	462	< 0.5	< 0.5	---	---	---	---	0.92	---	---	---	< 0.003	0.13	0.13	---	---	---	---	---	---
	05-Sep-2007	04-IN	722	7.93	---	---	290	382	< 0.5	0.9	25.2	0.16	**0.123**	389	80.4	21.7	6	24.5	466	< 0.5	< 0.5	---	---	---	---	0.86	---	---	---	< 0.003	0.121	0.121	---	---	---	6.4	---	---
	03-Sep-2008	04-IN	---	---	---	---	---	---	---	---	---	< 0.030	**0.0639**	---	81.9	25	7.15	27	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Sep-2010	04 IN	720	7.85	---	---	347	375	---	< 0.50	26.3	< 0.030	**0.416**	403	104	21.3	4.89	21	457	< 5.0	< 5.0	0.201	---	---	99.1	---	---	---	---	< 0.050	0.052	< 0.071	---	---	---	---	---	---
	07-Sep-2011	04-IN	711	8.24	---	---	384	380	---	< 0.50	22.3	< 0.030	**0.135**	420	109	27.1	6.77	26.2	464	< 5.0	< 5.0	0.199	---	---	111	---	---	---	---	< 0.050	0.1	0.1	---	---	---	---	---	---
	17-Sep-2014	04-IN	676	8.18	---	---	345	353	---	< 0.50	29.9	< 0.010	**0.603**	395	105	20.0	5.49	22.7	431	< 5.0	< 5.0	0.188	---	---	104	---	---	---	---	< 0.020	0.060	0.060	---	---	---	7.83	---	---
	28-Sep-2015	04-IN	708	8.12	---	---	395	361	---	<0.50	25.2	<0.010	**0.462**	416	120	23.2	5.44	24.0	441	<5.0	<5.0	0.206	---	---	---	---	---	---	---	<0.010	0.229	0.229	---	---	---	---	---	---
	26-Sep-2016	04-IN	708	8.05	---	---	361	376	---	<0.50	23.4	0.016	**0.222**	407	110	21.2	5.39	21.2	459	<5.0	<5.0	0.160	---	---	---	---	---	---	---	<0.010	0.110	0.11	---	---	---	---	---	---
	27-Sep-2017	04-IN	645	7.73	---	---	373	377	---	<0.50	25.1	<0.030	**0.669**	417	112	22.6	5.59	24.1	460	<5.0	<5.0	0.150	---	---	---	---	---	---	---	<0.010	0.183	0.183	---	---	---	---	---	---
	17-Sep-2018	04-IN	675	7.98	---	---	363	373	---	<0.50	24.6	<0.010	**0.061**	410	108	22.6	5.99	24.4	455	<5.0	<5.0	0.181	---	---	---	---	---	---	---	<0.010	0.040	0.04	---	---	---	---	---	---
	17-Sep-2019	04-IN	671	7.43	---	---	360	389	---	<0.50	26.3	0.051	**0.361**	418	107	22.6	5.77	22.3	475	<5.0	<5.0	0.225	---	---	---	---	---	---	---	<0.010	0.095	0.095	---	---	---	---	---	---
	22-Sep-2020	04-IN	722	7.89	---	---	332	376	---	<0.50	30.8	0.011	**0.678**	404	101	19.5	5.18	20.4	458	<5.0	<5.0	0.180	---	---	---	---	---	---	---	<0.010	0.239	0.239	---	---	---	---	---	---
	22-Sep-2021	04-IN	707	7.68	---	---	368	379	---	<0.50	30.7	<0.030	**0.598**	421	108	23.9	6.08	24	462	<5.0	<5.0	0.185	---	---	---	---	---	---	---	<0.010	0.213	0.213	---	---	---	---	---	---
	29-Sep-2022	04-IN	701	7.98	---	---	367	390	---	<0.50	31.0	<0.030	**0.325**	459	109	23.0	5.62	22.6	476	<1.0	<1.0	0.150	---	---	---	---	---	---	---	<0.010	0.224	0.224	---	---	---	---	---	---
	29-Sep-2023	04-IN	685	8.31	---	---	358	371	---	<0.50	29.3	0.024	**0.727**	442	106	22.7	5.72	22.8	445	3.5	<1.0	0.162	---	---	---	---	---	---	---	<0.010	0.201	0.201	---	---	---	---	---	---
	10-Sep-2024	04-IN	657	7.76	---	---	329	376	---	<0.50	25.6	0.043	**0.372**	430	97	21.4	5.18	21.1	459	<1.0	<1.0	0.226	---	---	---	---	---	---	---	<0.010	0.219	0.219	---	---	---	---	---	---
	17-Sep-2025	04-IN	718	7.52	---	---	352	382	---	<0.50	21.6	0.010	**0.234**	439	104	22.4	5.40	23.9	466	<0.6	<0.3	0.218																	
04-SS	16-Feb-1985	04-SS	---	---	---	---	228	233	---	---	---	---	---	270	---	---	---	---	284	---	---	---	---	---	---	---	---	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	18-Feb-1985	04-SS	---	---	---	---	206.7	237	---	---	---	---	---	268	---	---	---	---	288.9	---	---	---	---	---	---	---	---	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Sep-1985	04-SS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Dec-1985	04-SS	490	7.47	---	---	217.5	243	---	0.7	18.5	---	---	270	61	15.8	2.45	14.8	296.2	---	---	---	---	---	---	---	0.0060	---	---	0.005	0.017	---	---	---	---	---	---	---
	15-Feb-1986	04-SS	480	7	---	---	---	---	---	0.01	22	---	---	---	64.2	16.4	3.26	19	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-Jun-1986	04-SS	490	7.02	---	---	218.3	231	---	1.9	25	---	---	275	60.5	16.3	3.5	20.7	281.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Aug-1986	04-SS	485	6.97	---	---	214	222	---	0.4	25.6	---	---	265	59.1	16.1	3.54	20.2	270.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Oct-1986	04-SS	480	7.5	---	---	215	233	---	0.7	23.6	---	---	280	60	15.8	3.47	21	284	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.033	---	---	---	---	---	---	---
	15-May-1987	04-SS	453	7.2	---	---	213.8	229	---	0.3	24.6	---	---	270	59	16.1	3.62	21.7	279.2	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.22	---	---	---	---	---	---	---
	15-Sep-1987	04-SS	471	8.04	---	---	208.1	248	---	0.6	25.6	---	---	275	58.7	15	3.54	20.4	302	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Nov-1987	04-SS	478	7.35	---	---	214.6	232	---	0.7	23.1	---	---	275	59	16.3	3.45	21.2	282.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.016	---	---	---	---	---	---	---
	15-Feb-1988	04-SS	475	7.5	---	---	---	---	---	0.6	25	---	---	---	55.5	16.5	3.59	22	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	04-SS	463	7.31	---	---	205.5	230	---	0.8	24	---	---	260	57.9	14.8	3.66	21.3	280	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.004	---	---	---	---	---	---	---
	15-Aug-1988	04-SS	463	7.24	---	---	210.3	238.6	---	0.3	23.6	---	---	270	59.1	15.2	3.6	22.4	290.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.024	---	---	---	---	---	---	---
	15-Sep-1988	04-SS	467	7.31	---	---	209.6	231	---	0.3	23.6	---	---	265	59.3	14.9	3.58	22	281.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.053	---	---	---	---	---	---	---
	15-Mar-1989	04-SS	448	8.3	---	---	191.8	222	---	0.1	23.1	---	---	250	56.3	13.8	3.33	20.4	270.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.022	---	---	---	---	---	---	---
	15-Sep-1989	04-SS	452	7.07	---	---	---	---	---	---	---	---	---	300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	04-SS	466	8.21	---	---	199.1	227	---	0.3	23.3	---	---	258	54.6	15.2	3.63	22.5	276.7	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.135	---	---	---	---	---	---	---
	15-Mar-1990	04-SS	451	7.86	---	---	---	---	---	---	---	---	---	252	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	04-SS	449	7.73	---	---	183.1	223	---	0.3	22.4	---	---	248	50.2	14	3.51	21.6	271.8	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.02	---	---	---	---	---	---	---
	15-Aug-1990	04-SS	465	7.26	---	---	---	---	---	---	---	---	---	300	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	04-SS	460	7.98	---	---	185.8	226.4	---	0.01	22.1	---	---	251	51.6	13.8	3.58	21.5	276	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.083	---	---	---	---	---	---	---
	15-May-1991	04-SS	476	7.84	---	---	239	271	---	---	23.3	---	---	300	65	18.7	4.7	22.8	330	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.012	---	---	---	---	---	---	---
	03-Nov-1992	04-SS	368	7.02	---	---	---	---	---	0.00001	---	---	---	239	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2001	04-SS	557	8.18	---	---	---	---	---	---	---	---	---	365	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	07-Sep-2005	04-SS	676	8.15	---	---	360	393	< 0.5	< 0.5	10.5	< 0.01	**0.124**	385	101	26	2.3	9.3	480	< 0.5	< 0.5	---	---	---	---	0.94	---	---	---	< 0.003	0.02	0.02	---	---	---	---	---	---
	26-Sep-2013	04-SS	663	7.48	---	301	300	331	---	< 0.50	53.4	**1.65**	**0.601**	389	83.4	22.4	4.39	27.2	403	< 5.0	< 5.0	0.067	---	---	94.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	16-Sep-2014	04-SS	668	8.18	---	---	300	322	---	< 0.50	53.2	**3.17**	**0.581**	388	84.6	21.6	4.59	30.6	393	< 5.0	< 5.0	0.096	---	---	98.6	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	17.0	---	---
	28-Sep-2015	04-SS	665	7.75	---	---	318	309	---	<0.50	55.4	0.084	**0.533**	388	89.1	23.3	4.66	30.2	377	<5.0	<5.0	0.107	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2016	04-SS	656	7.96	---	---	294	316	---	<0.50	51.5	<0.010	**0.498**	378	84.2	20.2	4.54	27.9	385	<5.0	<5.0	0.082	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2017	04-SS	594	8.39	---	---	310	313	---	<0.50	54.6	<0.030	**0.537**	389	86.0	23.1	4.88	32.7	371	5.6	<5.0	0.077	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	17-Sep-2018	04-SS	614	7.59	---	---	320	307	---	<0.50	51.4	0.267	**0.588**	384	91.0	22.5	5.02	29.9	375	<5.0	<5.0	0.104	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	17-Sep-2019	04-SS	624	7.28	---	---	312	322	---	<0.50	55.4	**2.380**	**0.593**	394	84.9	24.2	4.95	31.1	393	<5.0	<5.0	0.117	---	---	---	---	---	---	---	0.020	0.077	0.097	---	---	---	---	---	---
	22-Sep-2020	04-SS	657	7.66	---	---	276	317	---	<0.50	55.7	**2.66**	**0.520**	379	77.5	20.1	4.72	30.2	386	<5.0	<5.0	0.089	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	04-SS	632	7.51	---	---	304	317	---	<0.50	53.5	**1.27**	**0.566**	388	82.1	24.1	5.35	32.7	386	<5.0	<5.0	0.095	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	29-Sep-2022	04-SS	637	7.83	---	---	303	324	---	<0.50	52.8	<0.030	**0.508**	432	83.7	22.8	5.07	31.0	395	<1.0	<1.0	0.073	---	---	---	---	---	---	---	<0.010	0.202	0.202	---	---	---	---	---	---
	29-Sep-2023	04-SS	652	8.49	---	---	293	321	---	<0.50	52.4	<0.010	**0.521**	422	81.5	21.7	4.79	29.4	371	10.3	<1.0	0.085	---	---	---	---	---	---	---	<0.010	0.208	0.208	---	---	---	---	---	---
	10-Sep-2024	04-SS	623	7.28	---	---	286	322	---	<0.50	54.7	<0.010	**0.557**	423	79.6	21.2	4.76	27.6	393	<1.0	<1.0	0.087	---	---	---	---	---	---	---	<0.010	0.226	0.226	---	---	---	---	---	---
	17-Sep-2025	04-SS	671	7.36	---	---	300	319	---	<0.50	49.0	**0.932**	**0.562**	424	83.1	22.6	4.74	32.2	389	<0.6	<0.3	0.108	---	---	---	---	---	---	---	<0.010	0.169	0.169	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [13]	0.0019	---	---
05-SH	18-Feb-1985	05-SH	---	---	---	---	254	256	---	---	---	---	---	261	---	---	---	---	312.1	---	---	---	---	---	---	---	---	---	---	0.003	0.061	---	---	---	---	---	---	---
	15-May-1985	05-SH	504	7.97	---	---	277.8	282	---	0.7	11.6	---	---	295	80	18.9	1	7.8	343.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.003	---	---	---	---	---	---	---
	15-Sep-1985	05-SH	530	7.68	---	---	266.1	281	---	0.8	9	---	---	290	76	18.5	1.05	6.9	342.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.006	---	---	---	---	---	---	---
	15-Dec-1985	05-SH	540	7.7	---	---	274	288	---	0.7	9.6	---	---	290	76	20.4	1.02	6.2	351.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.005	---	---	---	---	---	---	---
	15-Jun-1986	05-SH	500	8.18	---	---	272.2	258	---	1.7	8.1	---	---	270	74.3	21	0.91	5.8	314.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.009	---	---	---	---	---	---	---
	15-Aug-1986	05-SH	518	7.64	---	---	270.2	260	---	0.5	8.8	---	---	275	74	20.7	0.95	5.6	316.9	---	---	---	---	---	---	---	< 0.0020	---	---	0.012	0.021	---	---	---	---	---	---	---
	15-Oct-1986	05-SH	500	7.87	---	---	273.6	272	---	0.2	7.8	---	---	285	76	20.3	0.95	5.5	331.6	---	---	---	---	---	---	---	< 0.0020	---	---	0.005	0.043	---	---	---	---	---	---	---
	15-May-1987	05-SH	473	7.71	---	---	259	255	---	0.3	7.6	---	---	260	71	19.9	0.88	5.4	311	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.055	---	---	---	---	---	---	---
	15-Sep-1987	05-SH	484	8.09	---	---	257	256	---	0.7	9.1	---	---	263	72	18.7	0.92	5.6	312	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.064	---	---	---	---	---	---	---
	15-Nov-1987	05-SH	475	7.64	---	---	256.1	252	---	1.1	8.2	---	---	265	70	19.7	0.85	5.5	307.2	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.074	---	---	---	---	---	---	---
	15-Feb-1988	05-SH	473	7.75	---	---	---	---	---	0.6	8.9	---	---	---	69	19.8	0.9	5.4	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	05-SH	464	7.91	---	---	240	242	---	0.9	8.5	---	---	250	74.7	17.6	0.81	5.2	295	---	---	---	---	---	---	---	< 0.0010	---	---	0.003	0.048	---	---	---	---	---	---	---
	15-Aug-1988	05-SH	468	7.76	---	---	253.6	257.9	---	0.2	7.4	---	---	261	70.8	18.6	0.9	6.2	314.4	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.077	---	---	---	---	---	---	---
	15-Nov-1988	05-SH	478	7.55	---	---	249.6	255	---	0.5	7.2	---	---	258	69.4	18.5	0.85	5.6	310.8	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.09	---	---	---	---	---	---	---
	15-Mar-1989	05-SH	462	8.19	---	---	241.6	248	---	0.3	7.8	---	---	251	68	17.4	0.81	5.2	302.3	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.06	---	---	---	---	---	---	---
	15-May-1989	05-SH	452	7.4	---	---	242	240	---	0.3	7.7	---	---	246	68	17.5	0.76	5.1	292.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.037	---	---	---	---	---	---	---
	15-Sep-1989	05-SH	475	7.52	---	---	---	---	---	---	---	---	---	320	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	05-SH	472	8.2	---	---	262.4	258	---	0.5	7.7	---	---	264	73	19.4	0.9	5.7	314.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.033	---	---	---	---	---	---	---
	15-Aug-1990	05-SH	459	7.35	---	---	243.2	249	---	0.7	9.4	---	---	254	67.5	18.1	0.88	5.5	303.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.06	---	---	---	---	---	---	---
	15-Nov-1990	05-SH	476	7.95	---	---	240.3	252.8	---	0.1	9.4	---	---	255	66.5	18	0.85	5.7	308.2	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.033	---	---	---	---	---	---	---
	16-May-1991	05-SH	497	7.76	---	---	---	---	---	0.6	14.6	---	---	320	73.5	17	0.8	5.6	---	---	---	---	---	---	---	---	---	---	---	0.028	---	---	---	---	---	---	---	---
	04-Nov-1991	05-SH	496	7.97	---	---	---	255	---	0.7	23	---	---	280	78	19	0.98	5.72	311	---	---	---	---	---	---	---	< 0.0010	---	---	0.024	---	---	---	---	---	---	---	---
	12-May-1992	05-SH	553	7.72	---	---	291.4	262	---	1.2	49.3	---	---	271	81.5	21.3	0.88	5.95	319.4	---	---	---	---	---	---	0.97	< 0.0010	---	---	0.004	0.003	---	---	---	---	---	---	---
	03-Nov-1992	05-SH	637	7.94	---	---	---	268	---	1.4	92	---	---	391	100	26.3	1	6.43	326.7	---	---	---	---	---	---	1.02	< 0.0010	---	---	---	0.014	---	---	---	---	---	---	---
	10-Nov-1993	05-SH	726	7.52	---	---	374	301	---	0.9	101	---	---	424	99.5	30.5	0.9	8	367	---	---	---	---	---	---	0.96	0.001	---	---	< 0.003	< 0.003	---	---	---	---	---	---	---
	31-May-1994	05-SH	817	7.26	---	---	---	338	< 0.1	1.7	110	< 0.01	**0.246**	479	122	31.7	0.9	6.87	412	< 0.5	< 0.5	---	---	---	---	0.99	< 0.001	---	---	0.015	0.015	0.015	---	---	---	---	---	---
	21-Sep-1994	05-SH	869	7.23	---	---	---	363	0.1	2	131	0.01	0.002	**527**	129	35	1.1	7.4	442	0.5	0.5	---	---	---	---	0.96	0.001	---	---	0.02	0.02	0.02	---	---	---	---	---	---
	01-Nov-1994	05-SH	800	7.63	---	---	---	376	< 0.1	2.2	115	< 0.01	< 0.001	**529**	139	34.5	1.07	7.7	458	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	0.026	0.026	0.026	---	---	---	---	---	---
	28-Sep-1995	05-SH	771	7.29	---	---	577	437	< 0.1	2.6	114	< 0.01	**0.092**	**597**	163	41.2	1.1	8.6	533	< 0.5	< 0.5	---	---	---	---	1.07	< 0.001	---	---	---	0.01	---	---	---	---	---	---	---
	04-Sep-1996	05-SH	997	7.25	---	---	533	442	< 0.1	2.1	116	< 0.01	**0.196**	**585**	151	37.8	0.98	7.86	539	< 0.5	< 0.5	---	---	---	---	0.97	< 0.001	---	---	---	0.013	0.013	---	---	---	---	---	---
	03-Sep-1997	05-SH	1044	7.71	---	---	517	424	< 0.1	2.3	118	< 0.01	**0.126**	**567**	136	43	1	8.6	517	< 0.5	< 0.5	---	---	---	---	0.98	< 0.001	---	---	---	0.018	0.018	---	---	---	---	---	---
	16-Sep-1998	05-SH	987	7.28	---	---	580	472	< 0.1	1.5	120	---	---	**617**	154	48.3	0.9	9.1	576	< 0.5	< 0.5	---	12	12.1	---	1.01	0.001	---	---	---	0.064	0.064	---	---	---	---	---	---
	09-Sep-1999	05-SH	1110	7.47	---	---	700	519	< 0.1	1.9	134	---	---	**702**	192	53.9	0.6	8.8	633	< 0.5	< 0.5	---	13.2	14.4	---	1.09	< 0.001	---	< 0.001	---	0.016	0.016	---	---	---	---	---	---
	05-Sep-2000	05-SH	1050	7.52	---	---	610	517	< 0.1	1.8	105	< 0.01	**0.453**	**641**	166	47	1.3	8.9	631	< 0.5	< 0.5	---	12.6	12.6	---	1	0.003	---	---	< 0.003	0.011	0.011	---	---	---	---	---	---
	06-Sep-2001	05-SH	956	7.8	---	---	580	484	< 0.5	1.6	109	< 0.01	**0.418**	**616**	159	45.6	1.2	8.3	591	< 0.5	< 0.5	---	---	---	---	1.01	< 0.001	---	---	< 0.003	0.021	0.021	---	---	---	---	---	---
(Duplicate)	06-Sep-2001	05-SH DUP	991	7.92	---	---	620	501	< 0.5	2.4	107	0.03	**0.405**	**639**	173	46.1	1.2	8.2	612	< 0.5	< 0.5	---	---	---	---	1.04	< 0.001	---	---	< 0.003	0.025	0.025	---	---	---	---	---	---
	04-Sep-2002	05-SH	1130	7.45	---	---	560	520	< 0.5	1.8	93.3	0.03	**0.387**	**614**	157	41.2	1.1	7	635	< 0.5	< 0.5	---	---	---	---	0.93	< 0.001	---	---	< 0.003	0.023	0.023	---	---	---	---	32.7	---
(Duplicate)	04-Sep-2002	05-SH DUP	1080	7.77	---	---	490	496	< 0.5	1.8	99.1	0.02	**0.021**	**579**	133	39.2	1.1	7.1	605	< 0.5	< 0.5	---	---	---	---	0.85	0.001	---	---	< 0.003	0.03	0.03	---	---	---	---	30.7	---
	03-Sep-2003	05-SH	---	---	---	---	---	---	---	---	---	0.08	**0.415**	---	177	45	1.2	8.1	---	---	---	---	---	---	---	---	---	< 0.004	---	< 0.003	0.009	0.009	---	---	---	---	34.6	---
	07-Sep-2003	05-SH	1030	7.75	---	---	620	516	< 0.5	1.7	101	0.03	**0.433**	**639**	174	43.8	1.2	7.8	629	< 0.5	< 0.5	---	12.5	12.7	---	1.02	---	---	---	< 0.003	0.008	0.008	---	---	---	---	---	---
(Duplicate)	07-Sep-2003	05-SH DUP	1040	7.63	---	---	620	518	< 0.5	1.6	102	0.02	**0.251**	**642**	175	43.8	1.2	7.6	632	< 0.5	< 0.5	---	12.5	12.7	---	1.02	---	---	---	< 0.003	0.012	0.012	---	---	---	---	---	---
(Duplicate)	11-Sep-2003	05-SH DUP	---	---	---	---	---	---	---	---	---	0.06	**0.18**	---	166	45.1	1.2	8.8	---	---	---	---	---	---	---	---	---	< 0.004	---	< 0.003	0.012	0.012	---	---	---	---	34.7	---
	08-Sep-2004	05-SH	1090	7.77	---	---	600	527	< 0.5	2.5	101	0.07	**0.191**	**639**	167	43.4	1.2	7.8	642	< 0.5	< 0.5	---	---	---	---	0.97	---	< 0.004	---	< 0.003	0.033	0.033	---	---	---	---	32.1	---
(Duplicate)	08-Sep-2004	05-SH DUP	1100	7.83	---	---	590	532	< 0.5	2.3	101	0.05	**0.077**	**642**	165	44.4	1.2	8.4	649	< 0.5	< 0.5	---	---	---	---	0.96	---	< 0.004	---	< 0.003	0.036	0.036	---	---	---	---	32.7	---
	07-Sep-2005	05-SH	977	8.11	1.3	---	540	515	< 0.5	1.5	92.4	0.07	**0.262**	**604**	152	40.1	1.1	7.9	628	< 0.5	< 0.5	---	---	---	---	0.92	---	< 0.004	---	< 0.003	0.02	0.02	---	---	---	---	26.4	---
(Duplicate)	07-Sep-2005	05-SH DUP	1100	8.01	1.1	---	590	570	< 0.5	1.8	105	0.01	**0.048**	**670**	169	41	1.2	9.9	695	< 0.5	< 0.5	---	---	---	---	0.9	---	< 0.004	---	< 0.003	0.004	0.004	---	---	---	---	26.8	---
	07-Sep-2006	05-SH	---	---	---	---	---	---	---	---	---	< 0.01	**0.118**	---	171	49.1	1.1	9.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	32	---
(Duplicate)	07-Sep-2006	05-SH DUP	---	---	---	---	---	---	---	---	---	0.04	**0.118**	---	169	47.1	1.3	9.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	30.8	---
	05-Sep-2007	05-SH	1160	7.88	---	---	600	596	< 0.5	2.1	105	0.08	**0.064**	**688**	162	46.9	1.4	11.8	727	< 0.5	< 0.5	---	---	---	---	0.88	---	---	---	< 0.003	0.029	0.029	---	---	---	---	29.5	---
(Duplicate)	05-Sep-2007	05-SH DUP	1160	7.87	---	---	600	593	< 0.5	2	106	0.09	**0.16**	**686**	166	45.6	1.1	8.7	724	< 0.5	< 0.5	---	---	---	---	0.88	---	---	---	< 0.003	0.01	0.01	---	---	---	---	29	---
	05-Sep-2008	05-SH	1140	7.8	---	---	624	592	---	1.14	103	0.068	**0.178**	**690**	174	46.1	1.31	8.65	722	< 5	< 5	0.198	---	---	---	0.919	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
(Duplicate)	05-Sep-2008	05-SH DUP	1160	7.9	---	---	642	599	---	1.1	102	0.038	**0.0978**	**695**	175	49.7	< 0.50	7.54	731	< 5	< 5	0.196	---	---	---	0.93	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	05-SH	1110	7.94	---	---	669	560	---	1.14	98.4	**0.419**	**0.366**	**682**	188	48.5	1.1	8.6	684	< 5.0	< 5.0	0.155	---	---	---	1.04	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	09-Sep-2009	05-SH DUP	1160	7.94	---	---	711	584	---	1.15	101	< 0.030	< 0.0050	**714**	198	52.7	1.33	8.8	713	< 5.0	< 5.0	0.168	---	---	---	1.06	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	05 SH	1130	7.71	---	---	616	557	---	1.23	105	< 0.030	**0.128**	**666**	170	46.6	0.85	7.8	680	< 5.0	< 5.0	0.213	---	---	94.8	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	08-Sep-2010	SYLVITE 25	1160	7.76	---	---	662	575	---	1.33	109	0.063	**0.429**	**698**	183	49.8	1.2	8.3	702	< 5.0	< 5.0	0.23	---	---	98.5	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	05-SH	1150	8.11	---	---	650	579	---	1.03	105	0.202	**0.406**	**691**	178	50	1.15	8.4	707	< 5.0	< 5.0	0.221	---	---	97	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	07-Sep-2011	ZIRCON 25	1160	8.21	---	---	651	579	---	1.02	105	**0.382**	**0.812**	**692**	181	48.3	1.2	8.1	707	< 5.0	< 5.0	0.209	---	---	96.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	05-SH	1130	7.99	---	662	662	576	---	1.09	107	**0.899**	**0.625**	**697**	185	48.6	1.35	8.5	703	< 5.0	< 5.0	0.204	---	---	98.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	05-Sep-2012	SPINEL 23	1120	8.11	---	665	664	571	---	1.66	111	**0.338**	**0.222**	**699**	183	50.4	1.32	8.7	696	< 5.0	< 5.0	0.173	---	---	99.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	05-SH	1120	7.82	---	673	674	559	---	1.40	131	0.079	**0.488**	**715**	187	50.4	1.21	7.9	681	<5.0	<5.0	0.167	---	---	99.4	---	---	---	---	< 0.050	0.117	0.117	---	---	---	---	---	---
	17-Sep-2014	05-SH	1060	8.14	---	---	644	479	---	1.64	148	< 0.010	**0.442**	**678**	186	43.6	1.12	8.4	584	<5.0	<5.0	0.195	---	---	104	---	---	---	---	< 0.020	0.327	0.327	---	---	---	---	48.2	---
(Duplicate)	17-Sep-2014	25-SH	1040	8.14	---	---	616	455	---	1.64	149	< 0.010	**0.459**	**654**	176	42.9	1.12	8.4	556	<5.0	<5.0	0.193	---	---	103	---	---	---	---	< 0.020	0.328	0.328	---	---	---	---	47.4	---
	28-Sep-2015	05-SH	1110	7.83	---	---	684	505	---	2.03	166	<0.010	**0.0981**	**725**	193	49.1	1.16	7.98	616	<5.0	<5.0	0.233	---	---	---	---	---	---	---	<0.010	0.542	0.542	---	---	---	---	---	---
(Duplicate)	28-Sep-2015	25-SH	1090	7.95	---	---	676	488	---	2.04	167	<0.010	**0.0921**	**713**	190	48.9	1.17	8.24	596	<5.0	<5.0	0.231	---	---	---	---	---	---	---	<0.010	0.538	0.538	---	---	---	---	---	---
	28-Sep-2016	05-SH	1070	7.74	---	---	634	417	---	1.83	166	<0.010	**0.0900**	**656**	185	42.0	1.10	6.90	509	<5.0	<5.0	0.175	---	---	---	---	---	---	---	<0.010	0.591	0.591	---	---	---	---	---	---
(Duplicate)	28-Sep-2016	25-SH	1070	8.11	---	---	630	442	---	1.83	165	<0.010	**0.0869**	**668**	183	42.1	1.09	7.00	540	<5.0	<5.0	0.176	---	---	---	---	---	---	---	<0.010	0.596	0.596	---	---	---	---	---	---
	27-Sep-2017	05-SH	955	7.86	---	---	660	452	---	<2.5	169	<0.030	<0.0050	**688**	181	50.4	1.19	8.30	551	<5.0	<5.0	0.150	---	---	---	---	---	---	---	<0.050	1.480	1.48	---	---	---	---	---	---
(Duplicate)	27-Sep-2017	25-SH	960	7.65	---	---	662	442	---	<2.5	167	<0.030	<0.0050	**681**	182	50.5	1.18	8.30	539	<5.0	<5.0	0.130	---	---	---	---	---	---	---	<0.050	1.420	1.42	---	---	---	---	---	---
	17-Sep-2018	05-SH	992	7.91	---	---	680	454	---	2.06	160	<0.010	**0.0640**	**696**	192	48.6	1.07	8.20	554	<5.0	<5.0	0.198	---	---	---	---	---	---	---	<0.010	2.610	2.61	---	---	---	---	---	---
(Duplicate)	17-Sep-2018	25-SH	990	7.83	---	---	687	455	---	2.07	161	<0.010	**0.0605**	**701**	197	47.4	1.05	7.90	555	<5.0	<5.0	0.199	---	---	---	---	---	---	---	<0.010	2.560	2.56	---	---	---	---	---	---
	17-Sep-2019	05-SH	990	7.44	---	---	625	477	---	2.51	164	0.011	**0.0371**	**694**	170	48.7	1.25	7.80	582	<5.0	<5.0	0.253	---	---	---	---	---	---	---	<0.010	3.100	3.1	---	---	---	---	---	---
(Duplicate)	17-Sep-2019	25-SH	1000	7.54	---	---	524	470	---	2.52	164	<0.010	**0.0294**	**654**	144	39.9	1.04	6.60	574	<5.0	<5.0	0.262	---	---	---	---	---	---	---	<0.010	3.070	3.07	---	---	---	---	---	---
	22-Sep-2020	05-SH	1107	6.85	---	---	589	468	---	2.49	158	<0.010	0.00097	**670**	167	41.8	1.13	7.4	571	<5.0	<5.0	0.189	---	---	---	---	---	---	---	<0.010	2.61	2.61	---	---	---	---	---	---
(Duplicate)	22-Sep-2020	25-SH	1107	6.85	---	---	570	466	---	2.50	158	<0.010	0.00078	**662**	159	42.1	1.12	7.5	568	<5.0	<5.0	0.184	---	---	---	---	---	---	---	<0.010	2.61	2.61	---	---	---	---	---	---
	22-Sep-2021	05-SH	1050	7.66	---	---	635	500	---	2.26	146	<0.030	**0.0299**	**685**	170	51.2	1.24	8.4	610	<5.0	<5.0	0.189	---	---	---	---	---	---	---	<0.010	1.25	1.25	---	---	---	---	---	---
(Duplicate)	22-Sep-2021	25-SH	1030	7.67	---	---	645	495	---	2.24	145	<0.030	**0.0269**	**684**	174	51.1	1.2	8	604	<5.0	<5.0	0.185	---	---	---	---	---	---	---	<0.010	1.21	1.21	---	---	---	---	---	---
	29-Sep-2022	05-SH	1070	7.76	---	---	626	537	---	2.27	137.0	<0.030	**0.1100**	**726**	172	47.8	1.13	8.0	655	<1.0	<1.0	0.162	---	---	---	---	---	---	---	<0.010	0.54	0.536	---	---	---	---	---	---
(Duplicate)	29-Sep-2022	25-SH	1060	7.92	---	---	630	542	---	2.15	133	<0.030	**0.113**	**726**	171	49.4	1.16	8.22	661	<1.0	<1.0	0.141	---	---	---	---	---	---	---	<0.010	0.539	0.539	---	---	---	---	---	---
	28-Sep-2023	05-SH	934	8.11	---	---	626	418	---	2.72	119	<0.010	0.0187	**640**	177	44.6	1.23	9.21	509	<1.0	<1.0	---	---	---	---	---	---	---	0.192	0.010	0.127	0.137	---	---	---	---	---	---
(Duplicate)	28-Sep-2023	25-SH	904	8.13	---	---	562	393	---	2.66	118	<0.010	**0.0715**	**603**	157	41.4	1.1	12	479	<1.0	<1.0	0.189	---	---	---	---	---	---	---	<0.010	0.184	0.184	---	---	---	---	---	---
	10-Sep-2024	05-SH	1070	7.24	---	---	596	549	---	2.28	128	<0.010	0.004	**711**	162	46.4	1.03	7.6	670	<1.0	<1.0	0.215	---	---	---	---	---	---	---	<0.010	0.04	<0.0500	---	---	---	---	---	---
(Duplicate)	10-Sep-2024	25-SH	1080	7.39	---	---	596	548	---	2.26	128	<0.010	0.0037	**712**	163	45.8	1.02	7.68	668	<1.0	<1.0	0.199	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	17-Sep-2025	05-SH	1110	7.53	---	---	658	540	---	1.37	114	<0.010	0.00075	**713**	181	50.0	1.04	9.08	659	<0.6	<0.3	0.223	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
(Duplicate)	17-Sep-2025	25-SH	1120	7.44	---	---	652	536	---	1.37	114	<0.010	0.00083	**710**	180	49.3	1.02	9.04	654	<0.6	<0.3	0.233	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [13]	0.0019	---	---
05-IN	18-Feb-1985	05-IN	---	---	---	---	341.7	290	---	---	---	---	---	488	---	---	---	---	353.5	---	---	---	---	---	---	---	---	---	---	0.012	0.012	---	---	---	---	---	---	---
	15-May-1985	05-IN	601	7.96	---	---	286.9	294	---	2	46	---	---	365	83	19.3	2.08	24.3	358.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.032	0.36	---	---	---	---	---	---	---
	15-Sep-1985	05-IN	552	7.78	---	---	266.6	279	---	1.9	24	---	---	310	76	18.6	1.56	11.6	340.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.015	0.26	---	---	---	---	---	---	---
	15-Jun-1986	05-IN	640	6.86	---	---	321.1	275	---	4.5	55	---	---	370	89.9	23.4	2	20	335.2	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.167	---	---	---	---	---	---	---
	15-Aug-1986	05-IN	686	7.64	---	---	293.1	271	---	3	75	---	---	380	82	21.4	2.08	26.3	330.3	---	---	---	---	---	---	---	< 0.0020	---	---	0.009	0.24	---	---	---	---	---	---	---
	15-Oct-1986	05-IN	700	7.96	---	---	325.9	295	---	3.6	91.5	---	---	430	92	23.3	2.31	28.9	359.6	---	---	---	---	---	---	---	< 0.0020	---	---	0.015	0.088	---	---	---	---	---	---	---
	15-May-1987	05-IN	682	7.66	---	---	304.3	273	---	2.7	110	---	---	430	84	22.9	2.13	38	332.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.023	---	---	---	---	---	---	---
	15-Sep-1987	05-IN	707	8.14	---	---	307.2	259	---	4.2	113	---	---	425	87	21.8	2.1	38.6	315.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.009	---	---	---	---	---	---	---
	15-Nov-1987	05-IN	684	7.71	---	---	291	279	---	3.9	97	---	---	425	80	22.1	2.02	42	340.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.011	---	---	---	---	---	---	---
	15-Feb-1988	05-IN	789	7.22	---	---	---	---	---	3.2	146	---	---	---	97.5	23.8	2.84	37.4	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	05-IN	698	7.86	---	---	300.5	269	---	3.6	112	---	---	430	85.4	21.2	2.2	46	328	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.008	---	---	---	---	---	---	---
	15-Aug-1988	05-IN	707	7.72	---	---	285.5	282.7	---	1.7	95	---	---	424	81.1	20.1	2.1	51.9	344.6	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.018	---	---	---	---	---	---	---
	15-Nov-1988	05-IN	839	7.47	---	---	278.8	290	---	2.3	85	---	---	411	79.1	19.7	2.92	45.5	353.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.012	0.036	---	---	---	---	---	---	---
	15-Mar-1989	05-IN	749	8.23	---	---	295.2	272	---	1.9	128	---	---	455	84	20.7	2.28	52.5	331.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.021	---	---	---	---	---	---	---
	15-May-1989	05-IN	800	7.48	---	---	295.2	296	---	2.2	172	---	---	**522**	83.5	21	2.68	60	360.8	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Sep-1989	05-IN	743	7.6	---	---	---	---	---	---	---	---	---	460	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	05-IN	733	8.23	---	---	274.8	308	---	1.2	112	---	---	459	76.5	20.3	2.3	59.4	375.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.012	---	---	---	---	---	---	---
	15-Mar-1990	05-IN	732	7.7	---	---	---	---	---	---	---	---	---	444	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Aug-1990	05-IN	852	8.07	---	---	355.8	292	---	2.7	174	---	---	**534**	101	25.1	2.92	50	355.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.019	---	---	---	---	---	---	---
	15-Nov-1990	05-IN	758	8	---	---	275.2	290.4	---	1.1	94	---	---	430	76	20.7	2.35	59	354	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.099	---	---	---	---	---	---	---
	15-Dec-1990	05-IN	653	8.19	---	---	---	---	---	---	---	---	---	420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Nov-1992	05-IN	775	7.28	---	---	---	---	---	1.9	---	---	---	**504**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	18-May-1993	05-IN	843	7.4	---	---	---	---	---	2	---	---	---	**590**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Nov-1993	05-IN	960	7.23	---	---	---	---	---	1.5	---	---	---	**625**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Sep-1994	05-IN	977	7.28	---	---	---	---	---	---	---	---	---	**640**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-1995	05-IN	981	7.48	---	---	---	---	---	---	---	---	---	**665**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-1996	05-IN	1090	7.11	---	---	---	---	---	---	---	---	---	**760**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-1997	05-IN	1110	7.14	---	---	534	397	< 0.1	2.6	232	< 0.01	**1.15**	**746**	154	36.3	2.95	76.5	484	< 0.5	< 0.5	---	---	---	---	1.1	---	---	---	---	---	0.013	---	---	---	---	---	---
	16-Sep-1998	05-IN	1080	7.37	---	---	440	393	< 0.1	1.7	246	---	---	**710**	125	31.9	2.3	67.5	480	< 0.5	< 0.5	---	13	11.9	---	0.91	---	---	---	0.007	0.006	0.013	---	---	---	< 0.01	---	---
	09-Sep-1999	05-IN	1190	7.51	---	---	530	440	< 0.1	1.8	223	---	---	**751**	147	39.1	2.5	73.2	537	< 0.5	< 0.5	---	13.5	13.8	---	1.03	---	---	---	0.009	0.032	0.041	---	---	---	< 0.01	---	---
	05-Sep-2000	05-IN	1140	7.6	---	---	500	455	< 0.1	2	198	< 0.01	**1.01**	**733**	140	36.7	3	79.4	555	< 0.5	< 0.5	---	13.3	13.6	---	1.02	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	---	---
	06-Sep-2001	05-IN	1090	7.82	---	---	510	430	< 0.5	2.4	225	< 0.01	**1.05**	**745**	145	36.3	3.6	74.1	524	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	< 0.003	0.004	0.004	---	---	---	< 0.01	---	---
	04-Sep-2002	05-IN	1290	7.51	---	---	340	490	< 0.5	2	204	0.02	**0.215**	**700**	74.5	37.6	4.2	82.7	598	< 0.5	< 0.5	---	14.1	10.5	---	0.75	---	---	---	< 0.003	0.031	0.031	---	---	---	< 0.01	62.6	---
	08-Oct-2002	05-IN	1090	7.58	---	---	530	492	< 0.5	1.9	189	0.03	**1.13**	**757**	151	37	3.4	77.9	600	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	< 0.003	0.129	0.129	---	---	---	---	---	---
	03-Sep-2003	05-IN	1190	7.51	---	---	480	491	< 0.5	2	203	0.1	**0.583**	**747**	127	38.5	3.7	77.8	599	< 0.5	< 0.5	---	14.1	13	---	0.92	---	---	---	< 0.003	0.011	0.011	---	---	---	< 0.01	70.2	---
	08-Sep-2004	05-IN	1220	7.82	---	---	510	473	< 0.5	2.4	218	**0.42**	**1.08**	**761**	144	36.7	3.2	71.2	577	< 0.5	< 0.5	---	---	---	---	0.95	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	67.1	---
	07-Sep-2005	05-IN	1170	8.04	9.3	---	510	516	< 0.5	2.2	205	< 0.01	**1.05**	**769**	147	34.7	3.3	65.3	630	< 0.5	< 0.5	---	---	---	---	0.9	---	---	---	0.006	0.075	0.081	---	---	---	< 0.005	56.5	---
	07-Sep-2006	05-IN	1180	7.68	---	---	470	509	< 0.5	2.8	192	< 0.01	**0.685**	**751**	125	39.2	6	80.2	621	< 0.5	< 0.5	---	---	---	---	0.92	---	---	---	< 0.003	0.049	0.049	---	---	---	---	62.5	---
	05-Sep-2007	05-IN	1220	7.89	---	---	520	527	< 0.5	2.4	195	**0.49**	**1.12**	**774**	150	36.3	3	69.3	643	< 0.5	< 0.5	---	---	---	---	0.93	---	---	---	< 0.003	0.025	0.025	---	---	---	---	58.8	---
	05-Sep-2008	05-IN	1210	8	---	---	514	531	---	1.44	176	0.153	**1.06**	**749**	143	38	3.41	68.4	648	< 5	< 5	0.192	---	---	---	0.93	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	05-IN	1160	7.92	---	---	563	520	---	1.4	173	0.173	**1.14**	**764**	163	37.9	3.4	73.1	635	< 5.0	< 5.0	0.17	---	---	---	1.03	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	05 IN	1190	7.68	---	---	513	498	---	1.48	190	**0.38**	**0.795**	**739**	146	36.1	2.93	63.8	608	< 5.0	< 5.0	0.236	---	---	93.8	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	05-IN	1200	8.14	---	---	533	520	---	1.29	178	**0.443**	**1.13**	**752**	150	38.4	3.44	68.7	634	< 5.0	< 5.0	0.223	---	---	97	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	05-IN	1190	7.9	---	365	365	540	---	1.34	163	0.075	**0.356**	**699**	77	41.9	5.22	86.1	658	< 5.0	< 5.0	0.201	---	---	78.5	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	05-IN	1170	7.83	---	534	535	548	---	1.33	159	**0.778**	**1.20**	**750**	148	40.1	3.10	69.2	669	< 5.0	< 5.0	0.184	---	---	96.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	05-IN	1130	8.15	---	---	594	494	---	1.48	164	0.019	**1.07**	**732**	173	39.4	2.66	55.0	602	< 5.0	< 5.0	0.184	---	---	108	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	47.2	---
	28-Sep-2015	05-IN	1180	7.70	---	---	577	517	---	1.7	153	0.011	**0.522**	**738**	163	41.3	3.39	64.9	631	<5.0	<5.0	0.185	---	---	---	---	---	---	---	<0.020	0.049	0.049	---	---	---	---	---	---
	28-Sep-2016	05-IN	1170	8.07	---	---	556	490	---	1.7	145	0.122	**1.020**	**698**	163	36.4	3.11	54.4	597	<5.0	<5.0	0.170	---	---	---	---	---	---	---	<0.010	0.054	0.054	---	---	---	---	---	---
	27-Sep-2017	05-IN	1060	7.57	---	---	560	543	---	<2.5	153	<0.030	**0.919**	**748**	155	42.1	3.38	65.6	662	<5.0	<5.0	0.120	---	---	---	---	---	---	---	<0.050	0.720	0.72	---	---	---	---	---	---
	17-Sep-2018	05-IN	1080	7.88	---	---	616	540	---	2.0	147	<0.010	**0.855**	**759**	179	41.1	3.55	59.3	659	<5.0	<5.0	0.187	---	---	---	---	---	---	---	<0.010	0.677	0.677	---	---	---	---	---	---
	17-Sep-2019	05-IN	1080	7.49	---	724	619	568	---	2.3	148	<0.010	**0.585**	**772**	172	46.0	3.19	56.7	692	<5.0	<5.0	0.227	---	---	---	---	---	---	---	<0.010	0.650	0.65	---	---	---	---	---	---
	22-Sep-2020	05-IN	1151	6.96	---	---	550	540	---	2.10	147	<0.010	**0.179**	**724**	157	38.3	3.01	51.2	659	<5.0	<5.0	0.162	---	---	---	---	---	---	---	<0.010	0.348	0.348	---	---	---	---	---	---
	22-Sep-2021	05-IN	1100	7.60	---	---	589	527	---	1.74	148	<0.030	**0.131**	**733**	160	46.1	3.28	57	642	<5.0	<5.0	0.156	---	---	---	---	---	---	---	<0.010	0.114	0.114	---	---	---	---	---	---
	23-Sep-2022	05-IN	1080	7.92	---	---	616	539	---	1.66	139.0	<0.030	**0.113**	**774**	169	47.2	3.34	54.3	658	<1.0	<1.0	0.150	---	---	---	---	---	---	---	<0.010	0.145	0.145	---	---	---	---	---	---
	28-Sep-2023	05-IN	1040	8.16	---	---	543	484	---	1.54	132	<0.010	**0.0729**	**705**	155	37.8	3.44	54.2	591	<1.0	<1.0	0.157	---	---	---	---	---	---	---	<0.010	0.142	0.142	---	---	---	---	---	---
	10-Sep-2024	05-IN	1140	7.35	---	---	541	567	---	1.90	131	<0.010	**0.147**	**747**	150	40.4	2.82	46.4	691	<1.0	<1.0	0.176	---	---	---	---	---	---	---	<0.010	0.058	0.058	---	---	---	---	---	---
	17-Sep-2025	05-IN	1160	7.60	---	---	576	556	---	1.13	118	<0.010	**0.092**	**748**	160	42.9	3.20	57.8	678	<0.6	<0.3	0.202	---	---	---	---	---	---	---	<0.010	0.042	<0.0500	---	---	---	---	---	---
05-SS	10-Sep-2004	05-SS	482	7.85	---	---	160	230	< 0.5	1.2	22.4	< 0.01	**0.381**	256	47.4	9.7	4.6	32	281	< 0.5	< 0.5	---	---	---	---	0.92	---	---	---	0.003	0.005	0.008	---	---	---	---	6.4	---
	08-Sep-2005	05-SS	405	7.71	7.4	---	150	206	< 0.5	< 0.5	20	**1.32**	**0.382**	230	41.9	10.5	4.3	28.3	251	< 0.5	< 0.5	---	---	---	---	0.96	---	---	---	< 0.003	0.008	0.008	---	---	---	< 0.005	6.5	---
	07-Sep-2006	05-SS	413	7.53	---	---	160	205	< 0.5	1.2	22.5	**1.34**	**0.395**	240	46.2	11.2	4.3	30.2	250	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	< 0.003	0.003	0.003	---	---	---	---	7.3	---
	07-Sep-2007	05-SS	432	7.6	---	---	140	207	< 0.5	0.7	23.2	**1.58**	**0.336**	231	41.7	9.8	3.7	25.9	253	< 0.5	< 0.5	---	---	---	---	0.9	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	---	6.2	---
	04-Sep-2008	05-SS	424	7.7	---	---	155	210	---	< 0.50	21.6	**1.87**	**0.351**	236	44.5	10.6	4.19	28.7	256	< 5	< 5	0.111	---	---	---	0.956	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	17-Sep-2009	05-SS	424	7.75	---	---	163	207	---	< 0.50	22.1	< 0.030	**0.351**	239	46.5	11.5	4.35	29.5	252	< 5.0	< 5.0	0.098	---	---	---	1.01	---	---	---	< 0.050	0.066	< 0.071	---	---	---	---	---	---
(Duplicate)	17-Sep-2009	05-SS DUP	420	7.75	---	---	168	207	---	< 0.50	22	< 0.030	**0.358**	241	48.3	11.6	4.4	30.3	253	< 5.0	< 5.0	0.098	---	---	---	1.04	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	05 (R) SS	444	7.7	---	---	152	215	---	< 0.50	23.4	0.051	**0.34**	239	43.7	10.5	3.76	28	263	< 5.0	< 5.0	0.135	---	---	90.5	---	---	---	---	< 0.050	0.154	0.154	---	---	---	---	---	---
	08-Sep-2011	05-SS	441	8.03	---	---	166	214	---	< 0.50	22.9	**2.17**	**0.375**	242	46.5	12.1	4.1	27.6	262	< 5.0	< 5.0	0.151	---	---	96.7	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	16-Sep-2014	05-SS	448	8.27	---	---	172	221	---	< 0.50	23.6	**2.19**	**0.396**	253	50	11.4	4.14	31.3	270	< 5.0	< 5.0	0.126	---	---	99.6	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	7.84	---
	28-Sep-2015	05-SS	446	7.95	---	---	181	224	---	<0.50	26.3	0.137	**0.406**	261	52.4	12.3	4.30	31.5	273	<5.0	<5.0	0.146	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
(Duplicate)	28-Sep-2015	25-SS	445	7.98	---	---	184	222	---	<0.50	26.0	0.137	**0.406**	260	51.9	13.1	4.28	31.4	271	<5.0	<5.0	0.135	---	---	---	---	---	---	---	<0.010	0.021	<0.022	---	---	---	---	---	---
	28-Sep-2016	05-SS	440	8.07	---	---	156	202	---	<0.50	23.9	**1.500**	**0.369**	233	45.5	10.4	4.17	27.4	246	<5.0	<5.0	0.101	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
(Duplicate)	28-Sep-2016	25-SS	438	8.17	---	---	159	209	---	<0.50	23.6	**1.470**	**0.370**	237	46.4	10.4	4.14	27.2	255	<5.0	<5.0	0.098	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	05-SS	419	8.48	---	---	180	218	---	<0.50	25.8	<0.030	**0.407**	258	51.1	12.8	4.46	32.8	254	6.2	<5.0	0.098	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
(Duplicate)	27-Sep-2017	25-SS	418	8.46	---	---	180	217	---	<0.50	25.7	<0.030	**0.409**	257	51.0	12.7	4.40	32.7	253	5.4	<5.0	0.099	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	17-Sep-2018	05-SS	415	7.81	---	---	182	209	---	<0.50	24.6	<0.010	**0.436**	249	52.3	12.4	4.74	28.7	255	<5.0	<5.0	0.117	---	---	---	---	---	---	---	<0.010	0.085	0.085	---	---	---	---	---	---
(Duplicate)	17-Sep-2018	25-SS	411	7.82	---	---	179	207	---	<0.50	24.9	<0.010	**0.435**	247	51.2	12.4	4.70	29.6	253	<5.0	<5.0	0.117	---	---	---	---	---	---	---	<0.010	0.081	0.081	---	---	---	---	---	---
	17-Sep-2019	05-SS	424	7.41	---	---	174	231	---	<0.50	25.8	**0.557**	**0.391**	264	49.4	12.2	4.48	31.9	282	<5.0	<5.0	0.148	---	---	---	---	---	---	---	<0.010	0.27	0.27	---	---	---	---	---	---
(Duplicate)	17-Sep-2019	25-SS	418	7.37	---	---	176	221	---	<0.50	25.7	**0.559**	**0.400**	259	50.1	12.3	4.59	32.1	270	<5.0	<5.0	0.148	---	---	---	---	---	---	---	<0.010	0.227	0.227	---	---	---	---	---	---
	23-Sep-2020	05-SS	460	6.81	---	---	162	215	---	<0.50	26.0	**1.75**	**0.381**	244	46.9	11.0	4.15	26.9	263	<5.0	<5.0	0.122	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
(Duplicate)	23-Sep-2020	25-SS	460	7.57	---	---	161	224	---	<0.50	25.6	**1.84**	**0.375**	249	46.4	11.0	4.10	27.6	273	<5.0	<5.0	0.123	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	05-SS	426	7.6	---	---	172	219	---	<0.50	26	**0.969**	**0.4**	254	47.8	12.8	4.6	30.6	267	<5.0	<5.0	0.11	---	---	---	---	---	---	---	<0.010	0.062	0.062	---	---	---	---	---	---
(Duplicate)	22-Sep-2021	25-SS	438	7.77	---	---	169	214	---	<0.50	25.6	**0.928**	**0.392**	246	47.1	12.5	4.21	28.7	261	<5.0	<5.0	0.102	---	---	---	---	---	---	---	<0.010	0.109	0.109	---	---	---	---	---	---
	29-Sep-2022	05-SS	422	7.74	---	---	176	216	---	<0.50	23.9	<0.030	**0.383**	290	48.8	13.1	4.32	30.0	264	<1.0	<1.0	0.112	---	---	---	---	---	---	---	<0.010	0.182	0.182	---	---	---	---	---	---
(Duplicate)	29-Sep-2022	25-SS	426	7.77	---	---	173	217	---	<0.50	23.3	<0.0.30	**0.385**	288	48.4	12.6	4.32	29.5	265	<1.0	<1.0	0.115	---	---	---	---	---	---	---	<0.010	0.125	0.125	---	---	---	---	---	---
	28-Sep-2023	05-SS	447	8.45	---	---	165	227	---	<0.50	24.2	0.245	**0.39**	290	46.9	11.7	4.11	28.5	265	5.9	<1.0	0.108	---	---	---	---	---	---	---	<0.010	0.096	0.096	---	---	---	---	---	---
(Duplicate)	28-Sep-2023	25-SS	443	8.47	---	---	165	226	---	<0.50	22.6	**0.474**	**0.352**	289	47.1	11.5	4.18	29.3	262	6.8	<1.0	0.108	---	---	---	---	---	---	---	<0.010	0.067	0.067	---	---	---	---	---	---
	10-Sep-2024	05-SS	416	8.00	---	---	167	226	---	<0.50	24.0	<0.010	**0.417**	289	46.3	12.5	3.98	28.2	275	<1.0	<1.0	0.118	---	---	---	---	---	---	---	<0.010	0.185	0.185	---	---	---	---	---	---
(Duplicate)	10-Sep-2024	25-SS	422	7.52	---	---	220	167	---	<0.50	24	<0.010	**0.413**	287	47.1	12.1	4.1	27	261	3.7	<1.0	0.120	---	---	---	---	---	---	---	<0.010	0.175	0.175	---	---	---	---	---	---
	17-Sep-2025	05-SS	444	7.50	---	---	175	216	---	<0.50	23.6	0.034	**0.395**	288	49.2	12.6	4.19	30.2	264	<0.6	<0.3	0.178	---	---	---	---	---	---	---	<0.010	0.196	0.196	---	---	---	---	---	---
(Duplicate)	17-Sep-2025	25-SS	433	7.46	---	---	172	213	---	<0.50	20.3	0.035	0.382	282	48.9	12.2	4.04	29.1	260	<0.6	<0.3	0.178	---	---	---	---	---	---	---	<0.010	0.195	0.195	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	**7.0-10.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.05**	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	**1.0**	---	---	---	---	---	---	---	**0.12**	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1**	**10**	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	**6.5 - 8.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1.0**	**10**	---	---	---	**0.05**	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	**6.5 - 8.5**	---	---	---	---	---	**120**	**Variable**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	---	---	---	**Variable[13]**	**0.0019**	---	---
06-SH	18-Feb-1985	06-SH	---	---	---	285.5	295	---	---	---	---	---	---	295	---	---	---	---	359.6	---	---	---	---	---	---	---	---	---	---	0.003	0.009	---	---	---	---	---	---	---
	15-May-1985	06-SH	493	7.82	---	264.1	272	---	---	1	10.5	---	---	285	75	18.6	1.39	7.3	331.6	---	---	---	---	---	---	---	< 0.0020	---	---	0.017	0.003	---	---	---	---	---	---	---
	15-Sep-1985	06-SH	508	7.84	---	257	276	---	---	0.9	6.8	---	---	280	74	17.5	1.45	6.2	336.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.007	---	---	---	---	---	---	---
	15-Dec-1985	06-SH	530	7.49	---	268.6	289	---	---	1.12	5.8	---	---	290	74	20.3	1.35	5.9	352.3	---	---	---	---	---	---	---	< 0.0020	---	---	0.005	0.005	---	---	---	---	---	---	---
	15-Jun-1986	06-SH	520	8.26	---	282.7	278	---	---	1.8	5.3	---	---	280	77.7	21.5	1.2	6.1	---	---	---	---	---	---	---	---	< 0.0020	---	---	0.005	0.013	---	---	---	---	---	---	---
	15-Aug-1986	06-SH	528	7.27	---	282.3	276	---	---	1.1	6.7	---	---	285	78	21.2	1.25	5.9	336.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.014	---	---	---	---	---	---	---
	15-Oct-1986	06-SH	500	7.86	---	266.9	277	---	---	1.2	6.1	---	---	290	73	20.5	1.27	5.4	337.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.066	---	---	---	---	---	---	---
	15-May-1987	06-SH	505	8.15	---	270.2	275	---	---	0.8	6.5	---	---	280	73	21.3	1.2	5.8	335.2	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.057	---	---	---	---	---	---	---
	15-Sep-1987	06-SH	526	8.4	---	276	285	---	---	2.1	6.7	---	---	290	76.8	20.6	1.36	6.1	348	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.068	---	---	---	---	---	---	---
	15-Nov-1987	06-SH	536	7.55	---	294.7	289	---	---	2.3	6.7	---	---	305	81	22.4	1.31	6	352.3	---	---	---	---	---	---	---	< 0.0020	---	---	0.003	0.011	---	---	---	---	---	---	---
	15-Feb-1988	06-SH	543	7.47	---	---	---	---	---	1.3	7.5	---	---	---	77	22.6	1.25	6	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	06-SH	532	7.88	---	286.8	294	---	---	1.4	7.2	---	---	300	88	21.5	1.25	6.2	359	---	---	---	---	---	---	---	< 0.0010	---	---	0.003	0.036	---	---	---	---	---	---	---
	15-Aug-1988	06-SH	546	7.76	---	298.6	308	---	---	1.3	7.8	---	---	310	82.4	22.5	1.4	7.2	375.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.106	---	---	---	---	---	---	---
	15-Nov-1988	06-SH	545	7.89	---	308.3	287	---	---	1.2	7.4	---	---	303	85.8	22.8	1.4	6.6	349.9	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.06	---	---	---	---	---	---	---
	15-May-1989	06-SH	585	7.88	---	304.3	316	---	---	1.3	7.1	---	---	316	84.5	22.6	1.35	6.6	385.2	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.029	---	---	---	---	---	---	---
	15-Sep-1989	06-SH	597	7.49	---	---	---	---	---	---	---	---	---	400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	06-SH	626	8.2	---	343.2	356	---	---	1.2	9.1	---	---	356	93	26.9	1.62	7.2	434	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.02	---	---	---	---	---	---	---
	15-Mar-1990	06-SH	606	7.92	---	---	---	---	---	---	---	---	---	284	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Apr-1990	06-SH	706	7.36	---	---	---	---	---	---	---	---	---	370	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	06-SH	652	8.03	---	351.6	363	---	---	1.9	7.7	---	---	363	96.5	26.8	1.32	7.4	442.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.011	---	---	---	---	---	---	---
	15-Aug-1990	06-SH	703	7.69	---	---	---	---	---	---	---	---	---	460	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	06-SH	705	8.11	---	363.1	382.4	---	---	1.1	14.1	---	---	386	98.5	28.4	1.63	8.7	466.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.011	---	---	---	---	---	---	---
	12-May-1992	06-SH	779	7.95	---	346.6	399	---	---	2.2	51.4	---	---	413	95	26.5	1.75	44.1	486.4	---	---	---	---	---	---	---	< 0.0010	---	---	0.003	0.008	---	---	---	---	---	---	---
	21-Sep-1994	06-SH	992	7.13	---	---	559	0.1		5.2	13.9	0.03	**0.583**	**568**	135	37	6.08	29.7	681	0.5	0.5	---	---	---	---	---	0.97	0.001	---	---	0.153	0.144	0.153	---	---	---	---	---	---
	01-Nov-1994	06-SH	841	7.58	---	---	473	< 0.1		2.2	9	0.03	**0.628**	476	126	35.1	2.53	12.5	577	< 0.5	< 0.5	---	---	---	---	---	1.01	< 0.001	---	---	0.055	0.051	0.055	---	---	---	---	---	---
	28-Sep-1995	06-SH	953	7.02	---	609	567	< 0.1		2.5	6.6	< 0.01	**0.059**	**582**	171	44.1	2.1	10.4	691	< 0.5	< 0.5	---	---	---	---	---	1.1	< 0.001	---	---	---	0.012	---	---	---	---	---	---	---
	04-Sep-1996	06-SH	1080	6.98	---	599	612	< 0.1		2.6	9.6	< 0.01	**1.07**	**607**	167	44.1	1.95	9.04	746	< 0.5	< 0.5	---	---	---	---	---	0.99	0.001	---	---	---	0.007	0.007	---	---	---	---	---	---
	03-Sep-1997	06-SH	1018	7.24	---	645	604	< 0.1		2.3	5.3	< 0.01	**0.423**	**613**	174	50.9	1.91	10.2	736	< 0.5	< 0.5	---	---	---	---	---	1.09	< 0.001	---	---	---	0.04	0.04	---	---	---	---	---	---
	15-Sep-1998	06-SH	1090	6.9	---	630	635	< 0.1		1.8	5	---	---	**622**	172	49.8	1.7	10.9	775	< 0.5	< 0.5	---	12.9	13.2	---	1.03	0.001	---	---	---	0.014	0.017	---	---	---	---	---	---
(Duplicate)	15-Sep-1998	06-SH DUP	1100	7.14	---	650	606	< 0.1		1.7	4.8	---	---	**609**	176	50.7	1.8	11	739	< 0.5	< 0.5	---	12.3	13.5	---	1.1	0.001	---	---	---	0.014	0.014	---	---	---	---	---	---
	09-Sep-1999	06-SH	1220	7.04	---	780	760	< 0.1		2.7	4.6	---	---	**748**	211	60.9	1.6	11.6	927	< 0.5	< 0.5	---	15.4	16.1	---	1.05	< 0.001	---	< 0.001	---	0.011	0.011	---	---	---	---	---	---
	05-Sep-2000	06-SH	1150	7.37	---	650	706	< 0.1		3.2	4.9	< 0.01	**0.649**	**669**	171	52.9	2.4	11.2	861	< 0.5	< 0.5	---	14.3	13.5	---	0.94	0.003	---	---	< 0.003	0.02	0.02	---	---	---	---	---	---
	06-Sep-2001	06-SH	1110	7.66	---	700	707	< 0.5		3	4.8	< 0.01	**0.619**	**691**	190	54.9	2.3	11	862	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	< 0.003	0.031	0.031	---	---	---	---	---	---
(Duplicate)	06-Sep-2001	06-SH DUP	1130	7.85	---	700	702	< 0.5		3.1	4.6	< 0.01	**0.273**	**689**	192	54.6	2.2	10.5	857	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	< 0.003	0.03	0.03	---	---	---	---	---	---
	04-Sep-2002	06-SH	1300	7.32	---	670	732	< 0.5		3	4.5	0.03	**0.326**	**694**	182	51.5	2.1	11.1	893	< 0.5	< 0.5	---	---	---	---	0.93	< 0.001	---	---	< 0.003	0.031	0.031	---	---	---	---	2.4	---
(Duplicate)	04-Sep-2002	06-SH DUP	1300	7.53	---	670	740	< 0.5		2.9	4.9	0.02	**0.598**	**698**	185	49.6	2.1	9.1	903	< 0.5	< 0.5	---	---	---	---	0.92	0.001	---	---	< 0.003	0.016	0.016	---	---	---	---	1.5	---
	03-Sep-2003	06-SH	1230	7.25	---	770	735	< 0.5		2.9	4.9	0.03	**0.356**	**735**	216	56.6	2.3	10.2	897	< 0.5	< 0.5	---	---	---	---	1.07	---	< 0.004	---	< 0.003	0.016	0.016	---	---	---	---	1.8	---
(Duplicate)	03-Sep-2003	06-SH DUP	1230	7.28	---	760	726	< 0.5		2.9	4.7	0.03	**0.216**	**724**	209	57.9	2.4	11.2	886	< 0.5	< 0.5	---	---	---	---	1.07	---	< 0.004	---	< 0.003	0.019	0.019	---	---	---	---	1.8	---
	08-Sep-2004	06-SH	1260	7.61	---	690	730	< 0.5		3.5	4.4	0.04	**0.318**	**701**	191	52	2.2	9.4	890	< 0.5	< 0.5	---	---	---	---	0.97	---	< 0.004	---	< 0.003	0.026	0.026	---	---	---	---	1.5	---
(Duplicate)	08-Sep-2004	06-SH DUP	1230	7.64	---	680	709	< 0.5		3.4	4.3	0.03	**0.074**	**686**	188	52	2.2	10.1	865	< 0.5	< 0.5	---	---	---	---	0.99	---	< 0.004	---	< 0.003	0.02	0.02	---	---	---	---	1.5	---
	30-Oct-2004	06-SH	---	---	---	---	---	---	---	---	---	0.04	**0.935**	---	178	46.7	2.1	8.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.7	---
	07-Sep-2005	06-SH	1150	7.85	16.9	---	670	713	< 0.5	3.3	4.8	0.08	**3.55**	**687**	189	47.1	1.8	9.4	870	< 0.5	< 0.5	---	---	---	---	0.95	---	< 0.004	---	< 0.003	0.004	0.004	---	---	---	---	1.7	---
(Duplicate)	07-Sep-2005	06-SH DUP	1170	7.89	8.4	---	640	718	< 0.5	2.7	4	< 0.01	**2.03**	**679**	179	48.3	2	11.1	876	< 0.5	< 0.5	---	---	---	---	0.92	---	< 0.004	---	< 0.003	0.008	0.008	---	---	---	---	2.4	---
	07-Sep-2006	06-SH	1130	7.62	---	---	650	690	< 0.5	3.4	4.7	0.04	**1.18**	**663**	177	50.4	2.1	10.3	841	< 0.5	< 0.5	---	---	---	---	0.97	---	---	---	< 0.003	0.006	0.006	---	---	---	---	1.4	---
(Duplicate)	07-Sep-2006	06-SH DUP	1190	7.65	---	---	640	692	< 0.5	3.5	5.1	0.07	**1.16**	**660**	174	49.3	2.1	9.6	844	< 0.5	< 0.5	---	---	---	---	0.94	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	---	1.3	---
	05-Sep-2007	06-SH	1130	7.72	---	---	540	674	< 0.5	3	4	**0.36**	**0.541**	**614**	150	40.8	1.8	7.9	822	< 0.5	< 0.5	---	---	---	---	0.82	---	---	---	< 0.003	0.36	0.36	---	---	---	---	1.2	---
(Duplicate)	05-Sep-2007	06-SH DUP	1110	7.97	---	---	590	669	< 0.5	2.6	3.9	0.1	**1.08**	**628**	162	44.1	1.9	11	817	< 0.5	< 0.5	---	---	---	---	0.91	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	---	1.4	---
	03-Sep-2008	06-SH	1080	7.70	---	---	578	656	---	2.31	3.15	< 0.030	**1.19**	**613**	160	43.3	2.06	8.49	800	< 5	< 5	0.169	---	---	---	0.903	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
(Duplicate)	03-Sep-2008	06-SH DUP	1100	7.70	---	---	589	648	---	2.26	3.3	< 0.030	**1.2**	**612**	163	44.1	2.05	8.69	791	< 5	< 5	0.181	---	---	---	0.93	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	06-SH	1050	7.79	---	---	618	625	---	2.19	2.86	< 0.030	**0.79**	**610**	172	45.8	2.14	9.5	763	< 5.0	< 5.0	0.159	---	---	---	1.01	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	09-Sep-2009	06-SH DUP	1050	7.91	---	---	632	622	---	2.18	2.77	0.057	**1.27**	**612**	179	45	1.92	8	759	< 5.0	< 5.0	0.173	---	---	---	1.04	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	06 SH	1030	7.52	---	---	623	593	---	2.32	3.08	< 0.030	**0.157**	**590**	168	49.4	1.75	9.2	723	< 5.0	< 5.0	0.196	---	---	---	108	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	08-Sep-2010	SYLVITE 26	1030	7.74	---	---	553	588	---	2.38	3.06	0.065	**0.695**	**562**	150	43.3	1.75	8.3	717	< 5.0	< 5.0	0.18	---	---	96.3	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	06-SH	1010	8.09	---	---	561	587	---	2.07	2.53	< 0.030	**0.583**	**563**	152	44.1	1.8	8.6	716	< 5.0	< 5.0	0.179	---	---	98.1	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	07-Sep-2011	ZIRCON 26	910	8.10	---	---	510	523	---	2.05	2.51	< 0.030	**0.873**	**506**	140	38.9	1.65	6.9	638	< 5.0	< 5.0	0.179	---	---	99.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	06-SH	993	7.79	---	576	577	588	---	1.84	2.77	0.062	**1.13**	**571**	159	43.7	2.15	8.2	718	< 5.0	< 5.0	0.179	---	---	100	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	05-Sep-2012	SPINEL 25	975	7.93	---	589	590	581	---	1.86	2.81	0.069	**1.05**	**572**	162	45	2.21	9	709	< 5.0	< 5.0	0.174	---	---	104	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	25-Sep-2013	06-SH	978	7.64	---	573	573	593	---	1.46	6.15	0.091	**0.714**	**575**	159	42.7	1.74	7.6	723	< 5.0	< 5.0	0.169	---	---	98.3	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	25-Sep-2013	26-SH	968	7.63	---	560	560	589	---	1.44	5.86	0.079	**0.664**	**567**	153	43.3	1.72	7.8	718	< 5.0	< 5.0	0.155	---	---	97.0	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	06-SH	869	7.89	---	---	512	500	---	1.53	2.29	< 0.010	**0.749**	495	144	37.1	1.65	8.0	609	< 5.0	< 5.0	0.211	---	---	105	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	1.95	---
	29-Sep-2015	06-SH	949	7.78	---	---	594	530	---	1.59	5.51	<0.010	**1.26**	**544**	164	44.7	2.17	8.31	646	<5.0	<5.0	0.216	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	28-Sep-2016	06-SH	866	7.99	---	---	517	490	---	1.18	3.06	<0.010	**0.49**	490	147	36.6	1.79	6.70	598	<5.0	<5.0	0.164	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2017	06-SH	782	7.51	---	---	549	510	---	1.19	3.89	<0.030	**1.25**	**513**	147	44.1	2.17	8.40	623	<5.0	<5.0	0.152	---	---	---	---	---	---	---	<0.010	0.027	<0.050	---	---	---	---	---	---
	17-Sep-2018	06-SH	836	7.63	---	---	575	525	---	1.29	1.84	0.022	**1.22**	**531**	160	42.5	2.17	8.00	641	<5.0	<5.0	0.190	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	17-Sep-2019	06-SH	841	7.35	---	---	521	557	---	1.51	2.74	0.035	**1.02**	**531**	142	40.5	1.98	7.5	680	<5.0	<5.0	0.249	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2020	06-SH	913	6.90	---	---	475	538	---	1.30	4.60	<0.010	**0.713**	**505**	132	35.2	1.81	7.0	656	<5.0	<5.0	0.181	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	06-SH	873	7.54	---	---	543	535	---	1.35	2.55	<0.030	**0.965**	**524**	145	43.3	2.22	8.1	652	<5.0	<5.0	0.185	---	---	---	---	---	---	---	<0.010	0.028	0.028	---	---	---	---	---	---
	28-Sep-2022	06-SH	848	7.77	---	---	533	531	---	1.38	2.60	<0.030	**0.69**	**552**	143	42.8	1.82	7.6	648	<1.0	<1.0	0.137	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	29-Sep-2023	06-SH	732	8.00	---	---	508	430	---	0.81	1.91	<0.010	**0.692**	**481**	138	39.7	1.97	7.44	525	<1.0	<1.0	0.188	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	10-Sep-2024	06-SH	898	7.63	---	---	514	594	---	0.77	2.59	0.053	**1.170**	**584**	141	39.4	1.72	7.0	725	<1.0	<1.0	0.200	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	18-Sep-2025	06-SH	953	7.32	---	---	563	566	---	<0.50	1.91	0.040	**0.852**	**582**	154	43.4	1.68	7.57	690	<0.6	<0.3	0.197	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE														Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	**7.0-10.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.05**	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	**1.0**	---	---	---	---	---	---	---	**0.12**	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1**	**10**	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	**6.5 - 8.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1.0**	**10**	---	---	---	---	**0.05**	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	**6.5 - 8.5**	---	---	---	---	---	**120**	**Variable**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	---	---	---	**Variable[13]**	**0.0019**	---	---
06-IN	17-Feb-1985	06-IN	---	---	---	---	393.2	306	---	---	---	---	---	**571**	---	---	---	---	373	---	---	---	---	---	---	---	---	---	---	0.004	0.015	---	---	---	---	---	---	---
	15-May-1985	06-IN	684	7.96	---	---	312.7	308	---	2.2	83	---	---	430	91	20.7	3.11	34	375.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.039	1.08	---	---	---	---	---	---	---
	15-Sep-1985	06-IN	781	8.06	---	---	317.3	308	---	2.6	106	---	---	450	94	20	3.2	47	375.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.019	1.1	---	---	---	---	---	---	---
	15-Jun-1986	06-IN	750	7.18	---	---	369.1	305	---	5.1	89	---	---	450	106	25.3	3.06	25.7	371.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.017	---	---	---	---	---	---	---
	15-Aug-1986	06-IN	763	7.49	---	---	348	304	---	5	110	---	---	455	101	23.2	3	30	370.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.026	---	---	---	---	---	---	---
	15-Oct-1986	06-IN	780	7.85	---	---	347	314	---	5.9	118	---	---	490	97	25.4	2.9	37.5	382.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.058	---	---	---	---	---	---	---
	15-Feb-1987	06-IN	907	7.16	---	---	---	---	---	5.1	188	---	---	---	112	27.5	3.18	48.4	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1987	06-IN	781	8.09	---	---	356.2	301	---	5.8	145	---	---	**500**	99	26.4	3.1	36.5	366.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Sep-1987	06-IN	813	8.01	---	---	367.9	308	---	6.3	146	---	---	**505**	105	25.6	2.99	39.3	375.5	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.06	---	---	---	---	---	---	---
	15-Nov-1987	06-IN	842	7.92	---	---	384.5	308	---	6.2	147	---	---	**530**	109	27.2	3	42.5	375.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.046	---	---	---	---	---	---	---
	15-May-1988	06-IN	865	7.72	---	---	391.7	302	---	5.8	180	---	---	**560**	113	26.6	3.1	50	369	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.007	---	---	---	---	---	---	---
	15-Aug-1988	06-IN	874	7.87	---	---	379.9	318	---	3.8	159	---	---	**548**	108	26.7	3	54.1	387.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.004	---	---	---	---	---	---	---
	15-Nov-1988	06-IN	918	7.68	---	---	387	314	---	3.5	188	---	---	**595**	111	26.6	3.26	54	382.8	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.033	---	---	---	---	---	---	---
	15-Mar-1989	06-IN	928	8.08	---	---	367.8	276	---	3.7	197	---	---	**570**	104	26.2	3.1	57.5	336.4	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.049	---	---	---	---	---	---	---
	15-May-1989	06-IN	931	7.43	---	---	375.8	309	---	3.6	201	---	---	**596**	108	25.7	3.15	66	376.7	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.06	---	---	---	---	---	---	---
	15-Sep-1989	06-IN	904	7.4	---	---	---	---	---	---	---	---	---	**550**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	06-IN	952	8.17	---	---	376.1	292	---	3	184	---	---	**566**	104	28.2	3.5	65	355.9	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.065	---	---	---	---	---	---	---
	15-Mar-1990	06-IN	920	7.41	---	---	---	---	---	---	---	---	---	**548**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	06-IN	961	7.1	---	---	383.2	327	---	3.3	215	---	---	**622**	108	27.5	3.26	65.5	398.6	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.01	---	---	---	---	---	---	---
	15-Aug-1990	06-IN	980	7.77	---	---	---	---	---	---	---	---	---	**640**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	06-IN	958	7.93	---	---	331.1	287.6	---	1.6	182	---	---	**544**	88	27	3.55	66.5	350.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.107	---	---	---	---	---	---	---
	15-May-1991	06-IN	973	7.47	---	---	---	---	---	2.3	179	---	---	**632**	113	24.5	3.3	73.5	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---	---	---	---	---	---	---
	05-Nov-1991	06-IN	897	7.94	---	---	---	324	---	1.8	192	---	---	**600**	117	26.1	3.42	64.4	395	---	---	---	---	---	---	---	< 0.0010	---	---	0.067	---	---	---	---	---	---	---	---
	12-May-1992	06-IN	943	7.86	---	---	361.2	349	---	1.7	180	---	---	**617**	102	25.8	3.2	72	425.4	---	---	---	---	---	---	0.97	< 0.0010	---	---	< 0.003	0.073	---	---	---	---	---	---	---
	03-Nov-1992	06-IN	923	7.53	---	---	---	345	---	1.9	176	---	---	**601**	110	26.2	3.34	73.6	420.6	---	---	---	---	---	---	1.03	< 0.0010	---	---	---	0.054	---	---	---	---	---	---	---
	18-May-1993	06-IN	958	7.41	---	---	---	---	---	1.9	---	---	---	**685**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Nov-1993	06-IN	964	7.61	---	---	393	349	---	2.9	206	---	---	**631**	114	26.3	3.3	66	425	---	---	---	---	---	---	0.95	0.001	---	---	0.007	0.072	---	---	---	---	---	---	---
	21-Sep-1994	06-IN	802	7.78	---	---	---	---	---	---	---	---	---	**520**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-1995	06-IN	902	7.14	---	---	---	---	---	---	---	---	---	**604**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-1996	06-IN	990	7.21	---	---	---	---	---	---	---	---	---	**683**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-1997	06-IN	979	7.34	---	---	485	388	< 0.1	1.8	168	< 0.01	< 0.001	**638**	140	32.7	3.79	55.2	473	< 0.5	< 0.5	---	---	---	---	1.08	---	---	---	---	---	0.065	---	---	---	---	---	---
	15-Sep-1998	06-IN	948	7.18	---	---	450	375	< 0.1	1.3	170	---	---	**606**	128	30.9	3.3	47.8	458	< 0.5	< 0.5	---	11.1	11.1	---	1	---	---	---	0.005	0.08	0.085	---	---	---	< 0.01	---	---
	09-Sep-1999	06-IN	1010	7.58	---	---	440	417	< 0.1	1.5	147	---	---	**622**	124	31.7	2.2	65.2	509	< 0.5	< 0.5	---	11.4	11.7	---	1.02	---	---	---	0.012	0.024	0.036	---	---	---	< 0.01	---	---
	05-Sep-2000	06-IN	930	7.66	---	---	410	391	< 0.1	1.9	138	< 0.01	**0.039**	**580**	116	29.3	4.1	56.4	477	< 0.5	< 0.5	---	10.7	10.8	---	1	---	---	---	< 0.003	0.095	0.095	---	---	---	< 0.01	---	---
	06-Sep-2001	06-IN	866	7.92	---	---	440	383	< 0.5	1.6	135	< 0.01	**0.58**	**579**	125	31.1	3.7	50.6	468	< 0.5	< 0.5	---	---	---	---	1.06	---	---	---	0.004	0.108	0.112	---	---	---	< 0.01	---	---
	04-Sep-2002	06-IN	1010	7.69	---	---	410	424	< 0.5	1.7	103	0.02	**0.46**	**567**	117	27.7	3.8	58.6	517	< 0.5	< 0.5	---	10.7	10.8	---	1.01	---	---	---	< 0.003	0.085	0.085	---	---	---	< 0.01	37.9	---
	03-Sep-2003	06-IN	915	7.69	---	---	470	408	< 0.5	1.6	122	0.17	**0.34**	**591**	135	31.7	3.6	50.7	497	< 0.5	< 0.5	---	10.8	11.7	---	1.09	---	---	---	< 0.003	0.05	0.05	---	---	---	< 0.01	35	---
	08-Sep-2004	06-IN	946	7.95	---	---	400	419	< 0.5	2	109	0.02	< 0.004	**562**	115	28.2	3.6	52.9	511	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	0.067	0.067	---	---	---	< 0.01	35.7	---
	07-Sep-2005	06-IN	905	8.1	1.6	---	450	447	< 0.5	2	95.6	< 0.01	**2.56**	**576**	133	29	3.2	42.6	545	< 0.5	< 0.5	---	---	---	---	1	---	---	---	< 0.003	0.005	0.005	---	---	---	< 0.005	31.3	---
	07-Sep-2006	06-IN	896	7.86	---	---	400	430	< 0.5	2.3	82.4	< 0.01	**3.34**	**541**	115	27	3.4	49.5	525	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	0.019	0.019	---	---	---	---	27.9	---
	03-Sep-2008	06-IN	880	8	---	---	363	429	---	1.2	75.8	**0.331**	**1.93**	**516**	105	24.6	3.4	48.2	524	< 5	< 5	0.218	---	---	---	0.925	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	06-IN	864	7.98	---	---	462	444	---	3.37	67.5	0.278	**2.17**	**555**	135	30.3	3.82	48.6	542	< 5.0	< 5.0	0.197	---	---	---	1.1	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	06 IN	887	7.8	---	---	361	438	---	1.35	65.3	0.266	**1.77**	**504**	103	25.3	3.01	42.8	534	< 5.0	< 5.0	0.256	---	---	90.1	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	06-IN	895	8.25	---	---	403	449	---	1.2	60.9	**0.904**	**1.37**	**523**	114	28.7	3.43	45.4	548	< 5.0	< 5.0	0.248	---	---	98.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	06-IN	882	8.02	---	402	403	458	---	1.12	57.7	**0.878**	**1.21**	**529**	115	28.1	3.74	48.3	559	< 5.0	< 5.0	0.225	---	---	98.5	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	25-Sep-2013	06-IN	877	7.89	---	411	412	485	---	1.16	45.7	**0.928**	**1.30**	**542**	116	29.6	3.44	54.5	591	< 5.0	< 5.0	0.207	---	---	100	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
06(R)IN	17-Sep-2014	06(R)IN	803	8.08	---	---	488	446	---	0.91	10.0	<0.010	**1.38**	464	138	34.8	2.33	10.2	544	< 5.0	< 5.0	0.228	---	---	112	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	4.24	---
	29-Sep-2015	06(R)IN	1050	7.40	---	---	600	577	---	1.06	4.68	**0.893**	**2.04**	**577**	167	44.5	3.11	10.5	704	<5.0	<5.0	0.283	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	28-Sep-2016	06(R)IN	862	8.01	---	---	571	463	---	0.86	2.55	**1.910**	**1.45**	496	165	38.7	2.78	8.6	565	<5.0	<5.0	0.201	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2017	06(R)IN	832	7.60	---	---	577	561	---	0.82	4.17	**0.665**	**1.45**	**561**	157	44.8	2.84	14.1	684	<5.0	<5.0	0.191	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	17-Sep-2018	06(R)IN	890	7.84	---	---	609	556	---	0.98	2.67	**1.540**	**1.63**	**565**	172	43.5	3.02	9.0	678	<5.0	<5.0	0.237	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	17-Sep-2019	06(R)IN	875	7.67	---	---	553	580	---	1.08	3.25	**3.050**	**1.69**	**559**	152	42.1	2.93	8.9	707	<5.0	<5.0	0.288	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2020	06(R)IN	935	6.99	---	---	475	538	---	1.30	4.60	<0.010	**0.713**	**505**	132	35.2	1.81	7.0	656	<5.0	<5.0	0.181	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	06(R)IN	893	7.7	---	---	591	542	---	1.83	4.23	0.187	**0.799**	**550**	163	44.7	2.8	8.2	661	<5.0	<5.0	0.194	---	---	---	---	---	---	---	<0.010	0.042	0.042	---	---	---	---	---	---
	28-Sep-2022	06(R)IN	872	7.94	---	---	535	547	---	1.68	4.29	0.105	**1.14**	**570**	145	41.9	2.86	8.3	667	<1.0	<1.0	0.147	---	---	---	---	---	---	---	<0.010	0.020	<0.0500	---	---	---	---	---	---
	29-Sep-2023	06(R)IN	750	8.01	---	---	517	431	---	1.08	4.13	<0.010	**0.666**	**492**	145	37.7	2.32	8.52	526	<1.0	<1.0	0.17	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	10-Sep-2024	06(R)IN	926	8.19	---	---	511	628	---	0.80	2.00	0.277	**0.837**	**605**	139	39.8	1.96	7.6	337	211	<1.0	0.188	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	18-Sep-2025	06(R)IN	966	7.48	---	---	567	566	---	<0.50	1.60	<0.010	**1.22**	**588**	157	42.5	2.54	7.93	690	<0.6	<0.3	0.204	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [13]	0.0019	---	---
07-SH	18-Feb-1985	07-SH	---	---	---	---	308.4	299	---	---	---	---	---	340	---	---	---	---	364.5	---	---	---	---	---	---	---	---	---	---	0.004	0.019	---	---	---	---	---	---	---
	15-May-1985	07-SH	708	7.95	---	---	289.8	292	---	3	56	---	---	375	83	20	2.2	27	355.9	---	---	---	---	---	---	---	< 0.0020	---	---	0.01	0.71	---	---	---	---	---	---	---
	15-Sep-1985	07-SH	552	8.06	---	---	275.7	283	---	1.1	9.8	---	---	300	80	18.4	1.85	8.1	345	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.033	---	---	---	---	---	---	---
	15-Jun-1986	07-SH	620	7.17	---	---	333.9	316	---	1.8	18	---	---	350	---	---	2.14	9.9	385.2	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.038	---	---	---	---	---	---	---
	15-Aug-1986	07-SH	567	7.36	---	---	296.4	280	---	1.3	16.4	---	---	310	84	21	1.96	8.2	341.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.092	---	---	---	---	---	---	---
	15-Oct-1986	07-SH	560	7.62	---	---	290.6	277	---	1.8	19.2	---	---	310	81	21.4	2.04	8	337.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.3	---	---	---	---	---	---	---
	15-May-1987	07-SH	562	8.14	---	---	291.8	279	---	1.3	30	---	---	320	81	21.7	1.75	7.74	340.1	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.115	---	---	---	---	---	---	---
	15-Sep-1987	07-SH	571	7.77	---	---	303.9	287	---	2.3	34	---	---	330	87	21	1.9	8.3	349.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.055	---	---	---	---	---	---	---
	15-Nov-1987	07-SH	584	7.88	---	---	317.6	295	---	2.1	33.2	---	---	340	89	23.1	1.91	8.7	359.6	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.03	---	---	---	---	---	---	---
	15-Feb-1988	07-SH	598	7.44	---	---	---	---	---	1.4	37	---	---	---	85	23.3	1.98	9	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	07-SH	599	7.92	---	---	322.6	297	---	3	37	---	---	350	91.6	22.8	1.88	9.3	362	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.034	---	---	---	---	---	---	---
	15-Aug-1988	07-SH	616	8.17	---	---	325.9	317.9	---	1.2	35.6	---	---	358	91.5	23.6	2.1	9.8	387.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.014	---	---	---	---	---	---	---
	15-Oct-1988	07-SH	644	7.63	---	---	342.5	324	---	1.3	37.1	---	---	350	90	24.3	2.03	10.2	395	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.019	---	---	---	---	---	---	---
	15-Mar-1989	07-SH	650	7.99	---	---	348.4	303	---	1.6	39.8	---	---	362	100	23.9	2	10.4	369.4	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.016	---	---	---	---	---	---	---
	15-May-1989	07-SH	688	7.5	---	---	355.4	329	---	2.1	43.9	---	---	387	100	25.6	2.09	12.7	401.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.02	---	---	---	---	---	---	---
	15-Sep-1989	07-SH	665	7.31	---	---	---	---	---	---	---	---	---	430	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	07-SH	702	7.88	---	---	385.2	360	---	1.6	35.9	---	---	406	106	29.2	2.25	12	438.8	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.02	---	---	---	---	---	---	---
	15-May-1990	07-SH	732	7.9	---	---	381.1	383	---	2.2	39.9	---	---	424	106	28.2	2.12	11.9	466.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.017	---	---	---	---	---	---	---
	15-Aug-1990	07-SH	816	7.72	---	---	---	---	---	---	---	---	---	**530**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	07-SH	800	7.94	---	---	380.5	395.2	---	2.7	39.9	---	---	432	102	30.5	2.4	13.5	481.7	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.008	---	---	---	---	---	---	---
	15-May-1991	07-SH	775	7.54	---	---	---	---	---	3	37.5	---	---	500	114	27.5	2.26	11.5	---	---	---	---	---	---	---	---	---	---	---	0.009	---	---	---	---	---	---	---	---
	05-Nov-1991	07-SH	715	7.45	---	---	---	391	---	2.7	35.2	---	---	430	110	27.2	2.34	11.1	477	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	---	---	---	---	---	---	---	---
	12-May-1992	07-SH	776	7.95	---	---	406	346	---	2.2	51.4	---	---	370	114	29.4	2.19	11.5	421.8	---	---	---	---	---	---	1.08	< 0.0010	---	---	< 0.003	< 0.003	---	---	---	---	---	---	---
	03-Nov-1992	07-SH	773	7.42	---	---	---	403	---	2.9	38.4	---	---	456	125	30.3	2.46	11.5	491.3	---	---	---	---	---	---	1.04	< 0.0010	---	---	---	< 0.003	---	---	---	---	---	---	---
	20-May-1993	07-SH	755	7.53	---	---	427	414	---	3.1	40.8	---	---	461	120	30.9	2.23	12.1	505	---	---	---	---	---	---	0.99	< 0.0010	---	---	< 0.003	< 0.003	---	---	---	---	---	---	---
	10-Nov-1993	07-SH	790	7.57	---	---	404	413	---	2.3	40.1	---	---	450	110	31.4	2.2	12.5	503	---	---	---	---	---	---	0.95	0.001	---	---	< 0.003	0.017	---	---	---	---	---	---	---
	31-May-1994	07-SH	837	7.11	---	---	---	437	< 0.1	3.9	39.5	< 0.01	**0.52**	480	124	32.4	2.25	11.8	533	< 0.5	< 0.5	---	---	---	---	0.98	< 0.001	---	---	0.01	0.01	0.01	---	---	---	---	---	---
	21-Sep-1994	07-SH	847	7.22	---	---	---	440	0.1	4.8	41.6	0.01	**0.995**	488	125	33	2.54	12.7	536	0.5	0.5	---	---	---	---	0.98	0.001	---	---	0.007	0.007	0.007	---	---	---	---	---	---
	02-Nov-1994	07-SH	834	7.54	---	---	---	429	< 0.1	4.4	35.6	< 0.01	0.012	477	129	31.1	2.64	12.7	523	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	0.034	0.034	0.034	---	---	---	---	---	---
	28-Sep-1995	07-SH	788	7.76	---	---	507	443	< 0.1	5.2	37.3	< 0.01	**0.171**	**509**	147	34	2.7	13	540	< 0.5	< 0.5	---	---	---	---	1.1	< 0.001	---	---	---	0.007	---	---	---	---	---	---	---
	04-Sep-1996	07-SH	860	7.06	---	---	454	454	< 0.1	7.4	35.7	**0.97**	**0.673**	495	128	32.5	2.29	12.6	553	< 0.5	< 0.5	---	---	---	---	0.96	< 0.001	---	---	---	0.032	0.032	---	---	---	---	---	---
	03-Sep-1997	07-SH	876	7.25	---	---	470	472	< 0.1	8.6	31.6	< 0.01	< 0.001	**509**	133	33.5	2.5	11.9	575	< 0.5	< 0.5	---	---	---	---	0.97	< 0.001	---	---	---	0.022	0.022	---	---	---	---	---	---
	15-Sep-1998	07-SH	747	7.28	---	---	400	399	< 0.1	9	29.2	---	---	430	99.4	36.8	2.4	13.2	487	< 0.5	< 0.5	---	8.85	8.62	---	0.97	0.001	---	---	---	0.078	0.084	---	---	---	---	---	---
(Duplicate)	15-Sep-1998	07-SH DUP	756	7.28	---	---	390	423	< 0.1	8.9	29.3	---	---	442	98.4	35.8	2.3	12.8	516	< 0.5	< 0.5	---	9.33	8.47	---	0.91	0.001	---	---	---	0.075	0.08	---	---	---	---	---	---
	09-Sep-1999	07-SH	962	7.48	---	---	560	494	< 0.1	14.2	33.4	---	---	**558**	156	42.7	2.8	13.1	603	< 0.5	< 0.5	---	11	11.9	---	1.09	< 0.001	---	< 0.001	---	0.017	0.017	---	---	---	---	---	---
(Duplicate)	09-Sep-1999	07-SH DUP	998	7.38	---	---	590	512	< 0.1	17.2	34.8	---	---	**583**	165	44.5	2.1	12.9	625	< 0.5	< 0.5	---	11.5	12.5	---	1.09	< 0.001	---	< 0.001	---	< 0.003	< 0.003	---	---	---	---	---	---
	05-Sep-2000	07-SH	959	7.54	---	---	510	504	< 0.1	20.4	27.5	< 0.01	**0.378**	**546**	140	38.6	3.2	14.1	615	< 0.5	< 0.5	---	11.2	10.8	---	0.97	0.003	---	---	< 0.003	0.014	0.014	---	---	---	---	---	---
(Duplicate)	05-Sep-2000	07-SH DUP	969	7.49	---	---	540	513	< 0.1	22.2	28.3	< 0.01	**0.579**	**565**	150	39.9	2.8	14.5	625	< 0.5	< 0.5	---	11.5	11.5	---	1	< 0.001	---	---	< 0.003	0.02	0.02	---	---	---	---	---	---
	06-Sep-2001	07-SH	915	7.81	---	---	550	504	< 0.5	20	25.4	< 0.01	**0.475**	**558**	153	39.9	2.8	13.7	615	< 0.5	< 0.5	---	---	---	---	1.04	< 0.001	---	---	< 0.003	0.02	0.02	---	---	---	---	---	---
(Duplicate)	06-Sep-2001	07-SH DUP	934	7.94	---	---	550	506	< 0.5	20.3	25.1	**1.4**	**0.579**	**561**	154	40	2.6	13.3	618	< 0.5	< 0.5	---	---	---	---	1.04	< 0.001	---	---	< 0.003	0.015	0.015	---	---	---	---	---	---
	04-Sep-2002	07-SH	1080	7.49	---	---	500	521	< 0.5	27	22.7	**0.52**	**0.251**	**558**	139	37.4	3	15.4	636	< 0.5	< 0.5	---	---	---	---	0.92	< 0.001	---	---	< 0.003	0.031	0.031	---	---	---	---	9.7	---
(Duplicate)	04-Sep-2002	07-SH DUP	1070	7.74	---	---	530	520	< 0.5	25.3	25.2	0.02	**0.399**	**566**	150	37.8	2.7	12.7	635	< 0.5	< 0.5	---	---	---	---	0.96	0.001	---	---	< 0.003	0.027	0.027	---	---	---	---	8	---
	03-Sep-2003	07-SH	989	7.49	---	---	510	504	< 0.5	28.7	24.1	**0.67**	**0.298**	**551**	136	41.1	3.1	14.4	615	< 0.5	< 0.5	---	---	---	---	0.96	---	< 0.004	---	< 0.003	0.017	0.017	---	---	---	---	8.1	---
(Duplicate)	03-Sep-2003	07-SH DUP	994	7.53	---	---	510	498	< 0.5	28.4	24.5	**0.34**	**0.213**	**548**	137	41.2	3.1	14	608	< 0.5	< 0.5	---	---	---	---	0.97	---	< 0.004	---	< 0.003	0.016	0.016	---	---	---	---	8	---
	08-Sep-2004	07-SH	1050	7.82	---	---	540	522	< 0.5	30.7	23.4	**1.07**	**0.401**	**574**	151	38.6	2.7	12.8	637	< 0.5	< 0.5	---	---	---	---	0.96	---	< 0.004	---	< 0.003	0.013	0.013	---	---	---	---	7.5	---
(Duplicate)	08-Sep-2004	07-SH DUP	1040	7.85	---	---	530	524	< 0.5	29.8	25.5	0.11	**0.039**	**573**	149	38.3	2.7	13.3	639	< 0.5	< 0.5	---	---	---	---	0.95	---	< 0.004	---	< 0.003	0.027	0.027	---	---	---	---	7.5	---
	07-Sep-2005	07-SH	1000	8.06	18.3	---	510	526	< 0.5	36.7	23.5	**0.61**	**0.273**	**570**	137	39.8	2.9	14.1	642	< 0.5	< 0.5	---	---	---	---	0.9	---	< 0.004	---	< 0.003	0.014	0.014	---	---	---	---	7	---
(Duplicate)	07-Sep-2005	07-SH DUP	1010	8.01	11.8	---	510	524	< 0.5	36.6	22.1	**0.53**	**0.241**	**570**	143	37.1	2.7	13.3	639	< 0.5	< 0.5	---	---	---	---	0.91	---	< 0.004	---	< 0.003	0.01	0.01	---	---	---	---	6.5	---
	07-Sep-2006	07-SH	1040	7.77	---	---	550	522	< 0.5	35.5	21.7	< 0.01	**0.034**	**583**	154	40	2.8	16.1	637	< 0.5	< 0.5	---	---	---	---	0.99	---	---	---	< 0.003	0.016	0.016	---	---	---	---	6.7	---
(Duplicate)	07-Sep-2006	07-SH DUP	1040	7.83	---	---	550	515	< 0.5	35.7	21.6	0.22	**0.079**	**576**	154	39.6	2.7	12.9	628	< 0.5	< 0.5	---	---	---	---	0.99	---	---	---	< 0.003	0.008	0.008	---	---	---	---	6.4	---
	05-Sep-2007	07-SH	1030	7.77	---	---	560	527	< 0.5	36.4	20.5	0.17	**0.113**	**590**	158	39.7	2.8	15.3	643	< 0.5	< 0.5	---	---	---	---	0.99	---	---	---	< 0.003	0.134	0.134	---	---	---	---	6.1	---
(Duplicate)	05-Sep-2007	07-SH DUP	1040	7.88	---	---	480	532	< 0.5	36.1	20.5	0.2	**0.101**	**563**	136	34	2.5	13.2	650	< 0.5	< 0.5	---	---	---	---	0.85	---	---	---	0.004	0.011	0.015	---	---	---	---	5.5	---
	03-Sep-2008	07-SH	1030	7.8	---	---	428	535	---	34.9	16.9	0.043	**0.1**	**533**	99.8	43.3	2.61	13.9	653	< 5	< 5	0.153	---	---	---	0.765	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
(Duplicate)	03-Sep-2008	07-SH DUP	1030	8	---	---	474	518	---	35.5	18	**1.5**	**0.525**	**546**	126	38.8	3.14	13.5	632	< 5	< 5	0.141	---	---	---	0.864	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	07-SH	1040	7.92	---	---	610	523	---	38.4	17.7	**2.06**	**0.657**	**605**	174	42.6	3.19	14.8	638	< 5.0	< 5.0	0.134	---	---	---	1.08	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	09-Sep-2009	07-SH DUP	1050	8	---	---	586	532	---	36.3	15.6	**2.47**	**0.813**	**596**	170	39.2	2.68	12.5	649	< 5.0	< 5.0	0.134	---	---	---	1.03	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	07 SH	1050	7.68	---	---	525	517	---	41.5	17.1	< 0.030	**0.0348**	**569**	145	39.6	2.75	12.8	631	< 5.0	< 5.0	0.179	---	---	93.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	08-Sep-2010	SYLVITE 27	1040	7.88	---	---	516	517	---	38.2	16.7	**0.592**	**0.223**	**562**	144	38	2.43	12	631	< 5.0	< 5.0	0.174	---	---	92.5	---	---	---	---	< 0.050	0.061	< 0.071	---	---	---	---	---	---
	07-Sep-2011	07-SH	932	8.18	---	---	558	451	---	37.8	15	**1.83**	**0.757**	**537**	157	40.3	2.75	12.9	550	< 5.0	< 5.0	0.157	---	---	113	---	---	---	---	< 0.050	0.104	0.104	---	---	---	---	---	---
(Duplicate)	07-Sep-2011	ZIRCON 27	1050	8.28	---	---	528	522	---	40.1	14.9	**0.79**	**0.281**	**570**	147	39.1	2.74	12.4	637	< 5.0	< 5.0	0.166	---	---	93.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	07-SH	1070	7.94	---	575	575	532	---	50.3	15.8	**0.421**	**0.224**	**606**	162	41.3	3.16	14	649	< 5.0	< 5.0	0.134	---	---	98.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	05-Sep-2012	SPINEL 27	1070	8.02	---	562	563	531	---	48.1	15.2	**1.4**	**0.379**	**598**	158	40.8	3.17	13.8	648	< 5.0	< 5.0	0.164	---	---	96.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	25-Sep-2013	07-SH	1080	7.65	---	593	593	543	---	57.0	13.6	**0.318**	**0.277**	**622**	166	43.4	2.54	13.5	663	< 5.0	< 5.0	0.136	---	---	98.0	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Duplicate)	25-Sep-2013	27-SH	1080	7.64	---	600	600	568	---	56.9	13.7	0.287	**0.250**	**640**	169	43.3	2.54	13.3	693	< 5.0	< 5.0	0.137	---	---	95.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	07-SH	1060	8.18	---	---	593	474	---	71.7	15.6	0.117	**0.421**	**600**	170	41.0	2.54	15.0	578	< 5.0	< 5.0	0.146	---	---	106	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	5.39	---
(Duplicate)	17-Sep-2014	27-SH	1060	8.18	---	---	567	476	---	71.4	15.5	0.113	**0.407**	**592**	162	39.5	2.49	14.9	581	< 5.0	< 5.0	0.146	---	---	102	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	5.25	---
	29-Sep-2015	07-SH	1230	7.37	---	---	674	531	---	72.8	16.5	0.021	**0.354**	**665**	190	48.5	3.08	15.6	648	<5.0	<5.0	0.137	---	---	---	---	---	---	---	<0.020	<0.040	<0.045	---	---	---	---	---	---
(Duplicate)	29-Sep-2015	27-SH	1230	7.42	---	---	670	530	---	72.4	15.9	0.022	**0.335**	**662**	190	47.6	3.02	15.3	647	<5.0	<5.0	0.138	---	---	---	---	---	---	---	<0.020	<0.040	<0.045	---	---	---	---	---	---
	27-Sep-2016	07-SH	1120	7.99	---	---	625	487	---	83.3	15.1	0.050	**0.188**	**630**	179	43.1	2.98	14.4	594	<5.0	<5.0	0.126	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
(Duplicate)	27-Sep-2016	27-SH	1120	8.10	---	---	617	481	---	83.3	15.1	0.052	**0.176**	**624**	178	41.7	2.89	14.0	587	<5.0	<5.0	0.125	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2017	07-SH	1010	7.41	---	---	645	491	---	95.5	14.0	0.047	**0.257**	**649**	176	49.9	2.88	16.2	598	<5.0	<5.0	<0.10	---	---	---	---	---	---	---	<0.050	<0.10	<0.11	---	---	---	---	---	---
(Duplicate)	26-Sep-2017	27-SH	1090	7.93	---	---	662	492	---	94.5	13.8	0.033	**0.312**	**655**	181	51.1	2.97	16.6	600	<5.0	<5.0	0.100	---	---	---	---	---	---	---	<0.050	<0.10	<0.11	---	---	---	---	---	---
	17-Sep-2018	07-SH	1070	7.96	---	---	704	491	---	104.0	15.2	0.178	**0.638**	**682**	199	50.2	3.46	15.7	599	<5.0	<5.0	0.143	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
(Duplicate)	17-Sep-2018	27-SH	1070	7.79	---	---	685	489	---	104.0	15.0	0.179	**0.619**	**673**	193	49.2	3.36	15.2	597	<5.0	<5.0	0.137	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	16-Sep-2019	07-SH	1180	7.21	---	---	669	538	---	126.0	14.9	**0.675**	**0.532**	**720**	190	47.3	3.16	16.0	656	<5.0	<5.0	0.191	---	---	---	---	---	---	---	<0.010	0.033	0.033	---	---	---	---	---	---
(Duplicate)	16-Sep-2019	27-SH	1170	7.25	---	---	659	533	---	124.0	14.9	**0.681**	**0.547**	**711**	186	47.3	3.19	15.9	650	<5.0	<5.0	0.182	---	---	---	---	---	---	---	<0.010	0.022	0.022	---	---	---	---	---	---
	22-Sep-2020	07-SH	1358	6.85	---	---	643	504	---	142	13.7	0.034	**0.497**	**704**	182	45.8	2.97	15.3	615	<5.0	<5.0	0.118	---	---	---	---	---	---	---	<0.010	0.031	0.031	---	---	---	---	---	---
(Duplicate)	22-Sep-2020	27-SH	1358	7.68	---	---	635	502	---	143	13.8	0.040	**0.527**	**701**	178	46.3	2.95	15.3	612	<5.0	<5.0	0.118	---	---	---	---	---	---	---	<0.010	0.024	0.024	---	---	---	---	---	---
	22-Sep-2021	07-SH	1400	7.47	---	---	794	501	---	170	13.2	0.093	**0.903**	**785**	221	58.9	3.62	17.5	611	<5.0	<5.0	0.108	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
(Duplicate)	22-Sep-2021	27-SH	1420	7.47	---	---	740	498	---	169	13.3	0.097	**0.855**	**761**	201	57.8	3.34	17.4	607	<5.0	<5.0	0.105	---	---	---	---	---	---	---	<0.010	0.021	<0.022	---	---	---	---	---	---
	28-Sep-2022	07-SH	1380	7.88	---	---	746	495	---	198	13.2	0.043	**0.334**	**820**	203	58.2	3.20	17.7	604	<1.0	<1.0	0.088	---	---	---	---	---	---	---	<0.010	0.036	<0.0500	---	---	---	---	---	---
(Duplicate)	28-Sep-2022	27-SH	1370	7.72	---	---	761	504	---	196	13.1	0.044	**0.348**	**829**	209	58.1	3.24	17.5	615	<1.0	<1.0	0.087	---	---	---	---	---	---	---	<0.010	0.032	<0.0500	---	---	---	---	---	---
	29-Sep-2023	07-SH	1430	8.15	---	---	749	434	---	208	12.6	<0.010	**0.648**	**794**	210	54.6	3.31	18.1	529	<1.0	<1.0	0.127	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
(Duplicate)	29-Sep-2023	27-SH	1400	8.1	---	---	809	422	---	206	12.2	<0.010	**0.742**	**808**	234	54.5	3.3	17.5	515	<1.0	<1.0	0.111	---	---	---	---	---	---	---	<0.010	0.020	<0.0500	---	---	---	---	---	---
	10-Sep-2024	07-SH	1480	**8.83**	---	---	716	515	---	220	13.6	0.085	**0.428**	**840**	195	55.7	2.96	16.9	629	<1.0	<1.0	0.132	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
(Duplicate)	10-Sep-2024	27-SH	1470	8.25	---	---	731	494	---	220	13.6	0.079	**0.388**	**835**	201	55.6	2.94	17.3	602	<1.0	<1.0	0.137	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	18-Sep-2025	07-SH	1510	7.55	---	---	818	493	---	206	13.0	<0.010	**0.502**	**855**	227	61.0	3.12	20.2	601	<0.6	<0.3	0.196	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
(Duplicate)	18-Sep-2025	27-SH	1500	7.49	---	---	815	493	---	211	12.2	0.014	0.499	**858**	228	59.7	3.09	19.8	601	<0.6	<0.3	0.187	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [13]	0.0019	---	---
07-IN	18-Feb-1985	07-IN	---	---	---	---	330.1	368	---	---	---	---	---	487	---	---	---	---	448.6	---	---	---	---	---	---	---	---	---	---	0.005	0.008	---	---	---	---	---	---	---
	15-May-1985	07-IN	786	7.95	---	---	346	369	---	2.1	82	---	---	495	104	20.9	5.5	50	449.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.055	0.48	---	---	---	---	---	---	---
	15-Sep-1985	07-IN	823	8.06	---	---	333.1	358	---	1.6	97.5	---	---	**500**	100	20.2	5.7	53	436.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.048	0.33	---	---	---	---	---	---	---
	15-Jun-1986	07-IN	870	7.61	---	---	345.4	365	---	2.9	140	---	---	**560**	96	25.6	5.5	61	444.9	---	---	---	---	---	---	---	< 0.0020	---	---	0.005	0.024	---	---	---	---	---	---	---
	15-Aug-1986	07-IN	910	7.36	---	---	346.4	360	---	1.6	135	---	---	**555**	104	21	5.3	62	438.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.012	---	---	---	---	---	---	---
	15-Oct-1986	07-IN	850	7.75	---	---	344.3	375	---	1.7	110	---	---	**540**	100	22.9	5	60	457.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.019	---	---	---	---	---	---	---
	15-May-1987	07-IN	828	7.99	---	---	343.8	361	---	0.9	115	---	---	**530**	99	23.4	5.25	57.5	440.1	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.014	---	---	---	---	---	---	---
	15-Sep-1987	07-IN	838	7.72	---	---	356.8	370	---	1.9	110	---	---	**530**	106	22.3	5.06	54.2	451	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.006	---	---	---	---	---	---	---
	15-Nov-1987	07-IN	812	8.22	---	---	351.8	374	---	2	99	---	---	475	104	22.3	4.9	52.5	395	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.01	---	---	---	---	---	---	---
	15-Feb-1988	07-IN	807	7.68	---	---	---	---	---	1	87	---	---	---	96	21.9	5.2	51.5	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	07-IN	786	7.97	---	---	334	359	---	1.9	86.5	---	---	480	98.8	21.3	5	48.5	438	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.006	---	---	---	---	---	---	---
	15-Aug-1988	07-IN	789	7.91	---	---	331.9	365.8	---	0.4	62	---	---	458	97.2	21.6	5	49.1	445.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Nov-1988	07-IN	800	7.76	---	---	334.8	365	---	0.6	82	---	---	480	98.7	21.4	5	50	444.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.03	---	---	---	---	---	---	---
	15-Mar-1989	07-IN	827	8.23	---	---	346.4	356	---	0.3	108	---	---	**509**	103	21.6	4.85	54	434	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-May-1989	07-IN	798	7.46	---	---	328.5	364	---	0.4	81.5	---	---	478	97	20.9	5.36	51	443.7	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.004	---	---	---	---	---	---	---
	15-Sep-1989	07-IN	775	7.37	---	---	---	---	---	---	---	---	---	**500**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	07-IN	802	7.63	---	---	327.2	353	---	1.7	90	---	---	478	92.5	23.3	4.9	50	430.3	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Mar-1990	07-IN	783	7.59	---	---	---	---	---	---	---	---	---	352	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	07-IN	781	8.22	---	---	307.7	367	---	0.8	84	---	---	470	88.5	21	5.1	47	447.4	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.003	---	---	---	---	---	---	---
	15-Aug-1990	07-IN	820	7.56	---	---	---	---	---	---	---	---	---	**530**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	07-IN	786	7.96	---	---	318.5	378	---	0.01	66.5	---	---	469	92	21.5	4.9	53.5	460.8	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.005	---	---	---	---	---	---	---
	15-May-1991	07-IN	783	7.51	---	---	---	---	---	0.5	74.1	---	---	**510**	103	20	5	45	---	---	---	---	---	---	---	---	---	---	---	0.074	---	---	---	---	---	---	---	---
	15-Nov-1991	07-IN	712	7.78	---	---	---	357	---	0.7	57.9	---	---	440	100	20.9	5.06	38.6	435	---	---	---	---	---	---	---	< 0.0010	---	---	0.128	---	---	---	---	---	---	---	---
	12-May-1992	07-IN	754	7.79	---	---	332.7	358	---	0.6	66.4	---	---	383	98.5	21	5.11	40	436.4	---	---	---	---	---	---	1	< 0.0010	---	---	0.016	0.024	---	---	---	---	---	---	---
	03-Nov-1992	07-IN	691	7.72	---	---	---	354	---	0.00001	65.8	---	---	450	104	21.8	5.05	38	431.5	---	---	---	---	---	---	1.04	< 0.0010	---	---	---	0.025	---	---	---	---	---	---	---
	20-May-1993	07-IN	733	7.53	---	---	---	---	---	< 0.50	---	---	---	490	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Nov-1993	07-IN	764	7.3	---	---	335	352	---	0.6	68	---	---	444	97.5	22.2	4.9	36.7	429	---	---	---	---	---	---	0.99	0.001	---	---	0.003	0.003	---	---	---	---	---	---	---
	21-Sep-1994	07-IN	745	7.37	---	---	---	---	---	---	---	---	---	485	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-1995	07-IN	645	7.4	---	---	---	---	---	---	---	---	---	420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-1996	07-IN	825	7	---	---	---	---	---	---	---	---	---	**552**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-1997	07-IN	839	7.19	---	---	411	381	< 0.1	0.6	101	< 0.01	**1.2**	**531**	121	26.4	5.6	44	464	< 0.5	< 0.5	---	---	---	---	1.05	---	---	---	---	---	0.004	---	---	---	---	---	---
	15-Sep-1998	07-IN	838	7.1	---	---	390	368	< 0.1	< 0.5	108	---	---	**517**	113	25.3	4.9	44.8	449	< 0.5	< 0.5	---	9.62	9.79	---	1.02	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	---	---
	09-Sep-1999	07-IN	834	7.63	---	---	390	359	< 0.1	< 0.5	101	---	---	**505**	111	27.2	5.4	44.6	438	< 0.5	< 0.5	---	9.29	9.86	---	1.06	---	---	---	< 0.003	0.03	0.03	---	---	---	< 0.01	---	---
	05-Sep-2000	07-IN	834	7.59	---	---	360	374	< 0.1	< 0.5	99.7	< 0.01	**1.04**	**507**	106	24	5.4	47.1	456	< 0.5	< 0.5	---	9.55	9.46	---	0.99	---	---	---	< 0.003	0.006	0.006	---	---	---	< 0.01	---	---
	06-Sep-2001	07-IN	789	7.82	---	---	380	365	< 0.5	< 0.5	103	< 0.01	**1.08**	**509**	112	24.7	5.2	43.8	445	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	< 0.003	0.003	0.003	---	---	---	< 0.01	---	---
	04-Sep-2002	07-IN	860	7.7	---	---	320	373	< 0.5	< 0.5	80.8	**0.44**	**0.63**	469	90.1	23.3	5.6	44.2	456	< 0.5	< 0.5	---	9.15	8.48	---	0.93	---	---	---	< 0.003	0.004	0.004	---	---	---	< 0.01	28.8	---
	03-Sep-2003	07-IN	793	7.63	---	---	390	356	< 0.5	0.7	87	0.2	**0.832**	486	115	24.6	5.3	38.8	435	< 0.5	< 0.5	---	8.95	9.6	---	1.07	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	28.7	---
	08-Sep-2004	07-IN	820	7.87	---	---	350	359	< 0.5	0.9	89.7	**0.7**	**0.835**	476	103	22.6	5.1	38.4	438	< 0.5	< 0.5	---	---	---	---	0.97	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	27.9	---
	07-Sep-2005	07-IN	788	8.23	6.0	---	350	369	< 0.5	0.7	95.9	0.23	**0.458**	487	103	23.3	4.7	36.8	450	< 0.5	< 0.5	---	---	---	---	0.94	---	---	---	< 0.003	0.006	0.006	---	---	---	< 0.005	25.8	---
	07-Sep-2006	07-IN	809	7.83	---	---	350	363	< 0.5	1.5	84.4	0.21	**0.666**	475	100	23.4	5.2	42	443	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	0.007	0.007	---	---	---	---	28.5	---
	05-Sep-2007	07-IN	798	7.93	---	---	340	365	< 0.5	1.5	82.4	**0.7**	**0.9**	483	98.2	23.3	5.5	50.9	445	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	< 0.003	0.217	0.217	---	---	---	---	26.6	---
	03-Sep-2008	07-IN	792	8	---	---	334	369	---	< 0.50	80.6	< 0.030	**0.513**	462	98.6	21.2	5.11	34.6	450	< 5	< 5	0.177	---	---	---	0.916	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	07-IN	767	8.05	---	---	351	350	---	0.85	81.1	0.06	**0.382**	465	102	23.3	5.64	42	427	< 5.0	< 5.0	0.151	---	---	---	1.03	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	07 IN	792	7.88	---	---	312	353	---	< 0.50	85.8	0.067	**0.464**	450	88.2	22.4	4.77	37.3	431	< 5.0	< 5.0	0.202	---	---	90.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	07-IN	798	8.18	---	---	306	370	---	< 0.50	77.4	0.047	**0.278**	452	83.3	23.8	5.35	40.1	451	< 5.0	< 5.0	0.205	---	---	88.7	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	07-IN	794	8.02	---	308	308	377	---	< 0.50	78.2	0.249	**0.383**	455	83.6	24	5.34	37.7	459	< 5.0	< 5.0	0.193	---	---	86.5	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	25-Sep-2013	07-IN	782	7.80	---	348	349	387	---	< 0.50	72.4	< 0.030	**1.02**	468	103	22.3	4.73	33.1	473	< 5.0	<5.0	0.163	---	---	92.1	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	07-IN	714	8.18	---	---	344	329	---	< 0.50	68.3	0.111	**1.00**	430	103	21.1	5.50	35.0	402	< 5.0	<5.0	0.176	---	---	106	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	21.2	---
	29-Sep-2015	07-IN	810	7.54	---	---	379	371	---	<0.50	67.2	0.167	**0.595**	465	112	24.2	5.41	33.7	452	<5.0	<5.0	0.211	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2016	07-IN	745	8.23	---	---	351	361	---	<0.50	62.1	**0.420**	**0.928**	440	106	21.1	5.21	29.0	440	<5.0	<5.0	0.165	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2017	07-IN	646	7.62	---	---	372	357	---	<0.50	61.7	**0.453**	**1.090**	449	109	24.3	5.49	34.6	435	<5.0	<5.0	0.147	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	17-Sep-2018	07-IN	683	7.80	---	---	371	355	---	<0.50	61.5	**0.312**	**0.855**	444	110	23.4	5.75	30.1	433	<5.0	<5.0	0.186	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	16-Sep-2019	07-IN	687	7.79	---	---	338	390	---	<0.50	54.3	**0.737**	**1.040**	446	99	22.0	5.62	30.4	476	<5.0	<5.0	0.235	---	---	---	---	---	---	---	<0.010	0.089	0.089	---	---	---	---	---	---
	22-Sep-2020	07-IN	772	6.97	---	---	328	363	---	<0.50	55.2	0.249	**1.02**	425	97.8	20.4	5.16	27.9	443	<5.0	<5.0	0.177	---	---	---	---	---	---	---	0.018	0.041	0.060	---	---	---	---	---	---
	22-Sep-2021	07-IN	753	7.76	---	---	373	367	---	<0.50	64.7	0.07	**1.06**	457	108	25	6.06	33.1	447	<5.0	<5.0	0.157	---	---	---	---	---	---	---	<0.010	0.046	0.046	---	---	---	---	---	---
	28-Sep-2022	07-IN	699	8.07	---	---	358	373	---	0.53	56.2	0.089	**1.02**	474	104	23.9	5.52	31.3	455	<1.0	<1.0	0.142	---	---	---	---	---	---	---	<0.010	0.146	0.146	---	---	---	---	---	---
	29-Sep-2023	07-IN	677	8.23	---	---	354	338	---	0.84	52.1	<0.010	**0.795**	443	105	22.4	5.4	28.1	413	<1.0	<1.0	0.156	---	---	---	---	---	---	---	<0.010	0.052	0.052	---	---	---	---	---	---
	10-Sep-2024	07-IN	709	8.49	---	---	323	368	---	<0.50	53.7	0.086	**0.415**	449	92	22.6	5.28	28.3	449	<1.0	<1.0	0.182	---	---	---	---	---	---	---	<0.010	0.020	<0.0500	---	---	---	---	---	---
	18-Sep-2025	07-IN	720	7.96	---	---	350	359	---	0.70	49.4	0.022	**0.225**	458	101	23.8	5.57	33.2	438	<0.6	<0.3	0.229	---	---	---	---	---	---	---	<0.010	0.090	0.0900	---	---	---	---	---	---
07-SS [Decommissioned]	15-Feb-1985	07-SS	745	7.39	---	---	328.9	328	---	0.7	78	---	---	450	99.6	19.4	5.85	46.5	399.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.004	---	---	---	---	---	---	---
	18-Feb-1985	07-SS	---	---	---	---	288.2	319	---	---	---	---	---	407	---	---	---	---	388.9	---	---	---	---	---	---	---	---	---	---	< 0.003	0.076	---	---	---	---	---	---	---
	15-May-1985	07-SS	675	7.39	---	---	321	342	---	---	70.5	---	---	445	100	17.6	5.2	39	417	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.053	---	---	---	---	---	---	---
	15-Sep-1985	07-SS	689	7.73	---	---	285	310	---	0.7	65	---	---	400	87	16.4	5.5	37	377.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Dec-1985	07-SS	760	7.37	---	---	285.7	334	---	0.9	78	---	---	440	84	18.4	6	47	407.1	---	---	---	---	---	---	---	0.004	---	---	0.005	0.007	---	---	---	---	---	---	---
	15-Jun-1986	07-SS	720	7	---	---	305.7	326	---	1.2	75	---	---	435	89.7	19.8	5.5	42.4	397.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.003	---	---	---	---	---	---	---
	15-Aug-1986	07-SS	725	6.66	---	---	295.7	296	---	0.7	78.5	---	---	415	88	18.4	5	39	360.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.2	0.04	---	---	---	---	---	---	---
	15-Oct-1986	07-SS	690	7.37	---	---	300.3	317	---	0.9	68.5	---	---	420	88	19.5	5.05	35.9	386.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.2	0.04	---	---	---	---	---	---	---
	15-May-1987	07-SS	720	7	---	---	305.7	326	---	1.2	75	---	---	435	89.7	19.8	5.5	42.4	397.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.003	---	---	---	---	---	---	---
	15-Sep-1987	07-SS	683	7.24	---	---	299.1	317	---	1.1	68	---	---	410	89	18.6	4.6	32.4	386.4	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.009	---	---	---	---	---	---	---
	15-Nov-1987	07-SS	686	7.43	---	---	315.3	321	---	1.6	63.3	---	---	420	94	19.5	4.65	34.2	391.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Feb-1988	07-SS	694	7.56	---	---	---	---	---	0.7	69.2	---	---	---	83	19.6	4.75	35.2	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	07-SS	672	7.48	---	---	300.6	312	---	1	69.5	---	---	410	89.7	18.6	4.83	33.9	381	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.036	---	---	---	---	---	---	---
	15-Aug-1988	07-SS	674	8.26	---	---	304.2	316.9	---	0.6	41	---	---	382	90.4	19	4.7	33.6	386.3	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.032	---	---	---	---	---	---	---
	15-Oct-1988	07-SS	628	7.61	---	---	302.9	315	---	0.4	70	---	---	411	90.2	18.8	4.68	34.6	384	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.21	---	---	---	---	---	---	---
	15-Mar-1989	07-SS	626	8.03	---	---	254.5	253	---	0.01	74	---	---	357	75.5	17.8	4.63	33.5	308.4	---	---	---	---	---	---	---	< 0.0010	---	---	0.01	0.13	---	---	---	---	---	---	---
	15-May-1989	07-SS	689	7.91	---	---	303.6	312	---	0.1	68.5	---	---	407	91	18.5	4.76	33.8	380.3	---	---	---	---	---	---	---	< 0.0010	---	---	0.01	0.031	---	---	---	---	---	---	---
	15-Sep-1989	07-SS	661	7.93	---	---	---	---	---	---	---	---	---	410	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	07-SS	730	8.22	---	---	306.5	310	---	0.5	71.1	---	---	409	89	20.4	4.9	33.8	377.9	---	---	---	---	---	---	---	< 0.0010	---	---	0.008	0.004	---	---	---	---	---	---	---
	15-Mar-1990	07-SS	676	8.04	---	---	---	---	---	---	---	---	---	360	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	07-SS	683	8.21	---	---	284	320	---	0.5	65	---	---	400	82.5	18.9	4.81	33.6	390.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.012	0.055	---	---	---	---	---	---	---
	15-Aug-1990	07-SS	730	7.22	---	---	---	---	---	---	---	---	---	470	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	07-SS	711	8.03	---	---	295.3	320.8	---	0.01	56	---	---	397	87	18.9	4.75	35	391.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.016	0.016	---	---	---	---	---	---	---
	15-May-1991	07-SS	689	7.11	---	---	---	---	---	---	---	---	---	450	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Nov-1991	07-SS	662	7.36	---	---	---	---	---	0.3	---	---	---	430	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	14-May-1992	07-SS	699	7.57	---	---	---	---	---	0.5	---	---	---	450	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Nov-1992	07-SS	578	6.81	---	---	---	---	---	0.6	---	---	---	376	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-1995	07-SS	576	7.39	---	---	---	---	---	---	---	---	---	375	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-1996	07-SS	687	7.92	---	---	---	---	---	---	---	---	---	450	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-1997	07-SS	696	7.83	---	---	322	326	< 0.1	0.5	66.4	< 0.01	0.004	429	93.6	21.5	5.11	41.9	397	< 0.5	< 0.5	---	---	---	---	1.06	---	---	---	---	---	0.251	---	---	---	---	---	---
	04-Oct-1998	07-SS	710	7.84	---	---	300	326	< 0.1	< 0.5	62.7	---	---	406	85.4	20.1	4	37.6	398	< 0.5	< 0.5	---	7.83	7.66	---	0.98	---	---	---	< 0.003	0.085	0.085	---	---	---	< 0.01	---	---
	09-Sep-1999	07-SS	693	7.96	---	---	---	---	---	---	---	---	---	464	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Sep-2000	07-SS	674	7.66	---	---	---	---	---	---	---	---	---	448	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2001	07-SS	678	8.25	---	---	---	---	---	---	---	---	---	451	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2002	07-SS	746	8.07	---	---	---	---	---	---	---	---	---	432	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Sep-2003	07-SS	710	8.19	---	---	---	---	---	---	---	---	---	479	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	08-Sep-2004	07-SS	738	8.22	---	---	310	334	< 0.5	1.1	71.2	0.01	0.004	427	91.2	19.2	5	38.3	407	< 0.5	< 0.5	---	---	---	---	0.97	---	---	---	0.003	0.22	0.223	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable[13]	0.0019	---	---
07(R)SS	16-Sep-2014	07(R)SS	897	8.3	---	---	381	381	---	9.31	114	0.249	1.24	550	115	22.7	9.72	50.1	461	< 5.0	< 5.0	0.149	---	---	98.4	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	35.4	---
	29-Sep-2015	07(R)SS	916	7.23	---	---	382	399	---	6.27	85.6	<0.010	1.99	520	118	21.3	6.22	42.7	487	<5.0	<5.0	0.169	---	---	---	---	---	---	---	<0.010	0.028	0.028	---	---	---	---	---	---
	27-Sep-2016	07(R)SS	848	8.16	---	---	357	446	---	1.03	42.3	0.372	2.13	486	111	19.2	6.04	38.5	544	<5.0	<5.0	0.136	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2017	07(R)SS	721	7.62	---	---	364	423	---	1.21	37.7	<0.030	1.94	474	110	21.8	6.17	43.6	516	<5.0	<5.0	0.106	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	17-Sep-2018	07(R)SS	688	8.02	---	---	361	393	---	0.86	28.6	<0.010	1.33	444	106	23.5	7.05	42.3	479	<5.0	<5.0	0.092	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	16-Sep-2019	07(R)SS	719	7.47	---	---	328	413	---	0.55	48.8	0.018	1.22	462	96	21.8	6.68	40.7	504	<5.0	<5.0	0.108	---	---	---	---	---	---	---	<0.010	0.059	0.059	---	---	---	---	---	---
	23-Sep-2020	07(R)SS	740	6.89	---	---	311	397	---	<0.50	35.6	2.01	1.08	428	90.6	20.5	6.03	36.6	484	<5.0	<5.0	0.074	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	07(R)SS	713	7.88	---	---	317	370	---	1.24	41.7	<0.030	0.995	425	87.6	23.8	6.62	41.1	452	<5.0	<5.0	0.076	---	---	---	---	---	---	---	<0.010	0.153	0.153	---	---	---	---	---	---
	28-Sep-2022	07(R)SS	682	8.16	---	---	323	376	---	0.70	42.1	<0.030	0.85	472	92.9	22.1	6.36	39.4	459	<1.0	<1.0	0.085	---	---	---	---	---	---	---	<0.010	0.249	0.249	---	---	---	---	---	---
	29-Sep-2023	07(R)SS	693	8.46	---	---	304	343	---	<0.50	40	<0.010	0.824	439	88.1	20.3	5.76	38.9	399	9.5	<1.0	0.073	---	---	---	---	---	---	---	<0.010	0.218	0.218	---	---	---	---	---	---
	10-Sep-2024	07(R)SS	704	8.29	---	---	309	378	---	<0.50	41.5	<0.010	0.745	462	87	22.3	6.00	37.5	461	<1.0	<1.0	0.070	---	---	---	---	---	---	---	<0.010	0.218	0.218	---	---	---	---	---	---
	18-Sep-2025	07(R)SS	733	7.95	---	---	347	389	---	<0.50	36.5	<0.010	0.784	486	101	23.1	5.98	42.2	474	<0.6	<0.3	0.136	---	---	---	---	---	---	---	<0.010	0.193	0.193	---	---	---	---	---	---
08-SH	18-Feb-1985	08-SH	---	---	---	---	274.7	276	---	---	---	---	---	317	---	---	---	---	336.4	---	---	---	---	---	---	---	---	---	---	0.007	0.054	---	---	---	---	---	---	---
	15-May-1985	08-SH	516	7.93	---	---	258.7	277	---	1.4	16.7	---	---	300	75	17.3	2.02	17.2	337.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.016	0.118	---	---	---	---	---	---	---
	15-Sep-1985	08-SH	534	7.77	---	---	242.9	269	---	1	24	---	---	300	71	15.9	2.18	17.9	327.9	---	---	---	---	---	---	---	< 0.0020	---	---	0.005	0.102	---	---	---	---	---	---	---
	15-Jun-1986	08-SH	530	7.69	---	---	270.3	281	---	1.9	15.5	---	---	300	73.2	21.2	2	11.7	342.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.029	---	---	---	---	---	---	---
	15-Aug-1986	08-SH	545	7.49	---	---	264.4	275	---	0.7	12.5	---	---	290	73	19.9	2.05	10.5	335.2	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.006	---	---	---	---	---	---	---
	15-Oct-1986	08-SH	530	7.91	---	---	271.1	287	---	1.4	11.5	---	---	305	75	20.3	2.1	10.2	349.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.027	---	---	---	---	---	---	---
	15-May-1987	08-SH	533	8	---	---	269.4	275	---	1	15.5	---	---	300	74	20.5	2.13	11	335.2	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.017	---	---	---	---	---	---	---
	15-Sep-1987	08-SH	539	7.87	---	---	281.5	282	---	2.5	24	---	---	310	79	20.4	2.2	12	343.8	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.055	---	---	---	---	---	---	---
	15-Nov-1987	08-SH	555	7.68	---	---	280.3	269	---	1.8	27.9	---	---	315	80	19.5	2.1	12.6	327.9	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.072	---	---	---	---	---	---	---
	15-Feb-1988	08-SH	561	7.91	---	---	---	---	---	1.8	36	---	---	---	74.5	21.5	2.06	13	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	08-SH	552	7.67	---	---	273.7	266	---	1.3	25.8	---	---	300	78.7	18.7	2	11.8	324.3	---	---	---	---	---	---	---	0.004	---	---	< 0.003	0.063	---	---	---	---	---	---	---
	15-Aug-1988	08-SH	547	8.15	---	---	263.7	272	---	0.8	35.5	---	---	311	74.7	18.7	1.8	13.2	331.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.066	---	---	---	---	---	---	---
	15-Oct-1988	08-SH	560	7.86	---	---	284.4	272	---	0.9	36	---	---	320	75.8	19.9	2.19	14.2	331.6	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.045	---	---	---	---	---	---	---
	15-Mar-1989	08-SH	579	8.11	---	---	283.5	276	---	0.9	45.2	---	---	338	79	20.9	2.11	13.2	336.4	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.041	---	---	---	---	---	---	---
	15-May-1989	08-SH	590	7.66	---	---	303.5	278	---	0.9	43.4	---	---	337	86	21.5	2.1	13.4	338.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.059	---	---	---	---	---	---	---
	15-Sep-1989	08-SH	576	7.95	---	---	---	---	---	---	---	---	---	390	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	08-SH	568	8.16	---	---	285.2	280	---	0.6	36.4	---	---	326	80	20.7	2.32	14.8	341.3	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.06	---	---	---	---	---	---	---
	15-Mar-1990	08-SH	587	7.37	---	---	---	---	---	---	---	---	---	347	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	08-SH	567	7.84	---	---	290.6	272	---	0.9	39.2	---	---	325	83	20.2	2.09	13.8	331.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.201	---	---	---	---	---	---	---
	15-Aug-1990	08-SH	900	7.72	---	---	---	---	---	---	---	---	---	585	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	08-SH	594	8.16	---	---	279.4	283.2	---	0.01	44.5	---	---	333	78	20.5	2.35	15.2	345.2	---	---	---	---	---	---	---	< 0.0010	---	---	0.046	0.003	---	---	---	---	---	---	---
	15-Nov-1991	08-SH	570	7.79	---	---	---	277	---	0.7	46.3	---	---	340	90	20.8	2.25	13.6	338	---	---	---	---	---	---	---	< 0.0010	---	---	0.042	---	---	---	---	---	---	---	---
	13-May-1992	08-SH	616	8.2	---	---	290.2	275	---	1.2	51.3	---	---	287	82.5	20.4	2.15	13.4	335.2	---	---	---	---	---	---	0.98	< 0.0010	---	---	< 0.003	0.019	---	---	---	---	---	---	---
	03-Nov-1992	08-SH	564	7.76	---	---	---	272	---	0.6	43.5	---	---	330	83	20.1	2.24	14.6	331.6	---	---	---	---	---	---	1.02	< 0.0010	---	---	---	0.06	---	---	---	---	---	---	---
	19-May-1993	08-SH	512	7.66	---	---	288	280	---	1.5	48.9	---	---	339	81	20.8	2.02	13.9	341	---	---	---	---	---	---	0.96	< 0.0010	---	---	< 0.003	0.037	---	---	---	---	---	---	---
	12-Nov-1993	08-SH	573	7.6	---	---	293	270	---	0.8	45.1	---	---	329	83.5	20.5	1.9	12.6	329	---	---	---	---	---	---	1.01	0.002	---	---	< 0.003	0.021	---	---	---	---	---	---	---
	31-May-1994	08-SH	608	7.37	---	---	---	287	< 0.1	2.1	47.9	< 0.01	0.063	354	92.1	21.5	2.01	13.5	350	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	0.016	0.016	0.016	---	---	---	---	---	---
(Duplicate)	31-May-1994	08-SH DUP	602	7.4	---	---	---	285	< 0.1	0.7	47.3	< 0.01	0.071	341	82.5	22	1.99	13.2	347	< 0.5	< 0.5	---	---	---	---	0.98	< 0.001	---	---	0.016	0.016	0.016	---	---	---	---	---	---
	22-Sep-1994	08-SH	601	7.47	---	---	---	289	0.1	0.6	43.4	0.01	0.343	334	77.5	21	2.18	13.6	352	0.5	0.5	---	---	---	---	0.93	0.001	---	---	0.029	0.029	0.029	---	---	---	---	---	---
(Duplicate)	22-Sep-1994	08-SH DUP	600	7.4	---	---	---	298	0.1	0.7	42.9	0.01	0.363	348	86	21	2.14	13.5	363	0.5	0.5	---	---	---	---	0.97	< 0.001	---	---	0.029	0.029	0.029	---	---	---	---	---	---
	02-Nov-1994	08-SH	602	8.21	---	---	---	268	< 0.1	0.6	38.5	< 0.01	0.007	325	85.3	21.6	2.21	13.3	327	< 0.5	< 0.5	---	---	---	---	1.08	< 0.001	---	---	0.042	0.042	0.042	---	---	---	---	---	---
	28-Sep-1995	08-SH	512	7.38	---	---	301	285	< 0.1	0.7	45.8	< 0.01	0.026	343	83.2	22.7	2.4	14.6	347	< 0.5	< 0.5	---	---	---	---	1.01	< 0.001	---	---	---	0.052	---	---	---	---	---	---	---
	05-Sep-1996	08-SH	582	7.58	---	---	306	282	< 0.1	0.6	42.1	< 0.01	0.004	339	86.4	21.8	2.05	14.2	344	< 0.5	< 0.5	---	---	---	---	1.04	0.001	---	---	---	0.048	0.051	---	---	---	---	---	---
(Duplicate)	05-Sep-1996	08-SH DUP	583	7.57	---	---	290	284	< 0.1	0.8	42	< 0.01	0.014	334	81.4	21	2.02	13.6	346	< 0.5	< 0.5	---	---	---	---	0.98	0.001	---	---	---	0.049	0.053	---	---	---	---	---	---
	05-Sep-1997	08-SH	571	7.94	---	---	269	277	< 0.1	0.8	41.3	< 0.01	0.318	322	75	19.8	1.45	15.1	338	< 0.5	< 0.5	---	---	---	---	0.94	< 0.001	---	---	---	0.039	0.039	---	---	---	---	---	---
(Duplicate)	05-Sep-1997	08-SH DUP	570	7.84	---	---	---	---	---	---	---	---	---	368	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1998	08-SH	570	7.67	---	---	280	278	< 0.1	0.6	42.6	---	---	327	77.1	22.4	1.9	15	339	< 0.5	< 0.5	---	6.47	6.39	---	0.99	0.001	---	---	---	0.046	0.057	---	---	---	---	---	---
	09-Sep-1999	08-SH	597	7.8	---	---	330	282	< 0.1	0.7	50.8	---	---	355	90.2	25.4	1.6	16.5	344	< 0.5	< 0.5	---	6.72	7.35	---	1.09	< 0.0010	---	< 0.001	---	0.023	0.023	---	---	---	---	---	---
(Duplicate)	09-Sep-1999	08-SH DUP	---	---	---	---	---	---	---	---	---	---	---	---	73.2	21.1	3.4	27.3	---	---	---	---	---	---	---	---	< 0.0010	---	< 0.001	---	---	---	---	---	---	---	---
	05-Sep-2000	08-SH	574	7.78	---	---	280	283	< 0.1	0.9	41.2	< 0.01	0.027	331	78.1	21.4	2.1	17.5	345	< 0.5	< 0.5	---	6.55	6.48	---	0.99	0.004	---	---	< 0.003	0.019	0.019	---	---	---	---	---	---
(Duplicate)	05-Sep-2000	08-SH DUP	576	7.74	---	---	290	285	< 0.1	1	41.3	< 0.01	0.036	335	79.7	21.6	2.1	17.5	348	< 0.5	< 0.5	---	6.6	6.58	---	1	0.013[3]	---	---	< 0.003	0.041	0.041	---	---	---	---	---	---
	06-Sep-2001	08-SH	567	8.02	---	---	300	282	< 0.5	1.3	38.9	< 0.01	0.086	334	83.5	21.7	2.2	16.8	344	< 0.5	< 0.5	---	---	---	---	1.04	< 0.001	---	---	< 0.003	0.02	0.02	---	---	---	---	---	---
	05-Sep-2002	08-SH	620	7.78	---	---	280	288	< 0.5	1.3	37	0.01	0.009	329	79.2	20	2	16.3	352	< 0.5	< 0.5	---	---	---	---	0.97	< 0.001	---	---	< 0.003	0.017	0.017	---	---	---	---	12.4	---
	04-Sep-2003	08-SH	574	7.82	---	---	300	272	< 0.5	1.2	37.6	0.02	0.009	327	83.6	21.1	2.2	17.4	332	< 0.5	< 0.5	---	---	---	---	1.07	---	< 0.004	---	< 0.003	0.023	0.023	---	---	---	---	13.1	---
	09-Sep-2004	08-SH	594	8.01	---	---	280	284	< 0.5	1.7	37.6	0.02	0.017	326	77.5	20	2	17	346	< 0.5	< 0.5	---	---	---	---	0.97	---	< 0.004	---	< 0.003	0.014	0.014	---	---	---	---	12	---
	08-Sep-2005	08-SH	581	8.16	0.6	---	280	291	< 0.5	1.7	37.4	< 0.01	< 0.004	332	77	20.2	2	18.7	355	< 0.5	< 0.5	---	---	---	---	0.96	---	< 0.004	---	< 0.003	0.018	0.018	---	---	---	---	11.7	---
	07-Sep-2006	08-SH	578	7.97	---	---	270	281	< 0.5	2	36.9	< 0.01	0.035	325	72.3	20.9	2.2	21.4	343	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	0.025	0.06	0.085	---	---	---	---	11.2	---
	05-Sep-2007	08-SH	588	7.99	---	---	270	292	< 0.5	1.9	35	< 0.06	0.061	331	75.3	20.6	2.1	21	356	< 0.5	< 0.5	---	---	---	---	0.97	---	---	---	< 0.003	0.031	0.031	---	---	---	---	10.8	---
	03-Sep-2008	08-SH	580	8.1	---	---	237	293	---	1.57	31.7	< 0.030	0.0157	313	63.1	19.3	2.07	19.5	358	< 5	< 5	0.253	---	---	---	0.856	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	08-SH	579	8.04	---	---	296	289	---	1.73	30.1	< 0.030	0.02	334	84.5	20.6	2.11	21.6	352	< 5.0	< 5.0	0.23	---	---	---	1.07	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	8 SH	582	7.99	---	---	254	285	---	1.87	31.8	< 0.030	< 0.0050	315	70.2	19	1.64	19.5	347	< 5.0	< 5.0	0.289	---	---	92.8	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	08-SH	591	8.26	---	---	233	296	---	1.8	28.9	< 0.030	< 0.0050	312	60	20.2	2.09	21.4	361	< 5.0	< 5.0	0.282	---	---	85.7	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	08-SH	578	8.19	---	278	277	291	---	2.14	28.8	< 0.030	0.715	328	77.3	20.5	2.03	22	355	< 5.0	< 5.0	0.225	---	---	101	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	25-Sep-2013	08-SH	568	7.94	---	280	280	302	---	1.80	27.7	<0.030	0.166	334	78.6	20.4	1.97	22.1	368	< 5.0	< 5.0	0.242	---	---	99.1	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	16-Sep-2014	08-SH	595	8.30	---	---	291	301	---	1.97	27.2	<0.010	1.290	340	82.4	20.8	1.95	25.3	365	< 5.0	< 5.0	0.251	---	---	105	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	9.26	---
	29-Sep-2015	08-SH	651	7.73	---	---	296	305	---	2.31	32.3	<0.010	0.601	355	82.5	21.8	2.16	30.8	372	<5.0	<5.0	0.294	---	---	---	---	---	---	---	<0.010	0.048	0.048	---	---	---	---	---	---
	27-Sep-2016	08-SH	604	8.17	---	---	278	284	---	1.96	30.2	<0.010	0.399	330	79.3	19.5	2.11	26.6	347	<5.0	<5.0	0.233	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2017	08-SH	538	7.80	---	---	289	308	---	1.93	33.0	<0.030	0.021	363	80.0	21.7	2.21	39.1	376	<5.0	<5.0	0.224	---	---	---	---	---	---	---	<0.010	0.055	0.055	---	---	---	---	---	---
	17-Sep-2018	08-SH	581	8.04	---	---	300	313	---	1.96	32.3	<0.010	0.232	366	84.9	21.3	2.19	35.1	382	<5.0	<5.0	0.251	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	16-Sep-2019	08-SH	613	7.56	---	---	282	337	---	2.13	35.0	0.024	0.875	384	79.0	20.5	2.45	42.4	411	<5.0	<5.0	0.317	---	---	---	---	---	---	---	<0.010	0.043	0.043	---	---	---	---	---	---
	22-Sep-2020	08-SH	652	7.54	---	---	283	351	---	1.95	38.9	<0.010	0.0187	395	79.2	20.6	2.35	41.0	429	<5.0	<5.0	0.235	---	---	94.7	---	---	---	---	<0.010	0.042	0.042	---	---	---	---	---	---
	22-Sep-2021	08-SH	620	7.91	---	---	292	322	---	1.67	36.7	<0.030	0.368	379	79.2	22.8	2.32	42.5	392	<5.0	<5.0	0.213	---	---	---	---	---	---	---	<0.010	0.058	0.058	---	---	---	---	---	---
	28-Sep-2022	08-SH	679	8.16	---	---	306	364	---	1.61	41.4	<0.030	0.0909	438	82.2	24.4	2.48	46.1	444	<1.0	<1.0	0.205	---	---	---	---	---	---	---	<0.010	0.029	<0.0500	---	---	---	---	---	---
	27-Sep-2023	08-SH	683	8.25	---	---	304	342	---	1.25	42.8	<0.010	0.0113	421	85.6	21.9	2.36	43	418	<1.0	<1.0	0.23	---	---	---	---	---	---	---	<0.010	0.021	<0.0500	---	---	---	---	---	---
	11-Sep-2024	08-SH	704	7.58	---	---	302	370	---	1.47	44.9	<0.010	0.087	438	81.6	24.0	2.21	41.6	452	<1.0	<1.0	0.245	---	---	---	---	---	---	---	<0.010	0.038	<0.0500	---	---	---	---	---	---
	18-Sep-2025	08-SH	742	7.88			320	379		0.86	44.9	<0.010	0.109	463	86.2	25.4	2.52	53.2	462	<0.6	<0.3	0.248	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE														Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	**7.0-10.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.05**	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	**1.0**	---	---	---	---	---	---	---	**0.12**	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1**	**10**	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	**6.5 - 8.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1.0**	**10**	---	---	---	---	**0.05**	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	**6.5 - 8.5**	---	---	---	---	---	**120**	**Variable**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	---	---	---	**Variable [13]**	**0.0019**	---	---
08-IN	16-Feb-1985	08-IN	---	---	---	---	435.2	301	---	---	---	---	---	**610**	---	---	---	---	366.9	---	---	---	---	---	---	---	---	---	---	0.012	**3.1**	---	---	---	---	---	---	---
	18-Feb-1985	08-IN	---	---	---	---	402.4	320	---	---	---	---	---	**613**	---	---	---	---	390.1	---	---	---	---	---	---	---	---	---	---	0.005	1.79	---	---	---	---	---	---	---
	15-May-1985	08-IN	667	7.76	---	---	302.8	272	---	5.7	104	---	---	425	87	20.8	6	28.5	332	---	---	---	---	---	---	---	< 0.0020	---	---	**0.21**	0.59	---	---	---	---	---	---	---
	15-Sep-1985	08-IN	729	7.72	---	---	316.6	298	---	2.5	81	---	---	420	96	18.6	4.45	31.5	363.3	---	---	---	---	---	---	---	< 0.0020	---	---	0.028	0.73	---	---	---	---	---	---	---
	15-Dec-1985	08-IN	840	7.73	---	---	363.8	316	---	2.38	198	---	---	**600**	105	24.6	4.5	54	385.2	---	---	---	---	---	---	---	< 0.0020	---	---	0.021	2.78	---	---	---	---	---	---	---
	15-Feb-1986	08-IN	970	7.46	---	---	---	---	---	2.2	206	---	---	---	127	28.6	4.44	54.5	---	---	---	---	---	---	---	---	0.003	---	---	---	---	---	---	---	---	---	---	---
	15-Jun-1986	08-IN	980	7.36	---	---	436.4	301	---	4.1	220	---	---	**635**	126	29.5	4.3	51.8	366.9	---	---	---	---	---	---	---	< 0.0020	---	---	0.025	**3.46**	---	---	---	---	---	---	---
	15-Aug-1986	08-IN	1170	7.74	---	---	454.9	305	---	2.8	320	---	---	**760**	137	27.3	4.85	73	371.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.023	**3.18**	---	---	---	---	---	---	---
	15-Oct-1986	08-IN	970	8.07	---	---	441	331	---	2.6	196	---	---	**630**	127	30	4.65	53.5	403.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.069	**4.03**	---	---	---	---	---	---	---
	15-May-1987	08-IN	959	7.8	---	---	444.7	308	---	1.9	256	---	---	**680**	129	29.7	4.85	67.5	375.5	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	**3.62**	---	---	---	---	---	---	---
	15-Sep-1987	08-IN	920	7.78	---	---	437.2	321	---	3.3	191	---	---	**595**	126	29.7	4.36	43.6	391.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	2.4	---	---	---	---	---	---	---
	15-Nov-1987	08-IN	986	7.87	---	---	456.8	320	---	2.6	224	---	---	**655**	134	29.6	4.2	53.5	390.1	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	1.8	---	---	---	---	---	---	---
	15-Feb-1988	08-IN	967	8.06	---	---	---	---	---	2.2	215	---	---	---	118	26.1	4.16	51.2	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	08-IN	956	8.06	---	---	446.5	308	---	3	215	---	---	**620**	131	29	4.18	50	376	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	1.5	---	---	---	---	---	---	---
	15-Aug-1988	08-IN	938	8.03	---	---	389.1	287	---	1.3	192	---	---	**559**	114	25.3	3.6	46.4	349.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	1.34	---	---	---	---	---	---	---
	15-Nov-1988	08-IN	1030	7.81	---	---	426.5	314	---	1.3	253	---	---	**688**	125	27.7	4.3	67.5	382.8	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.99	---	---	---	---	---	---	---
	15-Mar-1989	08-IN	1040	7.8	---	---	444.8	311	---	1.2	266	---	---	**690**	131	28.5	4.25	68.5	379.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	1.06	---	---	---	---	---	---	---
	15-May-1989	08-IN	996	7.6	---	---	418.6	313	---	1.5	222	---	---	**630**	122	27.6	4.25	61	381.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	1.1	---	---	---	---	---	---	---
	15-Sep-1989	08-IN	1110	7.59	---	---	---	---	---	---	---	---	---	**750**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	08-IN	1070	8.14	---	---	425.6	361	---	1	257	---	---	**716**	122	29.3	4.85	81	440.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.97	---	---	---	---	---	---	---
	15-Mar-1990	08-IN	1080	7.19	---	---	---	---	---	---	---	---	---	**640**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	08-IN	961	8.04	---	---	394.1	334	---	2	198	---	---	**605**	114	26.5	4.29	55.5	407.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.96	---	---	---	---	---	---	---
	15-Aug-1990	08-IN	1090	7.86	---	---	---	---	---	---	---	---	---	**710**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	08-IN	1060	7.99	---	---	396.5	323.6	---	0.6	248	---	---	**659**	111	28.9	4.25	68	394.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.76	---	---	---	---	---	---	---
	17-May-1991	08-IN	989	7.67	---	---	---	---	---	---	---	---	---	**640**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Nov-1991	08-IN	1030	7.48	---	---	---	---	---	1.2	---	---	---	**670**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Nov-1992	08-IN	902	7.11	---	---	---	---	---	1.4	---	---	---	**630**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	19-May-1993	08-IN	1020	7.35	---	---	---	---	---	0.8	---	---	---	**702**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Nov-1993	08-IN	935	7.17	---	---	---	---	---	0.8	---	---	---	**608**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	22-Sep-1994	08-IN	1030	7.18	---	---	---	---	---	---	---	---	---	**675**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-1995	08-IN	855	7.24	---	---	---	---	---	---	---	---	---	**581**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Sep-1996	08-IN	958	7.06	---	---	---	---	---	---	---	---	---	**665**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Sep-1997	08-IN	867	7.85	---	---	---	---	---	---	---	---	---	**590**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Sep-1998	08-IN	974	7.14	---	---	---	---	---	---	---	---	---	**675**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Sep-1999	08-IN	868	8.4	---	---	---	---	---	---	---	---	---	**595**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Sep-2000	08-IN	888	7.28	---	---	---	---	---	---	---	---	---	**608**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2001	08-IN	858	8.03	---	---	---	---	---	---	---	---	---	**588**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	05-Sep-2002	08-IN	966	7.66	---	---	---	---	---	---	---	---	---	**558**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2003	08-IN	873	7.92	---	---	---	---	---	---	---	---	---	**598**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Sep-2004	08-IN	972	7.96	---	---	390	345	< 0.5	1.4	191	0.01	0.005	**593**	112	25.8	4.1	50.8	421	< 0.5	< 0.5	---	---	---	---	0.92	---	---	---	< 0.003	0.214	0.214	---	---	---	---	---	---
	08-Sep-2005	08-IN	838	8.04	---	---	400	329	< 0.5	1.2	156	< 0.01	< 0.004	**536**	117	25.3	3.7	35.7	401	< 0.5	< 0.5	---	---	---	---	0.97	---	---	---	< 0.003	0.13	0.13	---	---	---	---	---	---
	07-Sep-2006	08-IN	873	7.87	---	---	400	320	< 0.5	1.8	168	< 0.01	< 0.004	**547**	116	25.8	3.8	39.1	390	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	0.124	0.124	---	---	---	---	50.7	---
	05-Sep-2007	08-IN	878	7.89	---	---	410	323	< 0.5	1.3	170	0.1	< 0.004	**555**	120	26.3	3.9	39	395	< 0.5	< 0.5	---	---	---	---	0.99	---	---	---	< 0.003	0.137	0.137	---	---	---	---	47.8	---
	03-Sep-2008	08-IN	873	8	---	---	384	337	---	0.78	158	< 0.030	0.0019	**536**	111	25.9	3.31	34.6	411	< 5	< 5	0.183	---	---	---	0.92	---	---	---	< 0.050	0.097	0.097	---	---	---	---	---	---
	09-Sep-2009	08-IN	858	7.97	---	---	413	319	---	0.78	162	< 0.030	0.0139	**549**	122	26.3	4.42	42.1	389	< 5.0	< 5.0	0.17	---	---	---	1.04	---	---	---	< 0.050	0.064	< 0.071	---	---	---	---	---	---
	08-Sep-2010	8 IN	835	7.84	---	---	345	307	---	0.94	157	< 0.030	**0.0363**	**511**	99	23.7	3.61	41.9	374	< 5.0	< 5.0	0.221	---	---	93.2	---	---	---	---	< 0.050	0.119	0.119	---	---	---	---	---	---
	08-Sep-2011	08-IN	880	8.16	---	---	378	323	---	0.74	165	< 0.030	**1.01**	**537**	109	25.7	3.91	38.3	394	< 5.0	< 5.0	0.217	---	---	93.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	08-IN	850	8.06	---	383	383	326	---	0.82	151	< 0.030	**0.973**	**529**	112	25.2	3.98	39.8	398	< 5.0	< 5.0	0.205	---	---	97.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	25-Sep-2013	08-IN	817	7.83	---	382	381	326	---	0.71	142	< 0.030	**1.09**	**513**	112	24.7	3.87	34.3	397	< 5.0	< 5.0	0.174	---	---	97.1	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	16-Sep-2014	08-IN	824	8.20	---	---	390	298	---	0.60	152	< 0.010	**0.15**	**518**	115	24.9	3.96	42.3	363	< 5.0	< 5.0	0.201	---	---	106	---	---	---	---	< 0.020	0.117	0.117	---	---	---	---	46.9	---
	29-Sep-2015	08-IN	890	7.64	---	---	424	317	---	0.87	157	<0.010	**0.121**	**549**	125	27.2	4.19	42.4	386	<5.0	<5.0	0.216	---	---	---	---	---	---	---	<0.010	0.502	0.502	---	---	---	---	---	---
	27-Sep-2016	08-IN	816	8.10	---	---	392	306	---	0.66	147	<0.010	**0.187**	**519**	117	24.1	4.10	40.0	374	<5.0	<5.0	0.174	---	---	---	---	---	---	---	<0.010	0.536	0.536	---	---	---	---	---	---
	26-Sep-2017	08-IN	714	7.68	---	---	408	311	---	0.65	153	<0.030	**0.096**	**535**	117	28.2	4.23	44.6	379	<5.0	<5.0	0.166	---	---	---	---	---	---	---	<0.010	0.169	0.169	---	---	---	---	---	---
	17-Sep-2018	08-IN	739	8.04	---	---	407	297	---	0.68	142	<0.010	**0.105**	**512**	119	26.6	4.40	39.4	362	<5.0	<5.0	0.196	---	---	---	---	---	---	---	<0.010	0.375	0.375	---	---	---	---	---	---
	16-Sep-2019	08-IN	789	7.66	---	---	383	336	---	0.81	149	<0.010	**0.037**	**533**	111	25.6	4.27	39.7	410	<5.0	<5.0	0.247	---	---	---	---	---	---	---	<0.010	0.136	0.136	---	---	---	---	---	---
	22-Sep-2020	08-IN	837	7.03	---	---	358	324	---	0.77	139	<0.010	**0.0457**	**507**	105	23.3	3.99	39.1	395	<5.0	<5.0	0.200	---	---	---	---	---	---	---	<0.010	0.332	0.332	---	---	---	---	---	---
	22-Sep-2021	08-IN	815	7.73	---	---	385	336	---	0.74	135	<0.030	0.0152	**519**	109	27.3	4.86	39.7	410	<5.0	<5.0	0.175	---	---	---	---	---	---	---	<0.010	0.165	0.165	---	---	---	---	---	---
	28-Sep-2022	08-IN	785	8.15	---	---	376	335	---	0.79	134	<0.030	**0.0531**	**532**	107	26.4	4.09	39.1	409	<1.0	<1.0	0.200	---	---	---	---	---	---	---	<0.010	0.119	0.119	---	---	---	---	---	---
	27-Sep-2023	08-IN	800	8.35	---	---	389	328	---	0.59	129	<0.010	0.002	**526**	115	24.7	4.16	38.6	390	5	<1.0	0.163	---	---	---	---	---	---	---	<0.010	0.121	0.121	---	---	---	---	---	---
	11-Sep-2024	08-IN	796	7.26	---	---	366	336	---	0.74	127	<0.010	0.018	**519**	105	25.3	3.84	37.1	410	<1.0	<1.0	0.197	---	---	---	---	---	---	---	<0.010	0.082	0.082	---	---	---	---	---	---
	18-Sep-2025	08-IN	803	7.77	---	---	388	337	---	0.89	116	<0.010	**0.355**	**523**	113	25.8	4.00	40.7	411	<0.6	<0.3	0.247	---	---	---	---	---	---	---	<0.010	0.045	<0.0500	---	---	---	---	---	---
08-SS	16-Feb-1985	08-SS	---	---	---	---	273.8	313	---	---	---	---	---	390	---	---	---	---	381.5	---	---	---	---	---	---	---	---	---	---	< 0.003	0.274	---	---	---	---	---	---	---
	18-Feb-1985	08-SS	---	---	---	---	243.6	340	---	---	---	---	---	384	---	---	---	---	414.5	---	---	---	---	---	---	---	---	---	---	0.004	0.27	---	---	---	---	---	---	---
	15-May-1985	08-SS	728	7.99	---	---	280	335	---	---	105	---	---	**505**	91	12.7	4.86	78	408	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.83	---	---	---	---	---	---	---
	15-Sep-1985	08-SS	603	7.91	---	---	238.2	331	---	1	40	---	---	400	78	10.5	4.5	60	403.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.087	---	---	---	---	---	---	---
	15-Dec-1985	08-SS	690	7.53	---	---	246	373	---	0.92	37.5	---	---	420	77	13	4.5	58	454.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.031	0.096	---	---	---	---	---	---	---
	15-Feb-1986	08-SS	670	7.77	---	---	---	---	---	0.5	39	---	---	---	88.3	12.9	4.3	50	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-Jun-1986	08-SS	610	7.67	---	---	209.9	313	---	1.1	32.1	---	---	360	65.2	11.4	4.1	51.4	381.5	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.3	---	---	---	---	---	---	---
	15-Aug-1986	08-SS	621	7.37	---	---	199.1	285	---	0.4	32.7	---	---	345	64	9.5	4.48	53	347.4	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.34	---	---	---	---	---	---	---
	15-Oct-1986	08-SS	620	7.82	---	---	226.9	317	---	0.7	30	---	---	380	72	11.4	4.4	55	386.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.01	0.35	---	---	---	---	---	---	---
	15-May-1987	08-SS	610	7.67	---	---	209.9	313	---	1.1	32.1	---	---	360	65.2	11.4	4.1	51.4	381.5	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.3	---	---	---	---	---	---	---
	15-Sep-1987	08-SS	612	7.68	---	---	226.1	321	---	1.2	30	---	---	370	73	10.6	4.66	54.6	391.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.149	---	---	---	---	---	---	---
	15-Feb-1988	08-SS	656	7.94	---	---	---	---	---	0.7	30	---	---	---	77.5	12.1	4.5	52	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	08-SS	692	8.22	---	---	275.6	355	---	1	29.5	---	---	400	89.6	12.6	4.52	48	434	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.28	---	---	---	---	---	---	---
	15-Aug-1988	08-SS	669	8.02	---	---	252.7	335	---	0.4	29.6	---	---	380	81.8	11.7	4.1	47.5	408.4	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.228	---	---	---	---	---	---	---
	15-Oct-1988	08-SS	681	7.78	---	---	270	353	---	0.5	29.4	---	---	399	87.6	12.4	4.39	49.5	430.3	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.21	---	---	---	---	---	---	---
	15-May-1989	08-SS	657	7.68	---	---	257.3	332	---	0.2	29.5	---	---	382	83.5	11.8	4.35	50.4	404.7	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.22	---	---	---	---	---	---	---
	15-Sep-1989	08-SS	636	7.69	---	---	---	---	---	---	---	---	---	420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	08-SS	653	8.17	---	---	233.1	311	---	0.3	29.4	---	---	361	73.5	12	4.65	51.5	379.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.25	---	---	---	---	---	---	---
	15-May-1990	08-SS	629	7.97	---	---	240.7	324	---	0.5	28.6	---	---	372	78	11.1	4.54	52	395	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.132	---	---	---	---	---	---	---
	15-Aug-1990	08-SS	650	7.45	---	---	---	---	---	---	---	---	---	420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	08-SS	627	7.91	---	---	199.9	301.6	---	0.01	31	---	---	347	64	9.7	4.45	54	367.7	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.252	---	---	---	---	---	---	---
	17-May-1991	08-SS	587	7.31	---	---	---	---	---	---	---	---	---	380	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	03-Nov-1992	08-SS	477	6.93	---	---	---	---	---	0.6	---	---	---	310	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	12-Nov-1993	08-SS	578	6.96	---	---	---	---	---	< 0.50	---	---	---	376	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	22-Sep-1994	08-SS	565	7.75	---	---	---	---	---	---	---	---	---	365	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	28-Sep-1995	08-SS	517	7.75	---	---	---	---	---	---	---	---	---	336	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Oct-1998	08-SS	587	7.96	---	---	---	---	---	---	---	---	---	385	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Sep-1999	08-SS	572	8.18	---	---	---	---	---	---	---	---	---	378	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Sep-2001	08-SS	548	8.37	---	---	---	---	---	---	---	---	---	359	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	04-Sep-2003	08-SS	574	8.31	---	---	---	---	---	---	---	---	---	376	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	09-Sep-2004	08-SS	570	8.22	---	---	190	274	< 0.5	< 0.5	32.1	< 0.01	0.009	322	59.3	9.4	4.5	51.2	334	< 0.5	< 0.5	---	---	---	---	0.99	---	---	---	< 0.003	0.214	0.214	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE														Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	**7.0-10.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.05**	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	**1.0**	---	---	---	---	---	---	---	**0.12**	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1**	**10**	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	**6.5 - 8.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1.0**	**10**	---	---	---	---	**0.05**	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	**6.5 - 8.5**	---	---	---	---	---	**120**	**Variable**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	---	---	---	**Variable[15]**	**0.0019**	---	---
09-SH [Decommissioned]	15-May-1985	09-SH [DECOM]	781	7.18	---	---	271.4	151	---	3.2	260	---	---	---	86	13.7	1.58	65	184.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.031	2.77	---	---	---	---	---	---	---
	15-Sep-1985	09-SH [DECOM]	938	6.66	---	---	303.4	165	---	2.7	305	---	---	---	97	14.8	1.64	82	201.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.03	1.91	---	---	---	---	---	---	---
	15-Jun-1986	09-SH [DECOM]	750	6.84	---	---	273.9	178	---	3.3	211	---	---	---	86	14.3	1.4	61.4	217	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.004	---	---	---	---	---	---	---
	15-Aug-1986	09-SH [DECOM]	708	6.72	---	---	229.8	174	---	1.9	197	---	---	---	71	12.7	1.42	57	212.1	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.01	---	---	---	---	---	---	---
	15-Oct-1986	09-SH [DECOM]	710	7.08	---	---	265	208	---	2.6	182	---	---	---	83	14.1	3.9	57	253	---	---	---	---	---	---	---	< 0.0020	---	---	0.01	0.003	---	---	---	---	---	---	---
	15-May-1987	09-SH [DECOM]	715	6.79	---	---	235.2	174	---	1.6	198	---	---	---	72	13.4	1.55	73	212.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.003	---	---	---	---	---	---	---
	15-Sep-1987	09-SH [DECOM]	689	6.7	---	---	211.9	177	---	3.9	195	---	---	---	66	11.4	1.4	73.5	215.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.003	---	---	---	---	---	---	---
	15-Nov-1987	09-SH [DECOM]	659	6.79	---	---	228.5	187	---	5.2	125	---	---	---	71	12.4	1.3	58.5	228	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.01	---	---	---	---	---	---	---
	15-May-1988	09-SH [DECOM]	634	7.39	---	---	192	183	---	3.8	163	---	---	---	67.4	10	1.3	67.5	223	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.007	---	---	---	---	---	---	---
	15-Aug-1988	09-SH [DECOM]	673	6.78	---	---	198.2	180.1	---	4.6	186	---	---	---	62.5	10.2	1.3	72.8	219.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.01	---	---	---	---	---	---	---
	15-Nov-1988	09-SH [DECOM]	645	6.92	---	---	219.6	192	---	2.6	165	---	---	---	69.4	11.2	1.43	63	234	---	---	---	---	---	---	---	< 0.0020	---	---	0.013	0.018	---	---	---	---	---	---	---
	15-Mar-1989	09-SH [DECOM]	600	8.23	---	---	211.5	208	---	2.3	122	---	---	---	67	10.7	1.31	50	253.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.01	---	---	---	---	---	---	---
	15-May-1989	09-SH [DECOM]	596	6.65	---	---	228.6	225	---	3	99	---	---	---	71.5	12.1	1.2	59	274.3	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.003	---	---	---	---	---	---	---
	15-Sep-1989	09-SH [DECOM]	562	**6.44**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	09-SH [DECOM]	621	8.1	---	---	248.1	249	---	0.7	102	---	---	---	76.5	13.8	1.46	42.6	303.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.003	---	---	---	---	---	---	---
	15-Aug-1990	09-SH [DECOM]	553	6.66	---	---	174	179	---	0.8	101	---	---	---	54.3	9.3	1.21	57.5	218.2	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.003	---	---	---	---	---	---	---
	15-Nov-1990	09-SH [DECOM]	552	8	---	---	164.9	188	---	1	91	---	---	---	51.3	8.9	1.2	66.4	229.2	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.006	---	---	---	---	---	---	---
	06-Nov-1991	09-SH [DECOM]	500	7.5	---	---	---	185	---	1.6	90.5	---	---	320	56	8.4	1.2	52.9	226	---	---	---	---	---	---	---	0.01[3]	---	---	0.04	---	---	---	---	---	---	---	---
09-SH [Decommissioned]	12-May-1992	09-SH [DECOM]	498	7.3	---	---	152.3	188	---	7.06	84.4	---	---	234	48.4	7.6	1.17	55.5	229.2	---	---	---	---	---	---	0.96	< 0.0010	---	---	< 0.003	< 0.003	---	---	---	---	---	---	---
	31-Aug-1992	09-SH [DECOM]	479	6.7	---	---	---	185	---	2.5	83	---	---	308	47.8	7.4	1.33	52.9	225.5	---	---	---	---	---	---	0.97	---	---	---	0.007	0.006	---	---	---	---	---	---	---
09-IN [Decommissioned]	16-Feb-1985	09-IN [DECOM]	---	---	---	---	391.6	366	---	---	---	---	---	440	---	---	---	---	446.2	---	---	---	---	---	---	---	---	---	---	0.104	0.36	---	---	---	---	---	---	---
	18-Feb-1985	09-IN [DECOM]	---	---	---	---	398.7	386	---	---	---	---	---	**500**	---	---	---	---	463	---	---	---	---	---	---	---	---	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-May-1985	09-IN [DECOM]	582	7.87	---	---	293.3	311	---	6.4	12.5	---	---	350	89	17.2	4.37	16.8	379.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.083	0.34	---	---	---	---	---	---	---
	15-Sep-1985	09-IN [DECOM]	617	7.9	---	---	300.7	322	---	2.8	13.9	---	---	350	90	18.4	3.6	14.6	392.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.06	0.064	---	---	---	---	---	---	---
	15-Dec-1985	09-IN [DECOM]	730	7.61	---	---	355.5	369	---	1.8	33.1	---	---	420	104	23.2	3.4	18	449.8	---	---	---	---	---	---	---	0.006[3]	---	---	0.036	0.279	---	---	---	---	---	---	---
	15-Feb-1986	09-IN [DECOM]	760	7.6	---	---	---	---	---	1.3	46	---	---	---	115	25.3	3.45	21.7	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-Jun-1986	09-IN [DECOM]	780	7.99	---	---	396.1	355	---	2.8	80	---	---	470	114	27	3.3	24.9	432.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.033	0.21	---	---	---	---	---	---	---
	15-Aug-1986	09-IN [DECOM]	806	7.79	---	---	365	358	---	1.2	78.5	---	---	460	106	24.3	3.37	23.8	436.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.051	0.199	---	---	---	---	---	---	---
	15-Oct-1986	09-IN [DECOM]	810	7.9	---	---	407.8	381	---	2	79	---	---	**500**	119	26.8	3.38	25.6	464.4	---	---	---	---	---	---	---	< 0.0020	---	---	0.14	0.012	---	---	---	---	---	---	---
	15-May-1987	09-IN [DECOM]	802	7.9	---	---	412.3	370	---	1.2	90.5	---	---	**500**	119	27.9	3.75	26.5	451	---	---	---	---	---	---	---	< 0.0020	---	---	0.048	0.067	---	---	---	---	---	---	---
	15-Sep-1987	09-IN [DECOM]	814	7.8	---	---	408.2	382	---	2.3	98.1	---	---	**510**	117	28.1	3.1	25.4	465.7	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Nov-1987	09-IN [DECOM]	821	7.8	---	---	419	383	---	2.9	74	---	---	**505**	122	27.7	3.2	27.1	466.9	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.006	---	---	---	---	---	---	---
	15-Feb-1988	09-IN [DECOM]	825	8.15	---	---	---	---	---	1.6	88	---	---	---	116	26.4	3.3	29	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---	---
	15-May-1988	09-IN [DECOM]	806	8.18	---	---	397.1	376	---	2.6	90	---	---	**500**	117	25.5	3.05	28.6	458	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.005	---	---	---	---	---	---	---
	15-Aug-1988	09-IN [DECOM]	811	8.08	---	---	382.5	383.1	---	0.9	90	---	---	494	112	24.9	3.1	29.3	467	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Nov-1988	09-IN [DECOM]	819	7.92	---	---	377.8	383	---	0.7	81	---	---	469	108	26.2	3.3	31	466.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Mar-1989	09-IN [DECOM]	824	8.38	---	---	401.3	374	---	0.8	91.5	---	---	497	120	24.6	3.74	28.8	455.9	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-May-1989	09-IN [DECOM]	821	7.88	---	---	407.8	382	---	0.8	83	---	---	497	120	26.2	3.4	30.5	465.7	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.005	---	---	---	---	---	---	---
	15-Sep-1989	09-IN [DECOM]	807	7.42	---	---	---	---	---	---	---	---	---	**540**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	09-IN [DECOM]	829	8.21	---	---	402	379	---	0.3	80	---	---	490	117	26.6	3.45	32	462	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.01	---	---	---	---	---	---	---
	15-Mar-1990	09-IN [DECOM]	828	7.88	---	---	---	---	---	---	---	---	---	**508**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	09-IN [DECOM]	817	8.19	---	---	409.9	390	---	1.2	90	---	---	**509**	121	26.1	3.34	29.8	475.4	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.005	---	---	---	---	---	---	---
	15-Aug-1990	09-IN [DECOM]	873	7.89	---	---	---	---	---	---	---	---	---	**570**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	09-IN [DECOM]	855	7.75	---	---	385	400	---	0.6	78.5	---	---	493	110	26.7	3.24	30.4	488	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	16-May-1991	09-IN [DECOM]	854	7.72	---	---	---	---	---	---	---	---	---	**555**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	06-Nov-1991	09-IN [DECOM]	805	7.67	---	---	---	---	---	0.9	---	---	---	**520**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	31-Aug-1992	09-IN [DECOM]	603	8.05	---	---	---	386	---	1.2	95	---	---	**521**	124	28.6	3.39	33.2	470.5	---	---	---	---	---	---	1.04	---	---	---	0.007	0.057	---	---	---	---	---	---	---
09-PEAT	15-Nov-1987	09-PEAT	51.2	**4.00**	---	---	5.2	0.1	---	2.5	1.2	---	---	6	1.6	0.3	0.18	0.5	0.5	---	---	---	---	---	---	---	0.002	---	---	0.006	0.008	---	---	---	---	---	---	---
	15-May-1988	09-PEAT	57.2	**4.08**	---	---	17.4	0.01	---	7.1	11.6	---	---	30	5.8	0.7	0.2	1.2	0.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.01	---	---	---	---	---	---	---
	15-Aug-1988	09-PEAT	57.1	**4.25**	---	---	14.2	0.01	---	6.1	8.9	---	---	22	4.7	0.6	0.2	1.6	0.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.003	---	---	---	---	---	---	---
	15-Oct-1988	09-PEAT	50.5	**4.16**	---	---	13.7	0.01	---	5.2	7.4	---	---	19	4.5	0.6	0.2	1	0.5	---	---	---	---	---	---	---	0.002	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-May-1989	09-PEAT	88.2	**4.04**	---	---	22.5	0.01	---	12.4	9.7	---	---	33	7.5	0.9	0.4	1.7	0.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.054	0.316	---	---	---	---	---	---	---
	15-Sep-1989	09-PEAT	60.4	**4.15**	---	---	---	---	---	---	---	---	---	45	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	09-PEAT	61.3	**4.16**	---	---	---	0.01	---	4.4	9.1	---	---	21	5.3	0.6	0.27	0.9	0.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.003	---	---	---	---	---	---	---
	15-Mar-1990	09-PEAT	48.3	**3.96**	---	---	---	---	---	---	---	---	---	144	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	09-PEAT	56	**4.02**	---	---	13.8	0.01	---	4.5	7.7	---	---	18	4.7	0.5	0.19	0.8	0.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Aug-1990	09-PEAT	62.3	**4.21**	---	---	---	---	---	---	---	---	---	40	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	09-PEAT	64.9	**4.15**	---	---	15.5	0.01	---	6.2	9.5	---	---	24	5.2	0.6	0.64	1.5	0.5	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.003	---	---	---	---	---	---	---
10-SH [Decommissioned]	15-May-1985	10-SH [DECOM]	624	7.9	---	---	302.4	328	---	2.2	29.4	---	---	375	92	17.6	2.8	26.2	399.8	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.5	---	---	---	---	---	---	---
	15-Sep-1985	10-SH [DECOM]	670	7.94	---	---	303.3	334	---	1.3	38.4	---	---	380	92	17.8	2.83	28.3	407.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	0.36	---	---	---	---	---	---	---
	15-Jun-1986	10-SH [DECOM]	650	7.48	---	---	325.1	320	---	2	14.6	---	---	350	94.8	21.4	2.7	17	390.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.006	---	---	---	---	---	---	---
	15-Aug-1986	10-SH [DECOM]	621	7.42	---	---	297.8	320	---	0.4	8.2	---	---	330	87	19.5	2.67	16	390.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.004	0.005	---	---	---	---	---	---	---
	15-Oct-1986	10-SH [DECOM]	620	7.81	---	---	311.1	336	---	0.8	6.6	---	---	350	91	20.3	2.73	15.7	409.6	---	---	---	---	---	---	---	< 0.0020	---	---	0.011	0.003	---	---	---	---	---	---	---
	15-May-1987	10-SH [DECOM]	607	7.7	---	---	301.9	331	---	0.4	5.9	---	---	340	87	20.5	2.7	16.2	403.5	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.003	---	---	---	---	---	---	---
	15-Sep-1987	10-SH [DECOM]	603	7.64	---	---	307.7	344	---	1.1	6.1	---	---	350	90	20.1	2.8	16	419.3	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.005	---	---	---	---	---	---	---
	15-Nov-1987	10-SH [DECOM]	604	8.11	---	---	309.4	331	---	1.4	5.4	---	---	350	91	19.9	2.7	15.7	403.5	---	---	---	---	---	---	---	< 0.0020	---	---	0.006	0.24	---	---	---	---	---	---	---
	15-May-1988	10-SH [DECOM]	619	7.96	---	---	321.6	344	---	1.7	8.8	---	---	350	96	19.9	2.52	15.5	419	---	---	---	---	---	---	---	< 0.0010	---	---	0.007	0.061	---	---	---	---	---	---	---
	15-Aug-1988	10-SH [DECOM]	599	8.25	---	---	287.7	334	---	0.2	5.3	---	---	336	85.3	18.1	3.5	19.6	407.1	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.035	---	---	---	---	---	---	---
	15-Nov-1988	10-SH [DECOM]	601	7.72	---	---	306.5	334	---	0.4	5.7	---	---	338	91	19.2	2.68	15.6	407.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.006	0.182	---	---	---	---	---	---	---
	15-Mar-1989	10-SH [DECOM]	622	8.3	---	---	311.1	328	---	0.1	8	---	---	338	92.5	19.4	2.8	15	399.8	---	---	---	---	---	---	---	< 0.0010	---	---	0.012	0.123	---	---	---	---	---	---	---
	15-May-1989	10-SH [DECOM]	617	7.46	---	---	318.1	334	---	0.1	4.5	---	---	326	93.5	20.5	2.6	1	407.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.23	---	---	---	---	---	---	---
	15-Sep-1989	10-SH [DECOM]	624	7.24	---	---	---	---	---	---	---	---	---	420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	10-SH [DECOM]	629	8.13	---	---	329	349	---	0.4	8.2	---	---	359	98.5	20.1	2.87	16.3	425.4	---	---	---	---	---	---	---	< 0.0010	---	---	0.004	0.282	---	---	---	---	---	---	---
	15-Mar-1990	10-SH [DECOM]	649	7.67	---	---	---	---	---	---	---	---	---	380	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-May-1990	10-SH [DECOM]	604	8.09	---	---	298.6	337	---	0.6	5.6	---	---	337	87.5	19.4	2.67	15.1	410	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.246	---	---	---	---	---	---	---
	15-Aug-1990	10-SH [DECOM]	641	7.81	---	---	---	---	---	---	---	---	---	420	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	10-SH [DECOM]	643	7.9	---	---	318.6	356.4	---	0.01	12	---	---	362	94.5	20	2.82	15.7	434.5	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.201	---	---	---	---	---	---	---
	17-May-1991	10-SH [DECOM]	635	7.46	---	---	---	---	---	< 0.01	14	---	---	410	93	21.5	2.63	15	---	---	---	---	---	---	---	---	---	---	---	0.201	---	---	---	---	---	---	---	---
	12-May-1992	10-SH [DECOM]	665	7.72	---	---	340.6	380	---	0.4	13.9	---	---	373	101	21.4	2.72	15.7	463.2	---	---	---	---	---	---	0.96	< 0.0010	---	---	< 0.003	< 0.003	---	---	---	---	---	---	---
	01-Sep-1992	10-SH [DECOM]	540	7.54	---	---	---	331	---	0.5	12.4	---	---	353	100	21.4	2.57	14.5	403.5	---	---	---	---	---	---	1.08	---	---	---	0.006	0.043	---	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable[13]	0.0019	---	---
10-IN [Decommissioned]	16-Feb-1985	10-IN [DECOM]	---	---	---	---	370.5	321	---	---	---	---	---	460	---	---	---	---	391.3	---	---	---	---	---	---	---	---	---	---	0.168	0.622	---	---	---	---	---	---
	18-Feb-1985	10-IN [DECOM]	---	---	---	---	378.3	349	---	---	---	---	---	522	---	---	---	---	425.4	---	---	---	---	---	---	---	---	---	---	0.009	0.72	---	---	---	---	---	---
	15-Dec-1985	10-IN [DECOM]	800	7.62	---	---	330.6	332	---	4.81	102	---	---	480	96	22	5	42	404.7	---	---	---	---	---	---	---	0.0050	---	---	0.195	0.425	---	---	---	---	---	---
	15-Feb-1986	10-IN [DECOM]	780	7.35	---	---	---	---	---	3.7	90	---	---	---	109	23.8	4.9	35	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---
	15-Jun-1986	10-IN [DECOM]	830	7.94	---	---	381.2	320	---	4.1	114	---	---	495	111	25.2	4.6	38.4	390.1	---	---	---	---	---	---	---	< 0.0020	---	---	0.007	1.06	---	---	---	---	---	---
	15-Aug-1986	10-IN [DECOM]	823	7.22	---	---	337.6	323	---	2.3	108	---	---	475	99	21.9	4.8	34.6	393.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.018	1.49	---	---	---	---	---	---
	15-Oct-1986	10-IN [DECOM]	810	8.07	---	---	381.7	355	---	2.4	107	---	---	520	112	24.7	3.9	38.5	432.7	---	---	---	---	---	---	---	< 0.0020	---	---	0.011	1.12	---	---	---	---	---	---
	15-May-1987	10-IN [DECOM]	819	7.77	---	---	376.2	339	---	1.4	111	---	---	500	108	25.8	5	35	413.2	---	---	---	---	---	---	---	< 0.0020	---	---	0.005	0.88	---	---	---	---	---	---
	15-Sep-1987	10-IN [DECOM]	815	7.65	---	---	394.5	349	---	2.5	127	---	---	520	116	25.4	4.7	33.6	425.4	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.46	---	---	---	---	---	---
	15-Nov-1987	10-IN [DECOM]	854	7.67	---	---	409.1	353	---	2.5	116	---	---	530	121	25.9	4.8	36.8	430.3	---	---	---	---	---	---	---	< 0.0020	---	---	< 0.003	0.52	---	---	---	---	---	---
	15-Feb-1988	10-IN [DECOM]	848	7.93	---	---	---	---	---	1.3	130	---	---	---	111	24.5	4.84	37	---	---	---	---	---	---	---	---	< 0.0020	---	---	---	---	---	---	---	---	---	---
	15-May-1988	10-IN [DECOM]	839	8.15	---	---	393	338	---	2.3	131	---	---	520	117	24.5	4.95	37	412	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.85	---	---	---	---	---	---
	15-Aug-1988	10-IN [DECOM]	828	8.09	---	---	321.7	277	---	1.3	115	---	---	440	90.3	23.3	4.5	35.7	337.7	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.9	---	---	---	---	---	---
	15-Nov-1988	10-IN [DECOM]	850	7.95	---	---	391.7	338	---	0.8	139	---	---	531	116	24.7	4.89	38.4	412	---	---	---	---	---	---	---	< 0.0010	---	---	0.008	1.06	---	---	---	---	---	---
	15-Mar-1989	10-IN [DECOM]	877	8.25	---	---	386.7	315	---	0.7	142	---	---	522	114	24.7	4.85	42.5	384	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	1.08	---	---	---	---	---	---
	15-May-1989	10-IN [DECOM]	852	7.75	---	---	380.4	345	---	0.7	116	---	---	510	112	24.4	4.9	41	420.6	---	---	---	---	---	---	---	< 0.0010	---	---	< 0.003	0.95	---	---	---	---	---	---
	15-Sep-1989	10-IN [DECOM]	857	7.45	---	---	---	---	---	---	---	---	---	540	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1989	10-IN [DECOM]	838	8.04	---	---	368.3	334	---	0.5	111	---	---	495	106	25.1	4.94	42.6	407.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.008	1.36	---	---	---	---	---	---
	15-Mar-1990	10-IN [DECOM]	835	8.06	---	---	---	---	---	---	---	---	---	424	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10-IN [Decommissioned]	15-May-1990	10-IN [DECOM]	824	8.15	---	---	357.1	351	---	1.2	115	---	---	504	104	23.6	4.8	40.5	427.9	---	---	---	---	---	---	---	< 0.0010	---	---	0.02	1.35	---	---	---	---	---	---
	15-Aug-1990	10-IN [DECOM]	900	7.76	---	---	---	---	---	---	---	---	---	585	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	15-Nov-1990	10-IN [DECOM]	849	8.02	---	---	306.7	305.2	---	0.01	96	---	---	441	82	24.7	4.83	46.6	372	---	---	---	---	---	---	---	< 0.0010	---	---	0.005	0.935	---	---	---	---	---	---
	17-May-1991	10-IN [DECOM]	854	7.44	---	---	---	---	---	0.8	---	---	---	555	99.5	22.5	4.97	42.4	---	---	---	---	---	---	---	---	---	---	---	0.84	---	---	---	---	---	---	---
	06-Nov-1991	10-IN [DECOM]	823	7.71	---	---	---	365	---	0.5	---	---	---	525	110	23.4	4.88	41.4	445	---	---	---	---	---	---	---	< 0.0010	---	---	0.676	---	---	---	---	---	---	---
	12-May-1992	10-IN [DECOM]	823	7.75	---	---	365	369	---	0.3	---	---	---	403	107	23.7	4.84	41.2	449.8	---	---	---	---	---	---	0.94	0.001	---	---	0.006	0.614	---	---	---	---	---	---
	01-Sep-1992	10-IN [DECOM]	801	7.76	---	---	---	364	---	1	---	---	---	529	120	25.4	4.86	41.4	443.7	---	---	---	---	---	---	1.03	---	---	---	0.005	0.887	---	---	---	---	---	---
11-SH	17-May-1991	11-SH	764	7.63	---	---	---	---	---	0.2	---	---	---	500	117	23.5	2.65	16	---	---	---	---	---	---	---	---	---	---	---	0.007	---	---	---	---	---	---	---
	04-Nov-1991	11-SH	722	7.8	---	---	---	422	---	0.7	---	---	---	430	125	25.8	2.64	14.5	515	---	---	---	---	---	---	---	< 0.0010	---	---	0.013	---	---	---	---	---	---	---
	12-May-1992	11-SH	729	8.01	---	---	375.8	422	---	0.3	---	---	---	408	110	24.5	2.32	13.9	514.4	---	---	---	---	---	---	0.96	0.0330	---	---	< 0.003	< 0.003	---	---	---	---	---	---
	04-Nov-1992	11-SH	690	7.13	---	---	395	398	---	0.5	---	---	---	410	118	25	2.36	13.3	485.2	---	---	---	---	---	---	1.06	< 0.0010	---	---	< 0.003	0.005	---	---	---	---	---	---
	18-May-1993	11-SH	644	7.25	---	---	350	392	---	< 0.50	---	---	---	385	102	23.1	2.16	12.6	478	---	---	---	---	---	---	0.95	< 0.0010	---	---	< 0.003	< 0.003	---	---	---	---	---	---
	11-Nov-1993	11-SH	697	7.32	---	---	343	390	---	0.6	---	---	---	379	95.5	25.3	2.2	13.9	475	---	---	---	---	---	---	0.95	< 0.0010	---	---	0.005	0.18	---	---	---	---	---	---
	31-May-1994	11-SH	703	6.9	---	---	---	402	< 0.1	< 0.5	1.6	< 0.01	0.681	399	116	23.1	2.05	11.2	490	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	0.013	0.013	0.013	---	---	---	---	---
	22-Sep-1994	11-SH	703	7.06	---	---	---	395	0.1	0.5	1.7	0.1	0.801	386	104	25	2.21	11.9	482	0.5	0.5	---	---	---	---	0.99	< 0.001	---	---	0.104	0.095	0.104	---	---	---	---	---
	02-Nov-1994	11-SH	712	7.29	---	---	---	397	< 0.1	< 0.5	1.5	0.09	0.718	398	115	24.4	2.38	12.4	484	< 0.5	< 0.5	---	---	---	---	1.05	< 0.001	---	---	0.071	0.067	0.071	---	---	---	---	---
(Duplicate)	02-Nov-1994	11-SH DUP	717	7.08	---	---	---	402	< 0.1	< 0.5	1.8	0.06	0.751	401	114	25.4	2.38	12.4	490	< 0.5	< 0.5	---	---	---	---	1.04	< 0.001	---	---	0.063	0.059	0.063	---	---	---	---	---
	28-Sep-1995	11-SH	637	7.03	---	---	389	404	< 0.1	< 0.5	2	0.02	0.638	403	113	25.9	2.4	12.8	492	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	---	0.01	---	---	---	---	---	---
	05-Sep-1996	11-SH	716	7.19	---	---	395	399	< 0.1	< 0.5	2	< 0.01	0.608	402	115	26.2	2.3	12.8	486	< 0.5	< 0.5	---	---	---	---	1.06	0.001	---	---	---	0.117	0.12	---	---	---	---	---
	05-Sep-1997	11-SH	758	7.47	---	---	480	437	< 0.1	0.5	1.6	5.81	0.458	465	141	31	2.7	21.3	533	< 0.5	< 0.5	---	---	---	---	---	< 0.001	---	---	---	0.021	0.025	---	---	---	---	---
	09-Sep-1999	11-SH	751	7.39	---	---	410	411	< 0.1	1	9.2	---	---	428	119	28.1	2	21.6	501	< 0.5	< 0.5	---	8.44	9.25	---	1.1	< 0.0010	---	< 0.001	---	0.011	0.02	---	---	---	---	---
	06-Sep-2000	11-SH	824	7.53	---	---	420	446	< 0.1	1.1	31.9	< 0.01	0.622	481	125	27.4	2.4	25.7	545	< 0.5	< 0.5	---	9.62	9.66	---	1	0.002	---	---	< 0.003	0.008	0.008	---	---	---	---	---
	06-Sep-2001	11-SH	763	7.98	---	---	390	418	< 0.5	1.1	24.1	0.02	0.4	448	109	28.9	3	29	510	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	0.008	0.246	0.254	---	---	---	---	---
	05-Sep-2002	11-SH	844	7.51	---	---	390	447	< 0.5	< 0.5	10.2	12.9	0.57	458	117	24.6	2.2	22.5	545	< 0.5	< 0.5	---	---	---	---	0.97	0.001	---	---	< 0.003	0.019	0.019	0.54	---	---	4.4	---
	03-Sep-2003	11-SH	772	7.58	---	---	400	421	< 0.5	0.7	10.2	8.72	0.543	446	118	25.9	2.4	26	514	< 0.5	< 0.5	---	---	---	---	1.1	---	< 0.004	---	< 0.003	0.02	0.02	---	---	---	4.7	---
	08-Sep-2004	11-SH	805	7.75	---	---	360	422	< 0.5	2	18	11.8	0.457	440	103	24.2	2.2	25.8	515	< 0.5	< 0.5	---	---	---	---	0.98	---	< 0.004	---	< 0.003	0.023	0.023	---	---	---	4.6	---
	07-Sep-2005	11-SH	757	8.03	180	---	360	440	< 0.5	0.7	9.7	9.89	0.487	437	104	23.4	2.2	23.3	536	< 0.5	< 0.5	---	---	---	---	0.95	---	< 0.004	---	< 0.003	0.011	0.011	---	---	---	3.1	---
	07-Sep-2006	11-SH	768	7.73	---	---	370	430	< 0.5	1.5	13.5	3.84	0.431	437	106	25.9	2.4	25.2	525	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	2.8	---
	06-Sep-2007	11-SH	784	7.76	---	---	390	445	< 0.5	1.1	7.9	10.9	0.491	455	116	24	2.3	24.8	543	< 0.5	< 0.5	---	---	---	---	1.03	---	---	---	< 0.003	0.008	0.008	---	---	---	2.6	---
	04-Sep-2008	11-SH	787	7.9	---	---	366	446	---	< 0.50	6.59	0.763	0.383	433	106	24.6	2.45	25.6	545	< 5	< 5	0.264	---	---	---	0.935	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---
	10-Sep-2009	11-SH	786	7.95	---	---	377	439	---	< 0.50	7.74	< 0.030	0.432	441	110	24.9	2.71	32.2	536	< 5.0	< 5.0	0.223	---	---	---	1.01	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---
	09-Sep-2010	11 SH	804	7.57	---	---	371	446	---	< 0.50	8.04	1.22	0.469	437	107	25.1	2.07	26.5	544	< 5.0	< 5.0	0.296	---	---	94.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---
	08-Sep-2011	11-SH	836	8.08	---	---	395	473	---	< 0.50	6.2	3.9	0.483	463	115	26.3	2.32	28.7	577	< 5.0	< 5.0	0.27	---	---	96	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---
	06-Sep-2012	11-SH	845	7.92	---	403	404	484	---	< 0.50	9.43	2.89	0.467	480	117	27.2	2.66	33.4	590	< 5.0	< 5.0	0.25	---	---	97.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---
	26-Sep-2013	11-SH	749	7.75	---	377	377	435	---	< 0.50	9.97	0.196	0.226	438	111	24.3	2.90	28.4	531	< 5.0	< 5.0	0.160	---	---	99.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---
	17-Sep-2014	11-SH	869	8.22	---	---	442	481	---	< 0.50	25.1	0.925	0.515	507	133	26.6	2.22	31.1	587	< 5.0	< 5.0	0.219	---	---	101	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	7.57	---
(Duplicate)	17-Sep-2014	31-SH	843	8.27	---	---	428	465	---	< 0.50	24.8	0.890	0.490	492	130	25.0	2.16	31.0	568	< 5.0	< 5.0	0.218	---	---	101	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	7.43	---
	29-Sep-2015	11-SH	931	7.32	---	---	473	478	---	<0.50	31.6	1.20	0.515	525	138	31.1	2.48	34.0	583	<5.0	<5.0	0.244	---	---	---	---	---	---	---	0.012	0.150	0.162	---	---	---	---	---
(Duplicate)	29-Sep-2015	31-SH	929	7.41	---	---	418	445	---	<0.50	31.6	1.27	0.502	482	122	27.5	2.32	31.1	542	<5.0	<5.0	0.245	---	---	---	---	---	---	---	0.013	0.148	0.162	---	---	---	---	---
	27-Sep-2016	11-SH	914	7.81	---	---	470	455	---	<0.50	47.4	0.77	0.455	524	141	28.3	2.40	31.4	555	<5.0	<5.0	0.184	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---
(Duplicate)	27-Sep-2016	31-SH	897	8.07	---	---	446	443	---	<0.50	45.3	0.80	0.431	506	136	25.6	2.34	30.7	541	<5.0	<5.0	0.193	---	---	---	---	---	---	---	<0.010	0.068	0.068	---	---	---	---	---
	27-Sep-2017	11-SH	804	7.31	---	---	483	461	---	<0.50	61.9	0.60	0.392	554	141	31.8	2.46	39.0	562	<5.0	<5.0	0.169	---	---	---	---	---	---	---	<0.010	0.159	0.159	---	---	---	---	---
(Duplicate)	27-Sep-2017	31-SH	810	7.36	---	---	479	466	---	<0.50	62.1	0.59	0.393	555	140	31.4	2.41	38.7	569	<5.0	<5.0	0.167	---	---	---	---	---	---	---	<0.010	0.147	0.147	---	---	---	---	---
	18-Sep-2018	11-SH	870	7.93	---	---	521	475	---	<0.50	62.7	0.227	0.535	573	159	30.2	2.52	33.3	580	<5.0	<5.0	0.199	---	---	---	---	---	---	---	<0.010	0.097	0.097	---	---	---	---	---
(Duplicate)	18-Sep-2018	31-SH	884	7.91	---	---	501	463	---	<0.50	64.6	0.222	0.537	559	151	30.2	2.50	32.5	565	<5.0	<5.0	0.211	---	---	---	---	---	---	---	<0.010	0.091	0.091	---	---	---	---	---
	17-Sep-2019	11-SH	885	7.35	---	---	496	498	---	<0.50	86.8	2.200	0.723	605	146	31.8	2.59	38.6	607	<5.0	<5.0	0.245	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---
(Duplicate)	17-Sep-2019	31-SH	891	7.32	---	---	492	499	---	<0.50	87.2	2.150	0.705	604	145	31.5	2.55	37.9	609	<5.0	<5.0	0.239	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---
	21-Sep-2020	11-SH	1007	6.75	---	---	461	471	---	<0.50	94.0	1.92	0.551	582	138	28.3	2.36	35.8	575	<5.0	<5.0	0.196	---	---	---	---	---	---	---	<0.010	0.096	0.096	---	---	---	---	---
(Duplicate)	21-Sep-2020	31-SH	1007	7.60	---	---	465	470	---	<0.50	93.9	1.55	0.565	582	139	28.7	2.39	35.7	573	<5.0	<5.0	0.180	---	---	---	---	---	---	---	<0.010	0.098	0.098	---	---	---	---	---
	22-Sep-2021	11-SH	962	7.46	---	---	512	474	---	<0.50	104	0.038	0.456	611	151	32.7	2.64	35.8	578	<5.0	<5.0	0.176	---	---	---	---	---	---	---	<0.010	0.088	0.088	---	---	---	---	---
(Duplicate)	22-Sep-2021	31-SH	975	7.41	---	---	505	473	---	<0.50	110	0.037	0.441	613	147	33.6	2.62	35.3	577	<5.0	<5.0	0.168	---	---	---	---	---	---	---	<0.010	0.094	0.094	---	---	---	---	---
	29-Sep-2022	11-SH	963	7.84	---	---	512	488	---	<0.50	113.0	0.139	0.540	659	150	33.5	2.49	35.6	595	<1.0	<1.0	0.155	---	---	---	---	---	---	---	<0.010	0.083	0.083	---	---	---	---	---
(Duplicate)	29-Sep-2022	31-SH	964	7.87	---	---	522	483	---	<0.50	114	0.136	0.525	660	153	34.1	2.51	35.7	590	<1.0	<1.0	0.169	---	---	---	---	---	---	---	<0.010	0.061	0.061	---	---	---	---	---
	28-Sep-2023	11-SH	1030	8.11	---	---	543	450	---	<0.50	167	0.066	0.522	709	165	31.8	2.68	46.4	549	<1.0	<1.0	0.164	---	---	---	---	---	---	---	<0.010	0.151	0.151	---	---	---	---	---
(Duplicate)	28-Sep-2023	31-SH	1020	8.16	---	---	533	408	---	<0.50	165	0.062	0.511	677	163	30.6	2.6	43.7	497	<1.0	<1.0	0.168	---	---	---	---	---	---	---	<0.010	0.169	0.169	---	---	---	---	---
	11-Sep-2024	11-SH	1100	7.06	---	---	538	467	---	<0.50	198	0.053	0.690	747	160	33.7	2.34	47.4	570	<1.0	<1.0	0.196	---	---	---	---	---	---	---	<0.010	0.139	0.139	---	---	---	---	---
(Duplicate)	11-Sep-2024	31-SH	1110	7.05	---	---	530	469	---	<0.50	203	0.061	0.678	748	157	33.6	2.3	45.2	572	<1.0	<1.0	0.185	---	---	---	---	---	---	---	<0.010	0.127	0.127	---	---	---	---	---
	18-Sep-2025	11-SH	1130	7.44	---	---	597	460	---	<0.50	208	0.040	0.695	783	182	34.7	2.49	52.1	561	<0.6	<0.3	0.203	---	---	---	---	---	---	---	<0.010	0.084	0.0640	---	---	---	---	---
(Duplicate)	18-Sep-2025	31-SH	1150	7.45	---	---	593	458	---	<0.50	213	0.032	0.692	785	180	34.9	2.51	51.2	559	<0.6	<0.3	0.201	---	---	---	---	---	---	---	<0.010	0.063	0.0630	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [13]	0.0019	---	---
11-IN	17-May-1991	11-IN	700	7.37	---	---	338.7	371	---	0.1	---	---	---	383	98.5	22.5	3.76	24.3	452.2	---	---	---	---	---	---	---	< 0.0010	---	---	0.044	0.005	---	---	---	---	---	---	---
	04-Nov-1991	11-IN	657	7.98	---	---	---	376	---	0.5	---	---	---	389	100	24.7	3.67	24.2	458.3	---	---	---	---	---	---	---	< 0.0020	---	---	0.01	---	---	---	---	---	---	---	---
	12-May-1992	11-IN	686	7.43	---	---	344.6	402	---	0.3	---	---	---	395	98	24.2	3.67	24.1	490	---	---	---	---	---	---	0.98	< 0.0010	---	---	0.007	0.003	---	---	---	---	---	---	---
	18-May-1993	11-IN	698	7.45	---	---	---	---	---	< 0.50	---	---	---	475	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Nov-1993	11-IN	700	7.51	---	---	328	390	---	0.8	---	---	---	389	92	23.7	3.7	25.6	475	---	---	---	---	---	---	0.98	< 0.0010	---	---	0.012	0.053	---	---	---	---	---	---	---
	22-Sep-1994	11-IN	725	7.24	---	---	329	410	0.1	0.5	3	0.03	**0.969**	398	92	24	3.89	24.9	500	0.5	0.5	---	---	---	---	0.94	---	---	---	0.004	0.004	0.008	---	---	---	**0.27**	---	---
	28-Sep-1995	11-IN	651	7.38	---	---	368	423	< 0.1	< 0.5	1.1	0.01	**0.744**	420	104	26.3	4	26.7	516	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	< 0.003	0.009	0.009	---	---	---	< 0.01	---	---
	05-Sep-1996	11-IN	766	7.52	---	---	395	435	< 0.1	< 0.5	0.9	< 0.01	**0.797**	438	114	26.8	4.02	26.6	530	< 0.5	< 0.5	---	---	---	---	1.05	---	---	---	< 0.003	0.08	0.08	---	---	---	< 0.005	---	---
	05-Sep-1997	11-IN	787	7.45	---	---	470	458	< 0.1	0.5	0.5	**2.79**	**0.635**	483	137	31	4.6	30.4	558	< 0.5	< 0.5	---	---	---	---	---	---	---	---	< 0.003	0.014	0.014	---	---	---	**1.5**	---	---
	16-Sep-1998	11-IN	765	7.57	---	---	380	446	< 0.1	< 0.5	1.6	---	---	435	107	27.4	3.7	27.4	544	< 0.5	< 0.5	---	8.96	8.87	---	0.99	---	---	---	0.01	0.009	0.019	---	---	---	< 0.01	---	---
	09-Sep-1999	11-IN	737	7.69	---	---	390	405	< 0.1	< 0.5	7.2	---	---	418	110	28	3	26.4	494	< 0.5	< 0.5	---	8.25	9.02	---	1.09	---	---	---	0.014	0.023	0.037	---	---	---	< 0.01	---	---
	06-Sep-2000	11-IN	718	7.69	---	---	350	408	< 0.1	< 0.5	9.3	< 0.01	**0.569**	409	98.4	25.2	4	27.6	498	< 0.5	< 0.5	---	8.36	8.28	---	0.99	---	---	---	0.004	0.006	0.01	---	---	---	< 0.01	---	---
	06-Sep-2001	11-IN	693	7.92	---	---	350	398	< 0.5	< 0.5	8.7	< 0.01	**0.551**	403	98.5	25.1	4.2	26.9	486	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	0.003	0.006	0.009	---	---	---	< 0.01	---	---
	05-Sep-2002	11-IN	774	7.65	---	---	320	408	< 0.5	< 0.5	7.9	**0.57**	**0.43**	399	89.5	24	3.9	27.4	498	< 0.5	< 0.5	---	8.33	7.73	---	0.93	---	---	---	< 0.003	0.017	0.017	---	---	---	< 0.01	3.3	---
	08-Oct-2002	11-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.89	1.06	---	---	---	---
	03-Sep-2003	11-IN	715	7.74	---	---	350	393	< 0.5	0.7	8.6	0.14	**0.438**	403	98.6	25.6	4.2	27.6	480	< 0.5	< 0.5	---	8.09	8.35	---	1.03	---	---	---	0.011	0.325	0.336	---	---	---	< 0.01	3.3	---
	08-Sep-2004	11-IN	728	7.88	---	---	330	390	< 0.5	0.6	8.5	**0.48**	**0.44**	390	92.8	24.1	3.9	25.1	476	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	0.016	0.016	---	---	---	< 0.01	3	---
	07-Sep-2005	11-IN	683	8.2	1	---	310	396	< 0.5	< 0.5	9.8	**1.25**	**0.401**	390	87.4	23	3.6	26.3	483	< 0.5	< 0.5	---	---	---	---	0.93	---	---	---	0.005	0.075	0.08	---	---	---	< 0.005	3	---
	07-Sep-2006	11-IN	714	7.82	---	---	350	396	< 0.5	1.4	9.1	**0.44**	**0.493**	402	98.5	24.2	3.7	26.7	483	< 0.5	< 0.5	---	---	---	---	1	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	---	3.1	---
	06-Sep-2007	11-IN	712	8	---	---	340	395	< 0.5	0.9	9.2	< 0.06	**0.44**	401	97.8	23.7	4	27.6	482	< 0.5	< 0.5	---	---	---	---	1	---	---	---	< 0.003	0.024	0.024	---	---	---	---	3.2	---
	04-Sep-2008	11-IN	707	8	---	---	312	396	---	< 0.50	7.57	< 0.030	**0.266**	385	85.9	23.7	3.93	26.2	483	< 5	< 5	0.227	---	---	---	0.925	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	10-Sep-2009	11-IN	715	7.99	---	---	390	395	---	< 0.50	7.82	0.243	**0.534**	418	103	25.8	4.2	27.2	482	< 5.0	< 5.0	0.197	---	---	---	1.14	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	11 IN	717	7.83	---	---	315	393	---	< 0.50	8.89	< 0.030	**0.295**	384	85.7	24.5	3.72	25.6	479	< 5.0	< 5.0	0.287	---	---	93.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	11-IN	719	8.23	---	---	323	400	---	< 0.50	9.04	< 0.030	**0.224**	393	89.3	24.4	3.91	26	488	< 5.0	< 5.0	0.263	---	---	93.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	06-Sep-2012	11-IN	704	8.07	---	347	347	393	---	< 0.50	9.78	0.039	**0.272**	400	98.4	24.5	4.31	26.6	480	< 5.0	< 5.0	0.249	---	---	101	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	11-IN	722	7.95	---	369	368	443	---	< 0.50	13.5	**0.866**	**0.553**	441	104	0.553	3.68	27.7	541	< 5.0	< 5.0	0.256	---	---	94.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	11-IN	701	8.32	---	---	370	389	---	< 0.50	14.2	0.034	**0.357**	416	108	24.3	4.85	31.2	469	< 5.0	< 5.0	0.266	---	---	111	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	6.44	---
	29-Sep-2015	11-IN	794	7.58	---	---	390	408	---	<0.50	22.2	0.032	**0.449**	439	109	28.5	4.31	30.0	497	<5.0	<5.0	0.331	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2016	11-IN	739	8.04	---	---	360	387	---	<0.50	20.4	<0.010	**0.401**	414	103	24.9	3.98	29.6	472	<5.0	<5.0	0.261	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	11-IN	666	7.63	---	---	361	394	---	<0.50	18.7	0.207	**0.482**	420	101	26.5	4.11	33.1	480	<5.0	<5.0	0.247	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	18-Sep-2018	11-IN	695	8.11	---	---	363	396	---	<0.50	17.2	0.282	**0.452**	416	105	24.6	4.02	27.4	484	<5.0	<5.0	0.312	---	---	---	---	---	---	---	<0.010	0.06	0.06	---	---	---	---	---	---
	17-Sep-2019	11-IN	687	7.76	---	---	363	432	---	<0.50	17.6	**0.968**	**0.526**	446	101	26.9	4.25	36.0	527	<5.0	<5.0	0.301	---	---	---	---	---	---	---	0.03	0.186	0.216	---	---	---	---	---	---
	21-Sep-2020	11-IN	753	6.72	---	---	337	413	---	<0.50	20.7	**0.836**	**0.478**	425	96.4	23.5	3.82	32.7	503	<5.0	<5.0	0.289	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	11-IN	696	7.86	---	---	363	398	---	<0.50	14.1	**0.866**	**0.506**	420	100	27.4	4.33	33.9	486	<5.0	<5.0	0.251	---	---	---	---	---	---	---	<0.010	0.208	0.208	---	---	---	---	---	---
	29-Sep-2022	11-IN	696	8.17	---	---	364	409	---	<0.50	14.9	**0.380**	**0.458**	462	100	27.8	4.03	34.3	498	<1.0	<1.0	0.245	---	---	---	---	---	---	---	<0.010	0.400	0.419	---	---	---	---	---	---
	28-Sep-2023	11-IN	1080	8.23	---	---	513	441	---	<0.50	181	**0.09**	**0.634**	**709**	154	31.1	2.54	45	538	<1.0	<1.0	0.164	---	---	---	---	---	---	---	<0.010	0.082	0.082	---	---	---	---	---	---
	11-Sep-2024	11-IN	737	7.57	---	---	337	409	---	<0.50	17	0.014	**0.405**	446	93	25.5	3.77	28.2	499	<1.0	<1.0	0.318	---	---	---	---	---	---	---	0.012	0.055	0.067	---	---	---	---	---	---
	18-Sep-2025	11-IN	746	7.85	---	---	365	412	---	<0.50	15.4	**0.386**	**0.468**	466	103	26.2	3.89	35.6	503	<0.6	<0.3	0.319	---	---	---	---	---	---	---	0.024	0.051	0.0750	---	---	---	---	---	---
11-SS	17-May-1991	11-SS	482	7.69	---	---	124.3	218	---	< 0.01	---	---	---	268	41.5	5	6.75	55	265.7	---	---	---	---	---	---	---	< 0.0010	---	---	0.024	0.009	---	---	---	---	---	---	---
	12-May-1992	11-SS	482	7.46	---	---	142.5	242	---	0.8	---	---	---	261	47.3	5.9	6.15	53	295	---	---	---	---	---	---	0.97	0.001	---	---	0.008	0.502	---	---	---	---	---	---	---
	18-Sep-2025	11-SS	476	8.04	---	---	120	237	---	<0.50	25.0	0.063	**0.332**	317	37.9	6.13	5.99	65.8	289	<0.6	<0.3	0.063	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
12-SH	17-May-1991	12-SH	429	7.69	---	---	---	---	---	< 0.01	---	---	---	280	66	15.5	1.45	5	---	---	---	---	---	---	---	---	< 0.0010	---	---	0.012	---	---	---	---	---	---	---	---
	12-May-1992	12-SH	424	7.86	---	---	217.6	222	---	0.7	---	---	---	220.2	62	15.2	1.42	5.51	270.6	---	---	---	---	---	---	1	0.003	---	---	< 0.003	0.027	---	---	---	---	---	---	---
	04-Nov-1992	12-SH	360	7.8	---	---	---	228	---	0.6	---	---	---	235	64	16	1.54	6.33	277.9	---	---	---	---	---	---	1.02	< 0.0010	---	---	---	0.032	---	---	---	---	---	---	---
	18-May-1993	12-SH	388	7.66	---	---	213	231	---	< 0.50	---	---	---	231	59.1	15.9	1.5	5.83	282	---	---	---	---	---	---	0.95	< 0.0010	---	---	0.004	0.022	---	---	---	---	---	---	---
	11-Nov-1993	12-SH	390	7.95	---	---	209	206	---	0.7	---	---	---	214	56.1	16.8	1.5	6.2	251	---	---	---	---	---	---	1.04	< 0.0010	---	---	< 0.003	0.105	---	---	---	---	---	---	---
	31-May-1994	12-SH	414	7.49	---	---	---	228	< 0.1	0.5	6	< 0.01	**0.584**	228	59.5	14.7	1.49	6.37	278	< 0.5	< 0.5	---	---	---	---	0.96	< 0.001	---	---	0.028	0.028	0.028	---	---	---	---	---	---
	22-Sep-1994	12-SH	727	7.53	---	---	---	229	0.1	0.5	6.4	0.01	**0.352**	232	60	16	1.54	8.2	279	0.5	0.5	---	---	---	---	1	< 0.001	---	---	0.102	0.096	0.102	---	---	---	---	---	---
	01-Nov-1994	12-SH	446	8	---	---	---	236	< 0.1	0.7	5.8	0.04	0.01	239	63	15.1	1.73	8.2	288	< 0.5	< 0.5	---	---	---	---	0.98	< 0.001	---	---	0.254	0.254	0.254	---	---	---	---	---	---
	28-Sep-1995	12-SH	424	7.37	---	---	233	232	< 0.1	0.6	6.1	< 0.01	**0.396**	238	64.8	17.3	1.6	6.3	283	< 0.5	< 0.5	---	---	---	---	1.04	< 0.001	---	---	---	0.024	---	---	---	---	---	---	---
	05-Sep-1996	12-SH	272	7.38	---	---	145	142	< 0.1	< 0.5	3.2	< 0.01	**0.386**	146	40.9	10.4	0.91	3.89	173	< 0.5	< 0.5	---	---	---	---	1.06	0.001	---	---	---	0.043	0.048	---	---	---	---	---	---
(Duplicate)	05-Sep-1996	12-SH DUP	312	7.42	---	---	167	163	< 0.1	< 0.5	3.8	< 0.01	**0.373**	168	47	12	1.05	4.47	199	< 0.5	< 0.5	---	---	---	---	1.07	0.001	---	---	---	0.017	0.017	---	---	---	---	---	---
	05-Sep-1997	12-SH	360	8.02	---	---	175	194	< 0.1	0.5	4.8	0.11	**0.171**	192	44.2	15.7	1.15	7.34	236	< 0.5	< 0.5	---	---	---	---	0.96	< 0.001	---	---	---	0.052	0.052	---	---	---	---	---	---
(Duplicate)	05-Sep-1997	12-SH DUP	362	7.98	---	---	170	196	< 0.1	0.6	4.8	0.1	**0.15**	191	41.6	16	0.994	7.64	239	< 0.5	< 0.5	---	---	---	---	0.93	< 0.001	---	---	---	0.059	0.059	---	---	---	---	---	---
	16-Sep-1998	12-SH	388	7.64	---	---	200	207	< 0.1	< 0.5	4.5	---	---	205	49.5	18.6	1.4	6.6	253	< 0.5	< 0.5	---	4.24	4.32	---	1.02	0.001	---	---	---	0.039	0.047	---	---	---	---	---	---
	09-Sep-1999	12-SH	463	7.83	---	---	260	248	< 0.1	< 0.5	4.6	---	---	252	70.3	21.1	1.1	6	303	< 0.5	< 0.5	---	5.06	5.53	---	1.09	< 0.001	---	< 0.001	---	0.014	0.014	---	---	---	---	---	---
	06-Sep-2000	12-SH	486	7.77	---	---	230	268	< 0.1	< 0.5	3.7	0.04	**0.129**	253	59.6	19.5	1.6	7.9	328	< 0.5	< 0.5	---	5.45	4.96	---	0.91	0.004	---	---	< 0.003	0.021	0.021	---	---	---	---	---	---
	06-Sep-2001	12-SH	474	8.07	---	---	260	271	< 0.5	< 0.5	3.7	< 0.01	**0.174**	267	71.7	20.1	1.8	7.4	330	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	< 0.003	0.012	0.012	---	---	---	---	---	---
	04-Sep-2002	12-SH	541	7.87	---	---	240	287	< 0.5	< 0.5	3.9	0.1	**0.109**	272	61	21.8	1.9	10.5	350	< 0.5	< 0.5	---	---	---	---	0.92	< 0.001	---	---	< 0.003	< 0.003	< 0.003	---	---	---	---	2.9	---
	04-Sep-2003	12-SH	521	7.85	---	---	270	285	< 0.5	< 0.5	4.3	0.06	**0.097**	280	71.7	22.1	1.9	8.8	347	< 0.5	< 0.5	---	---	---	---	1.01	---	< 0.004	---	< 0.003	0.008	0.008	---	---	---	---	1.6	---
	09-Sep-2004	12-SH	556	8.11	---	---	260	300	< 0.5	< 0.5	4.1	0.03	0.012	284	70.3	20.3	1.7	7.9	366	< 0.5	< 0.5	---	---	---	---	0.91	---	< 0.004	---	< 0.003	< 0.003	< 0.003	---	---	---	---	1.4	---
	08-Sep-2005	12-SH	512	8.32	1.7	---	290	305	2.6	< 0.5	3.3	0.17	**0.363**	298	79.9	21.1	1.9	8	366	3.1	< 0.5	---	---	---	---	0.99	---	0.004	---	< 0.003	0.005	0.005	---	---	---	---	1.4	---
	07-Sep-2006	12-SH	517	8.06	---	---	270	287	< 0.5	1.2	3.7	< 0.01	**0.237**	282	71.6	22	1.9	8.6	350	< 0.5	< 0.5	---	---	---	---	0.99	---	---	---	< 0.003	0.02	0.02	---	---	---	---	1.2	---
	07-Sep-2007	12-SH	560	8.08	---	---	230	316	< 0.5	< 0.5	3.2	0.1	**1.19**	281	52.3	23.6	2.1	9.1	385	< 0.5	< 0.5	---	---	---	---	0.79	---	---	---	< 0.003	0.064	0.064	---	---	---	---	0.9	---
	05-Sep-2008	12-SH	558	8.1	---	---	283	327	---	< 0.50	2.08	0.273	**0.547**	308	77.7	21.7	2.06	8.32	398	< 5	< 5	0.396	---	---	---	0.923	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	10-Sep-2009	12-SH	522	8.17	---	---	172	298	---	< 0.50	0.93	0.057	**0.0961**	246	23.9	27.2	2.88	12.3	364	< 5.0	< 5.0	0.341	---	---	---	0.673	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	12 SH	580	8.13	---	---	159	325	---	< 0.50	0.89	0.07	**0.061**	257	17.2	28.1	2.9	12.3	396	< 5.0	< 5.0	0.472	---	---	57.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	12-SH	589	8.36	---	---	236	337	---	< 0.50	< 0.50	0.106	**0.12**	293	49.6	27.3	2.53	11.2	397	7	< 5.0	0.422	---	---	78	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	12-SH	587	8.17	---	246	246	333	---	< 0.50	3	0.183	**0.0997**	298	55.3	26.3	2.35	10.4	406	< 5.0	< 5.0	0.406	---	---	80.7	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	12-SH	603	8.02	---	332	332	357	---	< 0.50	2.17	0.168	**0.428**	346	92.3	24.6	1.84	10.1	436	< 5.0	<5.0	0.357	---	---	98.7	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	12-SH	561	8.16	---	---	315	312	---	< 0.50	2.06	0.018	**0.460**	315	90.3	21.8	1.79	11.7	381	< 5.0	<5.0	0.376	---	---	109	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	0.93	---
	29-Sep-2015	12-SH	653	7.76	---	---	362	351	---	<0.50	3.10	<0.010	**0.245**	354	99.8	27.3	2.00	10.3	429	<5.0	<5.0	0.457	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2016	12-SH	599	8.16	---	---	327	321	---	<0.50	2.45	0.022	**0.142**	324	93.9	22.6	1.92	10.5	392	<5.0	<5.0	0.390	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	12-SH	547	7.91	---	---	334	334	---	<0.50	2.42	**0.435**	**0.329**	334	93.5	24.5	1.95	11.0	407	<5.0	<5.0	0.369	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	18-Sep-2018	12-SH	583	8.21	---	---	324	349	---	<0.50	2.36	**0.62**	**0.406**	339	93.5	22.1	1.86	9.6	426	<5.0	<5.0	0.416	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	16-Sep-2019	12-SH	605	7.64	---	---	340	368	---	<0.50	3.22	0.037	**0.181**	361	95.5	24.7	2.20	13.8	448	<5.0	<5.0	0.480	---	---	---	---	---	---	---	<0.010	0.024	0.024	---	---	---	---	---	---
	22-Sep-2020	12-SH	622	7.37	---	---	326	366	---	<0.50	3.28	<0.010	**0.286**	352	91.6	23.6	1.93	11.6	446	<5.0	<5.0	0.373	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	12-SH	625	7.93	---	---	336	368	---	<0.50	2.85	<0.030	**0.296**	356	94	24.7	1.88	11	449	<5.0	<5.0	0.341	---	---	---	---	---	---	---	<0.010	0.027	0.027	---	---	---	---	---	---
	28-Sep-2022	12-SH	618	8.21	---	---	393	374	---	<0.50	3.79	<0.030	**0.288**	409	111.0	28.2	2.08	11.5	456	<1.0	<1.0	0.313	---	---	---	---	---	---	---	<0.010	0.034	<0.0500	---	---	---	---	---	---
	28-Sep-2023	12-SH	614	8.27	---	---	339	382	---	<0.50	2.76	<0.010	**0.0788**	393	93.9	25.4	2.1	11.6	466	<1.0	<1.0	0.35	---	---	---	---	---	---	---	<0.010	0.099	0.099	---	---	---	---	---	---
	11-Sep-2024	12-SH	643	7.67	---	---	343	376	---	<0.50	3.40	<0.010	**0.197**	392	95.4	25.4	1.82	12.0	459	<1.0	<1.0	0.390	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	18-Sep-2025	12-SH	663	7.91	---	---	366	377	---	<0.50	3.35	<0.010	**0.169**	402	103	26.5	1.98	13.1	460	<0.6	<0.3	0.396	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [13]	0.0019	---	---
12-IN	15-Jan-1990	12-IN	267	8.15	---	---	206.7	247	---	2.9	---	---	---	309	61.1	13.1	5.1	33.2	301.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.008	0.5	---	---	---	---	---	---	---
	15-Mar-1990	12-IN	553	8.13	---	---	230.9	280	---	1.6	---	---	---	326	68	14.8	4.05	30	341.3	---	---	---	---	---	---	---	< 0.0010	---	---	0.14	0.48	---	---	---	---	---	---	---
	15-May-1990	12-IN	623	8.11	---	---	196.1	292	---	1.5	---	---	---	361	56.2	13.5	4.11	57.5	355.9	---	---	---	---	---	---	---	< 0.0010	---	---	0.023	0.058	---	---	---	---	---	---	---
	15-Aug-1990	12-IN	564	7.5	---	---	243.4	279	---	0.8	---	---	---	317	71	16	4	24.5	340.1	---	---	---	---	---	---	---	< 0.0010	---	---	0.059	0.241	---	---	---	---	---	---	---
	15-Nov-1990	12-IN	585	7.79	---	---	252.1	300.4	---	< 0.01	---	---	---	331	73.5	16.6	3.85	27.5	366.2	---	---	---	---	---	---	---	< 0.0010	---	---	0.016	0.029	---	---	---	---	---	---	---
	17-May-1991	12-IN	572	7.51	---	---	280.9	273	---	0.8	---	---	---	312	86	16	3.68	15	332.8	---	---	---	---	---	---	---	< 0.0010	---	---	0.014	0.005	---	---	---	---	---	---	---
	04-Nov-1991	12-IN	538	8.19	---	---	---	275	---	1.2	---	---	---	328	87	17.7	4.04	15.4	335.2	---	---	---	---	---	---	---	< 0.0020	---	---	0.055	---	---	---	---	---	---	---	---
	12-May-1992	12-IN	441	7.57	---	---	215.9	194	---	1.3	---	---	---	208	62.5	14.5	2.08	9.3	236.5	---	---	---	---	---	---	1	0.001	---	---	0.008	0.155	---	---	---	---	---	---	---
	04-Nov-1992	12-IN	626	7.58	---	---	279.5	292	---	1.5	---	---	---	366	83	18	4.01	30.5	355.9	---	---	---	---	---	---	1.02	< 0.0010	---	---	0.032	0.151	---	---	---	---	---	---	---
	18-May-1993	12-IN	579	7.47	---	---	---	---	---	1	---	---	---	376	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Nov-1993	12-IN	634	7.41	---	---	302	296	---	1.1	---	---	---	372	88.5	19.6	4	17.8	361	---	---	---	---	---	---	0.96	< 0.0010	---	---	0.016	0.034	---	---	---	---	---	---	---
	28-Sep-1995	12-IN	600	7.32	---	---	334	308	< 0.1	1	65.8	< 0.01	**0.702**	399	96.4	22.6	4.3	21.3	375	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	0.006	0.018	0.024	---	---	---	< 0.01	---	---
	05-Sep-1996	12-IN	690	7.63	---	---	363	316	< 0.1	1	66.7	< 0.01	**1.69**	418	107	23.2	4.3	23.1	385	< 0.5	< 0.5	---	---	---	---	1.08	---	---	---	0.004	0.042	0.046	---	---	---	< 0.005	---	---
	05-Sep-1997	12-IN	589	7.76	---	---	291	253	< 0.1	1.1	69.9	**0.62**	**0.239**	355	84.5	19.3	2.99	22.5	308	< 0.5	< 0.5	---	---	---	---	1.05	---	---	---	0.003	0.109	0.112	---	---	---	< 0.01	---	---
	06-Sep-1997	12-IN	589	7.76	---	---	291	253	---	1.1	---	---	---	355	84.5	19.3	2.99	22.5	308	---	---	---	---	---	---	1.05	---	---	---	0.003	0.109	---	---	---	---	---	---	---
	16-Sep-1998	12-IN	581	7.43	---	---	290	314	< 0.1	< 0.5	73.2	---	---	392	74.6	26.3	4.2	24.9	383	< 0.5	< 0.5	---	7.81	7.07	---	0.91	---	---	---	0.028	0.086	0.114	---	---	---	< 0.01	---	---
	09-Sep-1999	12-IN	648	7.64	---	---	280	271	< 0.1	1.6	69.4	---	---	364	67.5	26.4	5.7	30	331	< 0.5	< 0.5	---	6.92	6.99	---	1.01	---	---	---	0.009	0.096	0.105	---	---	---	< 0.01	---	---
	06-Sep-2000	12-IN	668	7.57	---	---	330	289	< 0.1	1	81.8	**0.55**	**1.45**	402	95.8	21.4	3.9	24.1	352	< 0.5	< 0.5	---	7.51	7.69	---	1.02	---	---	---	0.035	0.089	0.124	---	---	---	< 0.01	---	---
	06-Sep-2001	12-IN	655	7.96	---	---	340	294	< 0.5	2.1	83.3	< 0.01	**0.116**	414	98	22.7	5	24.3	359	< 0.5	< 0.5	---	---	---	---	1.03	---	---	---	0.041	0.301	0.342	---	---	---	< 0.01	---	---
	04-Sep-2002	12-IN	754	7.7	---	---	330	305	< 0.5	1.1	83.2	0.26	**0.709**	416	96.1	21.3	4.7	24.6	372	< 0.5	< 0.5	---	7.87	7.74	---	0.98	---	---	---	< 0.003	0.295	0.295	---	---	---	< 0.01	28	---
	04-Sep-2003	12-IN	686	7.8	---	---	350	289	< 0.5	1.2	87.1	0.03	**0.994**	419	103	22.2	5.3	24.9	353	< 0.5	< 0.5	---	7.65	8.17	---	1.07	---	---	---	< 0.003	0.175	0.175	---	---	---	< 0.01	31	---
	09-Sep-2004	12-IN	699	8.12	---	---	310	293	< 0.5	1.2	86.3	0.02	**0.14**	403	87.4	21.2	4.5	24.5	358	< 0.5	< 0.5	---	---	---	---	0.94	---	---	---	0.014	0.247	0.261	---	---	---	< 0.01	27.4	---
	08-Sep-2005	12-IN	705	8.02	0.5	---	320	321	< 0.5	0.5	82.6	0.04	**0.707**	429	94.1	20.9	4.1	33	392	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	0.003	0.003	---	---	---	< 0.005	25.4	---
	07-Sep-2006	12-IN	711	7.9	---	---	330	322	< 0.5	1.6	77.4	< 0.01	**0.67**	430	97.2	21.8	3.9	33.8	392	< 0.5	< 0.5	---	---	---	---	1.01	---	---	---	< 0.003	0.058	0.058	---	---	---	---	25.9	---
	10-Dec-2006	12-IN	---	---	---	---	---	---	---	---	---	< 0.06	**0.398**	---	97.8	21.6	3.9	34.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	25.9
	07-Sep-2007	12-IN	720	7.96	---	---	340	319	< 0.5	0.8	78.8	< 0.06	**0.746**	427	99.8	21	3.7	30.5	390	< 0.5	< 0.5	---	---	---	---	1.01	---	---	---	< 0.003	0.011	0.011	---	---	---	---	25.9	---
	05-Sep-2008	12-IN	711	8.1	---	---	313	319	---	0.7	77.5	**0.469**	**0.808**	415	92.7	19.8	3.94	28.7	389	< 5	< 5	0.209	---	---	---	0.948	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	11-Sep-2009	12-IN	704	7.95	---	---	346	312	---	0.52	78.4	0.267	**0.893**	424	104	21	4.52	28.6	381	< 5.0	< 5.0	0.178	---	---	---	1.05	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	12 IN	702	7.95	---	---	312	310	---	0.63	79.1	**0.559**	**0.799**	409	91.2	20.4	3.63	28.2	378	< 5.0	< 5.0	0.223	---	---	95.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	12-IN	547	8.29	---	---	223	240	---	< 0.50	56.8	0.129	**0.314**	307	61	17.1	3.6	24	292	< 5.0	< 5.0	0.176	---	---	93.4	---	---	---	---	< 0.050	0.105	0.105	---	---	---	---	---	---
	06-Sep-2012	12-IN	555	8.16	---	262	262	244	---	< 0.50	59.5	**0.301**	**0.486**	331	73.2	19.3	4.06	27.5	298	< 5.0	< 5.0	0.142	---	---	107	---	---	---	---	< 0.050	0.108	0.108	---	---	---	---	---	---
	17-Sep-2014	12-IN	713	8.41	---	---	326	315	---	< 0.50	83.8	**1.79**	**0.788**	431	97.2	20.2	3.91	36.3	369	7.6	< 5.0	0.21	---	---	102	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	27.2	---
	29-Sep-2015	12-IN	759	7.62	---	---	342	321	---	<0.50	84.4	**1.02**	**0.812**	441	99.2	23.0	4.24	37.5	392	<5.0	<5.0	0.241	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2016	12-IN	710	8.09	---	---	320	307	---	<0.50	76.2	**1.28**	**0.704**	414	95.0	20.1	4.01	34.1	375	<5.0	<5.0	0.194	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	12-IN	640	8.30	---	---	320	314	---	<0.50	76.5	**1.34**	**0.747**	424	93.2	21.3	4.20	40.0	378	<5.0	<5.0	0.188	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	18-Sep-2018	12-IN	669	8.13	---	---	322	323	---	<0.50	73.1	**1.13**	**0.654**	424	96.3	19.8	4.09	36.8	393	<5.0	<5.0	0.223	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	16-Sep-2019	12-IN	671	7.46	---	---	303	352	---	<0.50	73.9	**1.91**	**0.802**	440	89.5	19.2	4.20	41.4	429	<5.0	<5.0	0.276	---	---	---	---	---	---	---	0.011	0.04	0.051	---	---	---	---	---	---
	22-Sep-2020	12-IN	681	7.31	---	---	291	341	---	<0.50	71.8	**1.36**	**0.685**	423	85.8	18.6	3.89	38.4	417	<5.0	<5.0	0.221	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	12-IN	702	7.81	---	---	311	333	---	<0.50	68.1	**0.658**	**0.757**	427	89.1	21.5	4.43	43.3	406	<5.0	<5.0	0.208	---	---	---	---	---	---	---	<0.010	0.028	0.028	---	---	---	---	---	---
	28-Sep-2022	12-IN	662	8.26	---	---	312	320	---	<0.50	63.6	**0.807**	**0.707**	437	89.3	21.5	4.08	41.8	390	<1.0	<1.0	0.191	---	---	---	---	---	---	---	<0.010	0.045	<0.0500	---	---	---	---	---	---
	28-Sep-2023	12-IN	680	8.11	---	---	283	353	---	<0.50	63	<0.010	**0.687**	446	82.1	19	3.85	40.7	430	<1.0	<1.0	0.226	---	---	---	---	---	---	---	<0.010	0.099	0.099	---	---	---	---	---	---
	11-Sep-2024	12-IN	688	7.56	---	---	282	332	---	<0.50	64.1	0.189	**0.726**	432	80.3	19.7	3.85	41.5	404	<1.0	<1.0	0.227	---	---	---	---	---	---	---	0.011	0.062	0.073	---	---	---	---	---	---
	18-Sep-2025	12-IN	694	7.92	---	---	307	334	---	<0.50	59.5	0.023	**0.715**	445	90.1	19.9	4.00	46.7	407	<0.6	<0.3	0.234	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
12(R)-SS	18-Sep-2025	12(R)-SS	893	8.53	---	---	98.8	435	---	4.14	60.2	<0.010	0.00336	**602**	32.6	4.23	4.80	**202**	515	7.9	<0.3	0.418	---	---	---	---	---	---	---	<0.010	0.101	0.101	---	---	---	---	---	---
13-SH	04-Nov-1991	13-SH	492	7.77	---	---	---	232	---	0.9	---	---	---	290	70	17.4	1.68	17.6	282	---	---	---	---	---	---	---	< 0.0010	---	---	0.154	---	---	---	---	---	---	---	---
	12-May-1992	13-SH	526	8.22	---	---	261.6	259	---	0.6	---	---	---	265	74.5	18.3	1.91	11.7	315.7	---	---	---	---	---	---	0.98	< 0.0010	---	---	0.006	0.026	---	---	---	---	---	---	---
	04-Nov-1992	13-SH	453	7.83	---	---	---	234	---	0.6	---	---	---	257	67	16.6	1.64	9.41	285.2	---	---	---	---	---	---	1.01	< 0.0010	---	---	---	0.047	---	---	---	---	---	---	---
	18-May-1993	13-SH	315	7.58	---	---	174	177	---	0.8	---	---	---	194	48.4	12.8	1.24	7.42	216	---	---	---	---	---	---	0.98	< 0.0010	---	---	0.022	0.036	---	---	---	---	---	---	---
	11-Nov-1993	13-SH	474	7.65	---	---	244	239	---	1	---	---	---	266	69	17.4	1.6	10.1	291	---	---	---	---	---	---	1.02	< 0.0010	---	---	< 0.003	0.17	---	---	---	---	---	---	---
	31-May-1994	13-SH	502	7.51	---	---	---	259	< 0.1	0.7	18.5	< 0.01	**0.261**	275	68.5	18	1.4	9.78	316	< 0.5	< 0.5	---	---	---	---	0.96	< 0.001	---	---	0.02	0.02	0.02	---	---	---	---	---	---
	22-Sep-1994	13-SH	443	7.56	---	---	---	229	0.1	2.4	8.7	0.01	**0.332**	240	60	16	5.46	7.9	279	0.5	0.5	---	---	---	---	0.99	< 0.001	---	---	0.13	0.124	0.13	---	---	---	---	---	---
	01-Nov-1994	13-SH	514	7.61	---	---	---	235	< 0.1	3	31.4	< 0.01	**0.309**	281	66	16.3	2.99	18	286	< 0.5	< 0.5	---	---	---	---	1.01	< 0.001	---	---	0.24	0.24	0.24	---	---	---	---	---	---
	28-Sep-1995	13-SH	523	7.35	---	---	255	255	< 0.1	2.1	33.5	< 0.01	**0.322**	307	72.4	18	1.8	23.6	311	< 0.5	< 0.5	---	---	---	---	1.05	< 0.001	---	---	---	0.055	---	---	---	---	---	---	---
	04-Sep-1996	13-SH	569	7.77	---	---	286	281	< 0.1	1.5	16	< 0.01	**0.039**	305	80.8	20.3	1.43	14	343	< 0.5	< 0.5	---	---	---	---	1.06	< 0.001	---	---	---	0.036	0.042	---	---	---	---	---	---
	04-Sep-1997	13-SH	627	7.91	---	---	363	347	< 0.1	1.8	12.6	< 0.01	**0.442**	368	102	26.2	1.4	12.1	423	< 0.5	< 0.5	---	---	---	---	1.08	< 0.001	---	---	---	0.048	0.048	---	---	---	---	---	---
(Duplicate)	04-Sep-1997	13-SH DUP	633	7.9	---	---	350	351	< 0.1	1.7	12.5	< 0.01	**0.496**	365	94.2	27.7	1.5	12.8	428	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	---	0.049	0.049	---	---	---	---	---	---
	16-Sep-1998	13-SH	791	7.64	---	---	430	496	< 0.1	1	15	---	---	484	116	35	1.7	16.6	605	< 0.5	< 0.5	---	10.3	9.45	---	0.92	0.001	---	---	---	0.072	0.083	---	---	---	---	---	---
	09-Sep-1999	13-SH	1380	7.5	---	---	740	796	< 0.1	2	30	---	---	**811**	202	57.2	2	39.7	971	< 0.5	< 0.5	---	16.6	16.5	---	1	< 0.0010	---	< 0.001	---	0.107	0.107	---	---	---	---	---	---
	05-Sep-2000	13-SH	1320	7.41	---	---	690	797	< 0.1	2	29.4	< 0.01	**0.115**	**787**	184	56.7	2.5	33	973	< 0.5	< 0.5	---	16.6	15.4	---	0.92	0.002	---	---	< 0.003	0.099	0.099	---	---	---	---	---	---
	06-Sep-2001	13-SH	1190	7.8	---	---	680	736	< 0.5	1.9	30.4	< 0.01	**0.079**	**754**	186	52.9	2.8	37.5	898	< 0.5	< 0.5	---	---	---	---	0.99	< 0.001	---	---	< 0.003	0.109	0.109	---	---	---	---	---	---
	04-Sep-2002	13-SH	1330	7.51	---	---	630	742	< 0.5	1.9	34.1	0.03	**0.044**	**747**	170	49.5	2.8	42.7	905	< 0.5	< 0.5	---	---	---	---	0.93	0.001	---	---	< 0.003	0.065	0.065	---	---	---	---	12.3	---
	04-Sep-2003	13-SH	1180	7.47	---	---	620	660	< 0.5	0.8	38.5	0.04	< 0.004	**697**	169	49	2.9	41.2	805	< 0.5	< 0.5	---	---	---	---	1.02	---	< 0.004	---	< 0.003	0.073	0.073	---	---	---	---	12.7	---
	09-Sep-2004	13-SH	1160	7.81	---	---	600	631	< 0.5	2.3	40.1	0.04	**0.02**	**667**	165	45.8	2.3	33.4	769	< 0.5	< 0.5	---	---	---	---	1	---	< 0.004	---	< 0.003	0.088	0.088	---	---	---	---	13	---
	08-Sep-2005	13-SH	1040	7.95	37.2	---	470	577	< 0.5	2.1	51.8	0.05	0.009	**624**	127	36.9	2.8	57.1	704	< 0.5	< 0.5	---	---	---	---	0.94	---	< 0.004	---	< 0.003	0.068	0.068	---	---	---	---	14	---
	07-Sep-2006	13-SH	1030	7.81	---	---	460	573	< 0.5	2.5	51.3	< 0.01	**0.025**	**633**	124	35.7	2.7	72.6	699	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	0.084	0.084	---	---	---	---	17.2	---
	05-Sep-2007	13-SH	1010	7.83	---	---	510	574	< 0.5	1.6	45.2	< 0.06	**0.058**	**622**	142	38.3	2.6	47.9	700	< 0.5	< 0.5	---	---	---	---	0.99	---	---	---	< 0.003	0.031	0.031	---	---	---	---	14	---
	03-Sep-2008	13-SH	966	7.9	---	---	289	521	---	1.39	45.4	< 0.030	**0.0707**	486	84.4	19	1.39	20.7	635	< 5	< 5	0.13	---	---	---	0.588	---	---	---	< 0.050	0.133	0.133	---	---	---	---	---	---
	10-Sep-2009	13-SH	1060	7.94	---	---	486	573	---	1.77	47.2	< 0.030	< 0.0050	**602**	134	36.8	2.14	36.5	699	< 5.0	< 5.0	0.121	---	---	---	0.909	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	13 SH	1000	7.79	---	---	456	529	---	1.9	49.6	< 0.030	**0.0646**	**571**	125	34.9	2.11	39.3	645	< 5.0	< 5.0	0.192	---	---	93.2	---	---	---	---	< 0.050	0.086	0.086	---	---	---	---	---	---
	07-Sep-2011	13-SH	879	8.23	---	---	350	457	---	2.25	45.7	< 0.030	**0.0262**	482	95.6	27.1	1.7	33.8	557	< 5.0	< 5.0	0.158	---	---	83.6	---	---	---	---	< 0.050	0.426	0.426	---	---	---	---	---	---
	05-Sep-2012	13-SH	878	8.04	---	358	358	454	---	5.08	50.3	< 0.030	< 0.0050	487	98.9	26.9	1.91	31.5	554	< 5.0	< 5.0	0.132	---	---	83.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	13-SH	876	7.86	---	402	402	484	---	2.83	44.1	< 0.030	**0.171**	**511**	112	29.6	1.44	30.1	591	< 5.0	< 5.0	0.146	---	---	87.6	---	---	---	---	< 0.050	0.072	0.072	---	---	---	---	---	---
	16-Sep-2014	13-SH	837	8.02	---	---	424	430	---	2.59	46.6	< 0.010	**0.0602**	492	118	31.5	1.47	33.6	524	< 5.0	< 5.0	0.191	---	---	104	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	18.1	---
	28-Sep-2015	13-SH	896	7.83	---	---	507	463	---	2.36	60.2	<0.010	**0.0392**	**541**	139	38.8	1.62	20.6	565	<5.0	<5.0	0.155	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2016	13-SH	777	7.97	---	---	440	371	---	1.89	53.2	0.012	**0.0791**	458	123	32.1	1.42	23.5	452	<5.0	<5.0	0.102	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	13-SH	710	7.80	---	---	474	384	---	2.04	58.8	<0.030	**0.1500**	479	128	37.6	1.71	20.8	468	<5.0	<5.0	0.090	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	18-Sep-2018	13-SH	701	7.88	---	---	384	371	---	1.76	52.4	<0.010	**0.0454**	444	107	28.4	1.31	30.5	452	<5.0	<5.0	0.117	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	16-Sep-2019	13-SH	749	7.52	---	---	399	405	---	2.01	49.2	<0.010	**0.1180**	465	110	30.3	1.41	28.5	495	<5.0	<5.0	0.192	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2020	13-SH	795	7.29	---	---	387	388	---	<0.50	51.9	0.062	0.210	444	108	28.6	1.25	20.1	474	<5.0	<5.0	0.127	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	21-Sep-2021	13-SH	733	7.89	---	---	367	382	---	2.84	43.8	<0.030	**0.103**	427	101	27.9	1.16	21.3	467	<5.0	<5.0	0.153	---	---	---	---	---	---	---	<0.010	0.021	<0.022	---	---	---	---	---	---
	29-Sep-2022	13-SH	706	8.14	---	---	382	369	---	2.07	46.0	<0.030	**0.021**	454	104	29.6	1.32	19.9	450	<1.0	<1.0	0.121	---	---	---	---	---	---	---	<0.010	0.025	<0.0500	---	---	---	---	---	---
	28-Sep-2023	13-SH	950	7.89	---	---	537	509	---	<0.50	81.4	<0.010	**0.238**	**626**	153	37.6	2	13.7	621	<1.0	<1.0	0.136	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	10-Sep-2024	13-SH	967	7.04	---	---	557	498	---	<0.50	89.6	<0.010	**0.252**	**628**	156	40.6	1.75	11.5	607	<1.0	<1.0	0.139	---	---	---	---	---	---	---	<0.010	0.021	<0.0500	---	---	---	---	---	---
	17-Sep-2025	13-SH	1010	7.46	---	---	601	535	---	<0.50	73.8	0.019	**0.360**	**655**	170	42.9	1.75	13.6	653	<0.6	<0.3	0.129	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [13]	0.0019	---	---
13-IN	17-May-1991	13-IN	560	7.59	---	---	234.6	261	---	0.7	---	---	---	285	67.5	16	4.2	13.5	318.2	---	---	---	---	---	---	---	< 0.0010	---	---	0.229	0.005	---	---	---	---	---	---	---
	04-Nov-1991	13-IN	531	7.85	---	---	---	269	---	1	---	---	---	310	80	16.7	3.88	13.8	327.9	---	---	---	---	---	---	---	< 0.0020	---	---	0.051	---	---	---	---	---	---	---	---
	12-May-1992	13-IN	588	7.44	---	---	284.9	286	---	0.8	---	---	---	297	85	17.6	4.05	15.2	348.6	---	---	---	---	---	---	0.98	< 0.0010	---	---	0.053	0.417	---	---	---	---	---	---	---
	04-Nov-1992	13-IN	557	7.89	---	---	---	283	---	1.6	---	---	---	349	86	19	3.89	16.7	345	---	---	---	---	---	---	0.99	< 0.0010	---	---	---	0.166	---	---	---	---	---	---	---
	18-May-1993	13-IN	609	7.55	---	---	---	---	---	1.1	---	---	---	400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Nov-1993	13-IN	630	7.44	---	---	301	293	---	0.8	---	---	---	363	88.5	19.3	4	17.8	357	---	---	---	---	---	---	0.98	< 0.0010	---	---	0.008	0.091	---	---	---	---	---	---	---
	22-Sep-1994	13-IN	664	7.33	---	---	325	310	0.1	1	57.4	0.01	**1.32**	385	92	23	4.01	18.3	378	0.5	0.5	---	---	---	---	1	---	---	---	< 0.003	0.015	0.015	---	---	---	**0.71**	---	---
	28-Sep-1995	13-IN	564	7.44	---	---	305	320	< 0.1	1.6	52	< 0.01	**0.316**	381	84.6	22.6	4.7	20.3	390	< 0.5	< 0.5	---	---	---	---	0.94	---	---	---	0.003	0.01	0.013	---	---	---	< 0.01	---	---
	04-Sep-1996	13-IN	682	7.64	---	---	332	327	< 0.1	1.1	52.7	< 0.01	**0.46**	397	96.7	22	4.23	20.9	399	< 0.5	< 0.5	---	---	---	---	1	---	---	---	< 0.003	0.016	0.016	---	---	---	< 0.005	---	---
	04-Sep-1997	13-IN	497	8.17	---	---	243	231	< 0.1	0.9	42.8	**0.34**	**0.45**	293	56.5	24.6	4.7	22.2	282	< 0.5	< 0.5	---	---	---	---	1.07	---	---	---	< 0.003	0.104	0.104	---	---	---	**0.56**	---	---
	16-Sep-1998	13-IN	680	8.20	---	---	350	208	< 0.1	< 0.5	45	---	---	320	100	23.1	4.1	22.9	254	< 0.5	< 0.5	---	5.1	8.02	---	1.57	---	---	---	0.01	0.01	0.02	---	---	---	< 0.01	---	---
	09-Sep-1999	13-IN	666	7.60	---	---	340	274	< 0.1	0.7	83.8	---	---	395	98.5	22.8	4.1	20.5	334	< 0.5	< 0.5	---	7.25	7.79	---	1.08	---	---	---	0.008	0.019	0.027	---	---	---	**1.22**	---	---
(Duplicate)	09-Sep-1999	13-IN DUP	698	7.66	---	---	350	294	< 0.1	1	82	---	---	409	98.3	25.7	4.4	21.2	359	< 0.5	< 0.5	---	7.62	8.06	---	1.06	< 0.001	---	< 0.001	---	0.037	0.044	---	---	---	---	---	---
	05-Sep-2000	13-IN	668	7.62	---	---	330	292	< 0.1	0.9	86.2	< 0.01	**2.28**	406	96.5	21.2	4.3	21.5	356	< 0.5	< 0.5	---	7.66	7.61	---	0.99	---	---	---	< 0.003	0.013	0.013	---	---	---	< 0.01	---	---
	06-Sep-2001	13-IN	641	7.90	---	---	330	285	< 0.5	0.9	86.1	< 0.01	**1.76**	404	97.9	21.9	4.3	20.3	348	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	< 0.003	0.032	0.032	---	---	---	< 0.01	---	---
	04-Sep-2002	13-IN	713	7.61	---	---	380	287	< 0.5	0.8	96.2	0.2	**0.972**	433	111	25.8	3.6	22.9	350	< 0.5	< 0.5	---	7.76	8.74	---	1.13	---	---	---	< 0.003	0.013	0.013	---	---	---	< 0.01	25.9	---
	04-Sep-2003	13-IN	674	7.64	---	---	360	272	< 0.5	2	99.1	**0.77**	**1.19**	421	106	21.9	4.5	22.1	332	< 0.5	< 0.5	---	7.56	8.22	---	1.09	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	35.6	---
	09-Sep-2004	13-IN	707	7.85	---	---	310	280	< 0.5	0.8	103	0.01	**1.14**	406	90.3	19.3	4.3	18.9	341	< 0.5	< 0.5	---	---	---	---	0.91	---	---	---	< 0.003	0.016	0.016	---	---	---	< 0.01	29.7	---
	08-Sep-2005	13-IN	637	8.28	37.7	---	310	274	< 0.5	0.9	97.8	**1.4**	**0.789**	403	92	20.4	4	21.2	334	< 0.5	< 0.5	---	---	---	---	0.97	---	---	---	< 0.003	0.003	0.003	---	---	---	< 0.005	32	---
	07-Sep-2006	13-IN	681	7.87	---	---	360	274	< 0.5	1.4	102	0.15	**0.487**	426	105	23.9	3.7	25.4	334	< 0.5	< 0.5	---	---	---	---	1.1	---	---	---	< 0.003	0.041	0.041	---	---	---	---	29.9	---
	05-Sep-2007	13-IN	692	7.92	---	---	340	281	< 0.5	0.6	101	**0.33**	**0.887**	422	102	20.8	4	24.1	343	< 0.5	< 0.5	---	---	---	---	1.03	---	---	---	< 0.003	0.014	0.014	---	---	---	---	32	---
	03-Sep-2008	13-IN	693	8.00	---	---	324	294	---	< 0.50	98.7	0.163	**0.907**	418	96.7	20.1	4.17	21.6	358	< 5	< 5	0.18	---	---	---	0.949	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	10-Sep-2009	13-IN	686	7.95	---	---	354	275	---	0.65	101	**0.363**	**0.752**	424	107	21.1	4.51	24.8	336	< 5.0	< 5.0	0.172	---	---	---	1.08	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	13 IN	693	7.85	---	---	318	274	---	0.57	107	0.191	**0.634**	412	93.9	20.2	3.85	21.5	334	< 5.0	< 5.0	0.216	---	---	95.5	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	13-IN	708	8.21	---	---	322	283	---	< 0.50	101	0.188	**0.943**	414	94	21.1	4.29	23.2	346	< 5.0	< 5.0	0.21	---	---	96.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	13-IN	692	8.03	---	327	327	281	---	0.5	98.7	**0.568**	**0.993**	411	97.6	20.3	4.19	21	343	< 5.0	< 5.0	0.17	---	---	98.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	13-IN	677	7.81	---	311	311	284	---	< 0.50	98.9	0.299	**0.907**	412	91.5	20.1	3.93	27.3	347	< 5.0	< 5.0	0.155	---	---	96.8	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	16-Sep-2014	13-IN	687	8.34	---	---	317	277	---	< 0.50	96.8	0.170	**0.886**	413	94.3	19.9	4.10	31.3	332	< 5.0	< 5.0	0.196	---	---	104	---	---	---	---	< 0.020	0.114	0.114	---	---	---	---	32.4	---
	28-Sep-2015	13-IN	691	8.10	---	---	336	288	---	0.54	104	0.010	**0.640**	431	99.7	21.2	4.06	28.2	352	<5.0	<5.0	0.223	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2016	13-IN	694	8.09	---	---	327	265	---	<0.50	96	0.088	**0.753**	404	98.7	19.5	4.01	26.5	323	<5.0	<5.0	0.171	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	13-IN	652	7.94	---	---	331	279	---	<0.50	98	<0.030	**0.498**	422	97.3	21.5	4.22	33.4	340	<5.0	<5.0	0.167	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---
	18-Sep-2018	13-IN	662	8.07	---	---	316	294	---	<0.50	95	0.015	**0.526**	418	93.5	20.0	3.96	29.7	359	<5.0	<5.0	0.197	---	---	---	---	---	---	---	<0.010	0.021	<0.022	---	---	---	---	---	---
	16-Sep-2019	13-IN	672	7.43	---	---	316	309	---	0.53	96	0.022	**0.273**	435	93.1	20.4	4.23	34.9	377	<5.0	<5.0	0.242	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2020	13-IN	715	7.12	---	---	319	302	---	0.53	93.5	0.082	**0.754**	423	95.3	19.6	4.02	27.8	369	<5.0	<5.0	0.194	---	---	---	---	---	---	---	<0.010	0.115	0.115	---	---	---	---	---	---
	21-Sep-2021	13-IN	684	7.90	---	---	340	306	---	<0.50	87.3	0.074	**0.74**	429	97.8	23.3	4.64	31	374	<5.0	<5.0	0.172	---	---	---	---	---	---	---	<0.010	0.176	0.176	---	---	---	---	---	---
	29-Sep-2022	13-IN	687	8.24	---	---	353	309	---	0.57	90.7	0.038	**0.878**	459	103.0	23.3	4.73	28.6	377	<1.0	<1.0	0.163	---	---	---	---	---	---	---	<0.010	0.231	0.231	---	---	---	---	---	---
	28-Sep-2023	13-IN	705	8.17	---	---	318	324	---	<0.50	86.2	0.016	0.0103	449	94.9	19.8	3.86	33.8	396	<1.0	<1.0	0.167	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	10-Sep-2024	13-IN	691	7.57	---	---	341	313	---	0.51	89.9	<0.010	**0.210**	452	101	21.6	4.04	28.3	382	<1.0	<1.0	0.198	---	---	---	---	---	---	---	<0.010	0.066	0.066	---	---	---	---	---	---
	17-Sep-2025	13-IN	701	7.80	---	---	326	314	---	0.57	83.2	0.038	**0.309**	450	96.1	20.9	3.95	38.6	383	<0.6	<0.3	0.20	---	---	---	---	---	---	---	<0.010	0.032	<0.0500	---	---	---	---	---	---
13-SS	17-May-1991	13-SS	467	8.11	---	---	181.5	210	---	0.4	---	---	---	244	52	12.5	2.7	24.2	256	---	---	---	---	---	---	---	< 0.0010	---	---	0.565	< 0.003	---	---	---	---	---	---	---
	13-May-1992	13-SS	478	8.09	---	---	199.1	228	---	0.3	---	---	---	236	56.9	13.8	4.11	22	277.9	---	---	---	---	---	---	0.97	< 0.0010	---	---	0.023	0.098	---	---	---	---	---	---	---
	18-May-1993	13-SS	466	7.75	---	---	---	---	---	< 0.50	---	---	---	303	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	11-Nov-1993	13-SS	478	7.52	---	---	218	237	---	0.6	---	---	---	285	64	14.1	3.8	26.5	289	---	---	---	---	---	---	1.04	< 0.0010	---	---	< 0.003	0.028	---	---	---	---	---	---	---
13(R)SS	10-Sep-2004	13(R)-SS	822	7.88	---	---	400	433	< 0.5	2.5	18.9	0.04	**0.493**	445	117	26.8	2.5	17.1	528	< 0.5	< 0.5	---	---	---	---	0.97	---	---	---	0.004	0.047	0.051	---	---	---	---	6.3	---
	08-Sep-2005	13(R)-SS	606	8.08	33.1	---	300	324	< 0.5	1.7	27	0.01	**0.406**	349	91	16.6	4.2	14.1	395	< 0.5	< 0.5	---	---	---	---	0.94	---	---	---	< 0.003	0.013	0.013	---	---	---	< 0.005	7.7	---
	07-Sep-2006	13(R)-SS	645	7.97	---	---	320	324	< 0.5	2.3	29.8	0.01	**0.92**	365	98.3	18.9	4.3	15.8	396	< 0.5	< 0.5	---	---	---	---	1.01	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	---	9.4	---
	16-Oct-2007	13(R)-SS	567	8.03	---	---	270	299	< 0.5	< 0.5	23.5	< 0.06	**0.612**	320	84.5	14.6	3.7	13.2	365	< 0.5	< 0.5	---	---	---	---	0.94	---	---	---	< 0.003	0.024	0.024	---	---	---	---	6.9	---
	04-Sep-2008	13(R)-SS	566	8	---	---	232	289	---	0.64	24.3	< 0.030	**0.612**	312	71.6	12.9	4.97	24.2	353	< 5	< 5	0.114	---	---	---	0.921	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	17-Sep-2009	13(R)-SS	673	8.14	---	---	205	287	---	1.02	81.2	< 0.030	0.0109	391	54.6	16.7	6.65	56.9	350	< 5.0	< 5.0	0.703	---	---	---	0.899	---	---	---	< 0.050	0.191	0.191	---	---	---	---	---	---
	09-Sep-2010	13 (R) SS	514	7.88	---	---	219	252	---	< 0.50	22.3	< 0.030	**0.384**	272	68.4	11.6	3.94	14.3	307	< 5.0	< 5.0	0.139	---	---	92.4	---	---	---	---	< 0.050	0.07	< 0.071	---	---	---	---	---	---
	08-Sep-2011	13 (R)-SS	538	8.18	---	---	230	261	---	0.8	28.8	< 0.030	**0.2**	310	71.2	12.8	5.69	33.2	318	< 5.0	< 5.0	0.134	---	---	106	---	---	---	---	< 0.050	0.238	0.238	---	---	---	---	---	---
	26-Sep-2013	13(R)SS	432	7.93	---	197	197	225	---	< 0.50	19.9	< 0.030	**0.309**	244	59.8	11.6	3.59	13.9	274	< 5.0	< 5.0	0.118	---	---	94.3	---	---	---	---	< 0.050	0.056	< 0.071	---	---	---	---	---	---
	16-Sep-2014	13(R)SS	449	8.29	---	---	203	221	---	< 0.50	22.1	< 0.010	**0.592**	248	61.7	12.0	3.86	15.9	269	< 5.0	< 5.0	0.152	---	---	99.6	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	7.27	---
	28-Sep-2015	13(R)SS	462	8.04	---	---	211	226	---	<0.50	24.8	<0.010	**0.462**	256	64.0	12.4	3.92	15.2	275	<5.0	<5.0	0.166	---	---	---	---	---	---	---	<0.010	0.084	0.084	---	---	---	---	---	---
	26-Sep-2016	13(R)SS	461	8.05	---	---	200	219	---	<0.50	23.7	<0.010	**0.150**	246	62.4	10.7	3.78	13.8	267	<5.0	<5.0	0.120	---	---	---	---	---	---	---	<0.010	0.043	0.043	---	---	---	---	---	---
	27-Sep-2017	13(R)SS	441	8.49	---	---	211	228	---	<0.50	25.0	<0.030	**0.182**	262	63.9	12.5	4.25	19.2	263	7.7	<5.0	0.128	---	---	---	---	---	---	---	<0.010	0.080	0.08	---	---	---	---	---	---
	18-Sep-2018	13(R)SS	436	7.93	---	---	200	225	---	<0.50	23.5	<0.010	**0.084**	249	61.4	11.3	3.66	13.7	274	<5.0	<5.0	0.142	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	16-Sep-2019	13(R)SS	424	7.29	---	---	210	246	---	<0.50	22.1	<0.010	**0.251**	266	64.6	11.9	4.13	14.7	300	<5.0	<5.0	0.203	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2020	13(R)SS	453	7.06	---	---	201	223	---	<0.50	20.9	<0.010	**0.913**	245	62.5	11.0	3.62	13.3	272	<5.0	<5.0	0.163	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	21-Sep-2021	13(R)SS	451	7.56	---	---	214	230	---	<0.50	20	<0.030	**0.0289**	255	64	13.1	4.28	14.7	280	<5.0	<5.0	0.136	---	---	---	---	---	---	---	<0.010	0.139	0.139	---	---	---	---	---	---
	29-Sep-2022	13(R)SS	444	8.06	---	---	218	230	---	<0.50	20.1	<0.030	<0.00500	290	64.9	13.6	3.92	14.8	280	<1.0	<1.0	0.137	---	---	---	---	---	---	---	<0.010	0.194	0.194	---	---	---	---	---	---
Could not obtain sample	28-Sep-2023	13(R)SS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Sep-2024	13(R)SS	424	7.50	---	---	206	224	---	<0.50	19.0	<0.010	0.0022	280	62.40	12.30	3.75	13.80	273	<1.0	<1.0	0.16	---	---	---	---	---	---	---	<0.010	0.19	0.19	---	---	---	---	---	---
	17-Sep-2025	13(R)SS	425	7.75	---	---	203	219	---	<0.50	17.0	<0.010	0.00152	278	62.4	11.5	3.72	14.9	267	<0.6	<0.3	0.172	---	---	---	---	---	---	---	<0.010	0.190	0.190	---	---	---	---	---	---
14-SH [Decommissioned]	13-Nov-1993	14-SH	449	7.8	---	---	237	235	---	1.3	---	---	---	245	66.5	17.1	3.4	6.3	286	---	---	---	---	---	---	1.04	0.003	---	---	0.003	0.029	---	---	---	---	---	---	---
	31-May-1994	14-SH	499	7.44	---	---	---	260	< 0.1	1.3	13.5	< 0.01	**0.092**	277	74.4	17.7	3.09	8.42	317	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	0.016	0.016	0.016	---	---	---	---	---	---
	22-Sep-1994	14-SH	494	7.35	---	---	---	261	0.1	1.6	13	0.01	**0.598**	270	62	20	3.12	11	318	0.5	0.5	---	---	---	---	0.96	< 0.001	---	---	0.024	0.024	0.024	---	---	---	---	---	---
	02-Nov-1994	14-SH	526	8.35	---	---	---	270	7.4	1.2	12.4	< 0.01	**0.412**	283	70.5	18.9	2.62	13.3	311	8.8	< 0.5	---	---	---	---	1.01	< 0.001	---	---	0.009	0.009	0.009	---	---	---	---	---	---
	28-Sep-1995	14-SH	478	7.33	---	---	261	279	< 0.1	1.7	11.4	< 0.01	**0.485**	294	71.4	20	2.2	17.1	340	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	---	0.018	---	---	---	---	---	---	---
(Duplicate)	28-Sep-1995	14-SH DUP	491	7.38	---	---	256	267	< 0.1	1.8	10.9	0.02	**0.487**	288	70	19.7	2.3	20.1	325	< 0.5	< 0.5	---	---	---	---	1.08	< 0.001	---	---	---	0.015	---	---	---	---	---	---	---
	05-Sep-1996	14-SH	476	7.41	---	---	223	243	< 0.1	2.2	10.1	< 0.01	**0.351**	253	62.2	16.5	1.71	12.4	296	< 0.5	< 0.5	---	---	---	---	0.98	0.001	---	---	---	0.062	0.062	---	---	---	---	---	---
	05-Sep-1997	14-SH	565	7.57	---	---	331	299	< 0.1	5.4	9.6	< 0.01	**0.067**	333	92.4	24.3	2.4	16.1	364	< 0.5	< 0.5	---	---	---	---	---	< 0.001	---	---	---	0.084	0.087	---	---	---	---	---	---
	15-Sep-1998	14-SH	616	6.86	---	---	180	261	< 0.1	13.2	59.8	---	---	364	48.8	13.8	1.7	64.1	318	< 0.5	< 0.5	---	6.93	6.4	---	0.92	0.001	---	---	---	1.24	1.24	---	---	---	---	---	---
	05-Sep-2000	14-SH	821	7.36	---	---	400	337	< 0.1	17.1	106	< 0.01	**1.07**	**500**	110	30.1	2.7	31.5	411	< 0.5	< 0.5	---	9.44	9.41	---	1	0.003	---	---	0.005	0.042	0.047	---	---	---	---	---	---
	06-Sep-2001	14-SH	953	7.71	---	---	540	506	< 0.5	8.2	72.2	< 0.01	**0.852**	**606**	149	40.5	3.2	28.1	618	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	< 0.003	0.011	0.011	---	---	---	---	---	---
	05-Sep-2002	14-SH	1260	7.75	---	---	630	672	< 0.5	7.2	36.9	0.03	**0.842**	**701**	174	46.3	3.5	28.6	820	< 0.5	< 0.5	---	---	---	---	0.96	0.001	---	---	< 0.003	0.017	0.017	---	---	---	---	11	---
	04-Sep-2003	14-SH	810	7.41	---	---	380	380	< 0.5	4	74.2	0.08	0.006	486	104	28	2.4	44.7	463	< 0.5	< 0.5	---	---	---	---	1.03	---	< 0.004	---	< 0.003	0.021	0.021	---	---	---	---	25	---
	09-Sep-2004	14-SH	1070	7.65	---	---	590	667	< 0.5	6.5	25.3	0.03	**0.309**	**673**	164	44.9	3.3	27.4	814	< 0.5	< 0.5	---	---	---	---	0.93	---	< 0.004	---	< 0.003	0.132	0.132	---	---	---	---	6.4	---
	08-Sep-2005	14-SH	1050	8.13	19.8	---	600	650	< 0.5	5.6	18.4	0.03	**0.103**	**654**	165	44.8	3.2	25.9	794	< 0.5	< 0.5	---	---	---	---	0.97	---	0.004	---	0.004	0.085	0.089	---	---	---	---	7.6	---
	07-Sep-2006	14-SH	1270	7.83	---	---	580	732	< 0.5	6	15.8	0.04	**0.092**	**698**	153	49.5	3.8	30.8	893	< 0.5	< 0.5	---	---	---	---	0.87	---	---	---	< 0.003	0.092	0.092	---	---	---	---	5.5	---
	05-Sep-2007	14-SH	1280	7.81	---	---	600	751	< 0.5	5.5	13.3	< 0.06	**0.19**	**714**	163	47.2	4	29.3	916	< 0.5	< 0.5	---	---	---	---	0.87	---	---	---	< 0.003	0.146	0.146	---	---	---	---	4.5	---
	03-Sep-2008	14-SH	1210	7.8	---	---	567	708	---	4.55	12.8	0.095	**0.245**	**672**	152	45.4	3.84	28.2	864	< 5	< 5	0.182	---	---	---	0.868	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	09-Sep-2009	14-SH	1200	7.87	---	---	632	691	---	4.52	12.3	0.08	**0.584**	**688**	178	45.5	3.94	28.5	843	< 5.0	< 5.0	0.156	---	---	---	0.983	---	---	---	< 0.050	0.051	< 0.071	---	---	---	---	---	---
	09-Sep-2010	14 SH	1190	7.61	---	---	484	681	---	4.59	14.1	< 0.030	**0.109**	**621**	132	37.6	2.91	20.9	831	< 5.0	< 5.0	0.222	---	---	75.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	14-SH	1190	8.12	---	---	358	685	---	3.99	14.3	< 0.030	**0.0849**	**573**	98.6	27.1	2.04	15.8	835	< 5.0	< 5.0	0.206	---	---	55.9	---	---	---	---	< 0.050	0.07	< 0.071	---	---	---	---	---	---
	05-Sep-2012	14-SH	1100	8.02	---	517	518	652	---	3.77	15.4	0.09	**0.404**	**618**	143	39.1	3.09	22.4	795	< 5.0	< 5.0	0.181	---	---	84.7	---	---	---	---	< 0.050	0.072	0.072	---	---	---	---	---	---
	25-Sep-2013	14-SH	1160	7.65	---	643	642	715	---	3.51	20.2	< 0.030	**0.218**	**706**	176	49.3	3.34	24.4	872	< 5.0	< 5.0	0.177	---	---	94.3	---	---	---	---	< 0.050	0.085	0.085	---	---	---	---	---	---
	16-Sep-2014	14-SH	1160	7.97	---	---	633	660	---	3.55	23.5	< 0.010	**0.225**	**675**	175	47.7	3.45	25.6	806	< 5.0	< 5.0	0.185	---	---	100	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	7.75	---
	29-Sep-2015	14-SH	1200	7.34	---	---	695	646	---	3.74	27.7	<0.010	**0.153**	**693**	191	53.0	3.72	26.1	788	<5.0	<5.0	0.202	---	---	---	---	---	---	---	<0.010	0.069	0.069	---	---	---	---	---	---
	27-Sep-2016	14-SH	1040	7.86	---	---	628	581	---	2.91	32.0	<0.010	**0.210**	**631**	177	45.3	3.36	21.1	709	<5.0	<5.0	0.157	---	---	---	---	---	---	---	<0.010	0.049	0.049	---	---	---	---	---	---
	26-Sep-2017	14-SH	871	7.45	---	---	621	552	---	<2.5	37.9	<0.030	**0.090**	**612**	166	50.1	3.25	23.1	673	<5.0	<5.0	0.130	---	---	---	---	---	---	---	<0.050	0.100	<0.11	---	---	---	---	---	---
	17-Sep-2018	14-SH	664	7.89	---	---	627	368	---	1.58	23.1	<0.010	**0.122**	**494**	174	46.7	3.59	22.7	449	<5.0	<5.0	0.135	---	---	---	---	---	---	---	<0.010	0.256	0.256	---	---	---	---	---	---
	16-Sep-2019	14-SH	493	7.47	---	---	82.3	286	---	0.90	19.8	<0.010	0.0007	237	23	6.2	0.81	10.6	349	<5.0	<5.0	0.194	---	---	---	---	---	---	---	<0.010	0.869	0.869	---	---	---	---	---	---
	22-Sep-2020	14-SH	733	7.01	---	---	362	370	---	1.29	29.1	<0.010	0.0348	398	99.3	27.6	2.08	15.7	451	<5.0	<5.0	0.154	---	---	---	---	---	---	---	<0.010	0.067	0.067	---	---	---	---	---	---
	22-Sep-2021	14-SH	764	7.75	---	---	435	410	---	1.45	31.6	<0.030	**0.0545**	452	118	34.2	2.35	17.7	501	<5.0	<5.0	0.126	---	---	---	---	---	---	---	<0.010	0.151	0.151	---	---	---	---	---	---
	28-Sep-2022	14-SH	718	8.12	---	---	425	394	---	1.33	30.7	<0.030	**0.0632**	461	112	35.3	2.32	17.6	481	<1.0	<1.0	0.137	---	---	---	---	---	---	---	<0.010	0.458	0.458	---	---	---	---	---	---
	27-Sep-2023	14-SH	856	8.12	---	---	308	459	---	2.49	26.3	<0.010	**0.00668**	444	81.6	25.3	1.9	13.1	560	<1.0	<1.0	0.176	---	---	---	---	---	---	---	<0.010	0.104	0.104	---	---	---	---	---	---
	11-Sep-2024	14-SH	864	7.22	---	---	480	479	---	1.66	42.9	<0.010	**0.0776**	**547**	130	37.7	2.24	15.9	584	<1.0	<1.0	0.160	---	---	---	---	---	---	---	<0.010	0.064	0.064	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	**7.0-10.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.05**	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	**1.0**	---	---	---	---	---	---	---	**0.12**	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1**	**10**	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	**6.5 - 8.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1.0**	**10**	---	---	---	---	**0.05**	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	**6.5 - 8.5**	---	---	---	---	---	**120**	**Variable**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	---	---	---	**Variable [13]**	**0.0019**	---	---
14(R)-SH - No sample obtained	18-Sep-2025	14(R)-SH	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14(R)-IN	18-Sep-2025	14(R)-IN	867	7.80	---	---	477	501	---	2.32	17.3	<0.010	**0.105**	**549**	132	35.9	2.91	27.7	611	<0.6	<0.3	0.234	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
14(R)-SS	18-Sep-2025	14(R)-SS	600	8.68	---	---	45.1	274	---	14.1	29.6	0.018	**0.0397**	390	14.8	1.98	3.04	140	315	9.6	<0.3	0.695	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
15-SH	18-May-1993	15-SH	373	7.54	---	---	210	226	---	0.8	---	---	---	231	58.2	15.7	1.48	5.71	275	---	---	---	---	---	---	0.94	< 0.0010	---	---	0.009	0.021	---	---	---	---	---	---	---
	12-Nov-1993	15-SH	480	7.9	---	---	215	236	---	3.2	---	---	---	264	63	14	6.4	15.7	288	---	---	---	---	---	---	0.99	0.01 [3]	---	---	0.005	0.052	---	---	---	---	---	---	---
	31-May-1994	15-SH	623	7.2	---	---	---	296	< 0.1	1.4	45	< 0.01	**0.626**	363	88.2	17.7	2.78	27.4	361	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	0.063	0.055	0.063	---	---	---	---	---	---
	22-Sep-1994	15-SH	620	7.29	---	---	---	304	0.1	0.9	39.1	0.01	**0.293**	359	88	20	3.17	21.9	371	0.5	0.5	---	---	---	---	1.02	< 0.001	---	---	0.345	0.329	0.345	---	---	---	---	---	---
	01-Nov-1994	15-SH	654	7.41	---	---	---	302	< 0.1	1.3	47.3	< 0.01	0.011	373	86.6	18	3.06	32.2	368	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	0.675	0.671	0.675	---	---	---	---	---	---
	28-Sep-1995	15-SH	563	7.01	---	---	308	304	< 0.1	1.1	32.6	< 0.01	**0.45**	355	91.1	19.5	2.9	21.9	371	< 0.5	< 0.5	---	---	---	---	1.06	< 0.001	---	---	---	0.145	---	---	---	---	---	---	---
(Duplicate)	28-Sep-1995	15-SH DUP	543	7.09	---	---	292	306	< 0.1	0.9	34.5	< 0.01	**0.329**	351	84.4	19.6	2.9	22	373	< 0.5	< 0.5	---	---	---	---	1	< 0.001	---	---	---	0.148	---	---	---	---	---	---	---
	04-Sep-1996	15-SH	676	7.14	---	---	322	316	< 0.1	0.9	58.8	< 0.01	**0.293**	398	96.1	19.9	2.88	27	385	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	---	0.035	0.054	---	---	---	---	---	---
	04-Sep-1997	15-SH	726	7.23	---	---	344	315	< 0.1	0.8	91.5	< 0.01	**0.091**	449	99.4	23.1	1.91	40.3	384	< 0.5	< 0.5	---	---	---	---	1.05	< 0.001	---	---	---	0.023	0.035	---	---	---	---	---	---
	16-Sep-1998	15-SH	564	7.02	---	---	240	269	< 0.1	< 0.5	76	---	---	362	68.9	16.9	1.3	37.2	328	< 0.5	< 0.5	---	6.97	6.48	---	0.93	0.001	---	---	---	0.054	0.077	---	---	---	---	---	---
	09-Sep-1999	15-SH	669	7.58	---	---	350	309	< 0.1	< 0.5	56.9	---	---	392	101	23.5	2.4	20.9	377	< 0.5	< 0.5	---	7.4	7.93	---	1.07	< 0.001	---	< 0.001	---	0.434	0.448	---	---	---	---	---	---
	06-Sep-2000	15-SH	629	7.58	---	---	300	311	< 0.1	0.9	44.3	< 0.01	**0.197**	369	88.5	20.3	3.5	23.7	380	< 0.5	< 0.5	---	7.19	7.21	---	1	0.004	---	---	0.014	0.188	0.202	---	---	---	---	---	---
	07-Sep-2001	15-SH	590	7.88	---	---	310	310	< 0.5	0.7	31.9	< 0.01	**0.227**	354	90.2	20.7	3.4	21	378	< 0.5	< 0.5	---	---	---	---	1.05	< 0.001	---	---	0.008	0.082	0.09	---	---	---	---	---	---
	05-Sep-2002	15-SH	664	7.84	---	---	290	328	< 0.5	0.5	26.7	0.02	**0.097**	351	85.5	18.9	2.9	18.1	400	< 0.5	< 0.5	---	---	---	---	0.93	0.001	---	---	< 0.003	0.325	0.325	---	---	---	---	8.3	---
	03-Sep-2003	15-SH	609	7.71	---	---	310	311	< 0.5	0.6	24.2	0.01	**0.268**	351	92.8	19.9	3.2	21.5	380	< 0.5	< 0.5	---	---	---	---	1.08	---	< 0.004	---	< 0.003	0.325	0.325	---	---	---	---	9.1	---
	08-Sep-2004	15-SH	642	7.89	---	---	290	322	< 0.5	1.6	25.4	0.01	0.007	348	85.6	18.9	2.9	18.3	393	< 0.5	< 0.5	---	---	---	---	0.95	---	< 0.004	---	0.004	0.366	0.37	---	---	---	---	8	---
	07-Sep-2005	15-SH	607	8.08	3.8	---	290	325	< 0.5	< 0.5	24.1	0.08	**0.386**	343	84.8	18.5	2.7	16.7	397	< 0.5	< 0.5	---	---	---	---	0.93	---	< 0.004	---	0.008	0.012	0.02	---	---	---	---	7.6	---
	07-Sep-2006	15-SH	603	7.93	---	---	290	311	< 0.5	1.5	20.6	0.03	**0.21**	335	84	19.1	3	19.5	380	< 0.5	< 0.5	---	---	---	---	1	---	---	---	0.006	0.09	0.096	---	---	---	---	7	---
	06-Sep-2007	15-SH	605	7.99	---	---	300	313	< 0.5	0.9	19.1	< 0.06	**0.201**	338	87.4	19.1	3	20.3	382	< 0.5	< 0.5	---	---	---	---	1.03	---	---	---	< 0.003	0.021	0.021	---	---	---	---	5.9	---
	04-Sep-2008	15-SH	672	8.1	---	---	278	342	---	< 0.50	36	0.063	**0.609**	378	79.9	19	4.06	33.7	417	< 5	< 5	0.186	---	---	---	0.938	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	10-Sep-2009	15-SH	563	7.97	---	---	301	314	---	0.59	15	< 0.030	**0.235**	333	88.9	19.2	3.2	18	383	< 5.0	< 5.0	0.193	---	---	---	1.04	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	15 SH	660	8.03	---	---	287	325	---	0.55	39.2	< 0.030	**0.61**	374	81.8	20.2	3.93	33.5	396	< 5.0	< 5.0	0.221	---	---	99.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	15-SH	662	8.3	---	---	288	332	---	< 0.50	37	< 0.030	**0.602**	378	82	20.3	4.1	34.7	400	< 5.0	< 5.0	0.211	---	---	101	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	06-Sep-2012	15-SH	663	8.18	---	300	300	339	---	< 0.50	37.5	0.248	**0.675**	387	86.4	20.5	4.29	35.2	414	< 5.0	< 5.0	0.178	---	---	101	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	15-SH	647	7.85	---	289	289	343	---	< 0.50	34.4	**0.461**	**0.678**	379	82.5	20.2	4.05	31.4	419	< 5.0	< 5.0	0.158	---	---	95.5	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
(Previously labeled 15-IN)	17-Sep-2014	15-SH	627	8.33	---	---	315	346	---	< 0.50	11.5	0.016	**0.211**	367	95.2	18.8	3.33	29.7	416	< 5.0	< 5.0	0.209	---	---	108	---	---	---	---	< 0.020	0.089	0.089	---	---	---	---	5.51	---
	29-Sep-2015	15-SH	727	7.55	---	---	340	381	---	<0.50	12.7	<0.010	**0.370**	401	97.5	23.5	3.35	33.5	465	<5.0	<5.0	0.257	---	---	---	---	---	---	---	<0.010	0.344	0.344	---	---	---	---	---	---
	27-Sep-2016	15-SH	676	8.06	---	---	327	375	---	<0.50	10.1	<0.010	**0.262**	384	97.0	20.5	3.32	26.6	457	<5.0	<5.0	0.202	---	---	---	---	---	---	---	<0.010	0.211	0.211	---	---	---	---	---	---
	27-Sep-2017	15-SH	618	7.62	---	---	341	381	---	<0.50	15.1	<0.030	**0.031**	404	99.3	22.6	3.47	33.5	465	<5.0	<5.0	0.191	---	---	---	---	---	---	---	<0.010	0.346	0.346	---	---	---	---	---	---
	18-Sep-2018	15-SH	643	8.06	---	---	329	380	---	<0.50	8.0	0.034	**0.603**	385	97.1	20.9	3.19	27.4	464	<5.0	<5.0	0.213	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	16-Sep-2019	15-SH	694	7.63	---	---	361	433	---	<0.50	12.2	<0.010	**0.047**	441	105.0	24.1	3.67	34.4	529	<5.0	<5.0	0.259	---	---	---	---	---	---	---	<0.010	0.252	0.252	---	---	---	---	---	---
	21-Sep-2020	15-SH	696	6.97	---	---	335	394	---	<0.50	11.8	0.028	**0.0707**	400	98	21.7	3.32	26.9	480	<5.0	<5.0	0.195	---	---	---	---	---	---	---	<0.010	0.207	0.207	---	---	---	---	---	---
	22-Sep-2021	15-SH	748	7.81	---	---	357	415	---	<0.50	10.7	<0.030	**0.215**	419	103	24.3	3.31	27.4	506	<5.0	<5.0	0.19	---	---	---	---	---	---	---	<0.010	0.194	0.194	---	---	---	---	---	---
	29-Sep-2022	15-SH	730	8.14	---	---	376	430	---	<0.50	10.9	0.079	**0.174**	457	108	25.9	3.64	28.4	525	<1.0	<1.0	0.187	---	---	---	---	---	---	---	<0.010	0.216	0.216	---	---	---	---	---	---
	28-Sep-2023	15-SH	750	8.33	---	---	346	421	---	<0.50	10.1	0.049	**0.629**	440	102	22.2	3.25	25.8	503	5.3	<1.0	0.206	---	---	---	---	---	---	---	<0.010	0.163	0.163	---	---	---	---	---	---
	11-Sep-2024	15-SH	758	7.44	---	---	371	442	---	<0.50	9.8	<0.010	**0.163**	461	108	24.7	3.40	27.5	539	<1.0	<1.0	0.220	---	---	---	---	---	---	---	<0.010	0.150	0.15	---	---	---	---	---	---
	18-Sep-2025	15-SH	770	7.92	---	---	375	438	---	<0.50	8.66	<0.010	**0.521**	465	109	24.9	3.48	30.8	534	<0.6	<0.3	0.237	---	---	---	---	---	---	---	<0.010	0.117	0.117	---	---	---	---	---	---
15-IN	22-Sep-1994	15-IN	774	7.57	---	---	353	278	0.1	3.1	144	0.01	**0.762**	480	100	25	5.36	31	339	0.5	0.5	---	---	---	---	0.97	---	---	---	0.072	1.78	1.85	---	---	---	0.01	---	---
	28-Sep-1995	15-IN	658	7.39	---	---	401	328	< 0.1	1.5	115	< 0.01	**0.412**	**500**	121	24	4.9	31.1	400	< 0.5	< 0.5	---	---	---	---	1.05	---	---	---	0.038	0.571	0.609	---	---	---	< 0.01	---	---
	04-Sep-1996	15-IN	761	7.24	---	---	352	331	< 0.1	1.1	87.7	< 0.01	**0.906**	455	103	22.9	4.59	32.3	403	< 0.5	< 0.5	---	---	---	---	1.01	---	---	---	0.003	0.3	0.303	---	---	---	< 0.005	---	---
	04-Sep-1997	15-IN	756	7.04	---	---	382	352	< 0.1	1	72.4	0.27	**1.08**	463	112	24.9	4.53	33.9	429	< 0.5	< 0.5	---	---	---	---	1.08	---	---	---	0.015	0.014	0.029	---	---	---	< 0.01	---	---
	16-Sep-1998	15-IN	734	7.32	---	---	340	347	< 0.1	0.6	61.1	---	---	427	98.7	22.9	4.1	31.5	423	< 0.5	< 0.5	---	8.24	8.29	---	1.01	---	---	---	0.017	0.064	0.081	---	---	---	< 0.01	---	---
	09-Sep-1999	15-IN	749	7.74	---	---	380	355	< 0.1	0.5	60	---	---	449	111	25.7	4.5	34	433	< 0.5	< 0.5	---	8.37	9.23	---	1.1	---	---	---	0.033	0.054	0.087	---	---	---	< 0.01	---	---
	06-Sep-2000	15-IN	716	7.6	---	---	330	358	< 0.1	0.7	49	< 0.01	**0.86**	420	94.9	21.8	4.5	34.7	436	< 0.5	< 0.5	---	8.19	8.16	---	1	---	---	---	0.013	< 0.003	0.013	---	---	---	< 0.01	---	---
	06-Sep-2001	15-IN	671	8	---	---	340	343	< 0.5	0.7	46	< 0.01	**0.76**	411	96.7	22.9	4.4	33.6	419	< 0.5	< 0.5	---	---	---	---	1.06	---	---	---	0.006	0.022	0.028	---	---	---	< 0.01	---	---
	05-Sep-2002	15-IN	736	7.95	---	---	270	349	< 0.5	0.7	44.5	0.01	**0.556**	392	74.9	20.2	4.2	37.8	425	< 0.5	< 0.5	---	7.92	7.15	---	0.9	---	---	---	< 0.003	0.018	0.018	---	---	---	< 0.01	15.6	---
	03-Sep-2003	15-IN	683	7.85	---	---	320	336	< 0.5	0.8	41.5	0.02	**0.753**	396	93.6	21.1	4.4	32	410	< 0.5	< 0.5	---	7.6	7.91	---	1.04	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	14.4	---
	08-Sep-2004	15-IN	707	7.89	---	---	290	343	< 0.5	1.3	40.9	0.01	**0.694**	386	82.7	19.4	4.1	30.4	419	< 0.5	< 0.5	---	---	---	---	0.92	---	---	---	< 0.003	0.126	0.126	---	---	---	< 0.01	11.4	---
	07-Sep-2005	15-IN	679	8.2	4.1	---	310	353	< 0.5	1.2	39.5	0.06	**0.814**	398	91.9	20.2	3.7	28.3	431	< 0.5	< 0.5	---	---	---	---	0.96	---	---	---	0.005	< 0.003	0.005	---	---	---	< 0.005	12.9	---
	07-Sep-2006	15-IN	679	7.97	---	---	300	340	< 0.5	1.6	38.5	0.05	**0.724**	392	87.9	20.2	4.2	34.3	415	< 0.5	< 0.5	---	---	---	---	1	---	---	---	0.005	0.008	0.013	---	---	---	---	13	---
	06-Sep-2007	15-IN	685	7.96	---	---	310	350	< 0.5	0.9	38.5	**0.42**	**0.731**	399	92.1	20.1	3.8	32.4	427	< 0.5	< 0.5	---	---	---	---	1	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	---	12.2	---
	04-Sep-2008	15-IN	589	8	---	---	239	324	---	< 0.50	15.6	< 0.030	**0.117**	322	69.8	15.6	2.43	23.3	395	< 5	< 5	0.214	---	---	---	0.857	---	---	---	< 0.050	0.129	0.129	---	---	---	---	---	---
	10-Sep-2009	15-IN	675	8.04	---	---	324	343	---	0.53	33.5	0.099	**0.745**	392	96	20.5	4.51	30.6	418	< 5.0	< 5.0	0.157	---	---	---	1.05	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	15 IN	594	7.83	---	---	265	311	---	0.52	14.8	< 0.030	**0.22**	317	76.5	17.9	2.72	17.5	379	< 5.0	< 5.0	0.255	---	---	93.5	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	15-IN	601	8.19	---	---	269	321	---	< 0.50	12.4	< 0.030	**0.0443**	322	77.9	18	2.75	17.8	391	< 5.0	< 5.0	0.243	---	---	93	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	06-Sep-2012	15-IN	604	8.01	---	296	296	331	---	0.53	11.6	**0.371**	**1.28**	339	86.2	19.6	3	19.5	404	< 5.0	< 5.0	0.208	---	---	99.3	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	15-IN	580	7.84	---	293	293	326	---	<0.50	11.5	0.162	**0.178**	336	84.4	19.9	3.36	20.0	398	< 5.0	< 5.0	0.208	---	---	100	---	---	---	---	< 0.050	0.225	0.225	---	---	---	---	---	---
(Previously labeled 15-SH)	17-Sep-2014	15-IN	653	8.28	---	---	294	324	---	<0.50	42.9	< 0.010	**0.609**	380	87.4	18.4	4.15	32.3	396	< 5.0	< 5.0	0.172	---	---	99.9	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	13.7	---
	29-Sep-2015	15-IN	758	7.61	---	---	349	326	---	0.52	64.3	<0.010	**0.693**	426	100	24.2	4.56	35.9	398	<5.0	<5.0	0.201	---	---	---	---	---	---	---	0.020	0.194	0.214	---	---	---	---	---	---
	27-Sep-2016	15-IN	719	8.07	---	---	339	334	---	<0.50	60.3	<0.010	**0.681**	424	101	21.1	4.38	32.8	407	<5.0	<5.0	0.150	---	---	---	---	---	---	---	<0.010	0.984	0.984	---	---	---	---	---	---
	27-Sep-2017	15-IN	657	7.65	---	---	349	348	---	<0.50	66.2	<0.030	**0.731**	444	101	23.5	4.64	39.0	425	<5.0	<5.0	0.133	---	---	---	---	---	---	---	<0.010	0.135	0.135	---	---	---	---	---	---
	18-Sep-2018	15-IN	684	8.16	---	---	345	342	---	<0.50	67.7	<0.010	**0.725**	436	101	22.5	4.46	34.5	417	<5.0	<5.0	0.173	---	---	---	---	---	---	---	<0.010	0.142	0.142	---	---	---	---	---	---
Dry	16-Sep-2019	15-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	21-Sep-2020	15-IN	755	7.03	---	---	322	357	---	<0.50	74.2	<0.010	**0.614**	444	94.3	21	4.28	34.2	436	<5.0	<5.0	0.163	---	---	---	---	---	---	---	0.024	0.255	0.279	---	---	---	---	---	---
	22-Sep-2021	15-IN	760	7.94	---	---	351	357	---	<0.50	78.4	<0.030	**0.56**	461	101	24	4.83	36.7	435	<5.0	<5.0	0.138	---	---	---	---	---	---	---	<0.010	0.297	0.297	---	---	---	---	---	---
	29-Sep-2022	15-IN	754	8.25	---	---	367	372	---	<0.50	76.5	<0.030	**0.470**	493	105	25.5	4.80	37.3	453	<1.0	<1.0	0.140	---	---	---	---	---	---	---	0.018	0.173	0.191	---	---	---	---	---	---
	28-Sep-2023	15-IN	756	8.25	---	---	349	363	---	<0.50	67.7	<0.010	**0.334**	468	104	21.6	4.12	33.1	443	<1.0	<1.0	0.155	---	---	---	---	---	---	---	0.021	0.123	0.144	---	---	---	---	---	---
	11-Sep-2024	15-IN	716	7.42	---	---	340	353	---	<0.50	67.0	<0.010	**0.345**	461	98	23.3	4.48	33.8	430	<1.0	<1.0	0.182	---	---	---	---	---	---	---	<0.010	0.863	0.863	---	---	---	---	---	---
	18-Sep-2025	15-IN	779	7.94	---	---	364	374	---	<0.50	68.5	<0.010	**0.128**	486	106	24.1	4.47	39.4	456	<0.6	<0.3	0.173	---	---	---	---	---	---	---	<0.010	0.038	<0.0500	---	---	---	---	---	---
15-SS [Decommissioned]	12-Nov-1993	15-SS	990	8.1	---	---	285	377	---	3.5	---	---	---	**616**	89	15.2	6.9	118	460	---	---	---	---	---	---	1	0.001	---	---	0.032	2.58	---	---	---	---	---	---	---
15(R)SS [Decommissioned]	10-Sep-2004	15(R)-SS	629	8	---	---	140	216	< 0.5	2.7	97.6	0.09	**0.251**	360	39.3	9.9	4.9	74	263	< 0.5	< 0.5	---	---	---	---	0.95	---	---	---	0.005	0.358	0.363	---	---	---	---	30.4	---
	30-Oct-2004	15(R)-SS	---	---	---	---	---	---	---	---	---	0.04	**0.47**	---	51.1	12.3	4.6	64.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	28.2	---
	08-Sep-2005	15(R)-SS	574	7.85	79.7	---	160	233	< 0.5	1.2	75.9	< 0.01	**0.443**	334	45.1	11.2	5.2	55.1	284	< 0.5	< 0.5	---	---	---	---	0.91	---	---	---	< 0.003	0.061	0.061	---	---	---	< 0.005	20.8	---
	07-Sep-2006	15(R)-SS	549	8.37	---	---	140	206	2.5	1.8	77.2	< 0.01	**0.28**	322	39.6	10.7	5	63.8	245	3	< 0.5	---	---	---	---	1	---	---	---	0.005	0.007	0.012	---	---	---	---	25.2	---
	10-Dec-2006	15(R)-SS	---	---	---	---	---	---	---	---	---	< 0.06	**0.365**	---	42.1	11.1	5	66.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	24.6
	07-Sep-2007	15(R)-SS	558	8.35	---	---	170	228	1.6	1.3	69.3	< 0.06	**0.404**	342	49.6	11.7	4.8	67.9	275	1.9	< 0.5	---	---	---	---	1.08	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	---	24.3	---
	04-Sep-2008	15(R)-SS	710	8.4	---	---	250	309	---	1.56	80.2	< 0.030	**1.05**	436	71.6	17.2	4.82	74.4	361	8	< 5	0.516	---	---	---	1.05	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	17-Sep-2009	15(R)-SS	1430	8.01	---	---	398	835	---	3.98	43.1	**1.75**	**2.04**	**770**	117	25.6	5.2	73.9	1020	< 5.0	< 5.0	0.338	---	---	---	0.636	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	15 (R) SS	1540	7.88	---	---	773	853	---	4.9	76.7	**19.5**	**3.69**	**931**	234	45.9	4.12	53.4	1040	< 5.0	< 5.0	0.392	---	---	95.1	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	15 (R)-SS	1390	8.2	---	---	819	751	---	1.47	95.5	**4.02**	**3.04**	**881**	245	50.3	4.3	33.6	916	< 5.0	< 5.0	0.219	---	---	105	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	15(R)SS	1430	7.98	---	827	827	867	---	1.00	68.4	**0.609**	**3.90**	**926**	246	51.6	4.56	33.7	1060	< 5.0	< 5.0	0.226	---	---	96.1	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL								INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [15]	0.0019	---	---
15(2R)SS	16-Sep-2014	15(2R)SS	881	8.45	---	---	147	279	---	30.1	148	**0.409**	**1.26**	**519**	43.4	9.48	4.35	116	328	6.4	< 5.0	0.410	---	---	84.9	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	38.6	---
	28-Sep-2015	15(2R)SS	545	8.19	---	---	137	225	---	12.1	52.2	<0.010	**1.61**	321	39.6	9.25	3.89	68.8	274	<5.0	<5.0	0.396	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	26-Sep-2016	15(2R)SS	556	8.03	---	---	133	213	---	14.1	59.4	<0.010	**1.45**	305	38.1	9.12	3.43	52.7	260	<5.0	<5.0	0.240	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	15(2R)SS	466	**8.51**	---	---	143	222	---	4.8	32.1	<0.030	**0.99**	280	39.6	10.60	3.65	54.9	257	6.7	<5.0	0.292	---	---	---	---	---	---	---	0.043	0.11	0.152	---	---	---	---	---	---
	18-Sep-2018	15(2R)SS	473	8.30	---	---	133	234	---	5.6	28.2	<0.010	**0.84**	282	37.4	9.57	3.71	56.5	282	<5.0	<5.0	0.281	---	---	---	---	---	---	---	0.024	0.076	0.099	---	---	---	---	---	---
	16-Sep-2019	15(2R)SS	430	7.83	---	---	122	222	---	2.3	24.6	0.043	**0.97**	265	33.8	9.22	3.67	57.5	271	<5.0	<5.0	0.380	---	---	---	---	---	---	---	0.109	0.056	0.165	---	---	---	---	---	---
	22-Sep-2020	15(2R)SS	429	7.3	---	---	322	357	---	<0.50	74.2	<0.010	**0.614**	444	94.3	21.0	4.28	34.2	436	<5.0	<5.0	0.163	---	---	---	---	---	---	---	0.024	0.255	0.279	---	---	---	---	---	---
	22-Sep-2021	15(2R)SS	402	8.1	---	---	118	206	---	<0.50	16.3	<0.030	**0.808**	231	32.1	9.23	3.05	46	251	<5.0	<5.0	0.208	---	---	---	---	---	---	---	0.015	0.122	0.137	---	---	---	---	---	---
	29-Sep-2022	15(2R)SS	402	8.37	---	---	122	210	---	<0.50	15.4	<0.030	**0.818**	271	33.4	9.47	3.06	47.3	251	2.6	<1.0	0.235	---	---	---	---	---	---	---	<0.010	0.160	0.16	---	---	---	---	---	---
Could not obtain sample	28-Sep-2023	15(2R)SS	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	10-Sep-2024	15(2R)SS	412	8.11	---	---	124	214	---	0.66	15.80	0.01	**0.75**	271	34.30	9.28	3.01	44.70	261	<1.0	<1.0	0.22	---	---	---	---	---	---	---	<0.010	0.22	0.22	---	---	---	---	---	---
	17-Sep-2025	15(2R)SS	414	8.36	---	---	136	213	---	0.93	13.6	<0.010	**0.675**	272	38.0	10.1	3.36	44.5	256	2.3	<0.3	0.229	---	---	---	---	---	---	---	<0.010	0.240	0.240	---	---	---	---	---	---
16-SH	28-Sep-1995	16-SH	685	7.31	---	---	352	370	< 0.1	1.9	71.8	< 0.01	**0.34**	457	92.2	29.4	3.8	31.6	451	< 0.5	< 0.5	---	---	---	---	0.95	< 0.001	---	---	---	0.087	---	---	---	---	---	---	---	---
	05-Sep-1996	16-SH	797	7.46	---	---	411	369	< 0.1	1.2	66.4	< 0.01	**0.571**	459	113	31.1	3.7	18.1	450	< 0.5	< 0.5	---	---	---	---	1.03	0.001	---	---	---	0.101	0.104	---	---	---	---	---	---
	04-Sep-1997	16-SH	785	7.74	---	---	428	391	< 0.1	1.3	54.9	< 0.01	0.019	470	116	33.5	3.38	22	477	< 0.5	< 0.5	---	---	---	---	1.06	< 0.001	---	---	---	0.176	0.176	---	---	---	---	---	---
	15-Sep-1998	16-SH	760	7.28	---	---	410	377	< 0.1	0.7	49	---	---	438	110	31.7	2.9	16.4	460	< 0.5	< 0.5	---	8.59	8.91	---	1.04	0.001	---	---	---	0.1	0.1	---	---	---	---	---	---
	09-Sep-1999	16-SH	778	7.7	---	---	420	383	< 0.1	0.8	56.7	---	---	457	113	33.4	2.6	19.8	467	< 0.5	< 0.5	---	8.88	9.32	---	1.05	< 0.0010	---	< 0.001	---	0.209	0.209	---	---	---	---	---	---
	05-Sep-2000	16-SH	754	7.65	---	---	380	390	< 0.1	0.6	41.7	< 0.01	**0.034**	442	103	29.4	3.2	25.7	476	< 0.5	< 0.5	---	8.74	8.79	---	1.01	0.004	---	---	< 0.003	0.759	0.759	---	---	---	---	---	---
	(Duplicate) 05-Sep-2000	16-SH DUP	754	7.66	---	---	370	390	< 0.1	0.8	45.1	< 0.01	**0.028**	445	100	28.9	3.1	30.3	476	< 0.5	< 0.5	---	8.81	8.78	---	1	0.004	---	---	< 0.003	0.691	0.691	---	---	---	---	---	---
	06-Sep-2001	16-SH	723	7.99	---	---	390	379	< 0.5	0.8	51.2	**0.69**	**0.049**	440	106	30.3	3.6	19.5	462	< 0.5	< 0.5	---	---	---	---	1.01	< 0.001	---	---	< 0.003	0.12	0.12	---	---	---	---	---	---
	04-Sep-2002	16-SH	809	7.84	---	---	360	393	< 0.5	0.7	41	0.02	**0.099**	427	95.9	28.3	3.4	18.9	480	< 0.5	< 0.5	---	---	---	---	0.91	0.001	---	---	< 0.003	0.502	0.502	---	---	---	---	14.4	---
	04-Sep-2003	16-SH	753	7.78	---	---	390	378	< 0.5	0.8	39.3	0.03	0.012	429	105	30.1	3.5	22.7	461	< 0.5	< 0.5	---	---	---	---	1.04	---	< 0.004	---	< 0.003	0.21	0.21	---	---	---	---	14.2	---
	08-Sep-2004	16-SH	774	7.96	---	---	350	393	< 0.5	1.2	42	0.02	< 0.004	431	95	27.3	3.2	26.5	479	< 0.5	< 0.5	---	---	---	---	0.94	---	< 0.004	---	< 0.003	0.074	0.074	---	---	---	---	12.7	---
	08-Sep-2005	16-SH	747	8.08	1.5	---	360	397	< 0.5	1	39.7	0.02	0.02	435	98.1	28.6	3.3	25	484	< 0.5	< 0.5	---	---	---	---	0.96	---	< 0.004	---	< 0.003	0.146	0.146	---	---	---	---	12.6	---
	07-Sep-2006	16-SH	760	8.03	---	---	360	387	< 0.5	1.5	40.8	0.03	**0.032**	424	97.7	27	3.2	21.1	472	< 0.5	< 0.5	---	---	---	---	0.94	---	---	---	< 0.003	0.109	0.109	---	---	---	---	11.7	---
	05-Sep-2007	16-SH	764	7.95	---	---	370	398	< 0.5	1.1	34.5	< 0.06	0.017	431	101	29.7	3.4	22.6	485	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	0.019	0.06	0.079	---	---	---	---	12.2	---
	03-Sep-2008	16-SH	748	8.1	---	---	359	391	---	< 0.50	36.5	< 0.030	**0.0328**	427	98.8	27.3	3.3	26	477	< 5	< 5	0.198	---	---	---	0.977	---	---	---	< 0.050	0.089	0.089	---	---	---	---	---	---
	10-Sep-2009	16-SH	769	8.02	---	---	413	400	---	< 0.50	35.5	< 0.030	0.0072	447	115	30.5	3.81	21.8	488	< 5.0	< 5.0	0.167	---	---	---	1.06	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	16 SH	773	7.89	---	---	343	397	---	< 0.50	35.9	< 0.030	< 0.0050	420	91.7	27.6	2.85	23.2	485	< 5.0	< 5.0	0.25	---	---	91	---	---	---	---	< 0.050	0.09	0.09	---	---	---	---	---	---
	07-Sep-2011	16-SH	770	8.24	---	---	360	406	---	< 0.50	32.9	< 0.030	0.0176	430	95.3	29.7	3.33	24.8	496	< 5.0	< 5.0	0.235	---	---	94.8	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	16-SH	770	8.07	---	379	379	411	---	< 0.50	33.2	< 0.030	< 0.0050	443	101	30.8	3.68	26.9	502	< 5.0	< 5.0	0.219	---	---	98.9	---	---	---	---	< 0.050	0.068	< 0.071	---	---	---	---	---	---
	26-Sep-2013	16-SH	763	7.95	---	368	368	423	---	< 0.50	29.3	< 0.030	0.0030	451	98.7	29.6	3.12	36.2	516	< 5.0	< 5.0	0.207	---	---	99.3	---	---	---	---	< 0.050	0.086	0.086	---	---	---	---	---	---
	16-Sep-2014	16-SH	751	8.26	---	---	372	396	---	< 0.50	33.4	< 0.010	0.0012	443	102	28.5	3.45	38.3	483	<5.0	<5.0	0.243	---	---	107	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	10.8	---
	28-Sep-2015	16-SH	758	8.12	---	---	406	401	---	1.40	40.0	<0.010	0.00214	459	111	31.3	4.40	29.3	489	<5.0	<5.0	0.282	---	---	---	---	---	---	---	<0.010	0.103	0.103	---	---	---	---	---	---
	26-Sep-2016	16-SH	752	8.02	---	---	380	380	---	1.58	26.7	<0.010	0.00103	426	106	28.0	3.26	31.9	464	<5.0	<5.0	0.233	---	---	---	---	---	---	---	<0.010	0.061	0.061	---	---	---	---	---	---
	27-Sep-2017	16-SH	688	7.87	---	---	399	394	---	1.63	33.7	<0.030	<0.0050	445	107	32.1	3.59	30.3	481	<5.0	<5.0	0.211	---	---	---	---	---	---	---	<0.010	0.112	0.112	---	---	---	---	---	---
	18-Sep-2018	16-SH	724	8.05	---	---	393	400	---	1.00	31.6	<0.010	0.00094	444	105	31.8	3.47	31.2	488	<5.0	<5.0	0.232	---	---	---	---	---	---	---	<0.010	0.040	0.04	---	---	---	---	---	---
	16-Sep-2019	16-SH	739	7.57	---	---	390	428	---	1.07	34.7	<0.010	0.00104	468	105	31.0	3.65	34.6	522	<5.0	<5.0	0.285	---	---	---	---	---	---	---	0.013	0.117	0.13	---	---	---	---	---	---
	22-Sep-2020	16-SH	755	7.13	---	---	322	357	---	<0.50	74.2	<0.010	**0.614**	444	94.3	21	4.28	34.2	436	<5.0	<5.0	0.163	---	---	---	---	---	---	---	0.024	0.255	0.279	---	---	---	---	---	---
	21-Sep-2021	16-SH	812	7.82	---	---	415	377	---	<0.50	90.1	<0.030	**0.128**	500	119	28.5	4.68	26.8	460	<5.0	<5.0	0.14	---	---	---	---	---	---	---	<0.010	1.07	1.07	---	---	---	---	---	---
	28-Sep-2022	16-SH	750	8.18	---	---	402	409	---	1.00	39.7	<0.030	<0.0050	479	106	33.4	3.69	26.2	499	<1.0	<1.0	0.216	---	---	---	---	---	---	---	<0.010	0.056	0.056	---	---	---	---	---	---
	28-Sep-2023	16-SH	734	8.21	---	---	381	390	---	0.78	35.8	0.01	0.00123	454	106	28.3	3.6	21.4	475	<1.0	<1.0	0.217	---	---	---	---	---	---	---	<0.010	0.186	0.186	---	---	---	---	---	---
	10-Sep-2024	16-SH	752	7.61	---	---	383	412	---	0.93	26.7	<0.010	0.00538	463	105	29.3	3.03	24.8	502	<1.0	<1.0	0.288	---	---	---	---	---	---	---	<0.010	0.118	0.118	---	---	---	---	---	---
	17-Sep-2025	16-SH	768	7.91	---	---	389	413	---	0.95	31.9	<0.010	0.00054	474	106	30.3	3.36	28.7	504	<0.6	<0.3	0.249	---	---	---	---	---	---	---	<0.010	0.120	0.120	---	---	---	---	---	---
16-IN	05-Sep-1996	16-IN	745	7.46	---	---	351	357	< 0.1	0.9	50.9	< 0.01	**0.037**	429	98.7	25.3	2.5	30.8	435	< 0.5	< 0.5	---	---	---	---	1.02	---	---	---	0.005	0.521	0.526	---	---	---	< 0.005	---	---
	04-Sep-1997	16-IN	791	7.12	---	---	397	382	< 0.1	1	63.4	< 0.01	0.01	484	113	27.9	3.65	40.3	466	< 0.5	< 0.5	---	---	---	---	1.09	---	---	---	< 0.003	0.348	0.348	---	---	---	< 0.01	---	---
	15-Sep-1998	16-IN	846	7.31	---	---	410	392	< 0.1	1	84.9	---	---	**511**	115	28.6	3.6	41.5	478	< 0.5	< 0.5	---	9.65	10	---	1.04	---	---	---	< 0.006	0.167	0.173	---	---	---	< 0.01	---	---
	09-Sep-1999	16-IN	906	7.85	---	---	450	414	< 0.1	1	104	---	---	**560**	124	32.8	3.3	45.2	505	< 0.5	< 0.5	---	10.5	11	---	1.04	---	---	---	< 0.003	0.075	0.075	---	---	---	< 0.01	---	---
	05-Sep-2000	16-IN	854	7.81	---	---	390	395	< 0.1	0.9	90.1	< 0.01	**0.298**	**517**	106	29.3	3.6	50	481	< 0.5	< 0.5	---	9.8	9.98	---	1.02	---	---	---	0.013	0.022	0.035	---	---	---	< 0.01	---	---
	06-Sep-2001	16-IN	777	8.06	---	---	360	377	< 0.5	0.9	84.9	< 0.01	0.007	490	98.8	28.2	2	48.6	459	< 0.5	< 0.5	---	---	---	---	1.01	---	---	---	< 0.003	0.089	0.089	---	---	---	< 0.01	---	---
	04-Sep-2002	16-IN	872	8.01	---	---	360	388	< 0.5	0.6	96.1	0.02	**0.129**	**502**	101	25.8	3.1	41.9	473	< 0.5	< 0.5	---	9.78	9.08	---	0.93	---	---	---	< 0.003	0.133	0.133	---	---	---	< 0.01	26.5	---
	04-Sep-2003	16-IN	789	7.94	---	---	360	357	< 0.5	0.9	78.3	0.02	**0.027**	472	95.7	29.9	2.2	49.6	436	< 0.5	< 0.5	---	8.81	9.45	---	1.07	---	---	---	< 0.003	0.105	0.105	---	---	---	< 0.01	26.7	---
	08-Sep-2004	16-IN	825	7.97	---	---	350	372	< 0.5	1.4	81.4	0.02	**0.191**	472	99.3	24.2	4.2	37.3	454	< 0.5	< 0.5	---	---	---	---	0.95	---	---	---	< 0.003	0.036	0.036	---	---	---	< 0.01	25.7	---
	08-Sep-2005	16-IN	795	8.14	11.5	---	330	382	< 0.5	1	84.8	0.19	**0.563**	476	88.2	27	3.5	40.9	466	< 0.5	< 0.5	---	---	---	---	0.9	---	---	---	< 0.003	0.008	0.008	---	---	---	< 0.005	25.5	---
	07-Sep-2006	16-IN	789	7.99	---	---	360	377	< 0.5	1.7	76.2	0.14	**0.746**	476	102	25.3	4.7	39.3	460	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	0.004	0.04	0.044	---	---	---	---	24.5	---
	05-Sep-2007	16-IN	817	7.99	---	---	390	391	< 0.5	1.5	102	**0.47**	**0.754**	**517**	115	25.5	4.3	32.8	477	< 0.5	< 0.5	---	---	---	---	0.95	---	---	---	< 0.003	0.014	0.014	---	---	---	---	23.1	---
	03-Sep-2008	16-IN	798	8.1	---	---	362	393	---	0.64	70.4	**0.952**	**0.61**	473	104	24.8	4.73	32.7	479	< 5	< 5	0.196	---	---	---	0.939	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	10-Sep-2009	16-IN	786	8.05	---	---	405	373	---	0.62	67.2	**3.31**	**0.732**	473	119	26.1	4.96	31.1	455	< 5.0	< 5.0	0.184	---	---	---	1.08	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2010	16 IN	798	8	---	---	377	377	---	0.64	70.9	**0.614**	**0.773**	467	109	25.5	4.39	30.3	460	< 5.0	< 5.0	0.22	---	---	99.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	07-Sep-2011	16-IN	821	8.25	---	---	376	398	---	0.64	66.2	**1.09**	**0.812**	476	108	25.9	4.85	31.6	485	< 5.0	< 5.0	0.231	---	---	96.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	05-Sep-2012	16-IN	765	8.17	---	372	374	374	---	0.53	64.6	**0.931**	**0.679**	462	105	27.1	5.33	34.7	456	< 5.0	< 5.0	0.197	---	---	103	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	16-IN	773	8.13	---	393	394	394	---	< 0.50	63.8	0.128	**0.574**	475	114	26.5	4.84	29.4	481	< 5.0	< 5.0	0.185	---	---	101	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	16-Sep-2014	16-IN	787	8.17	---	---	403	352	---	< 0.50	87.6	< 0.010	**0.601**	479	118	26.3	4.86	30.4	430	< 5.0	< 5.0	0.171	---	---	107	---	---	---	---	< 0.020	0.189	0.189	---	---	---	---	28.0	---
	28-Sep-2015	16-IN	802	8.05	---	---	421	368	---	0.56	93.5	<0.010	**0.528**	**505**	123	27.7	4.87	28.9	449	<5.0	<5.0	0.196	---	---	---	---	---	---	---	<0.010	1.20	1.2	---	---	---	---	---	---
	26-Sep-2016	16-IN	805	8.01	---	---	418	360	---	<0.50	87.1	<0.010	**0.406**	488	124	26.0	4.70	25.5	439	<5.0	<5.0	0.141	---	---	---	---	---	---	---	<0.010	1.01	1.01	---	---	---	---	---	---
	27-Sep-2017	16-IN	731	7.84	---	---	424	355	---	<0.50	95.1	0.069	**0.501**	**503**	121	29.7	5.05	31.0	433	<5.0	<5.0	0.125	---	---	---	---	---	---	---	<0.010	1.72	1.72	---	---	---	---	---	---
	18-Sep-2018	16-IN	779	7.98	---	---	408	375	---	<0.50	87.0	<0.010	**0.462**	493	120	26.3	4.87	26.5	457	<5.0	<5.0	0.150	---	---	---	---	---	---	---	<0.010	0.72	0.717	---	---	---	---	---	---
Dry	16-Sep-2019	16-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	22-Sep-2020	16-IN	810	7.32	---	---	393	374	---	<0.50	92.3	<0.010	**0.159**	495	115	25.7	4.75	27.1	456	<5.0	<5.0	0.148	---	---	---	---	---	---	---	<0.010	1.18	1.18	---	---	---	---	---	---
	21-Sep-2021	16-IN	770	7.86	---	---	389	420	---	1.01	35	<0.030	<0.0050	457	106	30.3	3.75	27.9	512	<5.0	<5.0	0.212	---	---	---	---	---	---	---	<0.010	0.152	0.152	---	---	---	---	---	---
	28-Sep-2022	16-IN	802	8.12	---	---	412	385	---	<0.50	88.6	<0.030	**0.08260**	**517**	119	28.0	5.05	27.7	469	<1.0	<1.0	0.116	---	---	---	---	---	---	---	<0.010	0.609	0.609	---	---	---	---	---	---
Dry	28-Sep-2023	16-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dry	10-Sep-2024	16-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dry	17-Sep-2025	16-IN	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	7.0-10.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.05	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	1.0	---	---	---	---	---	---	---	0.12	---	---	---	---	---	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1	10	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	6.5 - 8.5	---	---	---	---	---	250	500	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.2	0.2	0.2	1.0	10	---	---	---	---	0.05	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	6.5 - 8.5	---	---	---	---	---	120	Variable	0.3	0.02	500	---	---	---	200	---	---	---	1.5	---	---	---	---	0.0050	0.0050	0.0050	Variable	3	---	---	---	Variable [13]	0.0019	---	---
17-SH	01-Nov-1994	17-SH	508	7.95	---	---	---	272	< 0.1	1.9	18.9	< 0.01	**0.441**	300	78	20.1	3.02	11.9	332	< 0.5	< 0.5	---	---	---	---	1.04	< 0.001	---	---	0.093	0.085	0.093	---	---	---	---	---	---
	28-Sep-1995	17-SH	515	7.25	---	---	264	273	< 0.1	1.5	35.6	< 0.01	**0.208**	323	75.1	18.6	2.2	23.4	333	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	---	0.117	---	---	---	---	---	---	---
(Duplicate)	28-Sep-1995	17-SH DUP	549	7.39	---	---	266	273	< 0.1	1.2	30.9	< 0.01	**0.117**	318	74	19.6	2.3	22.7	333	< 0.5	< 0.5	---	---	---	---	1.03	< 0.001	---	---	---	0.103	---	---	---	---	---	---	---
	04-Sep-1996	17-SH	378	7.39	---	---	195	187	< 0.1	< 0.5	12.8	< 0.01	**0.253**	208	55.7	13.6	1.47	9.76	228	< 0.5	< 0.5	---	---	---	---	1.09	0.001	---	---	---	0.139	0.143	---	---	---	---	---	---
	04-Sep-1997	17-SH	485	7.69	---	---	256	262	< 0.1	< 0.5	10.4	< 0.01	**0.048**	272	71.9	18.6	1.25	9.32	319	< 0.5	< 0.5	---	---	---	---	1.02	< 0.001	---	---	---	0.025	0.025	---	---	---	---	---	---
	16-Sep-1998	17-SH	498	7.55	---	---	260	254	< 0.1	< 0.5	23.7	---	---	279	71.7	20.3	1.4	9.5	310	< 0.5	< 0.5	---	5.58	5.7	---	1.02	0.001	---	---	---	0.059	0.065	---	---	---	---	---	---
	09-Sep-1999	17-SH	530	7.64	---	---	300	288	< 0.1	< 0.5	21.1	---	---	308	81.4	22.4	1.1	9	351	< 0.5	< 0.5	---	6.2	6.33	---	1.02	< 0.0010	---	< 0.001	---	0.031	0.031	---	---	---	---	---	---
	06-Sep-2000	17-SH	549	7.78	---	---	280	286	< 0.1	< 0.5	25.2	< 0.01	**0.105**	311	79.1	20.6	2	12.5	349	< 0.5	< 0.5	---	6.26	6.24	---	1	0.003	---	---	< 0.003	0.052	0.052	---	---	---	---	---	---
	06-Sep-2001	17-SH	539	8.11	---	---	280	275	< 0.5	< 0.5	35.2	< 0.01	0.015	317	77.9	21.3	1.8	14.7	336	< 0.5	< 0.5	---	---	---	---	1.01	< 0.001	---	---	< 0.003	0.103	0.103	---	---	---	---	---	---
	05-Sep-2002	17-SH	611	8.04	---	---	290	299	< 0.5	< 0.5	25.5	0.02	**0.044**	322	81.1	20.9	2	12.6	365	< 0.5	< 0.5	---	---	---	---	0.98	0.001	---	---	< 0.003	0.052	0.052	---	---	---	---	12.1	---
	03-Sep-2003	17-SH	571	7.9	---	---	290	290	< 0.5	< 0.5	27.1	0.02	< 0.004	331	82.1	21	1.9	24.8	354	< 0.5	< 0.5	---	---	---	---	1.09	---	< 0.004	---	< 0.003	0.029	0.029	---	---	---	---	12.5	---
	08-Sep-2004	17-SH	593	8.06	---	---	270	297	< 0.5	1.9	23.7	0.01	< 0.004	318	76.4	19.5	1.8	17	362	< 0.5	< 0.5	---	---	---	---	0.96	---	< 0.004	---	< 0.003	0.018	0.018	---	---	---	---	8.5	---
	07-Sep-2005	17-SH	544	8.35	6.7	---	280	296	4	0.5	21.7	0.02	0.005	316	78.2	20.2	1.7	16.1	352	4.8	< 0.5	---	---	---	---	0.99	---	< 0.004	---	< 0.003	0.015	0.015	---	---	---	---	6.3	---
	07-Sep-2006	17-SH	568	8.11	---	---	280	296	< 0.5	1.2	17.9	0.01	0.007	310	77	20.7	1.7	13.4	361	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	0.034	0.034	---	---	---	---	5.8	---
	06-Sep-2007	17-SH	572	8.08	---	---	240	305	< 0.5	0.8	17.1	< 0.06	0.007	302	68.4	17.1	1.7	13.3	373	< 0.5	< 0.5	---	---	---	---	0.84	---	---	---	< 0.003	0.01	0.01	---	---	---	---	4.4	---
	04-Sep-2008	17-SH	585	8.2	---	---	277	314	---	< 0.50	15	0.096	0.0029	318	77.3	20.4	1.64	14.7	384	< 5	< 5	0.278	---	---	---	0.939	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	10-Sep-2009	17-SH	580	8.08	---	---	313	315	---	1.45	14.7	< 0.030	< 0.0050	332	88.9	22.1	1.89	13.6	385	< 5.0	< 5.0	0.251	---	---	---	1.03	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	17 SH	579	8.09	---	---	257	302	---	< 0.50	17.3	< 0.030	< 0.0050	315	71.6	19.1	1.37	24	369	< 5.0	< 5.0	0.326	---	---	96.9	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	17-SH	603	8.32	---	---	290	326	---	< 0.50	14.3	0.043	< 0.0050	331	79.7	22	1.83	17.1	390	< 5.0	< 5.0	0.302	---	---	98.1	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	06-Sep-2012	17-SH	538	8.19	---	265	265	291	---	< 0.50	13	< 0.030	< 0.0050	296	75.2	18.8	1.5	12.8	355	< 5.0	< 5.0	0.246	---	---	96.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	26-Sep-2013	17-SH	606	7.99	---	311	311	344	---	< 0.50	15.2	< 0.030	0.0027	352	85.9	23.4	1.82	18.8	419	< 5.0	< 5.0	0.239	---	---	98.3	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	17-Sep-2014	17-SH	617	8.21	---	---	323	318	---	2.52	23.3	< 0.010	0.00169	355	92.9	22.2	1.81	21.5	388	< 5.0	< 5.0	0.262	---	---	107	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	7.71	---
	29-Sep-2015	17-SH	755	7.70	---	---	376	348	---	12.2	36.0	<0.010	0.00306	413	104	28.2	2.20	21.6	424	<5.0	<5.0	0.309	---	---	---	---	---	---	---	<0.010	0.035	0.035	---	---	---	---	---	---
	27-Sep-2016	17-SH	742	8.12	---	---	377	342	---	21.8	39.9	<0.010	0.00188	425	107	26.5	2.11	22.1	417	<5.0	<5.0	0.240	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	27-Sep-2017	17-SH	642	7.86	---	---	381	323	---	18.5	45.1	<0.030	<0.0050	420	104	29.5	2.19	26.5	394	<5.0	<5.0	0.233	---	---	---	---	---	---	---	<0.010	0.031	<0.050	---	---	---	---	---	---
	18-Sep-2018	17-SH	660	8.12	---	---	361	331	---	14.7	38.1	<0.010	0.00126	401	102	25.7	2.03	19.8	404	<5.0	<5.0	0.263	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	17-Sep-2019	17-SH	609	7.87	---	---	306	325	---	9.8	29.9	0.063	0.00245	366	84	23.1	1.97	21.3	396	<5.0	<5.0	0.321	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	21-Sep-2020	17-SH	625	7.28	---	---	269	324	---	6.38	24.1	<0.010	0.00011	343	76.4	19.1	1.71	21.0	396	<5.0	<5.0	0.263	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	22-Sep-2021	17-SH	609	7.96	---	---	302	317	---	6.17	25.4	<0.030	<0.0050	349	83.2	22.9	1.79	18.7	386	<5.0	<5.0	0.241	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---
	29-Sep-2022	17-SH	615	8.29	---	---	298	322	---	6.46	27.1	<0.030	<0.0050	385	81.2	23.1	1.90	26.0	390	<1.0	<1.0	0.227	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	28-Sep-2023	17-SH	634	8.27	---	---	320	328	---	9.42	26.8	<0.010	0.00052	395	91	22.5	1.9	19.7	400	<1.0	<1.0	0.255	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	11-Sep-2024	17-SH	626	7.73	---	---	310	322	---	8.11	25.3	<0.010	0.00074	382	86.4	22.8	1.78	18.9	393	<1.0	<1.0	0.273	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
	18-Sep-2025	17-SH	646	8.01	---	---	325	332	---	8.00	24.7	<0.010	0.00266	394	90.3	24.2	1.87	21.2	405	<0.6	<0.3	0.282	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---
17-IN	28-Sep-1995	17-IN	615	7.09	---	---	326	348	< 0.1	2.2	67.2	< 0.01	**0.432**	429	93	22.8	5.6	26.1	424	< 0.5	< 0.5	---	---	---	---	0.93	---	---	---	0.034	0.073	0.107	---	---	---	< 0.01	---	---
	04-Sep-1996	17-IN	755	7.2	---	---	350	359	< 0.1	1.1	62	< 0.01	**0.952**	436	103	22.5	4.21	24.6	438	< 0.5	< 0.5	---	---	---	---	0.96	---	---	---	0.021	0.027	0.048	---	---	---	< 0.005	---	---
	04-Sep-1997	17-IN	778	7.05	---	---	417	388	< 0.1	1	54.8	0.1	**1.08**	475	123	26.7	4.66	28.4	473	< 0.5	< 0.5	---	---	---	---	1.09	---	---	---	0.005	0.008	0.013	---	---	---	< 0.01	---	---
	16-Sep-1998	17-IN	765	7.11	---	---	380	396	< 0.1	< 0.5	41.9	---	---	446	110	25.1	4.1	27	483	< 0.5	< 0.5	---	8.8	8.86	---	1.01	---	---	---	0.018	0.009	0.027	---	---	---	< 0.01	---	---
	09-Sep-1999	17-IN	766	7.63	---	---	380	370	< 0.1	0.7	56.1	---	---	447	110	25.9	4.7	26.9	451	< 0.5	< 0.5	---	8.6	8.91	---	1.04	---	---	---	0.01	0.143	0.153	---	---	---	< 0.01	---	---
	06-Sep-2000	17-IN	769	7.55	---	---	380	400	< 0.1	< 0.5	42.8	0.03	**0.945**	451	110	24.4	4.5	28.9	489	< 0.5	< 0.5	---	8.9	8.87	---	1	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	---	---
	06-Sep-2001	17-IN	730	7.98	---	---	370	386	< 0.5	0.7	47.5	< 0.01	**0.884**	445	108	25.2	4.2	27.2	471	< 0.5	< 0.5	---	---	---	---	1	---	---	---	0.006	0.017	0.023	---	---	---	< 0.01	---	---
	05-Sep-2002	17-IN	825	7.9	---	---	340	396	< 0.5	0.6	50.8	**0.48**	**0.791**	447	100	22.6	4.4	28.5	484	< 0.5	< 0.5	---	9.01	8.22	---	0.91	---	---	---	< 0.003	0.048	0.048	---	---	---	< 0.01	15.3	---
	03-Sep-2003	17-IN	775	7.68	---	---	390	382	< 0.5	0.8	52.5	0.03	**0.565**	460	114	25.2	4.9	32.2	466	< 0.5	< 0.5	---	8.75	9.31	---	1.06	---	---	---	0.003	0.004	0.007	---	---	---	< 0.01	18.9	---
	08-Sep-2004	17-IN	804	7.88	---	---	350	389	< 0.5	1.4	51.9	0.03	**0.237**	446	101	23.5	4.4	29.4	475	< 0.5	< 0.5	---	---	---	---	0.94	---	---	---	< 0.003	0.045	0.045	---	---	---	< 0.01	17	---
	07-Sep-2005	17-IN	771	8.13	1.6	---	370	402	< 0.5	0.8	53.4	0.03	**0.728**	463	109	23.1	4.2	30.4	491	< 0.5	< 0.5	---	---	---	---	0.95	---	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.005	16	---
	07-Sep-2006	17-IN	794	7.93	---	---	360	392	< 0.5	1.6	47.8	0.13	**0.705**	452	107	23.8	4.5	30.9	479	< 0.5	< 0.5	---	---	---	---	0.98	---	---	---	< 0.003	0.006	0.006	---	---	---	---	15.5	---
	06-Sep-2007	17-IN	783	7.92	---	---	330	402	< 0.5	0.6	46.5	< 0.06	**0.643**	439	99	20.9	4	26.6	490	< 0.5	< 0.5	---	---	---	---	0.88	---	---	---	< 0.003	0.008	0.008	---	---	---	---	13.7	---
	04-Sep-2008	17-IN	774	8	---	---	339	392	---	< 0.50	46.3	< 0.030	**0.508**	439	97	23.5	4.92	32	478	< 5	< 5	0.17	---	---	---	0.942	---	---	---	< 0.050	< 0.050	< 0.070	---	---	---	---	---	---
	10-Sep-2009	17-IN	767	7.99	---	---	377	393	---	< 0.50	44.9	< 0.030	**0.611**	448	112	23.7	4.81	26.9	479	< 5.0	< 5.0	0.15	---	---	---	1	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	09-Sep-2010	17 IN	774	7.98	---	---	352	386	---	< 0.50	48.6	< 0.030	**0.42**	439	102	23.6	4.33	28.4	471	< 5.0	< 5.0	0.205	---	---	95.8	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	08-Sep-2011	17-IN	786	8.25	---	---	322	398	---	< 0.50	45.8	< 0.030	**0.472**	430	93.5	21.5	4.55	25.9	485	< 5.0	< 5.0	0.204	---	---	86.2	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	06-Sep-2012	17-IN	761	8.14	---	383	383	396	---	< 0.50	46.3	< 0.030	**0.528**	457	113	24.4	4.99	30.4	483	< 5.0	< 5.0	0.202	---	---	102	---	---	---	---	< 0.050	0.102	0.102	---	---	---	---	---	---
	26-Sep-2013	17-IN	762	7.98	---	372	373	399	---	< 0.50	48.1	0.124	**0.710**	456	109	24.5	4.95	29.5	487	< 5.0	< 5.0	0.180	---	---	98.6	---	---	---	---	< 0.050	0.052	< 0.071	---	---	---	---	---	---
	17-Sep-2014	17-IN	730	8.12	---	---	388	347	---	< 0.50	59.8	0.048	**0.679**	447	117	23.2	4.97	33.2	423	< 5.0	< 5.0	0.162	---	---	114	---	---	---	---	< 0.020	0.183	0.183	---	---	---	---	20.6	---
	29-Sep-2015	17-IN	867	7.61	---	---	416	389	---	<0.50	77.5	<0.010	**0.395**	**501**	119	28.8	5.02	34.8	475	<5.0	<5.0	0.200	---	---	---	---	---	---	---	0.012	0.527	0.538	---	---	---	---	---	---
	27-Sep-2016	17-IN	799	8.04	---	---	397	361	---	<0.50	77.1	<0.010	**0.512**	478	119	24.2	4.74	31.4	441	<5.0	<5.0	0.142	---	---	---	---	---	---	---	<0.010	1.190	1.19	---	---	---	---	---	---
	27-Sep-2017	17-IN	713	7.45	---	---	405	402	---	<0.50	64.2	<0.030	**0.531**	493	118	26.7	4.97	37.6	491	<5.0	<5.0	0.137	---	---	---	---	---	---	---	<0.010	0.038	<0.050	---	---	---	---	---	---
	18-Sep-2018	17-IN	738	8.04	---	---	395	371	---	<0.50	69.0	<0.010	**0.209**	477	117	24.9	4.84	34.8	453	<5.0	<5.0	0.163	---	---	---	---	---	---	---	<0.010	0.773	0.773	---	---	---	---	---	---
	17-Sep-2019	17-IN	746	7.79	---	---	359	408	---	0.58	63.4	<0.010	**0.166**	477	106	22.9	4.53	33.2	497	<5.0	<5.0	0.199	---	---	---	---	---	---	---	0.012	0.232	0.244	---	---	---	---	---	---
	21-Sep-2020	17-IN	810	6.87	---	---	363	408	---	<0.50	67.3	<0.010	**0.358**	483	107	23.2	4.55	35.1	498	<5.0	<5.0	0.145	---	---	---	---	---	---	---	<0.010	0.248	0.248	---	---	---	---	---	---
	22-Sep-2021	17-IN	783	7.82	---	---	365	403	---	<0.50	53.6	<0.030	**0.496**	466	105	25	4.88	34.8	492	<5.0	<5.0	0.139	---	---	---	---	---	---	---	<0.010	0.065	0.065	---	---	---	---	---	---
	29-Sep-2022	17-IN	766	8.14	---	---	388	391	---	<0.50	56.1	<0.030	**0.427**	490	112	26.4	5.02	34.3	478	1.3	<1.0	0.105	---	---	---	---	---	---	---	<0.010	0.178	0.178	---	---	---	---	---	---
	28-Sep-2023	17-IN	753	8.14	---	---	351	389	---	<0.50	49.7	0.012	**0.163**	462	103	22.8	3.72	27.4	475	<1.0	<1.0	0.168	---	---	---	---	---	---	---	<0.010	0.257	0.257	---	---	---	---	---	---
	11-Sep-2024	17-IN	762	7.63	---	---	375	384	---	<0.50	59.9	<0.010	**0.410**	483	110	24.4	4.52	31.7	468	<1.0	<1.0	0.173	---	---	---	---	---	---	---	<0.010	0.736	0.736	---	---	---	---	---	---
	18-Sep-2025	17-IN	786	7.99	---	---	378	398	---	<0.50	54.1	<0.010	**0.394**	488	110	25.0	4.66	37.2	486	<0.6	<0.3	0.173	---	---	---	---	---	---	---	<0.010	0.130	0.130	---	---	---	---	---	---
M-5	01-Oct-2001	M-5	537	7.64	---	---	230	268	< 0.5	< 0.5	34.3	< 0.01	**0.289**	---	66.3	15.4	5	37.1	327	< 0.5	< 0.5	---	6.09	6.32	---	1.04	< 0.001	---	---	0.004	0.142	0.146	---	---	---	---	11.4	---
	23-Sep-2002	M-5	611	7.51	---	---	250	304	< 0.5	< 0.5	40.8	**12.6**	**0.342**	370	73.9	16.5	5.4	38	370	< 0.5	< 0.5	---	6.92	6.84	---	0.99	0.001	---	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	13.3	---
	18-Oct-2003	M-5	568	8.37	---	---	110	317	4.9	0.6	15.6	0.01	**0.329**	339	32.1	7.9	2.7	88.7	375	5.9	< 0.5	---	6.68	6.19	---	0.93	---	< 0.004	---	< 0.003	0.069	0.069	---	---	---	**2.7**	5	---
	26-Oct-2004	M-5	554	7.18	---	---	240	277	< 0.5	1.6	31.3	**27.2**	**0.381**	344	71.1	14	3.8	27.7	338	< 0.5	< 0.5	---	---	---	---	1.12	---	< 0.004	---	< 0.003	< 0.003	< 0.003	---	---	---	< 0.01	8.6	---
	24-Oct-2005	M-5	438	8.22	63.5	---	160	226	< 0.5	5.2	7.2	0.02	**0.074**	251	38.3	16	4.5	44.1	276	< 0.5	< 0.5	---	---	---	---	1.09	---	---	---	< 0.003	0.003	0.003	---	---	---	**1.51**	14.5	---
	12-Sep-2007	M-5	722	7.75	50	---	200	275	< 0.5	51	41.4	0.06	**0.2**	395	58.7	12.8	4	62.2	335	< 0.5	< 0.5	0.13	---	---	---	0.87	---	---	---	< 0.003	0.018	0.018	---	---	---	---	11.6	---
	08-Oct-2008	M-5	557	7.8	---	---	215	281	---	2	30.1	**3.3**	**0.414**	315	61.1	15.1	4.4	34	342	< 5	< 5	0.1	---	---	---	0.935	---	---	---	< 0.05	< 0.1	< 0.1	---	---	---	---	---	---
	11-Sep-2009	M-5	558	7.67	---	---	245	268	---	< 0.50	33.7	< 0.030	**0.131**	322	74.3	14.4	4.91	32.9	328	< 5.0	< 5.0	0.079	---	---	---	1.06	---	---	---	< 0.050	0.097	0.097	---	---	---	---	---	---
M-6	02-Oct-2001	M-6	---	---	---	---	---	---	---	---	---	**2.89**	**0.971**	---	43.2	13.5	3.5	13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.6	---
	29-Sep-2010	M-6	348	7.83	---	---	141	161	---	5.1	12	0.244	**0.828**	184	38.1	11.2	2.65	18.3	196	< 5.0	< 5.0	0.126	---	---	---	102	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
	16-Dec-2011	M6	240	7.37	---	---	105	88.7	---	1.85	24.9	**4.76**	**0.899**	122	28.4	8.18	1.7	4	108	< 5.0	< 5.0	0.089	---	---	98.4	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---
89-1	27-Mar-2006	89-1	1070	**8.9**	---	---	2.5	608	38	1	< 1	**0.305**	0.005	**624**	0.98	< 0.05	1	**255**	650	45	< 1	---	---	---	---	0.92	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---
	27-Jun-2006	89-1	1020	**8.8**	---	---	1.5	597	35	< 1	< 1	0.046	0.002	**644**	0.58	< 0.05	---	**284**	643	42	< 1	**2**	---	---	---	1.04	---	---	---	< 0.06	< 0.2	< 0.2	---	---	0.63	---	---	---
	26-Sep-2006	89-1	1020	**8.8**	---	---	1.6	597	29	< 1	< 1	0.13	< 0.004	**637**	0.6	< 0.2	1	**277**	658	35	< 1	---	---	---	---	1.02	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---
	19-Dec-2006	89-1	1080	**8.8**	---	---	2.2	622	36	< 1	< 1	< 0.06	< 0.004	**635**	0.9	< 0.2	1.2	**259**	671	43	< 1	---	---	---	---	0.91	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---
	10-Oct-2008	89-1	1070	**8.7**	---	---	5	608	---	2	< 0.5	0.131	0.01	**626**	1.7	0.2	0.6	**254**	648	46	< 5	**2.48**	12.3	11.2	---	0.905	---	---	---	< 0.05	< 0.1	< 0.1	---	---	---	---	---	---
99-1	27-Mar-2006	99-1	1070	**8.9**	---	---	2.5	607	37	< 1	< 1	0.284	0.004	**629**	0.99	< 0.05	1	**263**	649	45	< 1	---	---	---	---	0.95	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---
	27-Jun-2006	99-1	1020	**8.8**	---	---	1.5	603	35	< 1	< 1	0.045	0.002	**646**	0.6	< 0.05	---	**281**	652	42	< 1	**2**	---	---	---	1.02	---	---	---	< 0.06	< 0.2	< 0.2	---	---	0.62	---	---	---
	26-Sep-2006	99-1	1020	**8.8**	---	---	1.7	592	22	< 1	< 1	0.12	< 0.004	**639**	0.7	< 0.2	1	**282**	668	27	< 1	---	---	---	---	1.04	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---
	19-Dec-2006	99-1	1070	**8.8**	---	---	2	623	38	< 1	< 1	< 0.06	< 0.004	**634**	0.8	< 0.2	1.2	**258**	667	46	< 1	---	---	---	---	0.91	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---
86-2	27-Mar-2006	86-2	558	**8.6**	---	---	18	318	12	< 1	< 1	0.039	0.015	336	5.84	0.81	2.8	136	359	14	< 1	---	---	---	---	1	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---
	27-Jun-2006	86-2	534	**8.5**	---	---	17	311	7	< 1	< 1	0.011	0.013	339	5.44	0.77	---	143	362	9	< 1	0.2	---	---	---	1.07	---	---	---	< 0.06	< 0.2	< 0.2	---	---	0.41	---	---	---
	26-Sep-2006	86-2	533	**8.5**	---	---	17	306	2	< 1	< 1	**0.35**	**0.046**	327	5.5	0.9	2.7	133	369	2	< 1	---	---	---	---	1.02	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---
	19-Dec-2006	86-2	564	**8.5**	---	---	19	323	5	< 1	1	**0.41**	**0.085**	336	6	0.9	2.9	131	382	6	< 1	---	---	---	---	0.95	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL								INDICATORS					CATIONS, ANIONS AND ION BALANCE												Cyanide			NITROGEN PARAMETERS						SULPHUR		
Monitoring Well	**Date (dd-mmm-yyyy)**	**Sample Name**	**Electrical Conductivity (µS/cm)**	**pH**	**Turbidity (ntu)**	**Dissolved Hardness as CaCO3 (mg/L)**	**Total Hardness as CaCO3 (mg/L)**	**Total Alkalinity as CaCO3 (mg/L)**	**PP Alkalinity as CaCO3 (mg/L)**	**Chloride (mg/L)**	**Sulphate (mg/L)**	**Iron (mg/L)**	**Manganese (mg/L)**	**Total Dissolved Solids (mg/L)**	**Calcium:D (mg/L)**	**Magnesium:D (mg/L)**	**Potassium:D (mg/L)**	**Sodium:D (mg/L)**	**Bicarbonate (mg/L)**	**Carbonate (mg/L)**	**Hydroxide (mg/L)**	**Fluoride:D (mg/L)**	**Anion Sum (meq/L)**	**Cation Sum (meq/L)**	**Ion Balance (%)**	**Ion Balance (Balance)**	**Cyanide:D (mg/L)**	**Cyanide:T (mg/L)**	**Cyanide (WAD):D (mg/L)**	**Nitrite as N (mg/L)**	**Nitrate as N (mg/L)**	**Nitrate plus nitrite as N (mg/L)**	**DKN (mg/L)**	**TKN (mg/L)**	**Ammonia as N (Unionized) (mg/L)**	**Sulphide (mg/L)**	**Sulphur: D (mg/L)**	**Sulphur: T (mg/L)**
Canadian Drinking Water AO Guidelines 2022[1]			---	**7.0-10.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.05**	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	**1.0**	---	---	---	---	---	---	---	**0.12**	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1**	**10**	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	**6.5 - 8.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1.0**	**10**	---	---	---	---	**0.05**	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	**6.5 - 8.5**	---	---	---	---	---	**120**	**Variable**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	---	---	---	**Variable [15]**	**0.0019**	---	---
86-3	27-Mar-2006	86-3	581	7.9	---	---	240	250	< 1	< 1	73	**5.77**	**0.606**	360	71.6	13.9	6.2	38.4	305	< 1	< 1	---	---	---	1.03	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---	---	---
	27-Jun-2006	86-3	568	7.6	---	---	240	254	< 1	< 1	69	**0.86**	**0.604**	357	73.9	13.9	---	39.2	310	< 1	< 1	< 0.1	---	---	1.03	---	---	---	< 0.06	< 0.2	< 0.2	---	---	0.36	---	---	---	---
	26-Sep-2006	86-3	555	7.1	---	---	240	241	< 1	< 1	71	**5.53**	**0.59**	351	72.4	14.3	6	36.8	294	< 1	< 1	---	---	---	1.07	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---	---
	19-Dec-2006	86-3	585	7.8	---	---	220	260	< 1	< 1	66	**3.56**	**0.558**	350	67.8	13.2	6.2	37.2	317	< 1	< 1	---	---	---	0.97	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---	---
89-3	02-Oct-2001	89-3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	< 0.001	---	---	---	---	---	---	---	---	---	---	---	---
	24-Sep-2002	89-3	325	7.6	---	---	150	152	< 0.5	< 0.5	24.5	**8.95**	**0.904**	193	39.1	11.9	3.2	13.6	186	< 0.5	< 0.5	---	3.55	3.6	---	1.01	0.001	---	---	< 0.003	0.004	0.004	---	---	---	**7.6**	17.1	---
	14-Oct-2003	89-3	315	8.2	---	---	130	154	< 0.5	3.1	24.1	0.15	**0.818**	182	35.6	11.1	2.6	12.1	188	< 0.5	< 0.5	---	3.67	3.29	---	0.9	---	< 0.004	---	0.004	0.005	0.009	---	---	---	**9.7**	8.8	---
	26-Oct-2004	89-3	322	7.4	---	---	140	161	< 0.5	0.2	15.3	**2.07**	**0.689**	178	37.8	10.9	2.7	11.8	197	< 0.5	< 0.5	---	---	---	---	0.97	---	< 0.004	---	< 0.003	0.019	0.019	---	---	---	< 0.01	3.2	---
	25-Oct-2005	89-3	347	7.9	206	---	160	160	< 0.5	0.9	30.1	**3.93**	**0.992**	204	40.9	13.1	2.9	15.6	195	< 0.5	< 0.5	---	---	---	---	1.04	---	---	---	< 0.003	0.007	0.007	---	---	---	**0.42**	5	---
	27-Mar-2006	89-3	340	8.1	---	---	160	168	< 1	< 1	18	0.014	**1.02**	191	41.8	13.5	2.8	13.1	205	< 1	< 1	---	---	---	1.03	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---	---
	26-Sep-2006	89-3	330	7.3	---	---	140	156	< 1	< 1	17	< 0.06	**0.879**	176	35.4	13.7	2.7	12.6	190	< 1	< 1	---	---	---	1.01	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---	---
	19-Dec-2006	89-3	348	7.9	---	---	160	176	< 1	< 1	15	0.27	**0.873**	193	41.2	13.2	2.9	13	215	< 1	< 1	---	---	---	0.99	---	---	---	< 0.06	< 0.2	< 0.2	---	---	---	---	---	---	---
	13-Sep-2007	89-3	531	7.45	3.2	---	140	166	< 0.5	58.4	20	< 0.06	**0.318**	293	37.1	11.3	3.5	62.4	203	< 0.5	< 0.5	0.22	---	---	---	1.04	---	---	---	< 0.003	0.028	0.028	---	---	---	---	6.6	---
	08-Oct-2008	89-3	355	7.6	---	---	---	173	---	2	21.2	**1.74**	**0.942**	---	44.9	13.8	2.9	14.1	212	< 5	< 5	0.22	---	---	1.02	---	---	---	< 0.05	< 0.1	< 0.1	---	---	---	---	---	---	---
	28-Sep-2010	89-3	535	7.83	---	---	170	191	---	38.4	22.9	**1.32**	**0.686**	280	45.8	13.6	3.19	41.1	234	< 5.0	< 5.0	0.136	---	---	97.6	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---	---
	14-Dec-2011	89-3	381	7.87	---	---	174	175	---	1.62	20.2	**1.38**	**0.997**	205	46.8	13.9	3.11	14.6	214	< 5.0	< 5.0	0.149	---	---	105	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---	---
	26-Sep-2013	89-3	388	7.60	---	176	176	197	---	< 0.50	20.1	**1.14**	**1.10**	215	46.8	14.4	2.72	12.8	241	< 5.0	< 5.0	0.139	---	---	94.8	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---	---
	17-Sep-2014	89-3	390	8.26	---	---	175	190	---	< 0.50	20.4	**1.33**	**1.06**	213	47.6	13.7	2.77	13.9	232	< 5.0	< 5.0	0.166	---	---	98.6	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	6.84	---	---
	29-Sep-2015	PW	418	7.42	---	---	188	201	---	<0.50	18.0	**8.84**	**1.18**	221	47.6	16.9	3.00	14.4	245	<5.0	<5.0	0.183	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	27-Sep-2016	PW	393	7.98	---	---	166	187	---	<0.50	18.4	**7.53**	**1.22**	205	44.9	13.1	2.97	12.9	228	<5.0	<5.0	0.141	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	27-Sep-2017	PW	372	8.40	---	---	182	186	---	<0.50	18.1	**4.58**	**1.14**	211	47.8	15.3	3.05	14.7	218	<5.0	<5.0	0.140	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---	---
	18-Sep-2018	89-3	362	7.92	---	---	177	192	---	<0.50	13.6	**5.11**	**1.00**	206	47.4	14.2	2.91	12.6	235	<5.0	<5.0	0.166	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	17-Sep-2019	89-3	369	7.61	---	---	182	198	---	<0.50	20.2	**5.61**	**1.17**	219	47.9	15.2	3.14	13.7	242	<5.0	<5.0	0.203	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	21-Sep-2020	89-3	431	7.25	---	---	169	188	---	<0.50	20.4	0.233	**0.616**	208	45.4	13.5	2.87	13.0	230	<5.0	<5.0	0.171	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	22-Sep-2021	89-3	375	7.83	---	---	166	190	---	<0.50	18.2	**0.419**	**0.232**	206	42.8	14.3	2.91	13.3	231	<5.0	<5.0	0.142	---	---	---	---	---	---	---	<0.010	0.036	0.036	---	---	---	---	---	---	---
	29-Sep-2022	89-3	372	8.10	---	---	186	194	---	<0.50	19.3	**1.460**	**1.270**	257	48.4	15.8	3.36	15.1	236	<1.0	<1.0	0.141	---	---	---	---	---	---	---	<0.010	0.023	<0.0500	---	---	---	---	---	---	---
	29-Sep-2023	89-3	372	8.25	---	---	171	198	---	<0.50	17	<0.010	**1.08**	247	45.8	13.7	2.85	12.5	242	<1.0	<1.0	0.163	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	11-Sep-2024	89-3	373	7.34	---	---	172	185	---	<0.50	18.9	**0.990**	**1.060**	243	45.6	14.0	2.71	12.4	226	<1.0	<1.0	0.175	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	18-Sep-2025	89-3	350	7.69	---	---	158	177	---	<0.50	13.4	**1.76**	**1.09**	229	42.5	12.7	2.72	12.5	216	<0.6	<0.3	0.168	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
QA/QC																																							
Trip Blank	05-Sep-2012	SPINEL 1	0.44	**6.38**	---	< 1.3	---	< 5.0	---	< 0.50	< 0.50	< 0.030	< 0.0050	---	< 0.50	< 0.10	< 0.50	< 1.0	< 5.0	< 5.0	< 5.0	< 0.050	---	---	Low TDS	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---	---
	05-Sep-2012	SPINEL 18	0.27	**6.31**	---	< 1.3	---	< 5.0	---	< 0.50	< 0.50	< 0.030	< 0.0050	---	< 0.50	< 0.10	< 0.50	< 1.0	< 5.0	< 5.0	< 5.0	< 0.050	---	---	Low TDS	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---	---
	05-Sep-2012	SPINEL 28	< 0.20	**5.79**	---	< 1.3	---	< 5.0	---	< 0.50	< 0.50	< 0.030	< 0.0050	---	< 0.50	< 0.10	< 0.50	< 1.0	< 5.0	< 5.0	< 5.0	< 0.050	---	---	Low TDS	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---	---
	26-Sep-2013	TRIP BLANK	0.59	**5.24**	---	< 1.3	< 1.0	< 2.0	---	< 0.50	< 0.50	< 0.030	< 0.0020	< 1.0	< 0.50	< 0.10	< 0.50	< 1.0	< 5.0	< 5.0	< 5.0	< 0.020	---	---	Low TDS	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---	---
	16-Sep-2014	TRIP BLANK	1.45	**5.35**	---	---	< 1.0	< 2.0	---	< 0.50	< 0.50	< 0.010	< 0.000050	< 1.0	< 0.50	< 0.10	< 0.50	< 1.0	< 5.0	< 5.0	< 5.0	< 0.020	---	---	Low TDS	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	< 0.50	---	---
	29-Sep-2015	TRIP BLANK	0.30	**5.24**	---	---	<1.0	<2.0	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.050	<0.0050	<0.050	<0.050	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	28-Sep-2016	TRIP BLANK	<2.0	**5.15**	---	---	<1.3	<2.0	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	27-Sep-2017	TRIP BLANK	<2.0	**5.70**	---	---	<1.0	<5.0	---	<0.50	<0.30	<0.030	<0.0050	<1.0	<0.10	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---	---
	19-Sep-2018	TRIP BLANK	<2.0	**5.08**	---	---	<1.0	<2.0	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	16-Sep-2019	TRIP BLANK	<2.0	**5.07**	---	---	<1.0	<2.0	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	23-Sep-2020	TRIP BLANK	<2.0	**5.49**	---	---	<1.0	<2.0	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	22-Sep-2021	TRIP BLANK	<2.0	**5.24**	---	---	<1.0	<2.0	---	<0.50	<0.30	<0.030	<0.0050	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	28-Sep-2022	TRIP BLANK	<2.0	**5.55**	---	---	<0.50	<2.0	---	<0.50	<0.30	<0.030	<0.0050	<1.0	<0.050	<0.0050	<0.050	<0.050	<1.0	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	29-Sep-2023	TRIP BLANK	<2.0	**5.39**	---	---	<0.50	<2.0	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.050	<0.0050	<0.050	<0.050	<1.0	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	11-Sep-2024	TRIP BLANK	<2.0	**5.68**	---	---	<0.50	<2.0	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.050	<0.0050	<0.050	<0.050	<1.0	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	18-Sep-2025	TRIP BLANK	<2.0	**5.84**	---	---	<0.50	<2.0	---	<0.50	<0.30	<0.010	<0.00010	1.1	<0.050	<0.0050	<0.050	<0.050	<1.2	<0.6	<0.3	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---

Table 4.3
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)

			GENERAL							INDICATORS					CATIONS, ANIONS AND ION BALANCE															Cyanide			NITROGEN PARAMETERS							SULPHUR		
Monitoring Well	Date (dd-mmm-yyyy)	Sample Name	Electrical Conductivity (µS/cm)	pH	Turbidity (ntu)	Dissolved Hardness as CaCO3 (mg/L)	Total Hardness as CaCO3 (mg/L)	Total Alkalinity as CaCO3 (mg/L)	PP Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Dissolved Solids (mg/L)	Calcium:D (mg/L)	Magnesium:D (mg/L)	Potassium:D (mg/L)	Sodium:D (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Fluoride:D (mg/L)	Anion Sum (meq/L)	Cation Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Cyanide:D (mg/L)	Cyanide:T (mg/L)	Cyanide (WAD):D (mg/L)	Nitrite as N (mg/L)	Nitrate as N (mg/L)	Nitrate plus nitrite as N (mg/L)	DKN (mg/L)	TKN (mg/L)	Ammonia as N (Unionized) (mg/L)	Sulphide (mg/L)	Sulphur: D (mg/L)	Sulphur: T (mg/L)
Canadian Drinking Water AO Guidelines 2022[1]			---	**7.0-10.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**0.05**	---	---
Canadian Drinking Water MAC Guidelines 2022[2]			---	---	**1.0**	---	---	---	---	---	---	---	**0.12**	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1**	**10**	---	---	---	---	---	---	---	---
Alberta Tier 2 Potable Groundwater Guideline[3]			---	**6.5 - 8.5**	---	---	---	---	---	**250**	**500**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.2**	**0.2**	**0.2**	**1.0**	**10**	---	---	---	---	**0.05**	---	---
Alberta Tier 2 Aquatic Life Groundwater Guideline[4]			---	**6.5 - 8.5**	---	---	---	---	---	**120**	**Variable**	**0.3**	**0.02**	**500**	---	---	---	**200**	---	---	---	**1.5**	---	---	---	---	**0.0050**	**0.0050**	**0.0050**	**Variable**	**3**	---	---	---	**Variable [13]**	**0.0019**	---	---
Field Blank	25-Sep-2013	20-SH	0.36	**5.28**	---	---	< 1.3	< 1.0	< 2.0	---	< 0.50	< 0.50	< 0.030	< 0.0020	< 1.0	< 0.50	< 0.10	< 0.50	<1.0	<5.0	< 5.0	< 5.0	< 0.020	---	---	Low TDS	---	---	---	---	< 0.050	< 0.050	< 0.071	---	---	---	---	---	---	---
	16-Sep-2014	41-SH	0.47	**5.16**	---	---	< 1.0	<2.0	---	---	< 0.50	< 0.50	< 0.010	0.000092	< 1.0	< 0.50	< 0.10	< 0.50	< 1.0	< 5.0	< 5.0	< 5.0	< 0.020	---	---	Low TDS	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	< 0.50	---	---
	17-Sep-2014	42-SH	1.02	**5.62**	---	---	< 1.0	<2.0	---	---	< 0.50	< 0.50	< 0.010	< 0.000050	< 1.0	< 0.50	< 0.10	< 0.50	< 1.0	< 5.0	< 5.0	< 5.0	< 0.020	---	---	Low TDS	---	---	---	---	< 0.020	< 0.050	< 0.054	---	---	---	---	< 0.50	---	---
	28-Sep-2015	Field Blank 1	0.82	**5.36**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.050	<0.0050	<0.050	<0.050	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	29-Sep-2015	Field Blank 2	<0.20	**5.34**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	0.082	0.0050	<0.050	<0.050	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	26-Sep-2016	10-SH	<2.0	**5.36**	---	---	<1.3	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	28-Sep-2016	20-SH	<2.0	**5.34**	---	---	<1.3	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	27-Sep-2017	10-SH	<2.0	**5.23**	---	---	<1.0	<5.0	---	---	<0.50	<0.30	<0.030	<0.0050	<1.0	<0.10	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---	---
	27-Sep-2017	20-SH	<2.0	**6.11**	---	---	<1.0	<5.0	---	---	<0.50	<0.30	<0.030	<0.0050	<1.0	<0.10	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.050	---	---	---	---	---	---	---
	18-Sep-2018	10-SH	<2.0	**5.87**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.010	0.00011	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	18-Sep-2018	20-SH	<2.0	**5.10**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	16-Sep-2019	10-SH	<2.0	**5.47**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	17-Sep-2019	20-SH	<2.0	**4.73**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.010	0.00025	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	21-Sep-2020	10-SH	<2.0	**5.06**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	22-Sep-2020	20-SH	<2.0	**5.09**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	23-Sep-2020	30-SH	<2.0	**4.99**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	21-Sep-2021	10-SH	<2.0	**5.47**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.030	<0.0050	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	22-Sep-2021	20-SH	<2.0	**5.37**	---	---	<1.0	<2.0	---	---	<0.50	<0.30	<0.030	<0.0050	<1.0	<0.50	<0.10	<0.50	<1.0	<5.0	<5.0	<5.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.022	---	---	---	---	---	---	---
	28-Sep-2022	10-SH	<2.0	**5.53**	---	---	<0.50	<2.0	---	---	<0.50	<0.30	<0.030	<0.0050	<1.0	<0.050	<0.0050	<0.050	<0.050	<1.0	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	29-Sep-2022	20-SH	<2.0	**5.39**	---	---	<0.50	<2.0	---	---	<0.50	1.60	<0.030	<0.0050	1.7	<0.050	<0.0050	<0.050	<0.050	<1.0	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	0.020	<0.0500	---	---	---	---	---	---	---
	29-Sep-2023	Field Blank	<2.0	**5.31**	---	---	<0.50	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	<1.0	<0.050	<0.0050	<0.050	<0.050	<1.0	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	11-Sep-2024	10-SH	<2.0	**5.63**	---	---	<0.50	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	4.4	0.083	0.0103	<0.050	0.081	<1.0	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	11-Sep-2024	20-SH	<2.0	**5.65**	---	---	<0.50	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	2.4	0.062	0.0118	<0.050	0.11	<1.0	<1.0	<1.0	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	18-Sep-2025	10-SH	<2.0	**5.95**	---	---	<0.50	<2.0	---	---	<0.50	<0.30	<0.010	<0.00010	1.1	<0.050	<0.0050	<0.050	<0.050	<1.2	<0.6	<0.3	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---
	18-Sep-2025	20-SH	<2.0	**5.77**	---	---	<0.50	<2.0	---	---	<0.50	<0.30	<0.010	0.00017	1.6	<0.050	<0.0050	<0.050	<0.050	<1.2	<0.6	<0.3	<0.020	---	---	---	---	---	---	---	<0.010	<0.020	<0.0500	---	---	---	---	---	---	---

NOTES:

1: Health Canada Guidelines for Canadian Drinking Water Quality, September 2022 - Aesthetic Objective (AO)

2: Health Canada Guidelines for Canadian Drinking Water Quality, September 2022 - Maximum Acceptable Concentration (MAC)

3: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guideline Values for Commercial/Industrial - All Water Uses - Potable

Monitoring Well	Monitoring Well compared to Alberta Tier 2 Potable Groundwater Remediation Guideline for Commercial/Industrial Sites
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (June, 2024), Table B-4. Groundwater Remediation Guidline Values for Commercial/Industrial - All Water Uses - Aquatic Life

Monitoring Well	Monitoring Well compared to Alberta Tier 2 Aquatic Life Groundwater Remediation Guideline for Commercial/Industrial Sites - Fine Grain Guidelines = Coarse Grain Guidelines for Routine Parameters (Fine Grain for SH and IN wells, Coarse Grain for SS wells)
Bold	Guideline exceeded
Regular	Concentration is equal to the guideline

13: Ammonia Guideline: Environmental Quality Guidelines for Alberta Surface Waters (March 2018) - Table 1.2. Ammonia guidelines for protection of aquatic life at varying pH and temperature.

--- Guideline Row: No guideline for that parameter
--- Results: Parameter was not analyzed
Low TDS TDS too low to analyze

Sulphate Guideline Aquatic life (Environmental Quality Guidelines for Alberta Surface Waters (March 2018))

Water Hard	ideline (mg/L)
0-30	128
31-75	218
76-180	309
181-250	429
>250	Need to be determined based on site water

Nitrite-N Guideline Aquatic life (Environmental Quality Guidelines for Alberta Surface Waters (March 2018))

Chloride (r	n Nitrate as N (mg/L
<2	0.06
2-4	0.12
4-6	0.18
6-8	0.24
8-10	0.3
>10	0.6

Appendix E

Photographic Log

PHOTOGRAPHIC RECORD

AECOM Imagine it. Delivered.

Site Name:	Site Location:	Project No.
Swan Hills Treatment Centre	West half of 06-067-08W5	60442762

Photo No.	Date:
1	2014-05-22

Well:

01A-SH
01A-IN

Description:

Orange film observed on some bladder pumps and tubing.





Photo No.	Date:
2	2014-05-21

Well:

04-IN

Description:

Signs of oxidation on some bladder pumps.



PHOTOGRAPHIC RECORD 2

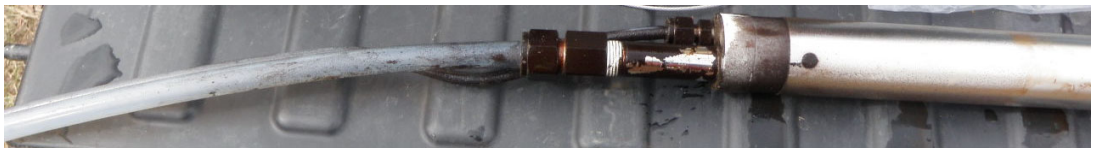
AECOM Imagine it. Delivered.

Site Name:	Site Location:	Project No.
Swan Hills Treatment Centre	West half of 06-067-08W5	60442762

Photo No.	Date:
3	2014-05-21

Well:

04-IN
13-SH





Description:

Black residue observed on some bladder pumps and tubing

Photo No.	Date:
4	2014-05-22

Well:

12-SH



Description:

Black residue observed on some bladder pumps and tubing

Appendix F

Laboratory Test Results

CERTIFICATE OF ANALYSIS

Work Order	:	**EO2508465**		
Client	:	**AECOM Canada ULC**	Laboratory	: ALS Environmental - Edmonton
Contact	:	Michael Steed	Account Manager	: Megha Walia
Address	:	101 - 18817 Stony Plain Rd. NW Edmonton Alberta Canada T5S 0C2	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	:	780 486 7000	E-mail	: Megha.Walia@alsglobal.com
Project	:	Swan Hills - 60757940	Telephone	: +1 780 413 5227
PO	:	60757940	Date Samples Received	: 19-Sep-2025 13:03
C-O-C number	:	----	Date Analysis Commenced	: 19-Sep-2025
Sampler	:	----	Issue Date	: 09-Oct-2025 18:00
Site	:	----		
Quote number	:	EO22-AECO100-016 (Swan Hills)		
No. of samples received	:	46		
No. of samples analysed	:	46		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Alannah Barron	Laboratory Analyst	Metals, Edmonton, Alberta
Alastair McGibbon	Laboratory Analyst	Inorganics, Edmonton, Alberta
Alex Drake	Lab Analyst	Metals, Edmonton, Alberta
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Laboratory Analyst	Metals, Edmonton, Alberta
Kari Mulroy	Lab Supervisor - Environmental	Organics, Edmonton, Alberta
Logan Carroll	Laboratory Analyst	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Shelly Nimilowich	Account Manager	Internal Subcontracting, Kelso, Washington DC (District of Columbia)
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Metals, Edmonton, Alberta
Yan Zhang	Team Leader - Organics	Organics, Edmonton, Alberta

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

CORRECTIONS MADE TO SAMPLE TIMES ON -042 & -043

Qualifiers

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
IB:INT	Ion Balance Reviewed: Imbalance is due to interference or non-measured component.
PRAR	PCB pattern most closely resembles Aroclor reported. Match is not exact.
RRV	Reported result verified by repeat analysis.
SFP	Sample was filtered and preserved at the laboratory.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	01(R)SH ----	01A-IN ----	01(2R)SS ----	03-SH ----	03-IN ----
					Client sampling date / time	18-Sep-2025 11:50	18-Sep-2025 11:35	18-Sep-2025 12:00	17-Sep-2025 16:25	17-Sep-2025 16:18
						EO2508465-001	EO2508465-002	EO2508465-003	EO2508465-004	EO2508465-005
						Result	Result	Result	Result	Result
Sample Preparation										
Dissolved carbon filtration location	----	EP358/EO	-	-		field	field	field	field	field
Physical Tests										
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L		505	310	91.9	491	420
Conductivity	----	E100/EO	2.0	µS/cm		1230	801	905	886	851
pH	----	E108/EO	0.10	pH units		6.26	7.14	8.18	7.57	7.74
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L		814	560	378	526	482
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L		<0.6	<0.6	<0.6	<0.6	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L		<0.3	<0.3	<0.3	<0.3	<0.3
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L		667	459	310	431	395
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L		1020	507	588	558	527
Anions and Nutrients										
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L		19.2	1.30	13.9	1.36	0.56
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L		0.681	0.152	0.590	0.323	0.233
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L		<0.020	0.194	<0.020	<0.020	0.046
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L		14.6	<0.30	136	76.2	81.6
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L		<0.0500	0.194	<0.0500	<0.0500	<0.0500
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L		172	21.6	11.8	5.20	3.99
Ion Balance										
Anion sum	----	EC101/EO	0.10	meq/L		14.2	9.23	9.45	10.2	9.62

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	01(R)SH ----	01A-IN ----	01(2R)SS ----	03-SH ----	03-IN ----
					Client sampling date / time	18-Sep-2025 11:50	18-Sep-2025 11:35	18-Sep-2025 12:00	17-Sep-2025 16:25	17-Sep-2025 16:18
						EO2508465-001	EO2508465-002	EO2508465-003	EO2508465-004	EO2508465-005
						Result	Result	Result	Result	Result
Ion Balance										
Cation sum	----	EC101/EO	0.10	meq/L		17.5	9.25	10.3	10.6	9.93
Ion balance (APHA)	----	EC101/EO	0.01	%		10.4	0.11	4.30	1.92	1.58
Ion balance (cations/anions)	----	EC101/EO	0.010	%		123 IB:INT	100	109	104	103
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L		138	81.6	29.1	134	115
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L		180	4.00	0.014	<0.010	<0.010
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L		39.0	25.8	4.67	38.1	32.3
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L		8.96	0.298	0.0103	0.00088	0.00183
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L		5.45	3.79	5.15	1.35	3.57
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L		10.2	64.4	191	16.9	33.1
Dissolved mercury filtration location	----	EP509/EO	-	-		Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/EO	-	-		Field	Field	Field	Field	Field
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L		0.0854	0.0013	0.0152	0.0072	0.0022
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L		0.00036	<0.00010	0.00050	0.00010	<0.00010
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L		0.0188	0.00342	0.00111	0.00021	0.00018
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L		0.458	0.360	0.113	0.441	0.107
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L		0.016	0.127	0.137	0.030	0.067
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L		0.0000733	0.0000118	0.0000161	0.0000390	0.0000050
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L		0.00442	<0.00050	<0.00050	0.00128	0.00073
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L		0.00073	0.00164	0.00344	0.00073	0.00081
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L		0.000131	0.000059	0.000105	<0.000050	0.000059

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 01(R)SH ----	01A-IN ----	01(2R)SS ----	03-SH ----	03-IN ----
					Client sampling date / time: 18-Sep-2025 11:50	18-Sep-2025 11:35	18-Sep-2025 12:00	17-Sep-2025 16:25	17-Sep-2025 16:18
					EO2508465-001	EO2508465-002	EO2508465-003	EO2508465-004	EO2508465-005
					Result	Result	Result	Result	Result
Dissolved Metals									
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L	0.0626	0.00061	0.00727	0.00178	0.00089
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L	0.000948	0.000076	0.000332	0.000068	0.000066
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L	0.000503	0.000377	0.00649	0.00474	0.00399
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L	0.0162	0.0036	0.0028	0.0020	0.0060
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Aggregate Organics									
Adsorbable organic halogens, [AOX], (as Cl)	----	AOX/1D	10	mg/L	----	----	----	see attached	----
Volatile Organic Compounds									
Benzene	71-43-2	E611A/EO	0.50	µg/L	0.93	----	----	<0.50	----
BTEX, total	----	E611A/EO	1.0	µg/L	13.0	----	----	<1.0	----
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L	1.08	----	----	<0.50	----
Toluene	108-88-3	E611A/EO	0.50	µg/L	11.0	----	----	<0.50	----
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L	<0.40	----	----	<0.40	----
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L	<0.30	----	----	<0.30	----
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L	<0.50	----	----	<0.50	----
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	100	µg/L	100	----	----	<100	----
F1-BTEX	----	EC580/EO	25	µg/L	<100	----	----	<100	----
Hydrocarbons Surrogates									
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	109	----	----	114	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 01(R)SH ----	01A-IN ----	01(2R)SS ----	03-SH ----	03-IN ----
					Client sampling date / time: 18-Sep-2025 11:50	18-Sep-2025 11:35	18-Sep-2025 12:00	17-Sep-2025 16:25	17-Sep-2025 16:18
					EO2508465-001	EO2508465-002	EO2508465-003	EO2508465-004	EO2508465-005
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	97.6	----	----	91.5	----
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	98.9	----	----	97.4	----
Polychlorinated Biphenyls									
Aroclor 1016	12674-11-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1221	11104-28-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1232	11141-16-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1242	53469-21-9	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1248	12672-29-6	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1254	11097-69-1	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1260	11096-82-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1262	37324-23-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1268	11100-14-4	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Polychlorinated biphenyls [PCBs], total	n/a	E687-L/WT	0.0300	µg/L	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Polychlorinated Biphenyls Surrogates									
Decachlorobiphenyl	2051-24-3	E687-L/WT	0.010	%	53.3	114	116	132	124
Tetrachloro-m-xylene	877-09-8	E687-L/WT	0.010	%	105	111	109	120	117

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 04-SH ----	04-IN ----	04-SS ----	25-SH ----	05-SH ----
					Client sampling date / time: 17-Sep-2025 17:10	17-Sep-2025 17:00	17-Sep-2025 16:45	17-Sep-2025 17:30	17-Sep-2025 17:50
					EO2508465-006	EO2508465-007	EO2508465-008	EO2508465-009	EO2508465-010
					Result	Result	Result	Result	Result
Sample Preparation									
Dissolved carbon filtration location	----	EP358/EO	-	-	field	field	field	field	field
Physical Tests									
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L	418	352	300	652	658
Conductivity	----	E100/EO	2.0	µS/cm	762	718	671	1120	1110
pH	----	E108/EO	0.10	pH units	7.62	7.52	7.36	7.44	7.53
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L	529	466	389	654	659
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L	<0.6	<0.6	<0.6	<0.6	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L	434	382	319	536	540
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L	453	439	424	710	713
Anions and Nutrients									
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	<0.50	<0.50	<0.50	1.37	1.37
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L	0.251	0.218	0.108	0.233	0.223
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L	<0.020	0.063	0.169	<0.020	<0.020
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L	<0.010	0.013	<0.010	<0.010	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L	8.02	21.6	49.0	114	114
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L	<0.0500	0.0760	0.169	<0.0500	<0.0500
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L	3.16	4.15	1.90	8.30	7.56
Ion Balance									
Anion sum	----	EC101/EO	0.10	meq/L	8.85	8.10	7.41	13.1	13.2

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 04-SH ----	04-IN ----	04-SS ----	25-SH ----	05-SH ----
					Client sampling date / time: 17-Sep-2025 17:10	17-Sep-2025 17:00	17-Sep-2025 16:45	17-Sep-2025 17:30	17-Sep-2025 17:50
					EO2508465-006	EO2508465-007	EO2508465-008	EO2508465-009	EO2508465-010
					Result	Result	Result	Result	Result
Ion Balance									
Cation sum	----	EC101/EO	0.10	meq/L	8.88	8.22	7.58	13.4	13.6
Ion balance (APHA)	----	EC101/EO	0.01	%	0.17	0.74	1.13	1.13	1.49
Ion balance (cations/anions)	----	EC101/EO	0.010	%	100	101	102	102	103
Dissolved Metals									
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L	113	104	83.1	180	181
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L	<0.010	0.010	0.932	<0.010	<0.010
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L	32.9	22.4	22.6	49.3	50.0
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L	0.478	0.234	0.562	0.00083	0.00075
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L	2.56	5.40	4.74	1.02	1.04
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L	10.5	23.9	32.2	9.04	9.08
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/EO	-	-	Field	Field	Field	Field	Field
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L	<0.0010	0.0012	0.0016	0.0017	0.0015
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L	0.00014	0.00295	0.00051	0.00019	0.00019
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L	0.222	0.0692	0.108	0.112	0.112
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L	0.092	0.224	0.028	0.032	0.031
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L	0.0000363	0.000100	0.0000425	0.0000097	0.0000131
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L	0.00090	0.00089	<0.00050	0.00330	0.00361
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L	0.00052	0.00036	0.00058	0.00070	0.00070
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	04-SH ----	04-IN ----	04-SS ----	25-SH ----	05-SH ----
					Client sampling date / time	17-Sep-2025 17:10	17-Sep-2025 17:00	17-Sep-2025 16:45	17-Sep-2025 17:30	17-Sep-2025 17:50
						EO2508465-006	EO2508465-007	EO2508465-008	EO2508465-009	EO2508465-010
						Result	Result	Result	Result	Result
Dissolved Metals										
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L		0.00164	0.00149	0.00192	0.00078	0.00077
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L		<0.000050	0.000059	<0.000050	0.000202	0.000164
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L		<0.000010	<0.000010	0.000022	<0.000010	<0.000010
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L		0.00803	0.00782	0.000188	0.00687	0.00688
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L		0.0017	0.0020	0.0049	0.0014	0.0012
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Volatile Organic Compounds										
Benzene	71-43-2	E611A/EO	0.50	µg/L		<0.50	----	----	<0.50	<0.50
BTEX, total	----	E611A/EO	1.0	µg/L		<1.0	----	----	<1.0	<1.0
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L		<0.50	----	----	<0.50	<0.50
Toluene	108-88-3	E611A/EO	0.50	µg/L		<0.50	----	----	<0.50	<0.50
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L		<0.40	----	----	<0.40	<0.40
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L		<0.30	----	----	<0.30	<0.30
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L		<0.50	----	----	<0.50	<0.50
Hydrocarbons										
F1 (C6-C10)	----	E581.F1/EO	100	µg/L		<100	----	----	<100	<100
F1-BTEX	----	EC580/EO	25	µg/L		<100	----	----	<100	<100
Hydrocarbons Surrogates										
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%		116	----	----	113	109
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%		99.0	----	----	70.2	79.6

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 04-SH ----	04-IN ----	04-SS ----	25-SH ----	05-SH ----
					Client sampling date / time: 17-Sep-2025 17:10	17-Sep-2025 17:00	17-Sep-2025 16:45	17-Sep-2025 17:30	17-Sep-2025 17:50
					EO2508465-006	EO2508465-007	EO2508465-008	EO2508465-009	EO2508465-010
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	104	----	----	98.6	95.1
Polychlorinated Biphenyls									
Aroclor 1016	12674-11-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1221	11104-28-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1232	11141-16-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1242	53469-21-9	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1248	12672-29-6	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1254	11097-69-1	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1260	11096-82-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1262	37324-23-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1268	11100-14-4	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Polychlorinated biphenyls [PCBs], total	n/a	E687-L/WT	0.0300	µg/L	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Polychlorinated Biphenyls Surrogates									
Decachlorobiphenyl	2051-24-3	E687-L/WT	0.010	%	138	120	124	123	119
Tetrachloro-m-xylene	877-09-8	E687-L/WT	0.010	%	129	116	115	117	118

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 05-IN ----	05-SS ----	25-SS ----	06-SH ----	06(R)IN ----
					Client sampling date / time: 17-Sep-2025 17:35	17-Sep-2025 18:15	17-Sep-2025 18:30	18-Sep-2025 16:45	18-Sep-2025 17:00
					EO2508465-011	EO2508465-012	EO2508465-013	EO2508465-014	EO2508465-015
					Result	Result	Result	Result	Result
Sample Preparation									
Dissolved carbon filtration location	----	EP358/EO	-	-	field	field	field	field	field
Physical Tests									
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L	576	175	172	563	567
Conductivity	----	E100/EO	2.0	µS/cm	1160	444	433	953	966
pH	----	E108/EO	0.10	pH units	7.60	7.50	7.46	7.32	7.48
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L	678	264	260	690	690
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L	<0.6	<0.6	<0.6	<0.6	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L	556	216	213	566	566
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L	748	288	282	582	588
Anions and Nutrients									
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	1.13	<0.50	<0.50	<0.50	<0.50
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L	0.202	0.178	0.178	0.197	0.204
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L	0.042	0.196	0.195	<0.020	<0.020
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L	118	23.6	20.3	1.91	1.60
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L	<0.0500	0.196	0.195	<0.0500	<0.0500
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L	7.64	1.31	1.14	4.98	5.86
Ion Balance									
Anion sum	----	EC101/EO	0.10	meq/L	13.6	4.83	4.70	11.4	11.4

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 05-IN ----	05-SS ----	25-SS ----	06-SH ----	06(R)IN ----
					Client sampling date / time: 17-Sep-2025 17:35	17-Sep-2025 18:15	17-Sep-2025 18:30	18-Sep-2025 16:45	18-Sep-2025 17:00
					EO2508465-011	EO2508465-012	EO2508465-013	EO2508465-014	EO2508465-015
					Result	Result	Result	Result	Result
Ion Balance									
Cation sum	----	EC101/EO	0.10	meq/L	14.1	4.93	4.83	11.7	11.8
Ion balance (APHA)	----	EC101/EO	0.01	%	1.80	1.02	1.36	1.30	1.72
Ion balance (cations/anions)	----	EC101/EO	0.010	%	104	102	103	103	104
Dissolved Metals									
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L	160	49.2	48.9	154	157
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L	<0.010	0.034	0.035	0.040	<0.010
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L	42.9	12.6	12.2	43.4	42.5
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L	0.0920	0.395	0.382	0.852	1.22
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L	3.20	4.19	4.04	1.68	2.54
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L	57.8	30.2	29.1	7.57	7.93
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/EO	-	-	Field	Field	Field	Field	Field
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L	<0.0010	<0.0010	0.0011	0.0383	0.0012
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L	<0.00010	<0.00010	<0.00010	0.00016	<0.00010
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L	0.00064	0.00020	0.00018	0.00056	0.00059
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L	0.0644	0.109	0.110	0.654	0.605
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L	0.053	0.023	0.023	0.043	0.056
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L	0.0000184	0.0000155	0.0000155	0.0000152	0.0000373
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L	0.00205	<0.00050	<0.00050	<0.00050	<0.00050
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L	0.00161	0.00285	0.00295	0.00062	0.00223
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L	<0.000050	<0.000050	<0.000050	0.000096	<0.000050

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 05-IN ----	05-SS ----	25-SS ----	06-SH ----	06(R)IN ----
					Client sampling date / time: 17-Sep-2025 17:35	17-Sep-2025 18:15	17-Sep-2025 18:30	18-Sep-2025 16:45	18-Sep-2025 17:00
					EO2508465-011	EO2508465-012	EO2508465-013	EO2508465-014	EO2508465-015
					Result	Result	Result	Result	Result
Dissolved Metals									
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L	0.00122	0.00136	0.00149	0.00558	0.0148
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000073
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	0.000158
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L	0.00803	0.000106	0.000103	0.00524	0.00609
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L	0.0028	0.0790	0.0752	0.0031	0.0048
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Volatile Organic Compounds									
Benzene	71-43-2	E611A/EO	0.50	µg/L	----	----	----	<0.50	----
BTEX, total	----	E611A/EO	1.0	µg/L	----	----	----	<1.0	----
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L	----	----	----	<0.50	----
Toluene	108-88-3	E611A/EO	0.50	µg/L	----	----	----	<0.50	----
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L	----	----	----	<0.40	----
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L	----	----	----	<0.30	----
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L	----	----	----	<0.50	----
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	100	µg/L	----	----	----	<100	----
F1-BTEX	----	EC580/EO	25	µg/L	----	----	----	<100	----
Hydrocarbons Surrogates									
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	----	----	----	107	----
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	----	----	----	78.0	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

					Client sample ID	05-IN ----	05-SS ----	25-SS ----	06-SH ----	06(R)IN ----
					Client sampling date / time	17-Sep-2025 17:35	17-Sep-2025 18:15	17-Sep-2025 18:30	18-Sep-2025 16:45	18-Sep-2025 17:00
Analyte	CAS Number	Method/Lab	LOR	Unit		EO2508465-011	EO2508465-012	EO2508465-013	EO2508465-014	EO2508465-015
						Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates										
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%		----	----	----	74.3	----
Polychlorinated Biphenyls										
Aroclor 1016	12674-11-2	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1221	11104-28-2	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1232	11141-16-5	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1242	53469-21-9	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1248	12672-29-6	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1254	11097-69-1	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1260	11096-82-5	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1262	37324-23-5	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1268	11100-14-4	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Polychlorinated biphenyls [PCBs], total	n/a	E687-L/WT	0.0300	µg/L		<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Polychlorinated Biphenyls Surrogates										
Decachlorobiphenyl	2051-24-3	E687-L/WT	0.010	%		112	117	104	120	124
Tetrachloro-m-xylene	877-09-8	E687-L/WT	0.010	%		106	114	103	128	133

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	07-SH ----	27-SH ----	07-IN ----	07(R)-SS ----	08-SH ----
					Client sampling date / time	18-Sep-2025 17:30	18-Sep-2025 17:48	18-Sep-2025 17:18	18-Sep-2025 17:55	18-Sep-2025 10:35
						EO2508465-016	EO2508465-017	EO2508465-018	EO2508465-019	EO2508465-020
						Result	Result	Result	Result	Result
Sample Preparation										
Dissolved carbon filtration location	----	EP358/EO	-	-		field	field	field	field	field
Physical Tests										
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L		818	815	350	347	320
Conductivity	----	E100/EO	2.0	µS/cm		1510	1500	720	733	742
pH	----	E108/EO	0.10	pH units		7.55	7.49	7.96	7.95	7.88
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L		601	601	438	474	462
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L		<0.6	<0.6	<0.6	<0.6	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L		<0.3	<0.3	<0.3	<0.3	<0.3
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L		493	493	359	389	379
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L		855	858	458	486	463
Anions and Nutrients										
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L		206	211	0.70	<0.50	0.86
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L		0.196	0.187	0.229	0.136	0.248
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L		<0.020	<0.020	0.090	0.193	<0.020
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L		13.0	12.2	49.4	36.5	44.9
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L		<0.0500	<0.0500	0.0900	0.193	<0.0500
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L		4.19	4.04	5.27	4.97	4.13
Ion Balance										
Anion sum	----	EC101/EO	0.10	meq/L		15.9	16.1	8.24	8.55	8.55

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 07-SH ----	27-SH ----	07-IN ----	07(R)-SS ----	08-SH ----
					Client sampling date / time: 18-Sep-2025 17:30	18-Sep-2025 17:48	18-Sep-2025 17:18	18-Sep-2025 17:55	18-Sep-2025 10:35
					EO2508465-016	EO2508465-017	EO2508465-018	EO2508465-019	EO2508465-020
					Result	Result	Result	Result	Result
Ion Balance									
Cation sum	----	EC101/EO	0.10	meq/L	17.3	17.2	8.59	8.96	8.77
Ion balance (APHA)	----	EC101/EO	0.01	%	4.22	3.30	2.08	2.34	1.27
Ion balance (cations/anions)	----	EC101/EO	0.010	%	109	107	104	105	102
Dissolved Metals									
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L	227	228	101	101	86.2
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L	<0.010	0.014	0.022	<0.010	<0.010
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L	61.0	59.7	23.8	23.1	25.4
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L	0.502	0.499	0.225	0.784	0.109
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L	3.12	3.09	5.57	5.98	2.52
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L	20.2	19.8	33.2	42.2	53.2
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/EO	-	-	Field	Field	Field	Field	Field
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L	<0.0010	0.0019	0.0016	0.0014	0.0165
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00020
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L	<0.00010	<0.00010	0.00203	0.00044	0.00107
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L	0.975	0.966	0.139	0.0970	0.216
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L	0.067	0.069	0.212	0.038	0.065
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L	0.0000372	0.0000189	0.0000718	0.0000098	0.0000541
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L	<0.00050	<0.00050	0.00053	<0.00050	0.00066
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L	0.00037	0.00096	0.00071	0.00094	0.00142
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	07-SH ----	27-SH ----	07-IN ----	07(R)-SS ----	08-SH ----
					Client sampling date / time	18-Sep-2025 17:30	18-Sep-2025 17:48	18-Sep-2025 17:18	18-Sep-2025 17:55	18-Sep-2025 10:35
						EO2508465-016	EO2508465-017	EO2508465-018	EO2508465-019	EO2508465-020
						Result	Result	Result	Result	Result
Dissolved Metals										
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L		0.00255	0.00259	0.00234	0.00130	0.00267
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L		0.00352	0.00356	0.00607	0.000400	0.00609
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L		0.0027	0.0049	0.0182	0.0043	0.0054
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Volatile Organic Compounds										
Benzene	71-43-2	E611A/EO	0.50	µg/L		<0.50	<0.50	----	----	<0.50
BTEX, total	----	E611A/EO	1.0	µg/L		<1.0	<1.0	----	----	<1.0
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L		<0.50	<0.50	----	----	<0.50
Toluene	108-88-3	E611A/EO	0.50	µg/L		<0.50	<0.50	----	----	<0.50
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L		<0.40	<0.40	----	----	<0.40
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L		<0.30	<0.30	----	----	<0.30
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L		<0.50	<0.50	----	----	<0.50
Hydrocarbons										
F1 (C6-C10)	----	E581.F1/EO	100	µg/L		<100	<100	----	----	<100
F1-BTEX	----	EC580/EO	25	µg/L		<100	<100	----	----	<100
Hydrocarbons Surrogates										
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%		111	108	----	----	108
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%		74.0	72.7	----	----	73.9

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

				Client sample ID	07-SH ----	27-SH ----	07-IN ----	07(R)-SS ----	08-SH ----
				Client sampling date / time	18-Sep-2025 17:30	18-Sep-2025 17:48	18-Sep-2025 17:18	18-Sep-2025 17:55	18-Sep-2025 10:35
Analyte	CAS Number	Method/Lab	LOR	Unit	EO2508465-016	EO2508465-017	EO2508465-018	EO2508465-019	EO2508465-020
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	105	102	----	----	75.8
Polychlorinated Biphenyls									
Aroclor 1016	12674-11-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1221	11104-28-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1232	11141-16-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1242	53469-21-9	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1248	12672-29-6	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1254	11097-69-1	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1260	11096-82-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1262	37324-23-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1268	11100-14-4	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Polychlorinated biphenyls [PCBs], total	n/a	E687-L/WT	0.0300	µg/L	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Polychlorinated Biphenyls Surrogates									
Decachlorobiphenyl	2051-24-3	E687-L/WT	0.010	%	122	98.2	106	107	118
Tetrachloro-m-xylene	877-09-8	E687-L/WT	0.010	%	127	105	113	109	122

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 08-IN ----	11-SH ----	31-SH ----	11-IN ----	12-SH ----
					Client sampling date / time: 18-Sep-2025 10:25	18-Sep-2025 12:45	18-Sep-2025 13:00	18-Sep-2025 12:30	18-Sep-2025 13:50
					EO2508465-021	EO2508465-022	EO2508465-023	EO2508465-024	EO2508465-025
					Result	Result	Result	Result	Result
Sample Preparation									
Dissolved carbon filtration location	----	EP358/EO	-	-	field	field	field	field	field
Physical Tests									
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L	388	597	593	365	366
Conductivity	----	E100/EO	2.0	µS/cm	803	1130	1150	746	663
pH	----	E108/EO	0.10	pH units	7.77	7.44	7.45	7.85	7.91
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L	411	561	559	503	460
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L	<0.6	<0.6	<0.6	<0.6	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L	337	460	458	412	377
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L	523	783	785	466	402
Anions and Nutrients									
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	0.89	<0.50	<0.50	<0.50	<0.50
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L	0.247	0.203	0.201	0.319	0.396
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L	0.045	0.064	0.063	0.051	<0.020
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L	<0.010	<0.010	<0.010	0.024	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L	116	208	213	15.4	3.35
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L	<0.0500	0.0640	0.0630	0.0750	<0.0500
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L	4.14	8.77	9.50	13.8	3.42
Ion Balance									
Anion sum	----	EC101/EO	0.10	meq/L	9.19	13.5	13.6	8.58	7.62

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 08-IN ----	11-SH ----	31-SH ----	11-IN ----	12-SH ----
					Client sampling date / time: 18-Sep-2025 10:25	18-Sep-2025 12:45	18-Sep-2025 13:00	18-Sep-2025 12:30	18-Sep-2025 13:50
					EO2508465-021	EO2508465-022	EO2508465-023	EO2508465-024	EO2508465-025
					Result	Result	Result	Result	Result
Ion Balance									
Cation sum	----	EC101/EO	0.10	meq/L	9.65	14.3	14.2	8.97	7.94
Ion balance (APHA)	----	EC101/EO	0.01	%	2.44	2.88	2.16	2.22	2.06
Ion balance (cations/anions)	----	EC101/EO	0.010	%	105	106	104	104	104
Dissolved Metals									
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L	113	182	180	103	103
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L	<0.010	0.040	0.032	0.386	<0.010
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L	25.8	34.7	34.9	26.2	26.5
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L	0.355	0.695	0.692	0.468	0.169
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L	4.00	2.49	2.51	3.89	1.98
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L	40.7	52.1	51.2	35.6	13.1
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/EO	-	-	Field	Field	Field	Field	Field
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L	0.0011	0.0061	0.0085	<0.0010	<0.0010
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L	<0.00010	0.00010	0.00012	0.00044	0.00055
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L	0.0648	0.114	0.114	0.300	0.430
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L	0.192	0.132	0.133	0.250	0.039
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L	0.0000328	0.0000404	0.0000404	0.0000072	0.0000363
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L	0.00135	<0.00050	<0.00050	<0.00050	<0.00050
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L	0.00326	0.00251	0.00155	0.00069	0.00164
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	08-IN ----	11-SH ----	31-SH ----	11-IN ----	12-SH ----
					Client sampling date / time	18-Sep-2025 10:25	18-Sep-2025 12:45	18-Sep-2025 13:00	18-Sep-2025 12:30	18-Sep-2025 13:50
						EO2508465-021	EO2508465-022	EO2508465-023	EO2508465-024	EO2508465-025
						Result	Result	Result	Result	Result
Dissolved Metals										
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L		0.00454	0.00404	0.00446	0.00221	0.00062
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L		0.000064	<0.000050	0.000065	0.000076	<0.000050
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L		0.00323	0.00274	0.00270	0.00285	0.00605
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L		0.0079	0.0088	0.0043	0.0036	0.0039
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Aggregate Organics										
Adsorbable organic halogens, [AOX], (as Cl)	----	AOX/1D	10	mg/L		----	----	----	----	see attached
Volatile Organic Compounds										
Benzene	71-43-2	E611A/EO	0.50	µg/L		----	<0.50	<0.50	----	<0.50
BTEX, total	----	E611A/EO	1.0	µg/L		----	<1.0	<1.0	----	<1.0
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L		----	<0.50	<0.50	----	<0.50
Toluene	108-88-3	E611A/EO	0.50	µg/L		----	<0.50	<0.50	----	<0.50
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L		----	<0.40	<0.40	----	<0.40
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L		----	<0.30	<0.30	----	<0.30
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L		----	<0.50	<0.50	----	<0.50
Hydrocarbons										
F1 (C6-C10)	----	E581.F1/EO	100	µg/L		----	<100	<100	----	<100
F1-BTEX	----	EC580/EO	25	µg/L		----	<100	<100	----	<100
Hydrocarbons Surrogates										
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%		----	108	106	----	103

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	08-IN ----	11-SH ----	31-SH ----	11-IN ----	12-SH ----
					Client sampling date / time	18-Sep-2025 10:25	18-Sep-2025 12:45	18-Sep-2025 13:00	18-Sep-2025 12:30	18-Sep-2025 13:50
						EO2508465-021	EO2508465-022	EO2508465-023	EO2508465-024	EO2508465-025
						Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%		----	74.2	71.0	----	76.1
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%		----	101	101	----	93.5
Polychlorinated Biphenyls										
Aroclor 1016	12674-11-2	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1221	11104-28-2	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1232	11141-16-5	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1242	53469-21-9	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1248	12672-29-6	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1254	11097-69-1	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1260	11096-82-5	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1262	37324-23-5	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1268	11100-14-4	E687-L/WT	0.0100	µg/L		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Polychlorinated biphenyls [PCBs], total	n/a	E687-L/WT	0.0300	µg/L		<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Polychlorinated Biphenyls Surrogates										
Decachlorobiphenyl	2051-24-3	E687-L/WT	0.010	%		124	113	113	120	118
Tetrachloro-m-xylene	877-09-8	E687-L/WT	0.010	%		116	108	109	114	110

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 32-SH ----	12-IN ----	12(R)-SS ----	13-SH ----	13-IN ----
					Client sampling date / time: 18-Sep-2025 13:55	18-Sep-2025 13:40	18-Sep-2025 14:05	17-Sep-2025 15:00	17-Sep-2025 15:15
					EO2508465-026	EO2508465-027	EO2508465-028	EO2508465-029	EO2508465-030
					Result	Result	Result	Result	Result
Sample Preparation									
Dissolved carbon filtration location	----	EP358/EO	-	-	field	field	field	field	field
Physical Tests									
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L	365	307	98.8	601	326
Conductivity	----	E100/EO	2.0	µS/cm	650	694	893	1010	701
pH	----	E108/EO	0.10	pH units	7.92	7.92	8.53	7.46	7.80
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L	461	407	515	653	383
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L	<0.6	<0.6	7.9	<0.6	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L	378	334	435	535	314
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L	402	445	602	655	450
Anions and Nutrients									
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	<0.50	<0.50	4.14	<0.50	0.57
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L	0.407	0.234	0.418	0.129	0.200
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L	<0.020	<0.020	0.101	<0.020	0.032
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L	3.34	59.5	60.2	73.8	83.2
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L	<0.0500	<0.0500	0.101	<0.0500	<0.0500
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L	2.98	5.21	5.58	7.18	4.17
Ion Balance									
Anion sum	----	EC101/EO	0.10	meq/L	7.64	7.92	10.1	12.2	8.04

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 32-SH ----	12-IN ----	12(R)-SS ----	13-SH ----	13-IN ----
					Client sampling date / time: 18-Sep-2025 13:55	18-Sep-2025 13:40	18-Sep-2025 14:05	17-Sep-2025 15:00	17-Sep-2025 15:15
					EO2508465-026	EO2508465-027	EO2508465-028	EO2508465-029	EO2508465-030
					Result	Result	Result	Result	Result
Ion Balance									
Cation sum	----	EC101/EO	0.10	meq/L	7.91	8.31	10.9	12.7	8.31
Ion balance (APHA)	----	EC101/EO	0.01	%	1.74	2.40	3.81	2.01	1.65
Ion balance (cations/anions)	----	EC101/EO	0.010	%	104	105	108	104	103
Dissolved Metals									
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L	103	90.1	32.6	170	96.1
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L	<0.010	0.023	<0.010	0.019	0.038
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L	26.2	19.9	4.23	42.9	20.9
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L	0.166	0.715	0.00336	0.360	0.309
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L	1.95	4.00	4.80	1.75	3.95
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L	12.9	46.7	202	13.6	38.6
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/EO	-	-	Field	Field	Field	Field	Field
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L	<0.0010	0.0257	0.0074	0.0048	0.0043
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L	<0.00010	<0.00010	0.00067	0.00023	<0.00010
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L	0.00055	0.00385	0.0102	0.00047	0.00025
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L	0.429	0.158	0.0765	0.274	0.150
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L	0.037	0.131	0.229	0.050	0.110
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L	0.0000178	0.0000562	0.0000102	0.0000619	<0.0000050
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L	<0.00050	<0.00050	0.00165	0.00093	<0.00050
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L	0.00154	0.161	0.00200	0.00121	0.00091
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L	<0.000050	0.000646	<0.000050	<0.000050	<0.000050

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 32-SH ----	12-IN ----	12(R)-SS ----	13-SH ----	13-IN ----
					Client sampling date / time: 18-Sep-2025 13:55	18-Sep-2025 13:40	18-Sep-2025 14:05	17-Sep-2025 15:00	17-Sep-2025 15:15
					EO2508465-026	EO2508465-027	EO2508465-028	EO2508465-029	EO2508465-030
					Result	Result	Result	Result	Result
Dissolved Metals									
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L	0.00062	0.00705	0.00236	0.00349	0.00238
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L	<0.000050	<0.000050	0.000531	0.000082	<0.000050
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L	0.00597	0.00226	0.00328	0.00364	0.00267
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L	0.0048	0.225	0.0040	0.0041	0.0037
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Aggregate Organics									
Adsorbable organic halogens, [AOX], (as Cl)	----	AOX/1D	10	mg/L	----	----	----	see attached	----
Volatile Organic Compounds									
Benzene	71-43-2	E611A/EO	0.50	µg/L	<0.50	----	----	<0.50	----
BTEX, total	----	E611A/EO	1.0	µg/L	<1.0	----	----	<1.0	----
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L	<0.50	----	----	<0.50	----
Toluene	108-88-3	E611A/EO	0.50	µg/L	<0.50	----	----	<0.50	----
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L	<0.40	----	----	<0.40	----
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L	<0.30	----	----	<0.30	----
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L	<0.50	----	----	<0.50	----
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	100	µg/L	<100	----	----	<100	----
F1-BTEX	----	EC580/EO	25	µg/L	<100	----	----	<100	----
Hydrocarbons Surrogates									
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	110	----	----	106	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 32-SH ----	12-IN ----	12(R)-SS ----	13-SH ----	13-IN ----
					Client sampling date / time: 18-Sep-2025 13:55	18-Sep-2025 13:40	18-Sep-2025 14:05	17-Sep-2025 15:00	17-Sep-2025 15:15
					EO2508465-026	EO2508465-027	EO2508465-028	EO2508465-029	EO2508465-030
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	70.9	----	----	70.3	----
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	101	----	----	103	----
Polychlorinated Biphenyls									
Aroclor 1016	12674-11-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1221	11104-28-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1232	11141-16-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1242	53469-21-9	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1248	12672-29-6	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1254	11097-69-1	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1260	11096-82-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1262	37324-23-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1268	11100-14-4	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Polychlorinated biphenyls [PCBs], total	n/a	E687-L/WT	0.0300	µg/L	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Polychlorinated Biphenyls Surrogates									
Decachlorobiphenyl	2051-24-3	E687-L/WT	0.010	%	118	129	114	115	112
Tetrachloro-m-xylene	877-09-8	E687-L/WT	0.010	%	105	113	109	107	107

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 13(R)SS ----	14(R)IN ----	14(R)SS ----	15-SH ----	15-IN ----
					Client sampling date / time: 17-Sep-2025 14:45	18-Sep-2025 09:40	18-Sep-2025 18:05	18-Sep-2025 15:00	18-Sep-2025 15:10
					EO2508465-031	EO2508465-032	EO2508465-033	EO2508465-034	EO2508465-035
					Result	Result	Result	Result	Result
Sample Preparation									
Dissolved carbon filtration location	----	EP358/EO	-	-	field	field	field	field	field
Physical Tests									
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L	203	477	45.1	375	364
Conductivity	----	E100/EO	2.0	µS/cm	425	867	600	770	779
pH	----	E108/EO	0.10	pH units	7.75	7.80	8.68	7.92	7.94
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L	267	611	315	534	456
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L	<0.6	<0.6	9.6	<0.6	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L	219	501	274	438	374
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L	278	549	390	465	486
Anions and Nutrients									
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	<0.50	2.32	14.1	<0.50	<0.50
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L	0.172	0.234	0.695	0.237	0.173
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L	0.190	<0.020	<0.020	0.117	0.038
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L	17.0	17.3	29.6	8.66	68.5
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L	0.190	<0.0500	<0.0500	0.117	<0.0500
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L	4.00	5.70	10.0	6.82	5.19
Ion Balance									
Anion sum	----	EC101/EO	0.10	meq/L	4.75	10.4	6.53	8.95	8.91

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	13(R)SS ----	14(R)IN ----	14(R)SS ----	15-SH ----	15-IN ----
					Client sampling date / time	17-Sep-2025 14:45	18-Sep-2025 09:40	18-Sep-2025 18:05	18-Sep-2025 15:00	18-Sep-2025 15:10
						EO2508465-031	EO2508465-032	EO2508465-033	EO2508465-034	EO2508465-035
						Result	Result	Result	Result	Result
Ion Balance										
Cation sum	----	EC101/EO	0.10	meq/L		4.80	10.8	7.07	8.94	9.10
Ion balance (APHA)	----	EC101/EO	0.01	%		0.52	1.89	3.97	-0.06	1.05
Ion balance (cations/anions)	----	EC101/EO	0.010	%		101	104	108	99.9	102
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L		62.4	132	14.8	109	106
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L		<0.010	<0.010	0.018	<0.010	<0.010
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L		11.5	35.9	1.98	24.9	24.1
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L		0.00152	0.105	0.0397	0.521	0.128
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L		3.72	2.91	3.04	3.48	4.47
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L		14.9	27.7	140	30.8	39.4
Dissolved mercury filtration location	----	EP509/EO	-	-		Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/EO	-	-		Field	Field	Field	Field	Field
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L		0.0017	0.0015	0.0263	0.0085	0.0035
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L		<0.00010	0.00012	0.00089	<0.00010	<0.00010
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L		0.00046	0.00044	0.00295	0.00019	0.00017
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L		0.0785	0.166	0.0315	0.549	0.153
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L		0.016	0.077	0.098	0.178	0.261
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L		0.0000153	0.0000250	0.0000210	0.0000221	0.0000215
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L		<0.00050	0.00215	<0.00050	<0.00050	<0.00050
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L		0.00044	0.00793	0.00070	0.00212	0.00417
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	0.000120

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	13(R)SS ----	14(R)IN ----	14(R)SS ----	15-SH ----	15-IN ----
					Client sampling date / time	17-Sep-2025 14:45	18-Sep-2025 09:40	18-Sep-2025 18:05	18-Sep-2025 15:00	18-Sep-2025 15:10
						EO2508465-031	EO2508465-032	EO2508465-033	EO2508465-034	EO2508465-035
						Result	Result	Result	Result	Result
Dissolved Metals										
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L		<0.00050	0.00410	0.0122	0.00821	0.00354
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L		<0.000050	0.000217	0.00120	0.000077	0.000091
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L		<0.000010	0.000039	<0.000010	<0.000010	<0.000010
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L		0.000364	0.00808	0.00597	0.00192	0.00434
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L		0.0035	0.0089	0.0043	0.0056	0.0040
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Aggregate Organics										
Adsorbable organic halogens, [AOX], (as Cl)	----	AOX/1D	10	mg/L		----	----	----	see attached	----
Volatile Organic Compounds										
Benzene	71-43-2	E611A/EO	0.50	µg/L		----	----	----	<0.50	----
BTEX, total	----	E611A/EO	1.0	µg/L		----	----	----	<1.0	----
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L		----	----	----	<0.50	----
Toluene	108-88-3	E611A/EO	0.50	µg/L		----	----	----	<0.50	----
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L		----	----	----	<0.40	----
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L		----	----	----	<0.30	----
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L		----	----	----	<0.50	----
Hydrocarbons										
F1 (C6-C10)	----	E581.F1/EO	100	µg/L		----	----	----	<100	----
F1-BTEX	----	EC580/EO	25	µg/L		----	----	----	<100	----
Hydrocarbons Surrogates										
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%		----	----	----	115	----

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Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 13(R)SS ----	14(R)IN ----	14(R)SS ----	15-SH ----	15-IN ----
					Client sampling date / time: 17-Sep-2025 14:45	18-Sep-2025 09:40	18-Sep-2025 18:05	18-Sep-2025 15:00	18-Sep-2025 15:10
					EO2508465-031	EO2508465-032	EO2508465-033	EO2508465-034	EO2508465-035
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	----	----	----	71.8	----
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	----	----	----	101	----
Polychlorinated Biphenyls									
Aroclor 1016	12674-11-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1221	11104-28-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1232	11141-16-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1242	53469-21-9	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1248	12672-29-6	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1254	11097-69-1	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1260	11096-82-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1262	37324-23-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1268	11100-14-4	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Polychlorinated biphenyls [PCBs], total	n/a	E687-L/WT	0.0300	µg/L	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Polychlorinated Biphenyls Surrogates									
Decachlorobiphenyl	2051-24-3	E687-L/WT	0.010	%	116	126	126	132	120
Tetrachloro-m-xylene	877-09-8	E687-L/WT	0.010	%	108	108	105	108	103

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 15(2R)SS ----	16-SH ----	17-SH ----	17-IN ----	89-3 ----
					Client sampling date / time: 17-Sep-2025 14:30	17-Sep-2025 15:45	18-Sep-2025 14:40	18-Sep-2025 14:30	18-Sep-2025 15:20
					EO2508465-036	EO2508465-037	EO2508465-038	EO2508465-039	EO2508465-040
					Result	Result	Result	Result	Result
Sample Preparation									
Dissolved carbon filtration location	----	EP358/EO	-	-	field	field	field	field	field
Physical Tests									
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L	136	389	325	378	158
Conductivity	----	E100/EO	2.0	µS/cm	414	768	646	786	350
pH	----	E108/EO	0.10	pH units	8.36	7.91	8.01	7.99	7.69
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L	256	504	405	486	216
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L	2.3	<0.6	<0.6	<0.6	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L	<0.3	<0.3	<0.3	<0.3	<0.3
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L	213	413	332	398	177
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L	272	474	394	488	229
Anions and Nutrients									
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	0.93	0.95	8.00	<0.50	<0.50
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L	0.229	0.249	0.282	0.173	0.168
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L	0.240	0.120	<0.020	0.130	<0.020
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L	13.6	31.9	24.7	54.1	13.4
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L	0.240	0.120	<0.0500	0.130	<0.0500
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L	1.42	3.48	2.05	2.86	1.90
Ion Balance									
Anion sum	----	EC101/EO	0.10	meq/L	4.60	8.97	7.39	9.10	3.82

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 15(2R)SS ----	16-SH ----	17-SH ----	17-IN ----	89-3 ----
					Client sampling date / time: 17-Sep-2025 14:30	17-Sep-2025 15:45	18-Sep-2025 14:40	18-Sep-2025 14:30	18-Sep-2025 15:20
					EO2508465-036	EO2508465-037	EO2508465-038	EO2508465-039	EO2508465-040
					Result	Result	Result	Result	Result
Ion Balance									
Cation sum	----	EC101/EO	0.10	meq/L	4.77	9.12	7.47	9.30	3.88
Ion balance (APHA)	----	EC101/EO	0.01	%	1.81	0.83	0.54	1.09	0.78
Ion balance (cations/anions)	----	EC101/EO	0.010	%	104	102	101	102	102
Dissolved Metals									
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L	38.0	106	90.3	110	42.5
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	1.76
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L	10.1	30.3	24.2	25.0	12.7
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L	0.675	0.00054	0.00266	0.394	1.09
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L	3.36	3.36	1.87	4.66	2.72
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L	44.5	28.7	21.2	37.2	12.5
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/EO	-	-	Field	Field	Field	Field	Field
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L	0.0015	0.0010	<0.0010	0.0012	<0.0010
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L	0.00311	0.00013	0.00013	0.00017	0.00193
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L	0.0389	0.167	0.296	0.0759	0.117
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L	0.026	0.082	0.067	0.272	0.017
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L	<0.0000050	0.0000063	0.0000156	0.0000441	0.0000055
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L	<0.00050	0.00152	<0.00050	<0.00050	<0.00050
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L	0.00040	0.00109	0.00138	0.00240	0.00037
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 15(2R)SS ----	16-SH ----	17-SH ----	17-IN ----	89-3 ----
					Client sampling date / time: 17-Sep-2025 14:30	17-Sep-2025 15:45	18-Sep-2025 14:40	18-Sep-2025 14:30	18-Sep-2025 15:20
					EO2508465-036	EO2508465-037	EO2508465-038	EO2508465-039	EO2508465-040
					Result	Result	Result	Result	Result
Dissolved Metals									
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L	0.00069	0.00089	0.00126	0.00289	0.00066
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L	<0.000050	0.00112	0.000073	0.000074	<0.000050
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L	0.00103	0.00896	0.00467	0.00440	0.000865
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L	0.0032	0.0021	0.0032	0.0050	0.0088
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Aggregate Organics									
Adsorbable organic halogens, [AOX], (as Cl)	----	AOX/1D	10	mg/L	----	see attached	see attached	----	----
Volatile Organic Compounds									
Benzene	71-43-2	E611A/EO	0.50	µg/L	----	<0.50	<0.50	----	----
BTEX, total	----	E611A/EO	1.0	µg/L	----	<1.0	<1.0	----	----
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L	----	<0.50	<0.50	----	----
Toluene	108-88-3	E611A/EO	0.50	µg/L	----	<0.50	<0.50	----	----
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L	----	<0.40	<0.40	----	----
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L	----	<0.30	<0.30	----	----
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L	----	<0.50	<0.50	----	----
Hydrocarbons									
F1 (C6-C10)	----	E581.F1/EO	100	µg/L	----	<100	<100	----	----
F1-BTEX	----	EC580/EO	25	µg/L	----	<100	<100	----	----
Hydrocarbons Surrogates									
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%	----	111	116	----	----

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Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 15(2R)SS ----	16-SH ----	17-SH ----	17-IN ----	89-3 ----
					Client sampling date / time: 17-Sep-2025 14:30	17-Sep-2025 15:45	18-Sep-2025 14:40	18-Sep-2025 14:30	18-Sep-2025 15:20
					EO2508465-036	EO2508465-037	EO2508465-038	EO2508465-039	EO2508465-040
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	----	71.8	75.6	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	----	74.2	73.7	----	----
Polychlorinated Biphenyls									
Aroclor 1016	12674-11-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1221	11104-28-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1232	11141-16-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1242	53469-21-9	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1248	12672-29-6	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1254	11097-69-1	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1260	11096-82-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1262	37324-23-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Aroclor 1268	11100-14-4	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Polychlorinated biphenyls [PCBs], total	n/a	E687-L/WT	0.0300	µg/L	<0.0300	<0.0300	<0.0300	<0.0300	<0.0300
Polychlorinated Biphenyls Surrogates									
Decachlorobiphenyl	2051-24-3	E687-L/WT	0.010	%	121	115	117	122	109
Tetrachloro-m-xylene	877-09-8	E687-L/WT	0.010	%	107	102	102	112	95.9

Please refer to the General Comments section for an explanation of any qualifiers detected.

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Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 10-SH ----	20-SH ----	51-SH ----	52-SH ----	11-SS ----
					Client sampling date / time: 17-Sep-2025 13:50	18-Sep-2025 15:50	18-Sep-2025 08:00	18-Sep-2025 08:15	18-Sep-2025 13:10
					EO2508465-041	EO2508465-042	EO2508465-043	EO2508465-044	EO2508465-045
					Result	Result	Result	Result	Result
Sample Preparation									
Dissolved carbon filtration location	----	EP358/EO	-	-	field	field	----	----	field
Physical Tests									
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L	<0.50	<0.50	----	----	120
Conductivity	----	E100/EO	2.0	µS/cm	<2.0	<2.0	----	----	476
pH	----	E108/EO	0.10	pH units	5.95	5.77	----	----	8.04
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L	<1.2	<1.2	----	----	289
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L	<0.6	<0.6	----	----	<0.6
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L	<0.3	<0.3	----	----	<0.3
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L	<2.0	<2.0	----	----	237
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L	1.1	1.6	----	----	317
Anions and Nutrients									
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L	<0.50	<0.50	----	----	<0.50
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L	<0.020	<0.020	----	----	0.063
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L	<0.020	<0.020	----	----	<0.020
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L	<0.010	<0.010	----	----	<0.010
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L	<0.30	<0.30	----	----	25.0
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L	<0.0500	<0.0500	----	----	<0.0500
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L	1.07	1.56	----	----	1.23
Ion Balance									
Anion sum	----	EC101/EO	0.10	meq/L	<0.10	<0.10	----	----	5.26

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 10-SH ----	20-SH ----	51-SH ----	52-SH ----	11-SS ----
					Client sampling date / time: 17-Sep-2025 13:50	18-Sep-2025 15:50	18-Sep-2025 08:00	18-Sep-2025 08:15	18-Sep-2025 13:10
					EO2508465-041	EO2508465-042	EO2508465-043	EO2508465-044	EO2508465-045
					Result	Result	Result	Result	Result
Ion Balance									
Cation sum	----	EC101/EO	0.10	meq/L	<0.10	<0.10	----	----	5.42
Ion balance (APHA)	----	EC101/EO	0.01	%	0.0	0.0	----	----	1.50
Ion balance (cations/anions)	----	EC101/EO	0.010	%	100	100	----	----	103
Dissolved Metals									
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L	<0.050	<0.050	----	----	37.9
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L	<0.010	<0.010	----	----	0.063
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L	<0.0050	<0.0050	----	----	6.13
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L	<0.00010	0.00017 RRV	----	----	0.332
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L	<0.050	<0.050	----	----	5.99
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L	<0.050	<0.050	----	----	65.8
Dissolved mercury filtration location	----	EP509/EO	-	-	Field	Field	----	----	Field
Dissolved metals filtration location	----	EP421/EO	-	-	Field	Field	----	----	Field
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L	<0.0010	<0.0010	----	----	0.0013
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L	<0.00010	<0.00010	----	----	<0.00010
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L	<0.00010	<0.00010	----	----	0.00046
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L	<0.00010	<0.00010	----	----	0.0613
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L	<0.010	<0.010	----	----	0.046
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	0.0000218
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L	<0.00050	<0.00050	----	----	<0.00050
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L	0.00031 RRV	<0.00020	----	----	0.00134
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L	<0.000050	<0.000050	----	----	<0.000050

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	10-SH ----	20-SH ----	51-SH ----	52-SH ----	11-SS ----
					Client sampling date / time	17-Sep-2025 13:50	18-Sep-2025 15:50	18-Sep-2025 08:00	18-Sep-2025 08:15	18-Sep-2025 13:10
						EO2508465-041	EO2508465-042	EO2508465-043	EO2508465-044	EO2508465-045
						Result	Result	Result	Result	Result
Dissolved Metals										
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L		<0.00050	<0.00050	----	----	0.00323
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L		<0.000050	<0.000050	----	----	<0.000050
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L		<0.000010	<0.000010	----	----	<0.000010
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L		<0.000010	<0.000010	----	----	0.000033
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L		<0.0010	<0.0010	----	----	0.0053
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L		<0.0000050	<0.0000050	----	----	<0.0000050
Aggregate Organics										
Adsorbable organic halogens, [AOX], (as Cl)	----	AOX/1D	10	mg/L		see attached	----	----	----	----
Volatile Organic Compounds										
Benzene	71-43-2	E611A/EO	0.50	µg/L		<0.50	<0.50	----	----	----
BTEX, total	----	E611A/EO	1.0	µg/L		<1.0	<1.0	----	----	----
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L		<0.50	<0.50	----	----	----
Toluene	108-88-3	E611A/EO	0.50	µg/L		<0.50	<0.50	----	----	----
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L		<0.40	<0.40	----	----	----
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L		<0.30	<0.30	----	----	----
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L		<0.50	<0.50	----	----	----
Hydrocarbons										
F1 (C6-C10)	----	E581.F1/EO	100	µg/L		<100	<100	----	----	----
F1-BTEX	----	EC580/EO	25	µg/L		<100	<100	----	----	----
Hydrocarbons Surrogates										
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%		114	110	----	----	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: 10-SH ----	20-SH ----	51-SH ----	52-SH ----	11-SS ----
					Client sampling date / time: 17-Sep-2025 13:50	18-Sep-2025 15:50	18-Sep-2025 08:00	18-Sep-2025 08:15	18-Sep-2025 13:10
					EO2508465-041	EO2508465-042	EO2508465-043	EO2508465-044	EO2508465-045
					Result	Result	Result	Result	Result
Volatile Organic Compounds Surrogates									
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%	73.6	74.2	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%	97.1	73.5	----	----	----
Polychlorinated Biphenyls									
Aroclor 1016	12674-11-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0500 DLM	<0.0500 DLM	<0.0100
Aroclor 1221	11104-28-2	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0500 DLM	<0.0500 DLM	<0.0100
Aroclor 1232	11141-16-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0500 DLM	<0.0500 DLM	<0.0100
Aroclor 1242	53469-21-9	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0500 DLM	<0.0500 DLM	<0.0100
Aroclor 1248	12672-29-6	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0500 DLM	<0.0500 DLM	<0.0100
Aroclor 1254	11097-69-1	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0560 DLM	0.512 PRAR	<0.0100
Aroclor 1260	11096-82-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	0.536 PRAR	<0.0610 DLM	<0.0100
Aroclor 1262	37324-23-5	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0500 DLM	<0.0500 DLM	<0.0100
Aroclor 1268	11100-14-4	E687-L/WT	0.0100	µg/L	<0.0100	<0.0100	<0.0500 DLM	<0.0500 DLM	<0.0100
Polychlorinated biphenyls [PCBs], total	n/a	E687-L/WT	0.0300	µg/L	<0.0300	<0.0300	0.536	0.512	<0.0300
Polychlorinated Biphenyls Surrogates									
Decachlorobiphenyl	2051-24-3	E687-L/WT	0.010	%	93.3	98.1	123	118	110
Tetrachloro-m-xylene	877-09-8	E687-L/WT	0.010	%	106	112	95.0	92.0	118

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Trip Blank ----	----	----	----	----
					Client sampling date / time	18-Sep-2025 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		EO2508465-046	----	----	----	----
						Result	----	----	----	----
Sample Preparation										
Dissolved carbon filtration location	----	EP358/EO	-	-		lab	----	----	----	----
Physical Tests										
Hardness (as CaCO3), dissolved	----	EC100/EO	0.50	mg/L		<0.50	----	----	----	----
Conductivity	----	E100/EO	2.0	µS/cm		<2.0	----	----	----	----
pH	----	E108/EO	0.10	pH units		5.84	----	----	----	----
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/EO	1.2	mg/L		<1.2	----	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/EO	1.0	mg/L		<0.6	----	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/EO	1.0	mg/L		<0.3	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/EO	2.0	mg/L		<2.0	----	----	----	----
Solids, total dissolved [TDS], calculated	----	EC103/EO	1.0	mg/L		<1.0	----	----	----	----
Anions and Nutrients										
Chloride	16887-00-6	E235.Cl/EO	0.50	mg/L		<0.50	----	----	----	----
Fluoride	16984-48-8	E235.F/EO	0.020	mg/L		<0.020	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/EO	0.020	mg/L		<0.020	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/EO	0.010	mg/L		<0.010	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/EO	0.30	mg/L		<0.30	----	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/EO	0.0500	mg/L		<0.0500	----	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/EO	0.50	mg/L		<0.50 SFP	----	----	----	----
Ion Balance										
Anion sum	----	EC101/EO	0.10	meq/L		<0.10	----	----	----	----

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Analytical Results

Sub-Matrix: Water
(Matrix: Water)

					Client sample ID	Trip Blank ----	----	----	----	----
					Client sampling date / time	18-Sep-2025 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		EO2508465-046	----	----	----	----
						Result	----	----	----	----
Ion Balance										
Cation sum	----	EC101/EO	0.10	meq/L		<0.10	----	----	----	----
Ion balance (APHA)	----	EC101/EO	0.01	%		0.0	----	----	----	----
Ion balance (cations/anions)	----	EC101/EO	0.010	%		100	----	----	----	----
Dissolved Metals										
Calcium, dissolved	7440-70-2	E421/EO	0.050	mg/L		<0.050	----	----	----	----
Iron, dissolved	7439-89-6	E421/EO	0.010	mg/L		<0.010	----	----	----	----
Magnesium, dissolved	7439-95-4	E421/EO	0.0050	mg/L		<0.0050	----	----	----	----
Manganese, dissolved	7439-96-5	E421/EO	0.00010	mg/L		<0.00010	----	----	----	----
Potassium, dissolved	7440-09-7	E421/EO	0.050	mg/L		<0.050	----	----	----	----
Sodium, dissolved	7440-23-5	E421/EO	0.050	mg/L		<0.050	----	----	----	----
Dissolved mercury filtration location	----	EP509/EO	-	-		Field	----	----	----	----
Dissolved metals filtration location	----	EP421/EO	-	-		Field	----	----	----	----
Aluminum, dissolved	7429-90-5	E421/EO	0.0010	mg/L		<0.0010	----	----	----	----
Antimony, dissolved	7440-36-0	E421/EO	0.00010	mg/L		<0.00010	----	----	----	----
Arsenic, dissolved	7440-38-2	E421/EO	0.00010	mg/L		<0.00010	----	----	----	----
Barium, dissolved	7440-39-3	E421/EO	0.00010	mg/L		<0.00010	----	----	----	----
Boron, dissolved	7440-42-8	E421/EO	0.010	mg/L		<0.010	----	----	----	----
Cadmium, dissolved	7440-43-9	E421/EO	0.0000050	mg/L		<0.0000050	----	----	----	----
Chromium, dissolved	7440-47-3	E421/EO	0.00050	mg/L		<0.00050	----	----	----	----
Copper, dissolved	7440-50-8	E421/EO	0.00020	mg/L		<0.00020	----	----	----	----
Lead, dissolved	7439-92-1	E421/EO	0.000050	mg/L		<0.000050	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Trip Blank ----	----	----	----	----
					Client sampling date / time	18-Sep-2025 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		EO2508465-046	----	----	----	----
						Result	----	----	----	----
Dissolved Metals										
Nickel, dissolved	7440-02-0	E421/EO	0.00050	mg/L		<0.00050	----	----	----	----
Selenium, dissolved	7782-49-2	E421/EO	0.000050	mg/L		<0.000050	----	----	----	----
Silver, dissolved	7440-22-4	E421/EO	0.000010	mg/L		<0.000010	----	----	----	----
Uranium, dissolved	7440-61-1	E421/EO	0.000010	mg/L		<0.000010	----	----	----	----
Zinc, dissolved	7440-66-6	E421/EO	0.0010	mg/L		<0.0010	----	----	----	----
Mercury, dissolved	7439-97-6	E509/EO	0.0000050	mg/L		<0.0000050	----	----	----	----
Volatile Organic Compounds										
Benzene	71-43-2	E611A/EO	0.50	µg/L		<0.50	----	----	----	----
BTEX, total	----	E611A/EO	1.0	µg/L		<1.0	----	----	----	----
Ethylbenzene	100-41-4	E611A/EO	0.50	µg/L		<0.50	----	----	----	----
Toluene	108-88-3	E611A/EO	0.50	µg/L		<0.50	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/EO	0.40	µg/L		<0.40	----	----	----	----
Xylene, o-	95-47-6	E611A/EO	0.30	µg/L		<0.30	----	----	----	----
Xylenes, total	1330-20-7	E611A/EO	0.50	µg/L		<0.50	----	----	----	----
Hydrocarbons										
F1 (C6-C10)	----	E581.F1/EO	100	µg/L		<100	----	----	----	----
F1-BTEX	----	EC580/EO	25	µg/L		<100	----	----	----	----
Hydrocarbons Surrogates										
Dichlorotoluene, 3,4-	95-75-0	E581.F1/EO	1.0	%		114	----	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/EO	1.0	%		70.7	----	----	----	----

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Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Trip Blank ----	----	----	----	----
					Client sampling date / time	18-Sep-2025 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		EO2508465-046	----	----	----	----
						Result	----	----	----	----
Volatile Organic Compounds Surrogates										
Difluorobenzene, 1,4-	540-36-3	E611A/EO	1.0	%		74.6	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **EO2508465**	Page	: 1 of 72
Client	: **AECOM Canada ULC**	Laboratory	: ALS Environmental - Edmonton
Contact	: Michael Steed	Account Manager	: Megha Walia
Address	: 101 - 18817 Stony Plain Rd. NW Edmonton AB Canada T5S 0C2	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 486 7000	Telephone	: +1 780 413 5227
Project	: Swan Hills - 60757940	Date Samples Received	: 19-Sep-2025 13:03
PO	: 60757940	Issue Date	: 09-Oct-2025 17:58
C-O-C number	: ----		
Sampler	: ----		
Site	:		
Quote number	: EO22-AECO100-016 (Swan Hills)		
No. of samples received	: 46		
No. of samples analysed	: 46		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration										
Amber glass (nitric acid)										
12-SH	AOX	18-Sep-2025	----	----	----		09-Oct-2025	180 days	21 days	✓
Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration										
Amber glass (nitric acid)										
15-SH	AOX	18-Sep-2025	----	----	----		09-Oct-2025	180 days	21 days	✓
Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration										
Amber glass (nitric acid)										
17-SH	AOX	18-Sep-2025	----	----	----		09-Oct-2025	180 days	21 days	✓
Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration										
Amber glass (nitric acid)										
03-SH	AOX	17-Sep-2025	----	----	----		09-Oct-2025	180 days	22 days	✓
Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration										
Amber glass (nitric acid)										
10-SH	AOX	17-Sep-2025	----	----	----		09-Oct-2025	180 days	22 days	✓
Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration										
Amber glass (nitric acid)										
13-SH	AOX	17-Sep-2025	----	----	----		09-Oct-2025	180 days	22 days	✓
Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration										
Amber glass (nitric acid)										
16-SH	AOX	17-Sep-2025	----	----	----		09-Oct-2025	180 days	22 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE 01(2R)SS	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 01(R)SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 01A-IN	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 06(R)IN	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 06-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 07(R)-SS	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 07-IN	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 07-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 08-IN	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE 08-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 11-IN	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 11-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 12(R)-SS	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 12-IN	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 12-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 14(R)IN	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 14(R)SS	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 15-IN	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Chloride in Water by IC										
HDPE										
15-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
17-IN	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
17-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
20-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
27-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
31-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
32-SH	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
89-3	E235.Cl	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
03-IN	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE 03-SH	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 04-IN	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 04-SH	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 04-SS	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 05-IN	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 05-SH	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 05-SS	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 10-SH	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 11-SS	E235.Cl	18-Sep-2025	20-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE 13(R)SS	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 13-IN	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 13-SH	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 15(2R)SS	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 16-SH	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 25-SH	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE 25-SS	E235.Cl	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Trip Blank	E235.Cl	18-Sep-2025	20-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 01(2R)SS	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE 01(R)SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 01A-IN	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 06(R)IN	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 06-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 07(R)-SS	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 07-IN	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 07-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 08-IN	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE 08-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
11-IN	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
11-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
12(R)-SS	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
12-IN	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
12-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
14(R)IN	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
14(R)SS	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
15-IN	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
15-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
17-IN	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
17-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
20-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
27-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
31-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
32-SH	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
89-3	E235.F	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
03-IN	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
03-SH	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
04-IN	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
04-SH	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
04-SS	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
05-IN	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
05-SH	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
05-SS	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
10-SH	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
11-SS	E235.F	18-Sep-2025	20-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
13(R)SS	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
13-IN	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
13-SH	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
15(2R)SS	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
16-SH	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
25-SH	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
25-SS	E235.F	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
Trip Blank	E235.F	18-Sep-2025	20-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
01(2R)SS	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
01(R)SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
01A-IN	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
06(R)IN	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
06-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
07(R)-SS	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
07-IN	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
07-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
08-IN	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
08-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
11-IN	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
11-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
12(R)-SS	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
12-IN	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
12-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
14(R)IN	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
14(R)SS	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
15-IN	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
15-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
17-IN	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE 17-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 20-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 27-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 31-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 32-SH	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 89-3	E235.NO3	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 03-IN	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 03-SH	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE 04-IN	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
04-SH	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
04-SS	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
05-IN	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
05-SH	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
05-SS	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
10-SH	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
11-SS	E235.NO3	18-Sep-2025	20-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
13(R)SS	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
13-IN	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
13-SH	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
15(2R)SS	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
16-SH	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
25-SH	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
25-SS	E235.NO3	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE										
Trip Blank	E235.NO3	18-Sep-2025	20-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
01(2R)SS	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
01(R)SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE										
01A-IN	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE 06(R)IN	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 06-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 07(R)-SS	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 07-IN	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 07-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 08-IN	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 08-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-IN	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE 12(R)-SS	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 12-IN	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 12-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 14(R)IN	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 14(R)SS	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 15-IN	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 15-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 17-IN	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 17-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE 20-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 27-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 31-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	19-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 32-SH	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 89-3	E235.NO2	18-Sep-2025	19-Sep-2025	3 days	1 days	✓	20-Sep-2025	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 03-IN	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 03-SH	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 04-IN	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 04-SH	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE 04-SS	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 05-IN	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 05-SH	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 05-SS	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 10-SH	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 11-SS	E235.NO2	18-Sep-2025	20-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 13(R)SS	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 13-IN	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 13-SH	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE 15(2R)SS	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 16-SH	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 25-SH	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE 25-SS	E235.NO2	17-Sep-2025	19-Sep-2025	3 days	2 days	✓	19-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE Trip Blank	E235.NO2	18-Sep-2025	20-Sep-2025	3 days	2 days	✓	20-Sep-2025	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01(2R)SS	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01(R)SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 01A-IN	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06(R)IN	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE 06-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07(R)-SS	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-IN	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 07-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-IN	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 08-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-IN	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 12(R)-SS	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE 12-IN	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 12-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 14(R)IN	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 14(R)SS	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 15-IN	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 15-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 17-IN	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 17-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 20-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE 27-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 31-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 32-SH	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 89-3	E235.SO4	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-IN	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 03-SH	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-IN	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-SH	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 04-SS	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-IN	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SH	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 05-SS	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 10-SH	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 11-SS	E235.SO4	18-Sep-2025	20-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 13(R)SS	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 13-IN	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 13-SH	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE 15(2R)SS	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
16-SH	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
25-SH	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
25-SS	E235.SO4	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
Trip Blank	E235.SO4	18-Sep-2025	20-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
01(2R)SS	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
01(R)SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
01A-IN	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
06(R)IN	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
06-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
07(R)-SS	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
07-IN	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
07-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
08-IN	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
08-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
11-IN	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
11-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
11-SS	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
12(R)-SS	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 12-IN	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 12-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 14(R)IN	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 14(R)SS	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 15-IN	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 15-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 17-IN	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 17-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) 20-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
27-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
31-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
32-SH	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
89-3	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
Trip Blank	E509	18-Sep-2025	23-Sep-2025	28 days	5 days	✓	23-Sep-2025	28 days	5 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
03-IN	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
03-SH	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
04-IN	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
04-SH	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
04-SS	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
05-IN	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
05-SH	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
05-SS	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
10-SH	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
13(R)SS	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
13-IN	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
13-SH	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
15(2R)SS	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
16-SH	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
25-SH	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
25-SS	E509	17-Sep-2025	23-Sep-2025	28 days	6 days	✓	23-Sep-2025	28 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
01(2R)SS	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
01(R)SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
01A-IN	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
06(R)IN	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
06-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
07(R)-SS	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 07-IN	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 07-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 08-IN	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 08-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 11-IN	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 11-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 11-SS	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 12(R)-SS	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 12-IN	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
12-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
14(R)IN	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
14(R)SS	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
15-IN	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
15-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
17-IN	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
17-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
20-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
27-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 31-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 32-SH	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 89-3	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) Trip Blank	E421	18-Sep-2025	22-Sep-2025	180 days	4 days	✓	22-Sep-2025	180 days	4 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 03-IN	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 03-SH	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 04-IN	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 04-SH	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 04-SS	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 05-IN	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 05-SH	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 05-SS	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 10-SH	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 13(R)SS	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 13-IN	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 13-SH	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 15(2R)SS	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 16-SH	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 25-SH	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) 25-SS	E421	17-Sep-2025	22-Sep-2025	180 days	5 days	✓	22-Sep-2025	180 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 01(R)SH	E581.F1	18-Sep-2025	23-Sep-2025	14 days	5 days	✓	24-Sep-2025	14 days	5 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 03-SH	E581.F1	17-Sep-2025	23-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 04-SH	E581.F1	17-Sep-2025	23-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 06-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 07-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 08-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 11-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 12-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 15-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 17-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 20-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 27-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 31-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 32-SH	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Trip Blank	E581.F1	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 05-SH	E581.F1	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 10-SH	E581.F1	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 13-SH	E581.F1	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 16-SH	E581.F1	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) 25-SH	E581.F1	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid) 01(2R)SS	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	24-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid) 01(R)SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	24-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid) 01A-IN	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	24-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid) 06(R)IN	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	24-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid) 06-SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	24-Sep-2025	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
07(R)-SS	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
07-IN	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
07-SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
08-IN	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
08-SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
11-IN	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
11-SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
12(R)-SS	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
12-IN	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
12-SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
14(R)IN	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
14(R)SS	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
15-IN	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
15-SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
27-SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
31-SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
32-SH	E358-L	18-Sep-2025	24-Sep-2025	28 days	6 days	✓	25-Sep-2025	28 days	6 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
03-IN	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
03-SH	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
04-IN	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
04-SH	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
04-SS	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
05-IN	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
05-SH	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
05-SS	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
11-SS	E358-L	18-Sep-2025	25-Sep-2025	28 days	7 days	✓	25-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
13(R)SS	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	25-Sep-2025	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
13-IN	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	25-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
13-SH	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	25-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
17-IN	E358-L	18-Sep-2025	25-Sep-2025	28 days	7 days	✓	25-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
17-SH	E358-L	18-Sep-2025	25-Sep-2025	28 days	7 days	✓	25-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
20-SH	E358-L	18-Sep-2025	25-Sep-2025	28 days	7 days	✓	25-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
25-SH	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
25-SS	E358-L	17-Sep-2025	24-Sep-2025	28 days	7 days	✓	24-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
89-3	E358-L	18-Sep-2025	25-Sep-2025	28 days	7 days	✓	25-Sep-2025	28 days	7 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
Trip Blank	E358-L	18-Sep-2025	25-Sep-2025	28 days	7 days	✓	25-Sep-2025	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
10-SH	E358-L	17-Sep-2025	25-Sep-2025	28 days	8 days	✓	25-Sep-2025	28 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
15(2R)SS	E358-L	17-Sep-2025	25-Sep-2025	28 days	8 days	✓	25-Sep-2025	28 days	8 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass - dissolved (field filtered/sulfuric acid)										
16-SH	E358-L	17-Sep-2025	25-Sep-2025	28 days	8 days	✓	25-Sep-2025	28 days	8 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
01(2R)SS	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
01(R)SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
01A-IN	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
06(R)IN	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
06-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
07(R)-SS	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE 07-IN	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 07-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 08-IN	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 08-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 11-IN	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 11-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 11-SS	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	20-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 12(R)-SS	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 12-IN	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE 12-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 14(R)IN	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 14(R)SS	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	20-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 15-IN	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	20-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 15-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	20-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 17-IN	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	20-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 17-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	20-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 20-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	20-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 27-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE 31-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 32-SH	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	19-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 89-3	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	20-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Trip Blank	E290	18-Sep-2025	19-Sep-2025	14 days	1 days	✓	20-Sep-2025	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 03-IN	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 03-SH	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 04-IN	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 04-SH	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 04-SS	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE 05-IN	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 05-SH	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 05-SS	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 10-SH	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	20-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 13(R)SS	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 13-IN	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 13-SH	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 15(2R)SS	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	20-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 16-SH	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	20-Sep-2025	14 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE 25-SH	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE 25-SS	E290	17-Sep-2025	19-Sep-2025	14 days	2 days	✓	19-Sep-2025	14 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 01(2R)SS	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 01(R)SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 01A-IN	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 06(R)IN	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 06-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 07(R)-SS	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 07-IN	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE 07-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 08-IN	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 08-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 11-IN	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 11-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 11-SS	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 12(R)-SS	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 12-IN	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 12-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE 14(R)IN	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 14(R)SS	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 15-IN	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 15-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 17-IN	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 17-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 20-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 27-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 31-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE 32-SH	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	19-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 89-3	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE Trip Blank	E100	18-Sep-2025	19-Sep-2025	28 days	1 days	✓	20-Sep-2025	28 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE 03-IN	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 03-SH	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 04-IN	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 04-SH	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 04-SS	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 05-IN	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE 05-SH	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 05-SS	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 10-SH	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 13(R)SS	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 13-IN	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 13-SH	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 15(2R)SS	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 16-SH	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	20-Sep-2025	28 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE 25-SH	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE 25-SS	E100	17-Sep-2025	19-Sep-2025	28 days	2 days	✓	19-Sep-2025	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE 07(R)-SS	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	22 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	22 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 07-IN	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	22 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	22 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 07-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	22 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	22 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 27-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	22 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	22 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 06(R)IN	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	23 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	23 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 06-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	23 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	23 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 14(R)SS	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	23 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	23 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 15-IN	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	25 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	25 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE 20-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	25 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 89-3	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	25 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	25 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 12(R)-SS	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 12-IN	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 12-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 15-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 17-IN	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 17-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 32-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE Trip Blank	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	26 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 11-IN	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	27 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 11-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	27 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 11-SS	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	27 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 31-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	27 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	27 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 01(2R)SS	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	28 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	28 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 01(R)SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	28 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	28 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 01A-IN	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	28 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	28 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE 08-IN	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	29 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	29 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE										
08-SH	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	29 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	29 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
14(R)IN	E108	18-Sep-2025	19-Sep-2025	0.25 hrs	30 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	30 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
05-SS	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	45 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	45 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
25-SS	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	45 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	45 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
04-SH	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	46 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	46 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
05-IN	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	46 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	46 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
05-SH	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	46 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	46 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
25-SH	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	46 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	46 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
03-IN	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	47 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	47 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : pH by Meter										
HDPE										
03-SH	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	47 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	47 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
04-IN	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	47 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	47 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
04-SS	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	47 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	47 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
13-IN	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	48 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	48 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
13(R)SS	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	49 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	49 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
13-SH	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	49 hrs	× EHTR-FM	19-Sep-2025	0.25 hrs	49 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
16-SH	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	49 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	49 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
15(2R)SS	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	50 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	50 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE										
10-SH	E108	17-Sep-2025	19-Sep-2025	0.25 hrs	51 hrs	× EHTR-FM	20-Sep-2025	0.25 hrs	51 hrs	× EHTR-FM

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap 01(2R)SS	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap 01(R)SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap 01A-IN	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap 06(R)IN	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap 06-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap 07(R)-SS	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap 07-IN	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap 07-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap 08-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
27-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
08-IN	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
11-IN	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
11-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
11-SS	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
12(R)-SS	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
12-IN	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
12-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
14(R)IN	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
14(R)SS	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
15-IN	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
15-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
17-IN	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
17-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
20-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
31-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
32-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
51-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
52-SH	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
89-3	E687-L	18-Sep-2025	25-Sep-2025	365 days	7 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
03-IN	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
03-SH	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
04-IN	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
04-SH	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
04-SS	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
05-IN	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
05-SH	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
05-SS	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
25-SH	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
25-SS	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	25-Sep-2025	40 days	0 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
10-SH	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
13(R)SS	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
13-IN	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
13-SH	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
15(2R)SS	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	29-Sep-2025	40 days	4 days	✓
Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)										
Amber glass/Teflon lined cap										
16-SH	E687-L	17-Sep-2025	25-Sep-2025	365 days	8 days	✓	29-Sep-2025	40 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 01(R)SH	E611A	18-Sep-2025	23-Sep-2025	14 days	5 days	✓	24-Sep-2025	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 03-SH	E611A	17-Sep-2025	23-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 04-SH	E611A	17-Sep-2025	23-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 06-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 07-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 08-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 11-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 12-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 15-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 17-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 20-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 27-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 31-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 32-SH	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) Trip Blank	E611A	18-Sep-2025	24-Sep-2025	14 days	6 days	✓	24-Sep-2025	14 days	6 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 05-SH	E611A	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 10-SH	E611A	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) 13-SH	E611A	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
16-SH	E611A	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate)										
25-SH	E611A	17-Sep-2025	24-Sep-2025	14 days	7 days	✓	24-Sep-2025	14 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Conductivity in Water	E100	2230038	3	55	5.4	5.0	✓
pH by Meter	E108	2230037	3	56	5.3	5.0	✓
Chloride in Water by IC	E235.Cl	2229997	4	80	5.0	5.0	✓
Fluoride in Water by IC	E235.F	2229998	4	62	6.4	5.0	✓
Nitrite in Water by IC	E235.NO2	2230001	4	61	6.5	5.0	✓
Nitrate in Water by IC	E235.NO3	2229999	4	61	6.5	5.0	✓
Sulfate in Water by IC	E235.SO4	2230002	4	73	5.4	5.0	✓
Alkalinity Species by Titration	E290	2230039	3	46	6.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2238247	3	60	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2233389	3	59	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	2233454	3	60	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2235111	2	39	5.1	5.0	✓
BTEX by Headspace GC-MS	E611A	2235109	2	40	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Conductivity in Water	E100	2230038	3	55	5.4	5.0	✓
pH by Meter	E108	2230037	3	56	5.3	5.0	✓
Chloride in Water by IC	E235.Cl	2229997	4	80	5.0	5.0	✓
Fluoride in Water by IC	E235.F	2229998	4	62	6.4	5.0	✓
Nitrite in Water by IC	E235.NO2	2230001	4	61	6.5	5.0	✓
Nitrate in Water by IC	E235.NO3	2229999	4	61	6.5	5.0	✓
Sulfate in Water by IC	E235.SO4	2230002	4	73	5.4	5.0	✓
Alkalinity Species by Titration	E290	2230039	3	46	6.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2238247	3	60	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2233389	3	59	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	2233454	3	60	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2235111	2	39	5.1	5.0	✓
BTEX by Headspace GC-MS	E611A	2235109	2	40	5.0	5.0	✓
PCB Aroclors by GC-MS (low level)	E687-L	2239636	3	45	6.6	5.0	✓
Method Blanks (MB)							
Conductivity in Water	E100	2230038	3	55	5.4	5.0	✓
Chloride in Water by IC	E235.Cl	2229997	4	80	5.0	5.0	✓
Fluoride in Water by IC	E235.F	2229998	4	62	6.4	5.0	✓
Nitrite in Water by IC	E235.NO2	2230001	4	61	6.5	5.0	✓
Nitrate in Water by IC	E235.NO3	2229999	4	61	6.5	5.0	✓
Sulfate in Water by IC	E235.SO4	2230002	4	73	5.4	5.0	✓

Matrix: **Water**

Evaluation: × = *QC frequency outside specification*; ✓ = *QC frequency within specification.*

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Method Blanks (MB) - Continued							
Alkalinity Species by Titration	E290	2230039	3	46	6.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2238247	3	60	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2233389	3	59	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	2233454	3	60	5.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	2235111	2	39	5.1	5.0	✓
BTEX by Headspace GC-MS	E611A	2235109	2	40	5.0	5.0	✓
PCB Aroclors by GC-MS (low level)	E687-L	2239636	3	45	6.6	5.0	✓
Matrix Spikes (MS)							
Chloride in Water by IC	E235.Cl	2229997	4	80	5.0	5.0	✓
Fluoride in Water by IC	E235.F	2229998	4	62	6.4	5.0	✓
Nitrite in Water by IC	E235.NO2	2230001	4	61	6.5	5.0	✓
Nitrate in Water by IC	E235.NO3	2229999	4	61	6.5	5.0	✓
Sulfate in Water by IC	E235.SO4	2230002	4	73	5.4	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	2238247	3	60	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	2233389	3	59	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	2233454	3	60	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	2235109	2	40	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration	AOX Kelso - Environmental - 1317 South 13th Avenue Kelso Washington DC (District of Columbia) United States 98626	Water	EPA 1650C	Organic halide in water is determined by adsorption onto granular activated carbon (GAC), washing the adsorbed sample and GAC to remove inorganic halide, combustion of the sample and GAC to form the hydrogen halide, and titration of the hydrogen halide with a micro-coulometer.
Conductivity in Water	E100 ALS Environmental - Edmonton	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Edmonton	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Chloride in Water by IC	E235.Cl ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Edmonton	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Edmonton	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Edmonton	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Edmonton	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Mercury in Water by CVAAS	E509 ALS Environmental - Edmonton	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
CCME PHC - F1 by Headspace GC-FID	E581.F1 ALS Environmental - Edmonton	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Edmonton	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PCB Aroclors by GC-MS (low level)	E687-L ALS Environmental - Waterloo	Water	EPA 8270E (mod)	PCB Aroclors are analyzed by GC-MS
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Edmonton	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Edmonton	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
TDS in Water (Calculation)	EC103 ALS Environmental - Edmonton	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Edmonton	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 ALS Environmental - Edmonton	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Edmonton	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421 ALS Environmental - Edmonton	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 ALS Environmental - Edmonton	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Edmonton	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.
Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction (Low Level)	EP660-L ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction.

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QUALITY CONTROL REPORT

Work Order	: **EO2508465**	Page	: 1 of 23
Client	: AECOM Canada ULC	Laboratory	: ALS Environmental - Edmonton
Contact	: Michael Steed	Account Manager	: Megha Walia
Address	: 101 - 18817 Stony Plain Rd. NW Edmonton AB Canada T5S 0C2	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 486 7000	Telephone	: +1 780 413 5227
Project	: Swan Hills - 60757940	Date Samples Received	: 19-Sep-2025 13:03
PO	: 60757940	Date Analysis Commenced	: 19-Sep-2025
C-O-C number	: ----	Issue Date	: 09-Oct-2025 17:58
Sampler	: ----		
Site	:		
Quote number	: EO22-AECO100-016 (Swan Hills)		
No. of samples received	: 46		
No. of samples analysed	: 46		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
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Shruti Mudliar	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Yan Zhang	Team Leader - Organics	Edmonton Organics, Edmonton, Alberta

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 2230037)											
EO2508458-001	Anonymous	pH	----	E108	0.10	pH units	7.31	7.31	0.00%	3%	----
Physical Tests (QC Lot: 2230038)											
EO2508458-001	Anonymous	Conductivity	----	E100	1.0	µS/cm	163	172	5.67%	10%	----
Physical Tests (QC Lot: 2230039)											
EO2508458-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	75.1	74.8	0.400%	20%	----
Physical Tests (QC Lot: 2230095)											
EO2508465-015	06(R)IN	pH	----	E108	0.10	pH units	7.48	7.40	1.08%	3%	----
Physical Tests (QC Lot: 2230096)											
EO2508465-015	06(R)IN	Conductivity	----	E100	2.0	µS/cm	966	971	0.516%	10%	----
Physical Tests (QC Lot: 2230097)											
EO2508465-015	06(R)IN	Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	566	564	0.371%	20%	----
Physical Tests (QC Lot: 2230201)											
EO2508461-001	Anonymous	pH	----	E108	0.10	pH units	8.23	8.15	0.977%	3%	----
Physical Tests (QC Lot: 2230202)											
EO2508461-001	Anonymous	Conductivity	----	E100	2.0	µS/cm	6890	7010	1.73%	10%	----
Physical Tests (QC Lot: 2230203)											
EO2508461-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	124	124	0.323%	20%	----
Anions and Nutrients (QC Lot: 2229997)											
EO2508458-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	1.56	1.52	0.04	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2229998)											
EO2508458-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.147	0.146	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2229999)											
EO2508458-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2230001)											
EO2508458-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2230002)											
EO2508458-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1.52	1.46	0.05	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2230007)											
EO2508465-020	08-SH	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2230008)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 2230008) - continued											
EO2508465-020	08-SH	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2230009)											
EO2508465-020	08-SH	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.248	0.243	2.04%	20%	----
Anions and Nutrients (QC Lot: 2230010)											
EO2508465-020	08-SH	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	44.9	45.0	0.0356%	20%	----
Anions and Nutrients (QC Lot: 2230011)											
EO2508465-020	08-SH	Chloride	16887-00-6	E235.Cl	0.50	mg/L	0.86	0.85	0.02	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2230013)											
EO2508447-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.274	0.274	0.00%	20%	----
Anions and Nutrients (QC Lot: 2230014)											
EO2508447-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2230015)											
EO2508447-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2230016)											
EO2508447-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	37.2	37.1	0.487%	20%	----
Anions and Nutrients (QC Lot: 2230017)											
EO2508447-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	0.60	0.56	0.03	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2231192)											
EO2508461-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	342	342	0.158%	20%	----
Anions and Nutrients (QC Lot: 2231193)											
EO2508461-001	Anonymous	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.116	0.111	0.005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2231194)											
EO2508461-001	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	2120	2120	0.302%	20%	----
Anions and Nutrients (QC Lot: 2231196)											
GP2501962-006	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 2231197)											
GP2501962-006	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 2238247)											
EO2508430-012	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	4.90	5.05	0.14	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 2239198)											
EO2508465-024	11-IN	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	13.8	13.4	3.30%	20%	----
Organic / Inorganic Carbon (QC Lot: 2240824)											
EO2508465-036	15(2R)SS	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.42	1.46	0.04	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 2233389)											
EO2508465-001	01(R)SH	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0854	0.0808	5.47%	20%	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00036	0.00036	0.000004	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.0188	0.0185	1.45%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.458	0.457	0.265%	20%	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.016	0.016	0.00004	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000733	0.0000640	13.4%	20%	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	138	136	1.81%	20%	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00442	0.00440	0.00002	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00073	0.00072	0.000002	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	180	180	0.491%	20%	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000131	0.000133	0.000002	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	39.0	38.0	2.81%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	8.96	8.79	1.94%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.0626	0.0611	2.49%	20%	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	5.45	5.41	0.820%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000250	mg/L	0.000948	0.000888	0.000060	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	10.2	9.98	2.62%	20%	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000503	0.000514	2.03%	20%	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0162	0.0170	4.57%	20%	----
Dissolved Metals (QC Lot: 2233390)											
EO2508465-021	08-IN	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0011	<0.0010	0.0001	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	0.00011	0.000008	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0648	0.0650	0.254%	20%	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.192	0.190	0.646%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000328	0.0000333	0.0000005	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	113	113	0.334%	20%	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00135	0.00146	0.00011	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00326	0.00319	2.33%	20%	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	25.8	25.6	0.592%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.355	0.355	0.0150%	20%	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 2233390) - continued											
EO2508465-021	08-IN	Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00454	0.00463	0.00008	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	4.00	4.02	0.645%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000064	0.000050	0.000014	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	40.7	40.4	0.675%	20%	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.00323	0.00319	1.14%	20%	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0079	0.0080	0.0001	Diff <2x LOR	----
Dissolved Metals (QC Lot: 2233391)											
EO2508465-041	10-SH	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00031	0.00029	0.00001	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 2233454)											
EO2508452-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 2233455)											
EO2508465-006	04-SH	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 2233456)											
EO2508465-026	32-SH	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Volatile Organic Compounds (QC Lot: 2235109)											
EO2508459-001	Anonymous	Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 2236290)											
EO2508465-009	25-SH	Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 2235111)											
EO2508459-001	Anonymous	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 2236289)											
EO2508465-009	25-SH	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 2230038)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 2230039)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 2230096)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 2230097)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 2230202)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 2230203)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Anions and Nutrients (QCLot: 2229997)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 2229998)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2229999)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2230001)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 2230002)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 2230007)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2230008)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 2230009)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2230010)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 2230011)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 2230013)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 2230013) - continued						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2230014)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2230015)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 2230016)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 2230017)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 2231192)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 2231193)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2231194)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 2231196)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 2231197)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Organic / Inorganic Carbon (QCLot: 2238247)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 2239198)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 2240824)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Dissolved Metals (QCLot: 2233389)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 2233389) - continued						
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Dissolved Metals (QCLot: 2233390)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Dissolved Metals (QCLot: 2233391)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 2233391) - continued						
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Dissolved Metals (QCLot: 2233454)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 2233455)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 2233456)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Volatile Organic Compounds (QCLot: 2235109)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
BTEX, total	----	E611A	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Volatile Organic Compounds (QCLot: 2236290)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
BTEX, total	----	E611A	1	µg/L	<1.0	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 2236290) - continued						
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 2235111)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 2236289)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Polychlorinated Biphenyls (QCLot: 2239636)						
Aroclor 1016	12674-11-2	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1221	11104-28-2	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1232	11141-16-5	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1242	53469-21-9	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1248	12672-29-6	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1254	11097-69-1	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1260	11096-82-5	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1262	37324-23-5	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1268	11100-14-4	E687-L	0.01	µg/L	<0.0100	----
Polychlorinated Biphenyls (QCLot: 2241207)						
Aroclor 1016	12674-11-2	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1221	11104-28-2	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1232	11141-16-5	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1242	53469-21-9	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1248	12672-29-6	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1254	11097-69-1	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1260	11096-82-5	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1262	37324-23-5	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1268	11100-14-4	E687-L	0.01	µg/L	<0.0100	----
Polychlorinated Biphenyls (QCLot: 2241209)						
Aroclor 1016	12674-11-2	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1221	11104-28-2	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1232	11141-16-5	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1242	53469-21-9	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1248	12672-29-6	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1254	11097-69-1	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1260	11096-82-5	E687-L	0.01	µg/L	<0.0100	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polychlorinated Biphenyls (QCLot: 2241209) - continued						
Aroclor 1262	37324-23-5	E687-L	0.01	µg/L	<0.0100	----
Aroclor 1268	11100-14-4	E687-L	0.01	µg/L	<0.0100	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 2230037)									
pH	----	E108	----	pH units	6 pH units	100	97.0	103	----
Physical Tests (QCLot: 2230038)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	98.0	90.0	110	----
Physical Tests (QCLot: 2230039)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	101	85.0	115	----
Physical Tests (QCLot: 2230095)									
pH	----	E108	----	pH units	6 pH units	102	97.0	103	----
Physical Tests (QCLot: 2230096)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	98.6	90.0	110	----
Physical Tests (QCLot: 2230097)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	98.9	85.0	115	----
Physical Tests (QCLot: 2230201)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 2230202)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	98.2	90.0	110	----
Physical Tests (QCLot: 2230203)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	99.6	85.0	115	----
Anions and Nutrients (QCLot: 2229997)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	97.6	90.0	110	----
Anions and Nutrients (QCLot: 2229998)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 2229999)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	97.8	90.0	110	----
Anions and Nutrients (QCLot: 2230001)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 2230002)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.0	90.0	110	----
Anions and Nutrients (QCLot: 2230007)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	96.4	90.0	110	----
Anions and Nutrients (QCLot: 2230008)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	99.5	90.0	110	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 2230009)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.5	90.0	110	----
Anions and Nutrients (QCLot: 2230010)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	97.1	90.0	110	----
Anions and Nutrients (QCLot: 2230011)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	96.4	90.0	110	----
Anions and Nutrients (QCLot: 2230013)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 2230014)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 2230015)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 2230016)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 2230017)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 2231192)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	98.8	90.0	110	----
Anions and Nutrients (QCLot: 2231193)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	96.2	90.0	110	----
Anions and Nutrients (QCLot: 2231194)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 2231196)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 2231197)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	103	90.0	110	----
Organic / Inorganic Carbon (QCLot: 2238247)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	95.1	80.0	120	----
Organic / Inorganic Carbon (QCLot: 2239198)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	96.1	80.0	120	----
Organic / Inorganic Carbon (QCLot: 2240824)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	99.2	80.0	120	----
Dissolved Metals (QCLot: 2233389)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	93.6	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 2233389) - continued									
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	98.8	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	105	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	100	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	98.7	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	101	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	99.5	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	102	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	102	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	104	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	94.5	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	101	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	99.7	80.0	120	----
Dissolved Metals (QCLot: 2233390)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	105	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	105	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	110	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	111	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	110	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	107	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	109	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	109	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	107	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	105	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	111	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	110	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	110	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	110	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	109	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike: Target Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 2233390) - continued									
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	100	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	113	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	107	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	107	80.0	120	----
Dissolved Metals (QCLot: 2233391)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	101	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	103	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	108	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	112	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	109	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	105	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	107	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	107	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	108	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	108	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	110	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	99.0	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	110	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	104	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	93.2	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	97.5	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	102	80.0	120	----
Volatile Organic Compounds (QCLot: 2235109)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	119	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	87.3	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	99.4	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	103	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	94.7	70.0	130	----
Volatile Organic Compounds (QCLot: 2236290)									

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 2236290) - continued									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	118	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	74.0	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	102	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	110	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	82.0	70.0	130	----
Hydrocarbons (QCLot: 2235111)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	125	70.0	130	----
Hydrocarbons (QCLot: 2236289)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	118	70.0	130	----
Polychlorinated Biphenyls (QCLot: 2239636)									
Aroclor 1016	12674-11-2	E687-L	0.01	µg/L	0.1 µg/L	94.8	60.0	140	----
Aroclor 1221	11104-28-2	E687-L	0.01	µg/L	0.1 µg/L	94.8	60.0	140	----
Aroclor 1232	11141-16-5	E687-L	0.01	µg/L	0.1 µg/L	94.8	60.0	140	----
Aroclor 1242	53469-21-9	E687-L	0.01	µg/L	0.1 µg/L	94.8	60.0	140	----
Aroclor 1248	12672-29-6	E687-L	0.01	µg/L	0.1 µg/L	92.7	60.0	140	----
Aroclor 1254	11097-69-1	E687-L	0.01	µg/L	0.1 µg/L	89.5	60.0	140	----
Aroclor 1260	11096-82-5	E687-L	0.01	µg/L	0.1 µg/L	86.4	60.0	140	----
Aroclor 1262	37324-23-5	E687-L	0.01	µg/L	0.1 µg/L	86.4	60.0	140	----
Aroclor 1268	11100-14-4	E687-L	0.01	µg/L	0.1 µg/L	86.4	60.0	140	----
Polychlorinated Biphenyls (QCLot: 2241207)									
Aroclor 1016	12674-11-2	E687-L	0.01	µg/L	0.1 µg/L	96.8	60.0	140	----
Aroclor 1221	11104-28-2	E687-L	0.01	µg/L	0.1 µg/L	96.8	60.0	140	----
Aroclor 1232	11141-16-5	E687-L	0.01	µg/L	0.1 µg/L	96.8	60.0	140	----
Aroclor 1242	53469-21-9	E687-L	0.01	µg/L	0.1 µg/L	96.8	60.0	140	----
Aroclor 1248	12672-29-6	E687-L	0.01	µg/L	0.1 µg/L	96.3	60.0	140	----
Aroclor 1254	11097-69-1	E687-L	0.01	µg/L	0.1 µg/L	93.2	60.0	140	----
Aroclor 1260	11096-82-5	E687-L	0.01	µg/L	0.1 µg/L	88.3	60.0	140	----
Aroclor 1262	37324-23-5	E687-L	0.01	µg/L	0.1 µg/L	88.3	60.0	140	----
Aroclor 1268	11100-14-4	E687-L	0.01	µg/L	0.1 µg/L	88.3	60.0	140	----
Polychlorinated Biphenyls (QCLot: 2241209)									
Aroclor 1016	12674-11-2	E687-L	0.01	µg/L	0.1 µg/L	102	60.0	140	----
Aroclor 1221	11104-28-2	E687-L	0.01	µg/L	0.1 µg/L	102	60.0	140	----
Aroclor 1232	11141-16-5	E687-L	0.01	µg/L	0.1 µg/L	102	60.0	140	----
Aroclor 1242	53469-21-9	E687-L	0.01	µg/L	0.1 µg/L	102	60.0	140	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Polychlorinated Biphenyls (QCLot: 2241209) - continued									
Aroclor 1248	12672-29-6	E687-L	0.01	µg/L	0.1 µg/L	92.4	60.0	140	----
Aroclor 1254	11097-69-1	E687-L	0.01	µg/L	0.1 µg/L	96.3	60.0	140	----
Aroclor 1260	11096-82-5	E687-L	0.01	µg/L	0.1 µg/L	91.5	60.0	140	----
Aroclor 1262	37324-23-5	E687-L	0.01	µg/L	0.1 µg/L	91.5	60.0	140	----
Aroclor 1268	11100-14-4	E687-L	0.01	µg/L	0.1 µg/L	91.5	60.0	140	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 2229997)										
EO2508458-001	Anonymous	Chloride	16887-00-6	E235.Cl	95.0 mg/L	100 mg/L	95.0	75.0	125	----
Anions and Nutrients (QCLot: 2229998)										
EO2508458-001	Anonymous	Fluoride	16984-48-8	E235.F	1.02 mg/L	1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 2229999)										
EO2508458-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.38 mg/L	2.5 mg/L	95.2	75.0	125	----
Anions and Nutrients (QCLot: 2230001)										
EO2508458-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.486 mg/L	0.5 mg/L	97.1	75.0	125	----
Anions and Nutrients (QCLot: 2230002)										
EO2508458-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	99.8 mg/L	100 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 2230007)										
EO2508465-020	08-SH	Nitrate (as N)	14797-55-8	E235.NO3	2.46 mg/L	2.5 mg/L	98.4	75.0	125	----
Anions and Nutrients (QCLot: 2230008)										
EO2508465-020	08-SH	Nitrite (as N)	14797-65-0	E235.NO2	0.490 mg/L	0.5 mg/L	97.9	75.0	125	----
Anions and Nutrients (QCLot: 2230009)										
EO2508465-020	08-SH	Fluoride	16984-48-8	E235.F	1.01 mg/L	1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 2230010)										
EO2508465-020	08-SH	Sulfate (as SO4)	14808-79-8	E235.SO4	91.8 mg/L	100 mg/L	91.8	75.0	125	----
Anions and Nutrients (QCLot: 2230011)										
EO2508465-020	08-SH	Chloride	16887-00-6	E235.Cl	96.0 mg/L	100 mg/L	96.0	75.0	125	----
Anions and Nutrients (QCLot: 2230013)										
EO2508447-001	Anonymous	Fluoride	16984-48-8	E235.F	0.976 mg/L	1 mg/L	97.6	75.0	125	----
Anions and Nutrients (QCLot: 2230014)										
EO2508447-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.55 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 2230015)										
EO2508447-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.498 mg/L	0.5 mg/L	99.7	75.0	125	----
Anions and Nutrients (QCLot: 2230016)										
EO2508447-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	95.6 mg/L	100 mg/L	95.6	75.0	125	----
Anions and Nutrients (QCLot: 2230017)										
EO2508447-001	Anonymous	Chloride	16887-00-6	E235.Cl	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 2231192)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 2231192) - continued										
GP2501962-006	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	96.3 mg/L	100 mg/L	96.3	75.0	125	----
Anions and Nutrients (QCLot: 2231193)										
GP2501962-006	Anonymous	Fluoride	16984-48-8	E235.F	0.994 mg/L	1 mg/L	99.4	75.0	125	----
Anions and Nutrients (QCLot: 2231194)										
GP2501962-006	Anonymous	Chloride	16887-00-6	E235.Cl	99.5 mg/L	100 mg/L	99.5	75.0	125	----
Anions and Nutrients (QCLot: 2231196)										
GP2501962-006	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.50 mg/L	2.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 2231197)										
GP2501962-006	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.506 mg/L	0.5 mg/L	101	75.0	125	----
Organic / Inorganic Carbon (QCLot: 2238247)										
EO2508430-012	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	5.03 mg/L	5 mg/L	101	70.0	130	----
Organic / Inorganic Carbon (QCLot: 2239198)										
EO2508465-024	11-IN	Carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	----	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 2240824)										
EO2508465-036	15(2R)SS	Carbon, dissolved organic [DOC]	----	E358-L	4.99 mg/L	5 mg/L	99.8	70.0	130	----
Dissolved Metals (QCLot: 2233389)										
EO2508465-001	01(R)SH	Aluminum, dissolved	7429-90-5	E421	0.171 mg/L	0.2 mg/L	85.3	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0230 mg/L	0.02 mg/L	115	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	----	ND	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.120 mg/L	0.1 mg/L	120	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00407 mg/L	0.004 mg/L	102	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0398 mg/L	0.04 mg/L	99.4	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0191 mg/L	0.02 mg/L	95.7	70.0	130	----
		Iron, dissolved	7439-89-6	E421	ND mg/L	----	ND	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0182 mg/L	0.02 mg/L	91.2	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	----	ND	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	ND mg/L	----	ND	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	ND mg/L	----	ND	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0343 mg/L	0.04 mg/L	85.8	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00322 mg/L	0.004 mg/L	80.6	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00383 mg/L	0.004 mg/L	95.7	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.393 mg/L	0.4 mg/L	98.3	70.0	130	----
Dissolved Metals (QCLot: 2233390)										
EO2508465-021	08-IN	Aluminum, dissolved	7429-90-5	E421	0.193 mg/L	0.2 mg/L	96.6	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0205 mg/L	0.02 mg/L	103	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 2233390) - continued										
EO2508465-021	08-IN	Arsenic, dissolved	7440-38-2	E421	0.0209 mg/L	0.02 mg/L	104	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	----	ND	70.0	130	----
		Boron, dissolved	7440-42-8	E421	ND mg/L	----	ND	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00406 mg/L	0.004 mg/L	101	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0398 mg/L	0.04 mg/L	99.5	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0187 mg/L	0.02 mg/L	93.4	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.97 mg/L	2 mg/L	98.7	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0180 mg/L	0.02 mg/L	90.2	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	----	ND	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0381 mg/L	0.04 mg/L	95.3	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	3.79 mg/L	4 mg/L	94.7	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0442 mg/L	0.04 mg/L	110	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00307 mg/L	0.004 mg/L	76.7	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00397 mg/L	0.004 mg/L	99.2	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.391 mg/L	0.4 mg/L	97.8	70.0	130	----
Dissolved Metals (QCLot: 2233391)										
EO2508465-041	10-SH	Aluminum, dissolved	7429-90-5	E421	0.190 mg/L	0.2 mg/L	95.0	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0195 mg/L	0.02 mg/L	97.7	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.108 mg/L	0.1 mg/L	108	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00407 mg/L	0.004 mg/L	102	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	3.98 mg/L	4 mg/L	99.6	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0391 mg/L	0.04 mg/L	97.9	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0209 mg/L	0.02 mg/L	104	70.0	130	----
		Iron, dissolved	7439-89-6	E421	2.02 mg/L	2 mg/L	101	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0179 mg/L	0.02 mg/L	89.7	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	1.02 mg/L	1 mg/L	102	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0410 mg/L	0.04 mg/L	102	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	4.07 mg/L	4 mg/L	102	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0432 mg/L	0.04 mg/L	108	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00399 mg/L	0.004 mg/L	99.7	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	2.11 mg/L	2 mg/L	106	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00386 mg/L	0.004 mg/L	96.6	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.412 mg/L	0.4 mg/L	103	70.0	130	----
Dissolved Metals (QCLot: 2233454)										
EO2508452-002	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000811 mg/L	0 mg/L	81.1	70.0	130	----
Dissolved Metals (QCLot: 2233455)										
EO2508465-007	04-IN	Mercury, dissolved	7439-97-6	E509	0.000104 mg/L	0 mg/L	104	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 2233456)										
EO2508465-027	12-IN	Mercury, dissolved	7439-97-6	E509	0.000102 mg/L	0 mg/L	102	70.0	130	----
Volatile Organic Compounds (QCLot: 2235109)										
EO2508459-002	Anonymous	Benzene	71-43-2	E611A	128 µg/L	100 µg/L	128	50.0	140	----
		Ethylbenzene	100-41-4	E611A	74.1 µg/L	100 µg/L	74.1	50.0	140	----
		Toluene	108-88-3	E611A	91.8 µg/L	100 µg/L	91.8	50.0	140	----
		Xylene, m+p-	179601-23-1	E611A	194 µg/L	200 µg/L	97.3	50.0	140	----
		Xylene, o-	95-47-6	E611A	86.9 µg/L	100 µg/L	86.9	50.0	140	----
Volatile Organic Compounds (QCLot: 2236290)										
EO2508465-010	05-SH	Benzene	71-43-2	E611A	123 µg/L	100 µg/L	123	50.0	140	----
		Ethylbenzene	100-41-4	E611A	82.3 µg/L	100 µg/L	82.3	50.0	140	----
		Toluene	108-88-3	E611A	93.7 µg/L	100 µg/L	93.7	50.0	140	----
		Xylene, m+p-	179601-23-1	E611A	206 µg/L	200 µg/L	103	50.0	140	----
		Xylene, o-	95-47-6	E611A	82.3 µg/L	100 µg/L	82.3	50.0	140	----

October 09, 2025 Service Request No:K2509437

Megha Walia
ALS Environmental - Canada
9450 17 Ave NW
Edmonton, AB T6N 1M9

Laboratory Results for: EO2508465

Dear Megha,

Enclosed are the results of the sample(s) submitted to our laboratory September 24, 2025
For your reference, these analyses have been assigned our service request number **K2509437.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3261. You may also contact me via email at Hayleigh.Smith@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Hayleigh Smith
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: ALS Environmental - Canada
Project: EO2508465
Sample Matrix: Water

Service Request: K2509437
Date Received: 09/24/2025

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Seven water samples were received for analysis at ALS Environmental on 09/24/2025. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Daeleigh Smith Date 10/09/2025

Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: ALS Environmental - Canada **Service Request:**K2509437
Project: EO2508465

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K2509437-001	EO2508465-004	9/17/2025	1525
K2509437-002	EO2508465-025	9/18/2025	1250
K2509437-003	EO2508465-029	9/17/2025	1400
K2509437-004	EO2508465-034	9/18/2025	1400
K2509437-005	EO2508465-037	9/17/2025	1445
K2509437-006	EO2508465-038	9/18/2025	1340
K2509437-007	EO2508465-041	9/17/2025	1250

Chain of Custody

ALS Environmental - Edmonton
9450 - 17 Avenue NW
Edmonton AB Canada T6N 1M9

276229

K2509437

Destination Lab:	**USA - Kelso**
Address:	1317 South 13th Avenue Kelso DC United States 98626
Client:	AECOM Canada ULC
Work Order Number:	**EO2508465**
Original Receipt Date/Time	Instructions Received
19/09/2025 12:03	

Relinquished By

Date/Time

Received By Mikel

Date/Time 9/24/25 1005

Receipt Temp

Return as Indicated: Results: ALSEDClientServices@alsglobal.com Invoice: ALSEDClientServices@alsglobal.com Electronic Data: ALSEDClientServices@alsglobal.com

Attention: Megha Walia

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
EO2508465-004	03-SH	Water	Amber glass (nitric acid)	AOX	Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration	10-10-2025	17/09/2025 15:25	
EO2508465-025	12-SH	Water	Amber glass (nitric acid)	AOX	Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration	10-10-2025	18/09/2025 12:50	
EO2508465-026	32-SH	Water	Amber glass (nitric acid)	AOX	Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration	10-10-2025	18/09/2025 12:55	
EO2508465-029	13-SH	Water	Amber glass (nitric acid)	AOX	Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration	10-10-2025	17/09/2025 14:00	
EO2508465-034	15-SH	Water	Amber glass (nitric acid)	AOX	Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration	10-10-2025	18/09/2025 14:00	
EO2508465-037	16-SH	Water	Amber glass (nitric acid)	AOX	Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration	10-10-2025	17/09/2025 14:45	
EO2508465-038	17-SH	Water	Amber glass (nitric acid)	AOX	Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration	10-10-2025	18/09/2025 13:40	
EO2508465-041	10-SH	Water	Amber glass (nitric acid)	AOX	Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration	10-10-2025	17/09/2025 12:50	

Cooler Receipt and Preservation Form

PM AS

Client ALS Canada Service Request K25 0943?

Received: 9/24/25 Opened: 9/24/25 By: VM Unloaded: 9/24/25 By: VM

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
	16-7	IR06		X	X	884580360535	

4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
   If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
5. Were samples received within the method specified temperature ranges? NA Y N
   If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*

6. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* paper, ice melted
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
13. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
14. Was C12/Res negative? NA Y N
15. Were samples received within method specified time limit? If not, notate the error below and notify the PM. NA Y N
16. Were 100mL sterile microbiology bottles filled exactly to the 100mL mark? NA Y N Underfilled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time
E025084105-026	250mL		X						

Notes, Discrepancies, Resolutions: _____

Q:\ENVIRONMENTAL\1 SOP & Policy Statements\SMO\CRF Update 2025-05-06.docx Updated: NP 05/07/25

Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value over the calibration range.
J	The result is an estimated value between the MDL and the MRL.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: ALS Environmental - Canada **Service Request:** K2509437
Project: EO2508465/

Sample Name: EO2508465-004 **Date Collected:** 09/17/25
Lab Code: K2509437-001 **Date Received:** 09/24/25
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
1650C		NFOTH

Sample Name: EO2508465-025 **Date Collected:** 09/18/25
Lab Code: K2509437-002 **Date Received:** 09/24/25
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
1650C		NFOTH

Sample Name: EO2508465-029 **Date Collected:** 09/17/25
Lab Code: K2509437-003 **Date Received:** 09/24/25
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
1650C		NFOTH

Sample Name: EO2508465-034 **Date Collected:** 09/18/25
Lab Code: K2509437-004 **Date Received:** 09/24/25
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
1650C		NFOTH

Sample Name: EO2508465-037 **Date Collected:** 09/17/25
Lab Code: K2509437-005 **Date Received:** 09/24/25
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
1650C		NFOTH

Client: ALS Environmental - Canada **Service Request:** K2509437
Project: EO2508465/

Sample Name: EO2508465-038 **Date Collected:** 09/18/25
Lab Code: K2509437-006 **Date Received:** 09/24/25
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
1650C		NFOTH

Sample Name: EO2508465-041 **Date Collected:** 09/17/25
Lab Code: K2509437-007 **Date Received:** 09/24/25
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
1650C		NFOTH

Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	09/17/25 15:25
Sample Matrix:	Water	**Date Received:**	09/24/25 10:05
Sample Name:	EO2508465-004	**Basis:**	NA
Lab Code:	K2509437-001		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	ND U	mg/L	0.010	1	10/07/25 10:13	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	09/18/25 12:50
Sample Matrix:	Water	**Date Received:**	09/24/25 10:05
Sample Name:	EO2508465-025	**Basis:**	NA
Lab Code:	K2509437-002		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	ND U	mg/L	0.010	1	10/07/25 10:13	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	09/17/25 14:00
Sample Matrix:	Water	**Date Received:**	09/24/25 10:05
Sample Name:	EO2508465-029	**Basis:**	NA
Lab Code:	K2509437-003		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	ND U	mg/L	0.010	1	10/07/25 10:13	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	09/18/25 14:00
Sample Matrix:	Water	**Date Received:**	09/24/25 10:05
Sample Name:	EO2508465-034	**Basis:**	NA
Lab Code:	K2509437-004		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	ND U	mg/L	0.010	1	10/07/25 10:13	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	09/17/25 14:45
Sample Matrix:	Water	**Date Received:**	09/24/25 10:05
Sample Name:	EO2508465-037	**Basis:**	NA
Lab Code:	K2509437-005		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	ND U	mg/L	0.010	1	10/07/25 10:13	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	09/18/25 13:40
Sample Matrix:	Water	**Date Received:**	09/24/25 10:05
Sample Name:	EO2508465-038	**Basis:**	NA
Lab Code:	K2509437-006		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	ND U	mg/L	0.010	1	10/07/25 10:13	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	09/17/25 12:50
Sample Matrix:	Water	**Date Received:**	09/24/25 10:05
Sample Name:	EO2508465-041	**Basis:**	NA
Lab Code:	K2509437-007		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	ND U	mg/L	0.010	1	10/07/25 10:13	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Batch QC	**Basis:**	NA
Lab Code:	KQ2517829-11		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	**0.47**	mg/L	0.25	25	10/07/25 10:13	

QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

General Chemistry

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1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K2509437-MB1		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	ND U	mg/L	0.010	1	10/07/25 10:13	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Basis:**	NA
Lab Code:	K2509437-MB2		

General Chemistry Parameters

Analyte Name	Analysis Method	Result	Units	MRL	Dil.	Date Analyzed	Q
Halides, Adsorbable Organic (AOX)	1650C	ND U	mg/L	0.010	1	10/07/25 10:13	

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465/	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Analyzed:	10/07/2025
		Analysis Lot:	895933

Calibration and Method Blank Summary
Halides, Adsorbable Organic (AOX)

1650C

	Halide Check Standard (ug)	**Instrument Calibration Standard** (ug)	**PAR Standard** (ug/L)
True Value	3.64	10.0	100
Run A	3.70	10.2	100
Percent Recovery A	102	102	100
Run B	3.67	10.0	100
Percent Recovery B	101	100	100

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - Canada	**Service Request:**	K2509437
Project:	EO2508465	**Date Collected:**	N/A
Sample Matrix:	Water	**Date Received:**	N/A
		Date Analyzed:	10/7/25
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Halides, Adsorbable Organic (AOX)

Sample Name:	Batch QC	**Units:**	mg/L
Lab Code:	KQ2517829-11	**Basis:**	NA
Analysis Method:	1650C		
Prep Method:	None		

		Matrix Spike KQ2517829-11MS			Duplicate Matrix Spike KQ2517829-11DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Halides, Adsorbable Organic (AOX)	0.47	5.16	5.00	94	5.12	5.00	93	78-116	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Report To	Contact and company name below will appear on the final report
Company:	AECOM Canada ULC
Contact:	Michael Steed
Phone:	1-780-264-4868
	Company address below will appear on the final report
Street:	18817 Stony Plain Rd #101 NW
City/Province:	Edmonton/Alberta
Postal Code:	T5S0C2
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: Bane.Brotschi@aecom.com
Email 2: Michael.Steed@aecom.com
Email 3: Sarah.Andersen@aecom.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: canssc.e-billing@aecom.com
Email 2: michael.steed@aecom.com

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Project Information

ALS Account # / Quote #:	
Job #:	Swan Hills - 60757940
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only): EO2508465

ALS Contact: Pamela Toledo **Sampler:**

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	DOC (F/P)	Routine	Dissolved Metals (F/P)	Dissolved Mercury (F/P)	BTEX, F1	PCB	AOX	UIRED	notes)
	01(R)SH	18-09-25	11:50	Water	8	X	X	X	X	x	X			
	01A-IN	18-09-25	11:35	Water	6	X	X	X	X		X			
	01(2R)SS	18-09-25	12:00	Water	6	X	X	X	X		X			
	03-SH	17-09-25	16:25	Water	9	X	X	X	X	x	X	x		
	03-IN	17-09-25	16:18	Water	6	X	X	X	X		X			
	04-SH	17-09-25	17:10	Water	8	X	X	X	X	x	X			
	04-IN	17-09-25	17:00	Water	6	X	X	X	X		X			
	04-SS	17-09-25	16:45	Water	6	X	X	X	X		X			
	25-SH	17-09-25	17:30	Water	8	X	X	X	X	x	X			
	05-SH	17-09-25	17:50	Water	8	X	X	X	X	x	X			
	05-IN	17-09-25	17:35	Water	6	X	X	X	X		X			
	05-SS	17-09-25	18:15	Water	6	X	X	X	X		X			

Environmental Division
Edmonton
Work Order Reference
EO2508465

Phone: +1 780 413 5227

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ YES ☑ NO

Are samples for human consumption/ use?
☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☑ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO
Cooler Custody Seals Intact: ☐ YES ☒ N/A Sample Custody Seals Intact: ☐ YES ☒ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C		
11.2	13.9	12.3	11.2	10.2	13.4	

SHIPMENT RELEASE (client use)

Released by:	Date:	Time:
Isabelle Martel	19-09-25	12:15

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:
SA	19-Sep-25	12:15

FINAL SHIPMENT RECEPTION (ALS use only)

Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To	Contact and company name below will appear on the final report
Company:	AECOM
Contact:	Michael Steed
Phone:	1-780-264-4868
	Company address below will appear on the final report
Street:	18817 Stony Plain Rd #101 NW
City/Province:	Edmonton/Alberta
Postal Code:	T5S0C2
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Reports / Recipients	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	Bane.Brotschi@aecom.com
Email 2	Michael.Steed@aecom.com
Email 3	carter.mackie@aecom.com
Invoice Recipients	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	canssc.e-billing@aecom.com
Email 2	

Turnaround Time (TAT) Requested
☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:	Swan Hills - 60757940	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		**ALS Contact:** Pamela Toledo	**Sampler:**

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	DOC (F/P)	Routine	Dissolved Metals (F/P)	Dissolved Mercury (F/P)	BTEX, F1	PCB	AOX	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	25-SS	17-09-25	18:30	Water	6	X	X	X	X		X				
	06-SH	18-09-25	16:45	Water	8	X	X	X	X	x	X				
	06(R)IN	18-09-25	17:00	Water	6	X	X	X	X		X				
	07-SH	18-09-25	17:30	Water	8	X	X	X	X	x	X				
	27-SH	18-09-25	17:48	Water	6	X	X	X	X	x	X				
	07-IN	18-09-25	17:18	Water	6	X	X	X	X		X				
	07(R)-SS	18-09-25	17:55	Water	6	X	X	X	X		X				
	08-SH	18-09-25	10:35	Water	9	X	X	X	X	x	X	x			
	08-IN	18-09-25	10:25	Water	6	X	X	X	X		X				
	11-SH	18-09-25	12:45	Water	8	X	X	X	X	x	X				
	31-SH	18-09-25	13:00	Water	8	X	X	X	X	x	X				
	11-IN	18-09-25	12:30	Water	6	X	X	X	X		X				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ YES ☒ NO

Are samples for human consumption/ use?
☐ YES ☒ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

SAMPLE RECEIPT DETAILS (ALS use only)

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Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

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Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page 3 of 4 12

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To	Contact and company name below will appear on the final report
Company:	AECOM
Contact:	Michael Steed
Phone:	1-780-264-4868
	Company address below will appear on the final report
Street:	18817 Stony Plain Rd #101 NW
City/Province:	Edmonton/Alberta
Postal Code:	T5S0C2
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: Bane.Brotschi@aecom.com

Email 2: Michael.Steed@aecom.com

Email 3: carter.mackie@aecom.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: canssc.e-billing@aecom.com

Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:	
Job #:	Swan Hills - 60757940
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (ALS use only):

ALS Contact: Pamela Toledo **Sampler:**

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	DOC (F/P)	Routine	Dissolved Metals (F/P)	Dissolved Mercury (F/P)	BTEX, F1	PCB	AOX	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	12-SH	18-09-25	13:50	Water	9	X	X	X	X	x	X	x			
	32-SH	18-09-25	13:55	Water	9	X	X	X	X	x	X	x			
	12-IN	18-09-25	13:40	Water	6	X	X	X	X		X				
	12(R)-SS	18-09-25	14:05	Water	6	X	X	X	X		X				
	13-SH	17-09-25	15:00	Water	9	X	X	X	X	x	X	x			
	13-IN	17-09-25	15:15	Water	6	X	X	X	X		X				
	13(R)SS	17-09-25	14:45	Water	6	X	X	X	X		X				
	~~14(R)SH~~			~~Water~~		~~X~~	~~X~~	~~X~~	~~X~~	~~x~~	~~X~~				
	14(R)IN	18-09-25	9:40	Water	6	X	X	X	X		X				
	14(R)SS	18-09-25	18:05	Water	6	X	X	X	X		X				
	15-SH	18-09-25	15:00	Water	9	X	X	X	X	x	X	x			
	15-IN	18-09-25	15:10	Water	6	X	X	X	X		X				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human consumption/ use? ☐ YES ☒ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (ALS use only)		
Received by:	Date:	Time:

FINAL SHIPMENT RECEPTION (ALS use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Chain of Custody (COC) / Analytical Request Form

COC Number: 22 -

Page 4 of 4

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Canada Toll Free: 1 800 668 9878

Report To	Contact and company name below will appear on the final report
Company:	AECOM
Contact:	Michael Steed
Phone:	1-780-264-4868
	Company address below will appear on the final report
Street:	18817 Stony Plain Rd #101 NW
City/Province:	Edmonton/Alberta
Postal Code:	T5S0C2
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	
Contact:	

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)

Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: Bane.Brotschi@aecom.com

Email 2: Michael.Steed@aecom.com

Email 3: carter.mackie@aecom.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: canssc.e-billing@aecom.com

Email 2:

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Account # / Quote #:

Job #: Swan Hills - 60757940

PO / AFE:

LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (ALS use only):

ALS Contact: Pamela Toledo

Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	DOC (F/P)	Routine	Dissolved Metals (F/P)	Dissolved Mercury (F/P)	BTEX, F1	PCB	AOX	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	15(2R)SS	17-09-25	14:30	Water	6	X	X	X	X		X				
	16-SH	17-09-25	15:45	Water	9	X	X	X	X	x	X	X			
	~~16-IN~~	~~17-09-25~~	~~15:35~~	~~Water~~		~~X~~	~~X~~	~~X~~	~~X~~		~~X~~				
	17-SH	18-09-25	14:40	Water	9	X	X	X	X	x	x	X			
	17-IN	18-09-25	14:30	Water	6	X	X	X	X		X				
	89-3	18-09-25	15:20	Water	6	X	X	X	X		X				
	10-SH	17-09-25	13:50	Water	9	X	X	X	X	x	X	X			
	20-SH	18-09-25	15:50	Water	8	X	X	X	X	x	X				
	~~30-SH~~			~~Water~~		~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~				
	51-SH	18-09-25	8:00	Water	2						X				
	52-SH	18-09-25	8:15	Water	2						X				
	11-SS	18-09-25	13:10	Water	6	X	X	X	X		X				

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ YES ☑ NO

Are samples for human consumption/ use?
☐ YES ☑ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

15(2R)SS Nutrients bottle was NOT field filtered; was preserved lab to filter please

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Appendix G

Statistical Output

App G1	Outlier Test Output – Shallow
App G2	Outlier Test Output – Intermediate
App G3	Outlier Test Output - Sandstone
App G4	Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Shallow
App G5	Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Intermediate
App G6	Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Sandstone
App G7	Sen's Slope/Mann-Kendall Trend Analysis Output – Outliers Removed - Shallow
App G8	Sen's Slope/Mann-Kendall Trend Analysis Output – Outliers Removed - Sandstone

App G1 Outlier Test Output – Shallow

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 8:50:43 AM
From File	2025-ShallowProUCL_b.xls
Full Precision	OFF

01(R)SH - OUTLIERS

Rosner's Outlier Test for pH ()

Mean	6.796
Standard Deviation	0.864
Number of data	52
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6.796	0.855	5.15	25	1.925	3.144	3.496

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	205.1
Standard Deviation	134.9
Number of data	52
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	205.1	133.6	724	32	3.885	3.144	3.496

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 724

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 724

Rosner's Outlier Test for Chloride (mg/L)

Mean	2.303
Standard Deviation	2.201
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

54	1	2.303	2.179	9.66	49	3.377	3.137	3.488			
55											
56	For 5% Significance Level, there is 1 Potential Outlier										
57	Potential outliers is: 9.66										
58											
59	For 1% Significance Level, there is no Potential Outlier										
60											
61											
62			Rosner's Outlier Test for Sulphate (mg/L)								
63											
64											
65			Mean	13.01							
66			Standard Deviation	32.23							
67			Number of data	51							
68			Number of suspected outliers	1							
69											
70				Potential	Obs.	Test	Critical	Critical			
71	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
72	1	13.01	31.91	214	31	6.298	3.137	3.488			
73											
74	For 5% Significance Level, there is 1 Potential Outlier										
75	Potential outliers is: 214										
76											
77	For 1% Significance Level, there is 1 Potential Outlier										
78	Potential outliers is: 214										
79											
80											
81			Dixon's Outlier Test for DOC (mg/L)								
82											
83	Number of Observations = 22										
84	10% critical value: 0.382										
85	5% critical value: 0.43										
86	1% critical value: 0.514										
87											
88	1. Observation Value 61 is a Potential Outlier (Upper Tai										
89											
90	Test Statistic: 0.175										
91											
92	For 10% significance level, 61 is not an outlier.										
93	For 5% significance level, 61 is not an outlier.										
94	For 1% significance level, 61 is not an outlier.										
95											
96	2. Observation Value 10 is a Potential Outlier (Lower Tail										
97											
98	Test Statistic: 0.359										
99											
100	For 10% significance level, 10 is not an outlier.										
101	For 5% significance level, 10 is not an outlier.										
102	For 1% significance level, 10 is not an outlier.										
103											
104											
105			Rosner's Outlier Test for Bicarbonate (mg/L)								
106											

	A	B	C	D	E	F	G	H	I	J	K	L
107												
108				Mean	213.9							
109				Standard Deviation	154.2							
110				Number of data	51							
111				Number of suspected outliers	1							
112												
113				Potential	Obs.	Test	Critical	Critical				
114	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
115	1	213.9	152.6	558	31	2.255	3.137	3.488				
116												
117	For 5% Significance Level, there is no Potential Outlier											
118												
119	For 1% Significance Level, there is no Potential Outlier											
120												
121												
122				Rosner's Outlier Test for Calcium (mg/L)								
123												
124												
125				Mean	49.12							
126				Standard Deviation	35.14							
127				Number of data	52							
128				Number of suspected outliers	1							
129												
130				Potential	Obs.	Test	Critical	Critical				
131	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
132	1	49.12	34.8	176	32	3.646	3.144	3.496				
133												
134	For 5% Significance Level, there is 1 Potential Outlier											
135	Potential outliers is: 176											
136												
137	For 1% Significance Level, there is 1 Potential Outlier											
138	Potential outliers is: 176											
139												
140												
141				Rosner's Outlier Test for Magnesium (mg/L)								
142												
143												
144				Mean	11.59							
145				Standard Deviation	9.051							
146				Number of data	53							
147				Number of suspected outliers	1							
148												
149				Potential	Obs.	Test	Critical	Critical				
150	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
151	1	11.59	8.965	35	33	2.611	3.151	3.504				
152												
153	For 5% Significance Level, there is no Potential Outlier											
154												
155	For 1% Significance Level, there is no Potential Outlier											
156												
157												
158				Rosner's Outlier Test for Sodium (mg/L)								
159												

			Mean	8.666							
			Standard Deviation	4.314							
			Number of data	52							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	8.666	4.273	20.8	47	2.84	3.144	3.496				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Arsenic (mg/L)								
			Mean	0.00323							
			Standard Deviation	0.0181							
			Number of data	51							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.00323	0.0179	0.13	14	7.067	3.137	3.488				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.13											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.13											
			Rosner's Outlier Test for Copper (mg/L)								
			Mean	0.0038							
			Standard Deviation	0.0141							
			Number of data	51							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.0038	0.014	0.102	18	7.021	3.137	3.488				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.102											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.102											

	A	B	C	D	E	F	G	H	I	J	K	L
213				Rosner's Outlier Test for Iron (mg/L)								
214												
215												
216				Mean	2.792							
217				Standard Deviation	1.407							
218				Number of data	33							
219				Number of suspected outliers	1							
220												
221				Potential	Obs.	Test	Critical	Critical				
222	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
223	1	2.792	1.385	6.79	5	2.886	2.95	3.29				
224												
225	For 5% Significance Level, there is no Potential Outlier											
226												
227	For 1% Significance Level, there is no Potential Outlier											
228												
229												
230				Rosner's Outlier Test for Manganese (mg/L)								
231												
232												
233				Mean	0.158							
234				Standard Deviation	0.202							
235				Number of data	33							
236				Number of suspected outliers	1							
237												
238				Potential	Obs.	Test	Critical	Critical				
239	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
240	1	0.158	0.199	0.844	2	3.451	2.95	3.29				
241												
242	For 5% Significance Level, there is 1 Potential Outlier											
243	Potential outliers is: 0.844											
244												
245	For 1% Significance Level, there is 1 Potential Outlier											
246	Potential outliers is: 0.844											
247												
248												
249				Rosner's Outlier Test for Nickel (mg/L)								
250												
251												
252				Mean	0.0138							
253				Standard Deviation	0.0258							
254				Number of data	50							
255				Number of suspected outliers	1							
256												
257				Potential	Obs.	Test	Critical	Critical				
258	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
259	1	0.0138	0.0256	0.16	17	5.712	3.13	3.48				
260												
261	For 5% Significance Level, there is 1 Potential Outlier											
262	Potential outliers is: 0.16											
263												
264	For 1% Significance Level, there is 1 Potential Outlier											
265	Potential outliers is: 0.16											

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.0133
Standard Deviation	0.02
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0133	0.0197	0.099	3	4.342	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.099

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.099

Rosner's Outlier Test for TOC (mg/L)

Mean	19.37
Standard Deviation	22.55
Number of data	34
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	19.37	22.21	80.1	19	2.734	2.97	3.3

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:03:58 AM
From File	2025-ShallowProUCL_c.xls
Full Precision	OFF

03-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.824
Standard Deviation	0.266
Number of data	60
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.824	0.264	7.26	9	2.142	3.2	3.56

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	383.8
Standard Deviation	88.9
Number of data	60
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	383.8	88.15	579	59	2.215	3.2	3.56

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	1.264
Standard Deviation	0.813
Number of data	58
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.264	0.806	4.4	27	3.891	3.186	3.544

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 4.4

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 4.4

Rosner's Outlier Test for Sulphate (mg/L)

Mean	49.01
Standard Deviation	25.94
Number of data	58
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	49.01	25.71	99.1	44	1.948	3.186	3.544

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 20

10% critical value: 0.401

5% critical value: 0.45

1% critical value: 0.535

1. Observation Value 8 is a Potential Outlier (Upper Tail)

Test Statistic: 0.587

For 10% significance level, 8 is an outlier.

For 5% significance level, 8 is an outlier.

For 1% significance level, 8 is an outlier.

2. Observation Value 3.9 is a Potential Outlier (Lower Tai

Test Statistic: 0.100

For 10% significance level, 3.9 is not an outlier.

For 5% significance level, 3.9 is not an outlier.

For 1% significance level, 3.9 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	393
Standard Deviation	78.24

107				Number of data	57						
108				Number of suspected outliers	1						
109											
110				Potential	Obs.	Test	Critical	Critical			
111	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
112	1	393	77.55	575	45	2.347	3.179	3.536			
113											
114	For 5% Significance Level, there is no Potential Outlier										
115											
116	For 1% Significance Level, there is no Potential Outlier										
117											
118											
119				Rosner's Outlier Test for Calcium (mg/L)							
120											
121											
122				Mean	91.43						
123				Standard Deviation	19.1						
124				Number of data	58						
125				Number of suspected outliers	1						
126											
127				Potential	Obs.	Test	Critical	Critical			
128	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
129	1	91.43	18.94	139	56	2.512	3.186	3.544			
130											
131	For 5% Significance Level, there is no Potential Outlier										
132											
133	For 1% Significance Level, there is no Potential Outlier										
134											
135											
136				Rosner's Outlier Test for Magnesium (mg/L)							
137											
138											
139				Mean	24.95						
140				Standard Deviation	5.423						
141				Number of data	58						
142				Number of suspected outliers	1						
143											
144				Potential	Obs.	Test	Critical	Critical			
145	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
146	1	24.95	5.376	38.1	58	2.447	3.186	3.544			
147											
148	For 5% Significance Level, there is no Potential Outlier										
149											
150	For 1% Significance Level, there is no Potential Outlier										
151											
152											
153				Rosner's Outlier Test for Sodium (mg/L)							
154											
155											
156				Mean	18.91						
157				Standard Deviation	10.92						
158				Number of data	58						
159				Number of suspected outliers	1						

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	18.91	10.83	46.4	40	2.539	3.186	3.544	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	5.4862E-4
Standard Deviation	0.00182
Number of data	58
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	5.4862E-4	0.0018	0.014	2	7.464	3.186	3.544

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.014

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.014

Rosner's Outlier Test for Chromium (mg/L)

Mean	0.00303
Standard Deviation	0.00388
Number of data	58
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00303	0.00384	0.018	30	3.897	3.186	3.544

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.018

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.018

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00322
Standard Deviation	0.00245

			Number of data	56							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
#	Mean	sd		outlier	Number	value	value (5%)	value (1%)			
1	0.00322	0.00243		0.015	29	4.853	3.172	3.528			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.015											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.015											
			Rosner's Outlier Test for Manganese (mg/L)								
			Mean	0.0557							
			Standard Deviation	0.0692							
			Number of data	33							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
#	Mean	sd		outlier	Number	value	value (5%)	value (1%)			
1	0.0557	0.0682		0.266	18	3.085	2.95	3.29			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.266											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Nickel (mg/L)								
			Mean	0.00521							
			Standard Deviation	0.00349							
			Number of data	35							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
#	Mean	sd		outlier	Number	value	value (5%)	value (1%)			
1	0.00521	0.00344		0.015	2	2.847	2.98	3.32			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Zinc (mg/L)								
			Mean	0.00635							

266			Standard Deviation	0.00581							
267			Number of data	35							
268			Number of suspected outliers	1							
269											
270				Potential	Obs.	Test	Critical	Critical			
271	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
272	1	0.00635	0.00573	0.0259	13	3.413	2.98	3.32			
273											
274	For 5% Significance Level, there is 1 Potential Outlier										
275	Potential outliers is: 0.0259										
276											
277	For 1% Significance Level, there is 1 Potential Outlier										
278	Potential outliers is: 0.0259										
279											
280											
281				Rosner's Outlier Test for TOC (mg/L)							
282											
283											
284			Mean	5.365							
285			Standard Deviation	1.109							
286			Number of data	40							
287			Number of suspected outliers	1							
288											
289				Potential	Obs.	Test	Critical	Critical			
290	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
291	1	5.365	1.095	2.8	29	2.343	3.04	3.38			
292											
293	For 5% Significance Level, there is no Potential Outlier										
294											
295	For 1% Significance Level, there is no Potential Outlier										
296											

Outlier Tests for Selected Uncensored Variables

User Selected Options

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Full Precision	OFF

04-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.744
Standard Deviation	0.298
Number of data	60
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.744	0.296	7.06	27	2.312	3.2	3.56

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	384.1
Standard Deviation	36.91
Number of data	60
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	384.1	36.6	244	17	3.827	3.2	3.56

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 244

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 244

Rosner's Outlier Test for Chloride (mg/L)

Mean	0.636
Standard Deviation	0.496
Number of data	57
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

	A	B	C	D	E	F	G	H	I	J	K	L
54	1	0.636	0.491	3.2	1	5.218	3.179	3.536				
55												
56	For 5% Significance Level, there is 1 Potential Outlier											
57	Potential outliers is: 3.2											
58												
59	For 1% Significance Level, there is 1 Potential Outlier											
60	Potential outliers is: 3.2											
61												
62												
63			Rosner's Outlier Test for Sulphate (mg/L)									
64												
65												
66			Mean	13.31								
67			Standard Deviation	5.59								
68			Number of data	57								
69			Number of suspected outliers	1								
70												
71				Potential	Obs.	Test	Critical	Critical				
72	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
73	1	13.31	5.54	34.5	1	3.825	3.179	3.536				
74												
75	For 5% Significance Level, there is 1 Potential Outlier											
76	Potential outliers is: 34.5											
77												
78	For 1% Significance Level, there is 1 Potential Outlier											
79	Potential outliers is: 34.5											
80												
81												
82			Dixon's Outlier Test for DOC (mg/L)									
83												
84	Number of Observations = 20											
85	10% critical value: 0.401											
86	5% critical value: 0.45											
87	1% critical value: 0.535											
88												
89	1. Observation Value 5 is a Potential Outlier (Upper Tail)											
90												
91	Test Statistic: 0.276											
92												
93	For 10% significance level, 5 is not an outlier.											
94	For 5% significance level, 5 is not an outlier.											
95	For 1% significance level, 5 is not an outlier.											
96												
97	2. Observation Value 2 is a Potential Outlier (Lower Tail)											
98												
99	Test Statistic: 0.045											
100												
101	For 10% significance level, 2 is not an outlier.											
102	For 5% significance level, 2 is not an outlier.											
103	For 1% significance level, 2 is not an outlier.											
104												
105												
106			Rosner's Outlier Test for Bicarbonate (mg/L)									

			Mean	459.8							
			Standard Deviation	45.21							
			Number of data	57							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	459.8	44.81	376.7	7	1.853	3.179	3.536			
	For 5% Significance Level, there is no Potential Outlier										
	For 1% Significance Level, there is no Potential Outlier										
			Rosner's Outlier Test for Calcium (mg/L)								
			Mean	101.4							
			Standard Deviation	10.46							
			Number of data	57							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	101.4	10.37	123	50	2.086	3.179	3.536			
	For 5% Significance Level, there is no Potential Outlier										
	For 1% Significance Level, there is no Potential Outlier										
			Rosner's Outlier Test for Magnesium (mg/L)								
			Mean	27.58							
			Standard Deviation	3.039							
			Number of data	57							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	27.58	3.012	20.5	2	2.351	3.179	3.536			
	For 5% Significance Level, there is no Potential Outlier										
	For 1% Significance Level, there is no Potential Outlier										
			Rosner's Outlier Test for Sodium (mg/L)								

			Mean	9.989							
		Standard Deviation		1.572							
			Number of data	57							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	9.989	1.558	19.5	1	6.105	3.179	3.536				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 19.5											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 19.5											
			Rosner's Outlier Test for Arsenic (mg/L)								
			Mean	2.7474E-4							
		Standard Deviation		2.2921E-4							
			Number of data	57							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	2.7474E-4	2.2719E-4	0.0016	43	5.833	3.179	3.536				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.0016											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.0016											
			Rosner's Outlier Test for Chromium (mg/L)								
			Mean	0.00598							
		Standard Deviation		0.008							
			Number of data	57							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.00598	0.00793	0.04	29	4.292	3.179	3.536				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.04											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.04											

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00267
Standard Deviation	0.00246
Number of data	57
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00267	0.00244	0.013	2	4.242	3.179	3.536

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.013

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.013

Rosner's Outlier Test for Manganese (mg/L)

Mean	0.144
Standard Deviation	0.142
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.144	0.14	0.524	28	2.716	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Nickel (mg/L)

Mean	0.00411
Standard Deviation	0.00345
Number of data	35
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00411	0.0034	0.018	3	4.082	2.98	3.32

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.018

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.018

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.00375
Standard Deviation	0.00404
Number of data	35
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00375	0.00398	0.0235	14	4.961	2.98	3.32

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0235

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0235

Rosner's Outlier Test for TOC (mg/L)

Mean	3.198
Standard Deviation	0.677
Number of data	40
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.198	0.668	5	1	2.698	3.04	3.38

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:11:58 AM
From File	2025-ShallowProUCL_e.xls
Full Precision	OFF

05-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.731
Standard Deviation	0.264
Number of data	57
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.731	0.262	7.23	26	1.914	3.179	3.536

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	495.9
Standard Deviation	190.8
Number of data	57
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	495.9	189.1	246	15	1.322	3.179	3.536

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	1.391
Standard Deviation	0.748
Number of data	56
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.391	0.742	2.72	54	1.792	3.172	3.528

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	80.76
Standard Deviation	57.57
Number of data	56
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	80.76	57.06	169	48	1.546	3.172	3.528

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 19

10% critical value: 0.412

5% critical value: 0.462

1% critical value: 0.547

1. Observation Value 7.83 is a Potential Outlier (Upper T

Test Statistic: 0.223

For 10% significance level, 7.83 is not an outlier.

For 5% significance level, 7.83 is not an outlier.

For 1% significance level, 7.83 is not an outlier.

2. Observation Value 4.5 is a Potential Outlier (Lower Tai

Test Statistic: 0.185

For 10% significance level, 4.5 is not an outlier.

For 5% significance level, 4.5 is not an outlier.

For 1% significance level, 4.5 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	488.1
Standard Deviation	153.5
Number of data	55
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	488.1	152.1	727	37	1.571	3.165	3.52	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	131.9
Standard Deviation	48.04
Number of data	59
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	131.9	47.63	66.5	18	1.374	3.193	3.552

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	35.32
Standard Deviation	13.17
Number of data	59
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	35.32	13.06	53.9	31	1.423	3.193	3.552

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	7.353
Standard Deviation	1.444
Number of data	59
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

	A	B	C	D	E	F	G	H	I	J	K	L
160	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
161	1	7.353	1.431	11.8	41	3.106	3.193	3.552				
162												
163	For 5% Significance Level, there is no Potential Outlier											
164												
165	For 1% Significance Level, there is no Potential Outlier											
166												
167												
168				Rosner's Outlier Test for Arsenic (mg/L)								
169												
170												
171				Mean	3.3345E-4							
172				Standard Deviation	2.8578E-4							
173				Number of data	58							
174			Number of suspected outliers	1								
175												
176				Potential	Obs.	Test	Critical	Critical				
177	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
178	1	3.3345E-4	2.8330E-4	0.0019	44	5.53	3.186	3.544				
179												
180	For 5% Significance Level, there is 1 Potential Outlier											
181	Potential outliers is: 0.0019											
182												
183	For 1% Significance Level, there is 1 Potential Outlier											
184	Potential outliers is: 0.0019											
185												
186												
187				Rosner's Outlier Test for Copper (mg/L)								
188												
189												
190				Mean	0.00272							
191				Standard Deviation	0.00205							
192				Number of data	58							
193			Number of suspected outliers	1								
194												
195				Potential	Obs.	Test	Critical	Critical				
196	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
197	1	0.00272	0.00204	0.009	6	3.086	3.186	3.544				
198												
199	For 5% Significance Level, there is no Potential Outlier											
200												
201	For 1% Significance Level, there is no Potential Outlier											
202												
203												
204				Rosner's Outlier Test for Manganese (mg/L)								
205												
206												
207				Mean	0.196							
208				Standard Deviation	0.18							
209				Number of data	34							
210			Number of suspected outliers	1								
211												
212				Potential	Obs.	Test	Critical	Critical				

	A	B	C	D	E	F	G	H	I	J	K	L
213	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
214	1	0.196	0.177	0.625	21	2.422	2.97	3.3				
215												
216	For 5% Significance Level, there is no Potential Outlier											
217												
218	For 1% Significance Level, there is no Potential Outlier											
219												
220												
221				Rosner's Outlier Test for Nickel (mg/L)								
222												
223												
224			Mean	0.00409								
225			Standard Deviation	0.00325								
226			Number of data	35								
227		Number of suspected outliers		1								
228												
229				Potential	Obs.	Test	Critical	Critical				
230	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
231	1	0.00409	0.0032	0.015	2	3.408	2.98	3.32				
232												
233	For 5% Significance Level, there is 1 Potential Outlier											
234	Potential outliers is: 0.015											
235												
236	For 1% Significance Level, there is 1 Potential Outlier											
237	Potential outliers is: 0.015											
238												
239												
240				Rosner's Outlier Test for Zinc (mg/L)								
241												
242												
243			Mean	0.00639								
244			Standard Deviation	0.0136								
245			Number of data	35								
246		Number of suspected outliers		1								
247												
248				Potential	Obs.	Test	Critical	Critical				
249	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
250	1	0.00639	0.0134	0.078	1	5.338	2.98	3.32				
251												
252	For 5% Significance Level, there is 1 Potential Outlier											
253	Potential outliers is: 0.078											
254												
255	For 1% Significance Level, there is 1 Potential Outlier											
256	Potential outliers is: 0.078											
257												
258												
259				Rosner's Outlier Test for TOC (mg/L)								
260												
261												
262			Mean	4.387								
263			Standard Deviation	0.579								
264			Number of data	38								
265		Number of suspected outliers		1								

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267				Potential	Obs.	Test	Critical	Critical				
268	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
269	1	4.387	0.571	2.8	24	2.78	3.01	3.36				
270												
271	For 5% Significance Level, there is no Potential Outlier											
272												
273	For 1% Significance Level, there is no Potential Outlier											
274												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:14:35 AM
From File	2025-ShallowProUCL_f.xls
Full Precision	OFF

06-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.66
Standard Deviation	0.335
Number of data	55
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.66	0.332	6.9	28	2.289	3.165	3.52

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	484.8
Standard Deviation	147.6
Number of data	55
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	484.8	146.2	748	29	1.8	3.165	3.52

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	1.89
Standard Deviation	0.911
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.89	0.902	5.2	19	3.668	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 5.2

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 5.2

Rosner's Outlier Test for Sulphate (mg/L)

Mean	6.42
Standard Deviation	6.989
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6.42	6.92	51.4	18	6.5	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 51.4

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 51.4

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 20

10% critical value: 0.401

5% critical value: 0.45

1% critical value: 0.535

1. Observation Value 7.5 is a Potential Outlier (Upper Ta

Test Statistic: 0.623

For 10% significance level, 7.5 is an outlier.

For 5% significance level, 7.5 is an outlier.

For 1% significance level, 7.5 is an outlier.

2. Observation Value 3.4 is a Potential Outlier (Lower Tai

Test Statistic: 0.571

For 10% significance level, 3.4 is an outlier.

For 5% significance level, 3.4 is an outlier.

For 1% significance level, 3.4 is an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

107			Mean	611.9							
108		Standard Deviation		193.1							
109		Number of data		50							
110	Number of suspected outliers			1							
111											
112				Potential	Obs.	Test	Critical	Critical			
113	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
114	1	611.9	191.2	927	24	1.648	3.13	3.48			
115											
116	For 5% Significance Level, there is no Potential Outlier										
117											
118	For 1% Significance Level, there is no Potential Outlier										
119											
120											
121			Rosner's Outlier Test for Calcium (mg/L)								
122											
123											
124			Mean	134.8							
125		Standard Deviation		42.49							
126		Number of data		52							
127	Number of suspected outliers			1							
128											
129				Potential	Obs.	Test	Critical	Critical			
130	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
131	1	134.8	42.08	216	29	1.929	3.144	3.496			
132											
133	For 5% Significance Level, there is no Potential Outlier										
134											
135	For 1% Significance Level, there is no Potential Outlier										
136											
137											
138			Rosner's Outlier Test for Magnesium (mg/L)								
139											
140											
141			Mean	37.26							
142		Standard Deviation		12.08							
143		Number of data		52							
144	Number of suspected outliers			1							
145											
146				Potential	Obs.	Test	Critical	Critical			
147	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
148	1	37.26	11.96	60.9	25	1.976	3.144	3.496			
149											
150	For 5% Significance Level, there is no Potential Outlier										
151											
152	For 1% Significance Level, there is no Potential Outlier										
153											
154											
155			Rosner's Outlier Test for Sodium (mg/L)								
156											
157											
158			Mean	9.253							
159		Standard Deviation		6.018							

			Number of data	52							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	9.253	5.96	44.1	18	5.847	3.144	3.496			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 44.1											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 44.1											
				Rosner's Outlier Test for Arsenic (mg/L)							
			Mean	5.2577E-4							
			Standard Deviation	3.6759E-4							
			Number of data	52							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	5.2577E-4	3.6404E-4	0.00208	38	4.269	3.144	3.496			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.00208											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.00208											
				Rosner's Outlier Test for Copper (mg/L)							
			Mean	0.00519							
			Standard Deviation	0.0181							
			Number of data	52							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	0.00519	0.0179	0.128	19	6.856	3.144	3.496			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.128											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.128											
				Rosner's Outlier Test for Manganese (mg/L)							

213											
214											
215			Mean	0.84							
216		Standard Deviation		0.595							
217			Number of data	32							
218	Number of suspected outliers			1							
219											
220				Potential	Obs.	Test	Critical	Critical			
221	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
222	1	0.84	0.585	3.55	12	4.631	2.94	3.27			
223											
224	For 5% Significance Level, there is 1 Potential Outlier										
225	Potential outliers is: 3.55										
226											
227	For 1% Significance Level, there is 1 Potential Outlier										
228	Potential outliers is: 3.55										
229											
230											
231				Rosner's Outlier Test for Nickel (mg/L)							
232											
233											
234			Mean	0.0143							
235		Standard Deviation		0.0286							
236			Number of data	34							
237	Number of suspected outliers			1							
238											
239				Potential	Obs.	Test	Critical	Critical			
240	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
241	1	0.0143	0.0282	0.167	1	5.423	2.97	3.3			
242											
243	For 5% Significance Level, there is 1 Potential Outlier										
244	Potential outliers is: 0.167										
245											
246	For 1% Significance Level, there is 1 Potential Outlier										
247	Potential outliers is: 0.167										
248											
249											
250				Rosner's Outlier Test for Zinc (mg/L)							
251											
252											
253			Mean	0.00547							
254		Standard Deviation		0.00921							
255			Number of data	34							
256	Number of suspected outliers			1							
257											
258				Potential	Obs.	Test	Critical	Critical			
259	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
260	1	0.00547	0.00907	0.054	1	5.35	2.97	3.3			
261											
262	For 5% Significance Level, there is 1 Potential Outlier										
263	Potential outliers is: 0.054										
264											
265	For 1% Significance Level, there is 1 Potential Outlier										

	A	B	C	D	E	F	G	H	I	J	K	L
266	Potential outliers is: 0.054											
267												
268												
269				Rosner's Outlier Test for TOC (mg/L)								
270												
271												
272				Mean	3.897							
273				Standard Deviation	1.413							
274				Number of data	35							
275				Number of suspected outliers	1							
276												
277				Potential	Obs.	Test	Critical	Critical				
278	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
279	1	3.897	1.393	7.8	23	2.802	2.98	3.32				
280												
281	For 5% Significance Level, there is no Potential Outlier											
282												
283	For 1% Significance Level, there is no Potential Outlier											
284												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:17:08 AM
From File	2025-ShallowProUCL_g.xls
Full Precision	OFF

07-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.695
Standard Deviation	0.331
Number of data	59
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.695	0.328	8.83	58	3.463	3.193	3.552

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 8.83

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	514.6
Standard Deviation	143.9
Number of data	59
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	514.6	142.7	855	59	2.385	3.193	3.552

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	40.32
Standard Deviation	60.12
Number of data	57
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	40.32	59.59	220	56	3.016	3.179	3.536

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	27.11
Standard Deviation	11.59
Number of data	57
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	27.11	11.49	56	1	2.515	3.179	3.536

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 20

10% critical value: 0.401

5% critical value: 0.45

1% critical value: 0.535

1. Observation Value 4.19 is a Potential Outlier (Upper T

Test Statistic: 0.498

For 10% significance level, 4.19 is an outlier.

For 5% significance level, 4.19 is an outlier.

For 1% significance level, 4.19 is not an outlier.

2. Observation Value 1.8 is a Potential Outlier (Lower Tai

Test Statistic: 0.154

For 10% significance level, 1.8 is not an outlier.

For 5% significance level, 1.8 is not an outlier.

For 1% significance level, 1.8 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	523.5
Standard Deviation	109.7
Number of data	56

	A	B	C	D	E	F	G	H	I	J	K	L
107	Number of suspected outliers			1								
108												
109				Potential	Obs.	Test	Critical	Critical				
110	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
111	1	523.5	108.7	337.7	6	1.709	3.172	3.528				
112												
113	For 5% Significance Level, there is no Potential Outlier											
114												
115	For 1% Significance Level, there is no Potential Outlier											
116												
117												
118			Rosner's Outlier Test for Calcium (mg/L)									
119												
120												
121			Mean	135.8								
122		Standard Deviation		40.48								
123		Number of data		56								
124	Number of suspected outliers			1								
125												
126				Potential	Obs.	Test	Critical	Critical				
127	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
128	1	135.8	40.12	227	56	2.273	3.172	3.528				
129												
130	For 5% Significance Level, there is no Potential Outlier											
131												
132	For 1% Significance Level, there is no Potential Outlier											
133												
134												
135			Rosner's Outlier Test for Magnesium (mg/L)									
136												
137												
138			Mean	35.9								
139		Standard Deviation		10.91								
140		Number of data		56								
141	Number of suspected outliers			1								
142												
143				Potential	Obs.	Test	Critical	Critical				
144	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
145	1	35.9	10.81	61	56	2.322	3.172	3.528				
146												
147	For 5% Significance Level, there is no Potential Outlier											
148												
149	For 1% Significance Level, there is no Potential Outlier											
150												
151												
152			Rosner's Outlier Test for Sodium (mg/L)									
153												
154												
155			Mean	13.2								
156		Standard Deviation		3.344								
157		Number of data		57								
158	Number of suspected outliers			1								
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160				Potential	Obs.	Test	Critical	Critical				
161	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
162	1	13.2	3.314	27	1	4.164	3.179	3.536				
163												
164	For 5% Significance Level, there is 1 Potential Outlier											
165	Potential outliers is: 27											
166												
167	For 1% Significance Level, there is 1 Potential Outlier											
168	Potential outliers is: 27											
169												
170												
171				Rosner's Outlier Test for Arsenic (mg/L)								
172												
173												
174				Mean	3.9088E-4							
175				Standard Deviation	2.5773E-4							
176				Number of data	57							
177				Number of suspected outliers	1							
178												
179				Potential	Obs.	Test	Critical	Critical				
180	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
181	1	3.9088E-4	2.5546E-4	0.0012	34	3.167	3.179	3.536				
182												
183	For 5% Significance Level, there is no Potential Outlier											
184												
185	For 1% Significance Level, there is no Potential Outlier											
186												
187												
188				Rosner's Outlier Test for Copper (mg/L)								
189												
190												
191				Mean	0.00301							
192				Standard Deviation	0.00487							
193				Number of data	57							
194				Number of suspected outliers	1							
195												
196				Potential	Obs.	Test	Critical	Critical				
197	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
198	1	0.00301	0.00482	0.035	31	6.633	3.179	3.536				
199												
200	For 5% Significance Level, there is 1 Potential Outlier											
201	Potential outliers is: 0.035											
202												
203	For 1% Significance Level, there is 1 Potential Outlier											
204	Potential outliers is: 0.035											
205												
206												
207				Rosner's Outlier Test for Iron (mg/L)								
208												
209												
210				Mean	0.317							
211				Standard Deviation	0.52							
212				Number of data	32							

	A	B	C	D	E	F	G	H	I	J	K	L
213	Number of suspected outliers			1								
214												
215				Potential	Obs.	Test	Critical	Critical				
216	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
217	1	0.317	0.512	2.06	16	3.405	2.94	3.27				
218												
219	For 5% Significance Level, there is 1 Potential Outlier											
220	Potential outliers is: 2.06											
221												
222	For 1% Significance Level, there is 1 Potential Outlier											
223	Potential outliers is: 2.06											
224												
225												
226			Rosner's Outlier Test for Manganese (mg/L)									
227												
228												
229			Mean	0.386								
230			Standard Deviation	0.255								
231			Number of data	32								
232	Number of suspected outliers			1								
233												
234				Potential	Obs.	Test	Critical	Critical				
235	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
236	1	0.386	0.251	0.995	2	2.428	2.94	3.27				
237												
238	For 5% Significance Level, there is no Potential Outlier											
239												
240	For 1% Significance Level, there is no Potential Outlier											
241												
242												
243			Rosner's Outlier Test for Nickel (mg/L)									
244												
245												
246			Mean	0.00385								
247			Standard Deviation	0.00329								
248			Number of data	34								
249	Number of suspected outliers			1								
250												
251				Potential	Obs.	Test	Critical	Critical				
252	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
253	1	0.00385	0.00324	0.017	2	4.055	2.97	3.3				
254												
255	For 5% Significance Level, there is 1 Potential Outlier											
256	Potential outliers is: 0.017											
257												
258	For 1% Significance Level, there is 1 Potential Outlier											
259	Potential outliers is: 0.017											
260												
261												
262			Rosner's Outlier Test for Zinc (mg/L)									
263												
264												
265			Mean	0.00468								

	A	B	C	D	E	F	G	H	I	J	K	L
266			Standard Deviation	0.00472								
267			Number of data	34								
268		Number of suspected outliers		1								
269												
270				Potential	Obs.	Test	Critical	Critical				
271	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
272	1	0.00468	0.00465	0.026	5	4.586	2.97	3.3				
273												
274	For 5% Significance Level, there is 1 Potential Outlier											
275	Potential outliers is: 0.026											
276												
277	For 1% Significance Level, there is 1 Potential Outlier											
278	Potential outliers is: 0.026											
279												
280												
281				Rosner's Outlier Test for TOC (mg/L)								
282												
283												
284			Mean	3.341								
285			Standard Deviation	1.08								
286			Number of data	39								
287		Number of suspected outliers		1								
288												
289				Potential	Obs.	Test	Critical	Critical				
290	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
291	1	3.341	1.066	8.3	5	4.651	3.03	3.37				
292												
293	For 5% Significance Level, there is 1 Potential Outlier											
294	Potential outliers is: 8.3											
295												
296	For 1% Significance Level, there is 1 Potential Outlier											
297	Potential outliers is: 8.3											
298												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:21:54 AM
From File	2025-ShallowProUCL_h.xls
Full Precision	OFF

08-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.878
Standard Deviation	0.24
Number of data	59
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.878	0.238	7.37	17	2.133	3.193	3.552

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	342.6
Standard Deviation	48.09
Number of data	59
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	342.6	47.68	585	19	5.083	3.193	3.552

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 585

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 585

Rosner's Outlier Test for Chloride (mg/L)

Mean	1.344
Standard Deviation	0.571
Number of data	56
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

	A	B	C	D	E	F	G	H	I	J	K	L
54	1	1.344	0.566	0.01	17	2.357	3.172	3.528				
55												
56	For 5% Significance Level, there is no Potential Outlier											
57												
58	For 1% Significance Level, there is no Potential Outlier											
59												
60												
61				Rosner's Outlier Test for Sulphate (mg/L)								
62												
63												
64				Mean	35.67							
65				Standard Deviation	9.525							
66				Number of data	56							
67				Number of suspected outliers	1							
68												
69				Potential	Obs.	Test	Critical	Critical				
70	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
71	1	35.67	9.44	11.5	5	2.56	3.172	3.528				
72												
73	For 5% Significance Level, there is no Potential Outlier											
74												
75	For 1% Significance Level, there is no Potential Outlier											
76												
77												
78				Dixon's Outlier Test for DOC (mg/L)								
79												
80	Number of Observations = 20											
81	10% critical value: 0.401											
82	5% critical value: 0.45											
83	1% critical value: 0.535											
84												
85	1. Observation Value 23 is a Potential Outlier (Upper Tai											
86												
87	Test Statistic: 0.875											
88												
89	For 10% significance level, 23 is an outlier.											
90	For 5% significance level, 23 is an outlier.											
91	For 1% significance level, 23 is an outlier.											
92												
93	2. Observation Value 1.26 is a Potential Outlier (Lower T											
94												
95	Test Statistic: 0.049											
96												
97	For 10% significance level, 1.26 is not an outlier.											
98	For 5% significance level, 1.26 is not an outlier.											
99	For 1% significance level, 1.26 is not an outlier.											
100												
101												
102				Rosner's Outlier Test for Bicarbonate (mg/L)								
103												
104												
105				Mean	355.3							
106				Standard Deviation	31.93							

			Number of data	56							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	355.3	31.64	462	56	3.372	3.172	3.528				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 462											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Calcium (mg/L)								
			Mean	79.27							
			Standard Deviation	5.896							
			Number of data	56							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	79.27	5.843	60	42	3.297	3.172	3.528				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 60											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Magnesium (mg/L)								
			Mean	20.84							
			Standard Deviation	1.619							
			Number of data	56							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	20.84	1.605	15.9	2	3.078	3.172	3.528				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Sodium (mg/L)								
			Mean	20.51							
			Standard Deviation	10.75							

	A	B	C	D	E	F	G	H	I	J	K	L
160			Number of data	56								
161			Number of suspected outliers	1								
162												
163				Potential	Obs.	Test	Critical	Critical				
164	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
165	1	20.51	10.66	53.2	56	3.068	3.172	3.528				
166												
167	For 5% Significance Level, there is no Potential Outlier											
168												
169	For 1% Significance Level, there is no Potential Outlier											
170												
171												
172				Rosner's Outlier Test for Arsenic (mg/L)								
173												
174												
175			Mean	7.1000E-4								
176			Standard Deviation	4.7734E-4								
177			Number of data	56								
178			Number of suspected outliers	1								
179												
180				Potential	Obs.	Test	Critical	Critical				
181	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
182	1	7.1000E-4	4.7306E-4	0.0022	1	3.15	3.172	3.528				
183												
184	For 5% Significance Level, there is no Potential Outlier											
185												
186	For 1% Significance Level, there is no Potential Outlier											
187												
188												
189				Rosner's Outlier Test for Chromium (mg/L)								
190												
191												
192			Mean	0.00555								
193			Standard Deviation	0.00686								
194			Number of data	56								
195			Number of suspected outliers	1								
196												
197				Potential	Obs.	Test	Critical	Critical				
198	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
199	1	0.00555	0.0068	0.027	29	3.154	3.172	3.528				
200												
201	For 5% Significance Level, there is no Potential Outlier											
202												
203	For 1% Significance Level, there is no Potential Outlier											
204												
205												
206				Rosner's Outlier Test for Copper (mg/L)								
207												
208												
209			Mean	0.00298								
210			Standard Deviation	0.00283								
211			Number of data	56								
212			Number of suspected outliers	1								

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	0.00298	0.00281	0.0123	35	3.319	3.172	3.528	

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0123

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Manganese (mg/L)

Mean	0.189
Standard Deviation	0.301
Number of data	32
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.189	0.296	1.29	21	3.72	2.94	3.27

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 1.29

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 1.29

Rosner's Outlier Test for Nickel (mg/L)

Mean	0.0055
Standard Deviation	0.00645
Number of data	34
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.0055	0.00635	0.0335	21	4.408	2.97	3.3

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0335

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0335

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.00462

	A	B	C	D	E	F	G	H	I	J	K	L
266			Standard Deviation	0.00426								
267			Number of data	34								
268		Number of suspected outliers		1								
269												
270				Potential	Obs.	Test	Critical	Critical				
271	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
272	1	0.00462	0.00419	0.0179	13	3.165	2.97	3.3				
273												
274	For 5% Significance Level, there is 1 Potential Outlier											
275	Potential outliers is: 0.0179											
276												
277	For 1% Significance Level, there is no Potential Outlier											
278												
279												
280				Rosner's Outlier Test for TOC (mg/L)								
281												
282												
283			Mean	1.887								
284			Standard Deviation	0.663								
285			Number of data	39								
286		Number of suspected outliers		1								
287												
288				Potential	Obs.	Test	Critical	Critical				
289	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
290	1	1.887	0.654	4.3	1	3.689	3.03	3.37				
291												
292	For 5% Significance Level, there is 1 Potential Outlier											
293	Potential outliers is: 4.3											
294												
295	For 1% Significance Level, there is 1 Potential Outlier											
296	Potential outliers is: 4.3											
297												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:34:00 AM
From File	2025-ShallowProUCL_i.xls
Full Precision	OFF

11-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.588
Standard Deviation	0.342
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.588	0.338	6.9	7	2.038	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	488.9
Standard Deviation	101.6
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	488.9	100.3	783	39	2.934	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	42.2
Standard Deviation	57.6
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	42.2	56.72	208	33	2.923	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 21

10% critical value: 0.391

5% critical value: 0.44

1% critical value: 0.524

1. Observation Value 14.2 is a Potential Outlier (Upper T

Test Statistic: 0.150

For 10% significance level, 14.2 is not an outlier.

For 5% significance level, 14.2 is not an outlier.

For 1% significance level, 14.2 is not an outlier.

2. Observation Value 3.3 is a Potential Outlier (Lower Tai

Test Statistic: 0.427

For 10% significance level, 3.3 is an outlier.

For 5% significance level, 3.3 is not an outlier.

For 1% significance level, 3.3 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	536.7
Standard Deviation	37.56
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	536.7	37.06	607	32	1.897	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	124.6
Standard Deviation	20.38
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	124.6	20.12	182	39	2.855	3.03	3.37	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	27.23
Standard Deviation	3.352
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	27.23	3.309	34.7	39	2.257	3.03	3.37	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	26.3
Standard Deviation	10.68
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	26.3	10.54	52.1	39	2.448	3.03	3.37	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	0.00174
Standard Deviation	0.00296
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	

	A	B	C	D	E	F	G	H	I	J	K	L
160	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
161	1	0.00174	0.00292	0.013	13	3.858	3.03	3.37				
162												
163	For 5% Significance Level, there is 1 Potential Outlier											
164	Potential outliers is: 0.013											
165												
166	For 1% Significance Level, there is 1 Potential Outlier											
167	Potential outliers is: 0.013											
168												
169												
170				Rosner's Outlier Test for Copper (mg/L)								
171												
172												
173			Mean	0.00246								
174		Standard Deviation		0.00169								
175			Number of data	39								
176	Number of suspected outliers			1								
177												
178				Potential	Obs.	Test	Critical	Critical				
179	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
180	1	0.00246	0.00167	0.007	5	2.711	3.03	3.37				
181												
182	For 5% Significance Level, there is no Potential Outlier											
183												
184	For 1% Significance Level, there is no Potential Outlier											
185												
186												
187				Rosner's Outlier Test for Iron (mg/L)								
188												
189												
190			Mean	2.541								
191		Standard Deviation		3.926								
192			Number of data	32								
193	Number of suspected outliers			1								
194												
195				Potential	Obs.	Test	Critical	Critical				
196	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
197	1	2.541	3.864	12.9	9	2.681	2.94	3.27				
198												
199	For 5% Significance Level, there is no Potential Outlier											
200												
201	For 1% Significance Level, there is no Potential Outlier											
202												
203												
204				Rosner's Outlier Test for Manganese (mg/L)								
205												
206												
207			Mean	0.53								
208		Standard Deviation		0.121								
209			Number of data	32								
210	Number of suspected outliers			1								
211												
212				Potential	Obs.	Test	Critical	Critical				

	A	B	C	D	E	F	G	H	I	J	K	L
213	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
214	1	0.53	0.119	0.226	20	2.548	2.94	3.27				
215												
216	For 5% Significance Level, there is no Potential Outlier											
217												
218	For 1% Significance Level, there is no Potential Outlier											
219												
220												
221				Rosner's Outlier Test for Nickel (mg/L)								
222												
223												
224			Mean	0.00594								
225			Standard Deviation	0.00569								
226			Number of data	33								
227			Number of suspected outliers	1								
228												
229				Potential	Obs.	Test	Critical	Critical				
230	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
231	1	0.00594	0.00561	0.027	2	3.758	2.95	3.29				
232												
233	For 5% Significance Level, there is 1 Potential Outlier											
234	Potential outliers is: 0.027											
235												
236	For 1% Significance Level, there is 1 Potential Outlier											
237	Potential outliers is: 0.027											
238												
239												
240				Rosner's Outlier Test for Zinc (mg/L)								
241												
242												
243			Mean	0.00877								
244			Standard Deviation	0.0161								
245			Number of data	33								
246			Number of suspected outliers	1								
247												
248				Potential	Obs.	Test	Critical	Critical				
249	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
250	1	0.00877	0.0159	0.097	3	5.551	2.95	3.29				
251												
252	For 5% Significance Level, there is 1 Potential Outlier											
253	Potential outliers is: 0.097											
254												
255	For 1% Significance Level, there is 1 Potential Outlier											
256	Potential outliers is: 0.097											
257												
258												
259				Dixon's Outlier Test for TOC (mg/L)								
260												
261	Number of Observations = 19											
262	10% critical value: 0.412											
263	5% critical value: 0.462											
264	1% critical value: 0.547											
265												

	A	B	C	D	E	F	G	H	I	J	K	L
266	1. Observation Value 17.2 is a Potential Outlier (Upper T											
267												
268	Test Statistic: 0.519											
269												
270	For 10% significance level, 17.2 is an outlier.											
271	For 5% significance level, 17.2 is an outlier.											
272	For 1% significance level, 17.2 is not an outlier.											
273												
274	2. Observation Value 10.6 is a Potential Outlier (Lower T											
275												
276	Test Statistic: 0.316											
277												
278	For 10% significance level, 10.6 is not an outlier.											
279	For 5% significance level, 10.6 is not an outlier.											
280	For 1% significance level, 10.6 is not an outlier.											
281												

Outlier Tests for Selected Uncensored Variables

User Selected Options	
Date/Time of Computation	ProUCL 5.12025-12-16 9:38:27 AM
From File	2025-ShallowProUCL_j.xls
Full Precision	OFF

12-SH

Rosner's Outlier Test for pH ()

Mean	7.928
Standard Deviation	0.255
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.928	0.251	7.37	9	2.22	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	287.4
Standard Deviation	62.58
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	287.4	61.77	146	10	2.289	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	3.409
Standard Deviation	1.407
Number of data	34
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.409	1.386	6.4	2	2.158	2.97	3.3

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 20

10% critical value: 0.401

5% critical value: 0.45

1% critical value: 0.535

1. Observation Value 3.42 is a Potential Outlier (Upper T

Test Statistic: 0.122

For 10% significance level, 3.42 is not an outlier.

For 5% significance level, 3.42 is not an outlier.

For 1% significance level, 3.42 is not an outlier.

2. Observation Value 1.24 is a Potential Outlier (Lower T

Test Statistic: 0.234

For 10% significance level, 1.24 is not an outlier.

For 5% significance level, 1.24 is not an outlier.

For 1% significance level, 1.24 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	358.2
Standard Deviation	75.9
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	358.2	74.89	173	9	2.473	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	71
Standard Deviation	21.75
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	71	21.47	17.2	24	2.506	3.03	3.37	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	21.3
Standard Deviation	4.539
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	21.3	4.481	10.4	10	2.433	3.03	3.37	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	9.033
Standard Deviation	2.509
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	9.033	2.476	3.89	10	2.077	3.03	3.37	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	8.8821E-4
Standard Deviation	6.1426E-4
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	

	A	B	C	D	E	F	G	H	I	J	K	L
160	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
161	1	8.8821E-4	6.0633E-4	0.00282	32	3.186	3.03	3.37				
162												
163	For 5% Significance Level, there is 1 Potential Outlier											
164	Potential outliers is: 0.00282											
165												
166	For 1% Significance Level, there is no Potential Outlier											
167												
168												
169			Rosner's Outlier Test for Copper (mg/L)									
170												
171												
172				Mean	0.00231							
173				Standard Deviation	0.00265							
174				Number of data	39							
175				Number of suspected outliers	1							
176												
177				Potential	Obs.	Test	Critical	Critical				
178	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
179	1	0.00231	0.00262	0.012	4	3.706	3.03	3.37				
180												
181	For 5% Significance Level, there is 1 Potential Outlier											
182	Potential outliers is: 0.012											
183												
184	For 1% Significance Level, there is 1 Potential Outlier											
185	Potential outliers is: 0.012											
186												
187												
188			Rosner's Outlier Test for Iron (mg/L)									
189												
190												
191				Mean	0.0878							
192				Standard Deviation	0.134							
193				Number of data	32							
194				Number of suspected outliers	1							
195												
196				Potential	Obs.	Test	Critical	Critical				
197	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
198	1	0.0878	0.132	0.62	25	4.036	2.94	3.27				
199												
200	For 5% Significance Level, there is 1 Potential Outlier											
201	Potential outliers is: 0.62											
202												
203	For 1% Significance Level, there is 1 Potential Outlier											
204	Potential outliers is: 0.62											
205												
206												
207			Rosner's Outlier Test for Manganese (mg/L)									
208												
209												
210				Mean	0.27							
211				Standard Deviation	0.226							
212				Number of data	32							

	A	B	C	D	E	F	G	H	I	J	K	L
213	Number of suspected outliers			1								
214												
215				Potential	Obs.	Test	Critical	Critical				
216	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
217	1	0.27	0.222	1.19	14	4.136	2.94	3.27				
218												
219	For 5% Significance Level, there is 1 Potential Outlier											
220	Potential outliers is: 1.19											
221												
222	For 1% Significance Level, there is 1 Potential Outlier											
223	Potential outliers is: 1.19											
224												
225												
226			Rosner's Outlier Test for Nickel (mg/L)									
227												
228												
229			Mean	0.00339								
230			Standard Deviation	0.00394								
231			Number of data	34								
232	Number of suspected outliers			1								
233												
234				Potential	Obs.	Test	Critical	Critical				
235	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
236	1	0.00339	0.00388	0.0153	16	3.071	2.97	3.3				
237												
238	For 5% Significance Level, there is 1 Potential Outlier											
239	Potential outliers is: 0.0153											
240												
241	For 1% Significance Level, there is no Potential Outlier											
242												
243												
244			Rosner's Outlier Test for Zinc (mg/L)									
245												
246												
247			Mean	0.00688								
248			Standard Deviation	0.00701								
249			Number of data	34								
250	Number of suspected outliers			1								
251												
252				Potential	Obs.	Test	Critical	Critical				
253	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
254	1	0.00688	0.00691	0.0307	32	3.449	2.97	3.3				
255												
256	For 5% Significance Level, there is 1 Potential Outlier											
257	Potential outliers is: 0.0307											
258												
259	For 1% Significance Level, there is 1 Potential Outlier											
260	Potential outliers is: 0.0307											
261												
262												
263			Dixon's Outlier Test for TOC (mg/L)									
264												
265	Number of Observations = 19											

	A	B	C	D	E	F	G	H	I	J	K	L
266	10% critical value: 0.412											
267	5% critical value: 0.462											
268	1% critical value: 0.547											
269												
270	1. Observation Value 2.5 is a Potential Outlier (Upper Ta											
271												
272	Test Statistic: 0.091											
273												
274	For 10% significance level, 2.5 is not an outlier.											
275	For 5% significance level, 2.5 is not an outlier.											
276	For 1% significance level, 2.5 is not an outlier.											
277												
278	2. Observation Value 1 is a Potential Outlier (Lower Tail)'											
279												
280	Test Statistic: 0.286											
281												
282	For 10% significance level, 1 is not an outlier.											
283	For 5% significance level, 1 is not an outlier.											
284	For 1% significance level, 1 is not an outlier.											
285												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:44:02 AM
From File	2025-ShallowProUCL_k.xls
Full Precision	OFF

13-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.757
Standard Deviation	0.247
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.757	0.244	7.04	38	2.94	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	490.4
Standard Deviation	168
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	490.4	165.9	811	13	1.933	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	1.782
Standard Deviation	0.897
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.782	0.886	5.08	26	3.724	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 5.08

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 5.08

Rosner's Outlier Test for Sulphate (mg/L)

Mean	43.4
Standard Deviation	18.1
Number of data	34
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	43.4	17.83	89.6	33	2.591	2.97	3.3

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 20

10% critical value: 0.401

5% critical value: 0.45

1% critical value: 0.535

1. Observation Value 8.39 is a Potential Outlier (Upper T

Test Statistic: 0.278

For 10% significance level, 8.39 is not an outlier.

For 5% significance level, 8.39 is not an outlier.

For 1% significance level, 8.39 is not an outlier.

2. Observation Value 1.14 is a Potential Outlier (Lower T

Test Statistic: 0.122

For 10% significance level, 1.14 is not an outlier.

For 5% significance level, 1.14 is not an outlier.

For 1% significance level, 1.14 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	545.8
Standard Deviation	204.4

			Number of data	39							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	545.8	201.8	973	14	2.117	3.03	3.37			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Calcium (mg/L)							
			Mean	116.2							
			Standard Deviation	39.55							
			Number of data	39							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	116.2	39.04	202	13	2.199	3.03	3.37			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Magnesium (mg/L)							
			Mean	31.65							
			Standard Deviation	11.97							
			Number of data	39							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	31.65	11.81	57.2	13	2.163	3.03	3.37			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Sodium (mg/L)							
			Mean	25.97							
			Standard Deviation	14.48							
			Number of data	39							
			Number of suspected outliers	1							

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	25.97	14.29	72.6	20	3.263	3.03	3.37	

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 72.6

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	0.00131
Standard Deviation	9.1998E-4
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00131	9.0811E-4	0.00355	32	2.47	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Cadmium (mg/L)

Mean	7.1298E-4
Standard Deviation	0.00114
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	7.1298E-4	0.00112	0.003	2	2.041	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chromium (mg/L)

Mean	0.00507
Standard Deviation	0.00636
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	0.00507	0.00628	0.022	20	2.697	3.03	3.37	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00674
Standard Deviation	0.0172
Number of data	39
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	0.00674	0.017	0.103	7	5.661	3.03	3.37	

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.103

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.103

Rosner's Outlier Test for Manganese (mg/L)

Mean	0.127
Standard Deviation	0.124
Number of data	32
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	0.127	0.122	0.442	6	2.583	2.94	3.27	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Nickel (mg/L)

Mean	0.00731
Standard Deviation	0.00777
Number of data	34
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	0.00731	0.00766	0.034	2	3.484	2.97	3.3	

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.034

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.034

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.0217
Standard Deviation	0.047
Number of data	34
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.0217	0.0463	0.245	22	4.827	2.97	3.3

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.245

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.245

Dixon's Outlier Test for TOC (mg/L)

Number of Observations = 19

10% critical value: 0.412

5% critical value: 0.462

1% critical value: 0.547

1. Observation Value 4.5 is a Potential Outlier (Upper Ta

Test Statistic: 0.233

For 10% significance level, 4.5 is not an outlier.

For 5% significance level, 4.5 is not an outlier.

For 1% significance level, 4.5 is not an outlier.

2. Observation Value 1 is a Potential Outlier (Lower Tail)

Test Statistic: 0.179

For 10% significance level, 1 is not an outlier.

For 5% significance level, 1 is not an outlier.

For 1% significance level, 1 is not an outlier.

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:46:28 AM
From File	2025-ShallowProUCL_I.xls
Full Precision	OFF

14(R)-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.698
Standard Deviation	0.324
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.698	0.319	6.86	8	2.622	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	511.3
Standard Deviation	165.7
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	511.3	163.2	237	28	1.681	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	4.131
Standard Deviation	3.475
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4.131	3.422	17.1	9	3.79	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 17.1

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 17.1

Rosner's Outlier Test for Sulphate (mg/L)

Mean	28.3
Standard Deviation	21.91
Number of data	32
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	28.3	21.57	106	8	3.602	2.94	3.27

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 106

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 106

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 19

10% critical value: 0.412

5% critical value: 0.462

1% critical value: 0.547

1. Observation Value 6.5 is a Potential Outlier (Upper Ta

Test Statistic: 0.492

For 10% significance level, 6.5 is an outlier.

For 5% significance level, 6.5 is an outlier.

For 1% significance level, 6.5 is not an outlier.

2. Observation Value 0.64 is a Potential Outlier (Lower T

Test Statistic: 0.542

For 10% significance level, 0.64 is an outlier.

For 5% significance level, 0.64 is an outlier.

For 1% significance level, 0.64 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

			Mean	596.1							
		Standard Deviation		222.7							
			Number of data	33							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	596.1	219.3	916	16	1.459	2.95	3.29				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Calcium (mg/L)								
			Mean	122.9							
		Standard Deviation		46.62							
			Number of data	33							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	122.9	45.91	22.8	28	2.181	2.95	3.29				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Magnesium (mg/L)								
			Mean	34.32							
		Standard Deviation		13.06							
			Number of data	33							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	34.32	12.86	6.16	28	2.19	2.95	3.29				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Sodium (mg/L)								
			Mean	22.56							
		Standard Deviation		11.02							

			Number of data	33							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	22.56	10.85	64.1	8	3.829	2.95	3.29				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 64.1											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 64.1											
			Rosner's Outlier Test for Arsenic (mg/L)								
			Mean	3.5364E-4							
			Standard Deviation	2.0351E-4							
			Number of data	33							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	3.5364E-4	2.0041E-4	0.0012	15	4.223	2.95	3.29				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.0012											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.0012											
			Rosner's Outlier Test for Cadmium (mg/L)								
			Mean	6.7731E-4							
			Standard Deviation	0.00107							
			Number of data	33							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	6.7731E-4	0.00105	0.0031	32	2.308	2.95	3.29				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Chromium (mg/L)								

			Mean	0.00379							
		Standard Deviation		0.00348							
		Number of data		33							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.00379	0.00343	0.016	13	3.561	2.95	3.29				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.016											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.016											
			Rosner's Outlier Test for Copper (mg/L)								
			Mean	0.00328							
		Standard Deviation		0.00284							
		Number of data		33							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.00328	0.0028	0.01	6	2.403	2.95	3.29				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Manganese (mg/L)								
			Mean	0.263							
		Standard Deviation		0.275							
		Number of data		31							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.263	0.271	1.07	7	2.981	2.92	3.25				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 1.07											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Nickel (mg/L)								

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267			Mean	0.00949								
268			Standard Deviation	0.0129								
269			Number of data	32								
270			Number of suspected outliers	1								
271												
272				Potential	Obs.	Test	Critical	Critical				
273	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
274	1	0.00949	0.0127	0.057	2	3.746	2.94	3.27				
275												
276	For 5% Significance Level, there is 1 Potential Outlier											
277	Potential outliers is: 0.057											
278												
279	For 1% Significance Level, there is 1 Potential Outlier											
280	Potential outliers is: 0.057											
281												
282												
283				Rosner's Outlier Test for Zinc (mg/L)								
284												
285												
286			Mean	0.0259								
287			Standard Deviation	0.0432								
288			Number of data	32								
289			Number of suspected outliers	1								
290												
291				Potential	Obs.	Test	Critical	Critical				
292	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
293	1	0.0259	0.0425	0.211	21	4.357	2.94	3.27				
294												
295	For 5% Significance Level, there is 1 Potential Outlier											
296	Potential outliers is: 0.211											
297												
298	For 1% Significance Level, there is 1 Potential Outlier											
299	Potential outliers is: 0.211											
300												
301												
302				Dixon's Outlier Test for TOC (mg/L)								
303												
304	Number of Observations = 14											
305	10% critical value: 0.492											
306	5% critical value: 0.546											
307	1% critical value: 0.641											
308												
309	1. Observation Value 5.5 is a Potential Outlier (Upper Ta											
310												
311	Test Statistic: 0.235											
312												
313	For 10% significance level, 5.5 is not an outlier.											
314	For 5% significance level, 5.5 is not an outlier.											
315	For 1% significance level, 5.5 is not an outlier.											
316												
317	2. Observation Value 1.5 is a Potential Outlier (Lower Tai											
318												

	A	B	C	D	E	F	G	H	I	J	K	L
319	Test Statistic: 0.188											
320												
321	For 10% significance level, 1.5 is not an outlier.											
322	For 5% significance level, 1.5 is not an outlier.											
323	For 1% significance level, 1.5 is not an outlier.											
324												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:48:35 AM
From File	2025-ShallowProUCL_m.xls
Full Precision	OFF

15-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.761
Standard Deviation	0.366
Number of data	36
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.761	0.361	7.01	6	2.081	2.99	3.33

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	377.4
Standard Deviation	48.85
Number of data	36
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	377.4	48.17	231	1	3.04	2.99	3.33

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 231

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	0.778
Standard Deviation	0.528
Number of data	35
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.778	0.52	3.2	2	4.653	2.98	3.32

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 3.2

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 3.2

Rosner's Outlier Test for Sulphate (mg/L)

Mean	29.24
Standard Deviation	20.17
Number of data	34
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	29.24	19.87	91.5	6	3.134	2.97	3.3

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 91.5

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 20

10% critical value: 0.401

5% critical value: 0.45

1% critical value: 0.535

1. Observation Value 7.2 is a Potential Outlier (Upper Ta

Test Statistic: 0.152

For 10% significance level, 7.2 is not an outlier.

For 5% significance level, 7.2 is not an outlier.

For 1% significance level, 7.2 is not an outlier.

2. Observation Value 4.3 is a Potential Outlier (Lower Tai

Test Statistic: 0.104

For 10% significance level, 4.3 is not an outlier.

For 5% significance level, 4.3 is not an outlier.

For 1% significance level, 4.3 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

107			Mean	414.2							
108		Standard Deviation		65.12							
109			Number of data	36							
110	Number of suspected outliers			1							
111											
112				Potential	Obs.	Test	Critical	Critical			
113	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
114	1	414.2	64.21	275	1	2.167	2.99	3.33			
115											
116	For 5% Significance Level, there is no Potential Outlier										
117											
118	For 1% Significance Level, there is no Potential Outlier										
119											
120											
121				Rosner's Outlier Test for Calcium (mg/L)							
122											
123											
124			Mean	90.56							
125		Standard Deviation		11.65							
126			Number of data	36							
127	Number of suspected outliers			1							
128											
129				Potential	Obs.	Test	Critical	Critical			
130	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
131	1	90.56	11.49	58.2	1	2.817	2.99	3.33			
132											
133	For 5% Significance Level, there is no Potential Outlier										
134											
135	For 1% Significance Level, there is no Potential Outlier										
136											
137											
138				Rosner's Outlier Test for Magnesium (mg/L)							
139											
140											
141			Mean	20.48							
142		Standard Deviation		2.628							
143			Number of data	36							
144	Number of suspected outliers			1							
145											
146				Potential	Obs.	Test	Critical	Critical			
147	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
148	1	20.48	2.591	14	2	2.5	2.99	3.33			
149											
150	For 5% Significance Level, there is no Potential Outlier										
151											
152	For 1% Significance Level, there is no Potential Outlier										
153											
154											
155				Rosner's Outlier Test for Sodium (mg/L)							
156											
157											
158			Mean	26.33							
159		Standard Deviation		7.33							

			Number of data	36							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	26.33	7.227	5.71	1	2.852	2.99	3.33			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Arsenic (mg/L)							
			Mean	3.4750E-4							
			Standard Deviation	3.0612E-4							
			Number of data	36							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	3.4750E-4	3.0184E-4	0.00144	24	3.619	2.99	3.33			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.00144											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.00144											
				Rosner's Outlier Test for Chromium (mg/L)							
			Mean	0.00335							
			Standard Deviation	0.00632							
			Number of data	36							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	0.00335	0.00624	0.035	10	5.076	2.99	3.33			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.035											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.035											
				Rosner's Outlier Test for Copper (mg/L)							

213				Mean	0.00405							
214				Standard Deviation	0.00371							
215				Number of data	36							
216				Number of suspected outliers	1							
217												
218				Potential	Obs.	Test	Critical	Critical				
219	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
220	1	0.00405	0.00366	0.018	5	3.816	2.99	3.33				
221												
222	For 5% Significance Level, there is 1 Potential Outlier											
223	Potential outliers is: 0.018											
224												
225	For 1% Significance Level, there is 1 Potential Outlier											
226	Potential outliers is: 0.018											
227												
228												
229				Rosner's Outlier Test for Manganese (mg/L)								
230												
231												
232				Mean	0.314							
233				Standard Deviation	0.219							
234				Number of data	32							
235				Number of suspected outliers	1							
236												
237				Potential	Obs.	Test	Critical	Critical				
238	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
239	1	0.314	0.215	0.678	20	1.689	2.94	3.27				
240												
241	For 5% Significance Level, there is no Potential Outlier											
242												
243	For 1% Significance Level, there is no Potential Outlier											
244												
245												
246				Rosner's Outlier Test for Nickel (mg/L)								
247												
248												
249				Mean	0.00957							
250				Standard Deviation	0.0119							
251				Number of data	34							
252				Number of suspected outliers	1							
253												
254				Potential	Obs.	Test	Critical	Critical				
255	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
256	1	0.00957	0.0117	0.0626	31	4.527	2.97	3.3				
257												
258	For 5% Significance Level, there is 1 Potential Outlier											
259	Potential outliers is: 0.0626											
260												
261	For 1% Significance Level, there is 1 Potential Outlier											
262	Potential outliers is: 0.0626											
263												
264												
265				Rosner's Outlier Test for Zinc (mg/L)								

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267												
268				Mean	0.00511							
269				Standard Deviation	0.00487							
270				Number of data	34							
271				Number of suspected outliers	1							
272												
273				Potential	Obs.	Test	Critical	Critical				
274	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
275	1	0.00511	0.0048	0.02	3	3.105	2.97	3.3				
276												
277	For 5% Significance Level, there is 1 Potential Outlier											
278	Potential outliers is: 0.02											
279												
280	For 1% Significance Level, there is no Potential Outlier											
281												
282												
283	Dixon's Outlier Test for TOC (mg/L)											
284												
285	Number of Observations = 16											
286	10% critical value: 0.454											
287	5% critical value: 0.507											
288	1% critical value: 0.595											
289												
290	1. Observation Value 12.5 is a Potential Outlier (Upper T											
291												
292	Test Statistic: 0.864											
293												
294	For 10% significance level, 12.5 is an outlier.											
295	For 5% significance level, 12.5 is an outlier.											
296	For 1% significance level, 12.5 is an outlier.											
297												
298	2. Observation Value 2.3 is a Potential Outlier (Lower Tai											
299												
300	Test Statistic: 0.656											
301												
302	For 10% significance level, 2.3 is an outlier.											
303	For 5% significance level, 2.3 is an outlier.											
304	For 1% significance level, 2.3 is an outlier.											
305												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:50:57 AM
From File	2025-ShallowProUCL_n.xls
Full Precision	OFF

16-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.892
Standard Deviation	0.254
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.892	0.25	7.28	4	2.451	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	447.2
Standard Deviation	18.54
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	447.2	18.24	500	27	2.897	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	0.934
Standard Deviation	0.388
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.934	0.382	1.9	1	2.529	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	42.06
Standard Deviation	13.86
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	42.06	13.64	90.1	27	3.522	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 90.1

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 90.1

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 20

10% critical value: 0.401

5% critical value: 0.45

1% critical value: 0.535

1. Observation Value 5.5 is a Potential Outlier (Upper Ta

Test Statistic: 0.478

For 10% significance level, 5.5 is an outlier.

For 5% significance level, 5.5 is an outlier.

For 1% significance level, 5.5 is not an outlier.

2. Observation Value 2.72 is a Potential Outlier (Lower T

Test Statistic: 0.286

For 10% significance level, 2.72 is not an outlier.

For 5% significance level, 2.72 is not an outlier.

For 1% significance level, 2.72 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	481.4
Standard Deviation	17.59

107			Number of data	31							
108		Number of suspected outliers		1							
109											
110				Potential	Obs.	Test	Critical	Critical			
111	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
112	1	481.4	17.31	522	25	2.347	2.92	3.25			
113											
114	For 5% Significance Level, there is no Potential Outlier										
115											
116	For 1% Significance Level, there is no Potential Outlier										
117											
118											
119				Rosner's Outlier Test for Calcium (mg/L)							
120											
121											
122			Mean	104.2							
123		Standard Deviation		6.917							
124			Number of data	31							
125		Number of suspected outliers		1							
126											
127				Potential	Obs.	Test	Critical	Critical			
128	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
129	1	104.2	6.805	119	27	2.179	2.92	3.25			
130											
131	For 5% Significance Level, there is no Potential Outlier										
132											
133	For 1% Significance Level, there is no Potential Outlier										
134											
135											
136				Rosner's Outlier Test for Magnesium (mg/L)							
137											
138											
139			Mean	29.89							
140		Standard Deviation		1.815							
141			Number of data	31							
142		Number of suspected outliers		1							
143											
144				Potential	Obs.	Test	Critical	Critical			
145	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
146	1	29.89	1.786	33.5	3	2.019	2.92	3.25			
147											
148	For 5% Significance Level, there is no Potential Outlier										
149											
150	For 1% Significance Level, there is no Potential Outlier										
151											
152											
153				Rosner's Outlier Test for Sodium (mg/L)							
154											
155											
156			Mean	25.64							
157		Standard Deviation		5.38							
158			Number of data	31							
159		Number of suspected outliers		1							

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	25.64	5.293	38.3	20	2.393	2.92	3.25	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	2.3419E-4
Standard Deviation	1.0871E-4
Number of data	31
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	2.3419E-4	1.0695E-4	5.8000E-4	17	3.233	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 5.8000E-4

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chromium (mg/L)

Mean	0.00658
Standard Deviation	0.00754
Number of data	31
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00658	0.00741	0.036	5	3.968	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.036

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.036

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00372
Standard Deviation	0.00557
Number of data	31

	A	B	C	D	E	F	G	H	I	J	K	L
213	Number of suspected outliers			1								
214												
215				Potential	Obs.	Test	Critical	Critical				
216	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
217	1	0.00372	0.00548	0.031	2	4.975	2.92	3.25				
218												
219	For 5% Significance Level, there is 1 Potential Outlier											
220	Potential outliers is: 0.031											
221												
222	For 1% Significance Level, there is 1 Potential Outlier											
223	Potential outliers is: 0.031											
224												
225												
226			Rosner's Outlier Test for Manganese (mg/L)									
227												
228												
229			Mean	0.0497								
230			Standard Deviation	0.12								
231			Number of data	29								
232	Number of suspected outliers			1								
233												
234				Potential	Obs.	Test	Critical	Critical				
235	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
236	1	0.0497	0.118	0.571	2	4.416	2.89	3.22				
237												
238	For 5% Significance Level, there is 1 Potential Outlier											
239	Potential outliers is: 0.571											
240												
241	For 1% Significance Level, there is 1 Potential Outlier											
242	Potential outliers is: 0.571											
243												
244												
245				Rosner's Outlier Test for Nickel (mg/L)								
246												
247												
248			Mean	0.00541								
249			Standard Deviation	0.0106								
250			Number of data	31								
251	Number of suspected outliers			1								
252												
253				Potential	Obs.	Test	Critical	Critical				
254	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
255	1	0.00541	0.0104	0.058	2	5.066	2.92	3.25				
256												
257	For 5% Significance Level, there is 1 Potential Outlier											
258	Potential outliers is: 0.058											
259												
260	For 1% Significance Level, there is 1 Potential Outlier											
261	Potential outliers is: 0.058											
262												
263												
264				Rosner's Outlier Test for Zinc (mg/L)								
265												

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267				Mean	0.0056							
268				Standard Deviation	0.00601							
269				Number of data	31							
270				Number of suspected outliers	1							
271												
272				Potential	Obs.	Test	Critical	Critical				
273	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
274	1	0.0056	0.00591	0.0262	19	3.485	2.92	3.25				
275												
276	For 5% Significance Level, there is 1 Potential Outlier											
277	Potential outliers is: 0.0262											
278												
279	For 1% Significance Level, there is 1 Potential Outlier											
280	Potential outliers is: 0.0262											
281												
282												
283	Dixon's Outlier Test for TOC (mg/L)											
284												
285	Number of Observations = 11											
286	10% critical value: 0.517											
287	5% critical value: 0.576											
288	1% critical value: 0.679											
289												
290	1. Observation Value 4.4 is a Potential Outlier (Upper Ta											
291												
292	Test Statistic: 0.231											
293												
294	For 10% significance level, 4.4 is not an outlier.											
295	For 5% significance level, 4.4 is not an outlier.											
296	For 1% significance level, 4.4 is not an outlier.											
297												
298	2. Observation Value 3 is a Potential Outlier (Lower Tail)											
299												
300	Test Statistic: 0.333											
301												
302	For 10% significance level, 3 is not an outlier.											
303	For 5% significance level, 3 is not an outlier.											
304	For 1% significance level, 3 is not an outlier.											
305												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-16 9:55:22 AM
From File	2025-ShallowProUCL_o.xls
Full Precision	OFF

17-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.969
Standard Deviation	0.265
Number of data	32
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.969	0.261	7.25	2	2.752	2.94	3.27

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	337.2
Standard Deviation	47.63
Number of data	32
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	337.2	46.88	208	3	2.755	2.94	3.27

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	4.368
Standard Deviation	5.763
Number of data	32
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4.368	5.672	21.8	23	3.073	2.94	3.27

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 21.8

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	24.1
Standard Deviation	8.634
Number of data	32
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	24.1	8.498	45.1	24	2.472	2.94	3.27

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 20

10% critical value: 0.401

5% critical value: 0.45

1% critical value: 0.535

1. Observation Value 3.6 is a Potential Outlier (Upper Ta

Test Statistic: 0.444

For 10% significance level, 3.6 is an outlier.

For 5% significance level, 3.6 is not an outlier.

For 1% significance level, 3.6 is not an outlier.

2. Observation Value 1.6 is a Potential Outlier (Lower Tai

Test Statistic: 0.167

For 10% significance level, 1.6 is not an outlier.

For 5% significance level, 1.6 is not an outlier.

For 1% significance level, 1.6 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	369.4
Standard Deviation	39.01
Number of data	32

	A	B	C	D	E	F	G	H	I	J	K	L
107	Number of suspected outliers			1								
108												
109				Potential	Obs.	Test	Critical	Critical				
110	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
111	1	369.4	38.39	228	3	3.682	2.94	3.27				
112												
113	For 5% Significance Level, there is 1 Potential Outlier											
114	Potential outliers is: 228											
115												
116	For 1% Significance Level, there is 1 Potential Outlier											
117	Potential outliers is: 228											
118												
119												
120			Rosner's Outlier Test for Calcium (mg/L)									
121												
122												
123			Mean	82.35								
124		Standard Deviation		11.08								
125			Number of data	32								
126	Number of suspected outliers			1								
127												
128				Potential	Obs.	Test	Critical	Critical				
129	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
130	1	82.35	10.91	55.7	3	2.444	2.94	3.27				
131												
132	For 5% Significance Level, there is no Potential Outlier											
133												
134	For 1% Significance Level, there is no Potential Outlier											
135												
136												
137			Rosner's Outlier Test for Magnesium (mg/L)									
138												
139												
140			Mean	21.58								
141		Standard Deviation		3.13								
142			Number of data	32								
143	Number of suspected outliers			1								
144												
145				Potential	Obs.	Test	Critical	Critical				
146	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
147	1	21.58	3.081	13.6	3	2.59	2.94	3.27				
148												
149	For 5% Significance Level, there is no Potential Outlier											
150												
151	For 1% Significance Level, there is no Potential Outlier											
152												
153												
154			Rosner's Outlier Test for Sodium (mg/L)									
155												
156												
157			Mean	17.39								
158		Standard Deviation		5.162								
159			Number of data	32								

	A	B	C	D	E	F	G	H	I	J	K	L
160	Number of suspected outliers			1								
161												
162				Potential	Obs.	Test	Critical	Critical				
163	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
164	1	17.39	5.081	26.5	24	1.792	2.94	3.27				
165												
166	For 5% Significance Level, there is no Potential Outlier											
167												
168	For 1% Significance Level, there is no Potential Outlier											
169												
170												
171			Rosner's Outlier Test for Arsenic (mg/L)									
172												
173												
174			Mean	2.3906E-4								
175		Standard Deviation		1.0938E-4								
176		Number of data		32								
177	Number of suspected outliers			1								
178												
179				Potential	Obs.	Test	Critical	Critical				
180	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
181	1	2.3906E-4	1.0766E-4	4.0000E-4	1	1.495	2.94	3.27				
182												
183	For 5% Significance Level, there is no Potential Outlier											
184												
185	For 1% Significance Level, there is no Potential Outlier											
186												
187												
188			Rosner's Outlier Test for Cadmium (mg/L)									
189												
190												
191			Mean	1.8841E-4								
192		Standard Deviation		5.2144E-4								
193		Number of data		32								
194	Number of suspected outliers			1								
195												
196				Potential	Obs.	Test	Critical	Critical				
197	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
198	1	1.8841E-4	5.1322E-4	0.003	1	5.478	2.94	3.27				
199												
200	For 5% Significance Level, there is 1 Potential Outlier											
201	Potential outliers is: 0.003											
202												
203	For 1% Significance Level, there is 1 Potential Outlier											
204	Potential outliers is: 0.003											
205												
206												
207			Rosner's Outlier Test for Chromium (mg/L)									
208												
209												
210			Mean	0.00232								
211		Standard Deviation		0.00418								
212		Number of data		32								

	A	B	C	D	E	F	G	H	I	J	K	L
213	Number of suspected outliers			1								
214												
215				Potential	Obs.	Test	Critical	Critical				
216	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
217	1	0.00232	0.00411	0.024	6	5.275	2.94	3.27				
218												
219	For 5% Significance Level, there is 1 Potential Outlier											
220	Potential outliers is: 0.024											
221												
222	For 1% Significance Level, there is 1 Potential Outlier											
223	Potential outliers is: 0.024											
224												
225												
226				Rosner's Outlier Test for Copper (mg/L)								
227												
228												
229				Mean	0.00391							
230				Standard Deviation	0.00767							
231				Number of data	32							
232	Number of suspected outliers			1								
233												
234				Potential	Obs.	Test	Critical	Critical				
235	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
236	1	0.00391	0.00755	0.045	1	5.441	2.94	3.27				
237												
238	For 5% Significance Level, there is 1 Potential Outlier											
239	Potential outliers is: 0.045											
240												
241	For 1% Significance Level, there is 1 Potential Outlier											
242	Potential outliers is: 0.045											
243												
244												
245				Rosner's Outlier Test for Manganese (mg/L)								
246												
247												
248				Mean	0.0399							
249				Standard Deviation	0.0965							
250				Number of data	30							
251	Number of suspected outliers			1								
252												
253				Potential	Obs.	Test	Critical	Critical				
254	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
255	1	0.0399	0.0949	0.441	1	4.229	2.91	3.24				
256												
257	For 5% Significance Level, there is 1 Potential Outlier											
258	Potential outliers is: 0.441											
259												
260	For 1% Significance Level, there is 1 Potential Outlier											
261	Potential outliers is: 0.441											
262												
263												
264				Rosner's Outlier Test for Nickel (mg/L)								
265												

			Mean	0.00292							
			Standard Deviation	0.00329							
			Number of data	32							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.00292	0.00323	0.015	1	3.733	2.94	3.27				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.015											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.015											
				Rosner's Outlier Test for Zinc (mg/L)							
			Mean	0.00518							
			Standard Deviation	0.00445							
			Number of data	32							
			Number of suspected outliers	1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.00518	0.00438	0.016	1	2.471	2.94	3.27				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Dixon's Outlier Test for TOC (mg/L)							
Number of Observations = 12											
10% critical value: 0.49											
5% critical value: 0.546											
1% critical value: 0.642											
1. Observation Value 3.5 is a Potential Outlier (Upper Ta											
Test Statistic: 0.333											
For 10% significance level, 3.5 is not an outlier.											
For 5% significance level, 3.5 is not an outlier.											
For 1% significance level, 3.5 is not an outlier.											
2. Observation Value 1.6 is a Potential Outlier (Lower Tai											
Test Statistic: 0.056											

	A	B	C	D	E	F	G	H	I	J	K	L
319	For 10% significance level, 1.6 is not an outlier.											
320	For 5% significance level, 1.6 is not an outlier.											
321	For 1% significance level, 1.6 is not an outlier.											
322												

App G2 Outlier Test Output – Intermediate

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 11:22:13 AM
From File	2025-IntermediateProUCL_b.xls
Full Precision	OFF

01A-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.531
Standard Deviation	0.459
Number of data	54
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.531	0.455	5.57	25	4.31	3.158	3.512

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 5.57

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 5.57

Rosner's Outlier Test for Chloride (mg/L)

Mean	1.582
Standard Deviation	0.896
Number of data	50
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.582	0.887	4.75	3	3.571	3.13	3.48

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 4.75

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 4.75

Rosner's Outlier Test for Sulphate (mg/L)

Mean	67.35
Standard Deviation	50.14
Number of data	47
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	67.35	49.61	182	3	2.311	3.1	3.46	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Iron (mg/L)

Mean	12.89
Standard Deviation	11.33
Number of data	29
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	12.89	11.13	33.8	17	1.879	2.89	3.22

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Manganese (mg/L)

Mean	0.441
Standard Deviation	0.103
Number of data	30
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.441	0.101	0.244	8	1.946	2.91	3.24

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Total Dissolved Solids (mg/L)

Mean	511.1
Standard Deviation	103.3
Number of data	54
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)

	A	B	C	D	E	F	G	H	I	J	K	L
107	1	511.1	102.3	73	25	4.282	3.158	3.512				
108												
109	For 5% Significance Level, there is 1 Potential Outlier											
110	Potential outliers is: 73											
111												
112	For 1% Significance Level, there is 1 Potential Outlier											
113	Potential outliers is: 73											
114												
115												
116			Rosner's Outlier Test for Calcium (mg/L)									
117												
118												
119			Mean	111.9								
120			Standard Deviation	22.66								
121			Number of data	48								
122		Number of suspected outliers	1									
123												
124				Potential	Obs.	Test	Critical	Critical				
125	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
126	1	111.9	22.42	20	18	4.1	3.11	3.46				
127												
128	For 5% Significance Level, there is 1 Potential Outlier											
129	Potential outliers is: 20											
130												
131	For 1% Significance Level, there is 1 Potential Outlier											
132	Potential outliers is: 20											
133												
134												
135			Rosner's Outlier Test for Magnesium (mg/L)									
136												
137												
138			Mean	26.91								
139			Standard Deviation	5.082								
140			Number of data	48								
141		Number of suspected outliers	1									
142												
143				Potential	Obs.	Test	Critical	Critical				
144	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
145	1	26.91	5.029	3.8	18	4.596	3.11	3.46				
146												
147	For 5% Significance Level, there is 1 Potential Outlier											
148	Potential outliers is: 3.8											
149												
150	For 1% Significance Level, there is 1 Potential Outlier											
151	Potential outliers is: 3.8											
152												
153												
154			Rosner's Outlier Test for Sodium (mg/L)									
155												
156												
157			Mean	37.54								
158			Standard Deviation	12.82								
159			Number of data	48								

	A	B	C	D	E	F	G	H	I	J	K	L
160	Number of suspected outliers			1								
161												
162				Potential	Obs.	Test	Critical	Critical				
163	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
164	1	37.54	12.69	2.6	18	2.753	3.11	3.46				
165												
166	For 5% Significance Level, there is no Potential Outlier											
167												
168	For 1% Significance Level, there is no Potential Outlier											
169												
170												
171			Rosner's Outlier Test for Bicarbonate (mg/L)									
172												
173												
174			Mean	491.4								
175		Standard Deviation		81.06								
176			Number of data	47								
177	Number of suspected outliers			1								
178												
179				Potential	Obs.	Test	Critical	Critical				
180	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
181	1	491.4	80.19	65.6	18	5.31	3.1	3.46				
182												
183	For 5% Significance Level, there is 1 Potential Outlier											
184	Potential outliers is: 65.6											
185												
186	For 1% Significance Level, there is 1 Potential Outlier											
187	Potential outliers is: 65.6											
188												
189												
190			Rosner's Outlier Test for Arsenic (mg/L)									
191												
192												
193			Mean	0.0114								
194		Standard Deviation		0.0186								
195			Number of data	48								
196	Number of suspected outliers			1								
197												
198				Potential	Obs.	Test	Critical	Critical				
199	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
200	1	0.0114	0.0184	0.095	29	4.546	3.11	3.46				
201												
202	For 5% Significance Level, there is 1 Potential Outlier											
203	Potential outliers is: 0.095											
204												
205	For 1% Significance Level, there is 1 Potential Outlier											
206	Potential outliers is: 0.095											
207												
208												
209			Rosner's Outlier Test for Copper (mg/L)									
210												
211												
212			Mean	0.00528								

			Standard Deviation	0.0161							
			Number of data	45							
		Number of suspected outliers		1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	0.00528	0.016	0.109	17	6.498	3.09	3.44			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.109											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.109											
			Rosner's Outlier Test for Nickel (mg/L)								
			Mean	0.0115							
			Standard Deviation	0.0205							
			Number of data	47							
		Number of suspected outliers		1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	0.0115	0.0203	0.13	3	5.839	3.1	3.46			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.13											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.13											
			Rosner's Outlier Test for Zinc (mg/L)								
			Mean	0.00545							
			Standard Deviation	0.00455							
			Number of data	31							
		Number of suspected outliers		1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	0.00545	0.00447	0.021	1	3.478	2.92	3.25			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.021											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.021											

Rosner's Outlier Test for Total Organic Carbon (mg/L)

Mean	11.35
Standard Deviation	10.73
Number of data	35
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11.35	10.57	43	25	2.994	2.98	3.32

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 43

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)

Number of Observations = 23

10% critical value: 0.374

5% critical value: 0.421

1% critical value: 0.505

1. Observation Value 63.8 is a Potential Outlier (Upper T

Test Statistic: 0.741

For 10% significance level, 63.8 is an outlier.

For 5% significance level, 63.8 is an outlier.

For 1% significance level, 63.8 is an outlier.

2. Observation Value 18.8 is a Potential Outlier (Lower T

Test Statistic: 0.138

For 10% significance level, 18.8 is not an outlier.

For 5% significance level, 18.8 is not an outlier.

For 1% significance level, 18.8 is not an outlier.

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 11:27:39 AM
From File	2025-IntermediateProUCL_c.xls
Full Precision	OFF

03-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.776
Standard Deviation	0.311
Number of data	59
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.776	0.308	7.04	30	2.391	3.193	3.552

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	1.922
Standard Deviation	1.226
Number of data	47
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.922	1.213	4.7	5	2.29	3.1	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	153.9
Standard Deviation	64.7
Number of data	43
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	153.9	63.94	295	17	2.207	3.07	3.41

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for Manganese (mg/L)

Number of Observations = 23

10% critical value: 0.374

5% critical value: 0.421

1% critical value: 0.505

1. Observation Value 0.347 is a Potential Outlier (Upper

Test Statistic: 0.655

For 10% significance level, 0.347 is an outlier.

For 5% significance level, 0.347 is an outlier.

For 1% significance level, 0.347 is an outlier.

2. Observation Value 0.00051 is a Potential Outlier (Lowe

Test Statistic: 0.011

For 10% significance level, 0.00051 is not an outlier.

For 5% significance level, 0.00051 is not an outlier.

For 1% significance level, 0.00051 is not an outlier.

Rosner's Outlier Test for Total Dissolved Solids (mg/L)

Mean	589.5
Standard Deviation	85.07
Number of data	59
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	589.5	84.34	767	18	2.105	3.193	3.552

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	121.4
Standard Deviation	19.16
Number of data	43
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	121.4	18.93	168	12	2.46	3.07	3.41	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	30.51
Standard Deviation	4.874
Number of data	43
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	30.51	4.817	17.1	1	2.783	3.07	3.41	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	38.8
Standard Deviation	11.7
Number of data	43
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	38.8	11.56	63.6	24	2.144	3.07	3.41	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	444.1
Standard Deviation	50.63
Number of data	43
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	

	A	B	C	D	E	F	G	H	I	J	K	L
160	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
161	1	444.1	50.04	726	12	5.634	3.07	3.41				
162												
163	For 5% Significance Level, there is 1 Potential Outlier											
164	Potential outliers is: 726											
165												
166	For 1% Significance Level, there is 1 Potential Outlier											
167	Potential outliers is: 726											
168												
169												
170			Rosner's Outlier Test for Arsenic (mg/L)									
171												
172												
173			Mean	4.7775E-4								
174		Standard Deviation		4.1918E-4								
175		Number of data		40								
176	Number of suspected outliers			1								
177												
178				Potential	Obs.	Test	Critical	Critical				
179	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
180	1	4.7775E-4	4.1391E-4	0.00245	26	4.765	3.04	3.38				
181												
182	For 5% Significance Level, there is 1 Potential Outlier											
183	Potential outliers is: 0.00245											
184												
185	For 1% Significance Level, there is 1 Potential Outlier											
186	Potential outliers is: 0.00245											
187												
188												
189			Rosner's Outlier Test for Chromium (mg/L)									
190												
191												
192			Mean	0.00627								
193		Standard Deviation		0.0142								
194		Number of data		40								
195	Number of suspected outliers			1								
196												
197				Potential	Obs.	Test	Critical	Critical				
198	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
199	1	0.00627	0.014	0.088	20	5.818	3.04	3.38				
200												
201	For 5% Significance Level, there is 1 Potential Outlier											
202	Potential outliers is: 0.088											
203												
204	For 1% Significance Level, there is 1 Potential Outlier											
205	Potential outliers is: 0.088											
206												
207												
208			Rosner's Outlier Test for Copper (mg/L)									
209												
210												
211			Mean	0.00337								
212		Standard Deviation		0.00366								

	A	B	C	D	E	F	G	H	I	J	K	L
213			Number of data	40								
214			Number of suspected outliers	1								
215												
216				Potential	Obs.	Test	Critical	Critical				
217	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
218	1	0.00337	0.00362	0.021	9	4.871	3.04	3.38				
219												
220	For 5% Significance Level, there is 1 Potential Outlier											
221	Potential outliers is: 0.021											
222												
223	For 1% Significance Level, there is 1 Potential Outlier											
224	Potential outliers is: 0.021											
225												
226												
227	Dixon's Outlier Test for Nickel (mg/L)											
228												
229	Number of Observations = 21											
230	10% critical value: 0.391											
231	5% critical value: 0.44											
232	1% critical value: 0.524											
233												
234	1. Observation Value 0.036 is a Potential Outlier (Upper											
235												
236	Test Statistic: 0.904											
237												
238	For 10% significance level, 0.036 is an outlier.											
239	For 5% significance level, 0.036 is an outlier.											
240	For 1% significance level, 0.036 is an outlier.											
241												
242	2. Observation Value 0.0007 is a Potential Outlier (Lower											
243												
244	Test Statistic: 0.009											
245												
246	For 10% significance level, 0.0007 is not an outlier.											
247	For 5% significance level, 0.0007 is not an outlier.											
248	For 1% significance level, 0.0007 is not an outlier.											
249												
250												
251	Dixon's Outlier Test for Zinc (mg/L)											
252												
253	Number of Observations = 21											
254	10% critical value: 0.391											
255	5% critical value: 0.44											
256	1% critical value: 0.524											
257												
258	1. Observation Value 0.036 is a Potential Outlier (Upper											
259												
260	Test Statistic: 0.864											
261												
262	For 10% significance level, 0.036 is an outlier.											
263	For 5% significance level, 0.036 is an outlier.											
264	For 1% significance level, 0.036 is an outlier.											
265												

2. Observation Value 0.001 is a Potential Outlier (Lower

Test Statistic: 0.096

For 10% significance level, 0.001 is not an outlier.
For 5% significance level, 0.001 is not an outlier.
For 1% significance level, 0.001 is not an outlier.

Rosner's Outlier Test for Total Organic Carbon (mg/L)

Mean	3.849
Standard Deviation	1.708
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.849	1.686	13.8	1	5.901	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Potential outliers is: 13.8

For 1% Significance Level, there is 1 Potential Outlier
Potential outliers is: 13.8

Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)

Number of Observations = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535

1. Observation Value 6 is a Potential Outlier (Upper Tail)

Test Statistic: 0.433

For 10% significance level, 6 is an outlier.
For 5% significance level, 6 is not an outlier.
For 1% significance level, 6 is not an outlier.

2. Observation Value 3.4 is a Potential Outlier (Lower Tai

Test Statistic: 0.181

For 10% significance level, 3.4 is not an outlier.
For 5% significance level, 3.4 is not an outlier.
For 1% significance level, 3.4 is not an outlier.

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 11:36:12 AM
From File	2025-IntermediateProUCL_d.xls
Full Precision	OFF

04-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.82
Standard Deviation	0.31
Number of data	36
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.82	0.306	8.44	6	2.026	2.99	3.33

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	26.04
Standard Deviation	2.759
Number of data	25
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	26.04	2.703	31	22	1.834	2.82	3.14

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for Manganese (mg/L)

Number of Observations = 19

10% critical value: 0.412

5% critical value: 0.462

1% critical value: 0.547

1. Observation Value 0.727 is a Potential Outlier (Upper

Test Statistic: 0.087

For 10% significance level, 0.727 is not an outlier.

For 5% significance level, 0.727 is not an outlier.

For 1% significance level, 0.727 is not an outlier.

2. Observation Value 0.004 is a Potential Outlier (Lower

Test Statistic: 0.085

For 10% significance level, 0.004 is not an outlier.

For 5% significance level, 0.004 is not an outlier.

For 1% significance level, 0.004 is not an outlier.

Rosner's Outlier Test for Total Dissolved Solids (mg/L)

Mean	430.6
Standard Deviation	30.23
Number of data	36
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	430.6	29.81	500	7	2.329	2.99	3.33

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	103.4
Standard Deviation	10.15
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	103.4	9.955	80.4	11	2.312	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	22.6
Standard Deviation	2.03
Number of data	26
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	22.6	1.99	27.4	8	2.412	2.84	3.16	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	23.48
Standard Deviation	2.346
Number of data	26
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	23.48	2.3	29.3	9	2.53	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	460.9
Standard Deviation	12.43
Number of data	25
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	460.9	12.18	431	14	2.458	2.82	3.14

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for Arsenic (mg/L)

Number of Observations = 23

10% critical value: 0.374

5% critical value: 0.421

1% critical value: 0.505

1. Observation Value 0.0052 is a Potential Outlier (Upper

	A	B	C	D	E	F	G	H	I	J	K	L
160	Test Statistic: 0.406											
161												
162	For 10% significance level, 0.0052 is an outlier.											
163	For 5% significance level, 0.0052 is not an outlier.											
164	For 1% significance level, 0.0052 is not an outlier.											
165												
166	2. Observation Value 0.0002 is a Potential Outlier (Lower											
167												
168	Test Statistic: 0.486											
169												
170	For 10% significance level, 0.0002 is an outlier.											
171	For 5% significance level, 0.0002 is an outlier.											
172	For 1% significance level, 0.0002 is not an outlier.											
173												
174												
175	Dixon's Outlier Test for Chromium (mg/L)											
176												
177	Number of Observations = 23											
178	10% critical value: 0.374											
179	5% critical value: 0.421											
180	1% critical value: 0.505											
181												
182	1. Observation Value 0.0124 is a Potential Outlier (Upper											
183												
184	Test Statistic: 0.618											
185												
186	For 10% significance level, 0.0124 is an outlier.											
187	For 5% significance level, 0.0124 is an outlier.											
188	For 1% significance level, 0.0124 is an outlier.											
189												
190	2. Observation Value 0.0002 is a Potential Outlier (Lower											
191												
192	Test Statistic: 0.048											
193												
194	For 10% significance level, 0.0002 is not an outlier.											
195	For 5% significance level, 0.0002 is not an outlier.											
196	For 1% significance level, 0.0002 is not an outlier.											
197												
198												
199	Dixon's Outlier Test for Copper (mg/L)											
200												
201	Number of Observations = 23											
202	10% critical value: 0.374											
203	5% critical value: 0.421											
204	1% critical value: 0.505											
205												
206	1. Observation Value 0.006 is a Potential Outlier (Upper											
207												
208	Test Statistic: 0.177											
209												
210	For 10% significance level, 0.006 is not an outlier.											
211	For 5% significance level, 0.006 is not an outlier.											
212	For 1% significance level, 0.006 is not an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
213												
214	2. Observation Value 0.00026 is a Potential Outlier (Lowe											
215												
216	Test Statistic: 0.021											
217												
218	For 10% significance level, 0.00026 is not an outlier.											
219	For 5% significance level, 0.00026 is not an outlier.											
220	For 1% significance level, 0.00026 is not an outlier.											
221												
222												
223	Dixon's Outlier Test for Nickel (mg/L)											
224												
225	Number of Observations = 16											
226	10% critical value: 0.454											
227	5% critical value: 0.507											
228	1% critical value: 0.595											
229												
230	1. Observation Value 0.0047 is a Potential Outlier (Uppe											
231												
232	Test Statistic: 0.588											
233												
234	For 10% significance level, 0.0047 is an outlier.											
235	For 5% significance level, 0.0047 is an outlier.											
236	For 1% significance level, 0.0047 is not an outlier.											
237												
238	2. Observation Value 0.00074 is a Potential Outlier (Lowe											
239												
240	Test Statistic: 0.354											
241												
242	For 10% significance level, 0.00074 is not an outlier.											
243	For 5% significance level, 0.00074 is not an outlier.											
244	For 1% significance level, 0.00074 is not an outlier.											
245												
246												
247	Dixon's Outlier Test for Zinc (mg/L)											
248												
249	Number of Observations = 16											
250	10% critical value: 0.454											
251	5% critical value: 0.507											
252	1% critical value: 0.595											
253												
254	1. Observation Value 0.0048 is a Potential Outlier (Uppe											
255												
256	Test Statistic: 0.474											
257												
258	For 10% significance level, 0.0048 is an outlier.											
259	For 5% significance level, 0.0048 is not an outlier.											
260	For 1% significance level, 0.0048 is not an outlier.											
261												
262	2. Observation Value 0.001 is a Potential Outlier (Lower											
263												
264	Test Statistic: 0.000											
265												

	A	B	C	D	E	F	G	H	I	J	K	L
266	For 10% significance level, 0.001 is not an outlier.											
267	For 5% significance level, 0.001 is not an outlier.											
268	For 1% significance level, 0.001 is not an outlier.											
269												
270												
271	Dixon's Outlier Test for Total Organic Carbon (mg/L)											
272												
273	Number of Observations = 21											
274	10% critical value: 0.391											
275	5% critical value: 0.44											
276	1% critical value: 0.524											
277												
278	1. Observation Value 4.8 is a Potential Outlier (Upper Ta											
279												
280	Test Statistic: 0.316											
281												
282	For 10% significance level, 4.8 is not an outlier.											
283	For 5% significance level, 4.8 is not an outlier.											
284	For 1% significance level, 4.8 is not an outlier.											
285												
286	2. Observation Value 2.6 is a Potential Outlier (Lower Tai											
287												
288	Test Statistic: 0.188											
289												
290	For 10% significance level, 2.6 is not an outlier.											
291	For 5% significance level, 2.6 is not an outlier.											
292	For 1% significance level, 2.6 is not an outlier.											
293												
294												
295	Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)											
296												
297	Number of Observations = 15											
298	10% critical value: 0.472											
299	5% critical value: 0.525											
300	1% critical value: 0.616											
301												
302	1. Observation Value 14.2 is a Potential Outlier (Upper T											
303												
304	Test Statistic: 0.911											
305												
306	For 10% significance level, 14.2 is an outlier.											
307	For 5% significance level, 14.2 is an outlier.											
308	For 1% significance level, 14.2 is an outlier.											
309												
310	2. Observation Value 3.1 is a Potential Outlier (Lower Tai											
311												
312	Test Statistic: 0.109											
313												
314	For 10% significance level, 3.1 is not an outlier.											
315	For 5% significance level, 3.1 is not an outlier.											
316	For 1% significance level, 3.1 is not an outlier.											
317												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 11:43:47 AM
From File	2025-IntermediateProUCL_e.xls
Full Precision	OFF

05-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.705
Standard Deviation	0.315
Number of data	56
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.705	0.313	6.86	3	2.704	3.172	3.528

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	2.148
Standard Deviation	0.783
Number of data	50
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.148	0.775	4.5	3	3.035	3.13	3.48

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	149.4
Standard Deviation	50.9
Number of data	47
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	149.4	50.36	24	2	2.491	3.1	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Iron (mg/L)

Mean	0.122
Standard Deviation	0.196
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.122	0.192	0.778	16	3.411	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.778

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.778

Rosner's Outlier Test for Manganese (mg/L)

Mean	0.731
Standard Deviation	0.409
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.731	0.402	0.0729	26	1.637	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Total Dissolved Solids (mg/L)

Mean	619.1
Standard Deviation	151.9
Number of data	56
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	619.1	150.5	310	3	2.054	3.172	3.528

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	124.5
Standard Deviation	35.82
Number of data	47
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	124.5	35.44	179	40	1.538	3.1	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	32.7
Standard Deviation	9.012
Number of data	47
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	32.7	8.916	47.2	44	1.626	3.1	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	57.29
Standard Deviation	17.33
Number of data	47
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	57.29	17.15	11.6	2	2.664	3.1	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	517.7
Standard Deviation	138.7
Number of data	47
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	517.7	137.2	315.7	8	1.472	3.1	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	8.1909E-4
Standard Deviation	6.6413E-4
Number of data	44
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	8.1909E-4	6.5654E-4	0.00341	30	3.946	3.08	3.43

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.00341

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.00341

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00554
Standard Deviation	0.011
Number of data	45
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00554	0.0109	0.0669	25	5.63	3.09	3.44

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0669

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0669

Rosner's Outlier Test for Nickel (mg/L)

Mean	0.00387
Standard Deviation	0.00243
Number of data	27
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00387	0.00238	0.0082	8	1.816	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.00754
Standard Deviation	0.00859
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00754	0.00843	0.0345	4	3.197	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0345

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Total Organic Carbon (mg/L)

Mean	4.949
Standard Deviation	2.104
Number of data	35
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4.949	2.074	16	1	5.329	2.98	3.32

For 5% Significance Level, there is 1 Potential Outlier

	A	B	C	D	E	F	G	H	I	J	K	L
266	Potential outliers is: 16											
267												
268	For 1% Significance Level, there is 1 Potential Outlier											
269	Potential outliers is: 16											
270												
271												
272	Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)											
273												
274	Number of Observations = 20											
275	10% critical value: 0.401											
276	5% critical value: 0.45											
277	1% critical value: 0.535											
278												
279	1. Observation Value 8.59 is a Potential Outlier (Upper T											
280												
281	Test Statistic: 0.279											
282												
283	For 10% significance level, 8.59 is not an outlier.											
284	For 5% significance level, 8.59 is not an outlier.											
285	For 1% significance level, 8.59 is not an outlier.											
286												
287	2. Observation Value 4.9 is a Potential Outlier (Lower Tai											
288												
289	Test Statistic: 0.179											
290												
291	For 10% significance level, 4.9 is not an outlier.											
292	For 5% significance level, 4.9 is not an outlier.											
293	For 1% significance level, 4.9 is not an outlier.											
294												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 11:48:58 AM
From File	2025-IntermediateProUCL_f.xls
Full Precision	OFF

06(R)-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.735
Standard Deviation	0.301
Number of data	57
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.735	0.299	7.1	18	2.126	3.179	3.536

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	2.442
Standard Deviation	1.629
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.442	1.613	6.3	8	2.391	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	105.3
Standard Deviation	71.49
Number of data	50
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	105.3	70.77	215	16	1.55	3.13	3.48

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Iron (mg/L)

Mean	0.545
Standard Deviation	0.761
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.545	0.746	3.05	20	3.359	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 3.05

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 3.05

Rosner's Outlier Test for Manganese (mg/L)

Mean	1.26
Standard Deviation	0.799
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.26	0.784	3.34	8	2.655	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Total Dissolved Solids (mg/L)

Mean	555.1
Standard Deviation	58.79
Number of data	57
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	555.1	58.28	417	23	2.37	3.179	3.536

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	121.6
Standard Deviation	21.34
Number of data	50
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	121.6	21.13	172	43	2.386	3.13	3.48

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	30.41
Standard Deviation	6.598
Number of data	50
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	30.41	6.532	44.8	42	2.202	3.13	3.48

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	41.93
Standard Deviation	21.3
Number of data	50
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	41.93	21.09	7.55	49	1.63	3.13	3.48

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	482.7
Standard Deviation	112.5
Number of data	49
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	482.7	111.4	707	43	2.014	3.12	3.47

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	0.0017
Standard Deviation	0.00288
Number of data	49
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0017	0.00285	0.0151	43	4.696	3.12	3.47

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0151

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0151

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00291
Standard Deviation	0.00343
Number of data	49
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00291	0.00339	0.0171	30	4.182	3.12	3.47

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0171

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0171

Rosner's Outlier Test for Nickel (mg/L)

Mean	0.0182
Standard Deviation	0.0207
Number of data	27
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0182	0.0203	0.108	16	4.42	2.86	3.18

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.108

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.108

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.0291
Standard Deviation	0.0513
Number of data	27
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0291	0.0503	0.201	2	3.415	2.86	3.18

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.201

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.201

Rosner's Outlier Test for Total Organic Carbon (mg/L)

Mean	2.655
Standard Deviation	0.471
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

	A	B	C	D	E	F	G	H	I	J	K	L
266	1	2.655	0.464	1.2	12	3.134	3.01	3.36				
267												
268	For 5% Significance Level, there is 1 Potential Outlier											
269	Potential outliers is: 1.2											
270												
271	For 1% Significance Level, there is no Potential Outlier											
272												
273												
274	Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)											
275												
276	Number of Observations = 19											
277	10% critical value: 0.412											
278	5% critical value: 0.462											
279	1% critical value: 0.547											
280												
281	1. Observation Value 7.22 is a Potential Outlier (Upper T											
282												
283	Test Statistic: 0.220											
284												
285	For 10% significance level, 7.22 is not an outlier.											
286	For 5% significance level, 7.22 is not an outlier.											
287	For 1% significance level, 7.22 is not an outlier.											
288												
289	2. Observation Value 3.2 is a Potential Outlier (Lower Tai											
290												
291	Test Statistic: 0.094											
292												
293	For 10% significance level, 3.2 is not an outlier.											
294	For 5% significance level, 3.2 is not an outlier.											
295	For 1% significance level, 3.2 is not an outlier.											
296												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 11:52:13 AM
From File	2025-IntermediateProUCL_g.xls
Full Precision	OFF

07-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.783
Standard Deviation	0.31
Number of data	58
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.783	0.307	7	29	2.547	3.186	3.544

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	0.828
Standard Deviation	0.592
Number of data	52
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.828	0.586	2.9	3	3.536	3.144	3.496

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 2.9

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 2.9

Rosner's Outlier Test for Sulphate (mg/L)

Mean	82.02
Standard Deviation	20.77
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

1	82.02	20.56	140	3	2.82	3.137	3.488	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Iron (mg/L)

Mean	0.212
Standard Deviation	0.225
Number of data	27
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.212	0.221	0.737	21	2.376	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Manganese (mg/L)

Mean	0.768
Standard Deviation	0.291
Number of data	27
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.768	0.285	0.225	27	1.903	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Total Dissolved Solids (mg/L)

Mean	476.3
Standard Deviation	39.28
Number of data	58
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	476.3	38.94	352	17	3.193	3.186	3.544

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 352

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	101.1
Standard Deviation	7.571
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	101.1	7.496	121	23	2.65	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	22.71
Standard Deviation	1.627
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	22.71	1.611	27.2	25	2.786	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	42.71
Standard Deviation	9.311
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	42.71	9.219	62	4	2.093	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	442.6
Standard Deviation	14.68
Number of data	50
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	442.6	14.53	395	9	3.277	3.13	3.48

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 395

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	0.00351
Standard Deviation	0.00275
Number of data	50
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00351	0.00272	0.016	8	4.585	3.13	3.48

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.016

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.016

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00212
Standard Deviation	0.00149
Number of data	50
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00212	0.00148	0.0061	32	2.692	3.13	3.48

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Nickel (mg/L)

Mean	0.00491
Standard Deviation	0.00347
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00491	0.00341	0.0191	10	4.166	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0191

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0191

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.0144
Standard Deviation	0.0291
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0144	0.0285	0.159	24	5.07	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.159

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.159

Rosner's Outlier Test for Total Organic Carbon (mg/L)

Mean	2.897
Standard Deviation	0.619
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

	A	B	C	D	E	F	G	H	I	J	K	L
266	1	2.897	0.611	4.2	1	2.132	3.01	3.36				
267												
268	For 5% Significance Level, there is no Potential Outlier											
269												
270	For 1% Significance Level, there is no Potential Outlier											
271												
272												
273	Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)											
274												
275	Number of Observations = 20											
276	10% critical value: 0.401											
277	5% critical value: 0.45											
278	1% critical value: 0.535											
279												
280	1. Observation Value 5.27 is a Potential Outlier (Upper T											
281												
282	Test Statistic: 0.404											
283												
284	For 10% significance level, 5.27 is an outlier.											
285	For 5% significance level, 5.27 is not an outlier.											
286	For 1% significance level, 5.27 is not an outlier.											
287												
288	2. Observation Value 2 is a Potential Outlier (Lower Tail)											
289												
290	Test Statistic: 0.145											
291												
292	For 10% significance level, 2 is not an outlier.											
293	For 5% significance level, 2 is not an outlier.											
294	For 1% significance level, 2 is not an outlier.											
295												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 12:20:11 PM
From File	2025-IntermediateProUCL_h.xls
Full Precision	OFF

08-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.766
Standard Deviation	0.329
Number of data	59
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.766	0.326	7.06	30	2.164	3.193	3.552

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	1.503
Standard Deviation	1.065
Number of data	45
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.503	1.053	5.7	1	3.986	3.09	3.44

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 5.7

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 5.7

Rosner's Outlier Test for Sulphate (mg/L)

Mean	179.6
Standard Deviation	49.87
Number of data	41
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

	A	B	C	D	E	F	G	H	I	J	K	L
54	1	179.6	49.26	320	6	2.851	3.05	3.39				
55												
56	For 5% Significance Level, there is no Potential Outlier											
57												
58	For 1% Significance Level, there is no Potential Outlier											
59												
60												
61	Dixon's Outlier Test for Manganese (mg/L)											
62												
63	Number of Observations = 22											
64	10% critical value: 0.382											
65	5% critical value: 0.43											
66	1% critical value: 0.514											
67												
68	1. Observation Value 1.09 is a Potential Outlier (Upper T											
69												
70	Test Statistic: 0.108											
71												
72	For 10% significance level, 1.09 is not an outlier.											
73	For 5% significance level, 1.09 is not an outlier.											
74	For 1% significance level, 1.09 is not an outlier.											
75												
76	2. Observation Value 0.0019 is a Potential Outlier (Lower											
77												
78	Test Statistic: 0.002											
79												
80	For 10% significance level, 0.0019 is not an outlier.											
81	For 5% significance level, 0.0019 is not an outlier.											
82	For 1% significance level, 0.0019 is not an outlier.											
83												
84												
85	Rosner's Outlier Test for Total Dissolved Solids (mg/L)											
86												
87												
88			Mean	592.7								
89			Standard Deviation	73.75								
90			Number of data	59								
91			Number of suspected outliers	1								
92												
93				Potential	Obs.	Test	Critical	Critical				
94	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
95	1	592.7	73.12	420	4	2.362	3.193	3.552				
96												
97	For 5% Significance Level, there is no Potential Outlier											
98												
99	For 1% Significance Level, there is no Potential Outlier											
100												
101												
102	Rosner's Outlier Test for Calcium (mg/L)											
103												
104												
105			Mean	116.3								
106			Standard Deviation	10.41								

			Number of data	41							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	116.3	10.29	87	1	2.853	3.05	3.39			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Magnesium (mg/L)							
			Mean	26.38							
			Standard Deviation	2.383							
			Number of data	41							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	26.38	2.354	18.6	2	3.303	3.05	3.39			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 18.6											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Sodium (mg/L)							
			Mean	47.29							
			Standard Deviation	12.28							
			Number of data	41							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	47.29	12.13	81	17	2.78	3.05	3.39			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Bicarbonate (mg/L)							
			Mean	388.2							
			Standard Deviation	20.31							
			Number of data	41							

	A	B	C	D	E	F	G	H	I	J	K	L
160	Number of suspected outliers			1								
161												
162				Potential	Obs.	Test	Critical	Critical				
163	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
164	1	388.2	20.06	332	3	2.802	3.05	3.39				
165												
166	For 5% Significance Level, there is no Potential Outlier											
167												
168	For 1% Significance Level, there is no Potential Outlier											
169												
170												
171			Rosner's Outlier Test for Chromium (mg/L)									
172												
173												
174			Mean	0.0061								
175		Standard Deviation		0.0137								
176		Number of data		39								
177	Number of suspected outliers			1								
178												
179				Potential	Obs.	Test	Critical	Critical				
180	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
181	1	0.0061	0.0136	0.075	8	5.08	3.03	3.37				
182												
183	For 5% Significance Level, there is 1 Potential Outlier											
184	Potential outliers is: 0.075											
185												
186	For 1% Significance Level, there is 1 Potential Outlier											
187	Potential outliers is: 0.075											
188												
189												
190			Rosner's Outlier Test for Copper (mg/L)									
191												
192												
193			Mean	0.00472								
194		Standard Deviation		0.0061								
195		Number of data		39								
196	Number of suspected outliers			1								
197												
198				Potential	Obs.	Test	Critical	Critical				
199	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
200	1	0.00472	0.00602	0.028	8	3.866	3.03	3.37				
201												
202	For 5% Significance Level, there is 1 Potential Outlier											
203	Potential outliers is: 0.028											
204												
205	For 1% Significance Level, there is 1 Potential Outlier											
206	Potential outliers is: 0.028											
207												
208												
209			Dixon's Outlier Test for Nickel (mg/L)									
210												
211	Number of Observations = 20											
212	10% critical value: 0.401											

	A	B	C	D	E	F	G	H	I	J	K	L
213	5% critical value: 0.45											
214	1% critical value: 0.535											
215												
216	1. Observation Value 0.0341 is a Potential Outlier (Uppe											
217												
218	Test Statistic: 0.426											
219												
220	For 10% significance level, 0.0341 is an outlier.											
221	For 5% significance level, 0.0341 is not an outlier.											
222	For 1% significance level, 0.0341 is not an outlier.											
223												
224	2. Observation Value 0.00083 is a Potential Outlier (Lowe											
225												
226	Test Statistic: 0.031											
227												
228	For 10% significance level, 0.00083 is not an outlier.											
229	For 5% significance level, 0.00083 is not an outlier.											
230	For 1% significance level, 0.00083 is not an outlier.											
231												
232												
233			Dixon's Outlier Test for Zinc (mg/L)									
234												
235	Number of Observations = 20											
236	10% critical value: 0.401											
237	5% critical value: 0.45											
238	1% critical value: 0.535											
239												
240	1. Observation Value 0.0198 is a Potential Outlier (Uppe											
241												
242	Test Statistic: 0.055											
243												
244	For 10% significance level, 0.0198 is not an outlier.											
245	For 5% significance level, 0.0198 is not an outlier.											
246	For 1% significance level, 0.0198 is not an outlier.											
247												
248	2. Observation Value 0.001 is a Potential Outlier (Lower											
249												
250	Test Statistic: 0.039											
251												
252	For 10% significance level, 0.001 is not an outlier.											
253	For 5% significance level, 0.001 is not an outlier.											
254	For 1% significance level, 0.001 is not an outlier.											
255												
256												
257			Rosner's Outlier Test for Total Organic Carbon (mg/L)									
258												
259												
260			Mean	2.164								
261			Standard Deviation	0.631								
262			Number of data	39								
263			Number of suspected outliers	1								
264												
265				Potential	Obs.	Test	Critical	Critical				

	A	B	C	D	E	F	G	H	I	J	K	L
266	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
267	1	2.164	0.623	0.2	1	3.151	3.03	3.37				
268												
269	For 5% Significance Level, there is 1 Potential Outlier											
270	Potential outliers is: 0.2											
271												
272	For 1% Significance Level, there is no Potential Outlier											
273												
274												
275	Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)											
276												
277	Number of Observations = 20											
278	10% critical value: 0.401											
279	5% critical value: 0.45											
280	1% critical value: 0.535											
281												
282	1. Observation Value 4.6 is a Potential Outlier (Upper Ta											
283												
284	Test Statistic: 0.164											
285												
286	For 10% significance level, 4.6 is not an outlier.											
287	For 5% significance level, 4.6 is not an outlier.											
288	For 1% significance level, 4.6 is not an outlier.											
289												
290	2. Observation Value 1.7 is a Potential Outlier (Lower Tai											
291												
292	Test Statistic: 0.041											
293												
294	For 10% significance level, 1.7 is not an outlier.											
295	For 5% significance level, 1.7 is not an outlier.											
296	For 1% significance level, 1.7 is not an outlier.											
297												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 12:43:27 PM
From File	2025-IntermediateProUCL_i.xls
Full Precision	OFF

11-SH OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.801
Standard Deviation	0.281
Number of data	37
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.801	0.277	7.24	6	2.024	3	3.34

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	16.11
Standard Deviation	30.67
Number of data	32
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	16.11	30.19	181	30	5.462	2.94	3.27

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 181

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 181

Rosner's Outlier Test for Iron (mg/L)

Mean	0.371
Standard Deviation	0.576
Number of data	30
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

	A	B	C	D	E	F	G	H	I	J	K	L
54	1	0.371	0.566	2.79	4	4.274	2.91	3.24				
55												
56	For 5% Significance Level, there is 1 Potential Outlier											
57	Potential outliers is: 2.79											
58												
59	For 1% Significance Level, there is 1 Potential Outlier											
60	Potential outliers is: 2.79											
61												
62												
63			Rosner's Outlier Test for Manganese (mg/L)									
64												
65												
66			Mean	0.489								
67			Standard Deviation	0.157								
68			Number of data	30								
69		Number of suspected outliers		1								
70												
71				Potential	Obs.	Test	Critical	Critical				
72	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
73	1	0.489	0.154	0.969	1	3.119	2.91	3.24				
74												
75	For 5% Significance Level, there is 1 Potential Outlier											
76	Potential outliers is: 0.969											
77												
78	For 1% Significance Level, there is no Potential Outlier											
79												
80												
81			Rosner's Outlier Test for Total Dissolved Solids (mg/L)									
82												
83												
84			Mean	424.9								
85			Standard Deviation	54.77								
86			Number of data	37								
87		Number of suspected outliers		1								
88												
89				Potential	Obs.	Test	Critical	Critical				
90	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
91	1	424.9	54.03	709	35	5.259	3	3.34				
92												
93	For 5% Significance Level, there is 1 Potential Outlier											
94	Potential outliers is: 709											
95												
96	For 1% Significance Level, there is 1 Potential Outlier											
97	Potential outliers is: 709											
98												
99												
100			Rosner's Outlier Test for Calcium (mg/L)									
101												
102												
103			Mean	101.5								
104			Standard Deviation	12.91								
105			Number of data	36								
106		Number of suspected outliers		1								

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	101.5	12.73	154	34	4.125	2.99	3.33	

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 154

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 154

Rosner's Outlier Test for Magnesium (mg/L)

Mean	24.84
Standard Deviation	4.621
Number of data	36
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	24.84	4.556	0.553	24	5.33	2.99	3.33	

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.553

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.553

Rosner's Outlier Test for Sodium (mg/L)

Mean	28.67
Standard Deviation	4.263
Number of data	36
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	28.67	4.204	45	34	3.885	2.99	3.33	

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 45

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 45

Rosner's Outlier Test for Bicarbonate (mg/L)

			Mean	494.8							
		Standard Deviation		24.16							
			Number of data	36							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	494.8	23.82	558	8	2.654	2.99	3.33				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Arsenic (mg/L)								
			Mean	9.8000E-4							
		Standard Deviation		7.0741E-4							
			Number of data	36							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	9.8000E-4	6.9752E-4	0.0033	10	3.326	2.99	3.33				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.0033											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Copper (mg/L)								
			Mean	0.00211							
		Standard Deviation		0.00191							
			Number of data	36							
	Number of suspected outliers			1							
			Potential	Obs.	Test	Critical	Critical				
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.00211	0.00188	0.0082	31	3.24	2.99	3.33				
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.0082											
For 1% Significance Level, there is no Potential Outlier											
			Rosner's Outlier Test for Nickel (mg/L)								

			Mean	0.013							
		Standard Deviation		0.0169							
			Number of data	32							
	Number of suspected outliers			1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	0.013	0.0167	0.0744	21	3.684	2.94	3.27			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.0744											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.0744											
			Rosner's Outlier Test for Zinc (mg/L)								
			Mean	0.00488							
		Standard Deviation		0.00555							
			Number of data	32							
	Number of suspected outliers			1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	0.00488	0.00546	0.03	3	4.601	2.94	3.27			
For 5% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.03											
For 1% Significance Level, there is 1 Potential Outlier											
Potential outliers is: 0.03											
			Dixon's Outlier Test for Total Organic Carbon (mg/L)								
Number of Observations = 18											
10% critical value: 0.424											
5% critical value: 0.475											
1% critical value: 0.561											
1. Observation Value 11.3 is a Potential Outlier (Upper T											
Test Statistic: 0.158											
For 10% significance level, 11.3 is not an outlier.											
For 5% significance level, 11.3 is not an outlier.											
For 1% significance level, 11.3 is not an outlier.											
2. Observation Value 9.2 is a Potential Outlier (Lower Tai											
Test Statistic: 0.111											

For 10% significance level, 9.2 is not an outlier.

For 5% significance level, 9.2 is not an outlier.

For 1% significance level, 9.2 is not an outlier.

Rosner's Outlier Test for Dissolved Organic Carbon (mg/L)

Mean	10.86
Standard Deviation	1.124
Number of data	36
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	10.86	1.108	13.8	36	2.658	2.99	3.33

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 12:46:22 PM
From File	2025-IntermediateProUCL_j.xls
Full Precision	OFF

12-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.859
Standard Deviation	0.29
Number of data	42
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.859	0.286	8.41	31	1.924	3.06	3.4

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	0.913
Standard Deviation	0.539
Number of data	42
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.913	0.532	2.9	1	3.734	3.06	3.4

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 2.9

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 2.9

Rosner's Outlier Test for Sulphate (mg/L)

Mean	73.83
Standard Deviation	8.667
Number of data	30
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

1	73.83	8.522	56.8	17	1.998	2.91	3.24	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Iron (mg/L)

Mean	0.515
Standard Deviation	0.579
Number of data	29
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.515	0.568	1.91	23	2.455	2.89	3.22

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Manganese (mg/L)

Mean	0.712
Standard Deviation	0.321
Number of data	29
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.712	0.315	1.69	2	3.104	2.89	3.22

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 1.69

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Total Dissolved Solids (mg/L)

Mean	388.1
Standard Deviation	51.79
Number of data	42
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	388.1	51.17	208	8	3.519	3.06	3.4

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 208

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 208

Rosner's Outlier Test for Calcium (mg/L)

Mean	86.42
Standard Deviation	12.85
Number of data	42
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	86.42	12.7	56.2	3	2.38	3.06	3.4

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	19.82
Standard Deviation	2.927
Number of data	42
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	19.82	2.892	13.1	1	2.323	3.06	3.4

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	30.35
Standard Deviation	9.399
Number of data	42
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	30.35	9.286	57.5	3	2.924	3.06	3.4

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	363.7
Standard Deviation	40.02
Number of data	41
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	363.7	39.53	236.5	8	3.218	3.05	3.39

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 236.5

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	0.00275
Standard Deviation	0.00301
Number of data	41
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00275	0.00298	0.0106	35	2.636	3.05	3.39

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Cadmium (mg/L)

Mean	5.1144E-4
Standard Deviation	7.8387E-4
Number of data	41
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5.1144E-4	7.7425E-4	0.003	8	3.214	3.05	3.39

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.003

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Copper (mg/L)

Mean	0.0147
Standard Deviation	0.0288
Number of data	41
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0147	0.0284	0.161	41	5.147	3.05	3.39

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.161

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.161

Rosner's Outlier Test for Lead (mg/L)

Mean	0.0012
Standard Deviation	0.00107
Number of data	41
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0012	0.00105	0.00539	27	3.977	3.05	3.39

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.00539

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.00539

Rosner's Outlier Test for Nickel (mg/L)

Mean	0.128
Standard Deviation	0.3
Number of data	31
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

	A	B	C	D	E	F	G	H	I	J	K	L
266	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
267	1	0.128	0.295	1.52	11	4.715	2.92	3.25				
268												
269	For 5% Significance Level, there is 1 Potential Outlier											
270	Potential outliers is: 1.52											
271												
272	For 1% Significance Level, there is 1 Potential Outlier											
273	Potential outliers is: 1.52											
274												
275												
276			Rosner's Outlier Test for Zinc (mg/L)									
277												
278												
279		Mean	0.315									
280		Standard Deviation	0.373									
281		Number of data	31									
282		Number of suspected outliers	1									
283												
284				Potential	Obs.	Test	Critical	Critical				
285	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
286	1	0.315	0.367	1.19	16	2.386	2.92	3.25				
287												
288	For 5% Significance Level, there is no Potential Outlier											
289												
290	For 1% Significance Level, there is no Potential Outlier											
291												
292												
293	Dixon's Outlier Test for Total Organic Carbon (mg/L)											
294												
295	Number of Observations = 22											
296	10% critical value: 0.382											
297	5% critical value: 0.43											
298	1% critical value: 0.514											
299												
300	1. Observation Value 4 is a Potential Outlier (Upper Tail)											
301												
302	Test Statistic: 0.053											
303												
304	For 10% significance level, 4 is not an outlier.											
305	For 5% significance level, 4 is not an outlier.											
306	For 1% significance level, 4 is not an outlier.											
307												
308	2. Observation Value 1.4 is a Potential Outlier (Lower Tai											
309												
310	Test Statistic: 0.280											
311												
312	For 10% significance level, 1.4 is not an outlier.											
313	For 5% significance level, 1.4 is not an outlier.											
314	For 1% significance level, 1.4 is not an outlier.											
315												
316												
317	Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)											
318												

	A	B	C	D	E	F	G	H	I	J	K	L
319	Number of Observations = 19											
320	10% critical value: 0.412											
321	5% critical value: 0.462											
322	1% critical value: 0.547											
323												
324	1. Observation Value 5.21 is a Potential Outlier (Upper T											
325												
326	Test Statistic: 0.190											
327												
328	For 10% significance level, 5.21 is not an outlier.											
329	For 5% significance level, 5.21 is not an outlier.											
330	For 1% significance level, 5.21 is not an outlier.											
331												
332	2. Observation Value 1.9 is a Potential Outlier (Lower Tai											
333												
334	Test Statistic: 0.037											
335												
336	For 10% significance level, 1.9 is not an outlier.											
337	For 5% significance level, 1.9 is not an outlier.											
338	For 1% significance level, 1.9 is not an outlier.											
339												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 12:51:30 PM
From File	2025-IntermediateProUCL_k.xls
Full Precision	OFF

13-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.851
Standard Deviation	0.273
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.851	0.269	7.33	7	1.932	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	0.778
Standard Deviation	0.364
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.778	0.359	2	16	3.406	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 2

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 2

Rosner's Outlier Test for Sulphate (mg/L)

Mean	88.33
Standard Deviation	17.95
Number of data	32
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

	A	B	C	D	E	F	G	H	I	J	K	L
54	1	88.33	17.67	42.8	4	2.577	2.94	3.27				
55												
56	For 5% Significance Level, there is no Potential Outlier											
57												
58	For 1% Significance Level, there is no Potential Outlier											
59												
60												
61				Rosner's Outlier Test for Iron (mg/L)								
62												
63												
64			Mean	0.187								
65		Standard Deviation		0.293								
66			Number of data	30								
67	Number of suspected outliers			1								
68												
69				Potential	Obs.	Test	Critical	Critical				
70	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
71	1	0.187	0.288	1.4	10	4.214	2.91	3.24				
72												
73	For 5% Significance Level, there is 1 Potential Outlier											
74	Potential outliers is: 1.4											
75												
76	For 1% Significance Level, there is 1 Potential Outlier											
77	Potential outliers is: 1.4											
78												
79												
80				Rosner's Outlier Test for Manganese (mg/L)								
81												
82												
83			Mean	0.789								
84		Standard Deviation		0.457								
85			Number of data	30								
86	Number of suspected outliers			1								
87												
88				Potential	Obs.	Test	Critical	Critical				
89	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
90	1	0.789	0.45	2.28	5	3.316	2.91	3.24				
91												
92	For 5% Significance Level, there is 1 Potential Outlier											
93	Potential outliers is: 2.28											
94												
95	For 1% Significance Level, there is 1 Potential Outlier											
96	Potential outliers is: 2.28											
97												
98												
99				Rosner's Outlier Test for Total Dissolved Solids (mg/L)								
100												
101												
102			Mean	399.3								
103		Standard Deviation		44.81								
104			Number of data	38								
105	Number of suspected outliers			1								
106												

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	399.3	44.21	285	1	2.584	3.01	3.36	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	94.09
Standard Deviation	10.15
Number of data	37
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	94.09	10.01	56.5	9	3.756	3	3.34

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 56.5

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 56.5

Rosner's Outlier Test for Magnesium (mg/L)

Mean	20.97
Standard Deviation	2.032
Number of data	37
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	20.97	2.005	16	1	2.478	3	3.34

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	24.05
Standard Deviation	5.96
Number of data	37
Number of suspected outliers	1

	A	B	C	D	E	F	G	H	I	J	K	L
160				Potential	Obs.	Test	Critical	Critical				
161	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
162	1	24.05	5.879	38.6	37	2.474	3	3.34				
163												
164	For 5% Significance Level, there is no Potential Outlier											
165												
166	For 1% Significance Level, there is no Potential Outlier											
167												
168												
169			Rosner's Outlier Test for Bicarbonate (mg/L)									
170												
171												
172				Mean	348.6							
173				Standard Deviation	28.79							
174				Number of data	37							
175			Number of suspected outliers		1							
176												
177				Potential	Obs.	Test	Critical	Critical				
178	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
179	1	348.6	28.4	254	10	3.332	3	3.34				
180												
181	For 5% Significance Level, there is 1 Potential Outlier											
182	Potential outliers is: 254											
183												
184	For 1% Significance Level, there is no Potential Outlier											
185												
186												
187			Rosner's Outlier Test for Arsenic (mg/L)									
188												
189												
190				Mean	7.9243E-4							
191				Standard Deviation	0.00119							
192				Number of data	37							
193			Number of suspected outliers		1							
194												
195				Potential	Obs.	Test	Critical	Critical				
196	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
197	1	7.9243E-4	0.00117	0.007	11	5.309	3	3.34				
198												
199	For 5% Significance Level, there is 1 Potential Outlier											
200	Potential outliers is: 0.007											
201												
202	For 1% Significance Level, there is 1 Potential Outlier											
203	Potential outliers is: 0.007											
204												
205												
206			Rosner's Outlier Test for Copper (mg/L)									
207												
208												
209				Mean	0.00121							
210				Standard Deviation	8.9264E-4							
211				Number of data	37							
212			Number of suspected outliers		1							

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	0.00121	8.8049E-4	0.0042	19	3.394	3	3.34	

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0042

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0042

Rosner's Outlier Test for Nickel (mg/L)

Mean	0.00433
Standard Deviation	0.00446
Number of data	32
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00433	0.00439	0.02	6	3.567	2.94	3.27

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.02

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.02

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.00645
Standard Deviation	0.0142
Number of data	32
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00645	0.0139	0.082	4	5.419	2.94	3.27

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.082

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.082

Dixon's Outlier Test for Total Organic Carbon (mg/L)

Number of Observations = 18

	A	B	C	D	E	F	G	H	I	J	K	L
266	10% critical value: 0.424											
267	5% critical value: 0.475											
268	1% critical value: 0.561											
269												
270	1. Observation Value 3.2 is a Potential Outlier (Upper Ta											
271												
272	Test Statistic: 0.400											
273												
274	For 10% significance level, 3.2 is not an outlier.											
275	For 5% significance level, 3.2 is not an outlier.											
276	For 1% significance level, 3.2 is not an outlier.											
277												
278	2. Observation Value 1 is a Potential Outlier (Lower Tail)'											
279												
280	Test Statistic: 0.143											
281												
282	For 10% significance level, 1 is not an outlier.											
283	For 5% significance level, 1 is not an outlier.											
284	For 1% significance level, 1 is not an outlier.											
285												
286												
287	Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)											
288												
289	Number of Observations = 20											
290	10% critical value: 0.401											
291	5% critical value: 0.45											
292	1% critical value: 0.535											
293												
294	1. Observation Value 4.2 is a Potential Outlier (Upper Ta											
295												
296	Test Statistic: 0.038											
297												
298	For 10% significance level, 4.2 is not an outlier.											
299	For 5% significance level, 4.2 is not an outlier.											
300	For 1% significance level, 4.2 is not an outlier.											
301												
302	2. Observation Value 1.3 is a Potential Outlier (Lower Tai											
303												
304	Test Statistic: 0.107											
305												
306	For 10% significance level, 1.3 is not an outlier.											
307	For 5% significance level, 1.3 is not an outlier.											
308	For 1% significance level, 1.3 is not an outlier.											
309												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 12:55:45 PM
From File	2025-IntermediateProUCL_m.xls
Full Precision	OFF

15-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.847
Standard Deviation	0.319
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.847	0.314	7.04	4	2.574	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	0.784
Standard Deviation	0.535
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.784	0.527	3.1	1	4.399	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 3.1

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 3.1

Rosner's Outlier Test for Sulphate (mg/L)

Mean	55.22
Standard Deviation	29.43
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

54	1	55.22	28.95	144	1	3.067	2.92	3.25			
55											
56	For 5% Significance Level, there is 1 Potential Outlier										
57	Potential outliers is: 144										
58											
59	For 1% Significance Level, there is no Potential Outlier										
60											
61											
62			Rosner's Outlier Test for Manganese (mg/L)								
63											
64											
65			Mean	0.604							
66			Standard Deviation	0.291							
67			Number of data	29							
68			Number of suspected outliers	1							
69											
70				Potential	Obs.	Test	Critical	Critical			
71	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
72	1	0.604	0.285	1.28	17	2.367	2.89	3.22			
73											
74	For 5% Significance Level, there is no Potential Outlier										
75											
76	For 1% Significance Level, there is no Potential Outlier										
77											
78											
79			Rosner's Outlier Test for Total Dissolved Solids (mg/L)								
80											
81											
82			Mean	416.7							
83			Standard Deviation	51.82							
84			Number of data	31							
85			Number of suspected outliers	1							
86											
87				Potential	Obs.	Test	Critical	Critical			
88	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
89	1	416.7	50.98	317	17	1.956	2.92	3.25			
90											
91	For 5% Significance Level, there is no Potential Outlier										
92											
93	For 1% Significance Level, there is no Potential Outlier										
94											
95											
96			Rosner's Outlier Test for Calcium (mg/L)								
97											
98											
99			Mean	95.15							
100			Standard Deviation	11.47							
101			Number of data	31							
102			Number of suspected outliers	1							
103											
104				Potential	Obs.	Test	Critical	Critical			
105	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
106	1	95.15	11.29	121	2	2.291	2.92	3.25			

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	21.68
Standard Deviation	2.49
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	21.68	2.45	15.6	15	2.481	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	31.45
Standard Deviation	5.89
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	31.45	5.794	17.5	17	2.408	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	415.8
Standard Deviation	23.23
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	415.8	22.85	339	1	3.361	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 339

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 339

Rosner's Outlier Test for Arsenic (mg/L)

Mean	3.3548E-4
Standard Deviation	2.1374E-4
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.3548E-4	2.1027E-4	0.001	14	3.16	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.001

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Cadmium (mg/L)

Mean	2.1906E-4
Standard Deviation	5.4703E-4
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.1906E-4	5.3813E-4	0.003	1	5.168	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.003

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.003

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00282
Standard Deviation	0.002
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

213	1	0.00282	0.00197	0.01	6	3.638	2.92	3.25				
214												
215	For 5% Significance Level, there is 1 Potential Outlier											
216	Potential outliers is: 0.01											
217												
218	For 1% Significance Level, there is 1 Potential Outlier											
219	Potential outliers is: 0.01											
220												
221												
222			Rosner's Outlier Test for Nickel (mg/L)									
223												
224												
225				Mean	0.0124							
226				Standard Deviation	0.0162							
227				Number of data	31							
228				Number of suspected outliers	1							
229												
230				Potential	Obs.	Test	Critical	Critical				
231	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
232	1	0.0124	0.016	0.092	4	4.982	2.92	3.25				
233												
234	For 5% Significance Level, there is 1 Potential Outlier											
235	Potential outliers is: 0.092											
236												
237	For 1% Significance Level, there is 1 Potential Outlier											
238	Potential outliers is: 0.092											
239												
240												
241			Rosner's Outlier Test for Zinc (mg/L)									
242												
243												
244				Mean	0.00494							
245				Standard Deviation	0.00528							
246				Number of data	31							
247				Number of suspected outliers	1							
248												
249				Potential	Obs.	Test	Critical	Critical				
250	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
251	1	0.00494	0.0052	0.026	6	4.052	2.92	3.25				
252												
253	For 5% Significance Level, there is 1 Potential Outlier											
254	Potential outliers is: 0.026											
255												
256	For 1% Significance Level, there is 1 Potential Outlier											
257	Potential outliers is: 0.026											
258												
259												
260	Dixon's Outlier Test for Total Organic Carbon (mg/L)											
261												
262	Number of Observations = 12											
263	10% critical value: 0.49											
264	5% critical value: 0.546											
265	1% critical value: 0.642											

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267	1. Observation Value 15 is a Potential Outlier (Upper Tai											
268												
269	Test Statistic: 0.861											
270												
271	For 10% significance level, 15 is an outlier.											
272	For 5% significance level, 15 is an outlier.											
273	For 1% significance level, 15 is an outlier.											
274												
275	2. Observation Value 4.2 is a Potential Outlier (Lower Tai											
276												
277	Test Statistic: 0.095											
278												
279	For 10% significance level, 4.2 is not an outlier.											
280	For 5% significance level, 4.2 is not an outlier.											
281	For 1% significance level, 4.2 is not an outlier.											
282												
283												
284	Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)											
285												
286	Number of Observations = 19											
287	10% critical value: 0.412											
288	5% critical value: 0.462											
289	1% critical value: 0.547											
290												
291	1. Observation Value 6.8 is a Potential Outlier (Upper Ta											
292												
293	Test Statistic: 0.141											
294												
295	For 10% significance level, 6.8 is not an outlier.											
296	For 5% significance level, 6.8 is not an outlier.											
297	For 1% significance level, 6.8 is not an outlier.											
298												
299	2. Observation Value 4.07 is a Potential Outlier (Lower Ta											
300												
301	Test Statistic: 0.247											
302												
303	For 10% significance level, 4.07 is not an outlier.											
304	For 5% significance level, 4.07 is not an outlier.											
305	For 1% significance level, 4.07 is not an outlier.											
306												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 1:10:19 PM
From File	2025-IntermediateProUCL_n.xls
Full Precision	OFF

16-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.935
Standard Deviation	0.264
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.935	0.258	7.12	2	3.152	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 7.12

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	0.805
Standard Deviation	0.335
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.805	0.329	1.7	11	2.72	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	79.47
Standard Deviation	16.09
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	79.47	15.78	35	25	2.819	2.84	3.16

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55	For 5% Significance Level, there is no Potential Outlier											
56												
57	For 1% Significance Level, there is no Potential Outlier											
58												
59												
60			Dixon's Outlier Test for Iron (mg/L)									
61												
62	Number of Observations = 24											
63	10% critical value: 0.367											
64	5% critical value: 0.413											
65	1% critical value: 0.497											
66												
67	1. Observation Value 3.31 is a Potential Outlier (Upper T											
68												
69	Test Statistic: 0.715											
70												
71	For 10% significance level, 3.31 is an outlier.											
72	For 5% significance level, 3.31 is an outlier.											
73	For 1% significance level, 3.31 is an outlier.											
74												
75	2. Observation Value 0.01 is a Potential Outlier (Lower T											
76												
77	Test Statistic: 0.000											
78												
79	For 10% significance level, 0.01 is not an outlier.											
80	For 5% significance level, 0.01 is not an outlier.											
81	For 1% significance level, 0.01 is not an outlier.											
82												
83												
84			Dixon's Outlier Test for Manganese (mg/L)									
85												
86	Number of Observations = 24											
87	10% critical value: 0.367											
88	5% critical value: 0.413											
89	1% critical value: 0.497											
90												
91	1. Observation Value 0.812 is a Potential Outlier (Upper											
92												
93	Test Statistic: 0.072											
94												
95	For 10% significance level, 0.812 is not an outlier.											
96	For 5% significance level, 0.812 is not an outlier.											
97	For 1% significance level, 0.812 is not an outlier.											
98												
99	2. Observation Value 0.005 is a Potential Outlier (Lower											
100												
101	Test Statistic: 0.007											
102												
103	For 10% significance level, 0.005 is not an outlier.											
104	For 5% significance level, 0.005 is not an outlier.											
105	For 1% significance level, 0.005 is not an outlier.											
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107												
108				Rosner's Outlier Test for Total Dissolved Solids (mg/L)								
109												
110												
111				Mean	487.3							
112				Standard Deviation	25.48							
113				Number of data	26							
114				Number of suspected outliers	1							
115												
116				Potential	Obs.	Test	Critical	Critical				
117	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
118	1	487.3	24.98	560	4	2.911	2.84	3.16				
119												
120	For 5% Significance Level, there is 1 Potential Outlier											
121	Potential outliers is: 560											
122												
123	For 1% Significance Level, there is no Potential Outlier											
124												
125												
126				Rosner's Outlier Test for Calcium (mg/L)								
127												
128												
129				Mean	110.1							
130				Standard Deviation	9.794							
131				Number of data	26							
132				Number of suspected outliers	1							
133												
134				Potential	Obs.	Test	Critical	Critical				
135	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
136	1	110.1	9.604	88.2	10	2.277	2.84	3.16				
137												
138	For 5% Significance Level, there is no Potential Outlier											
139												
140	For 1% Significance Level, there is no Potential Outlier											
141												
142												
143				Rosner's Outlier Test for Magnesium (mg/L)								
144												
145												
146				Mean	27.14							
147				Standard Deviation	2.016							
148				Number of data	26							
149				Number of suspected outliers	1							
150												
151				Potential	Obs.	Test	Critical	Critical				
152	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
153	1	27.14	1.977	32.8	4	2.861	2.84	3.16				
154												
155	For 5% Significance Level, there is 1 Potential Outlier											
156	Potential outliers is: 32.8											
157												
158	For 1% Significance Level, there is no Potential Outlier											
159												

Rosner's Outlier Test for Sodium (mg/L)

Mean	35.12
Standard Deviation	7.522
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	35.12	7.376	50	5	2.018	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	463.5
Standard Deviation	20.7
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	463.5	20.29	512	25	2.39	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	4.4538E-4
Standard Deviation	3.9163E-4
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4.4538E-4	3.8403E-4	0.00152	16	2.798	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Cadmium (mg/L)

213											
214											
215				Mean	1.4703E-4						
216				Standard Deviation	2.3071E-4						
217				Number of data	26						
218				Number of suspected outliers	1						
219											
220				Potential	Obs.	Test	Critical	Critical			
221	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
222	1	1.4703E-4	2.2623E-4	0.0012	3	4.654	2.84	3.16			
223											
224	For 5% Significance Level, there is 1 Potential Outlier										
225	Potential outliers is: 0.0012										
226											
227	For 1% Significance Level, there is 1 Potential Outlier										
228	Potential outliers is: 0.0012										
229											
230											
231				Rosner's Outlier Test for Copper (mg/L)							
232											
233											
234				Mean	0.0243						
235				Standard Deviation	0.0348						
236				Number of data	26						
237				Number of suspected outliers	1						
238											
239				Potential	Obs.	Test	Critical	Critical			
240	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
241	1	0.0243	0.0341	0.165	9	4.125	2.84	3.16			
242											
243	For 5% Significance Level, there is 1 Potential Outlier										
244	Potential outliers is: 0.165										
245											
246	For 1% Significance Level, there is 1 Potential Outlier										
247	Potential outliers is: 0.165										
248											
249											
250				Rosner's Outlier Test for Nickel (mg/L)							
251											
252											
253				Mean	0.00666						
254				Standard Deviation	0.00559						
255				Number of data	26						
256				Number of suspected outliers	1						
257											
258				Potential	Obs.	Test	Critical	Critical			
259	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
260	1	0.00666	0.00548	0.0268	12	3.674	2.84	3.16			
261											
262	For 5% Significance Level, there is 1 Potential Outlier										
263	Potential outliers is: 0.0268										
264											
265	For 1% Significance Level, there is 1 Potential Outlier										

Potential outliers is: 0.0268

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.103
Standard Deviation	0.205
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.103	0.201	0.796	2	3.456	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.796

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.796

Dixon's Outlier Test for Total Organic Carbon (mg/L)

Number of Observations = 10

10% critical value: 0.409

5% critical value: 0.477

1% critical value: 0.597

1. Observation Value 4.7 is a Potential Outlier (Upper Ta

Test Statistic: 0.357

For 10% significance level, 4.7 is not an outlier.

For 5% significance level, 4.7 is not an outlier.

For 1% significance level, 4.7 is not an outlier.

2. Observation Value 3.2 is a Potential Outlier (Lower Tai

Test Statistic: 0.100

For 10% significance level, 3.2 is not an outlier.

For 5% significance level, 3.2 is not an outlier.

For 1% significance level, 3.2 is not an outlier.

Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)

Number of Observations = 16

10% critical value: 0.454

5% critical value: 0.507

1% critical value: 0.595

	A	B	C	D	E	F	G	H	I	J	K	L
319	1. Observation Value 5.7 is a Potential Outlier (Upper Ta											
320												
321	Test Statistic: 0.583											
322												
323	For 10% significance level, 5.7 is an outlier.											
324	For 5% significance level, 5.7 is an outlier.											
325	For 1% significance level, 5.7 is not an outlier.											
326												
327	2. Observation Value 3 is a Potential Outlier (Lower Tail)'											
328												
329	Test Statistic: 0.231											
330												
331	For 10% significance level, 3 is not an outlier.											
332	For 5% significance level, 3 is not an outlier.											
333	For 1% significance level, 3 is not an outlier.											
334												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-17 1:11:12 PM
From File	2025-IntermediateProUCL_o.xls
Full Precision	OFF

17-IN OUTLIERS

Rosner's Outlier Test for pH ()

Mean	7.81
Standard Deviation	0.334
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.81	0.329	7.05	3	2.312	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sulphate (mg/L)

Mean	55.06
Standard Deviation	9.555
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	55.06	9.399	77.5	21	2.387	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Manganese (mg/L)

Mean	0.55
Standard Deviation	0.236
Number of data	29
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.55	0.231	1.08	3	2.289	2.89	3.22

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Total Dissolved Solids (mg/L)

Mean	459.7
Standard Deviation	19.9
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	459.7	19.58	501	21	2.111	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Calcium (mg/L)

Mean	108.3
Standard Deviation	7.512
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	108.3	7.39	93	1	2.067	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Magnesium (mg/L)

Mean	24.21
Standard Deviation	1.637
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	24.21	1.61	28.8	21	2.853	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Sodium (mg/L)

Mean	30.51
Standard Deviation	3.537
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	30.51	3.48	37.6	23	2.039	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	473.4
Standard Deviation	19.86
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	473.4	19.54	423	20	2.578	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	3.5677E-4
Standard Deviation	2.1856E-4
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.5677E-4	2.1501E-4	0.00106	19	3.271	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.00106

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.00106

Rosner's Outlier Test for Cadmium (mg/L)

Mean	1.0056E-4
Standard Deviation	9.0569E-5
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.0056E-4	8.9096E-5	3.0000E-4	4	2.238	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00292
Standard Deviation	0.00211
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00292	0.00208	0.01	4	3.407	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.01

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.01

Rosner's Outlier Test for Nickel (mg/L)

Mean	0.00568
Standard Deviation	0.00675
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00568	0.00664	0.04	1	5.167	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.04

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.04

Rosner's Outlier Test for Zinc (mg/L)

Mean	0.00425
Standard Deviation	0.00335
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00425	0.00329	0.015	8	3.265	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.015

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.015

Dixon's Outlier Test for Total Organic Carbon (mg/L)

Number of Observations = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

1. Observation Value 4.7 is a Potential Outlier (Upper Ta

Test Statistic: 0.625

For 10% significance level, 4.7 is an outlier.

For 5% significance level, 4.7 is an outlier.

For 1% significance level, 4.7 is not an outlier.

2. Observation Value 2.9 is a Potential Outlier (Lower Tai

Test Statistic: 0.188

For 10% significance level, 2.9 is not an outlier.

For 5% significance level, 2.9 is not an outlier.

For 1% significance level, 2.9 is not an outlier.

Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)

Number of Observations = 20

10% critical value: 0.401

5% critical value: 0.45

	A	B	C	D	E	F	G	H	I	J	K	L
266	1% critical value: 0.535											
267												
268	1. Observation Value 7.2 is a Potential Outlier (Upper Ta											
269												
270	Test Statistic: 0.645											
271												
272	For 10% significance level, 7.2 is an outlier.											
273	For 5% significance level, 7.2 is an outlier.											
274	For 1% significance level, 7.2 is an outlier.											
275												
276	2. Observation Value 2.53 is a Potential Outlier (Lower T											
277												
278	Test Statistic: 0.176											
279												
280	For 10% significance level, 2.53 is not an outlier.											
281	For 5% significance level, 2.53 is not an outlier.											
282	For 1% significance level, 2.53 is not an outlier.											
283												

App G3 Outlier Test Output - Sandstone

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-22 11:46:23 AM
From File	2025-SandstoneProUCL_c.xls
Full Precision	OFF

04-SS

Rosner's Outlier Test for pH ()

Mean	7.619
Standard Deviation	0.434
Number of data	36
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.619	0.428	8.49	34	2.035	2.99	3.33

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	321.4
Standard Deviation	65.79
Number of data	36
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	321.4	64.87	432	33	1.706	2.99	3.33

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	0.485
Standard Deviation	0.331
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.485	0.325	1.9	3	4.35	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 1.9

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 1.9

Rosner's Outlier Test for Sulphate (mg/L)

Mean	35.55
Standard Deviation	15.61
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	35.55	15.36	10.5	18	1.631	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 13

10% critical value: 0.467

5% critical value: 0.521

1% critical value: 0.615

1. Observation Value 4 is a Potential Outlier (Upper Tail)

Test Statistic: 0.628

For 10% significance level, 4 is an outlier.

For 5% significance level, 4 is an outlier.

For 1% significance level, 4 is an outlier.

2. Observation Value 1.4 is a Potential Outlier (Lower Tai

Test Statistic: 0.091

For 10% significance level, 1.4 is not an outlier.

For 5% significance level, 1.4 is not an outlier.

For 1% significance level, 1.4 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	333.7
Standard Deviation	58.16

107			Number of data	31							
108		Number of suspected outliers		1							
109											
110				Potential	Obs.	Test	Critical	Critical			
111	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
112	1	333.7	57.22	480	18	2.557	2.92	3.25			
113											
114	For 5% Significance Level, there is no Potential Outlier										
115											
116	For 1% Significance Level, there is no Potential Outlier										
117											
118											
119				Rosner's Outlier Test for Calcium (mg/L)							
120											
121											
122			Mean	70.41							
123		Standard Deviation		14.36							
124			Number of data	31							
125		Number of suspected outliers		1							
126											
127				Potential	Obs.	Test	Critical	Critical			
128	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
129	1	70.41	14.12	101	18	2.166	2.92	3.25			
130											
131	For 5% Significance Level, there is no Potential Outlier										
132											
133	For 1% Significance Level, there is no Potential Outlier										
134											
135											
136				Rosner's Outlier Test for Magnesium (mg/L)							
137											
138											
139			Mean	18.73							
140		Standard Deviation		3.791							
141			Number of data	31							
142		Number of suspected outliers		1							
143											
144				Potential	Obs.	Test	Critical	Critical			
145	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
146	1	18.73	3.729	26	18	1.951	2.92	3.25			
147											
148	For 5% Significance Level, there is no Potential Outlier										
149											
150	For 1% Significance Level, there is no Potential Outlier										
151											
152											
153				Rosner's Outlier Test for Sodium (mg/L)							
154											
155											
156			Mean	24.44							
157		Standard Deviation		5.679							
158			Number of data	31							
159		Number of suspected outliers		1							

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	24.44	5.587	9.3	18	2.709	2.92	3.25	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	0.00267
Standard Deviation	0.0057
Number of data	31
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00267	0.0056	0.029	1	4.699	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.029

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.029

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00198
Standard Deviation	0.00261
Number of data	31
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00198	0.00257	0.014	1	4.675	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.014

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.014

Dixon's Outlier Test for Iron (mg/L)

Number of Observations = 14

10% critical value: 0.492

5% critical value: 0.546

	A	B	C	D	E	F	G	H	I	J	K	L
213	1% critical value: 0.641											
214												
215	1. Observation Value 3.17 is a Potential Outlier (Upper T											
216												
217	Test Statistic: 0.250											
218												
219	For 10% significance level, 3.17 is not an outlier.											
220	For 5% significance level, 3.17 is not an outlier.											
221	For 1% significance level, 3.17 is not an outlier.											
222												
223	2. Observation Value 0.01 is a Potential Outlier (Lower T											
224												
225	Test Statistic: 0.000											
226												
227	For 10% significance level, 0.01 is not an outlier.											
228	For 5% significance level, 0.01 is not an outlier.											
229	For 1% significance level, 0.01 is not an outlier.											
230												
231												
232	Dixon's Outlier Test for Manganese (mg/L)											
233												
234	Number of Observations = 14											
235	10% critical value: 0.492											
236	5% critical value: 0.546											
237	1% critical value: 0.641											
238												
239	1. Observation Value 0.601 is a Potential Outlier (Upper											
240												
241	Test Statistic: 0.140											
242												
243	For 10% significance level, 0.601 is not an outlier.											
244	For 5% significance level, 0.601 is not an outlier.											
245	For 1% significance level, 0.601 is not an outlier.											
246												
247	2. Observation Value 0.124 is a Potential Outlier (Lower											
248												
249	Test Statistic: 0.828											
250												
251	For 10% significance level, 0.124 is an outlier.											
252	For 5% significance level, 0.124 is an outlier.											
253	For 1% significance level, 0.124 is an outlier.											
254												
255												
256	Dixon's Outlier Test for Nickel (mg/L)											
257												
258	Number of Observations = 13											
259	10% critical value: 0.467											
260	5% critical value: 0.521											
261	1% critical value: 0.615											
262												
263	1. Observation Value 0.0054 is a Potential Outlier (Upper											
264												
265	Test Statistic: 0.604											

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267	For 10% significance level, 0.0054 is an outlier.											
268	For 5% significance level, 0.0054 is an outlier.											
269	For 1% significance level, 0.0054 is not an outlier.											
270												
271	2. Observation Value 0.00028 is a Potential Outlier (Lowe											
272												
273	Test Statistic: 0.101											
274												
275	For 10% significance level, 0.00028 is not an outlier.											
276	For 5% significance level, 0.00028 is not an outlier.											
277	For 1% significance level, 0.00028 is not an outlier.											
278												
279												
280	Dixon's Outlier Test for Zinc (mg/L)											
281												
282	Number of Observations = 13											
283	10% critical value: 0.467											
284	5% critical value: 0.521											
285	1% critical value: 0.615											
286												
287	1. Observation Value 0.0217 is a Potential Outlier (Uppe											
288												
289	Test Statistic: 0.784											
290												
291	For 10% significance level, 0.0217 is an outlier.											
292	For 5% significance level, 0.0217 is an outlier.											
293	For 1% significance level, 0.0217 is an outlier.											
294												
295	2. Observation Value 0.0015 is a Potential Outlier (Lower											
296												
297	Test Statistic: 0.054											
298												
299	For 10% significance level, 0.0015 is not an outlier.											
300	For 5% significance level, 0.0015 is not an outlier.											
301	For 1% significance level, 0.0015 is not an outlier.											
302												
303												
304	Dixon's Outlier Test for TOC (mg/L)											
305												
306	Number of Observations = 24											
307	10% critical value: 0.367											
308	5% critical value: 0.413											
309	1% critical value: 0.497											
310												
311	1. Observation Value 8.6 is a Potential Outlier (Upper Ta											
312												
313	Test Statistic: 0.803											
314												
315	For 10% significance level, 8.6 is an outlier.											
316	For 5% significance level, 8.6 is an outlier.											
317	For 1% significance level, 8.6 is an outlier.											
318												

	A	B	C	D	E	F	G	H	I	J	K	L
319	2. Observation Value 0.8 is a Potential Outlier (Lower Tai											
320												
321	Test Statistic: 0.118											
322												
323	For 10% significance level, 0.8 is not an outlier.											
324	For 5% significance level, 0.8 is not an outlier.											
325	For 1% significance level, 0.8 is not an outlier.											
326												

				Outlier Tests for Selected Uncensored Variables							
			User Selected Options								
		Date/Time of Computation	ProUCL 5.12025-12-22 11:50:47 AM								
			From File	2025-SandstoneProUCL_d.xls							
			Full Precision	OFF							
			05-SS								
			Dixon's Outlier Test for pH ()								
Number of Observations = 20											
10% critical value: 0.401											
5% critical value: 0.45											
1% critical value: 0.535											
1. Observation Value 8.48 is a Potential Outlier (Upper T											
Test Statistic: 0.221											
For 10% significance level, 8.48 is not an outlier.											
For 5% significance level, 8.48 is not an outlier.											
For 1% significance level, 8.48 is not an outlier.											
2. Observation Value 7.41 is a Potential Outlier (Lower Ta											
Test Statistic: 0.140											
For 10% significance level, 7.41 is not an outlier.											
For 5% significance level, 7.41 is not an outlier.											
For 1% significance level, 7.41 is not an outlier.											
			Dixon's Outlier Test for TDS (mg/L)								
Number of Observations = 20											
10% critical value: 0.401											
5% critical value: 0.45											
1% critical value: 0.535											
1. Observation Value 290 is a Potential Outlier (Upper Ta											
Test Statistic: 0.018											
For 10% significance level, 290 is not an outlier.											
For 5% significance level, 290 is not an outlier.											
For 1% significance level, 290 is not an outlier.											
2. Observation Value 230 is a Potential Outlier (Lower Ta											
Test Statistic: 0.051											
For 10% significance level, 230 is not an outlier.											
For 5% significance level, 230 is not an outlier.											
For 1% significance level, 230 is not an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55												
56	Dixon's Outlier Test for Sulphate (mg/L)											
57												
58	Number of Observations = 20											
59	10% critical value: 0.401											
60	5% critical value: 0.45											
61	1% critical value: 0.535											
62												
63	1. Observation Value 26.3 is a Potential Outlier (Upper T											
64												
65	Test Statistic: 0.071											
66												
67	For 10% significance level, 26.3 is not an outlier.											
68	For 5% significance level, 26.3 is not an outlier.											
69	For 1% significance level, 26.3 is not an outlier.											
70												
71	2. Observation Value 20 is a Potential Outlier (Lower Tail											
72												
73	Test Statistic: 0.350											
74												
75	For 10% significance level, 20 is not an outlier.											
76	For 5% significance level, 20 is not an outlier.											
77	For 1% significance level, 20 is not an outlier.											
78												
79												
80	Dixon's Outlier Test for DOC (mg/L)											
81												
82	Number of Observations = 18											
83	10% critical value: 0.424											
84	5% critical value: 0.475											
85	1% critical value: 0.561											
86												
87	1. Observation Value 10.1 is a Potential Outlier (Upper T											
88												
89	Test Statistic: 0.609											
90												
91	For 10% significance level, 10.1 is an outlier.											
92	For 5% significance level, 10.1 is an outlier.											
93	For 1% significance level, 10.1 is an outlier.											
94												
95	2. Observation Value 0.7 is a Potential Outlier (Lower Tai											
96												
97	Test Statistic: 0.053											
98												
99	For 10% significance level, 0.7 is not an outlier.											
100	For 5% significance level, 0.7 is not an outlier.											
101	For 1% significance level, 0.7 is not an outlier.											
102												
103												
104	Dixon's Outlier Test for Bicarbonate (mg/L)											
105												
106	Number of Observations = 20											

	A	B	C	D	E	F	G	H	I	J	K	L
107	10% critical value: 0.401											
108	5% critical value: 0.45											
109	1% critical value: 0.535											
110												
111	1. Observation Value 282 is a Potential Outlier (Upper Ta											
112												
113	Test Statistic: 0.226											
114												
115	For 10% significance level, 282 is not an outlier.											
116	For 5% significance level, 282 is not an outlier.											
117	For 1% significance level, 282 is not an outlier.											
118												
119	2. Observation Value 246 is a Potential Outlier (Lower Ta											
120												
121	Test Statistic: 0.172											
122												
123	For 10% significance level, 246 is not an outlier.											
124	For 5% significance level, 246 is not an outlier.											
125	For 1% significance level, 246 is not an outlier.											
126												
127												
128	Dixon's Outlier Test for Calcium (mg/L)											
129												
130	Number of Observations = 20											
131	10% critical value: 0.401											
132	5% critical value: 0.45											
133	1% critical value: 0.535											
134												
135	1. Observation Value 52.4 is a Potential Outlier (Upper T											
136												
137	Test Statistic: 0.149											
138												
139	For 10% significance level, 52.4 is not an outlier.											
140	For 5% significance level, 52.4 is not an outlier.											
141	For 1% significance level, 52.4 is not an outlier.											
142												
143	2. Observation Value 41.7 is a Potential Outlier (Lower Ta											
144												
145	Test Statistic: 0.213											
146												
147	For 10% significance level, 41.7 is not an outlier.											
148	For 5% significance level, 41.7 is not an outlier.											
149	For 1% significance level, 41.7 is not an outlier.											
150												
151												
152	Dixon's Outlier Test for Magnesium (mg/L)											
153												
154	Number of Observations = 20											
155	10% critical value: 0.401											
156	5% critical value: 0.45											
157	1% critical value: 0.535											
158												
159	1. Observation Value 13.1 is a Potential Outlier (Upper T											

	A	B	C	D	E	F	G	H	I	J	K	L
160												
161	Test Statistic: 0.111											
162												
163	For 10% significance level, 13.1 is not an outlier.											
164	For 5% significance level, 13.1 is not an outlier.											
165	For 1% significance level, 13.1 is not an outlier.											
166												
167	2. Observation Value 9.7 is a Potential Outlier (Lower Tai											
168												
169	Test Statistic: 0.226											
170												
171	For 10% significance level, 9.7 is not an outlier.											
172	For 5% significance level, 9.7 is not an outlier.											
173	For 1% significance level, 9.7 is not an outlier.											
174												
175												
176	Dixon's Outlier Test for Sodium (mg/L)											
177												
178	Number of Observations = 20											
179	10% critical value: 0.401											
180	5% critical value: 0.45											
181	1% critical value: 0.535											
182												
183	1. Observation Value 32.8 is a Potential Outlier (Upper T											
184												
185	Test Statistic: 0.167											
186												
187	For 10% significance level, 32.8 is not an outlier.											
188	For 5% significance level, 32.8 is not an outlier.											
189	For 1% significance level, 32.8 is not an outlier.											
190												
191	2. Observation Value 25.9 is a Potential Outlier (Lower Ta											
192												
193	Test Statistic: 0.250											
194												
195	For 10% significance level, 25.9 is not an outlier.											
196	For 5% significance level, 25.9 is not an outlier.											
197	For 1% significance level, 25.9 is not an outlier.											
198												
199												
200	Dixon's Outlier Test for Arsenic (mg/L)											
201												
202	Number of Observations = 20											
203	10% critical value: 0.401											
204	5% critical value: 0.45											
205	1% critical value: 0.535											
206												
207	1. Observation Value 0.0097 is a Potential Outlier (Uppe											
208												
209	Test Statistic: 0.327											
210												
211	For 10% significance level, 0.0097 is not an outlier.											
212	For 5% significance level, 0.0097 is not an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
213	For 1% significance level, 0.0097 is not an outlier.											
214												
215	2. Observation Value 0.00019 is a Potential Outlier (Lowe											
216												
217	Test Statistic: 0.005											
218												
219	For 10% significance level, 0.00019 is not an outlier.											
220	For 5% significance level, 0.00019 is not an outlier.											
221	For 1% significance level, 0.00019 is not an outlier.											
222												
223												
224	Dixon's Outlier Test for Cadmium (mg/L)											
225												
226	Number of Observations = 20											
227	10% critical value: 0.401											
228	5% critical value: 0.45											
229	1% critical value: 0.535											
230												
231	1. Observation Value 0.0002 is a Potential Outlier (Uppe											
232												
233	Test Statistic: 0.000											
234												
235	For 10% significance level, 0.0002 is not an outlier.											
236	For 5% significance level, 0.0002 is not an outlier.											
237	For 1% significance level, 0.0002 is not an outlier.											
238												
239	2. Observation Value 5E-06 is a Potential Outlier (Lower											
240												
241	Test Statistic: 0.011											
242												
243	For 10% significance level, 5E-06 is not an outlier.											
244	For 5% significance level, 5E-06 is not an outlier.											
245	For 1% significance level, 5E-06 is not an outlier.											
246												
247												
248	Dixon's Outlier Test for Copper (mg/L)											
249												
250	Number of Observations = 20											
251	10% critical value: 0.401											
252	5% critical value: 0.45											
253	1% critical value: 0.535											
254												
255	1. Observation Value 0.101 is a Potential Outlier (Upper											
256												
257	Test Statistic: 0.886											
258												
259	For 10% significance level, 0.101 is an outlier.											
260	For 5% significance level, 0.101 is an outlier.											
261	For 1% significance level, 0.101 is an outlier.											
262												
263	2. Observation Value 0.0004 is a Potential Outlier (Lowe											
264												
265	Test Statistic: 0.050											

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267	For 10% significance level, 0.0004 is not an outlier.											
268	For 5% significance level, 0.0004 is not an outlier.											
269	For 1% significance level, 0.0004 is not an outlier.											
270												
271												
272			Dixon's Outlier Test for Iron (mg/L)									
273												
274	Number of Observations = 20											
275	10% critical value: 0.401											
276	5% critical value: 0.45											
277	1% critical value: 0.535											
278												
279	1. Observation Value 2.19 is a Potential Outlier (Upper T											
280												
281	Test Statistic: 0.147											
282												
283	For 10% significance level, 2.19 is not an outlier.											
284	For 5% significance level, 2.19 is not an outlier.											
285	For 1% significance level, 2.19 is not an outlier.											
286												
287	2. Observation Value 0.01 is a Potential Outlier (Lower T											
288												
289	Test Statistic: 0.000											
290												
291	For 10% significance level, 0.01 is not an outlier.											
292	For 5% significance level, 0.01 is not an outlier.											
293	For 1% significance level, 0.01 is not an outlier.											
294												
295												
296			Dixon's Outlier Test for Lead (mg/L)									
297												
298	Number of Observations = 20											
299	10% critical value: 0.401											
300	5% critical value: 0.45											
301	1% critical value: 0.535											
302												
303	1. Observation Value 0.101 is a Potential Outlier (Upper											
304												
305	Test Statistic: 0.898											
306												
307	For 10% significance level, 0.101 is an outlier.											
308	For 5% significance level, 0.101 is an outlier.											
309	For 1% significance level, 0.101 is an outlier.											
310												
311	2. Observation Value 5E-05 is a Potential Outlier (Lower											
312												
313	Test Statistic: 0.000											
314												
315	For 10% significance level, 5E-05 is not an outlier.											
316	For 5% significance level, 5E-05 is not an outlier.											
317	For 1% significance level, 5E-05 is not an outlier.											
318												

	A	B	C	D	E	F	G	H	I	J	K	L
319												
320	Dixon's Outlier Test for Manganese (mg/L)											
321												
322	Number of Observations = 20											
323	10% critical value: 0.401											
324	5% critical value: 0.45											
325	1% critical value: 0.535											
326												
327	1. Observation Value 0.436 is a Potential Outlier (Upper											
328												
329	Test Statistic: 0.341											
330												
331	For 10% significance level, 0.436 is not an outlier.											
332	For 5% significance level, 0.436 is not an outlier.											
333	For 1% significance level, 0.436 is not an outlier.											
334												
335	2. Observation Value 0.336 is a Potential Outlier (Lower											
336												
337	Test Statistic: 0.211											
338												
339	For 10% significance level, 0.336 is not an outlier.											
340	For 5% significance level, 0.336 is not an outlier.											
341	For 1% significance level, 0.336 is not an outlier.											
342												
343												
344	Dixon's Outlier Test for Nickel (mg/L)											
345												
346	Number of Observations = 20											
347	10% critical value: 0.401											
348	5% critical value: 0.45											
349	1% critical value: 0.535											
350												
351	1. Observation Value 0.272 is a Potential Outlier (Upper											
352												
353	Test Statistic: 0.965											
354												
355	For 10% significance level, 0.272 is an outlier.											
356	For 5% significance level, 0.272 is an outlier.											
357	For 1% significance level, 0.272 is an outlier.											
358												
359	2. Observation Value 0.00046 is a Potential Outlier (Lowe											
360												
361	Test Statistic: 0.030											
362												
363	For 10% significance level, 0.00046 is not an outlier.											
364	For 5% significance level, 0.00046 is not an outlier.											
365	For 1% significance level, 0.00046 is not an outlier.											
366												
367												
368	Dixon's Outlier Test for Zinc (mg/L)											
369												
370	Number of Observations = 20											
371	10% critical value: 0.401											

	A	B	C	D	E	F	G	H	I	J	K	L
372	5% critical value: 0.45											
373	1% critical value: 0.535											
374												
375	1. Observation Value 0.667 is a Potential Outlier (Upper											
376												
377	Test Statistic: 0.886											
378												
379	For 10% significance level, 0.667 is an outlier.											
380	For 5% significance level, 0.667 is an outlier.											
381	For 1% significance level, 0.667 is an outlier.											
382												
383	2. Observation Value 0.0032 is a Potential Outlier (Lower											
384												
385	Test Statistic: 0.068											
386												
387	For 10% significance level, 0.0032 is not an outlier.											
388	For 5% significance level, 0.0032 is not an outlier.											
389	For 1% significance level, 0.0032 is not an outlier.											
390												

Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation	ProUCL 5.12025-12-22 11:55:13 AM
From File	2025-SandstoneProUCL_e.xls
Full Precision	OFF

07(R)-SS

Rosner's Outlier Test for pH ()

Mean	7.721
Standard Deviation	0.437
Number of data	48
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.721	0.433	6.66	6	2.451	3.11	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for TDS (mg/L)

Mean	433.4
Standard Deviation	37.92
Number of data	48
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	433.4	37.53	550	37	3.106	3.11	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Chloride (mg/L)

Mean	1.097
Standard Deviation	1.723
Number of data	36
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.097	1.699	9.31	25	4.834	2.99	3.33

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 9.31

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 9.31

Rosner's Outlier Test for Sulphate (mg/L)

Mean	61.73
Standard Deviation	18.18
Number of data	34
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	61.73	17.91	114	23	2.919	2.97	3.3

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for DOC (mg/L)

Number of Observations = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Observation Value 6.1 is a Potential Outlier (Upper Ta

Test Statistic: 0.262

For 10% significance level, 6.1 is not an outlier.

For 5% significance level, 6.1 is not an outlier.

For 1% significance level, 6.1 is not an outlier.

2. Observation Value 1.67 is a Potential Outlier (Lower T

Test Statistic: 0.107

For 10% significance level, 1.67 is not an outlier.

For 5% significance level, 1.67 is not an outlier.

For 1% significance level, 1.67 is not an outlier.

Rosner's Outlier Test for Bicarbonate (mg/L)

Mean	418.6
Standard Deviation	51.2

			Number of data	34							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	418.6	50.44	544	25	2.487	2.97	3.3			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Calcium (mg/L)							
			Mean	92.95							
			Standard Deviation	9.557							
			Number of data	34							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	92.95	9.415	118	24	2.661	2.97	3.3			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Magnesium (mg/L)							
			Mean	20.03							
			Standard Deviation	1.795							
			Number of data	34							
			Number of suspected outliers	1							
				Potential	Obs.	Test	Critical	Critical			
	#	Mean	sd	outlier	Number	value	value (5%)	value (1%)			
	1	20.03	1.768	23.8	30	2.131	2.97	3.3			
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											
				Rosner's Outlier Test for Sodium (mg/L)							
			Mean	38.65							
			Standard Deviation	4.417							
			Number of data	34							
			Number of suspected outliers	1							

			Potential	Obs.	Test	Critical	Critical	
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)	
1	38.65	4.351	50.1	23	2.631	2.97	3.3	

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Arsenic (mg/L)

Mean	0.00126
Standard Deviation	0.00107
Number of data	32
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00126	0.00105	0.0038	27	2.415	2.94	3.27

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Copper (mg/L)

Mean	0.00196
Standard Deviation	0.00215
Number of data	32
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical
#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00196	0.00211	0.009	2	3.334	2.94	3.27

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.009

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.009

Dixon's Outlier Test for Manganese (mg/L)

Number of Observations = 14

10% critical value: 0.492

5% critical value: 0.546

1% critical value: 0.641

	A	B	C	D	E	F	G	H	I	J	K	L
213	1. Observation Value 2.13 is a Potential Outlier (Upper T											
214												
215	Test Statistic: 0.137											
216												
217	For 10% significance level, 2.13 is not an outlier.											
218	For 5% significance level, 2.13 is not an outlier.											
219	For 1% significance level, 2.13 is not an outlier.											
220												
221	2. Observation Value 0.004 is a Potential Outlier (Lower											
222												
223	Test Statistic: 0.383											
224												
225	For 10% significance level, 0.004 is not an outlier.											
226	For 5% significance level, 0.004 is not an outlier.											
227	For 1% significance level, 0.004 is not an outlier.											
228												
229												
230	Dixon's Outlier Test for Nickel (mg/L)											
231												
232	Number of Observations = 13											
233	10% critical value: 0.467											
234	5% critical value: 0.521											
235	1% critical value: 0.615											
236												
237	1. Observation Value 0.026 is a Potential Outlier (Upper											
238												
239	Test Statistic: 0.646											
240												
241	For 10% significance level, 0.026 is an outlier.											
242	For 5% significance level, 0.026 is an outlier.											
243	For 1% significance level, 0.026 is an outlier.											
244												
245	2. Observation Value 0.0013 is a Potential Outlier (Lower											
246												
247	Test Statistic: 0.023											
248												
249	For 10% significance level, 0.0013 is not an outlier.											
250	For 5% significance level, 0.0013 is not an outlier.											
251	For 1% significance level, 0.0013 is not an outlier.											
252												
253												
254	Dixon's Outlier Test for Zinc (mg/L)											
255												
256	Number of Observations = 13											
257	10% critical value: 0.467											
258	5% critical value: 0.521											
259	1% critical value: 0.615											
260												
261	1. Observation Value 0.0043 is a Potential Outlier (Upper											
262												
263	Test Statistic: 0.091											
264												
265	For 10% significance level, 0.0043 is not an outlier.											

For 5% significance level, 0.0043 is not an outlier.

For 1% significance level, 0.0043 is not an outlier.

2. Observation Value 0.001 is a Potential Outlier (Lower

Test Statistic: 0.000

For 10% significance level, 0.001 is not an outlier.

For 5% significance level, 0.001 is not an outlier.

For 1% significance level, 0.001 is not an outlier.

Rosner's Outlier Test for TOC (mg/L)

Mean	1.881
Standard Deviation	0.525
Number of data	36
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.881	0.518	3.4	2	2.934	2.99	3.33

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

	A	B	C	D	E	F	G	H	I	J	K	L
1					Outlier Tests for Selected Uncensored Variables							
2				User Selected Options								
3			Date/Time of Computation	ProUCL 5.12025-12-22 12:00:57 PM								
4				From File	2025-SandstoneProUCL_g.xls							
5				Full Precision	OFF							
6												
7			13(R)-SS									
8			Dixon's Outlier Test for pH ()									
9												
10	Number of Observations = 24											
11	10% critical value: 0.367											
12	5% critical value: 0.413											
13	1% critical value: 0.497											
14												
15	1. Observation Value 8.49 is a Potential Outlier (Upper T											
16												
17	Test Statistic: 0.320											
18												
19	For 10% significance level, 8.49 is not an outlier.											
20	For 5% significance level, 8.49 is not an outlier.											
21	For 1% significance level, 8.49 is not an outlier.											
22												
23	2. Observation Value 7.29 is a Potential Outlier (Lower Ta											
24												
25	Test Statistic: 0.258											
26												
27	For 10% significance level, 7.29 is not an outlier.											
28	For 5% significance level, 7.29 is not an outlier.											
29	For 1% significance level, 7.29 is not an outlier.											
30												
31												
32			Dixon's Outlier Test for TDS (mg/L)									
33												
34	Number of Observations = 24											
35	10% critical value: 0.367											
36	5% critical value: 0.413											
37	1% critical value: 0.497											
38												
39	1. Observation Value 445 is a Potential Outlier (Upper Ta											
40												
41	Test Statistic: 0.398											
42												
43	For 10% significance level, 445 is an outlier.											
44	For 5% significance level, 445 is not an outlier.											
45	For 1% significance level, 445 is not an outlier.											
46												
47	2. Observation Value 236 is a Potential Outlier (Lower Ta											
48												
49	Test Statistic: 0.062											
50												
51	For 10% significance level, 236 is not an outlier.											
52	For 5% significance level, 236 is not an outlier.											
53	For 1% significance level, 236 is not an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55												
56	Dixon's Outlier Test for Sulphate (mg/L)											
57												
58	Number of Observations = 20											
59	10% critical value: 0.401											
60	5% critical value: 0.45											
61	1% critical value: 0.535											
62												
63	1. Observation Value 81.2 is a Potential Outlier (Upper T											
64												
65	Test Statistic: 0.842											
66												
67	For 10% significance level, 81.2 is an outlier.											
68	For 5% significance level, 81.2 is an outlier.											
69	For 1% significance level, 81.2 is an outlier.											
70												
71	2. Observation Value 17 is a Potential Outlier (Lower Tail											
72												
73	Test Statistic: 0.169											
74												
75	For 10% significance level, 17 is not an outlier.											
76	For 5% significance level, 17 is not an outlier.											
77	For 1% significance level, 17 is not an outlier.											
78												
79												
80	Dixon's Outlier Test for DOC (mg/L)											
81												
82	Number of Observations = 17											
83	10% critical value: 0.438											
84	5% critical value: 0.49											
85	1% critical value: 0.577											
86												
87	1. Observation Value 10.1 is a Potential Outlier (Upper T											
88												
89	Test Statistic: 0.670											
90												
91	For 10% significance level, 10.1 is an outlier.											
92	For 5% significance level, 10.1 is an outlier.											
93	For 1% significance level, 10.1 is an outlier.											
94												
95	2. Observation Value 0.73 is a Potential Outlier (Lower Ta											
96												
97	Test Statistic: 0.083											
98												
99	For 10% significance level, 0.73 is not an outlier.											
100	For 5% significance level, 0.73 is not an outlier.											
101	For 1% significance level, 0.73 is not an outlier.											
102												
103												
104	Dixon's Outlier Test for Bicarbonate (mg/L)											
105												
106	Number of Observations = 23											

	A	B	C	D	E	F	G	H	I	J	K	L
107	10% critical value: 0.374											
108	5% critical value: 0.421											
109	1% critical value: 0.505											
110												
111	1. Observation Value 528 is a Potential Outlier (Upper Ta											
112												
113	Test Statistic: 0.510											
114												
115	For 10% significance level, 528 is an outlier.											
116	For 5% significance level, 528 is an outlier.											
117	For 1% significance level, 528 is an outlier.											
118												
119	2. Observation Value 256 is a Potential Outlier (Lower Ta											
120												
121	Test Statistic: 0.079											
122												
123	For 10% significance level, 256 is not an outlier.											
124	For 5% significance level, 256 is not an outlier.											
125	For 1% significance level, 256 is not an outlier.											
126												
127												
128	Dixon's Outlier Test for Calcium (mg/L)											
129												
130	Number of Observations = 23											
131	10% critical value: 0.374											
132	5% critical value: 0.421											
133	1% critical value: 0.505											
134												
135	1. Observation Value 117 is a Potential Outlier (Upper Ta											
136												
137	Test Statistic: 0.433											
138												
139	For 10% significance level, 117 is an outlier.											
140	For 5% significance level, 117 is an outlier.											
141	For 1% significance level, 117 is not an outlier.											
142												
143	2. Observation Value 52 is a Potential Outlier (Lower Tail											
144												
145	Test Statistic: 0.126											
146												
147	For 10% significance level, 52 is not an outlier.											
148	For 5% significance level, 52 is not an outlier.											
149	For 1% significance level, 52 is not an outlier.											
150												
151												
152	Dixon's Outlier Test for Magnesium (mg/L)											
153												
154	Number of Observations = 23											
155	10% critical value: 0.374											
156	5% critical value: 0.421											
157	1% critical value: 0.505											
158												
159	1. Observation Value 26.8 is a Potential Outlier (Upper T											

	A	B	C	D	E	F	G	H	I	J	K	L
160												
161	Test Statistic: 0.652											
162												
163	For 10% significance level, 26.8 is an outlier.											
164	For 5% significance level, 26.8 is an outlier.											
165	For 1% significance level, 26.8 is an outlier.											
166												
167	2. Observation Value 10.7 is a Potential Outlier (Lower T											
168												
169	Test Statistic: 0.100											
170												
171	For 10% significance level, 10.7 is not an outlier.											
172	For 5% significance level, 10.7 is not an outlier.											
173	For 1% significance level, 10.7 is not an outlier.											
174												
175												
176	Dixon's Outlier Test for Sodium (mg/L)											
177												
178	Number of Observations = 23											
179	10% critical value: 0.374											
180	5% critical value: 0.421											
181	1% critical value: 0.505											
182												
183	1. Observation Value 56.9 is a Potential Outlier (Upper T											
184												
185	Test Statistic: 0.704											
186												
187	For 10% significance level, 56.9 is an outlier.											
188	For 5% significance level, 56.9 is an outlier.											
189	For 1% significance level, 56.9 is an outlier.											
190												
191	2. Observation Value 13.2 is a Potential Outlier (Lower T											
192												
193	Test Statistic: 0.038											
194												
195	For 10% significance level, 13.2 is not an outlier.											
196	For 5% significance level, 13.2 is not an outlier.											
197	For 1% significance level, 13.2 is not an outlier.											
198												
199												
200	Dixon's Outlier Test for Arsenic (mg/L)											
201												
202	Number of Observations = 22											
203	10% critical value: 0.382											
204	5% critical value: 0.43											
205	1% critical value: 0.514											
206												
207	1. Observation Value 0.056 is a Potential Outlier (Upper											
208												
209	Test Statistic: 0.747											
210												
211	For 10% significance level, 0.056 is an outlier.											
212	For 5% significance level, 0.056 is an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
213	For 1% significance level, 0.056 is an outlier.											
214												
215	2. Observation Value 0.00042 is a Potential Outlier (Lowe											
216												
217	Test Statistic: 0.002											
218												
219	For 10% significance level, 0.00042 is not an outlier.											
220	For 5% significance level, 0.00042 is not an outlier.											
221	For 1% significance level, 0.00042 is not an outlier.											
222												
223												
224	Dixon's Outlier Test for Cadmium (mg/L)											
225												
226	Number of Observations = 22											
227	10% critical value: 0.382											
228	5% critical value: 0.43											
229	1% critical value: 0.514											
230												
231	1. Observation Value 0.003 is a Potential Outlier (Upper											
232												
233	Test Statistic: 0.670											
234												
235	For 10% significance level, 0.003 is an outlier.											
236	For 5% significance level, 0.003 is an outlier.											
237	For 1% significance level, 0.003 is an outlier.											
238												
239	2. Observation Value 5E-06 is a Potential Outlier (Lower											
240												
241	Test Statistic: 0.009											
242												
243	For 10% significance level, 5E-06 is not an outlier.											
244	For 5% significance level, 5E-06 is not an outlier.											
245	For 1% significance level, 5E-06 is not an outlier.											
246												
247												
248	Dixon's Outlier Test for Copper (mg/L)											
249												
250	Number of Observations = 21											
251	10% critical value: 0.391											
252	5% critical value: 0.44											
253	1% critical value: 0.524											
254												
255	1. Observation Value 0.083 is a Potential Outlier (Upper											
256												
257	Test Statistic: 0.517											
258												
259	For 10% significance level, 0.083 is an outlier.											
260	For 5% significance level, 0.083 is an outlier.											
261	For 1% significance level, 0.083 is not an outlier.											
262												
263	2. Observation Value 0.00044 is a Potential Outlier (Lowe											
264												
265	Test Statistic: 0.014											

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267	For 10% significance level, 0.00044 is not an outlier.											
268	For 5% significance level, 0.00044 is not an outlier.											
269	For 1% significance level, 0.00044 is not an outlier.											
270												
271												
272	Dixon's Outlier Test for Manganese (mg/L)											
273												
274	Number of Observations = 20											
275	10% critical value: 0.401											
276	5% critical value: 0.45											
277	1% critical value: 0.535											
278												
279	1. Observation Value 0.92 is a Potential Outlier (Upper T											
280												
281	Test Statistic: 0.337											
282												
283	For 10% significance level, 0.92 is not an outlier.											
284	For 5% significance level, 0.92 is not an outlier.											
285	For 1% significance level, 0.92 is not an outlier.											
286												
287	2. Observation Value 0.00152 is a Potential Outlier (Lowe											
288												
289	Test Statistic: 0.006											
290												
291	For 10% significance level, 0.00152 is not an outlier.											
292	For 5% significance level, 0.00152 is not an outlier.											
293	For 1% significance level, 0.00152 is not an outlier.											
294												
295												
296	Dixon's Outlier Test for Nickel (mg/L)											
297												
298	Number of Observations = 19											
299	10% critical value: 0.412											
300	5% critical value: 0.462											
301	1% critical value: 0.547											
302												
303	1. Observation Value 0.0227 is a Potential Outlier (Uppe											
304												
305	Test Statistic: 0.258											
306												
307	For 10% significance level, 0.0227 is not an outlier.											
308	For 5% significance level, 0.0227 is not an outlier.											
309	For 1% significance level, 0.0227 is not an outlier.											
310												
311	2. Observation Value 0.0005 is a Potential Outlier (Lower											
312												
313	Test Statistic: 0.008											
314												
315	For 10% significance level, 0.0005 is not an outlier.											
316	For 5% significance level, 0.0005 is not an outlier.											
317	For 1% significance level, 0.0005 is not an outlier.											
318												

	A	B	C	D	E	F	G	H	I	J	K	L
319												
320	Dixon's Outlier Test for Zinc (mg/L)											
321												
322	Number of Observations = 19											
323	10% critical value: 0.412											
324	5% critical value: 0.462											
325	1% critical value: 0.547											
326												
327	1. Observation Value 1.61 is a Potential Outlier (Upper T											
328												
329	Test Statistic: 0.699											
330												
331	For 10% significance level, 1.61 is an outlier.											
332	For 5% significance level, 1.61 is an outlier.											
333	For 1% significance level, 1.61 is an outlier.											
334												
335	2. Observation Value 0.0028 is a Potential Outlier (Lower											
336												
337	Test Statistic: 0.003											
338												
339	For 10% significance level, 0.0028 is not an outlier.											
340	For 5% significance level, 0.0028 is not an outlier.											
341	For 1% significance level, 0.0028 is not an outlier.											
342												
343												
344	Dixon's Outlier Test for TOC (mg/L)											
345												
346	Number of Observations = 6											
347	10% critical value: 0.482											
348	5% critical value: 0.56											
349	1% critical value: 0.698											
350												
351	1. Observation Value 5.9 is a Potential Outlier (Upper Ta											
352												
353	Test Statistic: 0.354											
354												
355	For 10% significance level, 5.9 is not an outlier.											
356	For 5% significance level, 5.9 is not an outlier.											
357	For 1% significance level, 5.9 is not an outlier.											
358												
359	2. Observation Value 1.1 is a Potential Outlier (Lower Tai											
360												
361	Test Statistic: 0.188											
362												
363	For 10% significance level, 1.1 is not an outlier.											
364	For 5% significance level, 1.1 is not an outlier.											
365	For 1% significance level, 1.1 is not an outlier.											
366												

	A	B	C	D	E	F	G	H	I	J	K	L
1					Outlier Tests for Selected Uncensored Variables							
2				User Selected Options								
3			Date/Time of Computation	ProUCL 5.12025-12-22 12:05:41 PM								
4				From File	2025-SandstoneProUCL_h.xls							
5				Full Precision	OFF							
6												
7			15(2R)-SS									
8			Dixon's Outlier Test for pH ()									
9												
10	Number of Observations = 21											
11	10% critical value: 0.391											
12	5% critical value: 0.44											
13	1% critical value: 0.524											
14												
15	1. Observation Value 8.51 is a Potential Outlier (Upper T											
16												
17	Test Statistic: 0.175											
18												
19	For 10% significance level, 8.51 is not an outlier.											
20	For 5% significance level, 8.51 is not an outlier.											
21	For 1% significance level, 8.51 is not an outlier.											
22												
23	2. Observation Value 7.83 is a Potential Outlier (Lower Ta											
24												
25	Test Statistic: 0.088											
26												
27	For 10% significance level, 7.83 is not an outlier.											
28	For 5% significance level, 7.83 is not an outlier.											
29	For 1% significance level, 7.83 is not an outlier.											
30												
31												
32			Dixon's Outlier Test for TDS (mg/L)									
33												
34	Number of Observations = 21											
35	10% critical value: 0.391											
36	5% critical value: 0.44											
37	1% critical value: 0.524											
38												
39	1. Observation Value 931 is a Potential Outlier (Upper Ta											
40												
41	Test Statistic: 0.075											
42												
43	For 10% significance level, 931 is not an outlier.											
44	For 5% significance level, 931 is not an outlier.											
45	For 1% significance level, 931 is not an outlier.											
46												
47	2. Observation Value 227 is a Potential Outlier (Lower Ta											
48												
49	Test Statistic: 0.058											
50												
51	For 10% significance level, 227 is not an outlier.											
52	For 5% significance level, 227 is not an outlier.											
53	For 1% significance level, 227 is not an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55												
56	Dixon's Outlier Test for Chloride (mg/L)											
57												
58	Number of Observations = 21											
59	10% critical value: 0.391											
60	5% critical value: 0.44											
61	1% critical value: 0.524											
62												
63	1. Observation Value 30.1 is a Potential Outlier (Upper T											
64												
65	Test Statistic: 0.611											
66												
67	For 10% significance level, 30.1 is an outlier.											
68	For 5% significance level, 30.1 is an outlier.											
69	For 1% significance level, 30.1 is an outlier.											
70												
71	2. Observation Value 0.5 is a Potential Outlier (Lower Tai											
72												
73	Test Statistic: 0.014											
74												
75	For 10% significance level, 0.5 is not an outlier.											
76	For 5% significance level, 0.5 is not an outlier.											
77	For 1% significance level, 0.5 is not an outlier.											
78												
79												
80	Dixon's Outlier Test for Sulphate (mg/L)											
81												
82	Number of Observations = 20											
83	10% critical value: 0.401											
84	5% critical value: 0.45											
85	1% critical value: 0.535											
86												
87	1. Observation Value 148 is a Potential Outlier (Upper Ta											
88												
89	Test Statistic: 0.397											
90												
91	For 10% significance level, 148 is not an outlier.											
92	For 5% significance level, 148 is not an outlier.											
93	For 1% significance level, 148 is not an outlier.											
94												
95	2. Observation Value 13.6 is a Potential Outlier (Lower Ta											
96												
97	Test Statistic: 0.027											
98												
99	For 10% significance level, 13.6 is not an outlier.											
100	For 5% significance level, 13.6 is not an outlier.											
101	For 1% significance level, 13.6 is not an outlier.											
102												
103												
104	Dixon's Outlier Test for DOC (mg/L)											
105												
106	Number of Observations = 18											

	A	B	C	D	E	F	G	H	I	J	K	L
107	10% critical value: 0.424											
108	5% critical value: 0.475											
109	1% critical value: 0.561											
110												
111	1. Observation Value 58.3 is a Potential Outlier (Upper T											
112												
113	Test Statistic: 0.534											
114												
115	For 10% significance level, 58.3 is an outlier.											
116	For 5% significance level, 58.3 is an outlier.											
117	For 1% significance level, 58.3 is not an outlier.											
118												
119	2. Observation Value 1.42 is a Potential Outlier (Lower Ta											
120												
121	Test Statistic: 0.025											
122												
123	For 10% significance level, 1.42 is not an outlier.											
124	For 5% significance level, 1.42 is not an outlier.											
125	For 1% significance level, 1.42 is not an outlier.											
126												
127												
128	Dixon's Outlier Test for Bicarbonate (mg/L)											
129												
130	Number of Observations = 21											
131	10% critical value: 0.391											
132	5% critical value: 0.44											
133	1% critical value: 0.524											
134												
135	1. Observation Value 1060 is a Potential Outlier (Upper T											
136												
137	Test Statistic: 0.049											
138												
139	For 10% significance level, 1060 is not an outlier.											
140	For 5% significance level, 1060 is not an outlier.											
141	For 1% significance level, 1060 is not an outlier.											
142												
143	2. Observation Value 244 is a Potential Outlier (Lower Ta											
144												
145	Test Statistic: 0.009											
146												
147	For 10% significance level, 244 is not an outlier.											
148	For 5% significance level, 244 is not an outlier.											
149	For 1% significance level, 244 is not an outlier.											
150												
151												
152	Dixon's Outlier Test for Calcium (mg/L)											
153												
154	Number of Observations = 23											
155	10% critical value: 0.374											
156	5% critical value: 0.421											
157	1% critical value: 0.505											
158												
159	1. Observation Value 246 is a Potential Outlier (Upper Ta											

	A	B	C	D	E	F	G	H	I	J	K	L
160												
161	Test Statistic: 0.056											
162												
163	For 10% significance level, 246 is not an outlier.											
164	For 5% significance level, 246 is not an outlier.											
165	For 1% significance level, 246 is not an outlier.											
166												
167	2. Observation Value 32.1 is a Potential Outlier (Lower T											
168												
169	Test Statistic: 0.006											
170												
171	For 10% significance level, 32.1 is not an outlier.											
172	For 5% significance level, 32.1 is not an outlier.											
173	For 1% significance level, 32.1 is not an outlier.											
174												
175												
176	Dixon's Outlier Test for Magnesium (mg/L)											
177												
178	Number of Observations = 23											
179	10% critical value: 0.374											
180	5% critical value: 0.421											
181	1% critical value: 0.505											
182												
183	1. Observation Value 51.6 is a Potential Outlier (Upper T											
184												
185	Test Statistic: 0.134											
186												
187	For 10% significance level, 51.6 is not an outlier.											
188	For 5% significance level, 51.6 is not an outlier.											
189	For 1% significance level, 51.6 is not an outlier.											
190												
191	2. Observation Value 8.12 is a Potential Outlier (Lower T											
192												
193	Test Statistic: 0.029											
194												
195	For 10% significance level, 8.12 is not an outlier.											
196	For 5% significance level, 8.12 is not an outlier.											
197	For 1% significance level, 8.12 is not an outlier.											
198												
199												
200	Dixon's Outlier Test for Sodium (mg/L)											
201												
202	Number of Observations = 23											
203	10% critical value: 0.374											
204	5% critical value: 0.421											
205	1% critical value: 0.505											
206												
207	1. Observation Value 118 is a Potential Outlier (Upper T											
208												
209	Test Statistic: 0.581											
210												
211	For 10% significance level, 118 is an outlier.											
212	For 5% significance level, 118 is an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
213	For 1% significance level, 118 is an outlier.											
214												
215	2. Observation Value 33.6 is a Potential Outlier (Lower T											
216												
217	Test Statistic: 0.230											
218												
219	For 10% significance level, 33.6 is not an outlier.											
220	For 5% significance level, 33.6 is not an outlier.											
221	For 1% significance level, 33.6 is not an outlier.											
222												
223												
224			Dixon's Outlier Test for Arsenic (mg/L)									
225												
226	Number of Observations = 23											
227	10% critical value: 0.374											
228	5% critical value: 0.421											
229	1% critical value: 0.505											
230												
231	1. Observation Value 0.0765 is a Potential Outlier (Uppe											
232												
233	Test Statistic: 0.370											
234												
235	For 10% significance level, 0.0765 is not an outlier.											
236	For 5% significance level, 0.0765 is not an outlier.											
237	For 1% significance level, 0.0765 is not an outlier.											
238												
239	2. Observation Value 0.0002 is a Potential Outlier (Lower											
240												
241	Test Statistic: 0.055											
242												
243	For 10% significance level, 0.0002 is not an outlier.											
244	For 5% significance level, 0.0002 is not an outlier.											
245	For 1% significance level, 0.0002 is not an outlier.											
246												
247												
248			Dixon's Outlier Test for Cadmium (mg/L)									
249												
250	Number of Observations = 23											
251	10% critical value: 0.374											
252	5% critical value: 0.421											
253	1% critical value: 0.505											
254												
255	1. Observation Value 0.003 is a Potential Outlier (Upper											
256												
257	Test Statistic: 0.868											
258												
259	For 10% significance level, 0.003 is an outlier.											
260	For 5% significance level, 0.003 is an outlier.											
261	For 1% significance level, 0.003 is an outlier.											
262												
263	2. Observation Value 5E-06 is a Potential Outlier (Lower											
264												
265	Test Statistic: 0.000											

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267	For 10% significance level, 5E-06 is not an outlier.											
268	For 5% significance level, 5E-06 is not an outlier.											
269	For 1% significance level, 5E-06 is not an outlier.											
270												
271												
272	Dixon's Outlier Test for Copper (mg/L)											
273												
274	Number of Observations = 23											
275	10% critical value: 0.374											
276	5% critical value: 0.421											
277	1% critical value: 0.505											
278												
279	1. Observation Value 0.454 is a Potential Outlier (Upper											
280												
281	Test Statistic: 0.714											
282												
283	For 10% significance level, 0.454 is an outlier.											
284	For 5% significance level, 0.454 is an outlier.											
285	For 1% significance level, 0.454 is an outlier.											
286												
287	2. Observation Value 0.00013 is a Potential Outlier (Lowe											
288												
289	Test Statistic: 0.001											
290												
291	For 10% significance level, 0.00013 is not an outlier.											
292	For 5% significance level, 0.00013 is not an outlier.											
293	For 1% significance level, 0.00013 is not an outlier.											
294												
295												
296	Dixon's Outlier Test for Manganese (mg/L)											
297												
298	Number of Observations = 22											
299	10% critical value: 0.382											
300	5% critical value: 0.43											
301	1% critical value: 0.514											
302												
303	1. Observation Value 3.9 is a Potential Outlier (Upper Ta											
304												
305	Test Statistic: 0.243											
306												
307	For 10% significance level, 3.9 is not an outlier.											
308	For 5% significance level, 3.9 is not an outlier.											
309	For 1% significance level, 3.9 is not an outlier.											
310												
311	2. Observation Value 0.251 is a Potential Outlier (Lower											
312												
313	Test Statistic: 0.041											
314												
315	For 10% significance level, 0.251 is not an outlier.											
316	For 5% significance level, 0.251 is not an outlier.											
317	For 1% significance level, 0.251 is not an outlier.											
318												

	A	B	C	D	E	F	G	H	I	J	K	L
319												
320	Dixon's Outlier Test for Nickel (mg/L)											
321												
322	Number of Observations = 22											
323	10% critical value: 0.382											
324	5% critical value: 0.43											
325	1% critical value: 0.514											
326												
327	1. Observation Value 0.723 is a Potential Outlier (Upper											
328												
329	Test Statistic: 0.899											
330												
331	For 10% significance level, 0.723 is an outlier.											
332	For 5% significance level, 0.723 is an outlier.											
333	For 1% significance level, 0.723 is an outlier.											
334												
335	2. Observation Value 0.00069 is a Potential Outlier (Lowe											
336												
337	Test Statistic: 0.002											
338												
339	For 10% significance level, 0.00069 is not an outlier.											
340	For 5% significance level, 0.00069 is not an outlier.											
341	For 1% significance level, 0.00069 is not an outlier.											
342												
343												
344	Dixon's Outlier Test for Zinc (mg/L)											
345												
346	Number of Observations = 22											
347	10% critical value: 0.382											
348	5% critical value: 0.43											
349	1% critical value: 0.514											
350												
351	1. Observation Value 1.85 is a Potential Outlier (Upper T											
352												
353	Test Statistic: 0.947											
354												
355	For 10% significance level, 1.85 is an outlier.											
356	For 5% significance level, 1.85 is an outlier.											
357	For 1% significance level, 1.85 is an outlier.											
358												
359	2. Observation Value 0.001 is a Potential Outlier (Lower											
360												
361	Test Statistic: 0.000											
362												
363	For 10% significance level, 0.001 is not an outlier.											
364	For 5% significance level, 0.001 is not an outlier.											
365	For 1% significance level, 0.001 is not an outlier.											
366												

	A	B	C	D	E	F	G	H	I	J	K	L
1					Outlier Tests for Selected Uncensored Variables							
2				User Selected Options								
3			Date/Time of Computation	ProUCL 5.12025-12-22 12:08:36 PM								
4				From File	2025-SandstoneProUCL_i.xls							
5				Full Precision	OFF							
6												
7			89-3									
8			Dixon's Outlier Test for pH ()									
9												
10	Number of Observations = 24											
11	10% critical value: 0.367											
12	5% critical value: 0.413											
13	1% critical value: 0.497											
14												
15	1. Observation Value 8.4 is a Potential Outlier (Upper Ta											
16												
17	Test Statistic: 0.150											
18												
19	For 10% significance level, 8.4 is not an outlier.											
20	For 5% significance level, 8.4 is not an outlier.											
21	For 1% significance level, 8.4 is not an outlier.											
22												
23	2. Observation Value 7.3 is a Potential Outlier (Lower Tai											
24												
25	Test Statistic: 0.105											
26												
27	For 10% significance level, 7.3 is not an outlier.											
28	For 5% significance level, 7.3 is not an outlier.											
29	For 1% significance level, 7.3 is not an outlier.											
30												
31												
32			Dixon's Outlier Test for TDS (mg/L)									
33												
34	Number of Observations = 23											
35	10% critical value: 0.374											
36	5% critical value: 0.421											
37	1% critical value: 0.505											
38												
39	1. Observation Value 293 is a Potential Outlier (Upper Ta											
40												
41	Test Statistic: 0.324											
42												
43	For 10% significance level, 293 is not an outlier.											
44	For 5% significance level, 293 is not an outlier.											
45	For 1% significance level, 293 is not an outlier.											
46												
47	2. Observation Value 176 is a Potential Outlier (Lower Ta											
48												
49	Test Statistic: 0.074											
50												
51	For 10% significance level, 176 is not an outlier.											
52	For 5% significance level, 176 is not an outlier.											
53	For 1% significance level, 176 is not an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55												
56	Dixon's Outlier Test for Sulphate (mg/L)											
57												
58	Number of Observations = 24											
59	10% critical value: 0.367											
60	5% critical value: 0.413											
61	1% critical value: 0.497											
62												
63	1. Observation Value 30.1 is a Potential Outlier (Upper T											
64												
65	Test Statistic: 0.397											
66												
67	For 10% significance level, 30.1 is an outlier.											
68	For 5% significance level, 30.1 is not an outlier.											
69	For 1% significance level, 30.1 is not an outlier.											
70												
71	2. Observation Value 13.4 is a Potential Outlier (Lower T											
72												
73	Test Statistic: 0.150											
74												
75	For 10% significance level, 13.4 is not an outlier.											
76	For 5% significance level, 13.4 is not an outlier.											
77	For 1% significance level, 13.4 is not an outlier.											
78												
79												
80	Dixon's Outlier Test for DOC (mg/L)											
81												
82	Number of Observations = 17											
83	10% critical value: 0.438											
84	5% critical value: 0.49											
85	1% critical value: 0.577											
86												
87	1. Observation Value 7.1 is a Potential Outlier (Upper Ta											
88												
89	Test Statistic: 0.508											
90												
91	For 10% significance level, 7.1 is an outlier.											
92	For 5% significance level, 7.1 is an outlier.											
93	For 1% significance level, 7.1 is not an outlier.											
94												
95	2. Observation Value 0.83 is a Potential Outlier (Lower T											
96												
97	Test Statistic: 0.113											
98												
99	For 10% significance level, 0.83 is not an outlier.											
100	For 5% significance level, 0.83 is not an outlier.											
101	For 1% significance level, 0.83 is not an outlier.											
102												
103												
104	Dixon's Outlier Test for Bicarbonate (mg/L)											
105												
106	Number of Observations = 24											

	A	B	C	D	E	F	G	H	I	J	K	L
107	10% critical value: 0.367											
108	5% critical value: 0.413											
109	1% critical value: 0.497											
110												
111	1. Observation Value 245 is a Potential Outlier (Upper Ta											
112												
113	Test Statistic: 0.055											
114												
115	For 10% significance level, 245 is not an outlier.											
116	For 5% significance level, 245 is not an outlier.											
117	For 1% significance level, 245 is not an outlier.											
118												
119	2. Observation Value 186 is a Potential Outlier (Lower Ta											
120												
121	Test Statistic: 0.071											
122												
123	For 10% significance level, 186 is not an outlier.											
124	For 5% significance level, 186 is not an outlier.											
125	For 1% significance level, 186 is not an outlier.											
126												
127												
128	Dixon's Outlier Test for Calcium (mg/L)											
129												
130	Number of Observations = 24											
131	10% critical value: 0.367											
132	5% critical value: 0.413											
133	1% critical value: 0.497											
134												
135	1. Observation Value 48.4 is a Potential Outlier (Upper T											
136												
137	Test Statistic: 0.053											
138												
139	For 10% significance level, 48.4 is not an outlier.											
140	For 5% significance level, 48.4 is not an outlier.											
141	For 1% significance level, 48.4 is not an outlier.											
142												
143	2. Observation Value 35.4 is a Potential Outlier (Lower Ta											
144												
145	Test Statistic: 0.137											
146												
147	For 10% significance level, 35.4 is not an outlier.											
148	For 5% significance level, 35.4 is not an outlier.											
149	For 1% significance level, 35.4 is not an outlier.											
150												
151												
152	Dixon's Outlier Test for Magnesium (mg/L)											
153												
154	Number of Observations = 24											
155	10% critical value: 0.367											
156	5% critical value: 0.413											
157	1% critical value: 0.497											
158												
159	1. Observation Value 16.9 is a Potential Outlier (Upper T											

	A	B	C	D	E	F	G	H	I	J	K	L
160												
161	Test Statistic: 0.286											
162												
163	For 10% significance level, 16.9 is not an outlier.											
164	For 5% significance level, 16.9 is not an outlier.											
165	For 1% significance level, 16.9 is not an outlier.											
166												
167	2. Observation Value 10.9 is a Potential Outlier (Lower T											
168												
169	Test Statistic: 0.091											
170												
171	For 10% significance level, 10.9 is not an outlier.											
172	For 5% significance level, 10.9 is not an outlier.											
173	For 1% significance level, 10.9 is not an outlier.											
174												
175												
176	Dixon's Outlier Test for Sodium (mg/L)											
177												
178	Number of Observations = 24											
179	10% critical value: 0.367											
180	5% critical value: 0.413											
181	1% critical value: 0.497											
182												
183	1. Observation Value 62.4 is a Potential Outlier (Upper T											
184												
185	Test Statistic: 0.936											
186												
187	For 10% significance level, 62.4 is an outlier.											
188	For 5% significance level, 62.4 is an outlier.											
189	For 1% significance level, 62.4 is an outlier.											
190												
191	2. Observation Value 11.8 is a Potential Outlier (Lower T											
192												
193	Test Statistic: 0.158											
194												
195	For 10% significance level, 11.8 is not an outlier.											
196	For 5% significance level, 11.8 is not an outlier.											
197	For 1% significance level, 11.8 is not an outlier.											
198												
199												
200	Dixon's Outlier Test for Arsenic (mg/L)											
201												
202	Number of Observations = 21											
203	10% critical value: 0.391											
204	5% critical value: 0.44											
205	1% critical value: 0.524											
206												
207	1. Observation Value 0.0036 is a Potential Outlier (Uppe											
208												
209	Test Statistic: 0.197											
210												
211	For 10% significance level, 0.0036 is not an outlier.											
212	For 5% significance level, 0.0036 is not an outlier.											

	A	B	C	D	E	F	G	H	I	J	K	L
213	For 1% significance level, 0.0036 is not an outlier.											
214												
215	2. Observation Value 0.0001 is a Potential Outlier (Lower											
216												
217	Test Statistic: 0.035											
218												
219	For 10% significance level, 0.0001 is not an outlier.											
220	For 5% significance level, 0.0001 is not an outlier.											
221	For 1% significance level, 0.0001 is not an outlier.											
222												
223												
224		Dixon's Outlier Test for Iron (mg/L)										
225												
226	Number of Observations = 24											
227	10% critical value: 0.367											
228	5% critical value: 0.413											
229	1% critical value: 0.497											
230												
231	1. Observation Value 8.95 is a Potential Outlier (Upper T											
232												
233	Test Statistic: 0.094											
234												
235	For 10% significance level, 8.95 is not an outlier.											
236	For 5% significance level, 8.95 is not an outlier.											
237	For 1% significance level, 8.95 is not an outlier.											
238												
239	2. Observation Value 0.01 is a Potential Outlier (Lower Ta											
240												
241	Test Statistic: 0.006											
242												
243	For 10% significance level, 0.01 is not an outlier.											
244	For 5% significance level, 0.01 is not an outlier.											
245	For 1% significance level, 0.01 is not an outlier.											
246												
247												
248		Dixon's Outlier Test for Manganese (mg/L)										
249												
250	Number of Observations = 24											
251	10% critical value: 0.367											
252	5% critical value: 0.413											
253	1% critical value: 0.497											
254												
255	1. Observation Value 1.27 is a Potential Outlier (Upper T											
256												
257	Test Statistic: 0.138											
258												
259	For 10% significance level, 1.27 is not an outlier.											
260	For 5% significance level, 1.27 is not an outlier.											
261	For 1% significance level, 1.27 is not an outlier.											
262												
263	2. Observation Value 0.232 is a Potential Outlier (Lower											
264												
265	Test Statistic: 0.405											

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267	For 10% significance level, 0.232 is an outlier.											
268	For 5% significance level, 0.232 is not an outlier.											
269	For 1% significance level, 0.232 is not an outlier.											
270												
271												
272	Dixon's Outlier Test for Nickel (mg/L)											
273												
274	Number of Observations = 21											
275	10% critical value: 0.391											
276	5% critical value: 0.44											
277	1% critical value: 0.524											
278												
279	1. Observation Value 0.0287 is a Potential Outlier (Uppe											
280												
281	Test Statistic: 0.791											
282												
283	For 10% significance level, 0.0287 is an outlier.											
284	For 5% significance level, 0.0287 is an outlier.											
285	For 1% significance level, 0.0287 is an outlier.											
286												
287	2. Observation Value 0.00048 is a Potential Outlier (Lowe											
288												
289	Test Statistic: 0.003											
290												
291	For 10% significance level, 0.00048 is not an outlier.											
292	For 5% significance level, 0.00048 is not an outlier.											
293	For 1% significance level, 0.00048 is not an outlier.											
294												
295												
296	Dixon's Outlier Test for Zinc (mg/L)											
297												
298	Number of Observations = 21											
299	10% critical value: 0.391											
300	5% critical value: 0.44											
301	1% critical value: 0.524											
302												
303	1. Observation Value 4.23 is a Potential Outlier (Upper T											
304												
305	Test Statistic: 0.845											
306												
307	For 10% significance level, 4.23 is an outlier.											
308	For 5% significance level, 4.23 is an outlier.											
309	For 1% significance level, 4.23 is an outlier.											
310												
311	2. Observation Value 0.0011 is a Potential Outlier (Lower											
312												
313	Test Statistic: 0.003											
314												
315	For 10% significance level, 0.0011 is not an outlier.											
316	For 5% significance level, 0.0011 is not an outlier.											
317	For 1% significance level, 0.0011 is not an outlier.											
318												

	A	B	C	D	E	F	G	H	I	J	K	L
319												
320	Dixon's Outlier Test for TOC (mg/L)											
321												
322	Number of Observations = 4											
323	10% critical value: 0.679											
324	5% critical value: 0.765											
325	1% critical value: 0.889											
326												
327	1. Observation Value 9 is a Potential Outlier (Upper Tail)											
328												
329	Test Statistic: 0.929											
330												
331	For 10% significance level, 9 is an outlier.											
332	For 5% significance level, 9 is an outlier.											
333	For 1% significance level, 9 is an outlier.											
334												
335	2. Observation Value 0.6 is a Potential Outlier (Lower Tai											
336												
337	Test Statistic: 0.036											
338												
339	For 10% significance level, 0.6 is not an outlier.											
340	For 5% significance level, 0.6 is not an outlier.											
341	For 1% significance level, 0.6 is not an outlier.											
342												

App G4 Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Shallow

1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects								
2			User Selected Options									
3			Date/Time of Computation	ProUCL 5.12025-12-16 10:10:48 AM								
4			From File	2025-ShallowProUCL_b.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	0.95								
7												
8	01(R)-SH											
9	Chloride (mg/L)											
10												
11			Raw Statistics									
12			Number of Valid Observations	51								
13			Number of Distinct Observations	37								
14			Minimum	0.3								
15			Maximum	9.66								
16			Mean of Raw Data	2.303								
17			Standard Deviation of Raw Data	2.201								
18			Khat	1.616								
19			Theta hat	1.425								
20			Kstar	1.534								
21			Theta star	1.502								
22			Mean of Log Transformed Data	0.494								
23			Standard Deviation of Log Transformed Data	0.813								
24												
25			Normal GOF Test Results									
26												
27			Correlation Coefficient R	0.858								
28			Approximate Shapiro Wilk Test Statistic	0.736								
29			Approximate Shapiro Wilk P Value	1.856E-11								
30			Lilliefors Test Statistic	0.225								
31			Lilliefors Critical (0.05) Value	0.123								
32	Data not Normal at (0.05) Significance Level											
33												
34			Gamma GOF Test Results									
35												
36			Correlation Coefficient R	0.966								
37			A-D Test Statistic	1.173								
38			A-D Critical (0.05) Value	0.766								
39			K-S Test Statistic	0.14								
40			K-S Critical(0.05) Value	0.126								
41	Data not Gamma Distributed at (0.05) Significance Level											
42												
43			Lognormal GOF Test Results									
44												
45			Correlation Coefficient R	0.992								
46			Approximate Shapiro Wilk Test Statistic	0.972								
47			Approximate Shapiro Wilk P Value	0.432								
48			Lilliefors Test Statistic	0.0814								
49			Lilliefors Critical (0.05) Value	0.123								
50	Data appear Lognormal at (0.05) Significance Level											
51												
52	Arsenic (mg/L)											
53												

	A	B	C	D	E	F	G	H	I	J	K	L
54			Raw Statistics									
55			Number of Valid Observations			51						
56			Number of Distinct Observations			22						
57					Minimum	1.0000E-4						
58					Maximum	0.13						
59					Mean of Raw Data	0.00323						
60			Standard Deviation of Raw Data			0.0181						
61					Khat	0.381						
62					Theta hat	0.00848						
63					Kstar	0.372						
64					Theta star	0.0087						
65			Mean of Log Transformed Data			-7.473						
66			Standard Deviation of Log Transformed Data			1.093						
67												
68			Normal GOF Test Results									
69												
70					Correlation Coefficient R	0.355						
71			Approximate Shapiro Wilk Test Statistic			0.163						
72			Approximate Shapiro Wilk P Value			0						
73					Lilliefors Test Statistic	0.488						
74					Lilliefors Critical (0.05) Value	0.123						
75	Data not Normal at (0.05) Significance Level											
76												
77			Gamma GOF Test Results									
78												
79					Correlation Coefficient R	0.66						
80					A-D Test Statistic	10.63						
81					A-D Critical (0.05) Value	0.843						
82					K-S Test Statistic	0.348						
83					K-S Critical(0.05) Value	0.133						
84	Data not Gamma Distributed at (0.05) Significance Level											
85												
86			Lognormal GOF Test Results									
87												
88					Correlation Coefficient R	0.879						
89			Approximate Shapiro Wilk Test Statistic			0.809						
90			Approximate Shapiro Wilk P Value			1.6046E-8						
91					Lilliefors Test Statistic	0.186						
92					Lilliefors Critical (0.05) Value	0.123						
93	Data not Lognormal at (0.05) Significance Level											
94												
95	Non-parametric GOF Test Results											
96												
97	Data do not follow a discernible distribution at (0.05) Level of Signifi											
98												
99	Copper (mg/L)											
100												
101			Raw Statistics									
102			Number of Valid Observations			51						
103			Number of Distinct Observations			25						
104					Minimum	2.0000E-4						
105					Maximum	0.102						
106					Mean of Raw Data	0.0038						

107				Standard Deviation of Raw Data	0.0141							
108				Khat	0.64							
109				Theta hat	0.00594							
110				Kstar	0.616							
111				Theta star	0.00618							
112				Mean of Log Transformed Data	-6.528							
113				Standard Deviation of Log Transformed Data	0.99							
114												
115			Normal GOF Test Results									
116												
117				Correlation Coefficient R	0.418							
118				Approximate Shapiro Wilk Test Statistic	0.215							
119				Approximate Shapiro Wilk P Value	0							
120				Lilliefors Test Statistic	0.405							
121				Lilliefors Critical (0.05) Value	0.123							
122	Data not Normal at (0.05) Significance Level											
123												
124			Gamma GOF Test Results									
125												
126				Correlation Coefficient R	0.669							
127				A-D Test Statistic	6.524							
128				A-D Critical (0.05) Value	0.803							
129				K-S Test Statistic	0.286							
130				K-S Critical(0.05) Value	0.13							
131	Data not Gamma Distributed at (0.05) Significance Level											
132												
133			Lognormal GOF Test Results									
134												
135				Correlation Coefficient R	0.926							
136				Approximate Shapiro Wilk Test Statistic	0.886							
137				Approximate Shapiro Wilk P Value	4.8951E-5							
138				Lilliefors Test Statistic	0.179							
139				Lilliefors Critical (0.05) Value	0.123							
140	Data not Lognormal at (0.05) Significance Level											
141												
142	Non-parametric GOF Test Results											
143												
144	Data do not follow a discernible distribution at (0.05) Level of Signifi											
145												
146	Nickel (mg/L)											
147												
148			Raw Statistics									
149				Number of Valid Observations	50							
150				Number of Distinct Observations	39							
151				Minimum	0.0011							
152				Maximum	0.16							
153				Mean of Raw Data	0.0138							
154				Standard Deviation of Raw Data	0.0258							
155				Khat	0.771							
156				Theta hat	0.018							
157				Kstar	0.738							
158				Theta star	0.0188							
159				Mean of Log Transformed Data	-5.053							

Standard Deviation of Log Transformed Data				1.107	
Normal GOF Test Results					
			Correlation Coefficient R	0.681	
			Shapiro Wilk Test Statistic	0.499	
			Shapiro Wilk Critical (0.05) Value	0.947	
			Approximate Shapiro Wilk P Value	0	
			Lilliefors Test Statistic	0.311	
			Lilliefors Critical (0.05) Value	0.125	
Data not Normal at (0.05) Significance Level					
Gamma GOF Test Results					
			Correlation Coefficient R	0.911	
			A-D Test Statistic	3.47	
			A-D Critical (0.05) Value	0.792	
			K-S Test Statistic	0.221	
			K-S Critical(0.05) Value	0.13	
Data not Gamma Distributed at (0.05) Significance Level					
Lognormal GOF Test Results					
			Correlation Coefficient R	0.959	
			Shapiro Wilk Test Statistic	0.915	
			Shapiro Wilk Critical (0.05) Value	0.947	
			Approximate Shapiro Wilk P Value	0.0014	
			Lilliefors Test Statistic	0.168	
			Lilliefors Critical (0.05) Value	0.125	
Data not Lognormal at (0.05) Significance Level					
Non-parametric GOF Test Results					
Data do not follow a discernible distribution at (0.05) Level of Signifi					
Zinc (mg/L)					
		Raw Statistics			
			Number of Valid Observations	33	
			Number of Distinct Observations	27	
			Minimum	0.002	
			Maximum	0.099	
			Mean of Raw Data	0.0133	
			Standard Deviation of Raw Data	0.02	
			Khat	1.149	
			Theta hat	0.0116	
			Kstar	1.065	
			Theta star	0.0125	
			Mean of Log Transformed Data	-4.814	
			Standard Deviation of Log Transformed Data	0.862	
		Normal GOF Test Results			

	A	B	C	D	E	F	G	H	I	J	K	L
213				Correlation Coefficient R		0.7						
214				Shapiro Wilk Test Statistic		0.513						
215				Shapiro Wilk Critical (0.05) Value		0.931						
216				Approximate Shapiro Wilk P Value		1.876E-11						
217				Lilliefors Test Statistic		0.335						
218				Lilliefors Critical (0.05) Value		0.152						
219	Data not Normal at (0.05) Significance Level											
220												
221			Gamma GOF Test Results									
222												
223				Correlation Coefficient R		0.892						
224				A-D Test Statistic		2.611						
225				A-D Critical (0.05) Value		0.772						
226				K-S Test Statistic		0.211						
227				K-S Critical(0.05) Value		0.157						
228	Data not Gamma Distributed at (0.05) Significance Level											
229												
230			Lognormal GOF Test Results									
231												
232				Correlation Coefficient R		0.948						
233				Shapiro Wilk Test Statistic		0.903						
234				Shapiro Wilk Critical (0.05) Value		0.931						
235				Approximate Shapiro Wilk P Value		0.00658						
236				Lilliefors Test Statistic		0.154						
237				Lilliefors Critical (0.05) Value		0.152						
238	Data not Lognormal at (0.05) Significance Level											
239												
240	Non-parametric GOF Test Results											
241												
242	Data do not follow a discernible distribution at (0.05) Level of Signifi											

1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects								
2			User Selected Options									
3			Date/Time of Computation	ProUCL 5.12025-12-16 10:56:48 AM								
4			From File	2025-ShallowProUCL_c.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	0.95								
7												
8	03-SH											
9	Chloride (mg/L)											
10												
11			Raw Statistics									
12			Number of Valid Observations	58								
13			Number of Distinct Observations	23								
14			Minimum	0.01								
15			Maximum	4.4								
16			Mean of Raw Data	1.264								
17			Standard Deviation of Raw Data	0.813								
18			Khat	2.443								
19			Theta hat	0.517								
20			Kstar	2.328								
21			Theta star	0.543								
22			Mean of Log Transformed Data	0.0158								
23			Standard Deviation of Log Transformed Data	0.822								
24												
25			Normal GOF Test Results									
26												
27			Correlation Coefficient R	0.91								
28			Approximate Shapiro Wilk Test Statistic	0.84								
29			Approximate Shapiro Wilk P Value	3.0840E-8								
30			Lilliefors Test Statistic	0.227								
31			Lilliefors Critical (0.05) Value	0.116								
32	Data not Normal at (0.05) Significance Level											
33												
34			Gamma GOF Test Results									
35												
36			Correlation Coefficient R	0.979								
37			A-D Test Statistic	1.265								
38			A-D Critical (0.05) Value	0.761								
39			K-S Test Statistic	0.147								
40			K-S Critical(0.05) Value	0.118								
41	Data not Gamma Distributed at (0.05) Significance Level											
42												
43			Lognormal GOF Test Results									
44												
45			Correlation Coefficient R	0.85								
46			Approximate Shapiro Wilk Test Statistic	0.769								
47			Approximate Shapiro Wilk P Value	7.643E-12								
48			Lilliefors Test Statistic	0.177								
49			Lilliefors Critical (0.05) Value	0.116								
50	Data not Lognormal at (0.05) Significance Level											
51												
52	Non-parametric GOF Test Results											
53												

54	Data do not follow a discernible distribution at (0.05) Level of Signifi											
55												
56	Arsenic (mg/L)											
57												
58			Raw Statistics									
59				Number of Valid Observations	58							
60				Number of Distinct Observations	17							
61				Minimum	1.2000E-4							
62				Maximum	0.014							
63				Mean of Raw Data	5.4862E-4							
64				Standard Deviation of Raw Data	0.00182							
65				Khat	0.858							
66				Theta hat	6.3931E-4							
67				Kstar	0.825							
68				Theta star	6.6479E-4							
69				Mean of Log Transformed Data	-8.193							
70				Standard Deviation of Log Transformed Data	0.752							
71												
72			Normal GOF Test Results									
73												
74				Correlation Coefficient R	0.41							
75				Approximate Shapiro Wilk Test Statistic	0.21							
76				Approximate Shapiro Wilk P Value	0							
77				Lilliefors Test Statistic	0.429							
78				Lilliefors Critical (0.05) Value	0.116							
79	Data not Normal at (0.05) Significance Level											
80												
81			Gamma GOF Test Results									
82												
83				Correlation Coefficient R	0.639							
84				A-D Test Statistic	10.27							
85				A-D Critical (0.05) Value	0.787							
86				K-S Test Statistic	0.359							
87				K-S Critical(0.05) Value	0.121							
88	Data not Gamma Distributed at (0.05) Significance Level											
89												
90			Lognormal GOF Test Results									
91												
92				Correlation Coefficient R	0.828							
93				Approximate Shapiro Wilk Test Statistic	0.717							
94				Approximate Shapiro Wilk P Value	2.753E-14							
95				Lilliefors Test Statistic	0.236							
96				Lilliefors Critical (0.05) Value	0.116							
97	Data not Lognormal at (0.05) Significance Level											
98												
99	Non-parametric GOF Test Results											
100												
101	Data do not follow a discernible distribution at (0.05) Level of Signifi											
102												
103	Chromium (mg/L)											
104												
105			Raw Statistics									
106				Number of Valid Observations	58							

107				Number of Distinct Observations	22							
108				Minimum	2.9000E-4							
109				Maximum	0.018							
110				Mean of Raw Data	0.00303							
111				Standard Deviation of Raw Data	0.00388							
112				Khat	1.107							
113				Theta hat	0.00273							
114				Kstar	1.061							
115				Theta star	0.00285							
116				Mean of Log Transformed Data	-6.316							
117				Standard Deviation of Log Transformed Data	0.967							
118												
119			Normal GOF Test Results									
120												
121				Correlation Coefficient R	0.788							
122				Approximate Shapiro Wilk Test Statistic	0.629							
123				Approximate Shapiro Wilk P Value	0							
124				Lilliefors Test Statistic	0.324							
125				Lilliefors Critical (0.05) Value	0.116							
126	Data not Normal at (0.05) Significance Level											
127												
128			Gamma GOF Test Results									
129												
130				Correlation Coefficient R	0.951							
131				A-D Test Statistic	3.27							
132				A-D Critical (0.05) Value	0.777							
133				K-S Test Statistic	0.246							
134				K-S Critical(0.05) Value	0.12							
135	Data not Gamma Distributed at (0.05) Significance Level											
136												
137			Lognormal GOF Test Results									
138												
139				Correlation Coefficient R	0.965							
140				Approximate Shapiro Wilk Test Statistic	0.92							
141				Approximate Shapiro Wilk P Value	7.9776E-4							
142				Lilliefors Test Statistic	0.172							
143				Lilliefors Critical (0.05) Value	0.116							
144	Data not Lognormal at (0.05) Significance Level											
145												
146	Non-parametric GOF Test Results											
147												
148	Data do not follow a discernible distribution at (0.05) Level of Signifi											
149												
150	Manganese (mg/L)											
151												
152			Raw Statistics									
153				Number of Valid Observations	33							
154				Number of Distinct Observations	30							
155				Minimum	8.8000E-4							
156				Maximum	0.266							
157				Mean of Raw Data	0.0557							
158				Standard Deviation of Raw Data	0.0692							
159				Khat	0.576							

160					Theta hat	0.0967						
161					Kstar	0.544						
162					Theta star	0.102						
163					Mean of Log Transformed Data	-3.966						
164					Standard Deviation of Log Transformed Data	1.727						
165												
166				Normal GOF Test Results								
167												
168					Correlation Coefficient R	0.887						
169					Shapiro Wilk Test Statistic	0.785						
170					Shapiro Wilk Critical (0.05) Value	0.931						
171					Approximate Shapiro Wilk P Value	4.6722E-6						
172					Lilliefors Test Statistic	0.24						
173					Lilliefors Critical (0.05) Value	0.152						
174	Data not Normal at (0.05) Significance Level											
175												
176				Gamma GOF Test Results								
177												
178					Correlation Coefficient R	0.973						
179					A-D Test Statistic	0.699						
180					A-D Critical (0.05) Value	0.804						
181					K-S Test Statistic	0.123						
182					K-S Critical(0.05) Value	0.161						
183	Data appear Gamma Distributed at (0.05) Significance Level											
184												
185				Lognormal GOF Test Results								
186												
187					Correlation Coefficient R	0.979						
188					Shapiro Wilk Test Statistic	0.937						
189					Shapiro Wilk Critical (0.05) Value	0.931						
190					Approximate Shapiro Wilk P Value	0.07						
191					Lilliefors Test Statistic	0.112						
192					Lilliefors Critical (0.05) Value	0.152						
193	Data appear Lognormal at (0.05) Significance Level											
194												
195	Nickel (mg/L)											
196												
197				Raw Statistics								
198					Number of Valid Observations	35						
199					Number of Distinct Observations	28						
200					Minimum	0.00149						
201					Maximum	0.015						
202					Mean of Raw Data	0.00521						
203					Standard Deviation of Raw Data	0.00349						
204					Khat	2.93						
205					Theta hat	0.00178						
206					Kstar	2.698						
207					Theta star	0.00193						
208					Mean of Log Transformed Data	-5.438						
209					Standard Deviation of Log Transformed Data	0.595						
210												
211				Normal GOF Test Results								
212												

213				Correlation Coefficient R	0.903							
214				Shapiro Wilk Test Statistic	0.812							
215				Shapiro Wilk Critical (0.05) Value	0.934							
216				Approximate Shapiro Wilk P Value	1.0731E-5							
217				Lilliefors Test Statistic	0.238							
218				Lilliefors Critical (0.05) Value	0.148							
219	Data not Normal at (0.05) Significance Level											
220												
221			Gamma GOF Test Results									
222												
223				Correlation Coefficient R	0.971							
224				A-D Test Statistic	0.672							
225				A-D Critical (0.05) Value	0.754							
226				K-S Test Statistic	0.163							
227				K-S Critical(0.05) Value	0.15							
228	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
229												
230			Lognormal GOF Test Results									
231												
232				Correlation Coefficient R	0.989							
233				Shapiro Wilk Test Statistic	0.966							
234				Shapiro Wilk Critical (0.05) Value	0.934							
235				Approximate Shapiro Wilk P Value	0.42							
236				Lilliefors Test Statistic	0.121							
237				Lilliefors Critical (0.05) Value	0.148							
238	Data appear Lognormal at (0.05) Significance Level											
239												
240	Zinc (mg/L)											
241												
242				Raw Statistics								
243				Number of Valid Observations	35							
244				Number of Distinct Observations	30							
245				Minimum	0.001							
246				Maximum	0.0259							
247				Mean of Raw Data	0.00635							
248				Standard Deviation of Raw Data	0.00581							
249				Khat	1.587							
250				Theta hat	0.004							
251				Kstar	1.47							
252				Theta star	0.00432							
253				Mean of Log Transformed Data	-5.407							
254				Standard Deviation of Log Transformed Data	0.85							
255												
256			Normal GOF Test Results									
257												
258				Correlation Coefficient R	0.885							
259				Shapiro Wilk Test Statistic	0.788							
260				Shapiro Wilk Critical (0.05) Value	0.934							
261				Approximate Shapiro Wilk P Value	2.4981E-6							
262				Lilliefors Test Statistic	0.186							
263				Lilliefors Critical (0.05) Value	0.148							
264	Data not Normal at (0.05) Significance Level											
265												

	A	B	C	D	E	F	G	H	I	J	K	L
266				Gamma GOF Test Results								
267												
268					Correlation Coefficient R	0.983						
269					A-D Test Statistic	0.474						
270					A-D Critical (0.05) Value	0.765						
271					K-S Test Statistic	0.0909						
272					K-S Critical(0.05) Value	0.151						
273	Data appear Gamma Distributed at (0.05) Significance Level											
274												
275				Lognormal GOF Test Results								
276												
277					Correlation Coefficient R	0.993						
278					Shapiro Wilk Test Statistic	0.973						
279					Shapiro Wilk Critical (0.05) Value	0.934						
280					Approximate Shapiro Wilk P Value	0.602						
281					Lilliefors Test Statistic	0.0848						
282					Lilliefors Critical (0.05) Value	0.148						
283	Data appear Lognormal at (0.05) Significance Level											

	Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects	
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-16 11:17:49 AM	
From File	2025-ShallowProUCL_d.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

04-SH

Chloride (mg/L)

Raw Statistics	
Number of Valid Observations	57
Number of Distinct Observations	16
Minimum	0.01
Maximum	3.2
Mean of Raw Data	0.636
Standard Deviation of Raw Data	0.496
Khat	1.35
Theta hat	0.471
Kstar	1.291
Theta star	0.493
Mean of Log Transformed Data	-0.866
Standard Deviation of Log Transformed Data	1.27

Normal GOF Test Results

Correlation Coefficient R	0.832
Approximate Shapiro Wilk Test Statistic	0.725
Approximate Shapiro Wilk P Value	1.268E-13
Lilliefors Test Statistic	0.295
Lilliefors Critical (0.05) Value	0.117

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.932
A-D Test Statistic	5.671
A-D Critical (0.05) Value	0.772
K-S Test Statistic	0.335
K-S Critical(0.05) Value	0.12

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.8
Approximate Shapiro Wilk Test Statistic	0.646
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.379
Lilliefors Critical (0.05) Value	0.117

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

54	Data do not follow a discernible distribution at (0.05) Level of Signifi											
55												
56	Arsenic (mg/L)											
57												
58			Raw Statistics									
59				Number of Valid Observations	57							
60				Number of Distinct Observations	10							
61				Minimum	1.0000E-4							
62				Maximum	0.0016							
63				Mean of Raw Data	2.7474E-4							
64				Standard Deviation of Raw Data	2.2921E-4							
65				Khat	2.94							
66				Theta hat	9.3444E-5							
67				Kstar	2.797							
68				Theta star	9.8223E-5							
69				Mean of Log Transformed Data	-8.379							
70				Standard Deviation of Log Transformed Data	0.545							
71												
72			Normal GOF Test Results									
73												
74				Correlation Coefficient R	0.744							
75				Approximate Shapiro Wilk Test Statistic	0.589							
76				Approximate Shapiro Wilk P Value	0							
77				Lilliefors Test Statistic	0.312							
78				Lilliefors Critical (0.05) Value	0.117							
79	Data not Normal at (0.05) Significance Level											
80												
81			Gamma GOF Test Results									
82												
83				Correlation Coefficient R	0.859							
84				A-D Test Statistic	3.816							
85				A-D Critical (0.05) Value	0.758							
86				K-S Test Statistic	0.308							
87				K-S Critical(0.05) Value	0.119							
88	Data not Gamma Distributed at (0.05) Significance Level											
89												
90			Lognormal GOF Test Results									
91												
92				Correlation Coefficient R	0.933							
93				Approximate Shapiro Wilk Test Statistic	0.877							
94				Approximate Shapiro Wilk P Value	3.9424E-6							
95				Lilliefors Test Statistic	0.284							
96				Lilliefors Critical (0.05) Value	0.117							
97	Data not Lognormal at (0.05) Significance Level											
98												
99	Non-parametric GOF Test Results											
100												
101	Data do not follow a discernible distribution at (0.05) Level of Signifi											
102												
103	Chromium (mg/L)											
104												
105			Raw Statistics									
106				Number of Valid Observations	57							

107				Number of Distinct Observations	29							
108				Minimum	1.0000E-4							
109				Maximum	0.04							
110				Mean of Raw Data	0.00598							
111				Standard Deviation of Raw Data	0.008							
112				Khat	0.795							
113				Theta hat	0.00752							
114				Kstar	0.765							
115				Theta star	0.00782							
116				Mean of Log Transformed Data	-5.867							
117				Standard Deviation of Log Transformed Data	1.267							
118												
119			Normal GOF Test Results									
120												
121				Correlation Coefficient R	0.827							
122				Approximate Shapiro Wilk Test Statistic	0.695							
123				Approximate Shapiro Wilk P Value	5.884E-15							
124				Lilliefors Test Statistic	0.231							
125				Lilliefors Critical (0.05) Value	0.117							
126	Data not Normal at (0.05) Significance Level											
127												
128			Gamma GOF Test Results									
129												
130				Correlation Coefficient R	0.987							
131				A-D Test Statistic	2.229							
132				A-D Critical (0.05) Value	0.79							
133				K-S Test Statistic	0.199							
134				K-S Critical(0.05) Value	0.122							
135	Data not Gamma Distributed at (0.05) Significance Level											
136												
137			Lognormal GOF Test Results									
138												
139				Correlation Coefficient R	0.968							
140				Approximate Shapiro Wilk Test Statistic	0.935							
141				Approximate Shapiro Wilk P Value	0.00584							
142				Lilliefors Test Statistic	0.198							
143				Lilliefors Critical (0.05) Value	0.117							
144	Data not Lognormal at (0.05) Significance Level											
145												
146	Non-parametric GOF Test Results											
147												
148	Data do not follow a discernible distribution at (0.05) Level of Signifi											
149												
150	Copper (mg/L)											
151												
152			Raw Statistics									
153				Number of Valid Observations	57							
154				Number of Distinct Observations	26							
155				Minimum	5.2000E-4							
156				Maximum	0.013							
157				Mean of Raw Data	0.00267							
158				Standard Deviation of Raw Data	0.00246							
159				Khat	1.676							

	A	B	C	D	E	F	G	H	I	J	K	L
160					Theta hat	0.00159						
161					Kstar	1.6						
162					Theta star	0.00167						
163				Mean of Log Transformed Data		-6.253						
164			Standard Deviation of Log Transformed Data			0.795						
165												
166			Normal GOF Test Results									
167												
168				Correlation Coefficient R		0.873						
169			Approximate Shapiro Wilk Test Statistic			0.773						
170				Approximate Shapiro Wilk P Value		2.072E-11						
171				Lilliefors Test Statistic		0.239						
172				Lilliefors Critical (0.05) Value		0.117						
173	Data not Normal at (0.05) Significance Level											
174												
175			Gamma GOF Test Results									
176												
177				Correlation Coefficient R		0.982						
178				A-D Test Statistic		1.405						
179				A-D Critical (0.05) Value		0.766						
180				K-S Test Statistic		0.168						
181				K-S Critical(0.05) Value		0.12						
182	Data not Gamma Distributed at (0.05) Significance Level											
183												
184			Lognormal GOF Test Results									
185												
186				Correlation Coefficient R		0.983						
187			Approximate Shapiro Wilk Test Statistic			0.951						
188				Approximate Shapiro Wilk P Value		0.0446						
189				Lilliefors Test Statistic		0.128						
190				Lilliefors Critical (0.05) Value		0.117						
191	Data not Lognormal at (0.05) Significance Level											
192												
193	Non-parametric GOF Test Results											
194												
195	Data do not follow a discernible distribution at (0.05) Level of Signifi											
196												
197	Manganese (mg/L)											
198												
199			Raw Statistics									
200				Number of Valid Observations		33						
201				Number of Distinct Observations		33						
202					Minimum	0.004						
203					Maximum	0.524						
204					Mean of Raw Data	0.144						
205				Standard Deviation of Raw Data		0.142						
206					Khat	1.009						
207					Theta hat	0.143						
208					Kstar	0.937						
209					Theta star	0.154						
210				Mean of Log Transformed Data		-2.507						
211			Standard Deviation of Log Transformed Data			1.221						
212												

	A	B	C	D	E	F	G	H	I	J	K	L
213			Normal GOF Test Results									
214												
215					Correlation Coefficient R	0.918						
216					Shapiro Wilk Test Statistic	0.835						
217					Shapiro Wilk Critical (0.05) Value	0.931						
218					Approximate Shapiro Wilk P Value	8.3717E-5						
219					Lilliefors Test Statistic	0.213						
220					Lilliefors Critical (0.05) Value	0.152						
221	Data not Normal at (0.05) Significance Level											
222												
223			Gamma GOF Test Results									
224												
225					Correlation Coefficient R	0.981						
226					A-D Test Statistic	0.3						
227					A-D Critical (0.05) Value	0.775						
228					K-S Test Statistic	0.101						
229					K-S Critical(0.05) Value	0.158						
230	Data appear Gamma Distributed at (0.05) Significance Level											
231												
232			Lognormal GOF Test Results									
233												
234					Correlation Coefficient R	0.984						
235					Shapiro Wilk Test Statistic	0.961						
236					Shapiro Wilk Critical (0.05) Value	0.931						
237					Approximate Shapiro Wilk P Value	0.333						
238					Lilliefors Test Statistic	0.0877						
239					Lilliefors Critical (0.05) Value	0.152						
240	Data appear Lognormal at (0.05) Significance Level											
241												
242	Nickel (mg/L)											
243												
244			Raw Statistics									
245					Number of Valid Observations	35						
246					Number of Distinct Observations	29						
247					Minimum	0.00105						
248					Maximum	0.018						
249					Mean of Raw Data	0.00411						
250					Standard Deviation of Raw Data	0.00345						
251					Khat	2.249						
252					Theta hat	0.00183						
253					Kstar	2.075						
254					Theta star	0.00198						
255					Mean of Log Transformed Data	-5.732						
256					Standard Deviation of Log Transformed Data	0.672						
257												
258			Normal GOF Test Results									
259												
260					Correlation Coefficient R	0.84						
261					Shapiro Wilk Test Statistic	0.723						
262					Shapiro Wilk Critical (0.05) Value	0.934						
263					Approximate Shapiro Wilk P Value	6.6051E-8						
264					Lilliefors Test Statistic	0.24						
265					Lilliefors Critical (0.05) Value	0.148						

	A	B	C	D	E	F	G	H	I	J	K	L
266	Data not Normal at (0.05) Significance Level											
267												
268				Gamma GOF Test Results								
269												
270					Correlation Coefficient R	0.942						
271					A-D Test Statistic	0.763						
272					A-D Critical (0.05) Value	0.758						
273					K-S Test Statistic	0.145						
274					K-S Critical(0.05) Value	0.15						
275	Data appear Gamma Distributed at (0.05) Significance Level											
276												
277				Lognormal GOF Test Results								
278												
279					Correlation Coefficient R	0.983						
280					Shapiro Wilk Test Statistic	0.962						
281					Shapiro Wilk Critical (0.05) Value	0.934						
282					Approximate Shapiro Wilk P Value	0.326						
283					Lilliefors Test Statistic	0.11						
284					Lilliefors Critical (0.05) Value	0.148						
285	Data appear Lognormal at (0.05) Significance Level											
286												
287	Zinc (mg/L)											
288												
289				Raw Statistics								
290					Number of Valid Observations	35						
291					Number of Distinct Observations	17						
292					Minimum	0.001						
293					Maximum	0.0235						
294					Mean of Raw Data	0.00375						
295					Standard Deviation of Raw Data	0.00404						
296					Khat	1.65						
297					Theta hat	0.00228						
298					Kstar	1.527						
299					Theta star	0.00246						
300					Mean of Log Transformed Data	-5.918						
301					Standard Deviation of Log Transformed Data	0.785						
302												
303				Normal GOF Test Results								
304												
305					Correlation Coefficient R	0.769						
306					Shapiro Wilk Test Statistic	0.622						
307					Shapiro Wilk Critical (0.05) Value	0.934						
308					Approximate Shapiro Wilk P Value	4.472E-10						
309					Lilliefors Test Statistic	0.248						
310					Lilliefors Critical (0.05) Value	0.148						
311	Data not Normal at (0.05) Significance Level											
312												
313				Gamma GOF Test Results								
314												
315					Correlation Coefficient R	0.9						
316					A-D Test Statistic	1.035						
317					A-D Critical (0.05) Value	0.765						
318					K-S Test Statistic	0.134						

	A	B	C	D	E	F	G	H	I	J	K	L
319					K-S Critical(0.05) Value	0.151						
320	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
321												
322			Lognormal GOF Test Results									
323												
324					Correlation Coefficient R	0.964						
325					Shapiro Wilk Test Statistic	0.922						
326					Shapiro Wilk Critical (0.05) Value	0.934						
327					Approximate Shapiro Wilk P Value	0.0196						
328					Lilliefors Test Statistic	0.125						
329					Lilliefors Critical (0.05) Value	0.148						
330	Data appear Approximate_Lognormal at (0.05) Significance Level											

	Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects	
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-16 11:50:49 AM	
From File	2025-ShallowProUCL_e.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

05-SH

Chloride (mg/L)

Raw Statistics	
Number of Valid Observations	56
Number of Distinct Observations	37
Minimum	0.1
Maximum	2.72
Mean of Raw Data	1.391
Standard Deviation of Raw Data	0.748
Khat	2.491
Theta hat	0.558
Kstar	2.37
Theta star	0.587
Mean of Log Transformed Data	0.116
Standard Deviation of Log Transformed Data	0.757

Normal GOF Test Results	
Correlation Coefficient R	0.983
Approximate Shapiro Wilk Test Statistic	0.941
Approximate Shapiro Wilk P Value	0.0132
Lilliefors Test Statistic	0.108
Lilliefors Critical (0.05) Value	0.118

Data appear Approximate Normal at (0.05) Significance Level

Gamma GOF Test Results	
Correlation Coefficient R	0.939
A-D Test Statistic	1.127
A-D Critical (0.05) Value	0.76
K-S Test Statistic	0.115
K-S Critical(0.05) Value	0.12

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal GOF Test Results	
Correlation Coefficient R	0.944
Approximate Shapiro Wilk Test Statistic	0.884
Approximate Shapiro Wilk P Value	1.1850E-5
Lilliefors Test Statistic	0.139
Lilliefors Critical (0.05) Value	0.118

Data not Lognormal at (0.05) Significance Level

Arsenic (mg/L)

Raw Statistics		
Number of Valid Observations	58	
Number of Distinct Observations	16	
Minimum	1.5000E-4	
Maximum	0.0019	
Mean of Raw Data	3.3345E-4	
Standard Deviation of Raw Data	2.8578E-4	
Khat	3.013	
Theta hat	1.1065E-4	
Kstar	2.869	
Theta star	1.1622E-4	
Mean of Log Transformed Data	-8.181	
Standard Deviation of Log Transformed Data	0.519	
Normal GOF Test Results		
Correlation Coefficient R	0.716	
Approximate Shapiro Wilk Test Statistic	0.543	
Approximate Shapiro Wilk P Value	0	
Lilliefors Test Statistic	0.26	
Lilliefors Critical (0.05) Value	0.116	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.843	
A-D Test Statistic	5.363	
A-D Critical (0.05) Value	0.758	
K-S Test Statistic	0.262	
K-S Critical(0.05) Value	0.118	
Data not Gamma Distributed at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.885	
Approximate Shapiro Wilk Test Statistic	0.789	
Approximate Shapiro Wilk P Value	7.866E-11	
Lilliefors Test Statistic	0.262	
Lilliefors Critical (0.05) Value	0.116	
Data not Lognormal at (0.05) Significance Level		
Non-parametric GOF Test Results		
Data do not follow a discernible distribution at (0.05) Level of Signifi		
Copper (mg/L)		
Raw Statistics		
Number of Valid Observations	58	
Number of Distinct Observations	26	
Minimum	7.0000E-4	
Maximum	0.009	
Mean of Raw Data	0.00272	

107				Standard Deviation of Raw Data	0.00205							
108				Khat	2.097							
109				Theta hat	0.0013							
110				Kstar	2							
111				Theta star	0.00136							
112				Mean of Log Transformed Data	-6.165							
113				Standard Deviation of Log Transformed Data	0.718							
114												
115			Normal GOF Test Results									
116												
117				Correlation Coefficient R	0.911							
118				Approximate Shapiro Wilk Test Statistic	0.821							
119				Approximate Shapiro Wilk P Value	3.2419E-9							
120				Lilliefors Test Statistic	0.171							
121				Lilliefors Critical (0.05) Value	0.116							
122	Data not Normal at (0.05) Significance Level											
123												
124			Gamma GOF Test Results									
125												
126				Correlation Coefficient R	0.98							
127				A-D Test Statistic	1.972							
128				A-D Critical (0.05) Value	0.762							
129				K-S Test Statistic	0.164							
130				K-S Critical(0.05) Value	0.118							
131	Data not Gamma Distributed at (0.05) Significance Level											
132												
133			Lognormal GOF Test Results									
134												
135				Correlation Coefficient R	0.964							
136				Approximate Shapiro Wilk Test Statistic	0.907							
137				Approximate Shapiro Wilk P Value	1.4147E-4							
138				Lilliefors Test Statistic	0.161							
139				Lilliefors Critical (0.05) Value	0.116							
140	Data not Lognormal at (0.05) Significance Level											
141												
142	Non-parametric GOF Test Results											
143												
144	Data do not follow a discernible distribution at (0.05) Level of Signifi											
145												
146	Manganese (mg/L)											
147												
148			Raw Statistics									
149				Number of Valid Observations	34							
150				Number of Distinct Observations	33							
151				Minimum	7.5000E-4							
152				Maximum	0.625							
153				Mean of Raw Data	0.196							
154				Standard Deviation of Raw Data	0.18							
155				Khat	0.643							
156				Theta hat	0.305							
157				Kstar	0.606							
158				Theta star	0.324							
159				Mean of Log Transformed Data	-2.579							

Standard Deviation of Log Transformed Data	1.986	
Normal GOF Test Results		
Correlation Coefficient R	0.946	
Shapiro Wilk Test Statistic	0.881	
Shapiro Wilk Critical (0.05) Value	0.933	
Approximate Shapiro Wilk P Value	0.00122	
Lilliefors Test Statistic	0.178	
Lilliefors Critical (0.05) Value	0.15	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.919	
A-D Test Statistic	0.962	
A-D Critical (0.05) Value	0.798	
K-S Test Statistic	0.13	
K-S Critical(0.05) Value	0.158	
Data follow Appr. Gamma Distribution at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.914	
Shapiro Wilk Test Statistic	0.822	
Shapiro Wilk Critical (0.05) Value	0.933	
Approximate Shapiro Wilk P Value	2.8253E-5	
Lilliefors Test Statistic	0.211	
Lilliefors Critical (0.05) Value	0.15	
Data not Lognormal at (0.05) Significance Level		
Nickel (mg/L)		
Raw Statistics		
Number of Valid Observations	35	
Number of Distinct Observations	28	
Minimum	7.4000E-4	
Maximum	0.015	
Mean of Raw Data	0.00409	
Standard Deviation of Raw Data	0.00325	
Khat	1.946	
Theta hat	0.0021	
Kstar	1.798	
Theta star	0.00227	
Mean of Log Transformed Data	-5.779	
Standard Deviation of Log Transformed Data	0.776	
Normal GOF Test Results		
Correlation Coefficient R	0.895	
Shapiro Wilk Test Statistic	0.806	
Shapiro Wilk Critical (0.05) Value	0.934	
Approximate Shapiro Wilk P Value	7.6547E-6	

213				Lilliefors Test Statistic	0.161							
214				Lilliefors Critical (0.05) Value	0.148							
215	Data not Normal at (0.05) Significance Level											
216												
217			Gamma GOF Test Results									
218												
219				Correlation Coefficient R	0.967							
220				A-D Test Statistic	0.477							
221				A-D Critical (0.05) Value	0.76							
222				K-S Test Statistic	0.0864							
223				K-S Critical(0.05) Value	0.151							
224	Data appear Gamma Distributed at (0.05) Significance Level											
225												
226			Lognormal GOF Test Results									
227												
228				Correlation Coefficient R	0.984							
229				Shapiro Wilk Test Statistic	0.957							
230				Shapiro Wilk Critical (0.05) Value	0.934							
231				Approximate Shapiro Wilk P Value	0.241							
232				Lilliefors Test Statistic	0.116							
233				Lilliefors Critical (0.05) Value	0.148							
234	Data appear Lognormal at (0.05) Significance Level											
235												
236	Zinc (mg/L)											
237												
238			Raw Statistics									
239				Number of Valid Observations	35							
240				Number of Distinct Observations	21							
241				Minimum	0.001							
242				Maximum	0.078							
243				Mean of Raw Data	0.00639							
244				Standard Deviation of Raw Data	0.0136							
245				Khat	0.775							
246				Theta hat	0.00824							
247				Kstar	0.728							
248				Theta star	0.00878							
249				Mean of Log Transformed Data	-5.822							
250				Standard Deviation of Log Transformed Data	1.041							
251												
252			Normal GOF Test Results									
253												
254				Correlation Coefficient R	0.616							
255				Shapiro Wilk Test Statistic	0.414							
256				Shapiro Wilk Critical (0.05) Value	0.934							
257				Approximate Shapiro Wilk P Value	7.128E-14							
258				Lilliefors Test Statistic	0.37							
259				Lilliefors Critical (0.05) Value	0.148							
260	Data not Normal at (0.05) Significance Level											
261												
262			Gamma GOF Test Results									
263												
264				Correlation Coefficient R	0.856							
265				A-D Test Statistic	3.136							

	A	B	C	D	E	F	G	H	I	J	K	L
266				A-D Critical (0.05) Value		0.786						
267				K-S Test Statistic		0.295						
268				K-S Critical(0.05) Value		0.154						
269	Data not Gamma Distributed at (0.05) Significance Level											
270												
271			Lognormal GOF Test Results									
272												
273				Correlation Coefficient R		0.934						
274				Shapiro Wilk Test Statistic		0.872						
275				Shapiro Wilk Critical (0.05) Value		0.934						
276				Approximate Shapiro Wilk P Value		5.3740E-4						
277				Lilliefors Test Statistic		0.186						
278				Lilliefors Critical (0.05) Value		0.148						
279	Data not Lognormal at (0.05) Significance Level											
280												
281	Non-parametric GOF Test Results											
282												
283	Data do not follow a discernible distribution at (0.05) Level of Signifi											

	Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects										
	User Selected Options										
	Date/Time of Computation	ProUCL 5.12025-12-16 12:36:08 PM									
	From File	2025-ShallowProUCL_f.xls									
	Full Precision	OFF									
	Confidence Coefficient	0.95									
06-SH											
Chloride (mg/L)											
	Raw Statistics										
	Number of Valid Observations	51									
	Number of Distinct Observations	40									
	Minimum	0.5									
	Maximum	5.2									
	Mean of Raw Data	1.89									
	Standard Deviation of Raw Data	0.911									
	Khat	4.774									
	Theta hat	0.396									
	Kstar	4.506									
	Theta star	0.42									
	Mean of Log Transformed Data	0.528									
	Standard Deviation of Log Transformed Data	0.474									
	Normal GOF Test Results										
	Correlation Coefficient R	0.953									
	Approximate Shapiro Wilk Test Statistic	0.915									
	Approximate Shapiro Wilk P Value	0.00119									
	Lilliefors Test Statistic	0.144									
	Lilliefors Critical (0.05) Value	0.123									
Data not Normal at (0.05) Significance Level											
	Gamma GOF Test Results										
	Correlation Coefficient R	0.987									
	A-D Test Statistic	0.546									
	A-D Critical (0.05) Value	0.754									
	K-S Test Statistic	0.112									
	K-S Critical(0.05) Value	0.125									
Data appear Gamma Distributed at (0.05) Significance Level											
	Lognormal GOF Test Results										
	Correlation Coefficient R	0.99									
	Approximate Shapiro Wilk Test Statistic	0.982									
	Approximate Shapiro Wilk P Value	0.792									
	Lilliefors Test Statistic	0.0887									
	Lilliefors Critical (0.05) Value	0.123									
Data appear Lognormal at (0.05) Significance Level											
Arsenic (mg/L)											

	A	B	C	D	E	F	G	H	I	J	K	L
54			Raw Statistics									
55					Number of Valid Observations	52						
56					Number of Distinct Observations	24						
57					Minimum	2.0000E-4						
58					Maximum	0.00208						
59					Mean of Raw Data	5.2577E-4						
60					Standard Deviation of Raw Data	3.6759E-4						
61					Khat	2.678						
62					Theta hat	1.9631E-4						
63					Kstar	2.537						
64					Theta star	2.0728E-4						
65					Mean of Log Transformed Data	-7.749						
66					Standard Deviation of Log Transformed Data	0.622						
67												
68			Normal GOF Test Results									
69												
70					Correlation Coefficient R	0.897						
71					Approximate Shapiro Wilk Test Statistic	0.816						
72					Approximate Shapiro Wilk P Value	2.1729E-8						
73					Lilliefors Test Statistic	0.188						
74					Lilliefors Critical (0.05) Value	0.122						
75	Data not Normal at (0.05) Significance Level											
76												
77			Gamma GOF Test Results									
78												
79					Correlation Coefficient R	0.976						
80					A-D Test Statistic	1.226						
81					A-D Critical (0.05) Value	0.759						
82					K-S Test Statistic	0.126						
83					K-S Critical(0.05) Value	0.124						
84	Data not Gamma Distributed at (0.05) Significance Level											
85												
86			Lognormal GOF Test Results									
87												
88					Correlation Coefficient R	0.968						
89					Approximate Shapiro Wilk Test Statistic	0.919						
90					Approximate Shapiro Wilk P Value	0.00152						
91					Lilliefors Test Statistic	0.142						
92					Lilliefors Critical (0.05) Value	0.122						
93	Data not Lognormal at (0.05) Significance Level											
94												
95	Non-parametric GOF Test Results											
96												
97	Data do not follow a discernible distribution at (0.05) Level of Signifi											
98												
99	Copper (mg/L)											
100												
101			Raw Statistics									
102					Number of Valid Observations	52						
103					Number of Distinct Observations	29						
104					Minimum	2.4000E-4						
105					Maximum	0.128						
106					Mean of Raw Data	0.00519						

107				Standard Deviation of Raw Data	0.0181							
108				Khat	0.607							
109				Theta hat	0.00855							
110				Kstar	0.585							
111				Theta star	0.00888							
112				Mean of Log Transformed Data	-6.276							
113			Standard Deviation of Log Transformed Data		1.037							
114												
115			Normal GOF Test Results									
116												
117				Correlation Coefficient R	0.454							
118			Approximate Shapiro Wilk Test Statistic		0.247							
119				Approximate Shapiro Wilk P Value	0							
120				Lilliefors Test Statistic	0.444							
121				Lilliefors Critical (0.05) Value	0.122							
122	Data not Normal at (0.05) Significance Level											
123												
124			Gamma GOF Test Results									
125												
126				Correlation Coefficient R	0.723							
127				A-D Test Statistic	6.545							
128				A-D Critical (0.05) Value	0.805							
129				K-S Test Statistic	0.287							
130				K-S Critical(0.05) Value	0.129							
131	Data not Gamma Distributed at (0.05) Significance Level											
132												
133			Lognormal GOF Test Results									
134												
135				Correlation Coefficient R	0.934							
136			Approximate Shapiro Wilk Test Statistic		0.896							
137				Approximate Shapiro Wilk P Value	1.1216E-4							
138				Lilliefors Test Statistic	0.134							
139				Lilliefors Critical (0.05) Value	0.122							
140	Data not Lognormal at (0.05) Significance Level											
141												
142	Non-parametric GOF Test Results											
143												
144	Data do not follow a discernible distribution at (0.05) Level of Signifi											
145												
146	Nickel (mg/L)											
147												
148			Raw Statistics									
149				Number of Valid Observations	34							
150				Number of Distinct Observations	29							
151				Minimum	0.0041							
152				Maximum	0.167							
153				Mean of Raw Data	0.0143							
154				Standard Deviation of Raw Data	0.0286							
155				Khat	1.048							
156				Theta hat	0.0137							
157				Kstar	0.975							
158				Theta star	0.0147							
159				Mean of Log Transformed Data	-4.794							

Standard Deviation of Log Transformed Data	0.807	
Normal GOF Test Results		
Correlation Coefficient R	0.574	
Shapiro Wilk Test Statistic	0.365	
Shapiro Wilk Critical (0.05) Value	0.933	
Approximate Shapiro Wilk P Value	3.286E-14	
Lilliefors Test Statistic	0.391	
Lilliefors Critical (0.05) Value	0.15	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.796	
A-D Test Statistic	4.826	
A-D Critical (0.05) Value	0.775	
K-S Test Statistic	0.32	
K-S Critical(0.05) Value	0.155	
Data not Gamma Distributed at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.856	
Shapiro Wilk Test Statistic	0.745	
Shapiro Wilk Critical (0.05) Value	0.933	
Approximate Shapiro Wilk P Value	3.4376E-7	
Lilliefors Test Statistic	0.221	
Lilliefors Critical (0.05) Value	0.15	
Data not Lognormal at (0.05) Significance Level		
Non-parametric GOF Test Results		
Data do not follow a discernible distribution at (0.05) Level of Signifi		
Zinc (mg/L)		
Raw Statistics		
Number of Valid Observations	34	
Number of Distinct Observations	24	
Minimum	0.001	
Maximum	0.054	
Mean of Raw Data	0.00547	
Standard Deviation of Raw Data	0.00921	
Khat	1.183	
Theta hat	0.00462	
Kstar	1.098	
Theta star	0.00498	
Mean of Log Transformed Data	-5.687	
Standard Deviation of Log Transformed Data	0.836	
Normal GOF Test Results		

	A	B	C	D	E	F	G	H	I	J	K	L
213					Correlation Coefficient R	0.63						
214					Shapiro Wilk Test Statistic	0.433						
215					Shapiro Wilk Critical (0.05) Value	0.933						
216					Approximate Shapiro Wilk P Value	3.789E-13						
217					Lilliefors Test Statistic	0.321						
218					Lilliefors Critical (0.05) Value	0.15						
219	Data not Normal at (0.05) Significance Level											
220												
221			Gamma GOF Test Results									
222												
223					Correlation Coefficient R	0.824						
224					A-D Test Statistic	2.225						
225					A-D Critical (0.05) Value	0.772						
226					K-S Test Statistic	0.21						
227					K-S Critical(0.05) Value	0.155						
228	Data not Gamma Distributed at (0.05) Significance Level											
229												
230			Lognormal GOF Test Results									
231												
232					Correlation Coefficient R	0.956						
233					Shapiro Wilk Test Statistic	0.923						
234					Shapiro Wilk Critical (0.05) Value	0.933						
235					Approximate Shapiro Wilk P Value	0.0232						
236					Lilliefors Test Statistic	0.131						
237					Lilliefors Critical (0.05) Value	0.15						
238	Data appear Approximate_Lognormal at (0.05) Significance Level											

1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects								
2			User Selected Options									
3			Date/Time of Computation	ProUCL 5.12025-12-16 1:14:27 PM								
4			From File	2025-ShallowProUCL_g.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	0.95								
7												
8	07-SH											
9	Arsenic (mg/L)											
10												
11				Raw Statistics								
12				Number of Valid Observations	57							
13				Number of Distinct Observations	15							
14				Minimum	1.0000E-4							
15				Maximum	0.0012							
16				Mean of Raw Data	3.9088E-4							
17				Standard Deviation of Raw Data	2.5773E-4							
18				Khat	2.388							
19				Theta hat	1.6370E-4							
20				Kstar	2.274							
21				Theta star	1.7191E-4							
22				Mean of Log Transformed Data	-8.071							
23				Standard Deviation of Log Transformed Data	0.697							
24												
25				Normal GOF Test Results								
26												
27				Correlation Coefficient R	0.948							
28				Approximate Shapiro Wilk Test Statistic	0.891							
29				Approximate Shapiro Wilk P Value	2.2427E-5							
30				Lilliefors Test Statistic	0.156							
31				Lilliefors Critical (0.05) Value	0.117							
32	Data not Normal at (0.05) Significance Level											
33												
34				Gamma GOF Test Results								
35												
36				Correlation Coefficient R	0.987							
37				A-D Test Statistic	0.92							
38				A-D Critical (0.05) Value	0.761							
39				K-S Test Statistic	0.145							
40				K-S Critical(0.05) Value	0.119							
41	Data not Gamma Distributed at (0.05) Significance Level											
42												
43				Lognormal GOF Test Results								
44												
45				Correlation Coefficient R	0.976							
46				Approximate Shapiro Wilk Test Statistic	0.93							
47				Approximate Shapiro Wilk P Value	0.00312							
48				Lilliefors Test Statistic	0.13							
49				Lilliefors Critical (0.05) Value	0.117							
50	Data not Lognormal at (0.05) Significance Level											
51												
52	Non-parametric GOF Test Results											
53												

54	Data do not follow a discernible distribution at (0.05) Level of Signifi											
55												
56	Copper (mg/L)											
57												
58			Raw Statistics									
59				Number of Valid Observations	57							
60				Number of Distinct Observations	28							
61				Minimum	2.0000E-4							
62				Maximum	0.035							
63				Mean of Raw Data	0.00301							
64				Standard Deviation of Raw Data	0.00487							
65				Khat	0.951							
66				Theta hat	0.00317							
67				Kstar	0.912							
68				Theta star	0.0033							
69				Mean of Log Transformed Data	-6.416							
70				Standard Deviation of Log Transformed Data	1.121							
71												
72			Normal GOF Test Results									
73												
74				Correlation Coefficient R	0.667							
75				Approximate Shapiro Wilk Test Statistic	0.49							
76				Approximate Shapiro Wilk P Value	0							
77				Lilliefors Test Statistic	0.297							
78				Lilliefors Critical (0.05) Value	0.117							
79	Data not Normal at (0.05) Significance Level											
80												
81			Gamma GOF Test Results									
82												
83				Correlation Coefficient R	0.851							
84				A-D Test Statistic	1.085							
85				A-D Critical (0.05) Value	0.782							
86				K-S Test Statistic	0.142							
87				K-S Critical(0.05) Value	0.122							
88	Data not Gamma Distributed at (0.05) Significance Level											
89												
90			Lognormal GOF Test Results									
91												
92				Correlation Coefficient R	0.98							
93				Approximate Shapiro Wilk Test Statistic	0.955							
94				Approximate Shapiro Wilk P Value	0.0658							
95				Lilliefors Test Statistic	0.127							
96				Lilliefors Critical (0.05) Value	0.117							
97	Data appear Approximate_Lognormal at (0.05) Significance Level											
98												
99	Iron (mg/L)											
100												
101			Raw Statistics									
102				Number of Valid Observations	32							
103				Number of Distinct Observations	22							
104				Minimum	0.01							
105				Maximum	2.06							
106				Mean of Raw Data	0.317							

107				Standard Deviation of Raw Data	0.52							
108				Khat	0.454							
109				Theta hat	0.7							
110				Kstar	0.432							
111				Theta star	0.735							
112				Mean of Log Transformed Data	-2.569							
113				Standard Deviation of Log Transformed Data	1.831							
114												
115			Normal GOF Test Results									
116												
117				Correlation Coefficient R	0.804							
118				Shapiro Wilk Test Statistic	0.653							
119				Shapiro Wilk Critical (0.05) Value	0.93							
120				Approximate Shapiro Wilk P Value	1.1330E-8							
121				Lilliefors Test Statistic	0.293							
122				Lilliefors Critical (0.05) Value	0.154							
123	Data not Normal at (0.05) Significance Level											
124												
125			Gamma GOF Test Results									
126												
127				Correlation Coefficient R	0.985							
128				A-D Test Statistic	1.624							
129				A-D Critical (0.05) Value	0.821							
130				K-S Test Statistic	0.198							
131				K-S Critical(0.05) Value	0.165							
132	Data not Gamma Distributed at (0.05) Significance Level											
133												
134			Lognormal GOF Test Results									
135												
136				Correlation Coefficient R	0.951							
137				Shapiro Wilk Test Statistic	0.879							
138				Shapiro Wilk Critical (0.05) Value	0.93							
139				Approximate Shapiro Wilk P Value	0.00164							
140				Lilliefors Test Statistic	0.179							
141				Lilliefors Critical (0.05) Value	0.154							
142	Data not Lognormal at (0.05) Significance Level											
143												
144	Non-parametric GOF Test Results											
145												
146	Data do not follow a discernible distribution at (0.05) Level of Signifi											
147												
148	Manganese (mg/L)											
149												
150			Raw Statistics									
151				Number of Valid Observations	32							
152				Number of Distinct Observations	32							
153				Minimum	0.001							
154				Maximum	0.995							
155				Mean of Raw Data	0.386							
156				Standard Deviation of Raw Data	0.255							
157				Khat	1.222							
158				Theta hat	0.316							
159				Kstar	1.128							

Theta star	0.342
Mean of Log Transformed Data	-1.414
Standard Deviation of Log Transformed Data	1.408
Normal GOF Test Results	
Correlation Coefficient R	0.987
Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical (0.05) Value	0.93
Approximate Shapiro Wilk P Value	0.408
Lilliefors Test Statistic	0.0723
Lilliefors Critical (0.05) Value	0.154
Data appear Normal at (0.05) Significance Level	
Gamma GOF Test Results	
Correlation Coefficient R	0.961
A-D Test Statistic	1.089
A-D Critical (0.05) Value	0.771
K-S Test Statistic	0.167
K-S Critical(0.05) Value	0.159
Data not Gamma Distributed at (0.05) Significance Level	
Lognormal GOF Test Results	
Correlation Coefficient R	0.855
Shapiro Wilk Test Statistic	0.749
Shapiro Wilk Critical (0.05) Value	0.93
Approximate Shapiro Wilk P Value	1.0735E-6
Lilliefors Test Statistic	0.228
Lilliefors Critical (0.05) Value	0.154
Data not Lognormal at (0.05) Significance Level	
Nickel (mg/L)	
Raw Statistics	
Number of Valid Observations	34
Number of Distinct Observations	24
Minimum	9.0000E-4
Maximum	0.017
Mean of Raw Data	0.00385
Standard Deviation of Raw Data	0.00329
Khat	2.157
Theta hat	0.00178
Kstar	1.987
Theta star	0.00194
Mean of Log Transformed Data	-5.81
Standard Deviation of Log Transformed Data	0.689
Normal GOF Test Results	
Correlation Coefficient R	0.828
Shapiro Wilk Test Statistic	0.704

213				Shapiro Wilk Critical (0.05) Value	0.933							
214				Approximate Shapiro Wilk P Value	4.2297E-8							
215				Lilliefors Test Statistic	0.209							
216				Lilliefors Critical (0.05) Value	0.15							
217	Data not Normal at (0.05) Significance Level											
218												
219			Gamma GOF Test Results									
220												
221				Correlation Coefficient R	0.927							
222				A-D Test Statistic	1.097							
223				A-D Critical (0.05) Value	0.759							
224				K-S Test Statistic	0.149							
225				K-S Critical(0.05) Value	0.153							
226	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
227												
228			Lognormal GOF Test Results									
229												
230				Correlation Coefficient R	0.973							
231				Shapiro Wilk Test Statistic	0.945							
232				Shapiro Wilk Critical (0.05) Value	0.933							
233				Approximate Shapiro Wilk P Value	0.112							
234				Lilliefors Test Statistic	0.153							
235				Lilliefors Critical (0.05) Value	0.15							
236	Data appear Approximate_Lognormal at (0.05) Significance Level											
237												
238	Zinc (mg/L)											
239												
240				Raw Statistics								
241				Number of Valid Observations	34							
242				Number of Distinct Observations	24							
243				Minimum	0.001							
244				Maximum	0.026							
245				Mean of Raw Data	0.00468							
246				Standard Deviation of Raw Data	0.00472							
247				Khat	1.699							
248				Theta hat	0.00275							
249				Kstar	1.569							
250				Theta star	0.00298							
251				Mean of Log Transformed Data	-5.687							
252			Standard Deviation of Log Transformed Data		0.782							
253												
254			Normal GOF Test Results									
255												
256				Correlation Coefficient R	0.81							
257				Shapiro Wilk Test Statistic	0.682							
258				Shapiro Wilk Critical (0.05) Value	0.933							
259				Approximate Shapiro Wilk P Value	1.4384E-8							
260				Lilliefors Test Statistic	0.234							
261				Lilliefors Critical (0.05) Value	0.15							
262	Data not Normal at (0.05) Significance Level											
263												
264			Gamma GOF Test Results									
265												

	A	B	C	D	E	F	G	H	I	J	K	L
266					Correlation Coefficient R	0.935						
267					A-D Test Statistic	0.711						
268					A-D Critical (0.05) Value	0.763						
269					K-S Test Statistic	0.152						
270					K-S Critical(0.05) Value	0.153						
271	Data appear Gamma Distributed at (0.05) Significance Level											
272												
273			Lognormal GOF Test Results									
274												
275					Correlation Coefficient R	0.986						
276					Shapiro Wilk Test Statistic	0.967						
277					Shapiro Wilk Critical (0.05) Value	0.933						
278					Approximate Shapiro Wilk P Value	0.442						
279					Lilliefors Test Statistic	0.0927						
280					Lilliefors Critical (0.05) Value	0.15						
281	Data appear Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-16 1:43:41 PM	
From File	2025-ShallowProUCL_h.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

08-SH

Arsenic (mg/L)

Raw Statistics	
Number of Valid Observations	56
Number of Distinct Observations	25
Minimum	2.0000E-4
Maximum	0.0022
Mean of Raw Data	7.1000E-4
Standard Deviation of Raw Data	4.7734E-4
Khat	2.557
Theta hat	2.7762E-4
Kstar	2.432
Theta star	2.9190E-4
Mean of Log Transformed Data	-7.458
Standard Deviation of Log Transformed Data	0.653

Normal GOF Test Results	
Correlation Coefficient R	0.936
Approximate Shapiro Wilk Test Statistic	0.867
Approximate Shapiro Wilk P Value	1.6042E-6
Lilliefors Test Statistic	0.154
Lilliefors Critical (0.05) Value	0.118

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results	
Correlation Coefficient R	0.992
A-D Test Statistic	0.704
A-D Critical (0.05) Value	0.76
K-S Test Statistic	0.125
K-S Critical(0.05) Value	0.12

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal GOF Test Results	
Correlation Coefficient R	0.988
Approximate Shapiro Wilk Test Statistic	0.953
Approximate Shapiro Wilk P Value	0.0551
Lilliefors Test Statistic	0.105
Lilliefors Critical (0.05) Value	0.118

Data appear Lognormal at (0.05) Significance Level

Chromium (mg/L)

	A	B	C	D	E	F	G	H	I	J	K	L
54			Raw Statistics									
55					Number of Valid Observations	56						
56					Number of Distinct Observations	32						
57					Minimum	1.0000E-4						
58					Maximum	0.027						
59					Mean of Raw Data	0.00555						
60					Standard Deviation of Raw Data	0.00686						
61					Khat	0.732						
62					Theta hat	0.00759						
63					Kstar	0.704						
64					Theta star	0.00788						
65					Mean of Log Transformed Data	-6.015						
66					Standard Deviation of Log Transformed Data	1.385						
67												
68			Normal GOF Test Results									
69												
70					Correlation Coefficient R	0.87						
71					Approximate Shapiro Wilk Test Statistic	0.75						
72					Approximate Shapiro Wilk P Value	3.183E-12						
73					Lilliefors Test Statistic	0.251						
74					Lilliefors Critical (0.05) Value	0.118						
75	Data not Normal at (0.05) Significance Level											
76												
77			Gamma GOF Test Results									
78												
79					Correlation Coefficient R	0.977						
80					A-D Test Statistic	1.791						
81					A-D Critical (0.05) Value	0.794						
82					K-S Test Statistic	0.184						
83					K-S Critical(0.05) Value	0.124						
84	Data not Gamma Distributed at (0.05) Significance Level											
85												
86			Lognormal GOF Test Results									
87												
88					Correlation Coefficient R	0.981						
89					Approximate Shapiro Wilk Test Statistic	0.946						
90					Approximate Shapiro Wilk P Value	0.0251						
91					Lilliefors Test Statistic	0.151						
92					Lilliefors Critical (0.05) Value	0.118						
93	Data not Lognormal at (0.05) Significance Level											
94												
95	Non-parametric GOF Test Results											
96												
97	Data do not follow a discernible distribution at (0.05) Level of Signifi											
98												
99	Copper (mg/L)											
100												
101			Raw Statistics									
102					Number of Valid Observations	56						
103					Number of Distinct Observations	29						
104					Minimum	4.4000E-4						
105					Maximum	0.0123						
106					Mean of Raw Data	0.00298						

Standard Deviation of Raw Data	0.00283				
Khat	1.467				
Theta hat	0.00203				
Kstar	1.4				
Theta star	0.00213				
Mean of Log Transformed Data	-6.195				
Standard Deviation of Log Transformed Data	0.869				
Normal GOF Test Results					
Correlation Coefficient R	0.882				
Approximate Shapiro Wilk Test Statistic	0.773				
Approximate Shapiro Wilk P Value	3.697E-11				
Lilliefors Test Statistic	0.193				
Lilliefors Critical (0.05) Value	0.118				
Data not Normal at (0.05) Significance Level					
Gamma GOF Test Results					
Correlation Coefficient R	0.981				
A-D Test Statistic	1.394				
A-D Critical (0.05) Value	0.769				
K-S Test Statistic	0.146				
K-S Critical(0.05) Value	0.121				
Data not Gamma Distributed at (0.05) Significance Level					
Lognormal GOF Test Results					
Correlation Coefficient R	0.984				
Approximate Shapiro Wilk Test Statistic	0.948				
Approximate Shapiro Wilk P Value	0.0326				
Lilliefors Test Statistic	0.115				
Lilliefors Critical (0.05) Value	0.118				
Data appear Approximate_Lognormal at (0.05) Significance Level					
Manganese (mg/L)					
Raw Statistics					
Number of Valid Observations	32				
Number of Distinct Observations	29				
Minimum	0.004				
Maximum	1.29				
Mean of Raw Data	0.189				
Standard Deviation of Raw Data	0.301				
Khat	0.497				
Theta hat	0.38				
Kstar	0.471				
Theta star	0.4				
Mean of Log Transformed Data	-2.947				
Standard Deviation of Log Transformed Data	1.743				
Normal GOF Test Results					

160				Correlation Coefficient R	0.811							
161				Shapiro Wilk Test Statistic	0.668							
162				Shapiro Wilk Critical (0.05) Value	0.93							
163				Approximate Shapiro Wilk P Value	2.2266E-8							
164				Lilliefors Test Statistic	0.292							
165				Lilliefors Critical (0.05) Value	0.154							
166	Data not Normal at (0.05) Significance Level											
167												
168			Gamma GOF Test Results									
169												
170				Correlation Coefficient R	0.994							
171				A-D Test Statistic	1.092							
172				A-D Critical (0.05) Value	0.811							
173				K-S Test Statistic	0.172							
174				K-S Critical(0.05) Value	0.164							
175	Data not Gamma Distributed at (0.05) Significance Level											
176												
177			Lognormal GOF Test Results									
178												
179				Correlation Coefficient R	0.981							
180				Shapiro Wilk Test Statistic	0.942							
181				Shapiro Wilk Critical (0.05) Value	0.93							
182				Approximate Shapiro Wilk P Value	0.109							
183				Lilliefors Test Statistic	0.117							
184				Lilliefors Critical (0.05) Value	0.154							
185	Data appear Lognormal at (0.05) Significance Level											
186												
187	Nickel (mg/L)											
188												
189				Raw Statistics								
190				Number of Valid Observations	34							
191				Number of Distinct Observations	25							
192				Minimum	5.0000E-4							
193				Maximum	0.0335							
194				Mean of Raw Data	0.0055							
195				Standard Deviation of Raw Data	0.00645							
196				Khat	1.429							
197				Theta hat	0.00385							
198				Kstar	1.322							
199				Theta star	0.00416							
200				Mean of Log Transformed Data	-5.593							
201				Standard Deviation of Log Transformed Data	0.83							
202												
203			Normal GOF Test Results									
204												
205				Correlation Coefficient R	0.775							
206				Shapiro Wilk Test Statistic	0.625							
207				Shapiro Wilk Critical (0.05) Value	0.933							
208				Approximate Shapiro Wilk P Value	9.597E-10							
209				Lilliefors Test Statistic	0.354							
210				Lilliefors Critical (0.05) Value	0.15							
211	Data not Normal at (0.05) Significance Level											
212												

	A	B	C	D	E	F	G	H	I	J	K	L
213				Gamma GOF Test Results								
214												
215					Correlation Coefficient R	0.931						
216					A-D Test Statistic	1.938						
217					A-D Critical (0.05) Value	0.767						
218					K-S Test Statistic	0.255						
219					K-S Critical(0.05) Value	0.154						
220	Data not Gamma Distributed at (0.05) Significance Level											
221												
222				Lognormal GOF Test Results								
223												
224					Correlation Coefficient R	0.962						
225					Shapiro Wilk Test Statistic	0.939						
226					Shapiro Wilk Critical (0.05) Value	0.933						
227					Approximate Shapiro Wilk P Value	0.0725						
228					Lilliefors Test Statistic	0.185						
229					Lilliefors Critical (0.05) Value	0.15						
230	Data appear Approximate_Lognormal at (0.05) Significance Level											
231												
232	Zinc (mg/L)											
233												
234				Raw Statistics								
235					Number of Valid Observations	34						
236					Number of Distinct Observations	21						
237					Minimum	6.0000E-4						
238					Maximum	0.0179						
239					Mean of Raw Data	0.00462						
240					Standard Deviation of Raw Data	0.00426						
241					Khat	1.483						
242					Theta hat	0.00312						
243					Kstar	1.372						
244					Theta star	0.00337						
245					Mean of Log Transformed Data	-5.75						
246					Standard Deviation of Log Transformed Data	0.887						
247												
248				Normal GOF Test Results								
249												
250					Correlation Coefficient R	0.892						
251					Shapiro Wilk Test Statistic	0.796						
252					Shapiro Wilk Critical (0.05) Value	0.933						
253					Approximate Shapiro Wilk P Value	6.0887E-6						
254					Lilliefors Test Statistic	0.222						
255					Lilliefors Critical (0.05) Value	0.15						
256	Data not Normal at (0.05) Significance Level											
257												
258				Gamma GOF Test Results								
259												
260					Correlation Coefficient R	0.982						
261					A-D Test Statistic	0.822						
262					A-D Critical (0.05) Value	0.766						
263					K-S Test Statistic	0.139						
264					K-S Critical(0.05) Value	0.154						
265	Data follow Appr. Gamma Distribution at (0.05) Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
266												
267			Lognormal GOF Test Results									
268												
269					Correlation Coefficient R	0.983						
270					Shapiro Wilk Test Statistic	0.954						
271					Shapiro Wilk Critical (0.05) Value	0.933						
272					Approximate Shapiro Wilk P Value	0.203						
273					Lilliefors Test Statistic	0.16						
274					Lilliefors Critical (0.05) Value	0.15						
275	Data appear Approximate_Lognormal at (0.05) Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects								
2			User Selected Options									
3			Date/Time of Computation	ProUCL 5.12025-12-16 2:02:14 PM								
4			From File	2025-ShallowProUCL_i.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	0.95								
7												
8	11-SH											
9	Arsenic (mg/L)											
10												
11			Raw Statistics									
12			Number of Valid Observations	39								
13			Number of Distinct Observations	33								
14			Minimum	1.0000E-4								
15			Maximum	0.013								
16			Mean of Raw Data	0.00174								
17			Standard Deviation of Raw Data	0.00296								
18			Khat	0.639								
19			Theta hat	0.00273								
20			Kstar	0.607								
21			Theta star	0.00287								
22			Mean of Log Transformed Data	-7.311								
23			Standard Deviation of Log Transformed Data	1.319								
24												
25			Normal GOF Test Results									
26												
27			Correlation Coefficient R	0.759								
28			Shapiro Wilk Test Statistic	0.588								
29			Shapiro Wilk Critical (0.05) Value	0.939								
30			Approximate Shapiro Wilk P Value	4.217E-12								
31			Lilliefors Test Statistic	0.314								
32			Lilliefors Critical (0.05) Value	0.14								
33	Data not Normal at (0.05) Significance Level											
34												
35			Gamma GOF Test Results									
36												
37			Correlation Coefficient R	0.966								
38			A-D Test Statistic	2.493								
39			A-D Critical (0.05) Value	0.8								
40			K-S Test Statistic	0.224								
41			K-S Critical(0.05) Value	0.148								
42	Data not Gamma Distributed at (0.05) Significance Level											
43												
44			Lognormal GOF Test Results									
45												
46			Correlation Coefficient R	0.969								
47			Shapiro Wilk Test Statistic	0.924								
48			Shapiro Wilk Critical (0.05) Value	0.939								
49			Approximate Shapiro Wilk P Value	0.0142								
50			Lilliefors Test Statistic	0.139								
51			Lilliefors Critical (0.05) Value	0.14								
52	Data appear Approximate_Lognormal at (0.05) Significance Level											
53												

	A	B	C	D	E	F	G	H	I	J	K	L
54	Copper (mg/L)											
55												
56			Raw Statistics									
57					Number of Valid Observations	39						
58					Number of Distinct Observations	29						
59					Minimum	2.0000E-4						
60					Maximum	0.007						
61					Mean of Raw Data	0.00246						
62					Standard Deviation of Raw Data	0.00169						
63					Khat	2.31						
64					Theta hat	0.00107						
65					Kstar	2.15						
66					Theta star	0.00115						
67					Mean of Log Transformed Data	-6.238						
68					Standard Deviation of Log Transformed Data	0.725						
69												
70			Normal GOF Test Results									
71												
72					Correlation Coefficient R	0.931						
73					Shapiro Wilk Test Statistic	0.862						
74					Shapiro Wilk Critical (0.05) Value	0.939						
75					Approximate Shapiro Wilk P Value	9.6813E-5						
76					Lilliefors Test Statistic	0.171						
77					Lilliefors Critical (0.05) Value	0.14						
78	Data not Normal at (0.05) Significance Level											
79												
80			Gamma GOF Test Results									
81												
82					Correlation Coefficient R	0.984						
83					A-D Test Statistic	0.74						
84					A-D Critical (0.05) Value	0.758						
85					K-S Test Statistic	0.149						
86					K-S Critical(0.05) Value	0.143						
87	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
88												
89			Lognormal GOF Test Results									
90												
91					Correlation Coefficient R	0.966						
92					Shapiro Wilk Test Statistic	0.941						
93					Shapiro Wilk Critical (0.05) Value	0.939						
94					Approximate Shapiro Wilk P Value	0.0577						
95					Lilliefors Test Statistic	0.13						
96					Lilliefors Critical (0.05) Value	0.14						
97	Data appear Lognormal at (0.05) Significance Level											
98												
99	Iron (mg/L)											
100												
101			Raw Statistics									
102					Number of Valid Observations	32						
103					Number of Distinct Observations	29						
104					Minimum	0.01						
105					Maximum	12.9						
106					Mean of Raw Data	2.541						

107				Standard Deviation of Raw Data	3.926							
108				Khat	0.364							
109				Theta hat	6.988							
110				Kstar	0.35							
111				Theta star	7.252							
112				Mean of Log Transformed Data	-0.906							
113				Standard Deviation of Log Transformed Data	2.375							
114												
115			Normal GOF Test Results									
116												
117				Correlation Coefficient R	0.83							
118				Shapiro Wilk Test Statistic	0.682							
119				Shapiro Wilk Critical (0.05) Value	0.93							
120				Approximate Shapiro Wilk P Value	4.1760E-8							
121				Lilliefors Test Statistic	0.288							
122				Lilliefors Critical (0.05) Value	0.154							
123	Data not Normal at (0.05) Significance Level											
124												
125			Gamma GOF Test Results									
126												
127				Correlation Coefficient R	0.948							
128				A-D Test Statistic	0.85							
129				A-D Critical (0.05) Value	0.841							
130				K-S Test Statistic	0.148							
131				K-S Critical(0.05) Value	0.167							
132	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
133												
134			Lognormal GOF Test Results									
135												
136				Correlation Coefficient R	0.974							
137				Shapiro Wilk Test Statistic	0.923							
138				Shapiro Wilk Critical (0.05) Value	0.93							
139				Approximate Shapiro Wilk P Value	0.029							
140				Lilliefors Test Statistic	0.105							
141				Lilliefors Critical (0.05) Value	0.154							
142	Data appear Approximate_Lognormal at (0.05) Significance Level											
143												
144	Nickel (mg/L)											
145												
146				Raw Statistics								
147				Number of Valid Observations	33							
148				Number of Distinct Observations	26							
149				Minimum	0.00168							
150				Maximum	0.027							
151				Mean of Raw Data	0.00594							
152				Standard Deviation of Raw Data	0.00569							
153				Khat	1.996							
154				Theta hat	0.00297							
155				Kstar	1.835							
156				Theta star	0.00324							
157				Mean of Log Transformed Data	-5.398							
158				Standard Deviation of Log Transformed Data	0.678							
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160			Normal GOF Test Results									
161												
162					Correlation Coefficient R	0.801						
163					Shapiro Wilk Test Statistic	0.655						
164					Shapiro Wilk Critical (0.05) Value	0.931						
165					Approximate Shapiro Wilk P Value	7.0773E-9						
166					Lilliefors Test Statistic	0.314						
167					Lilliefors Critical (0.05) Value	0.152						
168	Data not Normal at (0.05) Significance Level											
169												
170			Gamma GOF Test Results									
171												
172					Correlation Coefficient R	0.93						
173					A-D Test Statistic	1.813						
174					A-D Critical (0.05) Value	0.759						
175					K-S Test Statistic	0.218						
176					K-S Critical(0.05) Value	0.155						
177	Data not Gamma Distributed at (0.05) Significance Level											
178												
179			Lognormal GOF Test Results									
180												
181					Correlation Coefficient R	0.958						
182					Shapiro Wilk Test Statistic	0.915						
183					Shapiro Wilk Critical (0.05) Value	0.931						
184					Approximate Shapiro Wilk P Value	0.0146						
185					Lilliefors Test Statistic	0.157						
186					Lilliefors Critical (0.05) Value	0.152						
187	Data not Lognormal at (0.05) Significance Level											
188												
189	Non-parametric GOF Test Results											
190												
191	Data do not follow a discernible distribution at (0.05) Level of Signifi											
192												
193	Zinc (mg/L)											
194												
195				Raw Statistics								
196					Number of Valid Observations	33						
197					Number of Distinct Observations	31						
198					Minimum	0.001						
199					Maximum	0.097						
200					Mean of Raw Data	0.00877						
201					Standard Deviation of Raw Data	0.0161						
202					Khat	1.295						
203					Theta hat	0.00677						
204					Kstar	1.197						
205					Theta star	0.00733						
206					Mean of Log Transformed Data	-5.169						
207					Standard Deviation of Log Transformed Data	0.764						
208												
209			Normal GOF Test Results									
210												
211					Correlation Coefficient R	0.546						
212					Shapiro Wilk Test Statistic	0.337						

	A	B	C	D	E	F	G	H	I	J	K	L
213					Shapiro Wilk Critical (0.05) Value	0.931						
214					Approximate Shapiro Wilk P Value	3.431E-14						
215					Lilliefors Test Statistic	0.355						
216					Lilliefors Critical (0.05) Value	0.152						
217	Data not Normal at (0.05) Significance Level											
218												
219			Gamma GOF Test Results									
220												
221					Correlation Coefficient R	0.725						
222					A-D Test Statistic	2.647						
223					A-D Critical (0.05) Value	0.769						
224					K-S Test Statistic	0.211						
225					K-S Critical(0.05) Value	0.157						
226	Data not Gamma Distributed at (0.05) Significance Level											
227												
228			Lognormal GOF Test Results									
229												
230					Correlation Coefficient R	0.932						
231					Shapiro Wilk Test Statistic	0.901						
232					Shapiro Wilk Critical (0.05) Value	0.931						
233					Approximate Shapiro Wilk P Value	0.00584						
234					Lilliefors Test Statistic	0.116						
235					Lilliefors Critical (0.05) Value	0.152						
236	Data appear Approximate_Lognormal at (0.05) Significance Level											

1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects							
2			User Selected Options								
3			Date/Time of Computation	ProUCL 5.12025-12-16 2:29:00 PM							
4			From File	2025-ShallowProUCL_j.xls							
5			Full Precision	OFF							
6			Confidence Coefficient	0.95							
7											
8	12-SH										
9	Sulphate (mg/L)										
10											
11			Raw Statistics								
12			Number of Valid Observations	34							
13			Number of Distinct Observations	31							
14			Minimum	0.5							
15			Maximum	6.4							
16			Mean of Raw Data	3.409							
17			Standard Deviation of Raw Data	1.407							
18			Khat	4.622							
19			Theta hat	0.738							
20			Kstar	4.234							
21			Theta star	0.805							
22			Mean of Log Transformed Data	1.114							
23			Standard Deviation of Log Transformed Data	0.542							
24											
25			Normal GOF Test Results								
26											
27			Correlation Coefficient R	0.983							
28			Shapiro Wilk Test Statistic	0.963							
29			Shapiro Wilk Critical (0.05) Value	0.933							
30			Approximate Shapiro Wilk P Value	0.345							
31			Lilliefors Test Statistic	0.0992							
32			Lilliefors Critical (0.05) Value	0.15							
33	Data appear Normal at (0.05) Significance Level										
34											
35			Gamma GOF Test Results								
36											
37			Correlation Coefficient R	0.973							
38			A-D Test Statistic	0.865							
39			A-D Critical (0.05) Value	0.75							
40			K-S Test Statistic	0.132							
41			K-S Critical(0.05) Value	0.151							
42	Data follow Appr. Gamma Distribution at (0.05) Significance Level										
43											
44			Lognormal GOF Test Results								
45											
46			Correlation Coefficient R	0.92							
47			Shapiro Wilk Test Statistic	0.856							
48			Shapiro Wilk Critical (0.05) Value	0.933							
49			Approximate Shapiro Wilk P Value	2.3881E-4							
50			Lilliefors Test Statistic	0.165							
51			Lilliefors Critical (0.05) Value	0.15							
52	Data not Lognormal at (0.05) Significance Level										
53											

54	Arsenic (mg/L)											
55												
56			Raw Statistics									
57				Number of Valid Observations	39							
58				Number of Distinct Observations	26							
59				Minimum	2.0000E-4							
60				Maximum	0.00282							
61				Mean of Raw Data	8.8821E-4							
62				Standard Deviation of Raw Data	6.1426E-4							
63				Khat	2.56							
64				Theta hat	3.4694E-4							
65				Kstar	2.38							
66				Theta star	3.7315E-4							
67				Mean of Log Transformed Data	-7.234							
68				Standard Deviation of Log Transformed Data	0.656							
69												
70			Normal GOF Test Results									
71												
72				Correlation Coefficient R	0.918							
73				Shapiro Wilk Test Statistic	0.843							
74				Shapiro Wilk Critical (0.05) Value	0.939							
75				Approximate Shapiro Wilk P Value	2.2708E-5							
76				Lilliefors Test Statistic	0.211							
77				Lilliefors Critical (0.05) Value	0.14							
78	Data not Normal at (0.05) Significance Level											
79												
80			Gamma GOF Test Results									
81												
82				Correlation Coefficient R	0.984							
83				A-D Test Statistic	0.708							
84				A-D Critical (0.05) Value	0.757							
85				K-S Test Statistic	0.134							
86				K-S Critical(0.05) Value	0.143							
87	Data appear Gamma Distributed at (0.05) Significance Level											
88												
89			Lognormal GOF Test Results									
90												
91				Correlation Coefficient R	0.987							
92				Shapiro Wilk Test Statistic	0.964							
93				Shapiro Wilk Critical (0.05) Value	0.939							
94				Approximate Shapiro Wilk P Value	0.332							
95				Lilliefors Test Statistic	0.091							
96				Lilliefors Critical (0.05) Value	0.14							
97	Data appear Lognormal at (0.05) Significance Level											
98												
99	Copper (mg/L)											
100												
101			Raw Statistics									
102				Number of Valid Observations	39							
103				Number of Distinct Observations	28							
104				Minimum	2.0000E-4							
105				Maximum	0.012							
106				Mean of Raw Data	0.00231							

107				Standard Deviation of Raw Data	0.00265							
108				Khat	1.322							
109				Theta hat	0.00175							
110				Kstar	1.238							
111				Theta star	0.00186							
112				Mean of Log Transformed Data	-6.495							
113				Standard Deviation of Log Transformed Data	0.883							
114												
115			Normal GOF Test Results									
116												
117				Correlation Coefficient R	0.808							
118				Shapiro Wilk Test Statistic	0.664							
119				Shapiro Wilk Critical (0.05) Value	0.939							
120				Approximate Shapiro Wilk P Value	2.446E-10							
121				Lilliefors Test Statistic	0.266							
122				Lilliefors Critical (0.05) Value	0.14							
123	Data not Normal at (0.05) Significance Level											
124												
125			Gamma GOF Test Results									
126												
127				Correlation Coefficient R	0.954							
128				A-D Test Statistic	1.88							
129				A-D Critical (0.05) Value	0.77							
130				K-S Test Statistic	0.195							
131				K-S Critical(0.05) Value	0.145							
132	Data not Gamma Distributed at (0.05) Significance Level											
133												
134			Lognormal GOF Test Results									
135												
136				Correlation Coefficient R	0.974							
137				Shapiro Wilk Test Statistic	0.951							
138				Shapiro Wilk Critical (0.05) Value	0.939							
139				Approximate Shapiro Wilk P Value	0.119							
140				Lilliefors Test Statistic	0.142							
141				Lilliefors Critical (0.05) Value	0.14							
142	Data appear Approximate_Lognormal at (0.05) Significance Level											
143												
144	Iron (mg/L)											
145												
146				Raw Statistics								
147				Number of Valid Observations	32							
148				Number of Distinct Observations	18							
149				Minimum	0.01							
150				Maximum	0.62							
151				Mean of Raw Data	0.0878							
152				Standard Deviation of Raw Data	0.134							
153				Khat	0.735							
154				Theta hat	0.119							
155				Kstar	0.687							
156				Theta star	0.128							
157				Mean of Log Transformed Data	-3.25							
158				Standard Deviation of Log Transformed Data	1.27							
159												

	A	B	C	D	E	F	G	H	I	J	K	L
160			Normal GOF Test Results									
161												
162					Correlation Coefficient R	0.782						
163					Shapiro Wilk Test Statistic	0.628						
164					Shapiro Wilk Critical (0.05) Value	0.93						
165					Approximate Shapiro Wilk P Value	3.8649E-9						
166					Lilliefors Test Statistic	0.281						
167					Lilliefors Critical (0.05) Value	0.154						
168	Data not Normal at (0.05) Significance Level											
169												
170			Gamma GOF Test Results									
171												
172					Correlation Coefficient R	0.973						
173					A-D Test Statistic	1.553						
174					A-D Critical (0.05) Value	0.789						
175					K-S Test Statistic	0.173						
176					K-S Critical(0.05) Value	0.162						
177	Data not Gamma Distributed at (0.05) Significance Level											
178												
179			Lognormal GOF Test Results									
180												
181					Correlation Coefficient R	0.952						
182					Shapiro Wilk Test Statistic	0.887						
183					Shapiro Wilk Critical (0.05) Value	0.93						
184					Approximate Shapiro Wilk P Value	0.0028						
185					Lilliefors Test Statistic	0.201						
186					Lilliefors Critical (0.05) Value	0.154						
187	Data not Lognormal at (0.05) Significance Level											
188												
189	Non-parametric GOF Test Results											
190												
191	Data do not follow a discernible distribution at (0.05) Level of Signifi											
192												
193	Nickel (mg/L)											
194												
195				Raw Statistics								
196					Number of Valid Observations	34						
197					Number of Distinct Observations	22						
198					Minimum	5.0000E-4						
199					Maximum	0.0153						
200					Mean of Raw Data	0.00339						
201					Standard Deviation of Raw Data	0.00394						
202					Khat	1.172						
203					Theta hat	0.00289						
204					Kstar	1.088						
205					Theta star	0.00311						
206					Mean of Log Transformed Data	-6.172						
207					Standard Deviation of Log Transformed Data	0.943						
208												
209			Normal GOF Test Results									
210												
211					Correlation Coefficient R	0.828						
212					Shapiro Wilk Test Statistic	0.686						

213				Shapiro Wilk Critical (0.05) Value	0.933							
214				Approximate Shapiro Wilk P Value	1.6673E-8							
215				Lilliefors Test Statistic	0.314							
216				Lilliefors Critical (0.05) Value	0.15							
217	Data not Normal at (0.05) Significance Level											
218												
219			Gamma GOF Test Results									
220												
221				Correlation Coefficient R	0.96							
222				A-D Test Statistic	1.844							
223				A-D Critical (0.05) Value	0.772							
224				K-S Test Statistic	0.256							
225				K-S Critical(0.05) Value	0.155							
226	Data not Gamma Distributed at (0.05) Significance Level											
227												
228			Lognormal GOF Test Results									
229												
230				Correlation Coefficient R	0.967							
231				Shapiro Wilk Test Statistic	0.921							
232				Shapiro Wilk Critical (0.05) Value	0.933							
233				Approximate Shapiro Wilk P Value	0.0204							
234				Lilliefors Test Statistic	0.194							
235				Lilliefors Critical (0.05) Value	0.15							
236	Data not Lognormal at (0.05) Significance Level											
237												
238	Non-parametric GOF Test Results											
239												
240	Data do not follow a discernible distribution at (0.05) Level of Signifi											
241												
242	Zinc (mg/L)											
243												
244			Raw Statistics									
245				Number of Valid Observations	34							
246				Number of Distinct Observations	26							
247				Minimum	8.0000E-4							
248				Maximum	0.0307							
249				Mean of Raw Data	0.00688							
250				Standard Deviation of Raw Data	0.00701							
251				Khat	1.335							
252				Theta hat	0.00515							
253				Kstar	1.237							
254				Theta star	0.00556							
255				Mean of Log Transformed Data	-5.399							
256				Standard Deviation of Log Transformed Data	0.929							
257												
258			Normal GOF Test Results									
259												
260				Correlation Coefficient R	0.868							
261				Shapiro Wilk Test Statistic	0.759							
262				Shapiro Wilk Critical (0.05) Value	0.933							
263				Approximate Shapiro Wilk P Value	7.2571E-7							
264				Lilliefors Test Statistic	0.234							
265				Lilliefors Critical (0.05) Value	0.15							

	A	B	C	D	E	F	G	H	I	J	K	L
266	Data not Normal at (0.05) Significance Level											
267												
268			Gamma GOF Test Results									
269												
270					Correlation Coefficient R	0.981						
271					A-D Test Statistic	0.907						
272					A-D Critical (0.05) Value	0.769						
273					K-S Test Statistic	0.166						
274					K-S Critical(0.05) Value	0.154						
275	Data not Gamma Distributed at (0.05) Significance Level											
276												
277			Lognormal GOF Test Results									
278												
279					Correlation Coefficient R	0.988						
280					Shapiro Wilk Test Statistic	0.965						
281					Shapiro Wilk Critical (0.05) Value	0.933						
282					Approximate Shapiro Wilk P Value	0.409						
283					Lilliefors Test Statistic	0.111						
284					Lilliefors Critical (0.05) Value	0.15						
285	Data appear Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-16 2:50:44 PM	
From File	2025-ShallowProUCL_k.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

13-SH

Chloride (mg/L)

Raw Statistics	
Number of Valid Observations	39
Number of Distinct Observations	30
Minimum	0.5
Maximum	5.08
Mean of Raw Data	1.782
Standard Deviation of Raw Data	0.897
Khat	3.739
Theta hat	0.477
Kstar	3.468
Theta star	0.514
Mean of Log Transformed Data	0.438
Standard Deviation of Log Transformed Data	0.57

Normal GOF Test Results

Correlation Coefficient R	0.943
Shapiro Wilk Test Statistic	0.902
Shapiro Wilk Critical (0.05) Value	0.939
Approximate Shapiro Wilk P Value	0.00233
Lilliefors Test Statistic	0.109
Lilliefors Critical (0.05) Value	0.14

Data appear Approximate Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.957
A-D Test Statistic	1.29
A-D Critical (0.05) Value	0.753
K-S Test Statistic	0.179
K-S Critical(0.05) Value	0.142

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.951
Shapiro Wilk Test Statistic	0.899
Shapiro Wilk Critical (0.05) Value	0.939
Approximate Shapiro Wilk P Value	0.00173
Lilliefors Test Statistic	0.21
Lilliefors Critical (0.05) Value	0.14

Data not Lognormal at (0.05) Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
54	Cadmium (mg/L)											
55												
56			Raw Statistics									
57					Number of Valid Observations	39						
58					Number of Distinct Observations	25						
59					Minimum	1.6000E-5						
60					Maximum	0.003						
61					Mean of Raw Data	7.1298E-4						
62					Standard Deviation of Raw Data	0.00114						
63					Khat	0.475						
64					Theta hat	0.0015						
65					Kstar	0.456						
66					Theta star	0.00156						
67					Mean of Log Transformed Data	-8.593						
68					Standard Deviation of Log Transformed Data	1.698						
69												
70			Normal GOF Test Results									
71												
72					Correlation Coefficient R	0.775						
73					Shapiro Wilk Test Statistic	0.587						
74					Shapiro Wilk Critical (0.05) Value	0.939						
75					Approximate Shapiro Wilk P Value	3.968E-12						
76					Lilliefors Test Statistic	0.386						
77					Lilliefors Critical (0.05) Value	0.14						
78	Data not Normal at (0.05) Significance Level											
79												
80			Gamma GOF Test Results									
81												
82					Correlation Coefficient R	0.867						
83					A-D Test Statistic	3.064						
84					A-D Critical (0.05) Value	0.818						
85					K-S Test Statistic	0.277						
86					K-S Critical(0.05) Value	0.15						
87	Data not Gamma Distributed at (0.05) Significance Level											
88												
89			Lognormal GOF Test Results									
90												
91					Correlation Coefficient R	0.954						
92					Shapiro Wilk Test Statistic	0.886						
93					Shapiro Wilk Critical (0.05) Value	0.939						
94					Approximate Shapiro Wilk P Value	6.4574E-4						
95					Lilliefors Test Statistic	0.175						
96					Lilliefors Critical (0.05) Value	0.14						
97	Data not Lognormal at (0.05) Significance Level											
98												
99	Non-parametric GOF Test Results											
100												
101	Data do not follow a discernible distribution at (0.05) Level of Signifi											
102												
103	Chromium (mg/L)											
104												
105			Raw Statistics									
106					Number of Valid Observations	39						

	A	B	C	D	E	F	G	H	I	J	K	L
107					Number of Distinct Observations	27						
108					Minimum	1.0000E-4						
109					Maximum	0.022						
110					Mean of Raw Data	0.00507						
111					Standard Deviation of Raw Data	0.00636						
112					Khat	0.703						
113					Theta hat	0.00721						
114					Kstar	0.666						
115					Theta star	0.00762						
116					Mean of Log Transformed Data	-6.143						
117					Standard Deviation of Log Transformed Data	1.422						
118												
119			Normal GOF Test Results									
120												
121					Correlation Coefficient R	0.865						
122					Shapiro Wilk Test Statistic	0.739						
123					Shapiro Wilk Critical (0.05) Value	0.939						
124					Approximate Shapiro Wilk P Value	2.0941E-8						
125					Lilliefors Test Statistic	0.327						
126					Lilliefors Critical (0.05) Value	0.14						
127	Data not Normal at (0.05) Significance Level											
128												
129			Gamma GOF Test Results									
130												
131					Correlation Coefficient R	0.964						
132					A-D Test Statistic	1.354						
133					A-D Critical (0.05) Value	0.793						
134					K-S Test Statistic	0.242						
135					K-S Critical(0.05) Value	0.147						
136	Data not Gamma Distributed at (0.05) Significance Level											
137												
138			Lognormal GOF Test Results									
139												
140					Correlation Coefficient R	0.982						
141					Shapiro Wilk Test Statistic	0.949						
142					Shapiro Wilk Critical (0.05) Value	0.939						
143					Approximate Shapiro Wilk P Value	0.109						
144					Lilliefors Test Statistic	0.161						
145					Lilliefors Critical (0.05) Value	0.14						
146	Data appear Approximate_Lognormal at (0.05) Significance Level											
147												
148	Copper (mg/L)											
149												
150			Raw Statistics									
151					Number of Valid Observations	39						
152					Number of Distinct Observations	34						
153					Minimum	2.0000E-4						
154					Maximum	0.103						
155					Mean of Raw Data	0.00674						
156					Standard Deviation of Raw Data	0.0172						
157					Khat	0.624						
158					Theta hat	0.0108						
159					Kstar	0.593						

160				Theta star	0.0114							
161				Mean of Log Transformed Data	-5.985							
162				Standard Deviation of Log Transformed Data	1.221							
163												
164			Normal GOF Test Results									
165												
166				Correlation Coefficient R	0.567							
167				Shapiro Wilk Test Statistic	0.359							
168				Shapiro Wilk Critical (0.05) Value	0.939							
169				Approximate Shapiro Wilk P Value	1.110E-16							
170				Lilliefors Test Statistic	0.371							
171				Lilliefors Critical (0.05) Value	0.14							
172	Data not Normal at (0.05) Significance Level											
173												
174			Gamma GOF Test Results									
175												
176				Correlation Coefficient R	0.829							
177				A-D Test Statistic	2.736							
178				A-D Critical (0.05) Value	0.801							
179				K-S Test Statistic	0.196							
180				K-S Critical(0.05) Value	0.148							
181	Data not Gamma Distributed at (0.05) Significance Level											
182												
183			Lognormal GOF Test Results									
184												
185				Correlation Coefficient R	0.976							
186				Shapiro Wilk Test Statistic	0.962							
187				Shapiro Wilk Critical (0.05) Value	0.939							
188				Approximate Shapiro Wilk P Value	0.289							
189				Lilliefors Test Statistic	0.0875							
190				Lilliefors Critical (0.05) Value	0.14							
191	Data appear Lognormal at (0.05) Significance Level											
192												
193	Manganese (mg/L)											
194												
195			Raw Statistics									
196				Number of Valid Observations	32							
197				Number of Distinct Observations	31							
198				Minimum	0.004							
199				Maximum	0.442							
200				Mean of Raw Data	0.127							
201				Standard Deviation of Raw Data	0.124							
202				Khat	0.93							
203				Theta hat	0.137							
204				Kstar	0.864							
205				Theta star	0.147							
206				Mean of Log Transformed Data	-2.686							
207				Standard Deviation of Log Transformed Data	1.316							
208												
209			Normal GOF Test Results									
210												
211				Correlation Coefficient R	0.929							
212				Shapiro Wilk Test Statistic	0.852							

	A	B	C	D	E	F	G	H	I	J	K	L
213					Shapiro Wilk Critical (0.05) Value	0.93						
214					Approximate Shapiro Wilk P Value	3.0004E-4						
215					Lilliefors Test Statistic	0.214						
216					Lilliefors Critical (0.05) Value	0.154						
217	Data not Normal at (0.05) Significance Level											
218												
219			Gamma GOF Test Results									
220												
221					Correlation Coefficient R	0.971						
222					A-D Test Statistic	0.324						
223					A-D Critical (0.05) Value	0.779						
224					K-S Test Statistic	0.0925						
225					K-S Critical(0.05) Value	0.161						
226	Data appear Gamma Distributed at (0.05) Significance Level											
227												
228			Lognormal GOF Test Results									
229												
230					Correlation Coefficient R	0.975						
231					Shapiro Wilk Test Statistic	0.935						
232					Shapiro Wilk Critical (0.05) Value	0.93						
233					Approximate Shapiro Wilk P Value	0.0672						
234					Lilliefors Test Statistic	0.0858						
235					Lilliefors Critical (0.05) Value	0.154						
236	Data appear Lognormal at (0.05) Significance Level											
237												
238	Nickel (mg/L)											
239												
240				Raw Statistics								
241					Number of Valid Observations	34						
242					Number of Distinct Observations	31						
243					Minimum	0.0015						
244					Maximum	0.034						
245					Mean of Raw Data	0.00731						
246					Standard Deviation of Raw Data	0.00777						
247					Khat	1.617						
248					Theta hat	0.00452						
249					Kstar	1.494						
250					Theta star	0.0049						
251					Mean of Log Transformed Data	-5.258						
252					Standard Deviation of Log Transformed Data	0.77						
253												
254			Normal GOF Test Results									
255												
256					Correlation Coefficient R	0.793						
257					Shapiro Wilk Test Statistic	0.639						
258					Shapiro Wilk Critical (0.05) Value	0.933						
259					Approximate Shapiro Wilk P Value	1.8242E-9						
260					Lilliefors Test Statistic	0.318						
261					Lilliefors Critical (0.05) Value	0.15						
262	Data not Normal at (0.05) Significance Level											
263												
264			Gamma GOF Test Results									
265												

266				Correlation Coefficient R	0.925							
267				A-D Test Statistic	1.84							
268				A-D Critical (0.05) Value	0.764							
269				K-S Test Statistic	0.205							
270				K-S Critical(0.05) Value	0.154							
271	Data not Gamma Distributed at (0.05) Significance Level											
272												
273			Lognormal GOF Test Results									
274												
275				Correlation Coefficient R	0.966							
276				Shapiro Wilk Test Statistic	0.929							
277				Shapiro Wilk Critical (0.05) Value	0.933							
278				Approximate Shapiro Wilk P Value	0.0338							
279				Lilliefors Test Statistic	0.141							
280				Lilliefors Critical (0.05) Value	0.15							
281	Data appear Approximate_Lognormal at (0.05) Significance Level											
282												
283	Zinc (mg/L)											
284												
285				Raw Statistics								
286				Number of Valid Observations	34							
287				Number of Distinct Observations	28							
288				Minimum	6.0000E-4							
289				Maximum	0.245							
290				Mean of Raw Data	0.0217							
291				Standard Deviation of Raw Data	0.047							
292				Khat	0.543							
293				Theta hat	0.0399							
294				Kstar	0.515							
295				Theta star	0.0421							
296				Mean of Log Transformed Data	-4.986							
297				Standard Deviation of Log Transformed Data	1.428							
298												
299			Normal GOF Test Results									
300												
301				Correlation Coefficient R	0.667							
302				Shapiro Wilk Test Statistic	0.474							
303				Shapiro Wilk Critical (0.05) Value	0.933							
304				Approximate Shapiro Wilk P Value	1.787E-12							
305				Lilliefors Test Statistic	0.327							
306				Lilliefors Critical (0.05) Value	0.15							
307	Data not Normal at (0.05) Significance Level											
308												
309			Gamma GOF Test Results									
310												
311				Correlation Coefficient R	0.929							
312				A-D Test Statistic	2.329							
313				A-D Critical (0.05) Value	0.807							
314				K-S Test Statistic	0.237							
315				K-S Critical(0.05) Value	0.159							
316	Data not Gamma Distributed at (0.05) Significance Level											
317												
318			Lognormal GOF Test Results									

	A	B	C	D	E	F	G	H	I	J	K	L
319												
320					Correlation Coefficient R	0.978						
321					Shapiro Wilk Test Statistic	0.953						
322					Shapiro Wilk Critical (0.05) Value	0.933						
323					Approximate Shapiro Wilk P Value	0.183						
324					Lilliefors Test Statistic	0.14						
325					Lilliefors Critical (0.05) Value	0.15						
326	Data appear Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-17 7:56:18 AM	
From File	2025-ShallowProUCL_I.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

14(R)-SH

Chloride (mg/L)

Raw Statistics	
Number of Valid Observations	33
Number of Distinct Observations	32
Minimum	0.9
Maximum	17.1
Mean of Raw Data	4.131
Standard Deviation of Raw Data	3.475
Khat	2.007
Theta hat	2.058
Kstar	1.845
Theta star	2.239
Mean of Log Transformed Data	1.149
Standard Deviation of Log Transformed Data	0.733

Normal GOF Test Results	
Correlation Coefficient R	0.871
Shapiro Wilk Test Statistic	0.771
Shapiro Wilk Critical (0.05) Value	0.931
Approximate Shapiro Wilk P Value	2.1633E-6
Lilliefors Test Statistic	0.176
Lilliefors Critical (0.05) Value	0.152

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results	
Correlation Coefficient R	0.967
A-D Test Statistic	0.627
A-D Critical (0.05) Value	0.759
K-S Test Statistic	0.134
K-S Critical(0.05) Value	0.155

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results	
Correlation Coefficient R	0.983
Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical (0.05) Value	0.931
Approximate Shapiro Wilk P Value	0.278
Lilliefors Test Statistic	0.134
Lilliefors Critical (0.05) Value	0.152

Data appear Lognormal at (0.05) Significance Level

54	Arsenic (mg/L)											
55												
56			Raw Statistics									
57				Number of Valid Observations	33							
58				Number of Distinct Observations	19							
59				Minimum	1.7000E-4							
60				Maximum	0.0012							
61				Mean of Raw Data	3.5364E-4							
62				Standard Deviation of Raw Data	2.0351E-4							
63				Khat	4.327							
64				Theta hat	8.1722E-5							
65				Kstar	3.954							
66				Theta star	8.9434E-5							
67				Mean of Log Transformed Data	-8.067							
68				Standard Deviation of Log Transformed Data	0.474							
69												
70			Normal GOF Test Results									
71												
72				Correlation Coefficient R	0.854							
73				Shapiro Wilk Test Statistic	0.749							
74				Shapiro Wilk Critical (0.05) Value	0.931							
75				Approximate Shapiro Wilk P Value	6.9564E-7							
76				Lilliefors Test Statistic	0.183							
77				Lilliefors Critical (0.05) Value	0.152							
78	Data not Normal at (0.05) Significance Level											
79												
80			Gamma GOF Test Results									
81												
82				Correlation Coefficient R	0.925							
83				A-D Test Statistic	1.539							
84				A-D Critical (0.05) Value	0.75							
85				K-S Test Statistic	0.178							
86				K-S Critical(0.05) Value	0.154							
87	Data not Gamma Distributed at (0.05) Significance Level											
88												
89			Lognormal GOF Test Results									
90												
91				Correlation Coefficient R	0.94							
92				Shapiro Wilk Test Statistic	0.881							
93				Shapiro Wilk Critical (0.05) Value	0.931							
94				Approximate Shapiro Wilk P Value	0.00158							
95				Lilliefors Test Statistic	0.168							
96				Lilliefors Critical (0.05) Value	0.152							
97	Data not Lognormal at (0.05) Significance Level											
98												
99	Non-parametric GOF Test Results											
100												
101	Data do not follow a discernible distribution at (0.05) Level of Signifi											
102												
103	Cadmium (mg/L)											
104												
105			Raw Statistics									
106				Number of Valid Observations	33							

Number of Distinct Observations	22	
Minimum	1.4000E-5	
Maximum	0.0031	
Mean of Raw Data	6.7731E-4	
Standard Deviation of Raw Data	0.00107	
Khat	0.554	
Theta hat	0.00122	
Kstar	0.524	
Theta star	0.00129	
Mean of Log Transformed Data	-8.425	
Standard Deviation of Log Transformed Data	1.559	

Normal GOF Test Results

Correlation Coefficient R	0.776
Shapiro Wilk Test Statistic	0.593
Shapiro Wilk Critical (0.05) Value	0.931
Approximate Shapiro Wilk P Value	4.703E-10
Lilliefors Test Statistic	0.349
Lilliefors Critical (0.05) Value	0.152

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.9
A-D Test Statistic	2.151
A-D Critical (0.05) Value	0.806
K-S Test Statistic	0.253
K-S Critical(0.05) Value	0.161

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.971
Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical (0.05) Value	0.931
Approximate Shapiro Wilk P Value	0.0327
Lilliefors Test Statistic	0.16
Lilliefors Critical (0.05) Value	0.152

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Signifi

Chromium (mg/L)

Raw Statistics

Number of Valid Observations	33
Number of Distinct Observations	23
Minimum	5.3000E-4
Maximum	0.016
Mean of Raw Data	0.00379

Standard Deviation of Raw Data	0.00348				
Khat	1.613				
Theta hat	0.00235				
Kstar	1.487				
Theta star	0.00255				
Mean of Log Transformed Data	-5.916				
Standard Deviation of Log Transformed Data	0.836				

Normal GOF Test Results

Correlation Coefficient R	0.877
Shapiro Wilk Test Statistic	0.778
Shapiro Wilk Critical (0.05) Value	0.931
Approximate Shapiro Wilk P Value	3.1160E-6
Lilliefors Test Statistic	0.221
Lilliefors Critical (0.05) Value	0.152

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.978
A-D Test Statistic	0.878
A-D Critical (0.05) Value	0.764
K-S Test Statistic	0.192
K-S Critical(0.05) Value	0.156

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.985
Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical (0.05) Value	0.931
Approximate Shapiro Wilk P Value	0.388
Lilliefors Test Statistic	0.154
Lilliefors Critical (0.05) Value	0.152

Data appear Approximate_Lognormal at (0.05) Significance Level

Nickel (mg/L)

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	30
Minimum	5.0000E-4
Maximum	0.057
Mean of Raw Data	0.00949
Standard Deviation of Raw Data	0.0129
Khat	0.91
Theta hat	0.0104
Kstar	0.845
Theta star	0.0112
Mean of Log Transformed Data	-5.3
Standard Deviation of Log Transformed Data	1.085

	A	B	C	D	E	F	G	H	I	J	K	L
213			Normal GOF Test Results									
214												
215					Correlation Coefficient R	0.8						
216					Shapiro Wilk Test Statistic	0.652						
217					Shapiro Wilk Critical (0.05) Value	0.93						
218					Approximate Shapiro Wilk P Value	1.1125E-8						
219					Lilliefors Test Statistic	0.352						
220					Lilliefors Critical (0.05) Value	0.154						
221	Data not Normal at (0.05) Significance Level											
222												
223			Gamma GOF Test Results									
224												
225					Correlation Coefficient R	0.965						
226					A-D Test Statistic	2.437						
227					A-D Critical (0.05) Value	0.78						
228					K-S Test Statistic	0.286						
229					K-S Critical(0.05) Value	0.161						
230	Data not Gamma Distributed at (0.05) Significance Level											
231												
232			Lognormal GOF Test Results									
233												
234					Correlation Coefficient R	0.955						
235					Shapiro Wilk Test Statistic	0.914						
236					Shapiro Wilk Critical (0.05) Value	0.93						
237					Approximate Shapiro Wilk P Value	0.0156						
238					Lilliefors Test Statistic	0.211						
239					Lilliefors Critical (0.05) Value	0.154						
240	Data not Lognormal at (0.05) Significance Level											
241												
242	Non-parametric GOF Test Results											
243												
244	Data do not follow a discernible distribution at (0.05) Level of Signifi											
245												
246	Zinc (mg/L)											
247												
248				Raw Statistics								
249					Number of Valid Observations	32						
250					Number of Distinct Observations	29						
251					Minimum	0.0011						
252					Maximum	0.211						
253					Mean of Raw Data	0.0259						
254					Standard Deviation of Raw Data	0.0432						
255					Khat	0.712						
256					Theta hat	0.0363						
257					Kstar	0.666						
258					Theta star	0.0388						
259					Mean of Log Transformed Data	-4.501						
260					Standard Deviation of Log Transformed Data	1.258						
261												
262			Normal GOF Test Results									
263												
264					Correlation Coefficient R	0.744						
265					Shapiro Wilk Test Statistic	0.576						

	A	B	C	D	E	F	G	H	I	J	K	L
266				Shapiro Wilk Critical (0.05) Value		0.93						
267				Approximate Shapiro Wilk P Value		4.564E-10						
268				Lilliefors Test Statistic		0.322						
269				Lilliefors Critical (0.05) Value		0.154						
270	Data not Normal at (0.05) Significance Level											
271												
272			Gamma GOF Test Results									
273												
274				Correlation Coefficient R		0.95						
275				A-D Test Statistic		1.715						
276				A-D Critical (0.05) Value		0.791						
277				K-S Test Statistic		0.202						
278				K-S Critical(0.05) Value		0.162						
279	Data not Gamma Distributed at (0.05) Significance Level											
280												
281			Lognormal GOF Test Results									
282												
283				Correlation Coefficient R		0.983						
284				Shapiro Wilk Test Statistic		0.963						
285				Shapiro Wilk Critical (0.05) Value		0.93						
286				Approximate Shapiro Wilk P Value		0.382						
287				Lilliefors Test Statistic		0.1						
288				Lilliefors Critical (0.05) Value		0.154						
289	Data appear Lognormal at (0.05) Significance Level											

			Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects								
	User Selected Options										
	Date/Time of Computation		ProUCL 5.12025-12-17 8:28:30 AM								
	From File		2025-ShallowProUCL_m.xls								
	Full Precision		OFF								
	Confidence Coefficient		0.95								
15-SH											
Chloride (mg/L)											
		Raw Statistics									
		Number of Valid Observations	35								
		Number of Missing Observations	1								
		Number of Distinct Observations	13								
		Minimum	0.5								
		Maximum	3.2								
		Mean of Raw Data	0.778								
		Standard Deviation of Raw Data	0.528								
		Khat	4.027								
		Theta hat	0.193								
		Kstar	3.701								
		Theta star	0.21								
		Mean of Log Transformed Data	-0.38								
		Standard Deviation of Log Transformed Data	0.459								
		Normal GOF Test Results									
		Correlation Coefficient R	0.754								
		Shapiro Wilk Test Statistic	0.593								
		Shapiro Wilk Critical (0.05) Value	0.934								
		Approximate Shapiro Wilk P Value	1.170E-10								
		Lilliefors Test Statistic	0.299								
		Lilliefors Critical (0.05) Value	0.148								
Data not Normal at (0.05) Significance Level											
		Gamma GOF Test Results									
		Correlation Coefficient R	0.868								
		A-D Test Statistic	3.924								
		A-D Critical (0.05) Value	0.753								
		K-S Test Statistic	0.287								
		K-S Critical(0.05) Value	0.149								
Data not Gamma Distributed at (0.05) Significance Level											
		Lognormal GOF Test Results									
		Correlation Coefficient R	0.855								
		Shapiro Wilk Test Statistic	0.733								
		Shapiro Wilk Critical (0.05) Value	0.934								
		Approximate Shapiro Wilk P Value	1.1593E-7								
		Lilliefors Test Statistic	0.295								
		Lilliefors Critical (0.05) Value	0.148								
Data not Lognormal at (0.05) Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
54												
55	Non-parametric GOF Test Results											
56												
57	Data do not follow a discernible distribution at (0.05) Level of Signifi											
58												
59	Arsenic (mg/L)											
60												
61			Raw Statistics									
62					Number of Valid Observations	36						
63					Number of Distinct Observations	17						
64					Minimum	1.6000E-4						
65					Maximum	0.00144						
66					Mean of Raw Data	3.4750E-4						
67					Standard Deviation of Raw Data	3.0612E-4						
68					Khat	2.33						
69					Theta hat	1.4912E-4						
70					Kstar	2.155						
71					Theta star	1.6128E-4						
72					Mean of Log Transformed Data	-8.194						
73					Standard Deviation of Log Transformed Data	0.606						
74												
75			Normal GOF Test Results									
76												
77					Correlation Coefficient R	0.778						
78					Shapiro Wilk Test Statistic	0.614						
79					Shapiro Wilk Critical (0.05) Value	0.935						
80					Approximate Shapiro Wilk P Value	1.509E-10						
81					Lilliefors Test Statistic	0.339						
82					Lilliefors Critical (0.05) Value	0.145						
83	Data not Normal at (0.05) Significance Level											
84												
85			Gamma GOF Test Results									
86												
87					Correlation Coefficient R	0.911						
88					A-D Test Statistic	4.946						
89					A-D Critical (0.05) Value	0.758						
90					K-S Test Statistic	0.318						
91					K-S Critical(0.05) Value	0.148						
92	Data not Gamma Distributed at (0.05) Significance Level											
93												
94			Lognormal GOF Test Results									
95												
96					Correlation Coefficient R	0.858						
97					Shapiro Wilk Test Statistic	0.732						
98					Shapiro Wilk Critical (0.05) Value	0.935						
99					Approximate Shapiro Wilk P Value	6.4788E-8						
100					Lilliefors Test Statistic	0.314						
101					Lilliefors Critical (0.05) Value	0.145						
102	Data not Lognormal at (0.05) Significance Level											
103												
104	Non-parametric GOF Test Results											
105												
106	Data do not follow a discernible distribution at (0.05) Level of Signifi											

	A	B	C	D	E	F	G	H	I	J	K	L
107												
108	Chromium (mg/L)											
109												
110			Raw Statistics									
111			Number of Valid Observations			36						
112			Number of Distinct Observations			17						
113			Minimum			1.1000E-4						
114			Maximum			0.035						
115			Mean of Raw Data			0.00335						
116			Standard Deviation of Raw Data			0.00632						
117			Khat			0.669						
118			Theta hat			0.00501						
119			Kstar			0.632						
120			Theta star			0.00531						
121			Mean of Log Transformed Data			-6.607						
122			Standard Deviation of Log Transformed Data			1.335						
123												
124			Normal GOF Test Results									
125												
126			Correlation Coefficient R			0.687						
127			Shapiro Wilk Test Statistic			0.504						
128			Shapiro Wilk Critical (0.05) Value			0.935						
129			Approximate Shapiro Wilk P Value			1.064E-12						
130			Lilliefors Test Statistic			0.362						
131			Lilliefors Critical (0.05) Value			0.145						
132	Data not Normal at (0.05) Significance Level											
133												
134			Gamma GOF Test Results									
135												
136			Correlation Coefficient R			0.919						
137			A-D Test Statistic			1.492						
138			A-D Critical (0.05) Value			0.796						
139			K-S Test Statistic			0.264						
140			K-S Critical(0.05) Value			0.153						
141	Data not Gamma Distributed at (0.05) Significance Level											
142												
143			Lognormal GOF Test Results									
144												
145			Correlation Coefficient R			0.986						
146			Shapiro Wilk Test Statistic			0.969						
147			Shapiro Wilk Critical (0.05) Value			0.935						
148			Approximate Shapiro Wilk P Value			0.475						
149			Lilliefors Test Statistic			0.162						
150			Lilliefors Critical (0.05) Value			0.145						
151	Data appear Approximate_Lognormal at (0.05) Significance Level											
152												
153	Copper (mg/L)											
154												
155			Raw Statistics									
156			Number of Valid Observations			36						
157			Number of Distinct Observations			28						
158			Minimum			5.1000E-4						
159			Maximum			0.018						

160					Mean of Raw Data	0.00405						
161					Standard Deviation of Raw Data	0.00371						
162					Khat	1.664						
163					Theta hat	0.00243						
164					Kstar	1.544						
165					Theta star	0.00262						
166					Mean of Log Transformed Data	-5.839						
167					Standard Deviation of Log Transformed Data	0.842						
168												
169			Normal GOF Test Results									
170												
171					Correlation Coefficient R	0.856						
172					Shapiro Wilk Test Statistic	0.747						
173					Shapiro Wilk Critical (0.05) Value	0.935						
174					Approximate Shapiro Wilk P Value	1.5102E-7						
175					Lilliefors Test Statistic	0.203						
176					Lilliefors Critical (0.05) Value	0.145						
177	Data not Normal at (0.05) Significance Level											
178												
179			Gamma GOF Test Results									
180												
181					Correlation Coefficient R	0.959						
182					A-D Test Statistic	0.592						
183					A-D Critical (0.05) Value	0.764						
184					K-S Test Statistic	0.102						
185					K-S Critical(0.05) Value	0.149						
186	Data appear Gamma Distributed at (0.05) Significance Level											
187												
188			Lognormal GOF Test Results									
189												
190					Correlation Coefficient R	0.984						
191					Shapiro Wilk Test Statistic	0.964						
192					Shapiro Wilk Critical (0.05) Value	0.935						
193					Approximate Shapiro Wilk P Value	0.355						
194					Lilliefors Test Statistic	0.103						
195					Lilliefors Critical (0.05) Value	0.145						
196	Data appear Lognormal at (0.05) Significance Level											
197												
198	Nickel (mg/L)											
199												
200			Raw Statistics									
201					Number of Valid Observations	34						
202					Number of Distinct Observations	32						
203					Minimum	0.002						
204					Maximum	0.0626						
205					Mean of Raw Data	0.00957						
206					Standard Deviation of Raw Data	0.0119						
207					Khat	1.367						
208					Theta hat	0.007						
209					Kstar	1.266						
210					Theta star	0.00756						
211					Mean of Log Transformed Data	-5.057						
212					Standard Deviation of Log Transformed Data	0.816						

Normal GOF Test Results		
Correlation Coefficient R	0.759	
Shapiro Wilk Test Statistic	0.601	
Shapiro Wilk Critical (0.05) Value	0.933	
Approximate Shapiro Wilk P Value	3.339E-10	
Lilliefors Test Statistic	0.31	
Lilliefors Critical (0.05) Value	0.15	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.926	
A-D Test Statistic	2.476	
A-D Critical (0.05) Value	0.768	
K-S Test Statistic	0.263	
K-S Critical(0.05) Value	0.154	
Data not Gamma Distributed at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.948	
Shapiro Wilk Test Statistic	0.897	
Shapiro Wilk Critical (0.05) Value	0.933	
Approximate Shapiro Wilk P Value	0.00372	
Lilliefors Test Statistic	0.218	
Lilliefors Critical (0.05) Value	0.15	
Data not Lognormal at (0.05) Significance Level		
Non-parametric GOF Test Results		
Data do not follow a discernible distribution at (0.05) Level of Signifi		
Zinc (mg/L)		
Raw Statistics		
Number of Valid Observations	34	
Number of Distinct Observations	25	
Minimum	6.0000E-4	
Maximum	0.02	
Mean of Raw Data	0.00511	
Standard Deviation of Raw Data	0.00487	
Khat	1.611	
Theta hat	0.00317	
Kstar	1.488	
Theta star	0.00343	
Mean of Log Transformed Data	-5.618	
Standard Deviation of Log Transformed Data	0.829	
Normal GOF Test Results		
Correlation Coefficient R	0.853	

	A	B	C	D	E	F	G	H	I	J	K	L
266					Shapiro Wilk Test Statistic	0.731						
267					Shapiro Wilk Critical (0.05) Value	0.933						
268					Approximate Shapiro Wilk P Value	1.6370E-7						
269					Lilliefors Test Statistic	0.231						
270					Lilliefors Critical (0.05) Value	0.15						
271	Data not Normal at (0.05) Significance Level											
272												
273				Gamma GOF Test Results								
274												
275					Correlation Coefficient R	0.957						
276					A-D Test Statistic	0.787						
277					A-D Critical (0.05) Value	0.764						
278					K-S Test Statistic	0.131						
279					K-S Critical(0.05) Value	0.154						
280	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
281												
282				Lognormal GOF Test Results								
283												
284					Correlation Coefficient R	0.989						
285					Shapiro Wilk Test Statistic	0.974						
286					Shapiro Wilk Critical (0.05) Value	0.933						
287					Approximate Shapiro Wilk P Value	0.647						
288					Lilliefors Test Statistic	0.105						
289					Lilliefors Critical (0.05) Value	0.15						
290	Data appear Lognormal at (0.05) Significance Level											

1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects							
2			User Selected Options								
3			Date/Time of Computation	ProUCL 5.12025-12-17 9:43:56 AM							
4			From File	2025-ShallowProUCL_n.xls							
5			Full Precision	OFF							
6			Confidence Coefficient	0.95							
7											
8	16-SH										
9	Chloride (mg/L)										
10											
11			Raw Statistics								
12			Number of Valid Observations	31							
13			Number of Distinct Observations	18							
14			Minimum	0.5							
15			Maximum	1.9							
16			Mean of Raw Data	0.934							
17			Standard Deviation of Raw Data	0.388							
18			Khat	6.213							
19			Theta hat	0.15							
20			Kstar	5.634							
21			Theta star	0.166							
22			Mean of Log Transformed Data	-0.151							
23			Standard Deviation of Log Transformed Data	0.415							
24											
25			Normal GOF Test Results								
26											
27			Correlation Coefficient R	0.961							
28			Shapiro Wilk Test Statistic	0.911							
29			Shapiro Wilk Critical (0.05) Value	0.929							
30			Approximate Shapiro Wilk P Value	0.0155							
31			Lilliefors Test Statistic	0.132							
32			Lilliefors Critical (0.05) Value	0.156							
33	Data appear Approximate Normal at (0.05) Significance Level										
34											
35			Gamma GOF Test Results								
36											
37			Correlation Coefficient R	0.985							
38			A-D Test Statistic	0.678							
39			A-D Critical (0.05) Value	0.747							
40			K-S Test Statistic	0.156							
41			K-S Critical(0.05) Value	0.158							
42	Data appear Gamma Distributed at (0.05) Significance Level										
43											
44			Lognormal GOF Test Results								
45											
46			Correlation Coefficient R	0.969							
47			Shapiro Wilk Test Statistic	0.918							
48			Shapiro Wilk Critical (0.05) Value	0.929							
49			Approximate Shapiro Wilk P Value	0.0241							
50			Lilliefors Test Statistic	0.163							
51			Lilliefors Critical (0.05) Value	0.156							
52	Data not Lognormal at (0.05) Significance Level										
53											

54	Arsenic (mg/L)											
55												
56			Raw Statistics									
57			Number of Valid Observations	31								
58			Number of Distinct Observations	10								
59			Minimum	1.3000E-4								
60			Maximum	5.8000E-4								
61			Mean of Raw Data	2.3419E-4								
62			Standard Deviation of Raw Data	1.0871E-4								
63			Khat	6.214								
64			Theta hat	3.7689E-5								
65			Kstar	5.634								
66			Theta star	4.1568E-5								
67			Mean of Log Transformed Data	-8.442								
68			Standard Deviation of Log Transformed Data	0.392								
69												
70			Normal GOF Test Results									
71												
72			Correlation Coefficient R	0.87								
73			Shapiro Wilk Test Statistic	0.762								
74			Shapiro Wilk Critical (0.05) Value	0.929								
75			Approximate Shapiro Wilk P Value	3.0318E-6								
76			Lilliefors Test Statistic	0.365								
77			Lilliefors Critical (0.05) Value	0.156								
78	Data not Normal at (0.05) Significance Level											
79												
80			Gamma GOF Test Results									
81												
82			Correlation Coefficient R	0.927								
83			A-D Test Statistic	2.402								
84			A-D Critical (0.05) Value	0.747								
85			K-S Test Statistic	0.34								
86			K-S Critical(0.05) Value	0.158								
87	Data not Gamma Distributed at (0.05) Significance Level											
88												
89			Lognormal GOF Test Results									
90												
91			Correlation Coefficient R	0.927								
92			Shapiro Wilk Test Statistic	0.855								
93			Shapiro Wilk Critical (0.05) Value	0.929								
94			Approximate Shapiro Wilk P Value	4.6593E-4								
95			Lilliefors Test Statistic	0.318								
96			Lilliefors Critical (0.05) Value	0.156								
97	Data not Lognormal at (0.05) Significance Level											
98												
99	Non-parametric GOF Test Results											
100												
101	Data do not follow a discernible distribution at (0.05) Level of Signifi											
102												
103	Chromium (mg/L)											
104												
105			Raw Statistics									
106			Number of Valid Observations	31								

Number of Distinct Observations	25	
Minimum	6.2000E-4	
Maximum	0.036	
Mean of Raw Data	0.00658	
Standard Deviation of Raw Data	0.00754	
Khat	1.067	
Theta hat	0.00617	
Kstar	0.986	
Theta star	0.00668	
Mean of Log Transformed Data	-5.56	
Standard Deviation of Log Transformed Data	1.063	

Normal GOF Test Results

Correlation Coefficient R	0.848
Shapiro Wilk Test Statistic	0.735
Shapiro Wilk Critical (0.05) Value	0.929
Approximate Shapiro Wilk P Value	8.1395E-7
Lilliefors Test Statistic	0.228
Lilliefors Critical (0.05) Value	0.156

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.974
A-D Test Statistic	0.774
A-D Critical (0.05) Value	0.774
K-S Test Statistic	0.163
K-S Critical(0.05) Value	0.162

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.984
Shapiro Wilk Test Statistic	0.959
Shapiro Wilk Critical (0.05) Value	0.929
Approximate Shapiro Wilk P Value	0.318
Lilliefors Test Statistic	0.138
Lilliefors Critical (0.05) Value	0.156

Data appear Lognormal at (0.05) Significance Level

Copper (mg/L)

Raw Statistics

Number of Valid Observations	31
Number of Distinct Observations	28
Minimum	6.0000E-4
Maximum	0.031
Mean of Raw Data	0.00372
Standard Deviation of Raw Data	0.00557
Khat	1.32
Theta hat	0.00282
Kstar	1.214

160					Theta star	0.00306						
161					Mean of Log Transformed Data	-6.019						
162					Standard Deviation of Log Transformed Data	0.801						
163												
164				Normal GOF Test Results								
165												
166					Correlation Coefficient R	0.66						
167					Shapiro Wilk Test Statistic	0.469						
168					Shapiro Wilk Critical (0.05) Value	0.929						
169					Approximate Shapiro Wilk P Value	1.805E-11						
170					Lilliefors Test Statistic	0.322						
171					Lilliefors Critical (0.05) Value	0.156						
172	Data not Normal at (0.05) Significance Level											
173												
174				Gamma GOF Test Results								
175												
176					Correlation Coefficient R	0.841						
177					A-D Test Statistic	1.914						
178					A-D Critical (0.05) Value	0.768						
179					K-S Test Statistic	0.21						
180					K-S Critical(0.05) Value	0.161						
181	Data not Gamma Distributed at (0.05) Significance Level											
182												
183				Lognormal GOF Test Results								
184												
185					Correlation Coefficient R	0.958						
186					Shapiro Wilk Test Statistic	0.93						
187					Shapiro Wilk Critical (0.05) Value	0.929						
188					Approximate Shapiro Wilk P Value	0.0528						
189					Lilliefors Test Statistic	0.129						
190					Lilliefors Critical (0.05) Value	0.156						
191	Data appear Lognormal at (0.05) Significance Level											
192												
193	Manganese (mg/L)											
194												
195				Raw Statistics								
196					Number of Valid Observations	29						
197					Number of Distinct Observations	25						
198					Minimum	5.4000E-4						
199					Maximum	0.571						
200					Mean of Raw Data	0.0497						
201					Standard Deviation of Raw Data	0.12						
202					Khat	0.406						
203					Theta hat	0.122						
204					Kstar	0.387						
205					Theta star	0.128						
206					Mean of Log Transformed Data	-4.621						
207					Standard Deviation of Log Transformed Data	1.79						
208												
209				Normal GOF Test Results								
210												
211					Correlation Coefficient R	0.65						
212					Shapiro Wilk Test Statistic	0.447						

213				Shapiro Wilk Critical (0.05) Value	0.926							
214				Approximate Shapiro Wilk P Value	3.914E-11							
215				Lilliefors Test Statistic	0.379							
216				Lilliefors Critical (0.05) Value	0.161							
217	Data not Normal at (0.05) Significance Level											
218												
219			Gamma GOF Test Results									
220												
221				Correlation Coefficient R	0.938							
222				A-D Test Statistic	1.737							
223				A-D Critical (0.05) Value	0.833							
224				K-S Test Statistic	0.207							
225				K-S Critical(0.05) Value	0.174							
226	Data not Gamma Distributed at (0.05) Significance Level											
227												
228			Lognormal GOF Test Results									
229												
230				Correlation Coefficient R	0.985							
231				Shapiro Wilk Test Statistic	0.962							
232				Shapiro Wilk Critical (0.05) Value	0.926							
233				Approximate Shapiro Wilk P Value	0.402							
234				Lilliefors Test Statistic	0.115							
235				Lilliefors Critical (0.05) Value	0.161							
236	Data appear Lognormal at (0.05) Significance Level											
237												
238	Nickel (mg/L)											
239												
240				Raw Statistics								
241				Number of Valid Observations	31							
242				Number of Distinct Observations	24							
243				Minimum	3.1000E-4							
244				Maximum	0.058							
245				Mean of Raw Data	0.00541							
246				Standard Deviation of Raw Data	0.0106							
247				Khat	0.871							
248				Theta hat	0.00621							
249				Kstar	0.808							
250				Theta star	0.00669							
251				Mean of Log Transformed Data	-5.894							
252				Standard Deviation of Log Transformed Data	1.022							
253												
254			Normal GOF Test Results									
255												
256				Correlation Coefficient R	0.627							
257				Shapiro Wilk Test Statistic	0.427							
258				Shapiro Wilk Critical (0.05) Value	0.929							
259				Approximate Shapiro Wilk P Value	4.228E-12							
260				Lilliefors Test Statistic	0.366							
261				Lilliefors Critical (0.05) Value	0.156							
262	Data not Normal at (0.05) Significance Level											
263												
264			Gamma GOF Test Results									
265												

266				Correlation Coefficient R	0.849							
267				A-D Test Statistic	2.128							
268				A-D Critical (0.05) Value	0.782							
269				K-S Test Statistic	0.224							
270				K-S Critical(0.05) Value	0.163							
271	Data not Gamma Distributed at (0.05) Significance Level											
272												
273			Lognormal GOF Test Results									
274												
275				Correlation Coefficient R	0.966							
276				Shapiro Wilk Test Statistic	0.95							
277				Shapiro Wilk Critical (0.05) Value	0.929							
278				Approximate Shapiro Wilk P Value	0.184							
279				Lilliefors Test Statistic	0.119							
280				Lilliefors Critical (0.05) Value	0.156							
281	Data appear Lognormal at (0.05) Significance Level											
282												
283	Zinc (mg/L)											
284												
285				Raw Statistics								
286				Number of Valid Observations	31							
287				Number of Distinct Observations	24							
288				Minimum	0.001							
289				Maximum	0.0262							
290				Mean of Raw Data	0.0056							
291				Standard Deviation of Raw Data	0.00601							
292				Khat	1.295							
293				Theta hat	0.00433							
294				Kstar	1.191							
295				Theta star	0.0047							
296				Mean of Log Transformed Data	-5.618							
297				Standard Deviation of Log Transformed Data	0.914							
298												
299			Normal GOF Test Results									
300												
301				Correlation Coefficient R	0.854							
302				Shapiro Wilk Test Statistic	0.736							
303				Shapiro Wilk Critical (0.05) Value	0.929							
304				Approximate Shapiro Wilk P Value	8.6041E-7							
305				Lilliefors Test Statistic	0.222							
306				Lilliefors Critical (0.05) Value	0.156							
307	Data not Normal at (0.05) Significance Level											
308												
309			Gamma GOF Test Results									
310												
311				Correlation Coefficient R	0.981							
312				A-D Test Statistic	1.169							
313				A-D Critical (0.05) Value	0.769							
314				K-S Test Statistic	0.195							
315				K-S Critical(0.05) Value	0.161							
316	Data not Gamma Distributed at (0.05) Significance Level											
317												
318			Lognormal GOF Test Results									

	A	B	C	D	E	F	G	H	I	J	K	L
319												
320					Correlation Coefficient R	0.975						
321					Shapiro Wilk Test Statistic	0.936						
322					Shapiro Wilk Critical (0.05) Value	0.929						
323					Approximate Shapiro Wilk P Value	0.0755						
324					Lilliefors Test Statistic	0.159						
325					Lilliefors Critical (0.05) Value	0.156						
326	Data appear Approximate_Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-17 10:24:50 AM	
From File	2025-ShallowProUCL_o.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

17-SH

Chloride (mg/L)

Raw Statistics	
Number of Valid Observations	32
Number of Distinct Observations	18
Minimum	0.5
Maximum	21.8
Mean of Raw Data	4.368
Standard Deviation of Raw Data	5.763
Khat	0.681
Theta hat	6.415
Kstar	0.638
Theta star	6.847
Mean of Log Transformed Data	0.583
Standard Deviation of Log Transformed Data	1.374

Normal GOF Test Results

Correlation Coefficient R	0.852
Shapiro Wilk Test Statistic	0.724
Shapiro Wilk Critical (0.05) Value	0.93
Approximate Shapiro Wilk P Value	3.0229E-7
Lilliefors Test Statistic	0.291
Lilliefors Critical (0.05) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.982
A-D Test Statistic	2.513
A-D Critical (0.05) Value	0.794
K-S Test Statistic	0.249
K-S Critical(0.05) Value	0.162

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.912
Shapiro Wilk Test Statistic	0.808
Shapiro Wilk Critical (0.05) Value	0.93
Approximate Shapiro Wilk P Value	2.4838E-5
Lilliefors Test Statistic	0.261
Lilliefors Critical (0.05) Value	0.154

Data not Lognormal at (0.05) Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
54	Non-parametric GOF Test Results											
55												
56	Data do not follow a discernible distribution at (0.05) Level of Signifi											
57												
58	Arsenic (mg/L)											
59												
60				Raw Statistics								
61					Number of Valid Observations	32						
62					Number of Distinct Observations	9						
63					Minimum	1.0000E-4						
64					Maximum	4.0000E-4						
65					Mean of Raw Data	2.3906E-4						
66					Standard Deviation of Raw Data	1.0938E-4						
67					Khat	5.191						
68					Theta hat	4.6056E-5						
69					Kstar	4.725						
70					Theta star	5.0597E-5						
71					Mean of Log Transformed Data	-8.438						
72					Standard Deviation of Log Transformed Data	0.452						
73												
74				Normal GOF Test Results								
75												
76					Correlation Coefficient R	0.899						
77					Shapiro Wilk Test Statistic	0.787						
78					Shapiro Wilk Critical (0.05) Value	0.93						
79					Approximate Shapiro Wilk P Value	7.5213E-6						
80					Lilliefors Test Statistic	0.327						
81					Lilliefors Critical (0.05) Value	0.154						
82	Data not Normal at (0.05) Significance Level											
83												
84				Gamma GOF Test Results								
85												
86					Correlation Coefficient R	0.902						
87					A-D Test Statistic	2.204						
88					A-D Critical (0.05) Value	0.748						
89					K-S Test Statistic	0.285						
90					K-S Critical(0.05) Value	0.156						
91	Data not Gamma Distributed at (0.05) Significance Level											
92												
93				Lognormal GOF Test Results								
94												
95					Correlation Coefficient R	0.937						
96					Shapiro Wilk Test Statistic	0.857						
97					Shapiro Wilk Critical (0.05) Value	0.93						
98					Approximate Shapiro Wilk P Value	4.1521E-4						
99					Lilliefors Test Statistic	0.257						
100					Lilliefors Critical (0.05) Value	0.154						
101	Data not Lognormal at (0.05) Significance Level											
102												
103	Non-parametric GOF Test Results											
104												
105	Data do not follow a discernible distribution at (0.05) Level of Signifi											
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107	Cadmium (mg/L)											
108												
109			Raw Statistics									
110				Number of Valid Observations		32						
111				Number of Distinct Observations		20						
112					Minimum	8.0000E-6						
113					Maximum	0.003						
114					Mean of Raw Data	1.8841E-4						
115					Standard Deviation of Raw Data	5.2144E-4						
116					Khat	0.531						
117					Theta hat	3.5503E-4						
118					Kstar	0.502						
119					Theta star	3.7549E-4						
120					Mean of Log Transformed Data	-9.763						
121					Standard Deviation of Log Transformed Data	1.423						
122												
123			Normal GOF Test Results									
124												
125					Correlation Coefficient R	0.523						
126					Shapiro Wilk Test Statistic	0.309						
127					Shapiro Wilk Critical (0.05) Value	0.93						
128					Approximate Shapiro Wilk P Value	3.875E-14						
129					Lilliefors Test Statistic	0.429						
130					Lilliefors Critical (0.05) Value	0.154						
131	Data not Normal at (0.05) Significance Level											
132												
133			Gamma GOF Test Results									
134												
135					Correlation Coefficient R	0.771						
136					A-D Test Statistic	2.806						
137					A-D Critical (0.05) Value	0.808						
138					K-S Test Statistic	0.245						
139					K-S Critical(0.05) Value	0.164						
140	Data not Gamma Distributed at (0.05) Significance Level											
141												
142			Lognormal GOF Test Results									
143												
144					Correlation Coefficient R	0.924						
145					Shapiro Wilk Test Statistic	0.854						
146					Shapiro Wilk Critical (0.05) Value	0.93						
147					Approximate Shapiro Wilk P Value	3.6358E-4						
148					Lilliefors Test Statistic	0.216						
149					Lilliefors Critical (0.05) Value	0.154						
150	Data not Lognormal at (0.05) Significance Level											
151												
152	Non-parametric GOF Test Results											
153												
154	Data do not follow a discernible distribution at (0.05) Level of Signifi											
155												
156	Chromium (mg/L)											
157												
158			Raw Statistics									
159				Number of Valid Observations		32						

Number of Distinct Observations	18	
Minimum	2.3000E-4	
Maximum	0.024	
Mean of Raw Data	0.00232	
Standard Deviation of Raw Data	0.00418	
Khat	0.991	
Theta hat	0.00234	
Kstar	0.919	
Theta star	0.00252	
Mean of Log Transformed Data	-6.65	
Standard Deviation of Log Transformed Data	0.973	

Normal GOF Test Results

Correlation Coefficient R	0.626
Shapiro Wilk Test Statistic	0.428
Shapiro Wilk Critical (0.05) Value	0.93
Approximate Shapiro Wilk P Value	1.919E-12
Lilliefors Test Statistic	0.343
Lilliefors Critical (0.05) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.822
A-D Test Statistic	1.596
A-D Critical (0.05) Value	0.776
K-S Test Statistic	0.234
K-S Critical(0.05) Value	0.16

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.973
Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical (0.05) Value	0.93
Approximate Shapiro Wilk P Value	0.229
Lilliefors Test Statistic	0.14
Lilliefors Critical (0.05) Value	0.154

Data appear Lognormal at (0.05) Significance Level

Manganese (mg/L)

Raw Statistics

Number of Valid Observations	30
Number of Distinct Observations	21
Minimum	1.1000E-4
Maximum	0.441
Mean of Raw Data	0.0399
Standard Deviation of Raw Data	0.0965
Khat	0.36
Theta hat	0.111
Kstar	0.346

Theta star	0.115
Mean of Log Transformed Data	-5.081
Standard Deviation of Log Transformed Data	1.836

Normal GOF Test Results

Correlation Coefficient R	0.666
Shapiro Wilk Test Statistic	0.465
Shapiro Wilk Critical (0.05) Value	0.927
Approximate Shapiro Wilk P Value	3.375E-11
Lilliefors Test Statistic	0.402
Lilliefors Critical (0.05) Value	0.159

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.96
A-D Test Statistic	3.502
A-D Critical (0.05) Value	0.84
K-S Test Statistic	0.358
K-S Critical(0.05) Value	0.172

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.949
Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical (0.05) Value	0.927
Approximate Shapiro Wilk P Value	0.0132
Lilliefors Test Statistic	0.247
Lilliefors Critical (0.05) Value	0.159

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Signifi

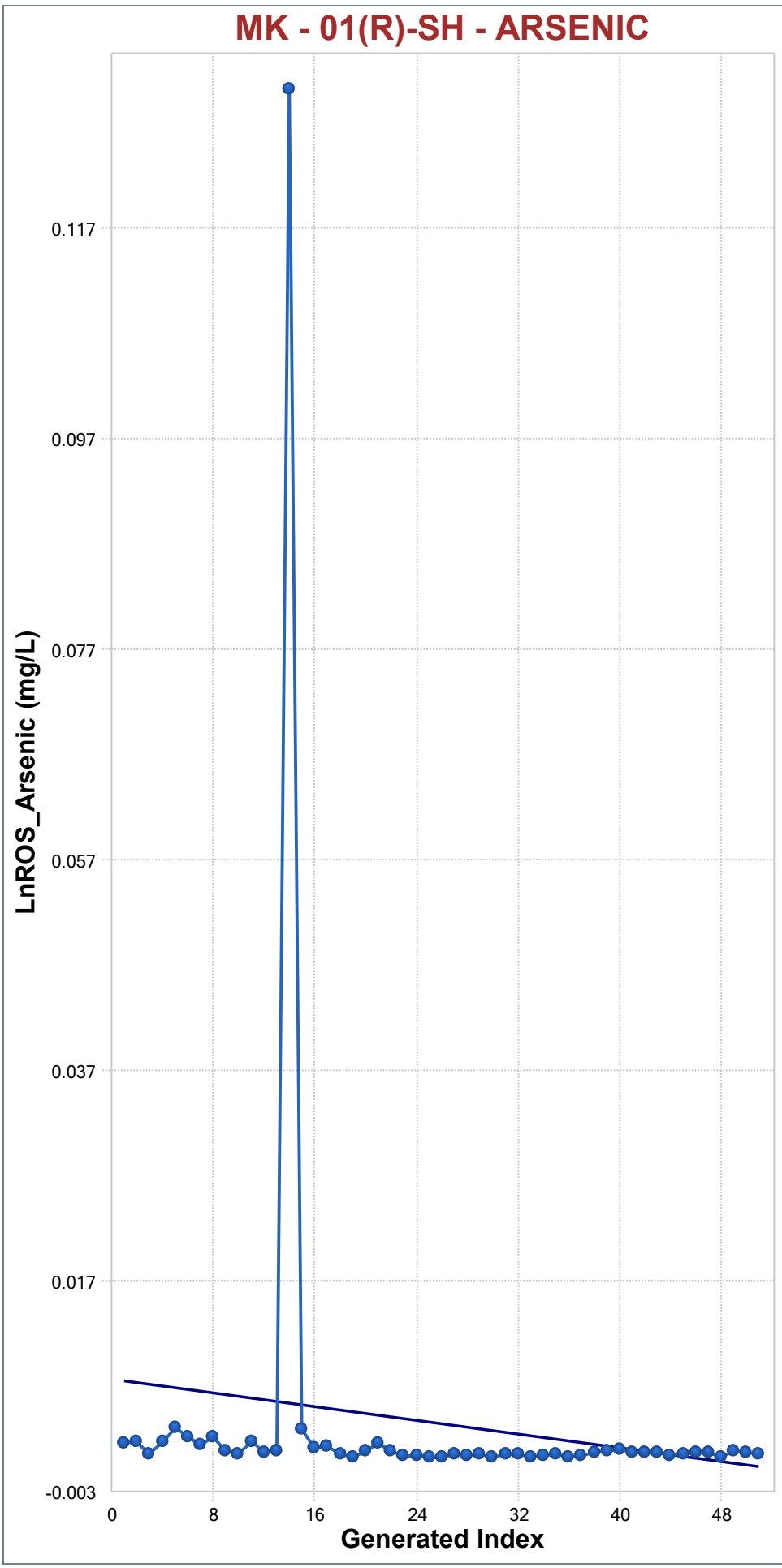
Nickel (mg/L)

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	25
Minimum	2.0000E-4
Maximum	0.015
Mean of Raw Data	0.00292
Standard Deviation of Raw Data	0.00329
Khat	1.324
Theta hat	0.00221
Kstar	1.221
Theta star	0.0024
Mean of Log Transformed Data	-6.257
Standard Deviation of Log Transformed Data	0.924

	A	B	C	D	E	F	G	H	I	J	K	L
266			Normal GOF Test Results									
267												
268					Correlation Coefficient R	0.806						
269					Shapiro Wilk Test Statistic	0.664						
270					Shapiro Wilk Critical (0.05) Value	0.93						
271					Approximate Shapiro Wilk P Value	1.8501E-8						
272					Lilliefors Test Statistic	0.234						
273					Lilliefors Critical (0.05) Value	0.154						
274	Data not Normal at (0.05) Significance Level											
275												
276			Gamma GOF Test Results									
277												
278					Correlation Coefficient R	0.938						
279					A-D Test Statistic	0.8						
280					A-D Critical (0.05) Value	0.768						
281					K-S Test Statistic	0.134						
282					K-S Critical(0.05) Value	0.159						
283	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
284												
285			Lognormal GOF Test Results									
286												
287					Correlation Coefficient R	0.987						
288					Shapiro Wilk Test Statistic	0.979						
289					Shapiro Wilk Critical (0.05) Value	0.93						
290					Approximate Shapiro Wilk P Value	0.809						
291					Lilliefors Test Statistic	0.0872						
292					Lilliefors Critical (0.05) Value	0.154						
293	Data appear Lognormal at (0.05) Significance Level											
294												
295	Zinc (mg/L)											
296												
297				Raw Statistics								
298					Number of Valid Observations	32						
299					Number of Distinct Observations	23						
300					Minimum	0.001						
301					Maximum	0.016						
302					Mean of Raw Data	0.00518						
303					Standard Deviation of Raw Data	0.00445						
304					Khat	1.668						
305					Theta hat	0.0031						
306					Kstar	1.533						
307					Theta star	0.00338						
308					Mean of Log Transformed Data	-5.592						
309					Standard Deviation of Log Transformed Data	0.826						
310												
311			Normal GOF Test Results									
312												
313					Correlation Coefficient R	0.901						
314					Shapiro Wilk Test Statistic	0.801						
315					Shapiro Wilk Critical (0.05) Value	0.93						
316					Approximate Shapiro Wilk P Value	1.6351E-5						
317					Lilliefors Test Statistic	0.239						
318					Lilliefors Critical (0.05) Value	0.154						

	A	B	C	D	E	F	G	H	I	J	K	L
319	Data not Normal at (0.05) Significance Level											
320												
321			Gamma GOF Test Results									
322												
323					Correlation Coefficient R	0.971						
324					A-D Test Statistic	0.733						
325					A-D Critical (0.05) Value	0.763						
326					K-S Test Statistic	0.136						
327					K-S Critical(0.05) Value	0.158						
328	Data appear Gamma Distributed at (0.05) Significance Level											
329												
330			Lognormal GOF Test Results									
331												
332					Correlation Coefficient R	0.984						
333					Shapiro Wilk Test Statistic	0.948						
334					Shapiro Wilk Critical (0.05) Value	0.93						
335					Approximate Shapiro Wilk P Value	0.16						
336					Lilliefors Test Statistic	0.118						
337					Lilliefors Critical (0.05) Value	0.154						
338	Data appear Lognormal at (0.05) Significance Level											



Mann-Kendall Trend Analysis

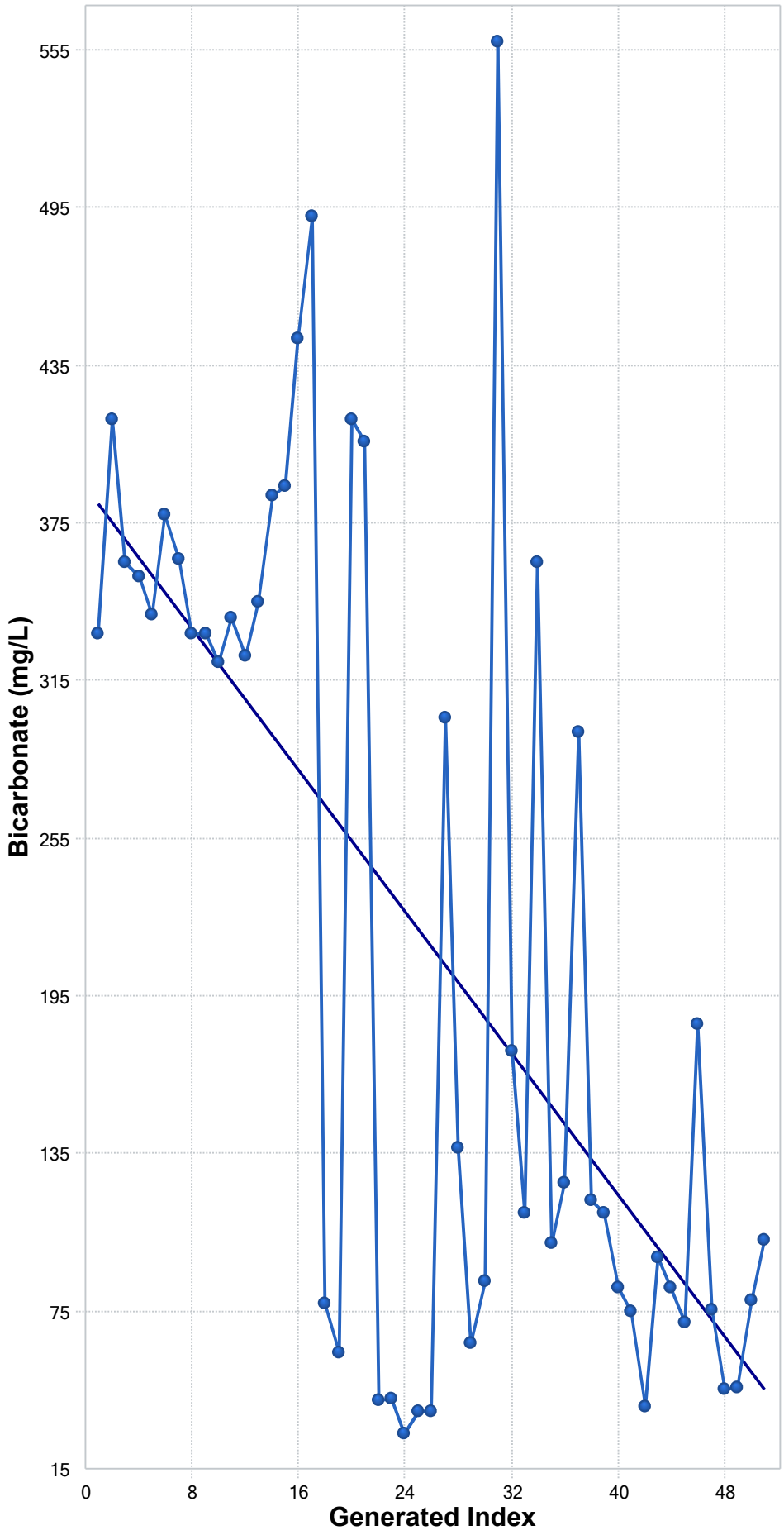
n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	122.8970
Standardized Value of S	-2.9293
M-K Test Value (S)	-361
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0017

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0075

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

MK - 01(R)-SH - BICARBONATE



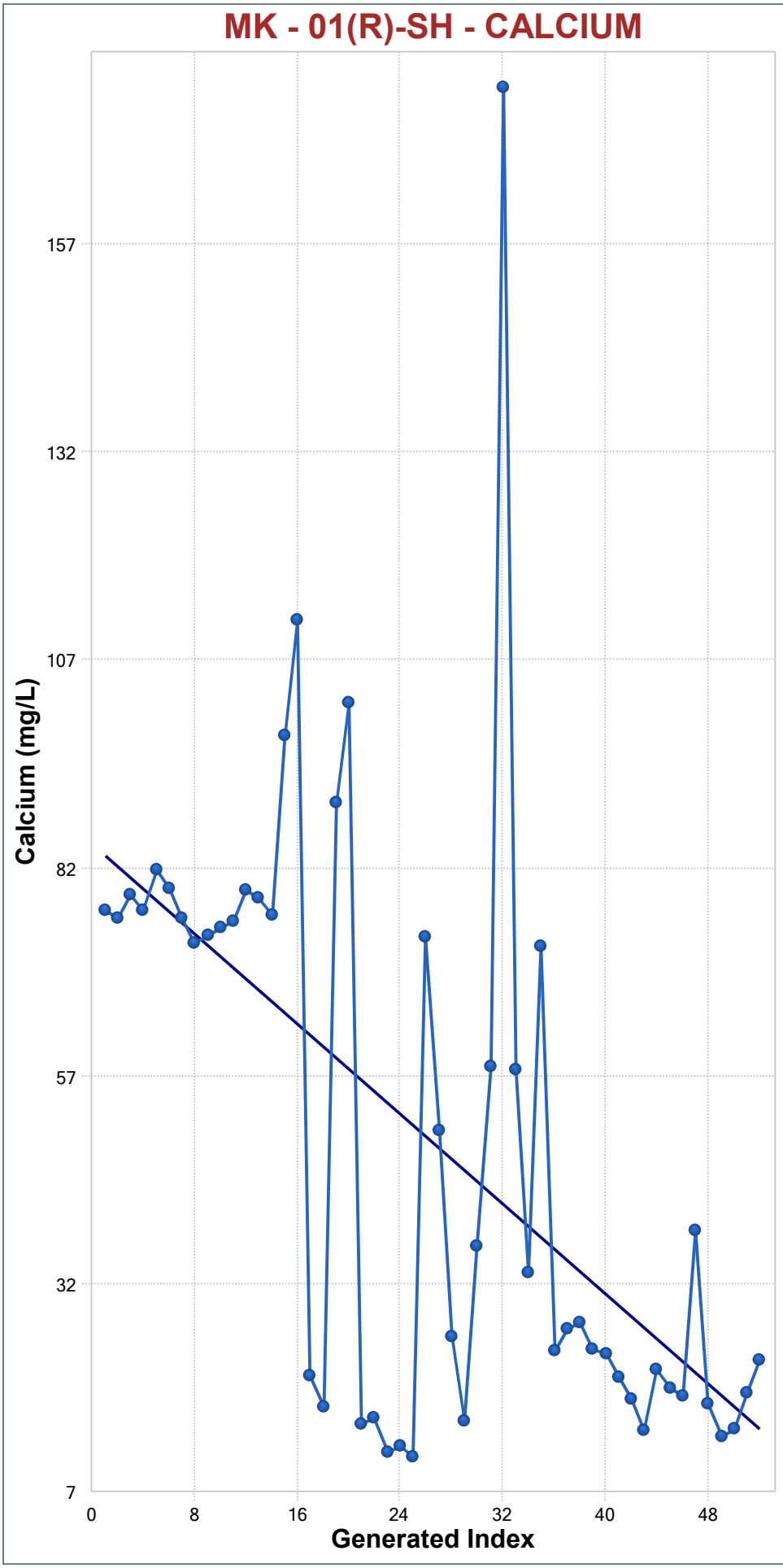
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	123.1002
Standardized Value of S	-3.8505
M-K Test Value (S)	-475
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-6.7405
OLS Regression Intercept	389.1245

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



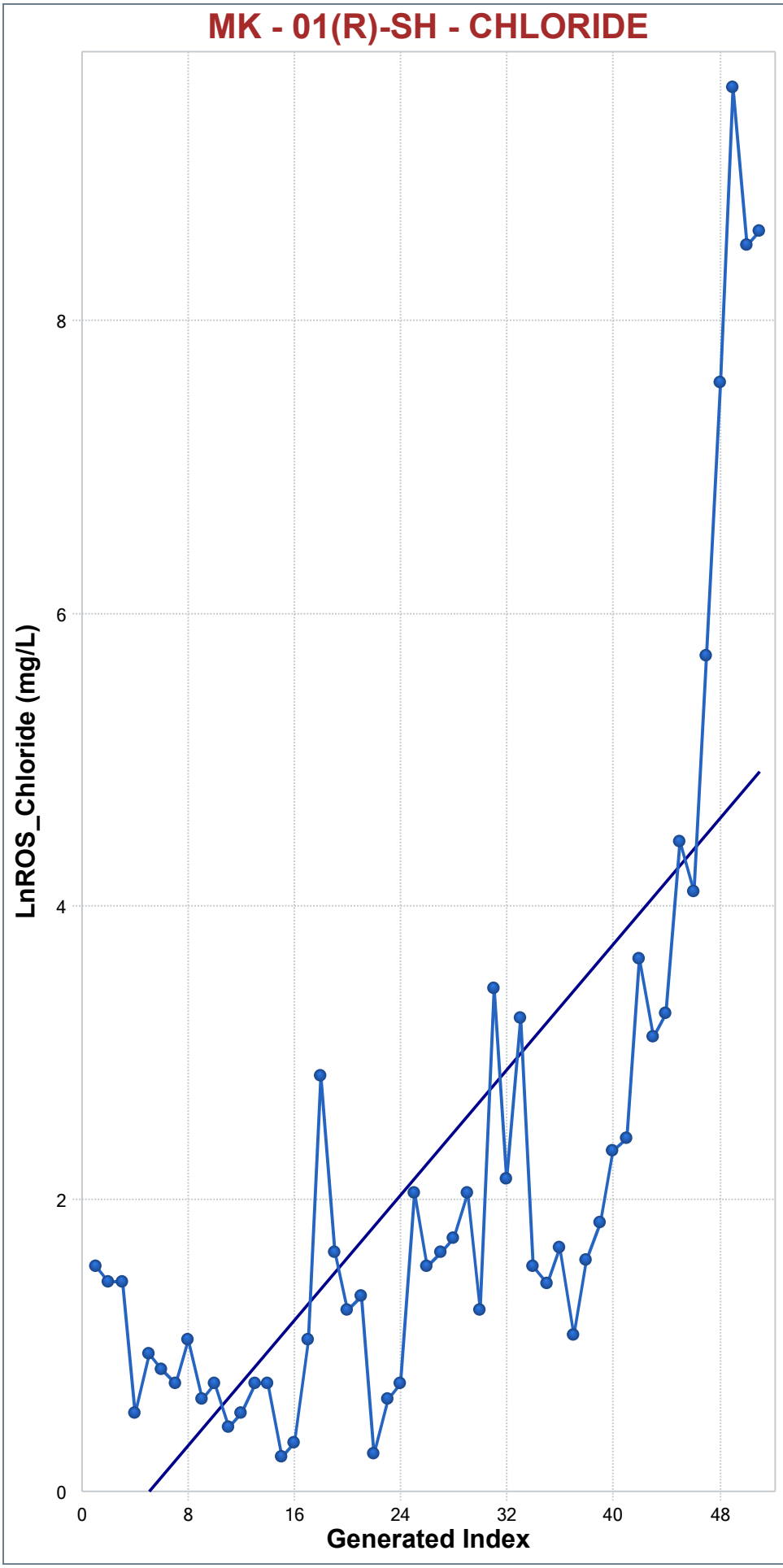
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.7175
Standardized Value of S	-4.4903
M-K Test Value (S)	-570
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-1.3509
OLS Regression Intercept	84.9152

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



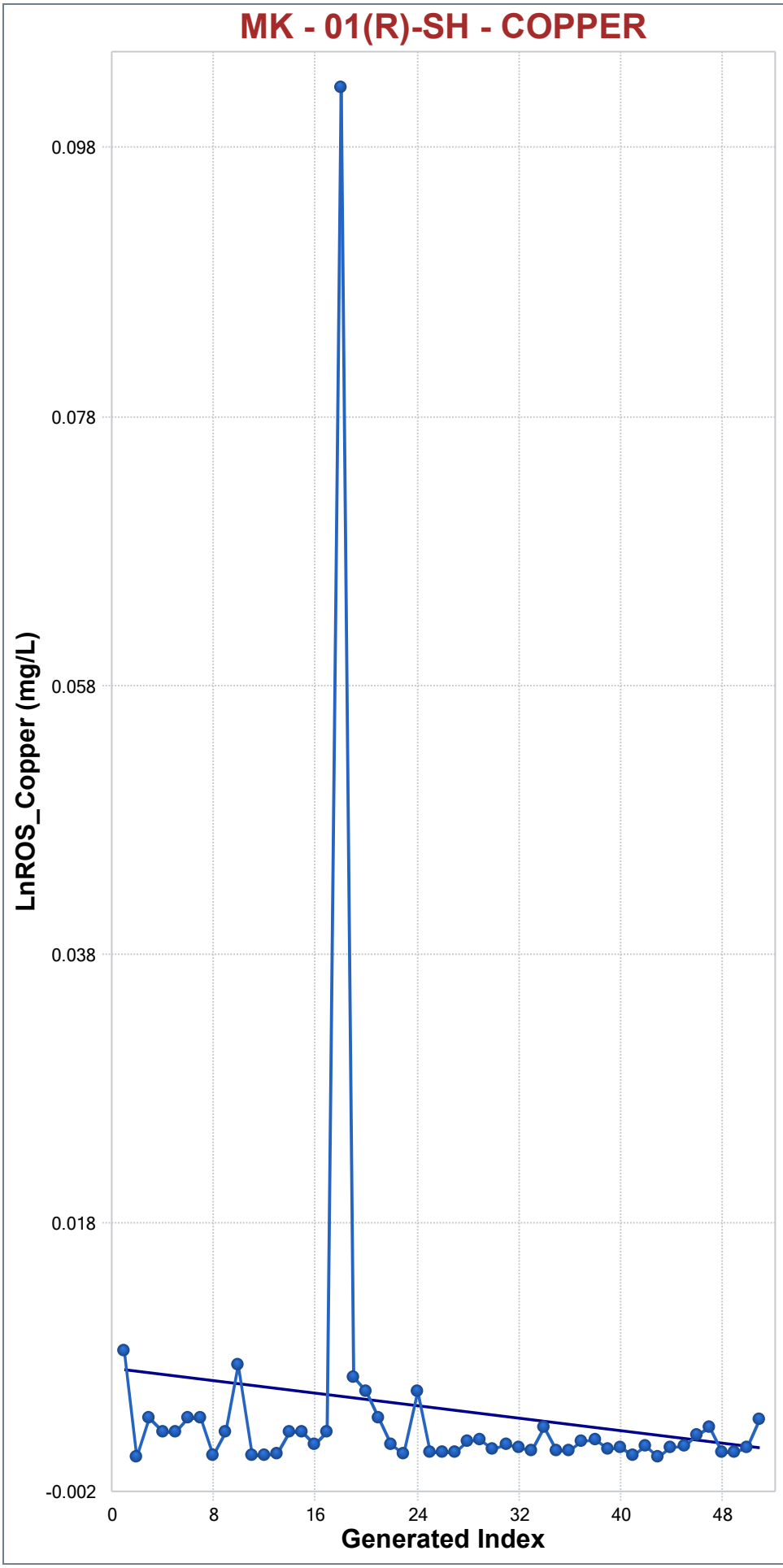
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	123.0081
Standardized Value of S	6.0646
M-K Test Value (S)	747
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.1072
OLS Regression Intercept	-0.4892

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



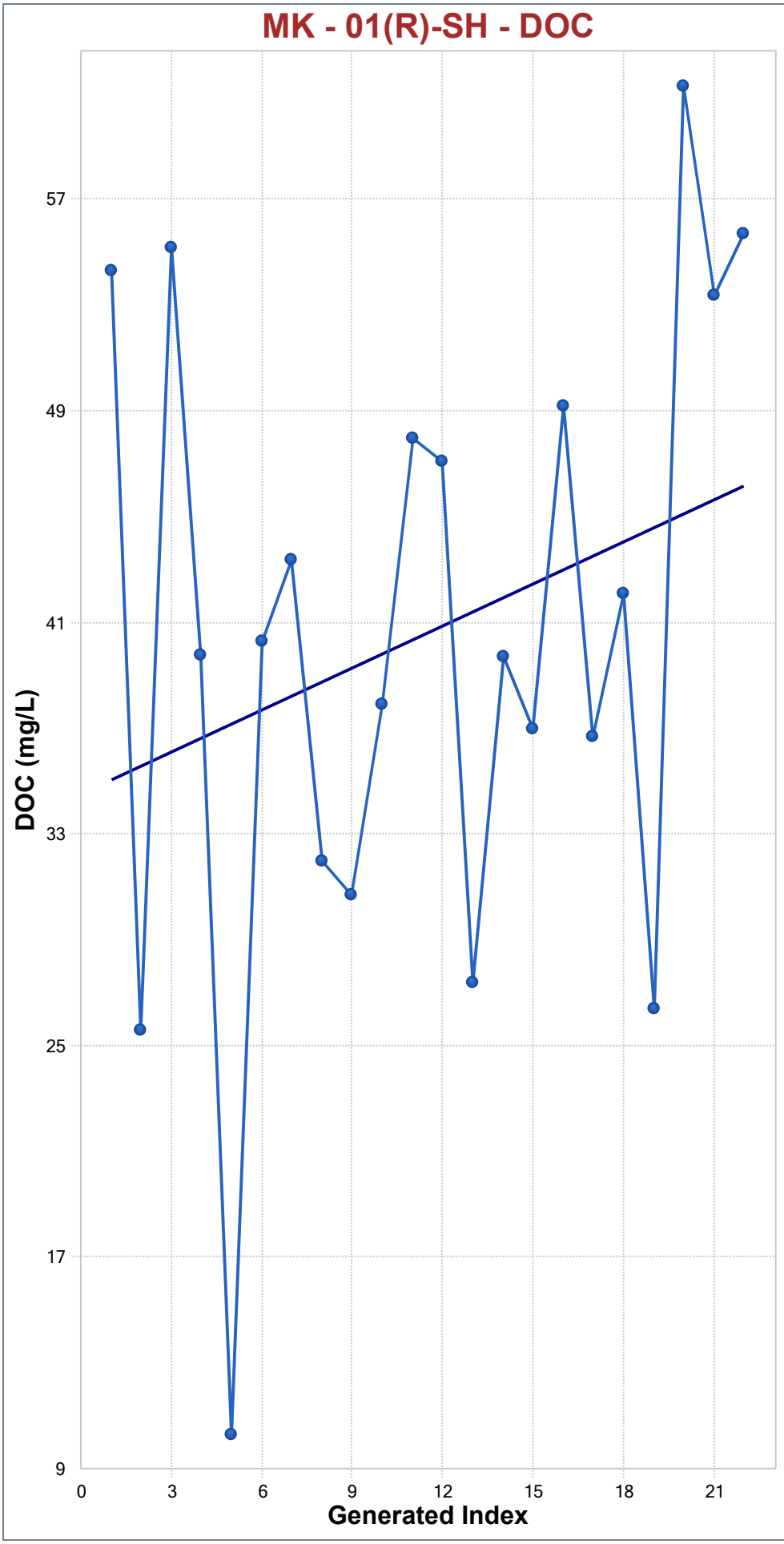
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	122.9458
Standardized Value of S	-1.6755
M-K Test Value (S)	-207
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0469

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0067

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



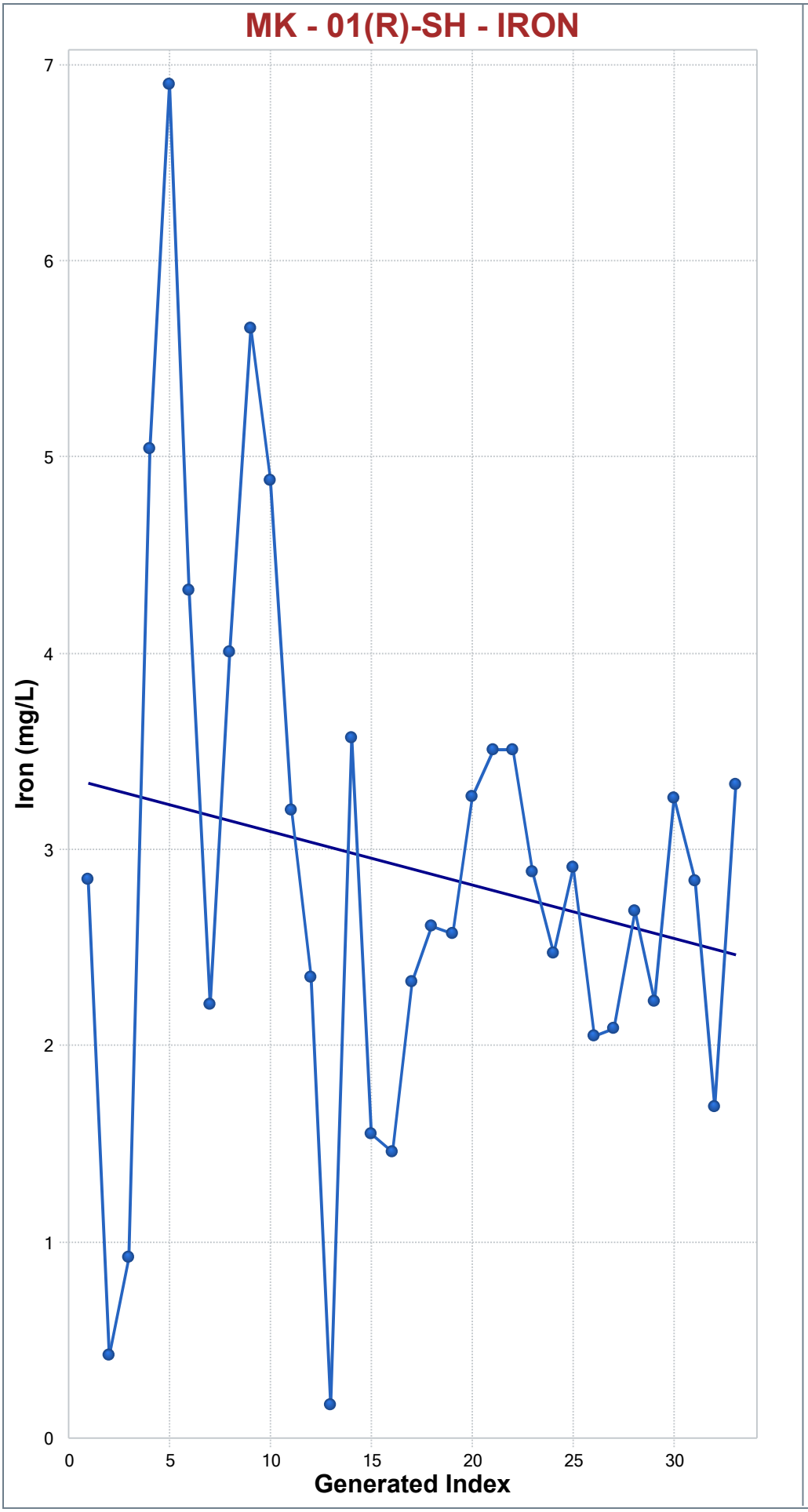
Mann-Kendall Trend Analysis

n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4636
Standardized Value of S	1.0151
M-K Test Value (S)	37
Tabulated p-value	0.1570
Approximate p-value	0.1550

OLS Regression Line (Blue)

OLS Regression Slope	0.5273
OLS Regression Intercept	34.2494

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



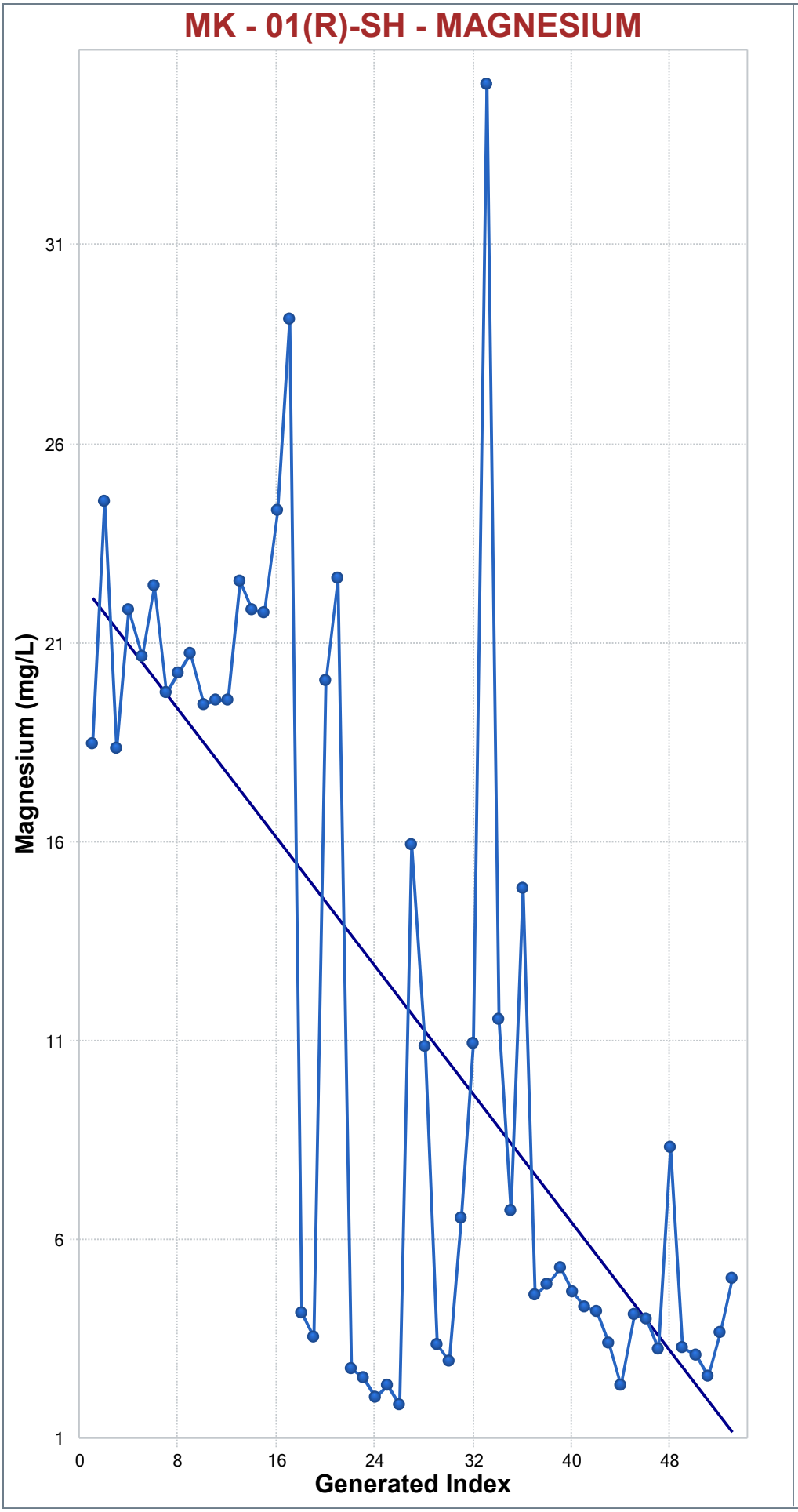
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5316
Standardized Value of S	-0.8368
M-K Test Value (S)	-55
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2014

OLS Regression Line (Blue)

OLS Regression Slope	-0.0273
OLS Regression Intercept	3.2556

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



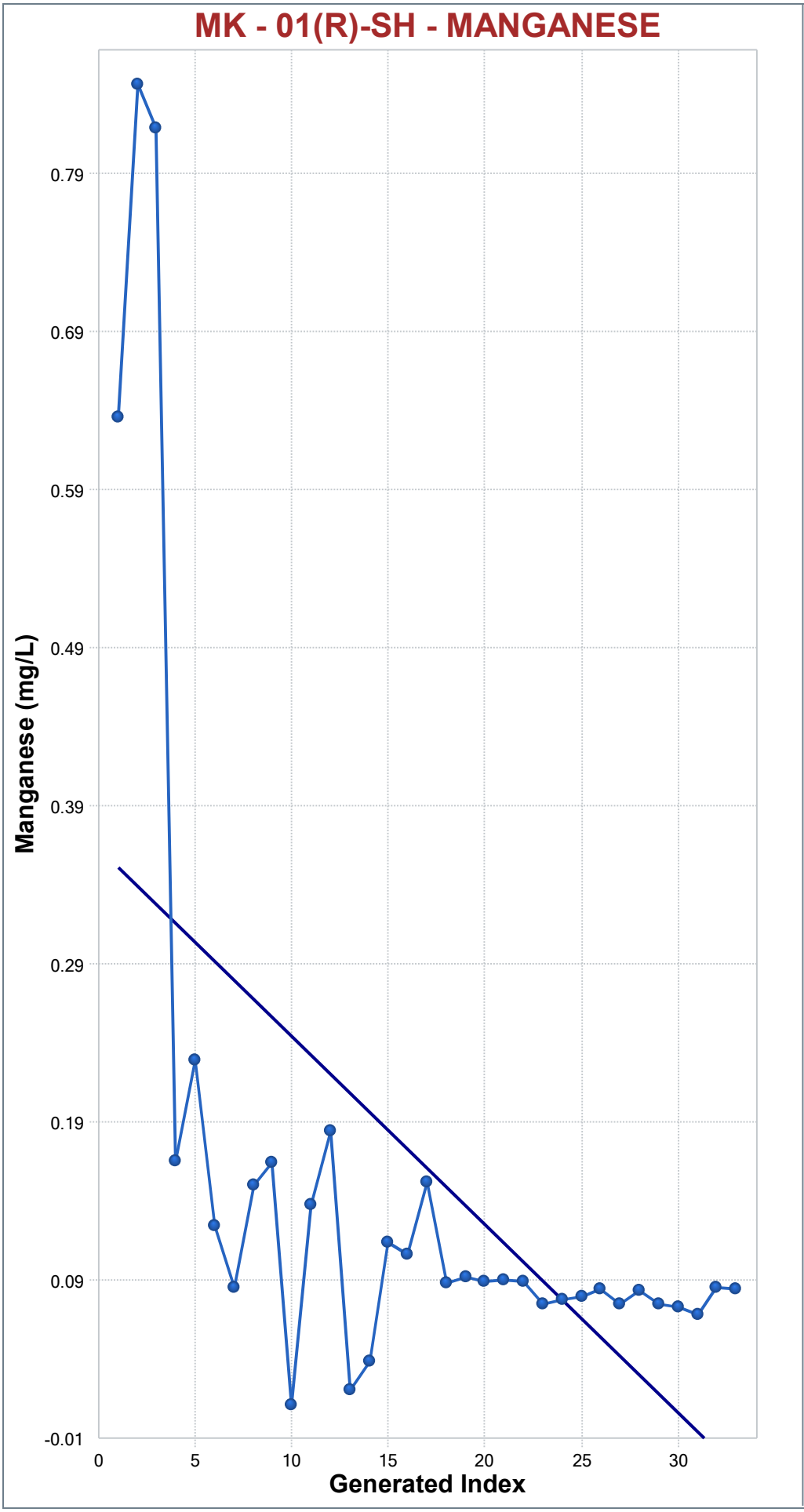
Mann-Kendall Trend Analysis

n	53
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	130.3585
Standardized Value of S	-4.4569
M-K Test Value (S)	-582
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.4035
OLS Regression Intercept	22.4870

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



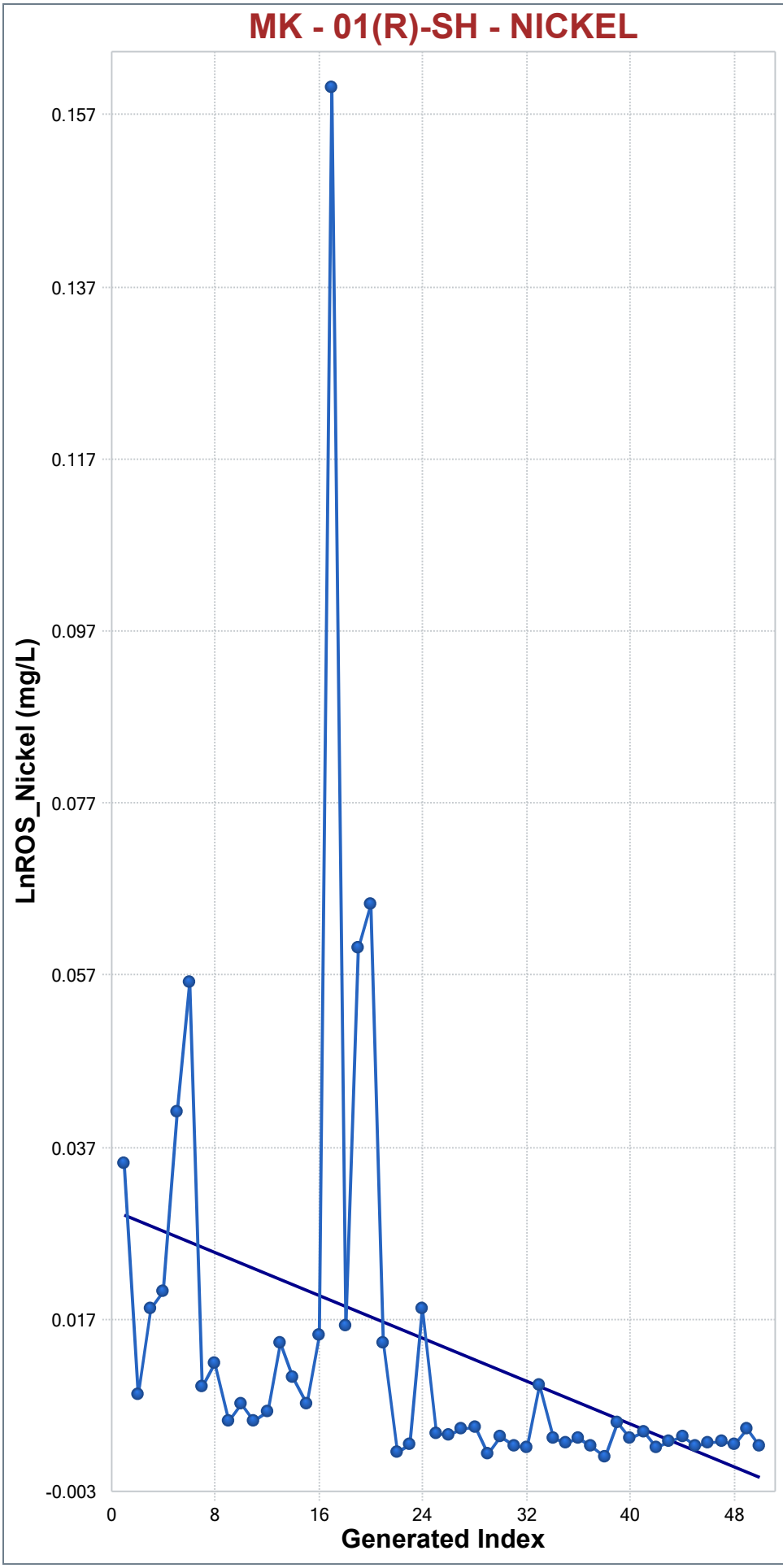
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5316
Standardized Value of S	-4.2460
M-K Test Value (S)	-275
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0119
OLS Regression Intercept	0.3607

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



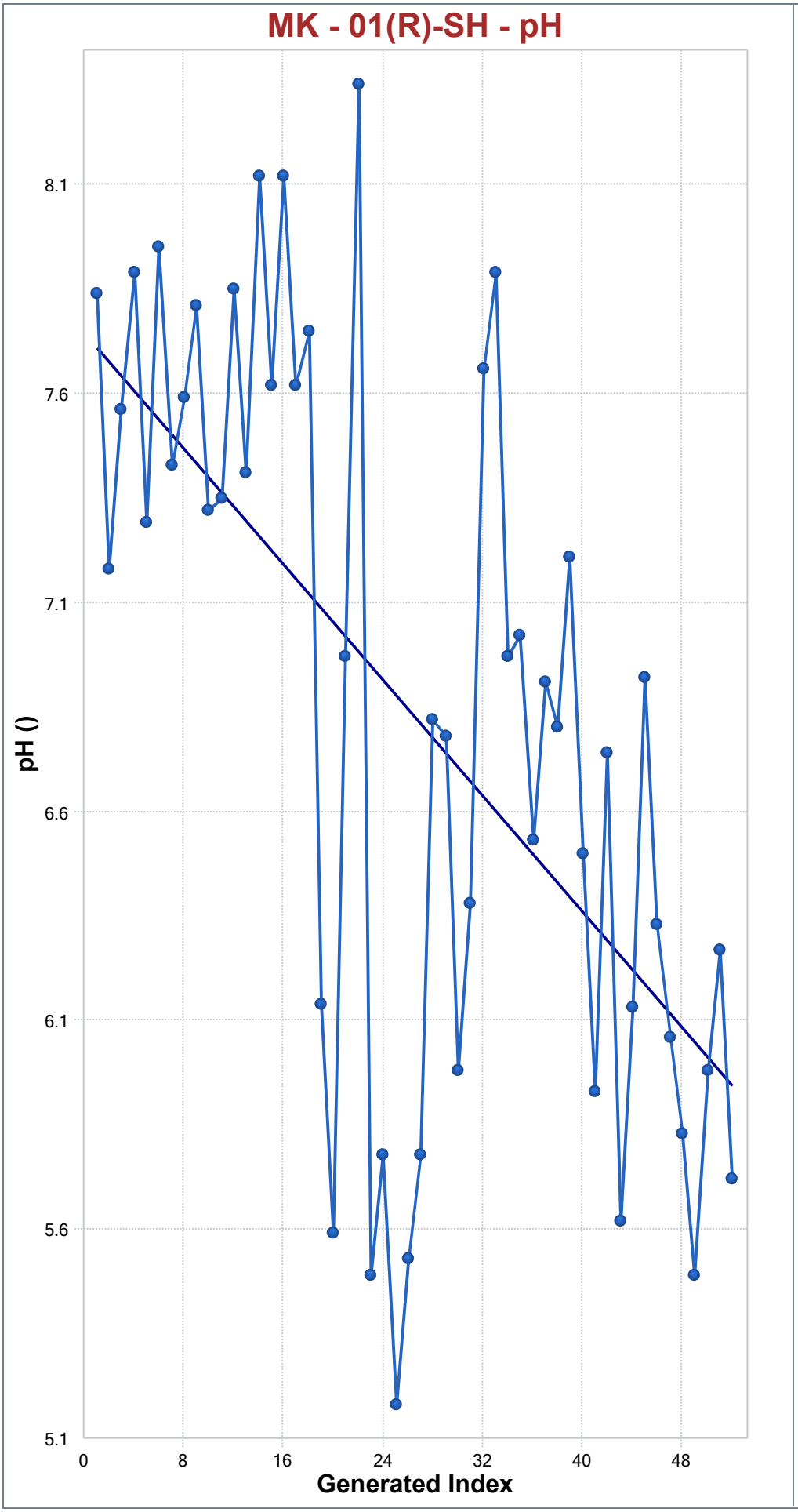
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.5185
Standardized Value of S	-4.8946
M-K Test Value (S)	-586
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0006
OLS Regression Intercept	0.0295

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



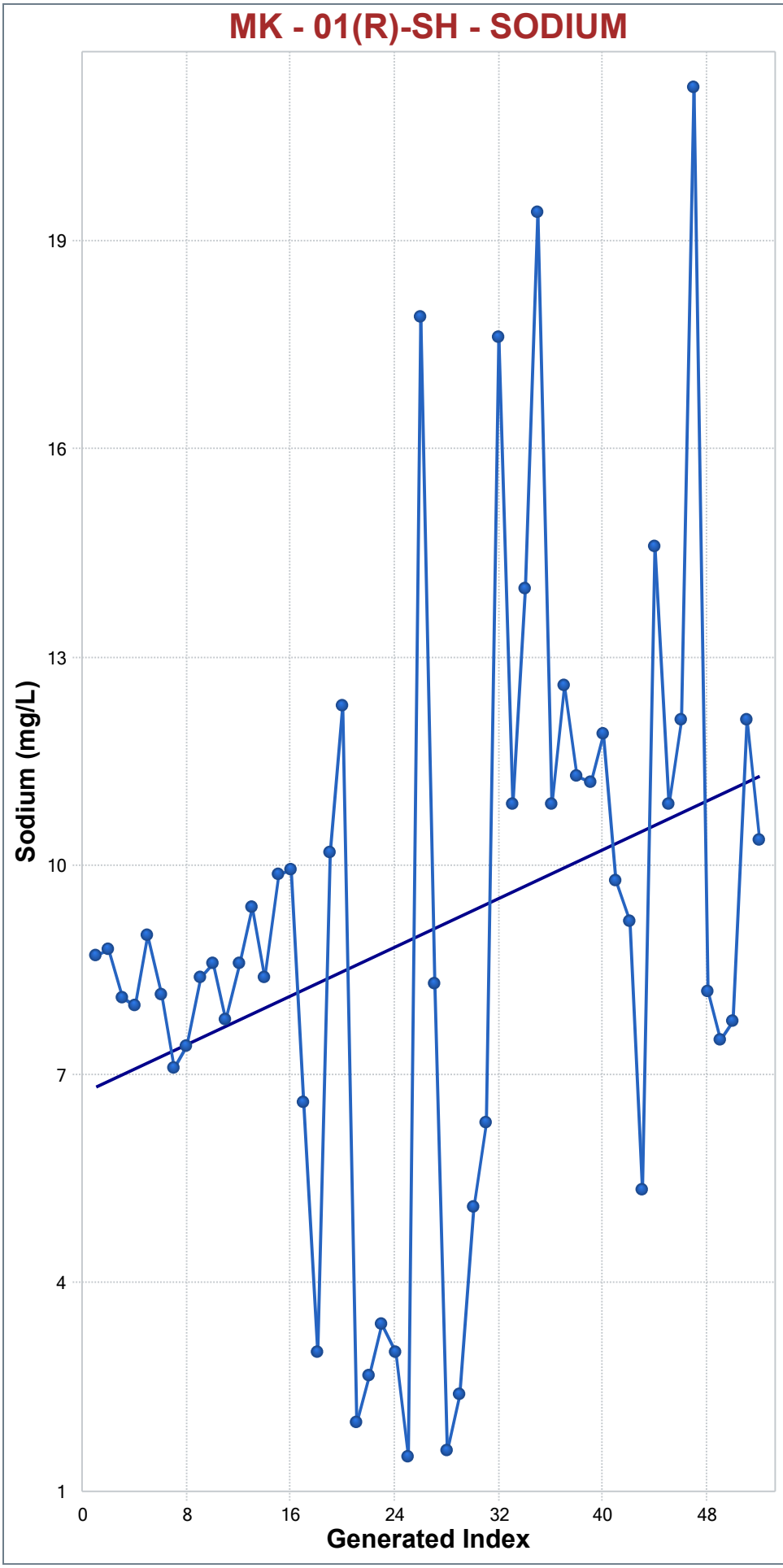
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.6978
Standardized Value of S	-4.2148
M-K Test Value (S)	-535
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0346
OLS Regression Intercept	7.7140

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



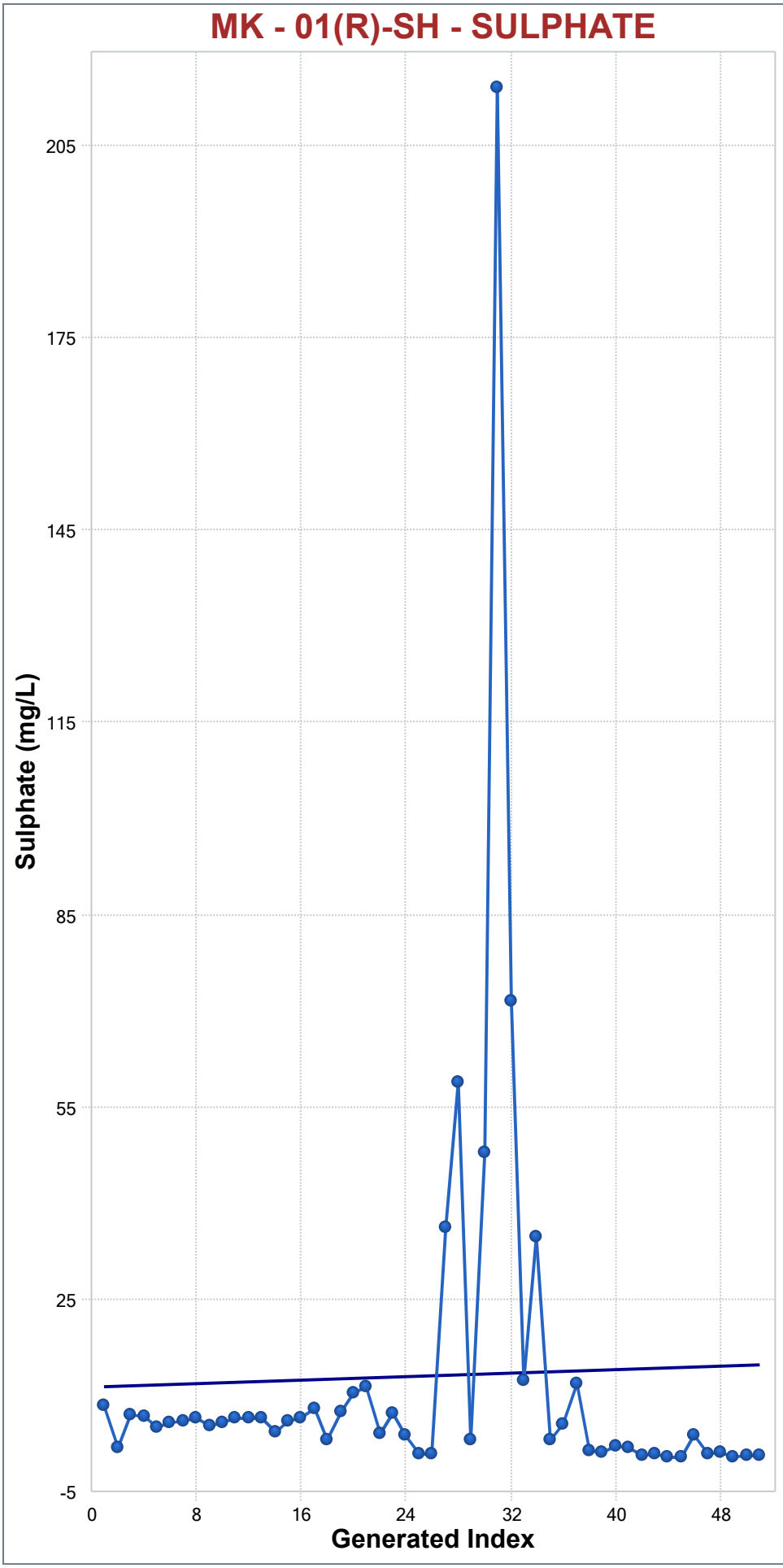
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.6952
Standardized Value of S	2.1469
M-K Test Value (S)	273
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0159

OLS Regression Line (Blue)

OLS Regression Slope	0.0876
OLS Regression Intercept	6.3456

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



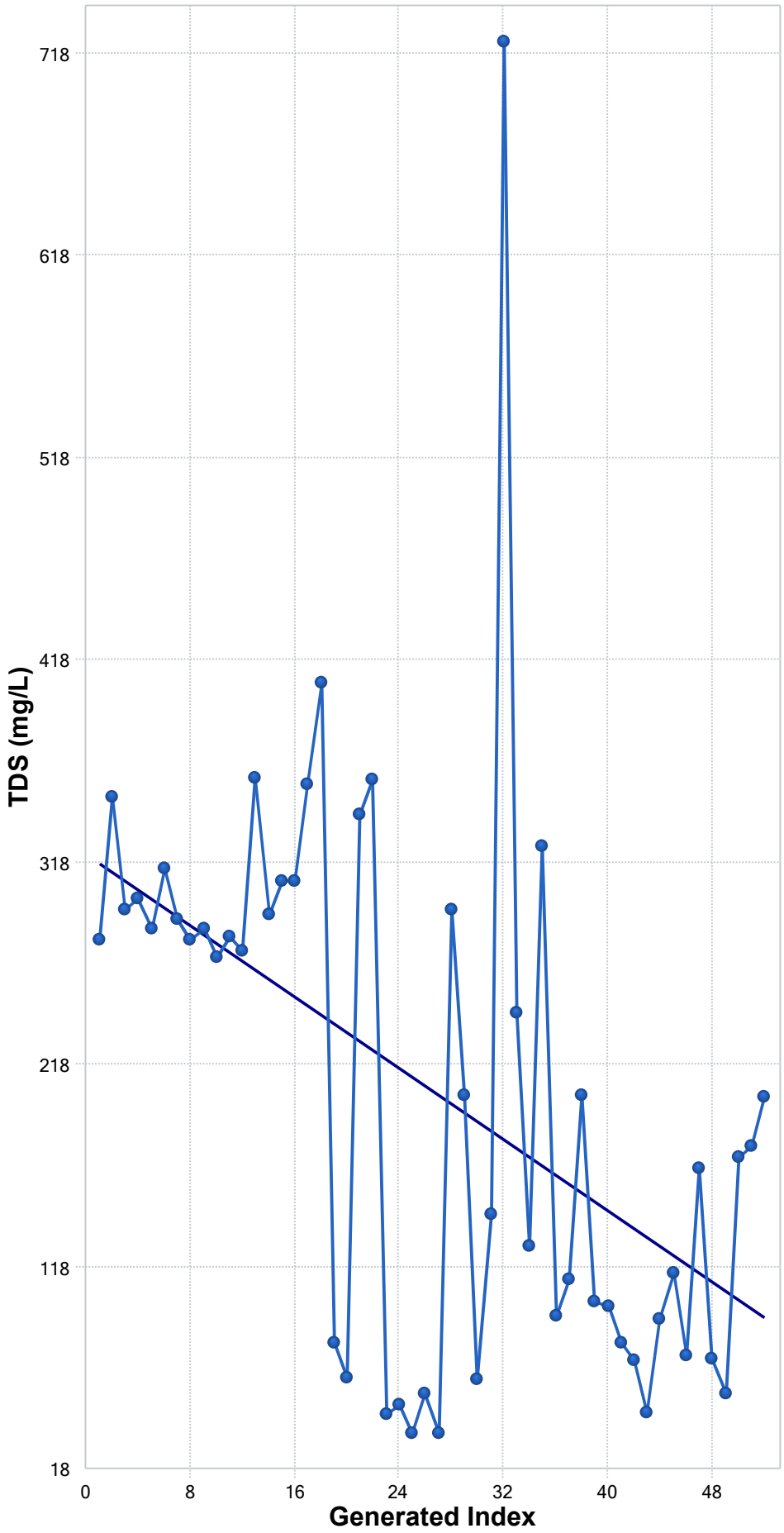
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	123.0880
Standardized Value of S	-3.0953
M-K Test Value (S)	-382
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0010

OLS Regression Line (Blue)

OLS Regression Slope	0.0690
OLS Regression Intercept	11.2153

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



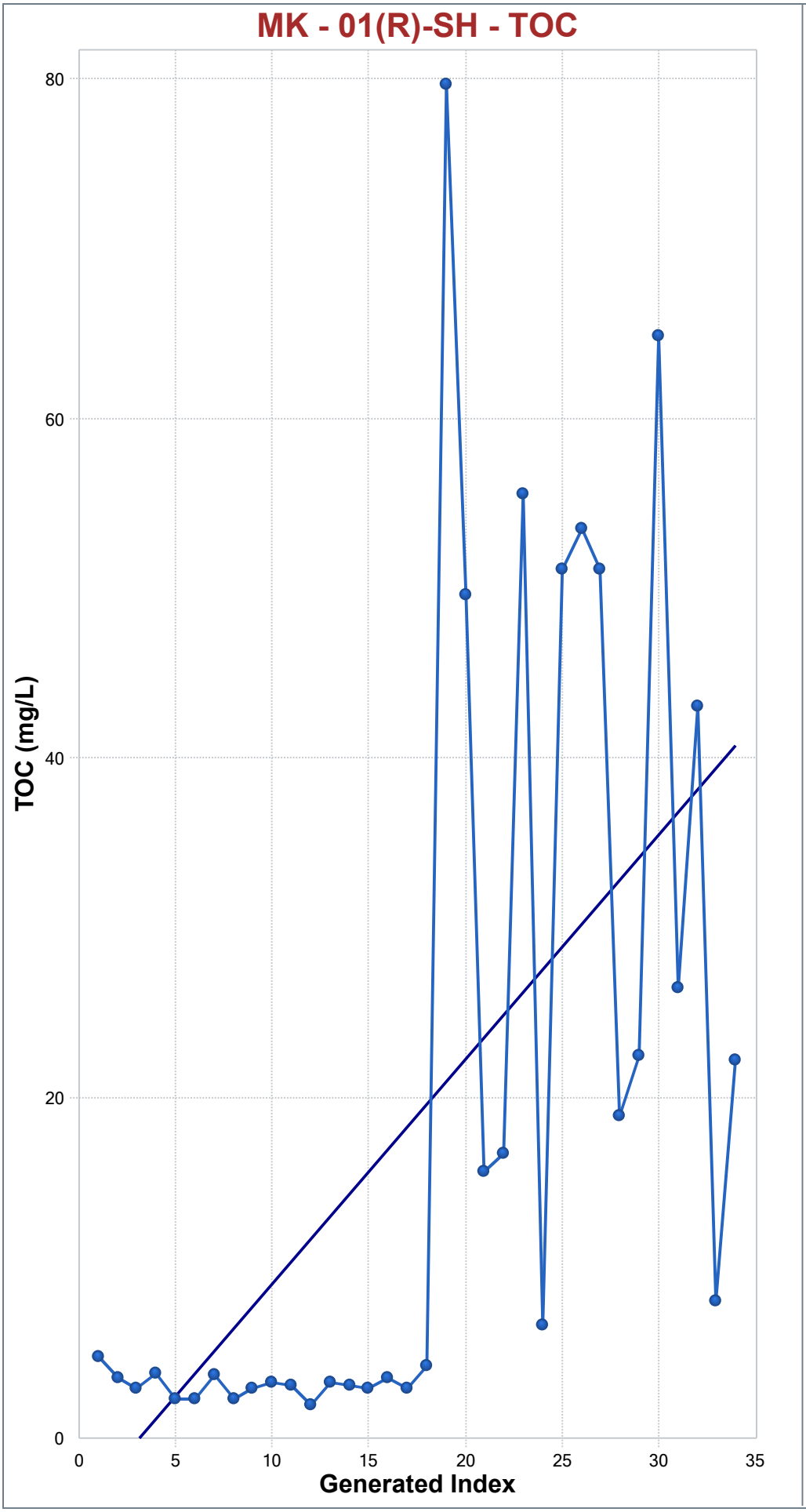
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.7057
Standardized Value of S	-3.3148
M-K Test Value (S)	-421
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0005

OLS Regression Line (Blue)

OLS Regression Slope	-4.3977
OLS Regression Intercept	321.6622

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



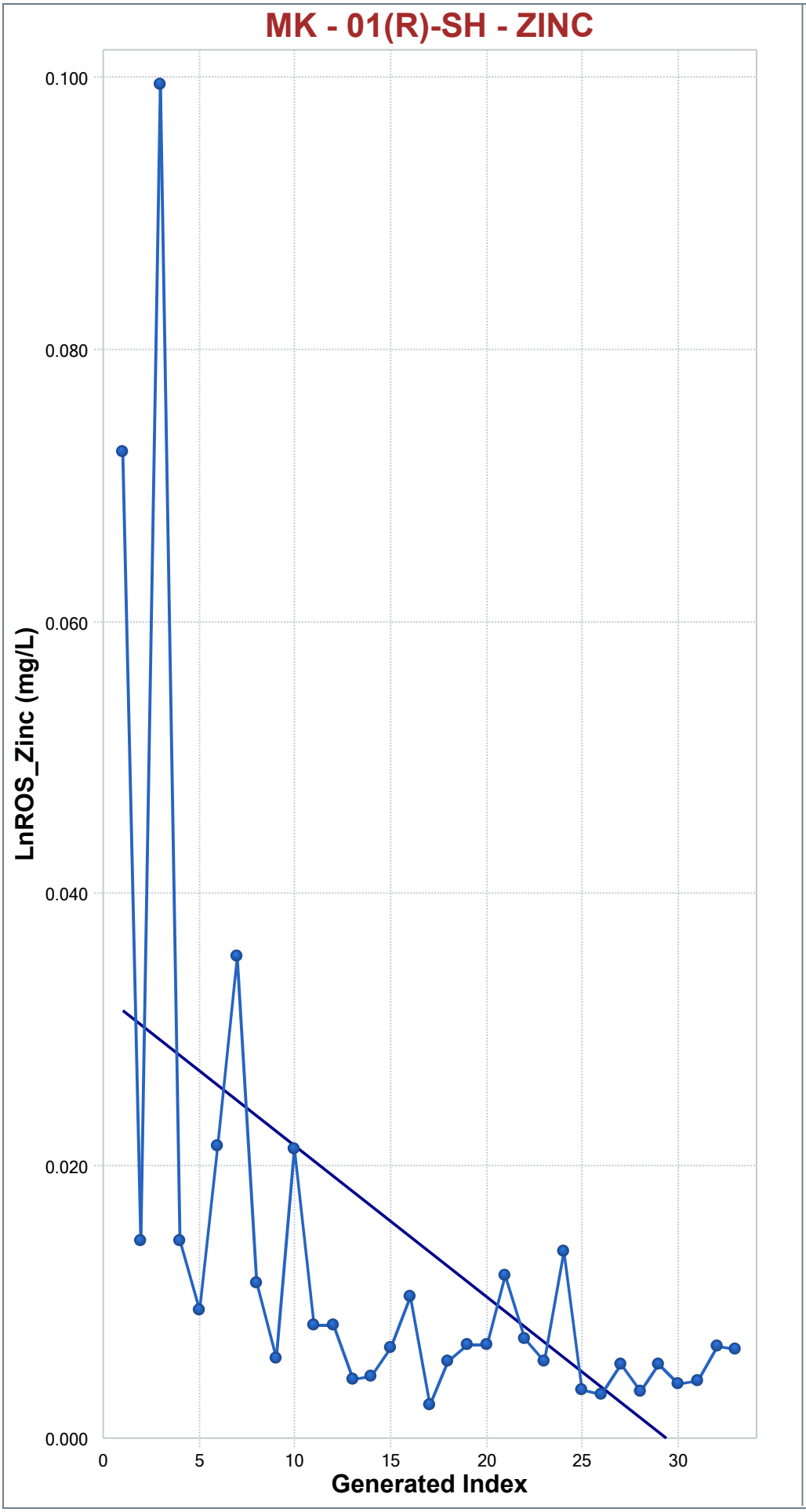
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.3350
Standardized Value of S	3.9058
M-K Test Value (S)	264
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.3215
OLS Regression Intercept	-3.7594

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



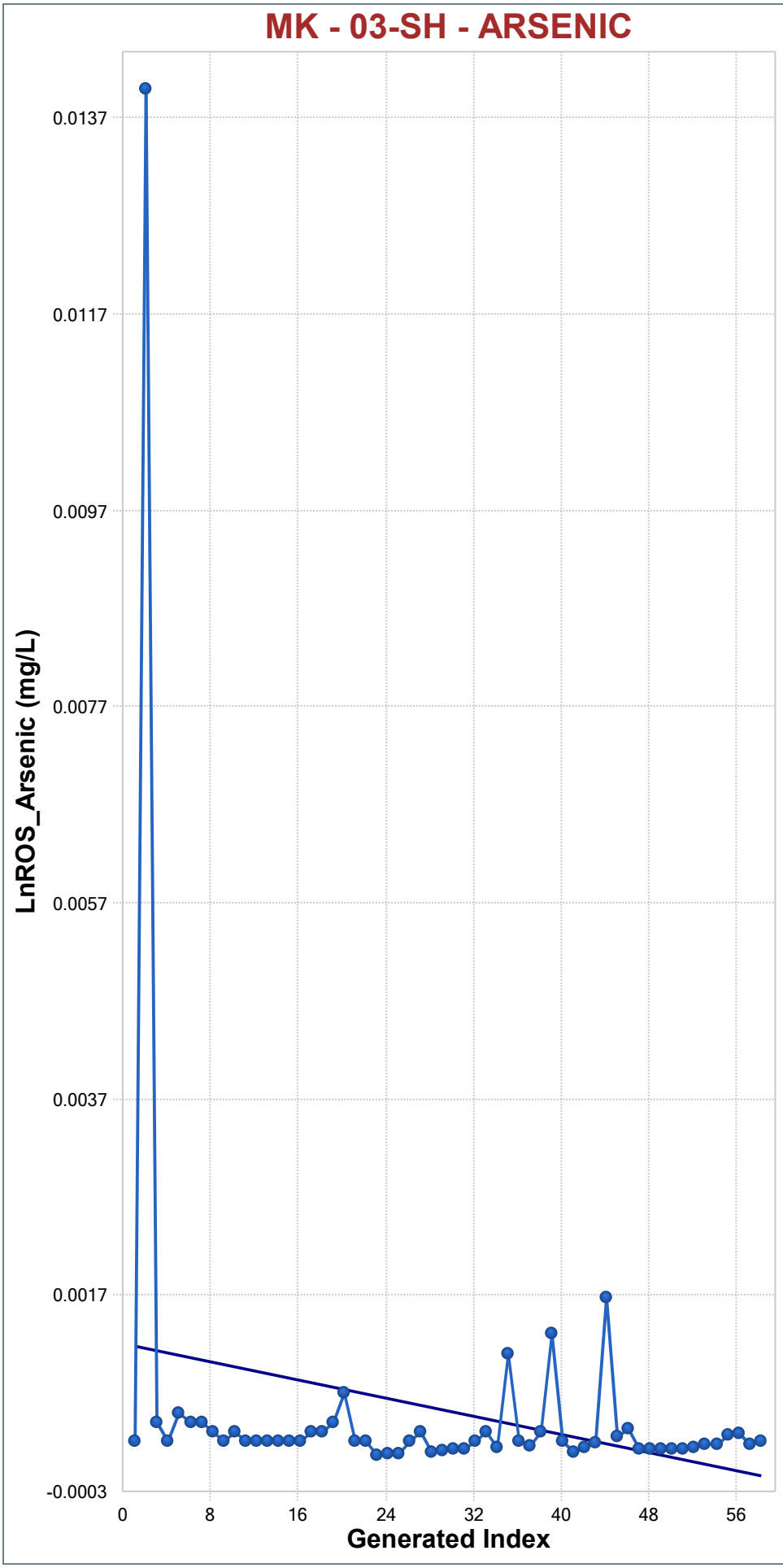
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5006
Standardized Value of S	-3.9379
M-K Test Value (S)	-255
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0011
OLS Regression Intercept	0.0321

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



Mann-Kendall Trend Analysis

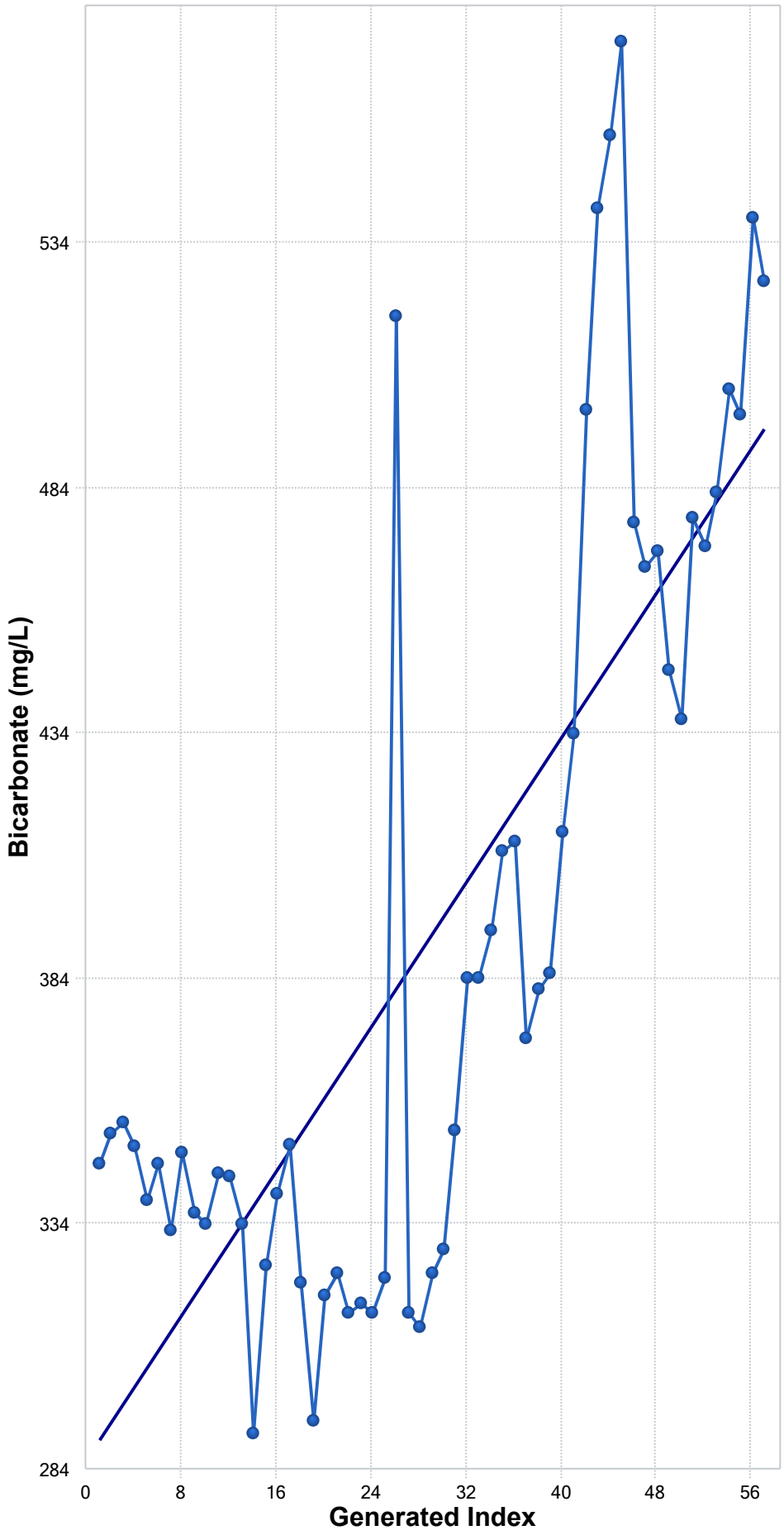
n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	147.5014
Standardized Value of S	-2.2440
M-K Test Value (S)	-332
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0124

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0012

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

MK - 03-SH - BICARBONATE



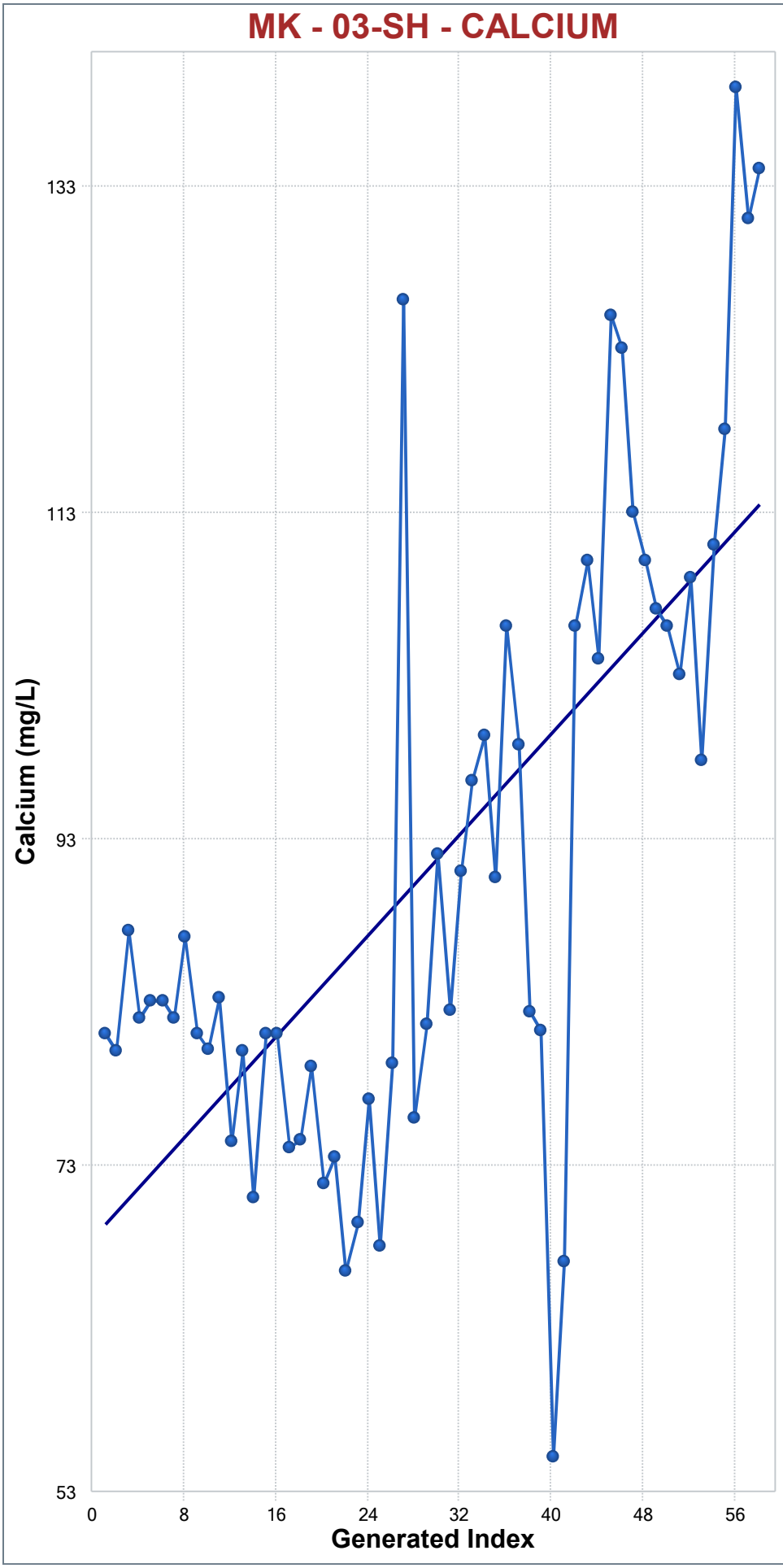
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2412
Standardized Value of S	5.3291
M-K Test Value (S)	775
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	3.6771
OLS Regression Intercept	286.3370

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



Mann-Kendall Trend Analysis

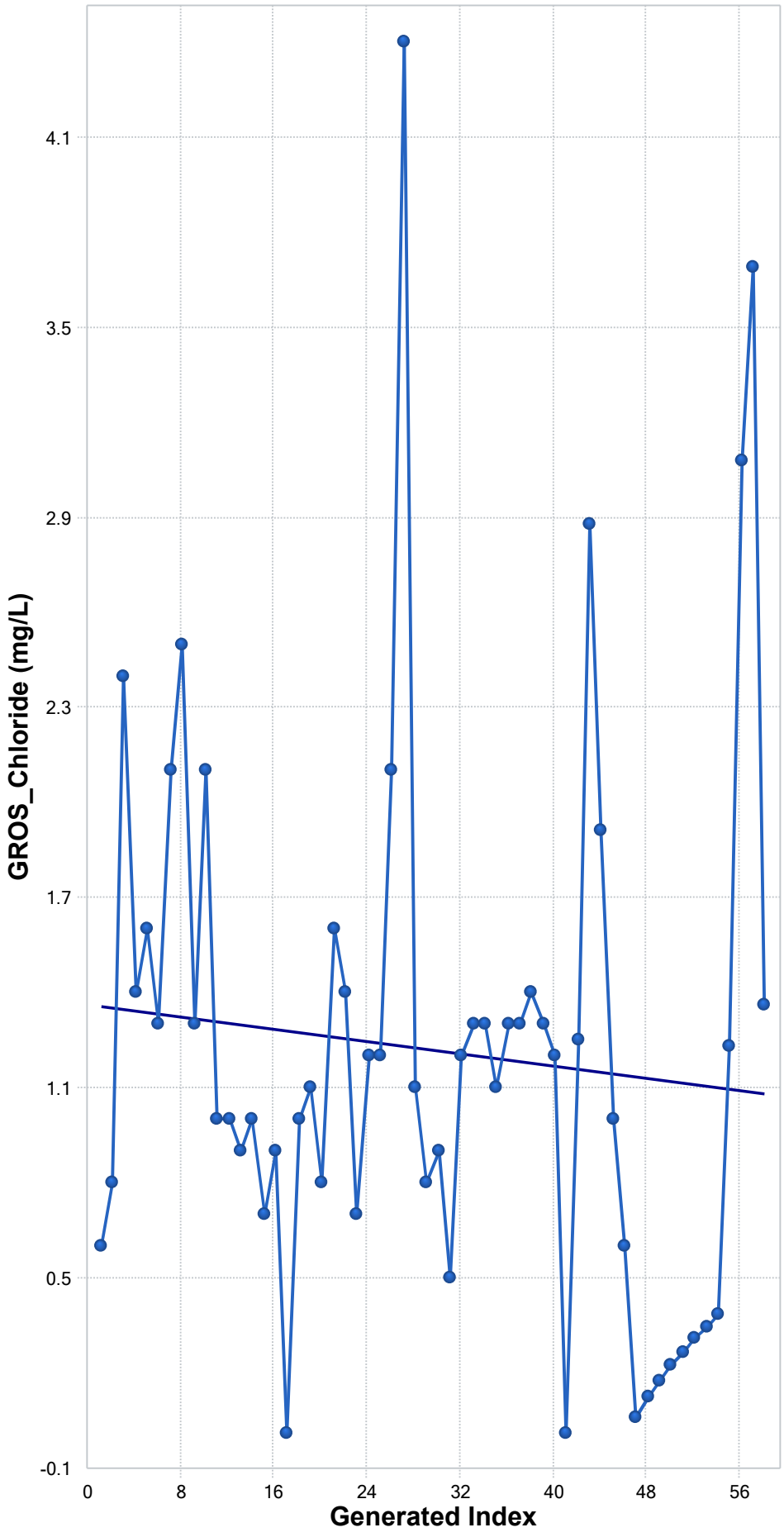
n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	149.0213
Standardized Value of S	4.6772
M-K Test Value (S)	698
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.7738
OLS Regression Intercept	68.5989

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

MK - 03-SH - CHLORIDE



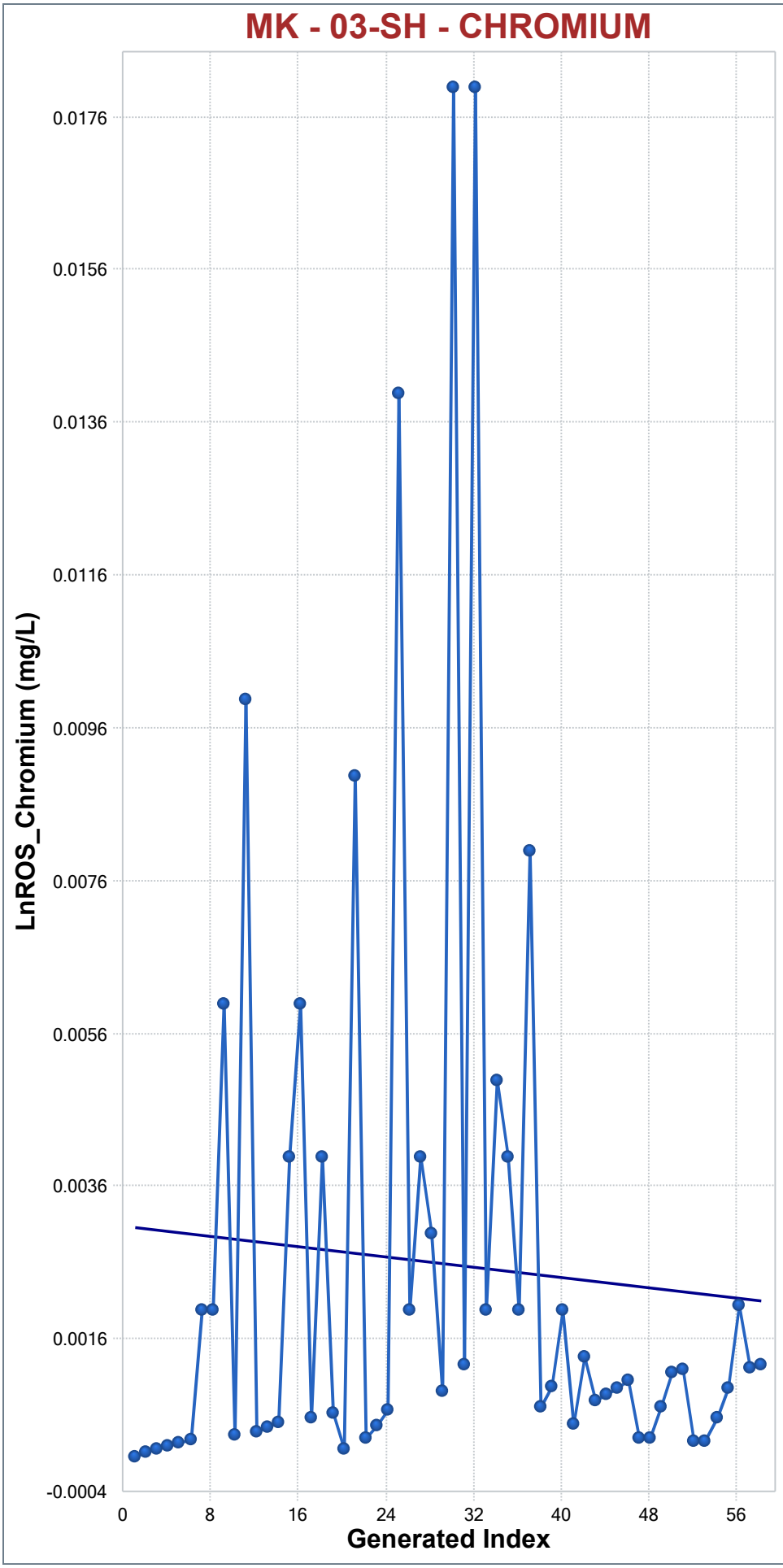
Mann-Kendall Trend Analysis

n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	148.7672
Standardized Value of S	-1.1427
M-K Test Value (S)	-171
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1266

OLS Regression Line (Blue)

OLS Regression Slope	-0.0049
OLS Regression Intercept	1.3624

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



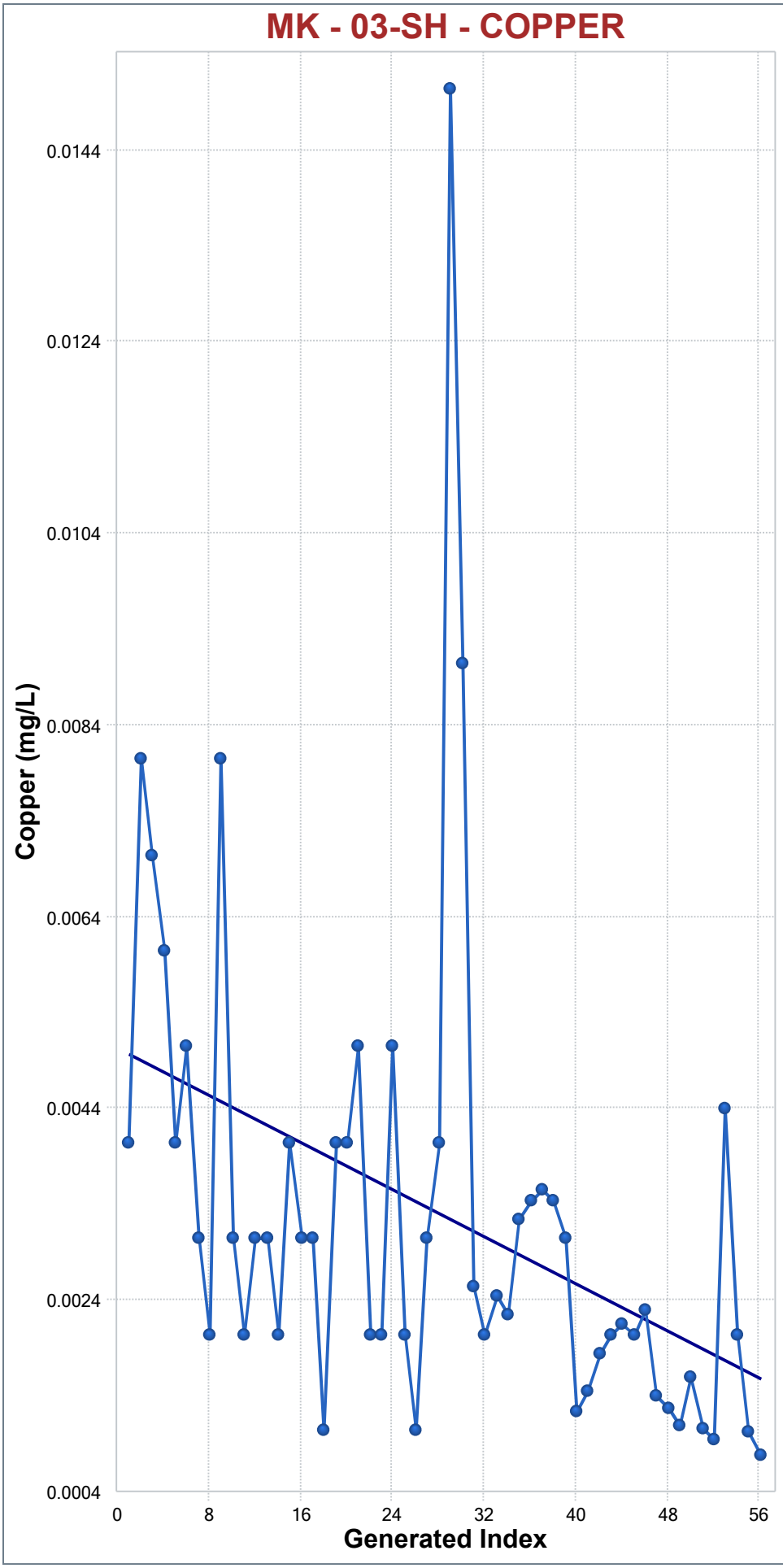
Mann-Kendall Trend Analysis

n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	148.9418
Standardized Value of S	1.1280
M-K Test Value (S)	169
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1297

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0031

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



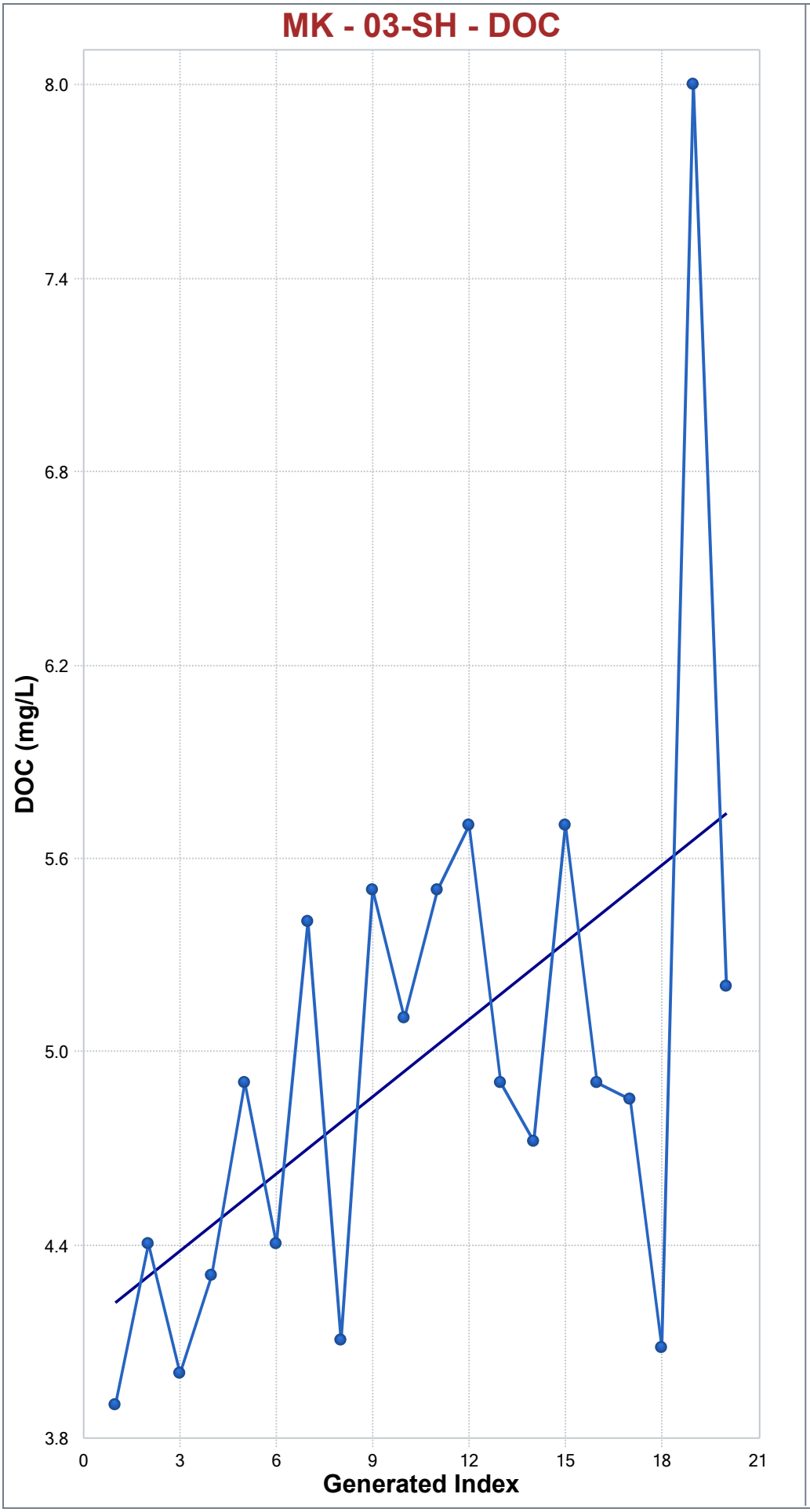
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	140.8107
Standardized Value of S	-4.5877
M-K Test Value (S)	-647
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0050

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



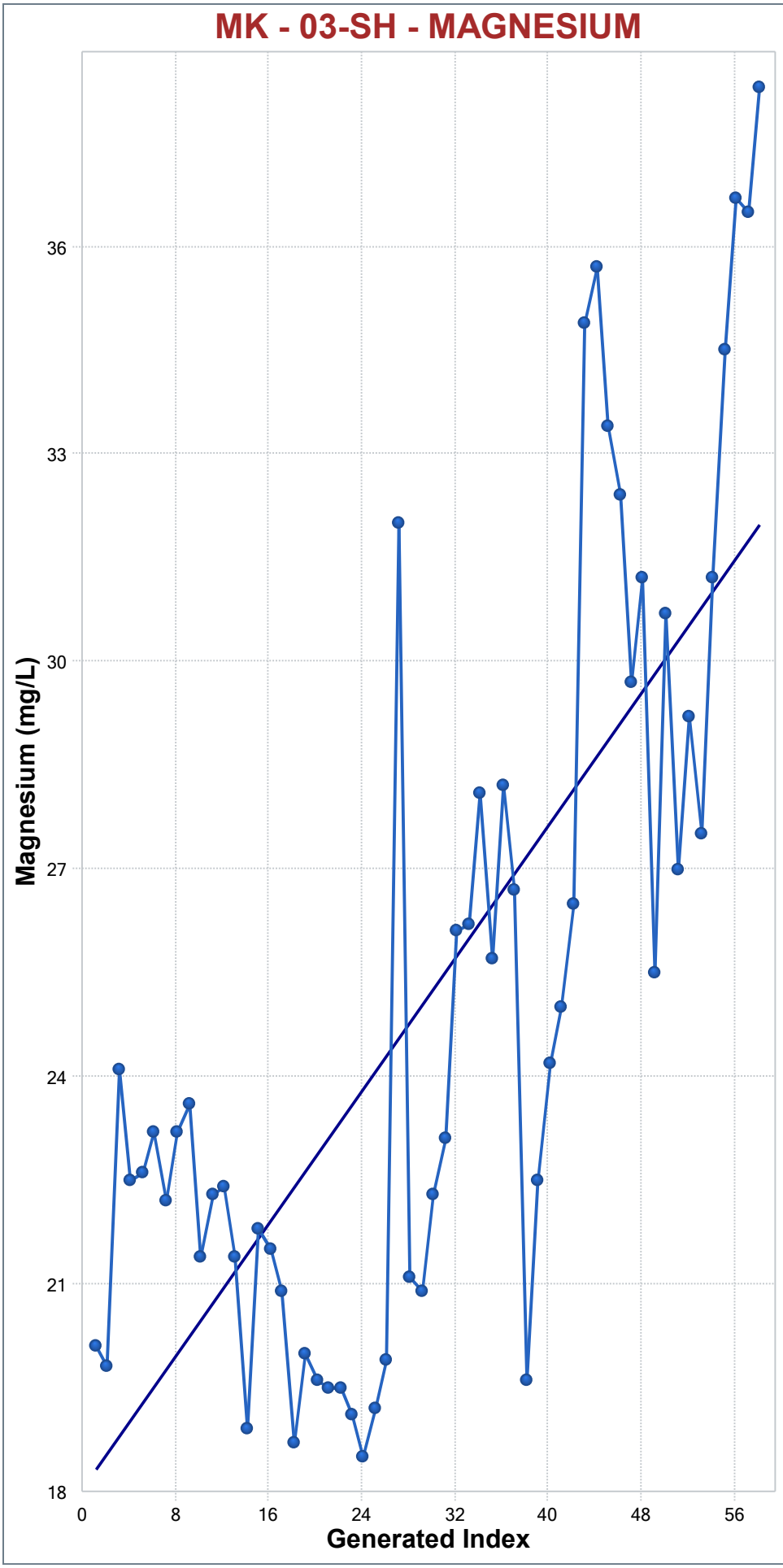
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7137
Standardized Value of S	2.1814
M-K Test Value (S)	68
Tabulated p-value	0.0140
Approximate p-value	0.0146

OLS Regression Line (Blue)

OLS Regression Slope	0.0798
OLS Regression Intercept	4.1392

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



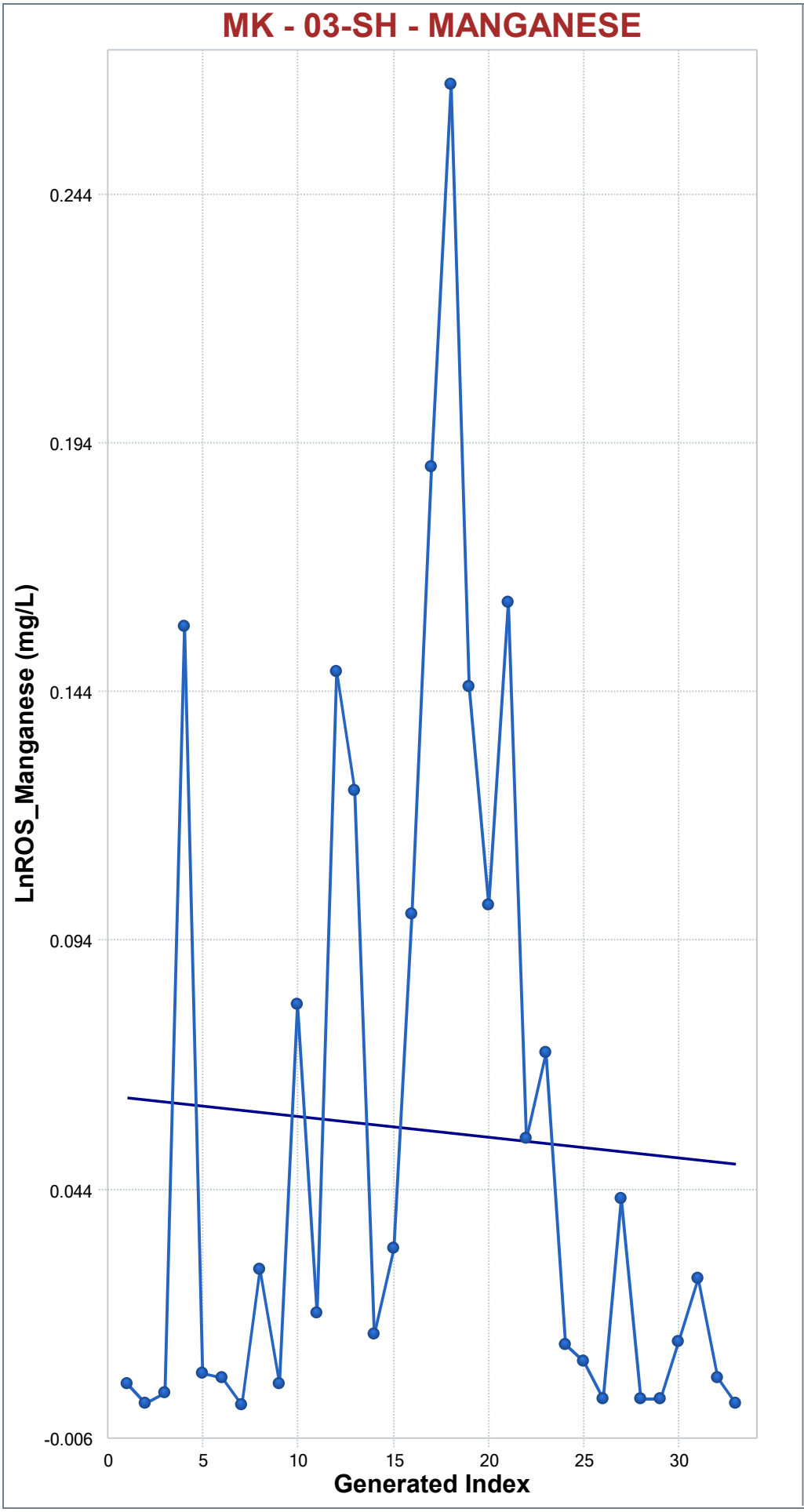
Mann-Kendall Trend Analysis

n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	149.0492
Standardized Value of S	5.2332
M-K Test Value (S)	781
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.2396
OLS Regression Intercept	17.8791

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



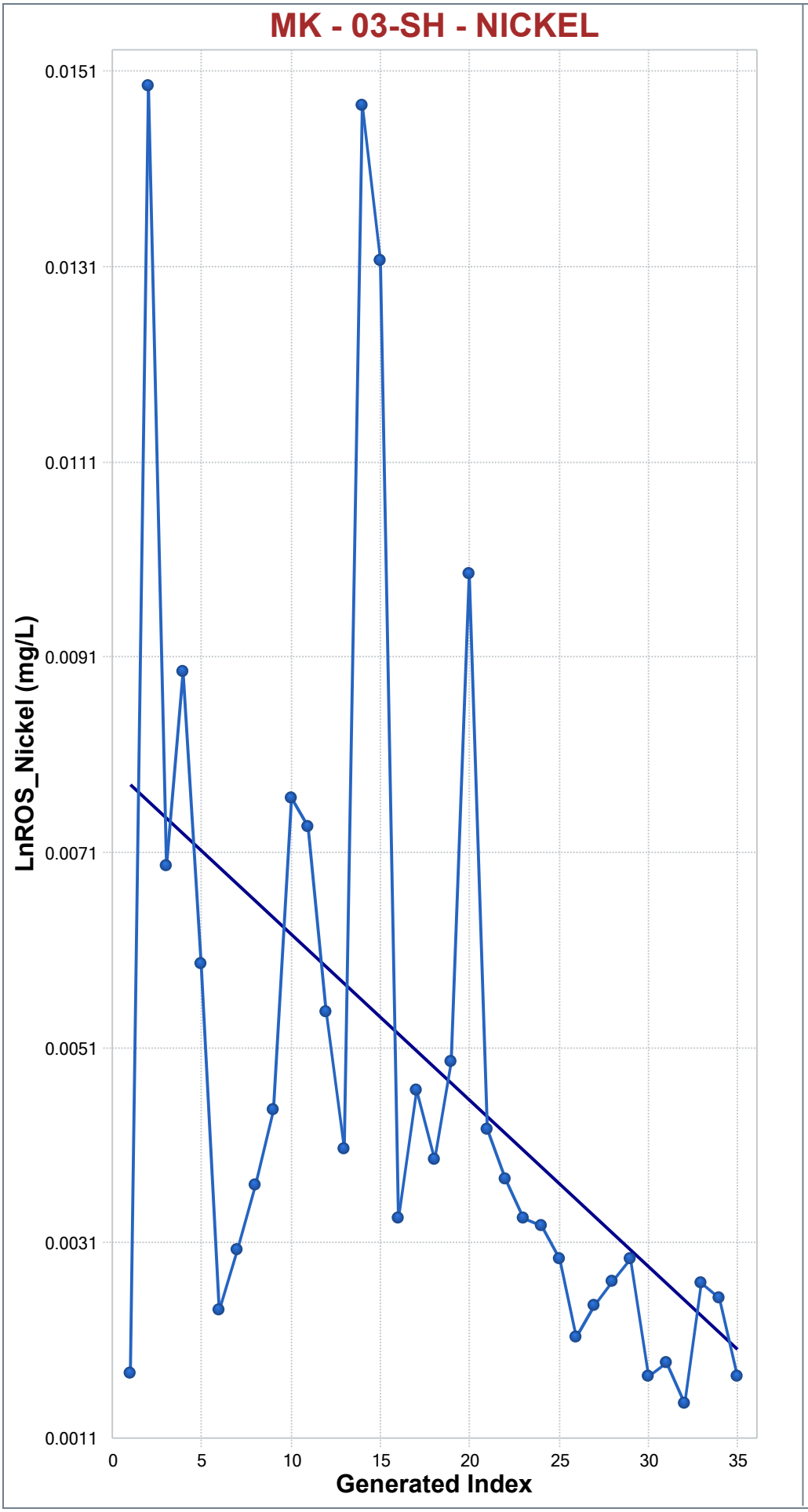
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5316
Standardized Value of S	-0.2479
M-K Test Value (S)	-17
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4021

OLS Regression Line (Blue)

OLS Regression Slope	-0.0004
OLS Regression Intercept	0.0628

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



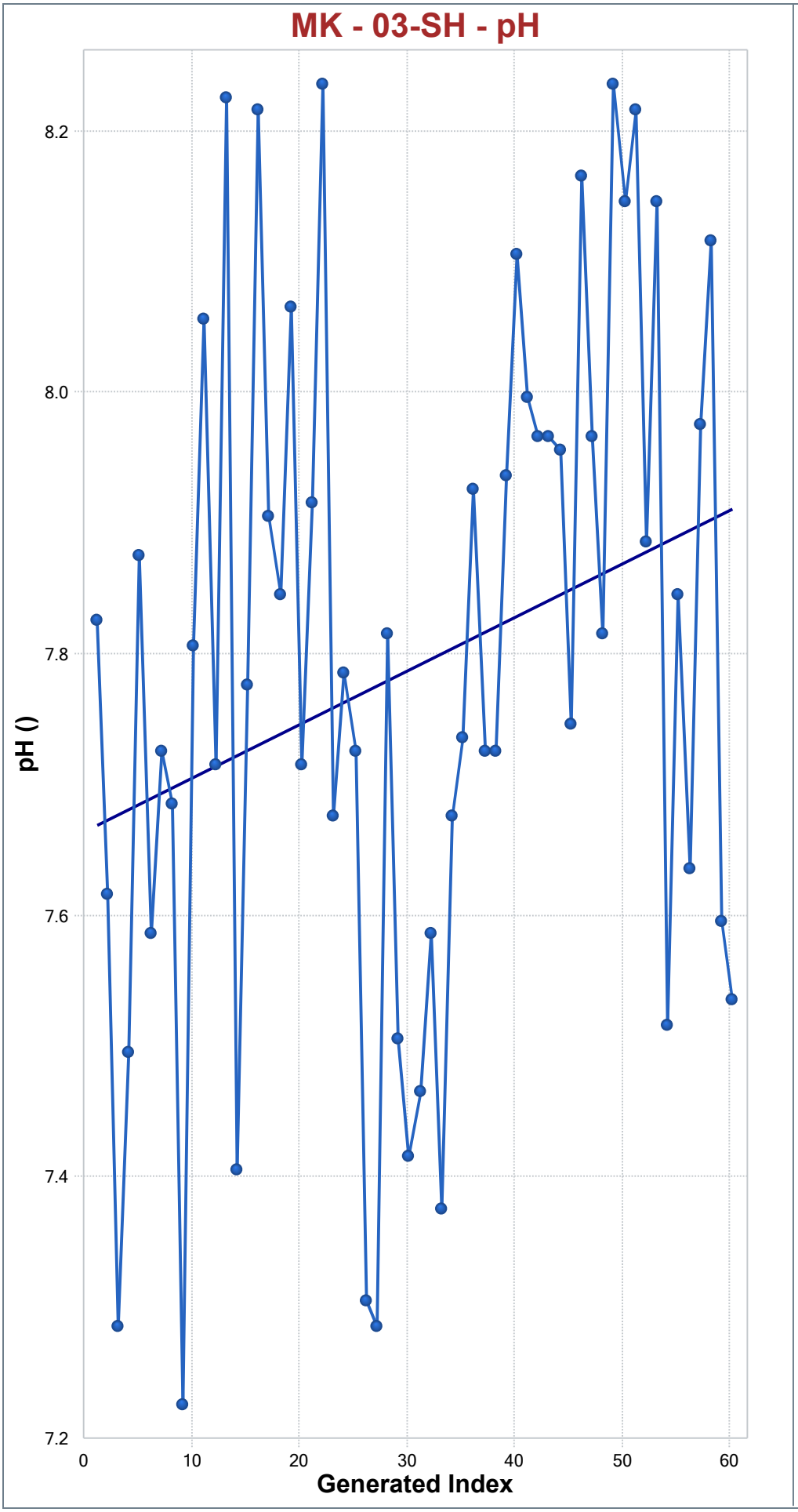
Mann-Kendall Trend Analysis

n	35
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	70.4012
Standardized Value of S	-4.0624
M-K Test Value (S)	-287
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0080

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



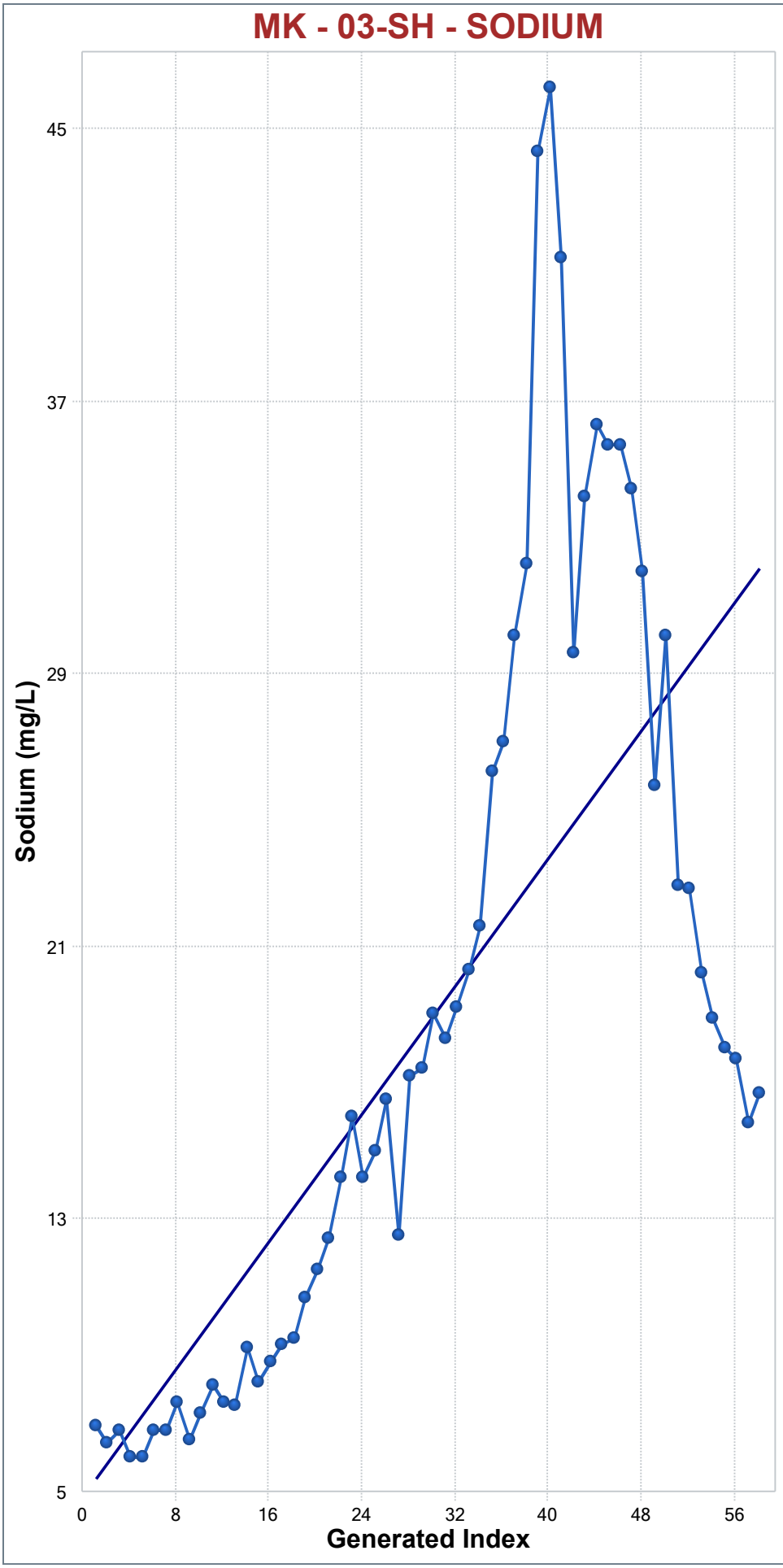
Mann-Kendall Trend Analysis

n	60
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	156.7227
Standardized Value of S	2.2907
M-K Test Value (S)	360
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0110

OLS Regression Line (Blue)

OLS Regression Slope	0.0041
OLS Regression Intercept	7.6989

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



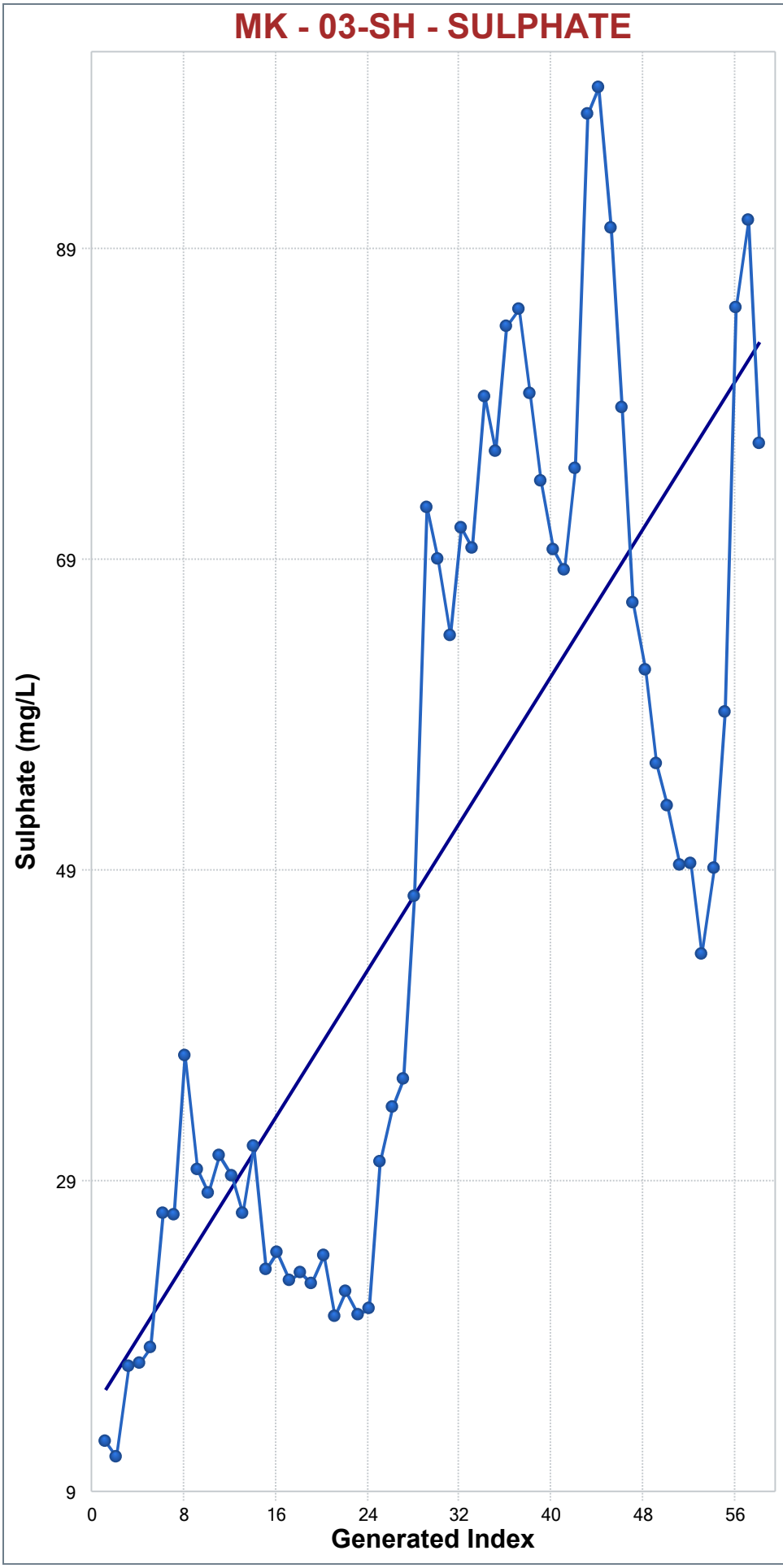
Mann-Kendall Trend Analysis

n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	149.0470
Standardized Value of S	7.3131
M-K Test Value (S)	1,091
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.4686
OLS Regression Intercept	5.0800

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



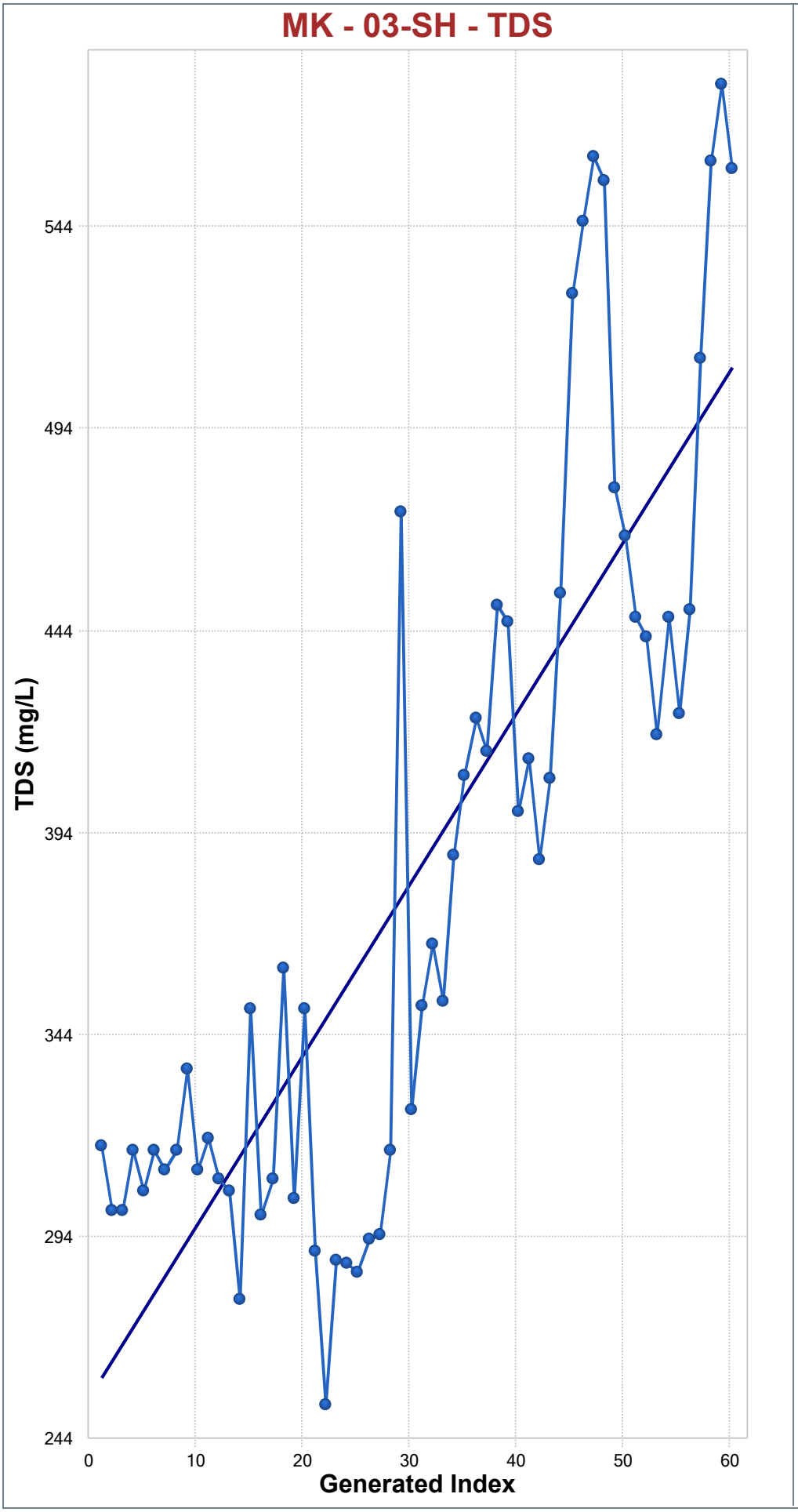
Mann-Kendall Trend Analysis

n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	149.0727
Standardized Value of S	5.7355
M-K Test Value (S)	856
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.1817
OLS Regression Intercept	14.1490

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



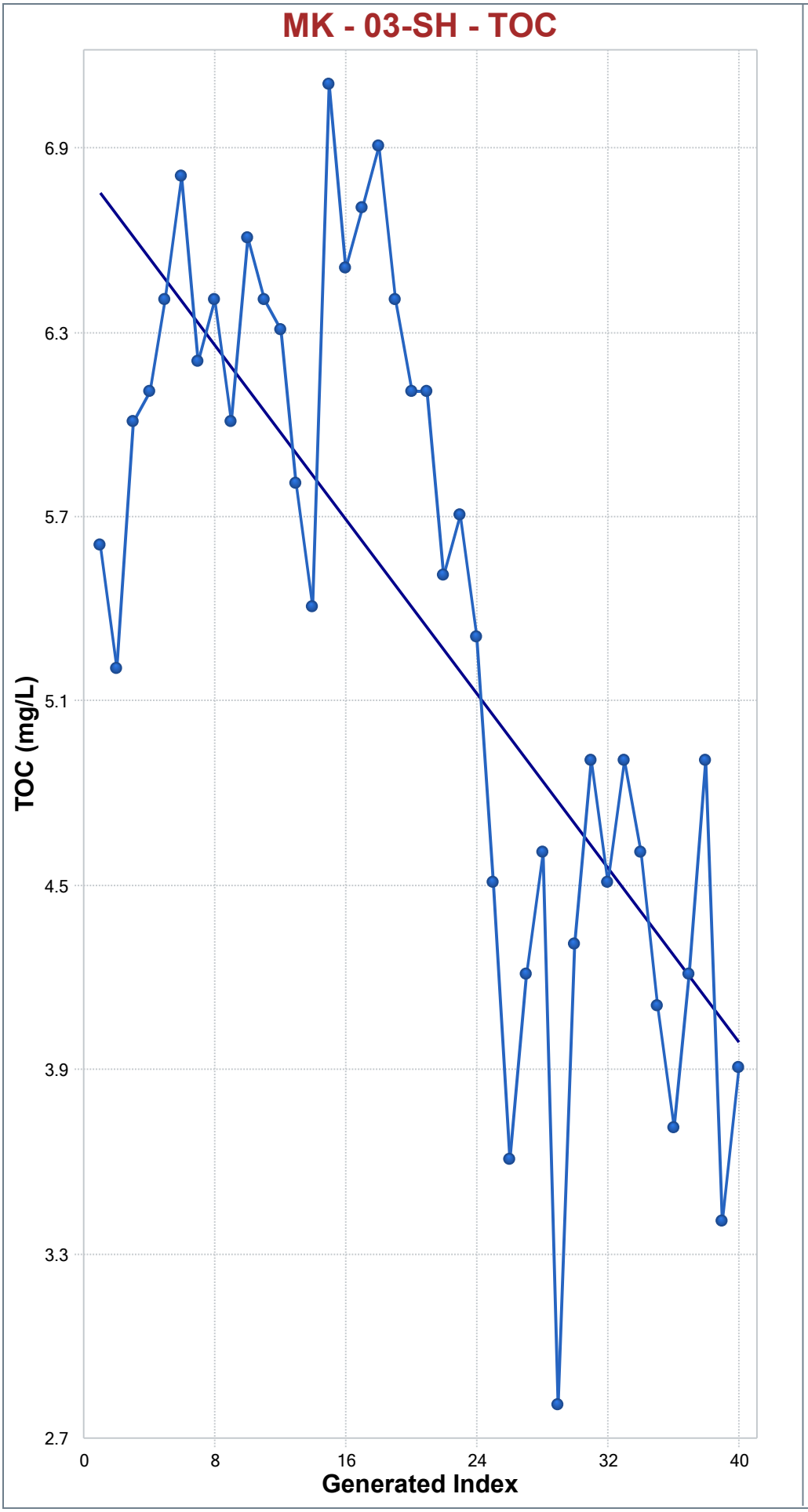
Mann-Kendall Trend Analysis

n	60
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	156.7440
Standardized Value of S	6.6031
M-K Test Value (S)	1,036
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	4.2385
OLS Regression Intercept	254.4746

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



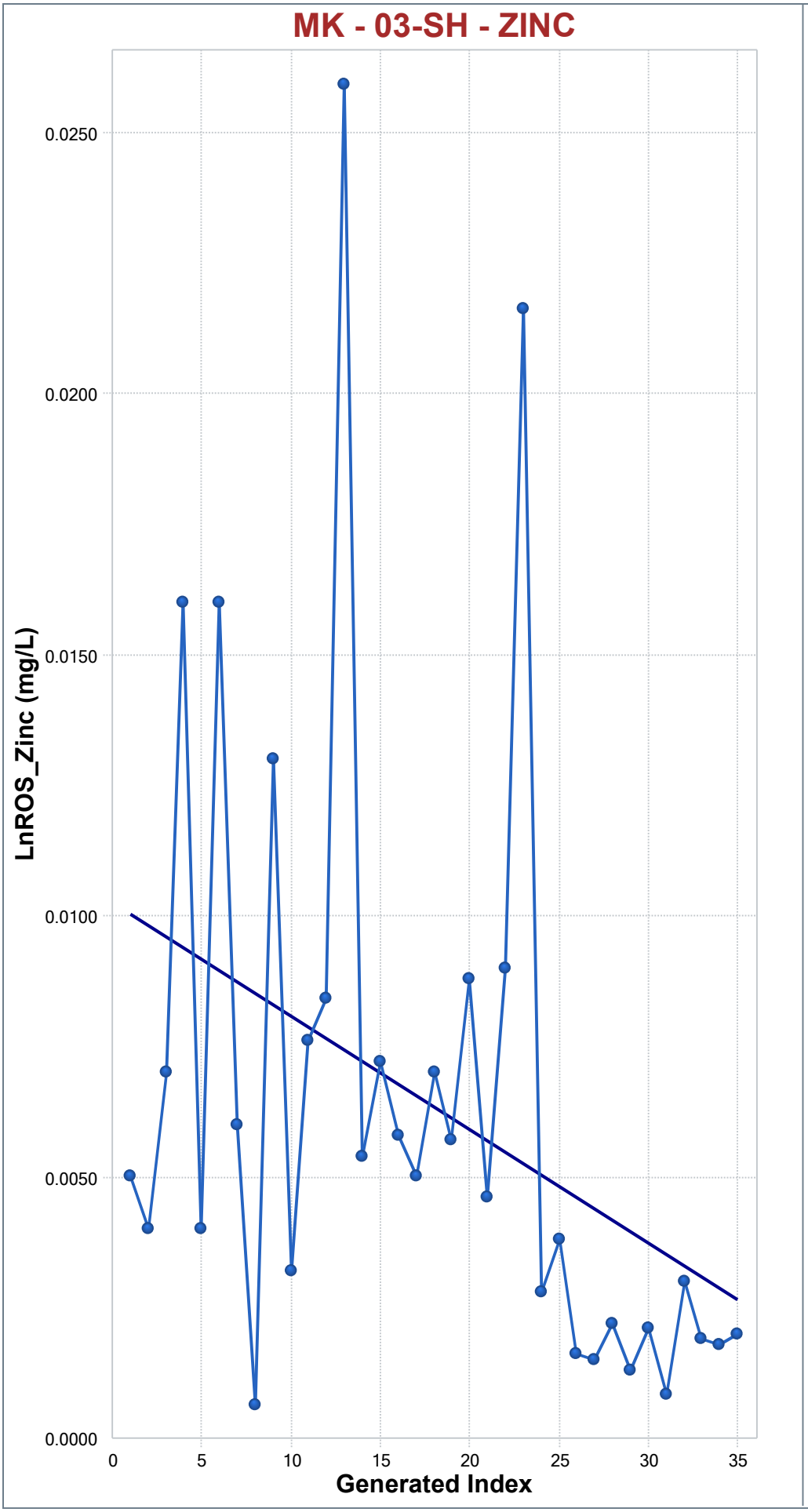
Mann-Kendall Trend Analysis

n	40
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	85.7127
Standardized Value of S	-4.5618
M-K Test Value (S)	-392
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0708
OLS Regression Intercept	6.8169

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



Mann-Kendall Trend Analysis

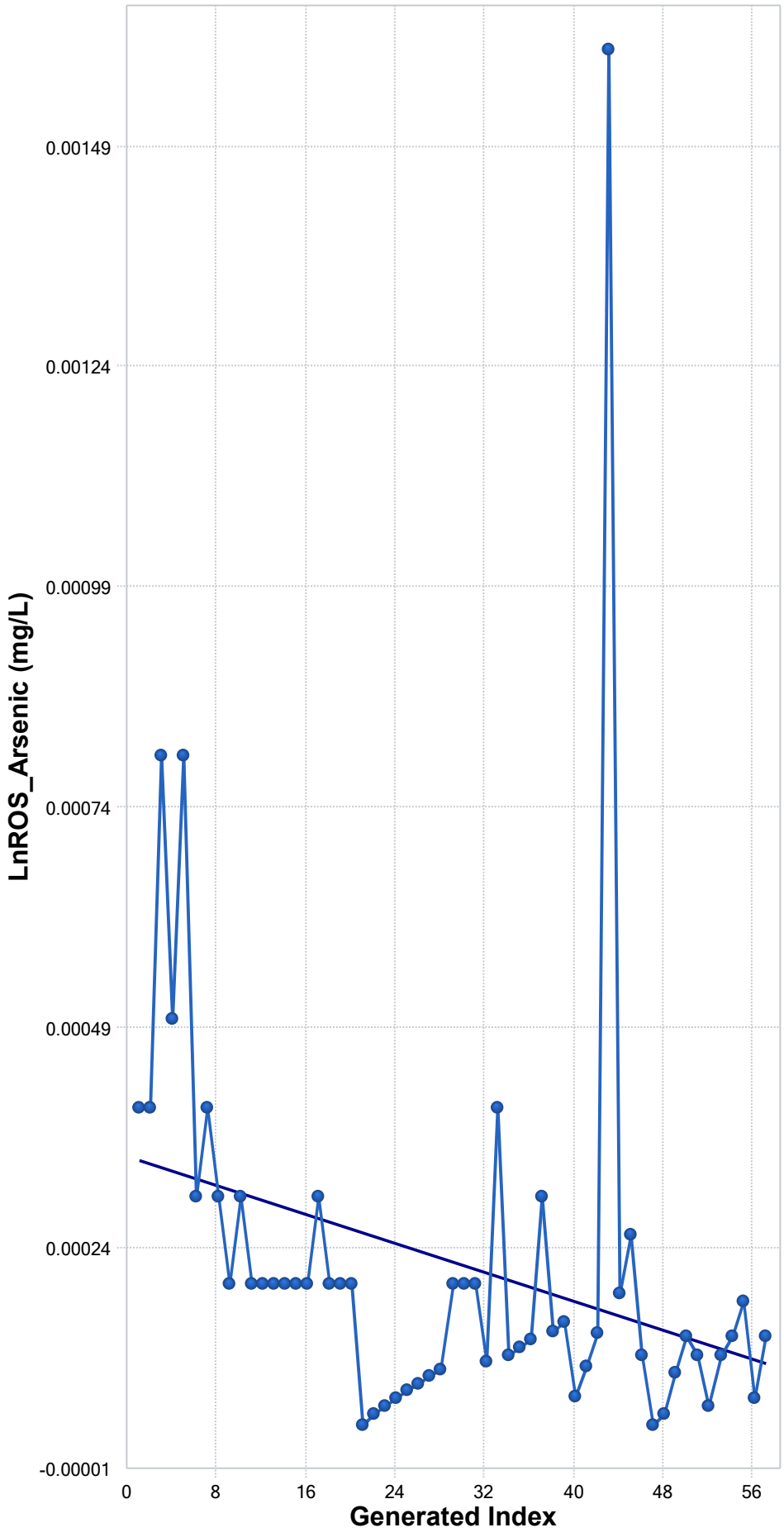
n	35
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	70.3870
Standardized Value of S	-3.2108
M-K Test Value (S)	-227
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0007

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0102

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

MK - 04-SH - ARSENIC



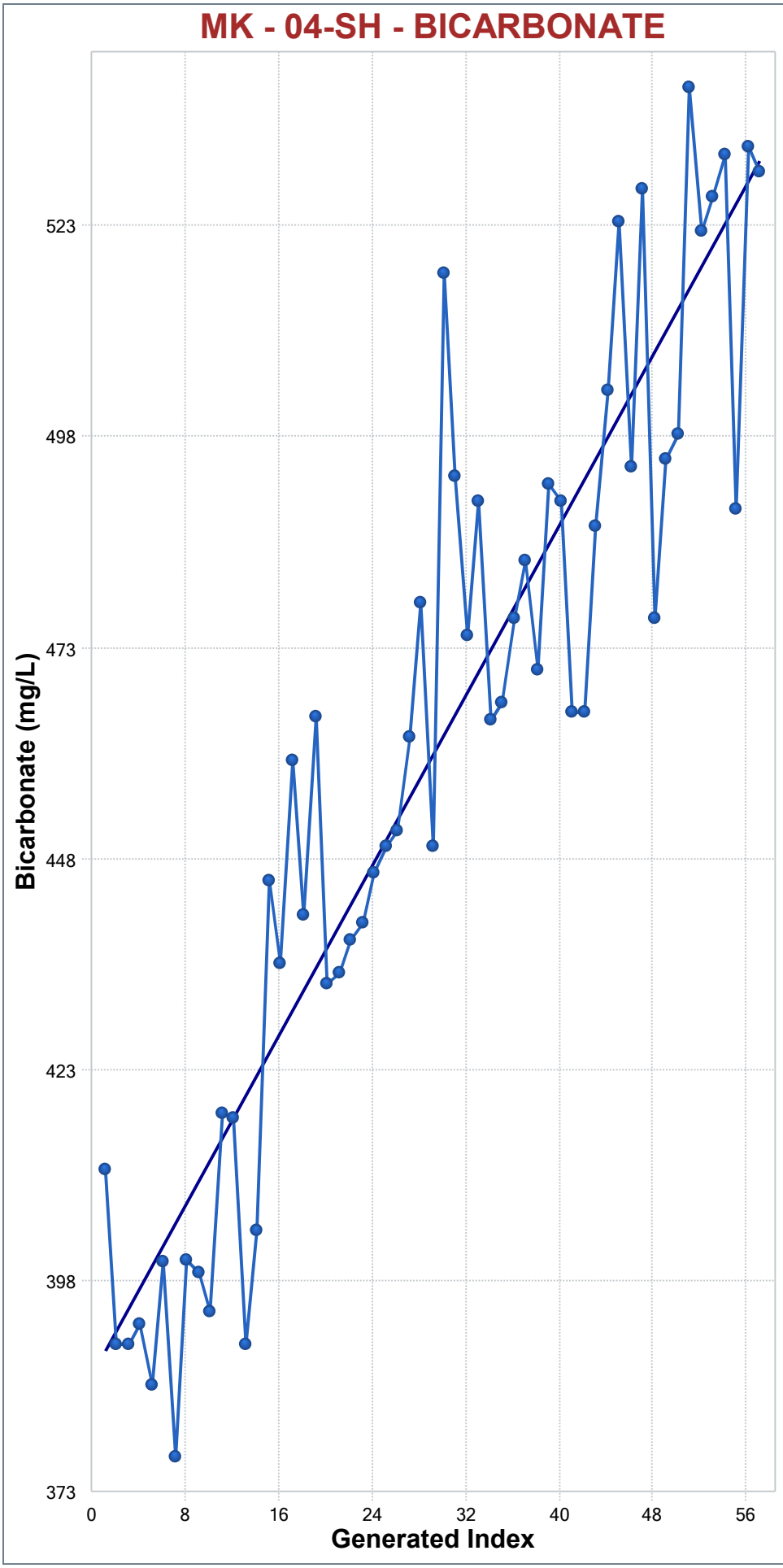
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	144.2128
Standardized Value of S	-4.0842
M-K Test Value (S)	-590
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0003

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



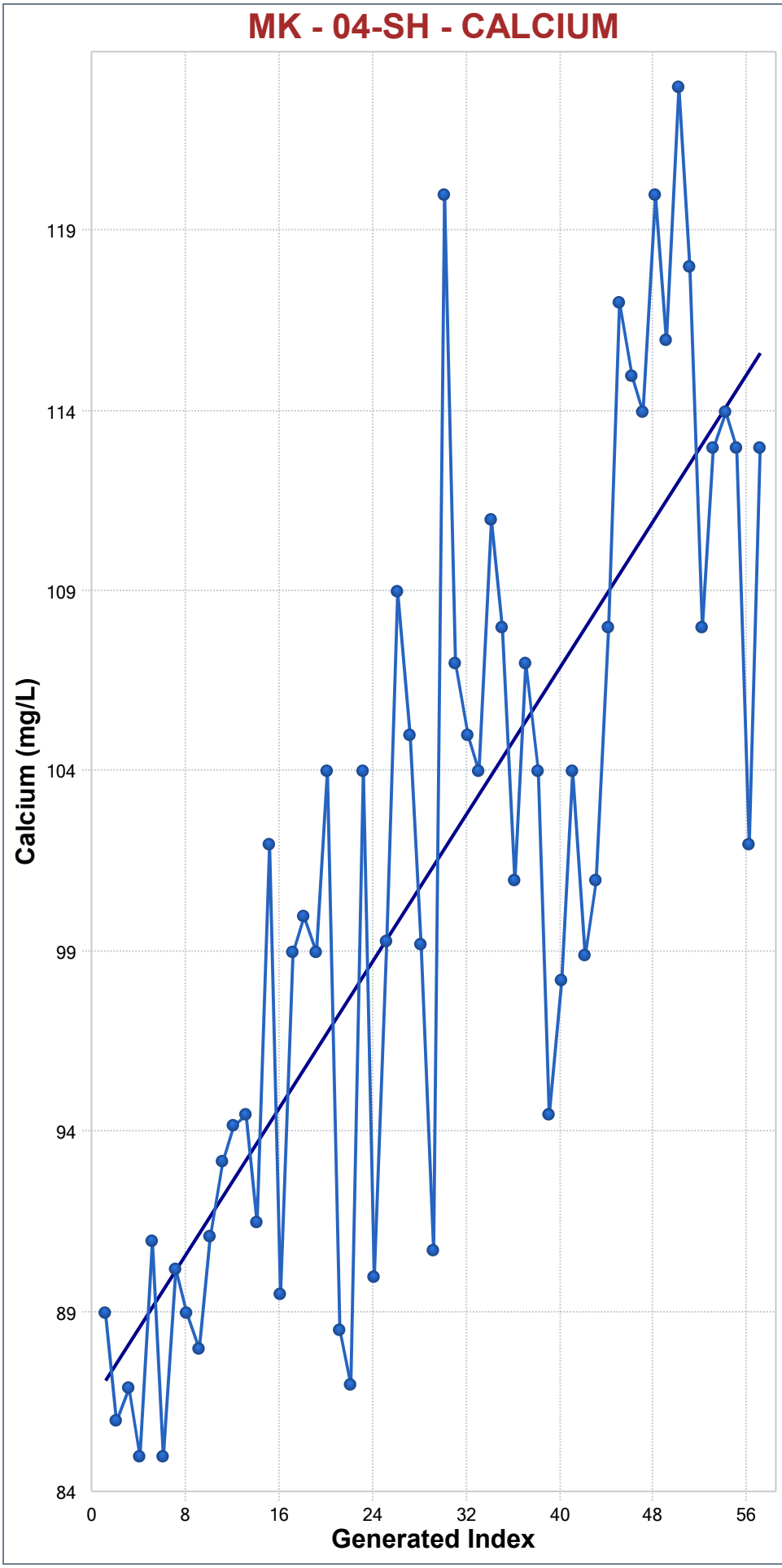
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2412
Standardized Value of S	8.4687
M-K Test Value (S)	1,231
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	2.5158
OLS Regression Intercept	386.8016

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



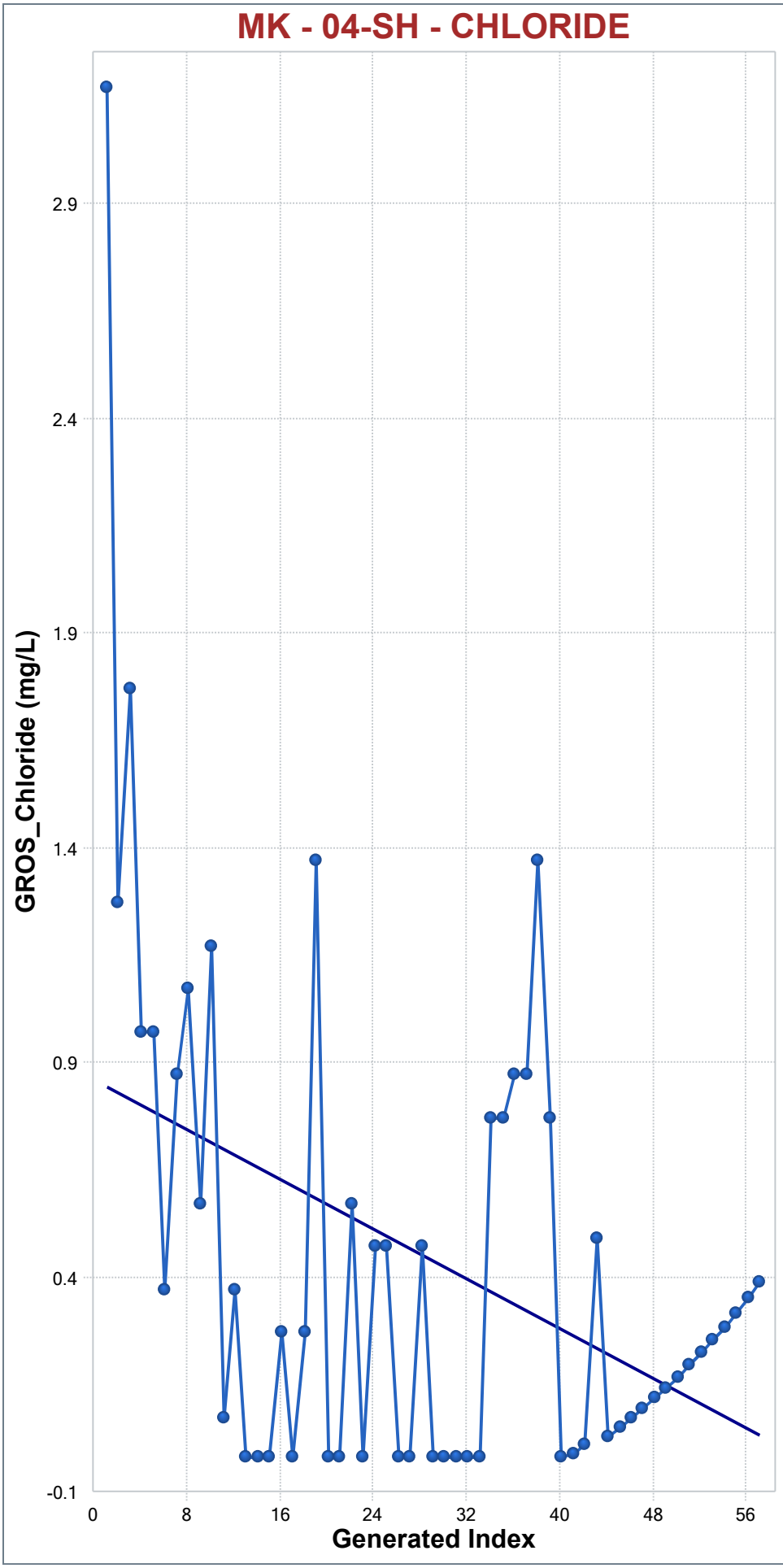
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.1505
Standardized Value of S	6.6207
M-K Test Value (S)	962
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.5085
OLS Regression Intercept	86.6296

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



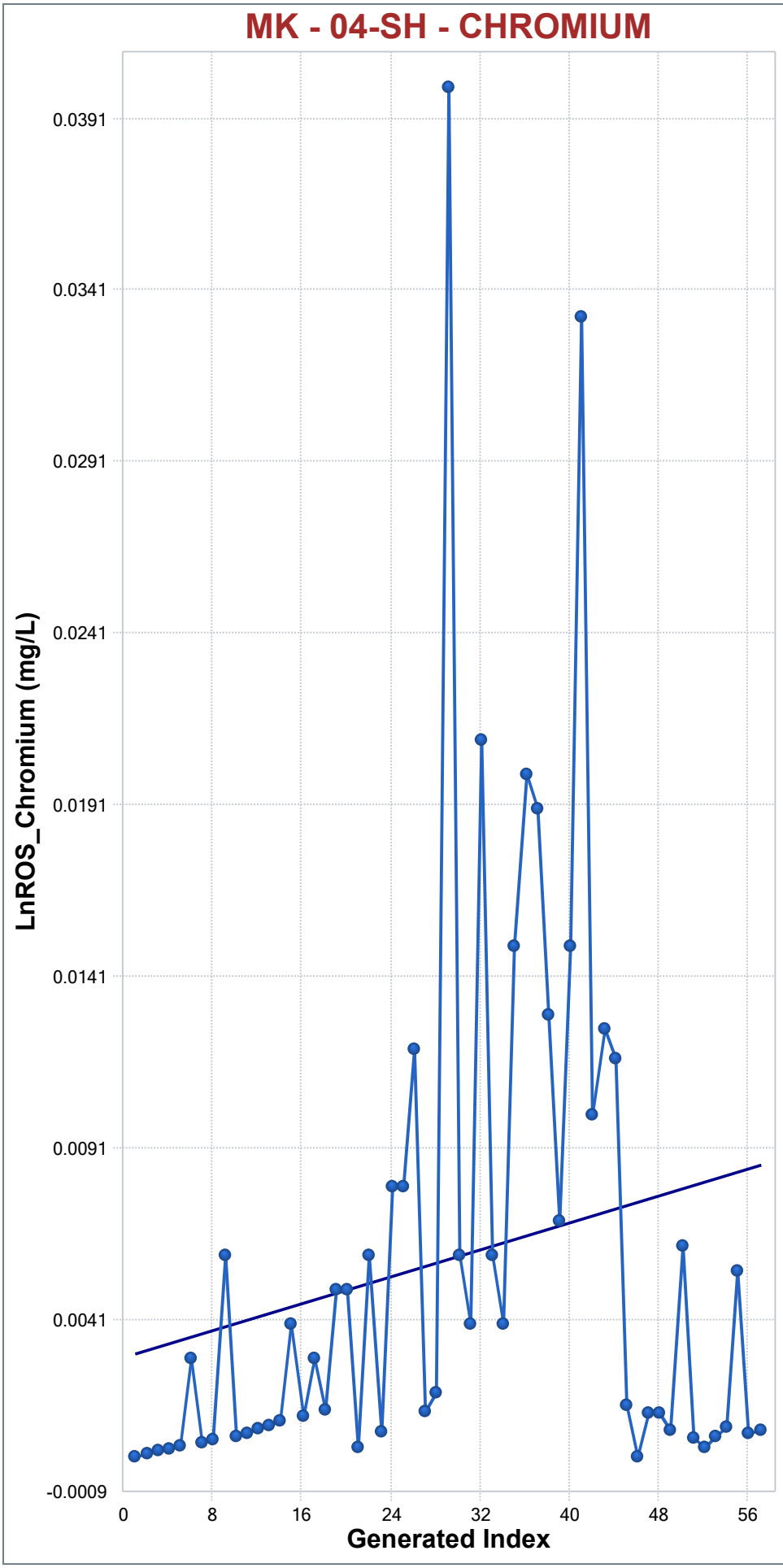
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	143.7996
Standardized Value of S	-1.1822
M-K Test Value (S)	-171
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1186

OLS Regression Line (Blue)

OLS Regression Slope	-0.0145
OLS Regression Intercept	0.8852

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



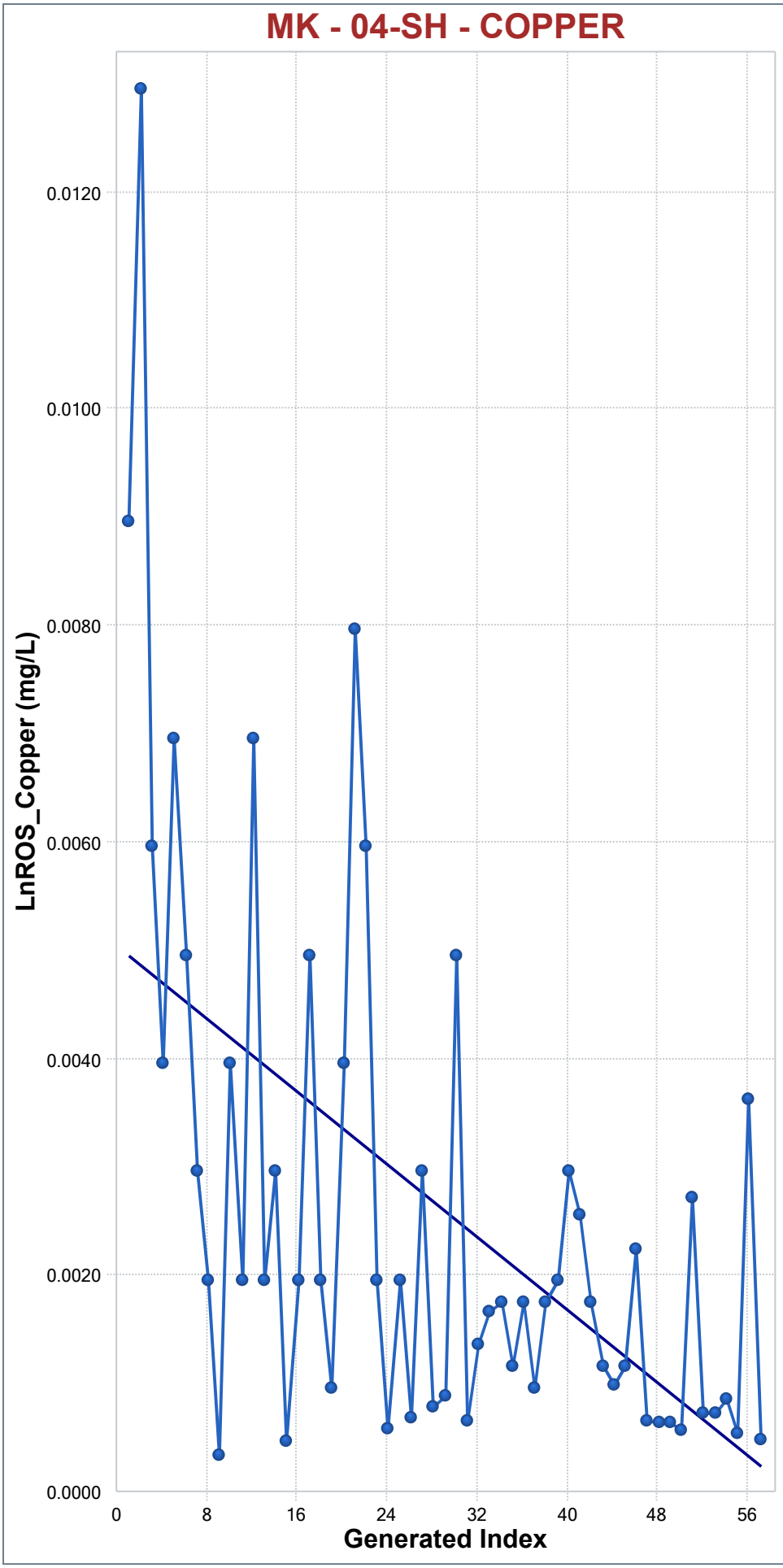
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2079
Standardized Value of S	2.5687
M-K Test Value (S)	374
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0051

OLS Regression Line (Blue)

OLS Regression Slope	0.0001
OLS Regression Intercept	0.0030

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



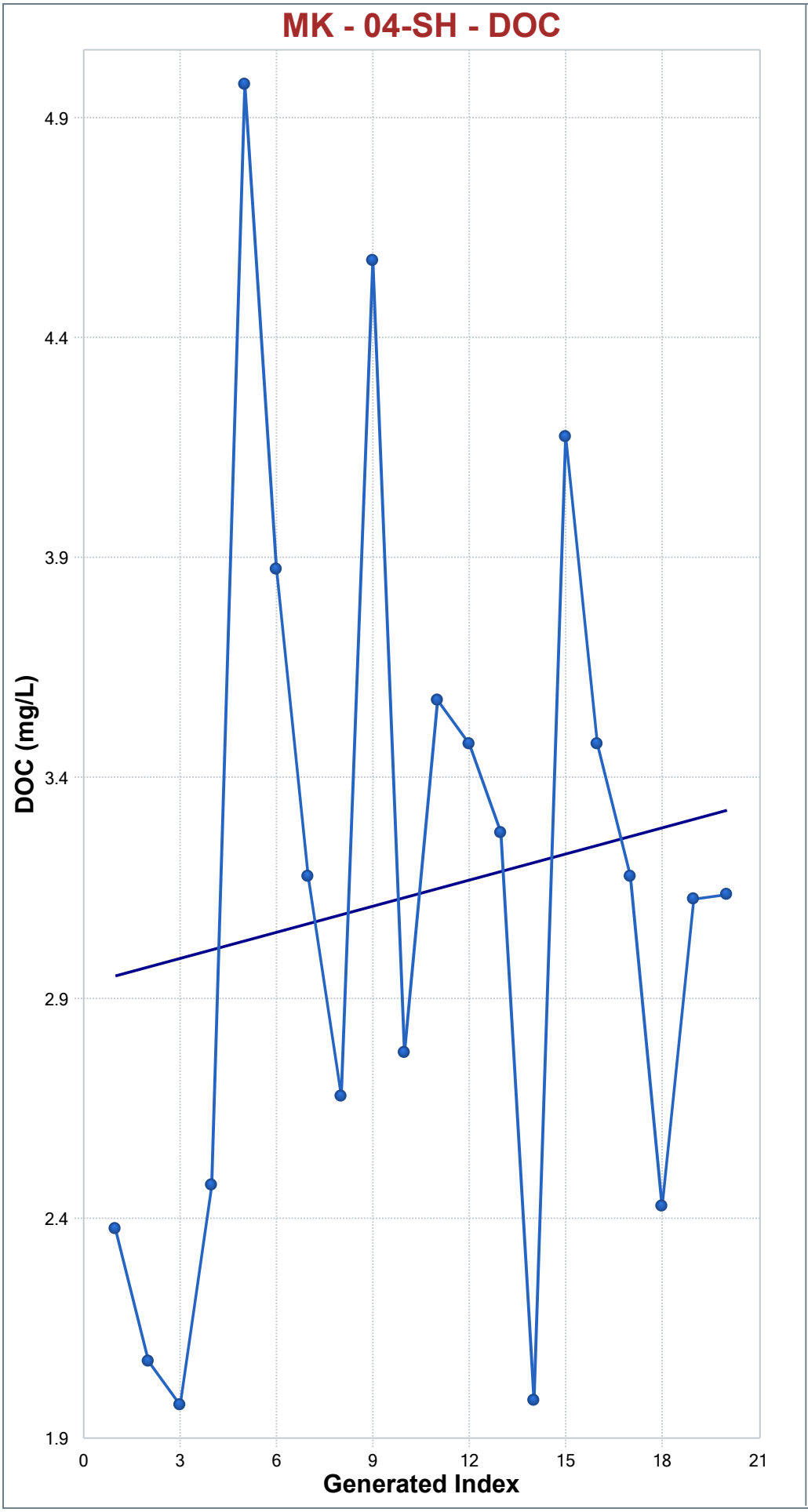
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	144.9276
Standardized Value of S	-4.4229
M-K Test Value (S)	-642
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0051

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



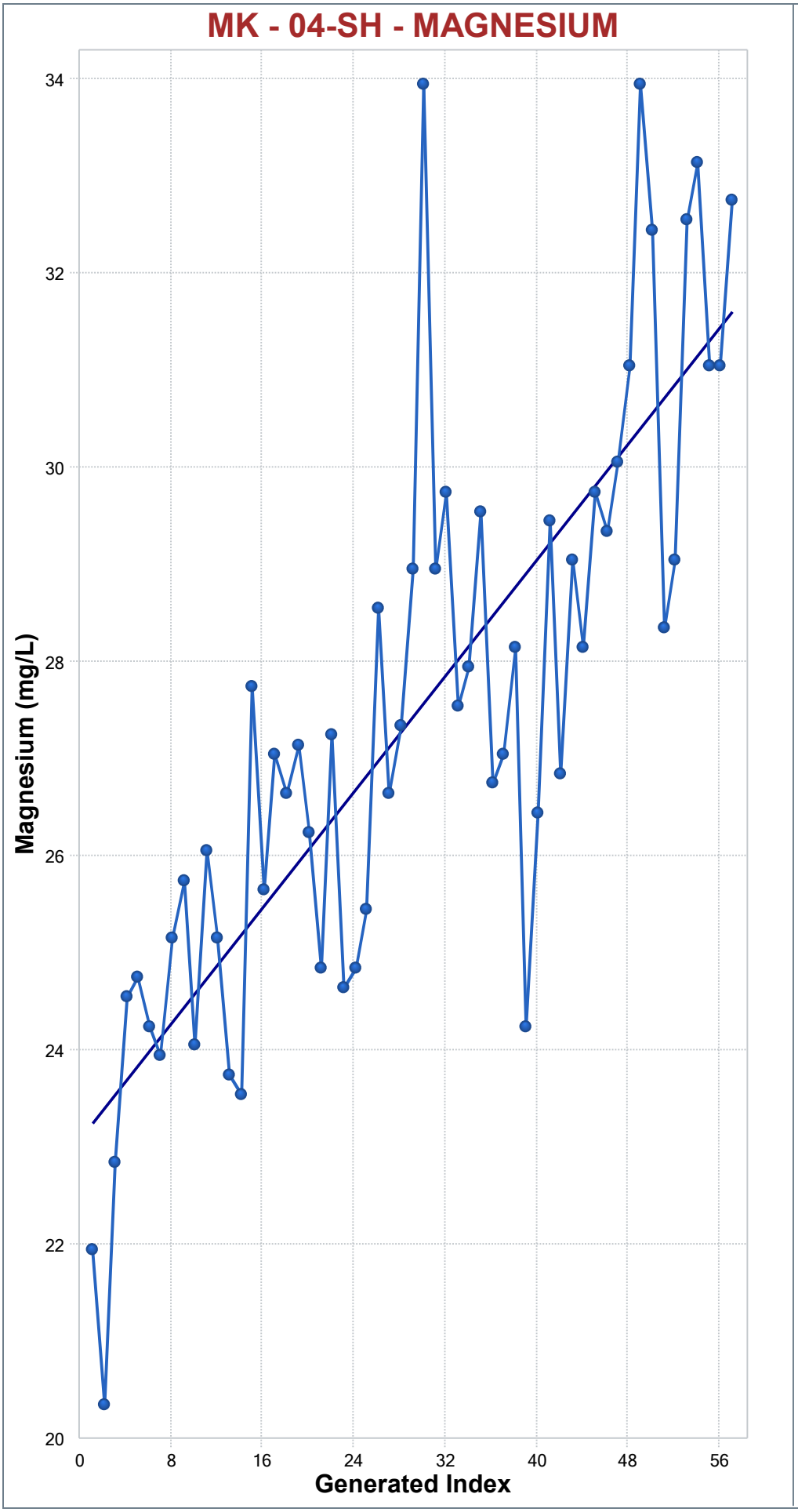
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7896
Standardized Value of S	0.4872
M-K Test Value (S)	16
Tabulated p-value	0.3150
Approximate p-value	0.3131

OLS Regression Line (Blue)

OLS Regression Slope	0.0199
OLS Regression Intercept	2.9542

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



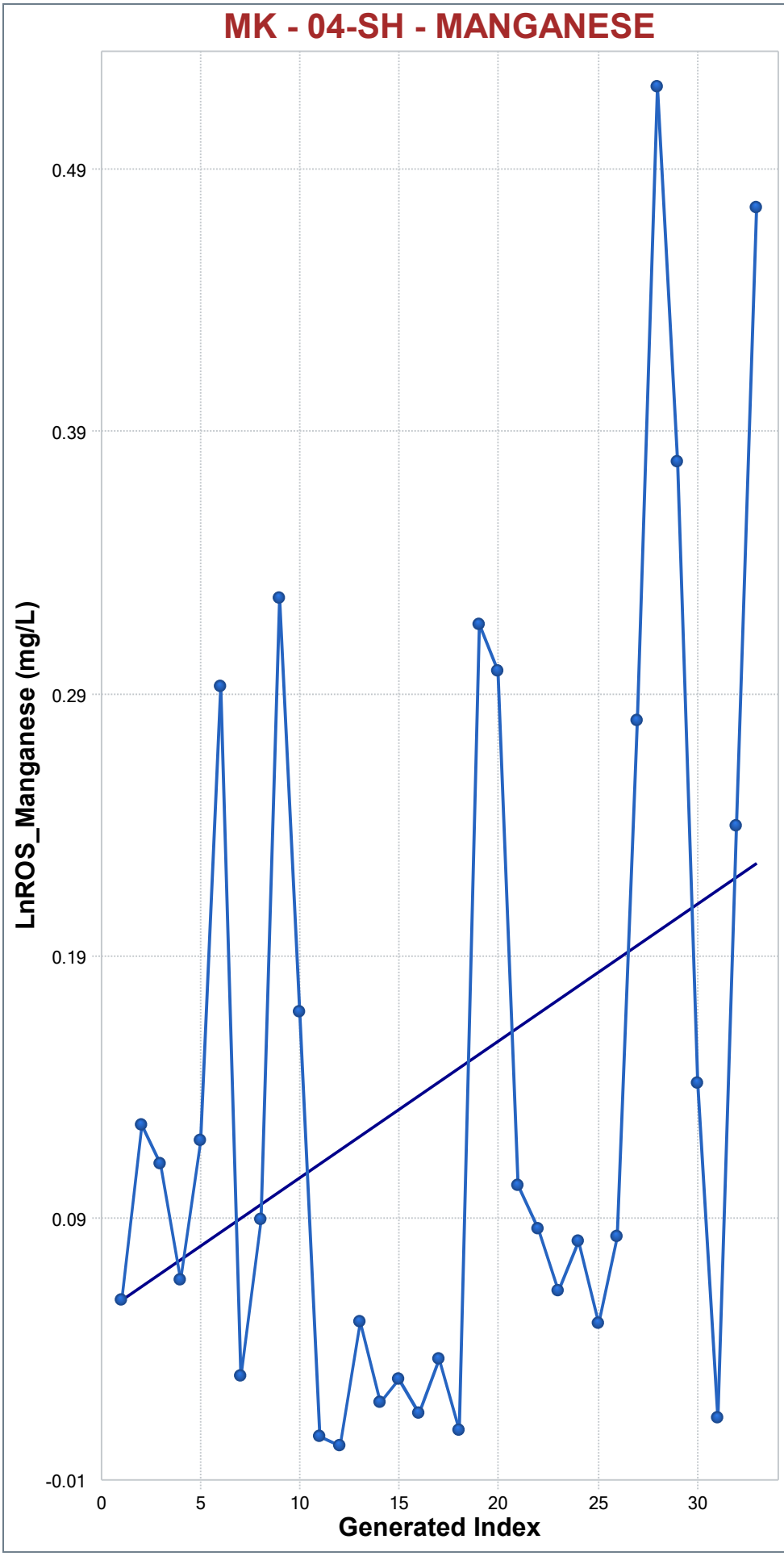
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2205
Standardized Value of S	7.1753
M-K Test Value (S)	1,043
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.1493
OLS Regression Intercept	23.2512

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



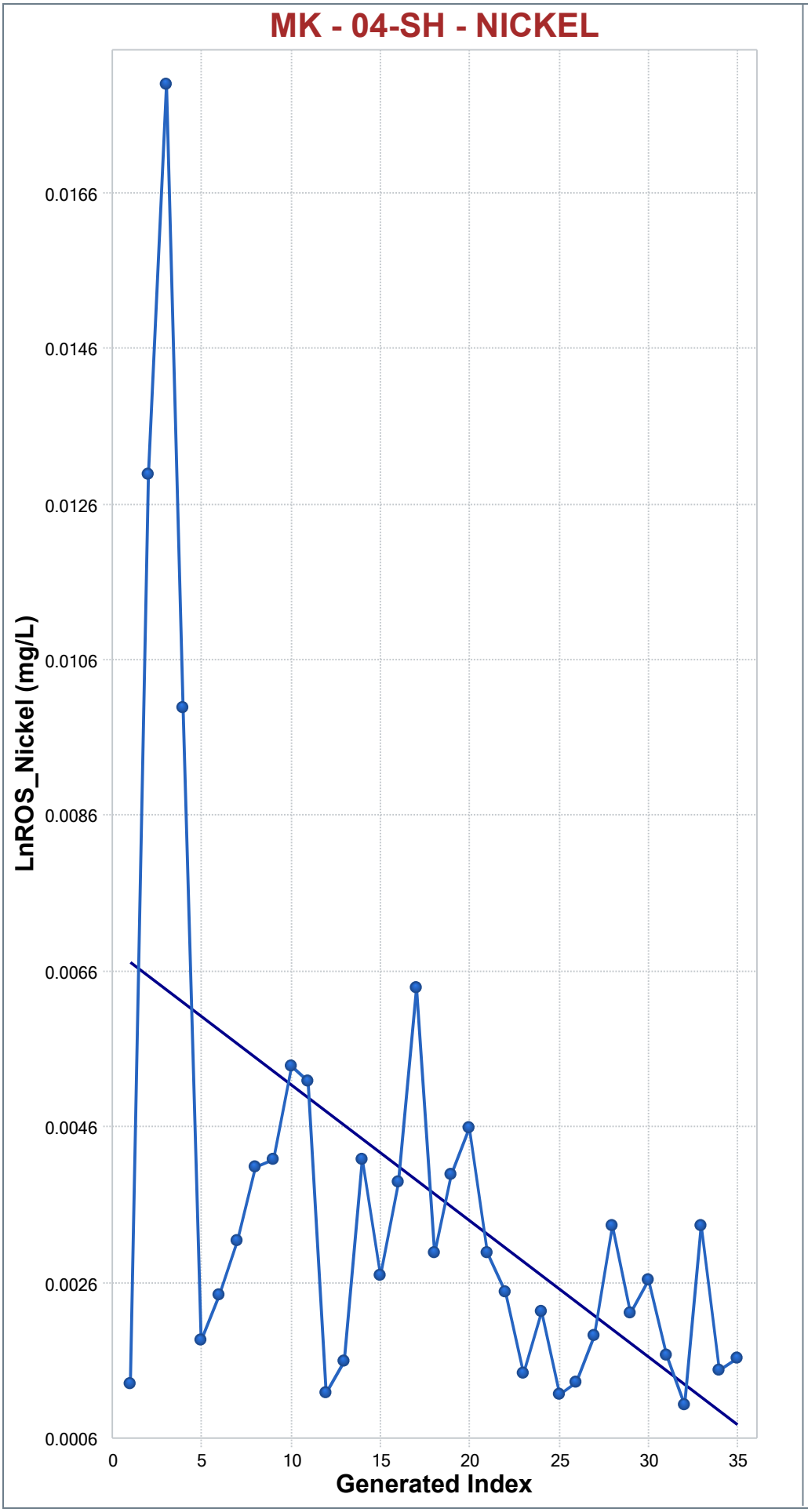
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5394
Standardized Value of S	1.1931
M-K Test Value (S)	78
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1164

OLS Regression Line (Blue)

OLS Regression Slope	0.0052
OLS Regression Intercept	0.0558

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



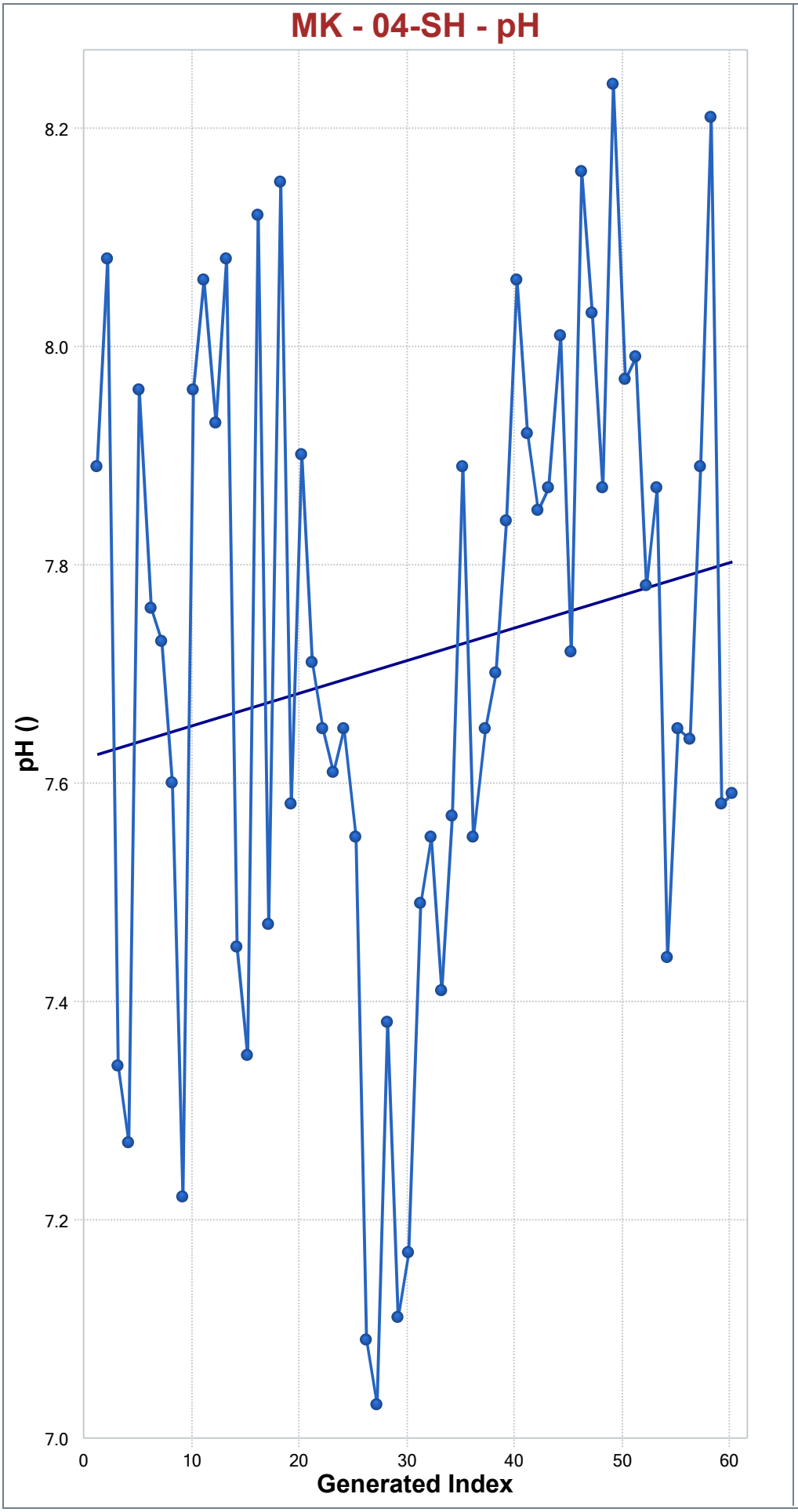
Mann-Kendall Trend Analysis

n	35
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	70.4012
Standardized Value of S	-2.8409
M-K Test Value (S)	-201
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0022

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0069

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



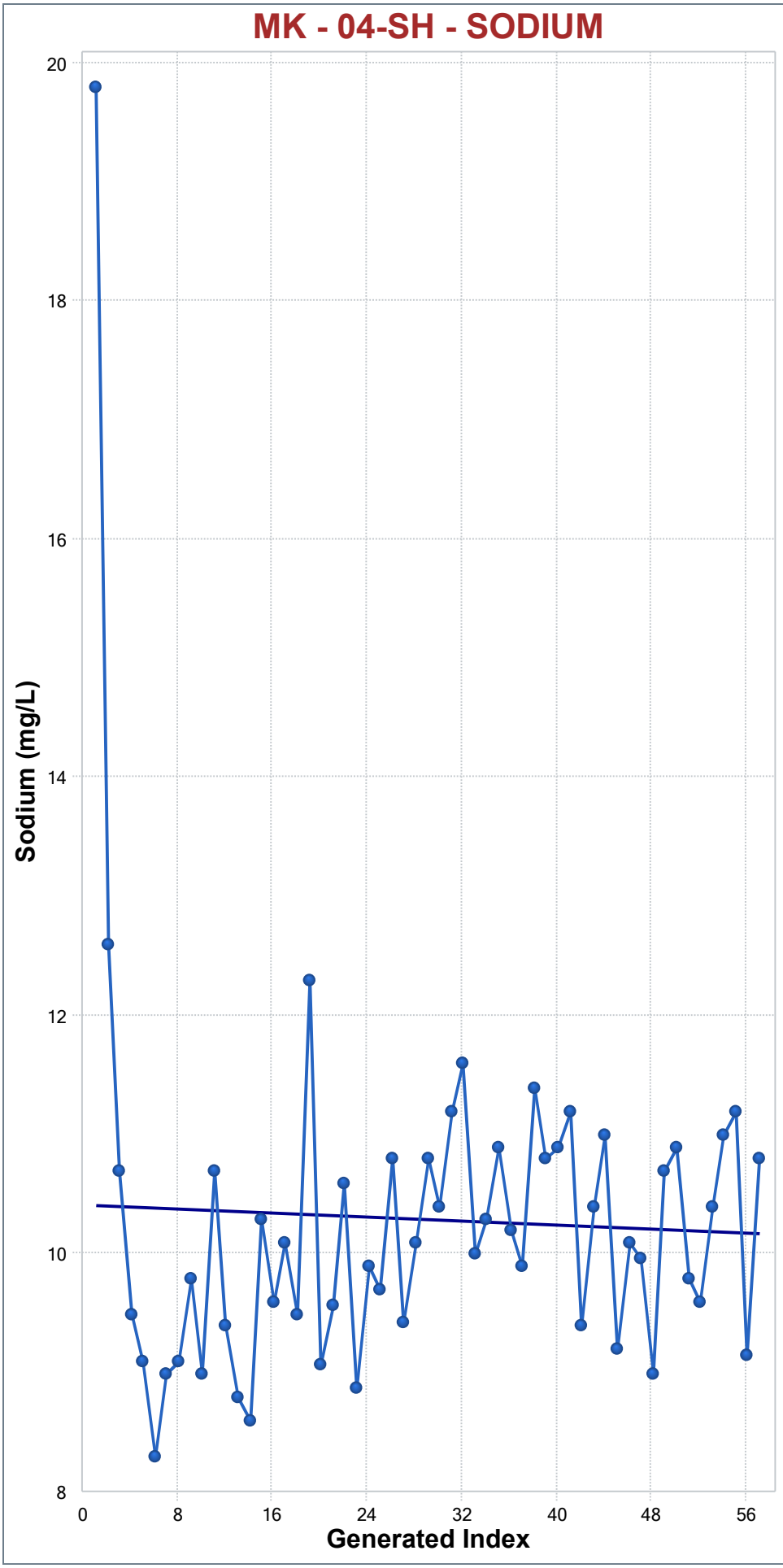
Mann-Kendall Trend Analysis

n	60
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	156.7152
Standardized Value of S	1.2634
M-K Test Value (S)	199
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1032

OLS Regression Line (Blue)

OLS Regression Slope	0.0030
OLS Regression Intercept	7.6524

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



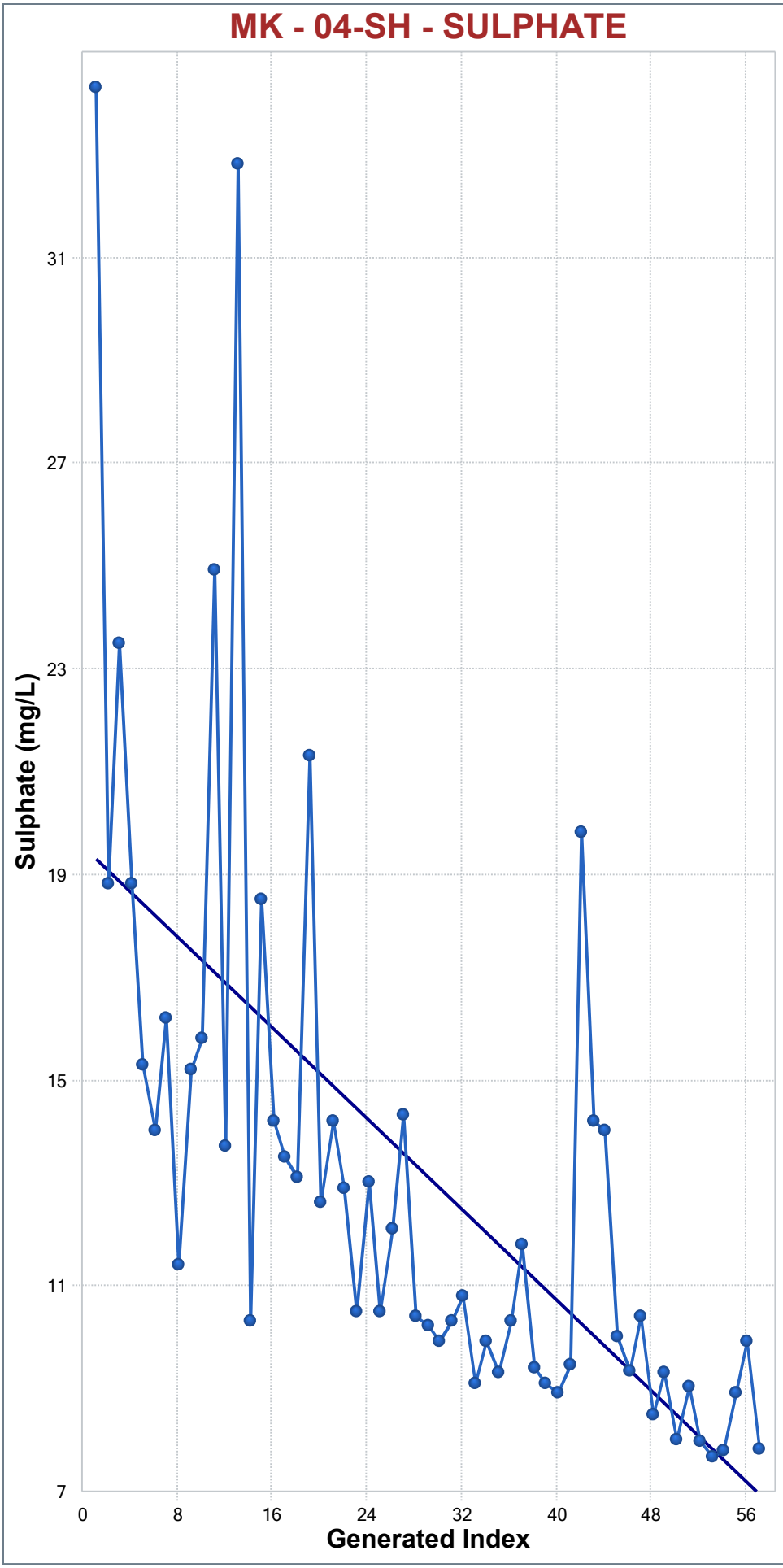
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.1344
Standardized Value of S	2.0877
M-K Test Value (S)	304
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0184

OLS Regression Line (Blue)

OLS Regression Slope	-0.0042
OLS Regression Intercept	10.1098

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



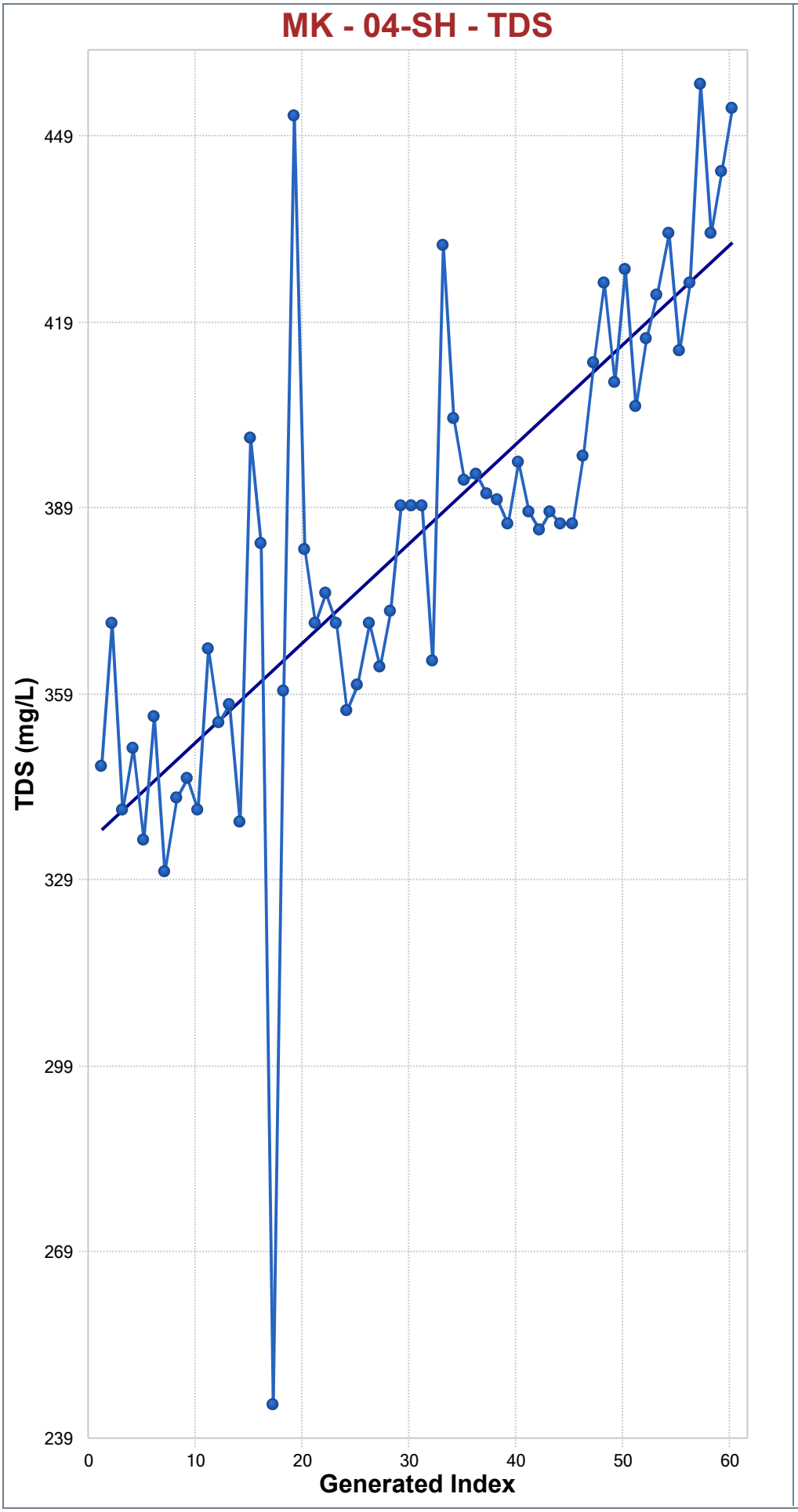
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2090
Standardized Value of S	-7.0519
M-K Test Value (S)	-1,025
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.2204
OLS Regression Intercept	19.7000

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



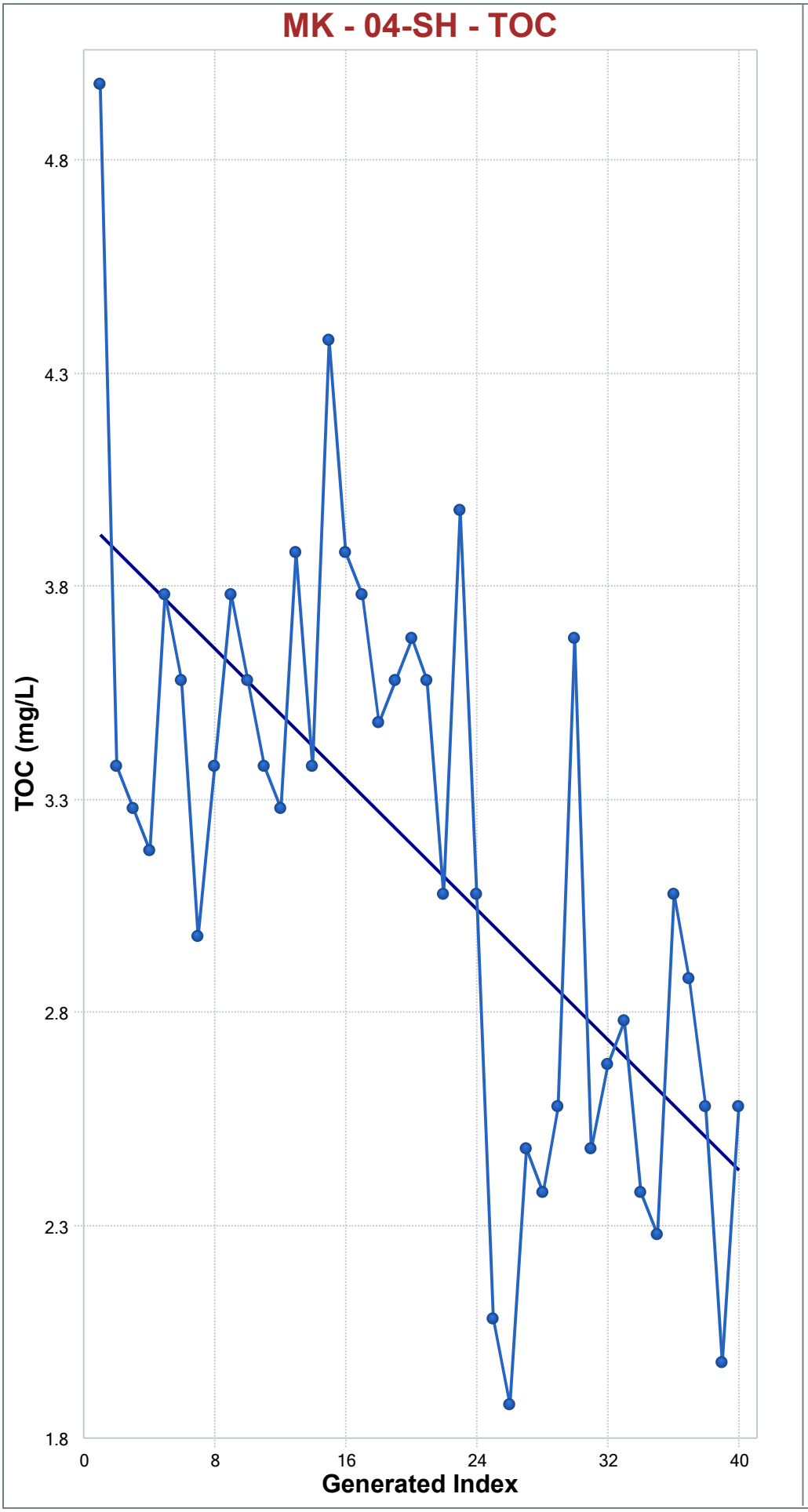
Mann-Kendall Trend Analysis

n	60
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	156.7269
Standardized Value of S	7.4588
M-K Test Value (S)	1,170
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.6054
OLS Regression Intercept	335.1198

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



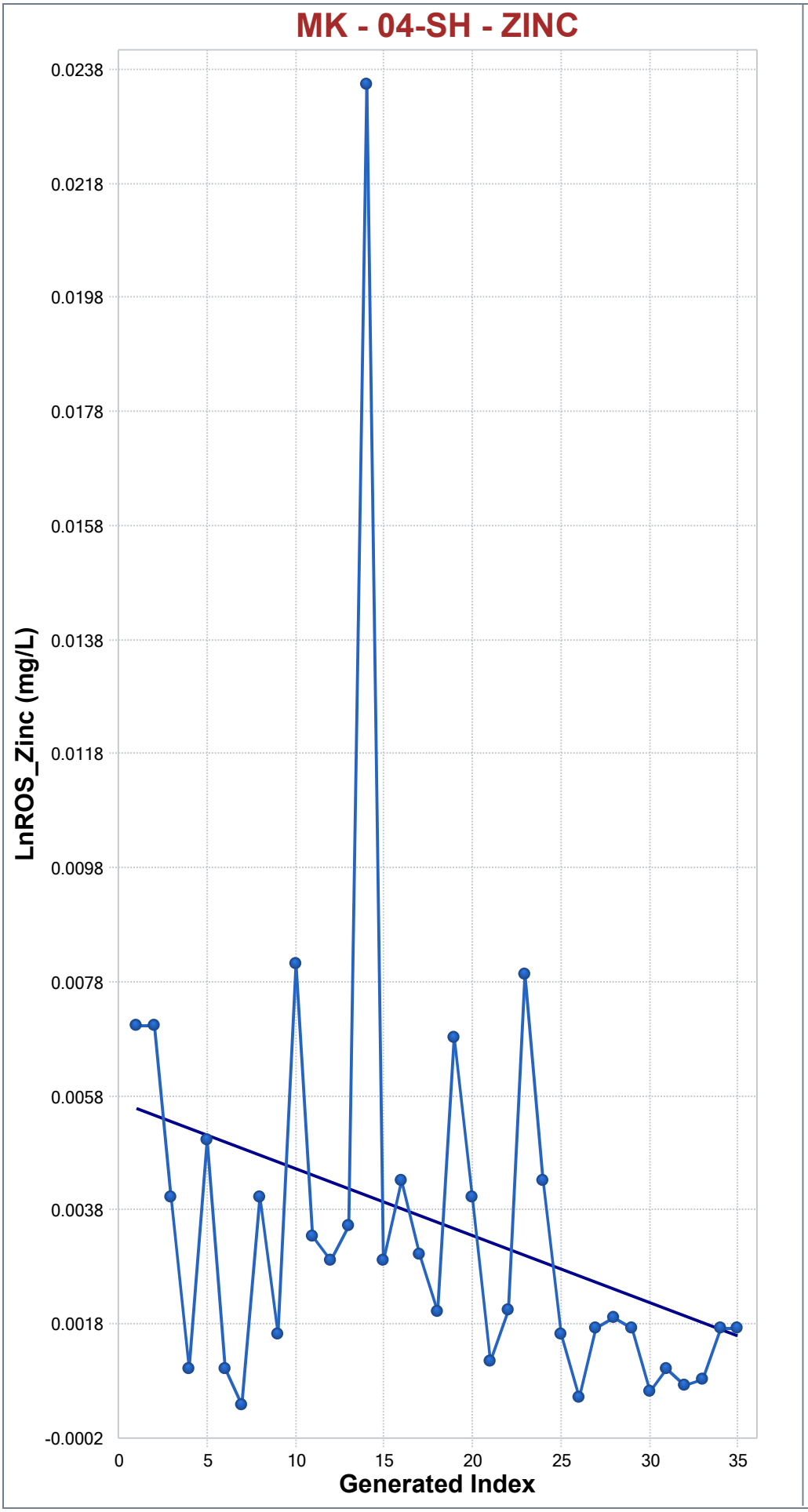
Mann-Kendall Trend Analysis

n	40
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	85.6349
Standardized Value of S	-3.6551
M-K Test Value (S)	-314
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.0382
OLS Regression Intercept	3.9800

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



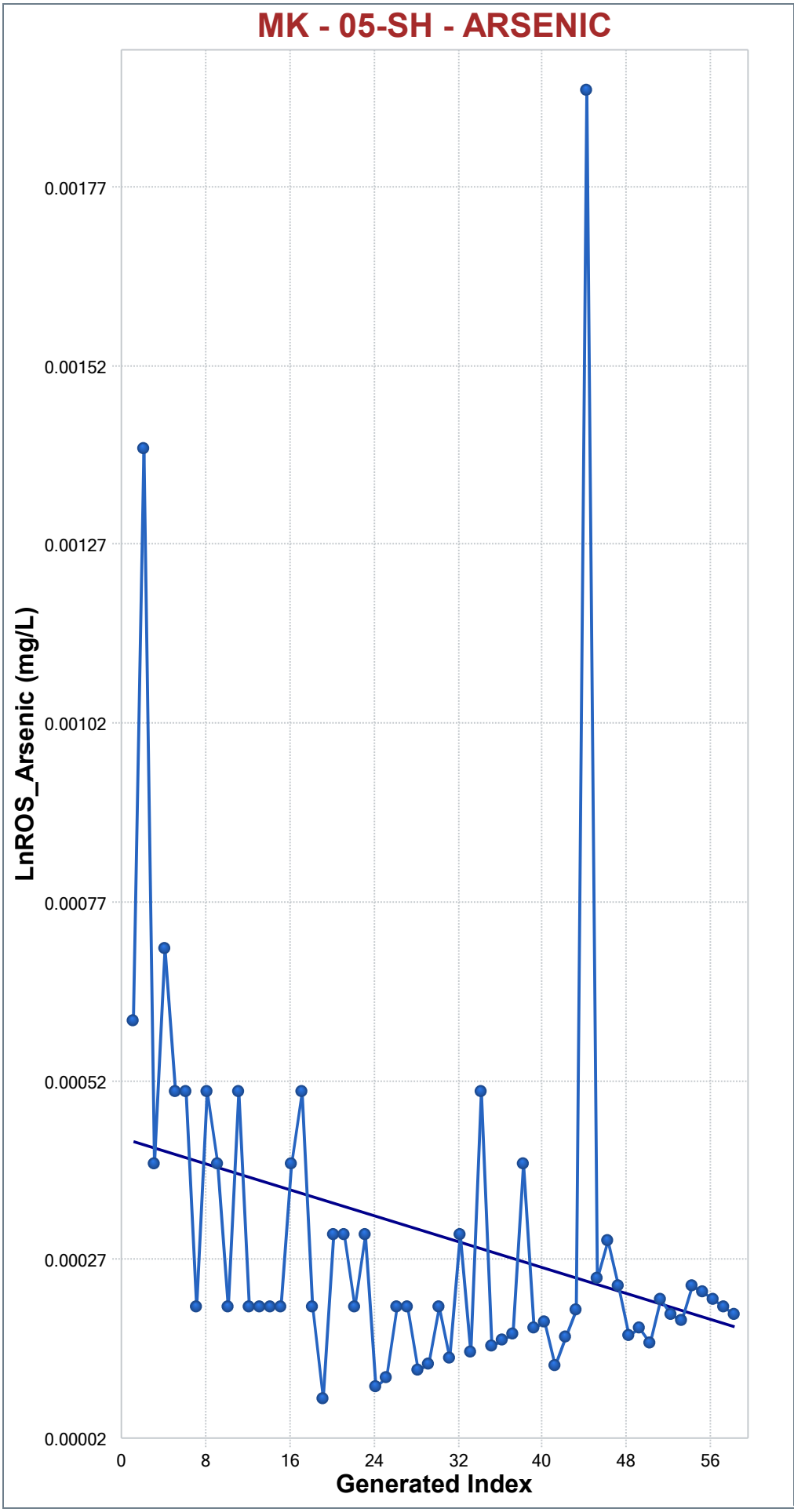
Mann-Kendall Trend Analysis

n	35
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	70.2733
Standardized Value of S	-2.6183
M-K Test Value (S)	-185
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0044

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0057

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



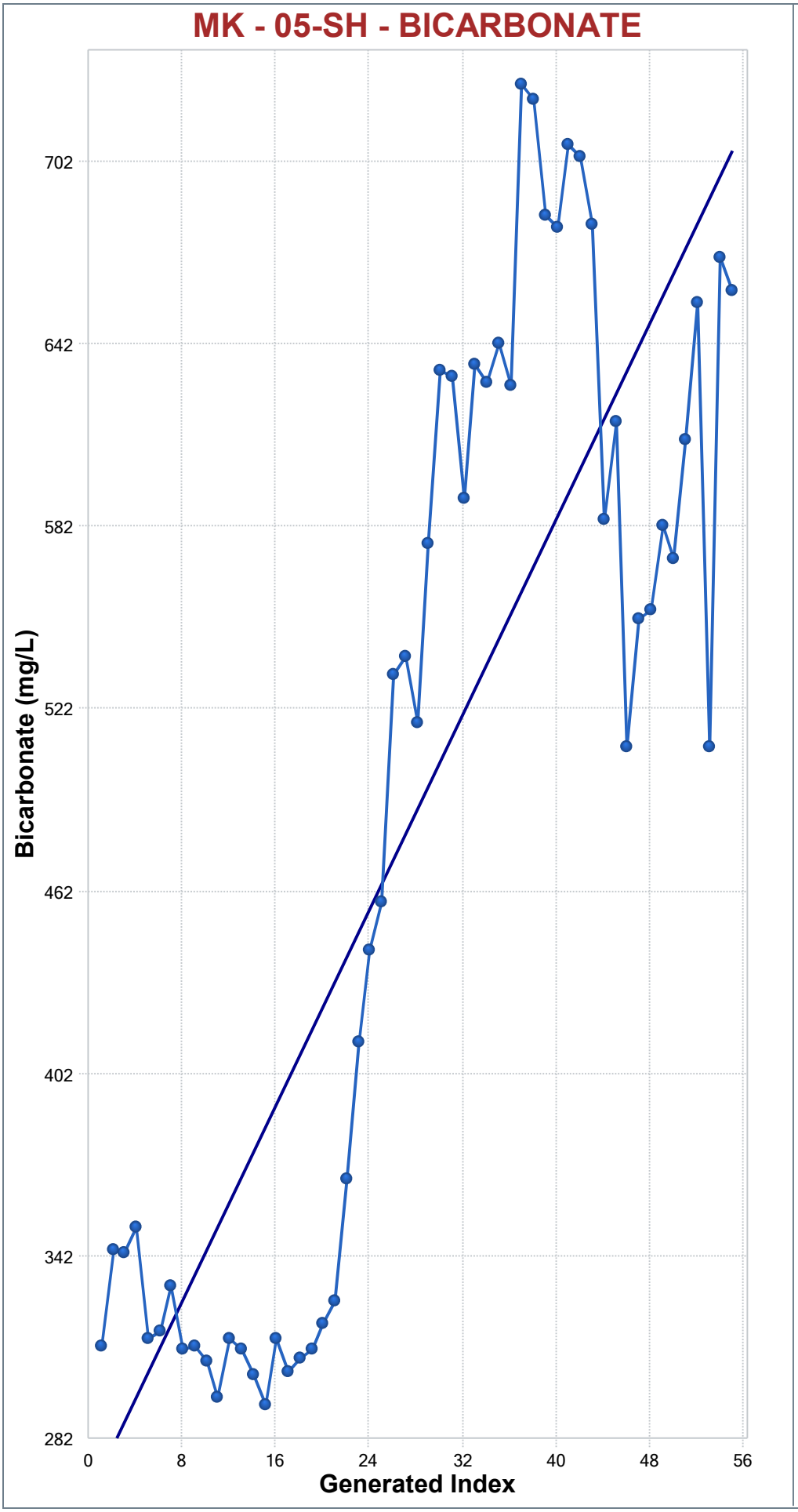
Mann-Kendall Trend Analysis

n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	148.1969
Standardized Value of S	-2.7261
M-K Test Value (S)	-405
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0032

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0004

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



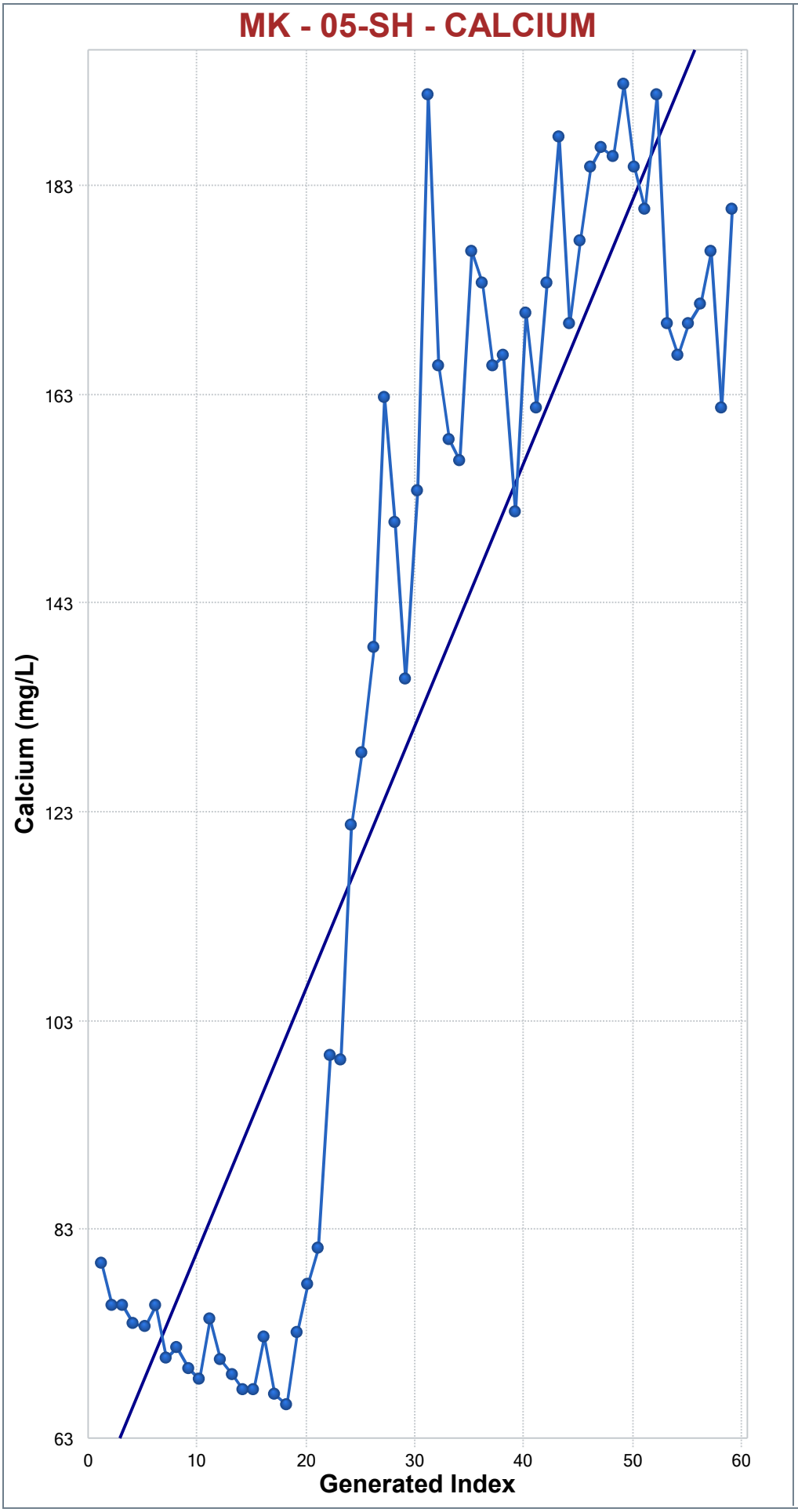
Mann-Kendall Trend Analysis

n	55
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	137.7389
Standardized Value of S	5.8299
M-K Test Value (S)	804
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	8.0426
OLS Regression Intercept	262.9531

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



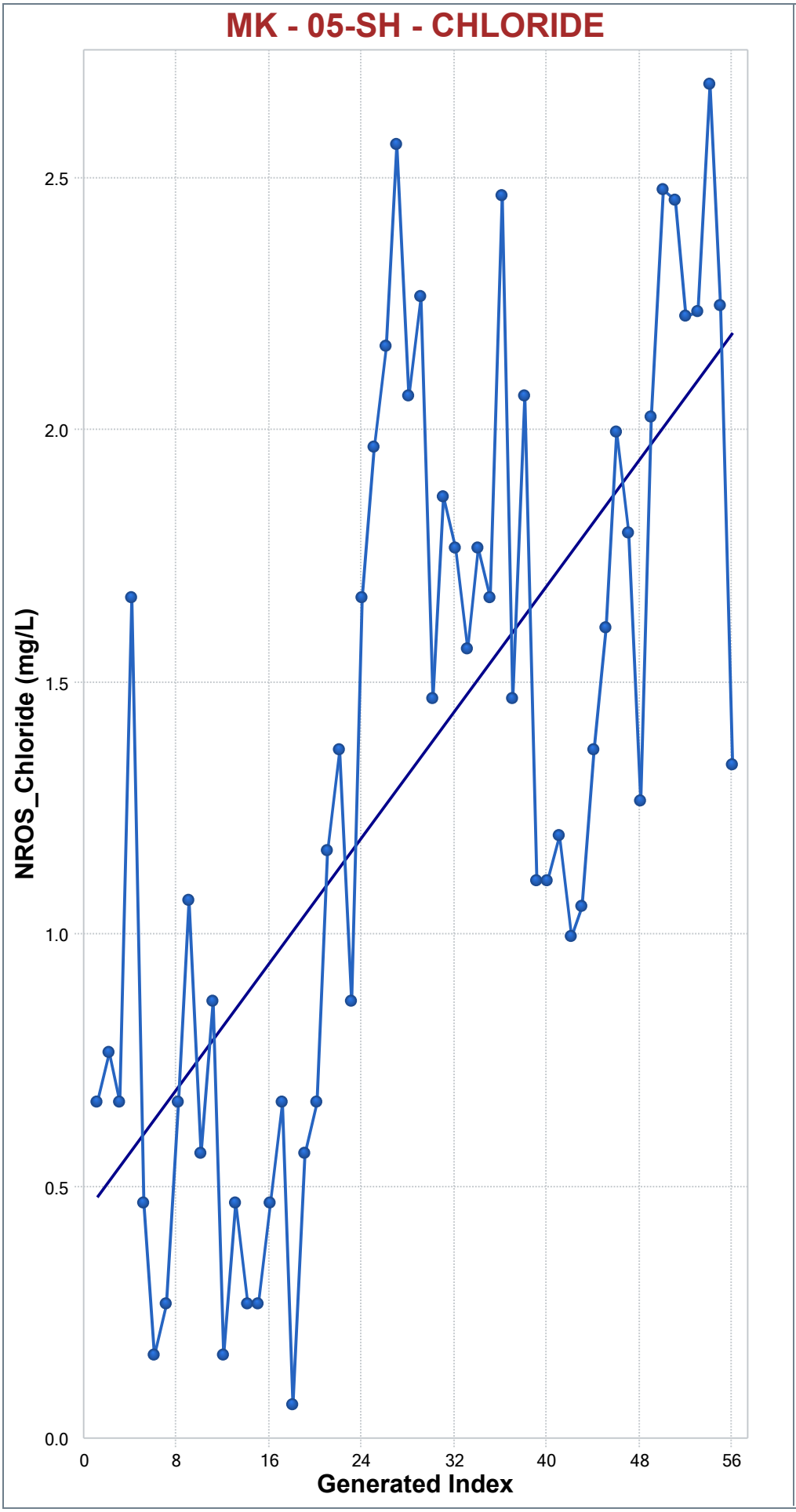
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.8638
Standardized Value of S	7.0193
M-K Test Value (S)	1,074
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	2.5161
OLS Regression Intercept	56.4437

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



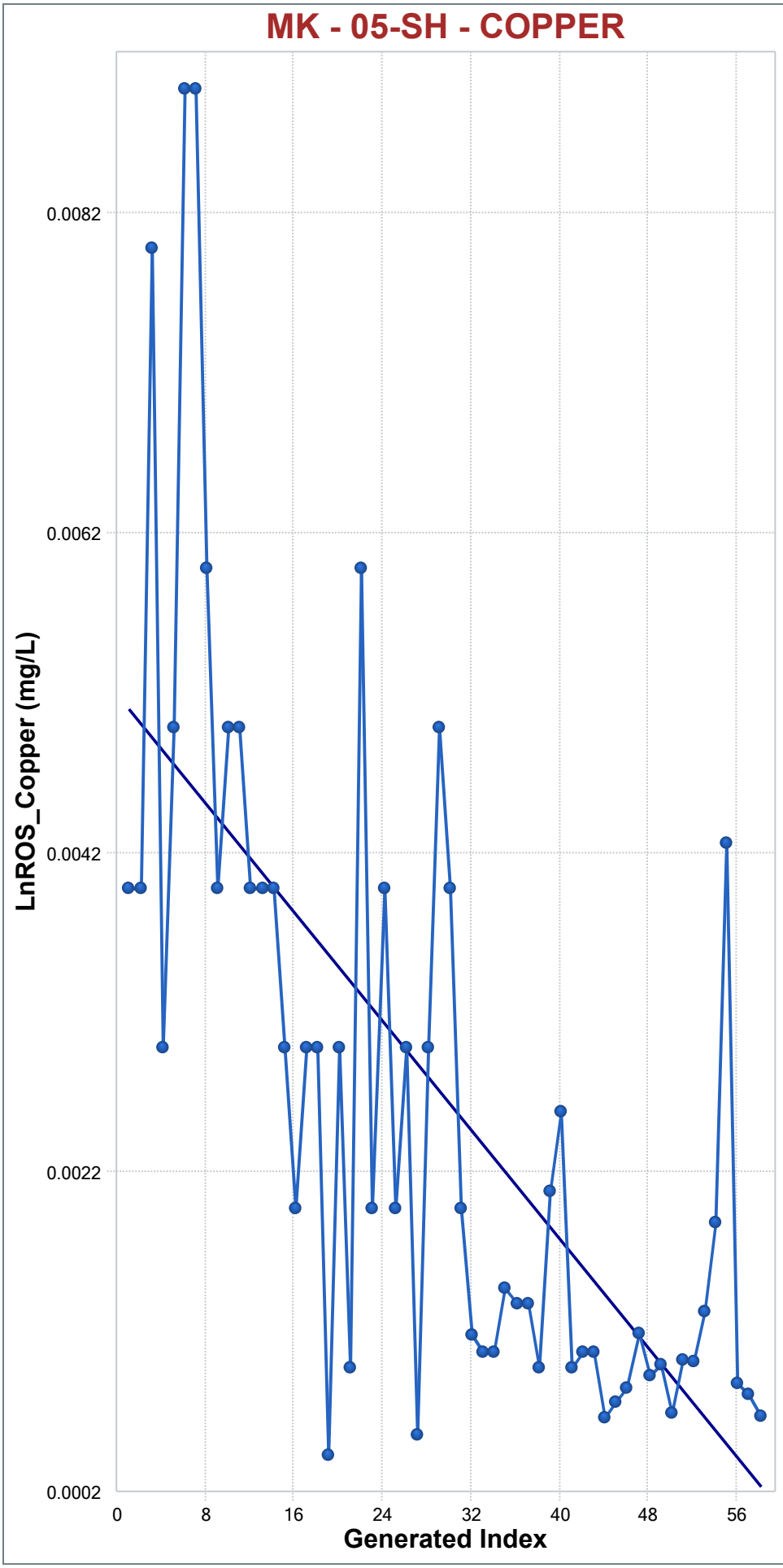
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.3660
Standardized Value of S	5.1922
M-K Test Value (S)	735
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.0312
OLS Regression Intercept	0.4808

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



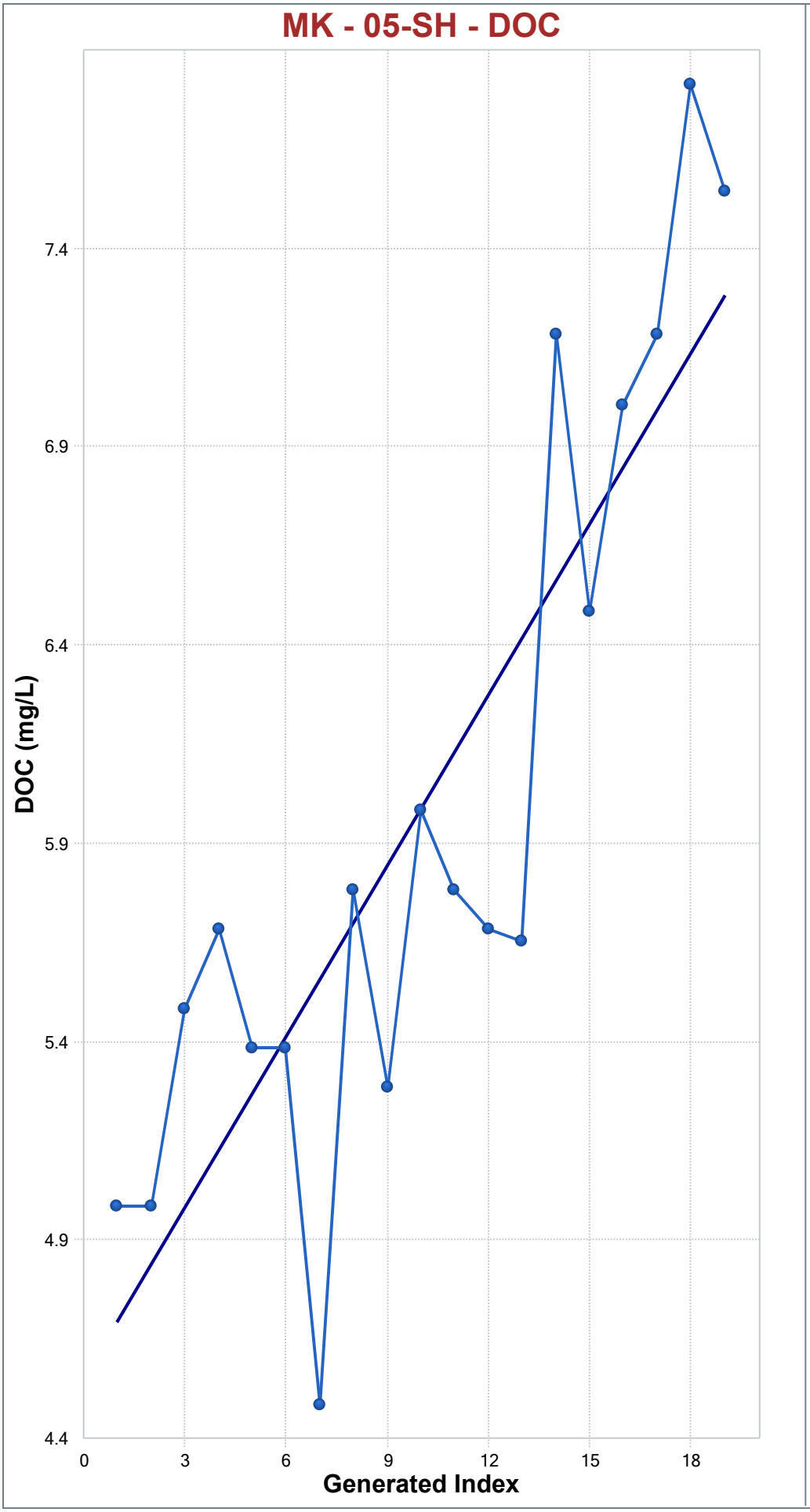
Mann-Kendall Trend Analysis

n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	148.5979
Standardized Value of S	-5.9691
M-K Test Value (S)	-888
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0052

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



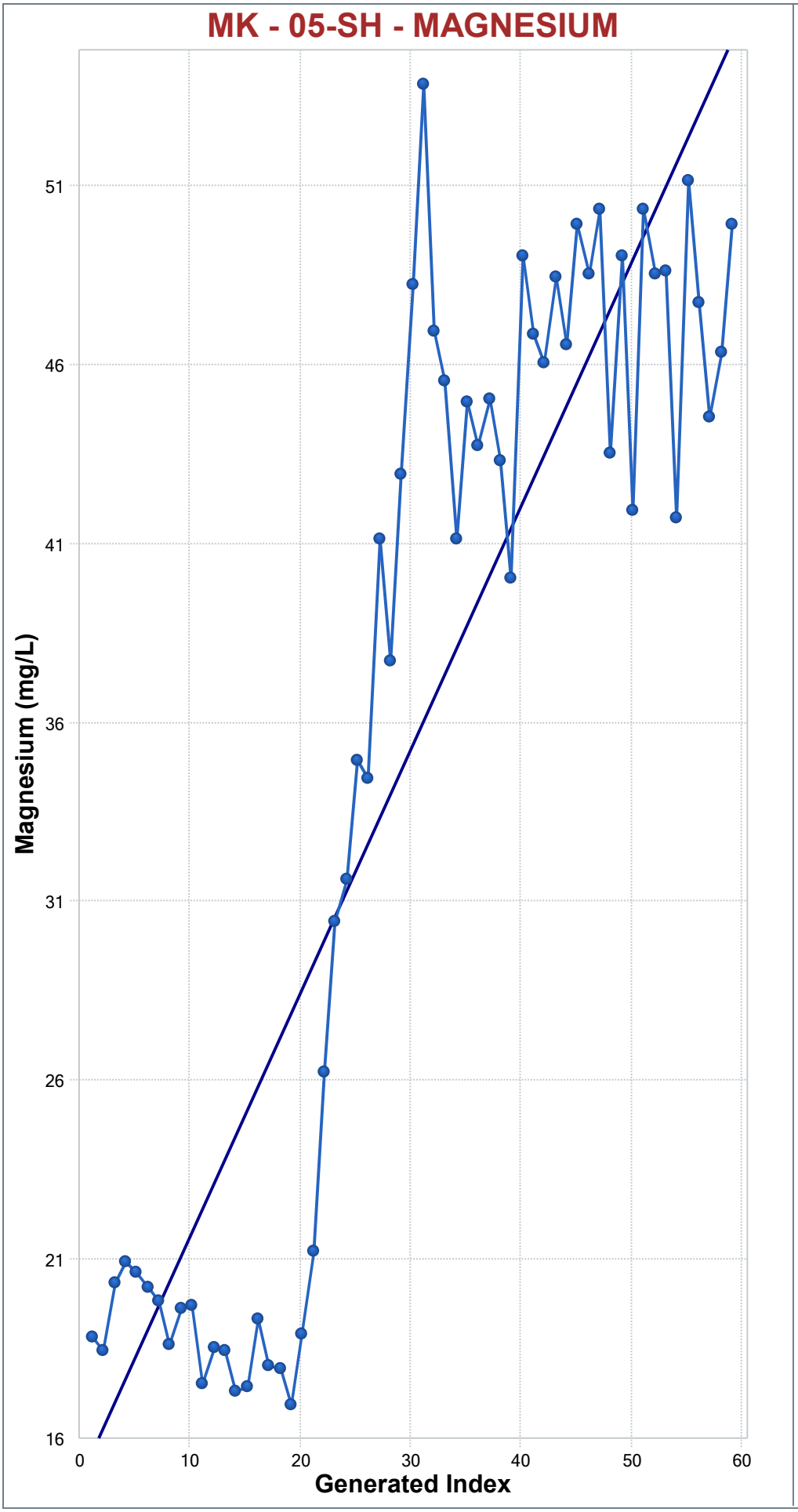
Mann-Kendall Trend Analysis

n	19
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	28.4956
Standardized Value of S	3.8953
M-K Test Value (S)	112
Tabulated p-value	0.0000
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.1439
OLS Regression Intercept	4.5654

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



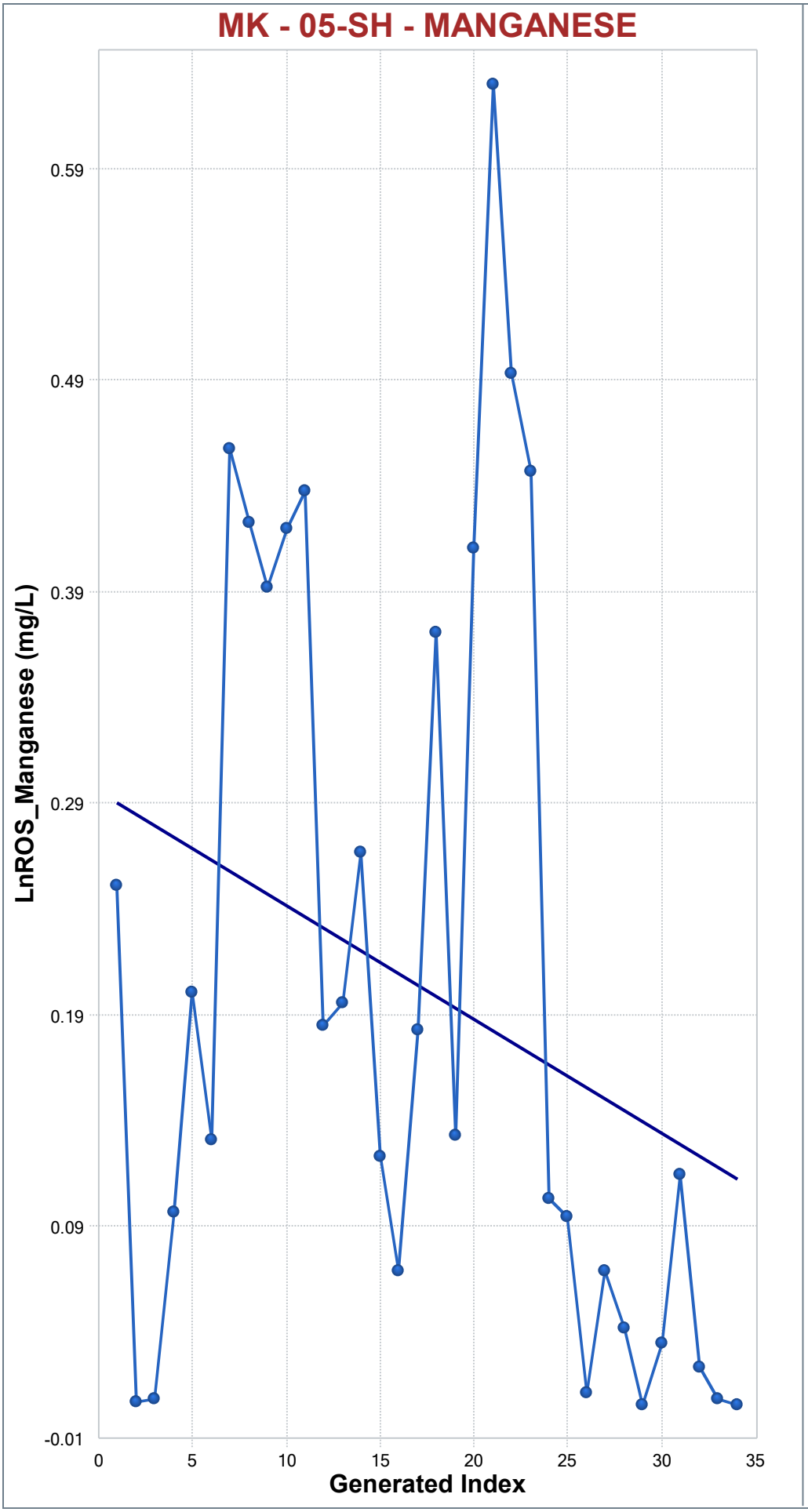
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.8976
Standardized Value of S	6.8019
M-K Test Value (S)	1,041
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.6804
OLS Regression Intercept	14.9122

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



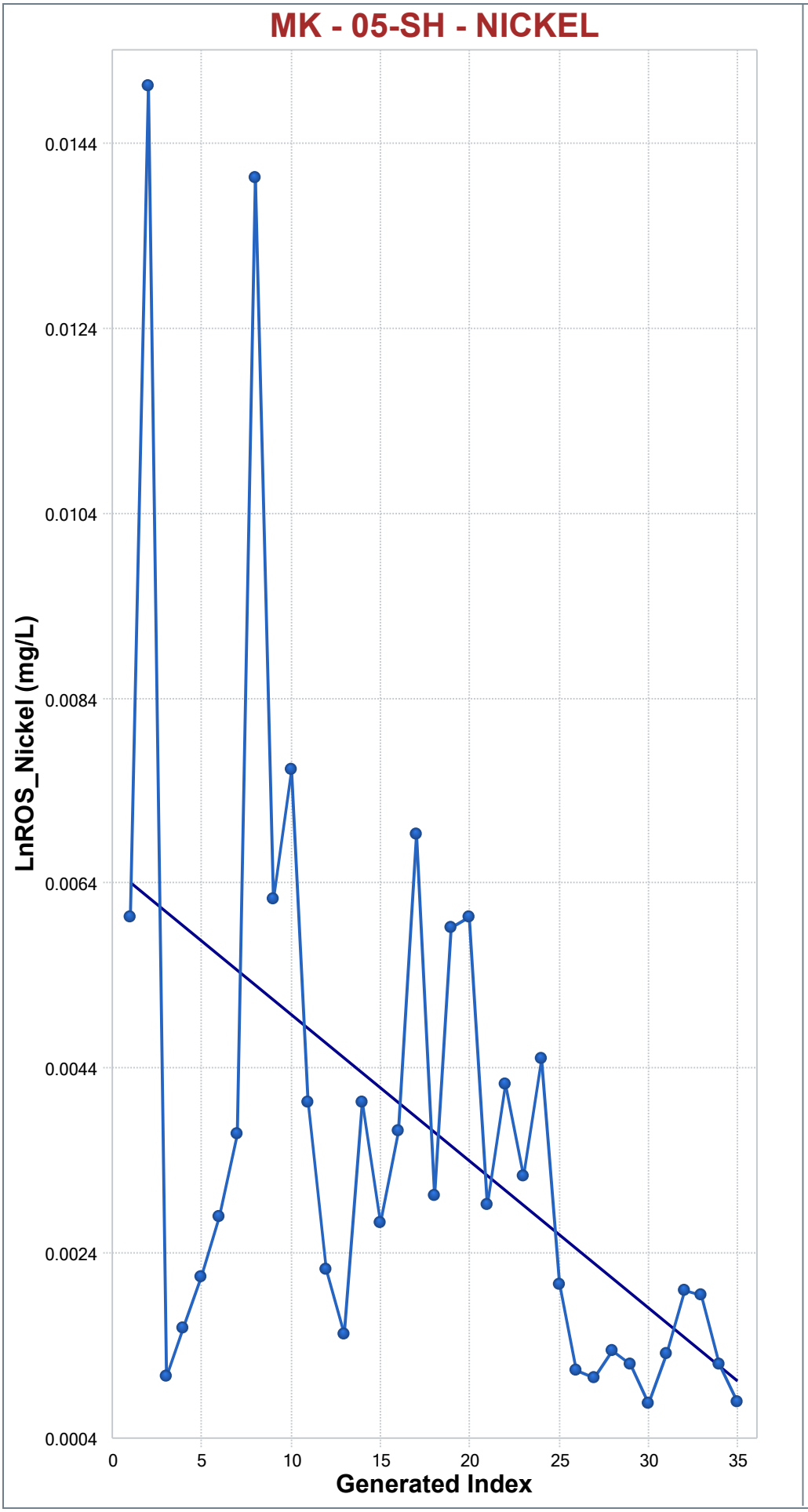
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4487
Standardized Value of S	-2.3870
M-K Test Value (S)	-162
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0085

OLS Regression Line (Blue)

OLS Regression Slope	-0.0054
OLS Regression Intercept	0.2911

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



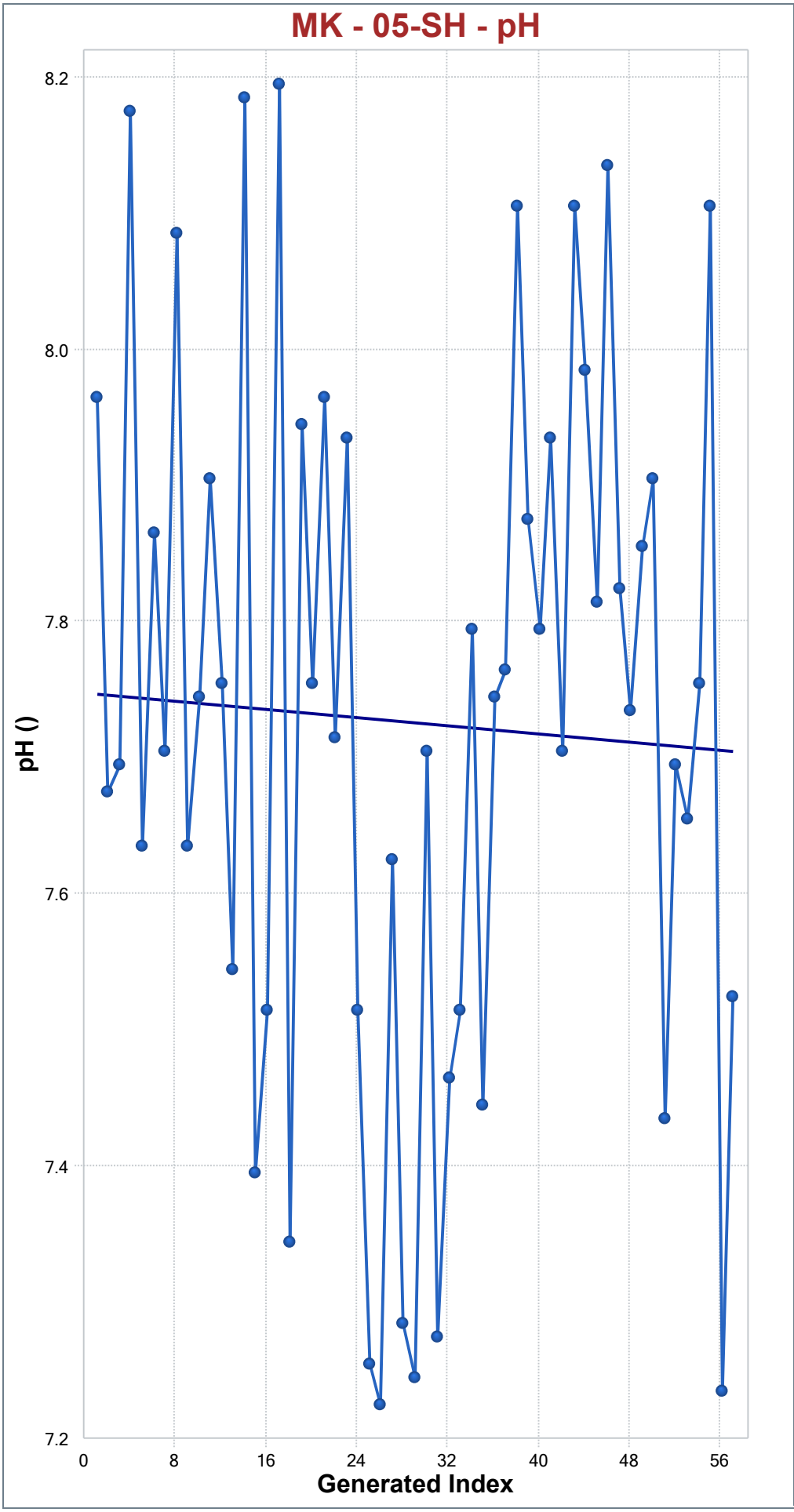
Mann-Kendall Trend Analysis

n	35
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	70.3941
Standardized Value of S	-3.1111
M-K Test Value (S)	-220
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0009

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0065

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



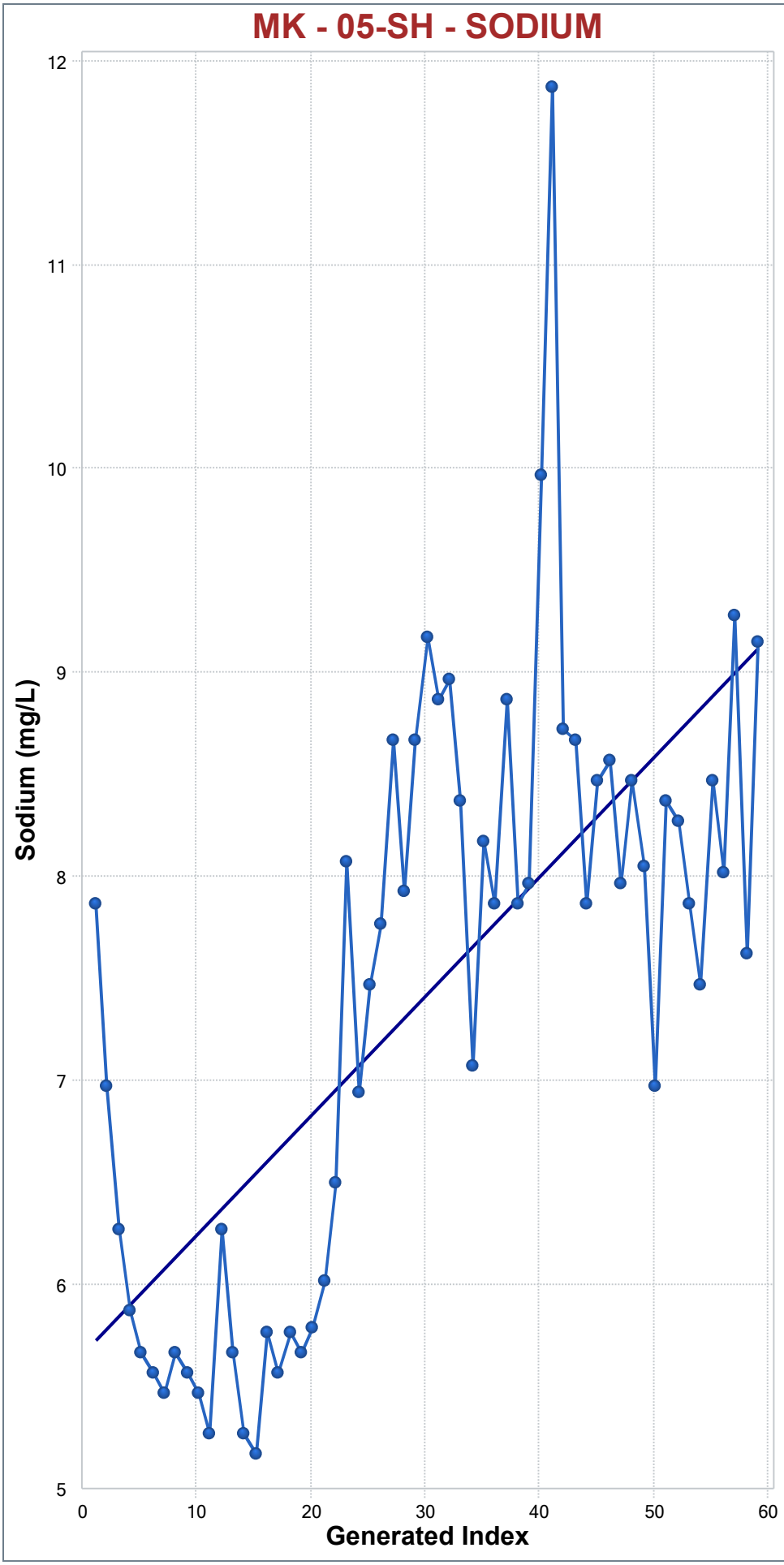
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.1930
Standardized Value of S	-0.0964
M-K Test Value (S)	-15
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4616

OLS Regression Line (Blue)

OLS Regression Slope	-0.0007
OLS Regression Intercept	7.7523

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



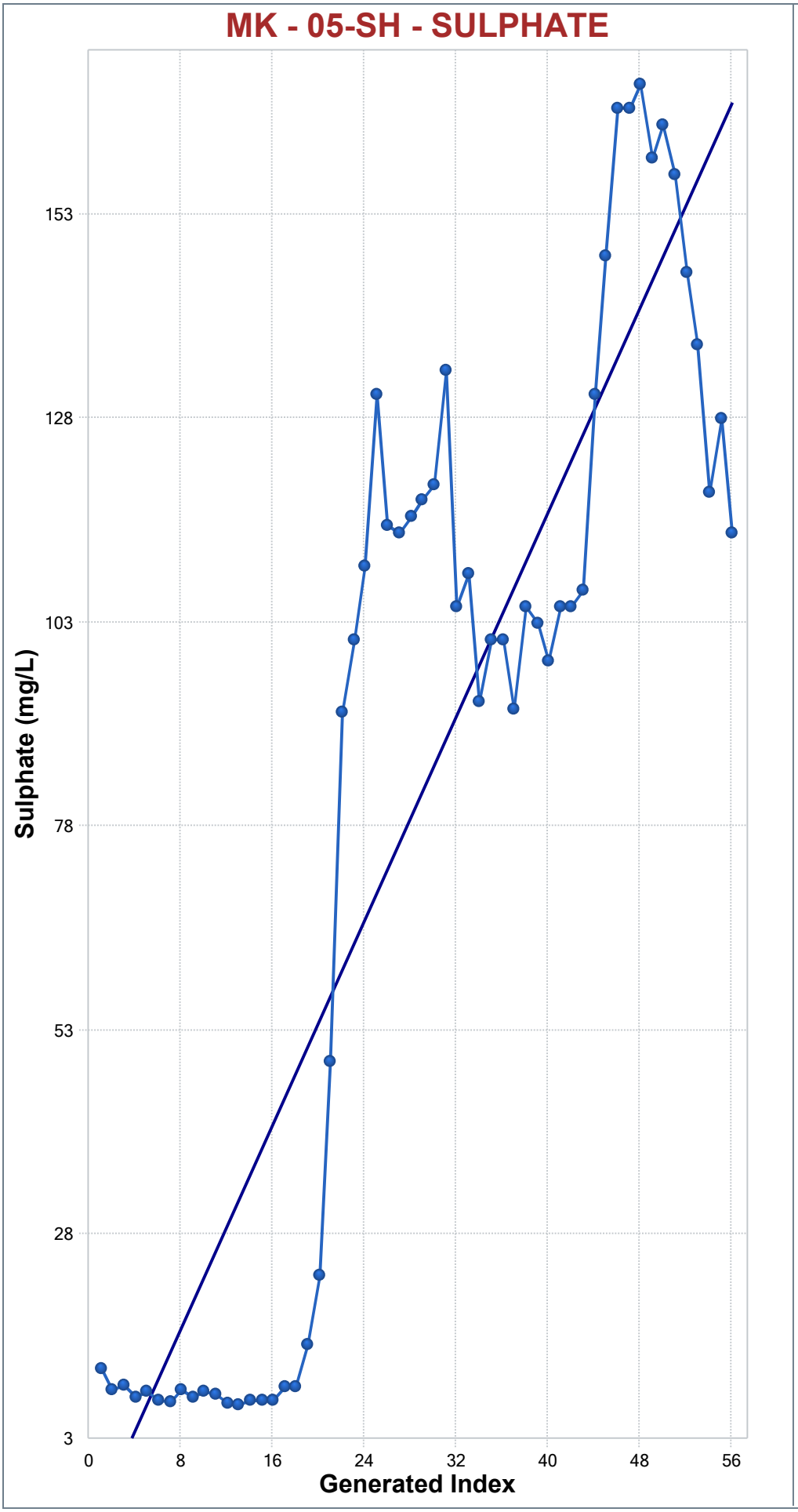
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.7689
Standardized Value of S	5.1450
M-K Test Value (S)	787
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.0584
OLS Regression Intercept	5.6001

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



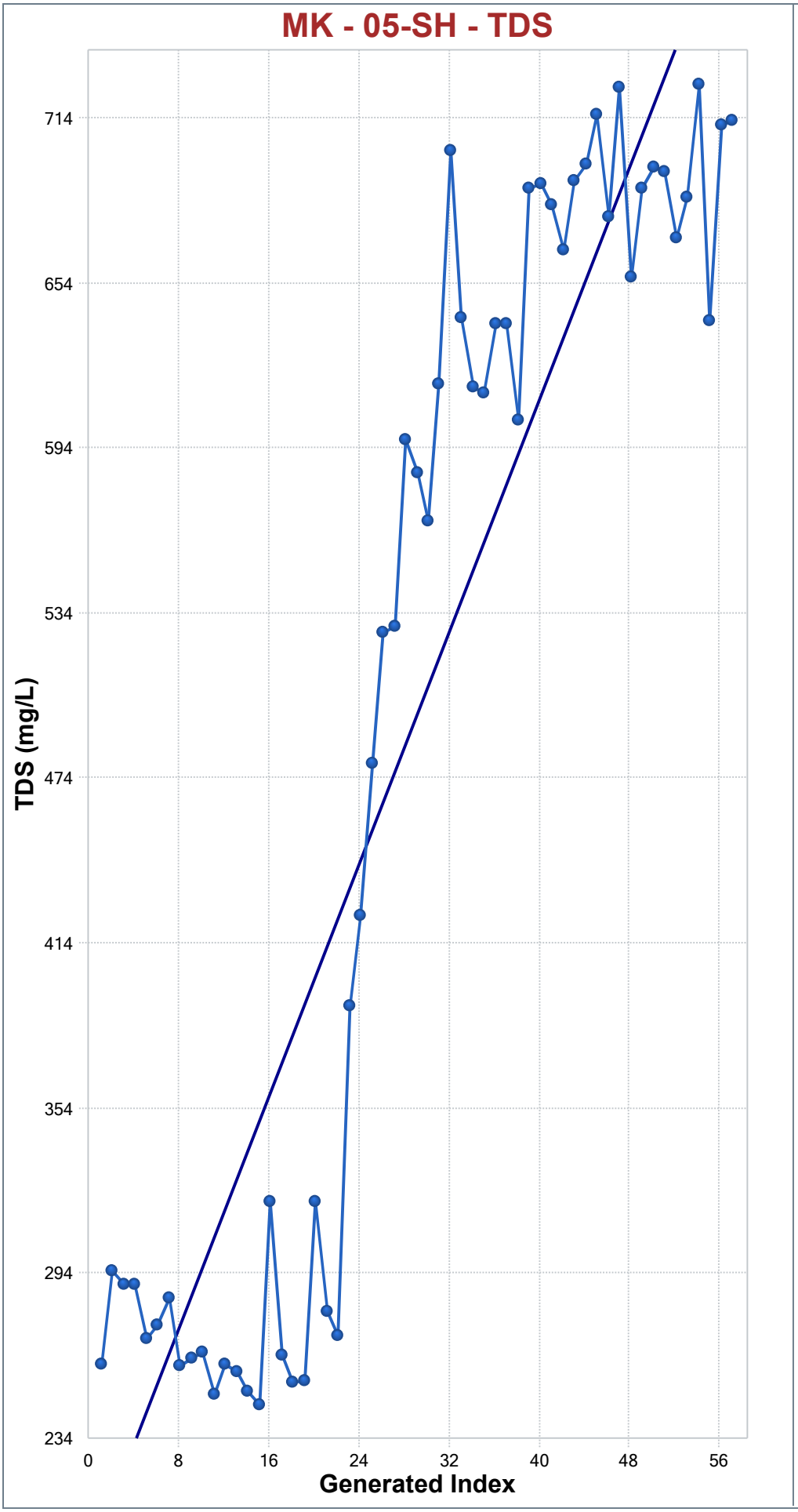
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4272
Standardized Value of S	6.6324
M-K Test Value (S)	939
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	3.1308
OLS Regression Intercept	-8.4625

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



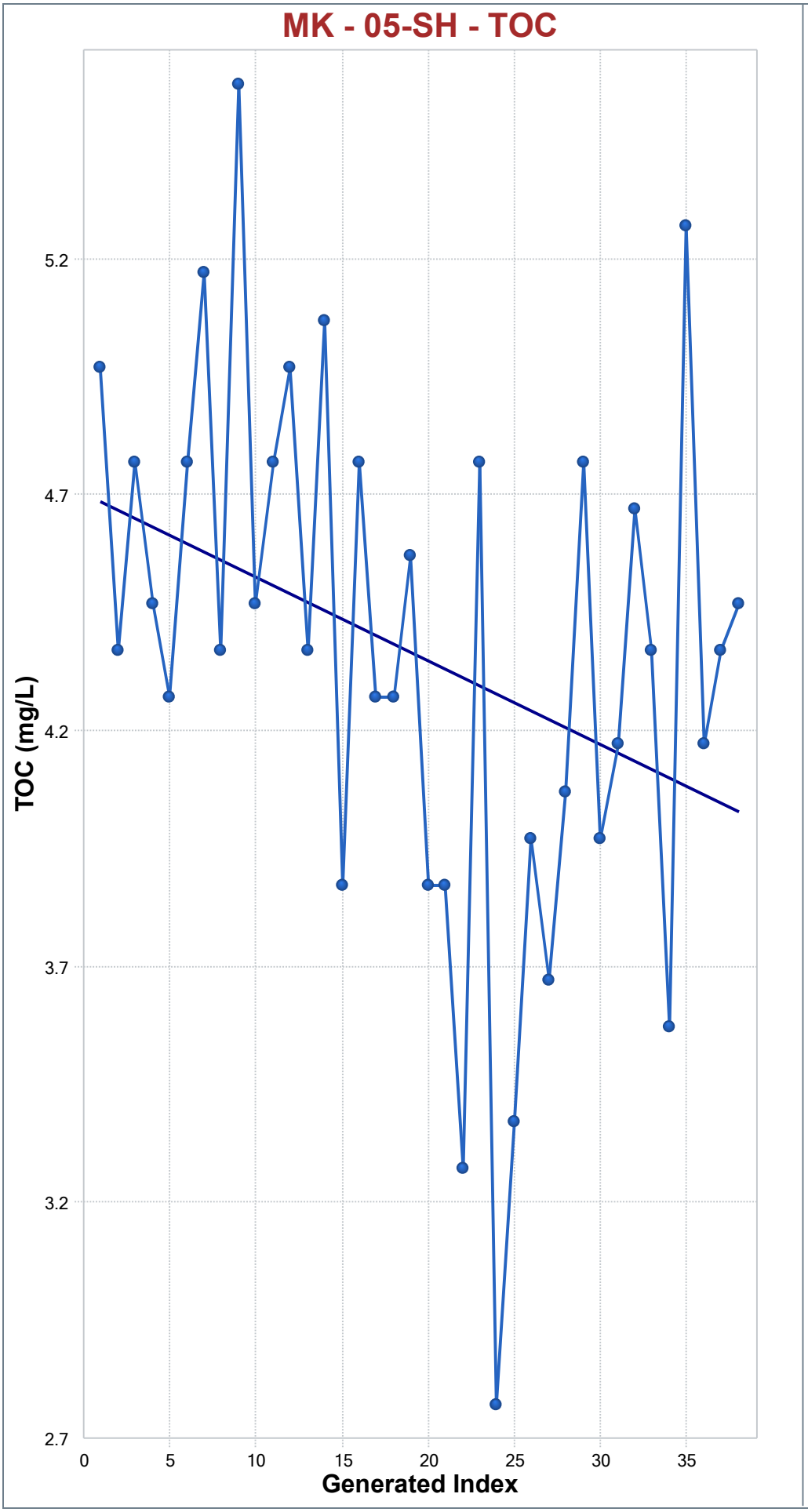
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2504
Standardized Value of S	7.5594
M-K Test Value (S)	1,099
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	10.5748
OLS Regression Intercept	189.2256

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



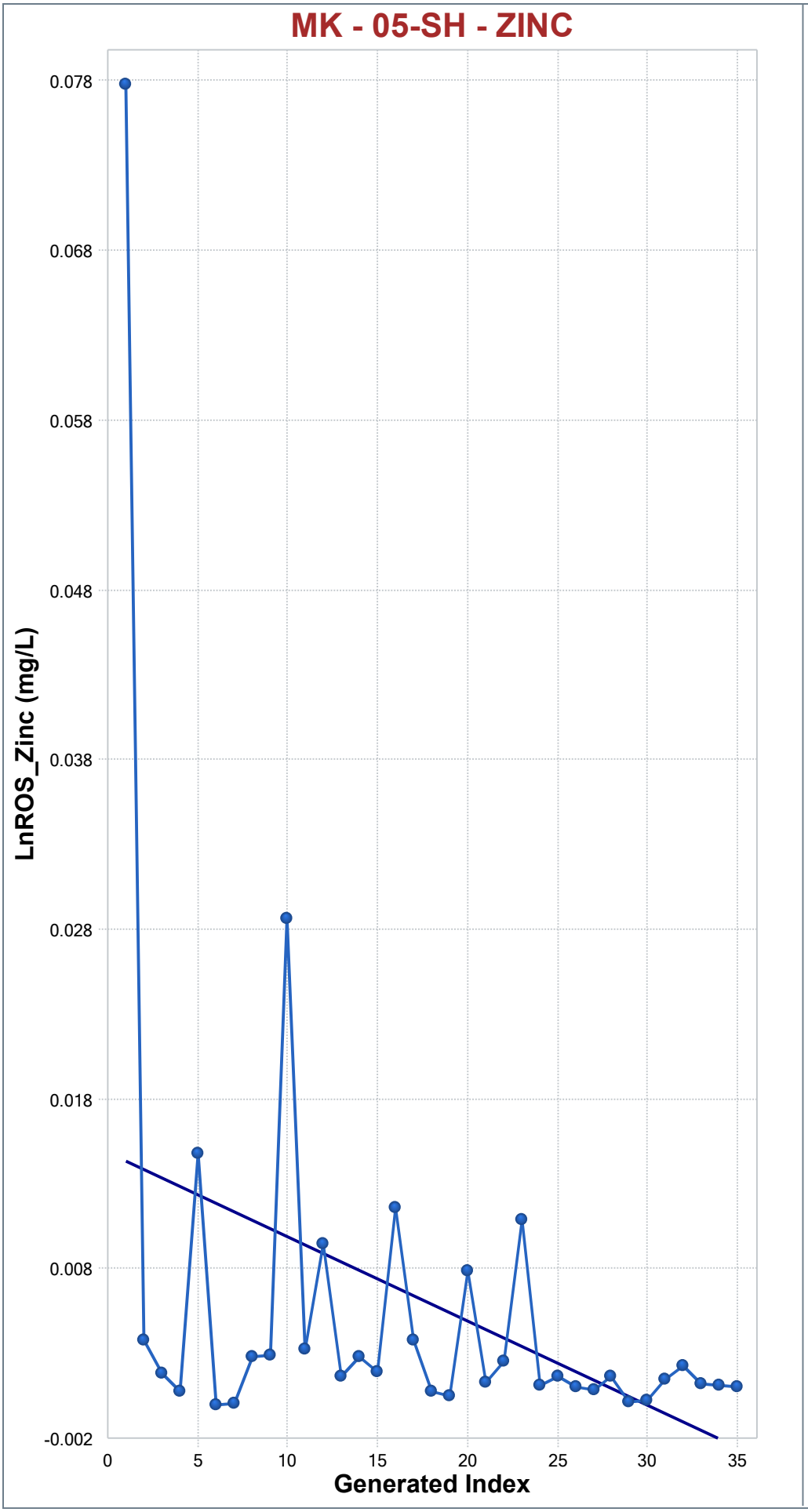
Mann-Kendall Trend Analysis

n	38
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	79.1707
Standardized Value of S	-2.0588
M-K Test Value (S)	-164
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0198

OLS Regression Line (Blue)

OLS Regression Slope	-0.0177
OLS Regression Intercept	4.7319

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



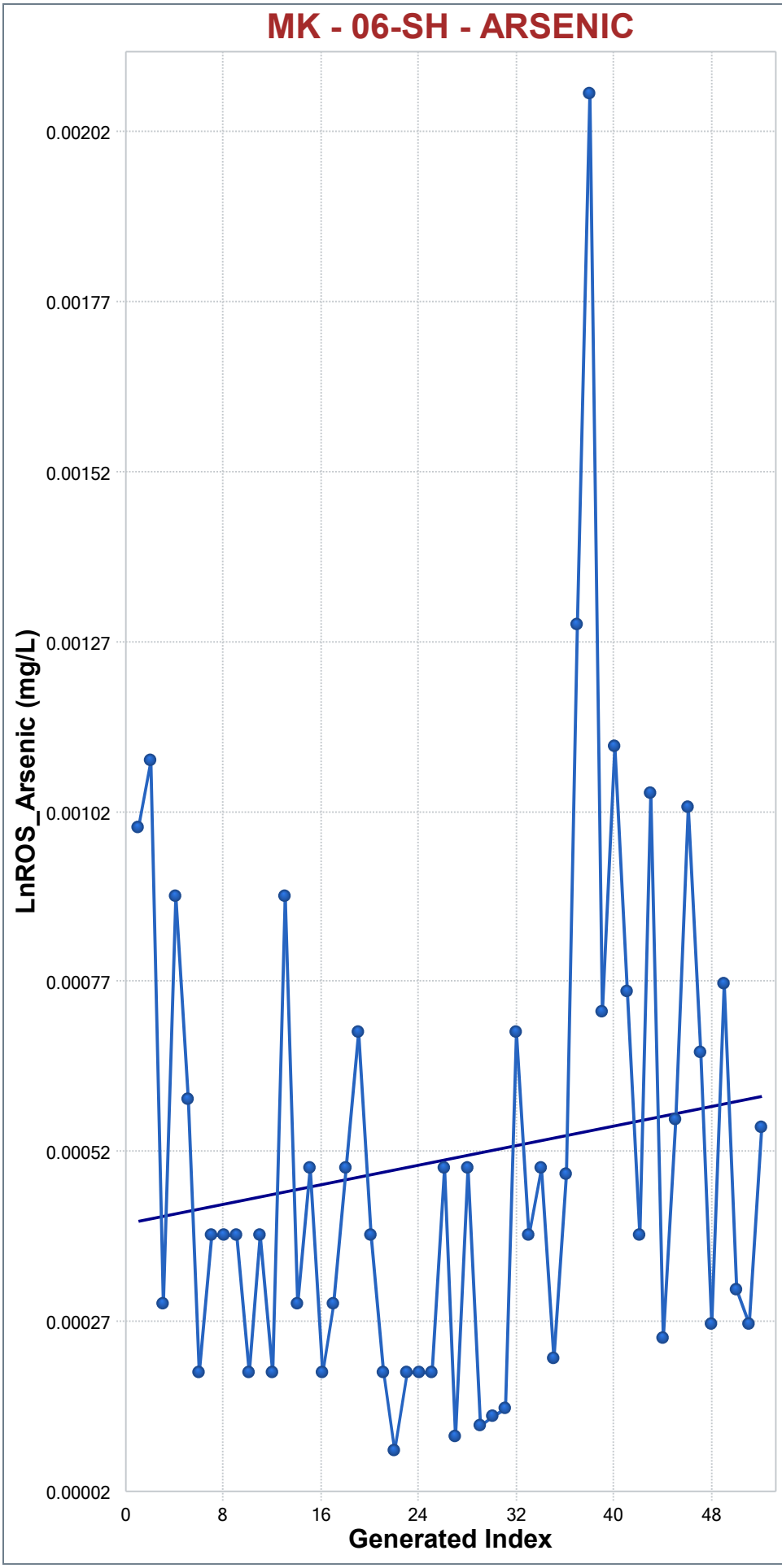
Mann-Kendall Trend Analysis

n	35
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	70.3610
Standardized Value of S	-2.3450
M-K Test Value (S)	-166
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0095

OLS Regression Line (Blue)

OLS Regression Slope	-0.0005
OLS Regression Intercept	0.0151

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



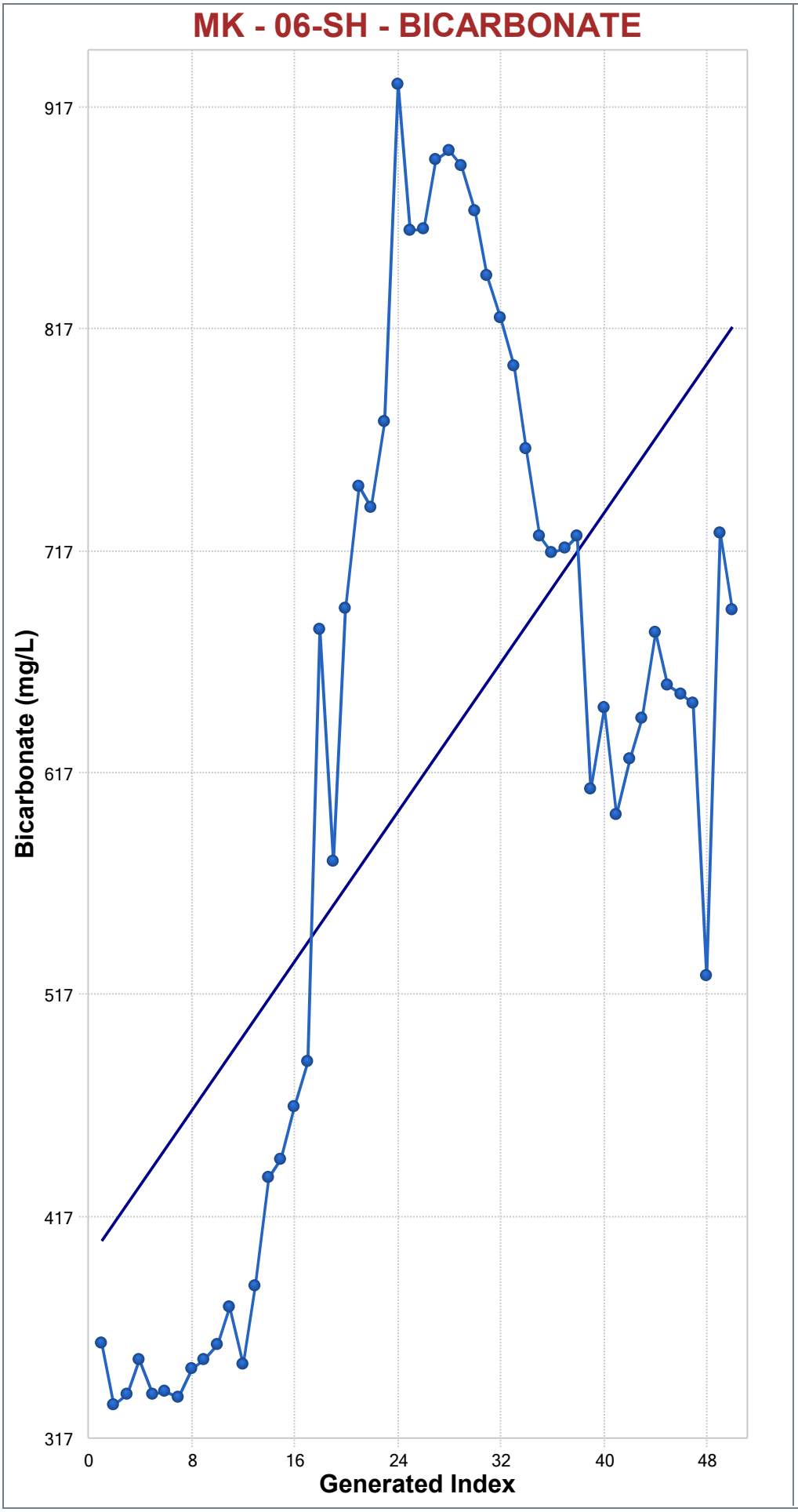
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.1996
Standardized Value of S	0.8875
M-K Test Value (S)	113
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1874

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0004

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



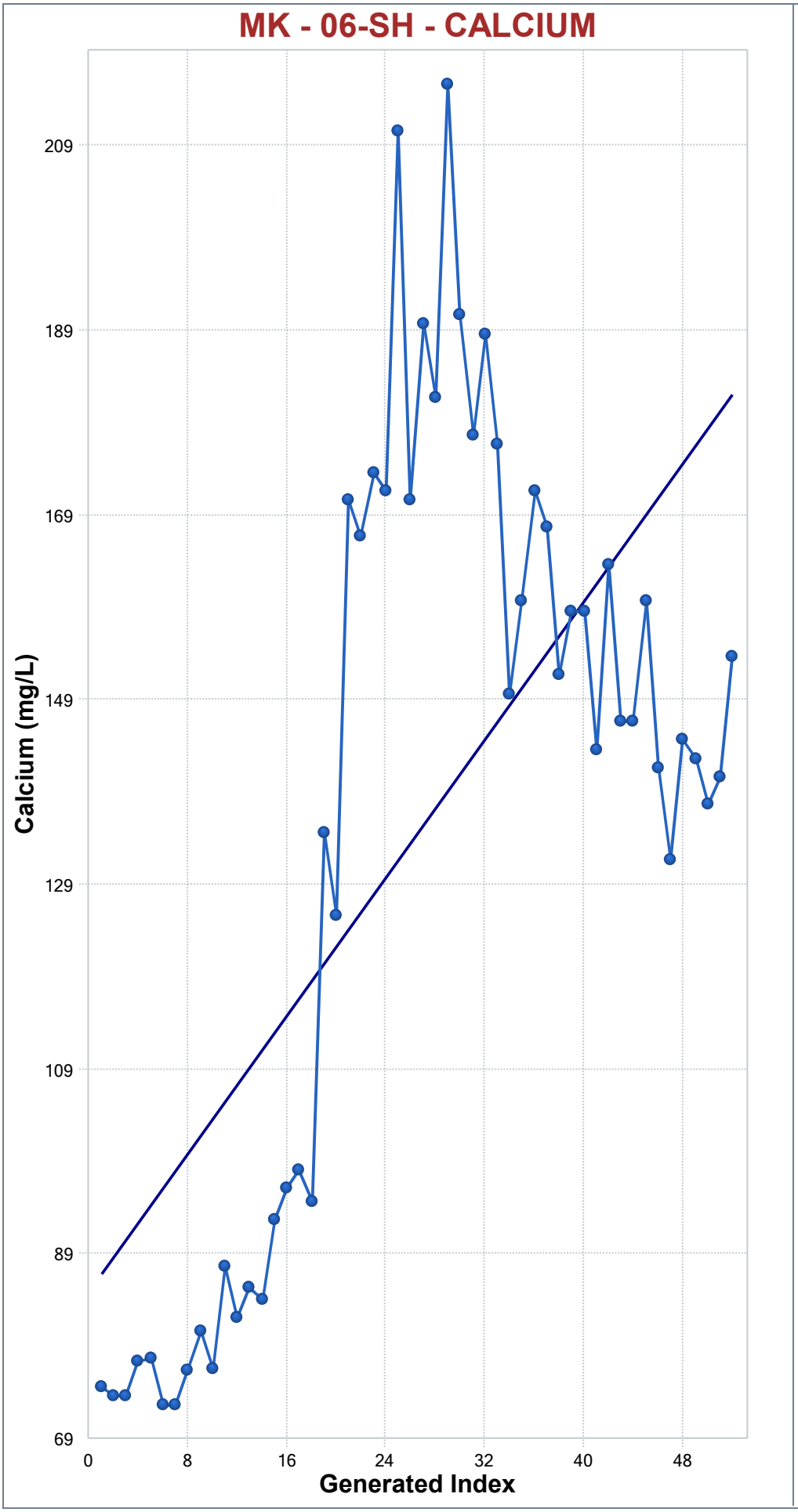
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.5352
Standardized Value of S	3.8399
M-K Test Value (S)	460
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	8.4061
OLS Regression Intercept	397.5071

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



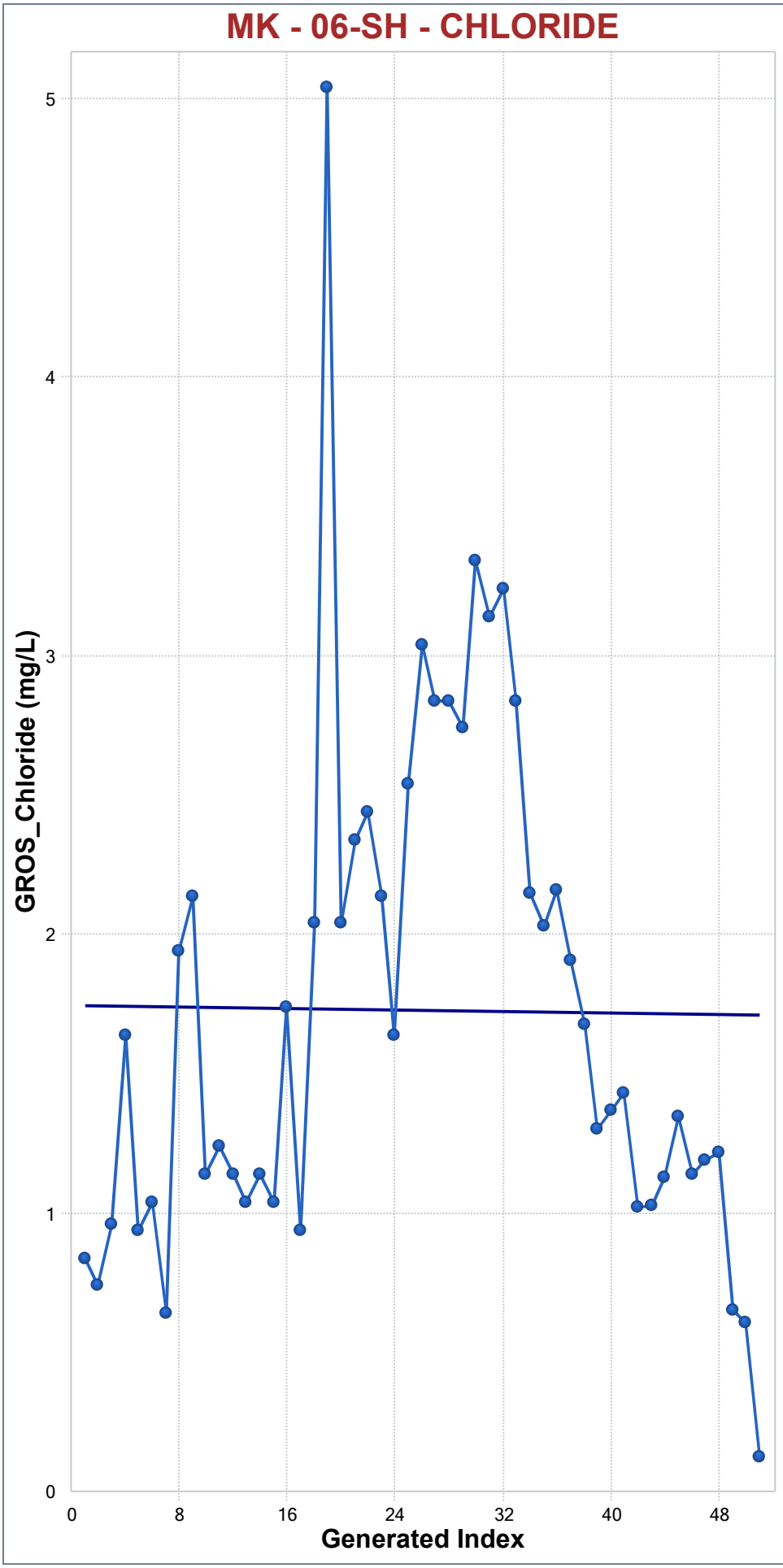
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.6978
Standardized Value of S	3.8201
M-K Test Value (S)	485
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	1.8674
OLS Regression Intercept	85.3260

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



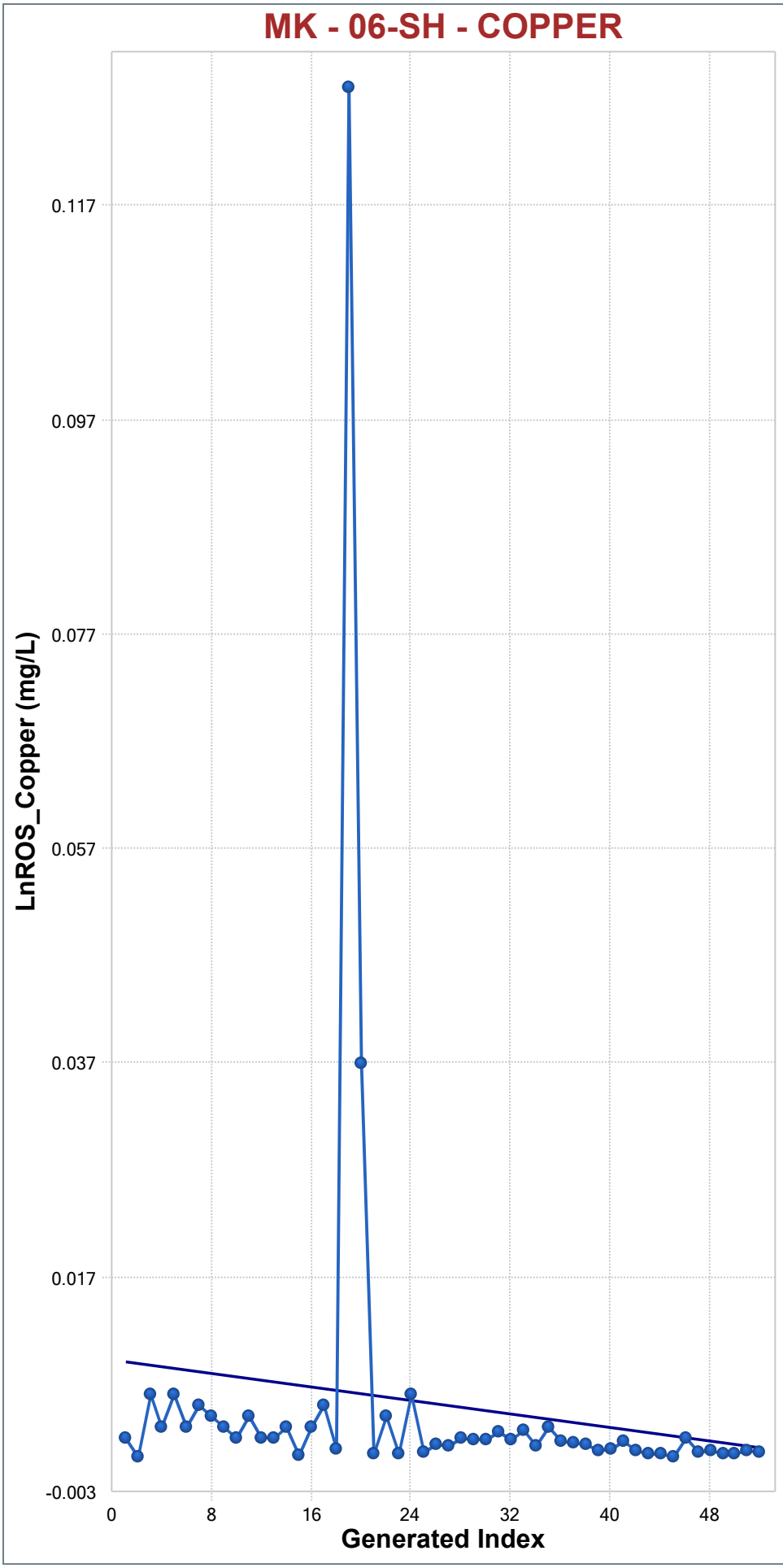
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	123.0379
Standardized Value of S	0.2926
M-K Test Value (S)	37
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3849

OLS Regression Line (Blue)

OLS Regression Slope	-0.0007
OLS Regression Intercept	1.9043

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



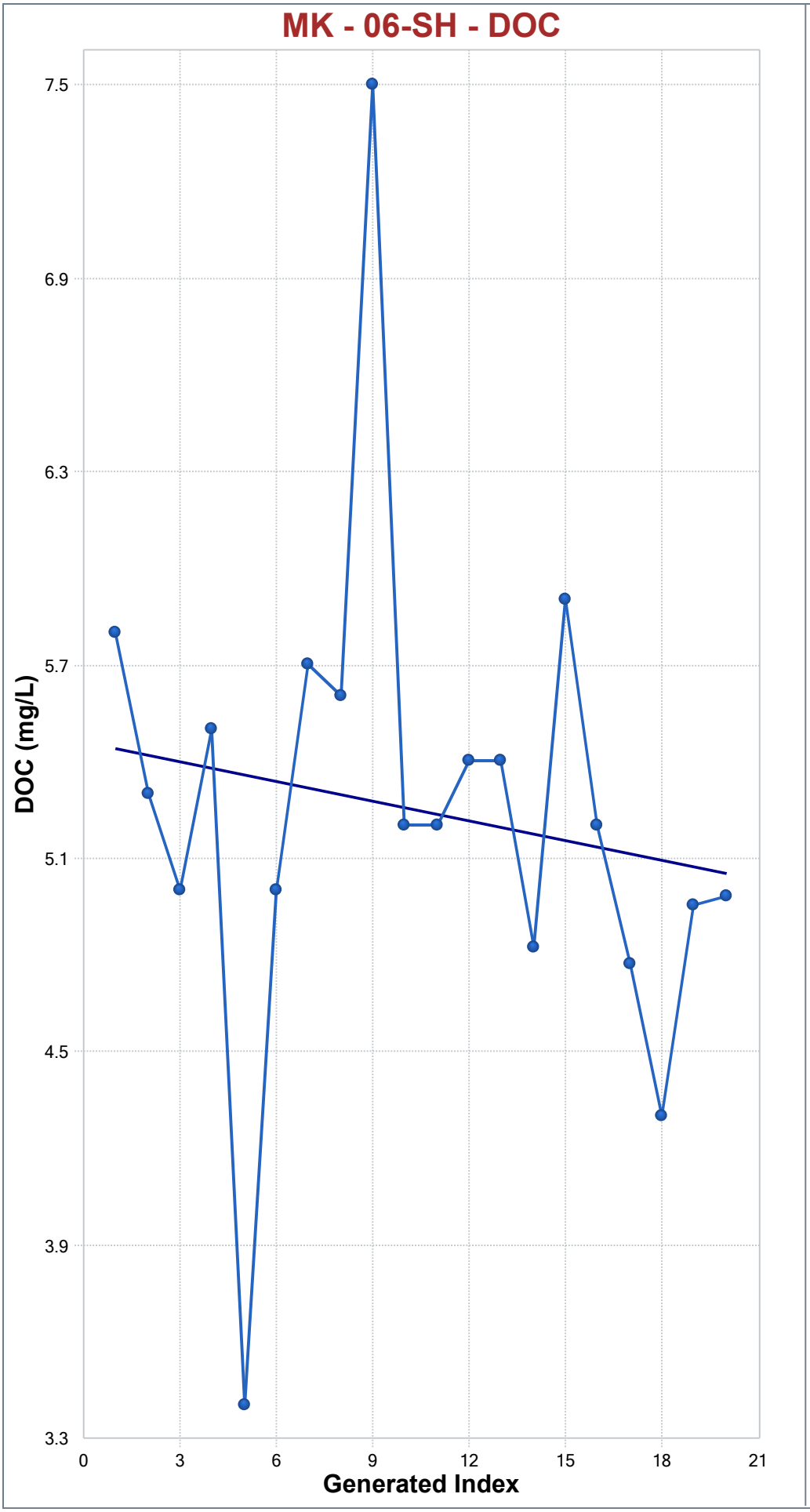
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.5069
Standardized Value of S	-4.2923
M-K Test Value (S)	-544
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0093

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



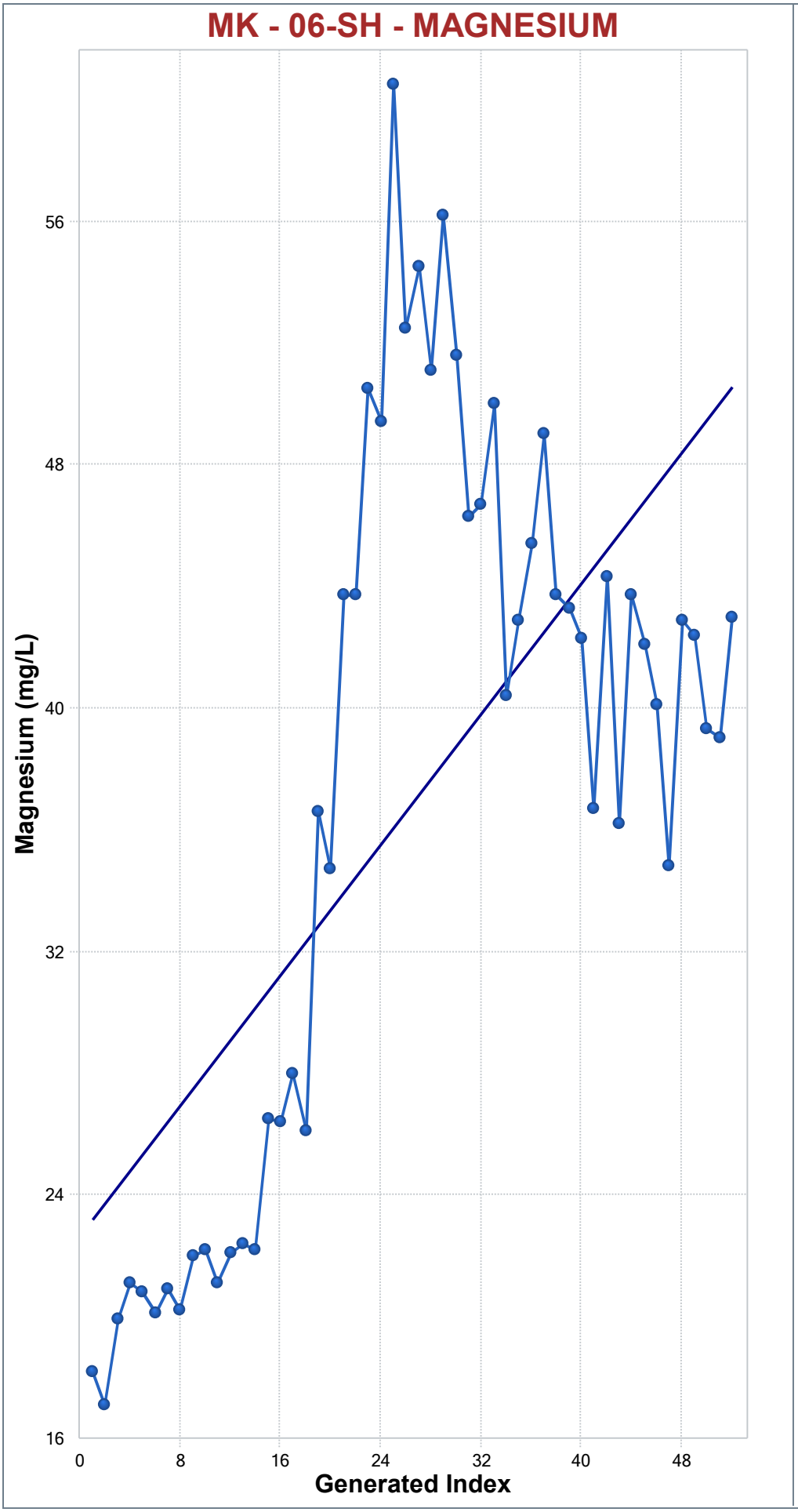
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7300
Standardized Value of S	-1.5620
M-K Test Value (S)	-49
Tabulated p-value	0.0640
Approximate p-value	0.0591

OLS Regression Line (Blue)

OLS Regression Slope	-0.0204
OLS Regression Intercept	5.4598

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



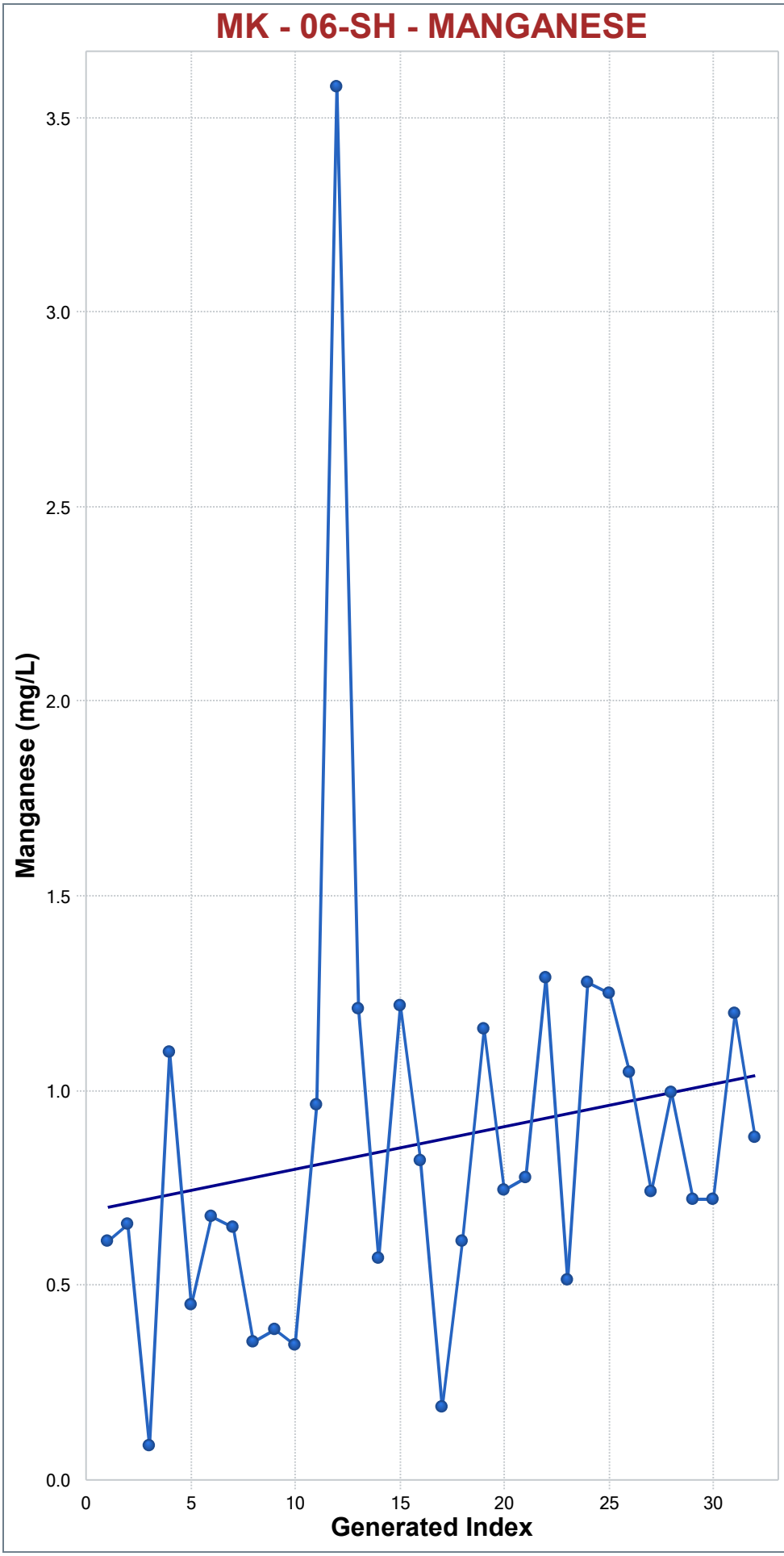
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.6794
Standardized Value of S	4.1206
M-K Test Value (S)	523
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.5363
OLS Regression Intercept	23.0495

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



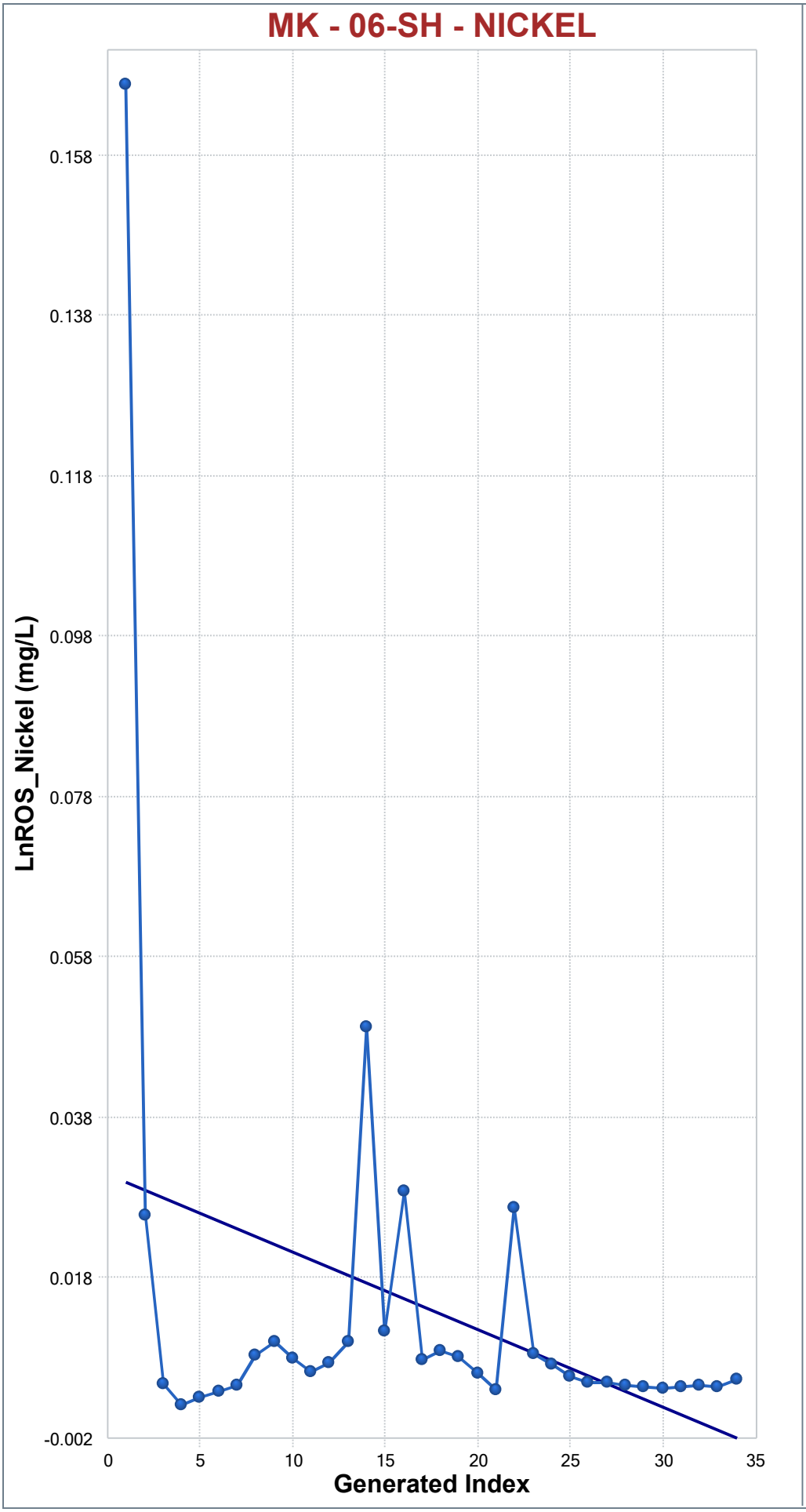
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	1.9462
M-K Test Value (S)	121
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0258

OLS Regression Line (Blue)

OLS Regression Slope	0.0109
OLS Regression Intercept	0.6596

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



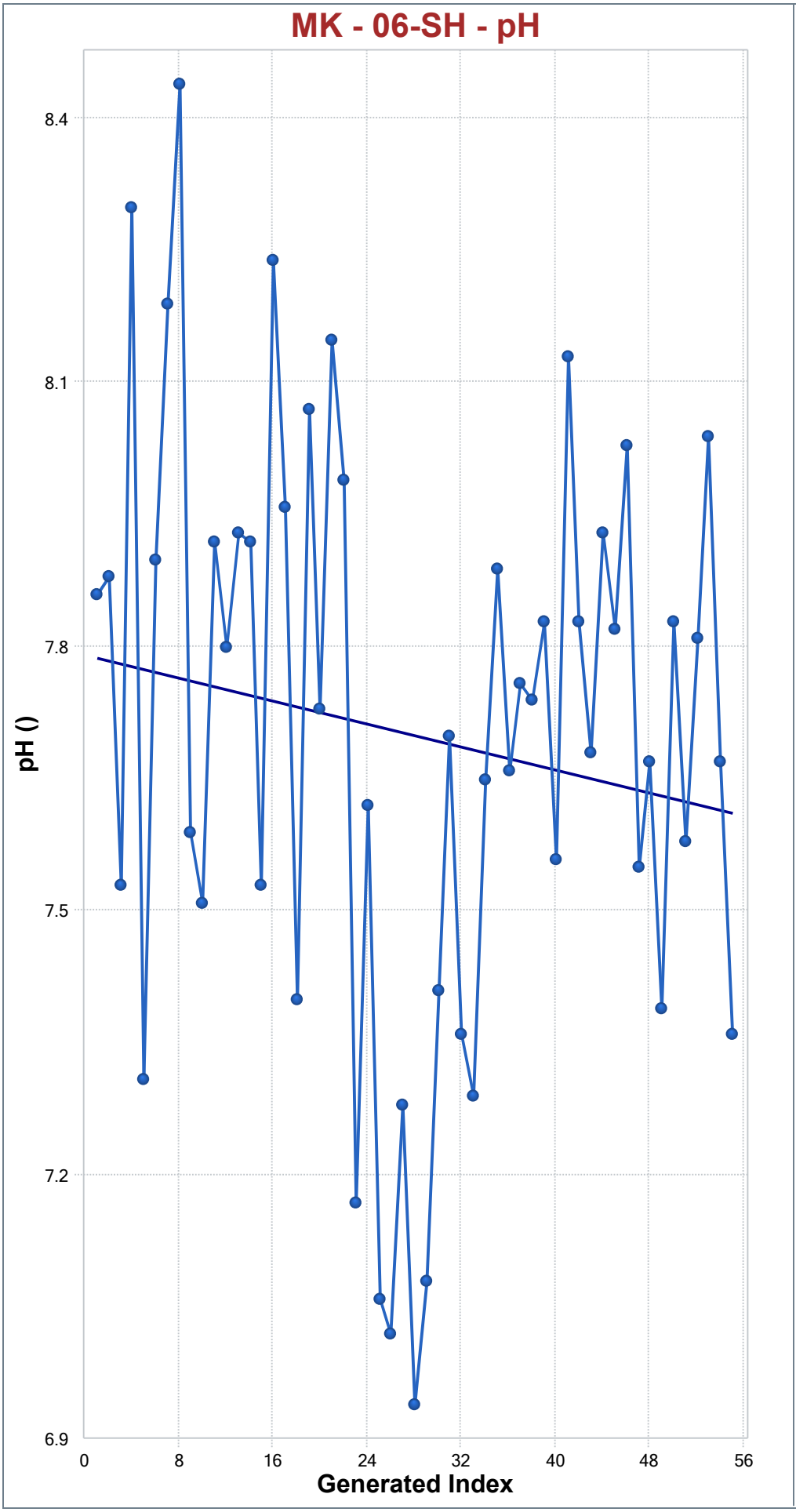
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4487
Standardized Value of S	-1.8236
M-K Test Value (S)	-124
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0341

OLS Regression Line (Blue)

OLS Regression Slope	-0.0010
OLS Regression Intercept	0.0310

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



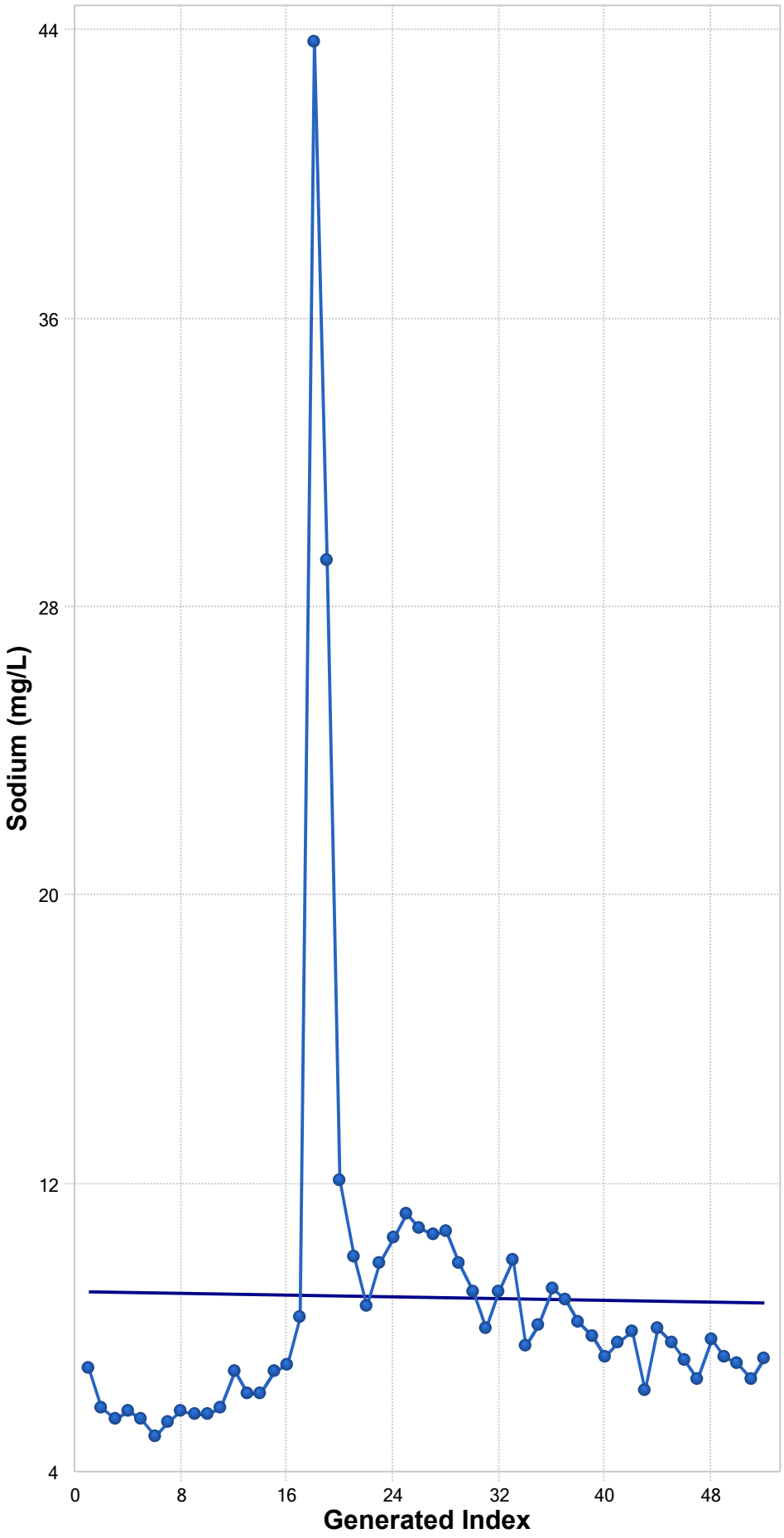
Mann-Kendall Trend Analysis

n	55
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	137.7183
Standardized Value of S	-0.8859
M-K Test Value (S)	-123
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1878

OLS Regression Line (Blue)

OLS Regression Slope	-0.0033
OLS Regression Intercept	7.7509

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



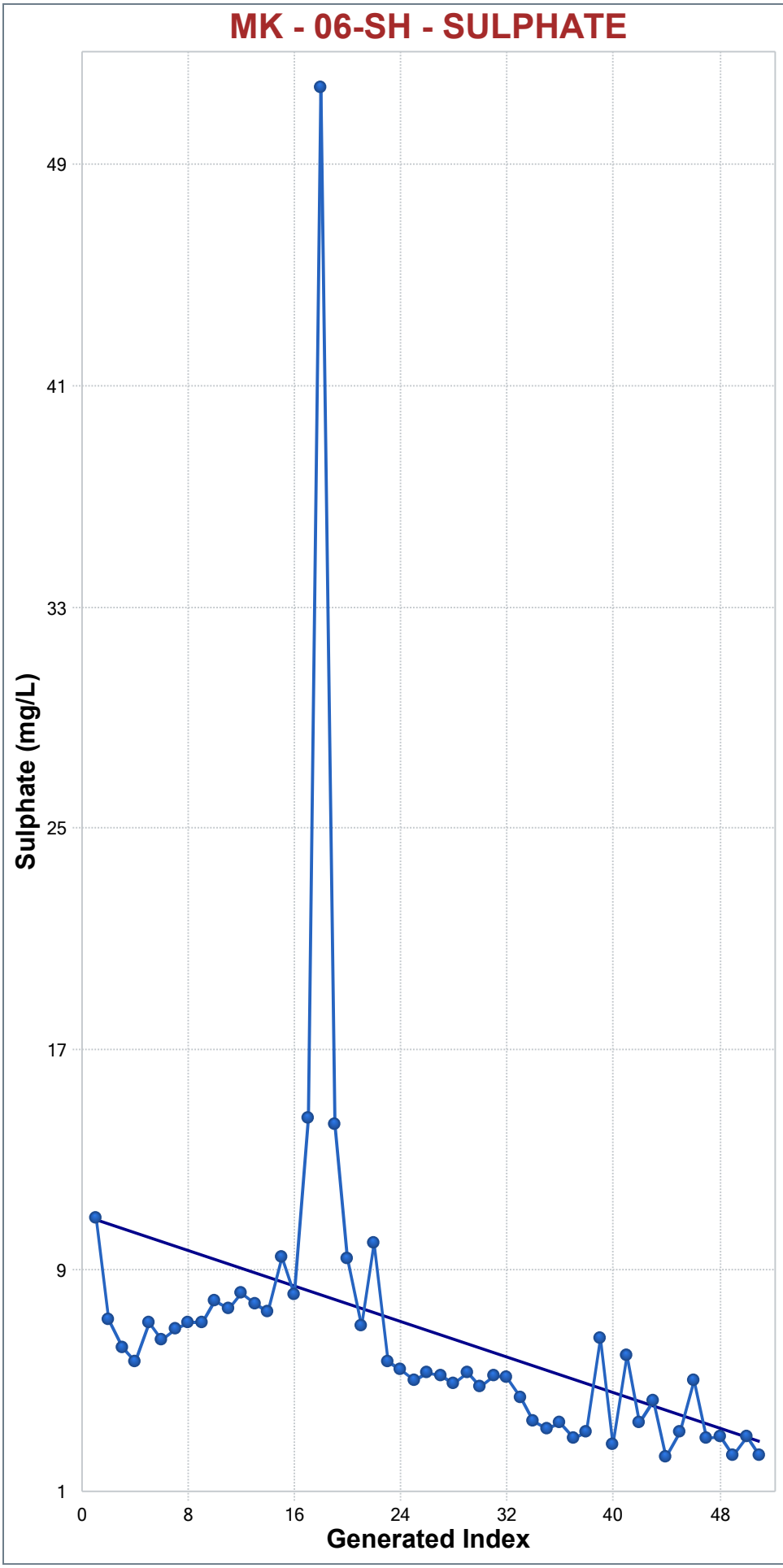
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.6820
Standardized Value of S	1.3419
M-K Test Value (S)	171
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0898

OLS Regression Line (Blue)

OLS Regression Slope	-0.0064
OLS Regression Intercept	9.4233

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



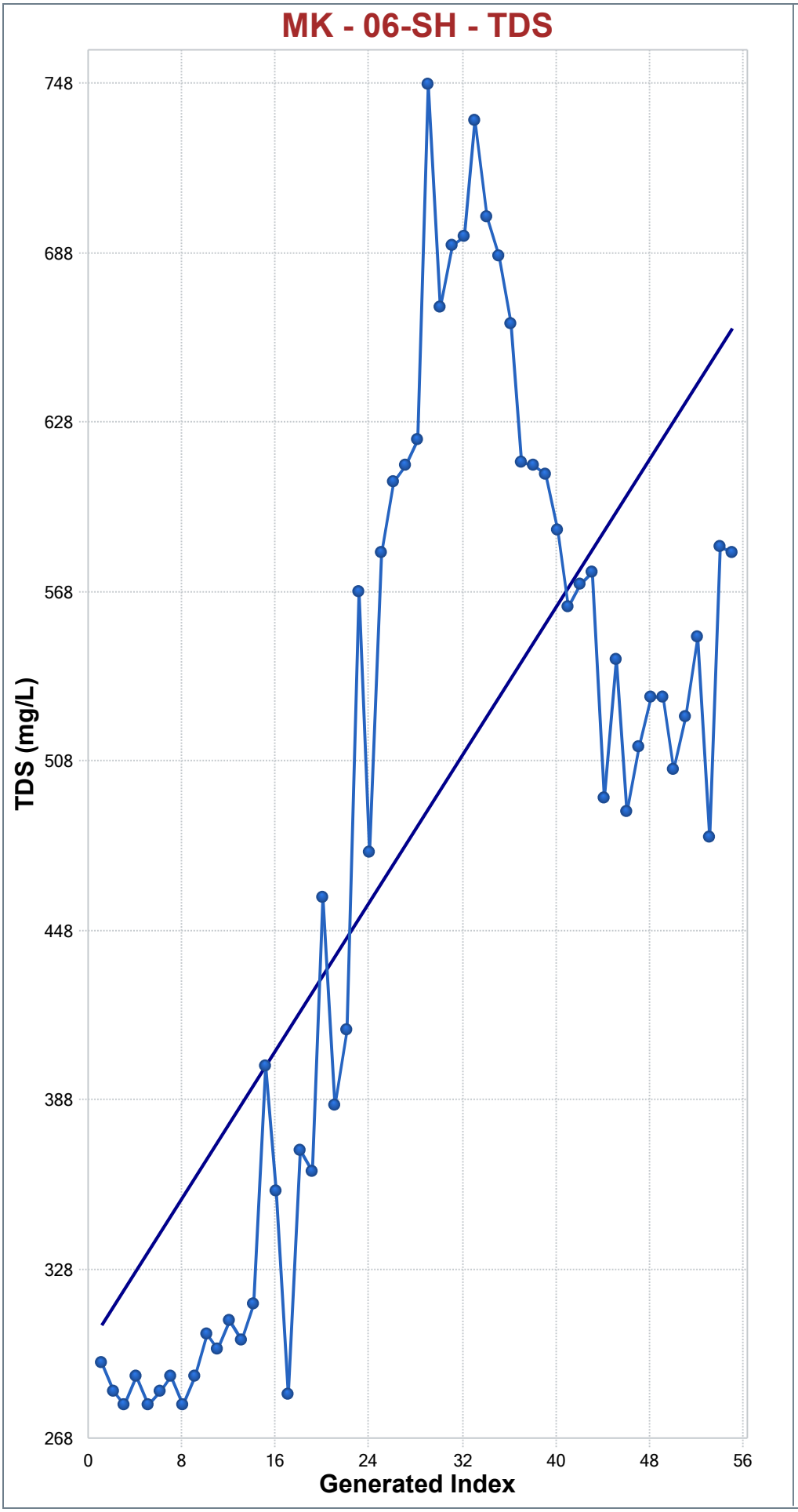
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	123.0840
Standardized Value of S	-6.0934
M-K Test Value (S)	-751
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.1595
OLS Regression Intercept	10.5679

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



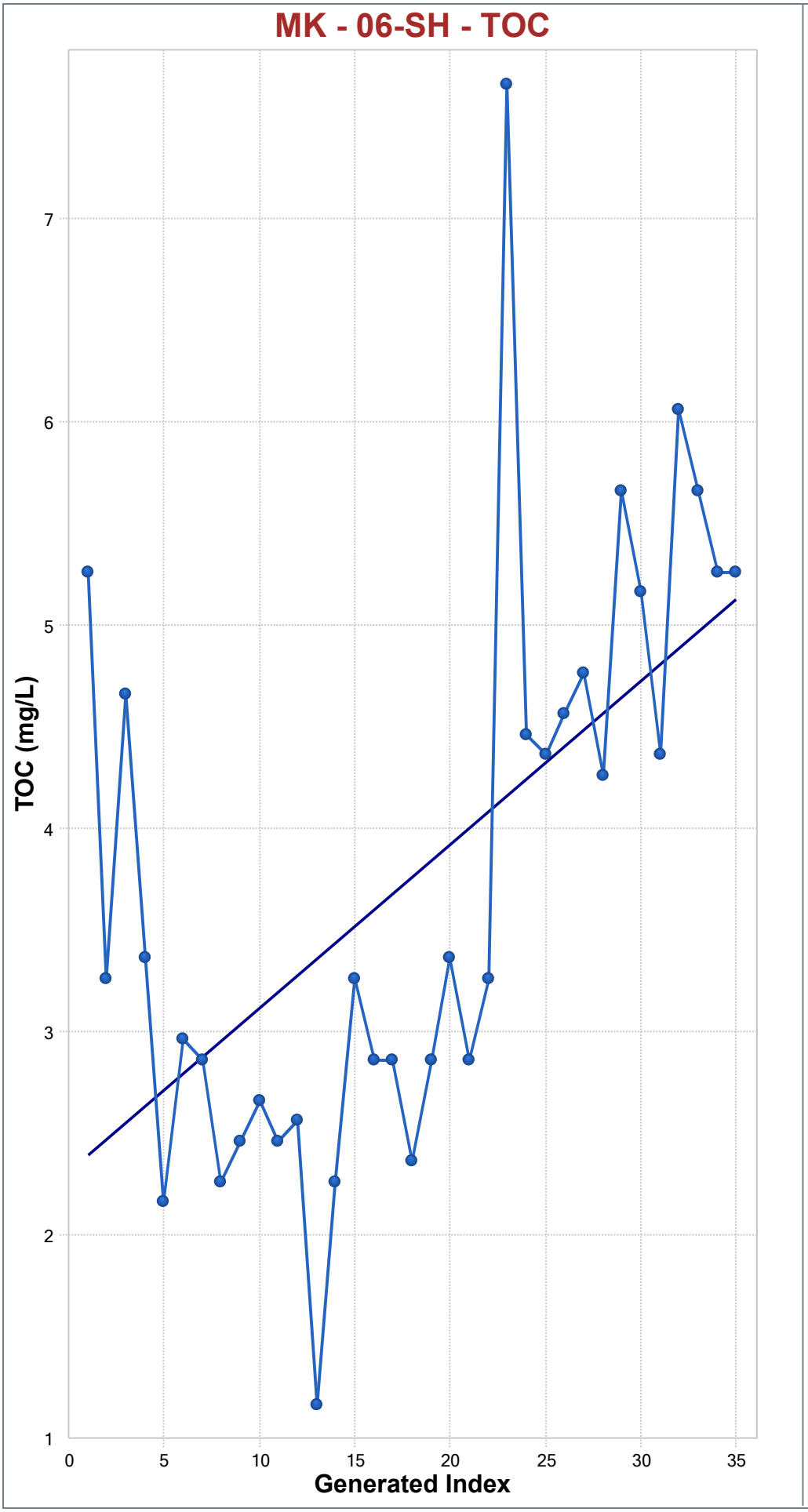
Mann-Kendall Trend Analysis

n	55
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	137.7086
Standardized Value of S	4.8363
M-K Test Value (S)	667
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	6.5403
OLS Regression Intercept	301.6909

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



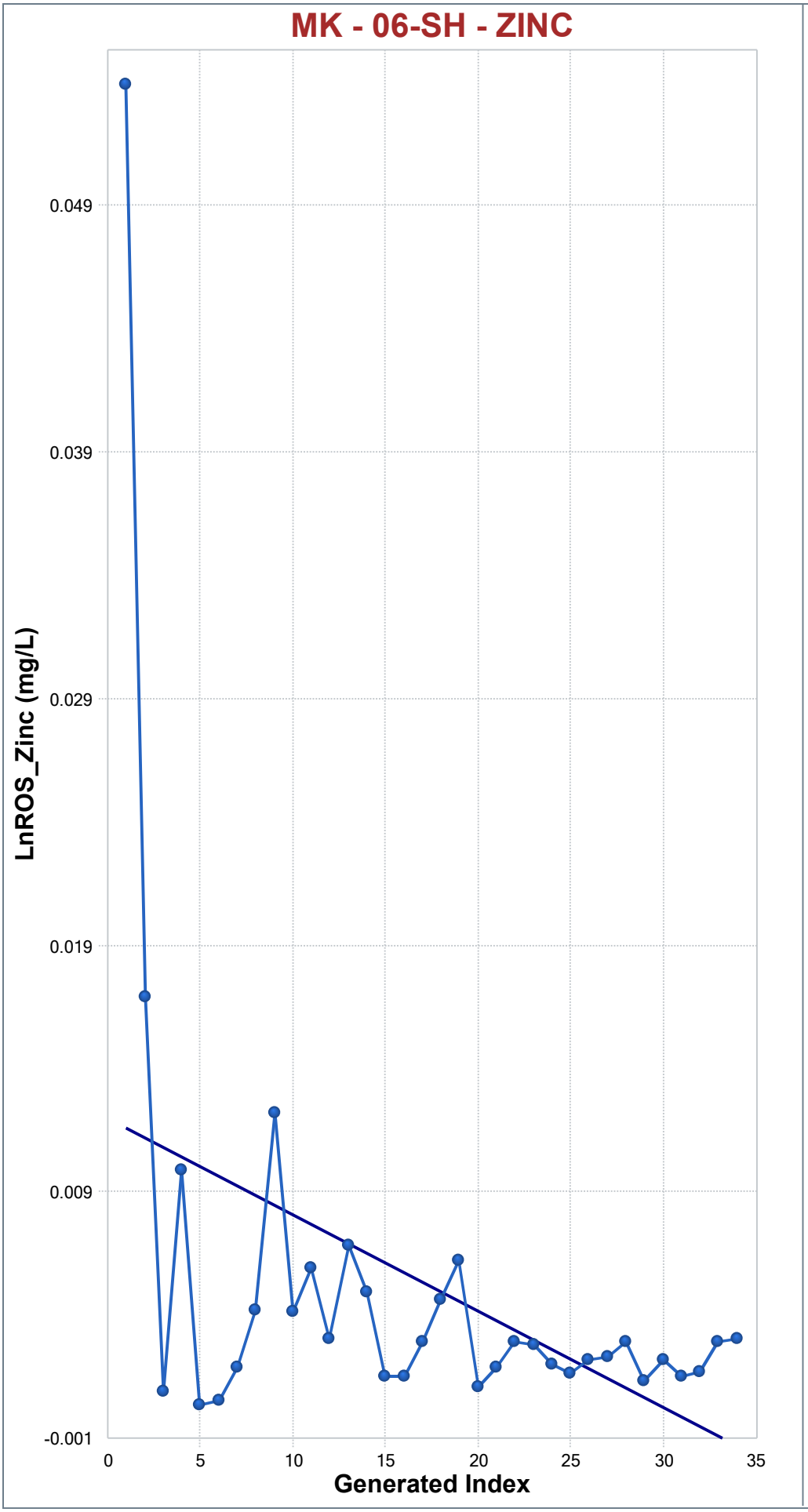
Mann-Kendall Trend Analysis

n	35
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	70.2092
Standardized Value of S	3.6035
M-K Test Value (S)	254
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0002

OLS Regression Line (Blue)

OLS Regression Slope	0.0805
OLS Regression Intercept	2.4476

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



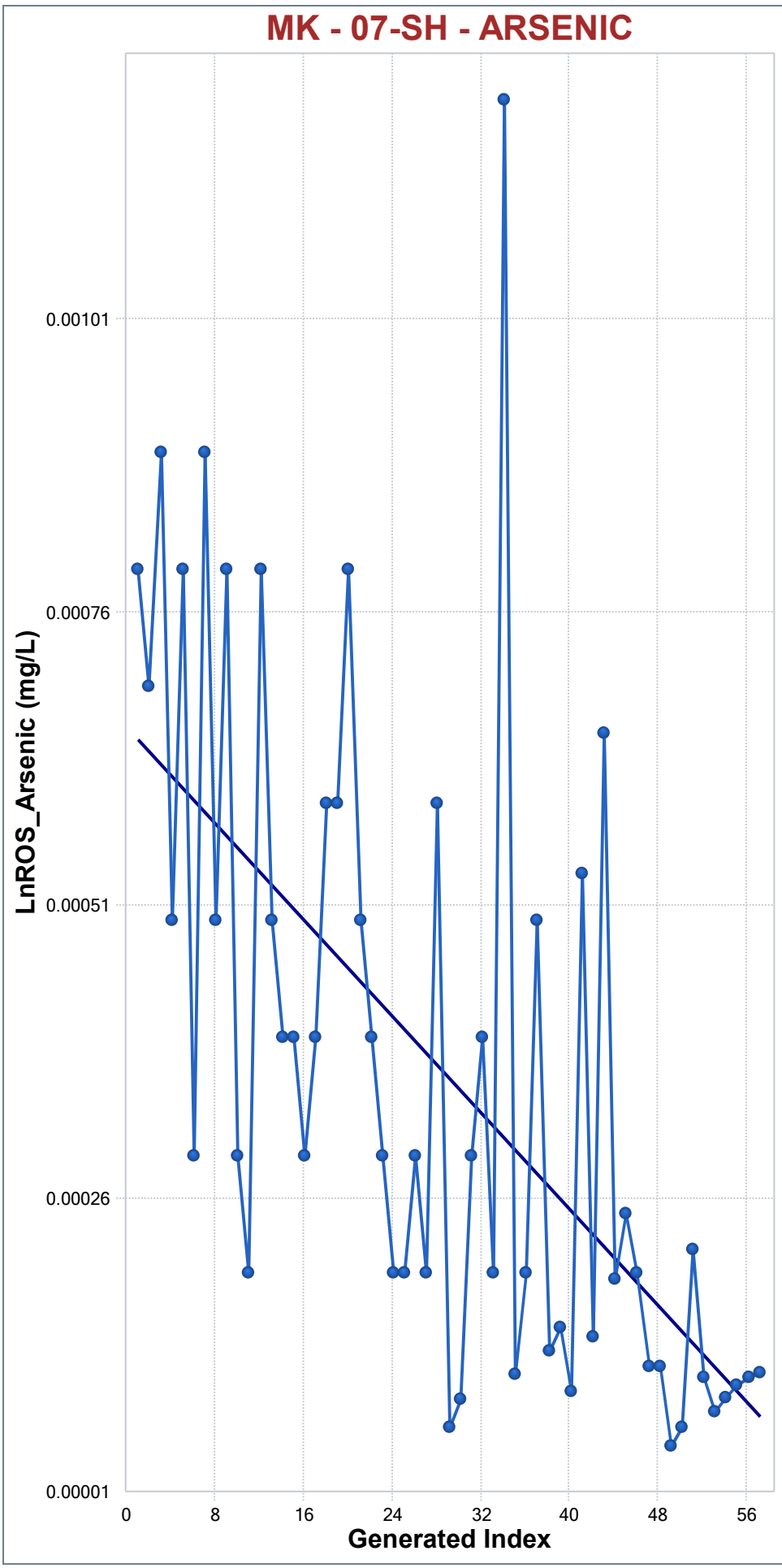
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4067
Standardized Value of S	-1.6616
M-K Test Value (S)	-113
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0483

OLS Regression Line (Blue)

OLS Regression Slope	-0.0004
OLS Regression Intercept	0.0121

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



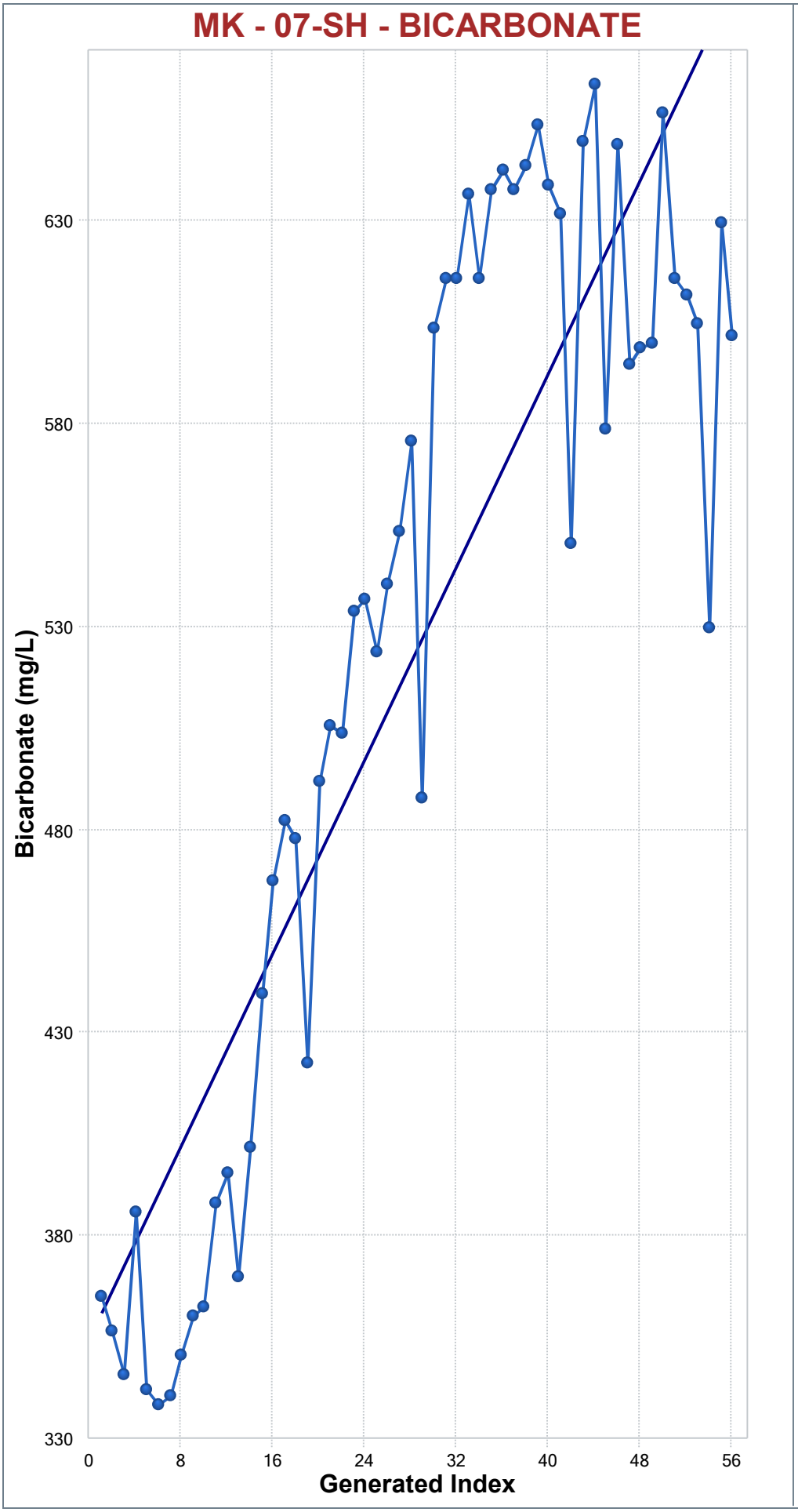
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	144.8217
Standardized Value of S	-5.6828
M-K Test Value (S)	-824
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0007

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



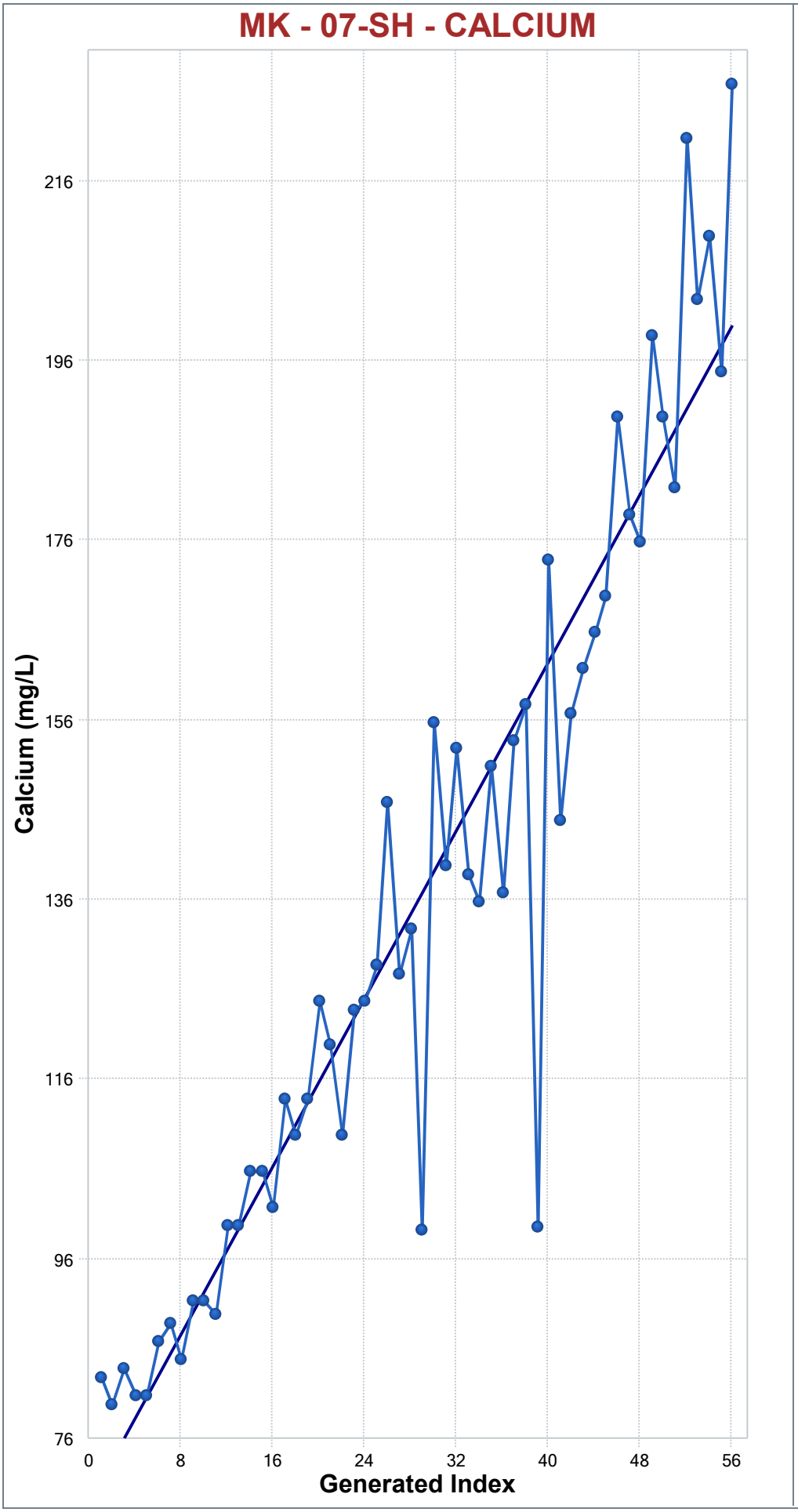
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4579
Standardized Value of S	7.4368
M-K Test Value (S)	1,053
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	5.9338
OLS Regression Intercept	354.3818

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



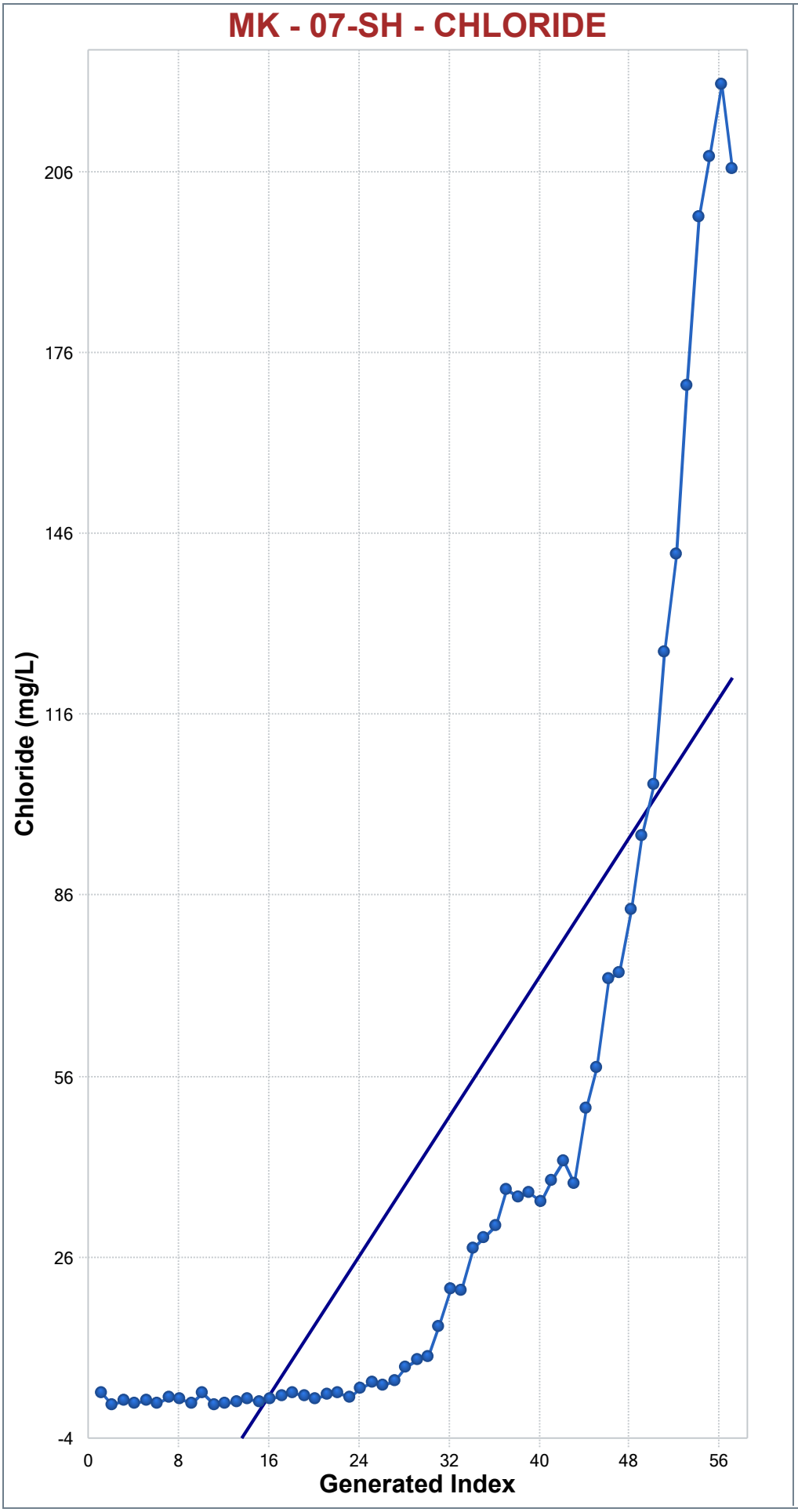
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4673
Standardized Value of S	9.2601
M-K Test Value (S)	1,311
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	2.3403
OLS Regression Intercept	69.1112

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



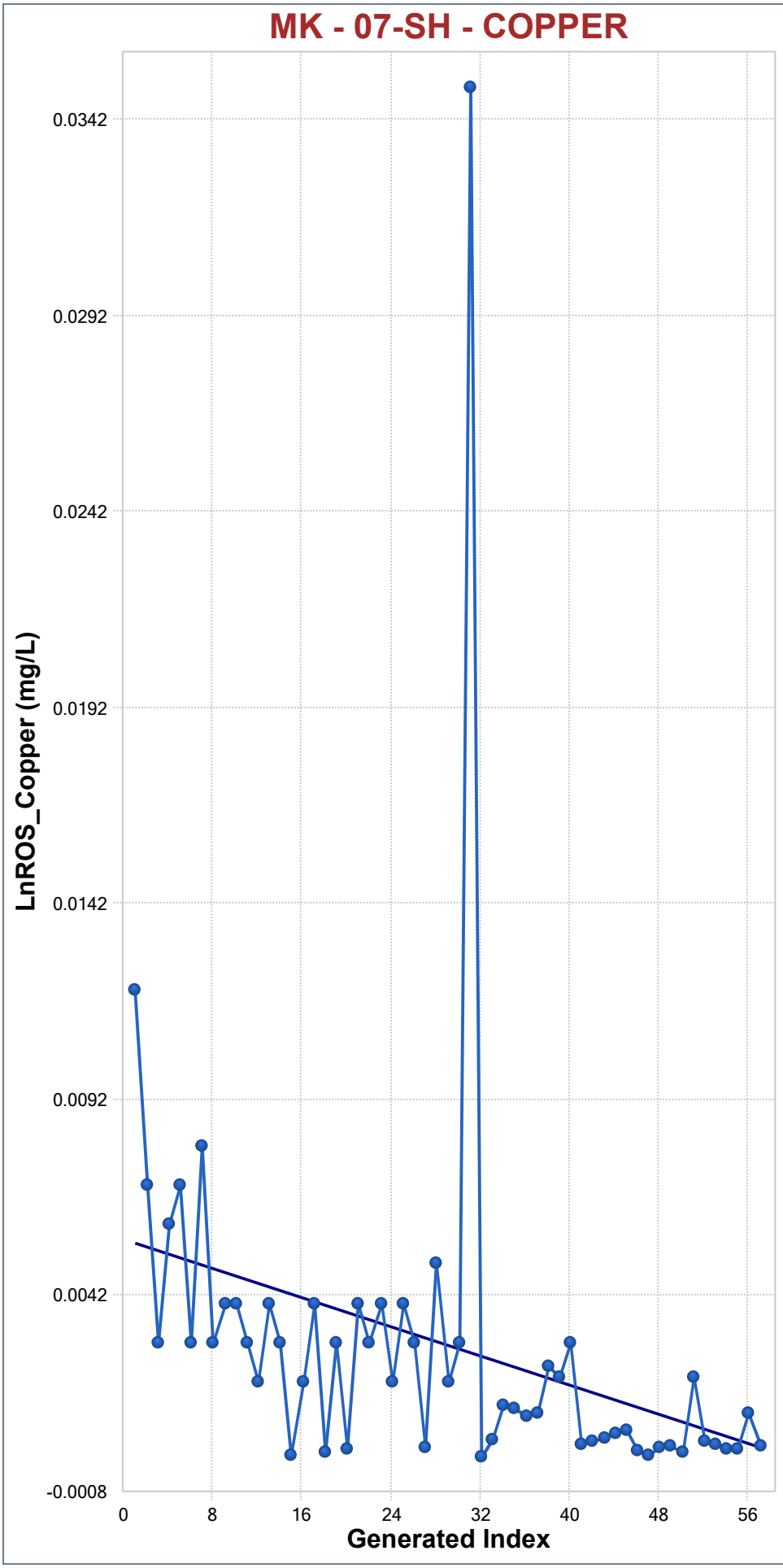
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2217
Standardized Value of S	9.7575
M-K Test Value (S)	1,418
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	2.9044
OLS Regression Intercept	-43.9108

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



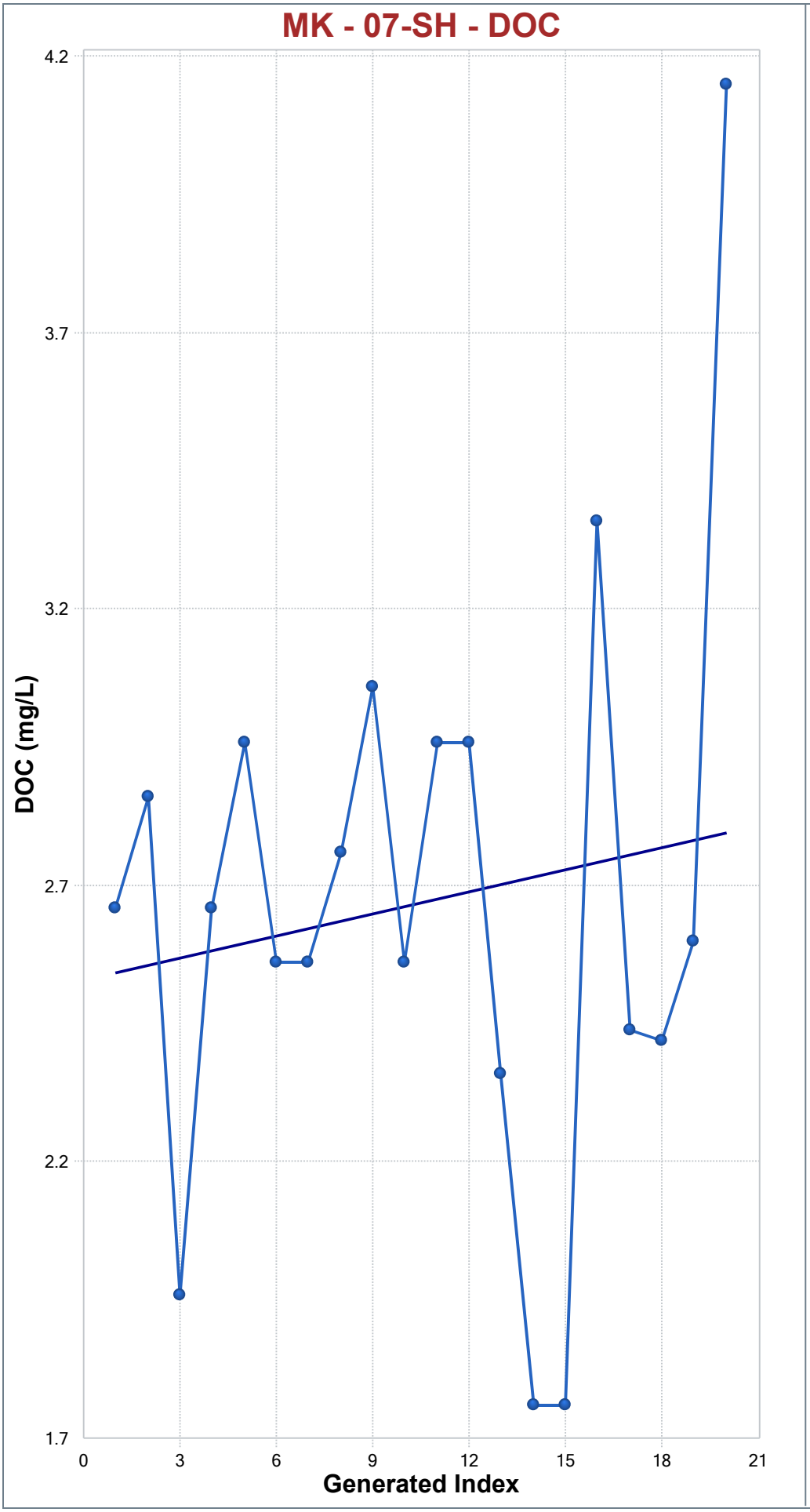
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	144.6467
Standardized Value of S	-5.2473
M-K Test Value (S)	-760
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0056

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



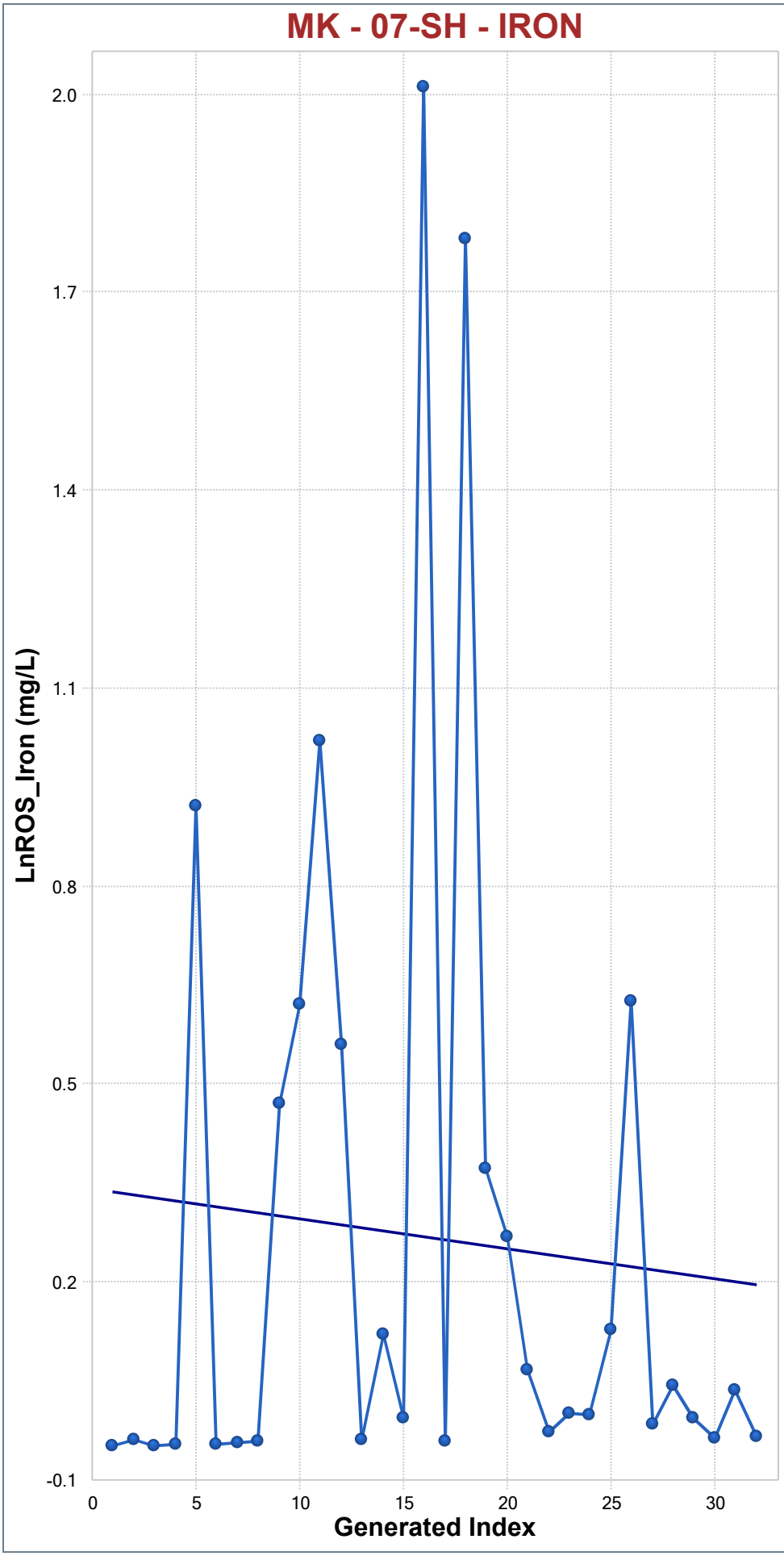
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.6703
Standardized Value of S	-0.0326
M-K Test Value (S)	-2
Tabulated p-value	0.4870
Approximate p-value	0.4870

OLS Regression Line (Blue)

OLS Regression Slope	0.0133
OLS Regression Intercept	2.5693

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



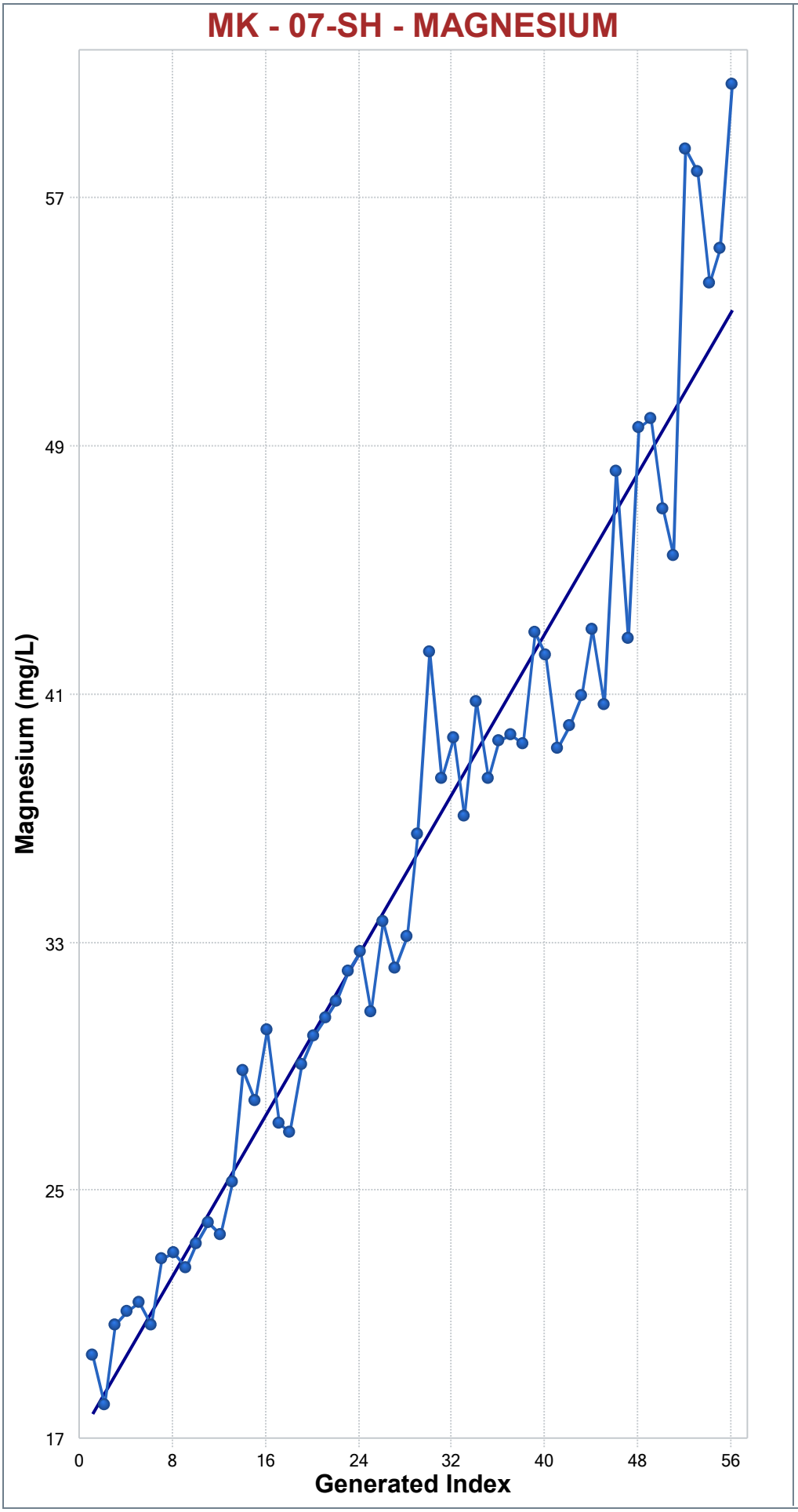
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	1.0704
M-K Test Value (S)	67
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1422

OLS Regression Line (Blue)

OLS Regression Slope	-0.0045
OLS Regression Intercept	0.3895

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



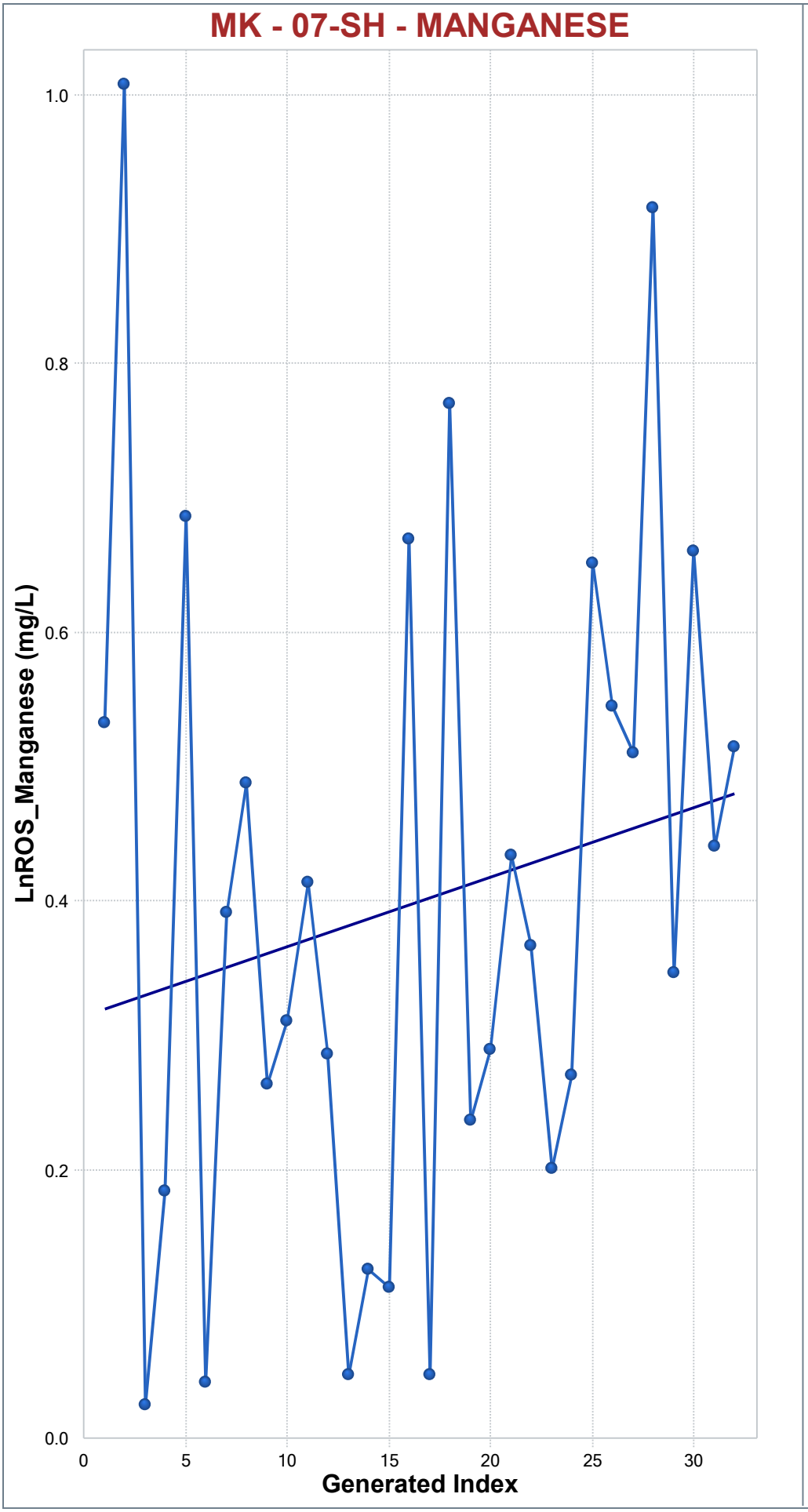
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4850
Standardized Value of S	9.7466
M-K Test Value (S)	1,380
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.6470
OLS Regression Intercept	17.4634

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



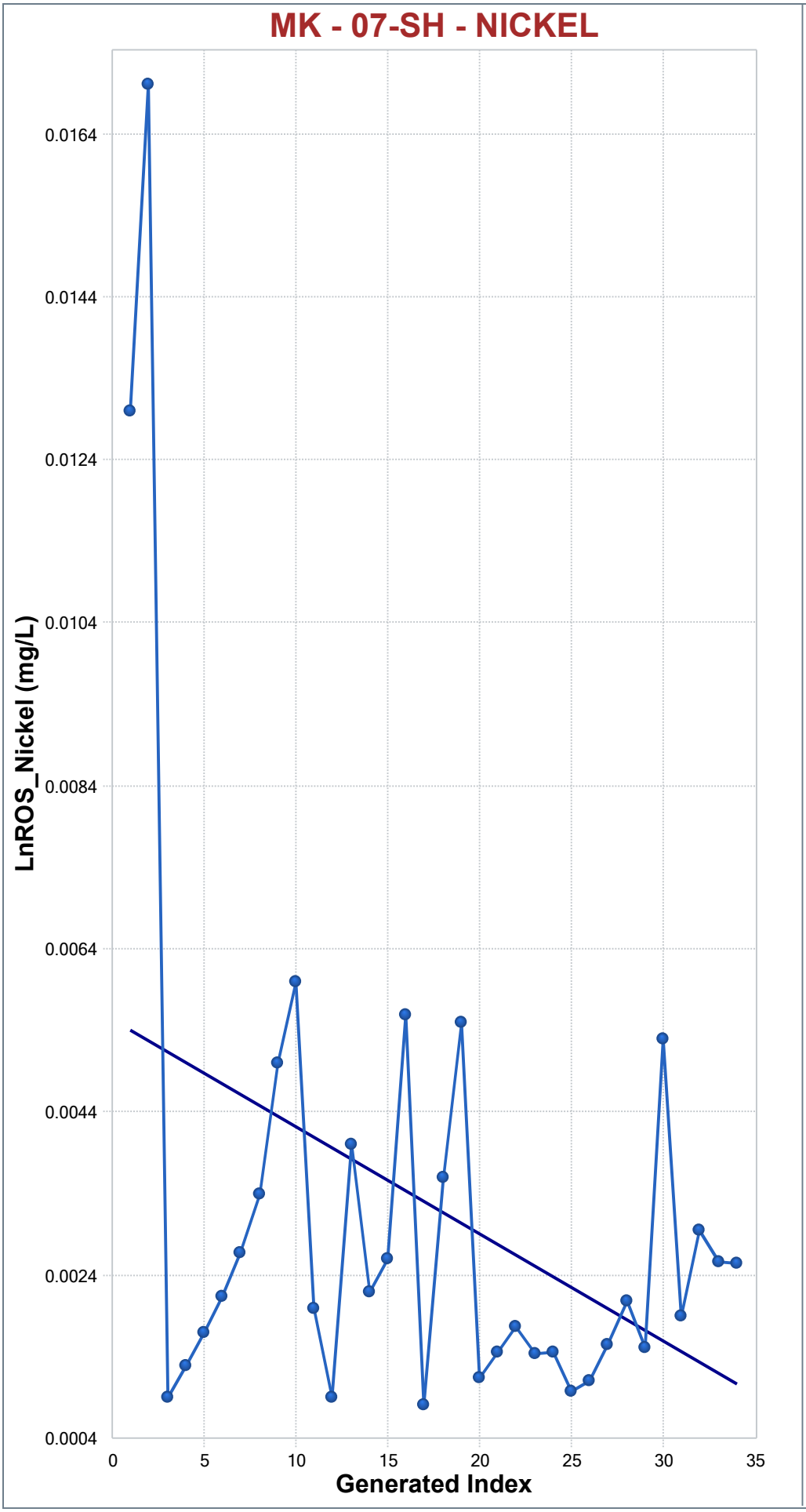
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6658
Standardized Value of S	1.4757
M-K Test Value (S)	92
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0700

OLS Regression Line (Blue)

OLS Regression Slope	0.0052
OLS Regression Intercept	0.3016

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



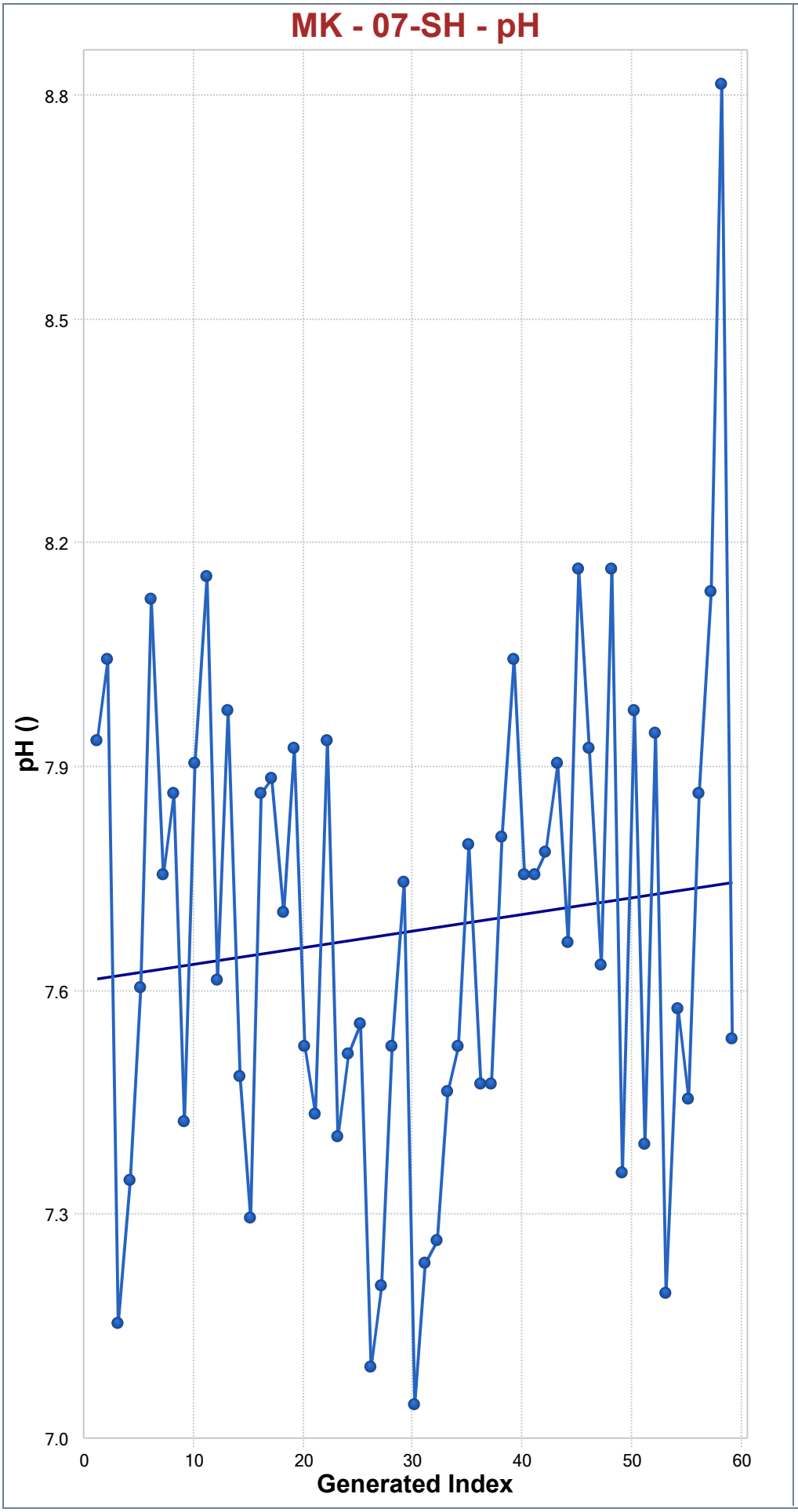
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4562
Standardized Value of S	-0.7709
M-K Test Value (S)	-53
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2204

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0055

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



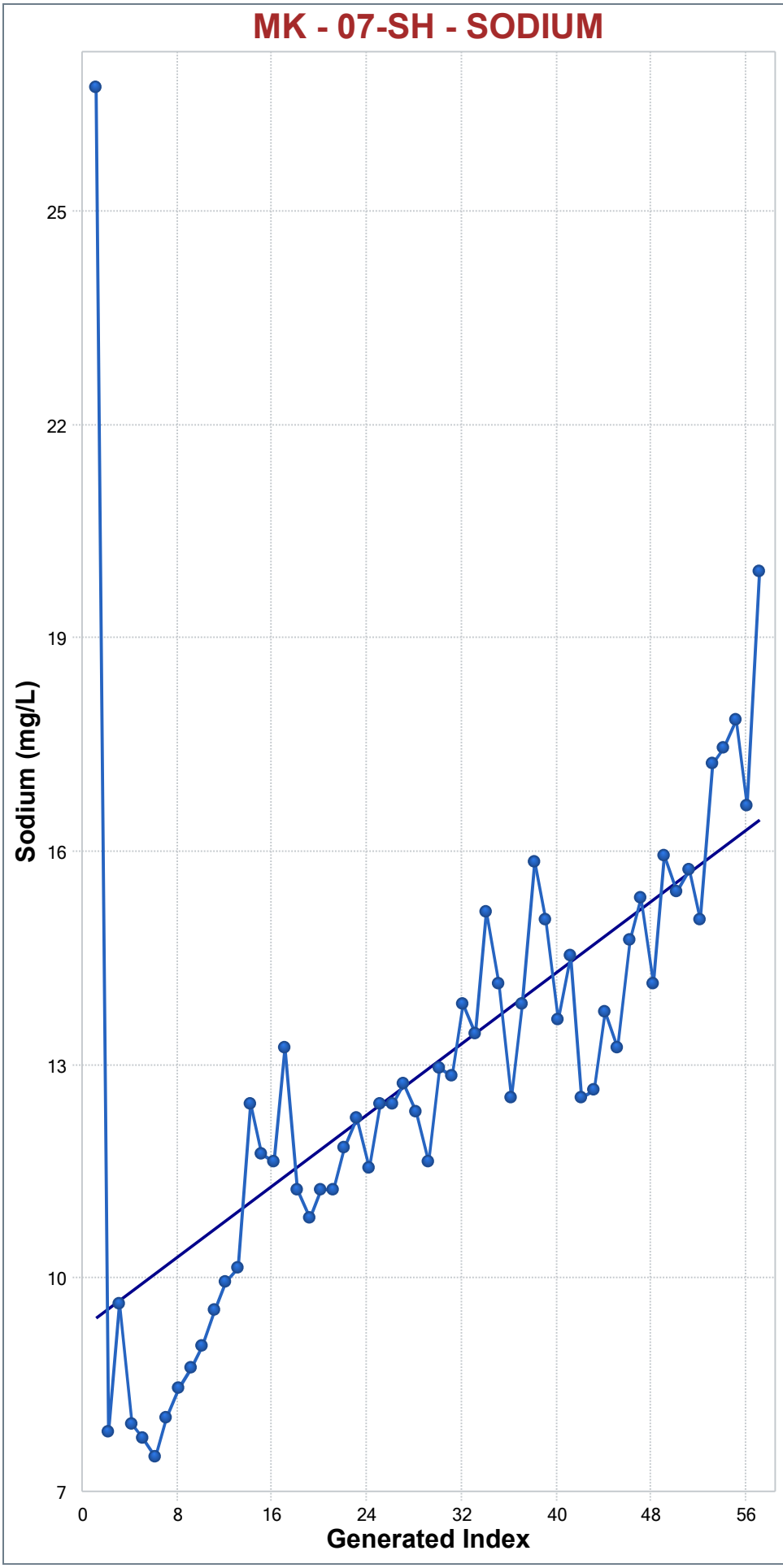
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.8583
Standardized Value of S	0.5888
M-K Test Value (S)	91
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2780

OLS Regression Line (Blue)

OLS Regression Slope	0.0022
OLS Regression Intercept	7.6289

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



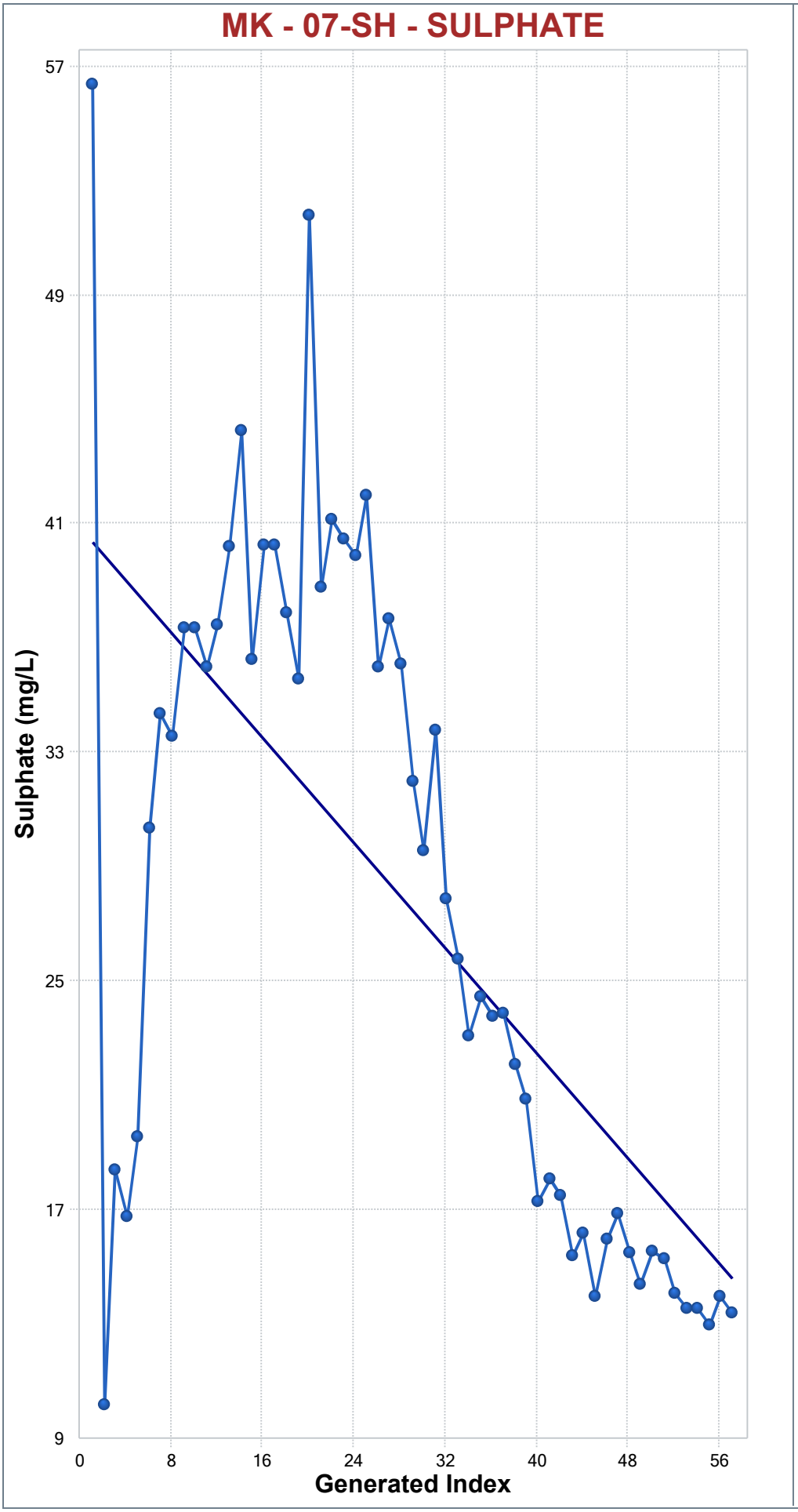
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2217
Standardized Value of S	8.0360
M-K Test Value (S)	1,168
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.1248
OLS Regression Intercept	9.5787

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



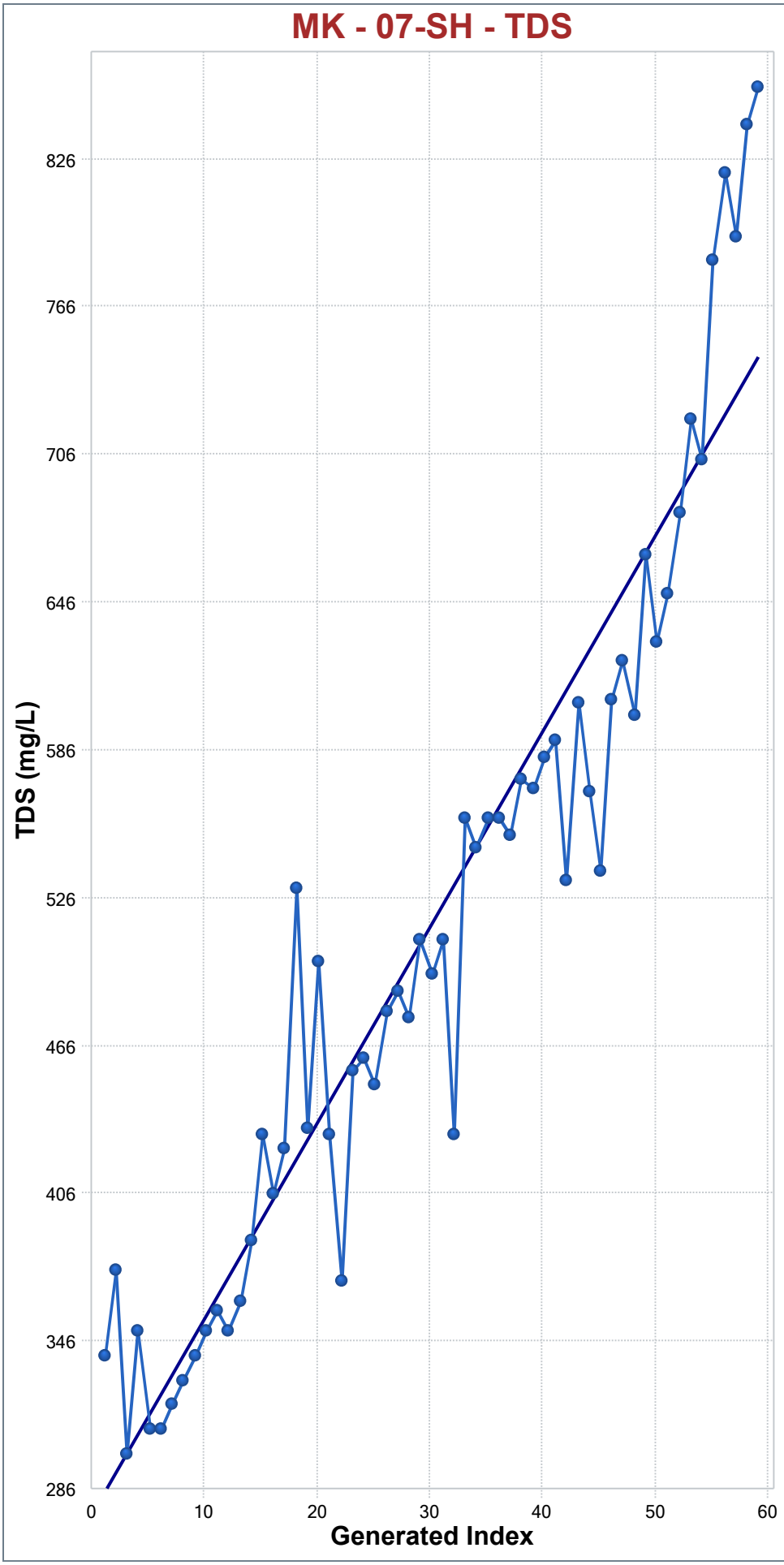
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2504
Standardized Value of S	-5.9897
M-K Test Value (S)	-871
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.4593
OLS Regression Intercept	40.4330

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



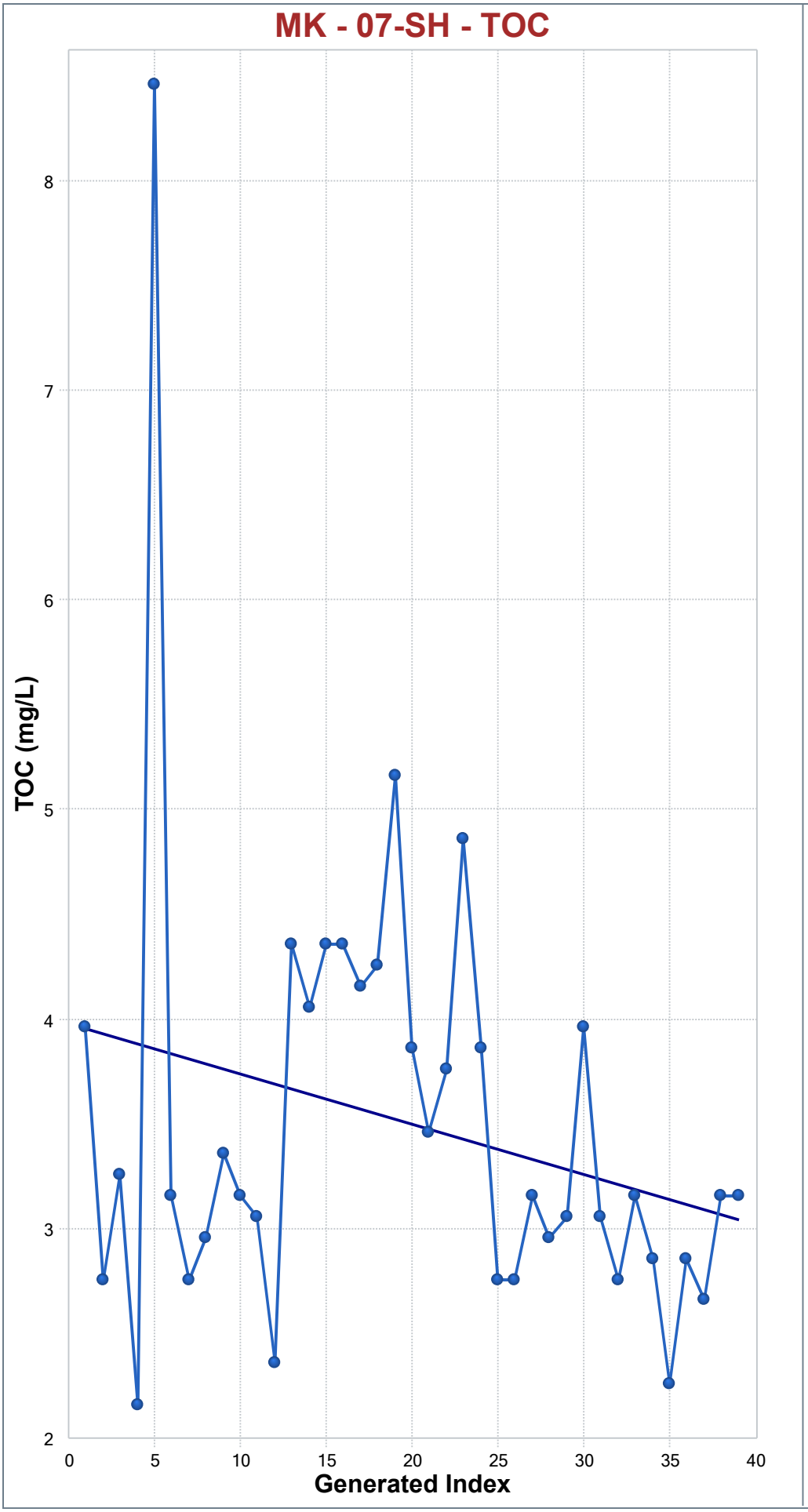
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.8714
Standardized Value of S	9.6944
M-K Test Value (S)	1,483
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	7.9507
OLS Regression Intercept	276.1052

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



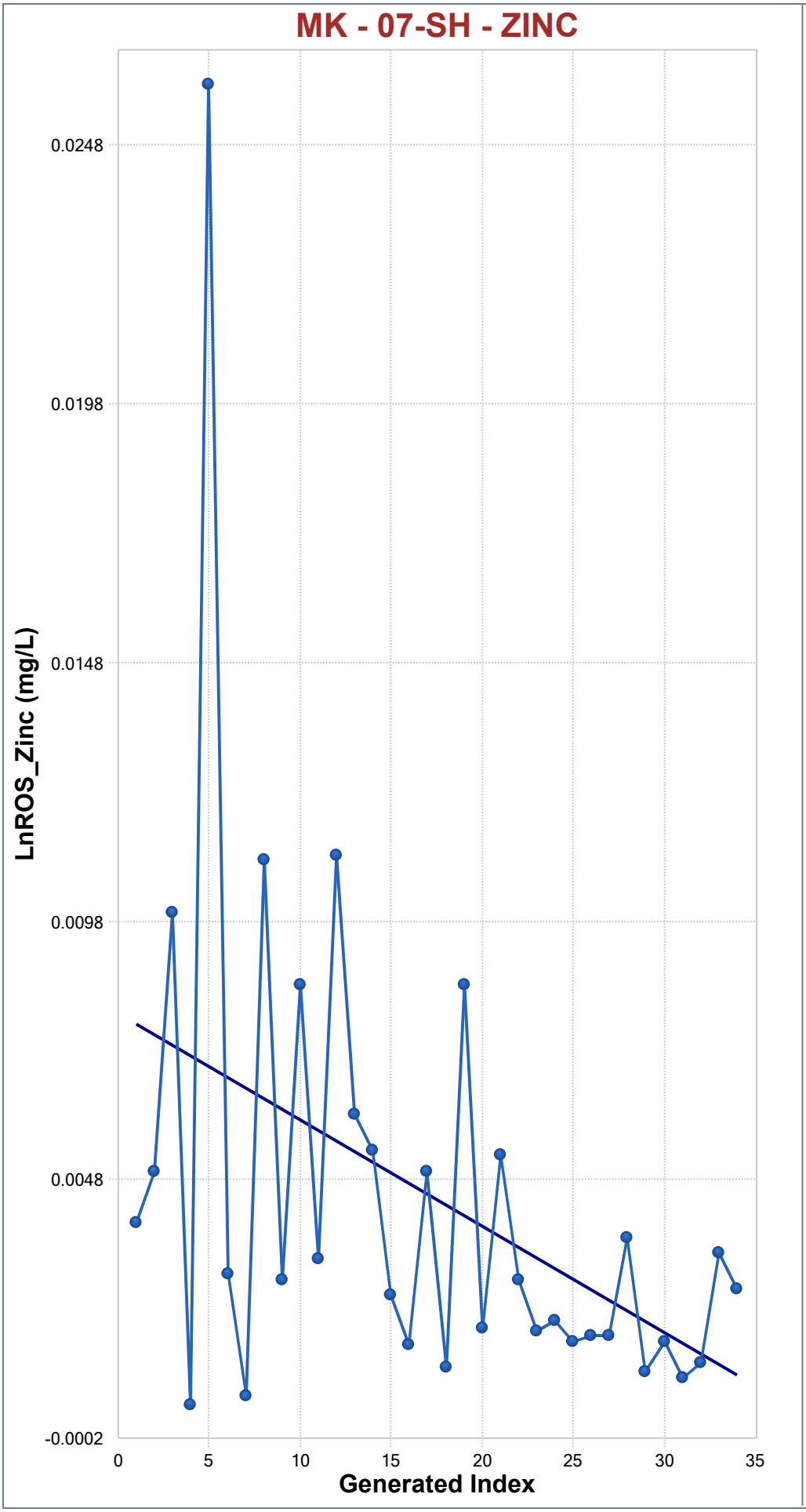
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.3246
Standardized Value of S	-1.3969
M-K Test Value (S)	-116
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0812

OLS Regression Line (Blue)

OLS Regression Slope	-0.0240
OLS Regression Intercept	3.8216

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



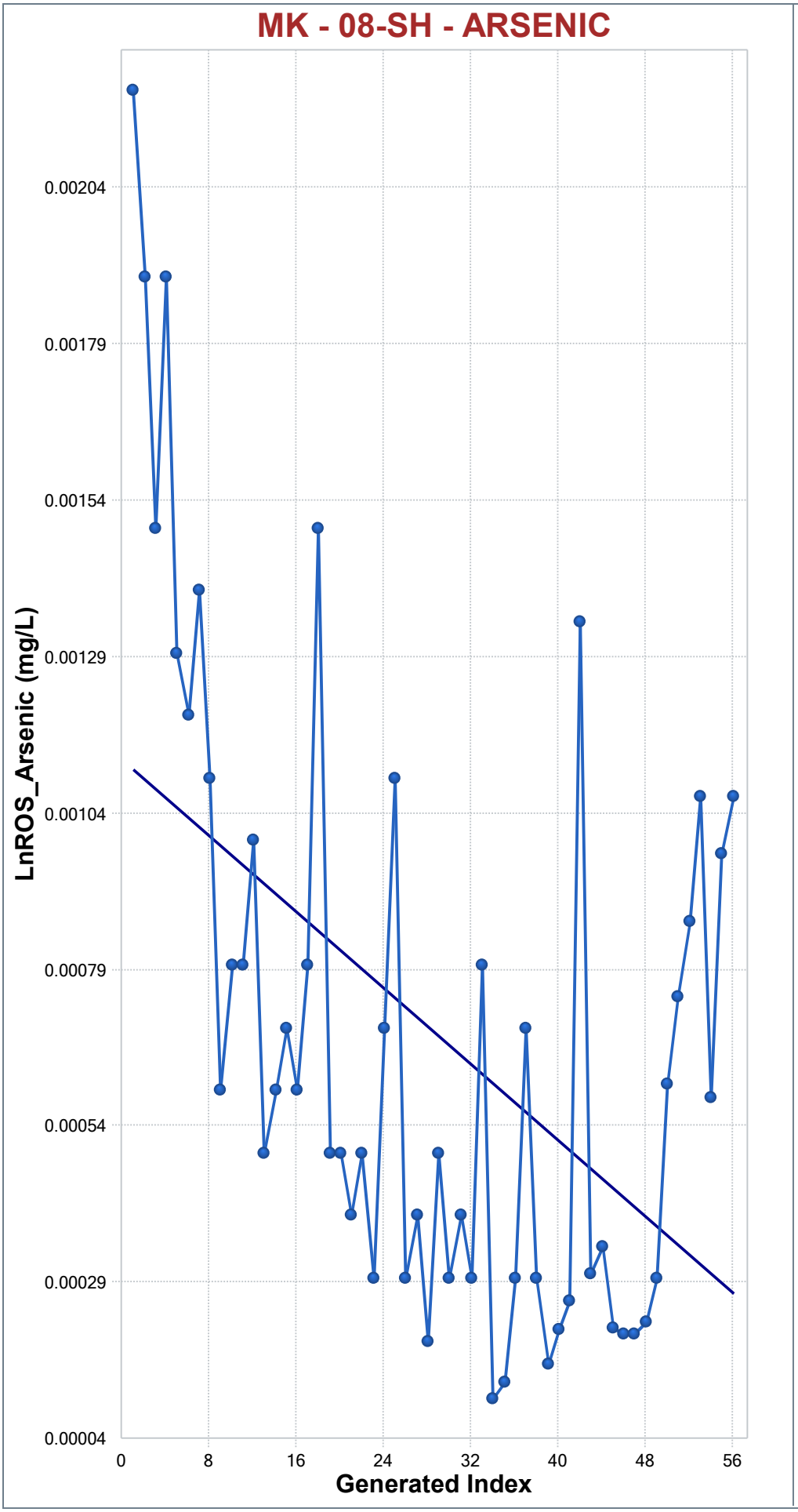
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4265
Standardized Value of S	-2.6992
M-K Test Value (S)	-183
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0035

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0080

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



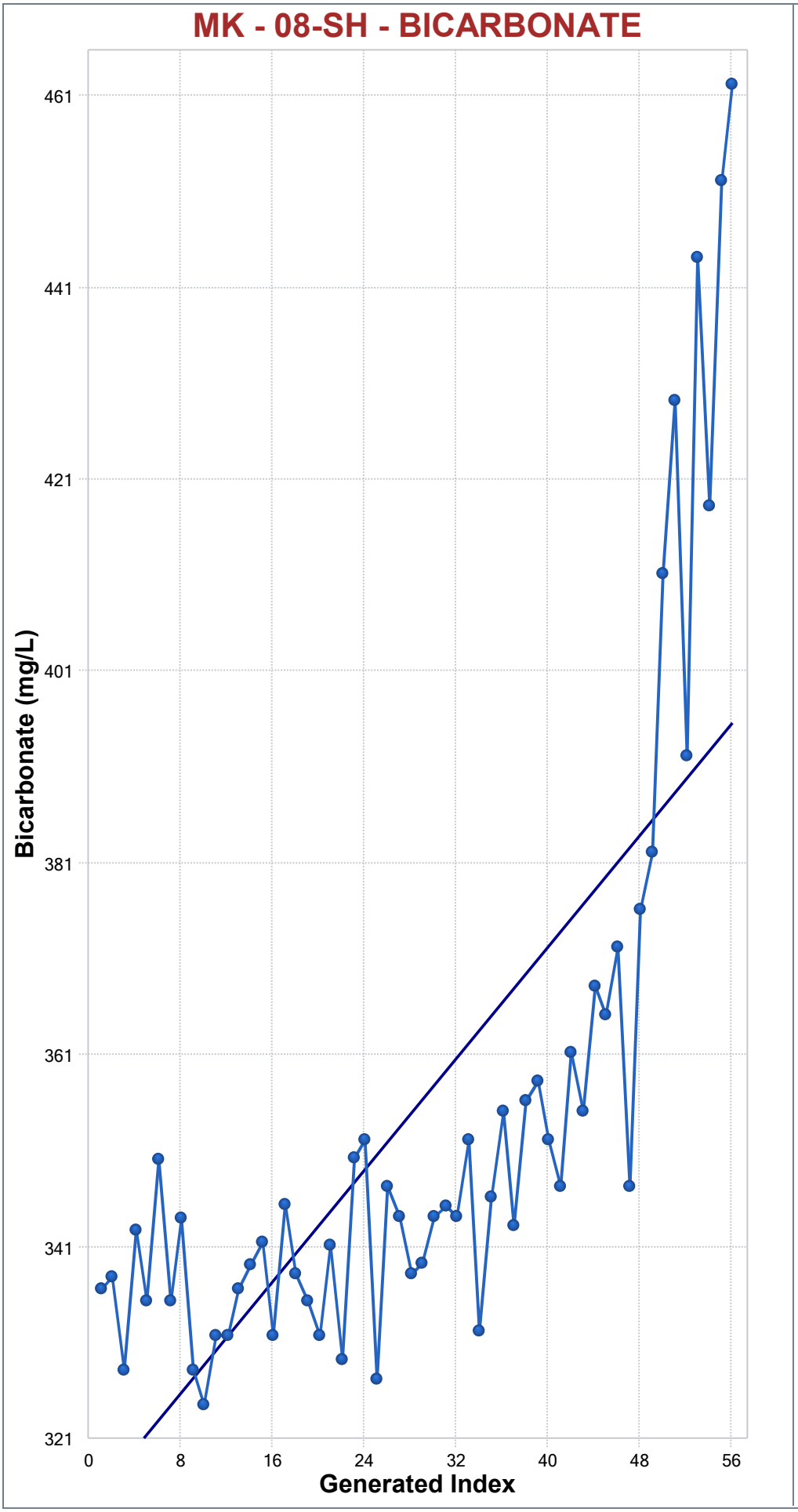
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.1890
Standardized Value of S	-3.8813
M-K Test Value (S)	-549
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0011

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



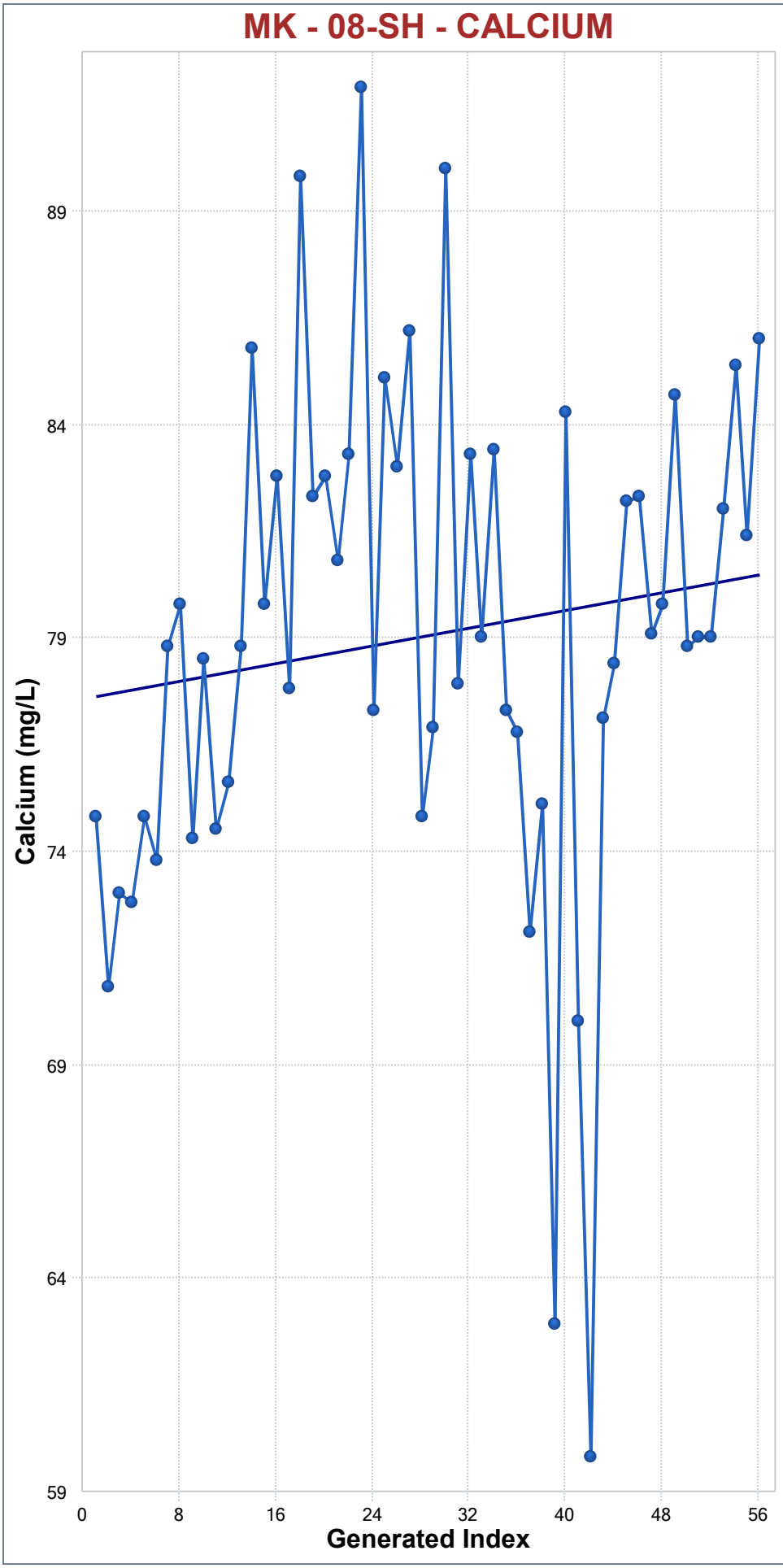
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.3954
Standardized Value of S	7.1219
M-K Test Value (S)	1,008
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.4591
OLS Regression Intercept	313.7231

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



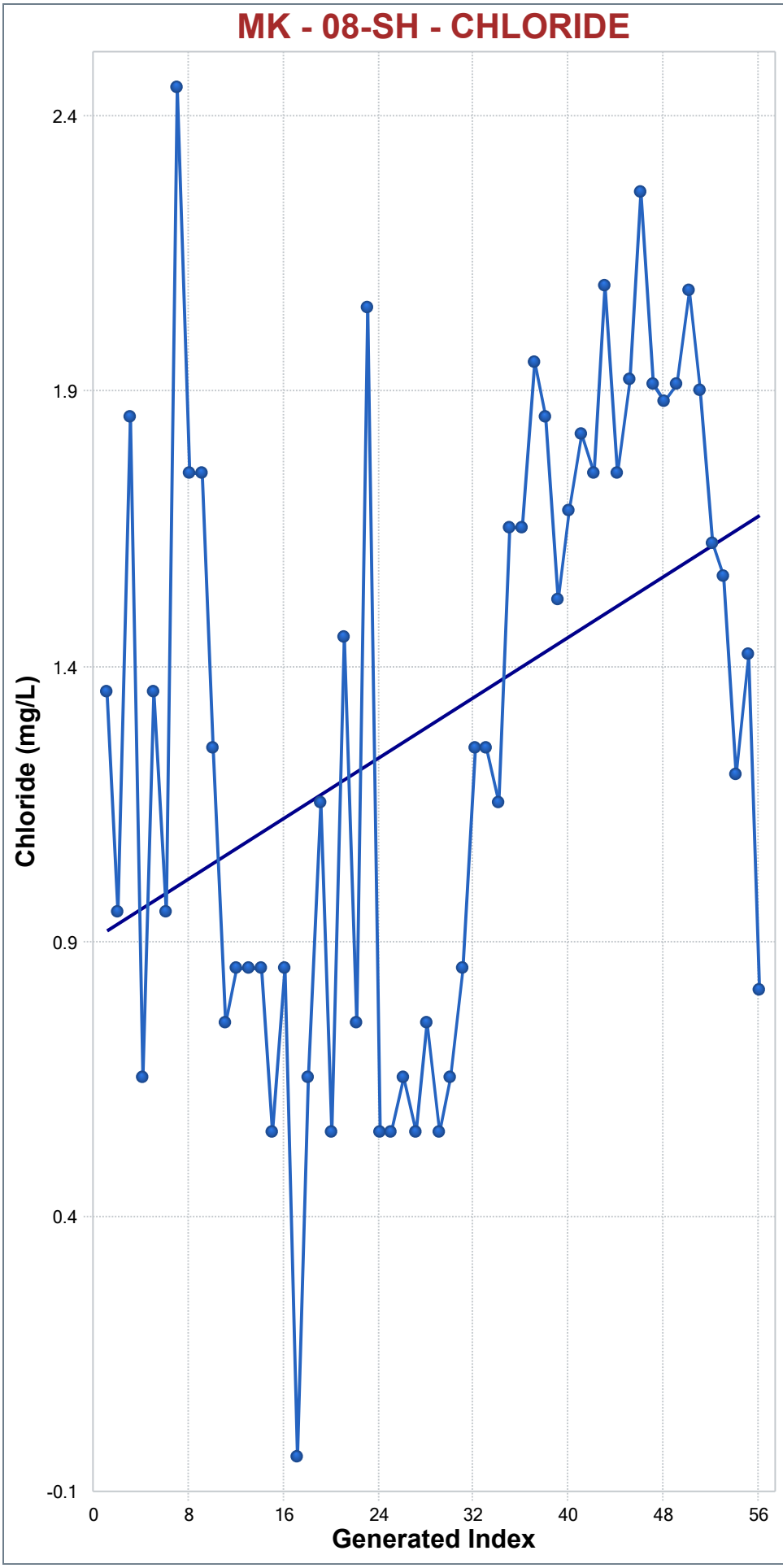
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4261
Standardized Value of S	2.1707
M-K Test Value (S)	308
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0150

OLS Regression Line (Blue)

OLS Regression Slope	0.0520
OLS Regression Intercept	77.7862

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



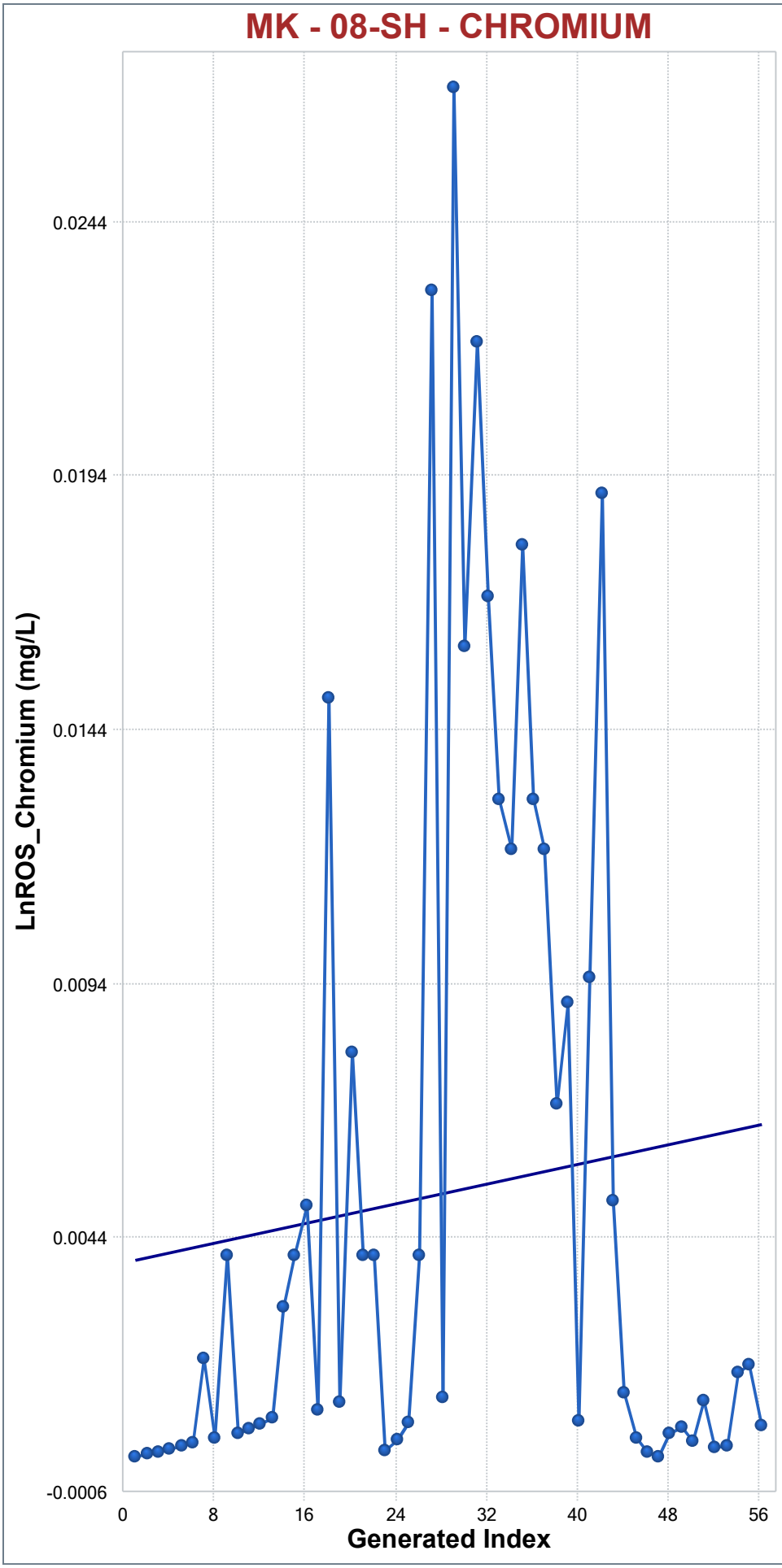
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.2244
Standardized Value of S	2.7474
M-K Test Value (S)	389
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0030

OLS Regression Line (Blue)

OLS Regression Slope	0.0138
OLS Regression Intercept	0.9520

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



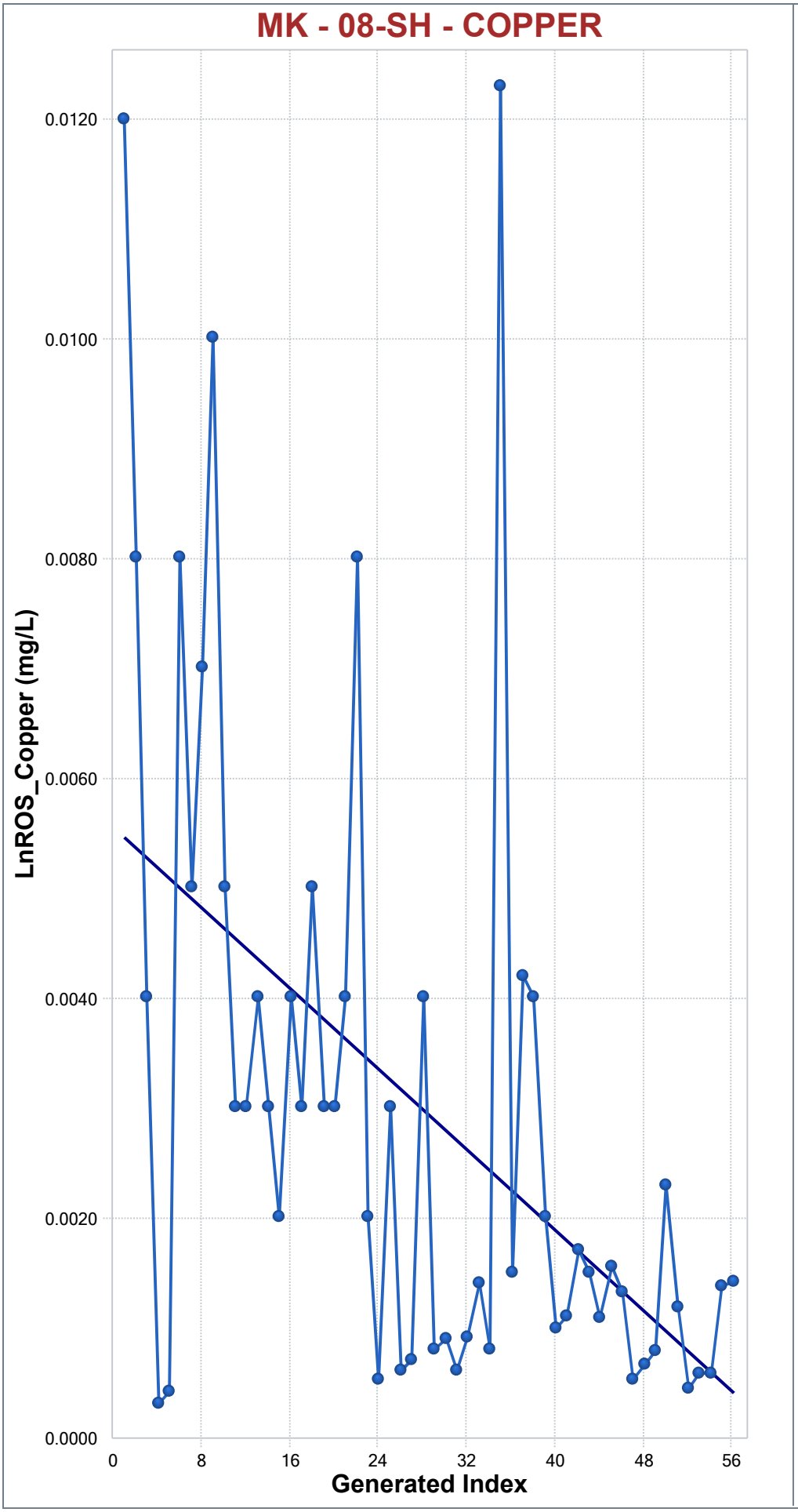
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4190
Standardized Value of S	1.4072
M-K Test Value (S)	200
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0797

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0039

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



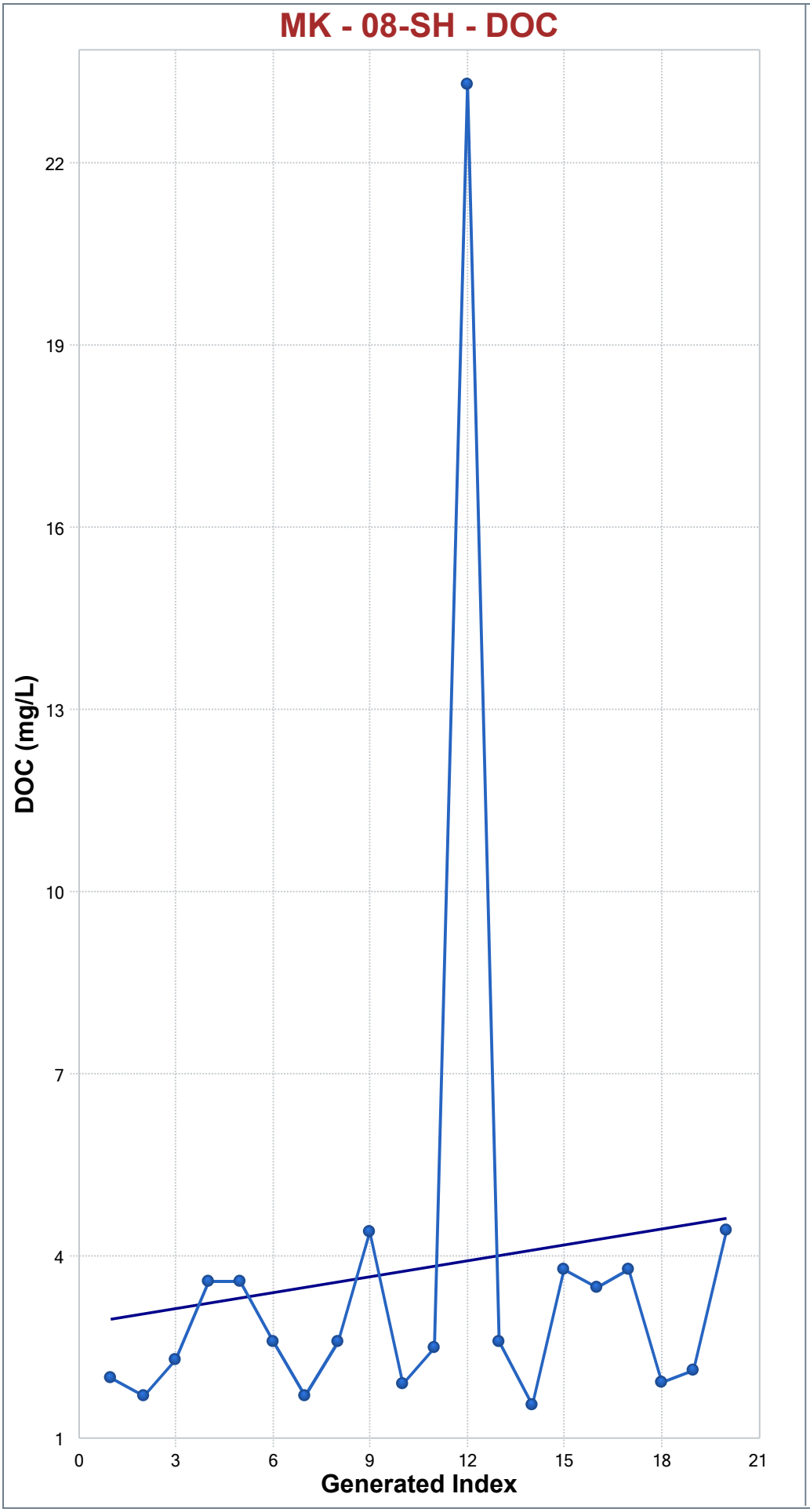
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.1890
Standardized Value of S	-4.0796
M-K Test Value (S)	-577
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0056

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



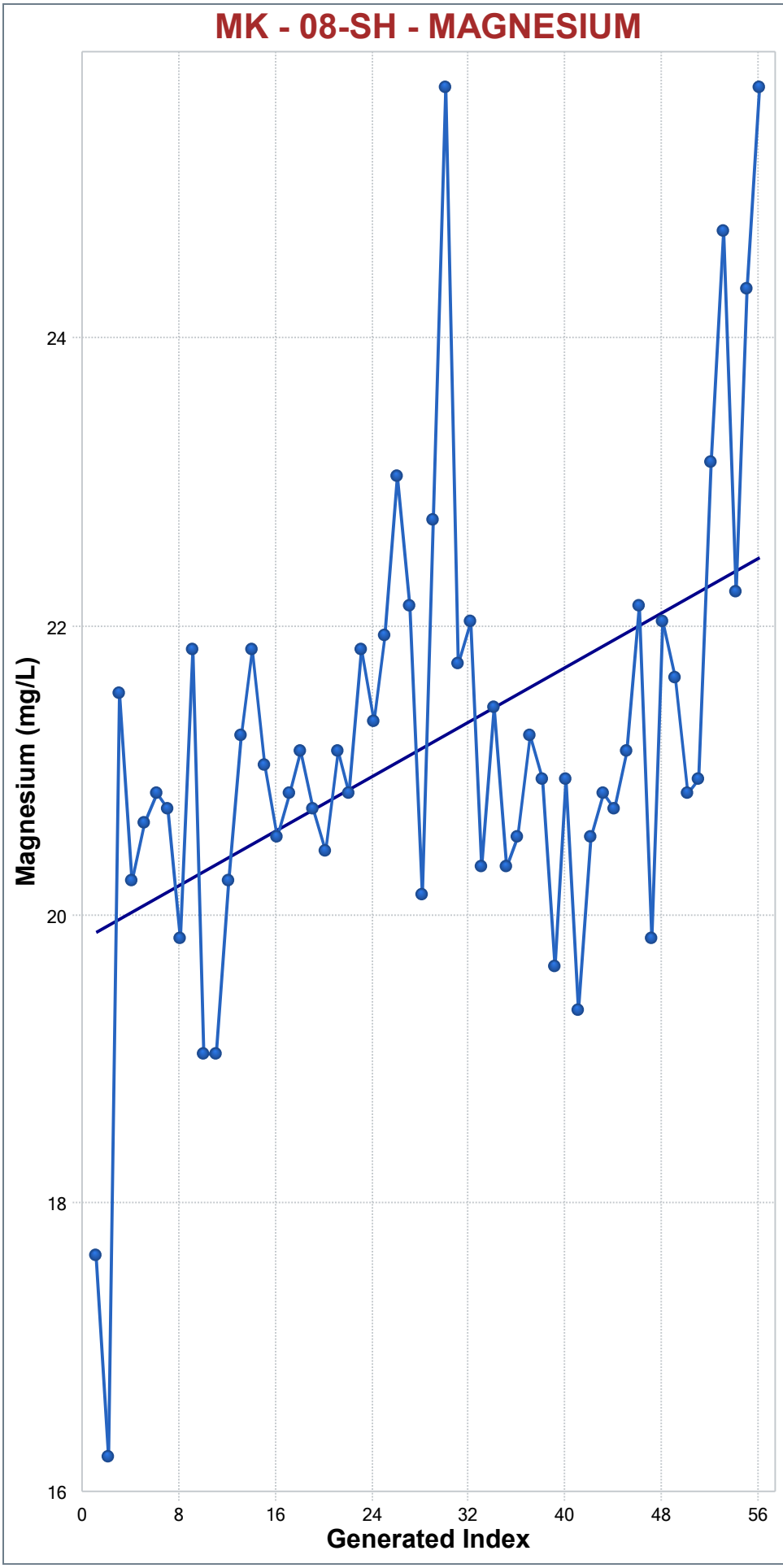
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7137
Standardized Value of S	1.1396
M-K Test Value (S)	36
Tabulated p-value	0.1300
Approximate p-value	0.1272

OLS Regression Line (Blue)

OLS Regression Slope	0.0879
OLS Regression Intercept	2.5758

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



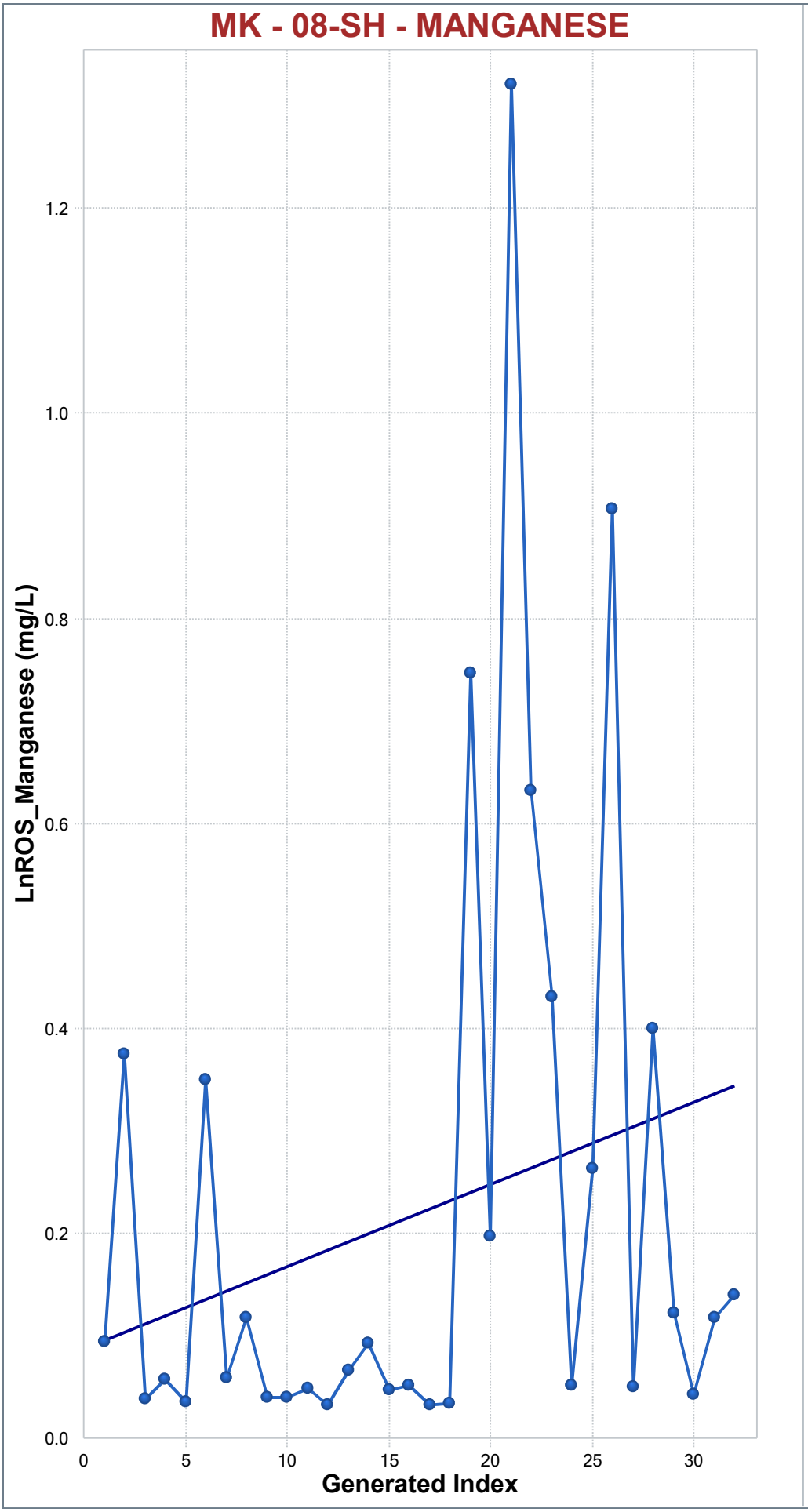
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.3400
Standardized Value of S	3.2263
M-K Test Value (S)	457
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0006

OLS Regression Line (Blue)

OLS Regression Slope	0.0474
OLS Regression Intercept	19.4897

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



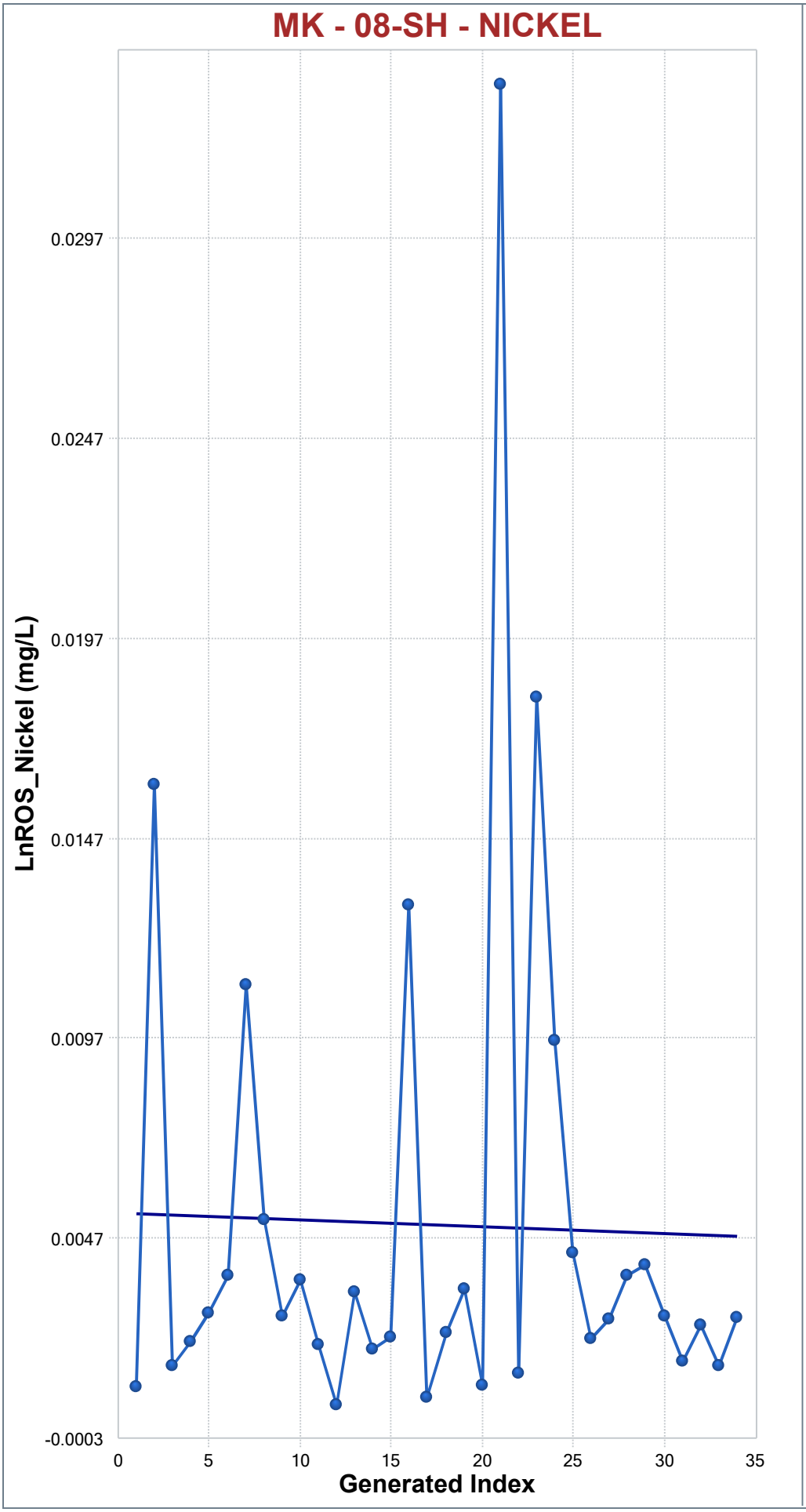
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	1.4921
M-K Test Value (S)	93
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0678

OLS Regression Line (Blue)

OLS Regression Slope	0.0080
OLS Regression Intercept	0.0559

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



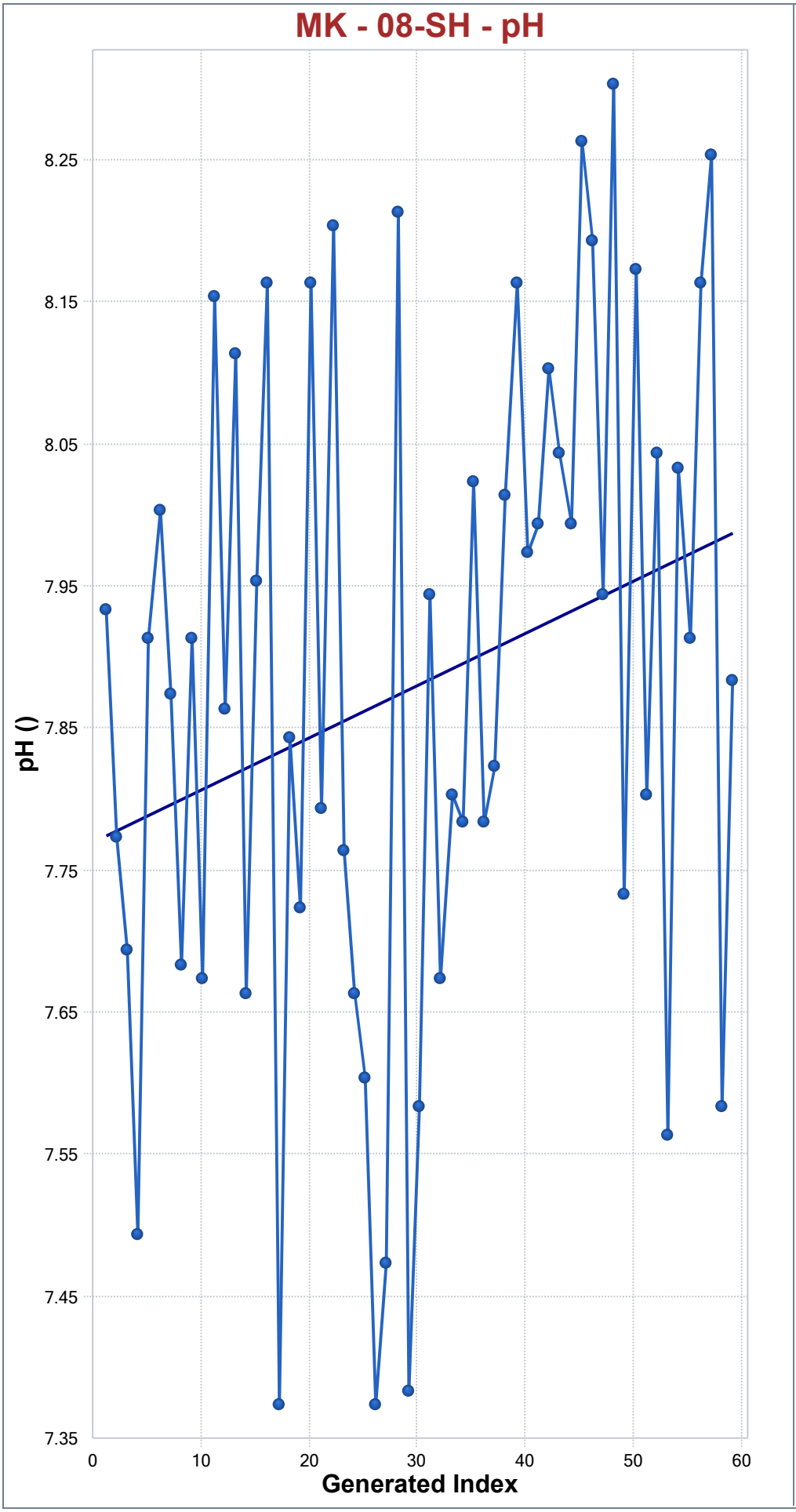
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4487
Standardized Value of S	-0.0741
M-K Test Value (S)	-6
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4705

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0053

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



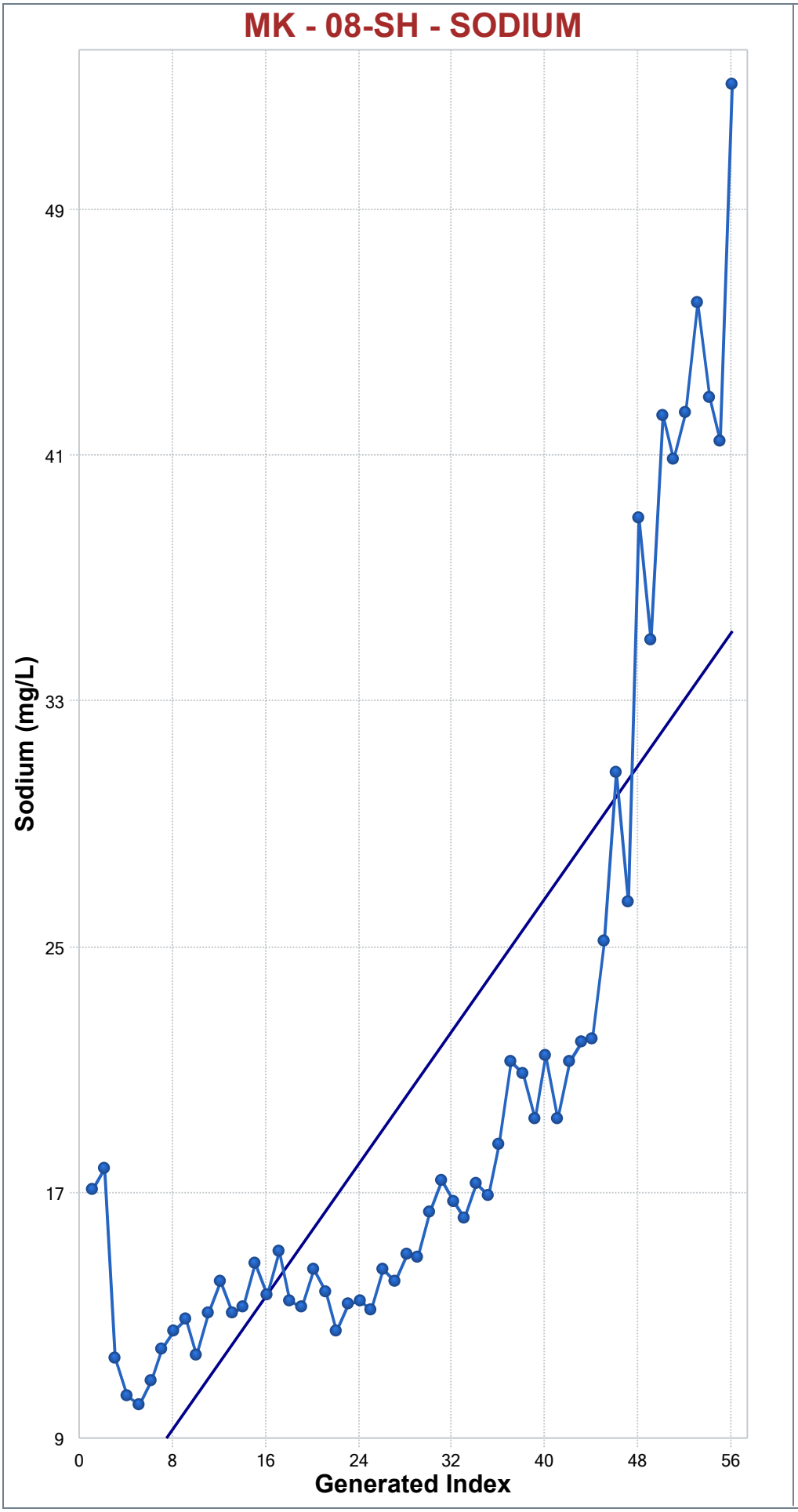
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.8474
Standardized Value of S	2.1067
M-K Test Value (S)	323
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0176

OLS Regression Line (Blue)

OLS Regression Slope	0.0037
OLS Regression Intercept	7.7676

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



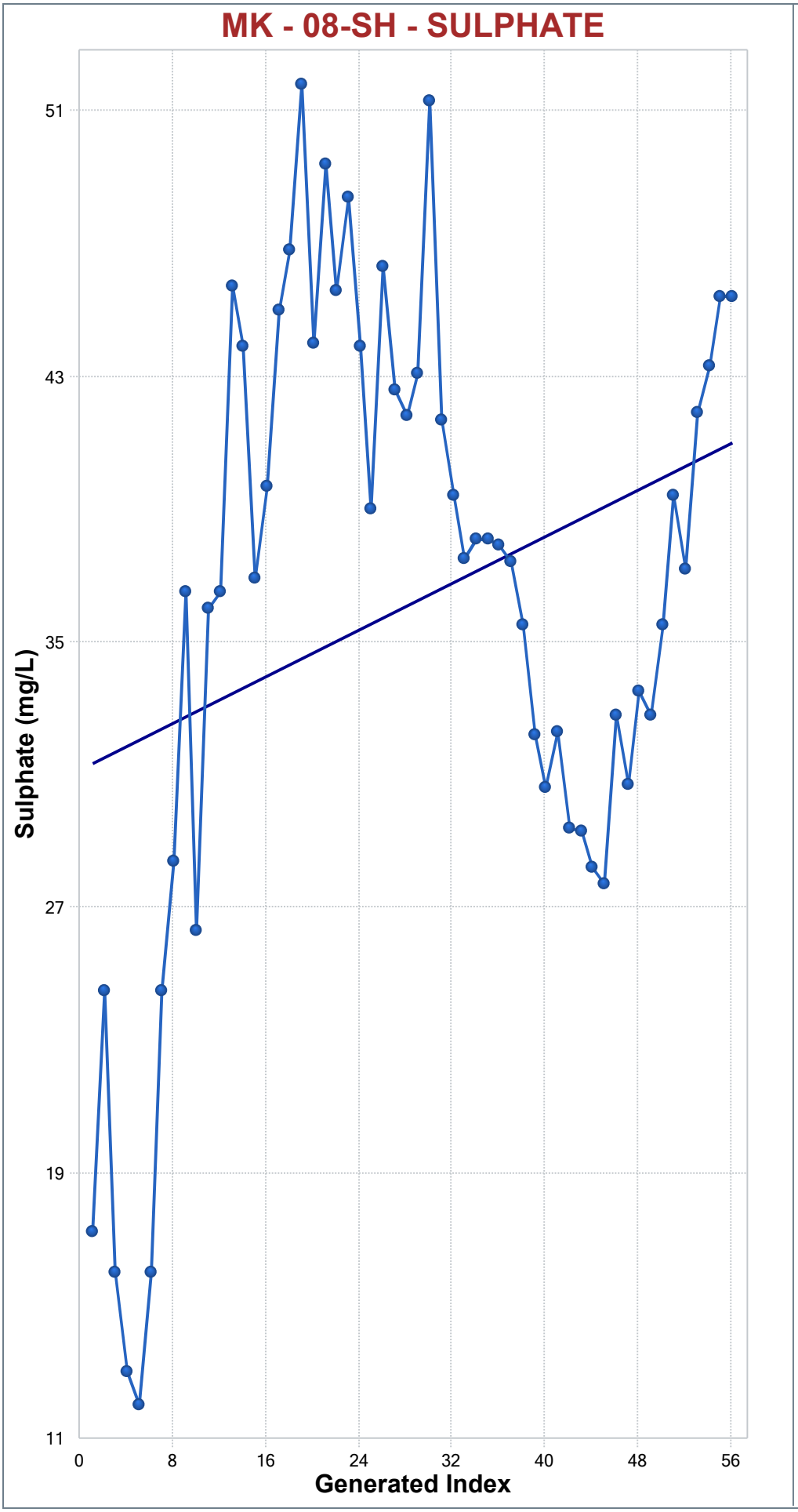
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4638
Standardized Value of S	8.6029
M-K Test Value (S)	1,218
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.5414
OLS Regression Intercept	5.0787

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



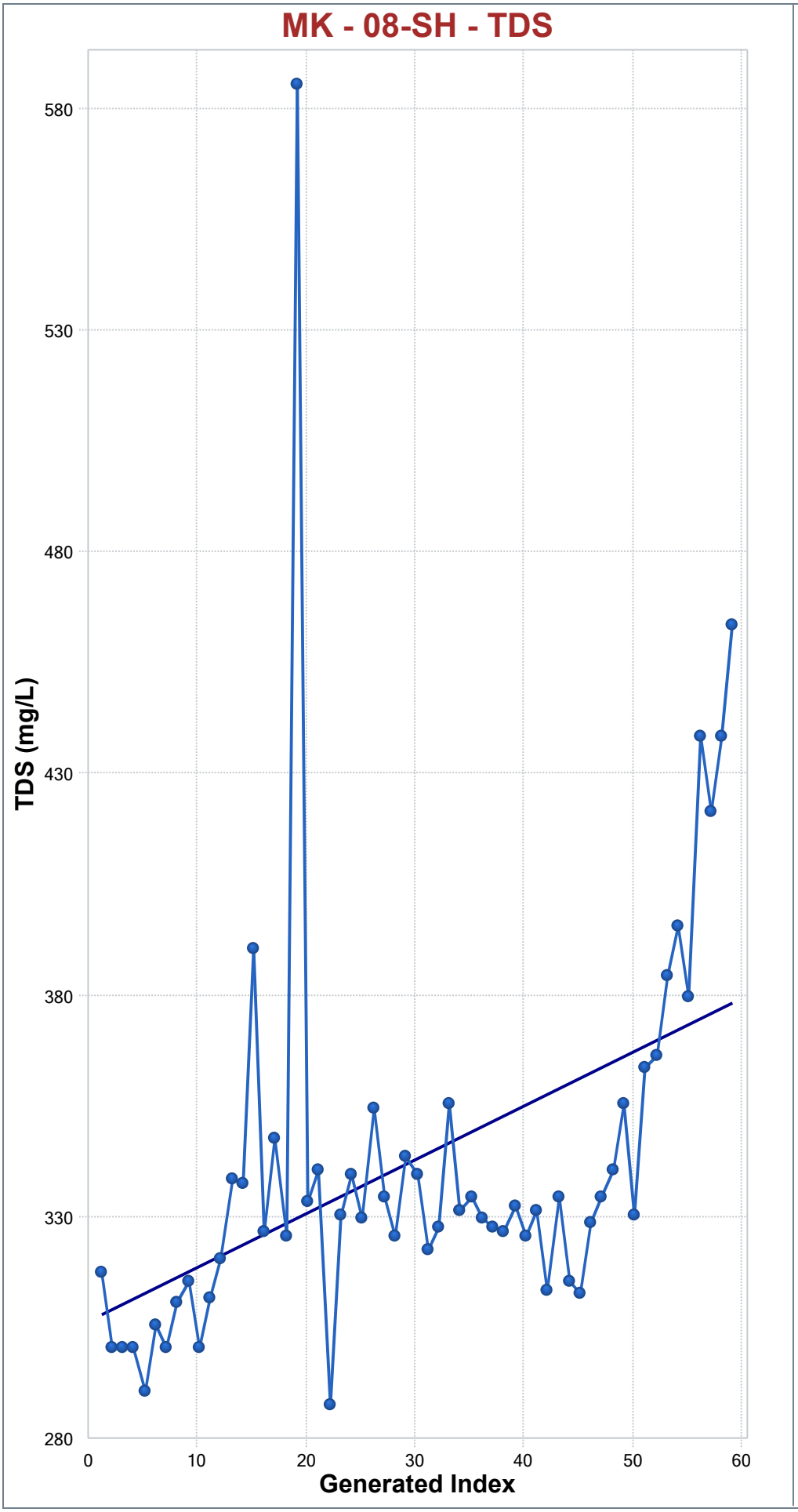
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4602
Standardized Value of S	0.8342
M-K Test Value (S)	119
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2021

OLS Regression Line (Blue)

OLS Regression Slope	0.1762
OLS Regression Intercept	30.6455

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



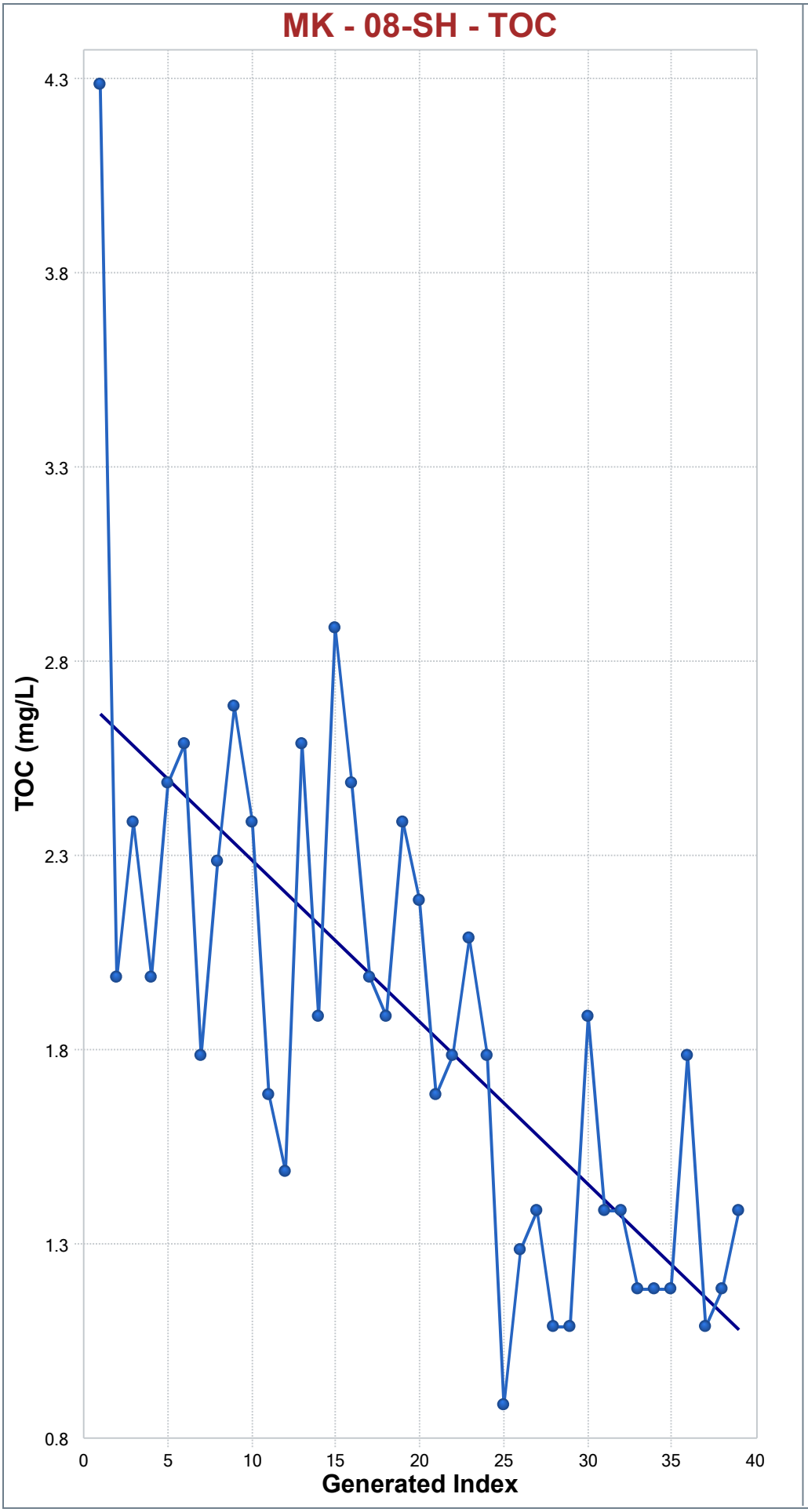
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.7896
Standardized Value of S	5.0200
M-K Test Value (S)	768
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.2110
OLS Regression Intercept	306.3127

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



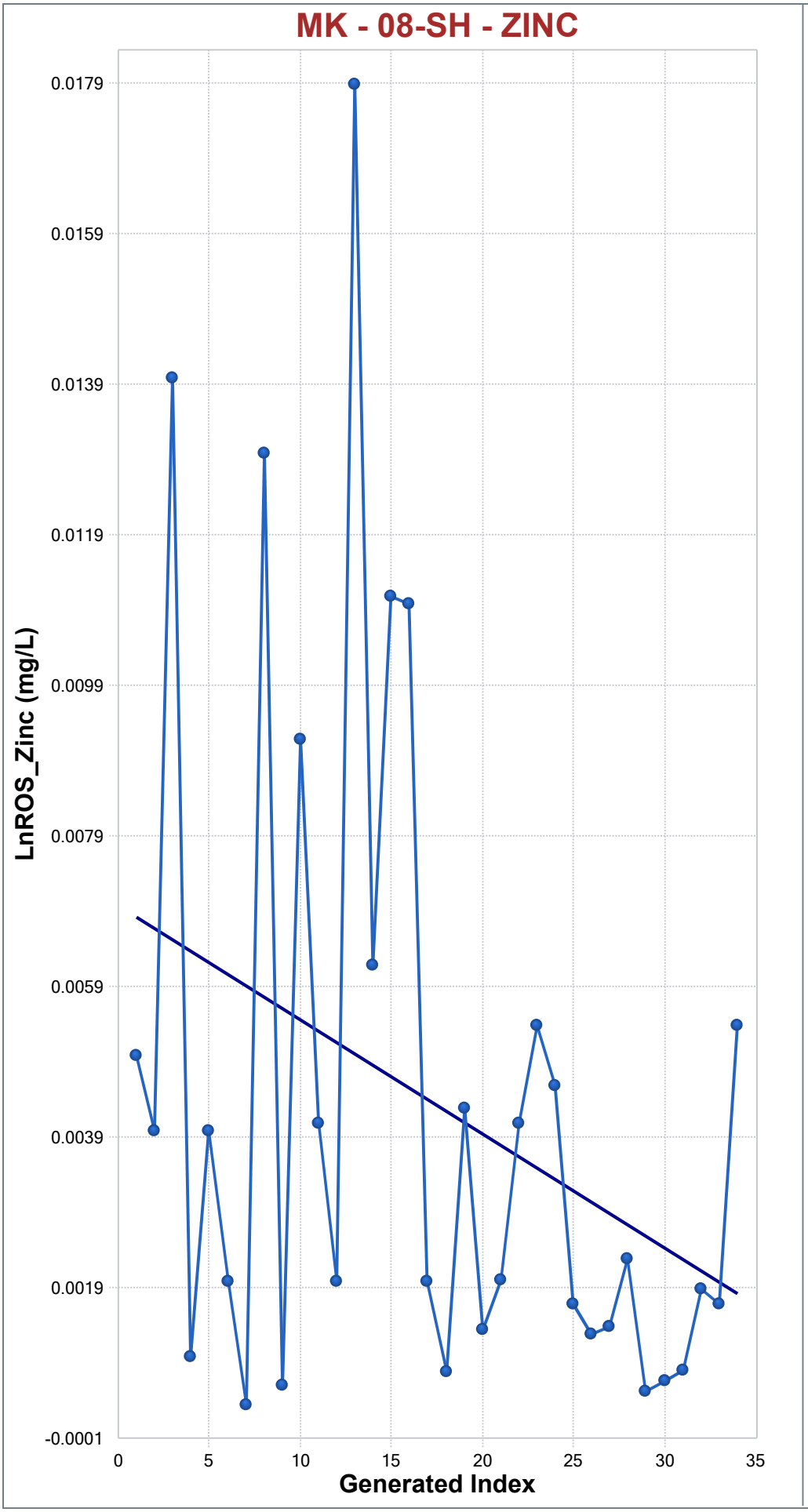
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.4015
Standardized Value of S	-4.7693
M-K Test Value (S)	-394
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0417
OLS Regression Intercept	2.7204

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



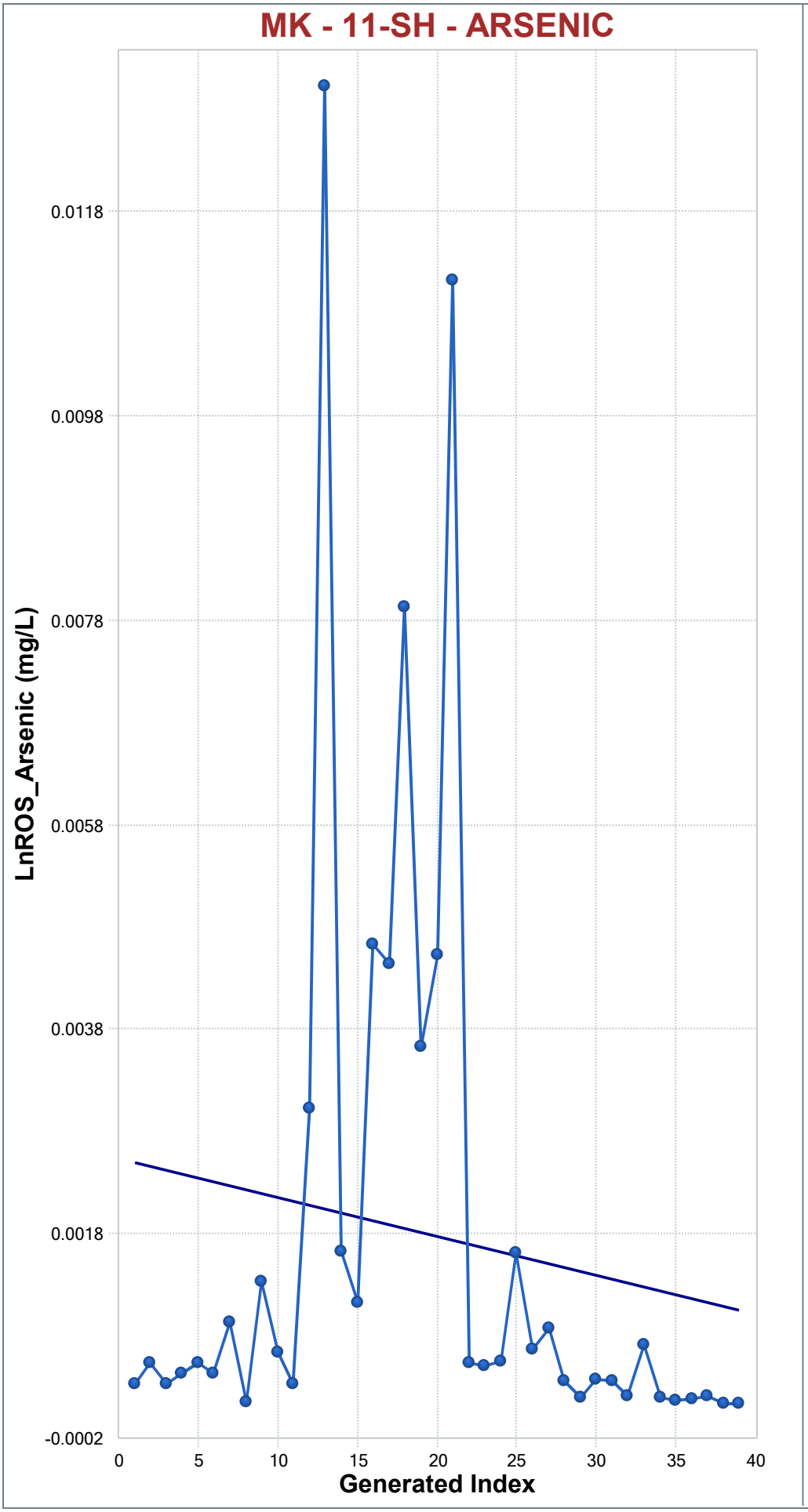
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.3993
Standardized Value of S	-1.7062
M-K Test Value (S)	-116
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0440

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0070

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



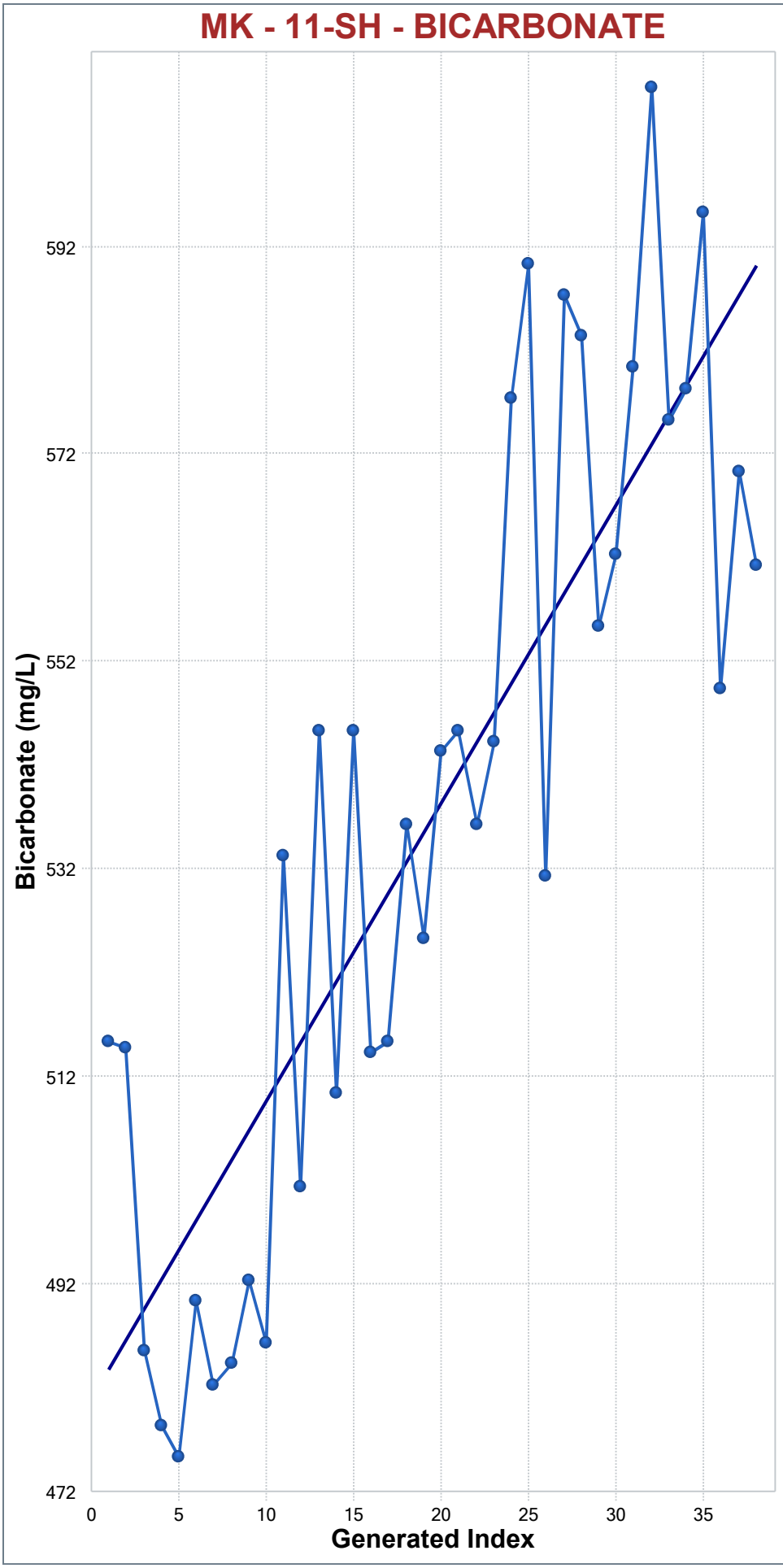
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6095
Standardized Value of S	-2.2031
M-K Test Value (S)	-183
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0138

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0025

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



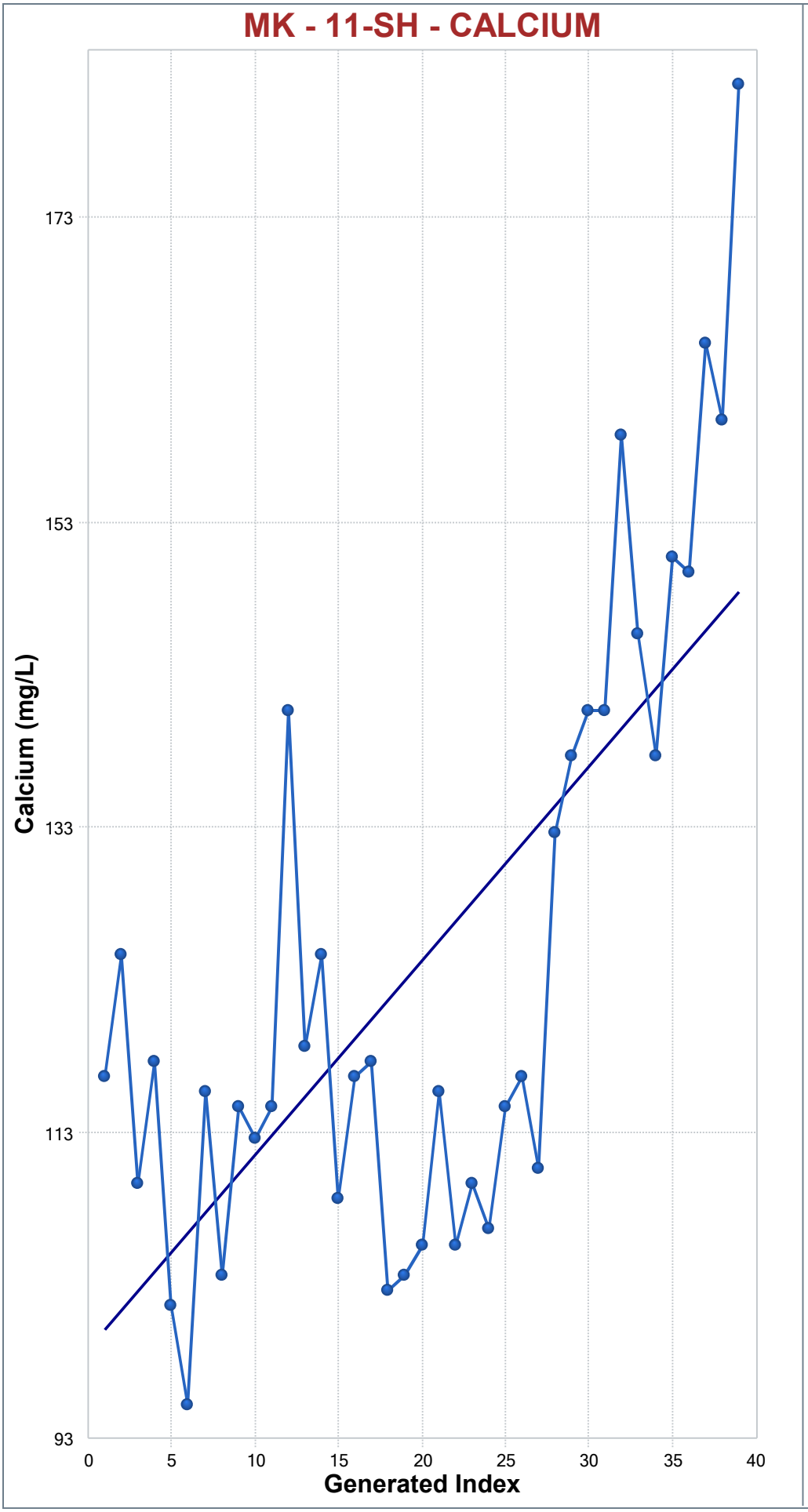
Mann-Kendall Trend Analysis

n	38
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	79.5068
Standardized Value of S	5.6725
M-K Test Value (S)	452
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	2.8737
OLS Regression Intercept	480.6373

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



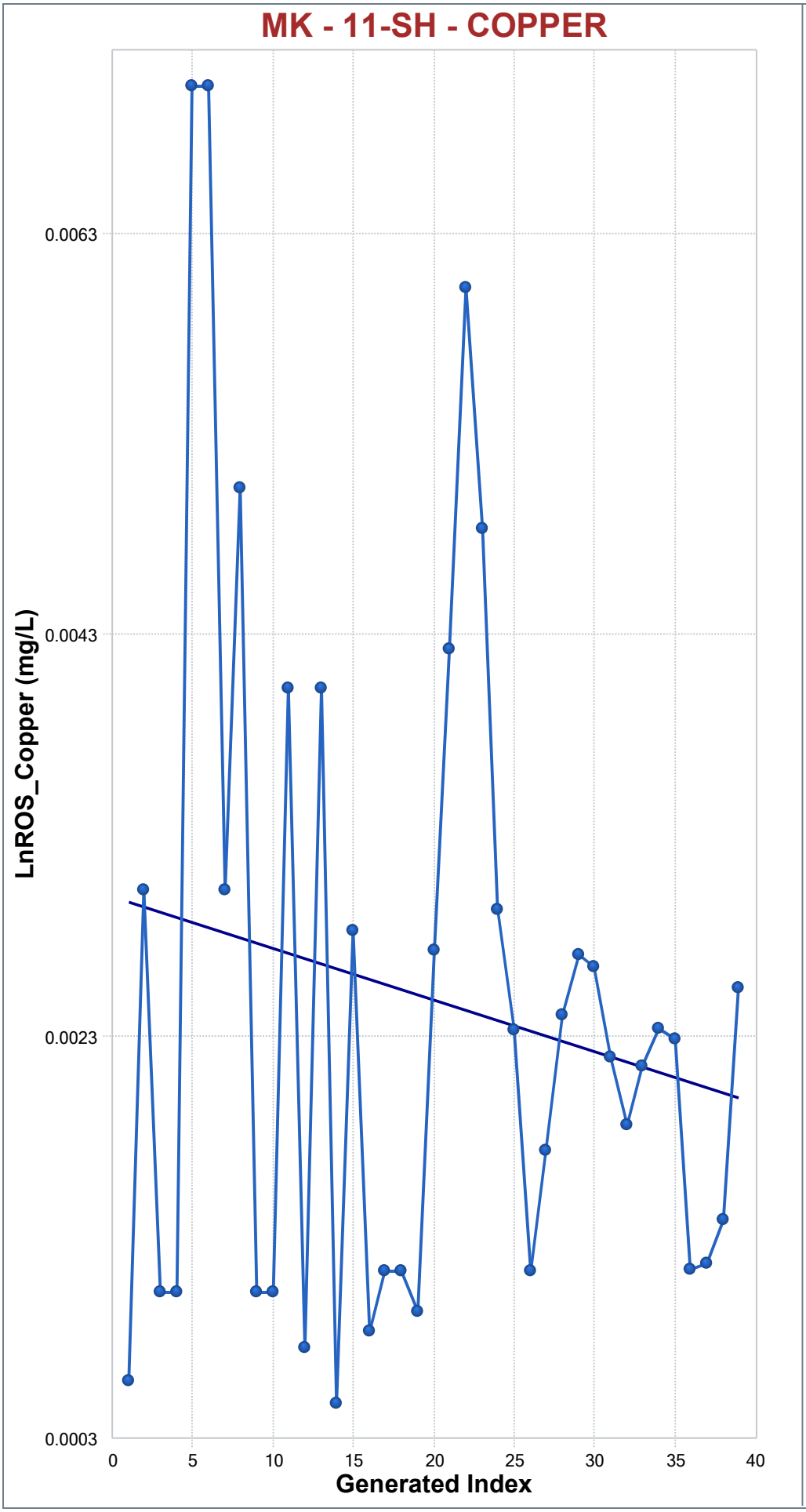
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.5571
Standardized Value of S	4.0699
M-K Test Value (S)	337
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.2715
OLS Regression Intercept	99.1478

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



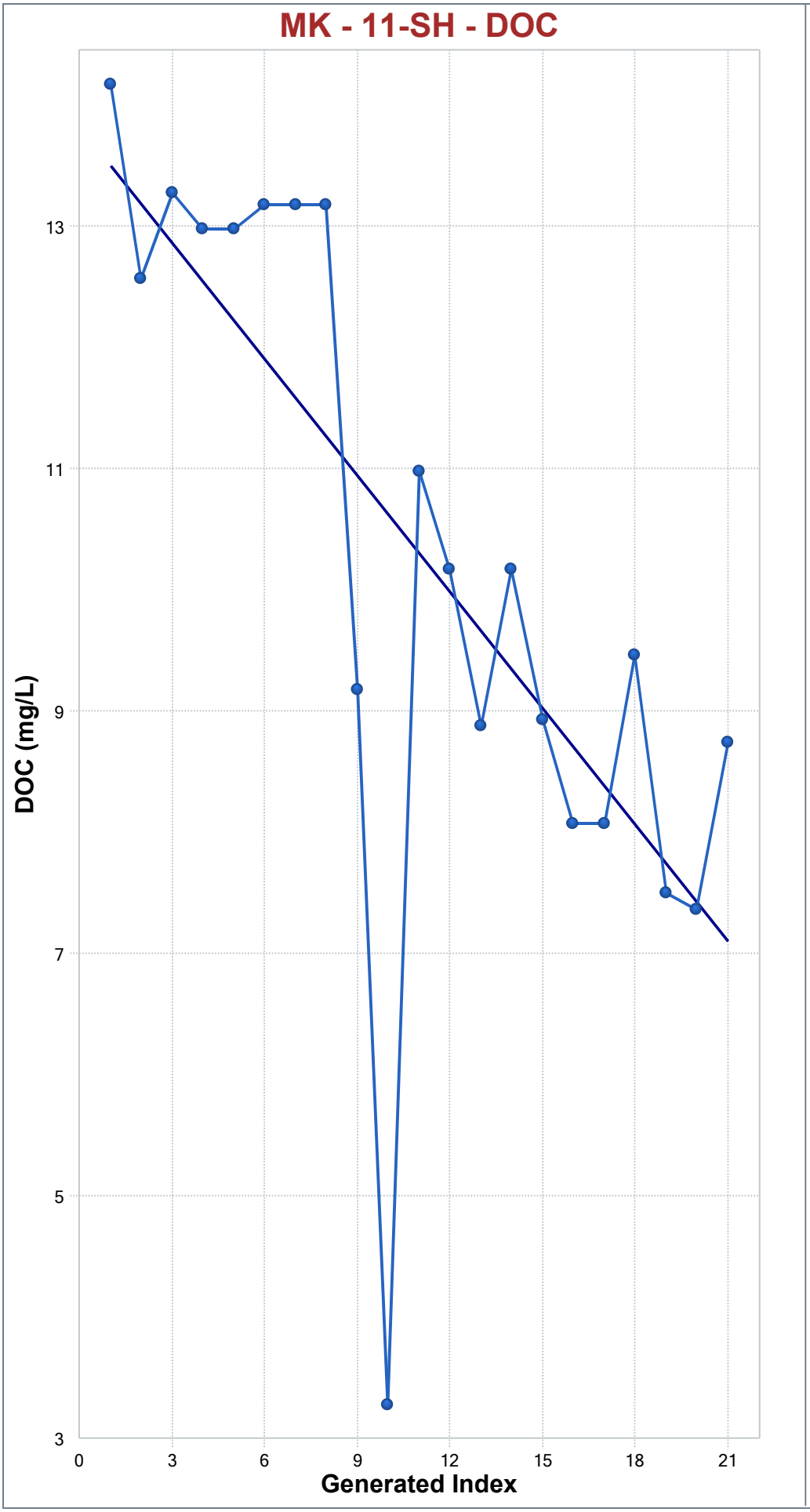
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.5732
Standardized Value of S	-0.1938
M-K Test Value (S)	-17
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4232

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0030

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



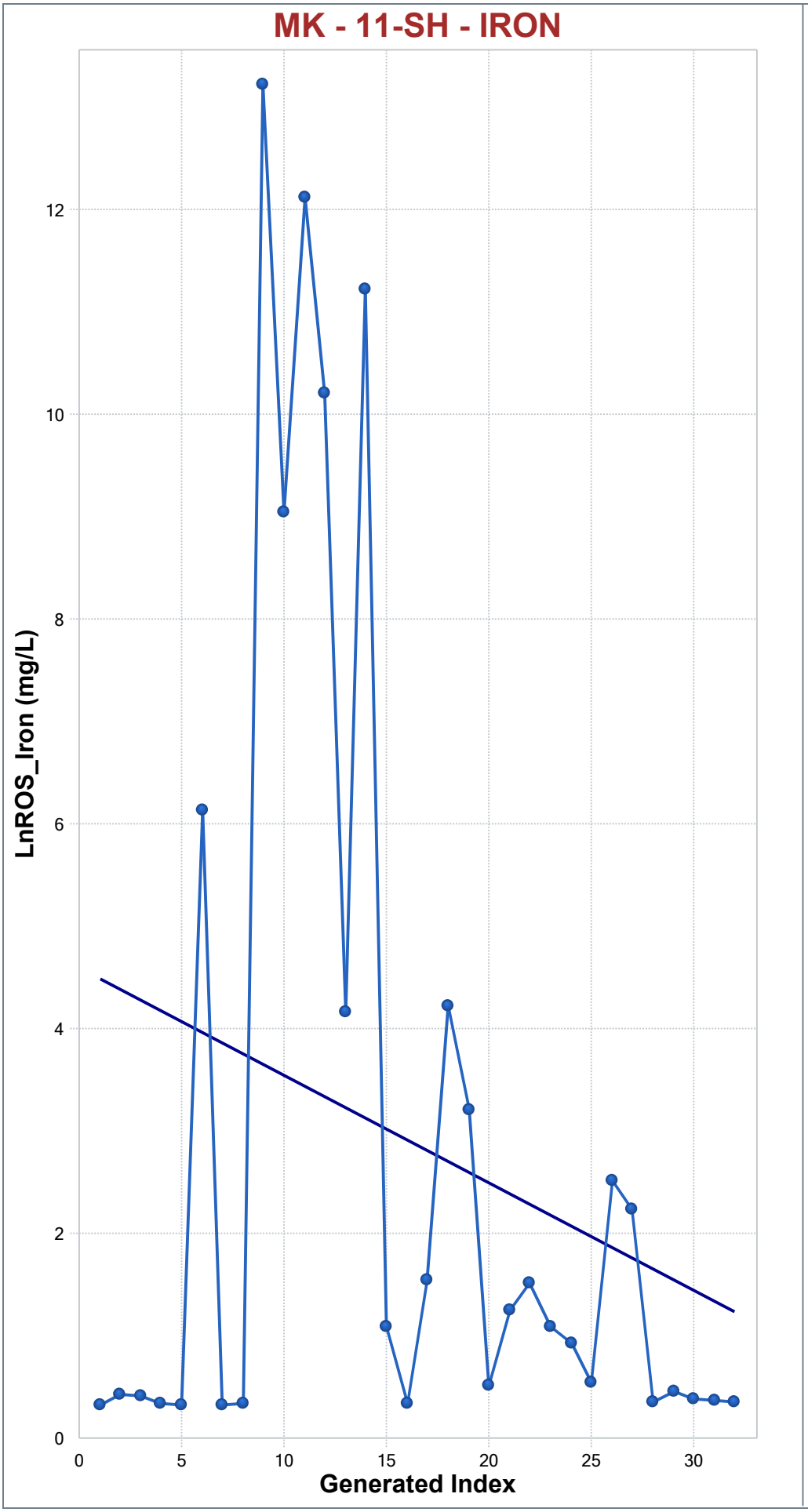
Mann-Kendall Trend Analysis

n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0151
Standardized Value of S	-3.9073
M-K Test Value (S)	-130
Tabulated p-value	0.0000
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.3201
OLS Regression Intercept	13.8469

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



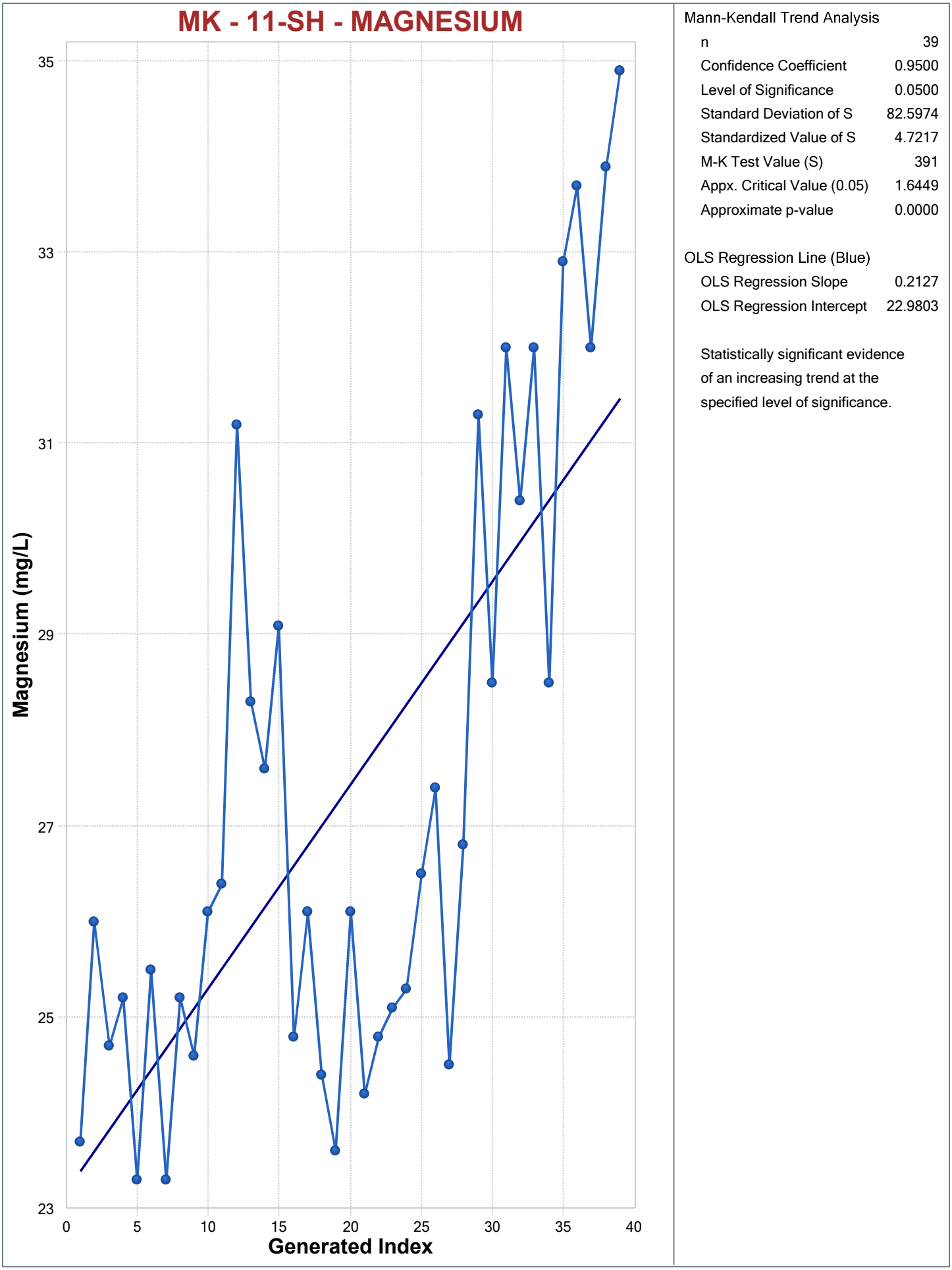
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	-0.5190
M-K Test Value (S)	-33
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3019

OLS Regression Line (Blue)

OLS Regression Slope	-0.1052
OLS Regression Intercept	4.2747

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



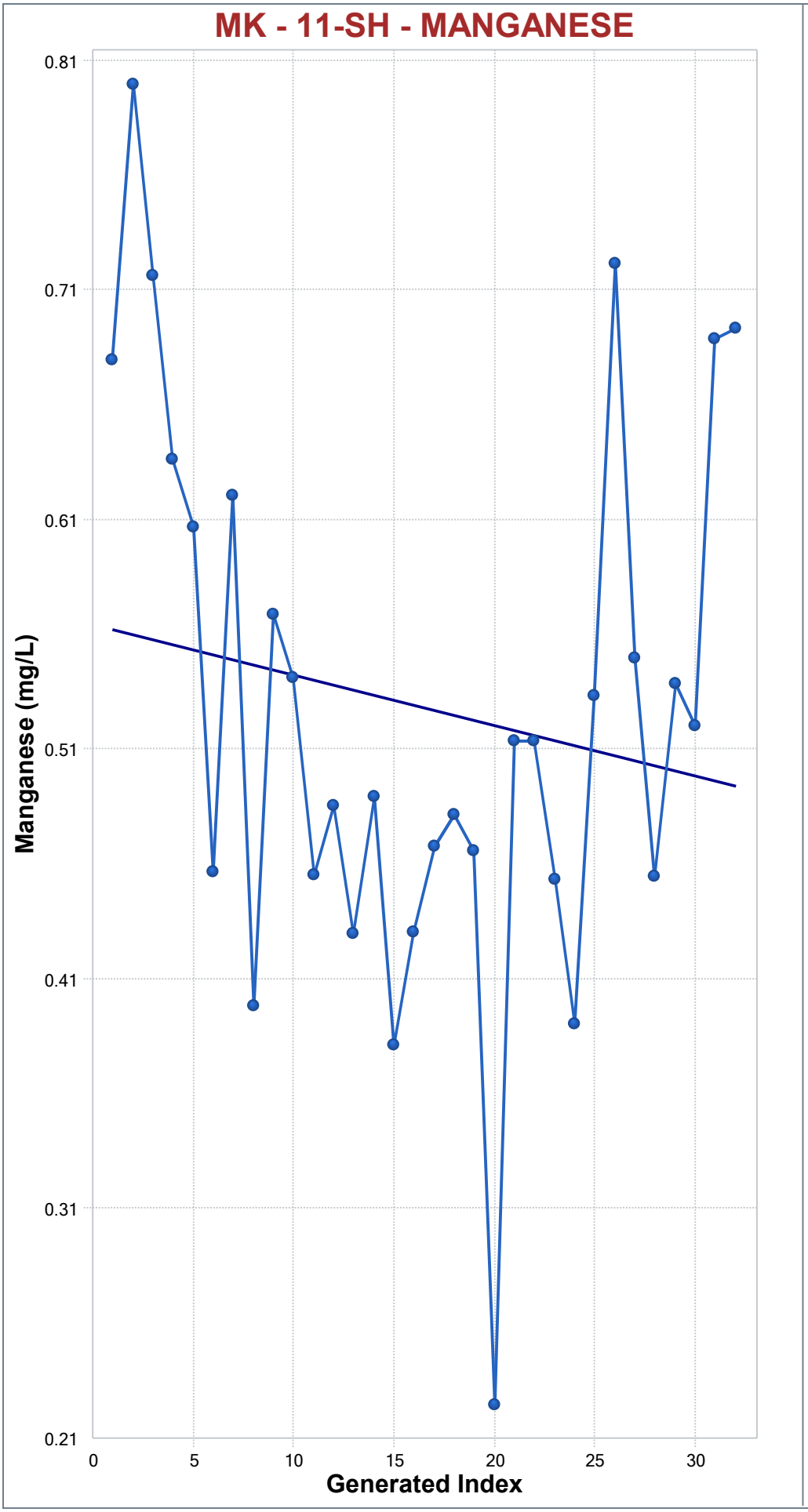
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.5974
Standardized Value of S	4.7217
M-K Test Value (S)	391
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.2127
OLS Regression Intercept	22.9803

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



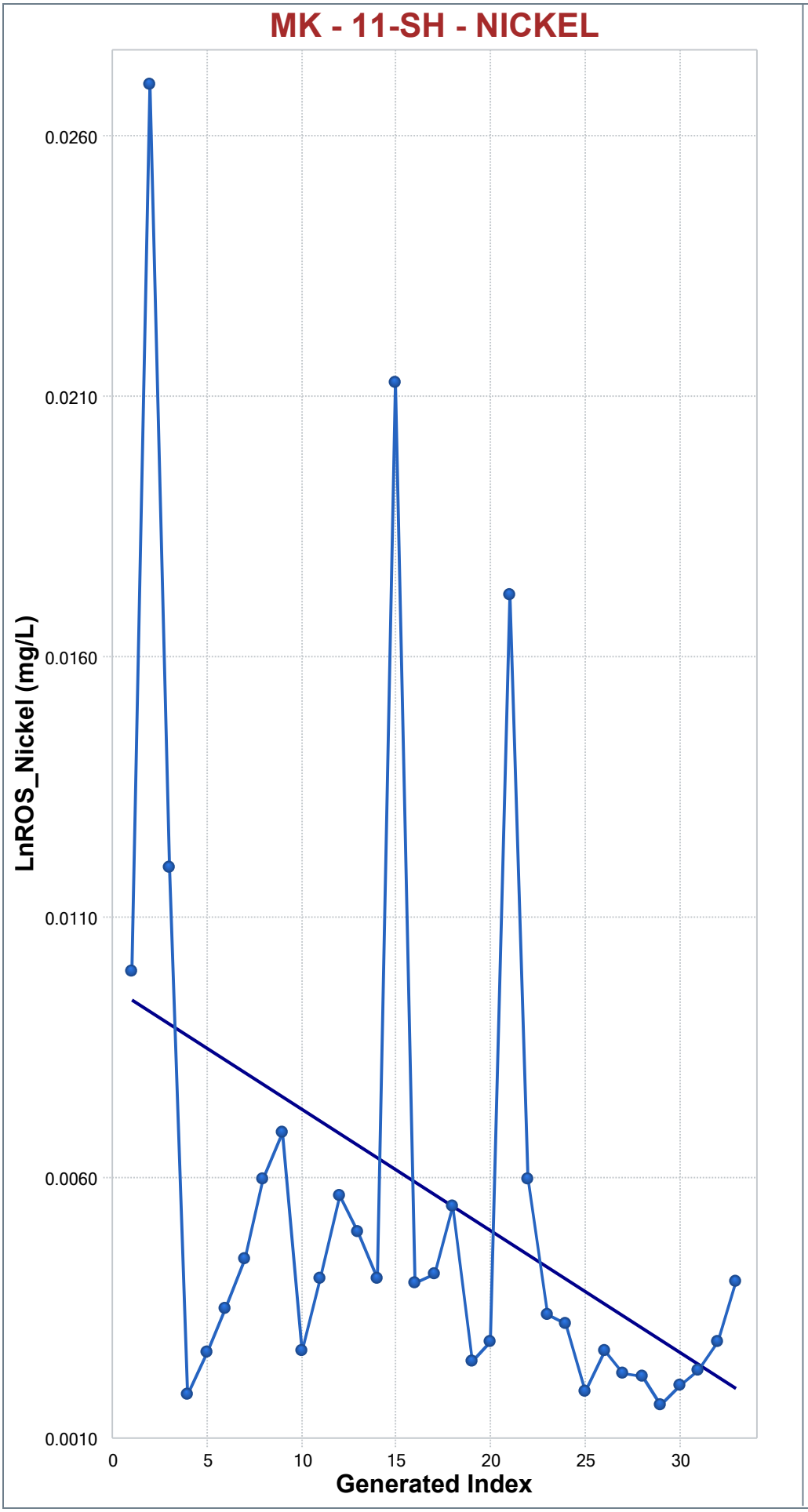
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	-0.6812
M-K Test Value (S)	-43
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2479

OLS Regression Line (Blue)

OLS Regression Slope	-0.0022
OLS Regression Intercept	0.5661

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



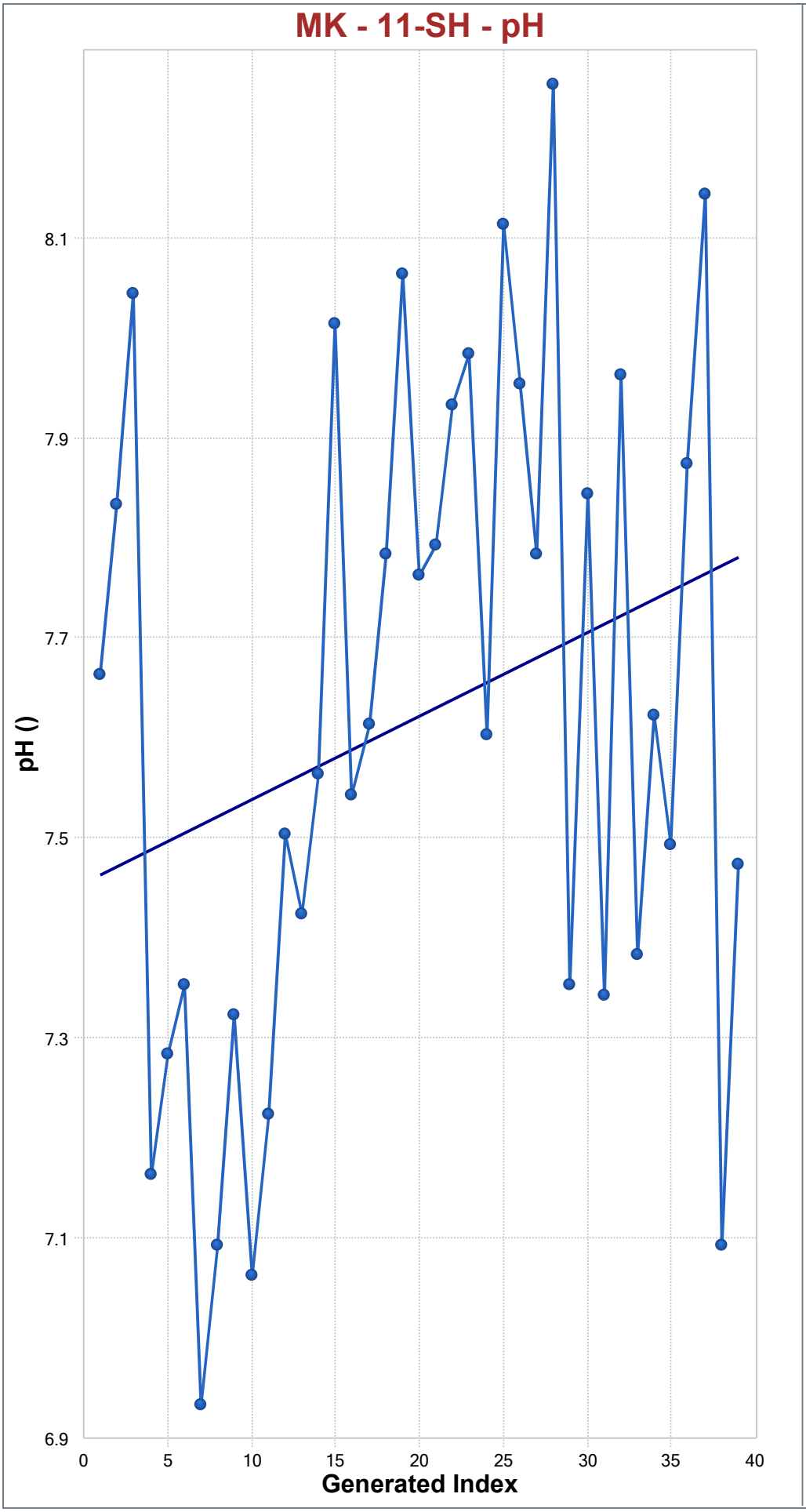
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5161
Standardized Value of S	-2.9760
M-K Test Value (S)	-193
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0015

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0097

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



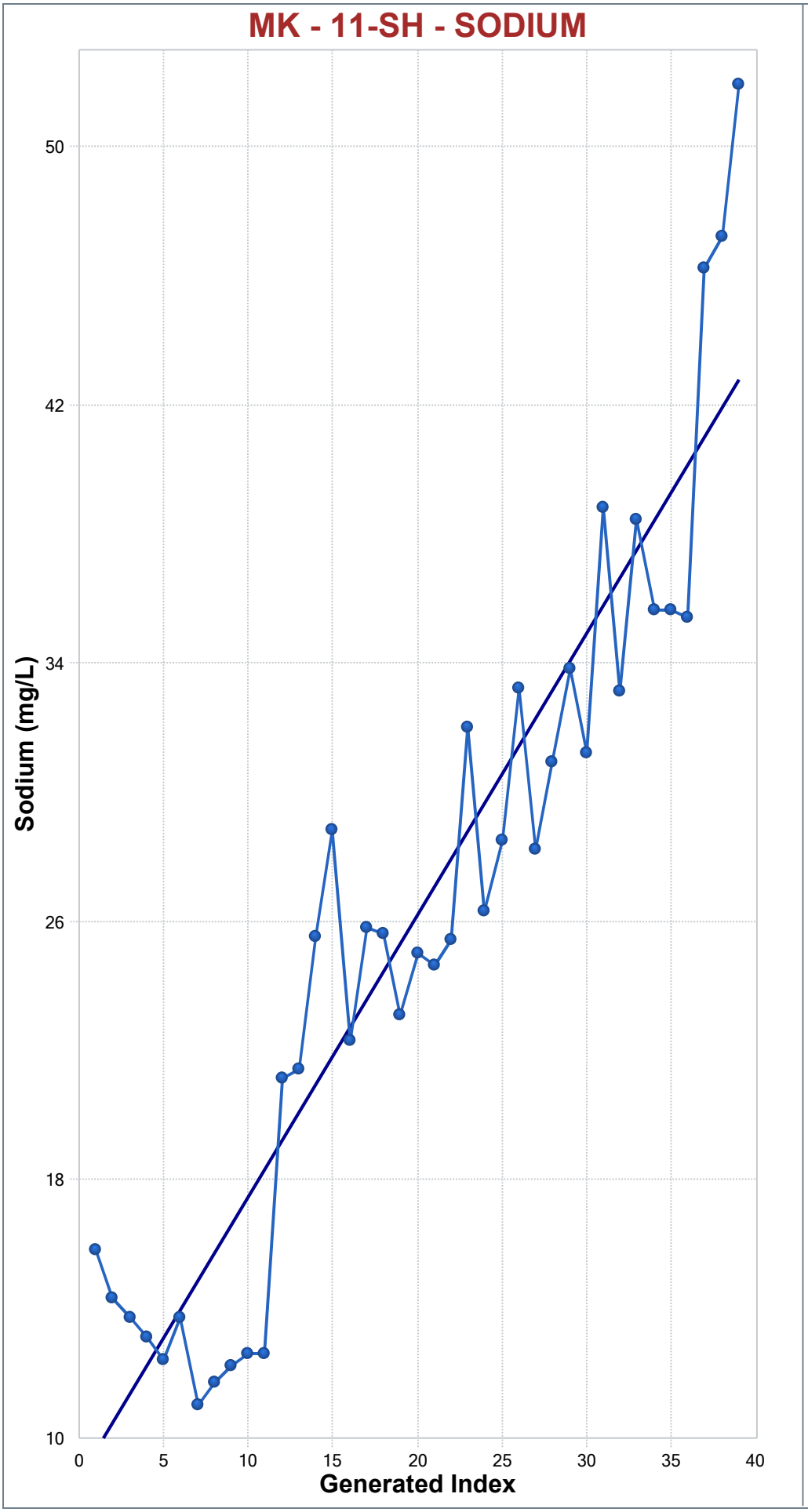
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6478
Standardized Value of S	1.9480
M-K Test Value (S)	162
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0257

OLS Regression Line (Blue)

OLS Regression Slope	0.0084
OLS Regression Intercept	7.4213

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



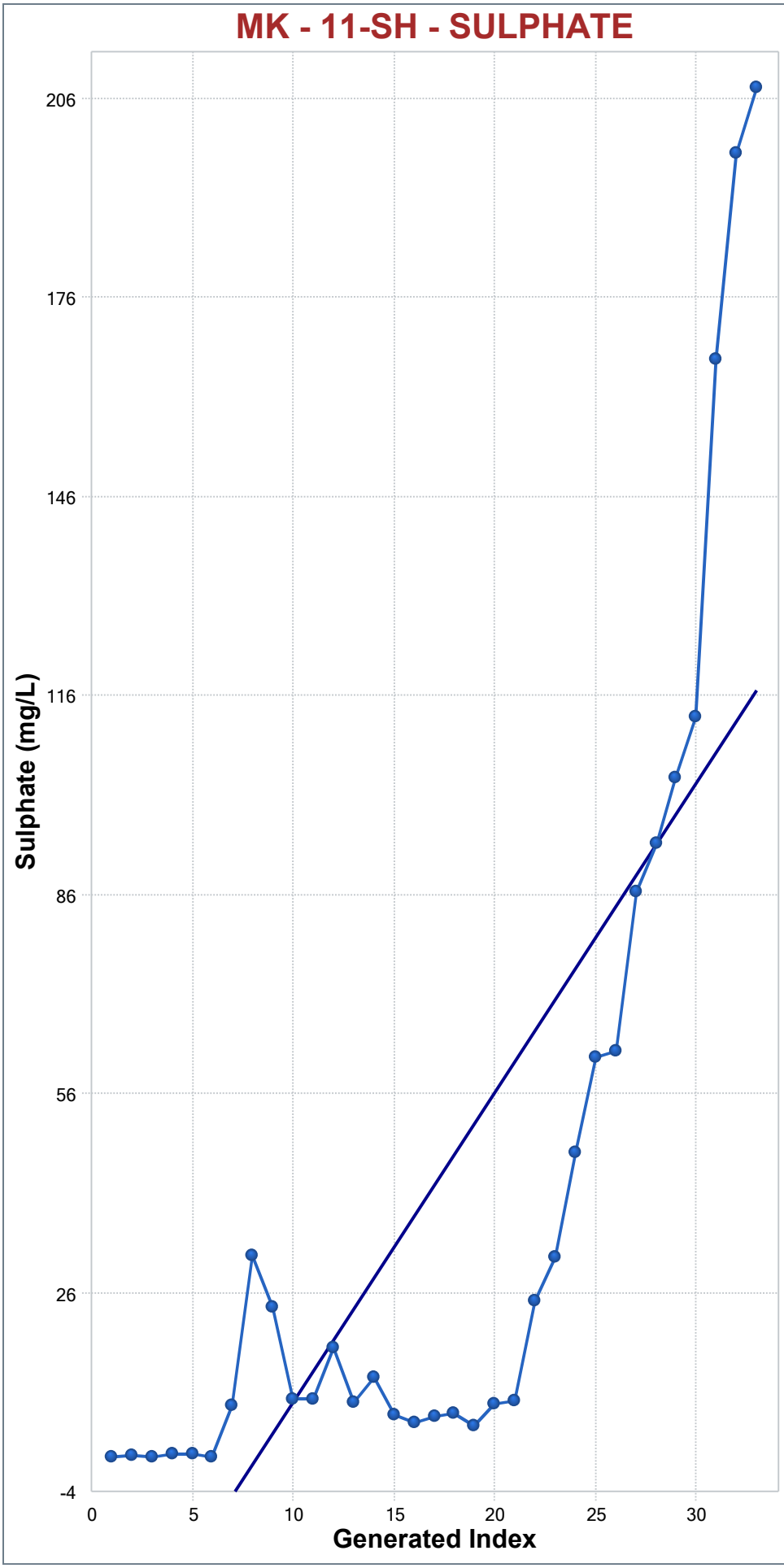
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6478
Standardized Value of S	6.8120
M-K Test Value (S)	564
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.8767
OLS Regression Intercept	8.7690

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



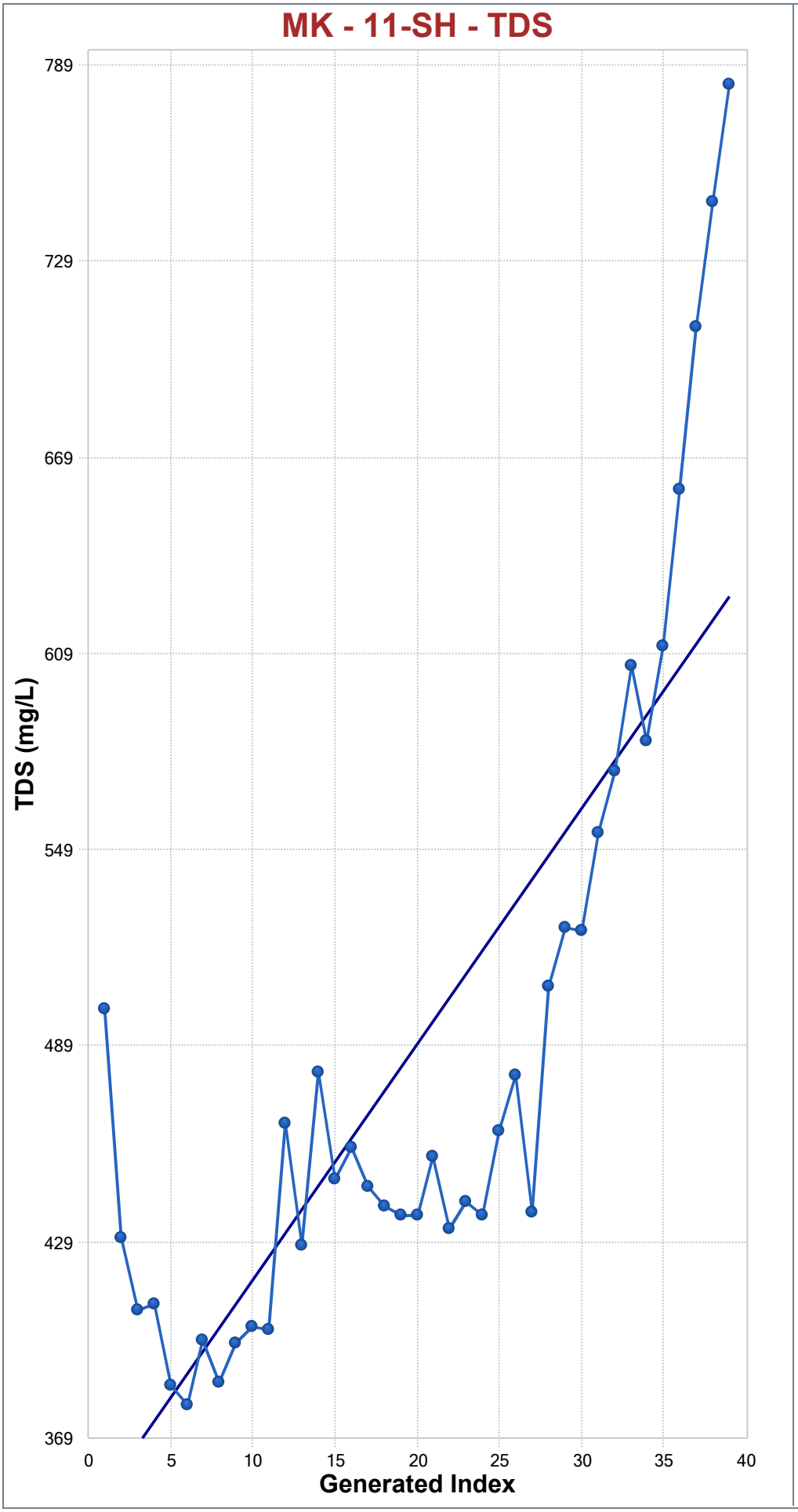
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5161
Standardized Value of S	5.6110
M-K Test Value (S)	363
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	4.6839
OLS Regression Intercept	-37.4266

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



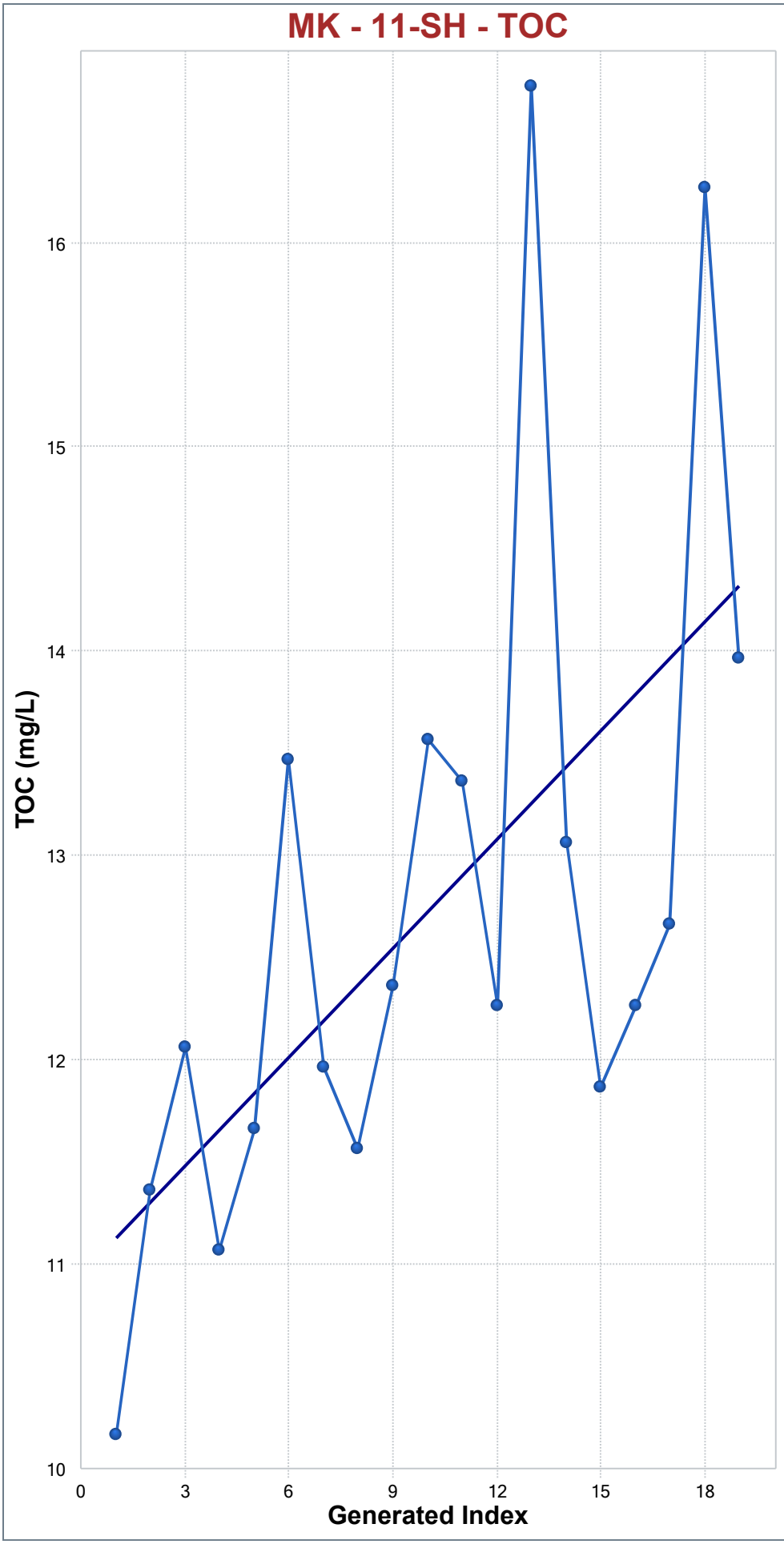
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6438
Standardized Value of S	5.9896
M-K Test Value (S)	496
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	7.2370
OLS Regression Intercept	344.1309

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



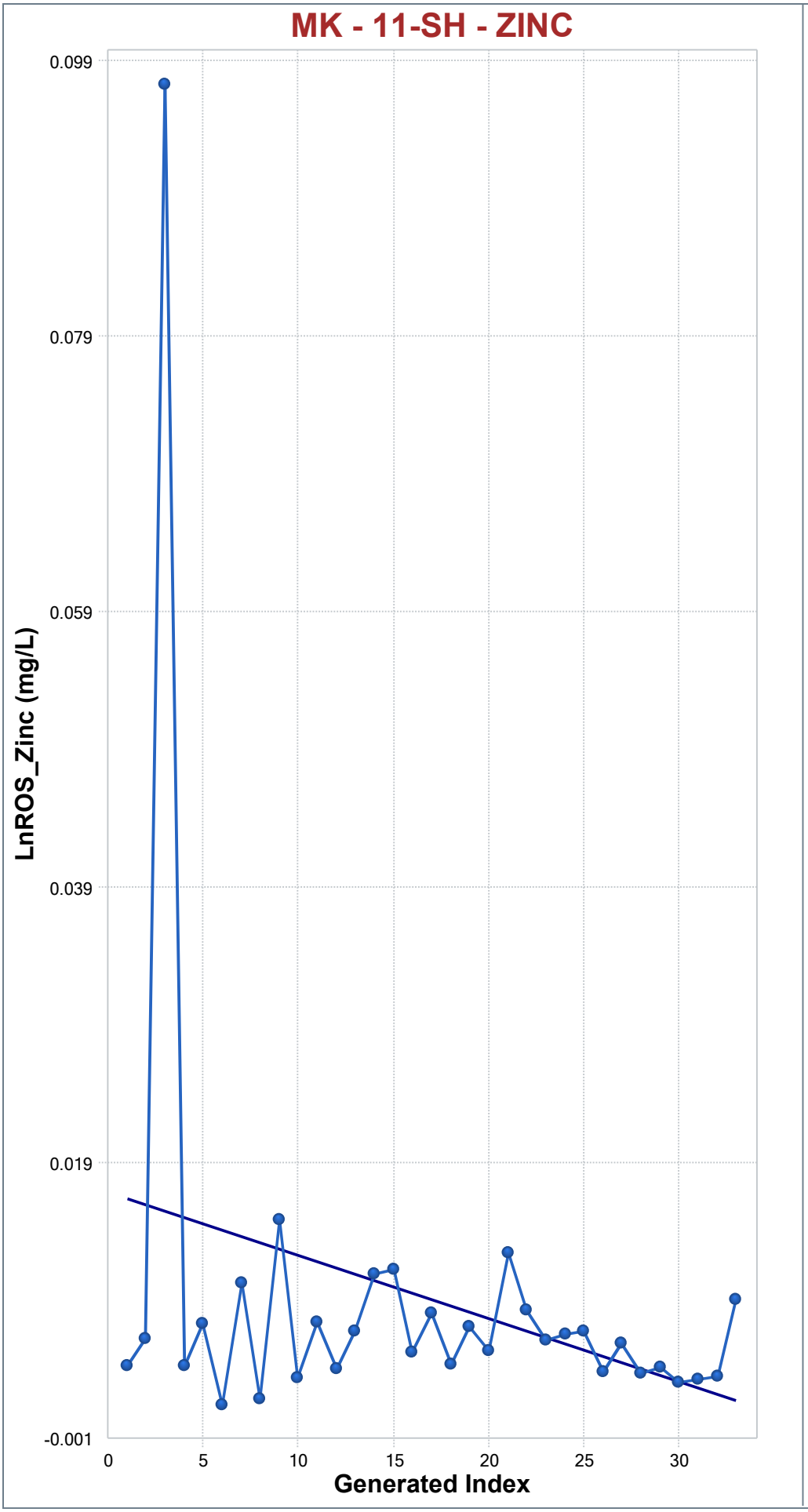
Mann-Kendall Trend Analysis

n	19
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	28.5657
Standardized Value of S	2.9056
M-K Test Value (S)	84
Tabulated p-value	0.0010
Approximate p-value	0.0018

OLS Regression Line (Blue)

OLS Regression Slope	0.1772
OLS Regression Intercept	11.3860

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



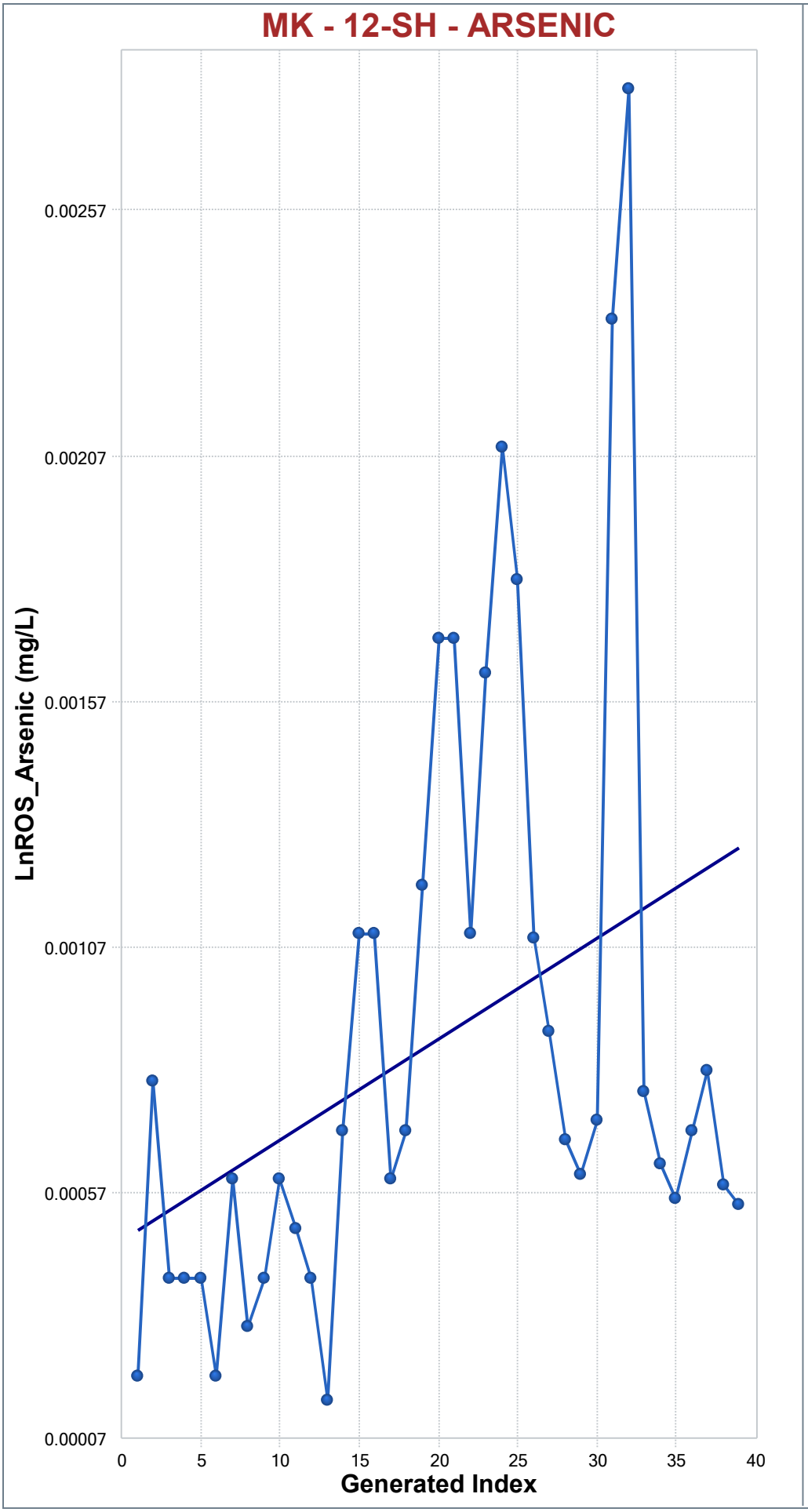
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5239
Standardized Value of S	-1.1624
M-K Test Value (S)	-76
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1225

OLS Regression Line (Blue)

OLS Regression Slope	-0.0005
OLS Regression Intercept	0.0165

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



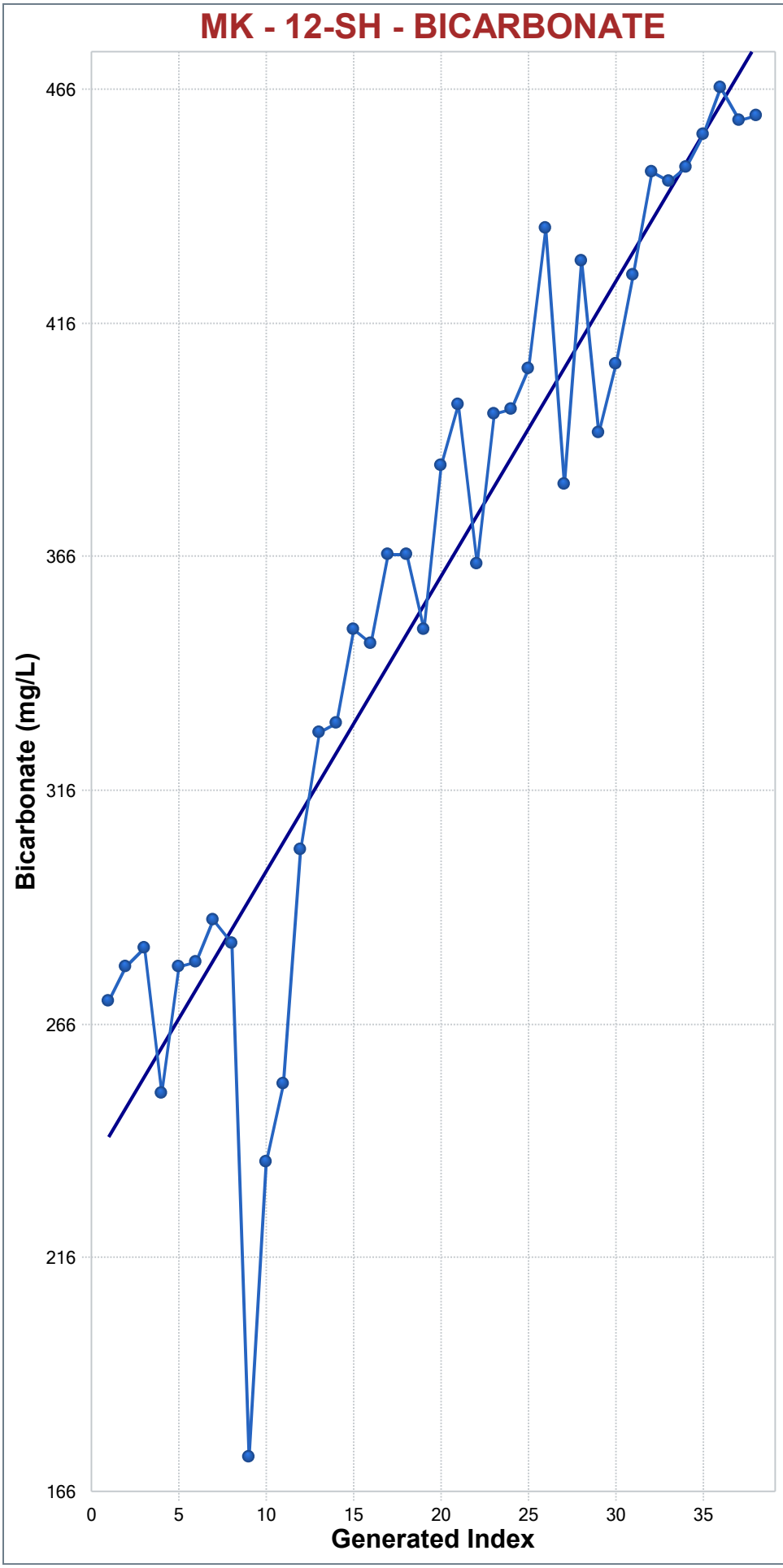
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.4864
Standardized Value of S	2.6792
M-K Test Value (S)	222
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0037

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0005

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



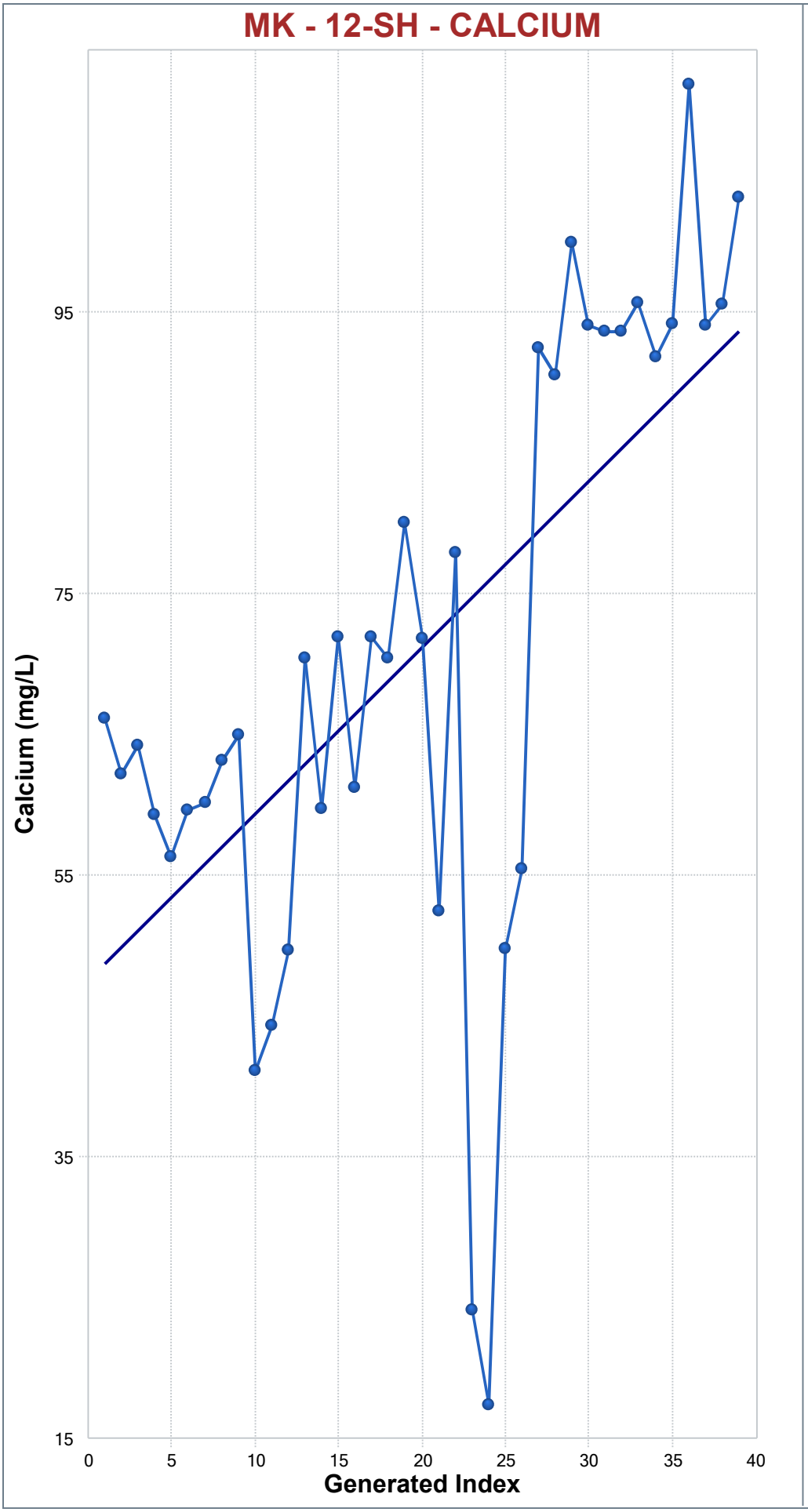
Mann-Kendall Trend Analysis

n	38
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	79.5299
Standardized Value of S	7.3432
M-K Test Value (S)	585
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	6.3133
OLS Regression Intercept	235.1142

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



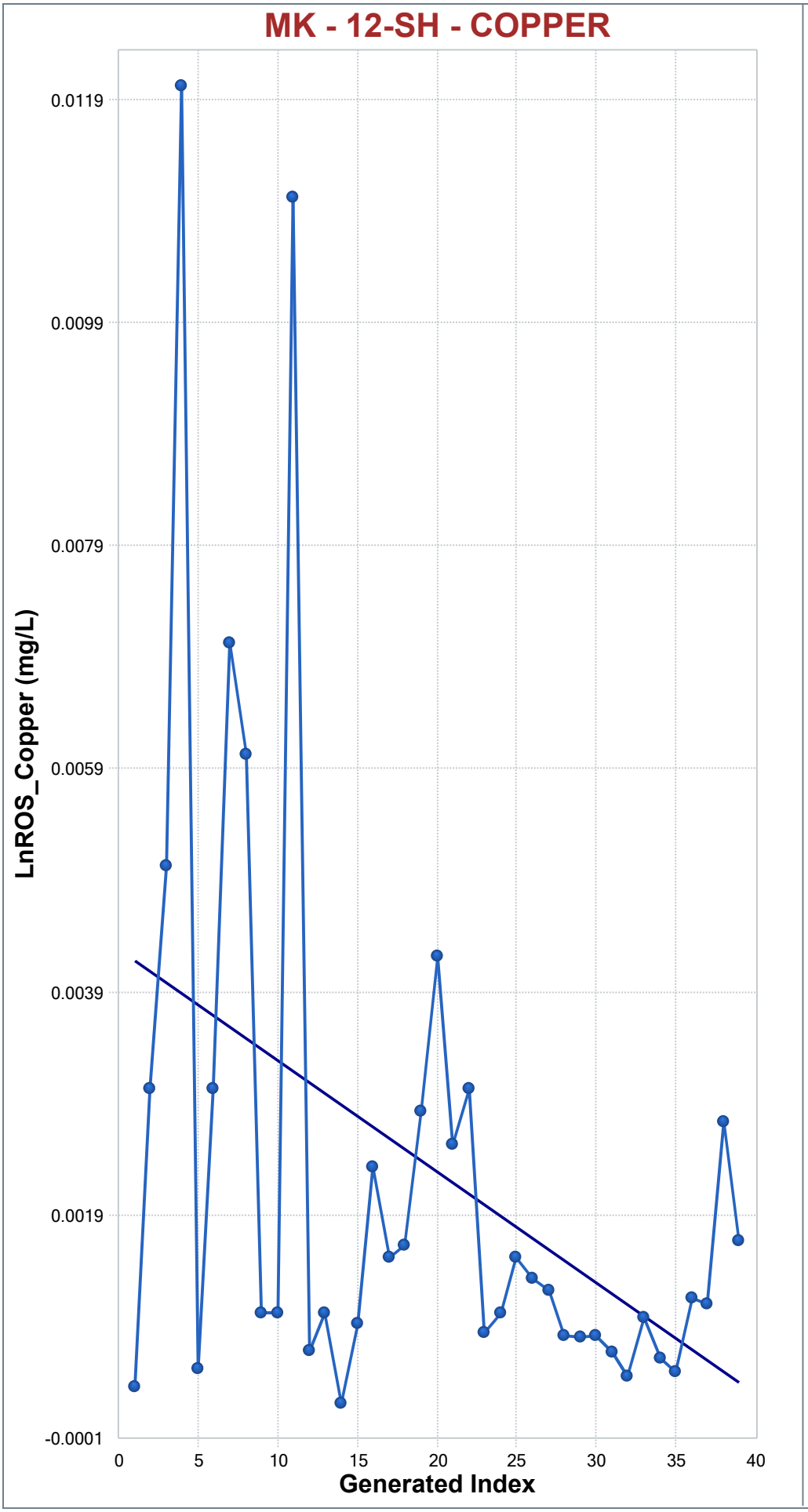
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6418
Standardized Value of S	4.3804
M-K Test Value (S)	363
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.1836
OLS Regression Intercept	47.3250

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



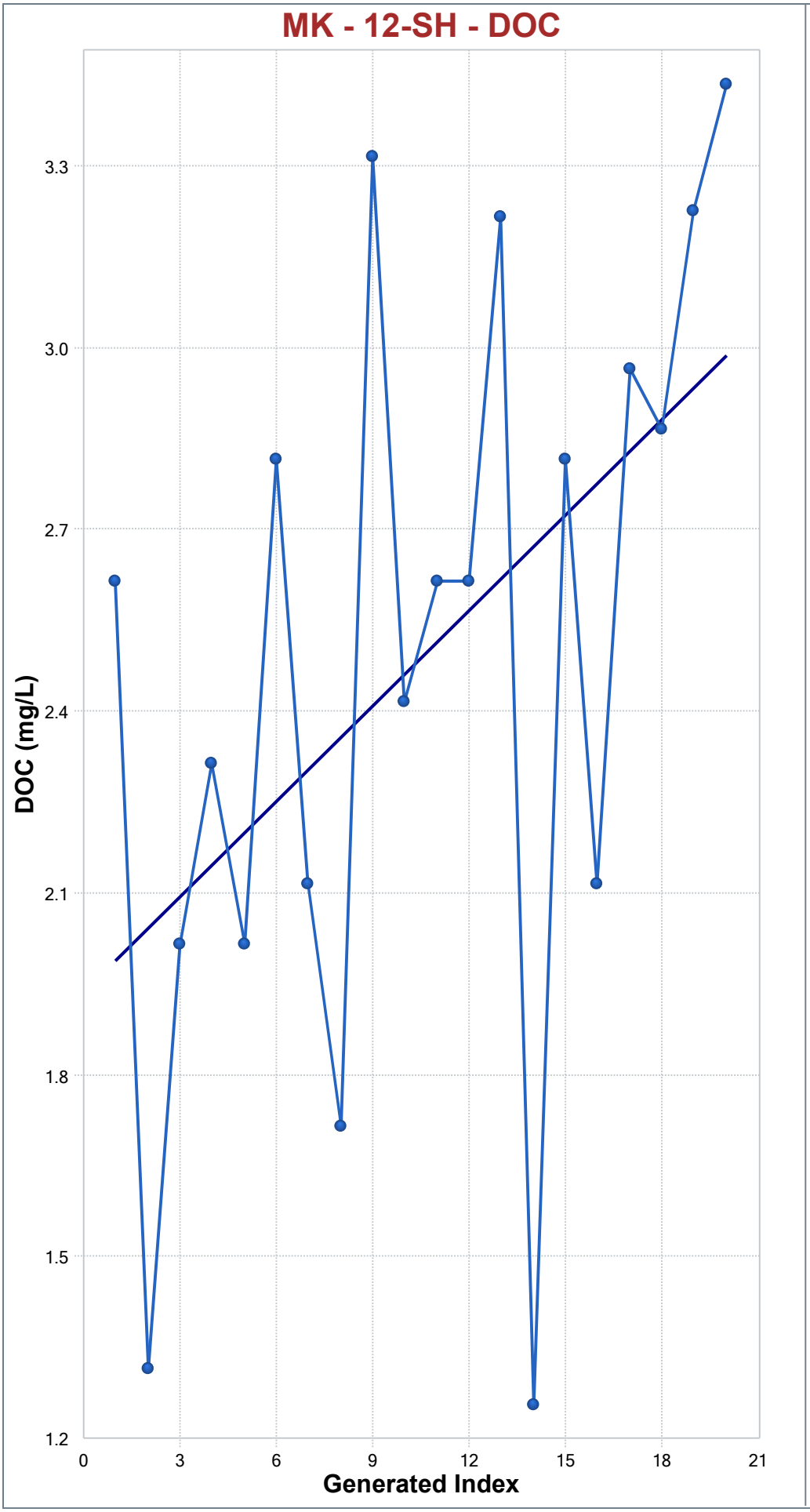
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.5793
Standardized Value of S	-2.0707
M-K Test Value (S)	-172
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0192

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0043

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



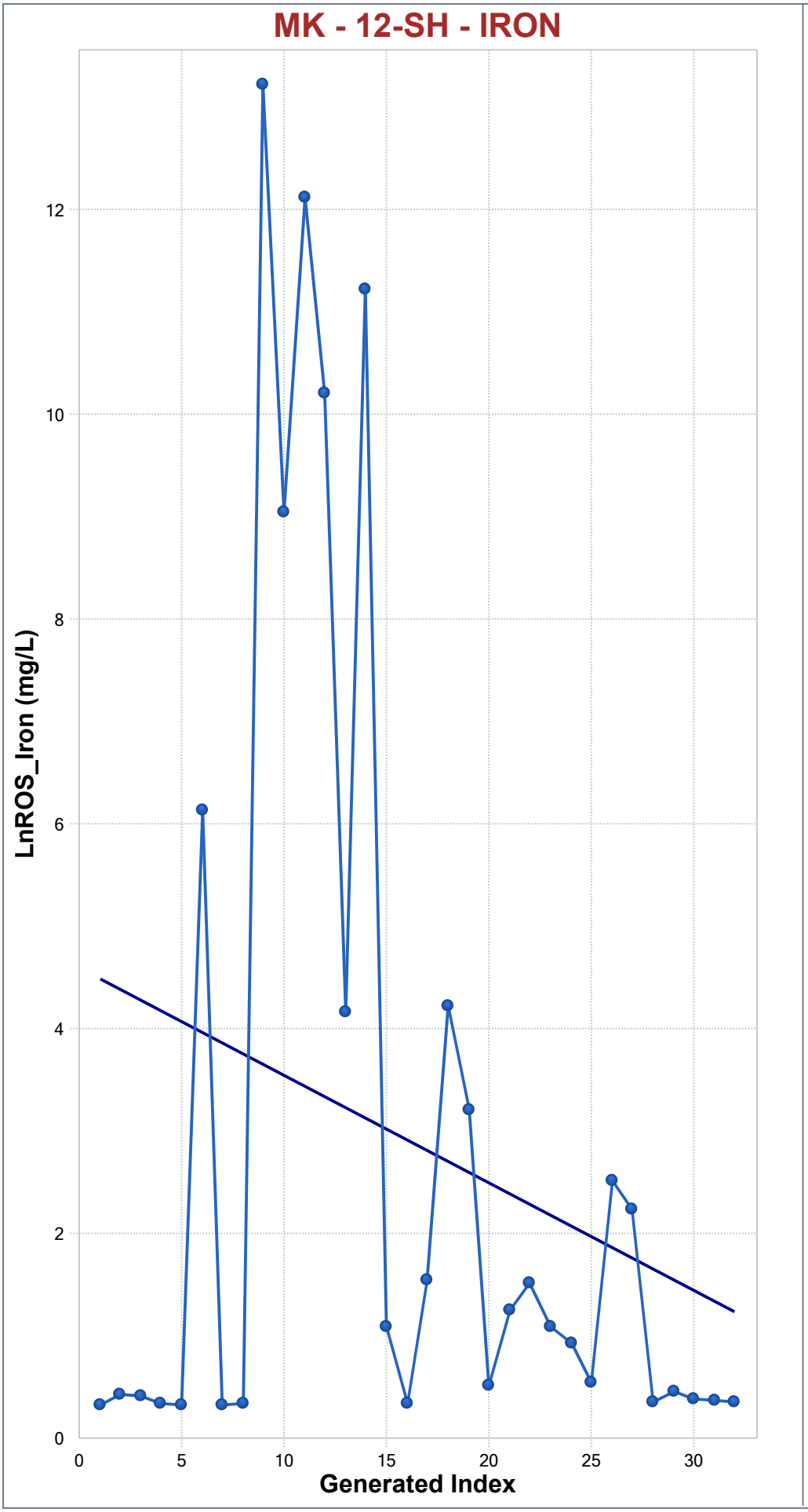
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7137
Standardized Value of S	2.5721
M-K Test Value (S)	80
Tabulated p-value	0.0050
Approximate p-value	0.0051

OLS Regression Line (Blue)

OLS Regression Slope	0.0526
OLS Regression Intercept	1.9214

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



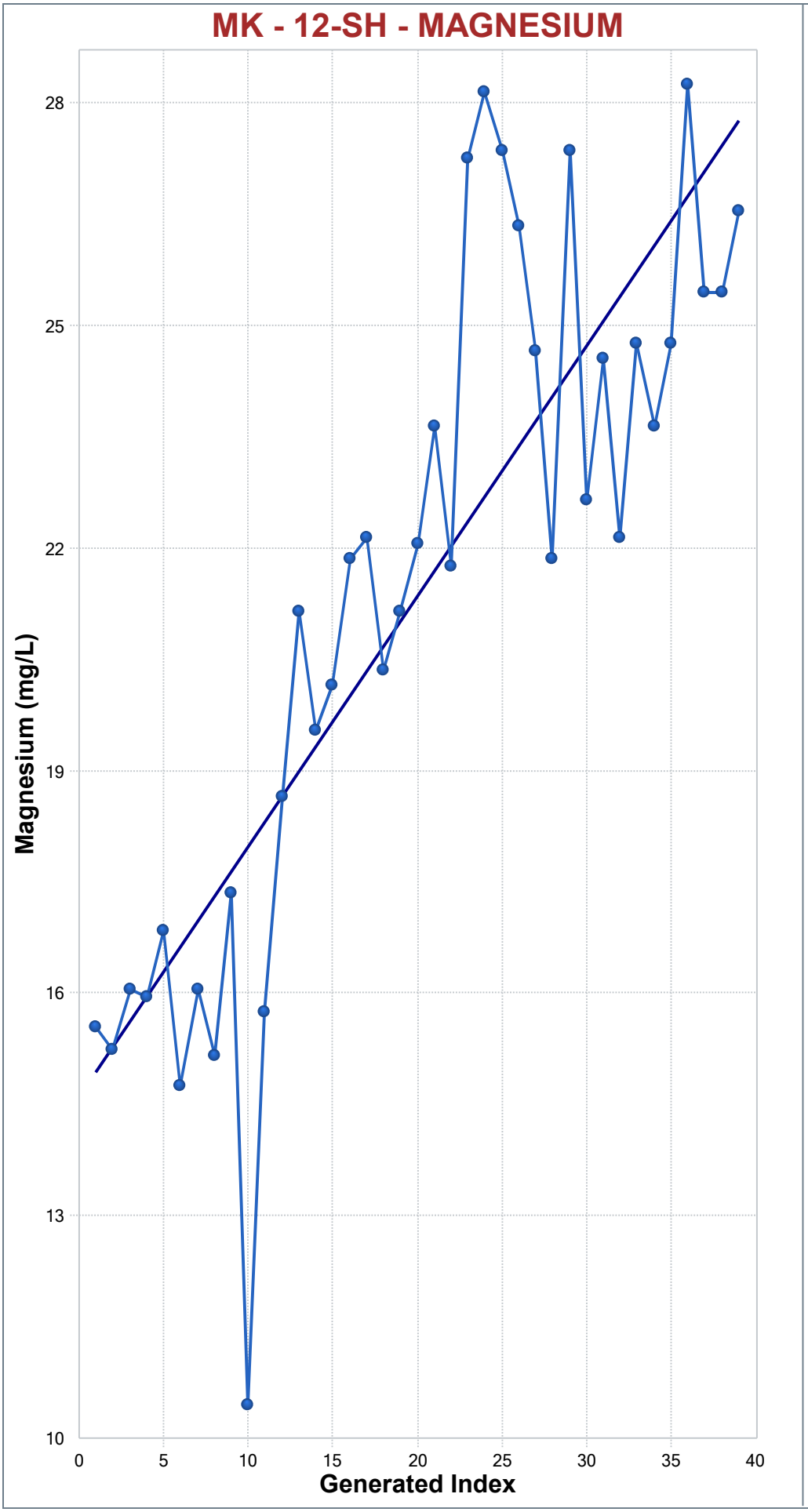
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	-0.5190
M-K Test Value (S)	-33
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3019

OLS Regression Line (Blue)

OLS Regression Slope	-0.1052
OLS Regression Intercept	4.2747

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



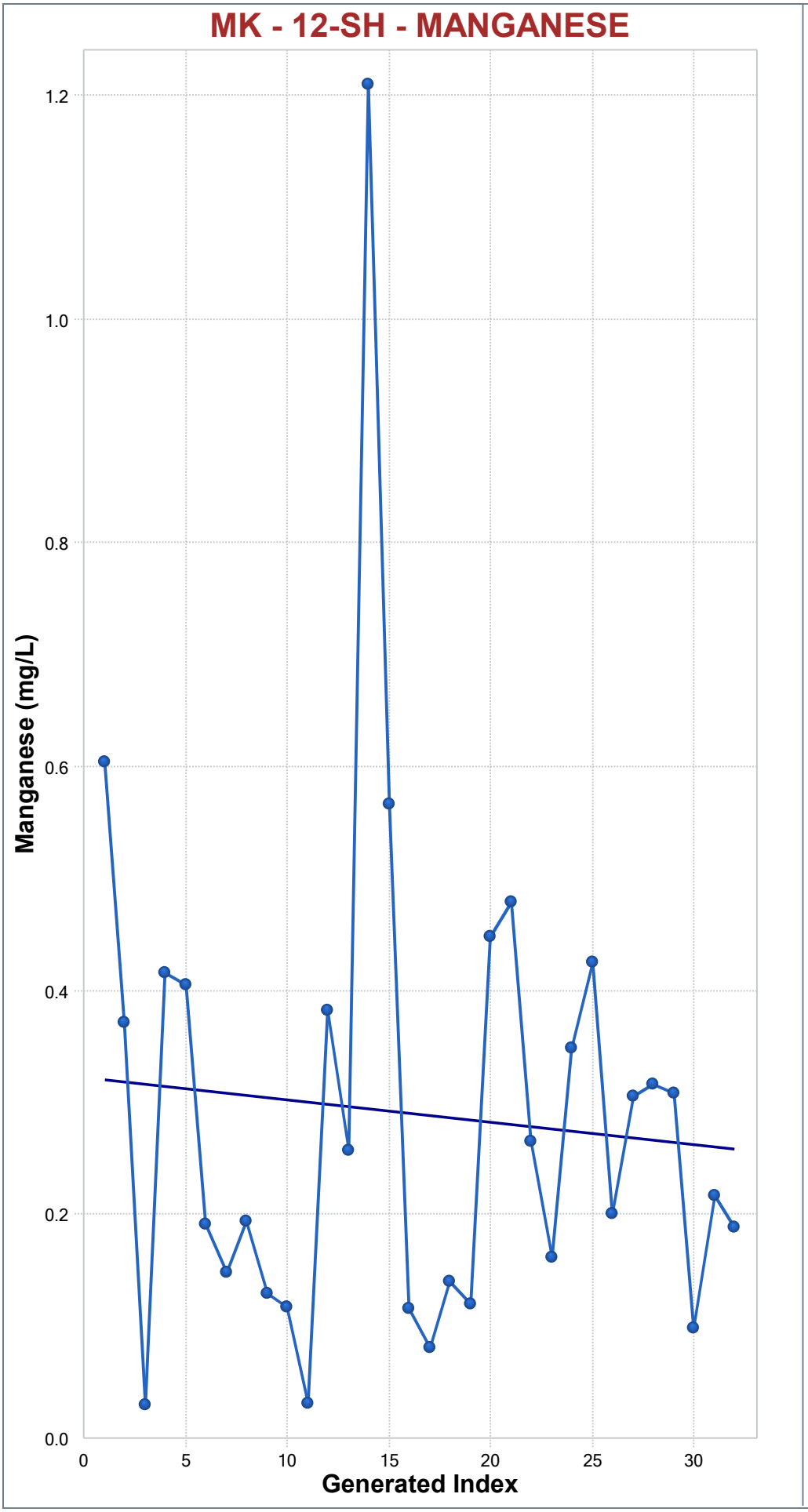
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6176
Standardized Value of S	6.1004
M-K Test Value (S)	505
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.3376
OLS Regression Intercept	14.5507

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



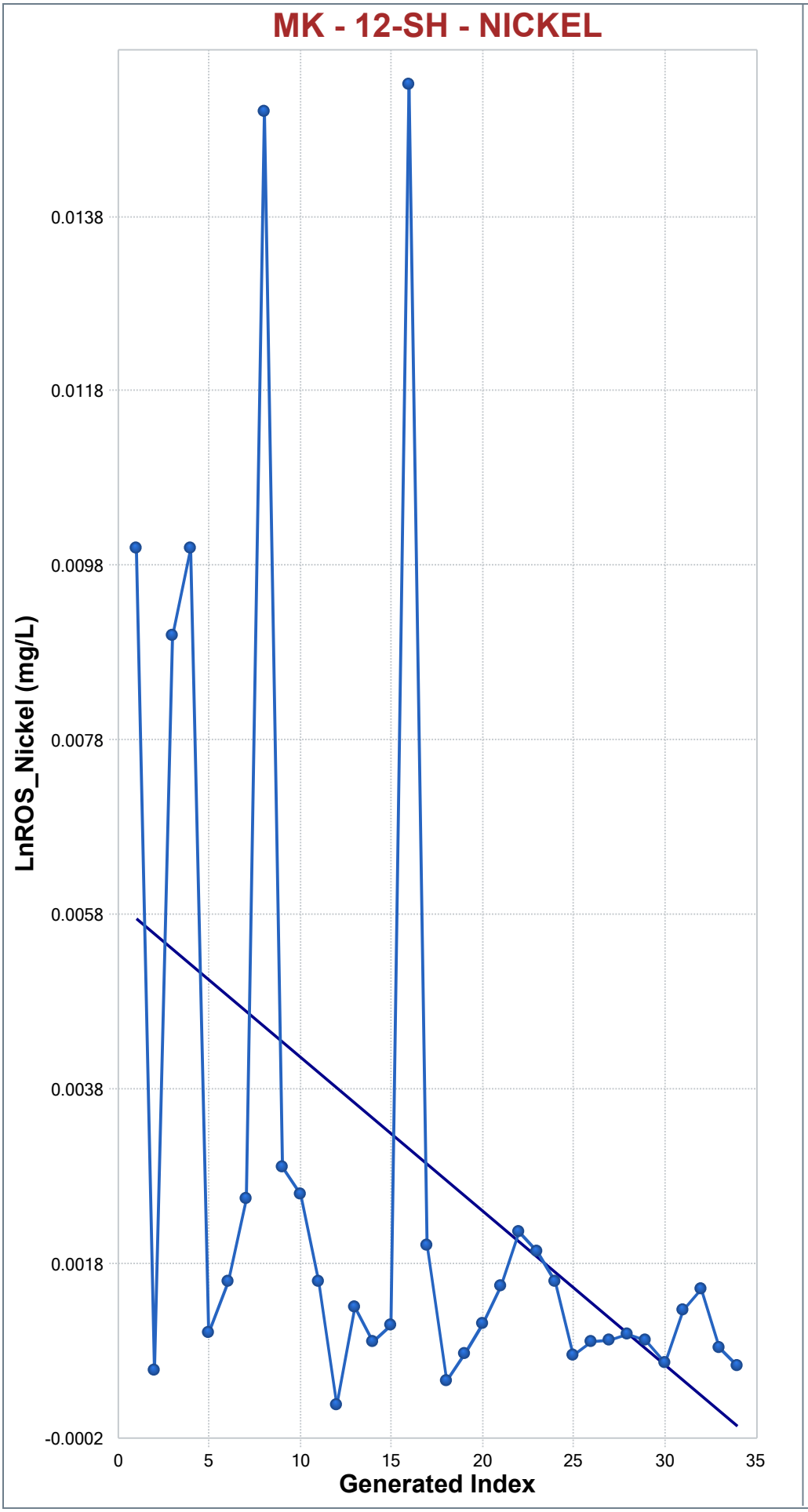
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6658
Standardized Value of S	-0.2108
M-K Test Value (S)	-14
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4165

OLS Regression Line (Blue)

OLS Regression Slope	-0.0020
OLS Regression Intercept	0.3034

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



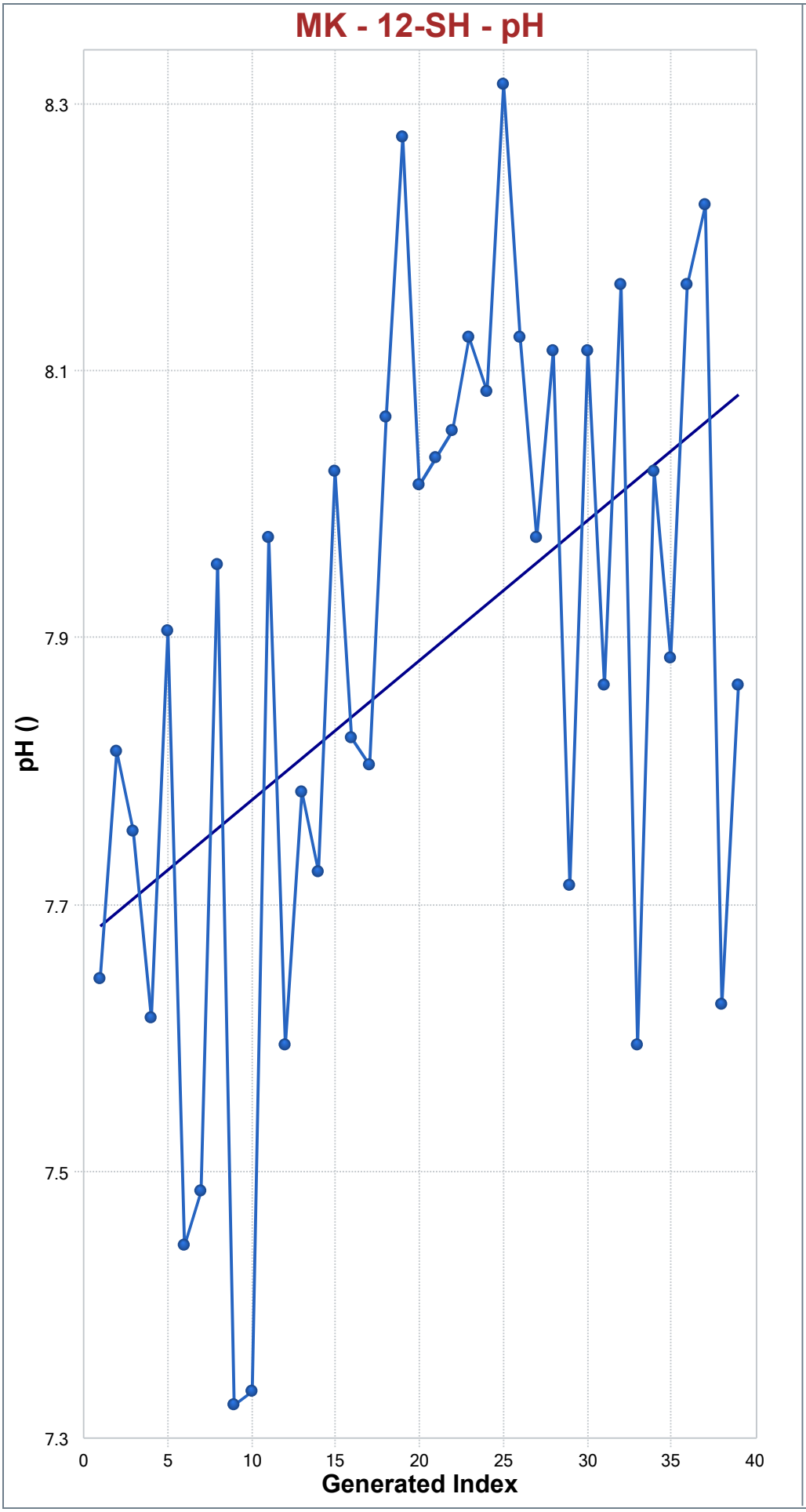
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4265
Standardized Value of S	-2.6992
M-K Test Value (S)	-183
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0035

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0059

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



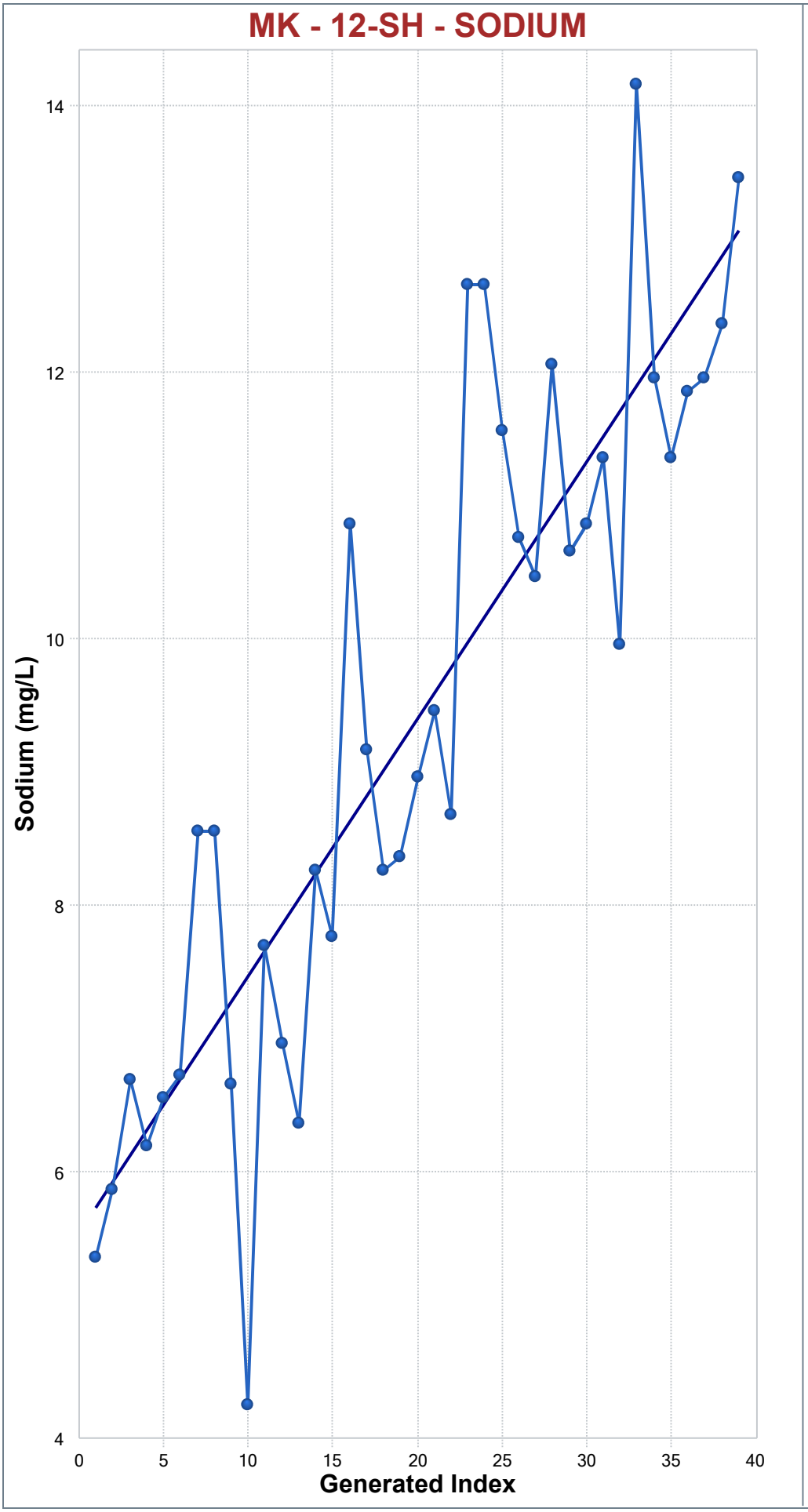
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6236
Standardized Value of S	3.1347
M-K Test Value (S)	260
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0009

OLS Regression Line (Blue)

OLS Regression Slope	0.0105
OLS Regression Intercept	7.7185

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



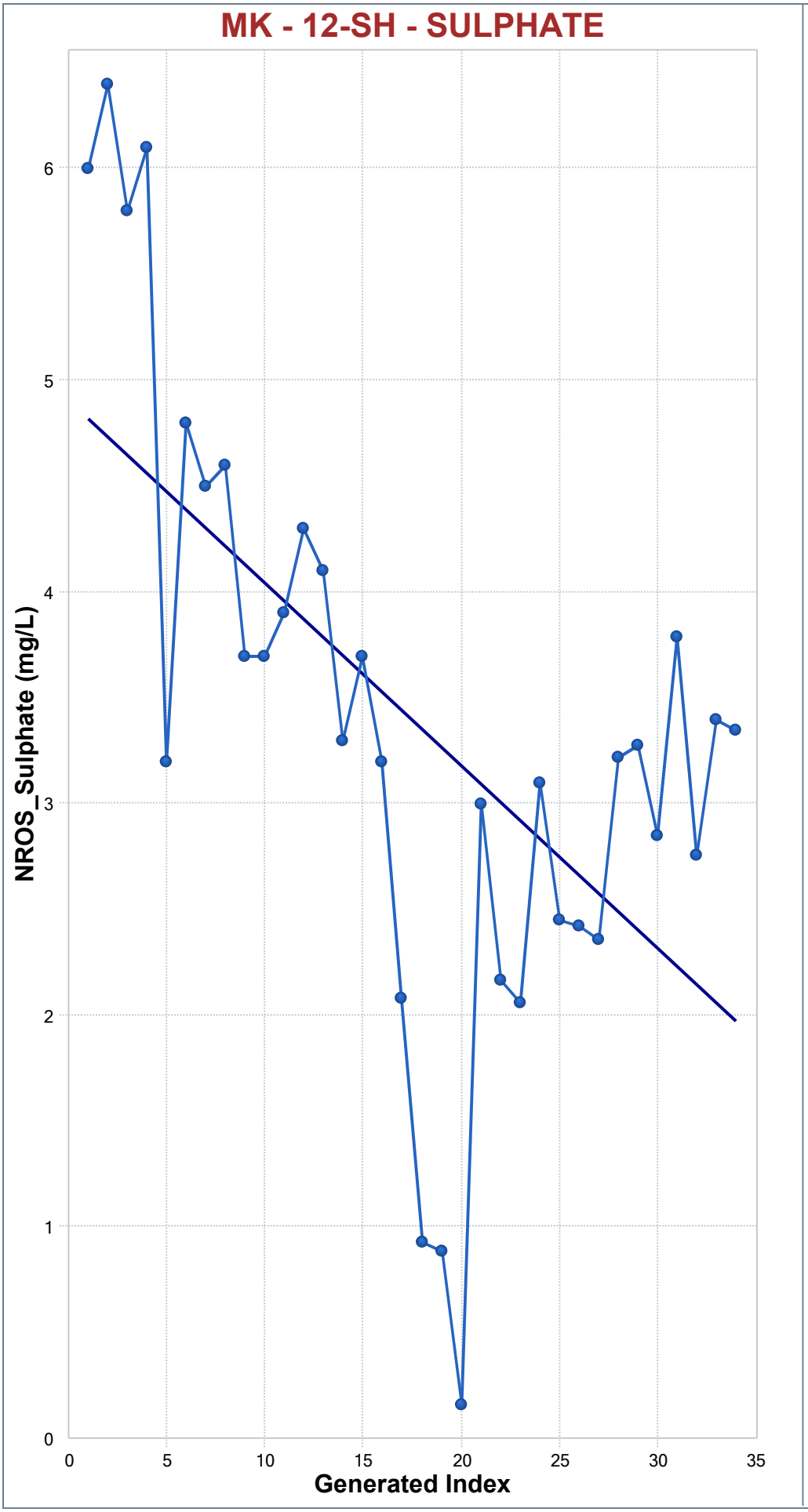
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6297
Standardized Value of S	6.2447
M-K Test Value (S)	517
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.1930
OLS Regression Intercept	5.1730

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



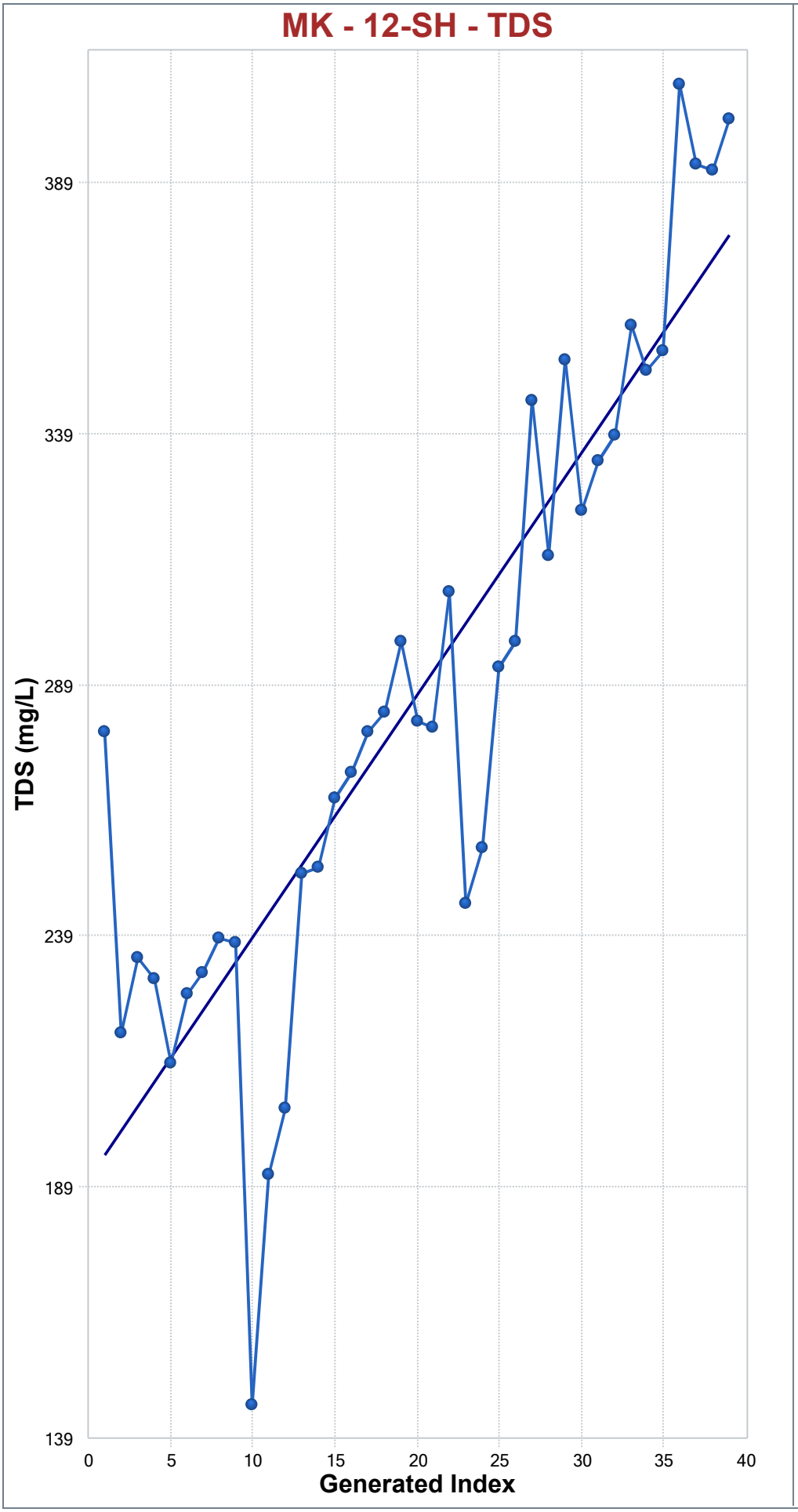
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4216
Standardized Value of S	-3.5004
M-K Test Value (S)	-237
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0002

OLS Regression Line (Blue)

OLS Regression Slope	-0.0863
OLS Regression Intercept	4.9096

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



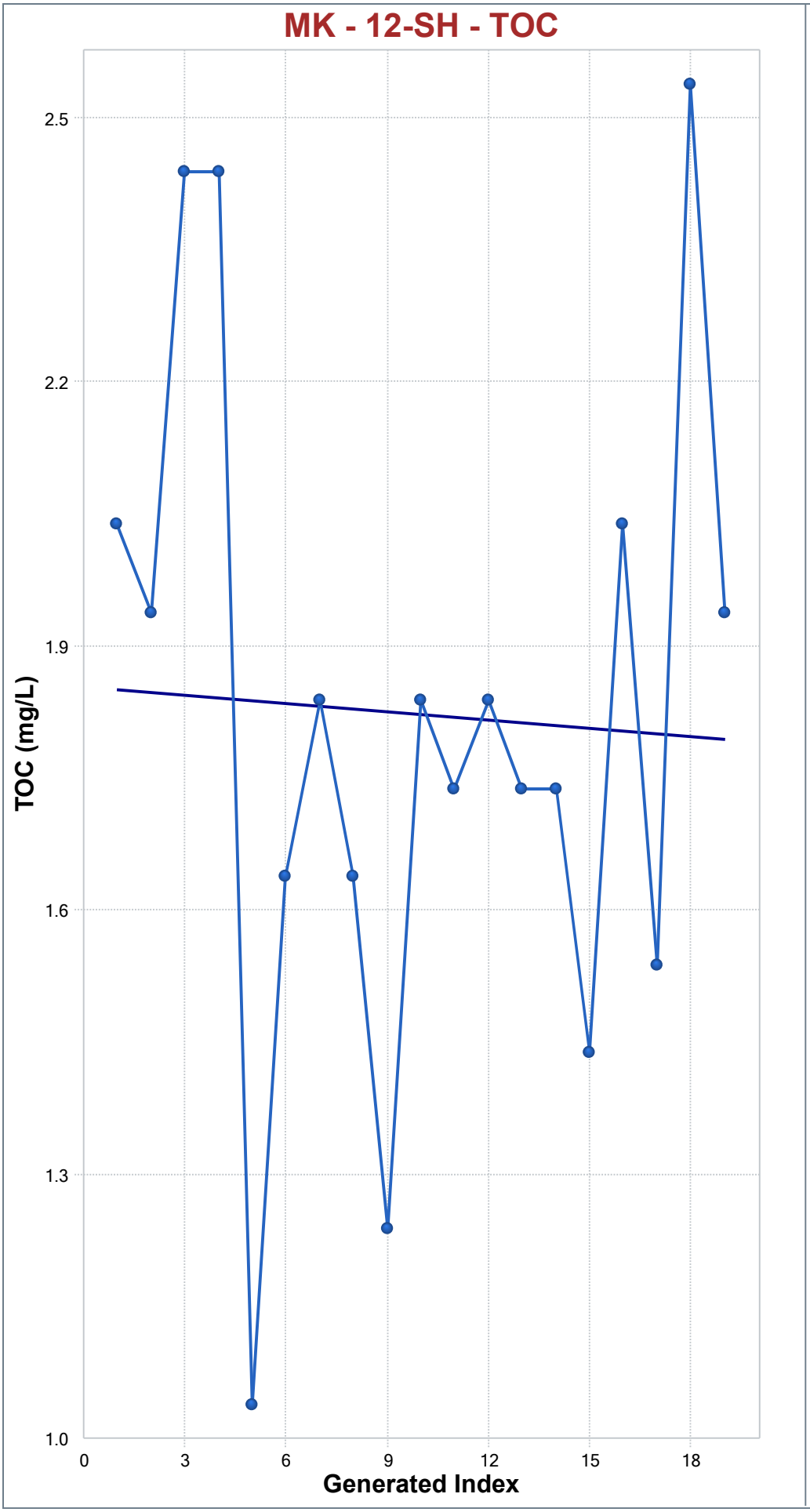
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6539
Standardized Value of S	6.7752
M-K Test Value (S)	561
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	4.8155
OLS Regression Intercept	191.0804

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



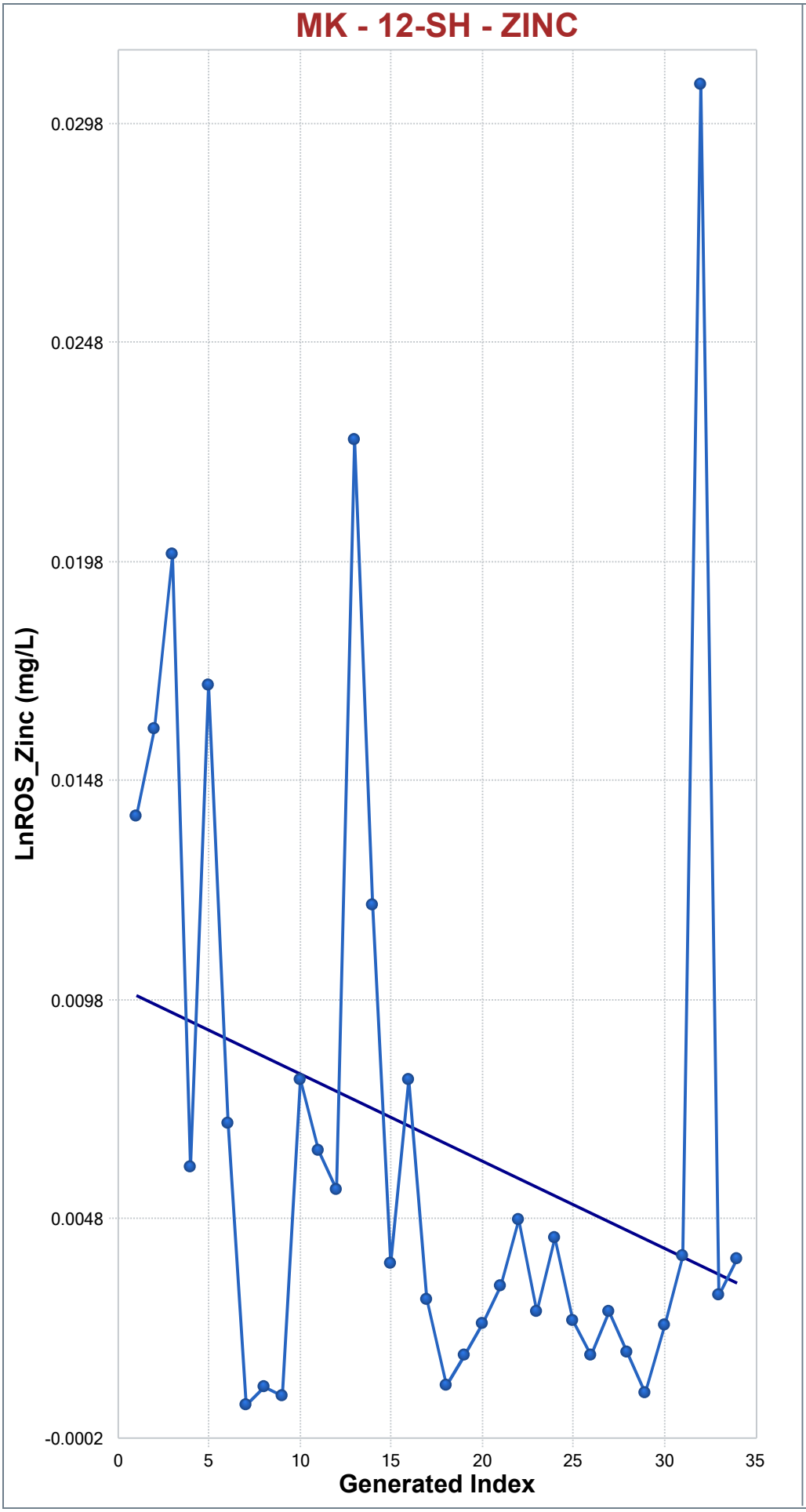
Mann-Kendall Trend Analysis

n	19
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	28.3843
Standardized Value of S	-0.2818
M-K Test Value (S)	-9
Tabulated p-value	0.3910
Approximate p-value	0.3890

OLS Regression Line (Blue)

OLS Regression Slope	-0.0032
OLS Regression Intercept	1.8158

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



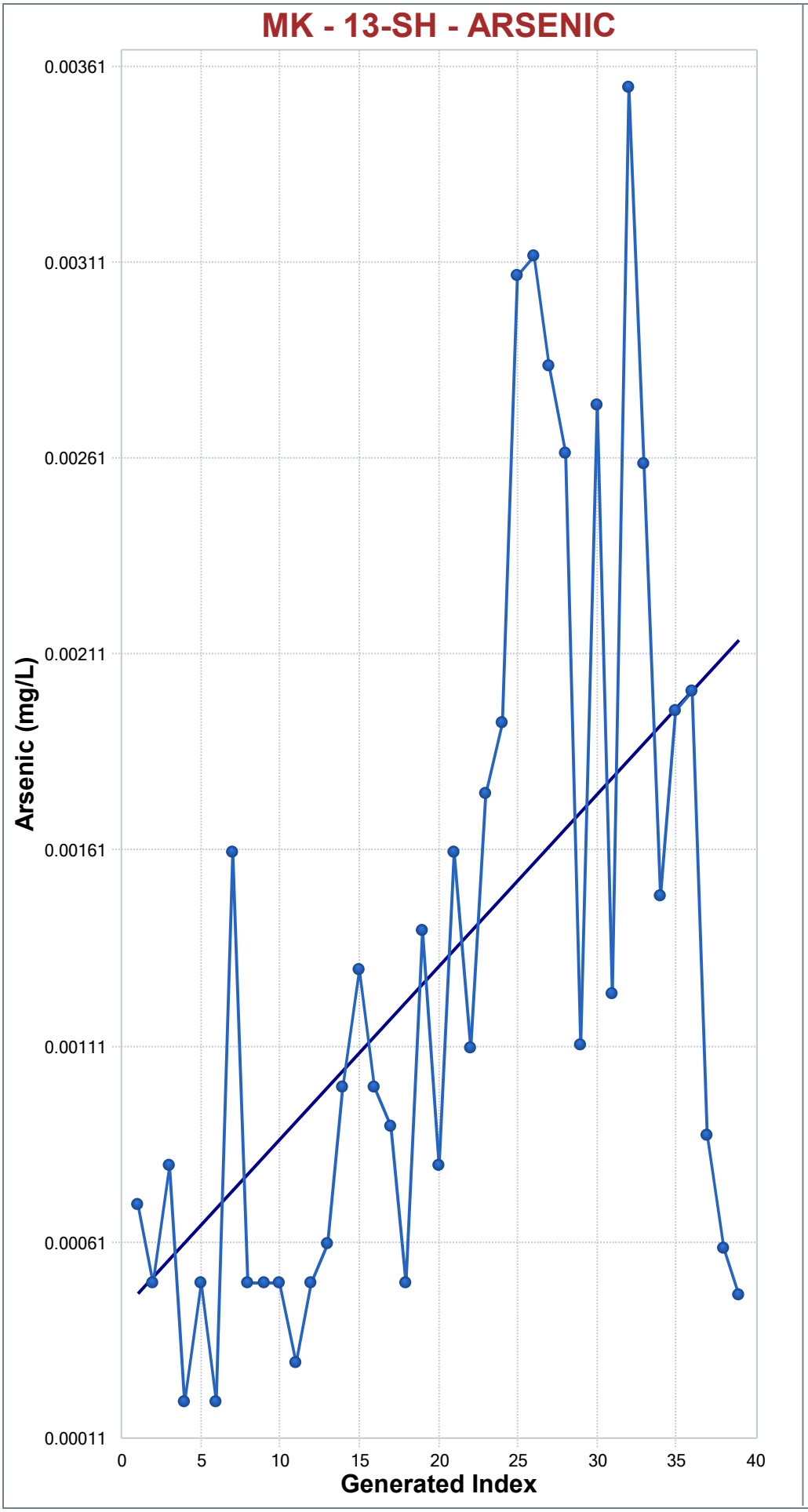
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4413
Standardized Value of S	-2.0166
M-K Test Value (S)	-137
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0219

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0101

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



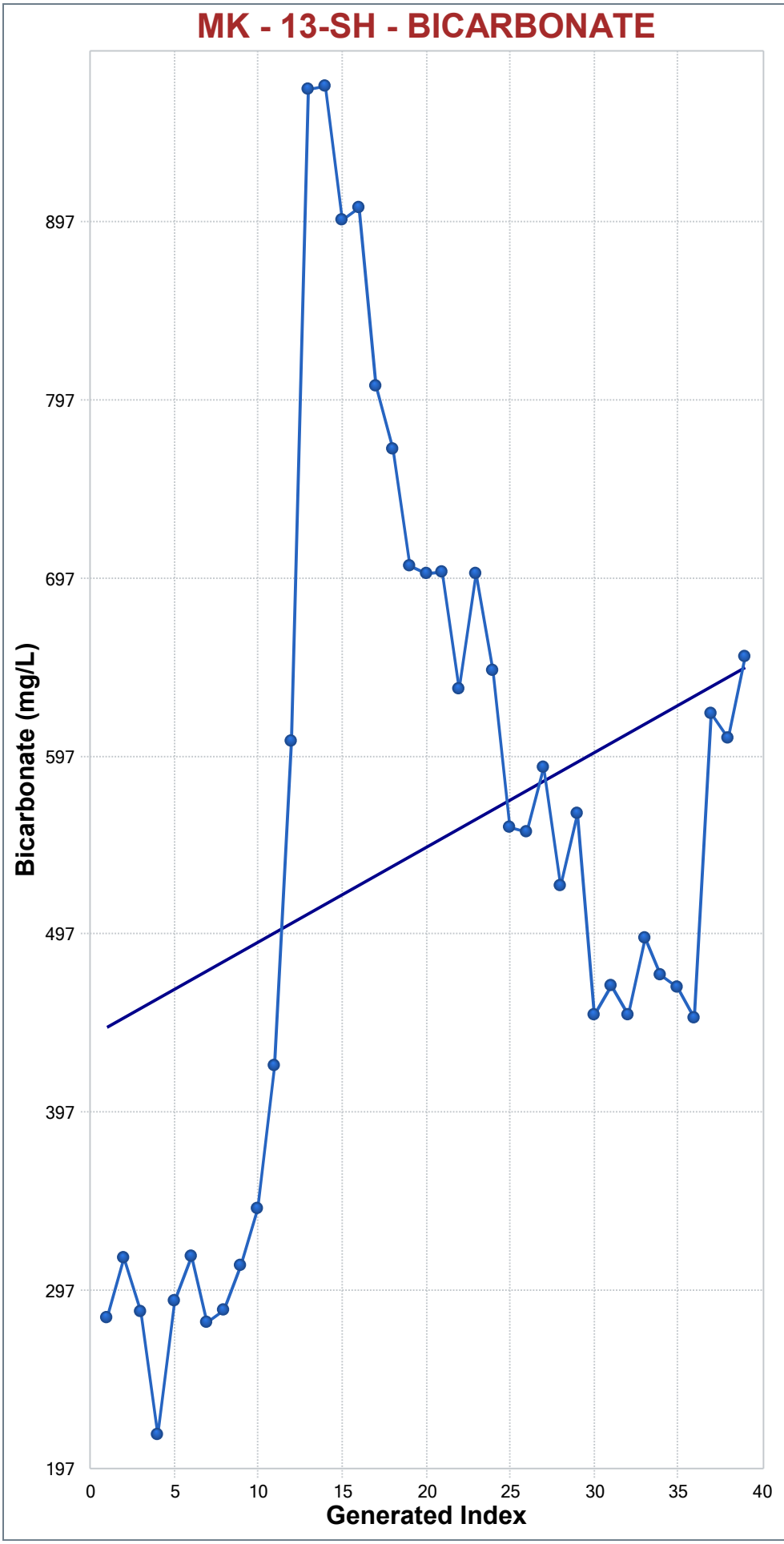
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.3731
Standardized Value of S	3.7269
M-K Test Value (S)	308
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0004

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



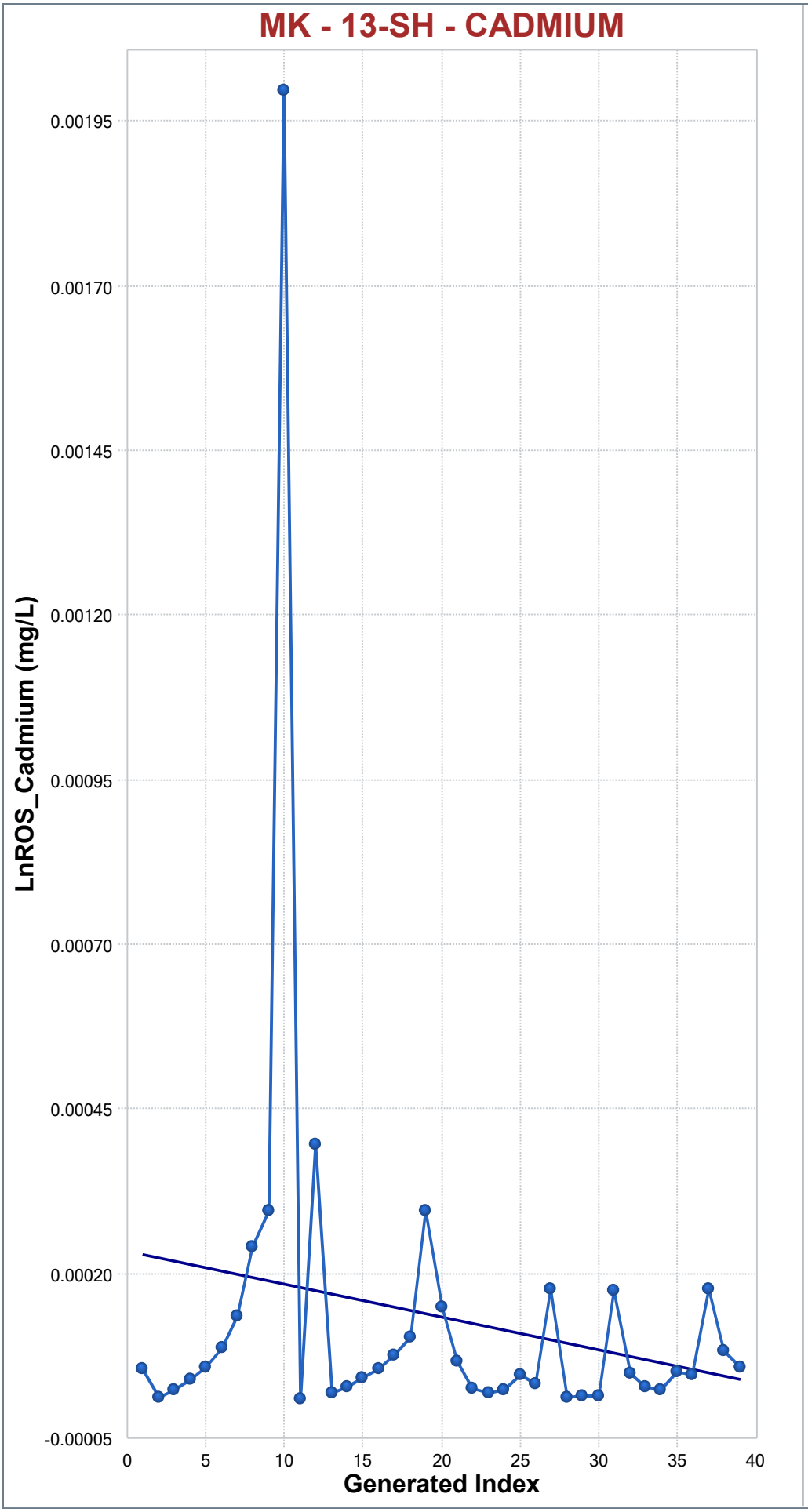
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6539
Standardized Value of S	1.2583
M-K Test Value (S)	105
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1041

OLS Regression Line (Blue)

OLS Regression Slope	5.3310
OLS Regression Intercept	439.1729

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



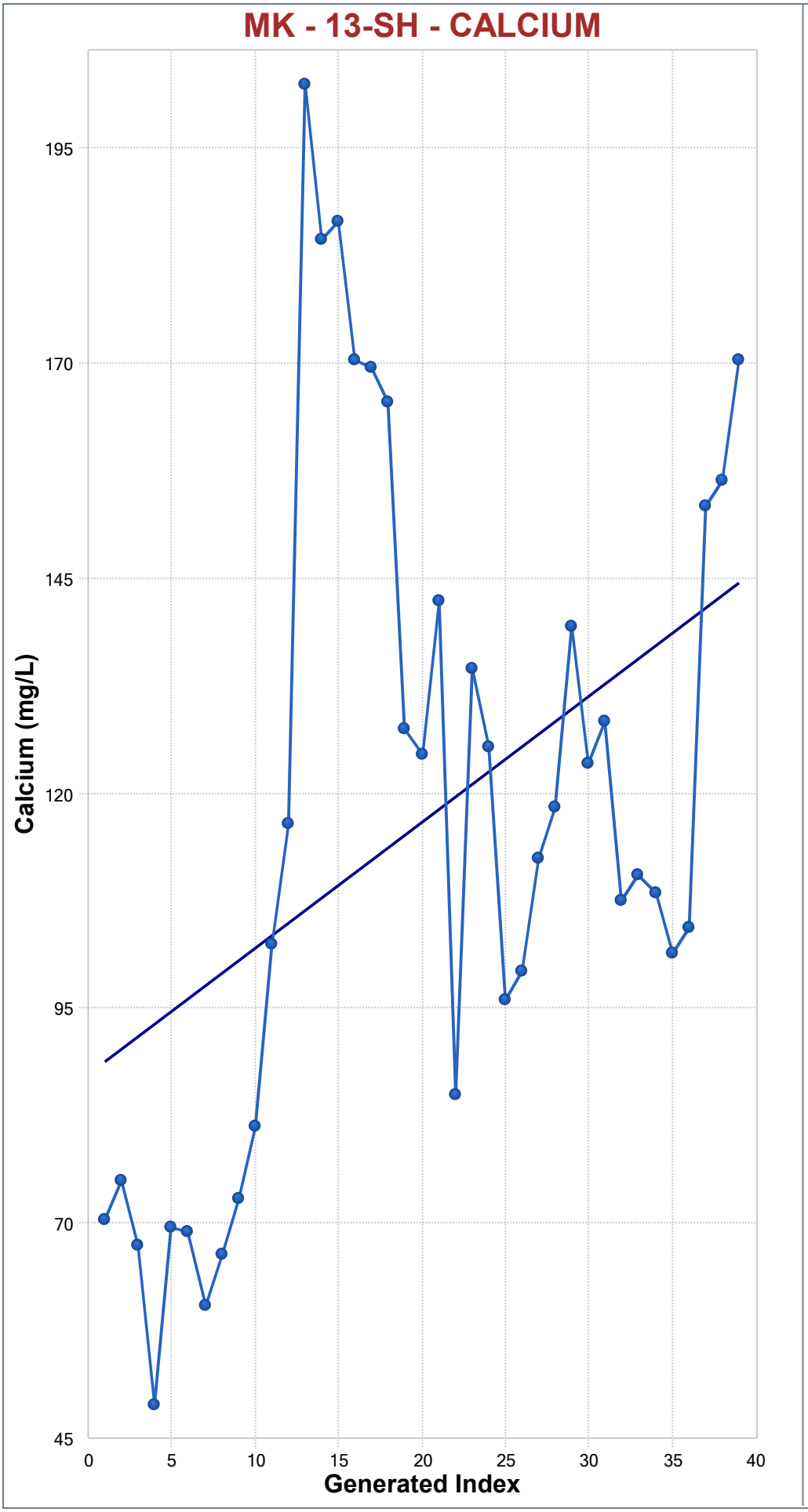
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6539
Standardized Value of S	-0.2662
M-K Test Value (S)	-23
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3951

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0002

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



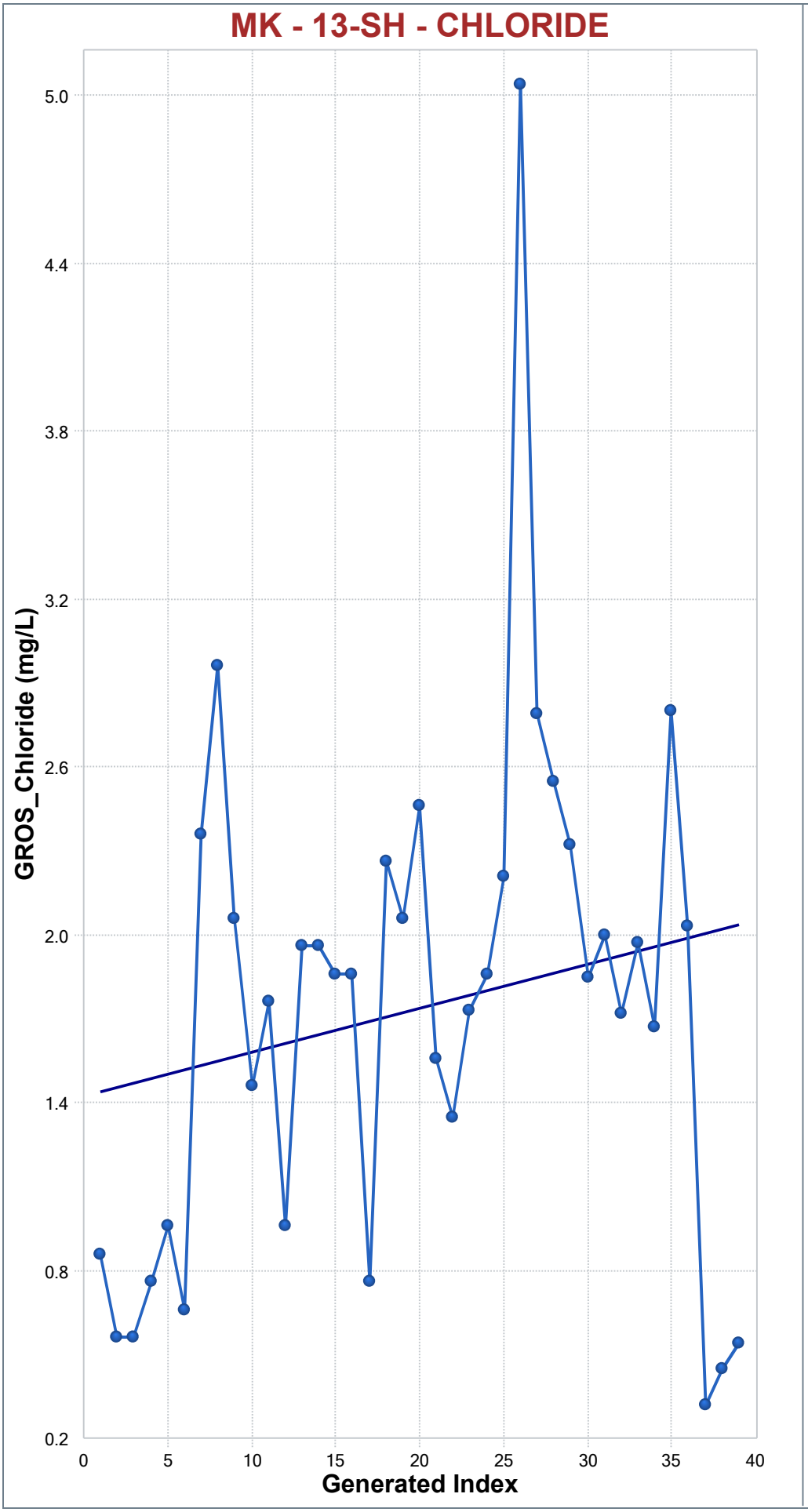
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6599
Standardized Value of S	2.5042
M-K Test Value (S)	208
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0061

OLS Regression Line (Blue)

OLS Regression Slope	1.4681
OLS Regression Intercept	86.8047

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



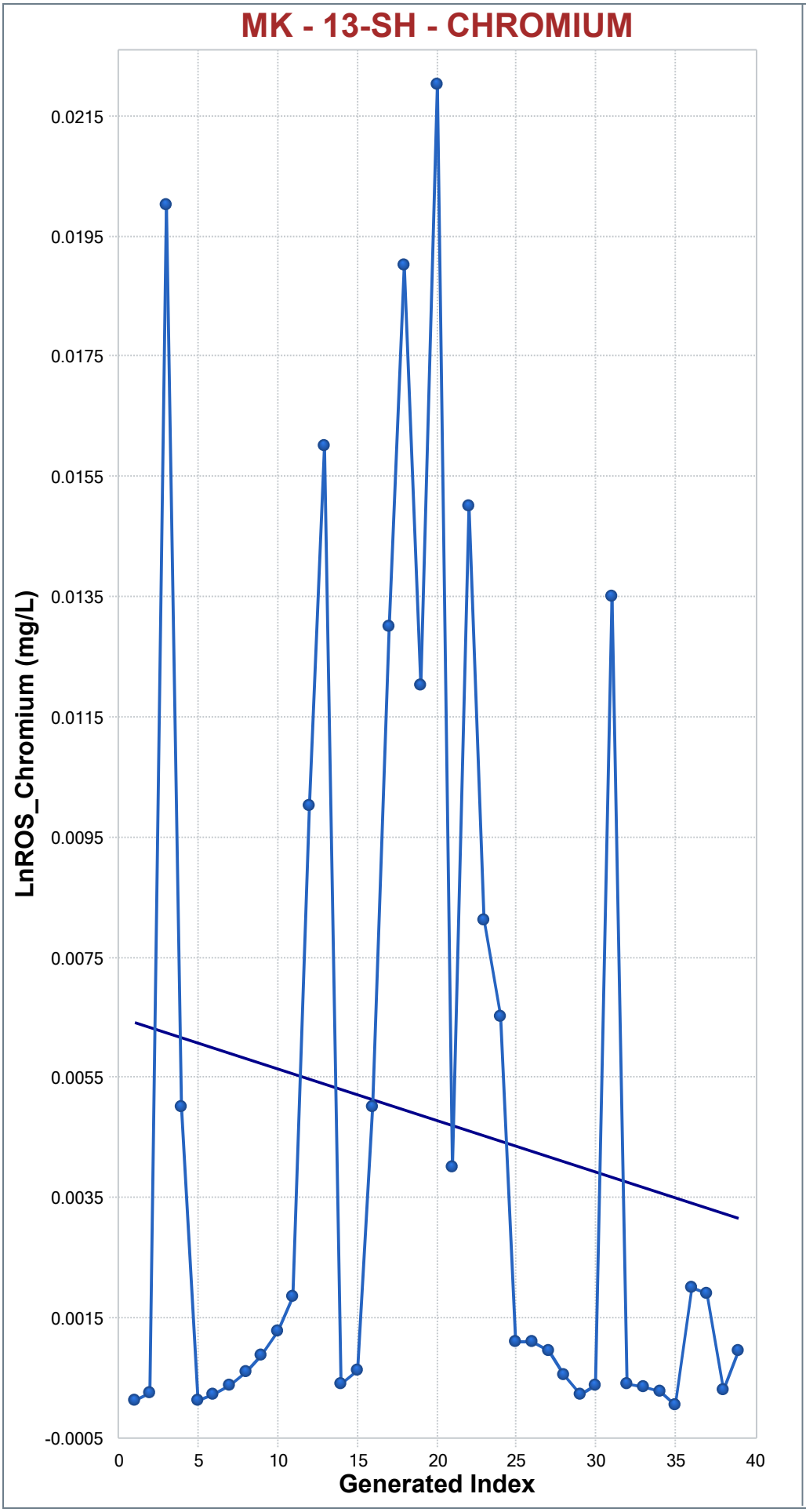
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6136
Standardized Value of S	1.2589
M-K Test Value (S)	105
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1040

OLS Regression Line (Blue)

OLS Regression Slope	0.0157
OLS Regression Intercept	1.4657

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



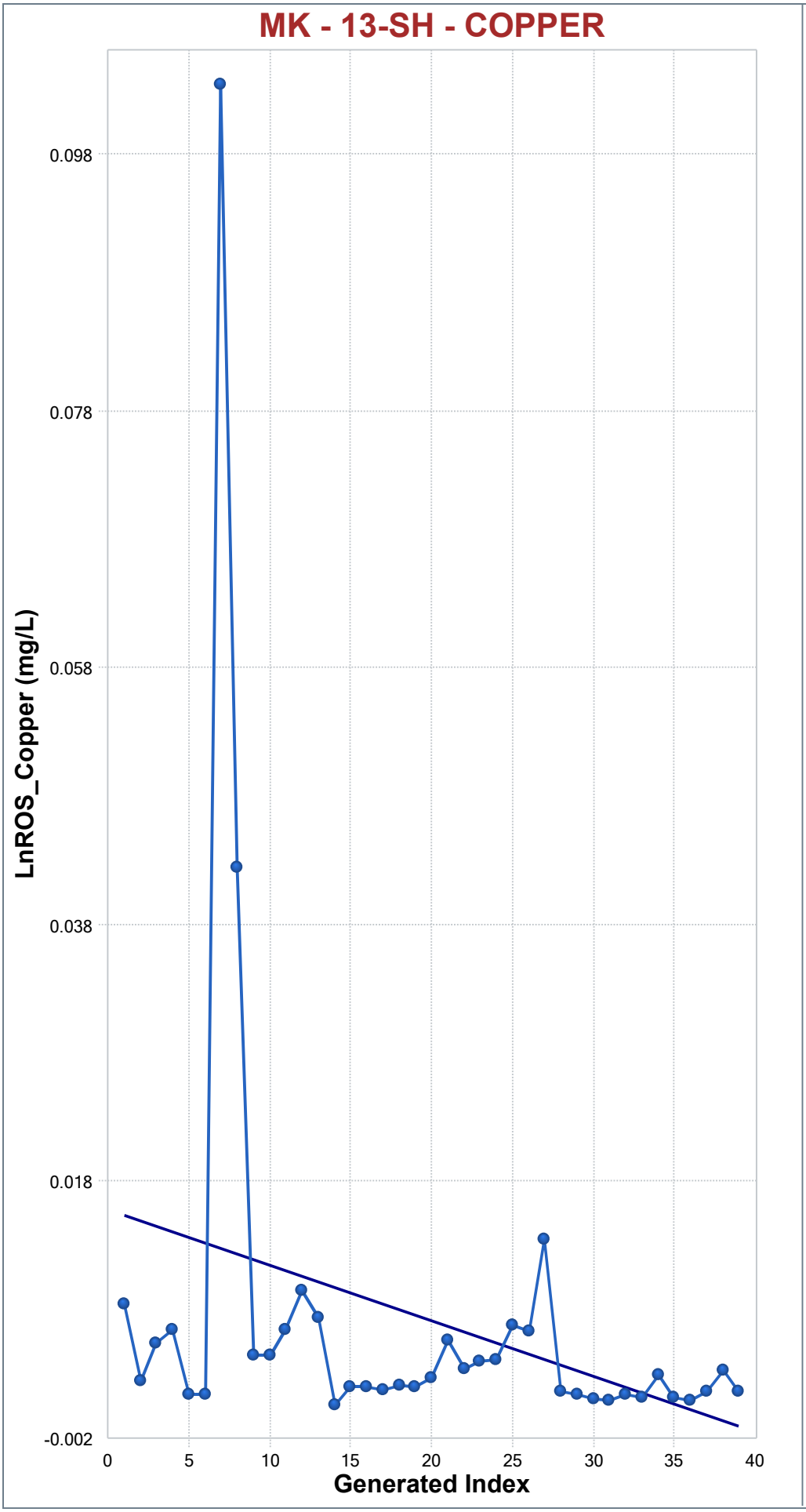
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6539
Standardized Value of S	-0.4839
M-K Test Value (S)	-41
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3142

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0065

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



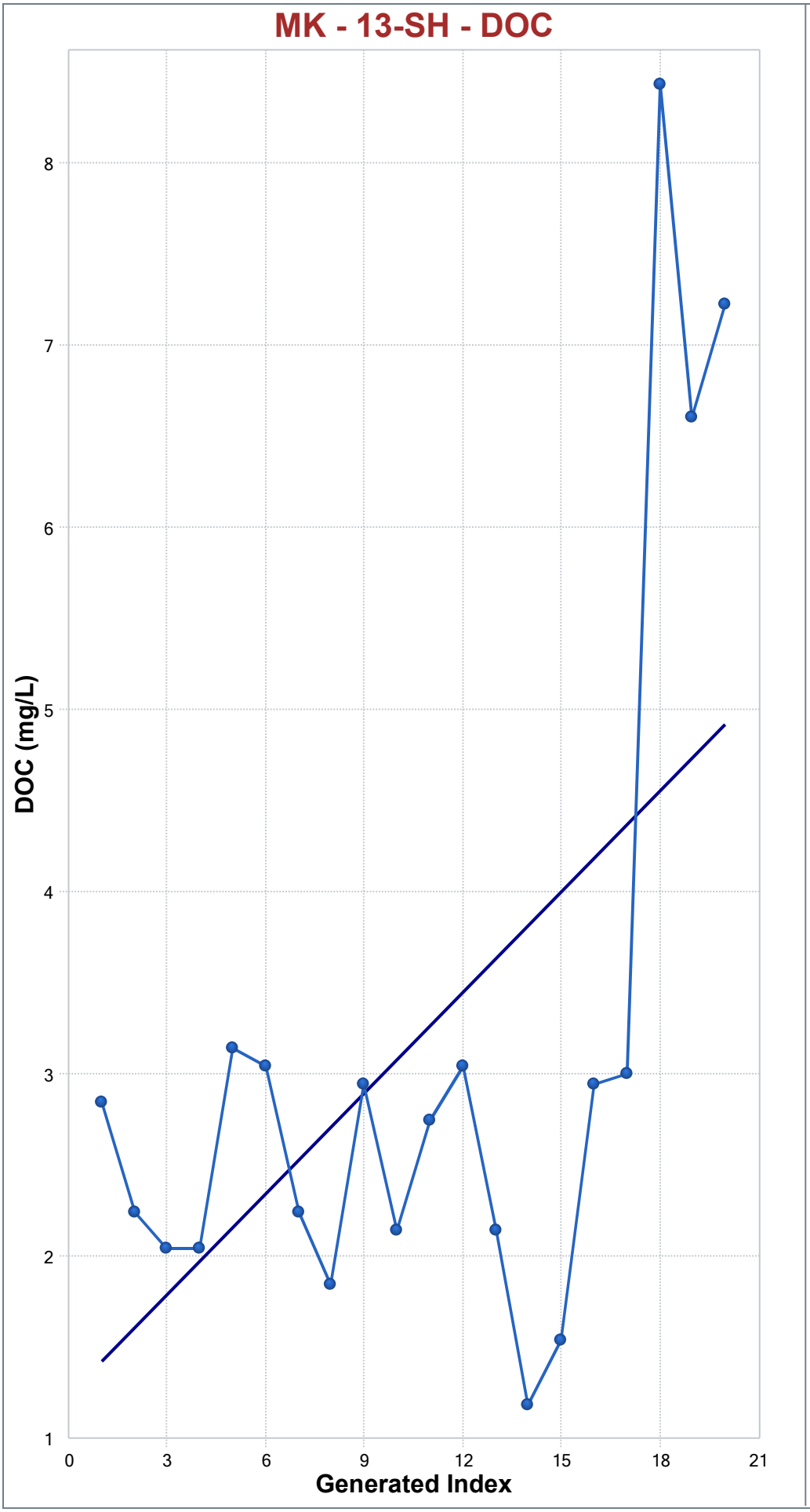
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6257
Standardized Value of S	-2.7594
M-K Test Value (S)	-229
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0029

OLS Regression Line (Blue)

OLS Regression Slope	-0.0004
OLS Regression Intercept	0.0154

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



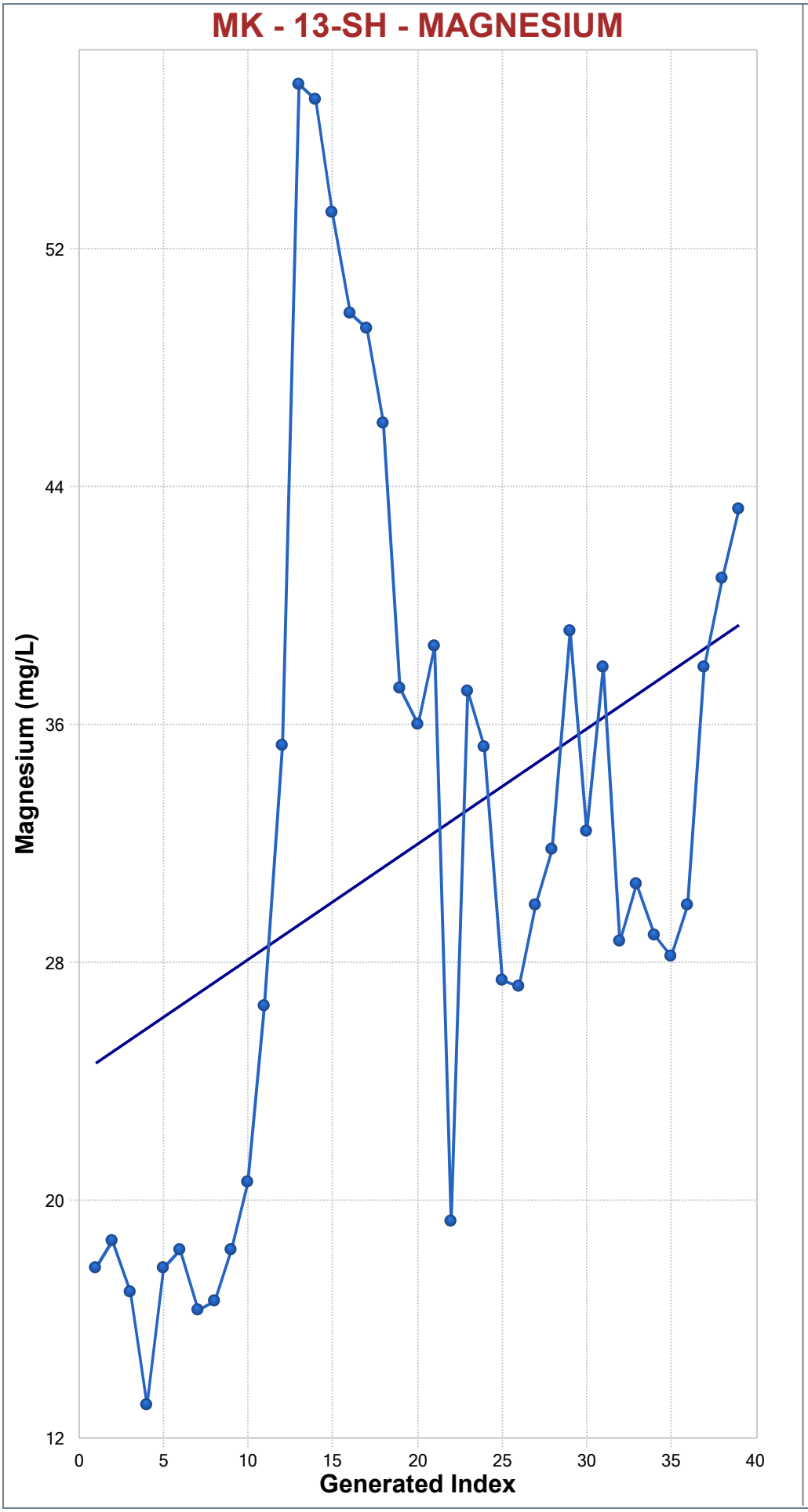
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7409
Standardized Value of S	1.3663
M-K Test Value (S)	43
Tabulated p-value	0.0930
Approximate p-value	0.0859

OLS Regression Line (Blue)

OLS Regression Slope	0.1842
OLS Regression Intercept	1.1927

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



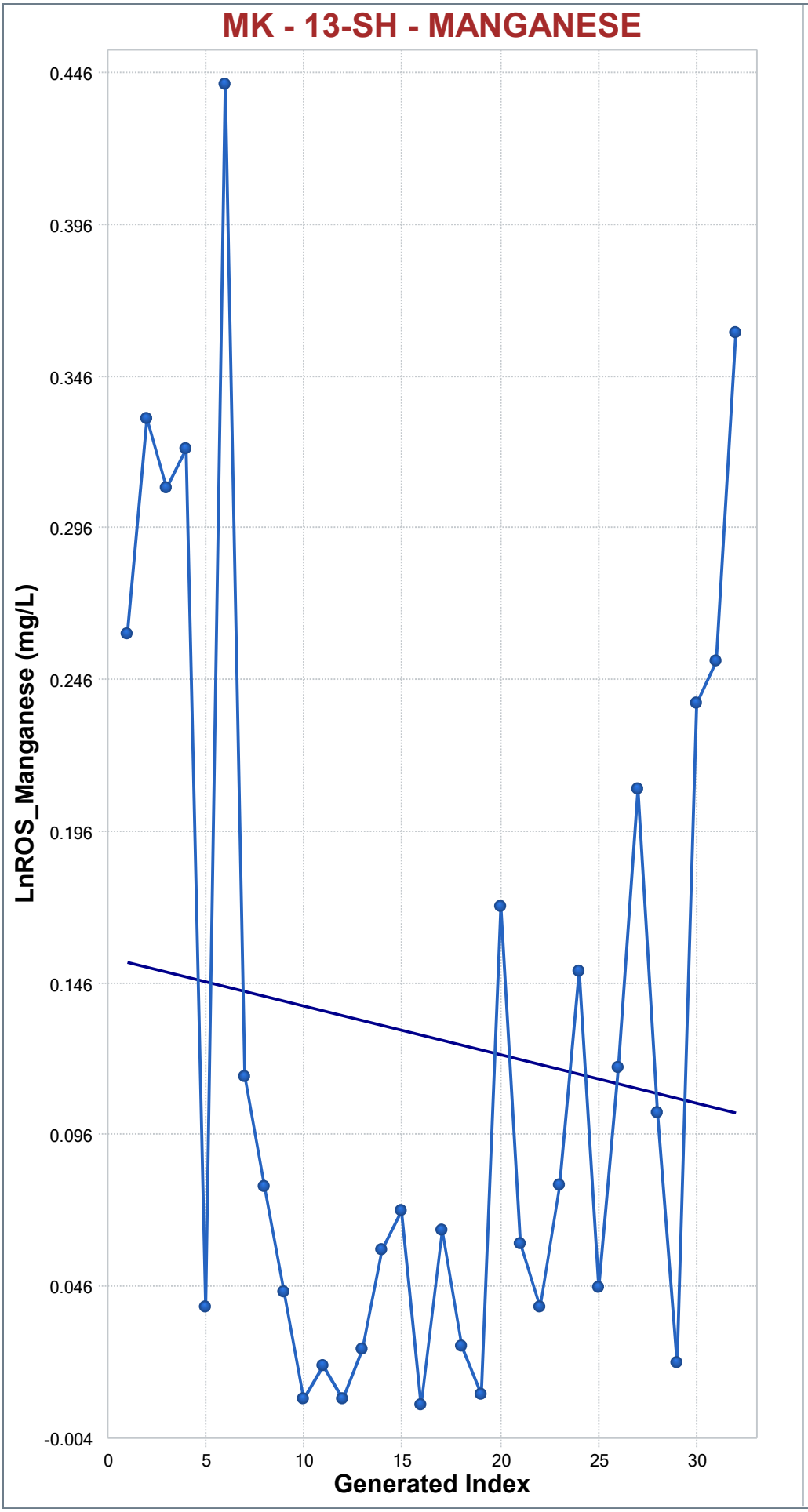
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6418
Standardized Value of S	2.4443
M-K Test Value (S)	203
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0073

OLS Regression Line (Blue)

OLS Regression Slope	0.3886
OLS Regression Intercept	23.8826

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



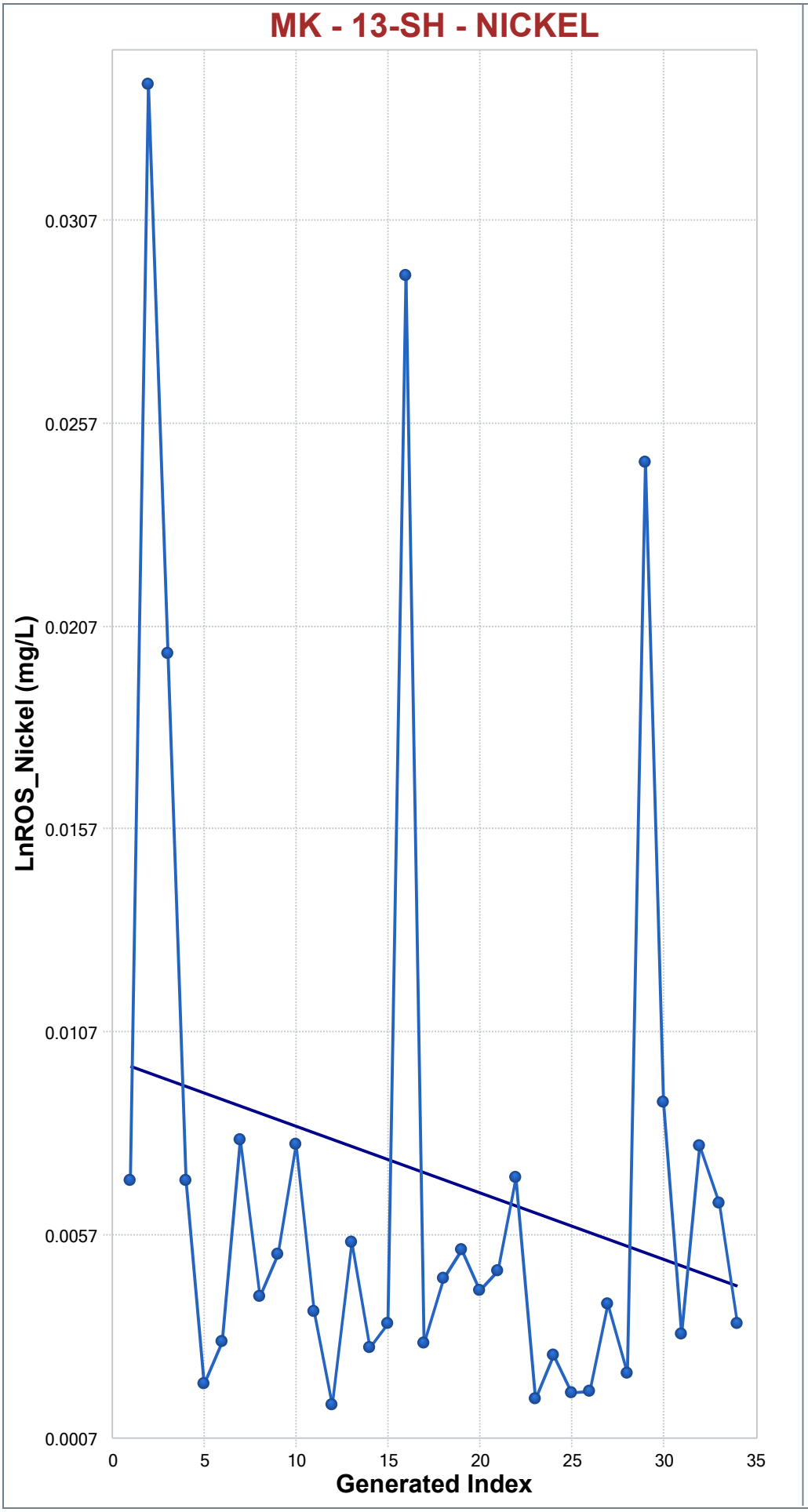
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6658
Standardized Value of S	0.3730
M-K Test Value (S)	24
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3546

OLS Regression Line (Blue)

OLS Regression Slope	-0.0016
OLS Regression Intercept	0.1542

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



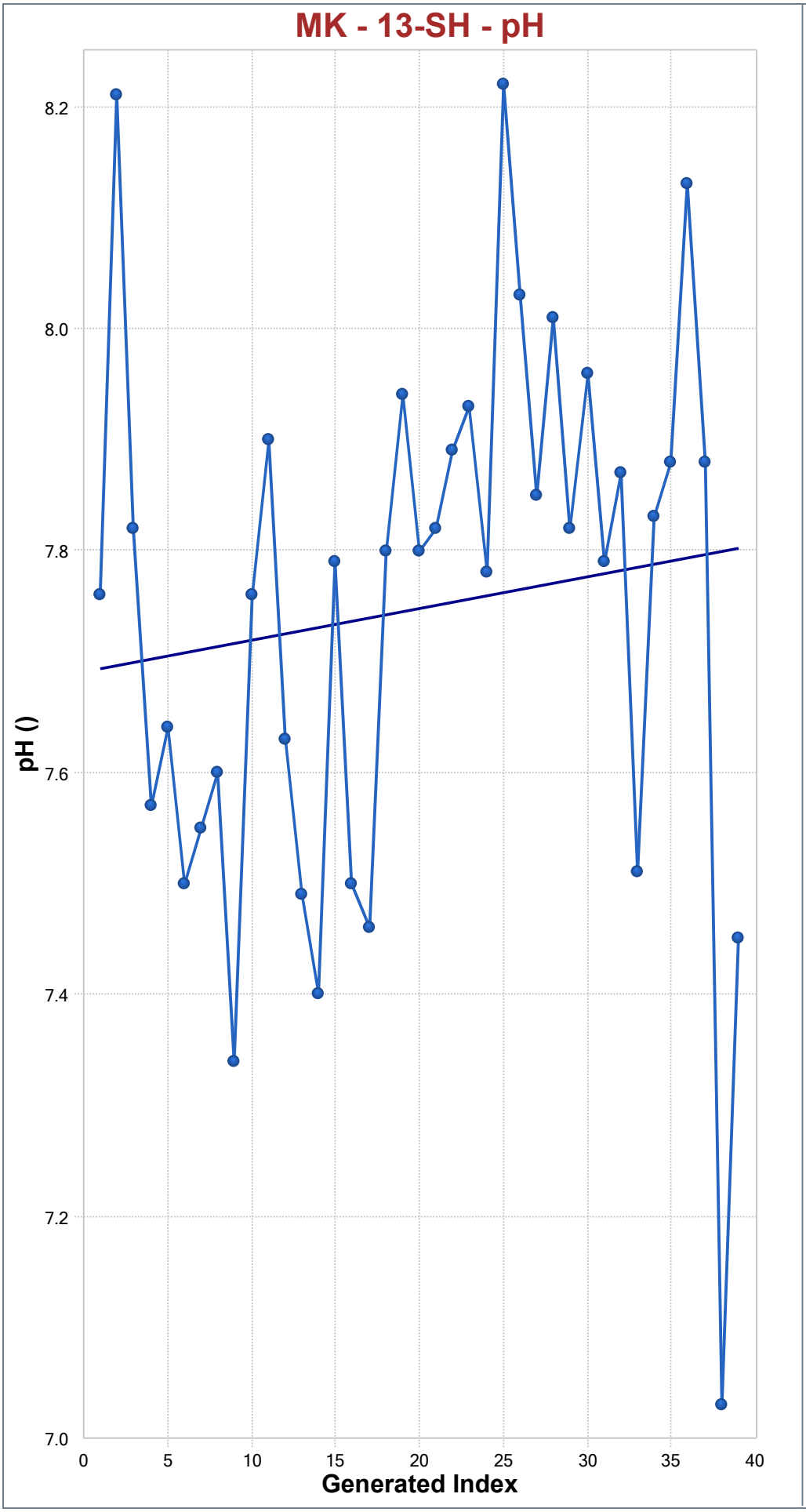
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4487
Standardized Value of S	-1.0823
M-K Test Value (S)	-74
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1396

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0100

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



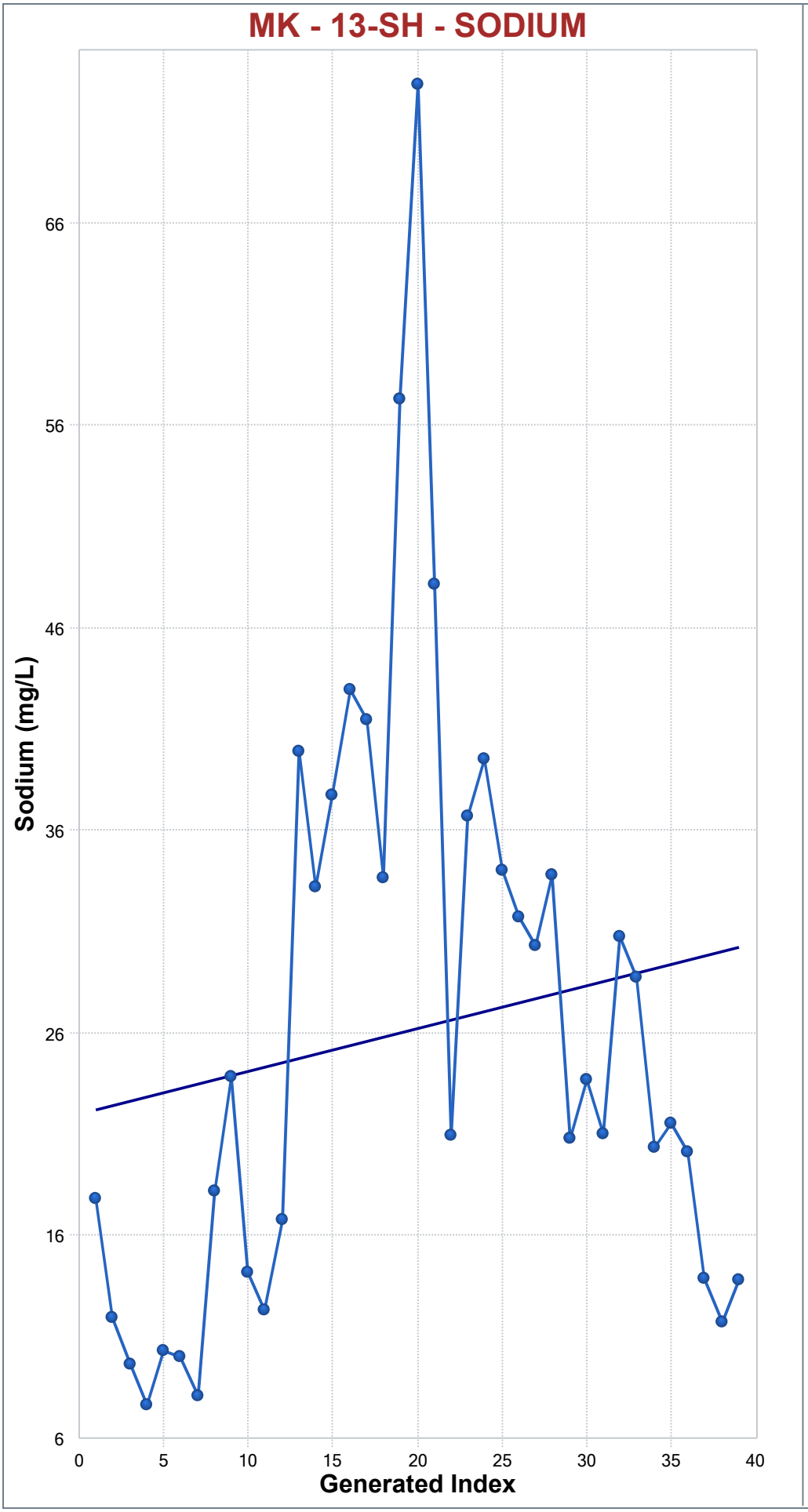
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6136
Standardized Value of S	1.7431
M-K Test Value (S)	145
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0407

OLS Regression Line (Blue)

OLS Regression Slope	0.0029
OLS Regression Intercept	7.7001

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



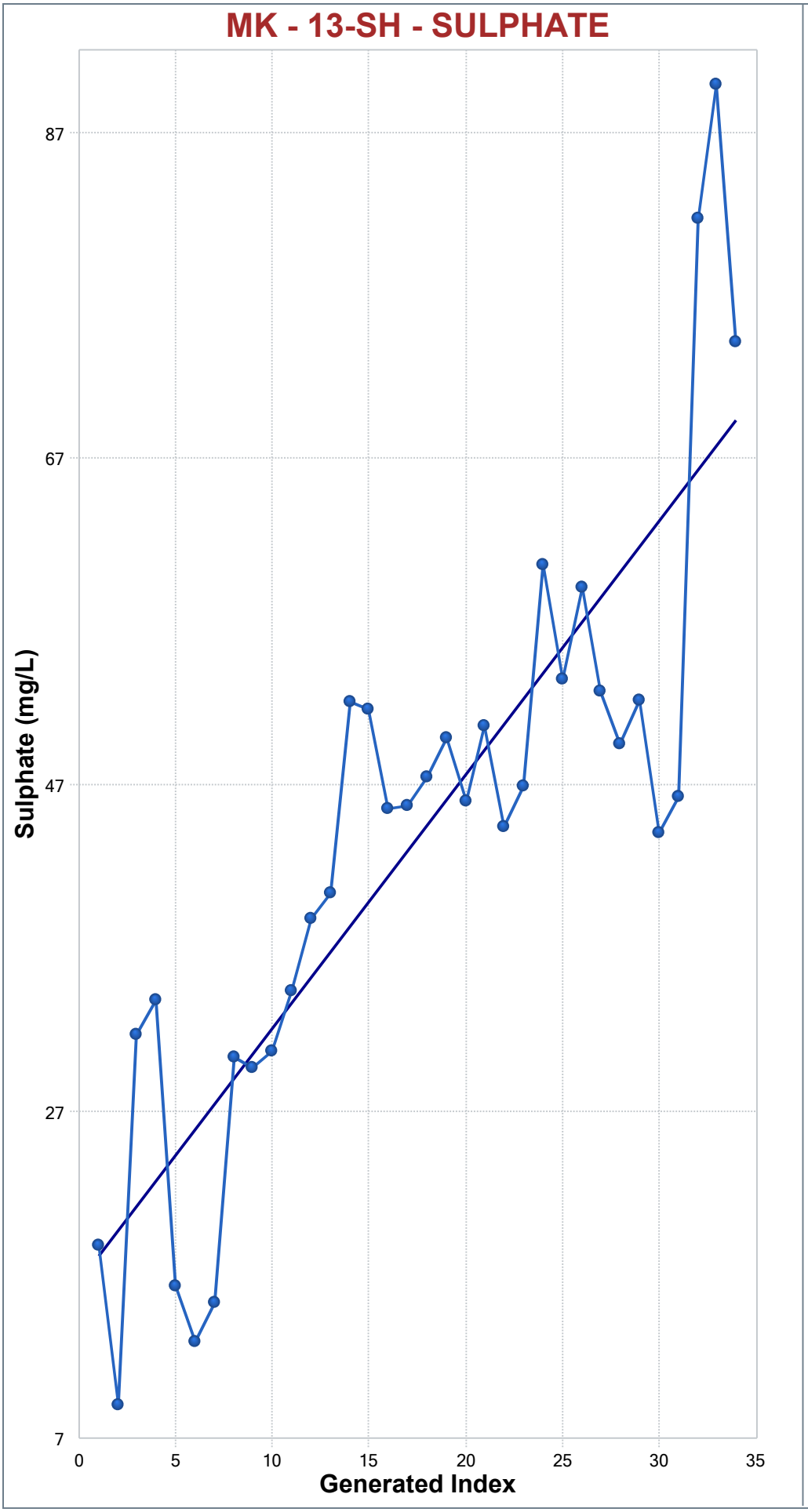
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6660
Standardized Value of S	0.7742
M-K Test Value (S)	65
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2194

OLS Regression Line (Blue)

OLS Regression Slope	0.2111
OLS Regression Intercept	21.7469

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



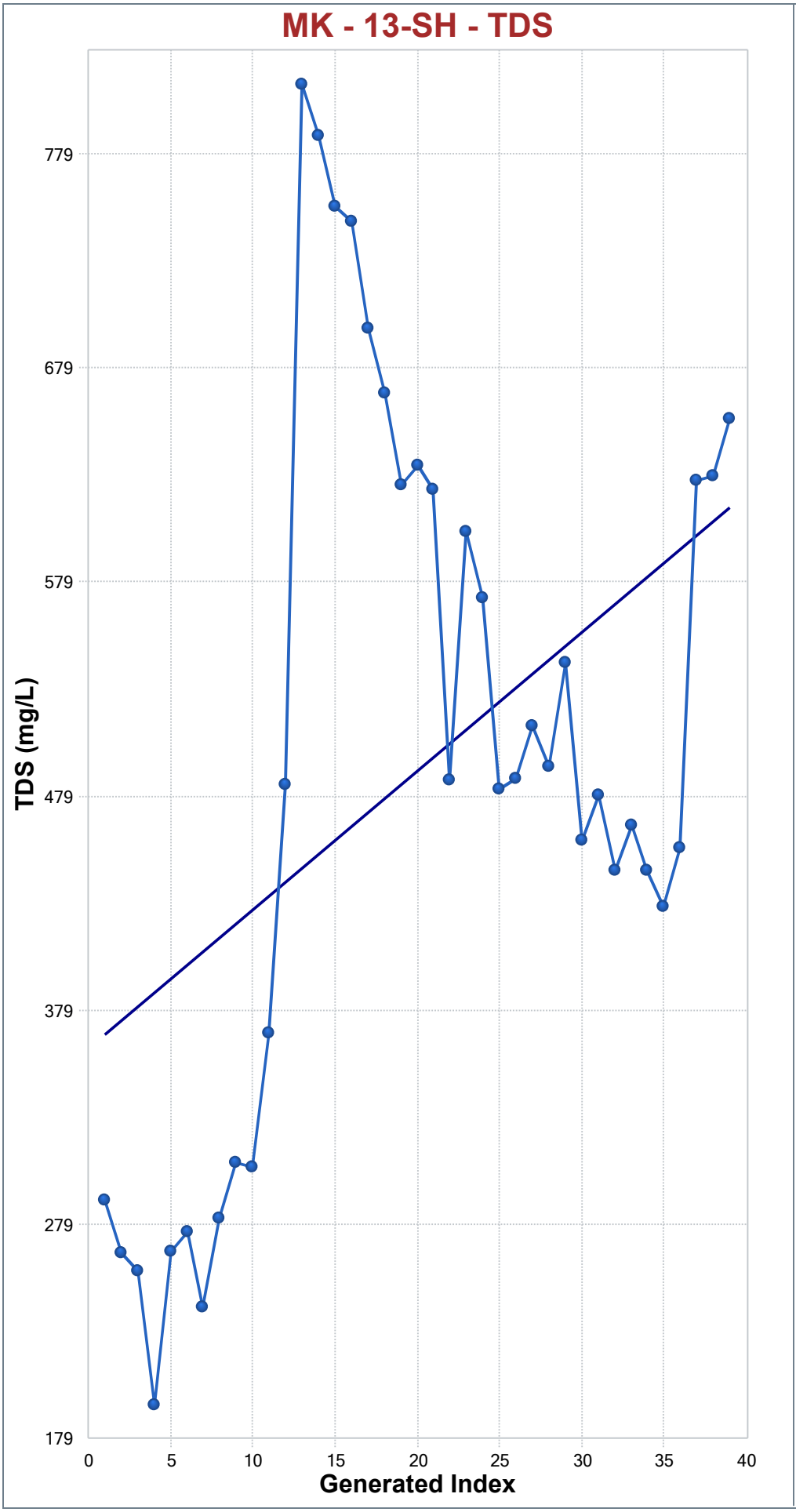
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4562
Standardized Value of S	5.5147
M-K Test Value (S)	373
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.5501
OLS Regression Intercept	16.2754

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



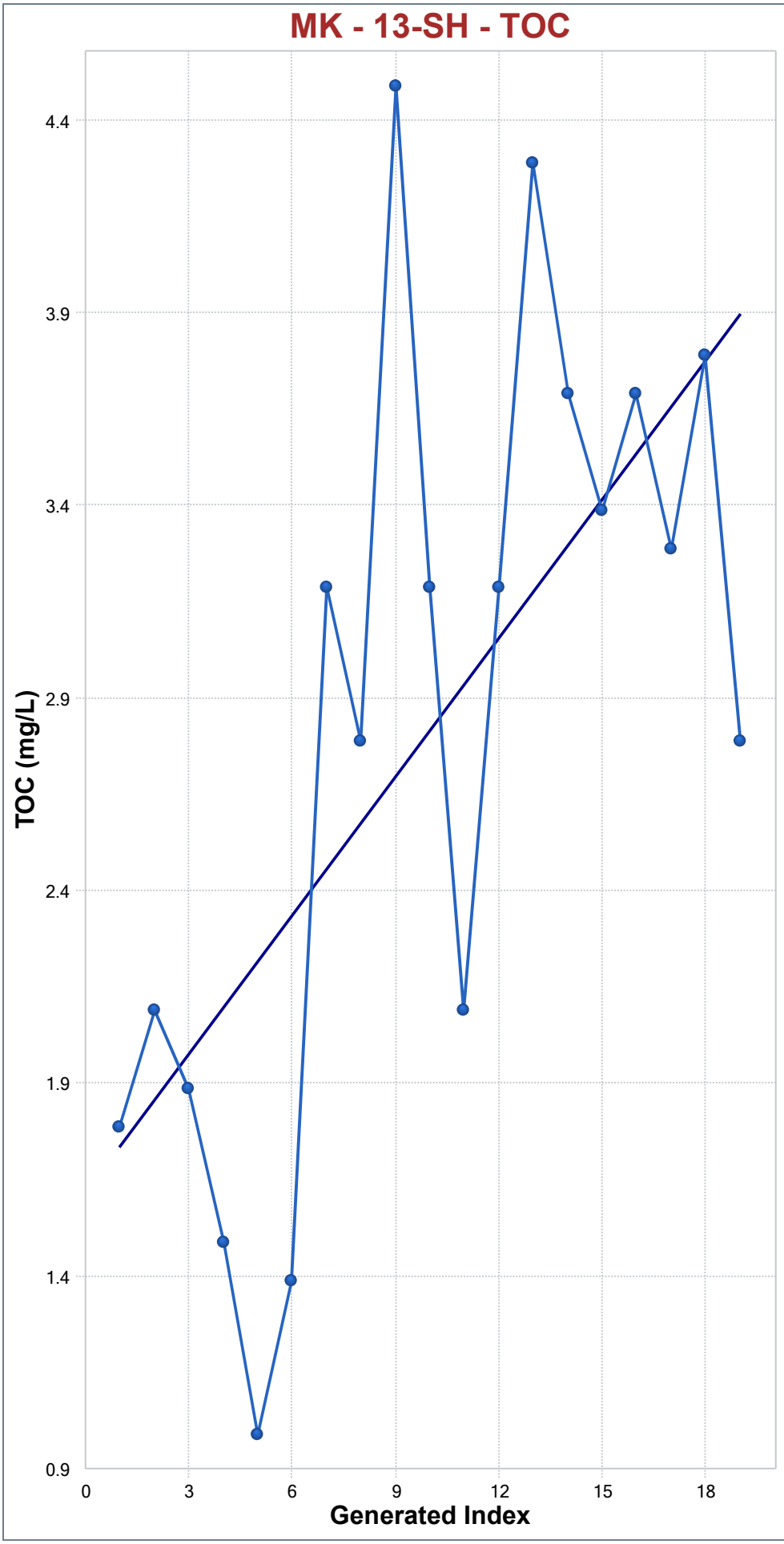
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6599
Standardized Value of S	1.7784
M-K Test Value (S)	148
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0377

OLS Regression Line (Blue)

OLS Regression Slope	6.4765
OLS Regression Intercept	360.8799

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



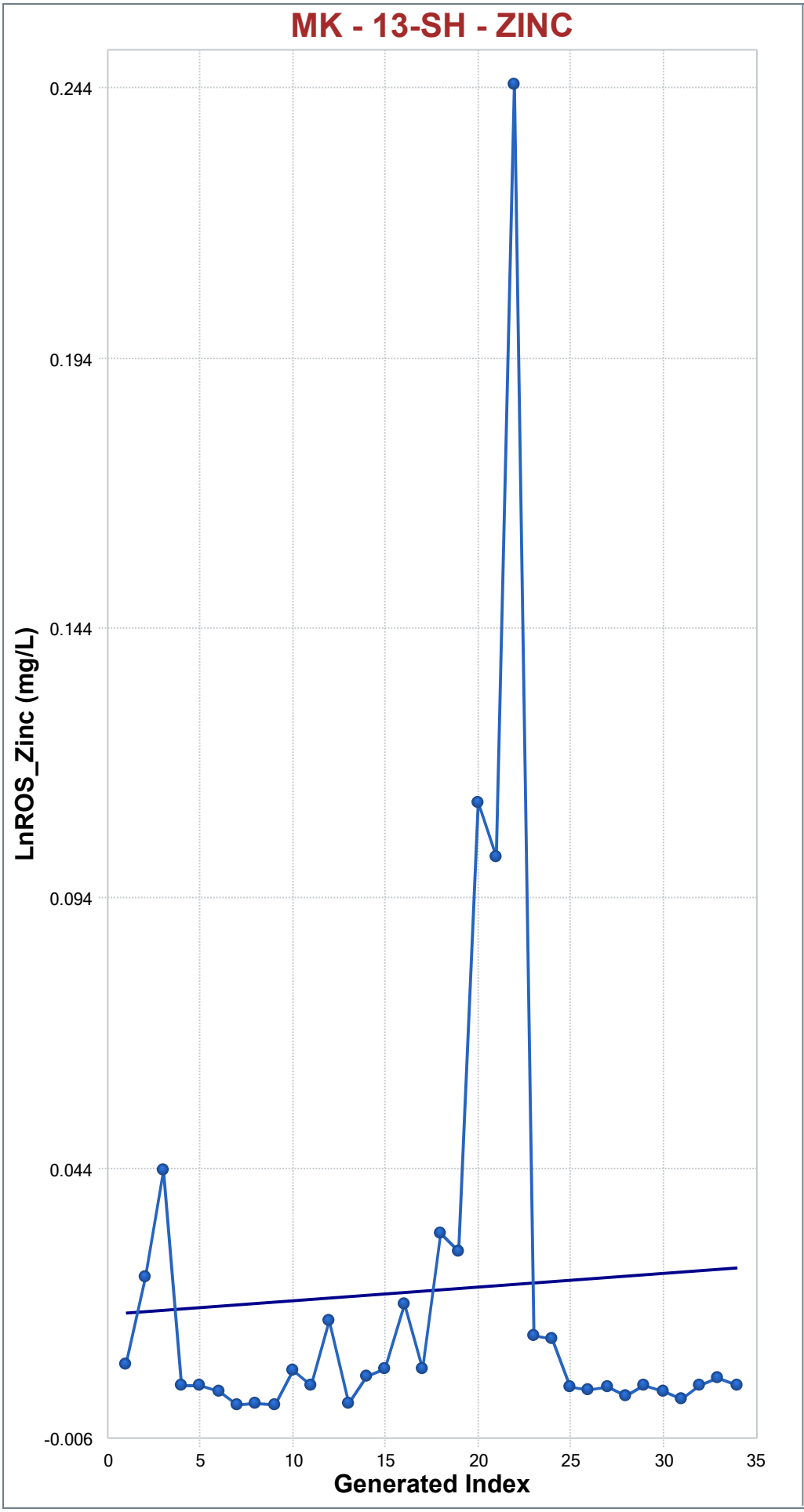
Mann-Kendall Trend Analysis

n	19
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	28.4664
Standardized Value of S	2.6698
M-K Test Value (S)	77
Tabulated p-value	0.0030
Approximate p-value	0.0038

OLS Regression Line (Blue)

OLS Regression Slope	0.1202
OLS Regression Intercept	1.6246

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



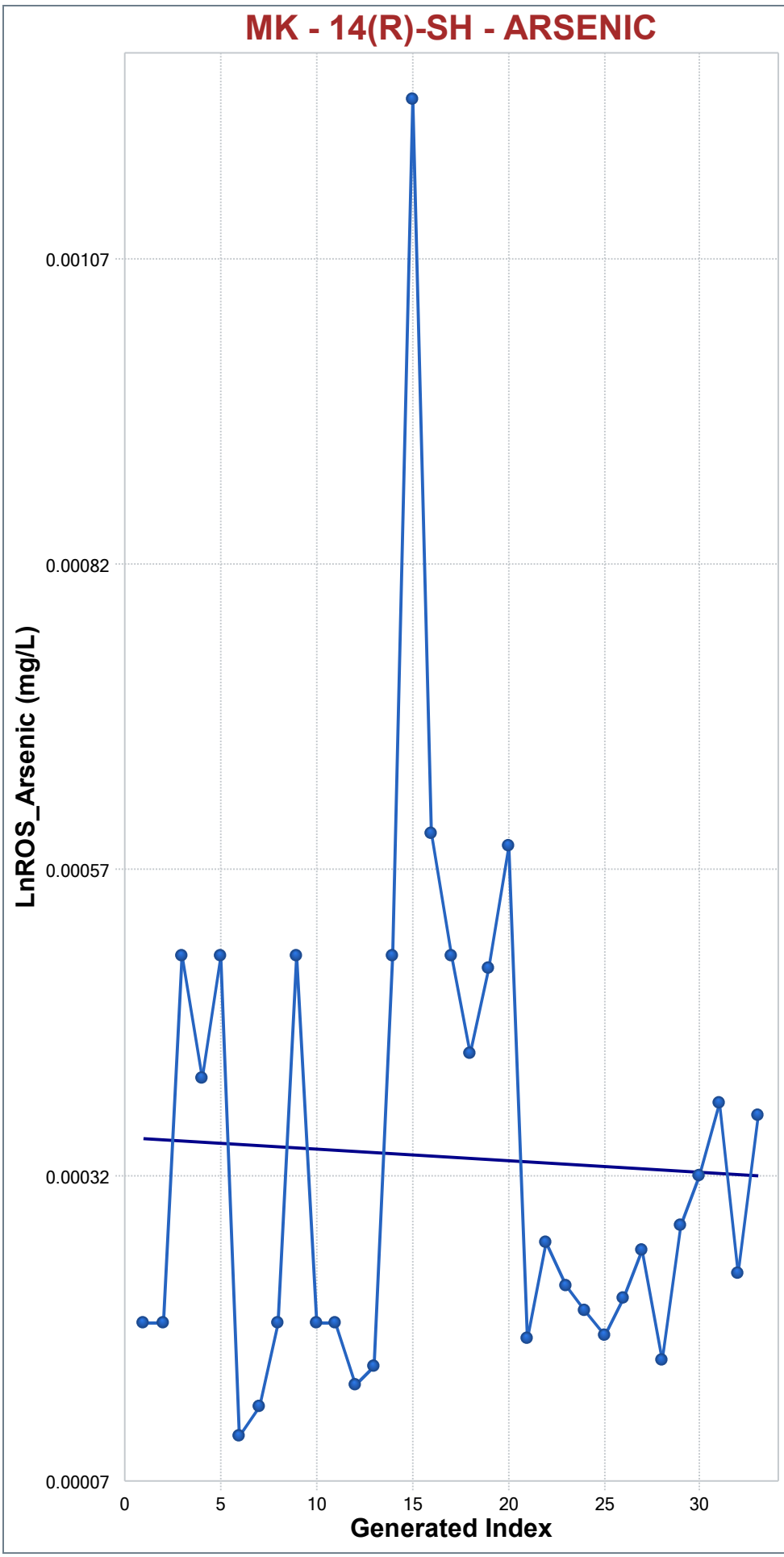
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.3696
Standardized Value of S	-0.2523
M-K Test Value (S)	-18
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4004

OLS Regression Line (Blue)

OLS Regression Slope	0.0003
OLS Regression Intercept	0.0171

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



Mann-Kendall Trend Analysis

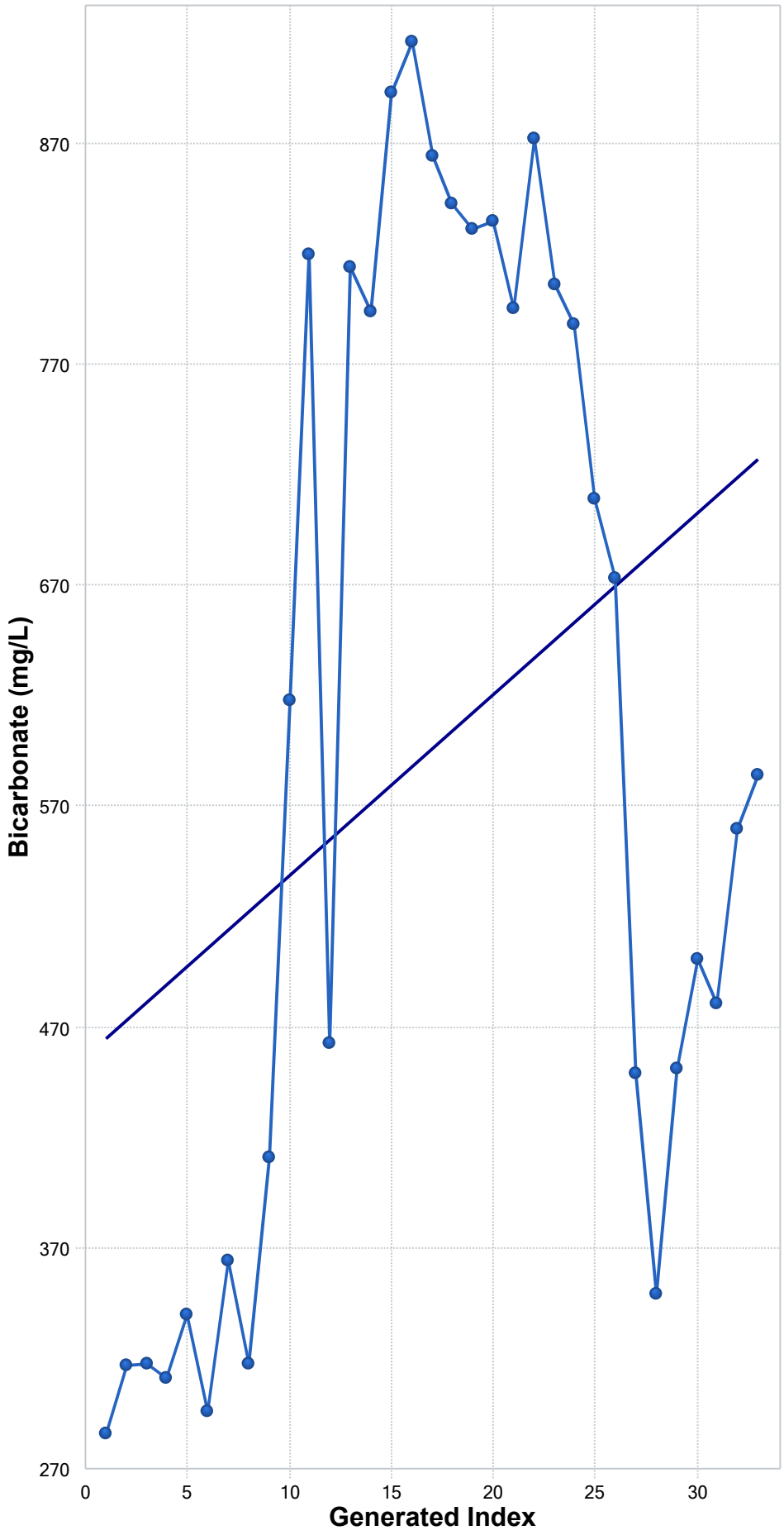
n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.2806
Standardized Value of S	0.4511
M-K Test Value (S)	30
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3259

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0004

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

MK - 14(R)-SH - BICARBONATE



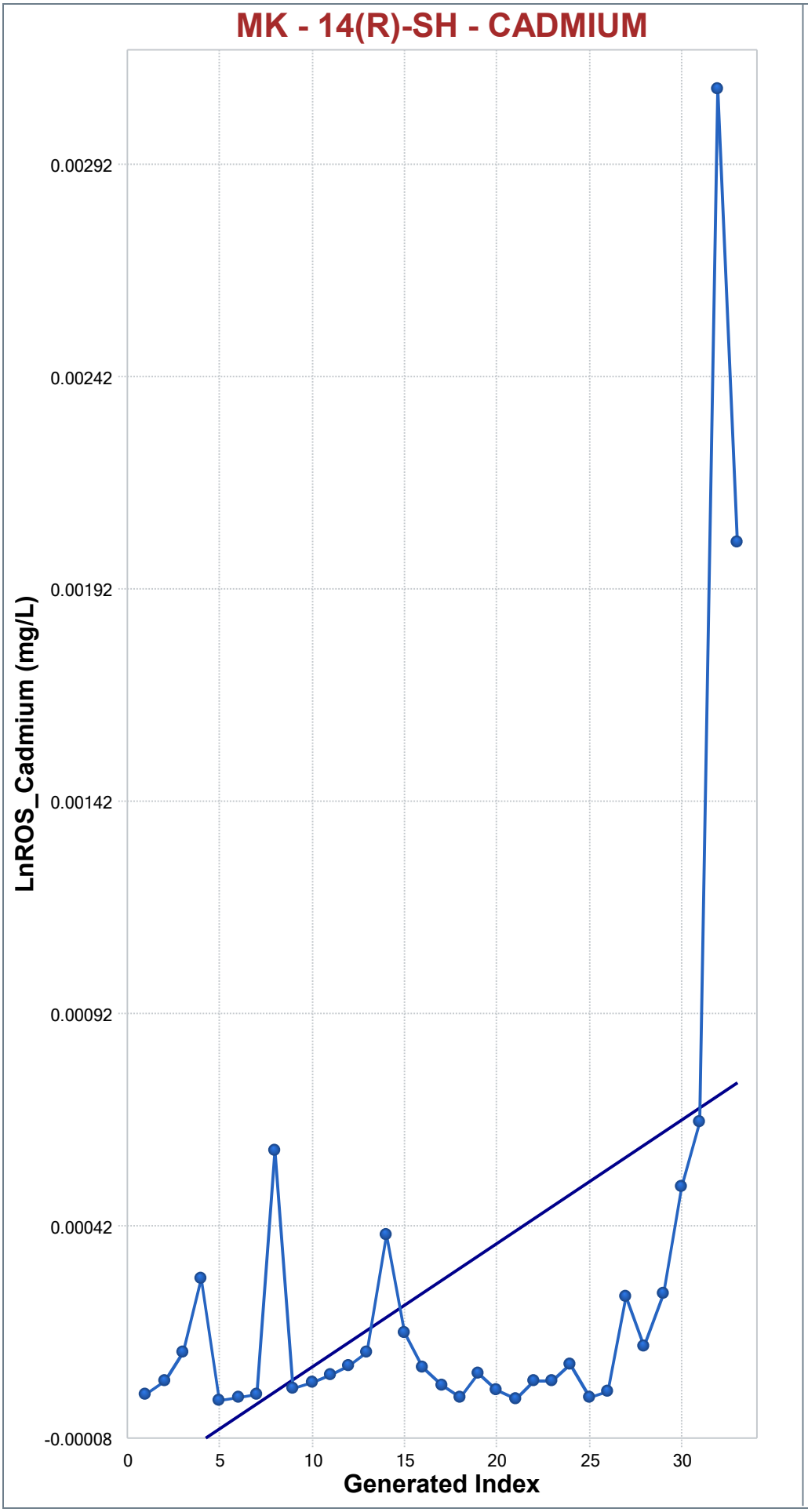
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5316
Standardized Value of S	1.8596
M-K Test Value (S)	121
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0315

OLS Regression Line (Blue)

OLS Regression Slope	8.1918
OLS Regression Intercept	456.7992

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



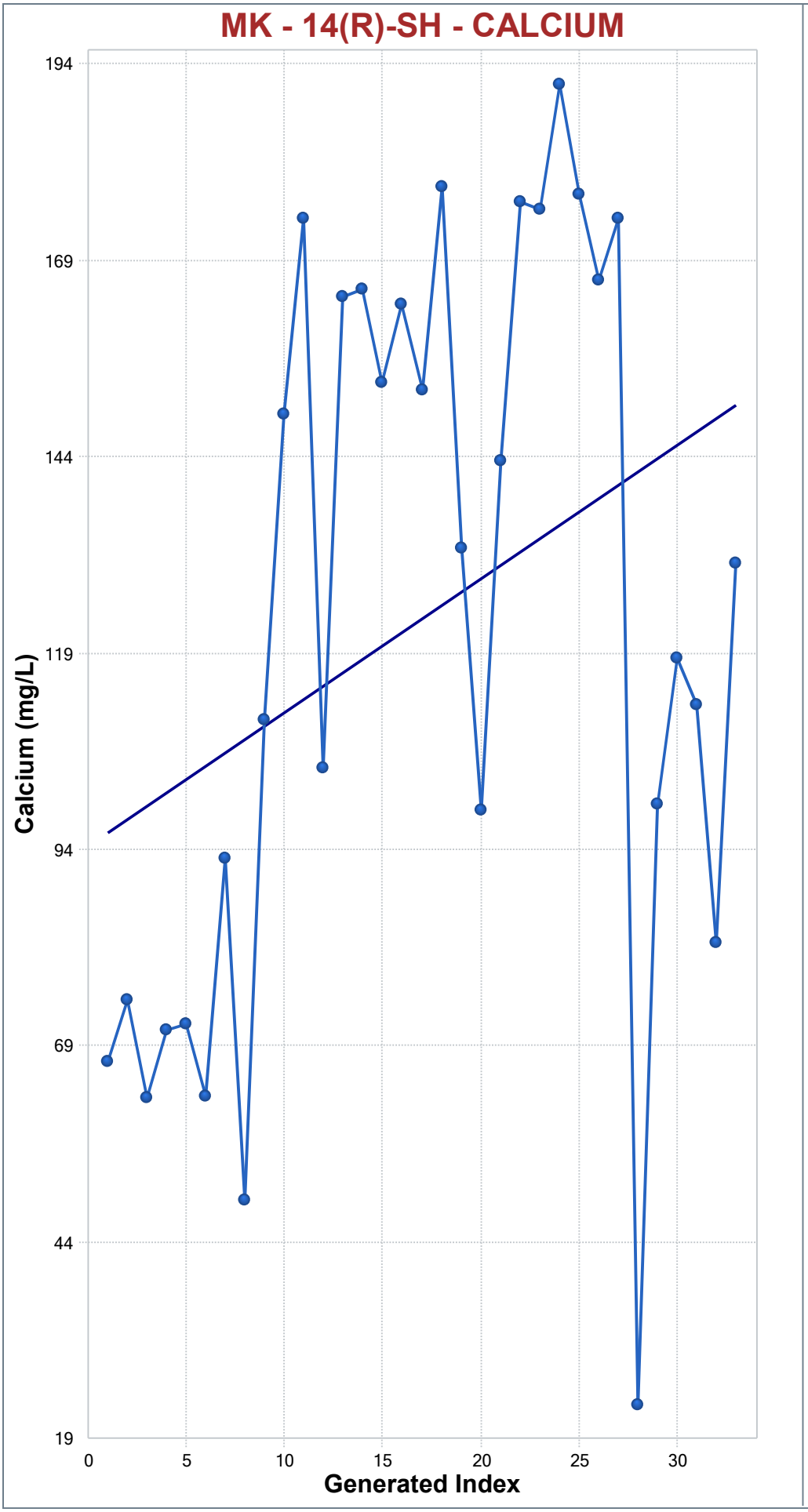
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5316
Standardized Value of S	2.3554
M-K Test Value (S)	153
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0093

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	-0.0002

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



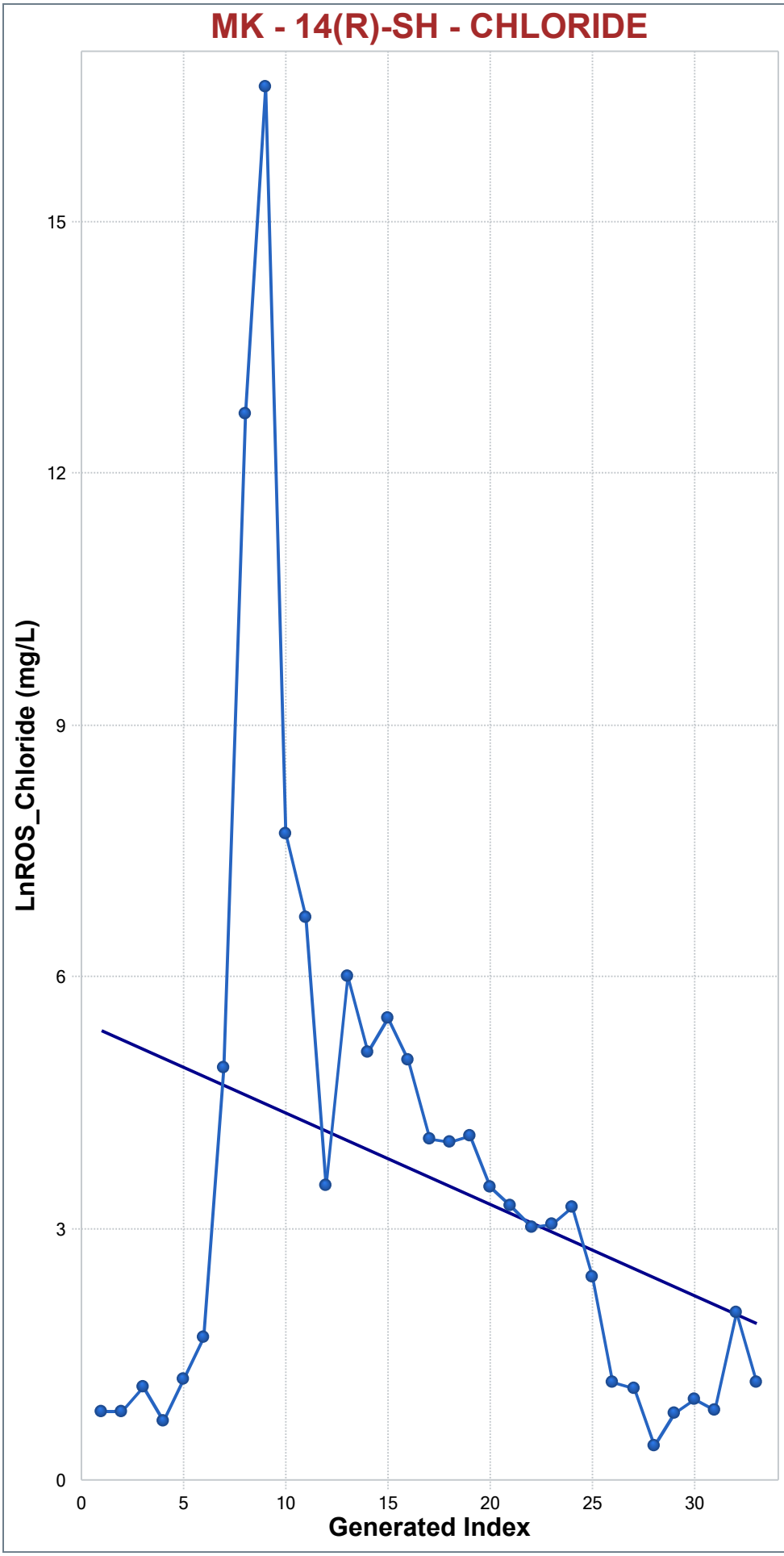
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5316
Standardized Value of S	2.2315
M-K Test Value (S)	145
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0128

OLS Regression Line (Blue)

OLS Regression Slope	1.7044
OLS Regression Intercept	93.9498

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



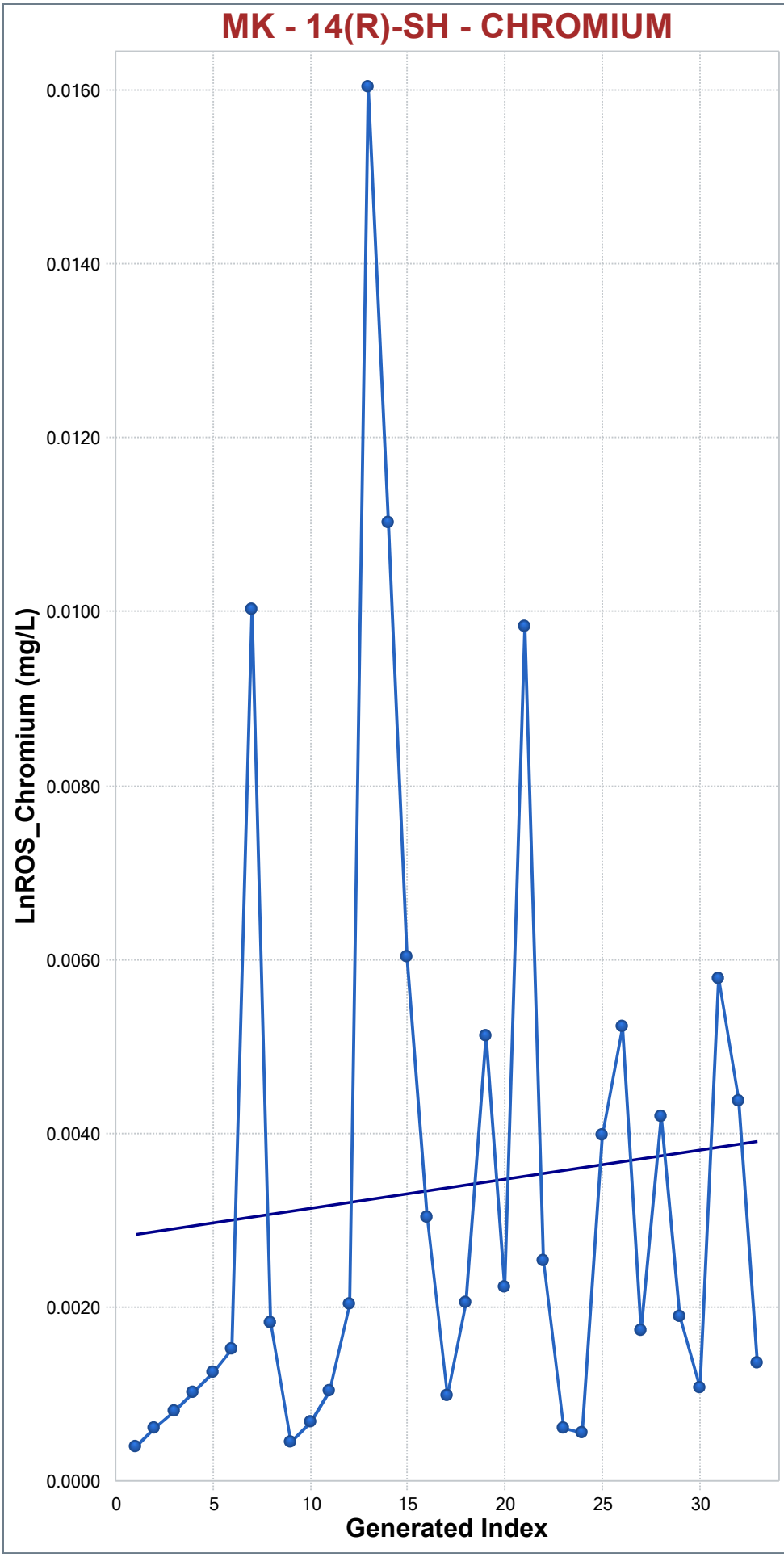
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5316
Standardized Value of S	-2.3554
M-K Test Value (S)	-153
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0093

OLS Regression Line (Blue)

OLS Regression Slope	-0.1092
OLS Regression Intercept	5.9627

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



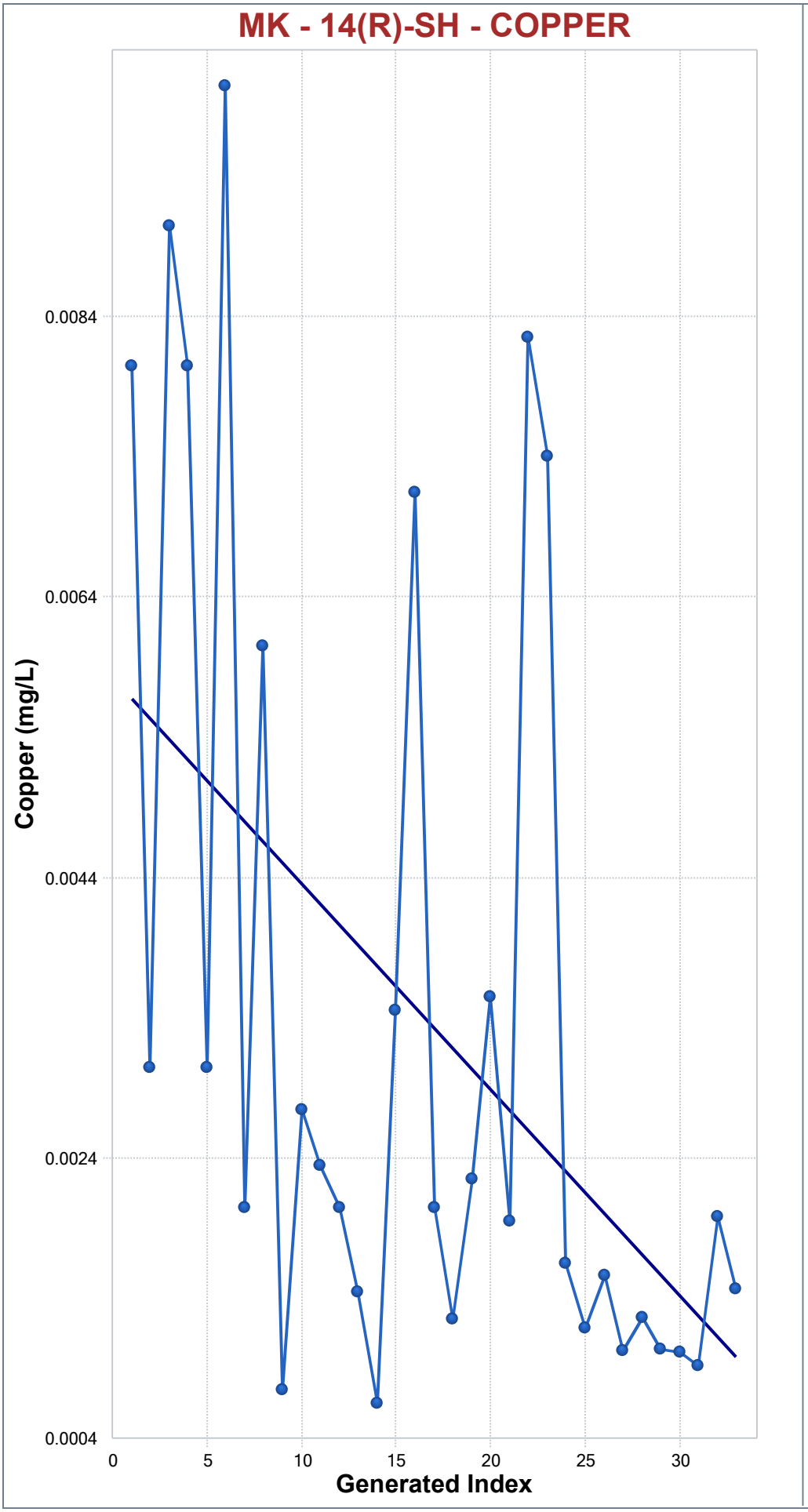
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5394
Standardized Value of S	1.9368
M-K Test Value (S)	126
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0264

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0028

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



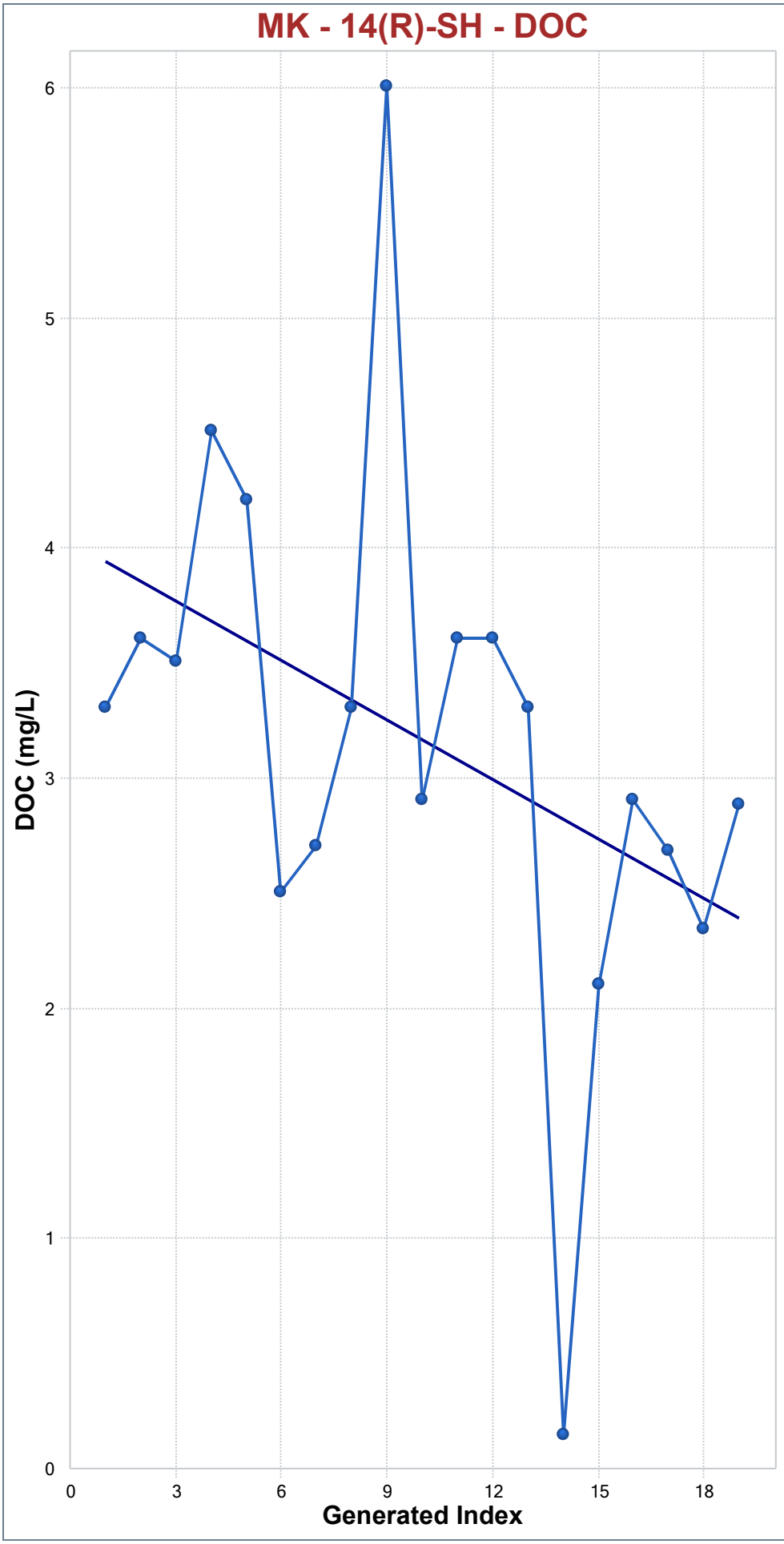
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.4955
Standardized Value of S	-3.4421
M-K Test Value (S)	-223
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0003

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0058

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



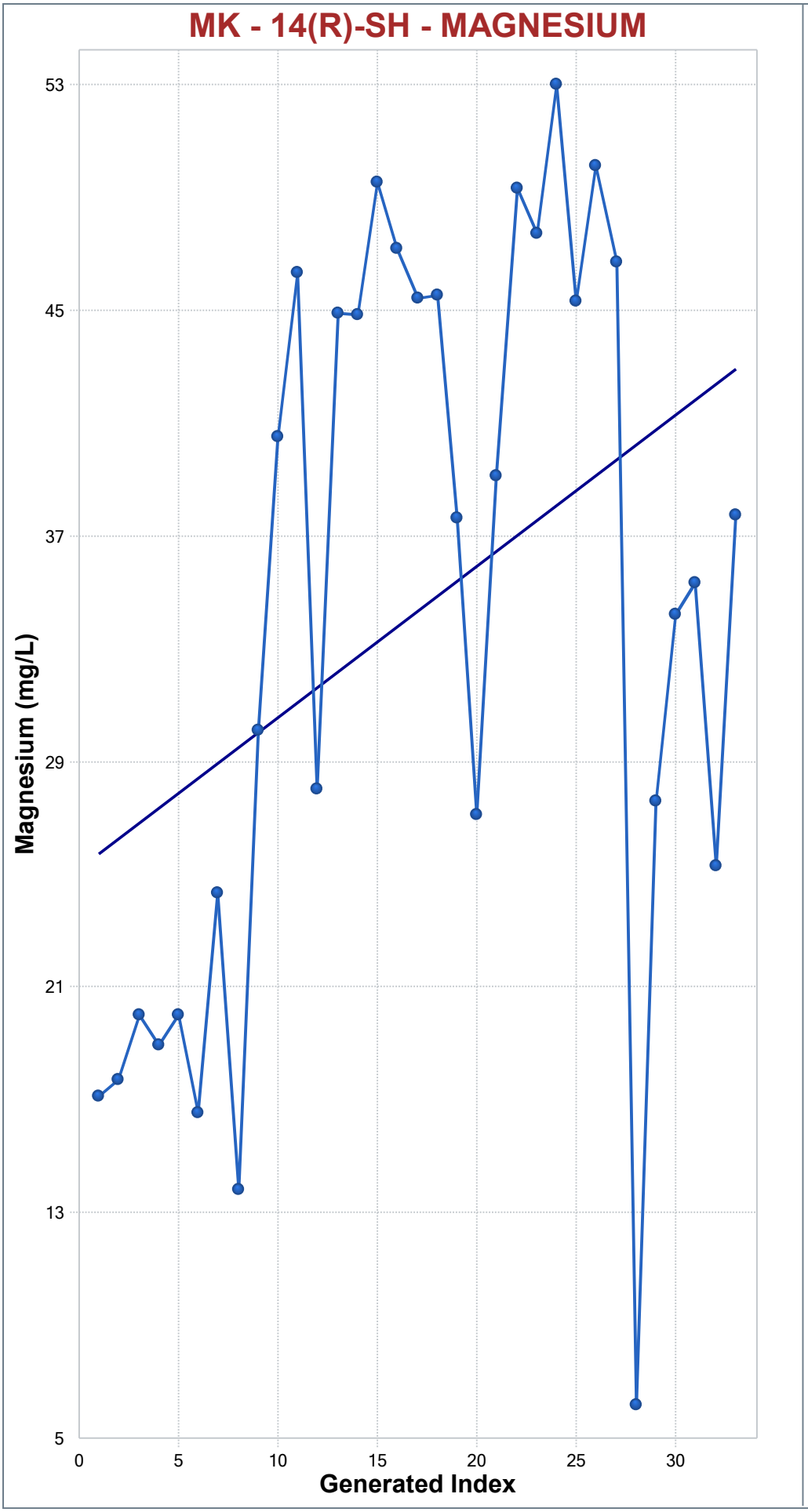
Mann-Kendall Trend Analysis

n	19
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	28.4371
Standardized Value of S	-2.0748
M-K Test Value (S)	-60
Tabulated p-value	0.0170
Approximate p-value	0.0190

OLS Regression Line (Blue)

OLS Regression Slope	-0.0862
OLS Regression Intercept	4.5221

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



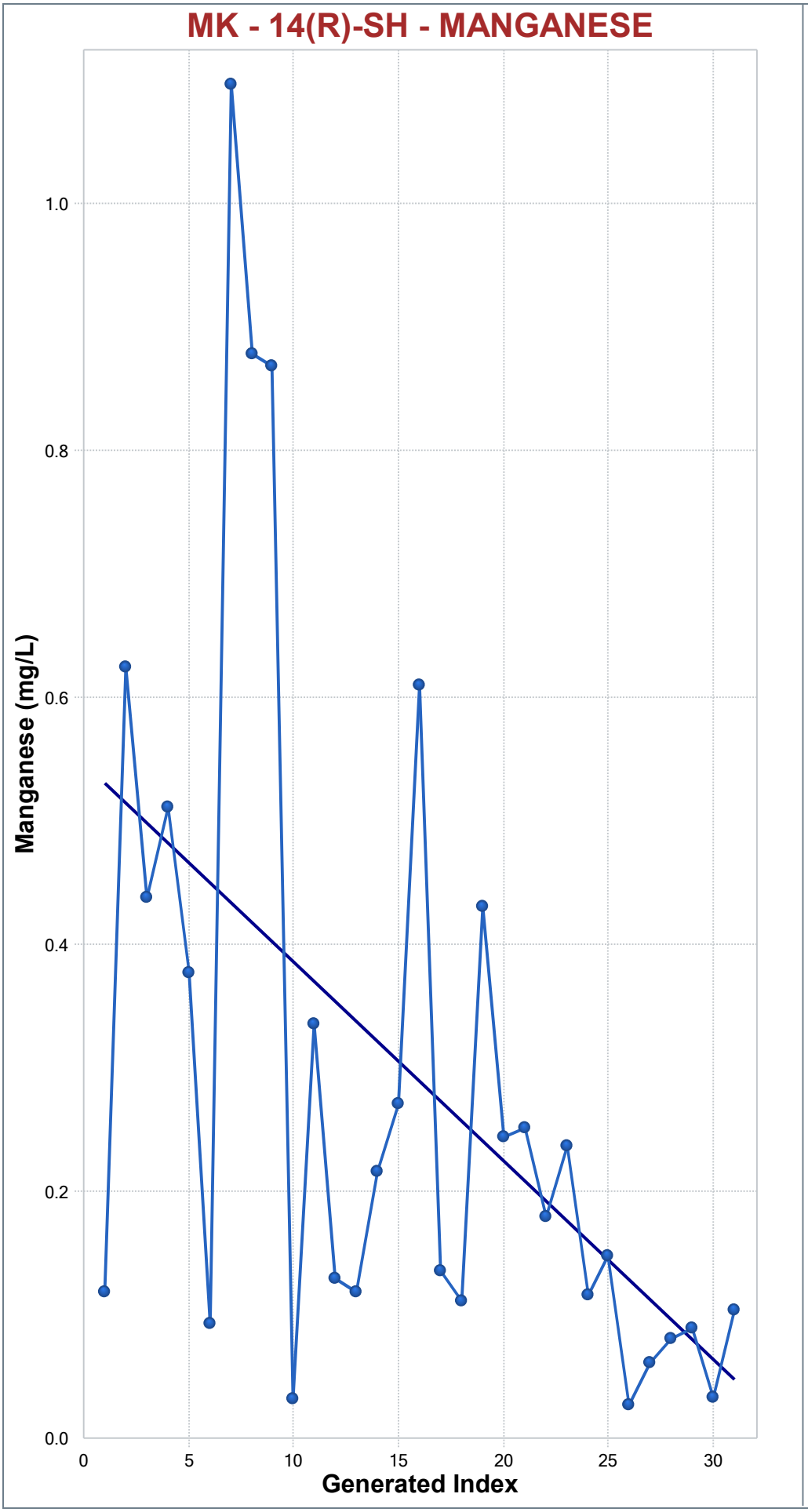
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5316
Standardized Value of S	2.4174
M-K Test Value (S)	157
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0078

OLS Regression Line (Blue)

OLS Regression Slope	0.5371
OLS Regression Intercept	25.1920

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



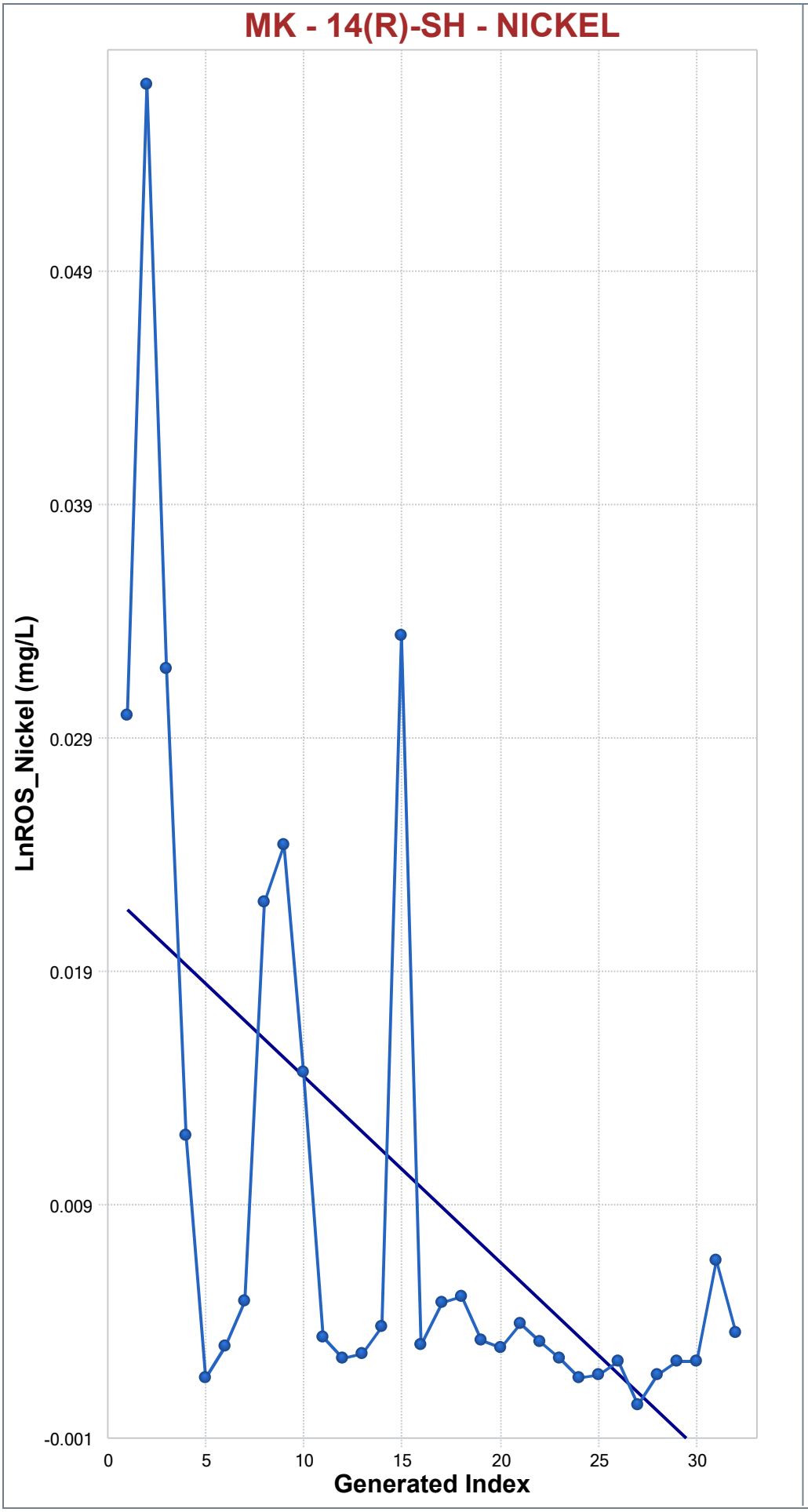
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8274
Standardized Value of S	-3.3488
M-K Test Value (S)	-198
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	-0.0161
OLS Regression Intercept	0.5202

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



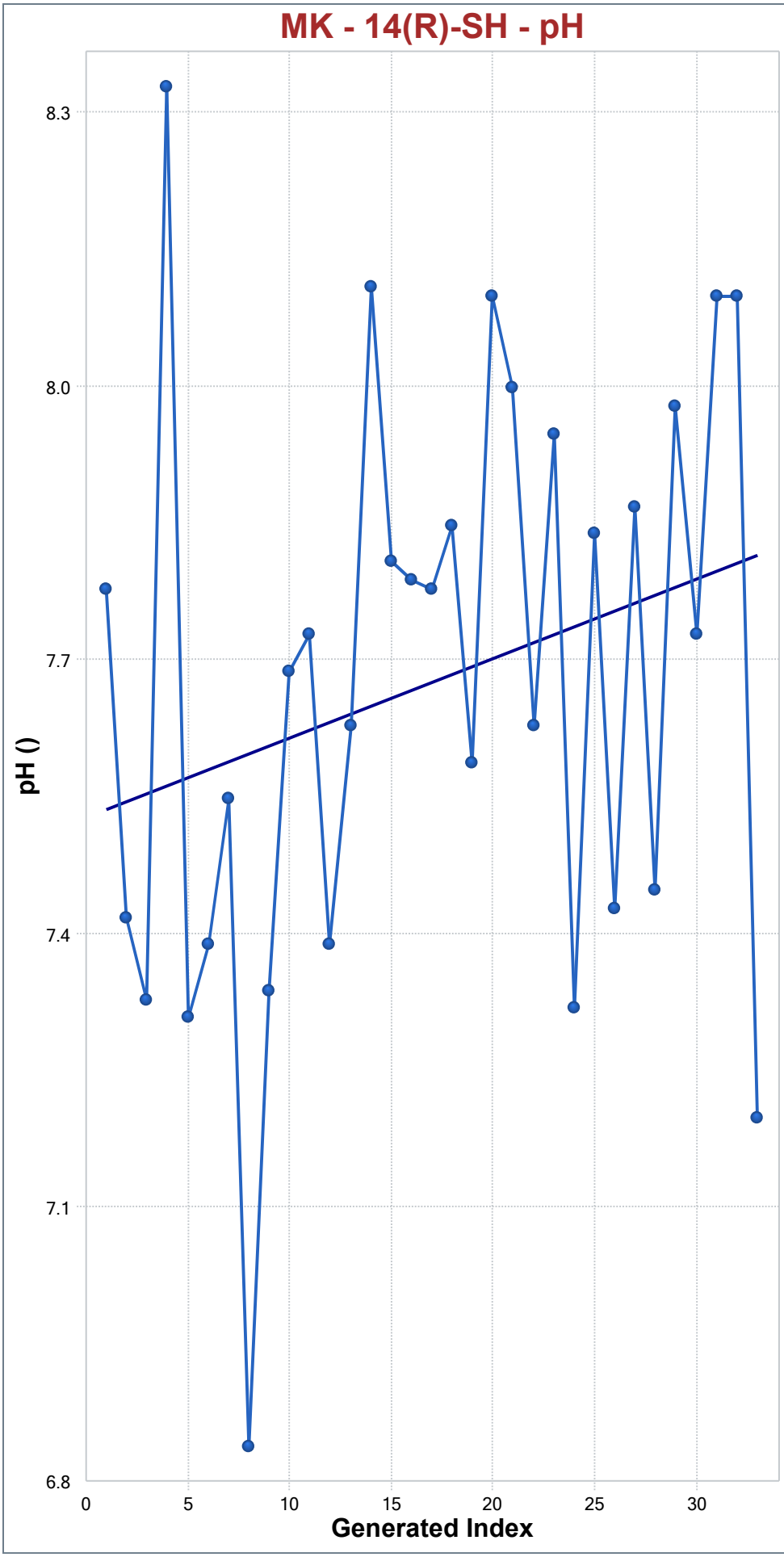
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6658
Standardized Value of S	-3.3244
M-K Test Value (S)	-206
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	-0.0008
OLS Regression Intercept	0.0225

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



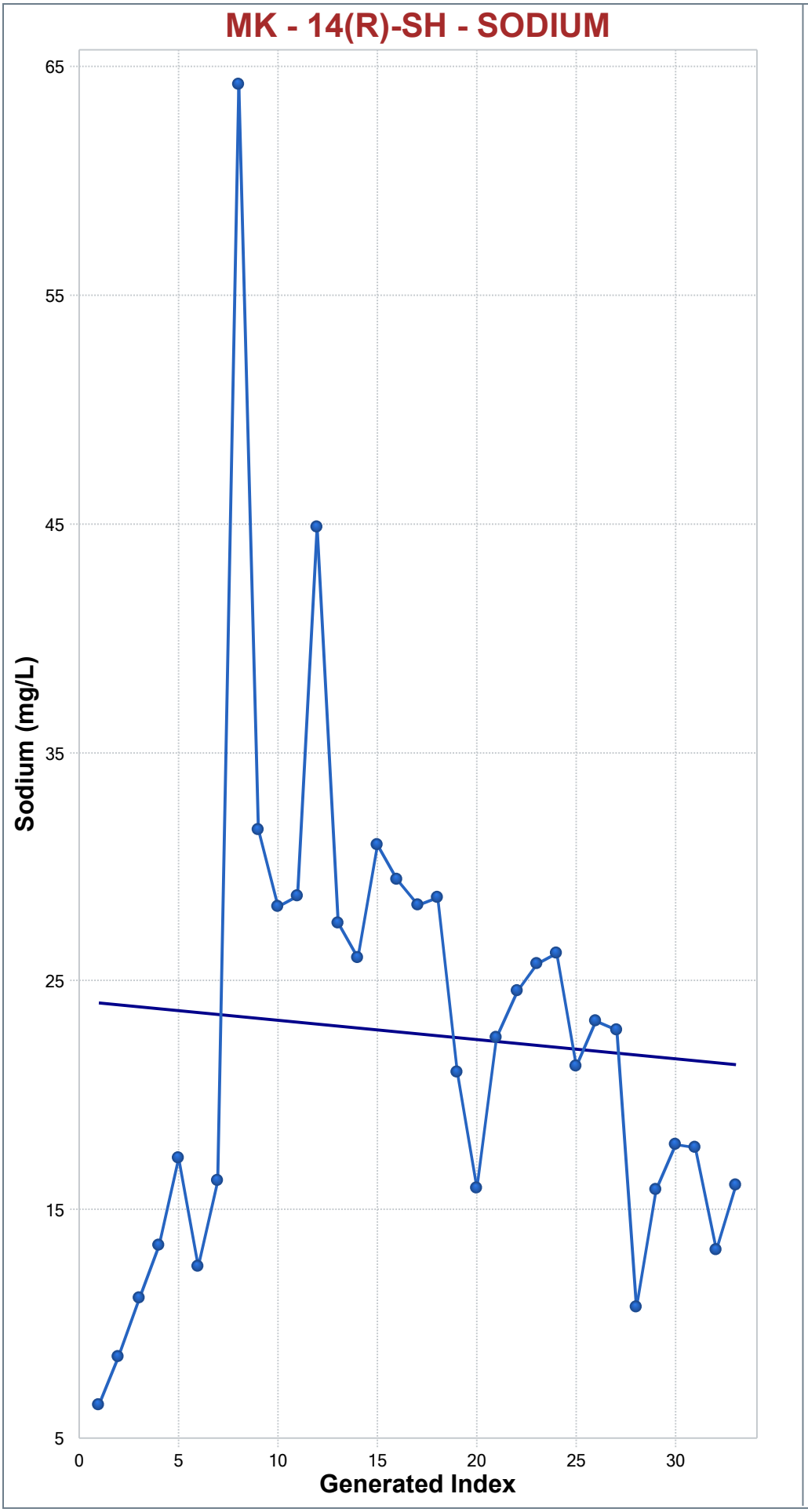
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.4800
Standardized Value of S	1.8921
M-K Test Value (S)	123
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0292

OLS Regression Line (Blue)

OLS Regression Slope	0.0087
OLS Regression Intercept	7.5492

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



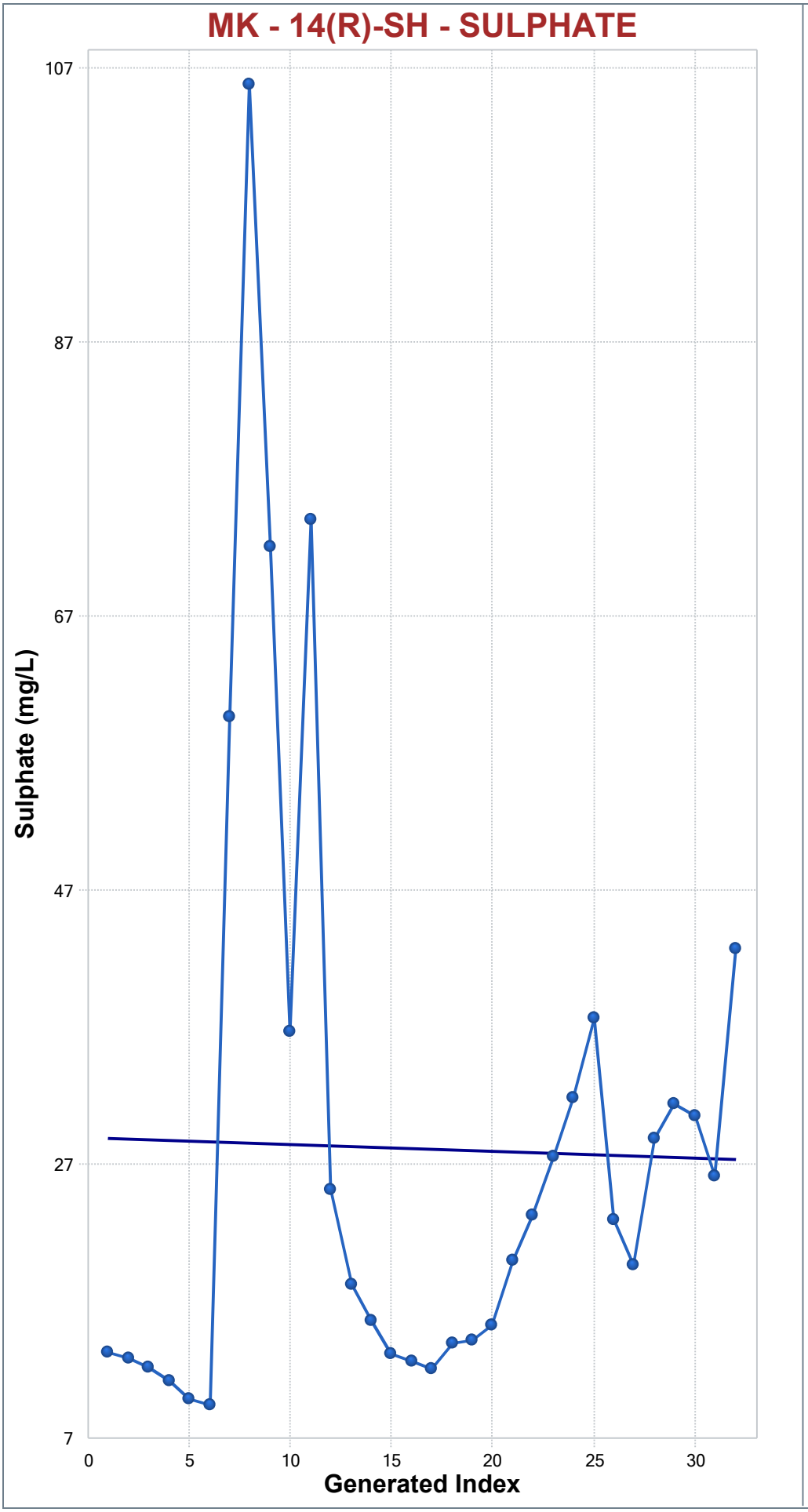
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5394
Standardized Value of S	-0.6663
M-K Test Value (S)	-44
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2526

OLS Regression Line (Blue)

OLS Regression Slope	-0.0848
OLS Regression Intercept	24.0002

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



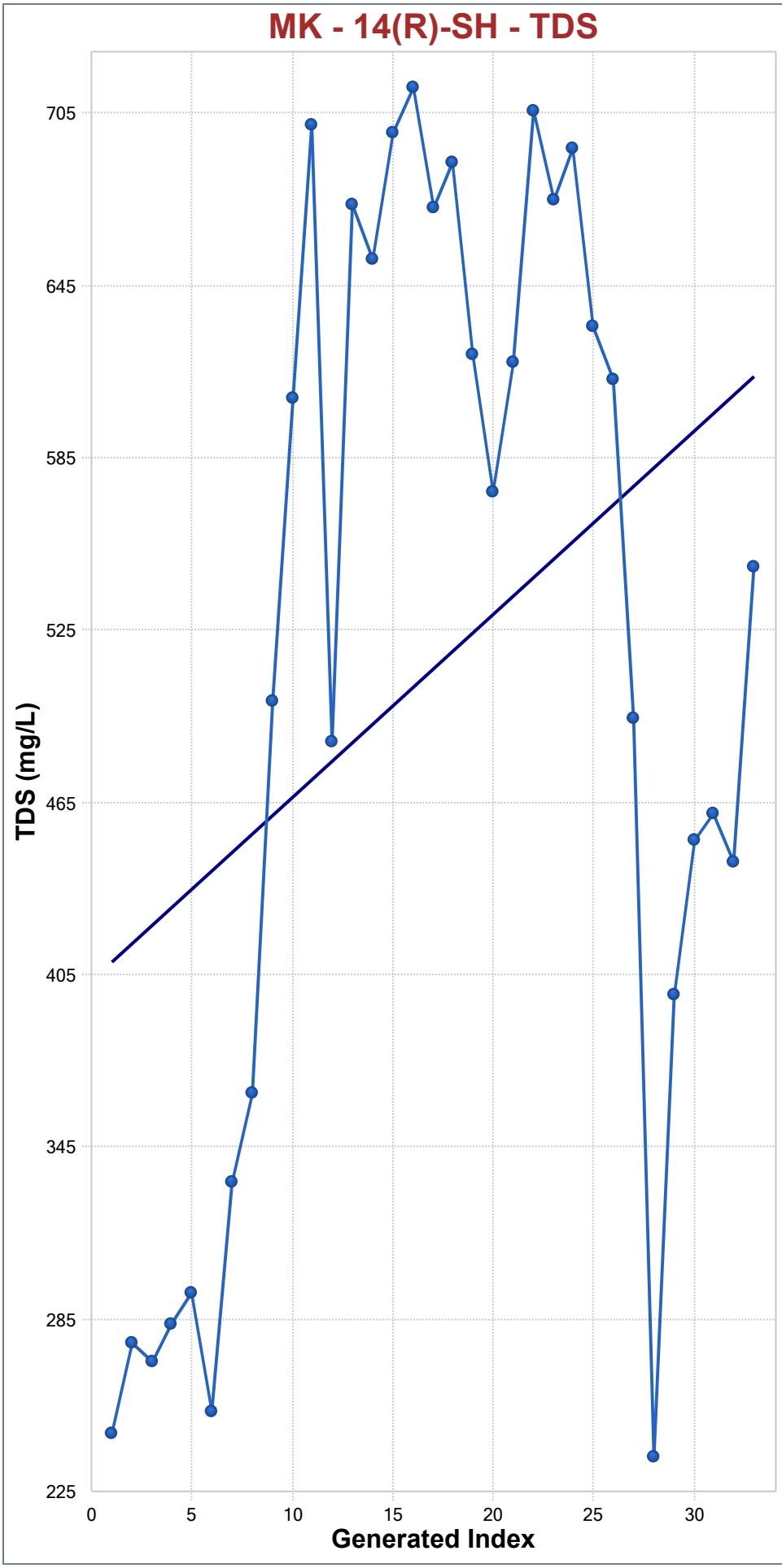
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6658
Standardized Value of S	2.1892
M-K Test Value (S)	136
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0143

OLS Regression Line (Blue)

OLS Regression Slope	-0.0477
OLS Regression Intercept	29.0875

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



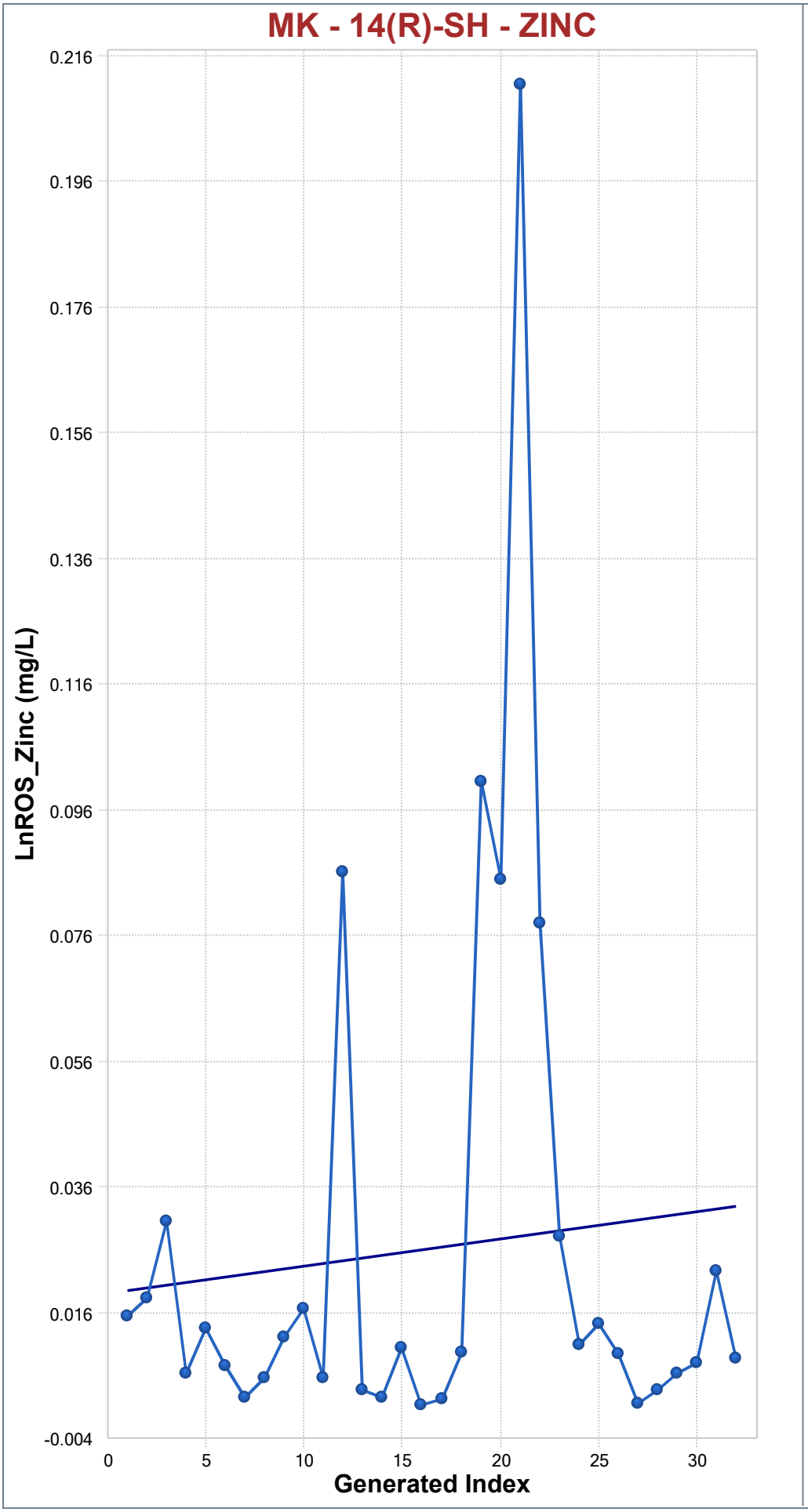
Mann-Kendall Trend Analysis

n	33
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	64.5394
Standardized Value of S	1.5339
M-K Test Value (S)	100
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0625

OLS Regression Line (Blue)

OLS Regression Slope	6.3770
OLS Regression Intercept	402.8939

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



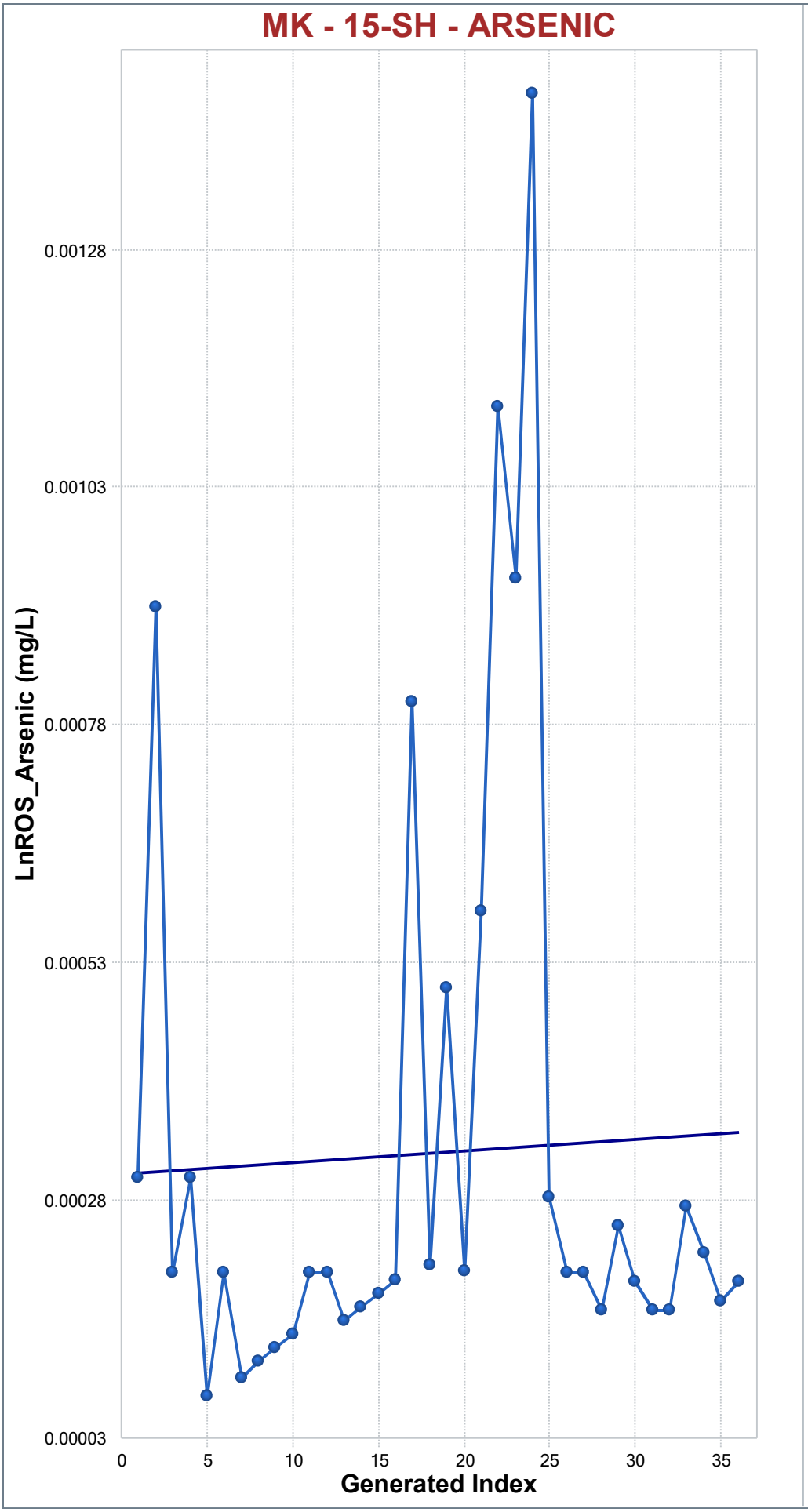
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6495
Standardized Value of S	-0.4380
M-K Test Value (S)	-28
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3307

OLS Regression Line (Blue)

OLS Regression Slope	0.0004
OLS Regression Intercept	0.0186

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



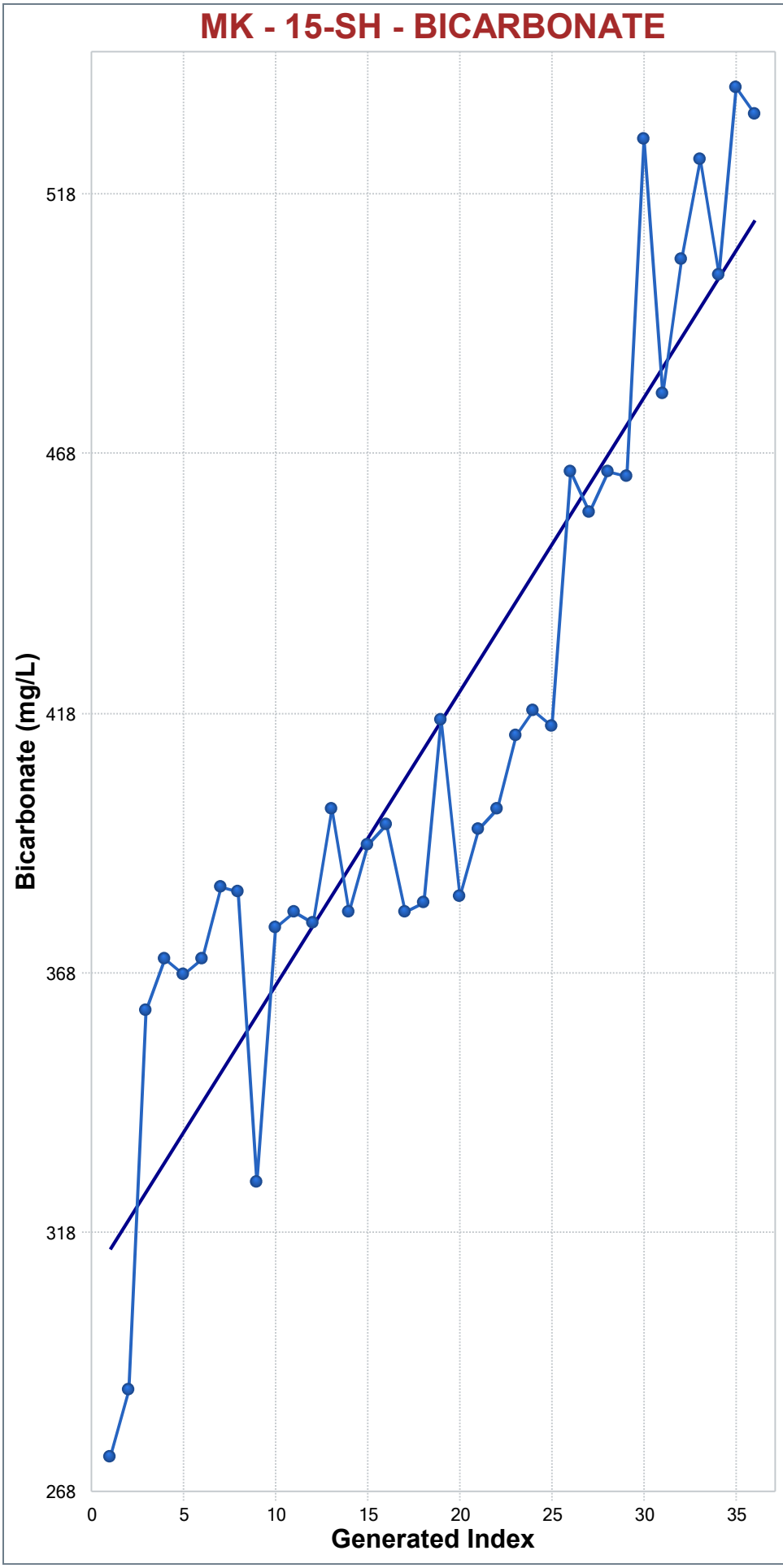
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.1847
Standardized Value of S	0.7242
M-K Test Value (S)	54
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2345

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0003

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



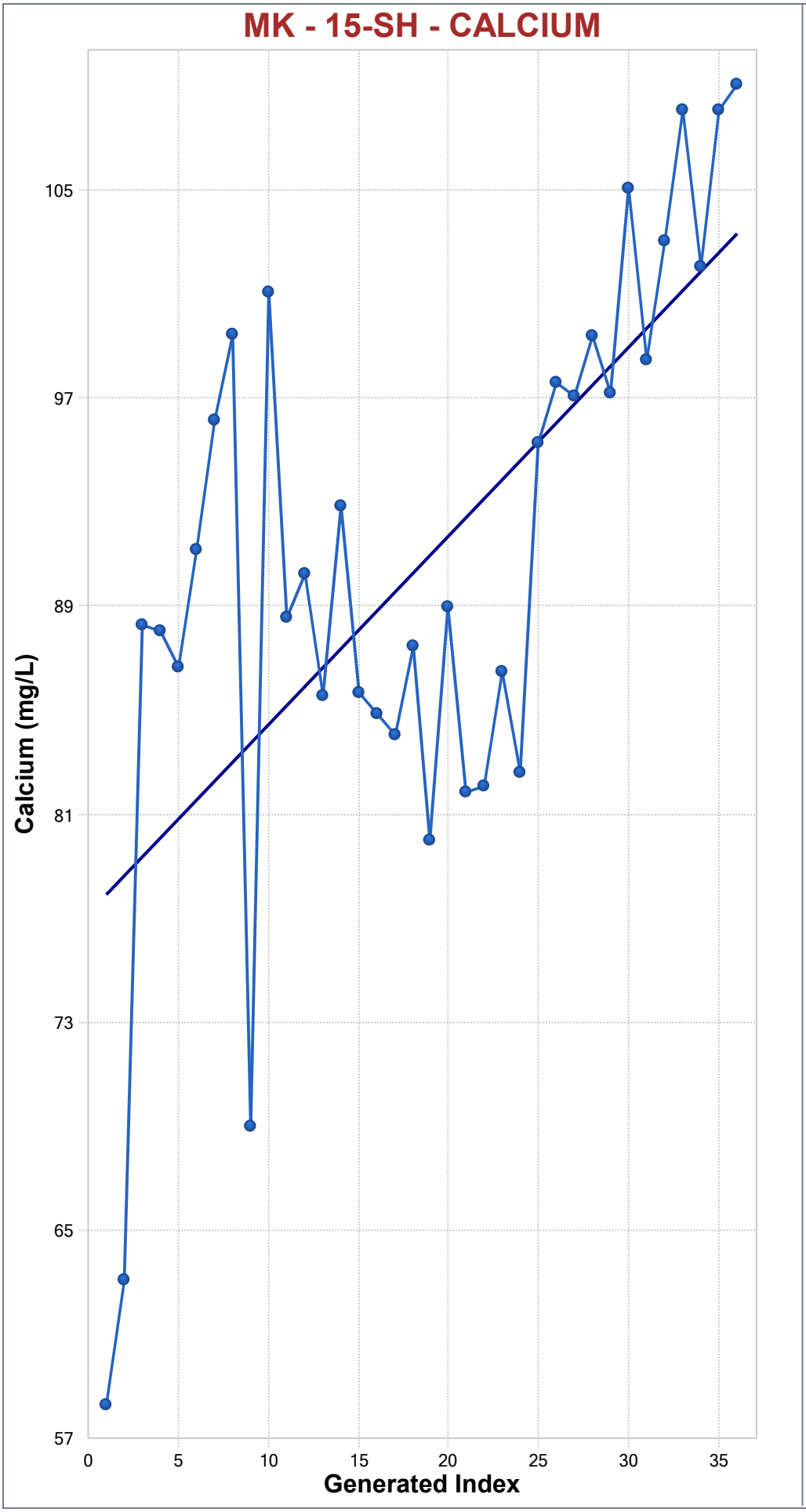
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3712
Standardized Value of S	7.0464
M-K Test Value (S)	518
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	5.6620
OLS Regression Intercept	309.4190

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



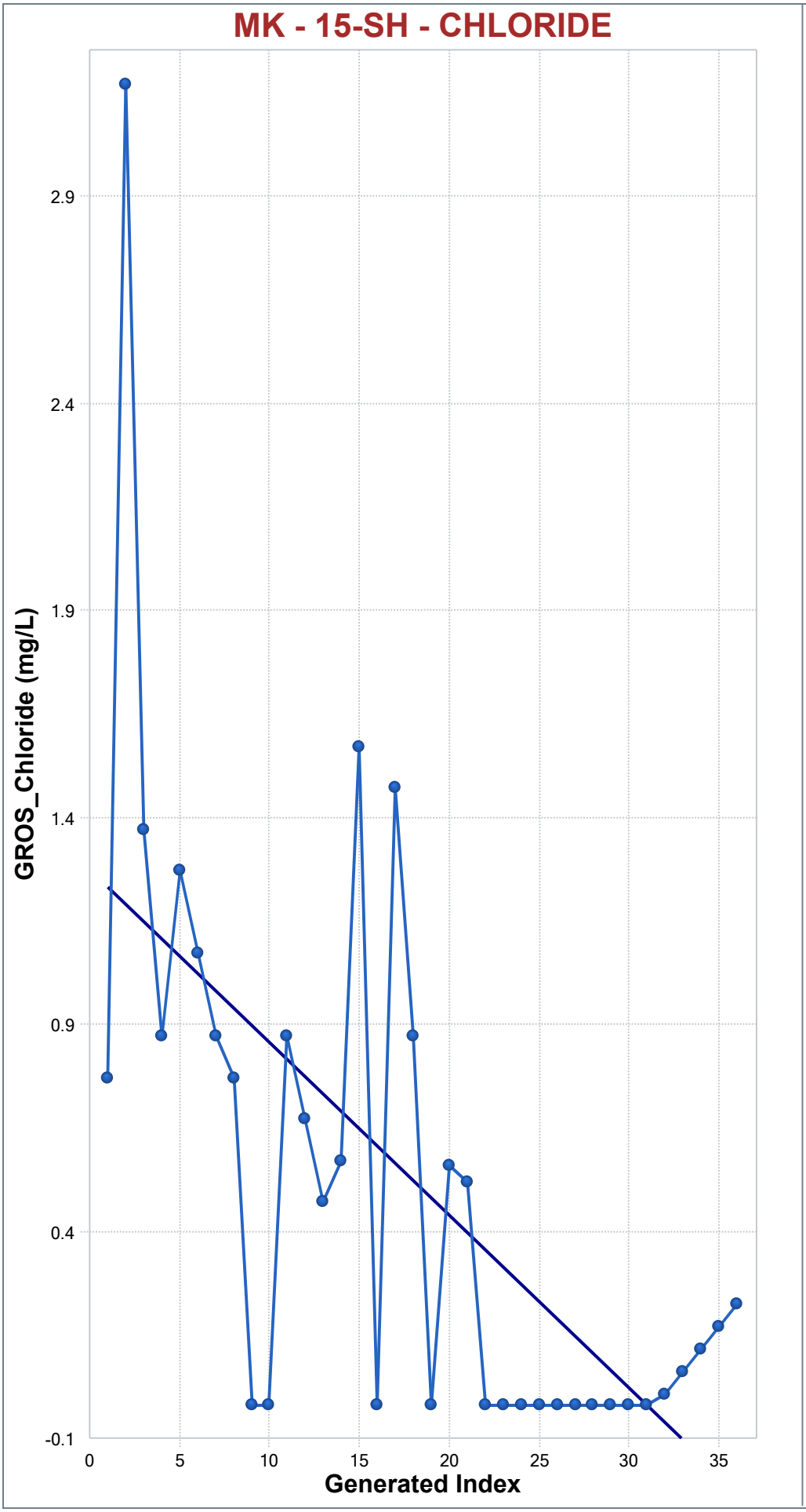
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.4098
Standardized Value of S	3.7325
M-K Test Value (S)	275
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	0.7257
OLS Regression Intercept	77.1389

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



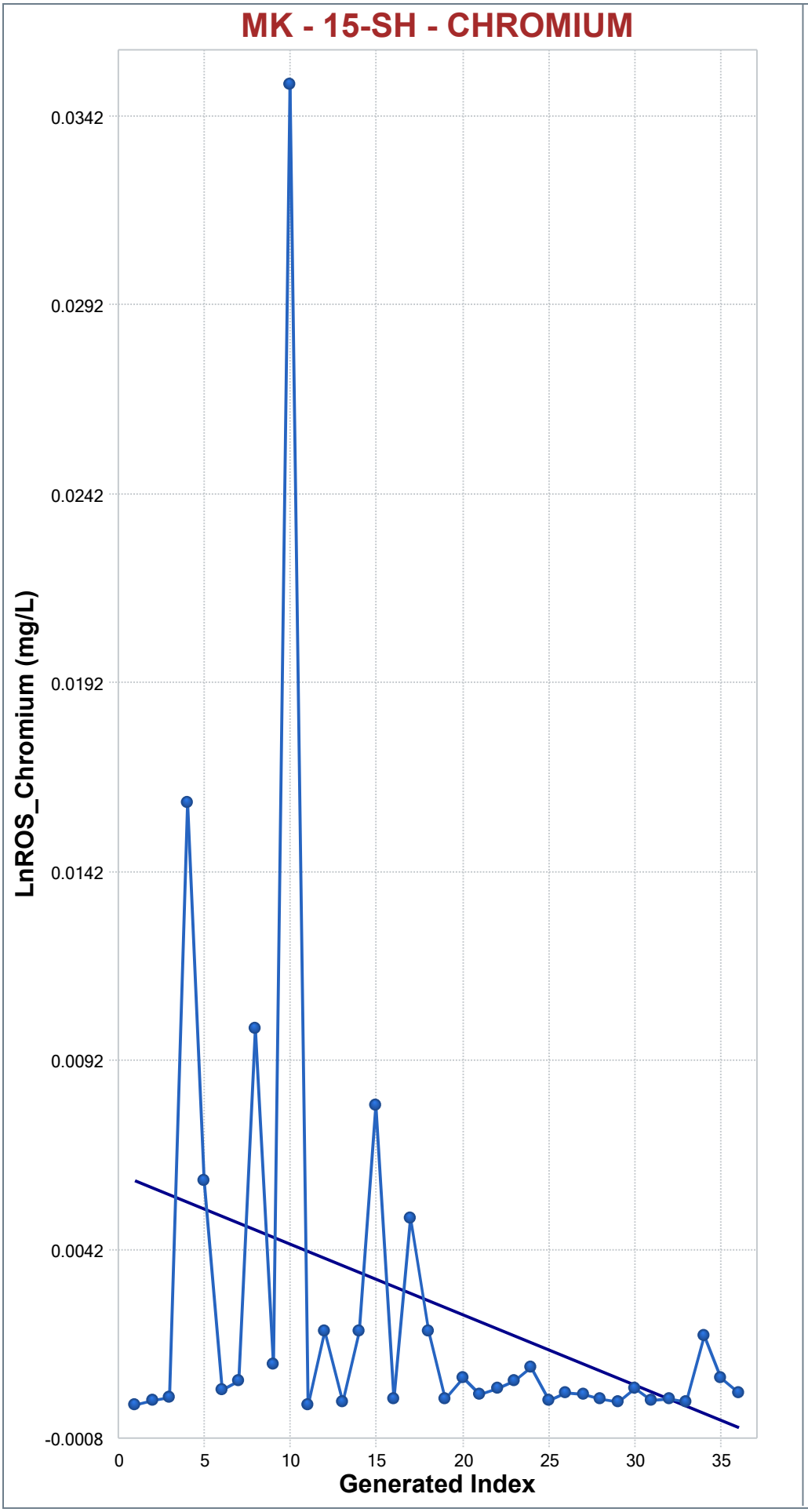
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	71.0399
Standardized Value of S	-3.4206
M-K Test Value (S)	-244
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0003

OLS Regression Line (Blue)

OLS Regression Slope	-0.0417
OLS Regression Intercept	1.3024

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



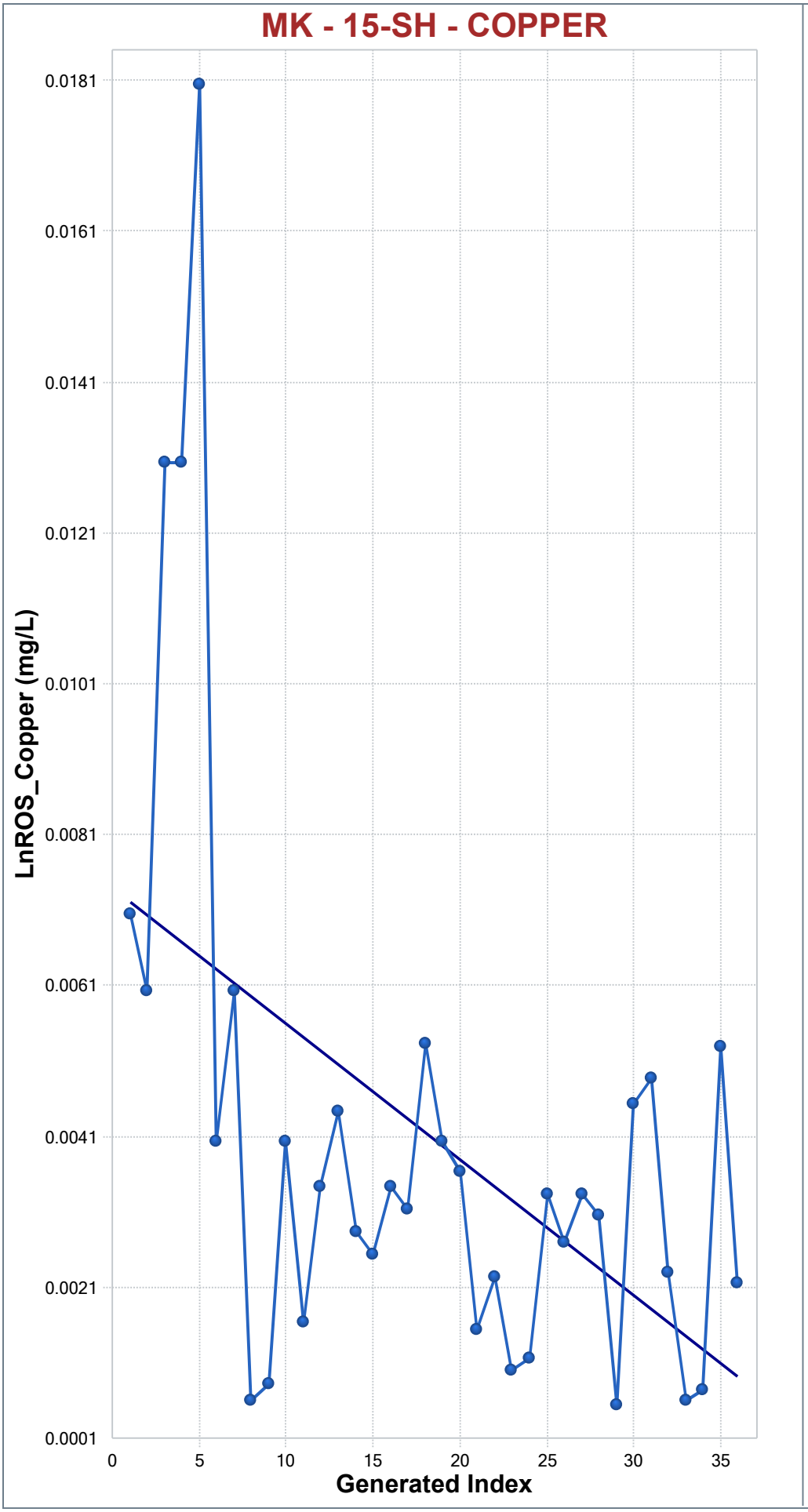
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3848
Standardized Value of S	-1.2673
M-K Test Value (S)	-94
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1025

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0062

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



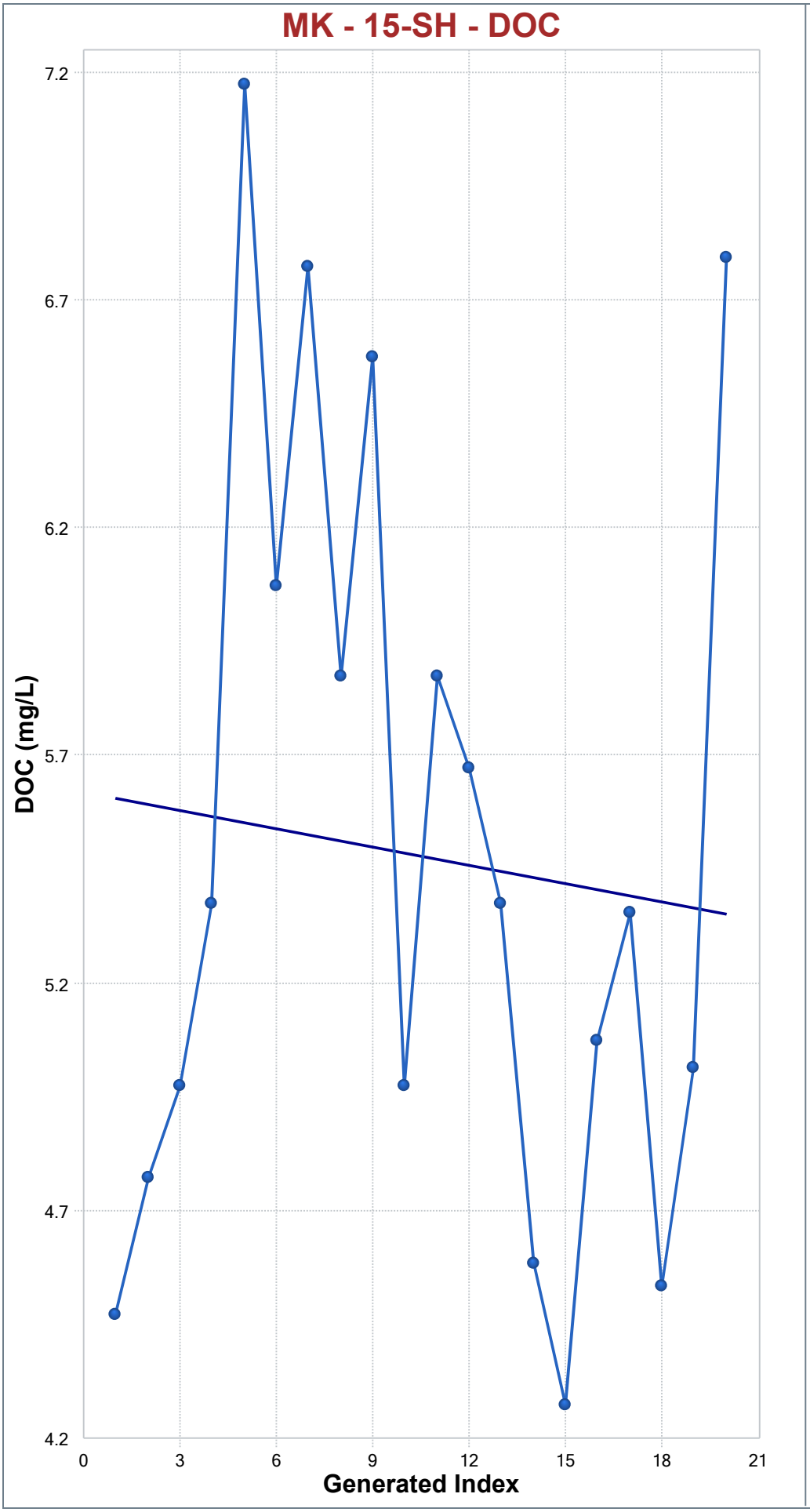
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3712
Standardized Value of S	-2.7940
M-K Test Value (S)	-206
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0026

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0074

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



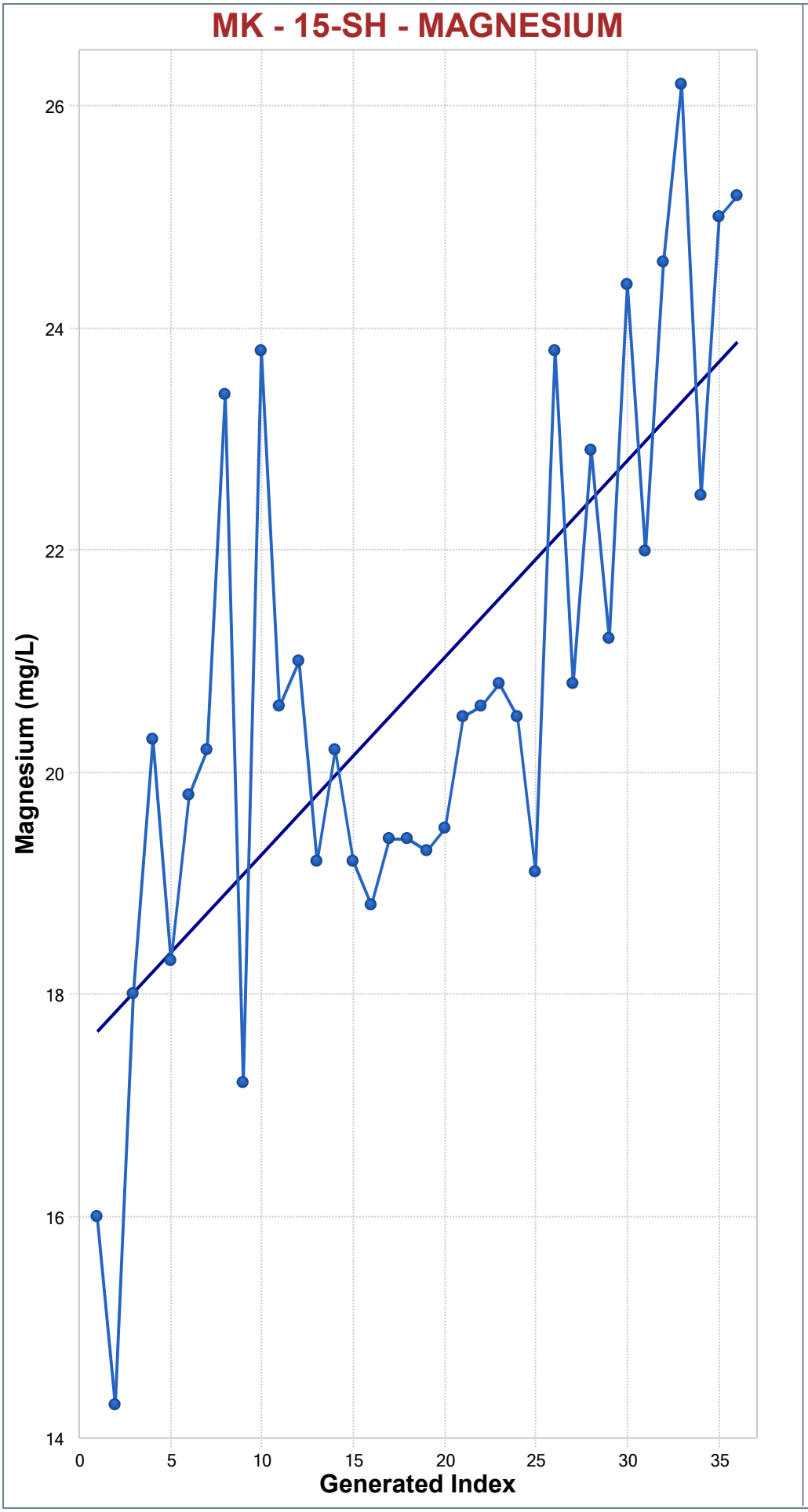
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7734
Standardized Value of S	-0.4549
M-K Test Value (S)	-15
Tabulated p-value	0.3390
Approximate p-value	0.3246

OLS Regression Line (Blue)

OLS Regression Slope	-0.0133
OLS Regression Intercept	5.6447

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



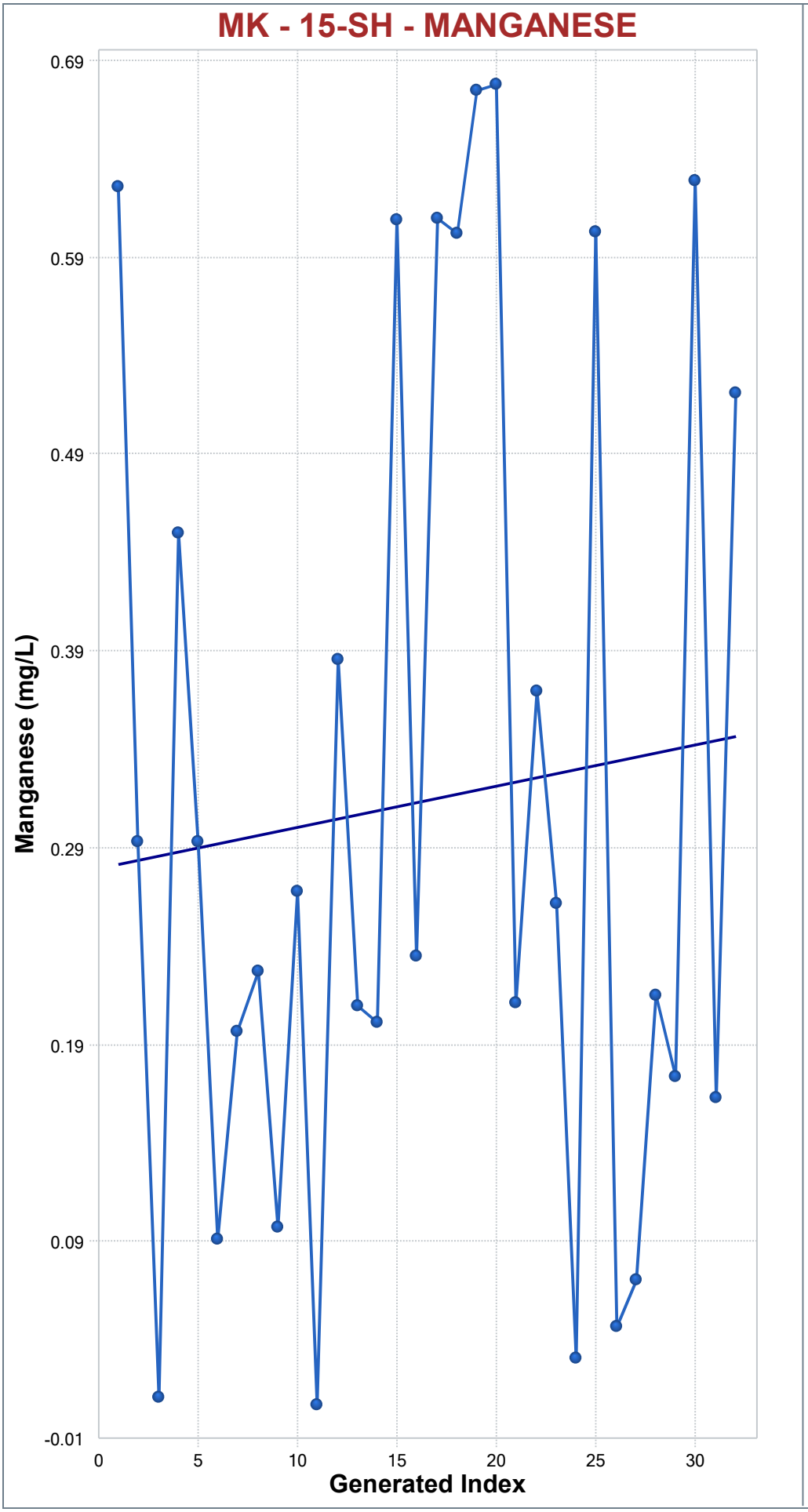
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3689
Standardized Value of S	4.7432
M-K Test Value (S)	349
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.1776
OLS Regression Intercept	17.1921

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



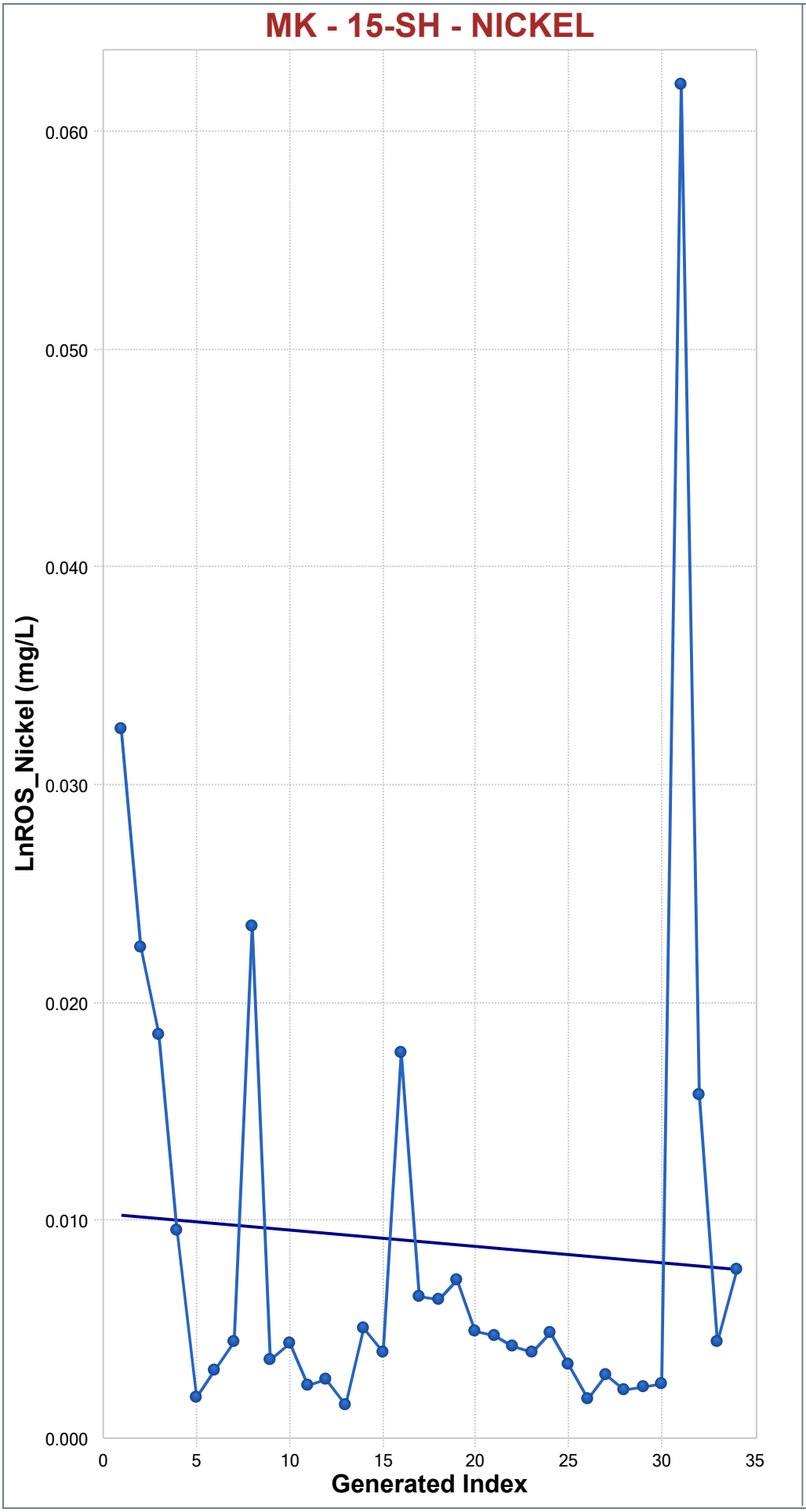
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	0.2271
M-K Test Value (S)	15
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4102

OLS Regression Line (Blue)

OLS Regression Slope	0.0021
OLS Regression Intercept	0.2799

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



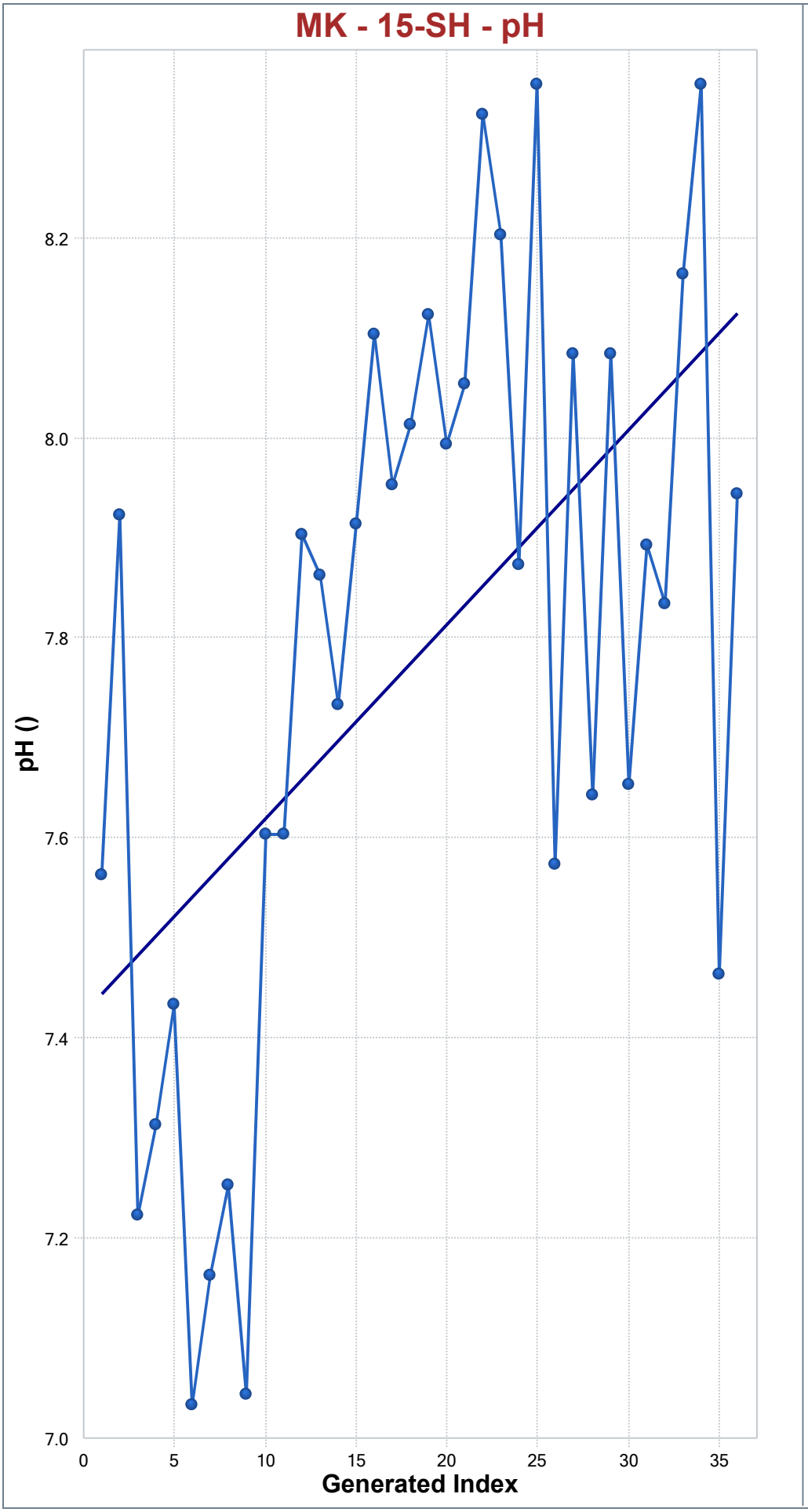
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4562
Standardized Value of S	-1.2453
M-K Test Value (S)	-85
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1065

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0107

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



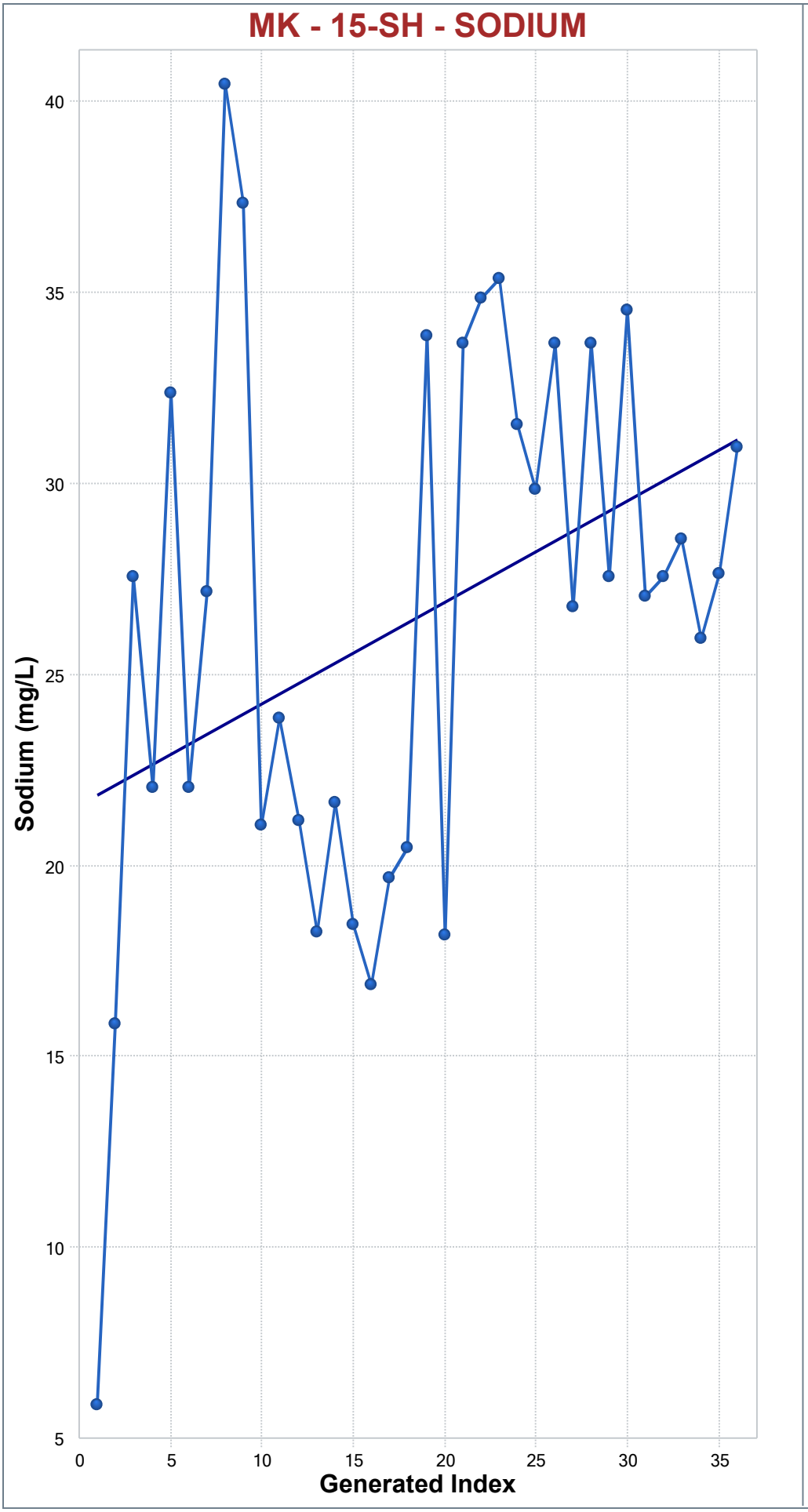
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3962
Standardized Value of S	3.3789
M-K Test Value (S)	249
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	0.0194
OLS Regression Intercept	7.4020

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



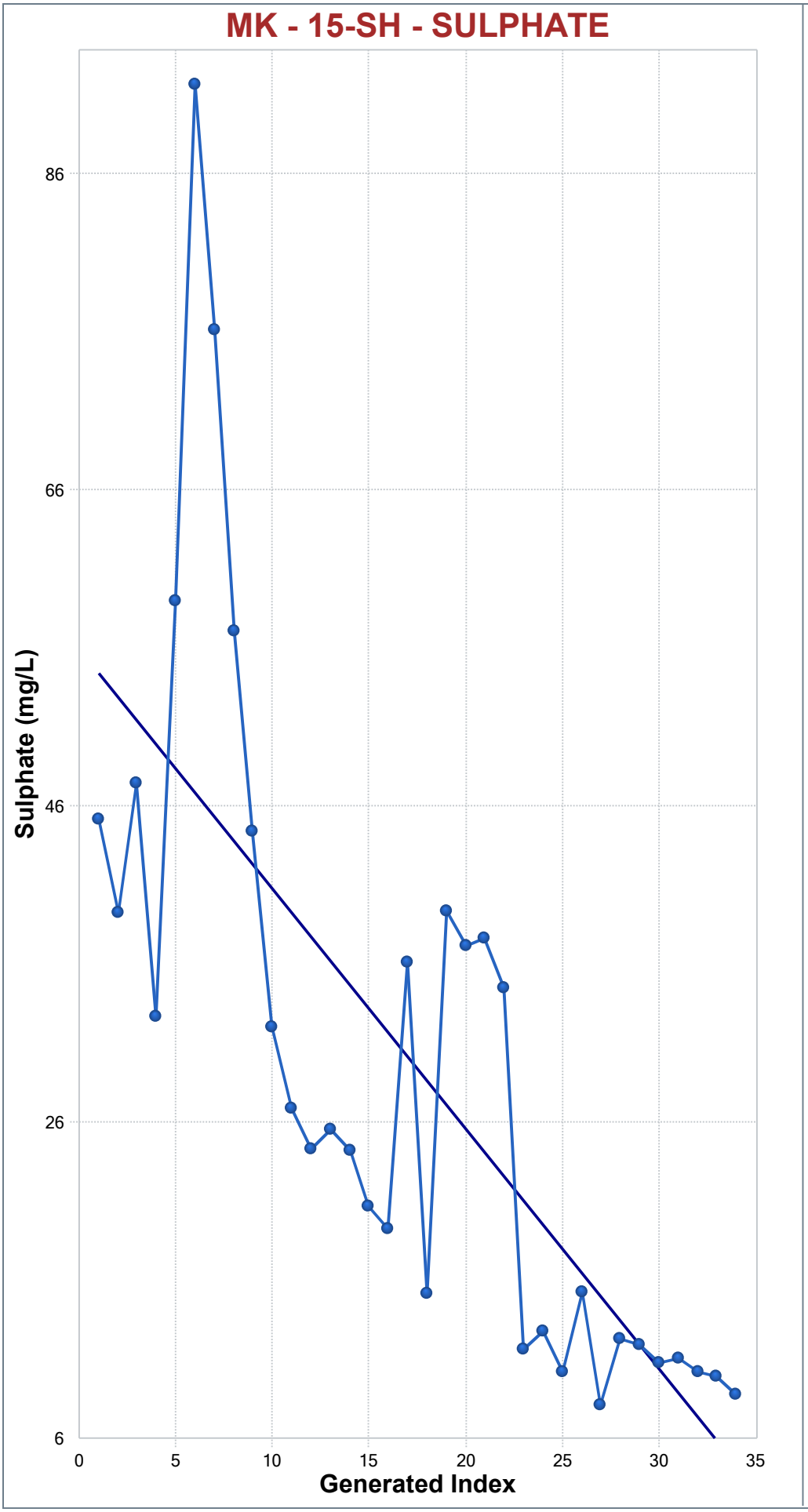
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3598
Standardized Value of S	1.6903
M-K Test Value (S)	125
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0455

OLS Regression Line (Blue)

OLS Regression Slope	0.2658
OLS Regression Intercept	21.4083

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



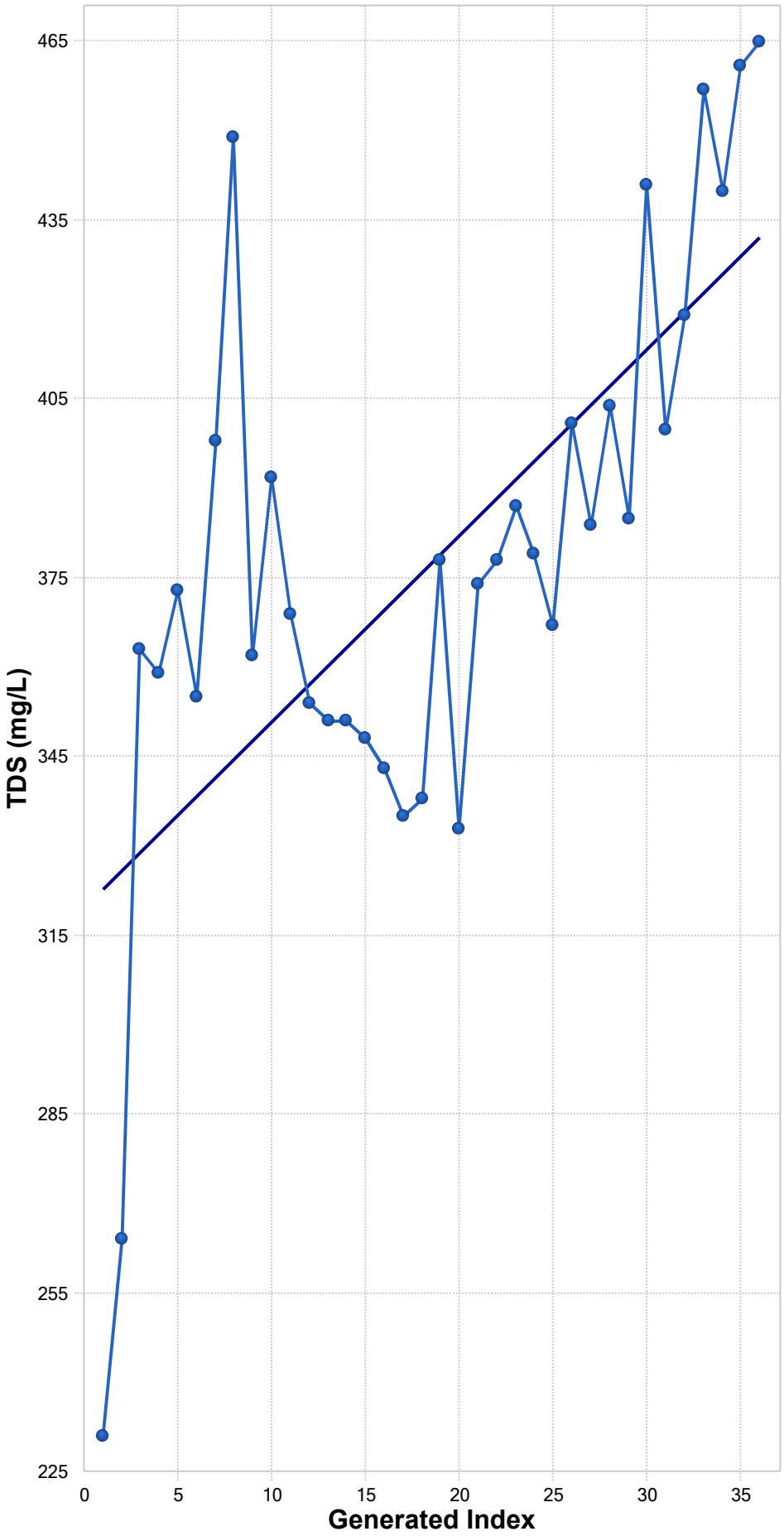
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4487
Standardized Value of S	-5.5894
M-K Test Value (S)	-378
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-1.5168
OLS Regression Intercept	55.7819

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



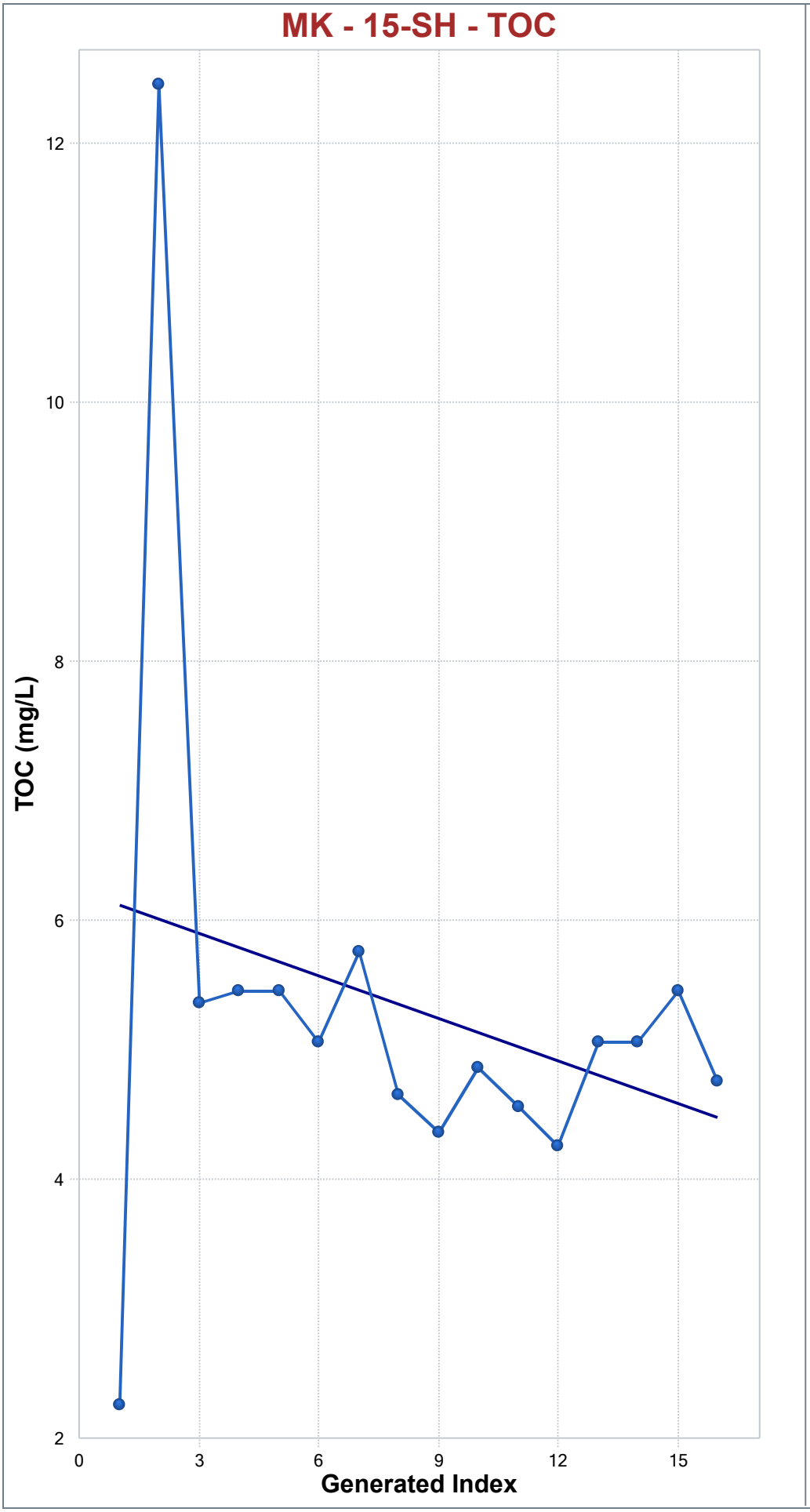
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.4030
Standardized Value of S	4.1006
M-K Test Value (S)	302
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	3.1241
OLS Regression Intercept	319.6492

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



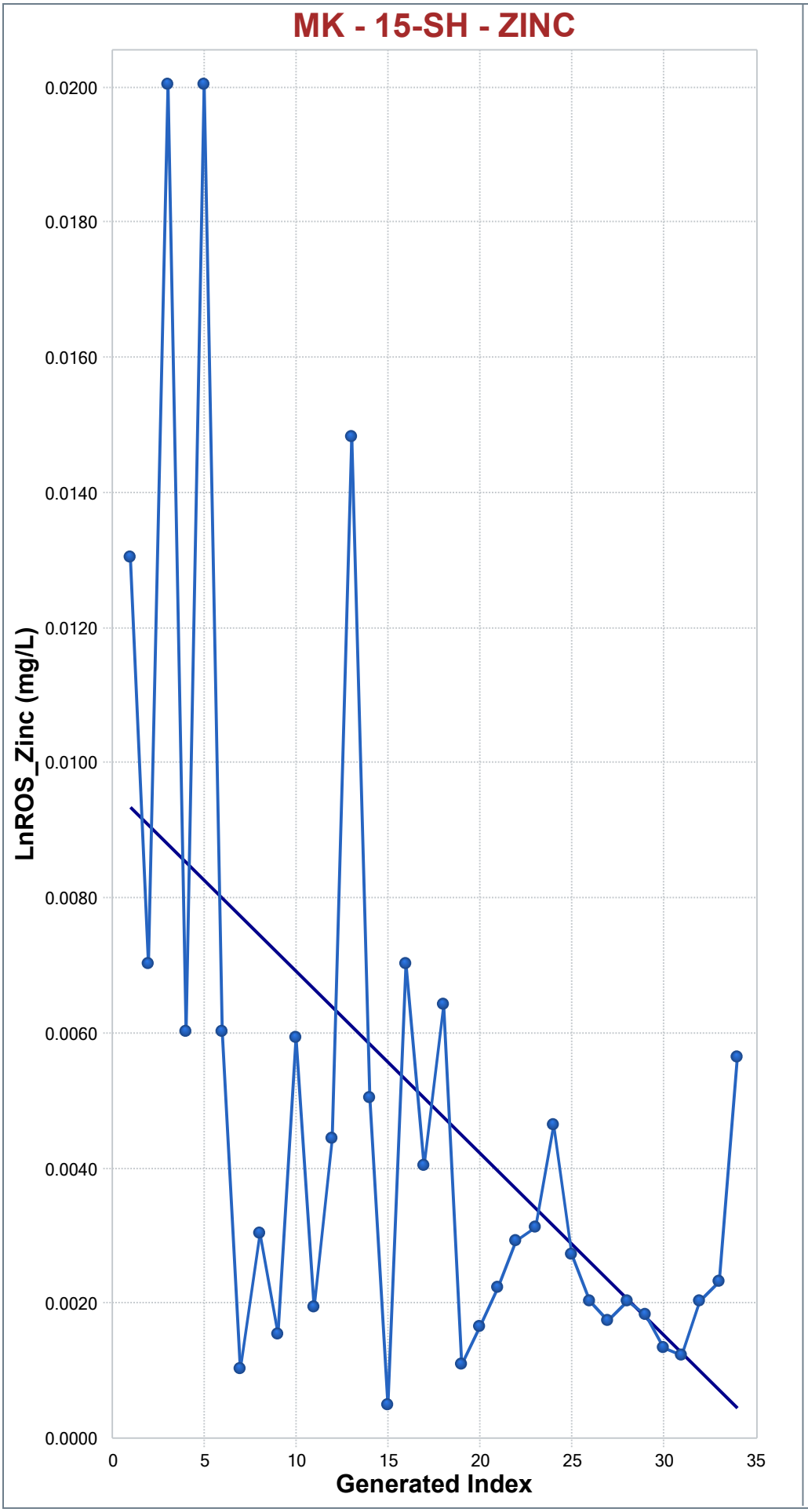
Mann-Kendall Trend Analysis

n	16
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	22.0454
Standardized Value of S	-0.8619
M-K Test Value (S)	-20
Tabulated p-value	0.1990
Approximate p-value	0.1944

OLS Regression Line (Blue)

OLS Regression Slope	-0.1093
OLS Regression Intercept	6.2725

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



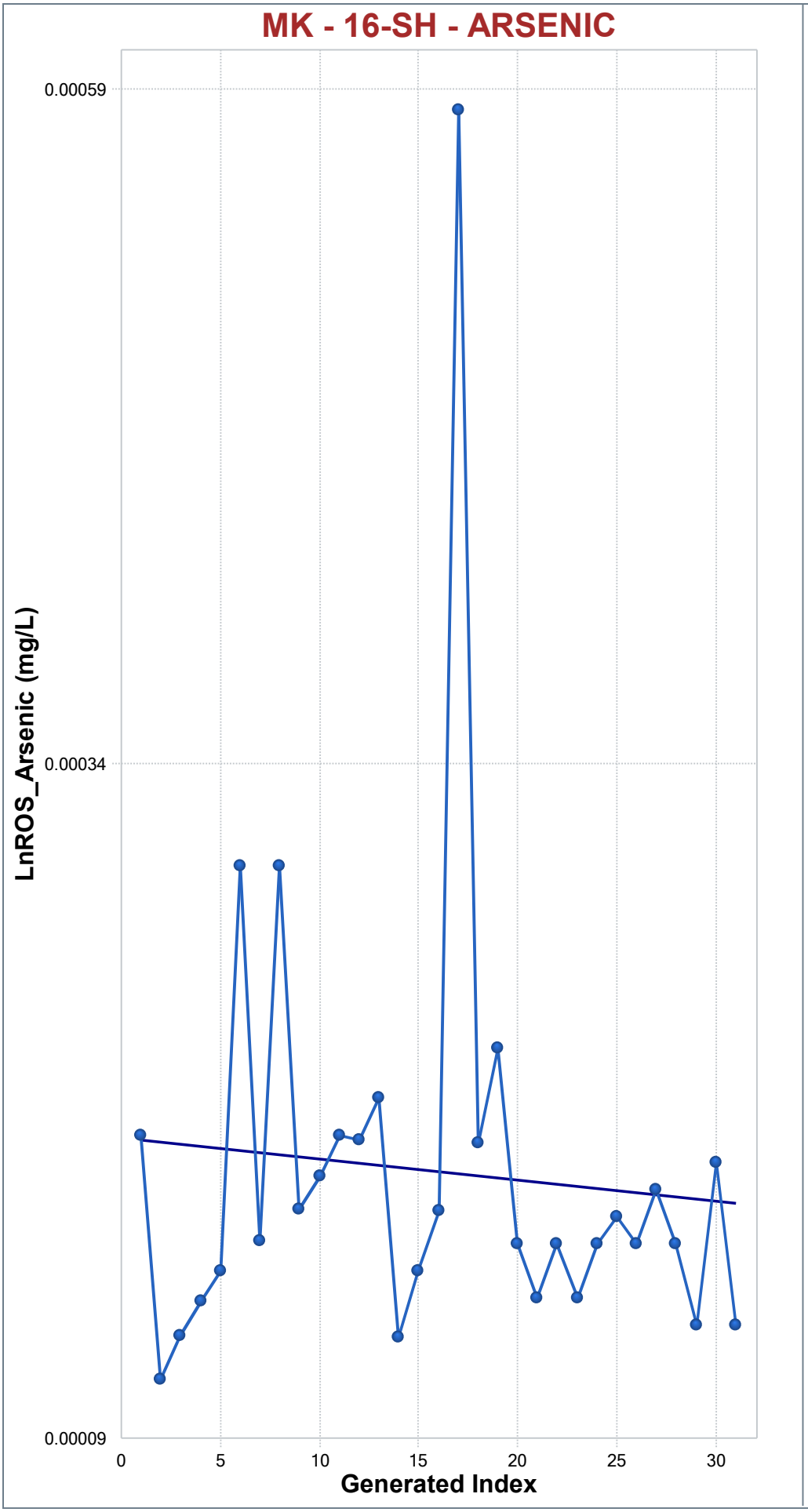
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.4067
Standardized Value of S	-2.8484
M-K Test Value (S)	-193
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0022

OLS Regression Line (Blue)

OLS Regression Slope	-0.0003
OLS Regression Intercept	0.0096

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



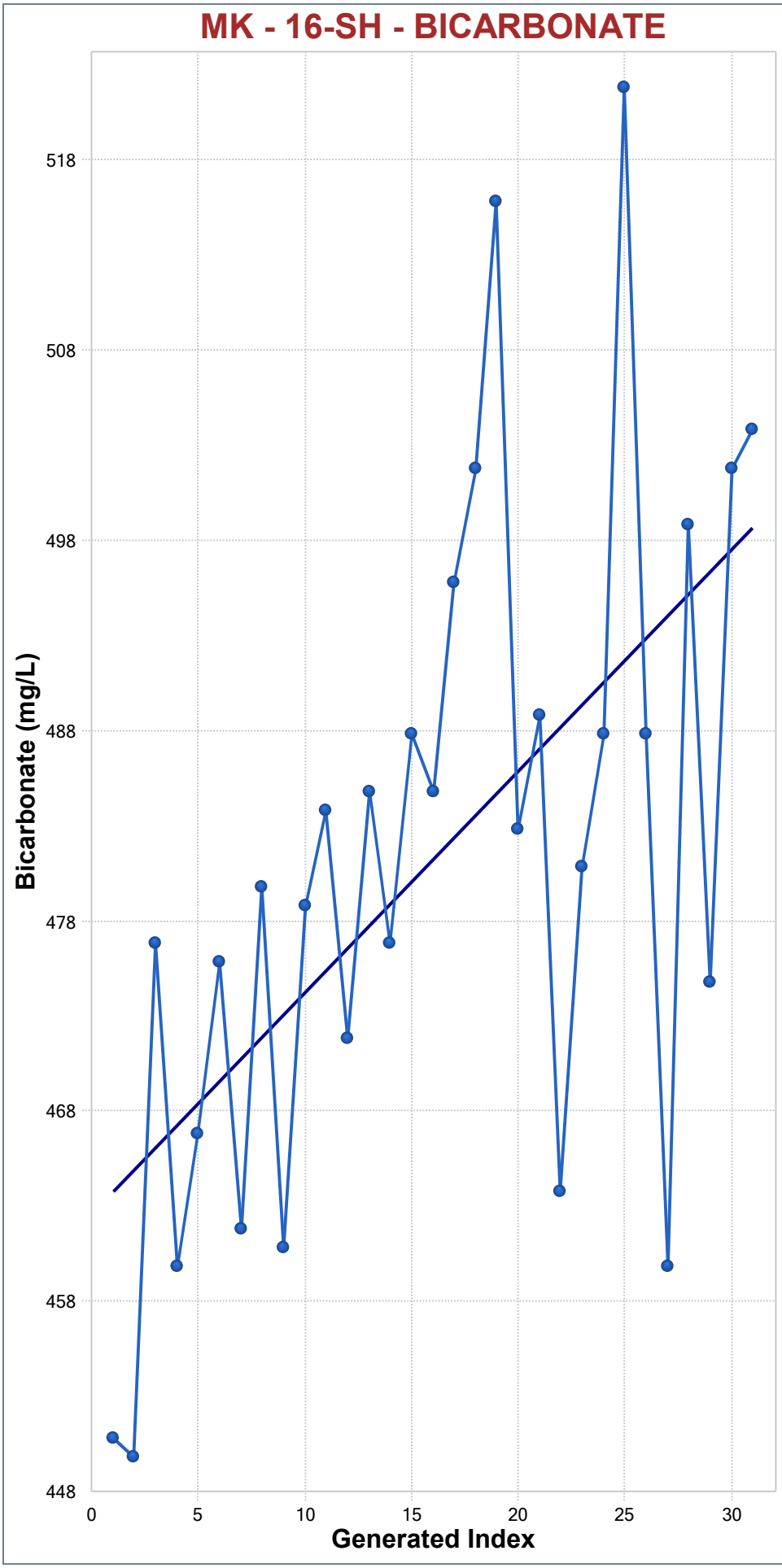
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.6600
Standardized Value of S	-0.5796
M-K Test Value (S)	-35
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2811

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0002

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



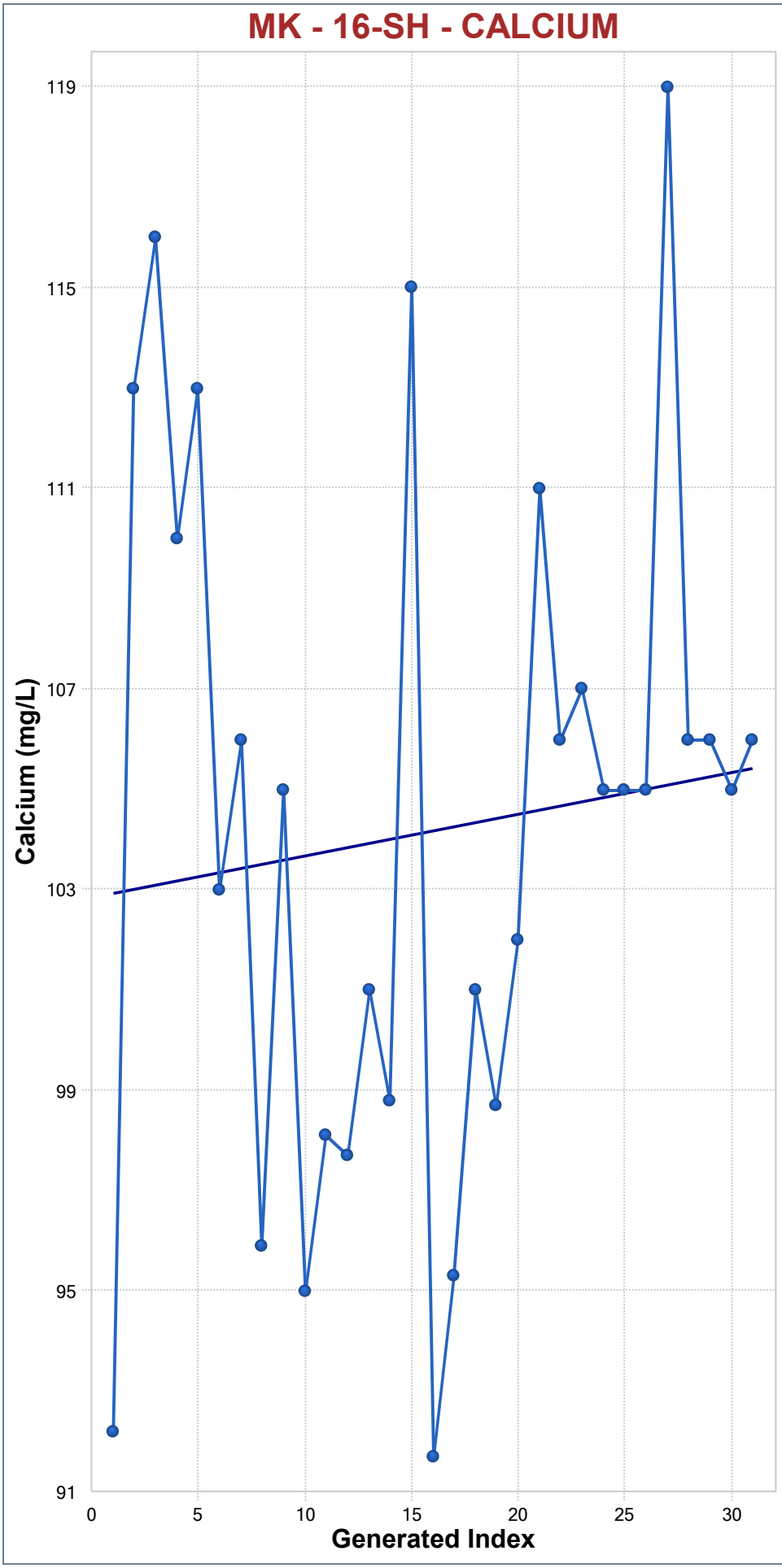
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7707
Standardized Value of S	3.8284
M-K Test Value (S)	226
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	1.1621
OLS Regression Intercept	462.7935

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



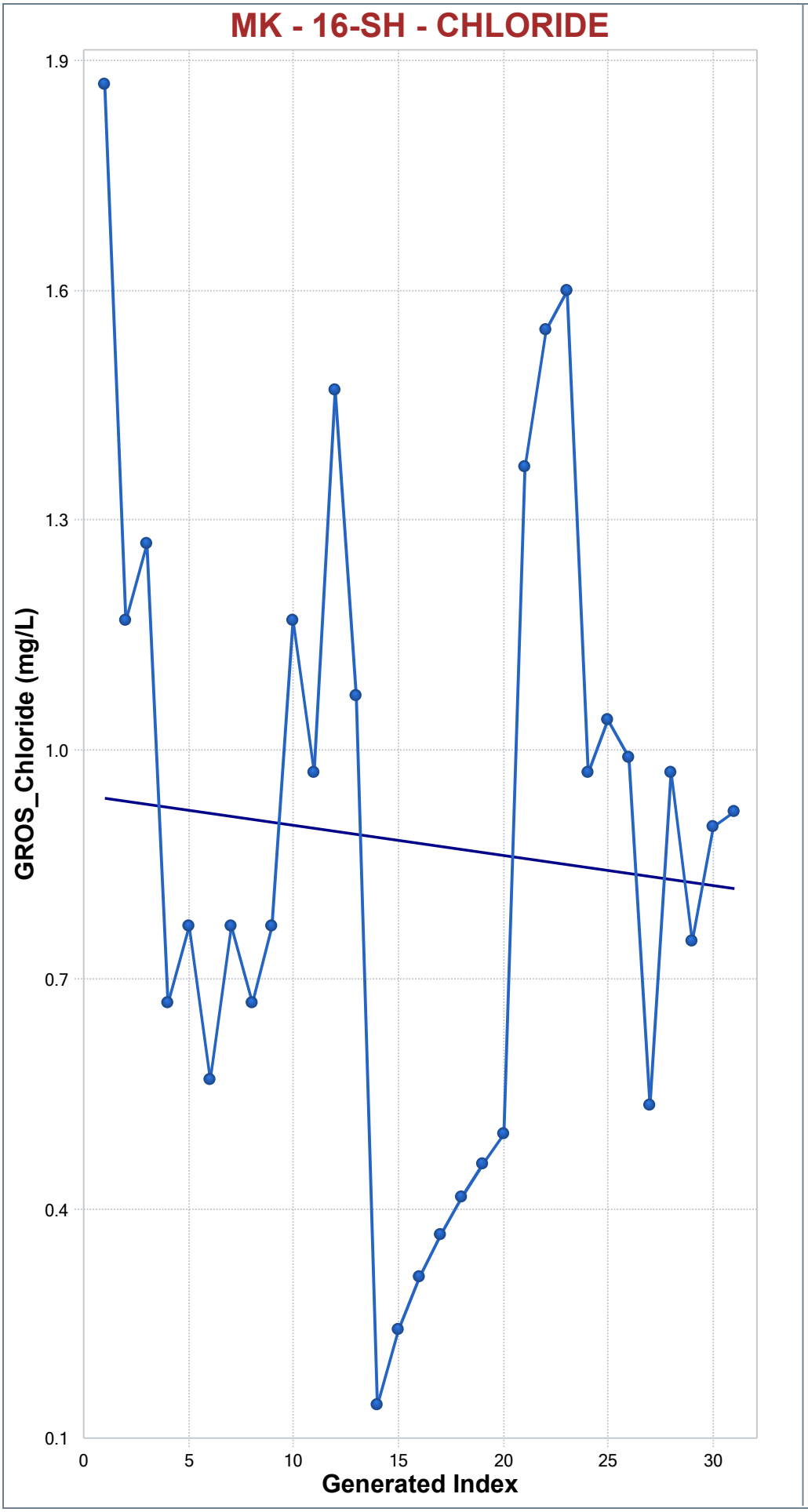
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.5349
Standardized Value of S	0.8884
M-K Test Value (S)	53
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1872

OLS Regression Line (Blue)

OLS Regression Slope	0.0832
OLS Regression Intercept	102.8432

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



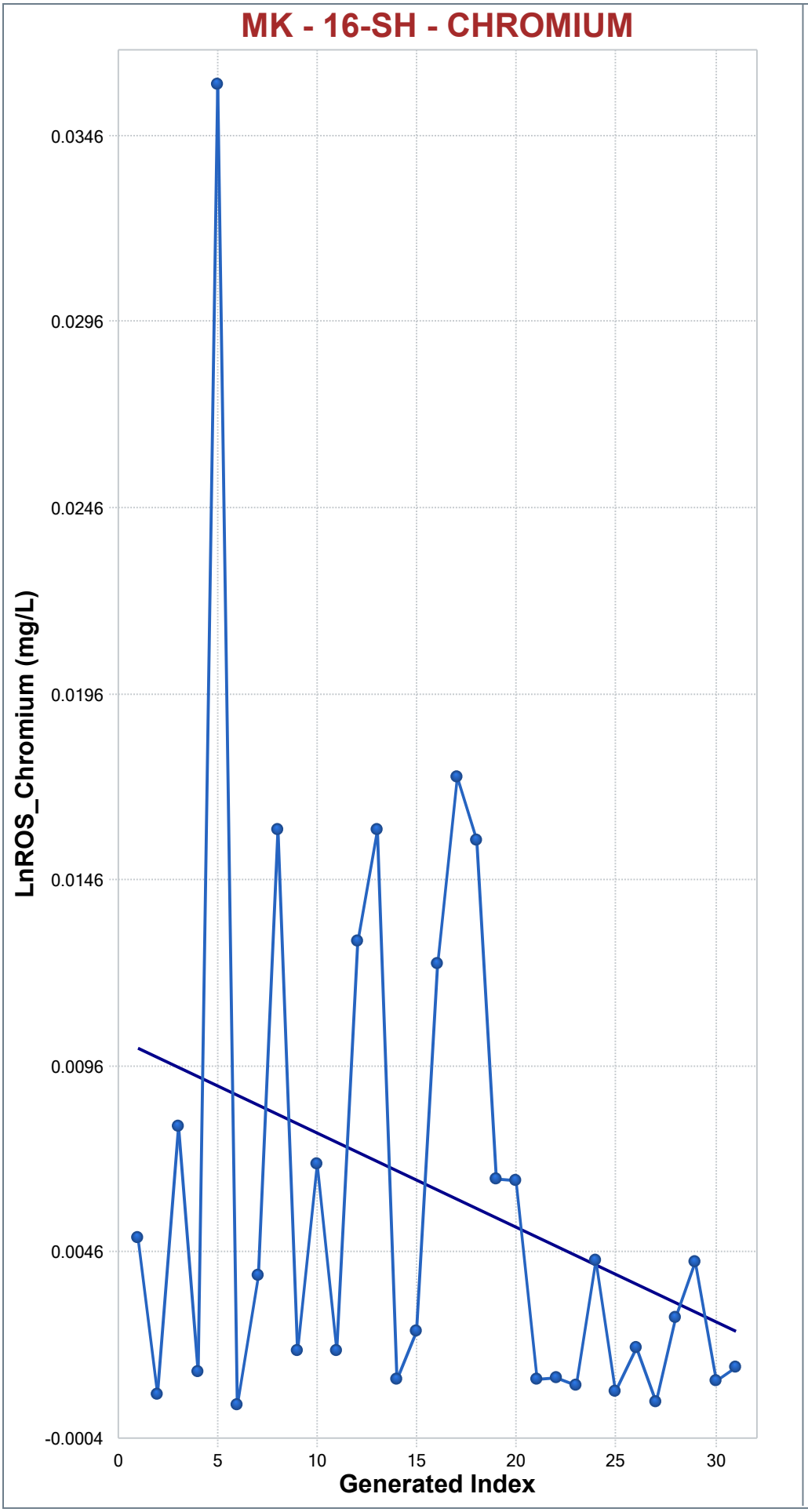
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7566
Standardized Value of S	-0.1702
M-K Test Value (S)	-11
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4324

OLS Regression Line (Blue)

OLS Regression Slope	-0.0039
OLS Regression Intercept	0.9714

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



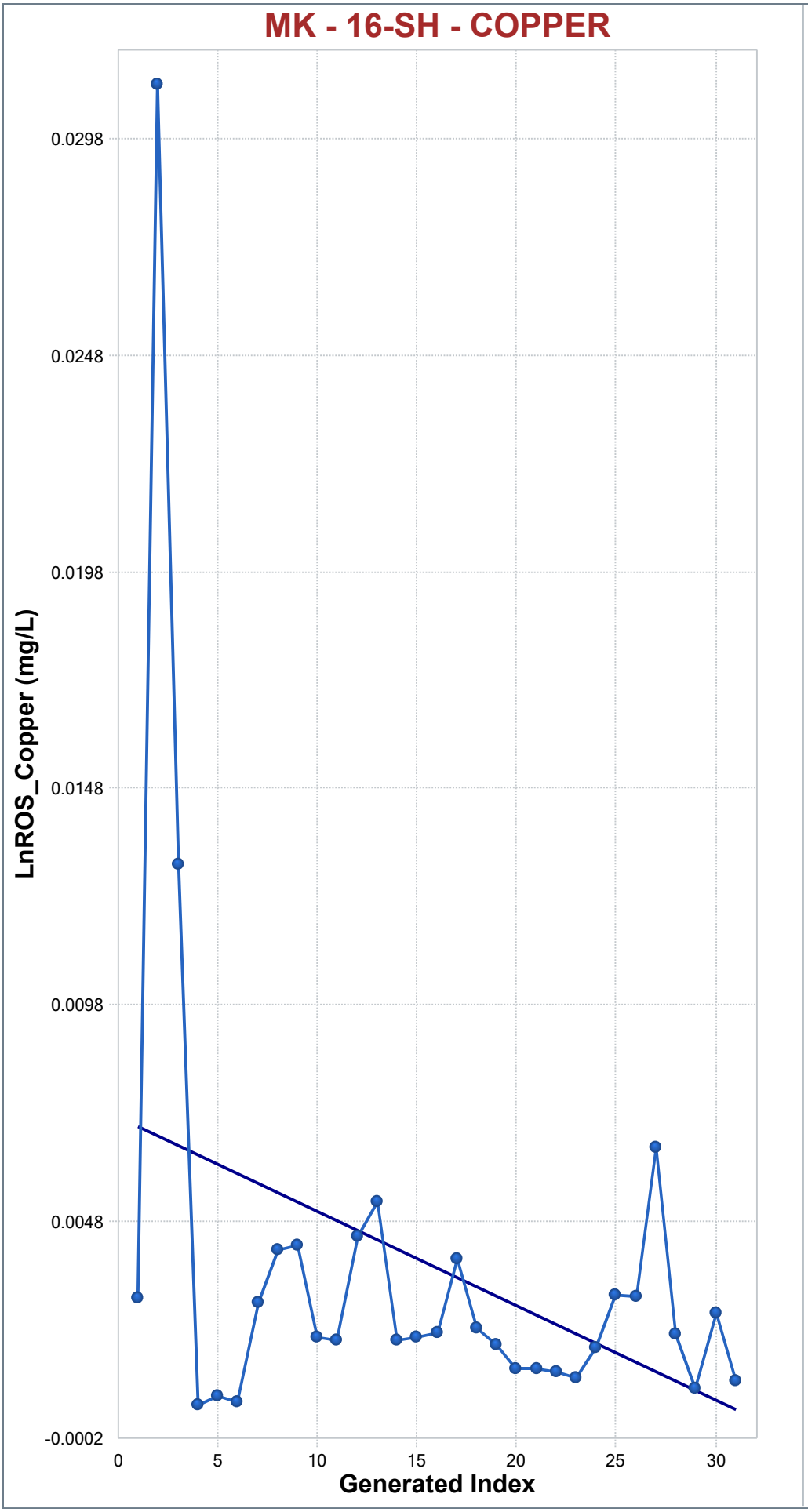
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8189
Standardized Value of S	-1.4961
M-K Test Value (S)	-89
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0673

OLS Regression Line (Blue)

OLS Regression Slope	-0.0003
OLS Regression Intercept	0.0103

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



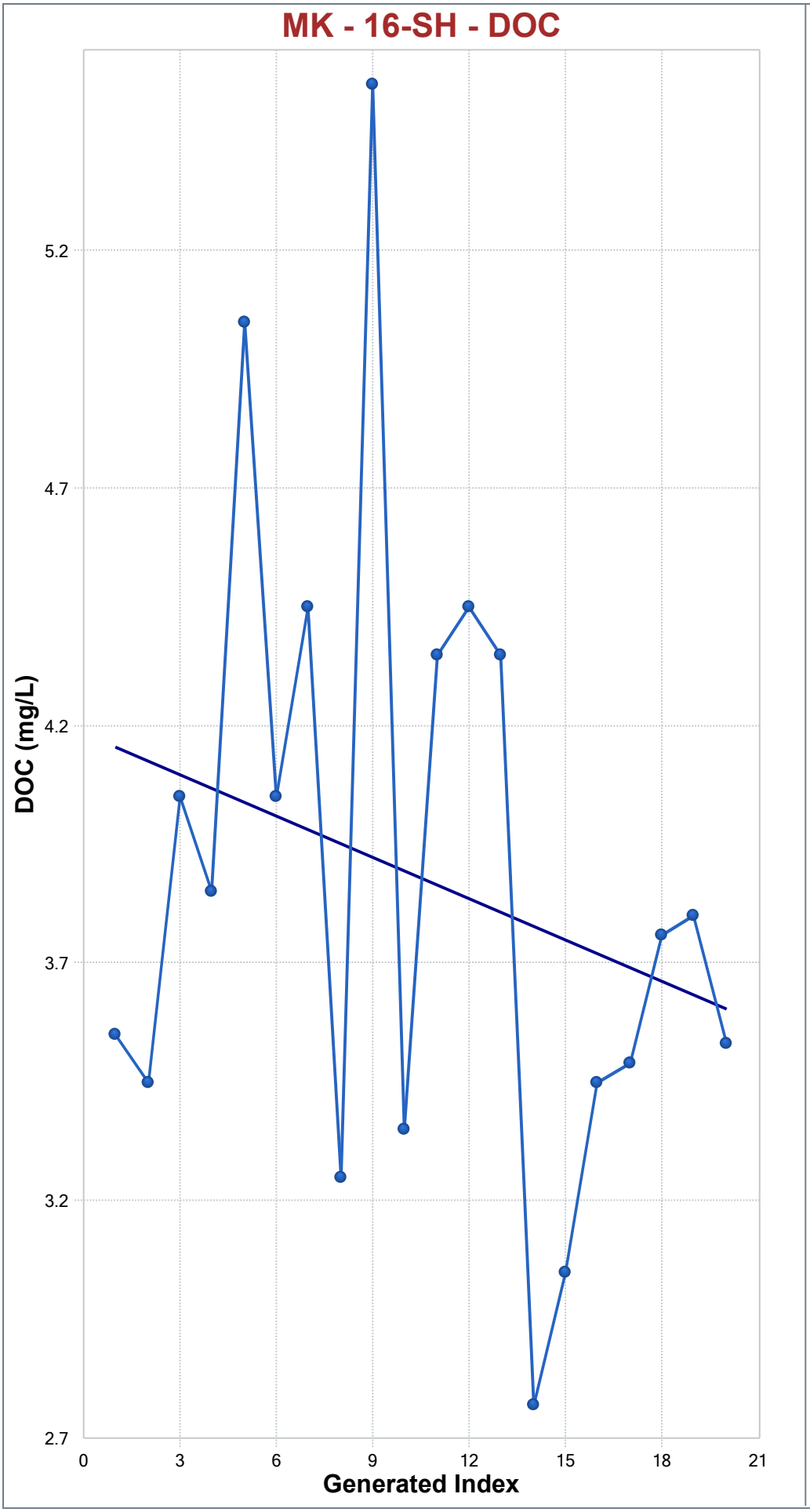
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8189
Standardized Value of S	-1.2581
M-K Test Value (S)	-75
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1042

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0072

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



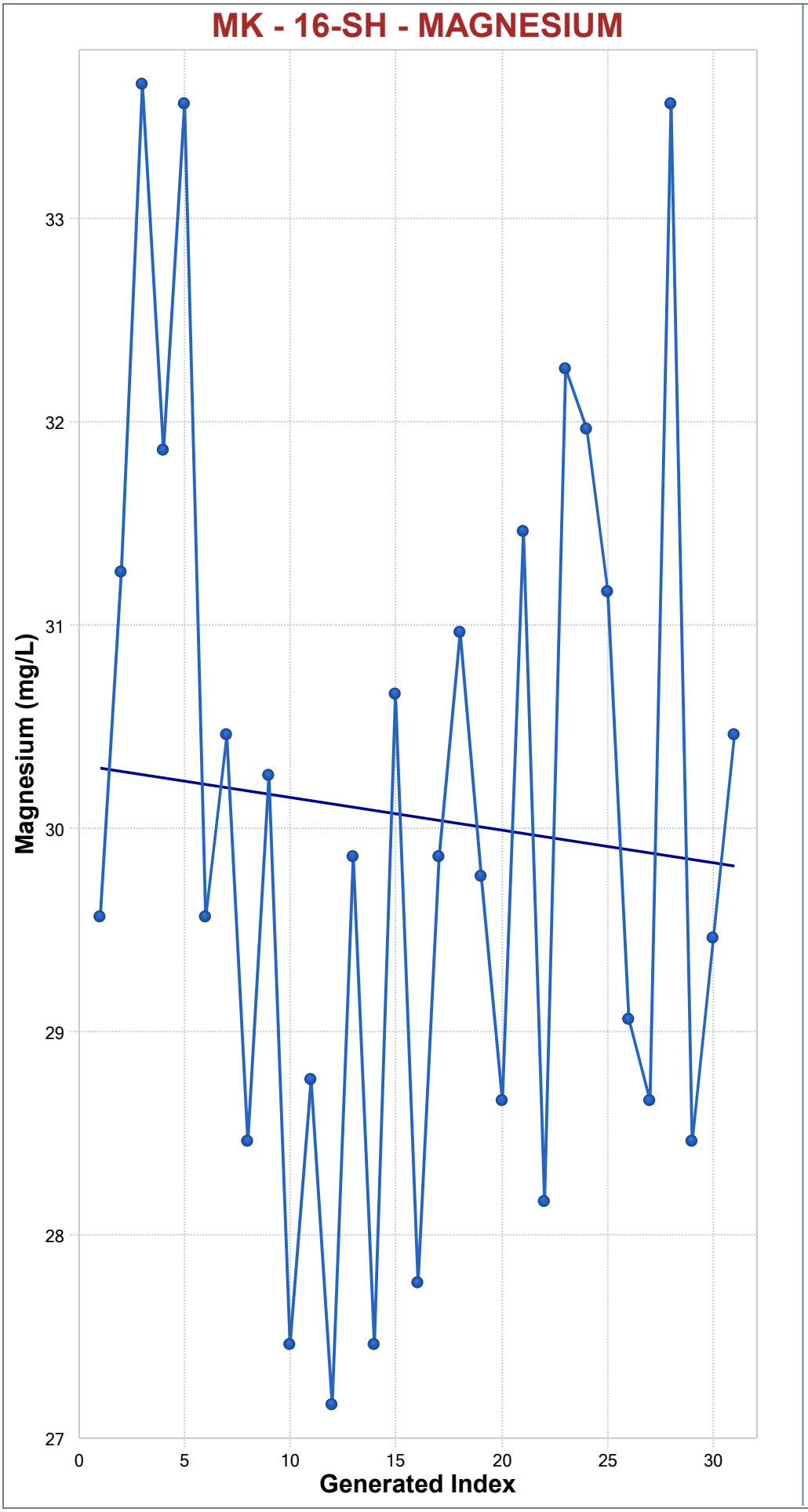
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7571
Standardized Value of S	-0.6828
M-K Test Value (S)	-22
Tabulated p-value	0.2500
Approximate p-value	0.2474

OLS Regression Line (Blue)

OLS Regression Slope	-0.0290
OLS Regression Intercept	4.1349

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



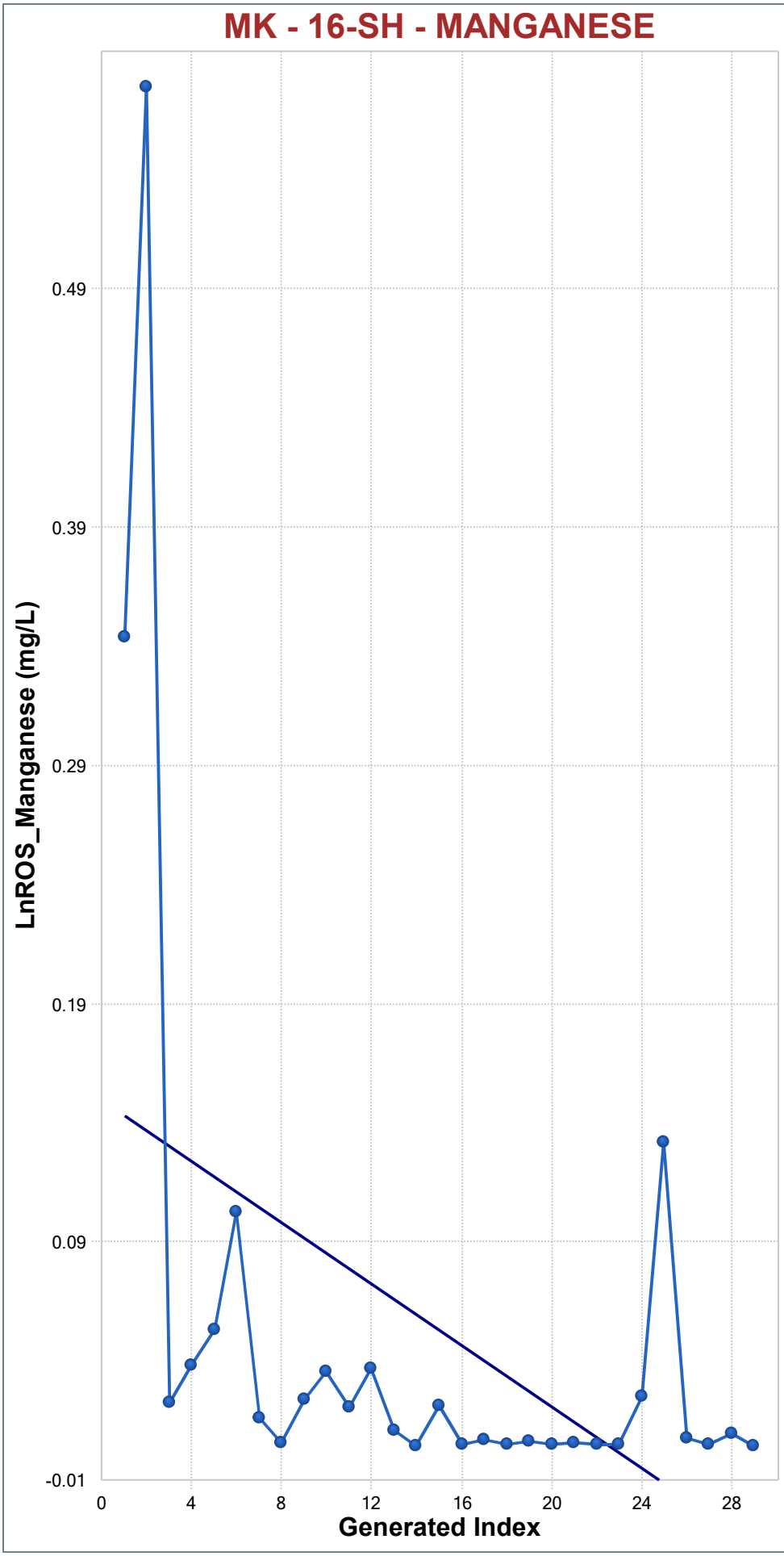
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7764
Standardized Value of S	-0.2892
M-K Test Value (S)	-18
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3862

OLS Regression Line (Blue)

OLS Regression Slope	-0.0161
OLS Regression Intercept	30.1510

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



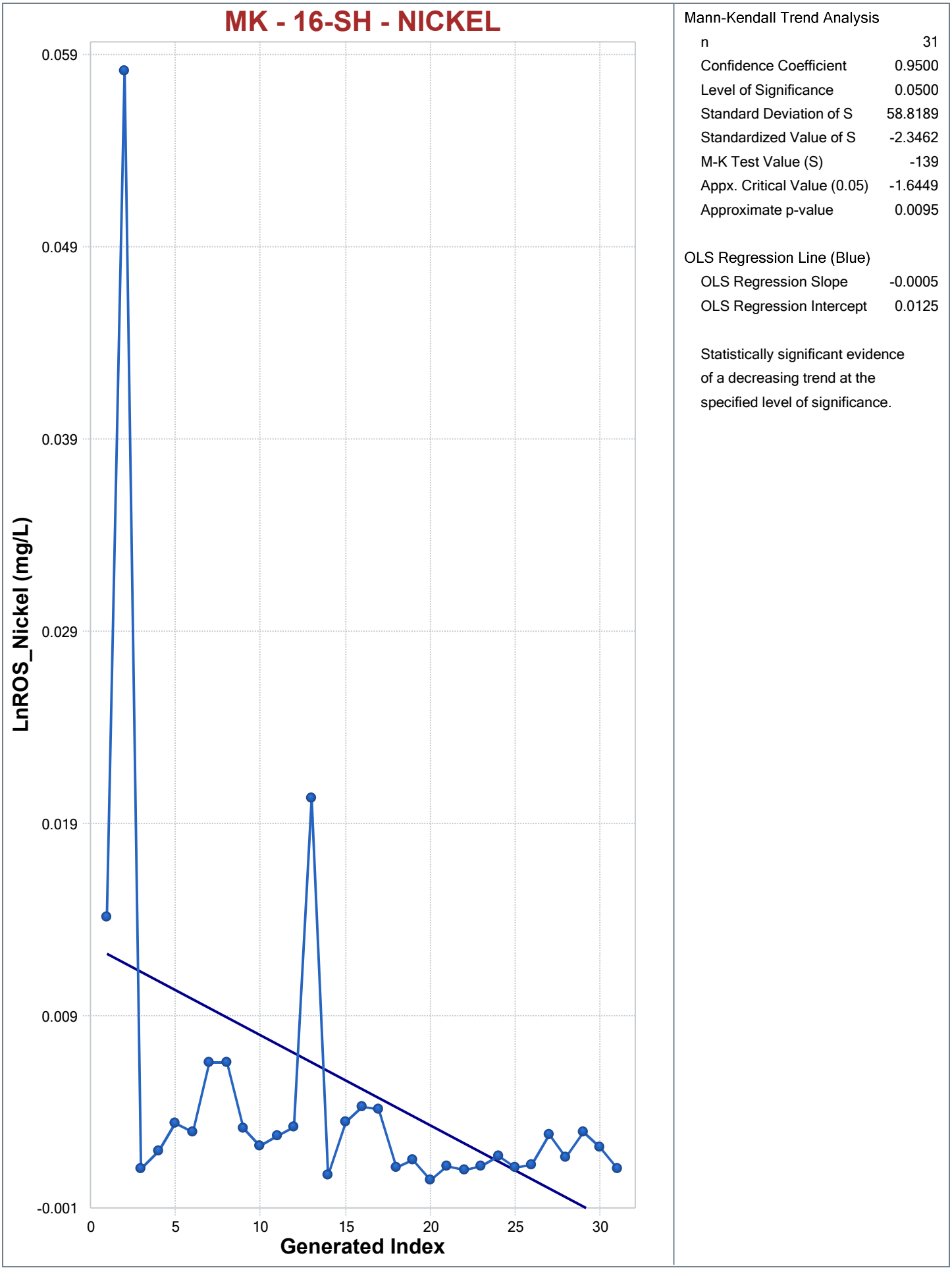
Mann-Kendall Trend Analysis

n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.3010
Standardized Value of S	-3.3020
M-K Test Value (S)	-177
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0005

OLS Regression Line (Blue)

OLS Regression Slope	-0.0064
OLS Regression Intercept	0.1458

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



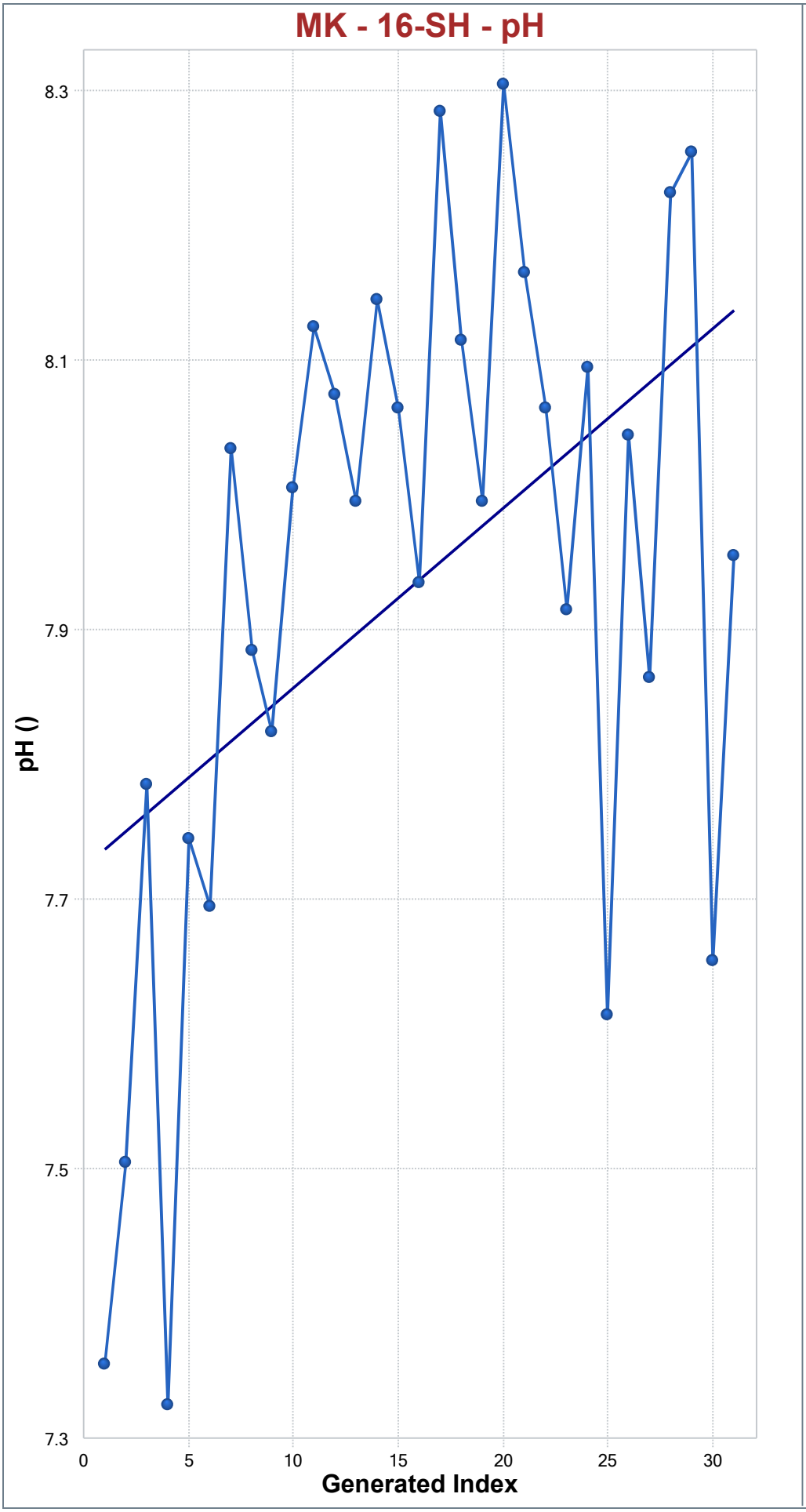
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8189
Standardized Value of S	-2.3462
M-K Test Value (S)	-139
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0095

OLS Regression Line (Blue)

OLS Regression Slope	-0.0005
OLS Regression Intercept	0.0125

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



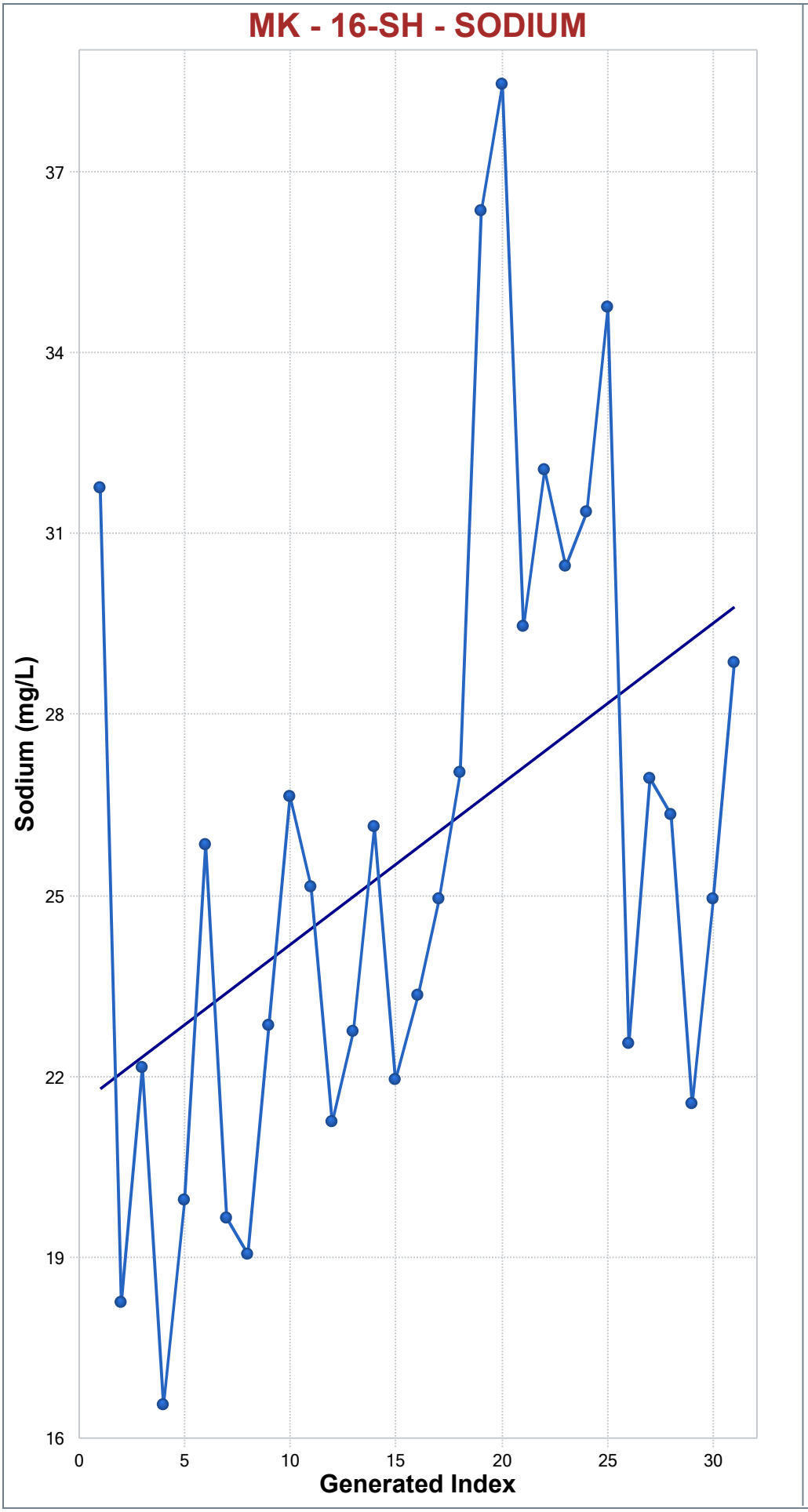
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8189
Standardized Value of S	2.4142
M-K Test Value (S)	143
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0079

OLS Regression Line (Blue)

OLS Regression Slope	0.0133
OLS Regression Intercept	7.6794

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



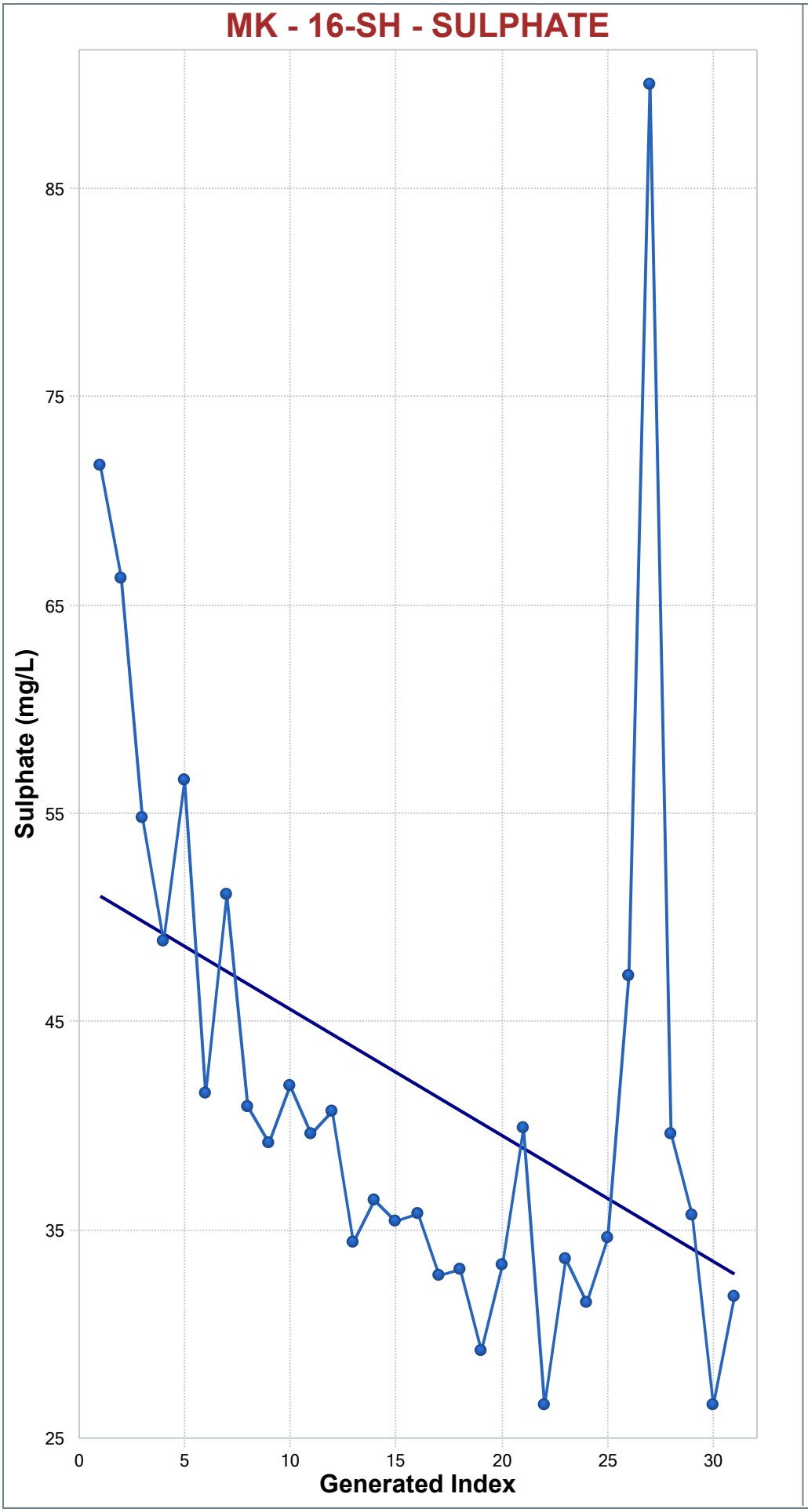
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8274
Standardized Value of S	2.7028
M-K Test Value (S)	160
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0034

OLS Regression Line (Blue)

OLS Regression Slope	0.2661
OLS Regression Intercept	21.3781

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



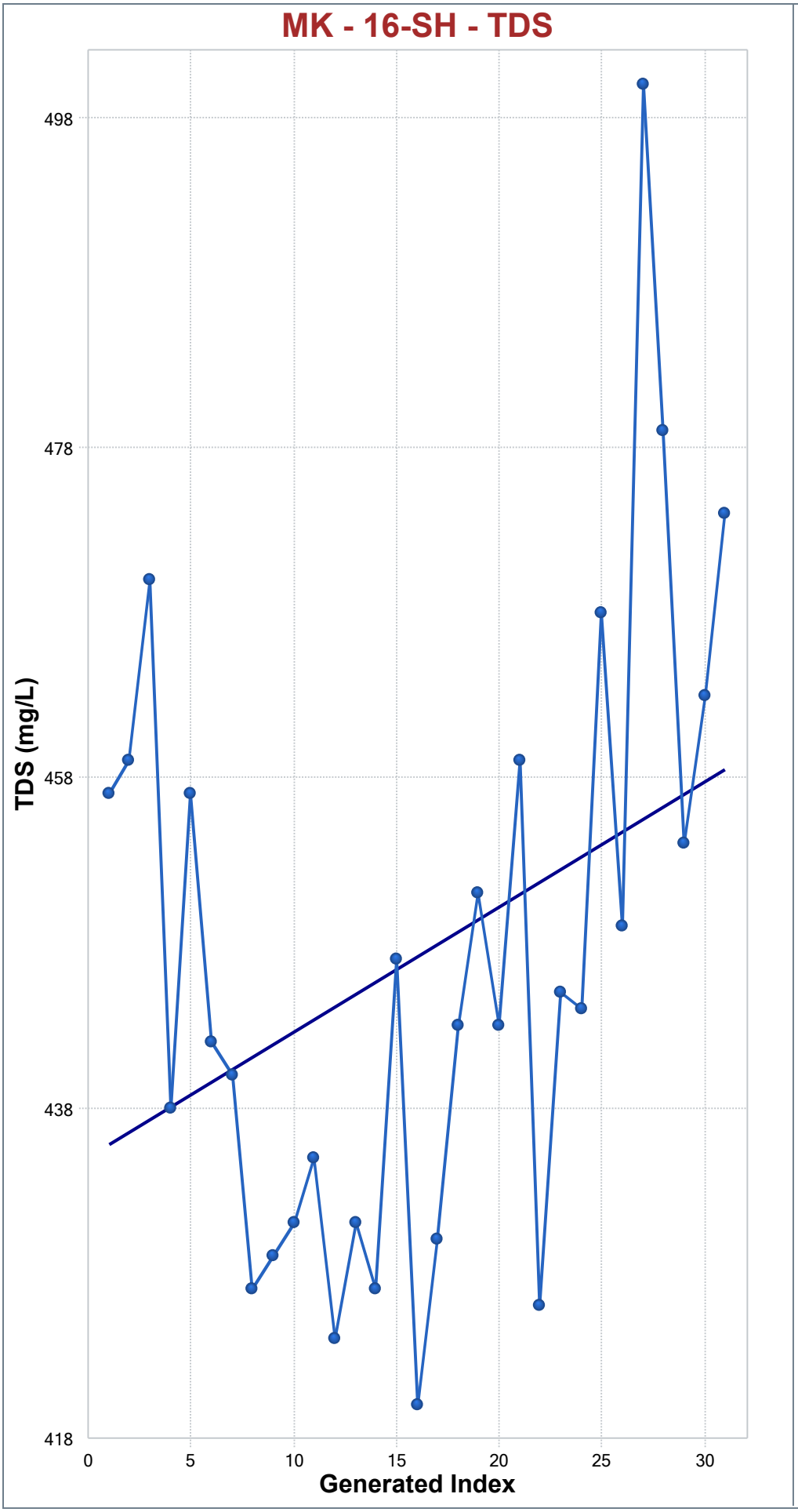
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8189
Standardized Value of S	-3.9443
M-K Test Value (S)	-233
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.6042
OLS Regression Intercept	51.7284

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



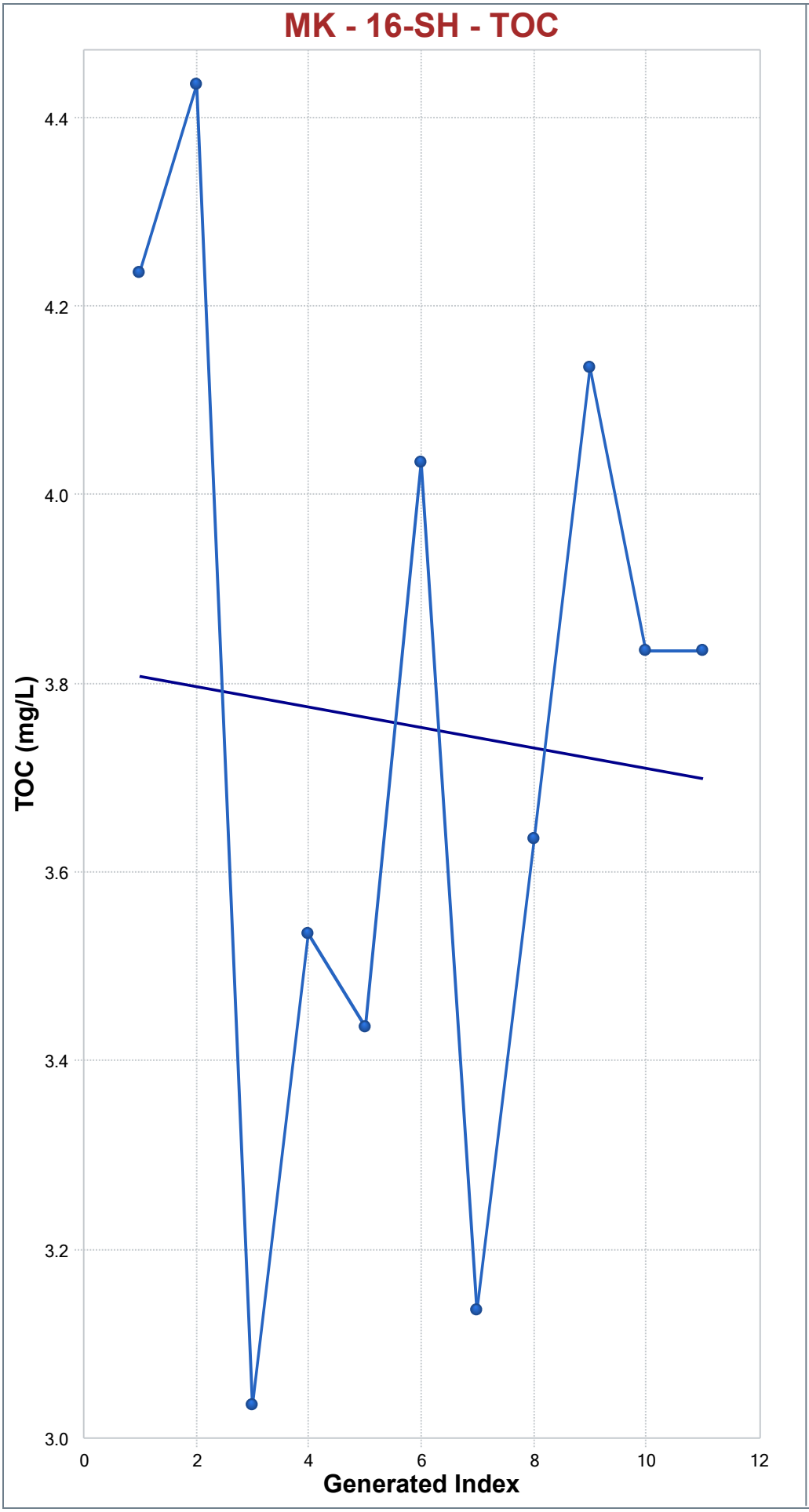
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7934
Standardized Value of S	1.8539
M-K Test Value (S)	110
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0319

OLS Regression Line (Blue)

OLS Regression Slope	0.7577
OLS Regression Intercept	435.0387

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



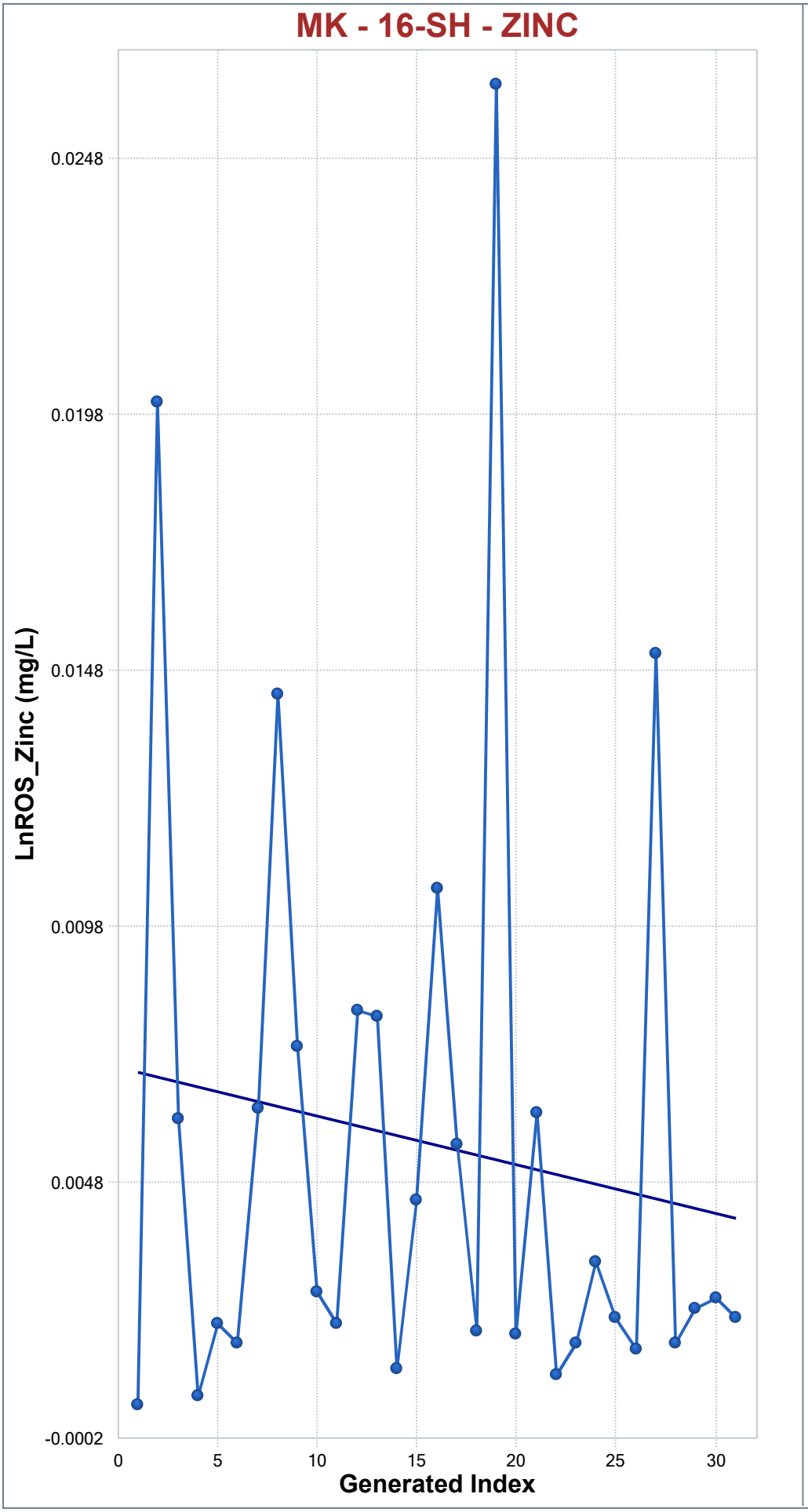
Mann-Kendall Trend Analysis

n	11
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	12.8062
Standardized Value of S	
M-K Test Value (S)	0
Tabulated p-value	0.5000
Approximate p-value	

OLS Regression Line (Blue)

OLS Regression Slope	-0.0109
OLS Regression Intercept	3.7836

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



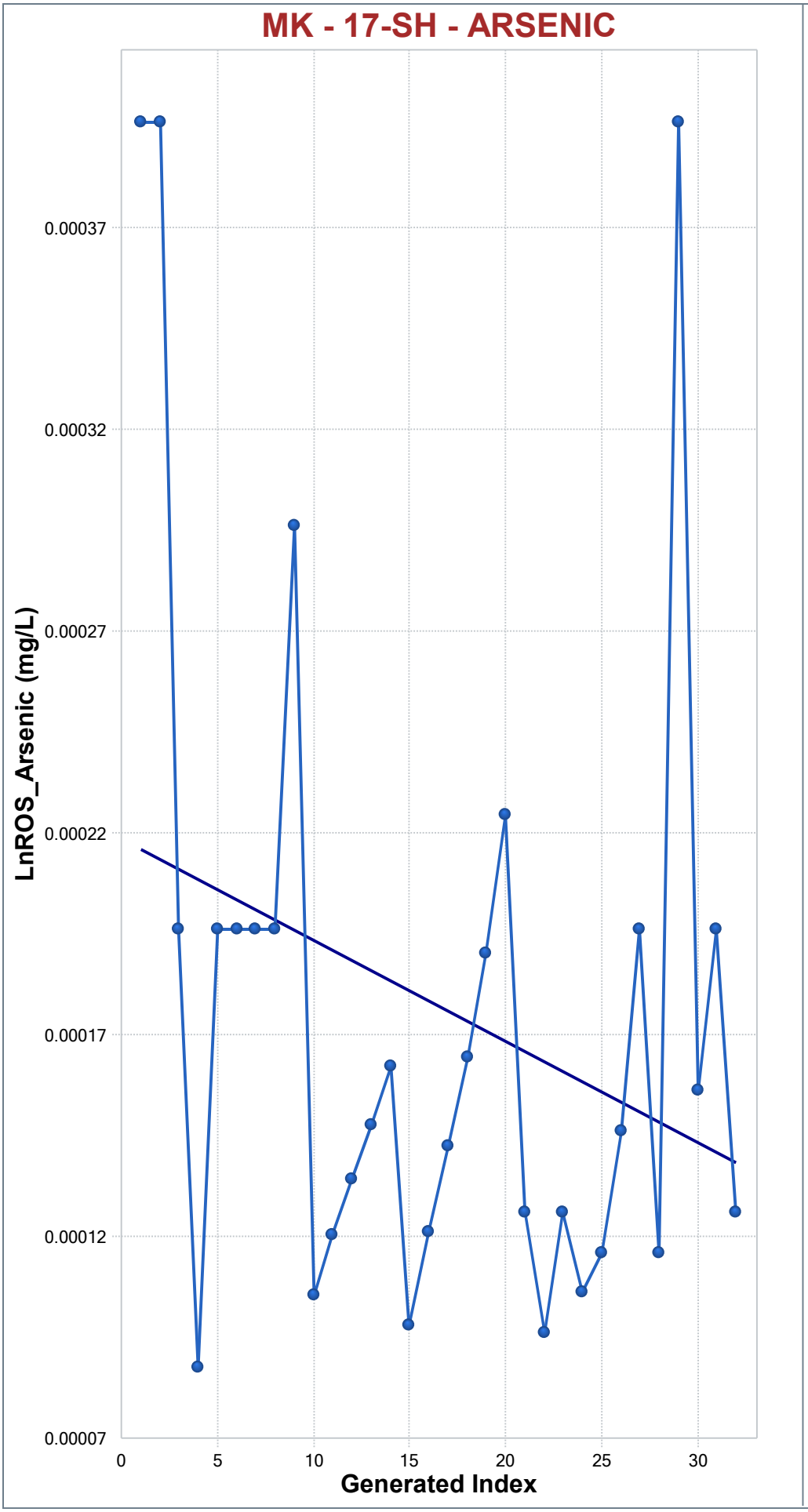
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7878
Standardized Value of S	-0.4593
M-K Test Value (S)	-28
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3230

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0070

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



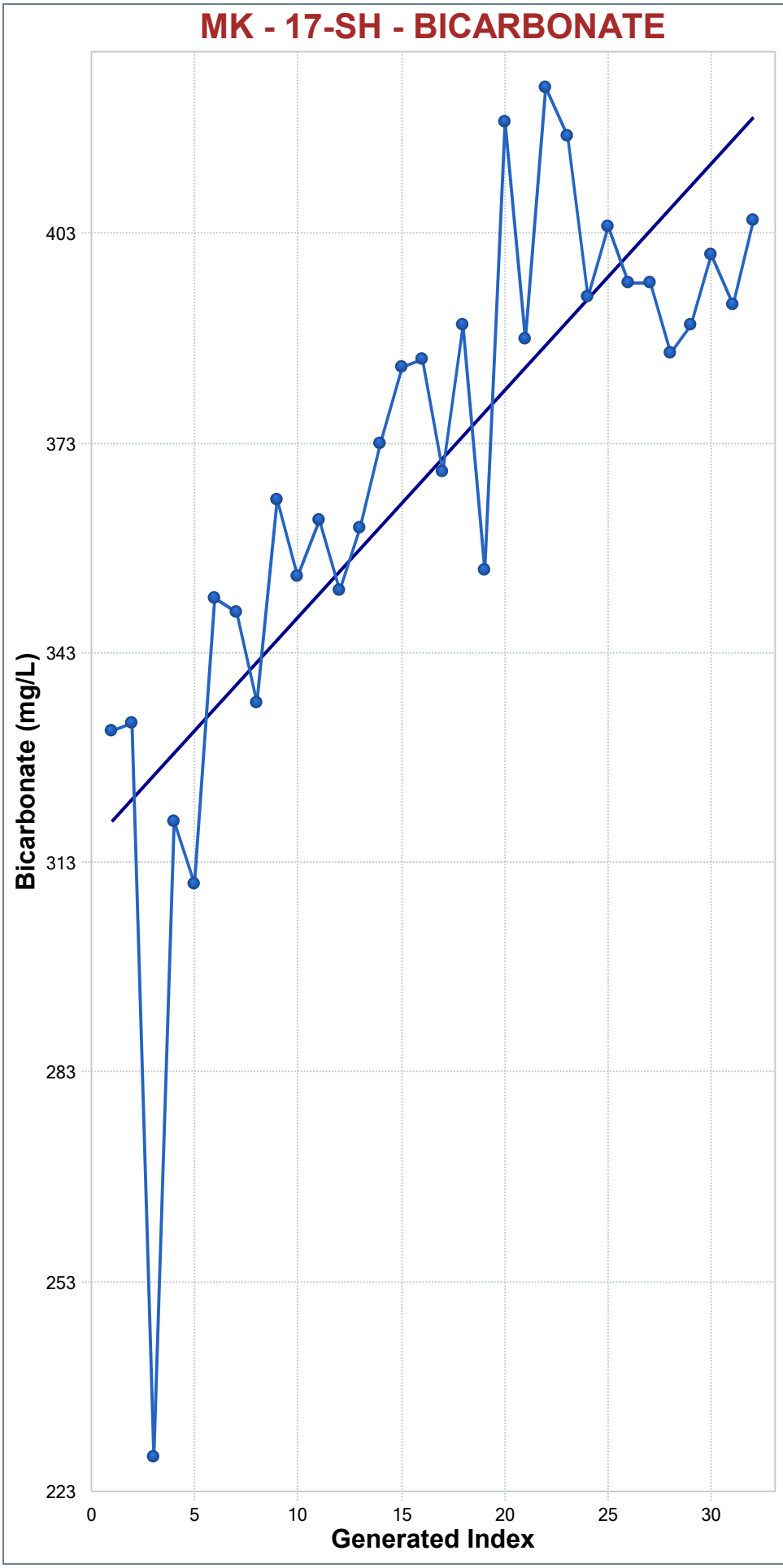
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.2372
Standardized Value of S	-1.2574
M-K Test Value (S)	-78
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1043

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0002

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



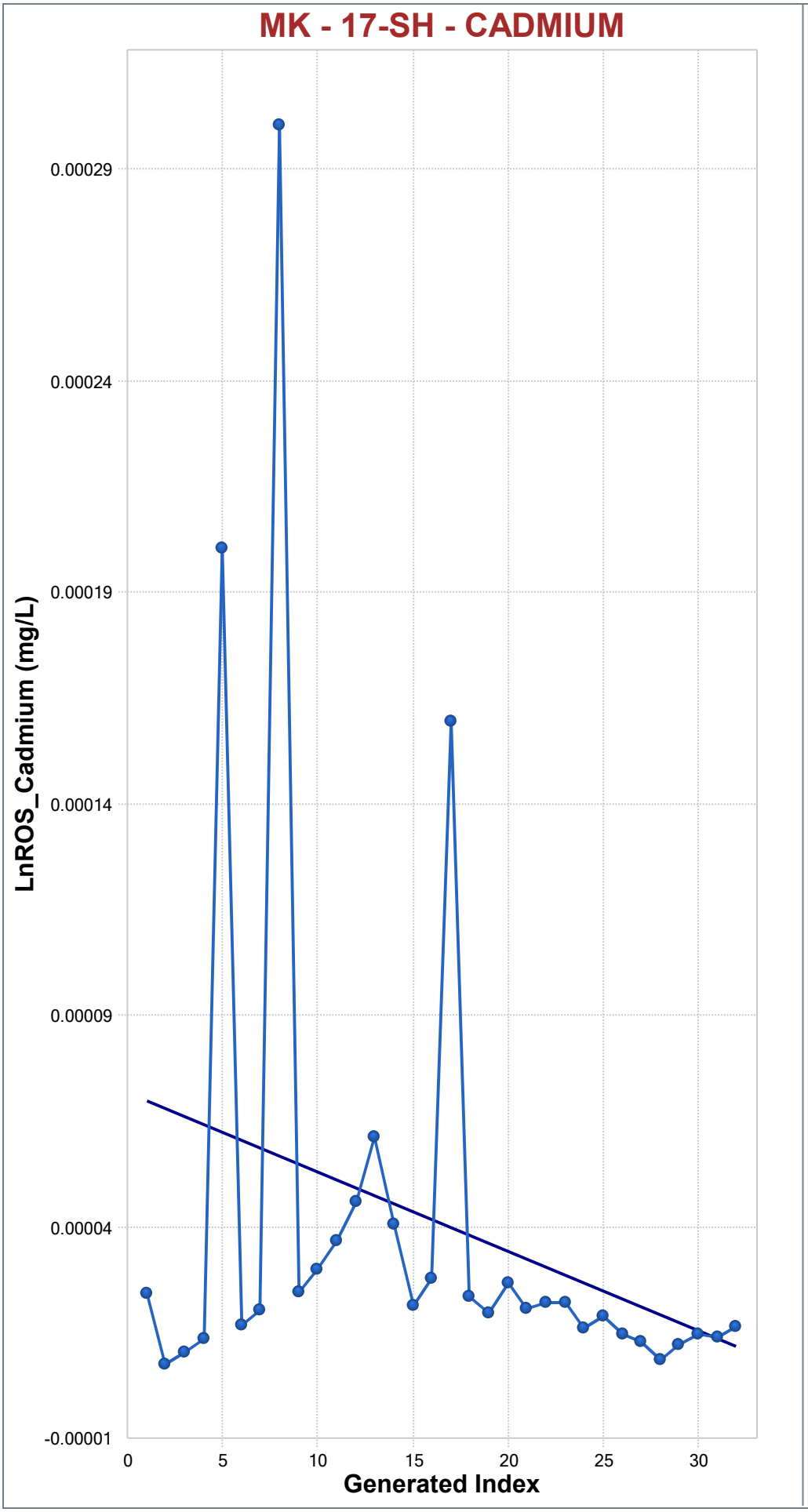
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6495
Standardized Value of S	5.4988
M-K Test Value (S)	340
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	3.2518
OLS Regression Intercept	315.7198

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



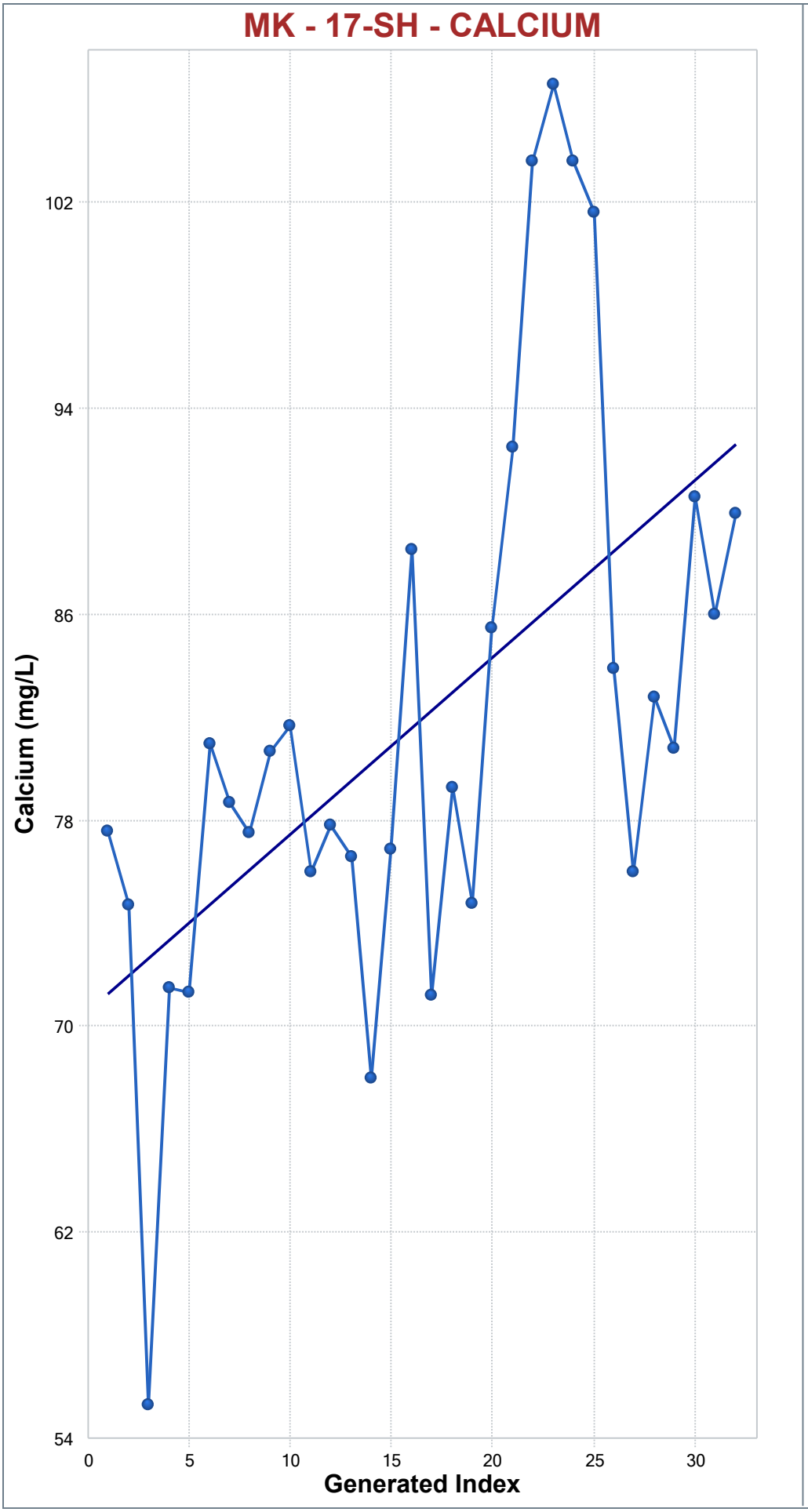
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6495
Standardized Value of S	-2.2222
M-K Test Value (S)	-138
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0131

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0001

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



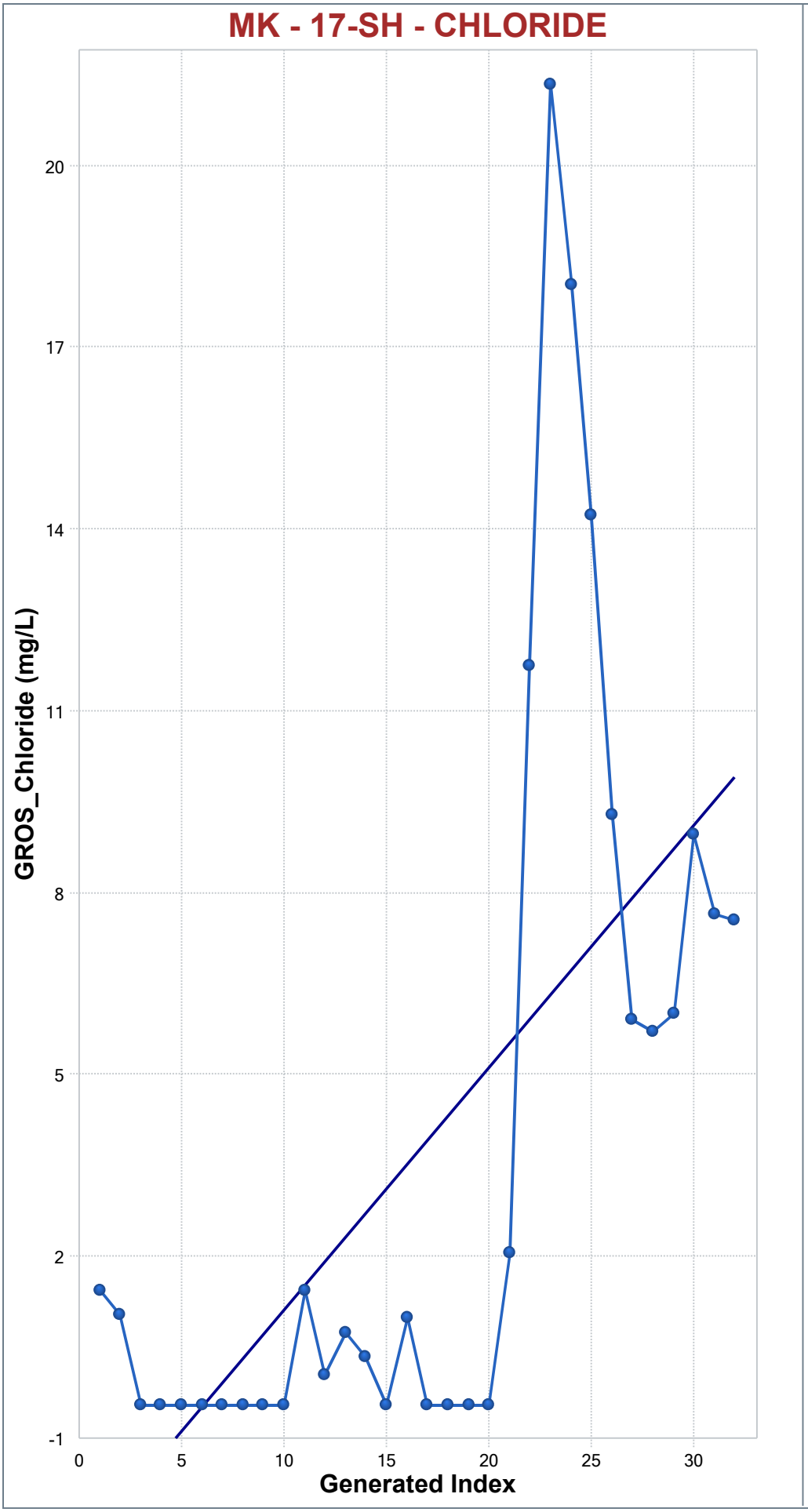
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6495
Standardized Value of S	3.2604
M-K Test Value (S)	202
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0006

OLS Regression Line (Blue)

OLS Regression Slope	0.6877
OLS Regression Intercept	71.0067

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



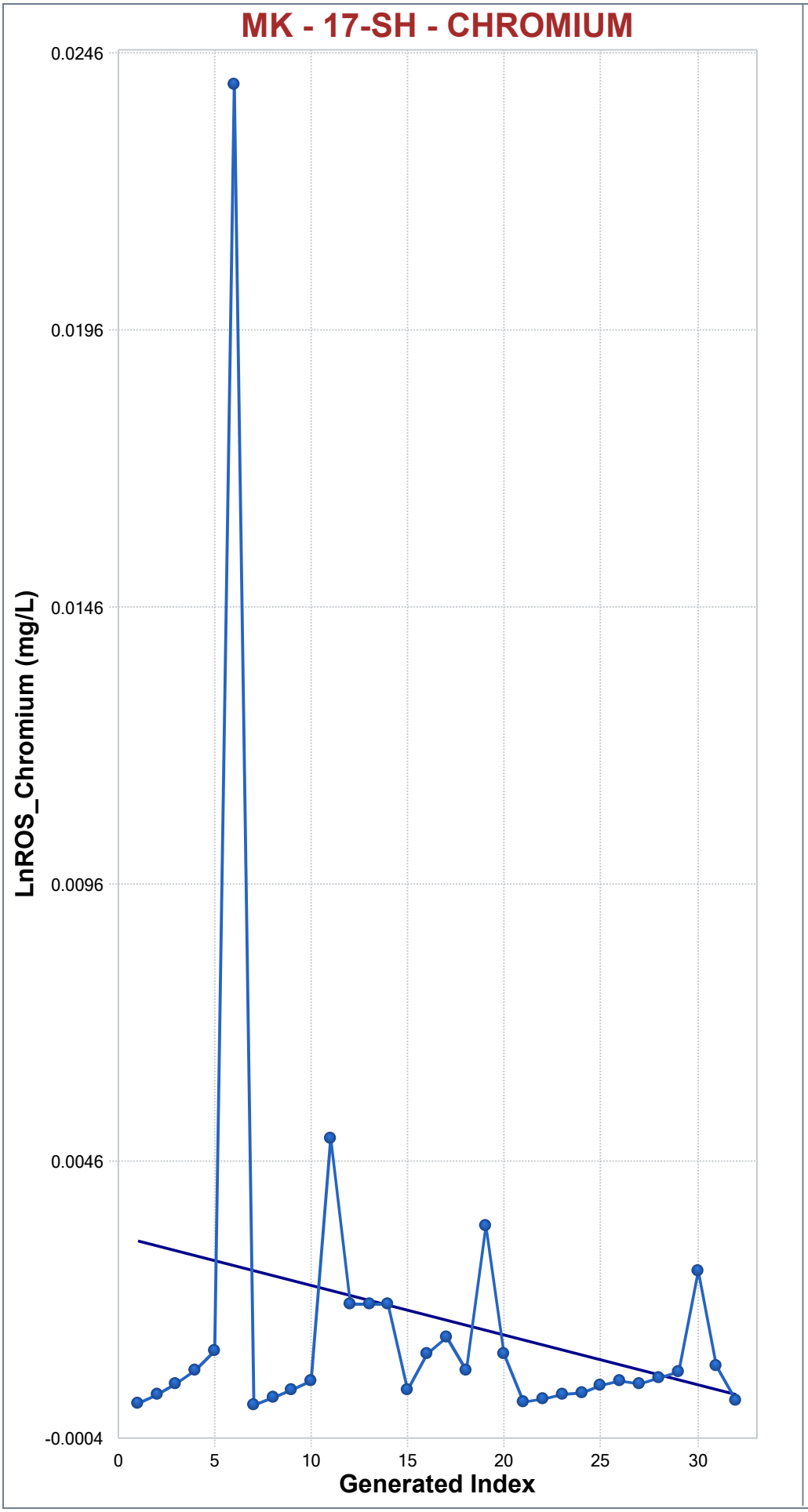
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	59.4390
Standardized Value of S	3.4657
M-K Test Value (S)	207
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0003

OLS Regression Line (Blue)

OLS Regression Slope	0.4004
OLS Regression Intercept	-2.4386

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



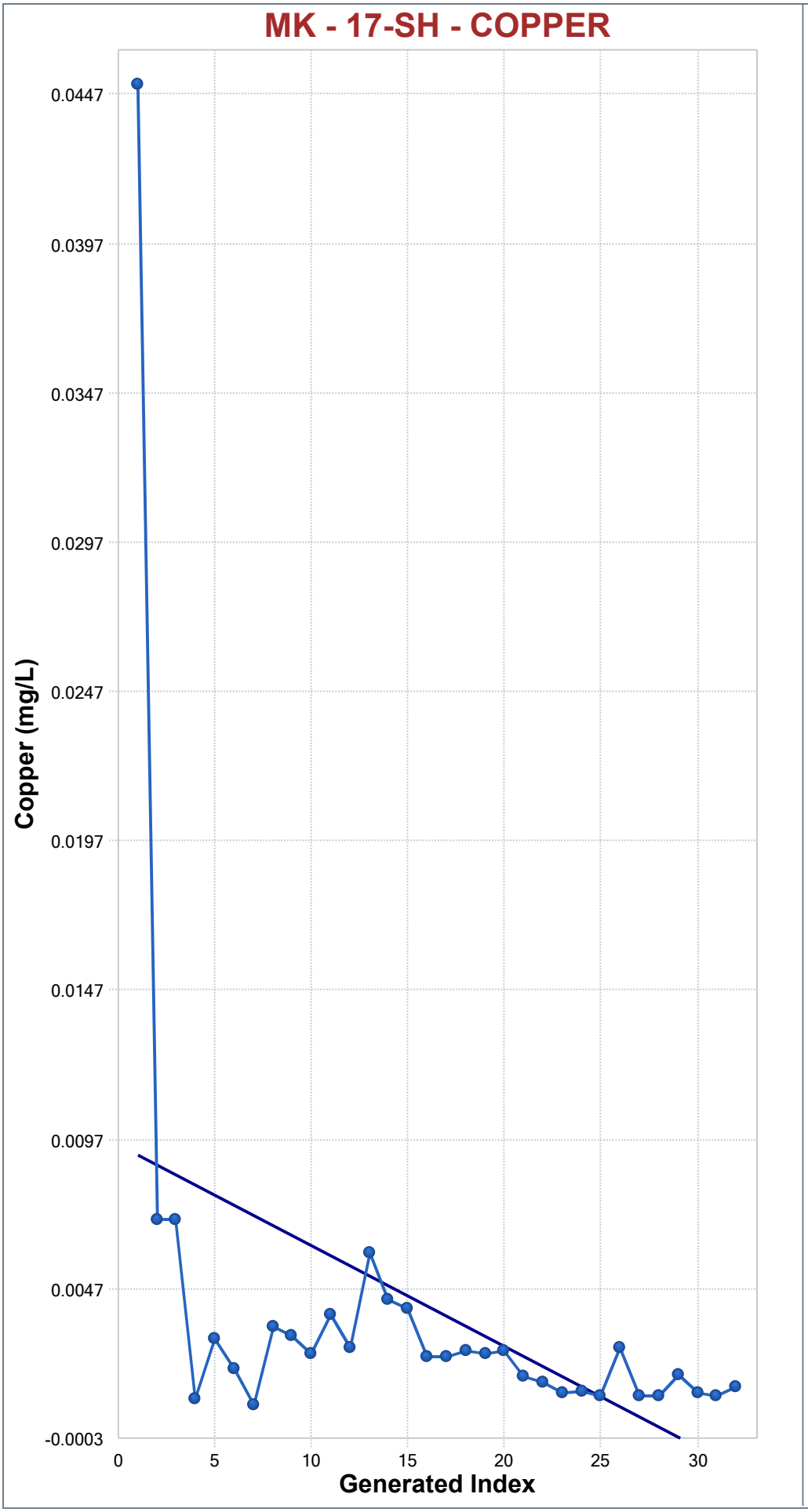
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6360
Standardized Value of S	0.2596
M-K Test Value (S)	17
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3976

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0032

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



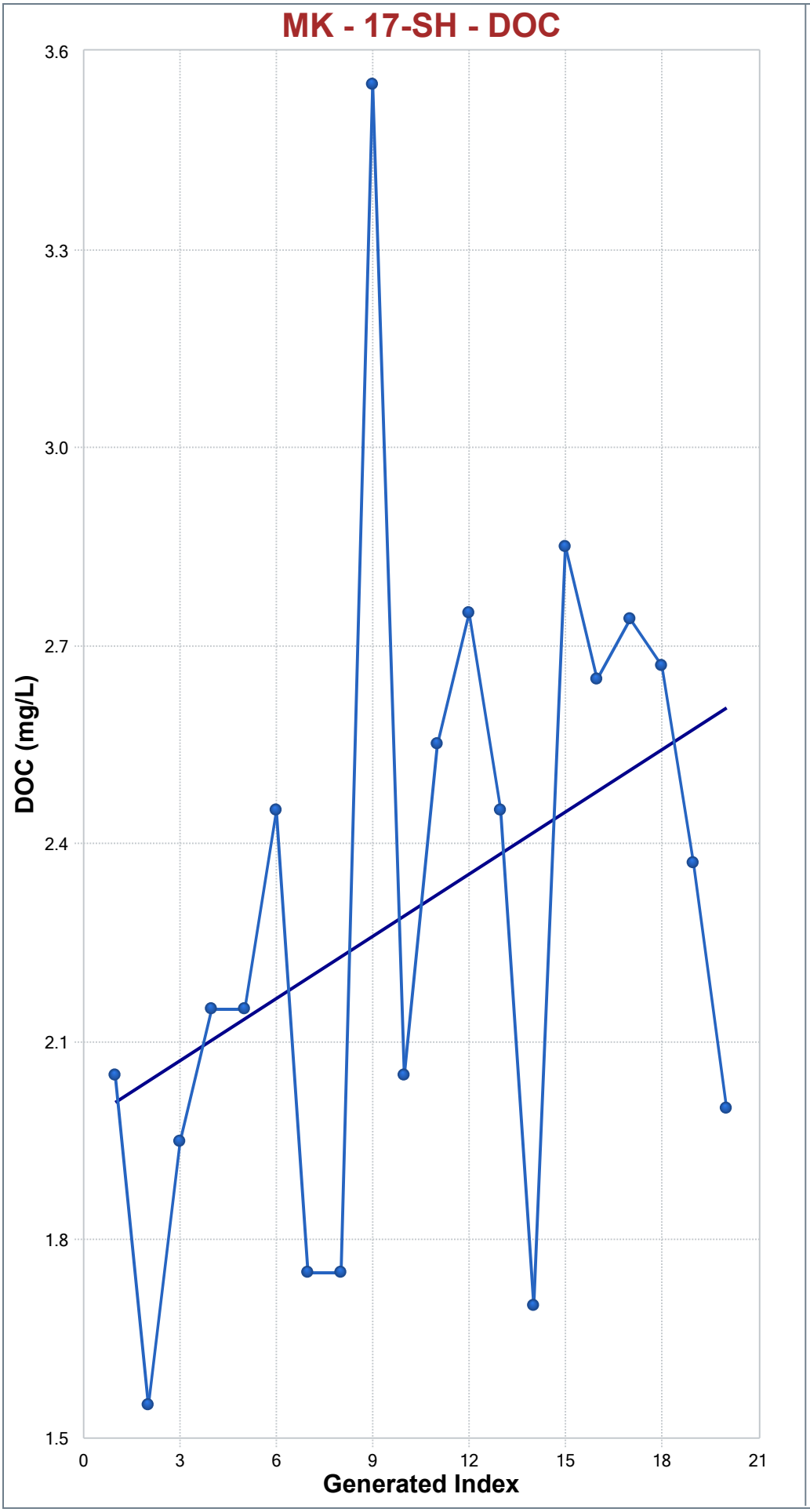
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6171
Standardized Value of S	-3.6191
M-K Test Value (S)	-224
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.0003
OLS Regression Intercept	0.0095

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



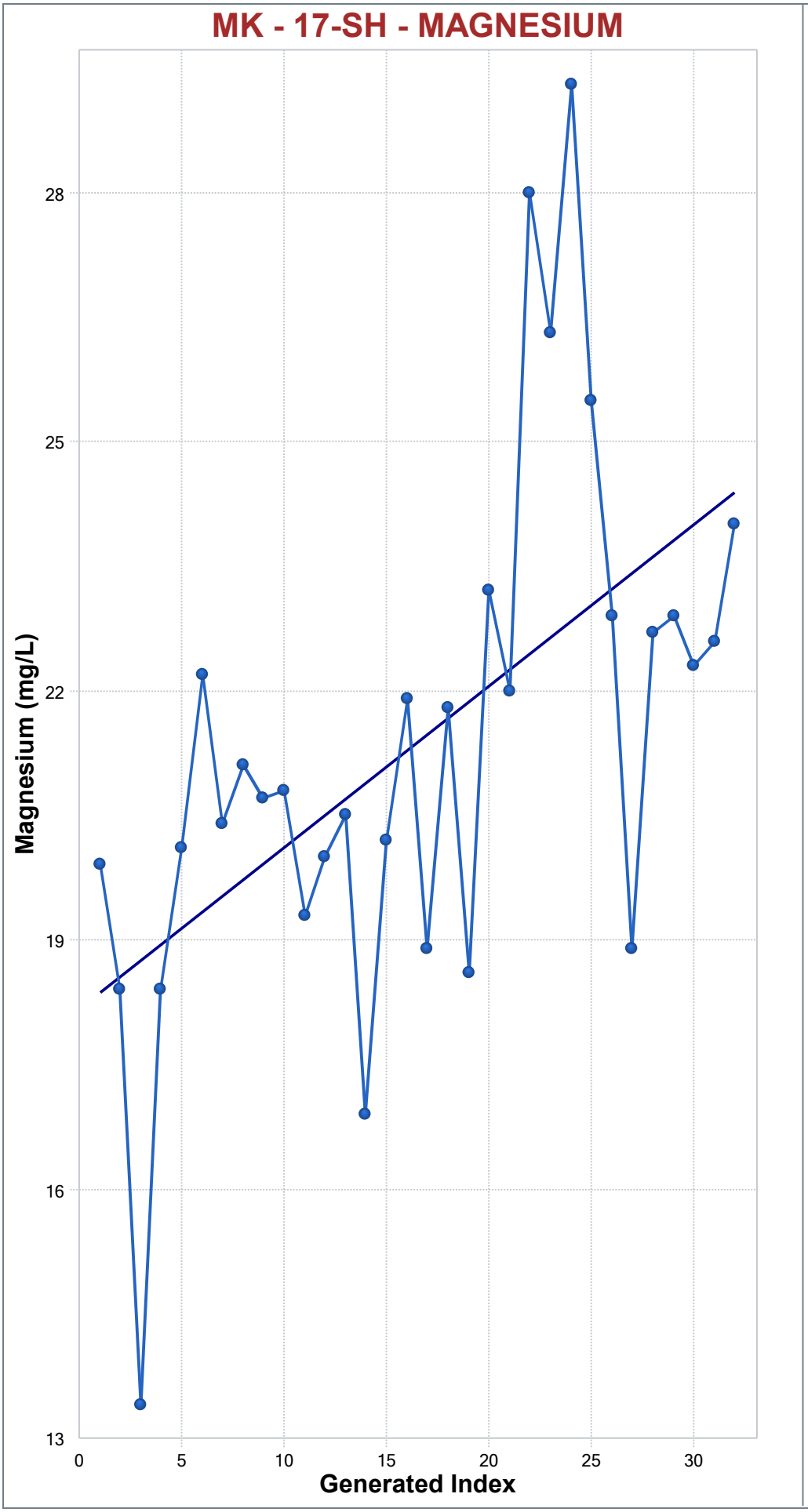
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7571
Standardized Value of S	1.6582
M-K Test Value (S)	52
Tabulated p-value	0.0490
Approximate p-value	0.0486

OLS Regression Line (Blue)

OLS Regression Slope	0.0314
OLS Regression Intercept	2.0264

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



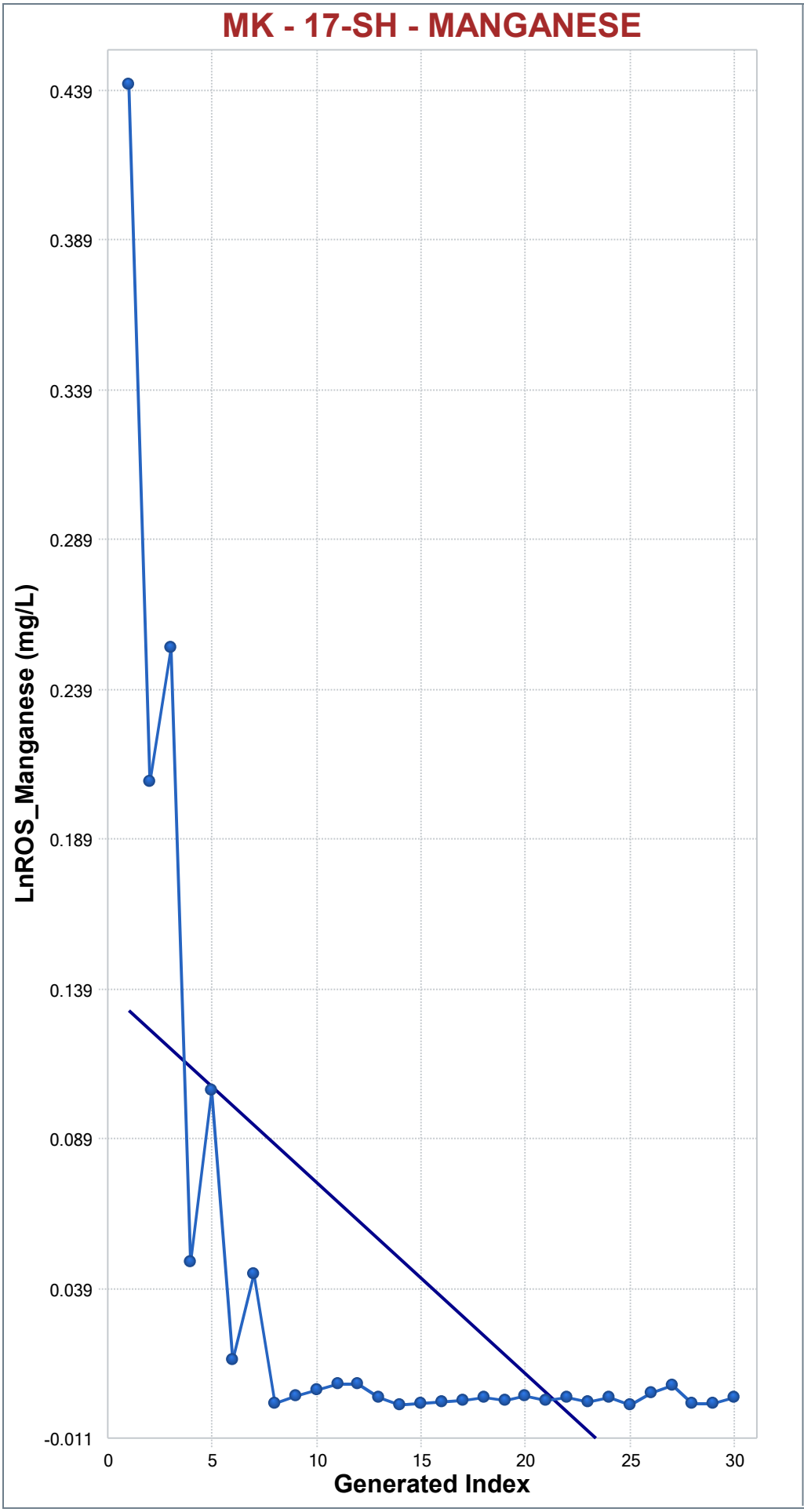
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6414
Standardized Value of S	3.5690
M-K Test Value (S)	221
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0002

OLS Regression Line (Blue)

OLS Regression Slope	0.1939
OLS Regression Intercept	18.3788

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



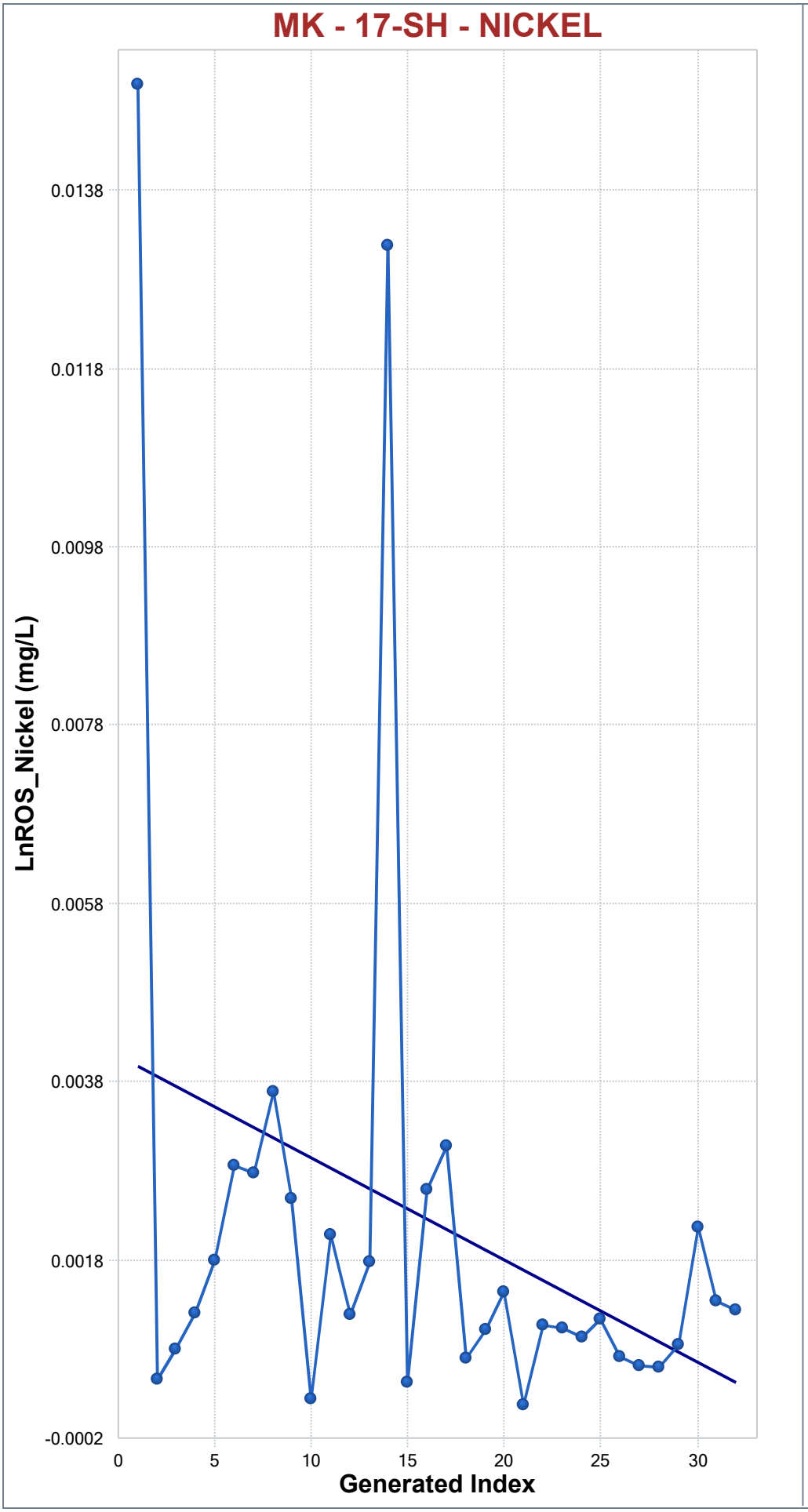
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0417
Standardized Value of S	-3.5509
M-K Test Value (S)	-200
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0002

OLS Regression Line (Blue)

OLS Regression Slope	-0.0064
OLS Regression Intercept	0.1384

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



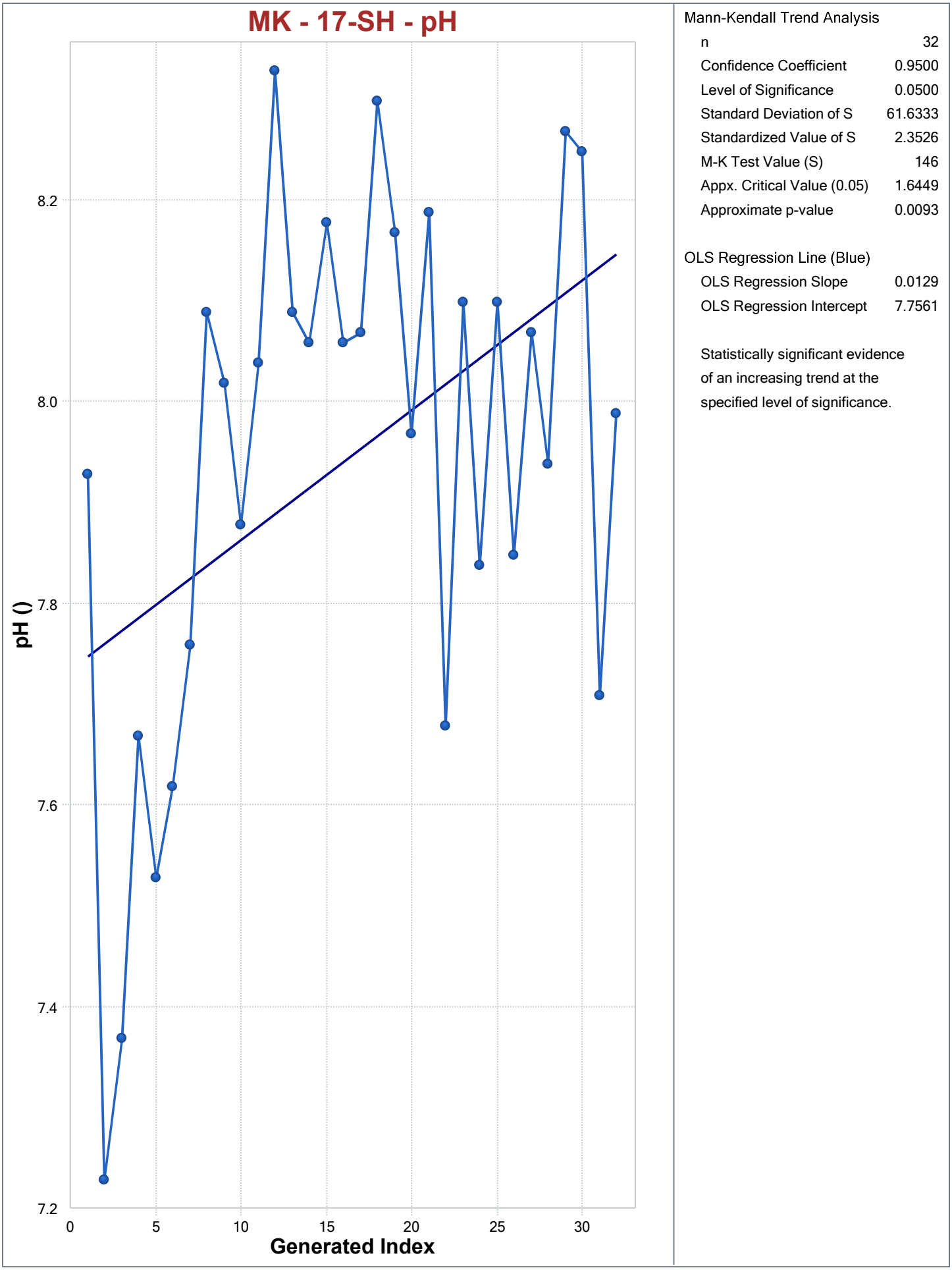
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6658
Standardized Value of S	-1.6703
M-K Test Value (S)	-104
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0474

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0041

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



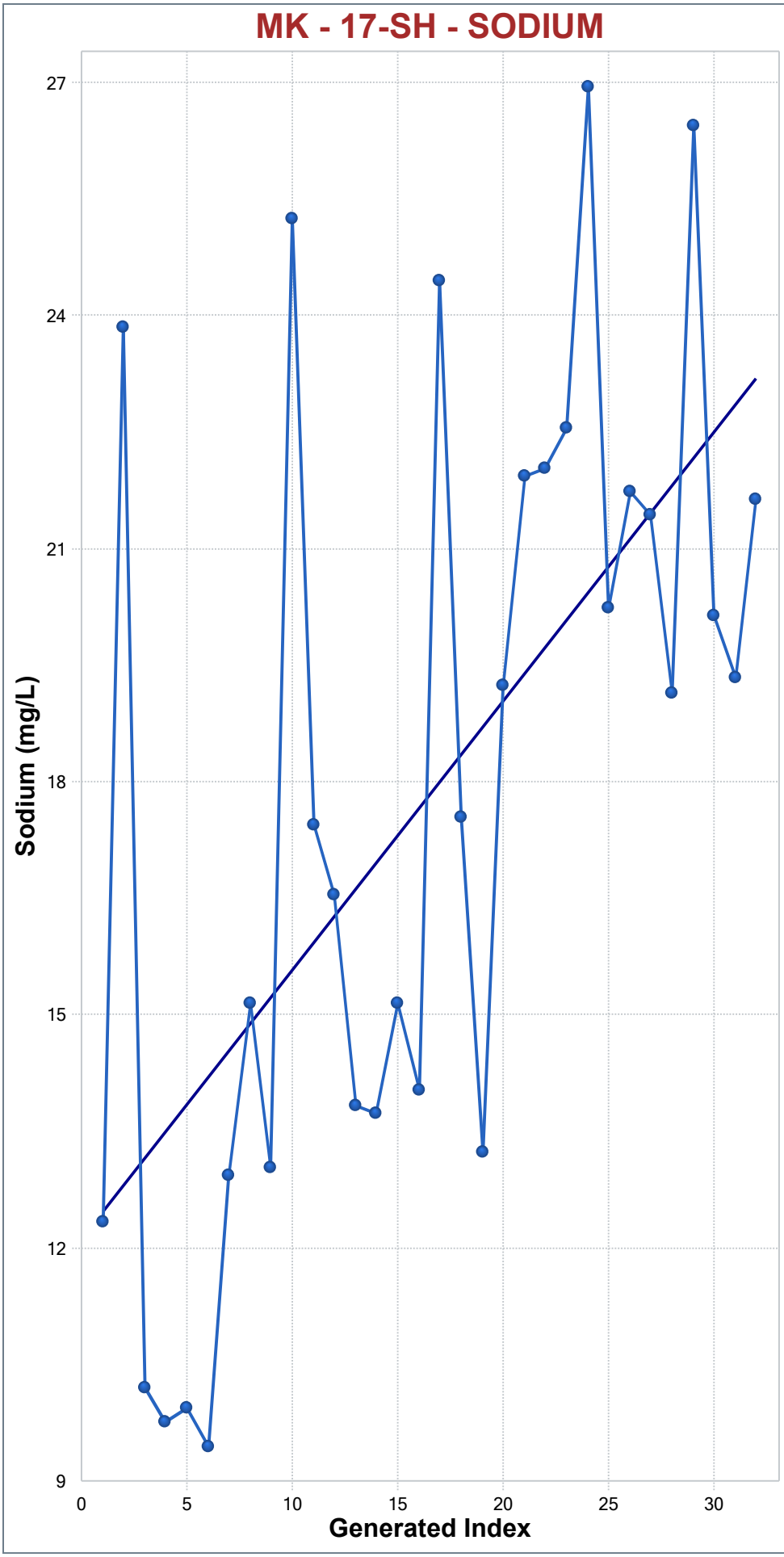
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6333
Standardized Value of S	2.3526
M-K Test Value (S)	146
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0093

OLS Regression Line (Blue)

OLS Regression Slope	0.0129
OLS Regression Intercept	7.7561

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



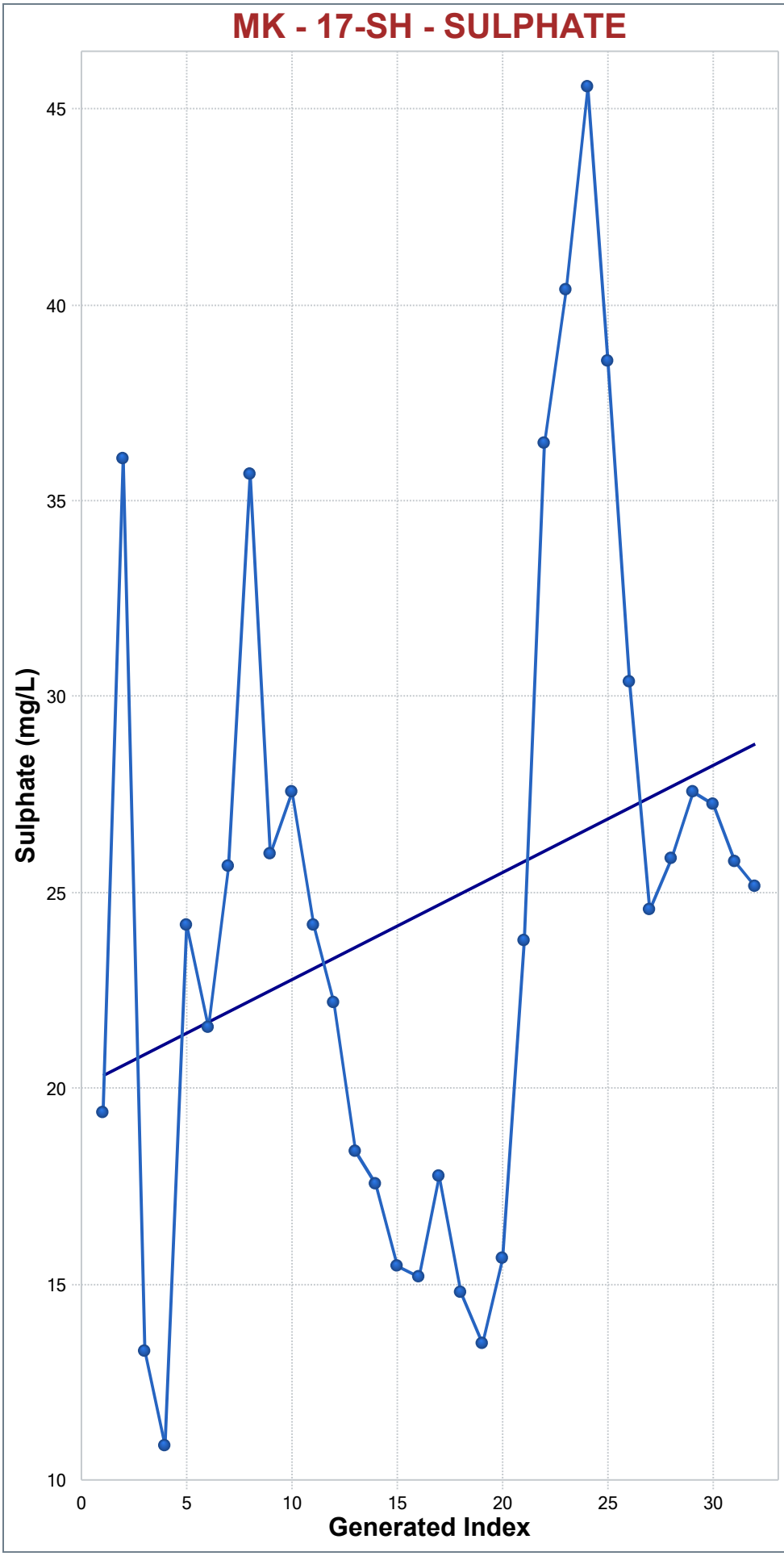
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	3.6005
M-K Test Value (S)	223
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0002

OLS Regression Line (Blue)

OLS Regression Slope	0.3457
OLS Regression Intercept	11.6890

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



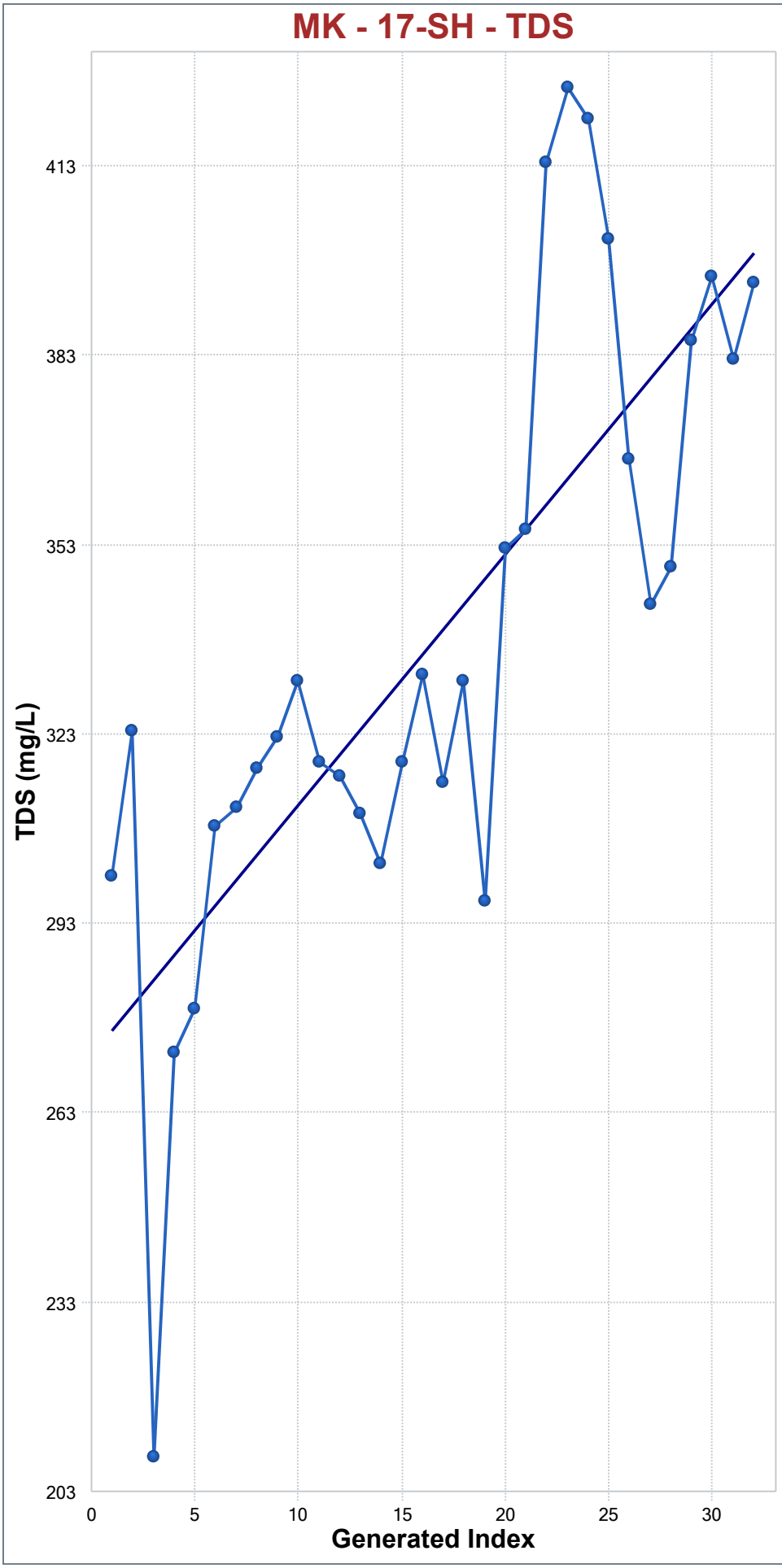
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6495
Standardized Value of S	1.4112
M-K Test Value (S)	88
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0791

OLS Regression Line (Blue)

OLS Regression Slope	0.2728
OLS Regression Intercept	19.5954

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



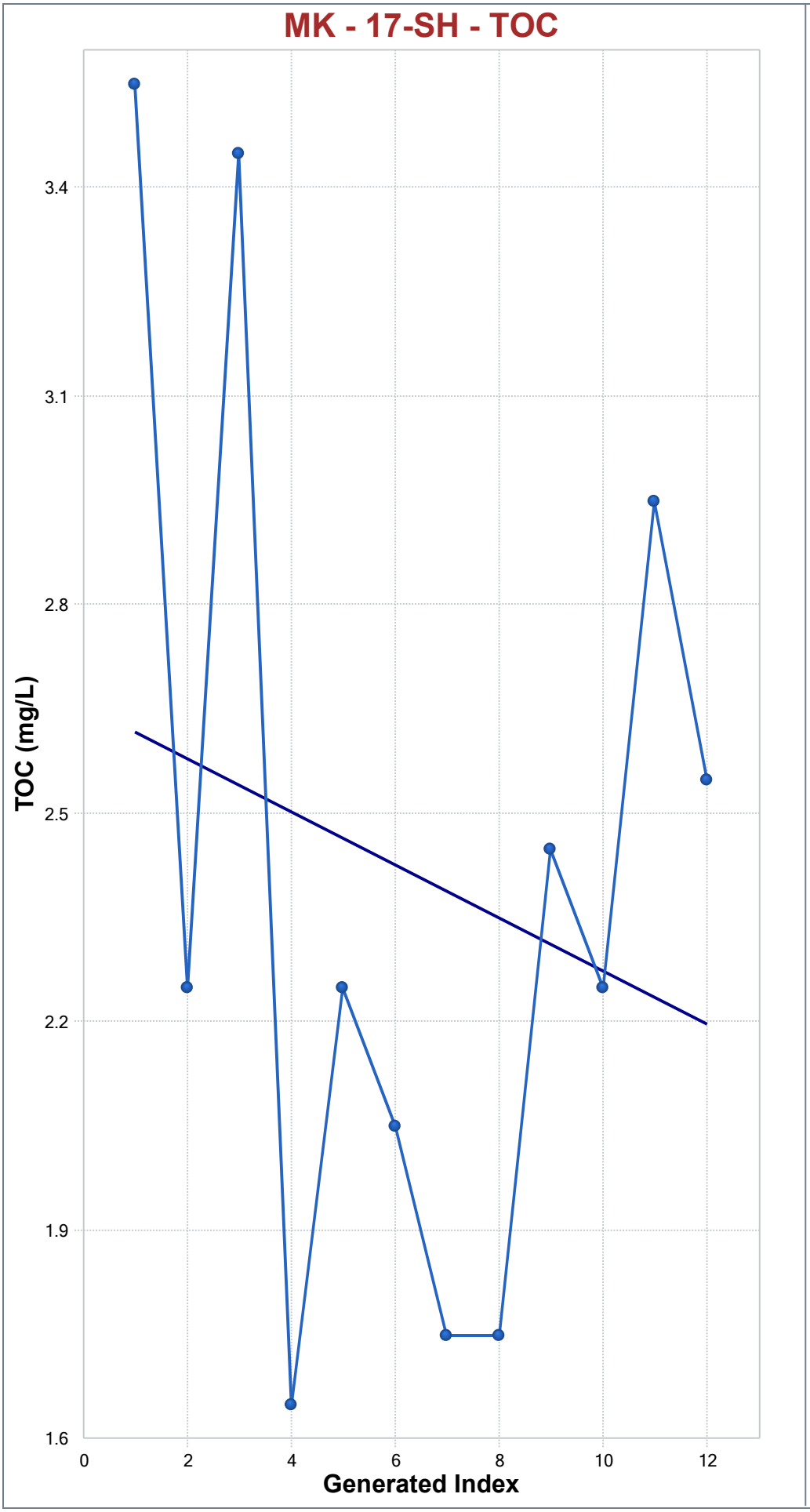
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6495
Standardized Value of S	4.6878
M-K Test Value (S)	290
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	3.9756
OLS Regression Intercept	271.5585

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



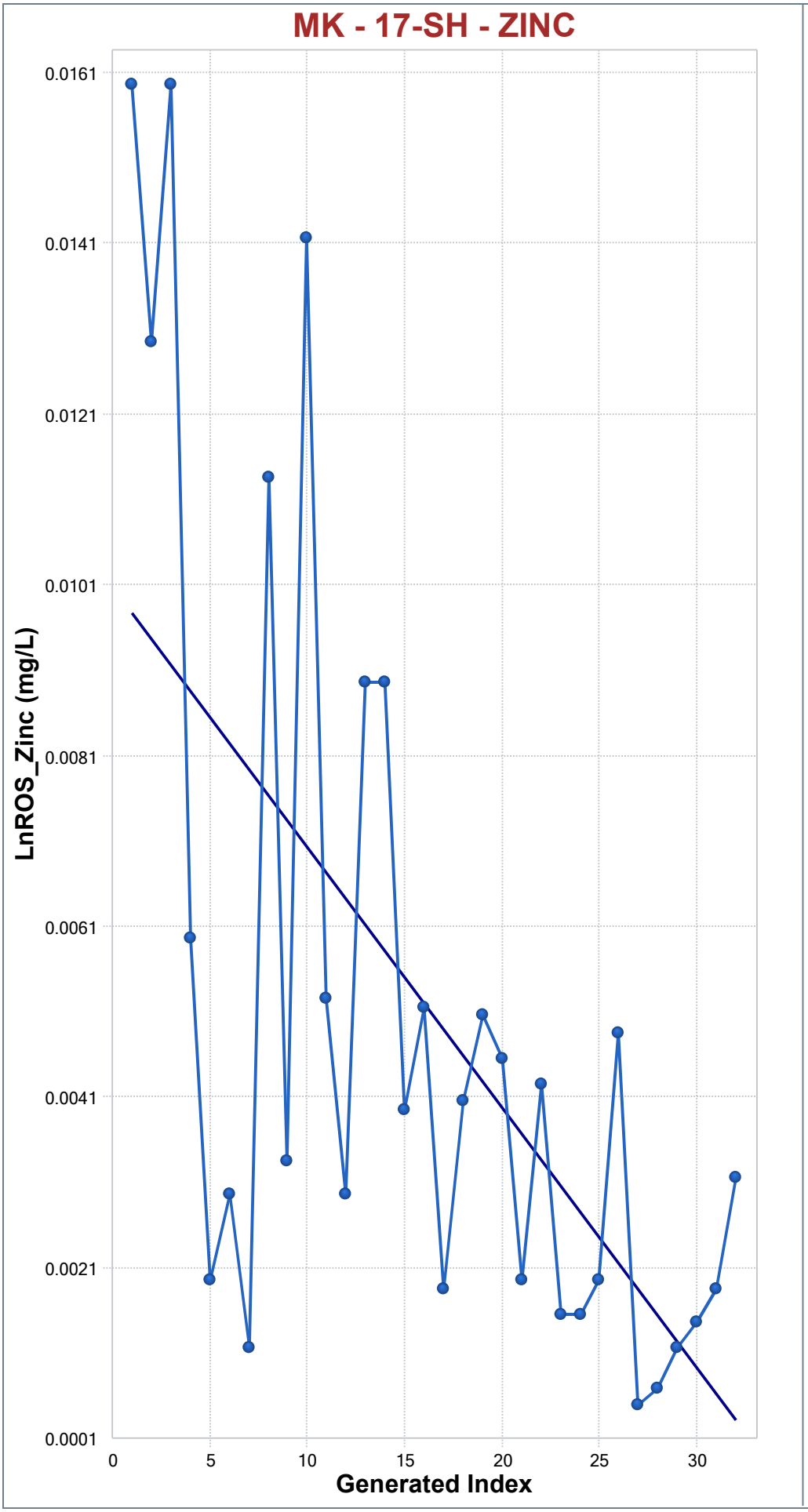
Mann-Kendall Trend Analysis

n	12
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	14.4222
Standardized Value of S	
M-K Test Value (S)	0
Tabulated p-value	0.5270
Approximate p-value	

OLS Regression Line (Blue)

OLS Regression Slope	-0.0381
OLS Regression Intercept	2.6061

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



Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.5955
Standardized Value of S	-3.6529
M-K Test Value (S)	-226
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.0003
OLS Regression Intercept	0.0101

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

App G5 Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Intermediate

			Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects								
	User Selected Options										
	Date/Time of Computation		ProUCL 5.12025-12-17 1:16:20 PM								
	From File		2025-IntermediateProUCL_b.xls								
	Full Precision		OFF								
	Confidence Coefficient		0.95								
01A-IN											
Sulphate (mg/L)											
		Raw Statistics									
			Number of Valid Observations	47							
			Number of Distinct Observations	44							
			Minimum	0.3							
			Maximum	182							
			Mean of Raw Data	67.35							
			Standard Deviation of Raw Data	50.14							
			Khat	0.797							
			Theta hat	84.45							
			Kstar	0.761							
			Theta star	88.53							
			Mean of Log Transformed Data	3.465							
			Standard Deviation of Log Transformed Data	1.813							
		Normal GOF Test Results									
			Correlation Coefficient R	0.97							
			Shapiro Wilk Test Statistic	0.922							
			Shapiro Wilk Critical (0.05) Value	0.946							
			Approximate Shapiro Wilk P Value	0.00433							
			Lilliefors Test Statistic	0.122							
			Lilliefors Critical (0.05) Value	0.128							
Data appear Approximate Normal at (0.05) Significance Level											
		Gamma GOF Test Results									
			Correlation Coefficient R	0.924							
			A-D Test Statistic	2.801							
			A-D Critical (0.05) Value	0.789							
			K-S Test Statistic	0.239							
			K-S Critical(0.05) Value	0.134							
Data not Gamma Distributed at (0.05) Significance Level											
		Lognormal GOF Test Results									
			Correlation Coefficient R	0.872							
			Shapiro Wilk Test Statistic	0.75							
			Shapiro Wilk Critical (0.05) Value	0.946							
			Approximate Shapiro Wilk P Value	6.189E-10							
			Lilliefors Test Statistic	0.282							
			Lilliefors Critical (0.05) Value	0.128							
Data not Lognormal at (0.05) Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
54	Iron (mg/L)											
55												
56			Raw Statistics									
57					Number of Valid Observations	29						
58					Number of Missing Observations	1						
59					Number of Distinct Observations	28						
60					Minimum	0.02						
61					Maximum	33.8						
62					Mean of Raw Data	12.89						
63					Standard Deviation of Raw Data	11.33						
64					Khat	0.722						
65					Theta hat	17.84						
66					Kstar	0.671						
67					Theta star	19.22						
68					Mean of Log Transformed Data	1.723						
69					Standard Deviation of Log Transformed Data	1.87						
70												
71			Normal GOF Test Results									
72												
73					Correlation Coefficient R	0.95						
74					Shapiro Wilk Test Statistic	0.882						
75					Shapiro Wilk Critical (0.05) Value	0.926						
76					Approximate Shapiro Wilk P Value	0.00344						
77					Lilliefors Test Statistic	0.165						
78					Lilliefors Critical (0.05) Value	0.161						
79	Data not Normal at (0.05) Significance Level											
80												
81			Gamma GOF Test Results									
82												
83					Correlation Coefficient R	0.908						
84					A-D Test Statistic	0.637						
85					A-D Critical (0.05) Value	0.787						
86					K-S Test Statistic	0.13						
87					K-S Critical(0.05) Value	0.169						
88	Data appear Gamma Distributed at (0.05) Significance Level											
89												
90			Lognormal GOF Test Results									
91												
92					Correlation Coefficient R	0.911						
93					Shapiro Wilk Test Statistic	0.83						
94					Shapiro Wilk Critical (0.05) Value	0.926						
95					Approximate Shapiro Wilk P Value	1.8614E-4						
96					Lilliefors Test Statistic	0.172						
97					Lilliefors Critical (0.05) Value	0.161						
98	Data not Lognormal at (0.05) Significance Level											
99												
100	Copper (mg/L)											
101												
102			Raw Statistics									
103					Number of Valid Observations	45						
104					Number of Missing Observations	3						
105					Number of Distinct Observations	31						
106					Minimum	1.0000E-4						

107					Maximum	0.109						
108					Mean of Raw Data	0.00528						
109					Standard Deviation of Raw Data	0.0161						
110					Khat	0.579						
111					Theta hat	0.00911						
112					Kstar	0.555						
113					Theta star	0.0095						
114					Mean of Log Transformed Data	-6.317						
115					Standard Deviation of Log Transformed Data	1.322						
116												
117			Normal GOF Test Results									
118												
119					Correlation Coefficient R	0.492						
120					Shapiro Wilk Test Statistic	0.283						
121					Shapiro Wilk Critical (0.05) Value	0.945						
122					Approximate Shapiro Wilk P Value	0						
123					Lilliefors Test Statistic	0.374						
124					Lilliefors Critical (0.05) Value	0.131						
125	Data not Normal at (0.05) Significance Level											
126												
127			Gamma GOF Test Results									
128												
129					Correlation Coefficient R	0.749						
130					A-D Test Statistic	2.397						
131					A-D Critical (0.05) Value	0.806						
132					K-S Test Statistic	0.21						
133					K-S Critical(0.05) Value	0.139						
134	Data not Gamma Distributed at (0.05) Significance Level											
135												
136			Lognormal GOF Test Results									
137												
138					Correlation Coefficient R	0.984						
139					Shapiro Wilk Test Statistic	0.978						
140					Shapiro Wilk Critical (0.05) Value	0.945						
141					Approximate Shapiro Wilk P Value	0.698						
142					Lilliefors Test Statistic	0.0872						
143					Lilliefors Critical (0.05) Value	0.131						
144	Data appear Lognormal at (0.05) Significance Level											
145												
146	Nickel (mg/L)											
147												
148			Raw Statistics									
149					Number of Valid Observations	47						
150					Number of Distinct Observations	37						
151					Minimum	5.0000E-4						
152					Maximum	0.13						
153					Mean of Raw Data	0.0115						
154					Standard Deviation of Raw Data	0.0205						
155					Khat	0.703						
156					Theta hat	0.0164						
157					Kstar	0.673						
158					Theta star	0.0171						
159					Mean of Log Transformed Data	-5.322						

Standard Deviation of Log Transformed Data	1.379	
Normal GOF Test Results		
Correlation Coefficient R	0.688	
Shapiro Wilk Test Statistic	0.512	
Shapiro Wilk Critical (0.05) Value	0.946	
Approximate Shapiro Wilk P Value	0	
Lilliefors Test Statistic	0.296	
Lilliefors Critical (0.05) Value	0.128	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.905	
A-D Test Statistic	1.02	
A-D Critical (0.05) Value	0.795	
K-S Test Statistic	0.133	
K-S Critical(0.05) Value	0.135	
Data follow Appr. Gamma Distribution at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.978	
Shapiro Wilk Test Statistic	0.943	
Shapiro Wilk Critical (0.05) Value	0.946	
Approximate Shapiro Wilk P Value	0.0359	
Lilliefors Test Statistic	0.157	
Lilliefors Critical (0.05) Value	0.128	
Data not Lognormal at (0.05) Significance Level		
Zinc (mg/L)		
Raw Statistics		
Number of Valid Observations	31	
Number of Distinct Observations	26	
Minimum	0.001	
Maximum	0.021	
Mean of Raw Data	0.00545	
Standard Deviation of Raw Data	0.00455	
Khat	1.739	
Theta hat	0.00313	
Kstar	1.593	
Theta star	0.00342	
Mean of Log Transformed Data	-5.527	
Standard Deviation of Log Transformed Data	0.833	
Normal GOF Test Results		
Correlation Coefficient R	0.904	
Shapiro Wilk Test Statistic	0.825	
Shapiro Wilk Critical (0.05) Value	0.929	
Approximate Shapiro Wilk P Value	8.3783E-5	

	A	B	C	D	E	F	G	H	I	J	K	L
213					Lilliefors Test Statistic	0.164						
214					Lilliefors Critical (0.05) Value	0.156						
215	Data not Normal at (0.05) Significance Level											
216												
217				Gamma GOF Test Results								
218												
219					Correlation Coefficient R	0.986						
220					A-D Test Statistic	0.366						
221					A-D Critical (0.05) Value	0.761						
222					K-S Test Statistic	0.103						
223					K-S Critical(0.05) Value	0.16						
224	Data appear Gamma Distributed at (0.05) Significance Level											
225												
226				Lognormal GOF Test Results								
227												
228					Correlation Coefficient R	0.984						
229					Shapiro Wilk Test Statistic	0.954						
230					Shapiro Wilk Critical (0.05) Value	0.929						
231					Approximate Shapiro Wilk P Value	0.237						
232					Lilliefors Test Statistic	0.105						
233					Lilliefors Critical (0.05) Value	0.156						
234	Data appear Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-17 2:10:11 PM	
From File	2025-IntermediateProUCL_c.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

03-IN GOF

Chloride (mg/L)

Raw Statistics

Number of Valid Observations	47
Number of Distinct Observations	34
Minimum	0.5
Maximum	4.7
Mean of Raw Data	1.922
Standard Deviation of Raw Data	1.226
Khat	2.333
Theta hat	0.824
Kstar	2.198
Theta star	0.874
Mean of Log Transformed Data	0.424
Standard Deviation of Log Transformed Data	0.718

Normal GOF Test Results

Correlation Coefficient R	0.963
Shapiro Wilk Test Statistic	0.905
Shapiro Wilk Critical (0.05) Value	0.946
Approximate Shapiro Wilk P Value	7.3385E-4
Lilliefors Test Statistic	0.123
Lilliefors Critical (0.05) Value	0.128

Data appear Approximate Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.977
A-D Test Statistic	0.767
A-D Critical (0.05) Value	0.76
K-S Test Statistic	0.101
K-S Critical(0.05) Value	0.131

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.971
Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical (0.05) Value	0.946
Approximate Shapiro Wilk P Value	0.00197
Lilliefors Test Statistic	0.12
Lilliefors Critical (0.05) Value	0.128

Data appear Approximate_Lognormal at (0.05) Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
54	Manganese (mg/L)											
55												
56			Raw Statistics									
57					Number of Valid Observations	23						
58					Number of Distinct Observations	19						
59					Minimum	5.1000E-4						
60					Maximum	0.347						
61					Mean of Raw Data	0.0597						
62					Standard Deviation of Raw Data	0.0819						
63					Khat	0.552						
64					Theta hat	0.108						
65					Kstar	0.509						
66					Theta star	0.117						
67					Mean of Log Transformed Data	-3.951						
68					Standard Deviation of Log Transformed Data	1.795						
69												
70			Normal GOF Test Results									
71												
72					Correlation Coefficient R	0.843						
73					Shapiro Wilk Test Statistic	0.723						
74					Shapiro Wilk Critical (0.05) Value	0.914						
75					Approximate Shapiro Wilk P Value	1.0259E-5						
76					Lilliefors Test Statistic	0.235						
77					Lilliefors Critical (0.05) Value	0.18						
78	Data not Normal at (0.05) Significance Level											
79												
80			Gamma GOF Test Results									
81												
82					Correlation Coefficient R	0.988						
83					A-D Test Statistic	0.694						
84					A-D Critical (0.05) Value	0.8						
85					K-S Test Statistic	0.189						
86					K-S Critical(0.05) Value	0.191						
87	Data not Gamma Distributed at (0.05) Significance Level											
88												
89			Lognormal GOF Test Results									
90												
91					Correlation Coefficient R	0.971						
92					Shapiro Wilk Test Statistic	0.935						
93					Shapiro Wilk Critical (0.05) Value	0.914						
94					Approximate Shapiro Wilk P Value	0.142						
95					Lilliefors Test Statistic	0.178						
96					Lilliefors Critical (0.05) Value	0.18						
97	Data appear Lognormal at (0.05) Significance Level											
98												
99	Arsenic (mg/L)											
100												
101			Raw Statistics									
102					Number of Valid Observations	40						
103					Number of Distinct Observations	16						
104					Minimum	1.6000E-4						
105					Maximum	0.00245						
106					Mean of Raw Data	4.7775E-4						

Standard Deviation of Raw Data	4.1918E-4	
Khat	2.229	
Theta hat	2.1437E-4	
Kstar	2.078	
Theta star	2.2989E-4	
Mean of Log Transformed Data	-7.887	
Standard Deviation of Log Transformed Data	0.659	

Normal GOF Test Results

Correlation Coefficient R	0.814
Shapiro Wilk Test Statistic	0.688
Shapiro Wilk Critical (0.05) Value	0.94
Approximate Shapiro Wilk P Value	5.329E-10
Lilliefors Test Statistic	0.224
Lilliefors Critical (0.05) Value	0.139

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.93
A-D Test Statistic	1.386
A-D Critical (0.05) Value	0.758
K-S Test Statistic	0.16
K-S Critical(0.05) Value	0.141

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.96
Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical (0.05) Value	0.94
Approximate Shapiro Wilk P Value	0.00567
Lilliefors Test Statistic	0.166
Lilliefors Critical (0.05) Value	0.139

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Signifi

Chromium (mg/L)

Raw Statistics

Number of Valid Observations	40
Number of Distinct Observations	25
Minimum	3.4000E-4
Maximum	0.088
Mean of Raw Data	0.00627
Standard Deviation of Raw Data	0.0142
Khat	0.633
Theta hat	0.0099
Kstar	0.603

Theta star	0.0104	
Mean of Log Transformed Data	-6.039	
Standard Deviation of Log Transformed Data	1.248	
Normal GOF Test Results		
Correlation Coefficient R	0.61	
Shapiro Wilk Test Statistic	0.411	
Shapiro Wilk Critical (0.05) Value	0.94	
Approximate Shapiro Wilk P Value	3.331E-16	
Lilliefors Test Statistic	0.338	
Lilliefors Critical (0.05) Value	0.139	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.856	
A-D Test Statistic	3.24	
A-D Critical (0.05) Value	0.8	
K-S Test Statistic	0.233	
K-S Critical(0.05) Value	0.146	
Data not Gamma Distributed at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.939	
Shapiro Wilk Test Statistic	0.882	
Shapiro Wilk Critical (0.05) Value	0.94	
Approximate Shapiro Wilk P Value	3.7864E-4	
Lilliefors Test Statistic	0.232	
Lilliefors Critical (0.05) Value	0.139	
Data not Lognormal at (0.05) Significance Level		
Non-parametric GOF Test Results		
Data do not follow a discernible distribution at (0.05) Level of Signifi		
Copper (mg/L)		
Raw Statistics		
Number of Valid Observations	40	
Number of Distinct Observations	25	
Minimum	6.1000E-4	
Maximum	0.021	
Mean of Raw Data	0.00337	
Standard Deviation of Raw Data	0.00366	
Khat	1.44	
Theta hat	0.00234	
Kstar	1.349	
Theta star	0.0025	
Mean of Log Transformed Data	-6.078	
Standard Deviation of Log Transformed Data	0.857	

	A	B	C	D	E	F	G	H	I	J	K	L
213			Normal GOF Test Results									
214												
215					Correlation Coefficient R	0.809						
216					Shapiro Wilk Test Statistic	0.683						
217					Shapiro Wilk Critical (0.05) Value	0.94						
218					Approximate Shapiro Wilk P Value	3.819E-10						
219					Lilliefors Test Statistic	0.226						
220					Lilliefors Critical (0.05) Value	0.139						
221	Data not Normal at (0.05) Significance Level											
222												
223			Gamma GOF Test Results									
224												
225					Correlation Coefficient R	0.943						
226					A-D Test Statistic	1.001						
227					A-D Critical (0.05) Value	0.767						
228					K-S Test Statistic	0.138						
229					K-S Critical(0.05) Value	0.142						
230	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
231												
232			Lognormal GOF Test Results									
233												
234					Correlation Coefficient R	0.978						
235					Shapiro Wilk Test Statistic	0.948						
236					Shapiro Wilk Critical (0.05) Value	0.94						
237					Approximate Shapiro Wilk P Value	0.0931						
238					Lilliefors Test Statistic	0.133						
239					Lilliefors Critical (0.05) Value	0.139						
240	Data appear Lognormal at (0.05) Significance Level											
241												
242	Nickel (mg/L)											
243												
244			Raw Statistics									
245					Number of Valid Observations	21						
246					Number of Distinct Observations	18						
247					Minimum	7.0000E-4						
248					Maximum	0.036						
249					Mean of Raw Data	0.00378						
250					Standard Deviation of Raw Data	0.00755						
251					Khat	0.936						
252					Theta hat	0.00403						
253					Kstar	0.834						
254					Theta star	0.00453						
255					Mean of Log Transformed Data	-6.2						
256					Standard Deviation of Log Transformed Data	0.915						
257												
258			Normal GOF Test Results									
259												
260					Correlation Coefficient R	0.597						
261					Shapiro Wilk Test Statistic	0.383						
262					Shapiro Wilk Critical (0.05) Value	0.908						
263					Approximate Shapiro Wilk P Value	1.0624E-9						
264					Lilliefors Test Statistic	0.388						
265					Lilliefors Critical (0.05) Value	0.188						

	A	B	C	D	E	F	G	H	I	J	K	L
266	Data not Normal at (0.05) Significance Level											
267												
268				Gamma GOF Test Results								
269												
270					Correlation Coefficient R	0.811						
271					A-D Test Statistic	2.04						
272					A-D Critical (0.05) Value	0.773						
273					K-S Test Statistic	0.264						
274					K-S Critical(0.05) Value	0.195						
275	Data not Gamma Distributed at (0.05) Significance Level											
276												
277				Lognormal GOF Test Results								
278												
279					Correlation Coefficient R	0.927						
280					Shapiro Wilk Test Statistic	0.87						
281					Shapiro Wilk Critical (0.05) Value	0.908						
282					Approximate Shapiro Wilk P Value	0.00802						
283					Lilliefors Test Statistic	0.15						
284					Lilliefors Critical (0.05) Value	0.188						
285	Data appear Approximate_Lognormal at (0.05) Significance Level											
286												
287	Zinc (mg/L)											
288												
289				Raw Statistics								
290					Number of Valid Observations	21						
291					Number of Distinct Observations	18						
292					Minimum	0.001						
293					Maximum	0.036						
294					Mean of Raw Data	0.00513						
295					Standard Deviation of Raw Data	0.00733						
296					Khat	1.369						
297					Theta hat	0.00375						
298					Kstar	1.205						
299					Theta star	0.00426						
300					Mean of Log Transformed Data	-5.68						
301					Standard Deviation of Log Transformed Data	0.812						
302												
303				Normal GOF Test Results								
304												
305					Correlation Coefficient R	0.661						
306					Shapiro Wilk Test Statistic	0.464						
307					Shapiro Wilk Critical (0.05) Value	0.908						
308					Approximate Shapiro Wilk P Value	8.3750E-9						
309					Lilliefors Test Statistic	0.347						
310					Lilliefors Critical (0.05) Value	0.188						
311	Data not Normal at (0.05) Significance Level											
312												
313				Gamma GOF Test Results								
314												
315					Correlation Coefficient R	0.822						
316					A-D Test Statistic	1.143						
317					A-D Critical (0.05) Value	0.761						
318					K-S Test Statistic	0.209						

	A	B	C	D	E	F	G	H	I	J	K	L
319					K-S Critical(0.05) Value	0.193						
320	Data not Gamma Distributed at (0.05) Significance Level											
321												
322			Lognormal GOF Test Results									
323												
324					Correlation Coefficient R	0.955						
325					Shapiro Wilk Test Statistic	0.922						
326					Shapiro Wilk Critical (0.05) Value	0.908						
327					Approximate Shapiro Wilk P Value	0.0942						
328					Lilliefors Test Statistic	0.136						
329					Lilliefors Critical (0.05) Value	0.188						
330	Data appear Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-17 2:30:15 PM	
From File	2025-IntermediateProUCL_d.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

04-IN GOF

Manganese (mg/L)

Raw Statistics	
Number of Valid Observations	19
Number of Distinct Observations	19
Minimum	0.004
Maximum	0.727
Mean of Raw Data	0.325
Standard Deviation of Raw Data	0.243
Khat	1.158
Theta hat	0.281
Kstar	1.01
Theta star	0.322
Mean of Log Transformed Data	-1.613
Standard Deviation of Log Transformed Data	1.307

Normal GOF Test Results	
Correlation Coefficient R	0.968
Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical (0.05) Value	0.901
Approximate Shapiro Wilk P Value	0.121
Lilliefors Test Statistic	0.152
Lilliefors Critical (0.05) Value	0.197

Data appear Normal at (0.05) Significance Level

Gamma GOF Test Results	
Correlation Coefficient R	0.922
A-D Test Statistic	0.469
A-D Critical (0.05) Value	0.765
K-S Test Statistic	0.149
K-S Critical(0.05) Value	0.204

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results	
Correlation Coefficient R	0.916
Shapiro Wilk Test Statistic	0.847
Shapiro Wilk Critical (0.05) Value	0.901
Approximate Shapiro Wilk P Value	0.0049
Lilliefors Test Statistic	0.172
Lilliefors Critical (0.05) Value	0.197

Data appear Approximate_Lognormal at (0.05) Significance Level

54	Arsenic (mg/L)											
55												
56			Raw Statistics									
57			Number of Valid Observations	23								
58			Number of Distinct Observations	22								
59			Minimum	2.0000E-4								
60			Maximum	0.0052								
61			Mean of Raw Data	0.00288								
62			Standard Deviation of Raw Data	0.001								
63			Khat	4.809								
64			Theta hat	5.9881E-4								
65			Kstar	4.211								
66			Theta star	6.8389E-4								
67			Mean of Log Transformed Data	-5.958								
68			Standard Deviation of Log Transformed Data	0.611								
69												
70			Normal GOF Test Results									
71												
72			Correlation Coefficient R	0.94								
73			Shapiro Wilk Test Statistic	0.905								
74			Shapiro Wilk Critical (0.05) Value	0.914								
75			Approximate Shapiro Wilk P Value	0.0302								
76			Lilliefors Test Statistic	0.197								
77			Lilliefors Critical (0.05) Value	0.18								
78	Data not Normal at (0.05) Significance Level											
79												
80			Gamma GOF Test Results									
81												
82			Correlation Coefficient R	0.933								
83			A-D Test Statistic	1.792								
84			A-D Critical (0.05) Value	0.747								
85			K-S Test Statistic	0.2								
86			K-S Critical(0.05) Value	0.182								
87	Data not Gamma Distributed at (0.05) Significance Level											
88												
89			Lognormal GOF Test Results									
90												
91			Correlation Coefficient R	0.755								
92			Shapiro Wilk Test Statistic	0.604								
93			Shapiro Wilk Critical (0.05) Value	0.914								
94			Approximate Shapiro Wilk P Value	1.6445E-7								
95			Lilliefors Test Statistic	0.264								
96			Lilliefors Critical (0.05) Value	0.18								
97	Data not Lognormal at (0.05) Significance Level											
98												
99	Non-parametric GOF Test Results											
100												
101	Data do not follow a discernible distribution at (0.05) Level of Signifi											
102												
103	Chromium (mg/L)											
104												
105			Raw Statistics									
106			Number of Valid Observations	23								

107				Number of Distinct Observations	17							
108				Minimum	2.0000E-4							
109				Maximum	0.0124							
110				Mean of Raw Data	0.00228							
111				Standard Deviation of Raw Data	0.00296							
112				Khat	1.04							
113				Theta hat	0.0022							
114				Kstar	0.933							
115				Theta star	0.00245							
116				Mean of Log Transformed Data	-6.635							
117				Standard Deviation of Log Transformed Data	1.031							
118												
119			Normal GOF Test Results									
120												
121				Correlation Coefficient R	0.797							
122				Shapiro Wilk Test Statistic	0.649							
123				Shapiro Wilk Critical (0.05) Value	0.914							
124				Approximate Shapiro Wilk P Value	7.2677E-7							
125				Lilliefors Test Statistic	0.314							
126				Lilliefors Critical (0.05) Value	0.18							
127	Data not Normal at (0.05) Significance Level											
128												
129			Gamma GOF Test Results									
130												
131				Correlation Coefficient R	0.959							
132				A-D Test Statistic	1.232							
133				A-D Critical (0.05) Value	0.769							
134				K-S Test Statistic	0.291							
135				K-S Critical(0.05) Value	0.187							
136	Data not Gamma Distributed at (0.05) Significance Level											
137												
138			Lognormal GOF Test Results									
139												
140				Correlation Coefficient R	0.974							
141				Shapiro Wilk Test Statistic	0.948							
142				Shapiro Wilk Critical (0.05) Value	0.914							
143				Approximate Shapiro Wilk P Value	0.264							
144				Lilliefors Test Statistic	0.238							
145				Lilliefors Critical (0.05) Value	0.18							
146	Data appear Approximate_Lognormal at (0.05) Significance Level											
147												
148	Nickel (mg/L)											
149												
150			Raw Statistics									
151				Number of Valid Observations	16							
152				Number of Distinct Observations	15							
153				Minimum	7.4000E-4							
154				Maximum	0.0047							
155				Mean of Raw Data	0.00219							
156				Standard Deviation of Raw Data	0.00107							
157				Khat	5.433							
158				Theta hat	4.0334E-4							
159				Kstar	4.456							

160					Theta star	4.9178E-4						
161					Mean of Log Transformed Data	-6.218						
162					Standard Deviation of Log Transformed Data	0.444						
163												
164				Normal GOF Test Results								
165												
166					Correlation Coefficient R	0.888						
167					Shapiro Wilk Test Statistic	0.797						
168					Shapiro Wilk Critical (0.05) Value	0.887						
169					Approximate Shapiro Wilk P Value	0.00188						
170					Lilliefors Test Statistic	0.253						
171					Lilliefors Critical (0.05) Value	0.213						
172	Data not Normal at (0.05) Significance Level											
173												
174				Gamma GOF Test Results								
175												
176					Correlation Coefficient R	0.934						
177					A-D Test Statistic	0.81						
178					A-D Critical (0.05) Value	0.741						
179					K-S Test Statistic	0.192						
180					K-S Critical(0.05) Value	0.216						
181	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
182												
183				Lognormal GOF Test Results								
184												
185					Correlation Coefficient R	0.949						
186					Shapiro Wilk Test Statistic	0.915						
187					Shapiro Wilk Critical (0.05) Value	0.887						
188					Approximate Shapiro Wilk P Value	0.12						
189					Lilliefors Test Statistic	0.168						
190					Lilliefors Critical (0.05) Value	0.213						
191	Data appear Lognormal at (0.05) Significance Level											
192												
193	Zinc (mg/L)											
194												
195				Raw Statistics								
196					Number of Valid Observations	16						
197					Number of Distinct Observations	13						
198					Minimum	0.001						
199					Maximum	0.0048						
200					Mean of Raw Data	0.00214						
201					Standard Deviation of Raw Data	0.00111						
202					Khat	4.48						
203					Theta hat	4.7855E-4						
204					Kstar	3.681						
205					Theta star	5.8232E-4						
206					Mean of Log Transformed Data	-6.261						
207					Standard Deviation of Log Transformed Data	0.493						
208												
209				Normal GOF Test Results								
210												
211					Correlation Coefficient R	0.946						
212					Shapiro Wilk Test Statistic	0.89						

	A	B	C	D	E	F	G	H	I	J	K	L
213					Shapiro Wilk Critical (0.05) Value	0.887						
214					Approximate Shapiro Wilk P Value	0.0603						
215					Lilliefors Test Statistic	0.177						
216					Lilliefors Critical (0.05) Value	0.213						
217	Data appear Normal at (0.05) Significance Level											
218												
219			Gamma GOF Test Results									
220												
221					Correlation Coefficient R	0.987						
222					A-D Test Statistic	0.328						
223					A-D Critical (0.05) Value	0.742						
224					K-S Test Statistic	0.126						
225					K-S Critical(0.05) Value	0.216						
226	Data appear Gamma Distributed at (0.05) Significance Level											
227												
228			Lognormal GOF Test Results									
229												
230					Correlation Coefficient R	0.981						
231					Shapiro Wilk Test Statistic	0.947						
232					Shapiro Wilk Critical (0.05) Value	0.887						
233					Approximate Shapiro Wilk P Value	0.529						
234					Lilliefors Test Statistic	0.111						
235					Lilliefors Critical (0.05) Value	0.213						
236	Data appear Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-17 2:47:26 PM	
From File	2025-IntermediateProUCL_e.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

05-IN GOF

Iron (mg/L)

Raw Statistics	
Number of Valid Observations	28
Number of Distinct Observations	15
Minimum	0.01
Maximum	0.778
Mean of Raw Data	0.122
Standard Deviation of Raw Data	0.196
Khat	0.542
Theta hat	0.225
Kstar	0.508
Theta star	0.24
Mean of Log Transformed Data	-3.261
Standard Deviation of Log Transformed Data	1.515

Normal GOF Test Results

Correlation Coefficient R	0.798
Shapiro Wilk Test Statistic	0.644
Shapiro Wilk Critical (0.05) Value	0.924
Approximate Shapiro Wilk P Value	6.6782E-8
Lilliefors Test Statistic	0.323
Lilliefors Critical (0.05) Value	0.164

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.977
A-D Test Statistic	2.529
A-D Critical (0.05) Value	0.806
K-S Test Statistic	0.282
K-S Critical(0.05) Value	0.174

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.913
Shapiro Wilk Test Statistic	0.814
Shapiro Wilk Critical (0.05) Value	0.924
Approximate Shapiro Wilk P Value	1.1033E-4
Lilliefors Test Statistic	0.224
Lilliefors Critical (0.05) Value	0.164

Data not Lognormal at (0.05) Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
54	Non-parametric GOF Test Results											
55												
56	Data do not follow a discernible distribution at (0.05) Level of Signifi											
57												
58	Arsenic (mg/L)											
59												
60			Raw Statistics									
61					Number of Valid Observations	44						
62					Number of Missing Observations	1						
63					Number of Distinct Observations	25						
64					Minimum	2.0000E-4						
65					Maximum	0.00341						
66					Mean of Raw Data	8.1909E-4						
67					Standard Deviation of Raw Data	6.6413E-4						
68					Khat	2.937						
69					Theta hat	2.7885E-4						
70					Kstar	2.752						
71					Theta star	2.9761E-4						
72					Mean of Log Transformed Data	-7.287						
73					Standard Deviation of Log Transformed Data	0.546						
74												
75			Normal GOF Test Results									
76												
77					Correlation Coefficient R	0.765						
78					Shapiro Wilk Test Statistic	0.602						
79					Shapiro Wilk Critical (0.05) Value	0.944						
80					Approximate Shapiro Wilk P Value	1.462E-13						
81					Lilliefors Test Statistic	0.306						
82					Lilliefors Critical (0.05) Value	0.132						
83	Data not Normal at (0.05) Significance Level											
84												
85			Gamma GOF Test Results									
86												
87					Correlation Coefficient R	0.873						
88					A-D Test Statistic	2.625						
89					A-D Critical (0.05) Value	0.756						
90					K-S Test Statistic	0.225						
91					K-S Critical(0.05) Value	0.134						
92	Data not Gamma Distributed at (0.05) Significance Level											
93												
94			Lognormal GOF Test Results									
95												
96					Correlation Coefficient R	0.944						
97					Shapiro Wilk Test Statistic	0.904						
98					Shapiro Wilk Critical (0.05) Value	0.944						
99					Approximate Shapiro Wilk P Value	0.00111						
100					Lilliefors Test Statistic	0.174						
101					Lilliefors Critical (0.05) Value	0.132						
102	Data not Lognormal at (0.05) Significance Level											
103												
104	Non-parametric GOF Test Results											
105												
106	Data do not follow a discernible distribution at (0.05) Level of Signifi											

	A	B	C	D	E	F	G	H	I	J	K	L
107												
108	Copper (mg/L)											
109												
110			Raw Statistics									
111			Number of Valid Observations			45						
112			Number of Distinct Observations			29						
113			Minimum			6.0000E-4						
114			Maximum			0.0669						
115			Mean of Raw Data			0.00554						
116			Standard Deviation of Raw Data			0.011						
117			Khat			0.866						
118			Theta hat			0.0064						
119			Kstar			0.823						
120			Theta star			0.00673						
121			Mean of Log Transformed Data			-5.874						
122			Standard Deviation of Log Transformed Data			0.972						
123												
124			Normal GOF Test Results									
125												
126			Correlation Coefficient R			0.628						
127			Shapiro Wilk Test Statistic			0.43						
128			Shapiro Wilk Critical (0.05) Value			0.945						
129			Approximate Shapiro Wilk P Value			0						
130			Lilliefors Test Statistic			0.364						
131			Lilliefors Critical (0.05) Value			0.131						
132	Data not Normal at (0.05) Significance Level											
133												
134			Gamma GOF Test Results									
135												
136			Correlation Coefficient R			0.862						
137			A-D Test Statistic			4.198						
138			A-D Critical (0.05) Value			0.784						
139			K-S Test Statistic			0.288						
140			K-S Critical(0.05) Value			0.136						
141	Data not Gamma Distributed at (0.05) Significance Level											
142												
143			Lognormal GOF Test Results									
144												
145			Correlation Coefficient R			0.941						
146			Shapiro Wilk Test Statistic			0.892						
147			Shapiro Wilk Critical (0.05) Value			0.945						
148			Approximate Shapiro Wilk P Value			3.0629E-4						
149			Lilliefors Test Statistic			0.204						
150			Lilliefors Critical (0.05) Value			0.131						
151	Data not Lognormal at (0.05) Significance Level											
152												
153	Non-parametric GOF Test Results											
154												
155	Data do not follow a discernible distribution at (0.05) Level of Signifi											
156												
157	Nickel (mg/L)											
158												
159			Raw Statistics									

160				Number of Valid Observations	27							
161				Number of Missing Observations	1							
162				Number of Distinct Observations	26							
163				Minimum	0.00111							
164				Maximum	0.0082							
165				Mean of Raw Data	0.00387							
166				Standard Deviation of Raw Data	0.00243							
167				Khat	2.663							
168				Theta hat	0.00145							
169				Kstar	2.392							
170				Theta star	0.00162							
171				Mean of Log Transformed Data	-5.753							
172				Standard Deviation of Log Transformed Data	0.655							
173												
174			Normal GOF Test Results									
175												
176				Correlation Coefficient R	0.941							
177				Shapiro Wilk Test Statistic	0.865							
178				Shapiro Wilk Critical (0.05) Value	0.923							
179				Approximate Shapiro Wilk P Value	0.00201							
180				Lilliefors Test Statistic	0.196							
181				Lilliefors Critical (0.05) Value	0.167							
182	Data not Normal at (0.05) Significance Level											
183												
184			Gamma GOF Test Results									
185												
186				Correlation Coefficient R	0.955							
187				A-D Test Statistic	0.79							
188				A-D Critical (0.05) Value	0.753							
189				K-S Test Statistic	0.133							
190				K-S Critical(0.05) Value	0.17							
191	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
192												
193			Lognormal GOF Test Results									
194												
195				Correlation Coefficient R	0.973							
196				Shapiro Wilk Test Statistic	0.925							
197				Shapiro Wilk Critical (0.05) Value	0.923							
198				Approximate Shapiro Wilk P Value	0.0574							
199				Lilliefors Test Statistic	0.117							
200				Lilliefors Critical (0.05) Value	0.167							
201	Data appear Lognormal at (0.05) Significance Level											
202												
203	Zinc (mg/L)											
204												
205				Raw Statistics								
206				Number of Valid Observations	28							
207				Number of Distinct Observations	25							
208				Minimum	0.001							
209				Maximum	0.0345							
210				Mean of Raw Data	0.00754							
211				Standard Deviation of Raw Data	0.00859							
212				Khat	1.225							

	A	B	C	D	E	F	G	H	I	J	K	L
213					Theta hat	0.00615						
214					Kstar	1.118						
215					Theta star	0.00674						
216					Mean of Log Transformed Data	-5.349						
217					Standard Deviation of Log Transformed Data	0.94						
218												
219				Normal GOF Test Results								
220												
221					Correlation Coefficient R	0.83						
222					Shapiro Wilk Test Statistic	0.693						
223					Shapiro Wilk Critical (0.05) Value	0.924						
224					Approximate Shapiro Wilk P Value	4.7867E-7						
225					Lilliefors Test Statistic	0.254						
226					Lilliefors Critical (0.05) Value	0.164						
227	Data not Normal at (0.05) Significance Level											
228												
229				Gamma GOF Test Results								
230												
231					Correlation Coefficient R	0.961						
232					A-D Test Statistic	1.079						
233					A-D Critical (0.05) Value	0.769						
234					K-S Test Statistic	0.207						
235					K-S Critical(0.05) Value	0.169						
236	Data not Gamma Distributed at (0.05) Significance Level											
237												
238				Lognormal GOF Test Results								
239												
240					Correlation Coefficient R	0.983						
241					Shapiro Wilk Test Statistic	0.957						
242					Shapiro Wilk Critical (0.05) Value	0.924						
243					Approximate Shapiro Wilk P Value	0.331						
244					Lilliefors Test Statistic	0.15						
245					Lilliefors Critical (0.05) Value	0.164						
246	Data appear Lognormal at (0.05) Significance Level											

	Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects										
	User Selected Options										
	Date/Time of Computation	ProUCL 5.12025-12-17 3:00:52 PM									
	From File	2025-IntermediateProUCL_f.xls									
	Full Precision	OFF									
	Confidence Coefficient	0.95									
6(R)-IN GOF											
Chloride (mg/L)											
	Raw Statistics										
	Number of Valid Observations	51									
	Number of Distinct Observations	39									
	Minimum	0.5									
	Maximum	6.3									
	Mean of Raw Data	2.442									
	Standard Deviation of Raw Data	1.629									
	Khat	2.651									
	Theta hat	0.921									
	Kstar	2.508									
	Theta star	0.974									
	Mean of Log Transformed Data	0.692									
	Standard Deviation of Log Transformed Data	0.635									
	Normal GOF Test Results										
	Correlation Coefficient R	0.923									
	Approximate Shapiro Wilk Test Statistic	0.836									
	Approximate Shapiro Wilk P Value	2.4372E-7									
	Lilliefors Test Statistic	0.215									
	Lilliefors Critical (0.05) Value	0.123									
Data not Normal at (0.05) Significance Level											
	Gamma GOF Test Results										
	Correlation Coefficient R	0.971									
	A-D Test Statistic	1.121									
	A-D Critical (0.05) Value	0.759									
	K-S Test Statistic	0.15									
	K-S Critical(0.05) Value	0.125									
Data not Gamma Distributed at (0.05) Significance Level											
	Lognormal GOF Test Results										
	Correlation Coefficient R	0.985									
	Approximate Shapiro Wilk Test Statistic	0.955									
	Approximate Shapiro Wilk P Value	0.0928									
	Lilliefors Test Statistic	0.107									
	Lilliefors Critical (0.05) Value	0.123									
Data appear Lognormal at (0.05) Significance Level											
Manganese (mg/L)											

	A	B	C	D	E	F	G	H	I	J	K	L
54			Raw Statistics									
55			Number of Valid Observations			26						
56			Number of Distinct Observations			24						
57			Minimum			0.001						
58			Maximum			3.34						
59			Mean of Raw Data			1.26						
60			Standard Deviation of Raw Data			0.799						
61			Khat			0.917						
62			Theta hat			1.373						
63			Kstar			0.837						
64			Theta star			1.505						
65			Mean of Log Transformed Data			-0.405						
66			Standard Deviation of Log Transformed Data			1.921						
67												
68			Normal GOF Test Results									
69												
70			Correlation Coefficient R			0.982						
71			Shapiro Wilk Test Statistic			0.964						
72			Shapiro Wilk Critical (0.05) Value			0.92						
73			Approximate Shapiro Wilk P Value			0.507						
74			Lilliefors Test Statistic			0.0983						
75			Lilliefors Critical (0.05) Value			0.17						
76	Data appear Normal at (0.05) Significance Level											
77												
78			Gamma GOF Test Results									
79												
80			Correlation Coefficient R			0.936						
81			A-D Test Statistic			2.203						
82			A-D Critical (0.05) Value			0.777						
83			K-S Test Statistic			0.257						
84			K-S Critical(0.05) Value			0.177						
85	Data not Gamma Distributed at (0.05) Significance Level											
86												
87			Lognormal GOF Test Results									
88												
89			Correlation Coefficient R			0.789						
90			Shapiro Wilk Test Statistic			0.636						
91			Shapiro Wilk Critical (0.05) Value			0.92						
92			Approximate Shapiro Wilk P Value			1.2823E-7						
93			Lilliefors Test Statistic			0.279						
94			Lilliefors Critical (0.05) Value			0.17						
95	Data not Lognormal at (0.05) Significance Level											
96												
97	Arsenic (mg/L)											
98												
99			Raw Statistics									
100			Number of Valid Observations			49						
101			Number of Distinct Observations			31						
102			Minimum			2.0000E-4						
103			Maximum			0.0151						
104			Mean of Raw Data			0.0017						
105			Standard Deviation of Raw Data			0.00288						
106			Khat			0.949						

107				Theta hat	0.00179						
108				Kstar	0.905						
109				Theta star	0.00188						
110				Mean of Log Transformed Data	-6.989						
111				Standard Deviation of Log Transformed Data	0.952						
112											
113			Normal GOF Test Results								
114											
115				Correlation Coefficient R	0.685						
116				Shapiro Wilk Test Statistic	0.493						
117				Shapiro Wilk Critical (0.05) Value	0.947						
118				Approximate Shapiro Wilk P Value	0						
119				Lilliefors Test Statistic	0.301						
120				Lilliefors Critical (0.05) Value	0.126						
121	Data not Normal at (0.05) Significance Level										
122											
123			Gamma GOF Test Results								
124											
125				Correlation Coefficient R	0.897						
126				A-D Test Statistic	4.152						
127				A-D Critical (0.05) Value	0.782						
128				K-S Test Statistic	0.203						
129				K-S Critical(0.05) Value	0.131						
130	Data not Gamma Distributed at (0.05) Significance Level										
131											
132			Lognormal GOF Test Results								
133											
134				Correlation Coefficient R	0.944						
135				Shapiro Wilk Test Statistic	0.889						
136				Shapiro Wilk Critical (0.05) Value	0.947						
137				Approximate Shapiro Wilk P Value	1.0140E-4						
138				Lilliefors Test Statistic	0.184						
139				Lilliefors Critical (0.05) Value	0.126						
140	Data not Lognormal at (0.05) Significance Level										
141											
142	Non-parametric GOF Test Results										
143											
144	Data do not follow a discernible distribution at (0.05) Level of Signifi										
145											
146	Copper (mg/L)										
147											
148			Raw Statistics								
149				Number of Valid Observations	49						
150				Number of Distinct Observations	24						
151				Minimum	2.0000E-4						
152				Maximum	0.0171						
153				Mean of Raw Data	0.00291						
154				Standard Deviation of Raw Data	0.00343						
155				Khat	1.122						
156				Theta hat	0.00259						
157				Kstar	1.067						
158				Theta star	0.00272						
159				Mean of Log Transformed Data	-6.349						

	A	B	C	D	E	F	G	H	I	J	K	L
160				Standard Deviation of Log Transformed Data		1.06						
161												
162				Normal GOF Test Results								
163												
164				Correlation Coefficient R		0.802						
165				Shapiro Wilk Test Statistic		0.658						
166				Shapiro Wilk Critical (0.05) Value		0.947						
167				Approximate Shapiro Wilk P Value		1.156E-13						
168				Lilliefors Test Statistic		0.252						
169				Lilliefors Critical (0.05) Value		0.126						
170	Data not Normal at (0.05) Significance Level											
171												
172				Gamma GOF Test Results								
173												
174				Correlation Coefficient R		0.942						
175				A-D Test Statistic		1.012						
176				A-D Critical (0.05) Value		0.776						
177				K-S Test Statistic		0.13						
178				K-S Critical(0.05) Value		0.13						
179	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
180												
181				Lognormal GOF Test Results								
182												
183				Correlation Coefficient R		0.979						
184				Shapiro Wilk Test Statistic		0.948						
185				Shapiro Wilk Critical (0.05) Value		0.947						
186				Approximate Shapiro Wilk P Value		0.0498						
187				Lilliefors Test Statistic		0.132						
188				Lilliefors Critical (0.05) Value		0.126						
189	Data appear Approximate_Lognormal at (0.05) Significance Level											
190												
191	Nickel (mg/L)											
192												
193				Raw Statistics								
194				Number of Valid Observations		27						
195				Number of Distinct Observations		26						
196				Minimum		0.0016						
197				Maximum		0.108						
198				Mean of Raw Data		0.0182						
199				Standard Deviation of Raw Data		0.0207						
200				Khat		1.383						
201				Theta hat		0.0132						
202				Kstar		1.254						
203				Theta star		0.0145						
204				Mean of Log Transformed Data		-4.407						
205				Standard Deviation of Log Transformed Data		0.911						
206												
207				Normal GOF Test Results								
208												
209				Correlation Coefficient R		0.785						
210				Shapiro Wilk Test Statistic		0.644						
211				Shapiro Wilk Critical (0.05) Value		0.923						
212				Approximate Shapiro Wilk P Value		1.1054E-7						

213				Lilliefors Test Statistic	0.222							
214				Lilliefors Critical (0.05) Value	0.167							
215	Data not Normal at (0.05) Significance Level											
216												
217			Gamma GOF Test Results									
218												
219				Correlation Coefficient R	0.92							
220				A-D Test Statistic	0.382							
221				A-D Critical (0.05) Value	0.765							
222				K-S Test Statistic	0.105							
223				K-S Critical(0.05) Value	0.172							
224	Data appear Gamma Distributed at (0.05) Significance Level											
225												
226			Lognormal GOF Test Results									
227												
228				Correlation Coefficient R	0.992							
229				Shapiro Wilk Test Statistic	0.991							
230				Shapiro Wilk Critical (0.05) Value	0.923							
231				Approximate Shapiro Wilk P Value	0.995							
232				Lilliefors Test Statistic	0.0809							
233				Lilliefors Critical (0.05) Value	0.167							
234	Data appear Lognormal at (0.05) Significance Level											
235												
236	Zinc (mg/L)											
237												
238			Raw Statistics									
239				Number of Valid Observations	27							
240				Number of Distinct Observations	26							
241				Minimum	0.001							
242				Maximum	0.201							
243				Mean of Raw Data	0.0291							
244				Standard Deviation of Raw Data	0.0513							
245				Khat	0.596							
246				Theta hat	0.0488							
247				Kstar	0.555							
248				Theta star	0.0525							
249				Mean of Log Transformed Data	-4.574							
250				Standard Deviation of Log Transformed Data	1.483							
251												
252			Normal GOF Test Results									
253												
254				Correlation Coefficient R	0.731							
255				Shapiro Wilk Test Statistic	0.546							
256				Shapiro Wilk Critical (0.05) Value	0.923							
257				Approximate Shapiro Wilk P Value	3.4682E-9							
258				Lilliefors Test Statistic	0.306							
259				Lilliefors Critical (0.05) Value	0.167							
260	Data not Normal at (0.05) Significance Level											
261												
262			Gamma GOF Test Results									
263												
264				Correlation Coefficient R	0.93							
265				A-D Test Statistic	0.945							

	A	B	C	D	E	F	G	H	I	J	K	L
266				A-D Critical (0.05) Value		0.798						
267				K-S Test Statistic		0.147						
268				K-S Critical(0.05) Value		0.177						
269	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
270												
271			Lognormal GOF Test Results									
272												
273				Correlation Coefficient R		0.986						
274				Shapiro Wilk Test Statistic		0.96						
275				Shapiro Wilk Critical (0.05) Value		0.923						
276				Approximate Shapiro Wilk P Value		0.391						
277				Lilliefors Test Statistic		0.0808						
278				Lilliefors Critical (0.05) Value		0.167						
279	Data appear Lognormal at (0.05) Significance Level											

1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects							
2			User Selected Options								
3			Date/Time of Computation	ProUCL 5.12025-12-22 7:36:29 AM							
4			From File	2025-IntermediateProUCL_g.xls							
5			Full Precision	OFF							
6			Confidence Coefficient	0.95							
7											
8	07-IN										
9	Chloride (mg/L)										
10											
11			Raw Statistics								
12			Number of Valid Observations	52							
13			Number of Distinct Observations	20							
14			Minimum	1.0000E-5							
15			Maximum	2.9							
16			Mean of Raw Data	0.828							
17			Standard Deviation of Raw Data	0.592							
18			Khat	1.316							
19			Theta hat	0.629							
20			Kstar	1.253							
21			Theta star	0.661							
22			Mean of Log Transformed Data	-0.615							
23			Standard Deviation of Log Transformed Data	1.736							
24											
25			Normal GOF Test Results								
26											
27			Correlation Coefficient R	0.88							
28			Approximate Shapiro Wilk Test Statistic	0.783							
29			Approximate Shapiro Wilk P Value	7.864E-10							
30			Lilliefors Test Statistic	0.258							
31			Lilliefors Critical (0.05) Value	0.122							
32	Data not Normal at (0.05) Significance Level										
33											
34			Gamma GOF Test Results								
35											
36			Correlation Coefficient R	0.965							
37			A-D Test Statistic	4.4							
38			A-D Critical (0.05) Value	0.772							
39			K-S Test Statistic	0.313							
40			K-S Critical(0.05) Value	0.126							
41	Data not Gamma Distributed at (0.05) Significance Level										
42											
43			Lognormal GOF Test Results								
44											
45			Correlation Coefficient R	0.641							
46			Approximate Shapiro Wilk Test Statistic	0.459							
47			Approximate Shapiro Wilk P Value	0							
48			Lilliefors Test Statistic	0.386							
49			Lilliefors Critical (0.05) Value	0.122							
50	Data not Lognormal at (0.05) Significance Level										
51											
52	Non-parametric GOF Test Results										
53											

	A	B	C	D	E	F	G	H	I	J	K	L
54	Data do not follow a discernible distribution at (0.05) Level of Signifi											
55												
56	Iron (mg/L)											
57												
58			Raw Statistics									
59					Number of Valid Observations	27						
60					Number of Distinct Observations	21						
61					Minimum	0.01						
62					Maximum	0.737						
63					Mean of Raw Data	0.212						
64					Standard Deviation of Raw Data	0.225						
65					Khat	0.818						
66					Theta hat	0.259						
67					Kstar	0.752						
68					Theta star	0.282						
69					Mean of Log Transformed Data	-2.275						
70					Standard Deviation of Log Transformed Data	1.395						
71												
72			Normal GOF Test Results									
73												
74					Correlation Coefficient R	0.91						
75					Shapiro Wilk Test Statistic	0.816						
76					Shapiro Wilk Critical (0.05) Value	0.923						
77					Approximate Shapiro Wilk P Value	1.5711E-4						
78					Lilliefors Test Statistic	0.191						
79					Lilliefors Critical (0.05) Value	0.167						
80	Data not Normal at (0.05) Significance Level											
81												
82			Gamma GOF Test Results									
83												
84					Correlation Coefficient R	0.967						
85					A-D Test Statistic	0.382						
86					A-D Critical (0.05) Value	0.781						
87					K-S Test Statistic	0.0976						
88					K-S Critical(0.05) Value	0.174						
89	Data appear Gamma Distributed at (0.05) Significance Level											
90												
91			Lognormal GOF Test Results									
92												
93					Correlation Coefficient R	0.974						
94					Shapiro Wilk Test Statistic	0.927						
95					Shapiro Wilk Critical (0.05) Value	0.923						
96					Approximate Shapiro Wilk P Value	0.0636						
97					Lilliefors Test Statistic	0.128						
98					Lilliefors Critical (0.05) Value	0.167						
99	Data appear Lognormal at (0.05) Significance Level											
100												
101	Copper (mg/L)											
102												
103			Raw Statistics									
104					Number of Valid Observations	50						
105					Number of Distinct Observations	27						
106					Minimum	2.0000E-4						

107					Maximum	0.0061						
108					Mean of Raw Data	0.00212						
109					Standard Deviation of Raw Data	0.00149						
110					Khat	1.82						
111					Theta hat	0.00116						
112					Kstar	1.724						
113					Theta star	0.00123						
114					Mean of Log Transformed Data	-6.455						
115					Standard Deviation of Log Transformed Data	0.856						
116												
117				Normal GOF Test Results								
118												
119					Correlation Coefficient R	0.956						
120					Shapiro Wilk Test Statistic	0.901						
121					Shapiro Wilk Critical (0.05) Value	0.947						
122					Approximate Shapiro Wilk P Value	2.9669E-4						
123					Lilliefors Test Statistic	0.198						
124					Lilliefors Critical (0.05) Value	0.125						
125	Data not Normal at (0.05) Significance Level											
126												
127				Gamma GOF Test Results								
128												
129					Correlation Coefficient R	0.978						
130					A-D Test Statistic	1.012						
131					A-D Critical (0.05) Value	0.764						
132					K-S Test Statistic	0.159						
133					K-S Critical(0.05) Value	0.127						
134	Data not Gamma Distributed at (0.05) Significance Level											
135												
136				Lognormal GOF Test Results								
137												
138					Correlation Coefficient R	0.968						
139					Shapiro Wilk Test Statistic	0.923						
140					Shapiro Wilk Critical (0.05) Value	0.947						
141					Approximate Shapiro Wilk P Value	0.00333						
142					Lilliefors Test Statistic	0.139						
143					Lilliefors Critical (0.05) Value	0.125						
144	Data not Lognormal at (0.05) Significance Level											
145												
146	Non-parametric GOF Test Results											
147												
148	Data do not follow a discernible distribution at (0.05) Level of Signifi											
149												
150	Nickel (mg/L)											
151												
152				Raw Statistics								
153					Number of Valid Observations	28						
154					Number of Distinct Observations	25						
155					Minimum	0.002						
156					Maximum	0.0191						
157					Mean of Raw Data	0.00491						
158					Standard Deviation of Raw Data	0.00347						
159					Khat	3.811						

160				Theta hat	0.00129							
161				Kstar	3.426							
162				Theta star	0.00143							
163				Mean of Log Transformed Data	-5.453							
164				Standard Deviation of Log Transformed Data	0.477							
165												
166			Normal GOF Test Results									
167												
168				Correlation Coefficient R	0.766							
169				Shapiro Wilk Test Statistic	0.611							
170				Shapiro Wilk Critical (0.05) Value	0.924							
171				Approximate Shapiro Wilk P Value	1.9683E-8							
172				Lilliefors Test Statistic	0.305							
173				Lilliefors Critical (0.05) Value	0.164							
174	Data not Normal at (0.05) Significance Level											
175												
176			Gamma GOF Test Results									
177												
178				Correlation Coefficient R	0.866							
179				A-D Test Statistic	1.902							
180				A-D Critical (0.05) Value	0.75							
181				K-S Test Statistic	0.231							
182				K-S Critical(0.05) Value	0.166							
183	Data not Gamma Distributed at (0.05) Significance Level											
184												
185			Lognormal GOF Test Results									
186												
187				Correlation Coefficient R	0.93							
188				Shapiro Wilk Test Statistic	0.879							
189				Shapiro Wilk Critical (0.05) Value	0.924							
190				Approximate Shapiro Wilk P Value	0.0034							
191				Lilliefors Test Statistic	0.185							
192				Lilliefors Critical (0.05) Value	0.164							
193	Data not Lognormal at (0.05) Significance Level											
194												
195	Non-parametric GOF Test Results											
196												
197	Data do not follow a discernible distribution at (0.05) Level of Signifi											
198												
199	Zinc (mg/L)											
200												
201			Raw Statistics									
202				Number of Valid Observations	28							
203				Number of Distinct Observations	28							
204				Minimum	0.0013							
205				Maximum	0.159							
206				Mean of Raw Data	0.0144							
207				Standard Deviation of Raw Data	0.0291							
208				Khat	0.981							
209				Theta hat	0.0146							
210				Kstar	0.9							
211				Theta star	0.016							
212				Mean of Log Transformed Data	-4.833							

	A	B	C	D	E	F	G	H	I	J	K	L
213		Standard Deviation of Log Transformed Data				0.914						
214												
215			Normal GOF Test Results									
216												
217					Correlation Coefficient R	0.577						
218					Shapiro Wilk Test Statistic	0.367						
219					Shapiro Wilk Critical (0.05) Value	0.924						
220					Approximate Shapiro Wilk P Value	7.341E-12						
221					Lilliefors Test Statistic	0.358						
222					Lilliefors Critical (0.05) Value	0.164						
223	Data not Normal at (0.05) Significance Level											
224												
225			Gamma GOF Test Results									
226												
227					Correlation Coefficient R	0.783						
228					A-D Test Statistic	2.024						
229					A-D Critical (0.05) Value	0.775						
230					K-S Test Statistic	0.213						
231					K-S Critical(0.05) Value	0.17						
232	Data not Gamma Distributed at (0.05) Significance Level											
233												
234			Lognormal GOF Test Results									
235												
236					Correlation Coefficient R	0.956						
237					Shapiro Wilk Test Statistic	0.936						
238					Shapiro Wilk Critical (0.05) Value	0.924						
239					Approximate Shapiro Wilk P Value	0.0955						
240					Lilliefors Test Statistic	0.112						
241					Lilliefors Critical (0.05) Value	0.164						
242	Data appear Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-22 7:55:51 AM	
From File	2025-IntermediateProUCL_h.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

08-IN

Manganese (mg/L)

Raw Statistics	
Number of Valid Observations	22
Number of Distinct Observations	20
Minimum	0.0019
Maximum	1.09
Mean of Raw Data	0.197
Standard Deviation of Raw Data	0.347
Khat	0.412
Theta hat	0.477
Kstar	0.386
Theta star	0.509
Mean of Log Transformed Data	-3.215
Standard Deviation of Log Transformed Data	2.008

Normal GOF Test Results

Correlation Coefficient R	0.767
Shapiro Wilk Test Statistic	0.588
Shapiro Wilk Critical (0.05) Value	0.911
Approximate Shapiro Wilk P Value	1.6228E-7
Lilliefors Test Statistic	0.329
Lilliefors Critical (0.05) Value	0.184

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.936
A-D Test Statistic	0.876
A-D Critical (0.05) Value	0.823
K-S Test Statistic	0.149
K-S Critical(0.05) Value	0.198

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.982
Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical (0.05) Value	0.911
Approximate Shapiro Wilk P Value	0.28
Lilliefors Test Statistic	0.123
Lilliefors Critical (0.05) Value	0.184

Data appear Lognormal at (0.05) Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
54	Chromium (mg/L)											
55												
56			Raw Statistics									
57					Number of Valid Observations	39						
58					Number of Distinct Observations	23						
59					Minimum	6.6000E-4						
60					Maximum	0.075						
61					Mean of Raw Data	0.0061						
62					Standard Deviation of Raw Data	0.0137						
63					Khat	0.632						
64					Theta hat	0.00966						
65					Kstar	0.601						
66					Theta star	0.0102						
67					Mean of Log Transformed Data	-6.069						
68					Standard Deviation of Log Transformed Data	1.171						
69												
70			Normal GOF Test Results									
71												
72					Correlation Coefficient R	0.631						
73					Shapiro Wilk Test Statistic	0.429						
74					Shapiro Wilk Critical (0.05) Value	0.939						
75					Approximate Shapiro Wilk P Value	2.109E-15						
76					Lilliefors Test Statistic	0.378						
77					Lilliefors Critical (0.05) Value	0.14						
78	Data not Normal at (0.05) Significance Level											
79												
80			Gamma GOF Test Results									
81												
82					Correlation Coefficient R	0.895						
83					A-D Test Statistic	4.431						
84					A-D Critical (0.05) Value	0.8						
85					K-S Test Statistic	0.238						
86					K-S Critical(0.05) Value	0.148						
87	Data not Gamma Distributed at (0.05) Significance Level											
88												
89			Lognormal GOF Test Results									
90												
91					Correlation Coefficient R	0.907						
92					Shapiro Wilk Test Statistic	0.819						
93					Shapiro Wilk Critical (0.05) Value	0.939						
94					Approximate Shapiro Wilk P Value	4.2656E-6						
95					Lilliefors Test Statistic	0.216						
96					Lilliefors Critical (0.05) Value	0.14						
97	Data not Lognormal at (0.05) Significance Level											
98												
99	Non-parametric GOF Test Results											
100												
101	Data do not follow a discernible distribution at (0.05) Level of Signifi											
102												
103	Copper (mg/L)											
104												
105			Raw Statistics									
106					Number of Valid Observations	39						

Number of Distinct Observations	29	
Minimum	7.2000E-4	
Maximum	0.028	
Mean of Raw Data	0.00472	
Standard Deviation of Raw Data	0.0061	
Khat	1.122	
Theta hat	0.0042	
Kstar	1.053	
Theta star	0.00448	
Mean of Log Transformed Data	-5.865	
Standard Deviation of Log Transformed Data	0.954	

Normal GOF Test Results

Correlation Coefficient R	0.784	
Shapiro Wilk Test Statistic	0.628	
Shapiro Wilk Critical (0.05) Value	0.939	
Approximate Shapiro Wilk P Value	3.333E-11	
Lilliefors Test Statistic	0.295	
Lilliefors Critical (0.05) Value	0.14	

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.947	
A-D Test Statistic	1.542	
A-D Critical (0.05) Value	0.775	
K-S Test Statistic	0.165	
K-S Critical(0.05) Value	0.145	

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.976	
Shapiro Wilk Test Statistic	0.939	
Shapiro Wilk Critical (0.05) Value	0.939	
Approximate Shapiro Wilk P Value	0.0478	
Lilliefors Test Statistic	0.111	
Lilliefors Critical (0.05) Value	0.14	

Data appear Lognormal at (0.05) Significance Level

Zinc (mg/L)

Raw Statistics

Number of Valid Observations	20	
Number of Distinct Observations	19	
Minimum	0.001	
Maximum	0.0198	
Mean of Raw Data	0.00692	
Standard Deviation of Raw Data	0.00642	
Khat	1.429	
Theta hat	0.00484	
Kstar	1.248	

	A	B	C	D	E	F	G	H	I	J	K	L
160					Theta star	0.00555						
161					Mean of Log Transformed Data	-5.362						
162					Standard Deviation of Log Transformed Data	0.909						
163												
164			Normal GOF Test Results									
165												
166					Correlation Coefficient R	0.89						
167					Shapiro Wilk Test Statistic	0.779						
168					Shapiro Wilk Critical (0.05) Value	0.905						
169					Approximate Shapiro Wilk P Value	2.5640E-4						
170					Lilliefors Test Statistic	0.262						
171					Lilliefors Critical (0.05) Value	0.192						
172	Data not Normal at (0.05) Significance Level											
173												
174			Gamma GOF Test Results									
175												
176					Correlation Coefficient R	0.951						
177					A-D Test Statistic	0.681						
178					A-D Critical (0.05) Value	0.759						
179					K-S Test Statistic	0.175						
180					K-S Critical(0.05) Value	0.198						
181	Data appear Gamma Distributed at (0.05) Significance Level											
182												
183			Lognormal GOF Test Results									
184												
185					Correlation Coefficient R	0.983						
186					Shapiro Wilk Test Statistic	0.951						
187					Shapiro Wilk Critical (0.05) Value	0.905						
188					Approximate Shapiro Wilk P Value	0.433						
189					Lilliefors Test Statistic	0.118						
190					Lilliefors Critical (0.05) Value	0.192						
191	Data appear Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-22 8:12:16 AM	
From File	2025-IntermediateProUCL_j.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

11-IN

Iron (mg/L)

Raw Statistics	
Number of Valid Observations	29
Number of Distinct Observations	24
Minimum	0.01
Maximum	1.91
Mean of Raw Data	0.515
Standard Deviation of Raw Data	0.579
Khat	0.562
Theta hat	0.916
Kstar	0.527
Theta star	0.977
Mean of Log Transformed Data	-1.775
Standard Deviation of Log Transformed Data	1.865

Normal GOF Test Results

Correlation Coefficient R	0.917
Shapiro Wilk Test Statistic	0.828
Shapiro Wilk Critical (0.05) Value	0.926
Approximate Shapiro Wilk P Value	1.7012E-4
Lilliefors Test Statistic	0.196
Lilliefors Critical (0.05) Value	0.161

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.953
A-D Test Statistic	0.743
A-D Critical (0.05) Value	0.805
K-S Test Statistic	0.142
K-S Critical(0.05) Value	0.171

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.953
Shapiro Wilk Test Statistic	0.882
Shapiro Wilk Critical (0.05) Value	0.926
Approximate Shapiro Wilk P Value	0.00359
Lilliefors Test Statistic	0.156
Lilliefors Critical (0.05) Value	0.161

Data appear Approximate_Lognormal at (0.05) Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
54	Arsenic (mg/L)											
55												
56			Raw Statistics									
57					Number of Valid Observations	41						
58					Number of Distinct Observations	29						
59					Minimum	2.0000E-4						
60					Maximum	0.0106						
61					Mean of Raw Data	0.00275						
62					Standard Deviation of Raw Data	0.00301						
63					Khat	0.914						
64					Theta hat	0.00301						
65					Kstar	0.864						
66					Theta star	0.00319						
67					Mean of Log Transformed Data	-6.533						
68					Standard Deviation of Log Transformed Data	1.182						
69												
70			Normal GOF Test Results									
71												
72					Correlation Coefficient R	0.89						
73					Shapiro Wilk Test Statistic	0.779						
74					Shapiro Wilk Critical (0.05) Value	0.941						
75					Approximate Shapiro Wilk P Value	1.1469E-7						
76					Lilliefors Test Statistic	0.234						
77					Lilliefors Critical (0.05) Value	0.137						
78	Data not Normal at (0.05) Significance Level											
79												
80			Gamma GOF Test Results									
81												
82					Correlation Coefficient R	0.965						
83					A-D Test Statistic	1.549						
84					A-D Critical (0.05) Value	0.782						
85					K-S Test Statistic	0.17						
86					K-S Critical(0.05) Value	0.143						
87	Data not Gamma Distributed at (0.05) Significance Level											
88												
89			Lognormal GOF Test Results									
90												
91					Correlation Coefficient R	0.973						
92					Shapiro Wilk Test Statistic	0.925						
93					Shapiro Wilk Critical (0.05) Value	0.941						
94					Approximate Shapiro Wilk P Value	0.0117						
95					Lilliefors Test Statistic	0.146						
96					Lilliefors Critical (0.05) Value	0.137						
97	Data not Lognormal at (0.05) Significance Level											
98												
99	Non-parametric GOF Test Results											
100												
101	Data do not follow a discernible distribution at (0.05) Level of Signifi											
102												
103	Copper (mg/L)											
104												
105			Raw Statistics									
106					Number of Valid Observations	41						

107				Number of Distinct Observations	29							
108				Minimum	2.0000E-4							
109				Maximum	0.161							
110				Mean of Raw Data	0.0147							
111				Standard Deviation of Raw Data	0.0288							
112				Khat	0.587							
113				Theta hat	0.0251							
114				Kstar	0.561							
115				Theta star	0.0263							
116				Mean of Log Transformed Data	-5.272							
117				Standard Deviation of Log Transformed Data	1.432							
118												
119			Normal GOF Test Results									
120												
121				Correlation Coefficient R	0.698							
122				Shapiro Wilk Test Statistic	0.519							
123				Shapiro Wilk Critical (0.05) Value	0.941							
124				Approximate Shapiro Wilk P Value	2.032E-14							
125				Lilliefors Test Statistic	0.313							
126				Lilliefors Critical (0.05) Value	0.137							
127	Data not Normal at (0.05) Significance Level											
128												
129			Gamma GOF Test Results									
130												
131				Correlation Coefficient R	0.94							
132				A-D Test Statistic	2.016							
133				A-D Critical (0.05) Value	0.805							
134				K-S Test Statistic	0.205							
135				K-S Critical(0.05) Value	0.145							
136	Data not Gamma Distributed at (0.05) Significance Level											
137												
138			Lognormal GOF Test Results									
139												
140				Correlation Coefficient R	0.981							
141				Shapiro Wilk Test Statistic	0.963							
142				Shapiro Wilk Critical (0.05) Value	0.941							
143				Approximate Shapiro Wilk P Value	0.289							
144				Lilliefors Test Statistic	0.117							
145				Lilliefors Critical (0.05) Value	0.137							
146	Data appear Lognormal at (0.05) Significance Level											
147												
148	Nickel (mg/L)											
149												
150			Raw Statistics									
151				Number of Valid Observations	31							
152				Number of Distinct Observations	29							
153				Minimum	0.00444							
154				Maximum	1.52							
155				Mean of Raw Data	0.128							
156				Standard Deviation of Raw Data	0.3							
157				Khat	0.403							
158				Theta hat	0.318							
159				Kstar	0.386							

160				Theta star	0.333							
161				Mean of Log Transformed Data	-3.682							
162				Standard Deviation of Log Transformed Data	1.702							
163												
164			Normal GOF Test Results									
165												
166				Correlation Coefficient R	0.669							
167				Shapiro Wilk Test Statistic	0.475							
168				Shapiro Wilk Critical (0.05) Value	0.929							
169				Approximate Shapiro Wilk P Value	2.224E-11							
170				Lilliefors Test Statistic	0.34							
171				Lilliefors Critical (0.05) Value	0.156							
172	Data not Normal at (0.05) Significance Level											
173												
174			Gamma GOF Test Results									
175												
176				Correlation Coefficient R	0.955							
177				A-D Test Statistic	3.029							
178				A-D Critical (0.05) Value	0.831							
179				K-S Test Statistic	0.3							
180				K-S Critical(0.05) Value	0.169							
181	Data not Gamma Distributed at (0.05) Significance Level											
182												
183			Lognormal GOF Test Results									
184												
185				Correlation Coefficient R	0.93							
186				Shapiro Wilk Test Statistic	0.852							
187				Shapiro Wilk Critical (0.05) Value	0.929							
188				Approximate Shapiro Wilk P Value	4.0046E-4							
189				Lilliefors Test Statistic	0.229							
190				Lilliefors Critical (0.05) Value	0.156							
191	Data not Lognormal at (0.05) Significance Level											
192												
193	Non-parametric GOF Test Results											
194												
195	Data do not follow a discernible distribution at (0.05) Level of Signifi											
196												
197	Zinc (mg/L)											
198												
199			Raw Statistics									
200				Number of Valid Observations	31							
201				Number of Distinct Observations	28							
202				Minimum	0.001							
203				Maximum	1.19							
204				Mean of Raw Data	0.315							
205				Standard Deviation of Raw Data	0.373							
206				Khat	0.518							
207				Theta hat	0.609							
208				Kstar	0.489							
209				Theta star	0.645							
210				Mean of Log Transformed Data	-2.375							
211				Standard Deviation of Log Transformed Data	2.146							
212												

	A	B	C	D	E	F	G	H	I	J	K	L
213			Normal GOF Test Results									
214												
215					Correlation Coefficient R	0.89						
216					Shapiro Wilk Test Statistic	0.78						
217					Shapiro Wilk Critical (0.05) Value	0.929						
218					Approximate Shapiro Wilk P Value	7.3737E-6						
219					Lilliefors Test Statistic	0.244						
220					Lilliefors Critical (0.05) Value	0.156						
221	Data not Normal at (0.05) Significance Level											
222												
223			Gamma GOF Test Results									
224												
225					Correlation Coefficient R	0.947						
226					A-D Test Statistic	0.498						
227					A-D Critical (0.05) Value	0.808						
228					K-S Test Statistic	0.122						
229					K-S Critical(0.05) Value	0.167						
230	Data appear Gamma Distributed at (0.05) Significance Level											
231												
232			Lognormal GOF Test Results									
233												
234					Correlation Coefficient R	0.947						
235					Shapiro Wilk Test Statistic	0.88						
236					Shapiro Wilk Critical (0.05) Value	0.929						
237					Approximate Shapiro Wilk P Value	0.00211						
238					Lilliefors Test Statistic	0.215						
239					Lilliefors Critical (0.05) Value	0.156						
240	Data not Lognormal at (0.05) Significance Level											

1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects								
2			User Selected Options									
3			Date/Time of Computation	ProUCL 5.12025-12-22 8:27:11 AM								
4			From File	2025-IntermediateProUCL_j.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	0.95								
7												
8	12-IN											
9	Chloride (mg/L)											
10												
11				Raw Statistics								
12				Number of Valid Observations	42							
13				Number of Distinct Observations	14							
14				Minimum	0.01							
15				Maximum	2.9							
16				Mean of Raw Data	0.913							
17				Standard Deviation of Raw Data	0.539							
18				Khat	2.537							
19				Theta hat	0.36							
20				Kstar	2.372							
21				Theta star	0.385							
22				Mean of Log Transformed Data	-0.3							
23				Standard Deviation of Log Transformed Data	0.84							
24												
25				Normal GOF Test Results								
26												
27				Correlation Coefficient R	0.913							
28				Shapiro Wilk Test Statistic	0.811							
29				Shapiro Wilk Critical (0.05) Value	0.942							
30				Approximate Shapiro Wilk P Value	1.9365E-5							
31				Lilliefors Test Statistic	0.198							
32				Lilliefors Critical (0.05) Value	0.135							
33	Data not Normal at (0.05) Significance Level											
34												
35				Gamma GOF Test Results								
36												
37				Correlation Coefficient R	0.974							
38				A-D Test Statistic	1.814							
39				A-D Critical (0.05) Value	0.757							
40				K-S Test Statistic	0.233							
41				K-S Critical(0.05) Value	0.138							
42	Data not Gamma Distributed at (0.05) Significance Level											
43												
44				Lognormal GOF Test Results								
45												
46				Correlation Coefficient R	0.803							
47				Shapiro Wilk Test Statistic	0.659							
48				Shapiro Wilk Critical (0.05) Value	0.942							
49				Approximate Shapiro Wilk P Value	1.591E-10							
50				Lilliefors Test Statistic	0.296							
51				Lilliefors Critical (0.05) Value	0.135							
52	Data not Lognormal at (0.05) Significance Level											
53												

	A	B	C	D	E	F	G	H	I	J	K	L
54	Non-parametric GOF Test Results											
55												
56	Data do not follow a discernible distribution at (0.05) Level of Signifi											
57												
58	Iron (mg/L)											
59												
60				Raw Statistics								
61				Number of Valid Observations		29						
62				Number of Distinct Observations		24						
63				Minimum		0.01						
64				Maximum		1.91						
65				Mean of Raw Data		0.515						
66				Standard Deviation of Raw Data		0.579						
67				Khat		0.562						
68				Theta hat		0.916						
69				Kstar		0.527						
70				Theta star		0.977						
71				Mean of Log Transformed Data		-1.775						
72				Standard Deviation of Log Transformed Data		1.865						
73												
74				Normal GOF Test Results								
75												
76				Correlation Coefficient R		0.917						
77				Shapiro Wilk Test Statistic		0.828						
78				Shapiro Wilk Critical (0.05) Value		0.926						
79				Approximate Shapiro Wilk P Value		1.7012E-4						
80				Lilliefors Test Statistic		0.196						
81				Lilliefors Critical (0.05) Value		0.161						
82	Data not Normal at (0.05) Significance Level											
83												
84				Gamma GOF Test Results								
85												
86				Correlation Coefficient R		0.953						
87				A-D Test Statistic		0.743						
88				A-D Critical (0.05) Value		0.805						
89				K-S Test Statistic		0.142						
90				K-S Critical(0.05) Value		0.171						
91	Data appear Gamma Distributed at (0.05) Significance Level											
92												
93				Lognormal GOF Test Results								
94												
95				Correlation Coefficient R		0.953						
96				Shapiro Wilk Test Statistic		0.882						
97				Shapiro Wilk Critical (0.05) Value		0.926						
98				Approximate Shapiro Wilk P Value		0.00359						
99				Lilliefors Test Statistic		0.156						
100				Lilliefors Critical (0.05) Value		0.161						
101	Data appear Approximate_Lognormal at (0.05) Significance Level											
102												
103	Arsenic (mg/L)											
104												
105				Raw Statistics								
106				Number of Valid Observations		41						

Number of Distinct Observations	29	
Minimum	2.0000E-4	
Maximum	0.0106	
Mean of Raw Data	0.00275	
Standard Deviation of Raw Data	0.00301	
Khat	0.914	
Theta hat	0.00301	
Kstar	0.864	
Theta star	0.00319	
Mean of Log Transformed Data	-6.533	
Standard Deviation of Log Transformed Data	1.182	

Normal GOF Test Results

Correlation Coefficient R	0.89
Shapiro Wilk Test Statistic	0.779
Shapiro Wilk Critical (0.05) Value	0.941
Approximate Shapiro Wilk P Value	1.1469E-7
Lilliefors Test Statistic	0.234
Lilliefors Critical (0.05) Value	0.137

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.965
A-D Test Statistic	1.549
A-D Critical (0.05) Value	0.782
K-S Test Statistic	0.17
K-S Critical(0.05) Value	0.143

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.973
Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical (0.05) Value	0.941
Approximate Shapiro Wilk P Value	0.0117
Lilliefors Test Statistic	0.146
Lilliefors Critical (0.05) Value	0.137

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Signifi

Cadmium (mg/L)

Raw Statistics

Number of Valid Observations	41
Number of Distinct Observations	25
Minimum	2.9400E-5
Maximum	0.003
Mean of Raw Data	5.1144E-4

160				Standard Deviation of Raw Data	7.8387E-4							
161				Khat	0.7							
162				Theta hat	7.3096E-4							
163				Kstar	0.665							
164				Theta star	7.6938E-4							
165				Mean of Log Transformed Data	-8.442							
166				Standard Deviation of Log Transformed Data	1.308							
167												
168			Normal GOF Test Results									
169												
170				Correlation Coefficient R	0.774							
171				Shapiro Wilk Test Statistic	0.602							
172				Shapiro Wilk Critical (0.05) Value	0.941							
173				Approximate Shapiro Wilk P Value	1.744E-12							
174				Lilliefors Test Statistic	0.289							
175				Lilliefors Critical (0.05) Value	0.137							
176	Data not Normal at (0.05) Significance Level											
177												
178			Gamma GOF Test Results									
179												
180				Correlation Coefficient R	0.938							
181				A-D Test Statistic	1.988							
182				A-D Critical (0.05) Value	0.794							
183				K-S Test Statistic	0.236							
184				K-S Critical(0.05) Value	0.144							
185	Data not Gamma Distributed at (0.05) Significance Level											
186												
187			Lognormal GOF Test Results									
188												
189				Correlation Coefficient R	0.975							
190				Shapiro Wilk Test Statistic	0.931							
191				Shapiro Wilk Critical (0.05) Value	0.941							
192				Approximate Shapiro Wilk P Value	0.0193							
193				Lilliefors Test Statistic	0.157							
194				Lilliefors Critical (0.05) Value	0.137							
195	Data not Lognormal at (0.05) Significance Level											
196												
197	Non-parametric GOF Test Results											
198												
199	Data do not follow a discernible distribution at (0.05) Level of Signifi											
200												
201	Copper (mg/L)											
202												
203			Raw Statistics									
204				Number of Valid Observations	41							
205				Number of Distinct Observations	29							
206				Minimum	2.0000E-4							
207				Maximum	0.161							
208				Mean of Raw Data	0.0147							
209				Standard Deviation of Raw Data	0.0288							
210				Khat	0.587							
211				Theta hat	0.0251							
212				Kstar	0.561							

213				Theta star	0.0263							
214				Mean of Log Transformed Data	-5.272							
215				Standard Deviation of Log Transformed Data	1.432							
216												
217			Normal GOF Test Results									
218												
219				Correlation Coefficient R	0.698							
220				Shapiro Wilk Test Statistic	0.519							
221				Shapiro Wilk Critical (0.05) Value	0.941							
222				Approximate Shapiro Wilk P Value	2.032E-14							
223				Lilliefors Test Statistic	0.313							
224				Lilliefors Critical (0.05) Value	0.137							
225	Data not Normal at (0.05) Significance Level											
226												
227			Gamma GOF Test Results									
228												
229				Correlation Coefficient R	0.94							
230				A-D Test Statistic	2.016							
231				A-D Critical (0.05) Value	0.805							
232				K-S Test Statistic	0.205							
233				K-S Critical(0.05) Value	0.145							
234	Data not Gamma Distributed at (0.05) Significance Level											
235												
236			Lognormal GOF Test Results									
237												
238				Correlation Coefficient R	0.981							
239				Shapiro Wilk Test Statistic	0.963							
240				Shapiro Wilk Critical (0.05) Value	0.941							
241				Approximate Shapiro Wilk P Value	0.289							
242				Lilliefors Test Statistic	0.117							
243				Lilliefors Critical (0.05) Value	0.137							
244	Data appear Lognormal at (0.05) Significance Level											
245												
246	Lead (mg/L)											
247												
248			Raw Statistics									
249				Number of Valid Observations	41							
250				Number of Distinct Observations	25							
251				Minimum	5.0000E-5							
252				Maximum	0.00539							
253				Mean of Raw Data	0.0012							
254				Standard Deviation of Raw Data	0.00107							
255				Khat	1.292							
256				Theta hat	9.3272E-4							
257				Kstar	1.214							
258				Theta star	9.9287E-4							
259				Mean of Log Transformed Data	-7.156							
260				Standard Deviation of Log Transformed Data	1.028							
261												
262			Normal GOF Test Results									
263												
264				Correlation Coefficient R	0.891							
265				Shapiro Wilk Test Statistic	0.807							

	A	B	C	D	E	F	G	H	I	J	K	L
266				Shapiro Wilk Critical (0.05) Value		0.941						
267				Approximate Shapiro Wilk P Value		8.6535E-7						
268				Lilliefors Test Statistic		0.223						
269				Lilliefors Critical (0.05) Value		0.137						
270	Data not Normal at (0.05) Significance Level											
271												
272			Gamma GOF Test Results									
273												
274				Correlation Coefficient R		0.942						
275				A-D Test Statistic		1.613						
276				A-D Critical (0.05) Value		0.771						
277				K-S Test Statistic		0.185						
278				K-S Critical(0.05) Value		0.141						
279	Data not Gamma Distributed at (0.05) Significance Level											
280												
281			Lognormal GOF Test Results									
282												
283				Correlation Coefficient R		0.961						
284				Shapiro Wilk Test Statistic		0.923						
285				Shapiro Wilk Critical (0.05) Value		0.941						
286				Approximate Shapiro Wilk P Value		0.01						
287				Lilliefors Test Statistic		0.19						
288				Lilliefors Critical (0.05) Value		0.137						
289	Data not Lognormal at (0.05) Significance Level											
290												
291	Non-parametric GOF Test Results											
292												
293	Data do not follow a discernible distribution at (0.05) Level of Signifi											
294												
295	Nickel (mg/L)											
296												
297			Raw Statistics									
298				Number of Valid Observations		31						
299				Number of Distinct Observations		29						
300					Minimum	0.00444						
301					Maximum	1.52						
302					Mean of Raw Data	0.128						
303					Standard Deviation of Raw Data	0.3						
304					Khat	0.403						
305					Theta hat	0.318						
306					Kstar	0.386						
307					Theta star	0.333						
308					Mean of Log Transformed Data	-3.682						
309					Standard Deviation of Log Transformed Data	1.702						
310												
311			Normal GOF Test Results									
312												
313				Correlation Coefficient R		0.669						
314				Shapiro Wilk Test Statistic		0.475						
315				Shapiro Wilk Critical (0.05) Value		0.929						
316				Approximate Shapiro Wilk P Value		2.224E-11						
317				Lilliefors Test Statistic		0.34						
318				Lilliefors Critical (0.05) Value		0.156						

319	Data not Normal at (0.05) Significance Level											
320												
321			Gamma GOF Test Results									
322												
323					Correlation Coefficient R	0.955						
324					A-D Test Statistic	3.029						
325					A-D Critical (0.05) Value	0.831						
326					K-S Test Statistic	0.3						
327					K-S Critical(0.05) Value	0.169						
328	Data not Gamma Distributed at (0.05) Significance Level											
329												
330			Lognormal GOF Test Results									
331												
332					Correlation Coefficient R	0.93						
333					Shapiro Wilk Test Statistic	0.852						
334					Shapiro Wilk Critical (0.05) Value	0.929						
335					Approximate Shapiro Wilk P Value	4.0046E-4						
336					Lilliefors Test Statistic	0.229						
337					Lilliefors Critical (0.05) Value	0.156						
338	Data not Lognormal at (0.05) Significance Level											
339												
340	Non-parametric GOF Test Results											
341												
342	Data do not follow a discernible distribution at (0.05) Level of Signifi											
343												
344	Zinc (mg/L)											
345												
346				Raw Statistics								
347					Number of Valid Observations	31						
348					Number of Distinct Observations	28						
349					Minimum	0.001						
350					Maximum	1.19						
351					Mean of Raw Data	0.315						
352					Standard Deviation of Raw Data	0.373						
353					Khat	0.518						
354					Theta hat	0.609						
355					Kstar	0.489						
356					Theta star	0.645						
357					Mean of Log Transformed Data	-2.375						
358					Standard Deviation of Log Transformed Data	2.146						
359												
360			Normal GOF Test Results									
361												
362					Correlation Coefficient R	0.89						
363					Shapiro Wilk Test Statistic	0.78						
364					Shapiro Wilk Critical (0.05) Value	0.929						
365					Approximate Shapiro Wilk P Value	7.3737E-6						
366					Lilliefors Test Statistic	0.244						
367					Lilliefors Critical (0.05) Value	0.156						
368	Data not Normal at (0.05) Significance Level											
369												
370			Gamma GOF Test Results									
371												

	A	B	C	D	E	F	G	H	I	J	K	L
372				Correlation Coefficient R		0.947						
373				A-D Test Statistic		0.498						
374				A-D Critical (0.05) Value		0.808						
375				K-S Test Statistic		0.122						
376				K-S Critical(0.05) Value		0.167						
377	Data appear Gamma Distributed at (0.05) Significance Level											
378												
379			Lognormal GOF Test Results									
380												
381				Correlation Coefficient R		0.947						
382				Shapiro Wilk Test Statistic		0.88						
383				Shapiro Wilk Critical (0.05) Value		0.929						
384				Approximate Shapiro Wilk P Value		0.00211						
385				Lilliefors Test Statistic		0.215						
386				Lilliefors Critical (0.05) Value		0.156						
387	Data not Lognormal at (0.05) Significance Level											

Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-22 8:56:46 AM	
From File	2025-IntermediateProUCL_k.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	

13-IN

Chloride (mg/L)

Raw Statistics	
Number of Valid Observations	38
Number of Distinct Observations	15
Minimum	0.5
Maximum	2
Mean of Raw Data	0.778
Standard Deviation of Raw Data	0.364
Khat	6.198
Theta hat	0.126
Kstar	5.726
Theta star	0.136
Mean of Log Transformed Data	-0.334
Standard Deviation of Log Transformed Data	0.39

Normal GOF Test Results

Correlation Coefficient R	0.877
Shapiro Wilk Test Statistic	0.77
Shapiro Wilk Critical (0.05) Value	0.938
Approximate Shapiro Wilk P Value	2.4500E-7
Lilliefors Test Statistic	0.222
Lilliefors Critical (0.05) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.945
A-D Test Statistic	2.153
A-D Critical (0.05) Value	0.75
K-S Test Statistic	0.199
K-S Critical(0.05) Value	0.143

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.927
Shapiro Wilk Test Statistic	0.847
Shapiro Wilk Critical (0.05) Value	0.938
Approximate Shapiro Wilk P Value	4.2847E-5
Lilliefors Test Statistic	0.194
Lilliefors Critical (0.05) Value	0.142

Data not Lognormal at (0.05) Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
54	Non-parametric GOF Test Results											
55												
56	Data do not follow a discernible distribution at (0.05) Level of Signifi											
57												
58	Iron (mg/L)											
59												
60				Raw Statistics								
61				Number of Valid Observations		30						
62				Number of Distinct Observations		22						
63				Minimum		0.01						
64				Maximum		1.4						
65				Mean of Raw Data		0.187						
66				Standard Deviation of Raw Data		0.293						
67				Khat		0.588						
68				Theta hat		0.318						
69				Kstar		0.551						
70				Theta star		0.339						
71				Mean of Log Transformed Data		-2.73						
72				Standard Deviation of Log Transformed Data		1.571						
73												
74				Normal GOF Test Results								
75												
76				Correlation Coefficient R		0.789						
77				Shapiro Wilk Test Statistic		0.642						
78				Shapiro Wilk Critical (0.05) Value		0.927						
79				Approximate Shapiro Wilk P Value		2.2577E-8						
80				Lilliefors Test Statistic		0.273						
81				Lilliefors Critical (0.05) Value		0.159						
82	Data not Normal at (0.05) Significance Level											
83												
84				Gamma GOF Test Results								
85												
86				Correlation Coefficient R		0.981						
87				A-D Test Statistic		1.051						
88				A-D Critical (0.05) Value		0.802						
89				K-S Test Statistic		0.159						
90				K-S Critical(0.05) Value		0.168						
91	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
92												
93				Lognormal GOF Test Results								
94												
95				Correlation Coefficient R		0.958						
96				Shapiro Wilk Test Statistic		0.897						
97				Shapiro Wilk Critical (0.05) Value		0.927						
98				Approximate Shapiro Wilk P Value		0.00743						
99				Lilliefors Test Statistic		0.15						
100				Lilliefors Critical (0.05) Value		0.159						
101	Data appear Approximate_Lognormal at (0.05) Significance Level											
102												
103	Arsenic (mg/L)											
104												
105				Raw Statistics								
106				Number of Valid Observations		37						

Number of Distinct Observations	22	
Minimum	2.0000E-4	
Maximum	0.007	
Mean of Raw Data	7.9243E-4	
Standard Deviation of Raw Data	0.00119	
Khat	1.301	
Theta hat	6.0901E-4	
Kstar	1.214	
Theta star	6.5291E-4	
Mean of Log Transformed Data	-7.572	
Standard Deviation of Log Transformed Data	0.793	

Normal GOF Test Results

Correlation Coefficient R	0.67
Shapiro Wilk Test Statistic	0.484
Shapiro Wilk Critical (0.05) Value	0.936
Approximate Shapiro Wilk P Value	1.776E-13
Lilliefors Test Statistic	0.309
Lilliefors Critical (0.05) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.859
A-D Test Statistic	2.833
A-D Critical (0.05) Value	0.771
K-S Test Statistic	0.194
K-S Critical(0.05) Value	0.148

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.934
Shapiro Wilk Test Statistic	0.876
Shapiro Wilk Critical (0.05) Value	0.936
Approximate Shapiro Wilk P Value	4.5766E-4
Lilliefors Test Statistic	0.165
Lilliefors Critical (0.05) Value	0.144

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Signifi

Copper (mg/L)

Raw Statistics

Number of Valid Observations	37
Number of Distinct Observations	23
Minimum	7.8000E-6
Maximum	0.0042
Mean of Raw Data	0.00121

160				Standard Deviation of Raw Data	8.9264E-4							
161				Khat	1.606							
162				Theta hat	7.5425E-4							
163				Kstar	1.494							
164				Theta star	8.1091E-4							
165				Mean of Log Transformed Data	-7.058							
166				Standard Deviation of Log Transformed Data	1.078							
167												
168			Normal GOF Test Results									
169												
170				Correlation Coefficient R	0.921							
171				Shapiro Wilk Test Statistic	0.856							
172				Shapiro Wilk Critical (0.05) Value	0.936							
173				Approximate Shapiro Wilk P Value	1.1032E-4							
174				Lilliefors Test Statistic	0.279							
175				Lilliefors Critical (0.05) Value	0.144							
176	Data not Normal at (0.05) Significance Level											
177												
178			Gamma GOF Test Results									
179												
180				Correlation Coefficient R	0.98							
181				A-D Test Statistic	1.128							
182				A-D Critical (0.05) Value	0.765							
183				K-S Test Statistic	0.171							
184				K-S Critical(0.05) Value	0.148							
185	Data not Gamma Distributed at (0.05) Significance Level											
186												
187			Lognormal GOF Test Results									
188												
189				Correlation Coefficient R	0.873							
190				Shapiro Wilk Test Statistic	0.793							
191				Shapiro Wilk Critical (0.05) Value	0.936							
192				Approximate Shapiro Wilk P Value	1.5739E-6							
193				Lilliefors Test Statistic	0.221							
194				Lilliefors Critical (0.05) Value	0.144							
195	Data not Lognormal at (0.05) Significance Level											
196												
197	Non-parametric GOF Test Results											
198												
199	Data do not follow a discernible distribution at (0.05) Level of Signifi											
200												
201	Nickel (mg/L)											
202												
203			Raw Statistics									
204				Number of Valid Observations	32							
205				Number of Distinct Observations	26							
206				Minimum	7.0000E-4							
207				Maximum	0.02							
208				Mean of Raw Data	0.00433							
209				Standard Deviation of Raw Data	0.00446							
210				Khat	1.687							
211				Theta hat	0.00257							
212				Kstar	1.55							

213					Theta star	0.0028						
214					Mean of Log Transformed Data	-5.766						
215					Standard Deviation of Log Transformed Data	0.769						
216												
217			Normal GOF Test Results									
218												
219					Correlation Coefficient R	0.8						
220					Shapiro Wilk Test Statistic	0.651						
221					Shapiro Wilk Critical (0.05) Value	0.93						
222					Approximate Shapiro Wilk P Value	1.0721E-8						
223					Lilliefors Test Statistic	0.284						
224					Lilliefors Critical (0.05) Value	0.154						
225	Data not Normal at (0.05) Significance Level											
226												
227			Gamma GOF Test Results									
228												
229					Correlation Coefficient R	0.929						
230					A-D Test Statistic	1.456						
231					A-D Critical (0.05) Value	0.762						
232					K-S Test Statistic	0.199						
233					K-S Critical(0.05) Value	0.158						
234	Data not Gamma Distributed at (0.05) Significance Level											
235												
236			Lognormal GOF Test Results									
237												
238					Correlation Coefficient R	0.971						
239					Shapiro Wilk Test Statistic	0.944						
240					Shapiro Wilk Critical (0.05) Value	0.93						
241					Approximate Shapiro Wilk P Value	0.114						
242					Lilliefors Test Statistic	0.153						
243					Lilliefors Critical (0.05) Value	0.154						
244	Data appear Lognormal at (0.05) Significance Level											
245												
246	Zinc (mg/L)											
247												
248			Raw Statistics									
249					Number of Valid Observations	32						
250					Number of Distinct Observations	25						
251					Minimum	6.0000E-4						
252					Maximum	0.082						
253					Mean of Raw Data	0.00645						
254					Standard Deviation of Raw Data	0.0142						
255					Khat	0.843						
256					Theta hat	0.00765						
257					Kstar	0.785						
258					Theta star	0.00822						
259					Mean of Log Transformed Data	-5.743						
260					Standard Deviation of Log Transformed Data	1.023						
261												
262			Normal GOF Test Results									
263												
264					Correlation Coefficient R	0.569						
265					Shapiro Wilk Test Statistic	0.361						

	A	B	C	D	E	F	G	H	I	J	K	L
266				Shapiro Wilk Critical (0.05) Value		0.93						
267				Approximate Shapiro Wilk P Value		1.987E-13						
268				Lilliefors Test Statistic		0.34						
269				Lilliefors Critical (0.05) Value		0.154						
270	Data not Normal at (0.05) Significance Level											
271												
272			Gamma GOF Test Results									
273												
274				Correlation Coefficient R		0.785						
275				A-D Test Statistic		1.842						
276				A-D Critical (0.05) Value		0.783						
277				K-S Test Statistic		0.185						
278				K-S Critical(0.05) Value		0.161						
279	Data not Gamma Distributed at (0.05) Significance Level											
280												
281			Lognormal GOF Test Results									
282												
283				Correlation Coefficient R		0.97						
284				Shapiro Wilk Test Statistic		0.949						
285				Shapiro Wilk Critical (0.05) Value		0.93						
286				Approximate Shapiro Wilk P Value		0.168						
287				Lilliefors Test Statistic		0.0959						
288				Lilliefors Critical (0.05) Value		0.154						
289	Data appear Lognormal at (0.05) Significance Level											

1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects							
2			User Selected Options								
3			Date/Time of Computation	ProUCL 5.12025-12-22 9:25:48 AM							
4			From File	2025-IntermediateProUCL_m.xls							
5			Full Precision	OFF							
6			Confidence Coefficient	0.95							
7											
8	15-IN										
9	Chloride (mg/L)										
10											
11			Raw Statistics								
12			Number of Valid Observations	31							
13			Number of Distinct Observations	14							
14			Minimum	0.5							
15			Maximum	3.1							
16			Mean of Raw Data	0.784							
17			Standard Deviation of Raw Data	0.535							
18			Khat	3.944							
19			Theta hat	0.199							
20			Kstar	3.584							
21			Theta star	0.219							
22			Mean of Log Transformed Data	-0.376							
23			Standard Deviation of Log Transformed Data	0.465							
24											
25			Normal GOF Test Results								
26											
27			Correlation Coefficient R	0.76							
28			Shapiro Wilk Test Statistic	0.6							
29			Shapiro Wilk Critical (0.05) Value	0.929							
30			Approximate Shapiro Wilk P Value	2.2830E-9							
31			Lilliefors Test Statistic	0.298							
32			Lilliefors Critical (0.05) Value	0.156							
33	Data not Normal at (0.05) Significance Level										
34											
35			Gamma GOF Test Results								
36											
37			Correlation Coefficient R	0.875							
38			A-D Test Statistic	3.483							
39			A-D Critical (0.05) Value	0.75							
40			K-S Test Statistic	0.292							
41			K-S Critical(0.05) Value	0.158							
42	Data not Gamma Distributed at (0.05) Significance Level										
43											
44			Lognormal GOF Test Results								
45											
46			Correlation Coefficient R	0.857							
47			Shapiro Wilk Test Statistic	0.737							
48			Shapiro Wilk Critical (0.05) Value	0.929							
49			Approximate Shapiro Wilk P Value	8.8696E-7							
50			Lilliefors Test Statistic	0.292							
51			Lilliefors Critical (0.05) Value	0.156							
52	Data not Lognormal at (0.05) Significance Level										
53											

	A	B	C	D	E	F	G	H	I	J	K	L
54	Non-parametric GOF Test Results											
55												
56	Data do not follow a discernible distribution at (0.05) Level of Signifi											
57												
58	Arsenic (mg/L)											
59												
60				Raw Statistics								
61				Number of Valid Observations		31						
62				Number of Distinct Observations		15						
63				Minimum		1.4000E-4						
64				Maximum		0.001						
65				Mean of Raw Data		3.3548E-4						
66				Standard Deviation of Raw Data		2.1374E-4						
67				Khat		3.267						
68				Theta hat		1.0268E-4						
69				Kstar		2.973						
70				Theta star		1.1286E-4						
71				Mean of Log Transformed Data		-8.161						
72				Standard Deviation of Log Transformed Data		0.555						
73												
74				Normal GOF Test Results								
75												
76				Correlation Coefficient R		0.893						
77				Shapiro Wilk Test Statistic		0.799						
78				Shapiro Wilk Critical (0.05) Value		0.929						
79				Approximate Shapiro Wilk P Value		2.0894E-5						
80				Lilliefors Test Statistic		0.236						
81				Lilliefors Critical (0.05) Value		0.156						
82	Data not Normal at (0.05) Significance Level											
83												
84				Gamma GOF Test Results								
85												
86				Correlation Coefficient R		0.965						
87				A-D Test Statistic		1.41						
88				A-D Critical (0.05) Value		0.752						
89				K-S Test Statistic		0.208						
90				K-S Critical(0.05) Value		0.159						
91	Data not Gamma Distributed at (0.05) Significance Level											
92												
93				Lognormal GOF Test Results								
94												
95				Correlation Coefficient R		0.957						
96				Shapiro Wilk Test Statistic		0.903						
97				Shapiro Wilk Critical (0.05) Value		0.929						
98				Approximate Shapiro Wilk P Value		0.00884						
99				Lilliefors Test Statistic		0.194						
100				Lilliefors Critical (0.05) Value		0.156						
101	Data not Lognormal at (0.05) Significance Level											
102												
103	Non-parametric GOF Test Results											
104												
105	Data do not follow a discernible distribution at (0.05) Level of Signifi											
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107	Cadmium (mg/L)											
108												
109			Raw Statistics									
110					Number of Valid Observations	31						
111					Number of Distinct Observations	20						
112					Minimum	1.0000E-5						
113					Maximum	0.003						
114					Mean of Raw Data	2.1906E-4						
115					Standard Deviation of Raw Data	5.4703E-4						
116					Khat	0.582						
117					Theta hat	3.7641E-4						
118					Kstar	0.547						
119					Theta star	4.0036E-4						
120					Mean of Log Transformed Data	-9.493						
121					Standard Deviation of Log Transformed Data	1.3						
122												
123			Normal GOF Test Results									
124												
125					Correlation Coefficient R	0.574						
126					Shapiro Wilk Test Statistic	0.363						
127					Shapiro Wilk Critical (0.05) Value	0.929						
128					Approximate Shapiro Wilk P Value	5.425E-13						
129					Lilliefors Test Statistic	0.449						
130					Lilliefors Critical (0.05) Value	0.156						
131	Data not Normal at (0.05) Significance Level											
132												
133			Gamma GOF Test Results									
134												
135					Correlation Coefficient R	0.83						
136					A-D Test Statistic	2.807						
137					A-D Critical (0.05) Value	0.803						
138					K-S Test Statistic	0.289						
139					K-S Critical(0.05) Value	0.166						
140	Data not Gamma Distributed at (0.05) Significance Level											
141												
142			Lognormal GOF Test Results									
143												
144					Correlation Coefficient R	0.937						
145					Shapiro Wilk Test Statistic	0.883						
146					Shapiro Wilk Critical (0.05) Value	0.929						
147					Approximate Shapiro Wilk P Value	0.00253						
148					Lilliefors Test Statistic	0.193						
149					Lilliefors Critical (0.05) Value	0.156						
150	Data not Lognormal at (0.05) Significance Level											
151												
152	Non-parametric GOF Test Results											
153												
154	Data do not follow a discernible distribution at (0.05) Level of Signifi											
155												
156	Copper (mg/L)											
157												
158			Raw Statistics									
159					Number of Valid Observations	31						

160			Number of Distinct Observations	25								
161			Minimum	2.0000E-4								
162			Maximum	0.01								
163			Mean of Raw Data	0.00282								
164			Standard Deviation of Raw Data	0.002								
165			Khat	2.074								
166			Theta hat	0.00136								
167			Kstar	1.895								
168			Theta star	0.00149								
169			Mean of Log Transformed Data	-6.13								
170			Standard Deviation of Log Transformed Data	0.799								
171												
172			Normal GOF Test Results									
173												
174			Correlation Coefficient R	0.929								
175			Shapiro Wilk Test Statistic	0.877								
176			Shapiro Wilk Critical (0.05) Value	0.929								
177			Approximate Shapiro Wilk P Value	0.0018								
178			Lilliefors Test Statistic	0.129								
179			Lilliefors Critical (0.05) Value	0.156								
180	Data appear Approximate Normal at (0.05) Significance Level											
181												
182			Gamma GOF Test Results									
183												
184			Correlation Coefficient R	0.982								
185			A-D Test Statistic	0.328								
186			A-D Critical (0.05) Value	0.758								
187			K-S Test Statistic	0.0976								
188			K-S Critical(0.05) Value	0.16								
189	Data appear Gamma Distributed at (0.05) Significance Level											
190												
191			Lognormal GOF Test Results									
192												
193			Correlation Coefficient R	0.968								
194			Shapiro Wilk Test Statistic	0.948								
195			Shapiro Wilk Critical (0.05) Value	0.929								
196			Approximate Shapiro Wilk P Value	0.169								
197			Lilliefors Test Statistic	0.146								
198			Lilliefors Critical (0.05) Value	0.156								
199	Data appear Lognormal at (0.05) Significance Level											
200												
201	Nickel (mg/L)											
202												
203			Raw Statistics									
204			Number of Valid Observations	31								
205			Number of Distinct Observations	28								
206			Minimum	0.00354								
207			Maximum	0.092								
208			Mean of Raw Data	0.0124								
209			Standard Deviation of Raw Data	0.0162								
210			Khat	1.539								
211			Theta hat	0.00808								
212			Kstar	1.412								

Theta star	0.00881	
Mean of Log Transformed Data	-4.746	
Standard Deviation of Log Transformed Data	0.744	
Normal GOF Test Results		
Correlation Coefficient R	0.691	
Shapiro Wilk Test Statistic	0.51	
Shapiro Wilk Critical (0.05) Value	0.929	
Approximate Shapiro Wilk P Value	7.661E-11	
Lilliefors Test Statistic	0.292	
Lilliefors Critical (0.05) Value	0.156	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.854	
A-D Test Statistic	2.004	
A-D Critical (0.05) Value	0.763	
K-S Test Statistic	0.206	
K-S Critical(0.05) Value	0.161	
Data not Gamma Distributed at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.938	
Shapiro Wilk Test Statistic	0.884	
Shapiro Wilk Critical (0.05) Value	0.929	
Approximate Shapiro Wilk P Value	0.00266	
Lilliefors Test Statistic	0.165	
Lilliefors Critical (0.05) Value	0.156	
Data not Lognormal at (0.05) Significance Level		
Non-parametric GOF Test Results		
Data do not follow a discernible distribution at (0.05) Level of Signifi		
Zinc (mg/L)		
Raw Statistics		
Number of Valid Observations	31	
Number of Distinct Observations	23	
Minimum	0.001	
Maximum	0.026	
Mean of Raw Data	0.00494	
Standard Deviation of Raw Data	0.00528	
Khat	1.628	
Theta hat	0.00304	
Kstar	1.492	
Theta star	0.00331	
Mean of Log Transformed Data	-5.648	
Standard Deviation of Log Transformed Data	0.778	

	A	B	C	D	E	F	G	H	I	J	K	L
266			Normal GOF Test Results									
267												
268					Correlation Coefficient R	0.795						
269					Shapiro Wilk Test Statistic	0.651						
270					Shapiro Wilk Critical (0.05) Value	0.929						
271					Approximate Shapiro Wilk P Value	1.8749E-8						
272					Lilliefors Test Statistic	0.231						
273					Lilliefors Critical (0.05) Value	0.156						
274	Data not Normal at (0.05) Significance Level											
275												
276			Gamma GOF Test Results									
277												
278					Correlation Coefficient R	0.933						
279					A-D Test Statistic	1.055						
280					A-D Critical (0.05) Value	0.762						
281					K-S Test Statistic	0.131						
282					K-S Critical(0.05) Value	0.16						
283	Data follow Appr. Gamma Distribution at (0.05) Significance Level											
284												
285			Lognormal GOF Test Results									
286												
287					Correlation Coefficient R	0.979						
288					Shapiro Wilk Test Statistic	0.956						
289					Shapiro Wilk Critical (0.05) Value	0.929						
290					Approximate Shapiro Wilk P Value	0.272						
291					Lilliefors Test Statistic	0.109						
292					Lilliefors Critical (0.05) Value	0.156						
293	Data appear Lognormal at (0.05) Significance Level											

1				Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects								
2			User Selected Options									
3			Date/Time of Computation	ProUCL 5.12025-12-22 10:06:51 AM								
4			From File	2025-IntermediateProUCL_n.xls								
5			Full Precision	OFF								
6			Confidence Coefficient	0.95								
7												
8	16-IN											
9	Chloride (mg/L)											
10												
11				Raw Statistics								
12				Number of Valid Observations	26							
13				Number of Distinct Observations	12							
14				Minimum	0.5							
15				Maximum	1.7							
16				Mean of Raw Data	0.805							
17				Standard Deviation of Raw Data	0.335							
18				Khat	6.983							
19				Theta hat	0.115							
20				Kstar	6.203							
21				Theta star	0.13							
22				Mean of Log Transformed Data	-0.29							
23				Standard Deviation of Log Transformed Data	0.38							
24												
25				Normal GOF Test Results								
26												
27				Correlation Coefficient R	0.914							
28				Shapiro Wilk Test Statistic	0.83							
29				Shapiro Wilk Critical (0.05) Value	0.92							
30				Approximate Shapiro Wilk P Value	4.2229E-4							
31				Lilliefors Test Statistic	0.227							
32				Lilliefors Critical (0.05) Value	0.17							
33	Data not Normal at (0.05) Significance Level											
34												
35				Gamma GOF Test Results								
36												
37				Correlation Coefficient R	0.958							
38				A-D Test Statistic	1.264							
39				A-D Critical (0.05) Value	0.745							
40				K-S Test Statistic	0.214							
41				K-S Critical(0.05) Value	0.171							
42	Data not Gamma Distributed at (0.05) Significance Level											
43												
44				Lognormal GOF Test Results								
45												
46				Correlation Coefficient R	0.944							
47				Shapiro Wilk Test Statistic	0.875							
48				Shapiro Wilk Critical (0.05) Value	0.92							
49				Approximate Shapiro Wilk P Value	0.00419							
50				Lilliefors Test Statistic	0.198							
51				Lilliefors Critical (0.05) Value	0.17							
52	Data not Lognormal at (0.05) Significance Level											
53												

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Signifi

Iron (mg/L)

Raw Statistics

Number of Valid Observations	24
Number of Distinct Observations	13
Minimum	0.01
Maximum	3.31
Mean of Raw Data	0.338
Standard Deviation of Raw Data	0.718
Khat	0.375
Theta hat	0.901
Kstar	0.356
Theta star	0.949
Mean of Log Transformed Data	-2.86
Standard Deviation of Log Transformed Data	1.926

Normal GOF Test Results

Correlation Coefficient R	0.704
Shapiro Wilk Test Statistic	0.519
Shapiro Wilk Critical (0.05) Value	0.916
Approximate Shapiro Wilk P Value	7.6401E-9
Lilliefors Test Statistic	0.331
Lilliefors Critical (0.05) Value	0.177

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

Correlation Coefficient R	0.963
A-D Test Statistic	2.122
A-D Critical (0.05) Value	0.834
K-S Test Statistic	0.272
K-S Critical(0.05) Value	0.191

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

Correlation Coefficient R	0.921
Shapiro Wilk Test Statistic	0.833
Shapiro Wilk Critical (0.05) Value	0.916
Approximate Shapiro Wilk P Value	7.5436E-4
Lilliefors Test Statistic	0.215
Lilliefors Critical (0.05) Value	0.177

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

Data do not follow a discernible distribution at (0.05) Level of Signifi

	A	B	C	D	E	F	G	H	I	J	K	L
107	Manganese (mg/L)											
108												
109			Raw Statistics									
110					Number of Valid Observations	24						
111					Number of Distinct Observations	24						
112					Minimum	0.005						
113					Maximum	0.812						
114					Mean of Raw Data	0.404						
115					Standard Deviation of Raw Data	0.29						
116					Khat	0.874						
117					Theta hat	0.462						
118					Kstar	0.792						
119					Theta star	0.51						
120					Mean of Log Transformed Data	-1.579						
121					Standard Deviation of Log Transformed Data	1.614						
122												
123			Normal GOF Test Results									
124												
125					Correlation Coefficient R	0.955						
126					Shapiro Wilk Test Statistic	0.89						
127					Shapiro Wilk Critical (0.05) Value	0.916						
128					Approximate Shapiro Wilk P Value	0.0124						
129					Lilliefors Test Statistic	0.143						
130					Lilliefors Critical (0.05) Value	0.177						
131	Data appear Approximate Normal at (0.05) Significance Level											
132												
133			Gamma GOF Test Results									
134												
135					Correlation Coefficient R	0.83						
136					A-D Test Statistic	1.528						
137					A-D Critical (0.05) Value	0.777						
138					K-S Test Statistic	0.228						
139					K-S Critical(0.05) Value	0.184						
140	Data not Gamma Distributed at (0.05) Significance Level											
141												
142			Lognormal GOF Test Results									
143												
144					Correlation Coefficient R	0.893						
145					Shapiro Wilk Test Statistic	0.788						
146					Shapiro Wilk Critical (0.05) Value	0.916						
147					Approximate Shapiro Wilk P Value	1.0165E-4						
148					Lilliefors Test Statistic	0.246						
149					Lilliefors Critical (0.05) Value	0.177						
150	Data not Lognormal at (0.05) Significance Level											
151												
152	Arsenic (mg/L)											
153												
154			Raw Statistics									
155					Number of Valid Observations	26						
156					Number of Distinct Observations	16						
157					Minimum	1.5000E-4						
158					Maximum	0.00152						
159					Mean of Raw Data	4.4538E-4						

160				Standard Deviation of Raw Data	3.9163E-4							
161				Khat	2.014							
162				Theta hat	2.2115E-4							
163				Kstar	1.807							
164				Theta star	2.4645E-4							
165				Mean of Log Transformed Data	-7.985							
166				Standard Deviation of Log Transformed Data	0.687							
167												
168			Normal GOF Test Results									
169												
170				Correlation Coefficient R	0.832							
171				Shapiro Wilk Test Statistic	0.692							
172				Shapiro Wilk Critical (0.05) Value	0.92							
173				Approximate Shapiro Wilk P Value	1.0353E-6							
174				Lilliefors Test Statistic	0.305							
175				Lilliefors Critical (0.05) Value	0.17							
176	Data not Normal at (0.05) Significance Level											
177												
178			Gamma GOF Test Results									
179												
180				Correlation Coefficient R	0.94							
181				A-D Test Statistic	2.42							
182				A-D Critical (0.05) Value	0.757							
183				K-S Test Statistic	0.225							
184				K-S Critical(0.05) Value	0.173							
185	Data not Gamma Distributed at (0.05) Significance Level											
186												
187			Lognormal GOF Test Results									
188												
189				Correlation Coefficient R	0.912							
190				Shapiro Wilk Test Statistic	0.822							
191				Shapiro Wilk Critical (0.05) Value	0.92							
192				Approximate Shapiro Wilk P Value	2.8524E-4							
193				Lilliefors Test Statistic	0.216							
194				Lilliefors Critical (0.05) Value	0.17							
195	Data not Lognormal at (0.05) Significance Level											
196												
197	Non-parametric GOF Test Results											
198												
199	Data do not follow a discernible distribution at (0.05) Level of Signifi											
200												
201	Cadmium (mg/L)											
202												
203			Raw Statistics									
204				Number of Valid Observations	26							
205				Number of Distinct Observations	16							
206				Minimum	5.0000E-6							
207				Maximum	0.0012							
208				Mean of Raw Data	1.4703E-4							
209				Standard Deviation of Raw Data	2.3071E-4							
210				Khat	0.739							
211				Theta hat	1.9899E-4							
212				Kstar	0.679							

Theta star	2.1645E-4	
Mean of Log Transformed Data	-9.637	
Standard Deviation of Log Transformed Data	1.407	
Normal GOF Test Results		
Correlation Coefficient R	0.686	
Shapiro Wilk Test Statistic	0.501	
Shapiro Wilk Critical (0.05) Value	0.92	
Approximate Shapiro Wilk P Value	1.4931E-9	
Lilliefors Test Statistic	0.371	
Lilliefors Critical (0.05) Value	0.17	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.844	
A-D Test Statistic	1.18	
A-D Critical (0.05) Value	0.785	
K-S Test Statistic	0.215	
K-S Critical(0.05) Value	0.178	
Data not Gamma Distributed at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.953	
Shapiro Wilk Test Statistic	0.904	
Shapiro Wilk Critical (0.05) Value	0.92	
Approximate Shapiro Wilk P Value	0.0199	
Lilliefors Test Statistic	0.21	
Lilliefors Critical (0.05) Value	0.17	
Data not Lognormal at (0.05) Significance Level		
Non-parametric GOF Test Results		
Data do not follow a discernible distribution at (0.05) Level of Signifi		
Nickel (mg/L)		
Raw Statistics		
Number of Valid Observations	26	
Number of Distinct Observations	21	
Minimum	0.00106	
Maximum	0.0268	
Mean of Raw Data	0.00666	
Standard Deviation of Raw Data	0.00559	
Khat	2.124	
Theta hat	0.00313	
Kstar	1.904	
Theta star	0.0035	
Mean of Log Transformed Data	-5.266	
Standard Deviation of Log Transformed Data	0.717	

	A	B	C	D	E	F	G	H	I	J	K	L
266			Normal GOF Test Results									
267												
268					Correlation Coefficient R	0.848						
269					Shapiro Wilk Test Statistic	0.736						
270					Shapiro Wilk Critical (0.05) Value	0.92						
271					Approximate Shapiro Wilk P Value	6.1108E-6						
272					Lilliefors Test Statistic	0.248						
273					Lilliefors Critical (0.05) Value	0.17						
274	Data not Normal at (0.05) Significance Level											
275												
276			Gamma GOF Test Results									
277												
278					Correlation Coefficient R	0.948						
279					A-D Test Statistic	0.711						
280					A-D Critical (0.05) Value	0.756						
281					K-S Test Statistic	0.15						
282					K-S Critical(0.05) Value	0.173						
283	Data appear Gamma Distributed at (0.05) Significance Level											
284												
285			Lognormal GOF Test Results									
286												
287					Correlation Coefficient R	0.981						
288					Shapiro Wilk Test Statistic	0.969						
289					Shapiro Wilk Critical (0.05) Value	0.92						
290					Approximate Shapiro Wilk P Value	0.606						
291					Lilliefors Test Statistic	0.136						
292					Lilliefors Critical (0.05) Value	0.17						
293	Data appear Lognormal at (0.05) Significance Level											

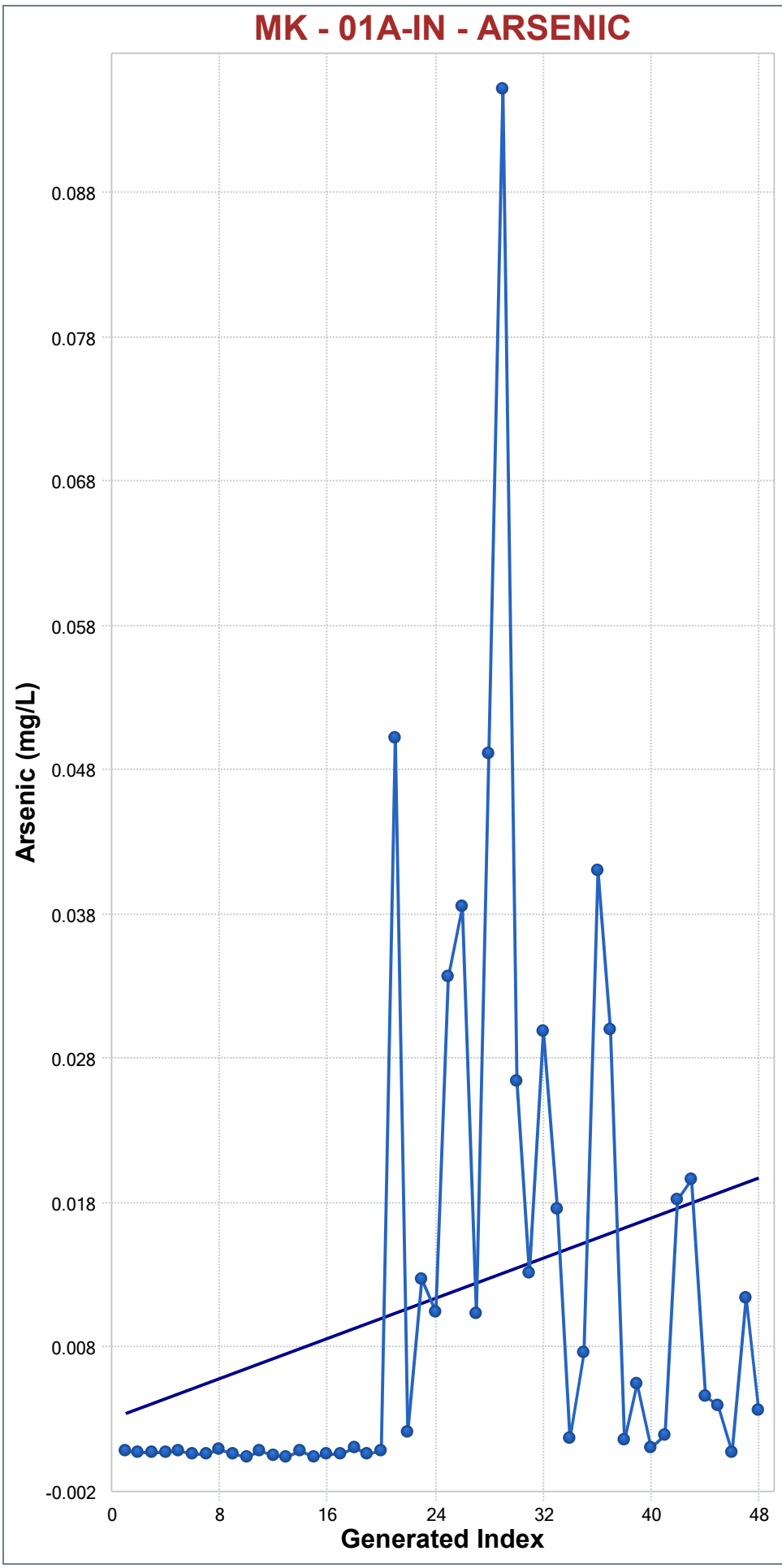
Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.12025-12-22 10:30:05 AM	
From File	2025-IntermediateProUCL_o.xls	
Full Precision	OFF	
Confidence Coefficient	0.95	
17-SH		
Arsenic (mg/L)		
Raw Statistics		
Number of Valid Observations	31	
Number of Distinct Observations	16	
Minimum	1.7000E-4	
Maximum	0.00106	
Mean of Raw Data	3.5677E-4	
Standard Deviation of Raw Data	2.1856E-4	
Khat	3.695	
Theta hat	9.6544E-5	
Kstar	3.359	
Theta star	1.0620E-4	
Mean of Log Transformed Data	-8.08	
Standard Deviation of Log Transformed Data	0.513	
Normal GOF Test Results		
Correlation Coefficient R	0.883	
Shapiro Wilk Test Statistic	0.782	
Shapiro Wilk Critical (0.05) Value	0.929	
Approximate Shapiro Wilk P Value	8.3771E-6	
Lilliefors Test Statistic	0.228	
Lilliefors Critical (0.05) Value	0.156	
Data not Normal at (0.05) Significance Level		
Gamma GOF Test Results		
Correlation Coefficient R	0.96	
A-D Test Statistic	1.457	
A-D Critical (0.05) Value	0.751	
K-S Test Statistic	0.171	
K-S Critical(0.05) Value	0.159	
Data not Gamma Distributed at (0.05) Significance Level		
Lognormal GOF Test Results		
Correlation Coefficient R	0.95	
Shapiro Wilk Test Statistic	0.89	
Shapiro Wilk Critical (0.05) Value	0.929	
Approximate Shapiro Wilk P Value	0.00405	
Lilliefors Test Statistic	0.167	
Lilliefors Critical (0.05) Value	0.156	
Data not Lognormal at (0.05) Significance Level		

	A	B	C	D	E	F	G	H	I	J	K	L
54	Non-parametric GOF Test Results											
55												
56	Data do not follow a discernible distribution at (0.05) Level of Signifi											
57												
58	Cadmium (mg/L)											
59												
60				Raw Statistics								
61				Number of Valid Observations		31						
62				Number of Distinct Observations		20						
63				Minimum		8.8000E-6						
64				Maximum		3.0000E-4						
65				Mean of Raw Data		1.0056E-4						
66				Standard Deviation of Raw Data		9.0569E-5						
67				Khat		1.069						
68				Theta hat		9.4113E-5						
69				Kstar		0.987						
70				Theta star		1.0193E-4						
71				Mean of Log Transformed Data		-9.741						
72				Standard Deviation of Log Transformed Data		1.136						
73												
74				Normal GOF Test Results								
75												
76				Correlation Coefficient R		0.888						
77				Shapiro Wilk Test Statistic		0.775						
78				Shapiro Wilk Critical (0.05) Value		0.929						
79				Approximate Shapiro Wilk P Value		6.0014E-6						
80				Lilliefors Test Statistic		0.292						
81				Lilliefors Critical (0.05) Value		0.156						
82	Data not Normal at (0.05) Significance Level											
83												
84				Gamma GOF Test Results								
85												
86				Correlation Coefficient R		0.874						
87				A-D Test Statistic		2.074						
88				A-D Critical (0.05) Value		0.774						
89				K-S Test Statistic		0.254						
90				K-S Critical(0.05) Value		0.162						
91	Data not Gamma Distributed at (0.05) Significance Level											
92												
93				Lognormal GOF Test Results								
94												
95				Correlation Coefficient R		0.944						
96				Shapiro Wilk Test Statistic		0.87						
97				Shapiro Wilk Critical (0.05) Value		0.929						
98				Approximate Shapiro Wilk P Value		0.00119						
99				Lilliefors Test Statistic		0.246						
100				Lilliefors Critical (0.05) Value		0.156						
101	Data not Lognormal at (0.05) Significance Level											
102												
103	Non-parametric GOF Test Results											
104												
105	Data do not follow a discernible distribution at (0.05) Level of Signifi											
106												

	A	B	C	D	E	F	G	H	I	J	K	L
107	Copper (mg/L)											
108												
109			Raw Statistics									
110					Number of Valid Observations	31						
111					Number of Distinct Observations	27						
112					Minimum	2.0000E-4						
113					Maximum	0.01						
114					Mean of Raw Data	0.00292						
115					Standard Deviation of Raw Data	0.00211						
116					Khat	2.587						
117					Theta hat	0.00113						
118					Kstar	2.358						
119					Theta star	0.00124						
120					Mean of Log Transformed Data	-6.042						
121					Standard Deviation of Log Transformed Data	0.689						
122												
123			Normal GOF Test Results									
124												
125					Correlation Coefficient R	0.844						
126					Shapiro Wilk Test Statistic	0.727						
127					Shapiro Wilk Critical (0.05) Value	0.929						
128					Approximate Shapiro Wilk P Value	5.5888E-7						
129					Lilliefors Test Statistic	0.25						
130					Lilliefors Critical (0.05) Value	0.156						
131	Data not Normal at (0.05) Significance Level											
132												
133			Gamma GOF Test Results									
134												
135					Correlation Coefficient R	0.93						
136					A-D Test Statistic	1.33						
137					A-D Critical (0.05) Value	0.755						
138					K-S Test Statistic	0.166						
139					K-S Critical(0.05) Value	0.159						
140	Data not Gamma Distributed at (0.05) Significance Level											
141												
142			Lognormal GOF Test Results									
143												
144					Correlation Coefficient R	0.921						
145					Shapiro Wilk Test Statistic	0.877						
146					Shapiro Wilk Critical (0.05) Value	0.929						
147					Approximate Shapiro Wilk P Value	0.00172						
148					Lilliefors Test Statistic	0.152						
149					Lilliefors Critical (0.05) Value	0.156						
150	Data appear Approximate_Lognormal at (0.05) Significance Level											
151												
152	Nickel (mg/L)											
153												
154			Raw Statistics									
155					Number of Valid Observations	31						
156					Number of Distinct Observations	27						
157					Minimum	0.00211						
158					Maximum	0.04						
159					Mean of Raw Data	0.00568						

160				Standard Deviation of Raw Data	0.00675							
161				Khat	2.125							
162				Theta hat	0.00267							
163				Kstar	1.941							
164				Theta star	0.00293							
165				Mean of Log Transformed Data	-5.425							
166				Standard Deviation of Log Transformed Data	0.599							
167												
168			Normal GOF Test Results									
169												
170				Correlation Coefficient R	0.642							
171				Shapiro Wilk Test Statistic	0.447							
172				Shapiro Wilk Critical (0.05) Value	0.929							
173				Approximate Shapiro Wilk P Value	8.543E-12							
174				Lilliefors Test Statistic	0.32							
175				Lilliefors Critical (0.05) Value	0.156							
176	Data not Normal at (0.05) Significance Level											
177												
178			Gamma GOF Test Results									
179												
180				Correlation Coefficient R	0.787							
181				A-D Test Statistic	2.228							
182				A-D Critical (0.05) Value	0.758							
183				K-S Test Statistic	0.217							
184				K-S Critical(0.05) Value	0.16							
185	Data not Gamma Distributed at (0.05) Significance Level											
186												
187			Lognormal GOF Test Results									
188												
189				Correlation Coefficient R	0.919							
190				Shapiro Wilk Test Statistic	0.859							
191				Shapiro Wilk Critical (0.05) Value	0.929							
192				Approximate Shapiro Wilk P Value	6.0891E-4							
193				Lilliefors Test Statistic	0.146							
194				Lilliefors Critical (0.05) Value	0.156							
195	Data appear Approximate_Lognormal at (0.05) Significance Level											
196												
197	Zinc (mg/L)											
198												
199			Raw Statistics									
200				Number of Valid Observations	31							
201				Number of Distinct Observations	23							
202				Minimum	6.0000E-4							
203				Maximum	0.015							
204				Mean of Raw Data	0.00425							
205				Standard Deviation of Raw Data	0.00335							
206				Khat	1.712							
207				Theta hat	0.00248							
208				Kstar	1.568							
209				Theta star	0.00271							
210				Mean of Log Transformed Data	-5.782							
211				Standard Deviation of Log Transformed Data	0.852							
212												

	A	B	C	D	E	F	G	H	I	J	K	L
213			Normal GOF Test Results									
214												
215					Correlation Coefficient R	0.934						
216					Shapiro Wilk Test Statistic	0.874						
217					Shapiro Wilk Critical (0.05) Value	0.929						
218					Approximate Shapiro Wilk P Value	0.00152						
219					Lilliefors Test Statistic	0.149						
220					Lilliefors Critical (0.05) Value	0.156						
221	Data appear Approximate Normal at (0.05) Significance Level											
222												
223			Gamma GOF Test Results									
224												
225					Correlation Coefficient R	0.992						
226					A-D Test Statistic	0.552						
227					A-D Critical (0.05) Value	0.762						
228					K-S Test Statistic	0.12						
229					K-S Critical(0.05) Value	0.16						
230	Data appear Gamma Distributed at (0.05) Significance Level											
231												
232			Lognormal GOF Test Results									
233												
234					Correlation Coefficient R	0.979						
235					Shapiro Wilk Test Statistic	0.947						
236					Shapiro Wilk Critical (0.05) Value	0.929						
237					Approximate Shapiro Wilk P Value	0.16						
238					Lilliefors Test Statistic	0.168						
239					Lilliefors Critical (0.05) Value	0.156						
240	Data appear Approximate_Lognormal at (0.05) Significance Level											



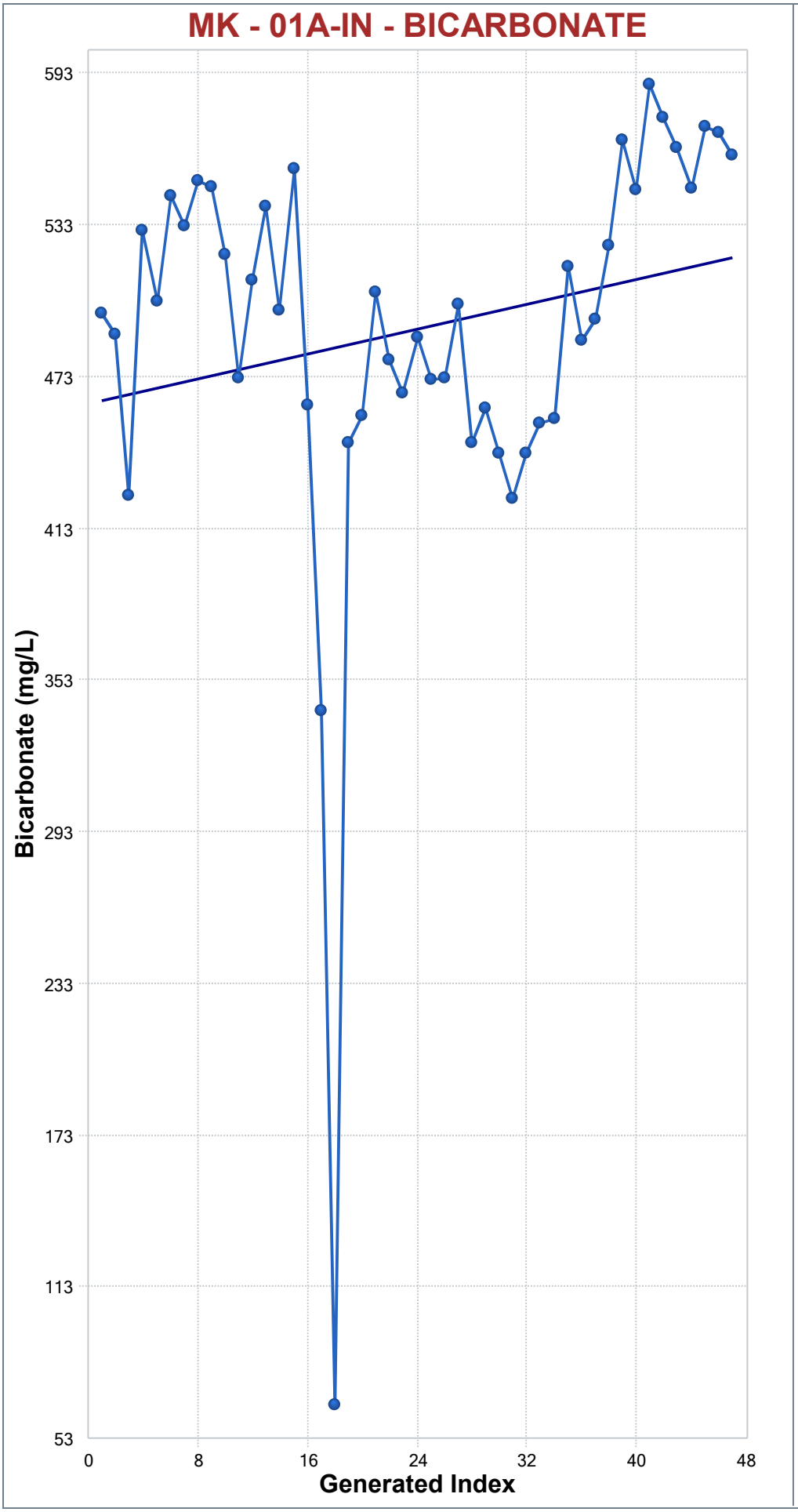
Mann-Kendall Trend Analysis

n	48
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	112.2779
Standardized Value of S	3.4735
M-K Test Value (S)	391
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0003

OLS Regression Line (Blue)

OLS Regression Slope	0.0003
OLS Regression Intercept	0.0028

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



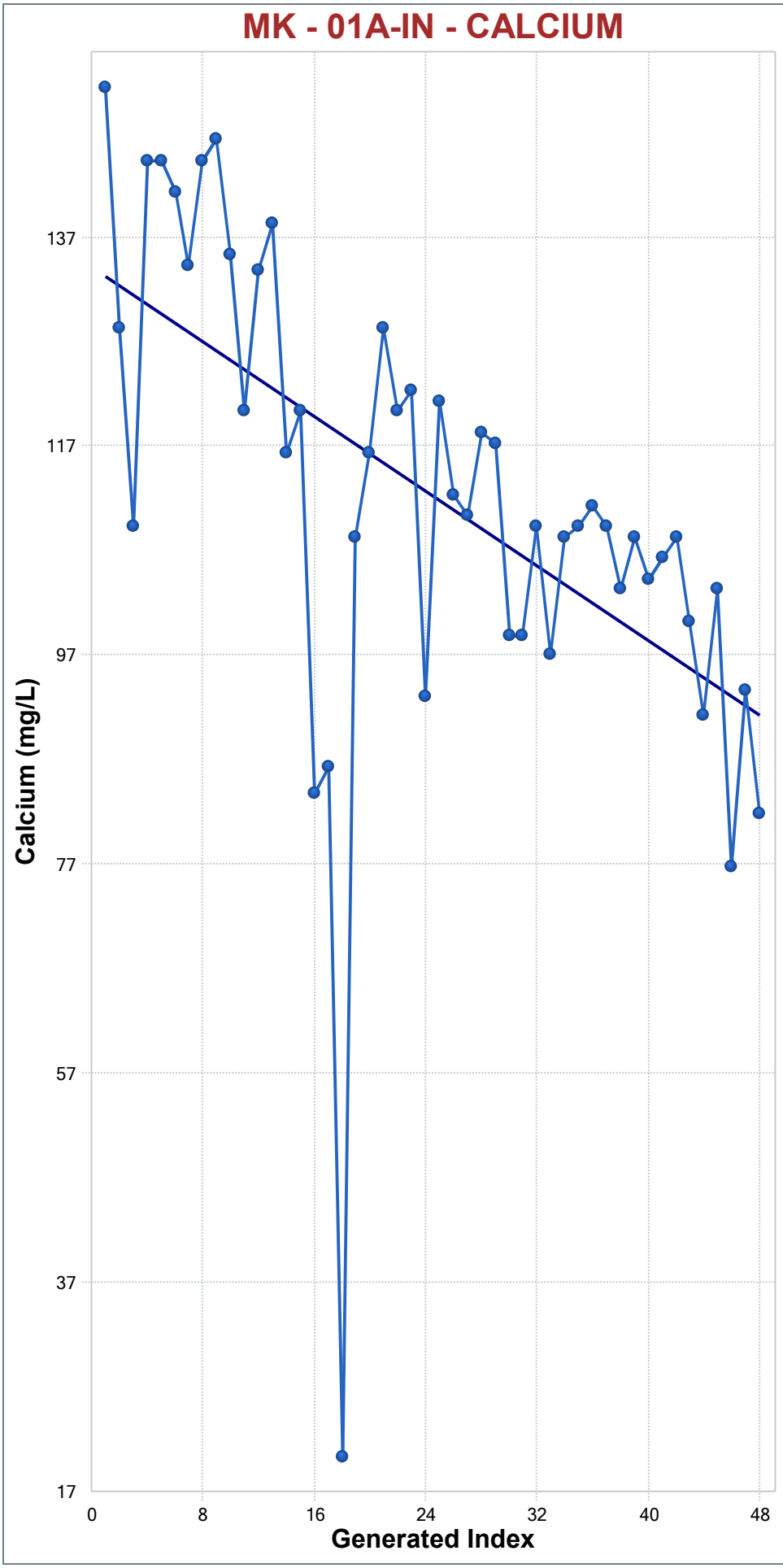
Mann-Kendall Trend Analysis

n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	109.0367
Standardized Value of S	1.4857
M-K Test Value (S)	163
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0687

OLS Regression Line (Blue)

OLS Regression Slope	1.2315
OLS Regression Intercept	461.8725

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



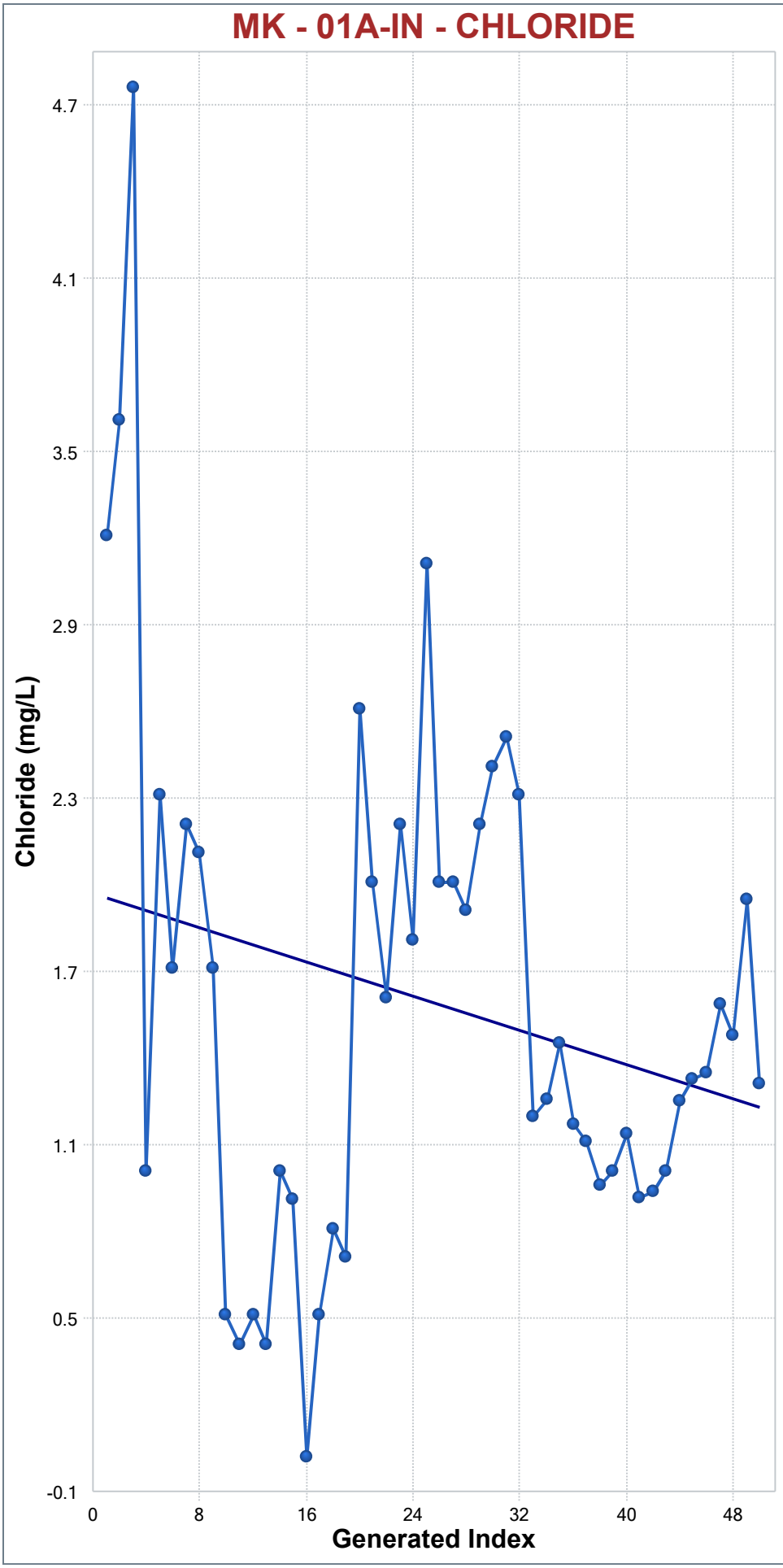
Mann-Kendall Trend Analysis

n	48
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	112.3877
Standardized Value of S	-5.4988
M-K Test Value (S)	-619
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.8920
OLS Regression Intercept	133.7684

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



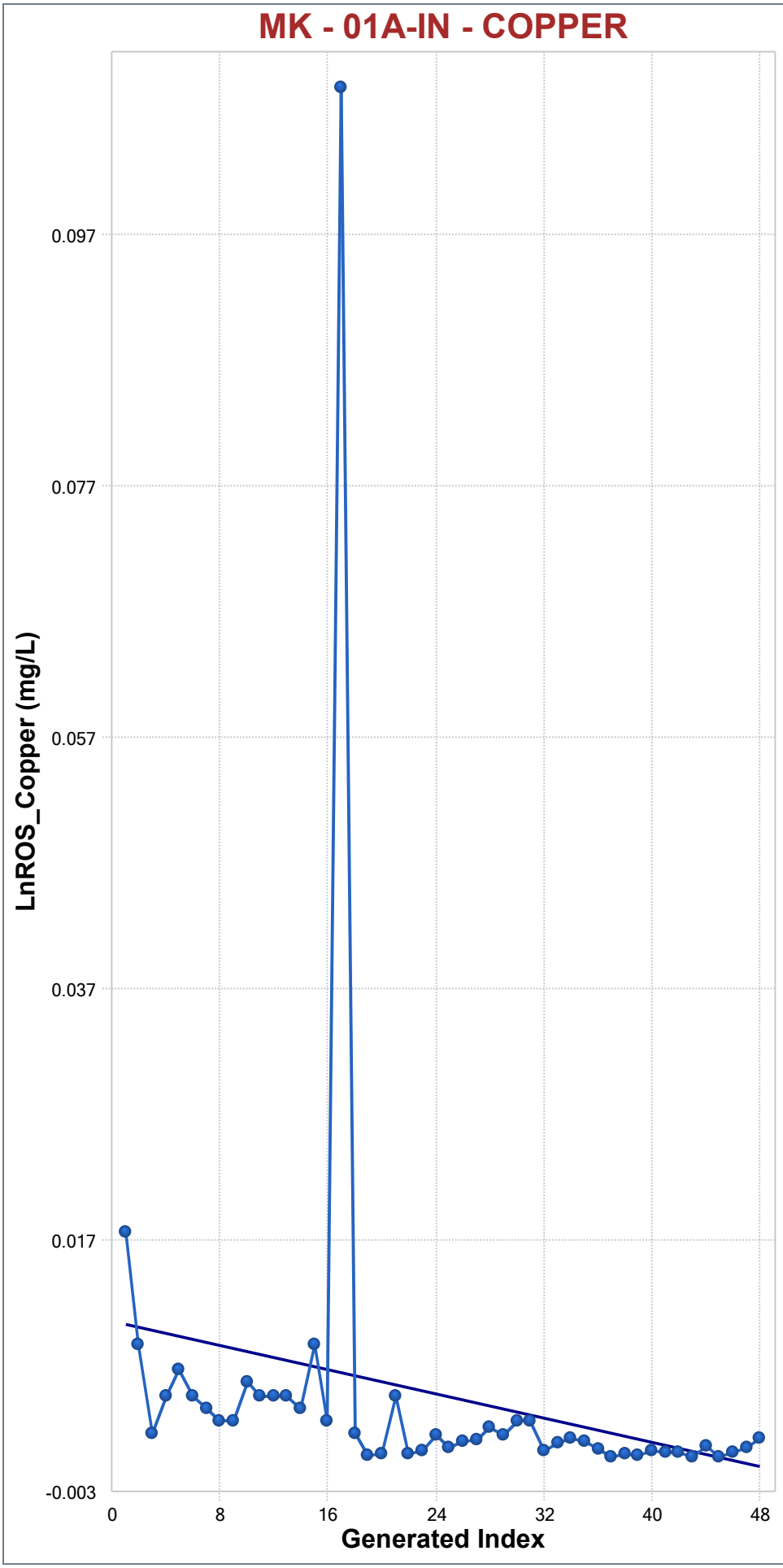
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.4529
Standardized Value of S	-0.8371
M-K Test Value (S)	-101
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2013

OLS Regression Line (Blue)

OLS Regression Slope	-0.0148
OLS Regression Intercept	1.9584

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



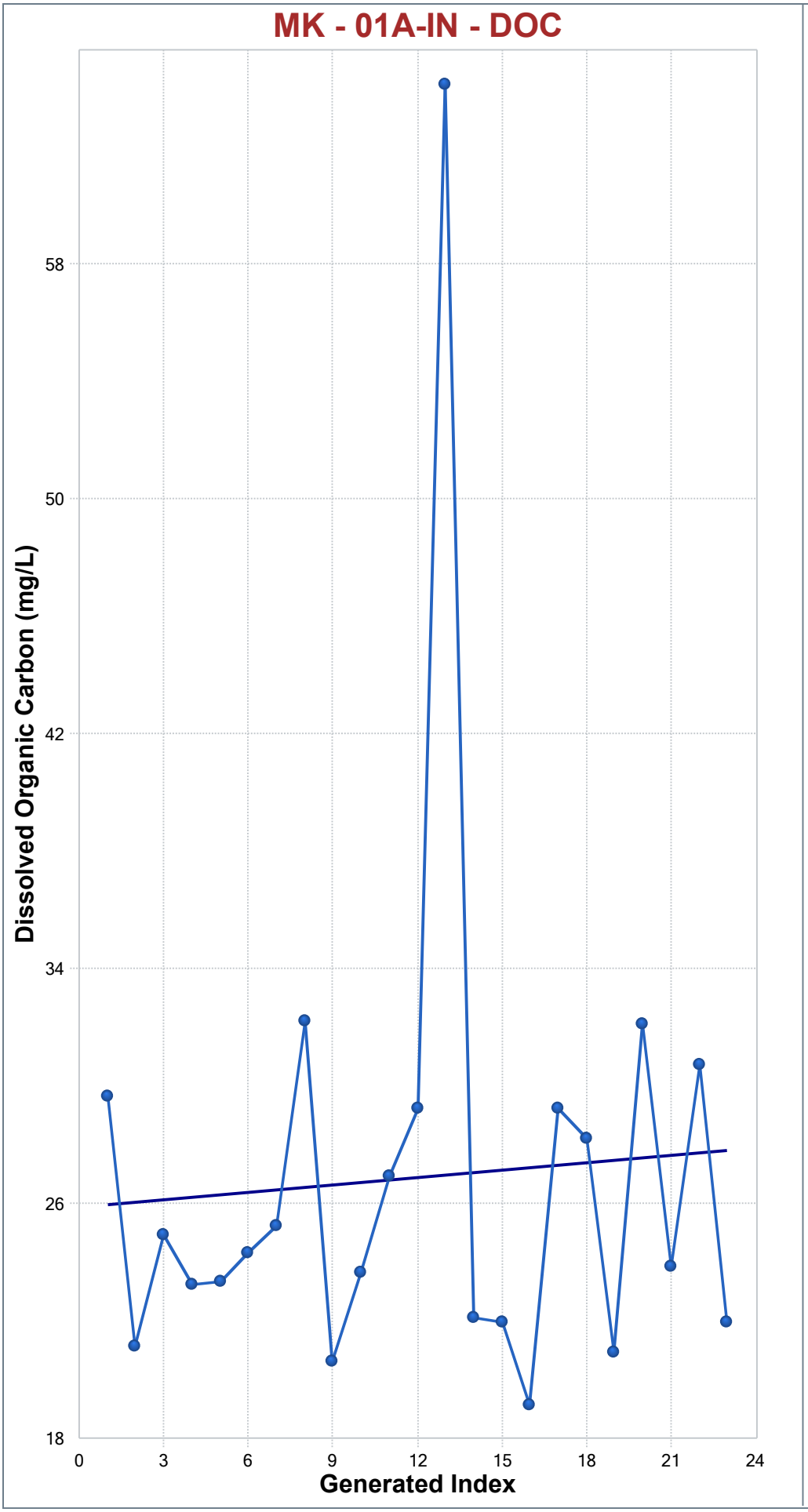
Mann-Kendall Trend Analysis

n	48
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	112.2928
Standardized Value of S	-5.3254
M-K Test Value (S)	-599
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0108

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



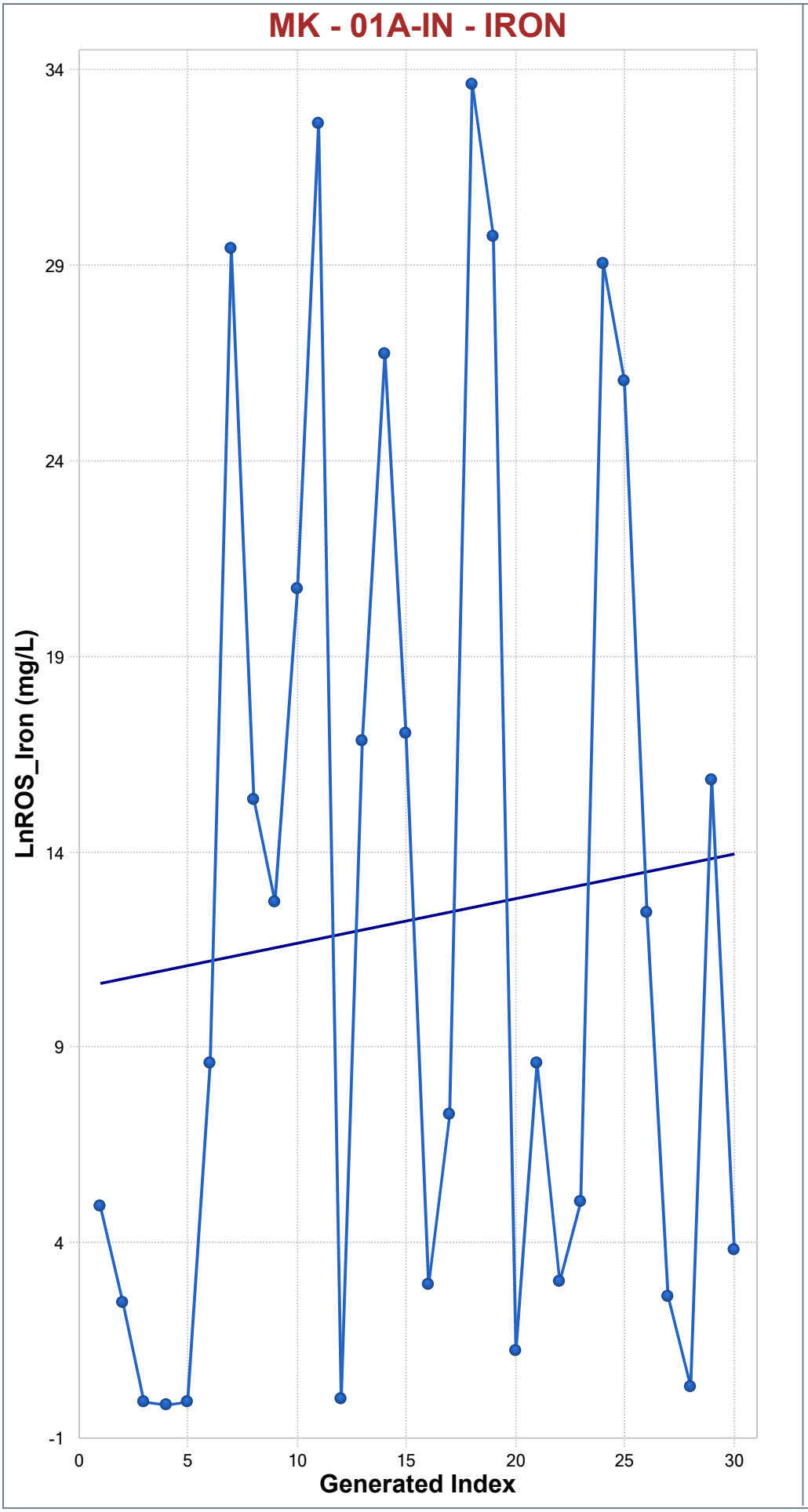
Mann-Kendall Trend Analysis

n	23
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	37.8374
Standardized Value of S	0.2114
M-K Test Value (S)	9
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4163

OLS Regression Line (Blue)

OLS Regression Slope	0.0839
OLS Regression Intercept	25.5672

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



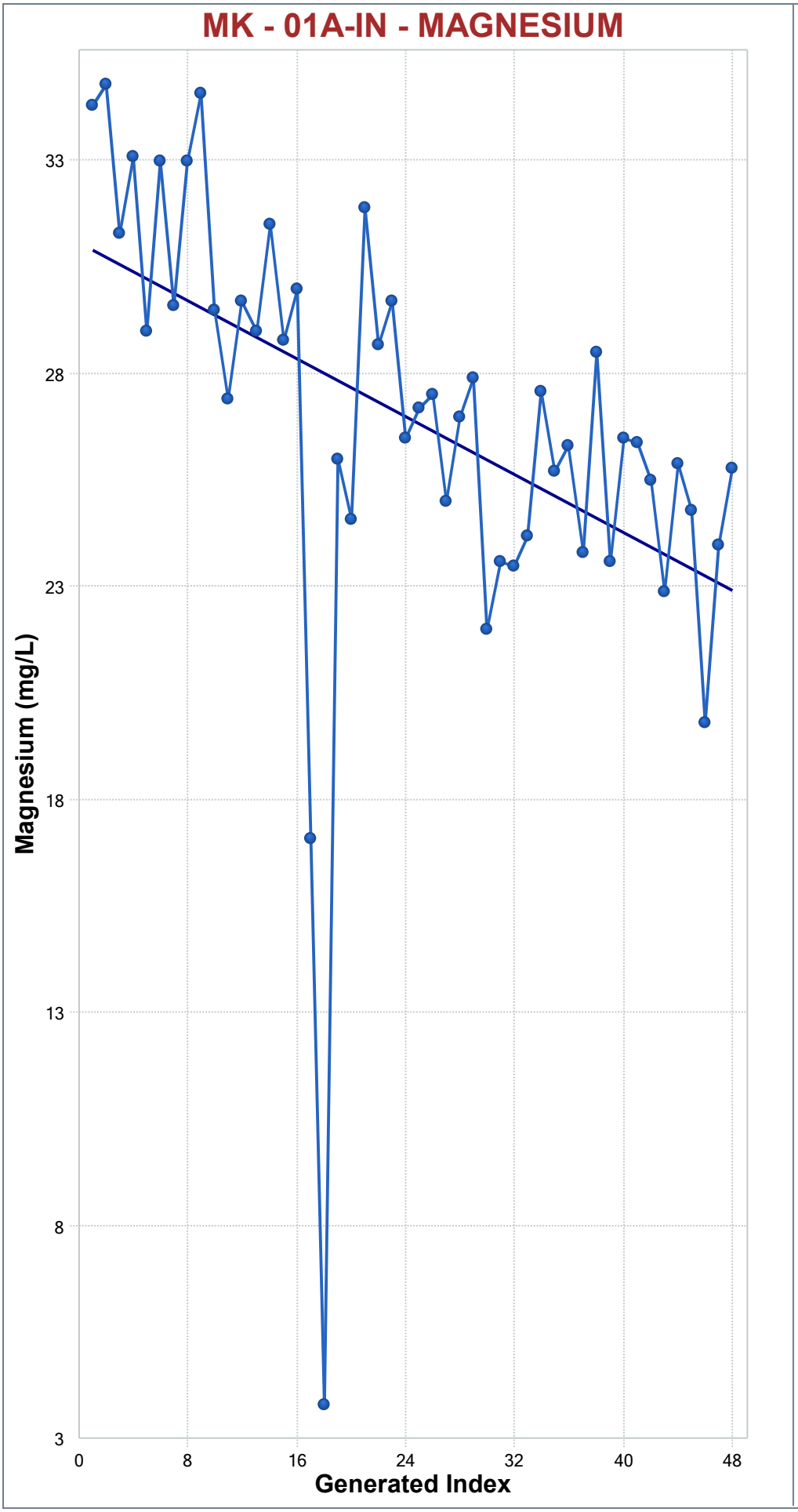
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0417
Standardized Value of S	0.7316
M-K Test Value (S)	42
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2322

OLS Regression Line (Blue)

OLS Regression Slope	0.1141
OLS Regression Intercept	10.6933

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



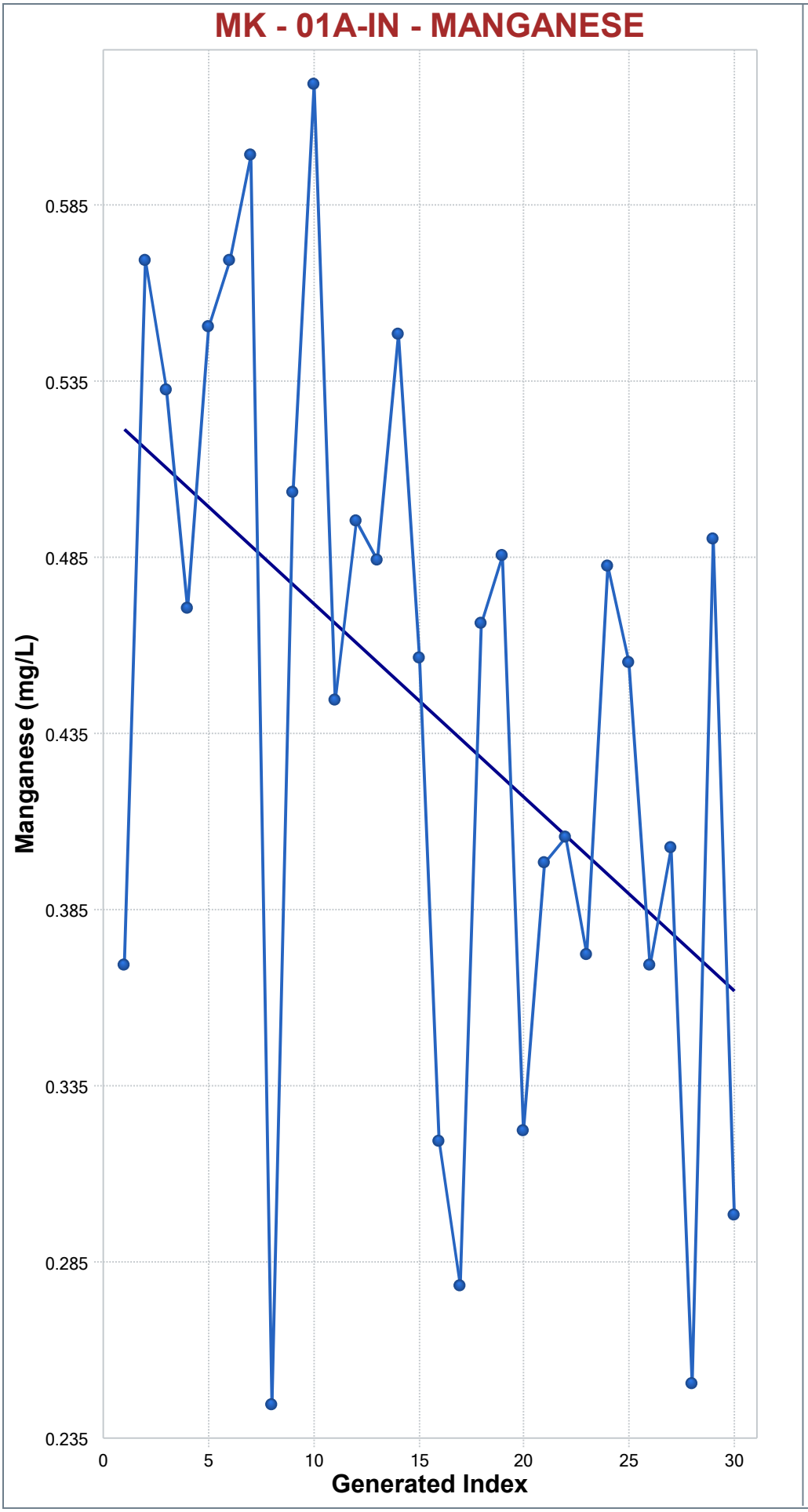
Mann-Kendall Trend Analysis

n	48
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	112.4885
Standardized Value of S	-5.2272
M-K Test Value (S)	-589
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.1705
OLS Regression Intercept	31.0916

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



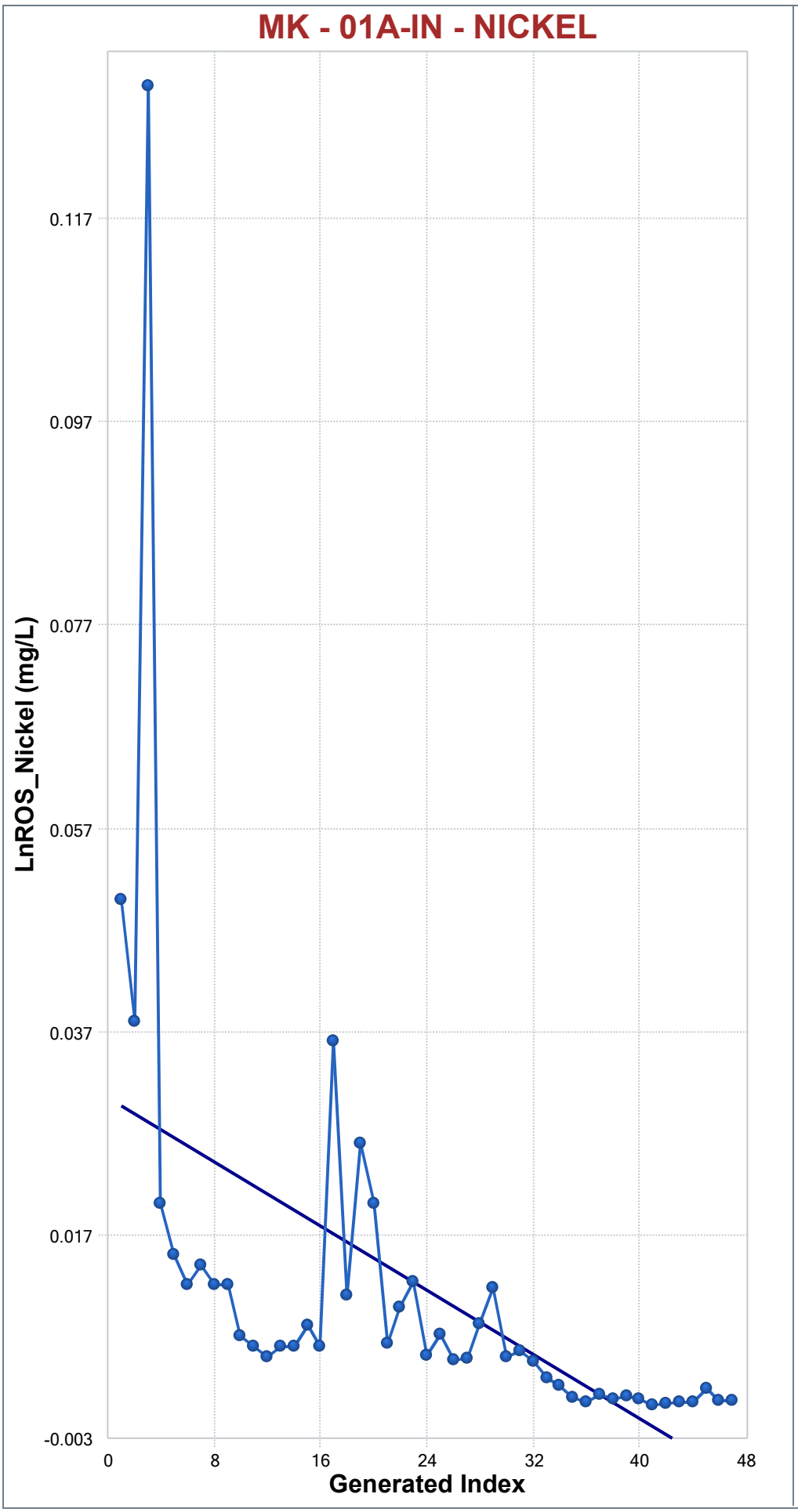
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0327
Standardized Value of S	-2.6770
M-K Test Value (S)	-151
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0037

OLS Regression Line (Blue)

OLS Regression Slope	-0.0055
OLS Regression Intercept	0.5268

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



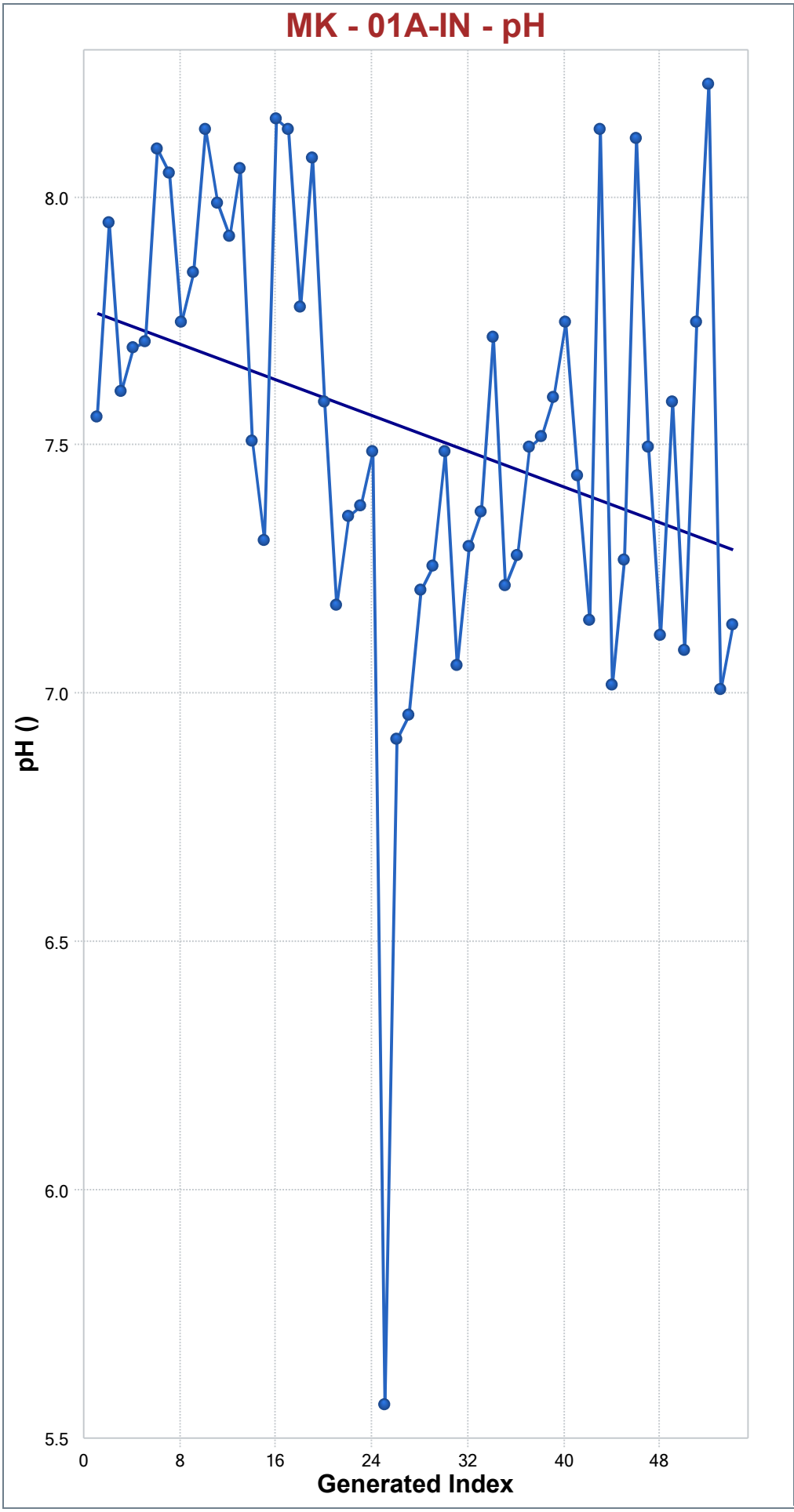
Mann-Kendall Trend Analysis

n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	108.9801
Standardized Value of S	-6.8361
M-K Test Value (S)	-746
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0008
OLS Regression Intercept	0.0305

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



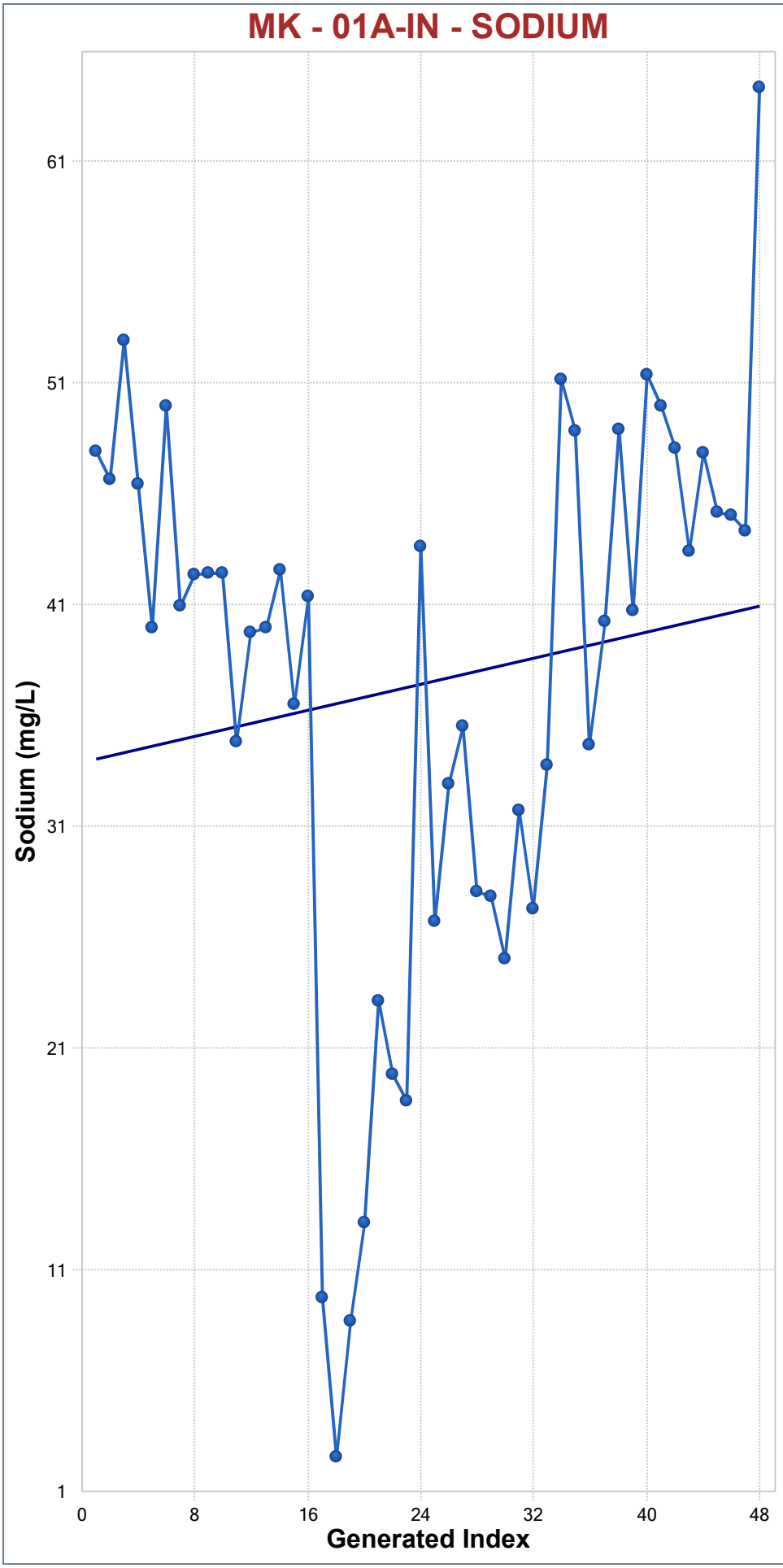
Mann-Kendall Trend Analysis

n	54
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	134.0025
Standardized Value of S	-2.5597
M-K Test Value (S)	-344
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0052

OLS Regression Line (Blue)

OLS Regression Slope	-0.0089
OLS Regression Intercept	7.7765

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



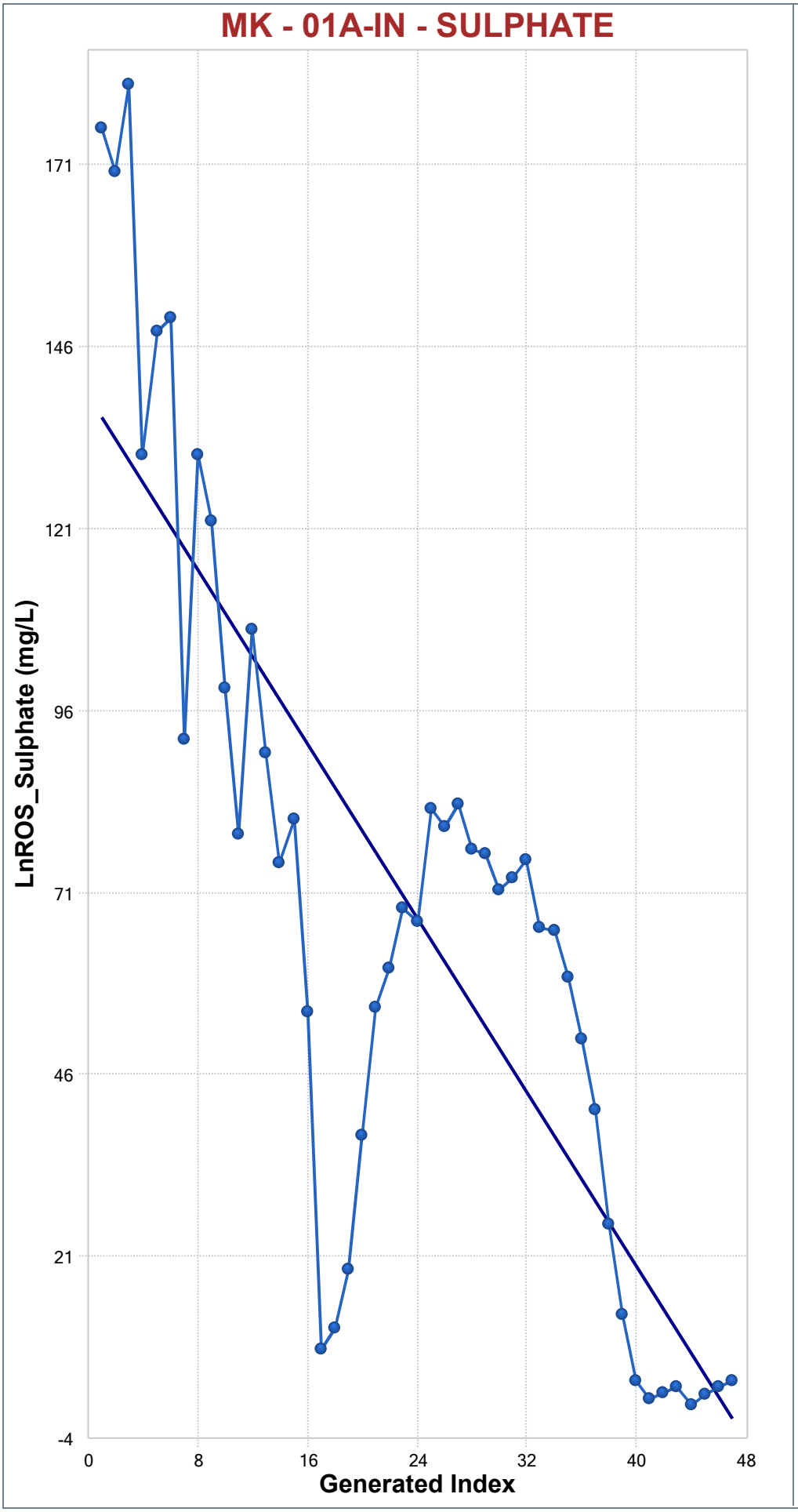
Mann-Kendall Trend Analysis

n	48
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	112.4974
Standardized Value of S	1.0311
M-K Test Value (S)	117
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1512

OLS Regression Line (Blue)

OLS Regression Slope	0.1473
OLS Regression Intercept	33.9337

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



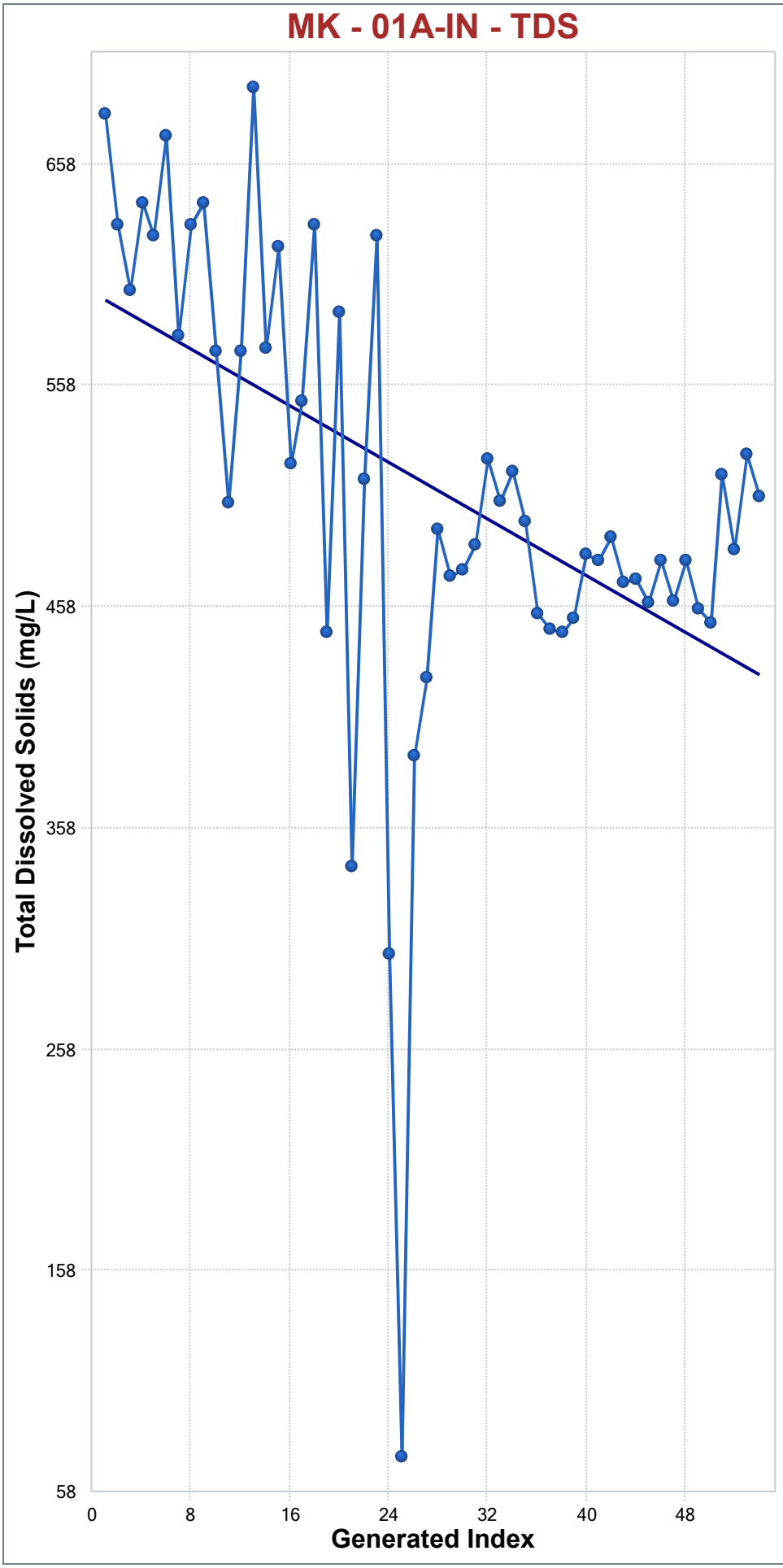
Mann-Kendall Trend Analysis

n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	109.0413
Standardized Value of S	-6.5571
M-K Test Value (S)	-716
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-2.9908
OLS Regression Intercept	139.2918

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



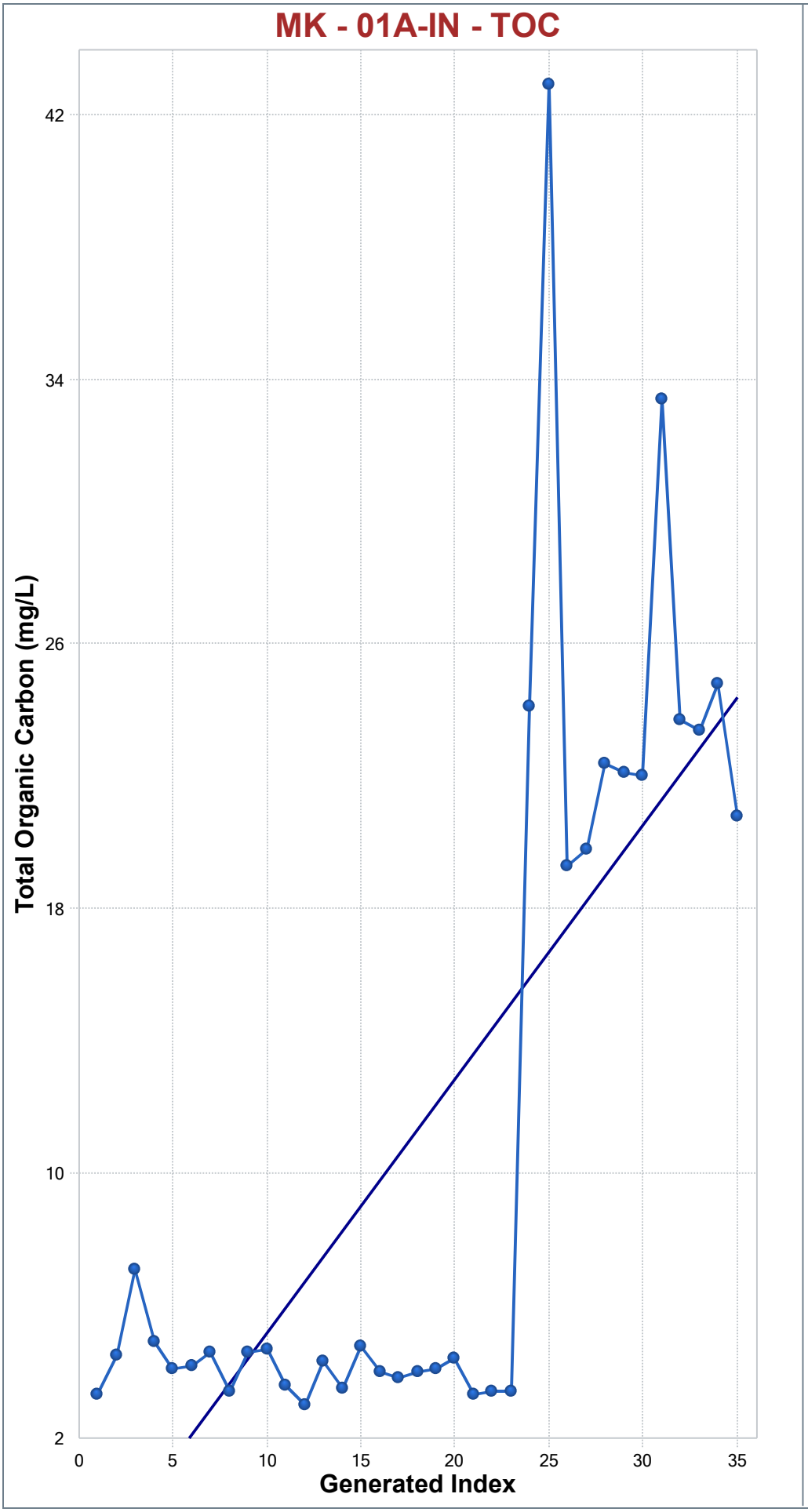
Mann-Kendall Trend Analysis

n	54
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	133.9988
Standardized Value of S	-4.2687
M-K Test Value (S)	-573
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-3.1954
OLS Regression Intercept	599.0028

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



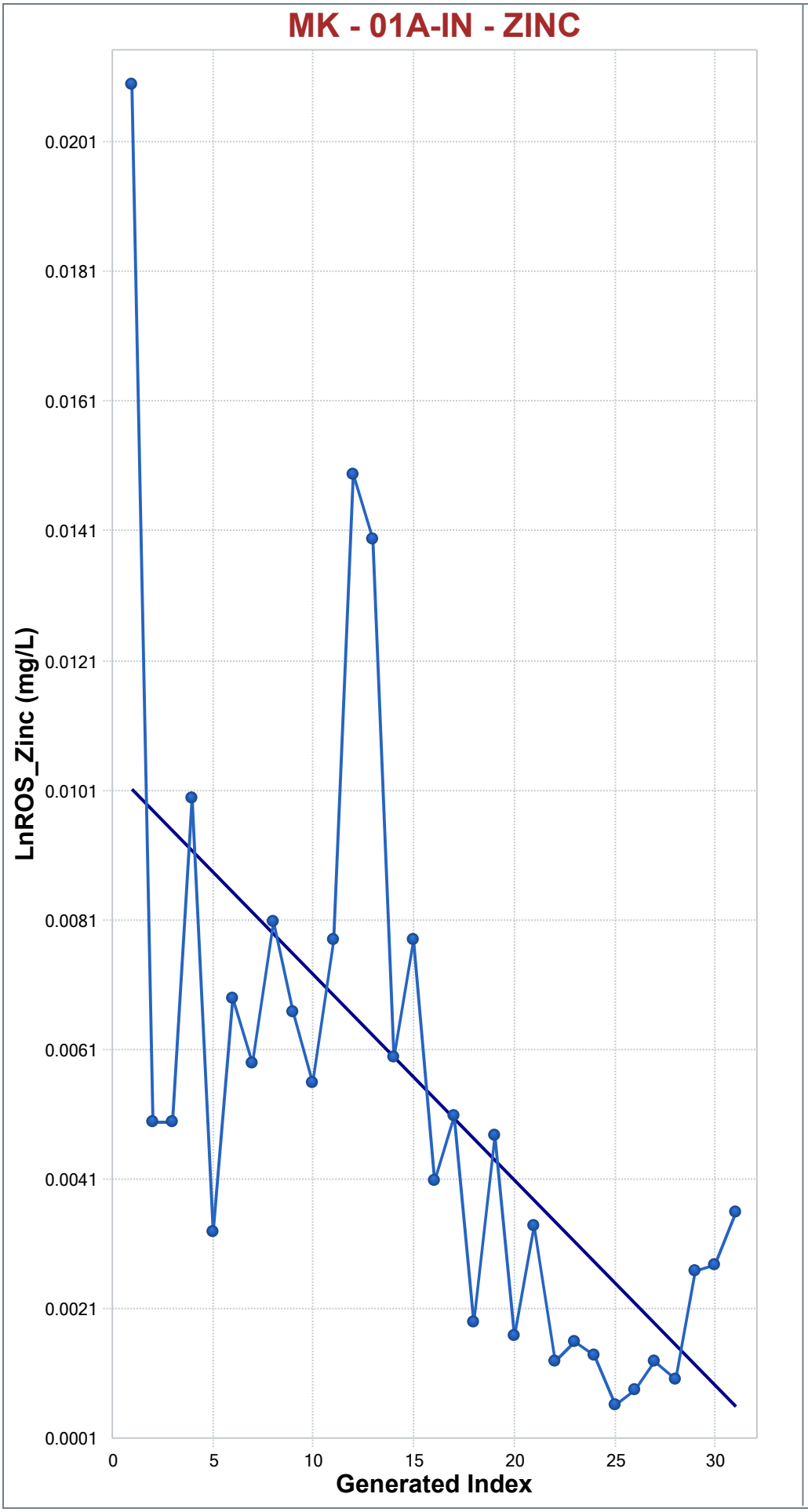
Mann-Kendall Trend Analysis

n	35
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	70.3610
Standardized Value of S	3.0272
M-K Test Value (S)	214
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0012

OLS Regression Line (Blue)

OLS Regression Slope	0.7714
OLS Regression Intercept	-2.5371

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



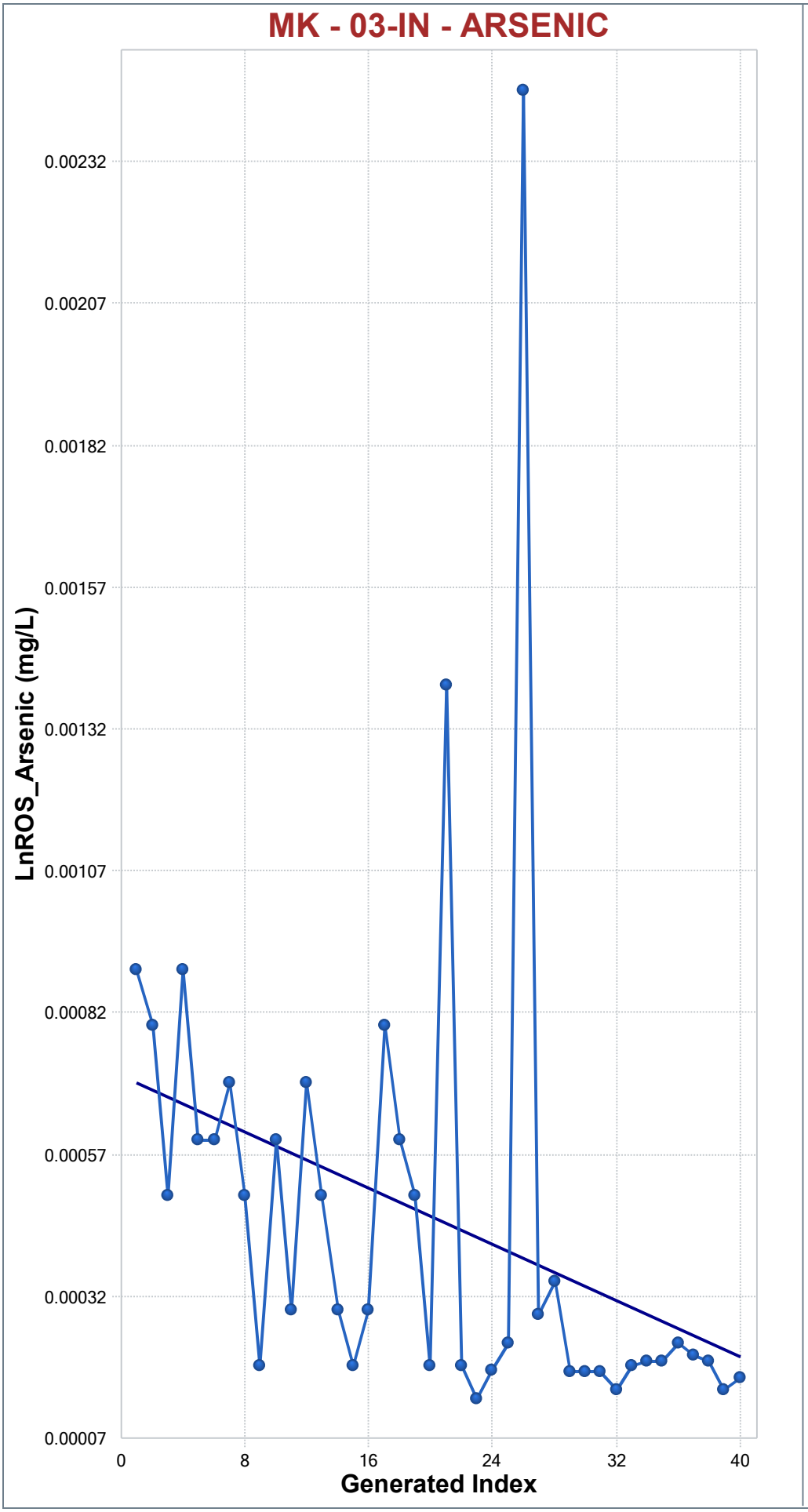
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8104
Standardized Value of S	-4.0979
M-K Test Value (S)	-242
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0003
OLS Regression Intercept	0.0104

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



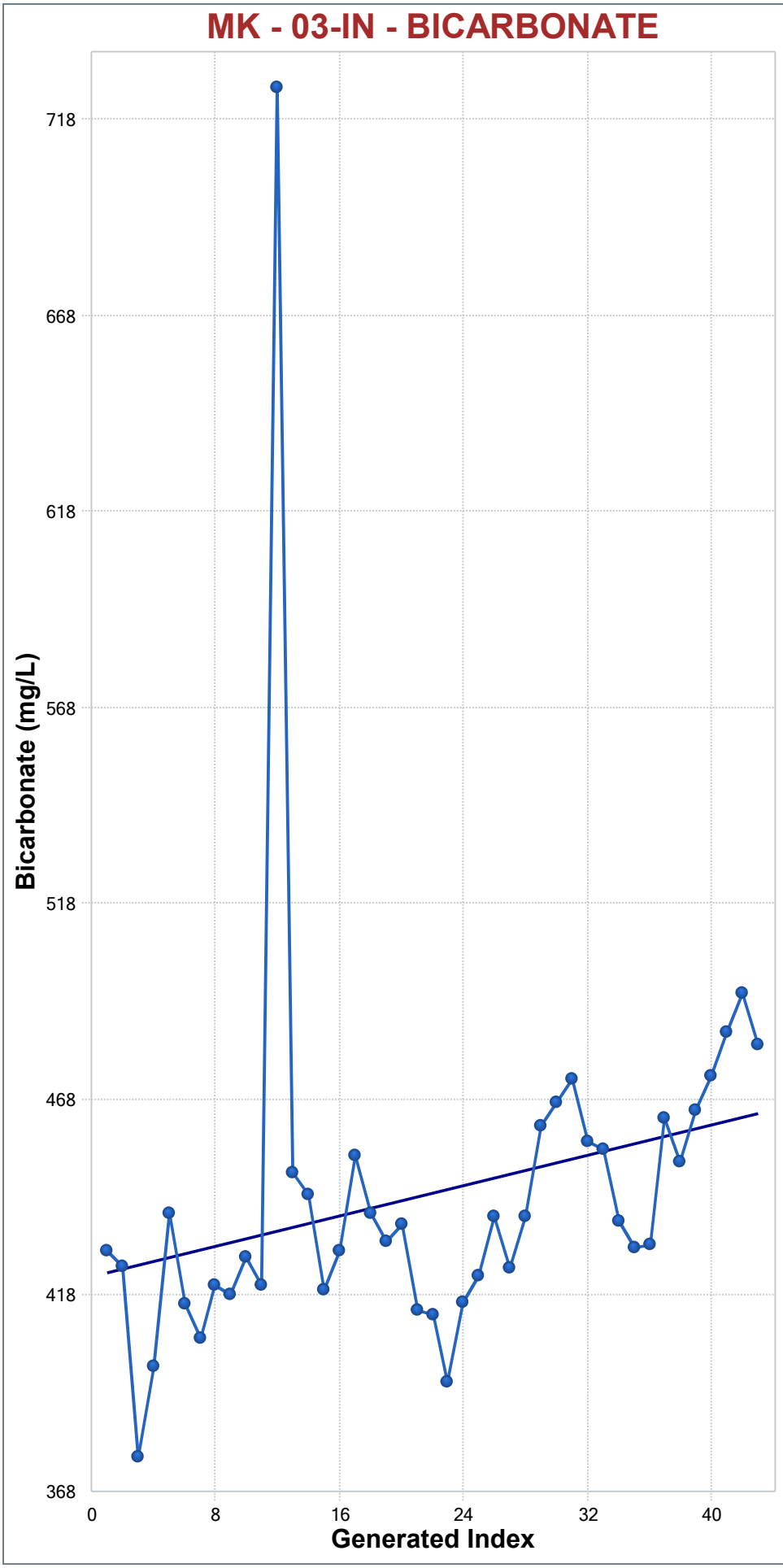
Mann-Kendall Trend Analysis

n	40
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	85.5434
Standardized Value of S	-4.2084
M-K Test Value (S)	-361
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0007

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



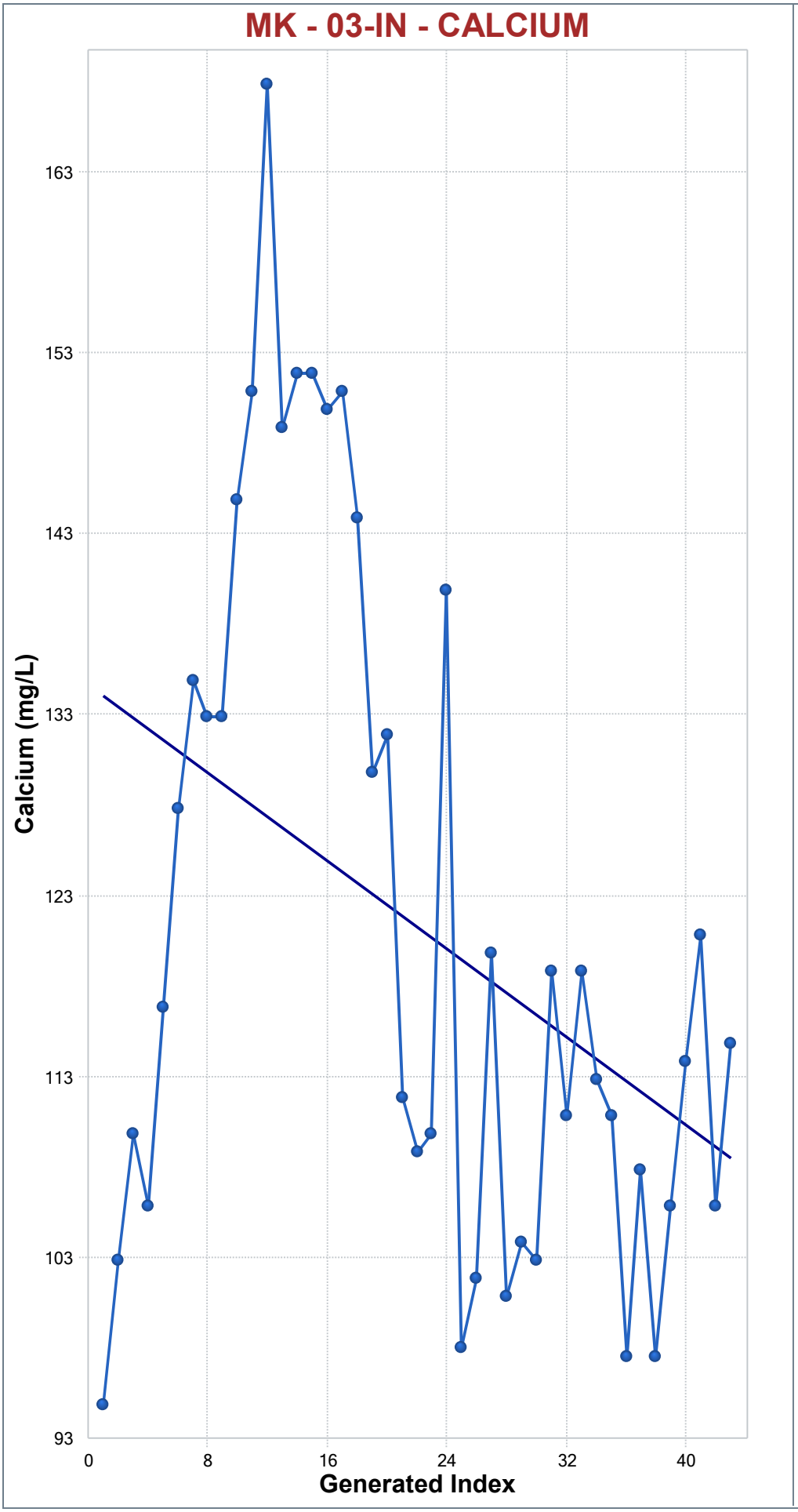
Mann-Kendall Trend Analysis

n	43
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	95.5318
Standardized Value of S	4.2918
M-K Test Value (S)	411
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.9629
OLS Regression Intercept	422.9276

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



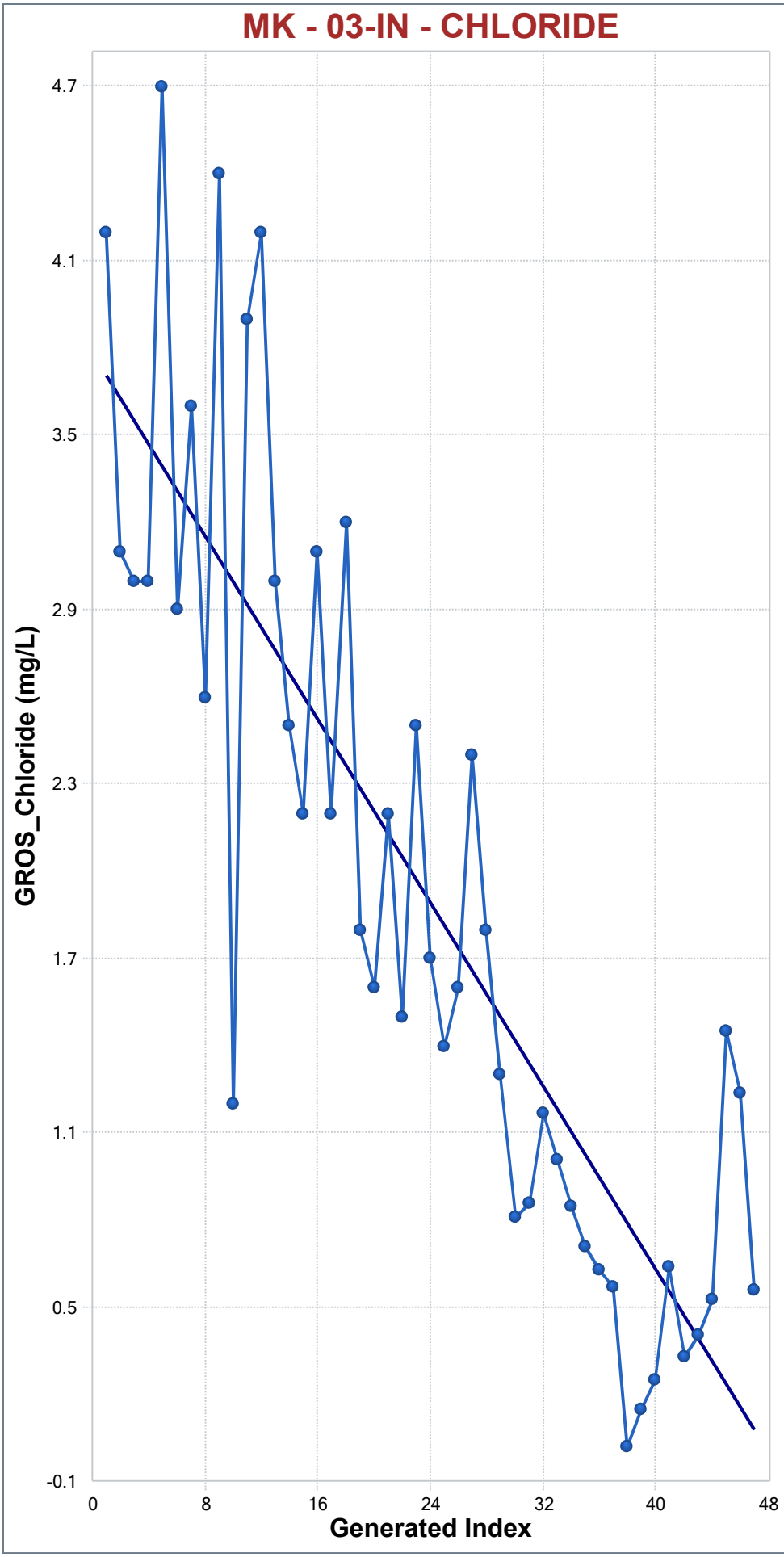
Mann-Kendall Trend Analysis

n	43
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	95.4917
Standardized Value of S	-2.1049
M-K Test Value (S)	-202
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0177

OLS Regression Line (Blue)

OLS Regression Slope	-0.6080
OLS Regression Intercept	134.8093

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



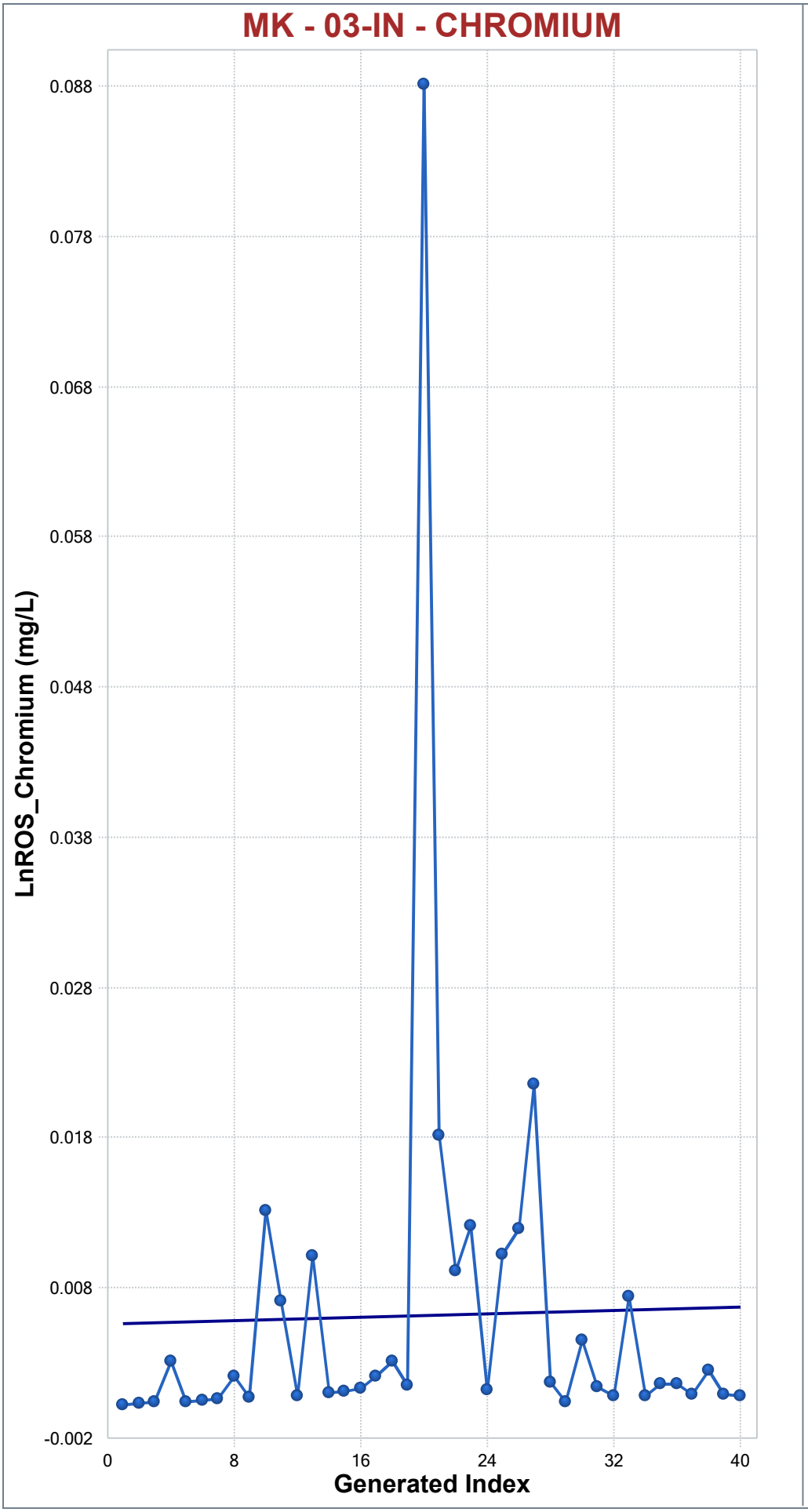
Mann-Kendall Trend Analysis

n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	108.9893
Standardized Value of S	-6.9089
M-K Test Value (S)	-754
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0789
OLS Regression Intercept	3.7868

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



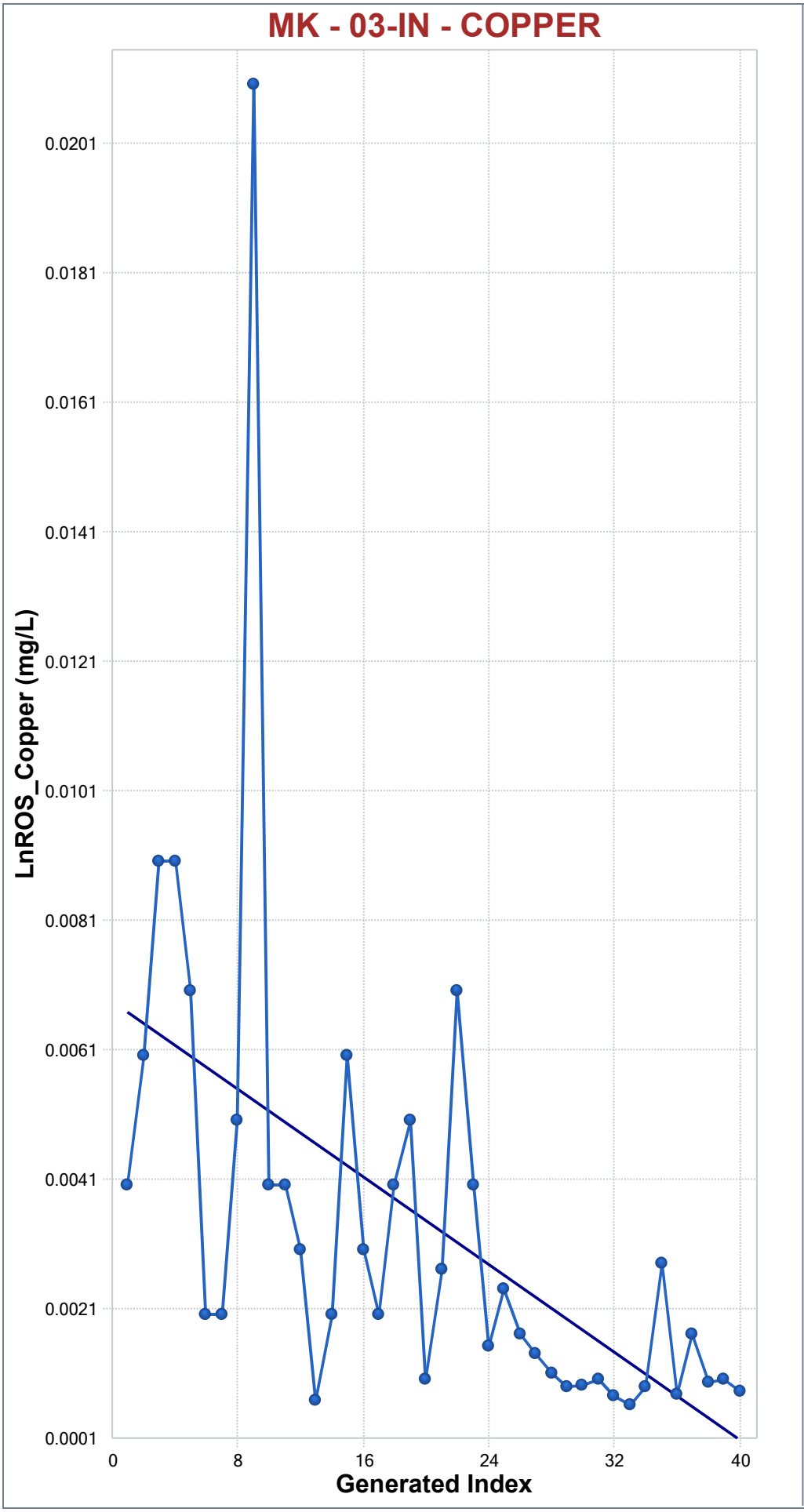
Mann-Kendall Trend Analysis

n	40
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	85.8118
Standardized Value of S	1.5382
M-K Test Value (S)	133
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0620

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0055

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



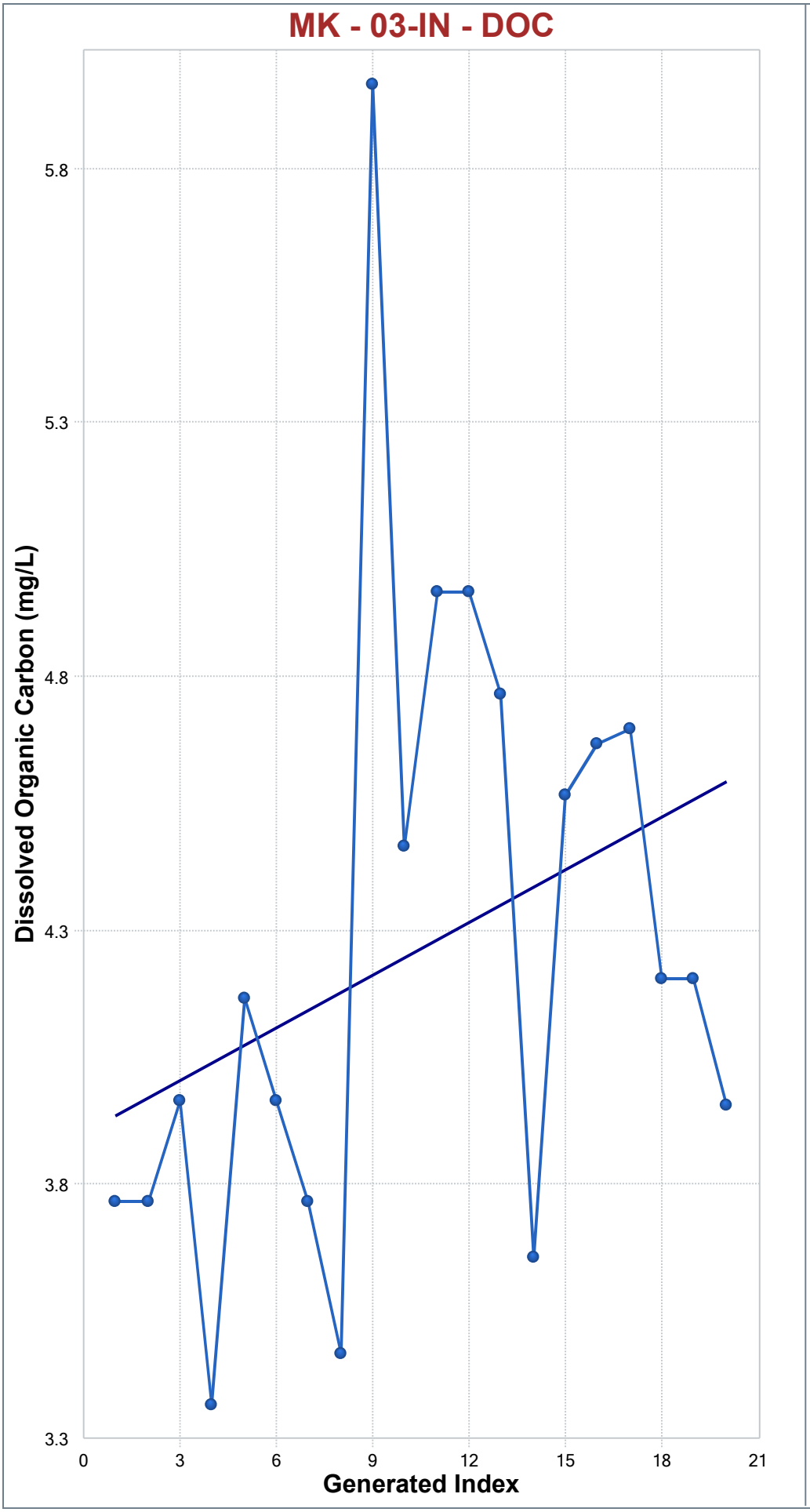
Mann-Kendall Trend Analysis

n	40
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	85.6466
Standardized Value of S	-4.8922
M-K Test Value (S)	-420
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0069

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



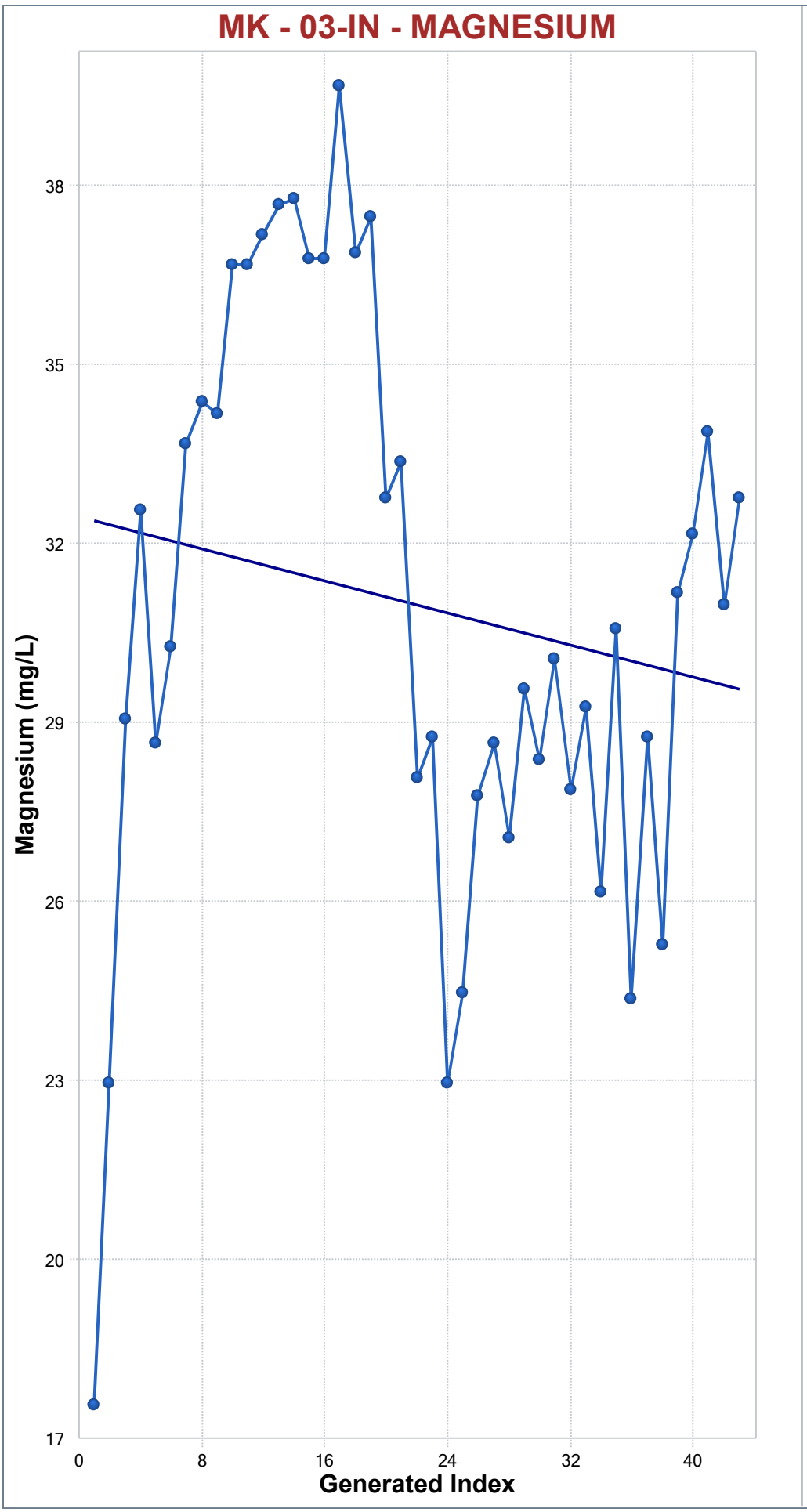
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7137
Standardized Value of S	1.3349
M-K Test Value (S)	42
Tabulated p-value	0.0930
Approximate p-value	0.0910

OLS Regression Line (Blue)

OLS Regression Slope	0.0347
OLS Regression Intercept	3.9355

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



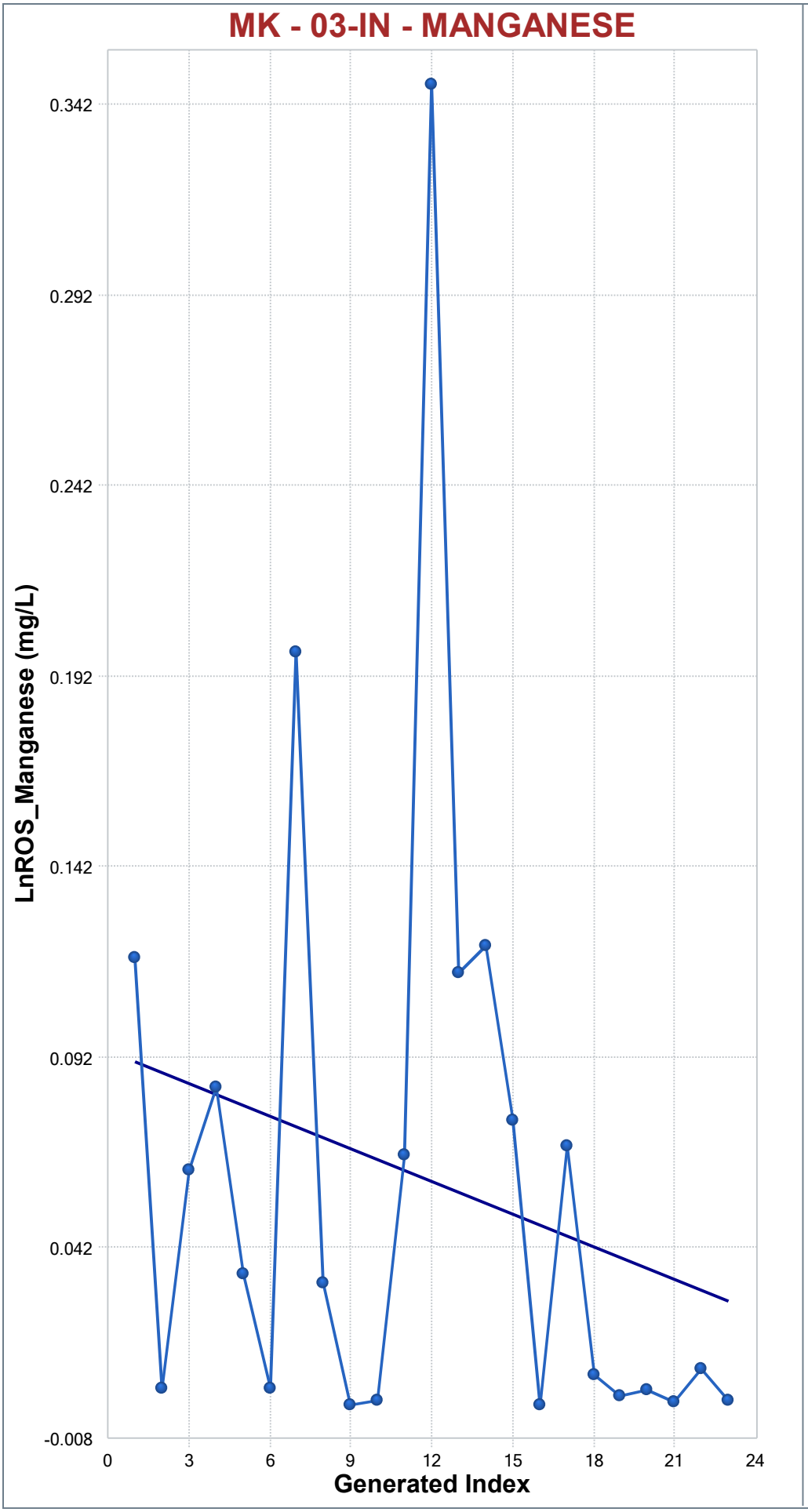
Mann-Kendall Trend Analysis

n	43
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	95.5214
Standardized Value of S	-0.9422
M-K Test Value (S)	-91
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1730

OLS Regression Line (Blue)

OLS Regression Slope	-0.0667
OLS Regression Intercept	31.9748

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



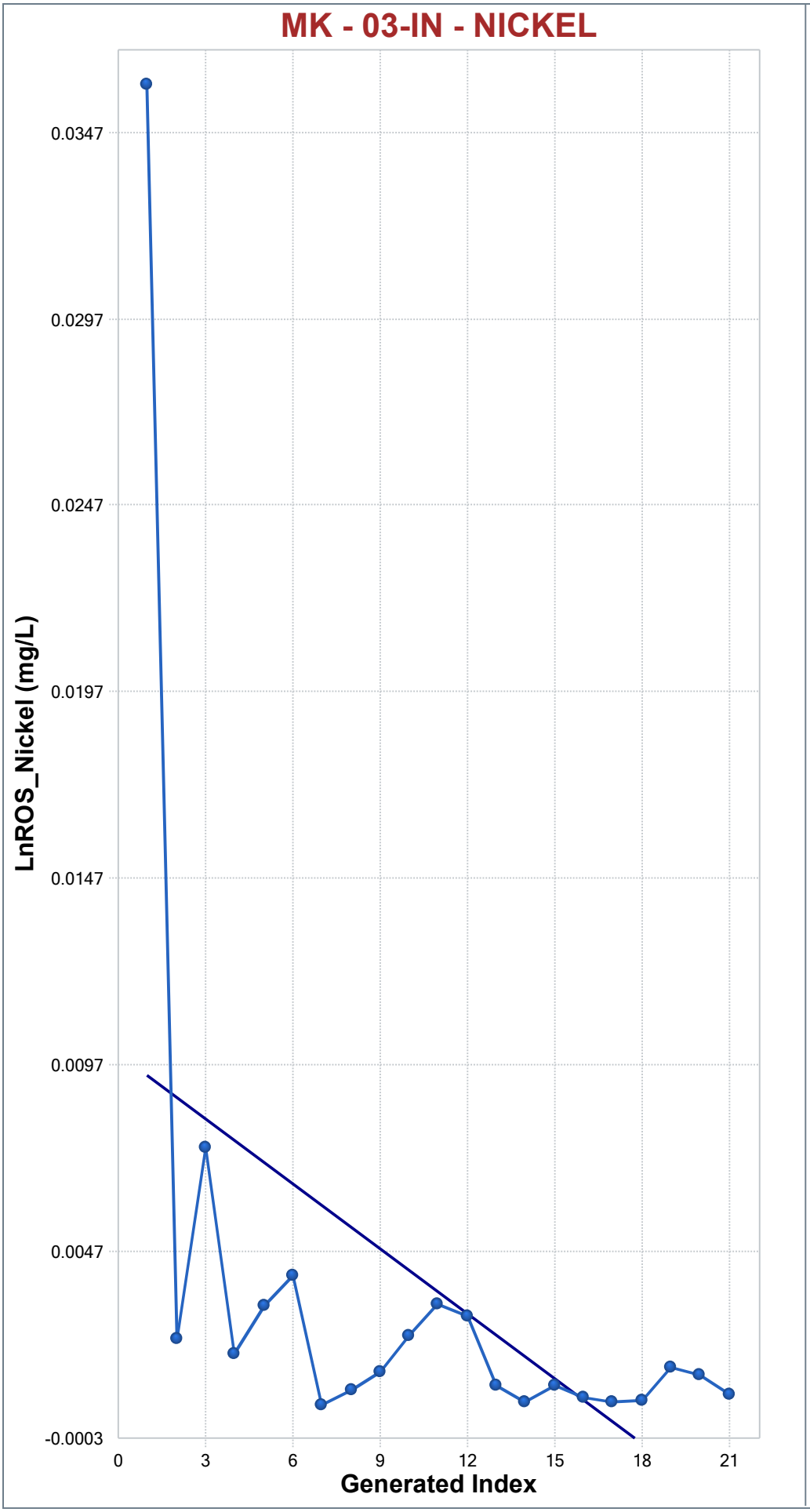
Mann-Kendall Trend Analysis

n	23
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	37.8638
Standardized Value of S	-1.6374
M-K Test Value (S)	-63
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0508

OLS Regression Line (Blue)

OLS Regression Slope	-0.0028
OLS Regression Intercept	0.0934

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



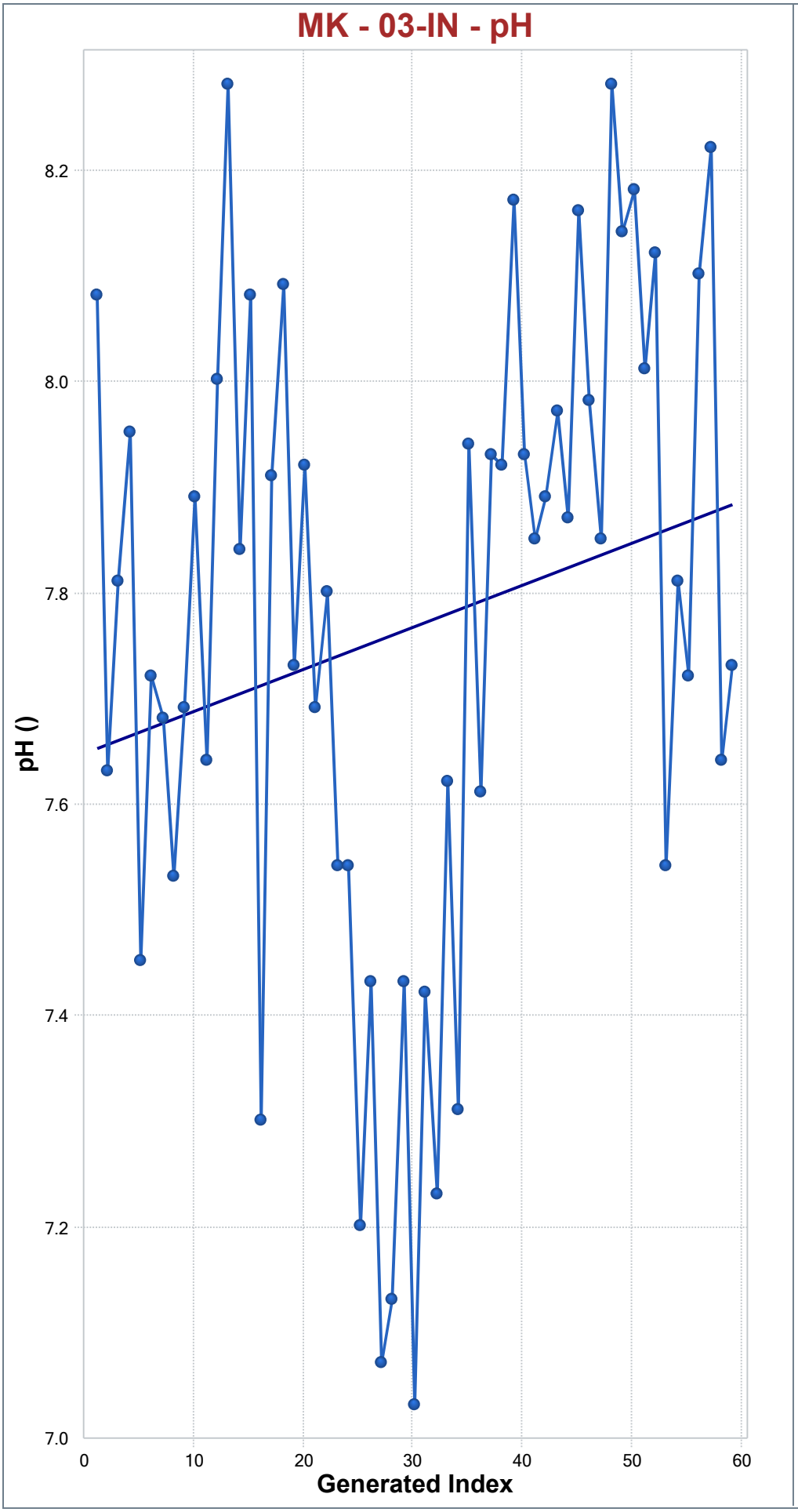
Mann-Kendall Trend Analysis

n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.1160
Standardized Value of S	-2.5063
M-K Test Value (S)	-84
Tabulated p-value	0.0050
Approximate p-value	0.0061

OLS Regression Line (Blue)

OLS Regression Slope	-0.0006
OLS Regression Intercept	0.0100

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



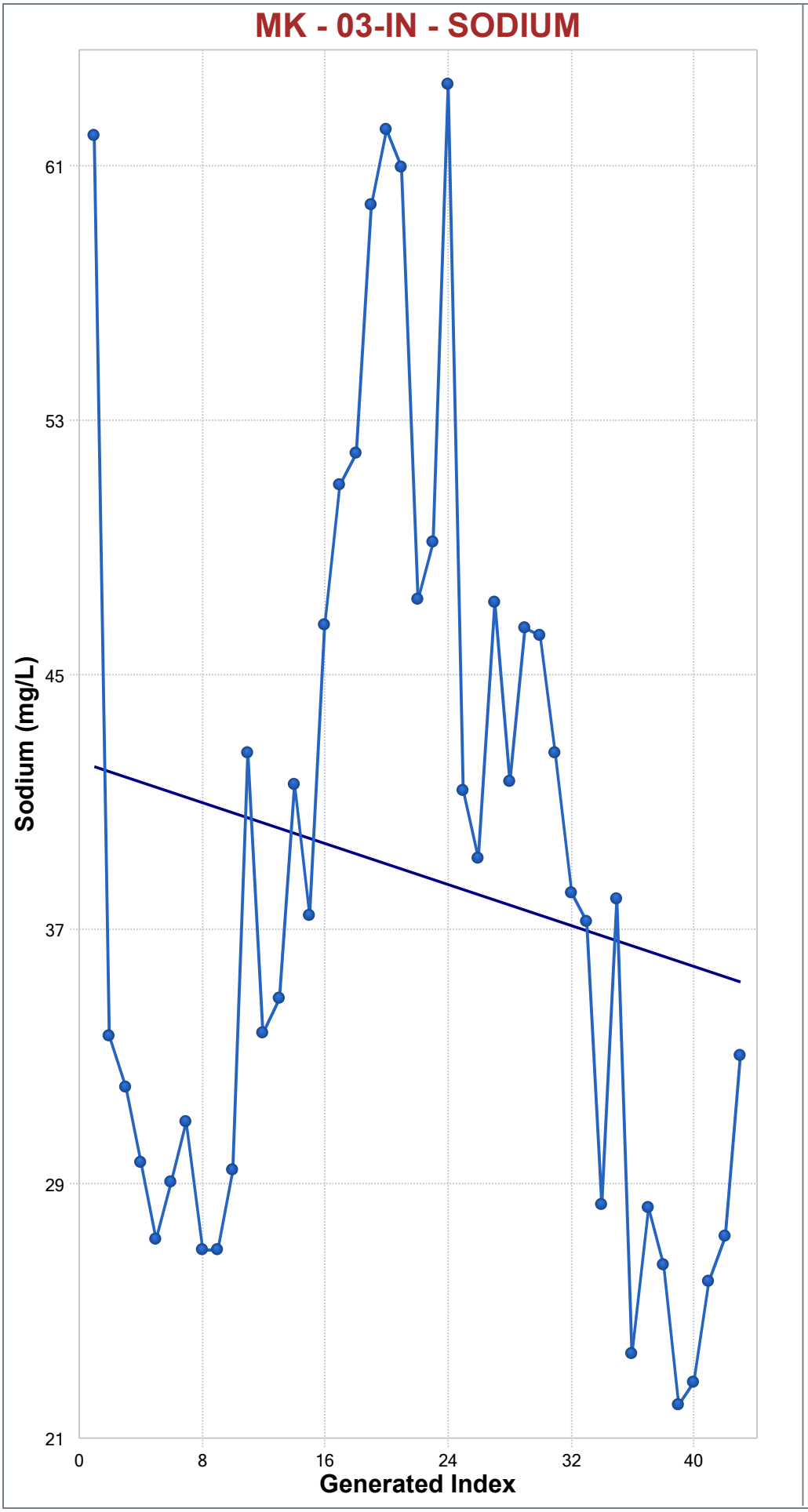
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.8660
Standardized Value of S	1.7728
M-K Test Value (S)	272
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0381

OLS Regression Line (Blue)

OLS Regression Slope	0.0040
OLS Regression Intercept	7.6568

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



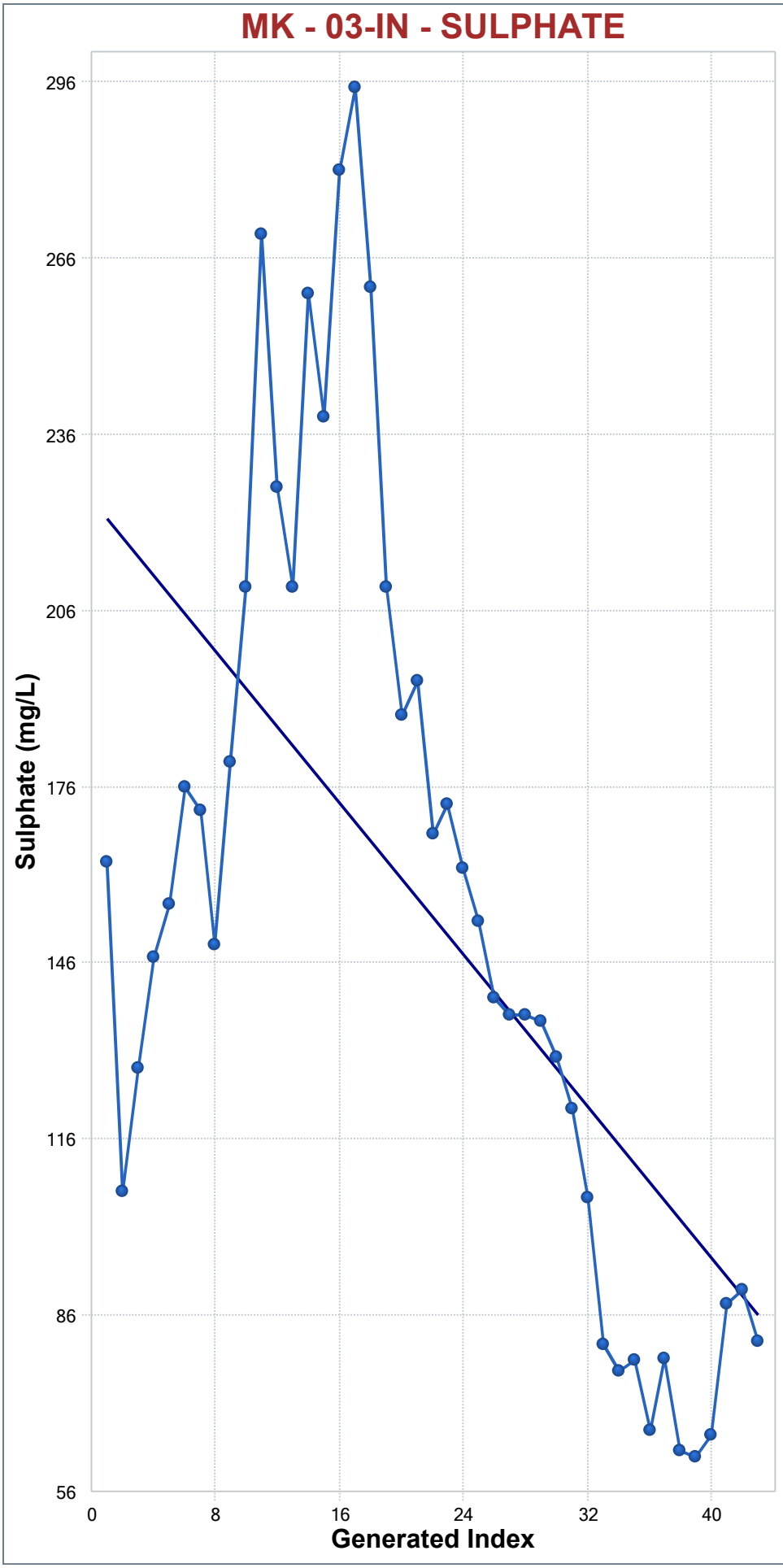
Mann-Kendall Trend Analysis

n	43
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	95.5423
Standardized Value of S	-1.2560
M-K Test Value (S)	-121
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1046

OLS Regression Line (Blue)

OLS Regression Slope	-0.1612
OLS Regression Intercept	42.3478

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



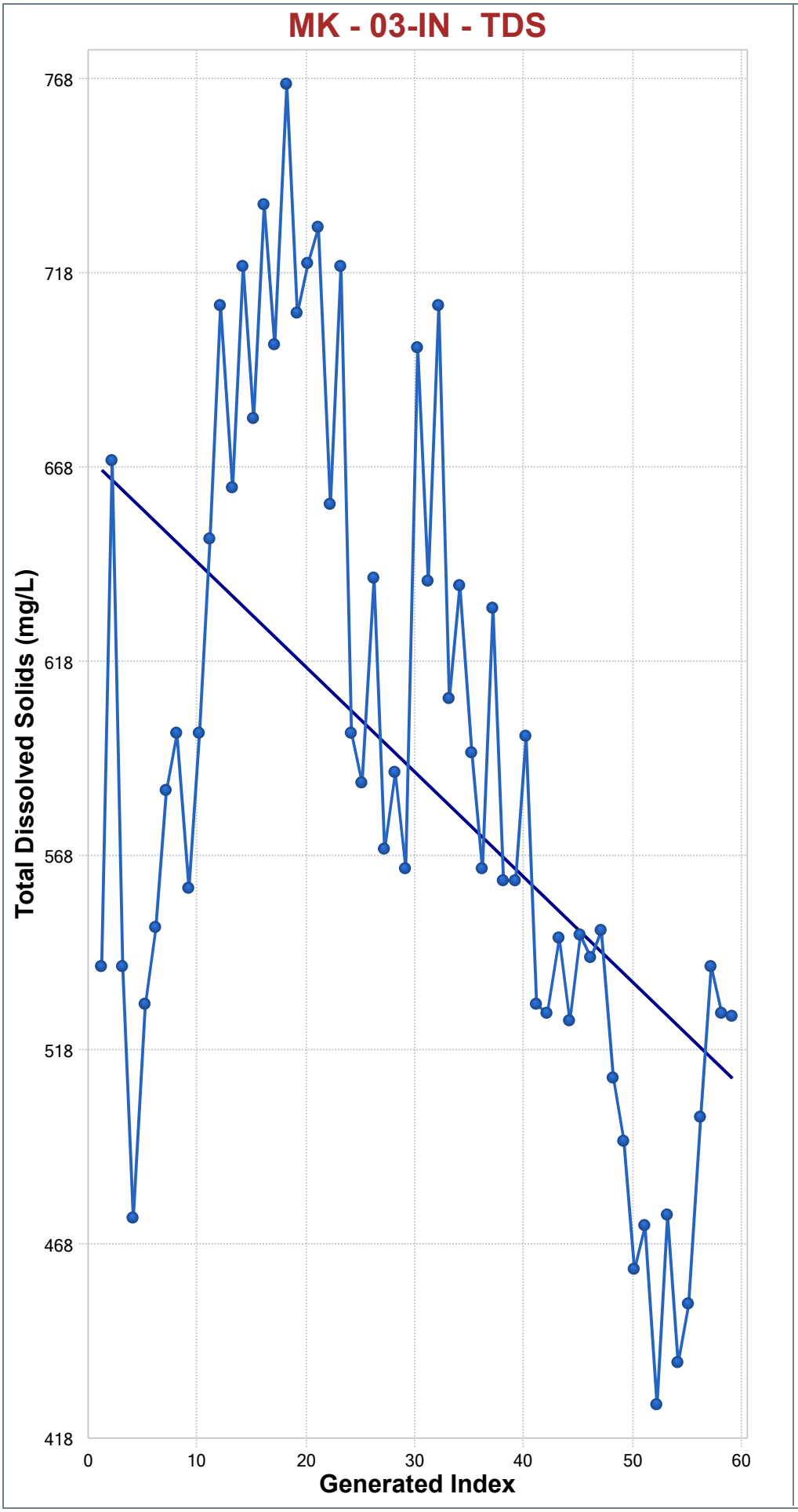
Mann-Kendall Trend Analysis

n	43
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	95.5284
Standardized Value of S	-4.6478
M-K Test Value (S)	-445
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-3.2312
OLS Regression Intercept	224.9658

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



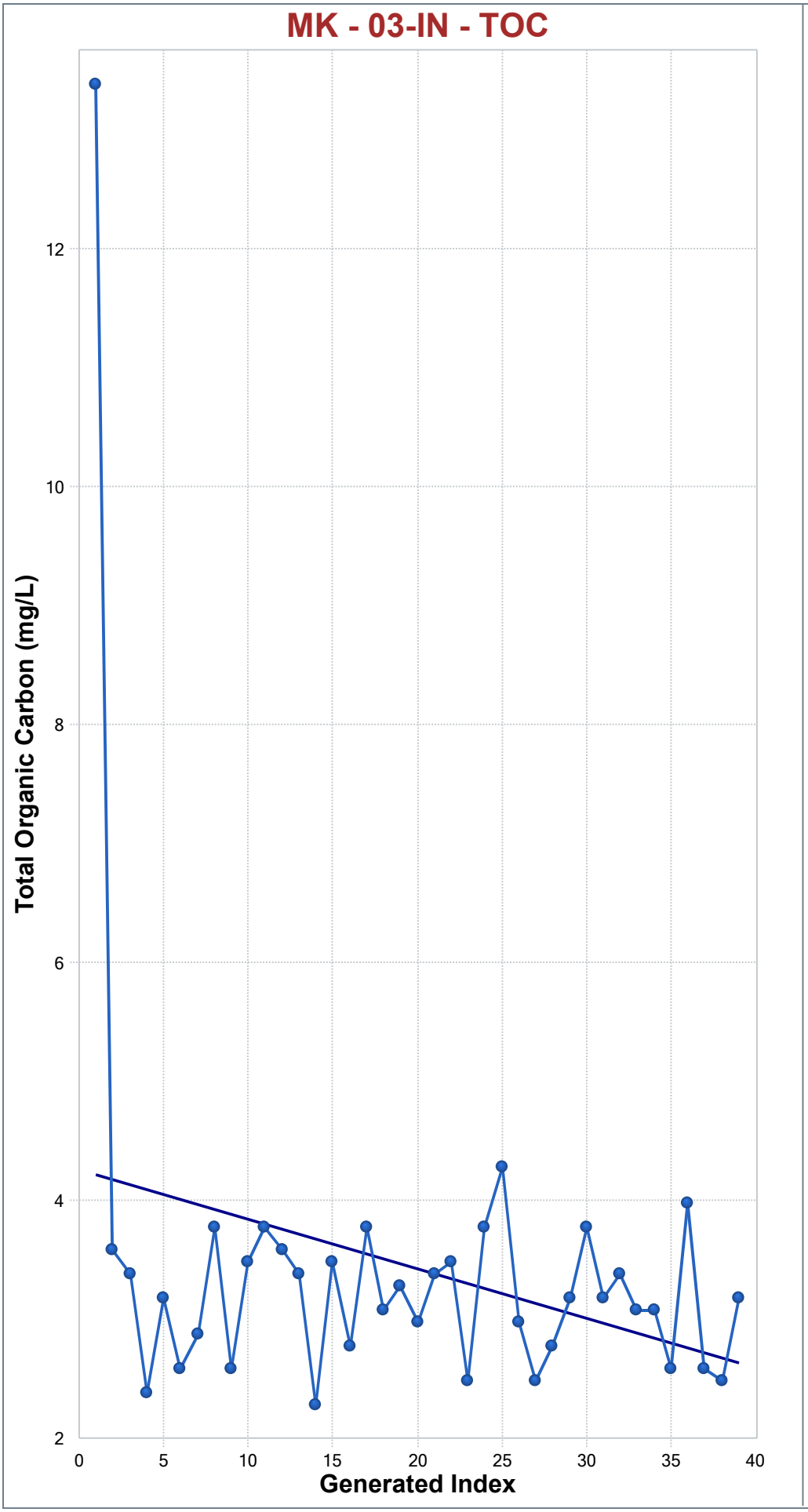
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.8736
Standardized Value of S	-4.7359
M-K Test Value (S)	-725
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-2.6957
OLS Regression Intercept	670.3296

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



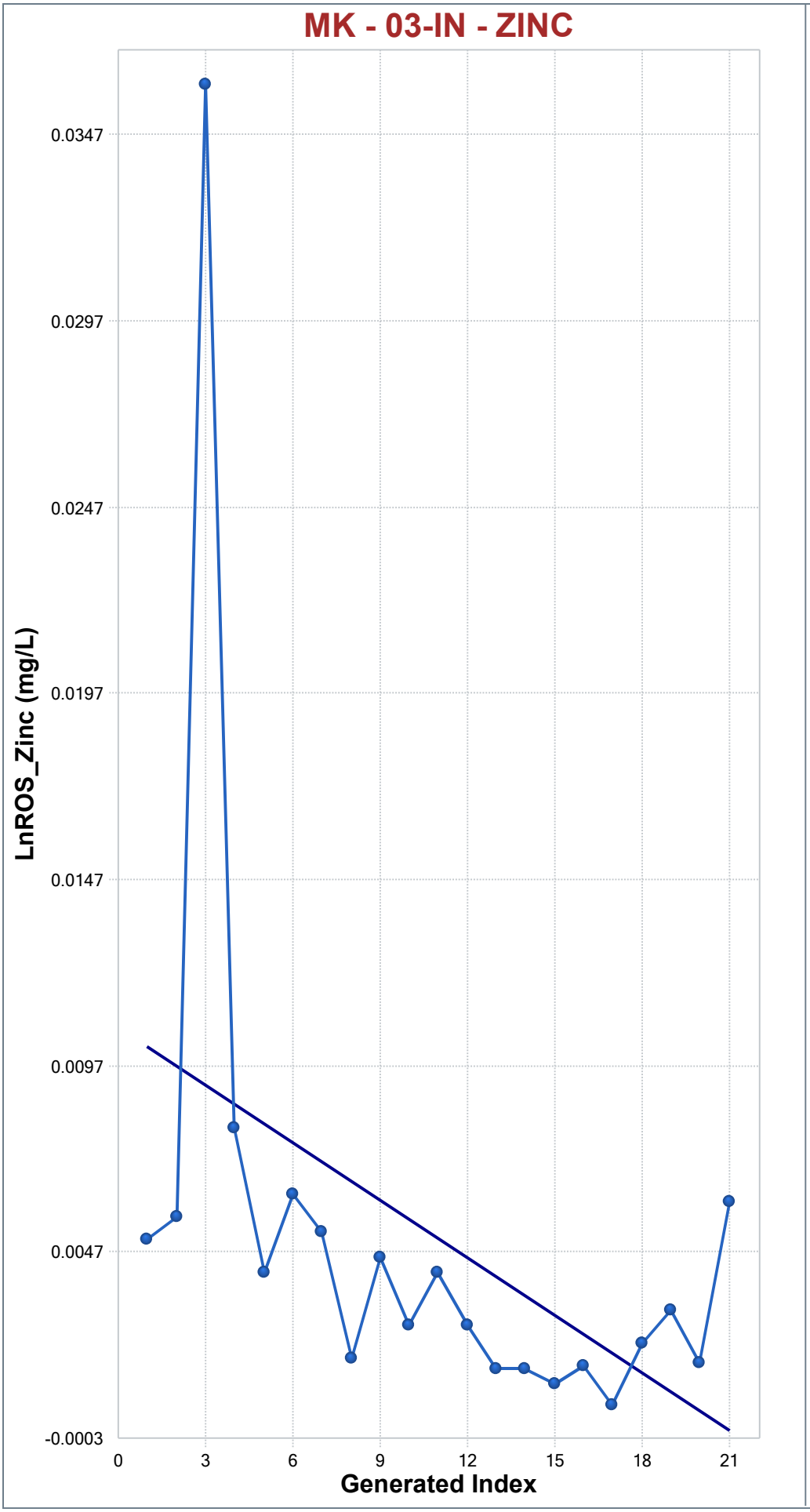
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.3225
Standardized Value of S	-0.9961
M-K Test Value (S)	-83
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1596

OLS Regression Line (Blue)

OLS Regression Slope	-0.0415
OLS Regression Intercept	4.6791

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



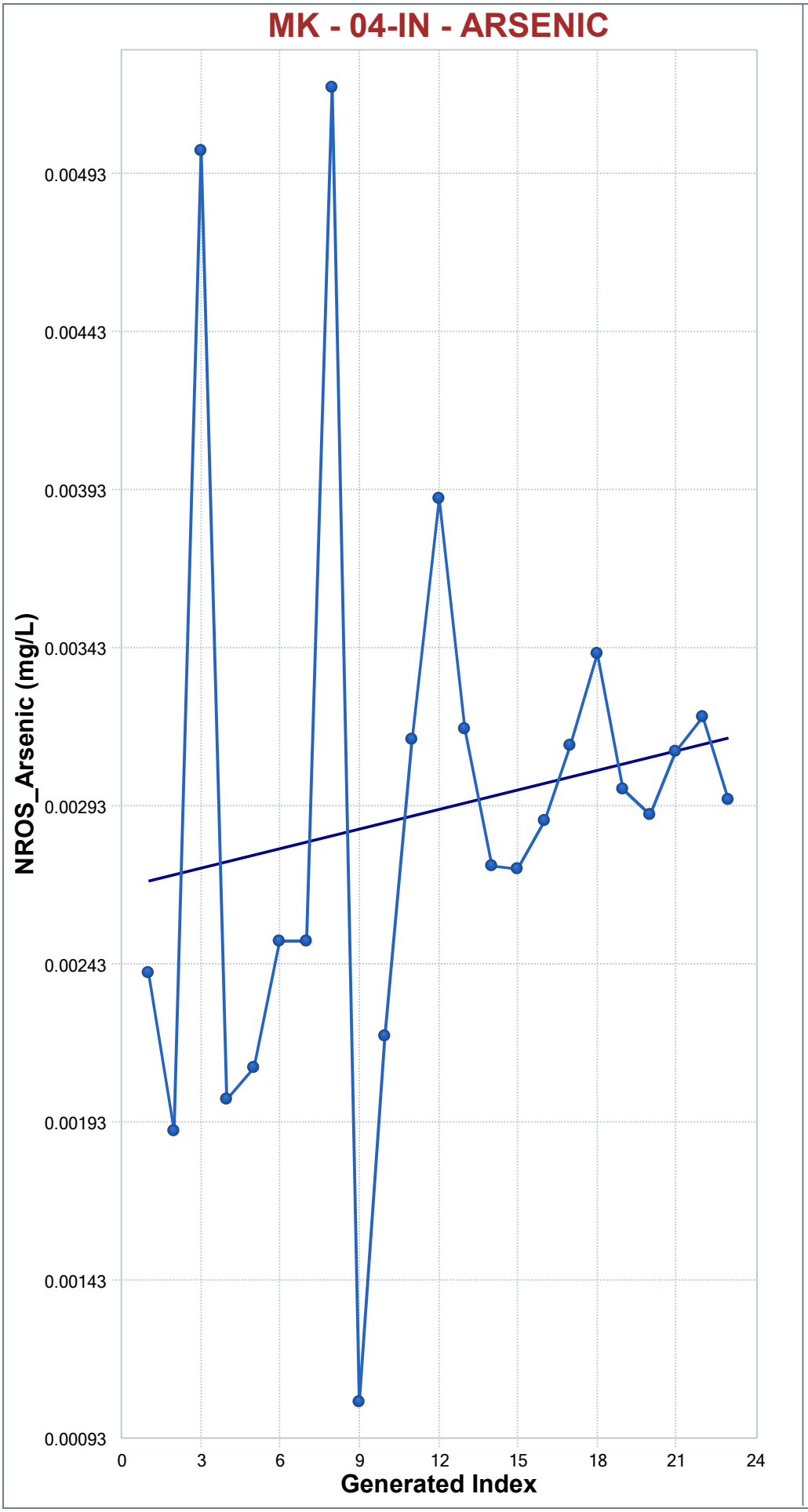
Mann-Kendall Trend Analysis

n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	33.0706
Standardized Value of S	-2.8424
M-K Test Value (S)	-95
Tabulated p-value	0.0020
Approximate p-value	0.0022

OLS Regression Line (Blue)

OLS Regression Slope	-0.0005
OLS Regression Intercept	0.0107

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



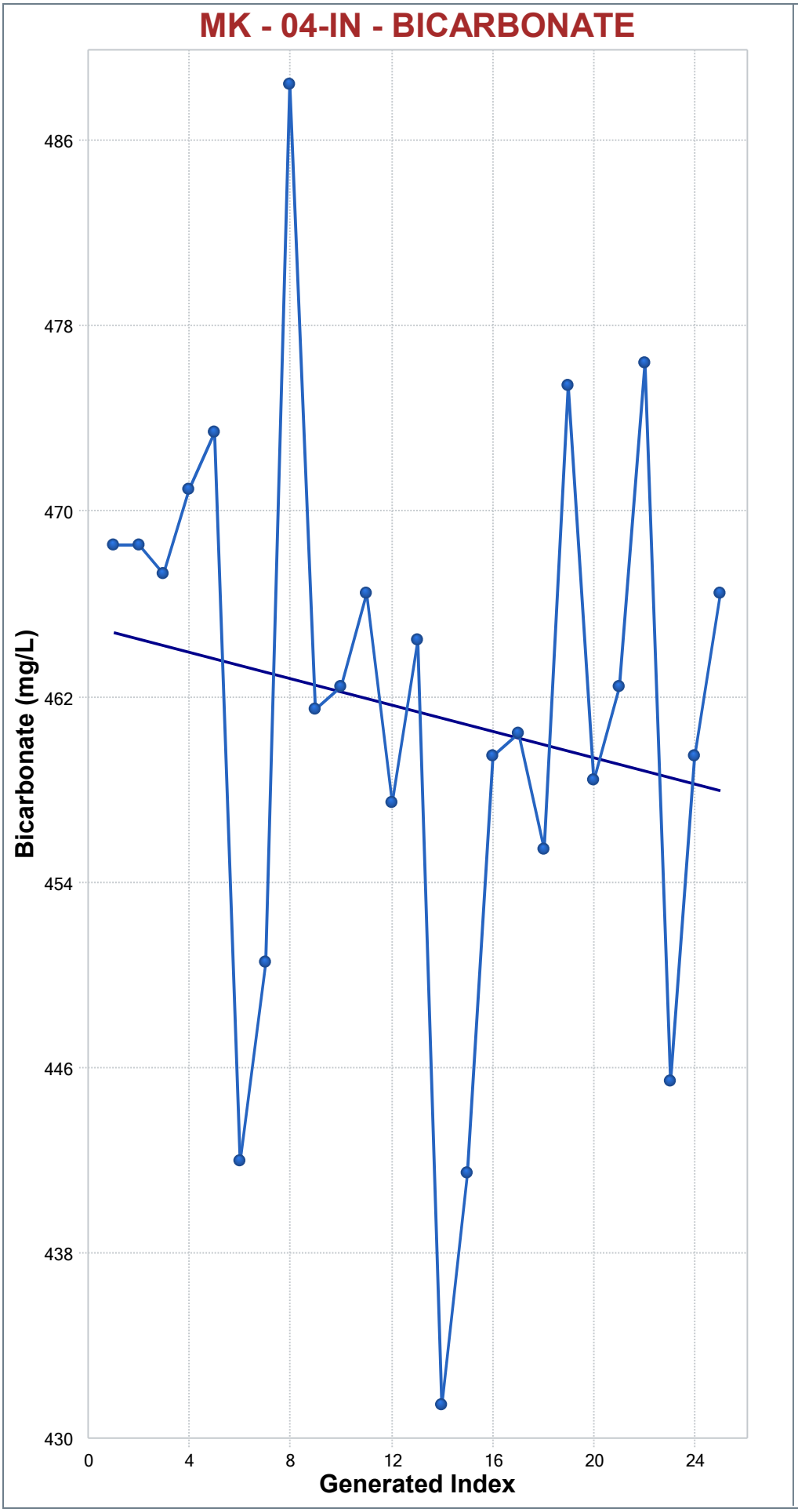
Mann-Kendall Trend Analysis

n	23
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	37.8506
Standardized Value of S	2.0343
M-K Test Value (S)	78
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0210

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0027

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



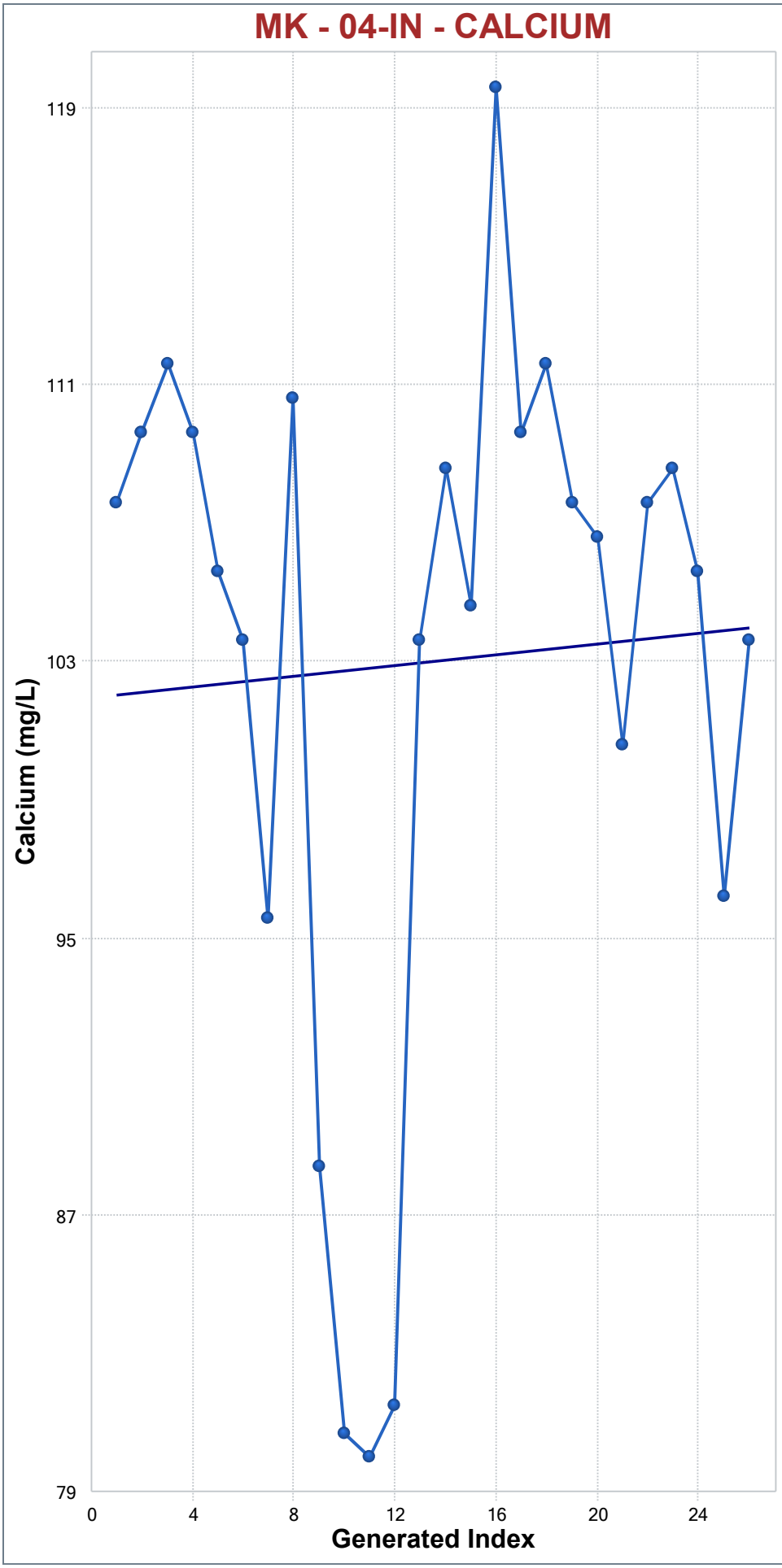
Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7707
Standardized Value of S	-1.0054
M-K Test Value (S)	-44
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1574

OLS Regression Line (Blue)

OLS Regression Slope	-0.2861
OLS Regression Intercept	464.6470

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



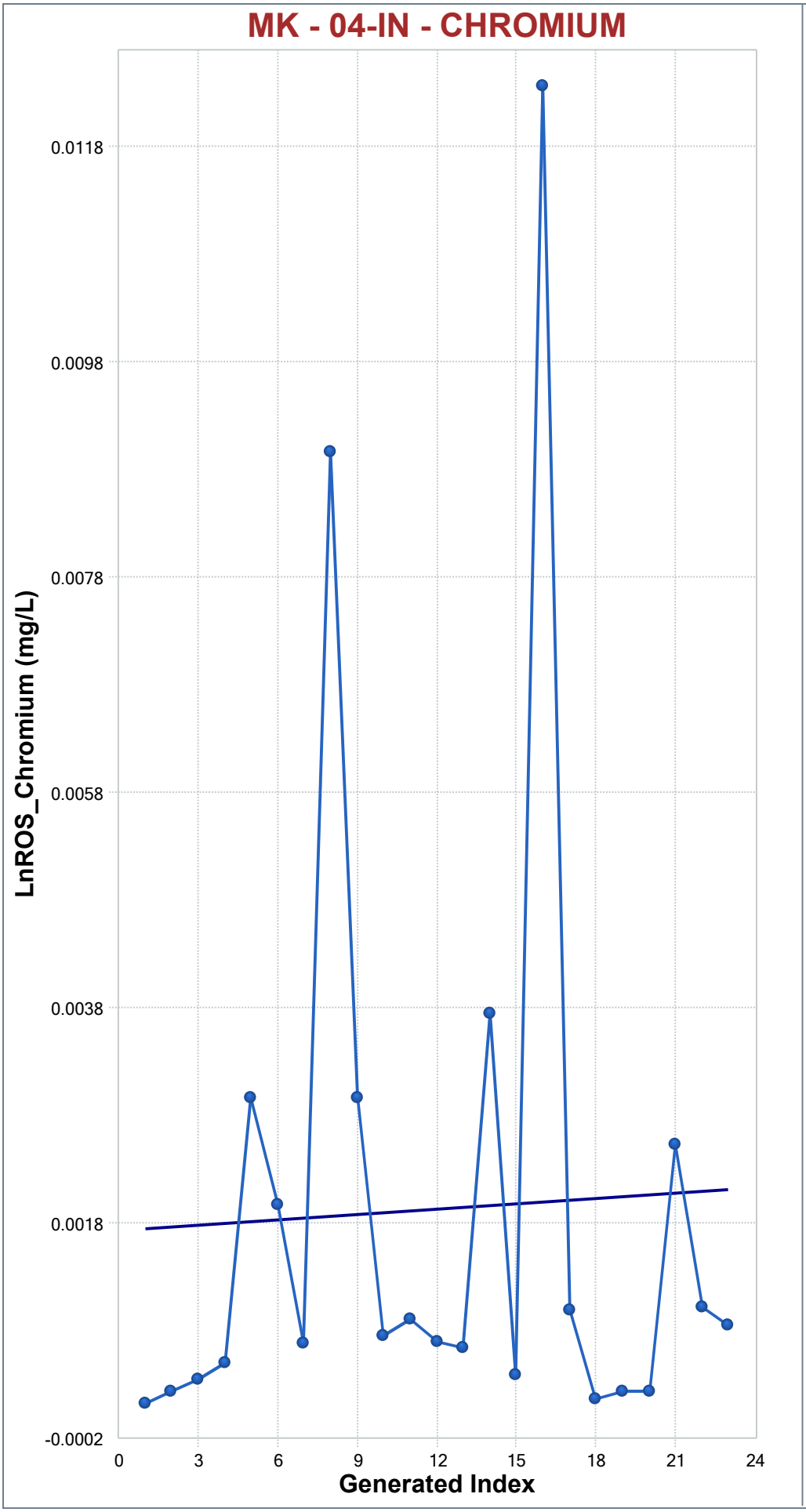
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.2143
Standardized Value of S	-0.5750
M-K Test Value (S)	-27
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2826

OLS Regression Line (Blue)

OLS Regression Slope	0.0784
OLS Regression Intercept	102.3575

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



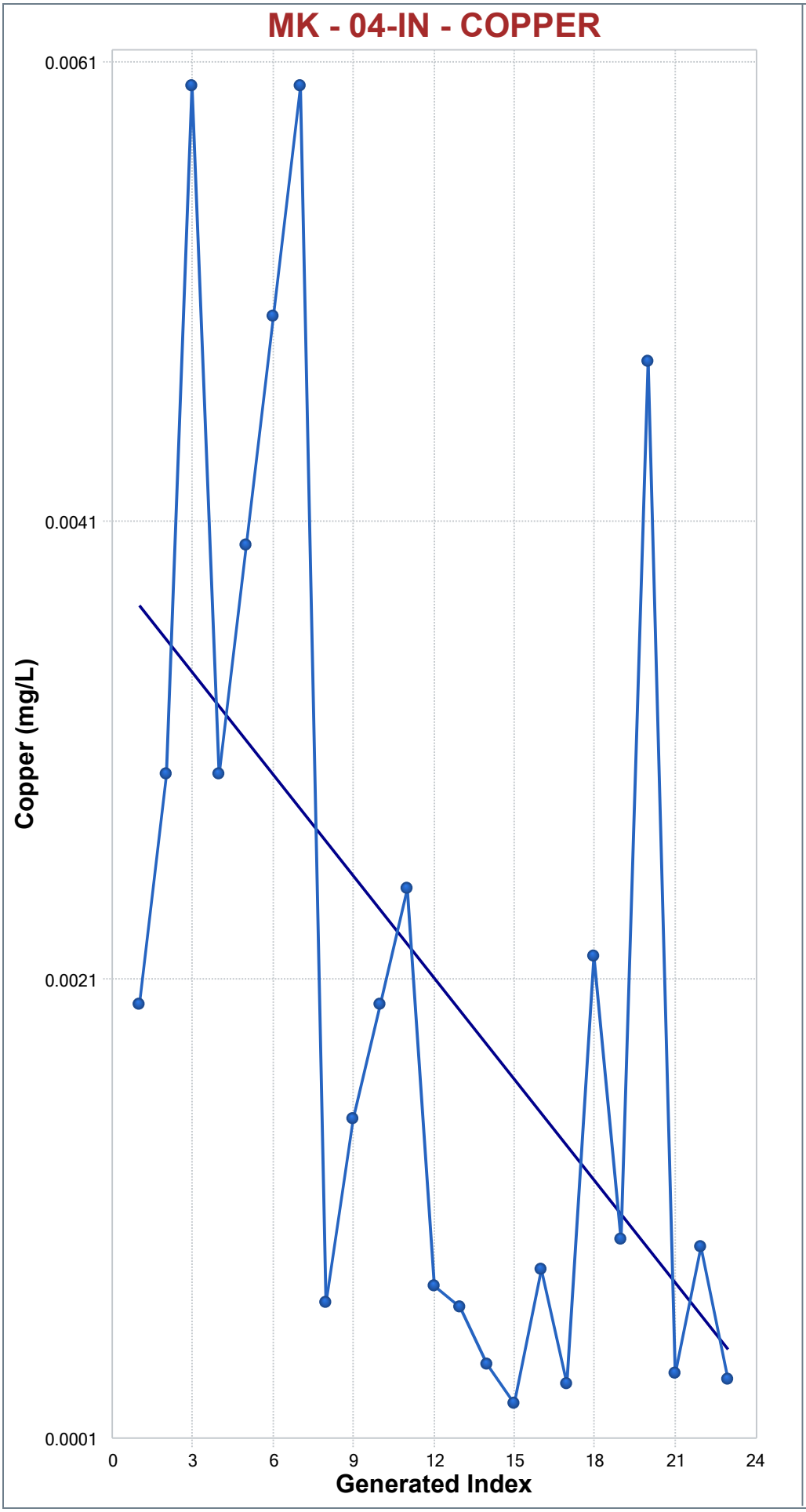
Mann-Kendall Trend Analysis

n	23
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	37.8374
Standardized Value of S	0.6343
M-K Test Value (S)	25
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2629

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0018

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



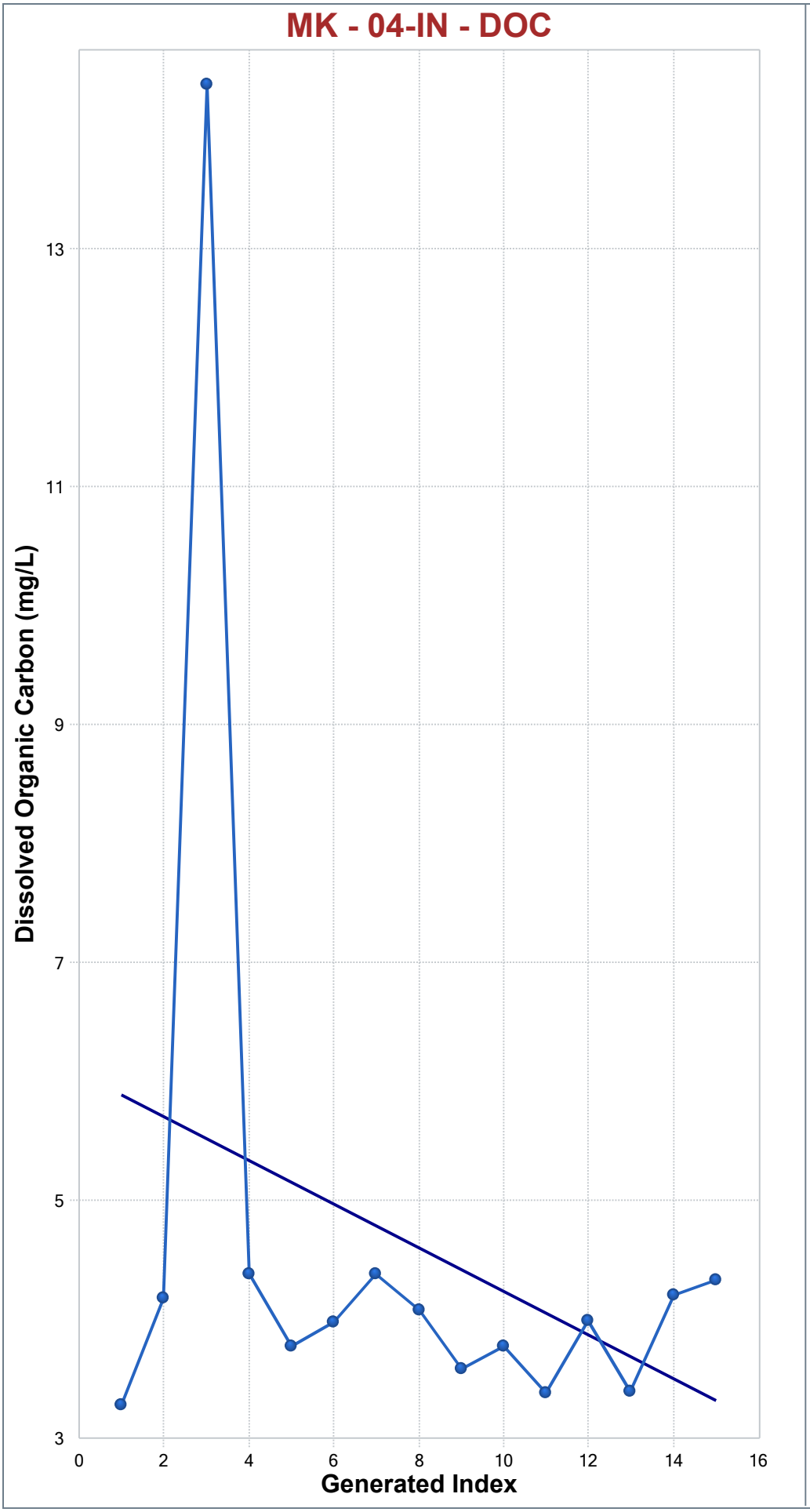
Mann-Kendall Trend Analysis

n	23
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	37.8242
Standardized Value of S	-2.6174
M-K Test Value (S)	-100
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0044

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0039

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



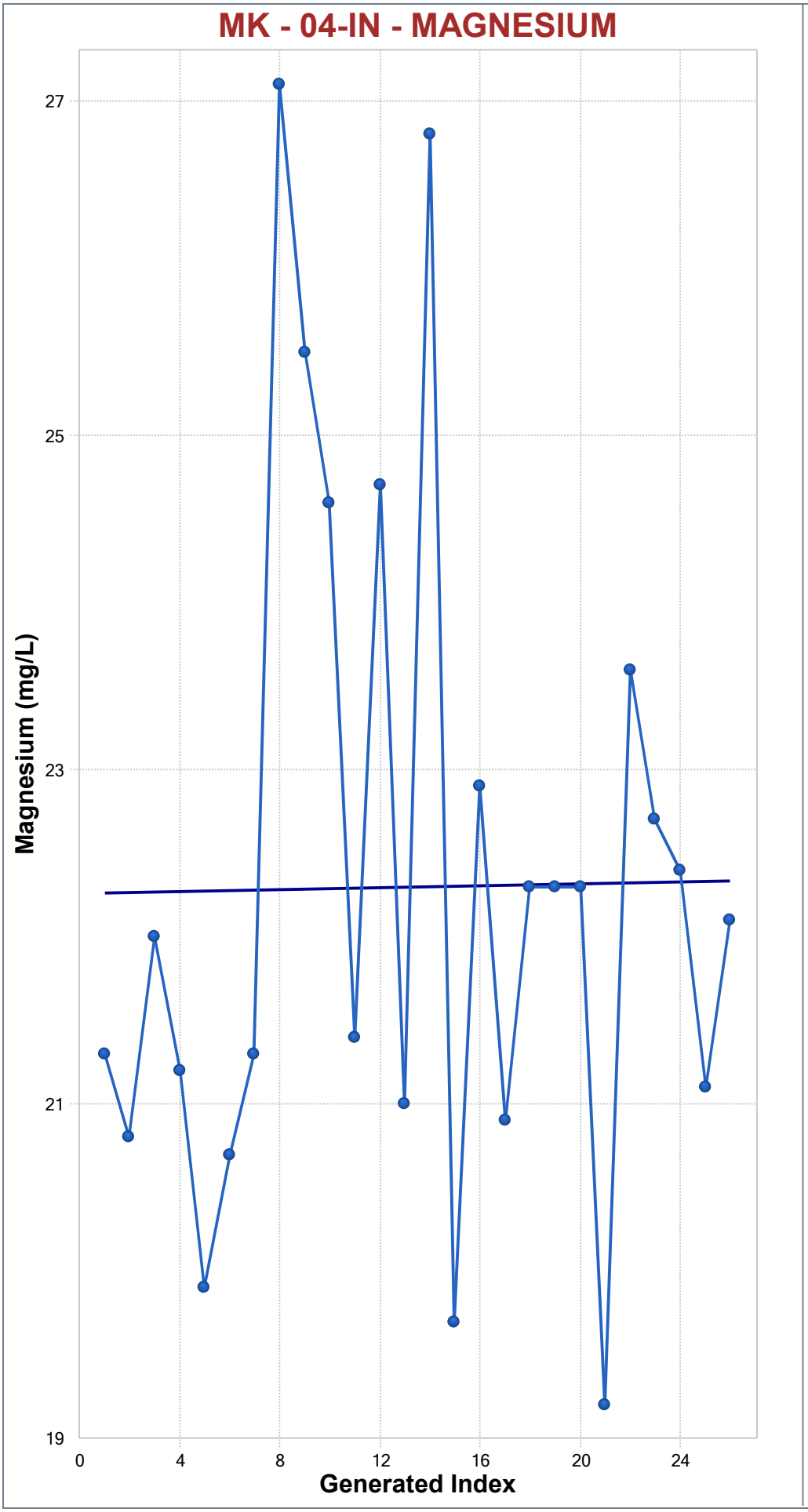
Mann-Kendall Trend Analysis

n	15
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	20.1577
Standardized Value of S	-0.2977
M-K Test Value (S)	-7
Tabulated p-value	0.3850
Approximate p-value	0.3830

OLS Regression Line (Blue)

OLS Regression Slope	-0.1835
OLS Regression Intercept	5.8953

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



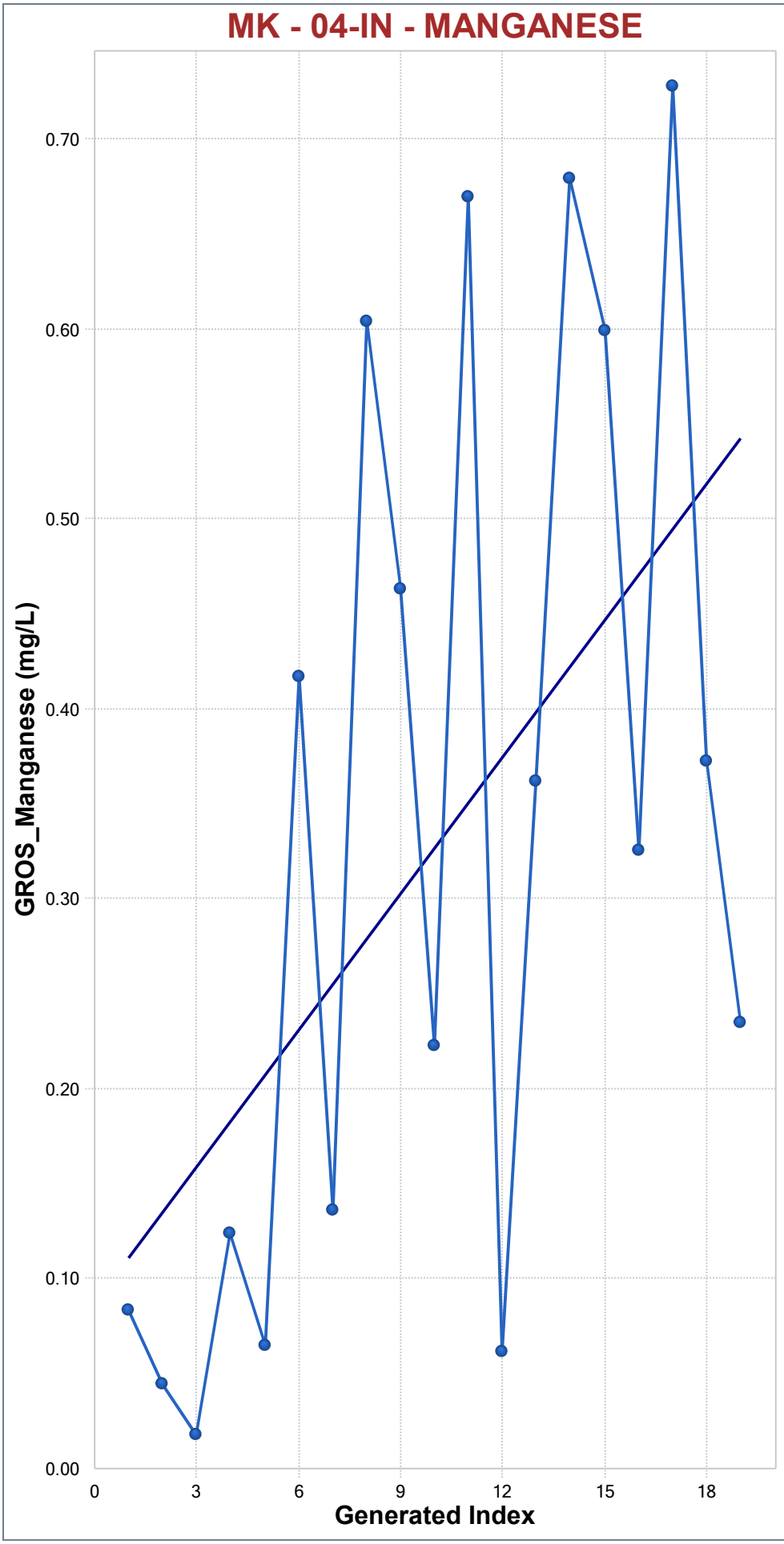
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3174
Standardized Value of S	0.4855
M-K Test Value (S)	23
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3137

OLS Regression Line (Blue)

OLS Regression Slope	0.0027
OLS Regression Intercept	22.5631

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



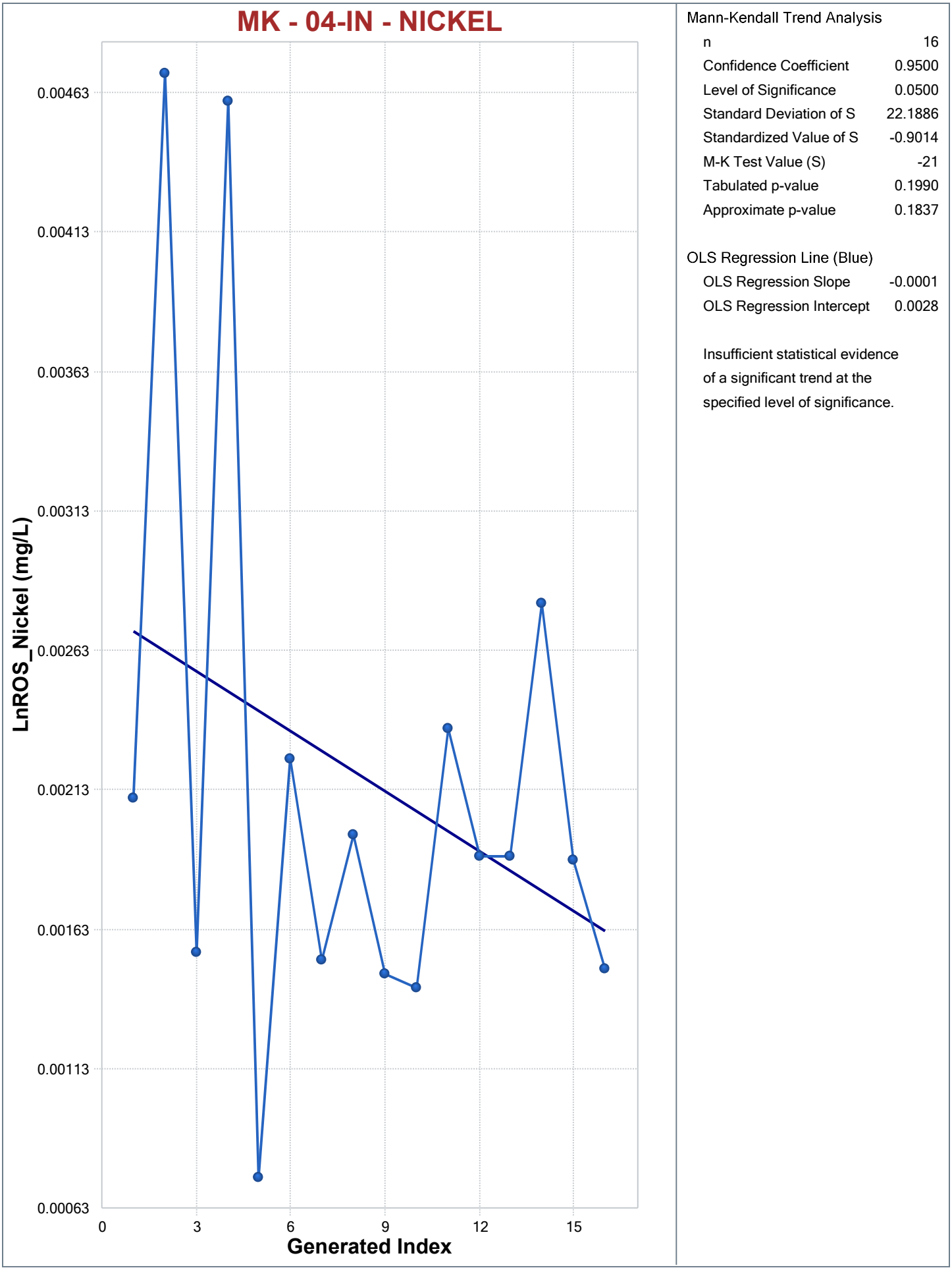
Mann-Kendall Trend Analysis

n	19
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	28.5832
Standardized Value of S	2.4490
M-K Test Value (S)	71
Tabulated p-value	0.0060
Approximate p-value	0.0072

OLS Regression Line (Blue)

OLS Regression Slope	0.0240
OLS Regression Intercept	0.0859

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



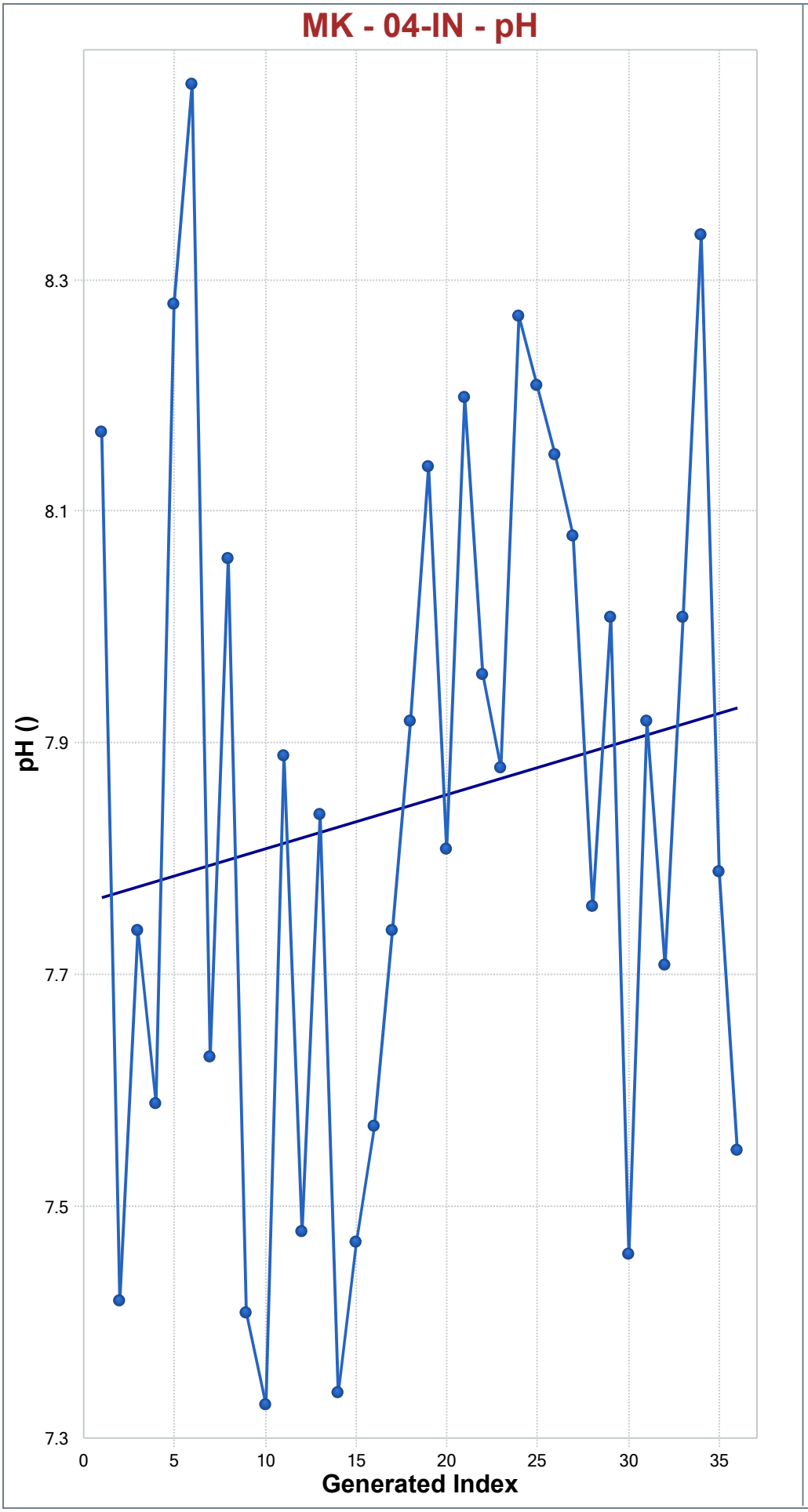
Mann-Kendall Trend Analysis

n	16
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	22.1886
Standardized Value of S	-0.9014
M-K Test Value (S)	-21
Tabulated p-value	0.1990
Approximate p-value	0.1837

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0028

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



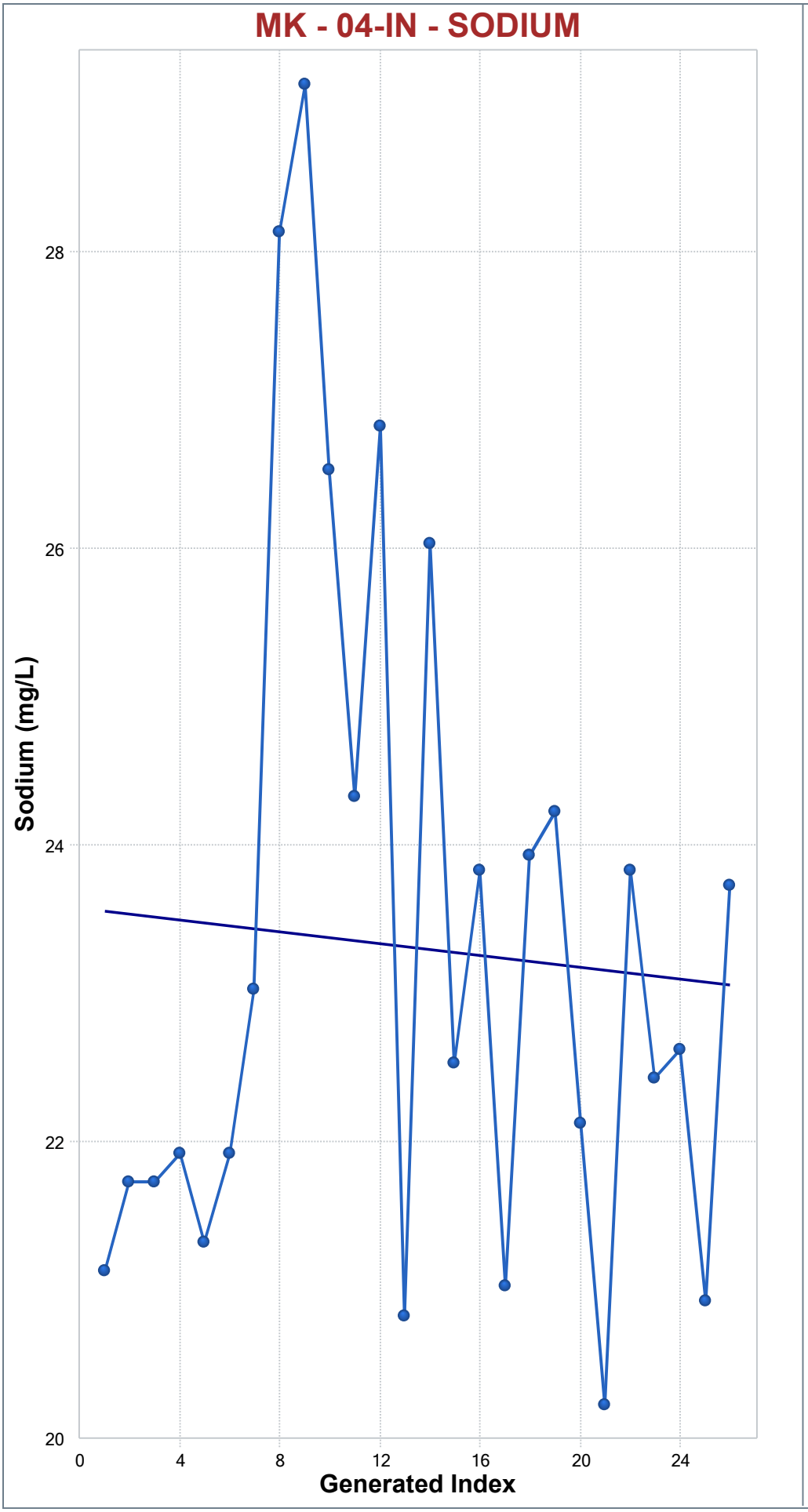
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3962
Standardized Value of S	1.0082
M-K Test Value (S)	75
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1567

OLS Regression Line (Blue)

OLS Regression Slope	0.0047
OLS Regression Intercept	7.7329

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



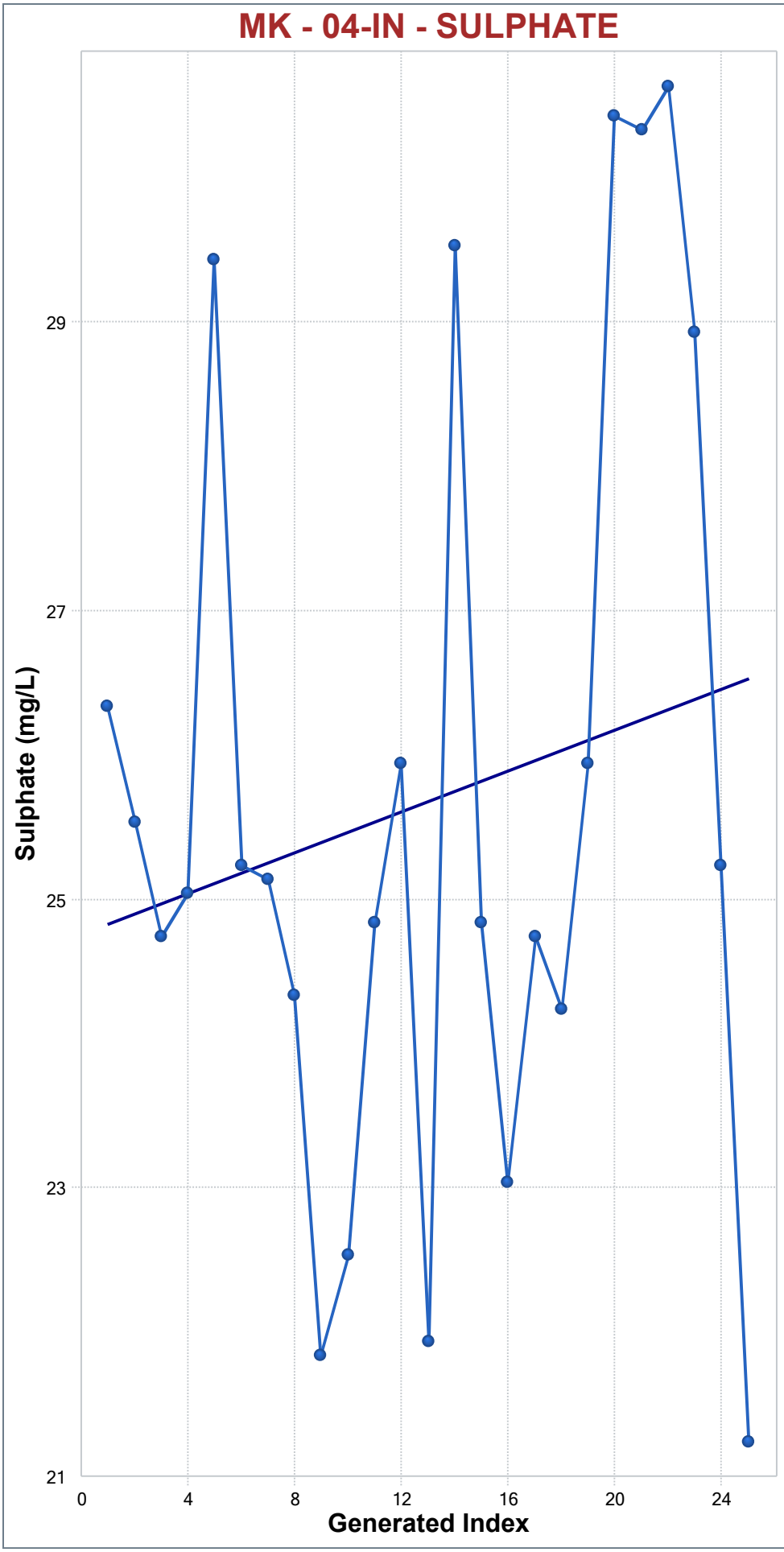
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3358
Standardized Value of S	0.0221
M-K Test Value (S)	2
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4912

OLS Regression Line (Blue)

OLS Regression Slope	-0.0199
OLS Regression Intercept	23.7489

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



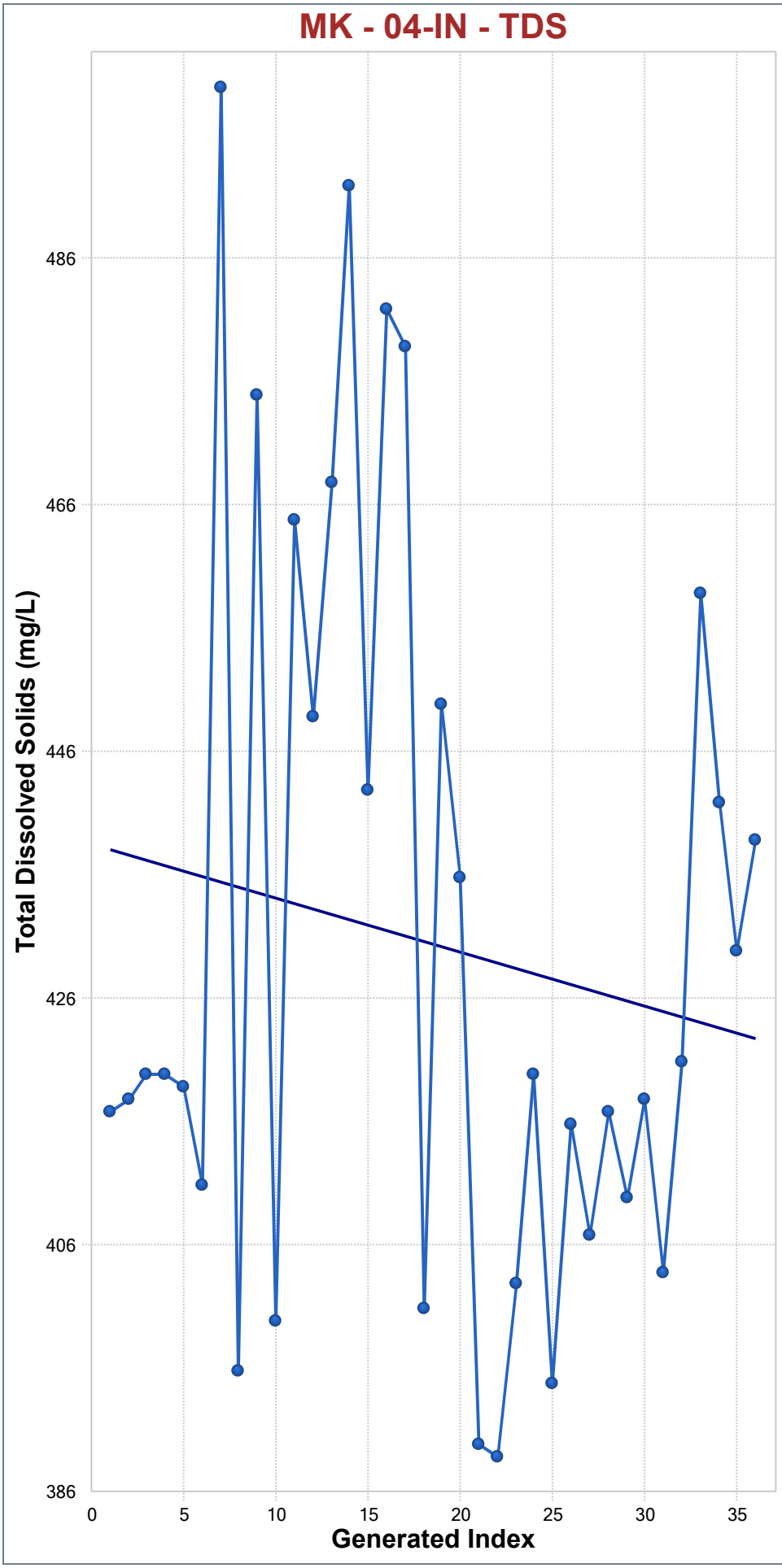
Mann-Kendall Trend Analysis

n	25
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	42.7707
Standardized Value of S	0.3507
M-K Test Value (S)	16
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3629

OLS Regression Line (Blue)

OLS Regression Slope	0.0712
OLS Regression Intercept	25.1190

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



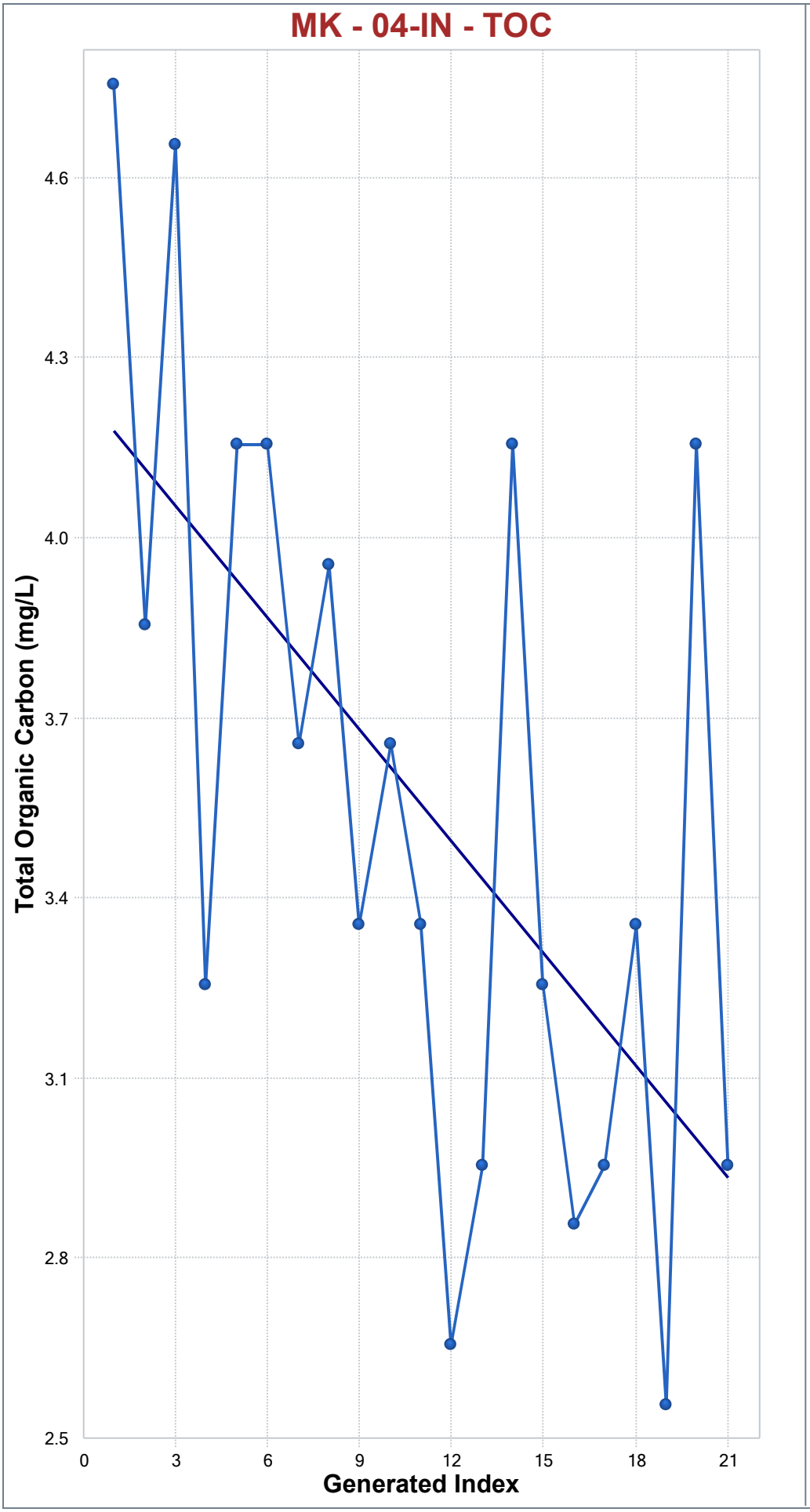
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3780
Standardized Value of S	-0.4361
M-K Test Value (S)	-33
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3314

OLS Regression Line (Blue)

OLS Regression Slope	-0.4377
OLS Regression Intercept	438.6810

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



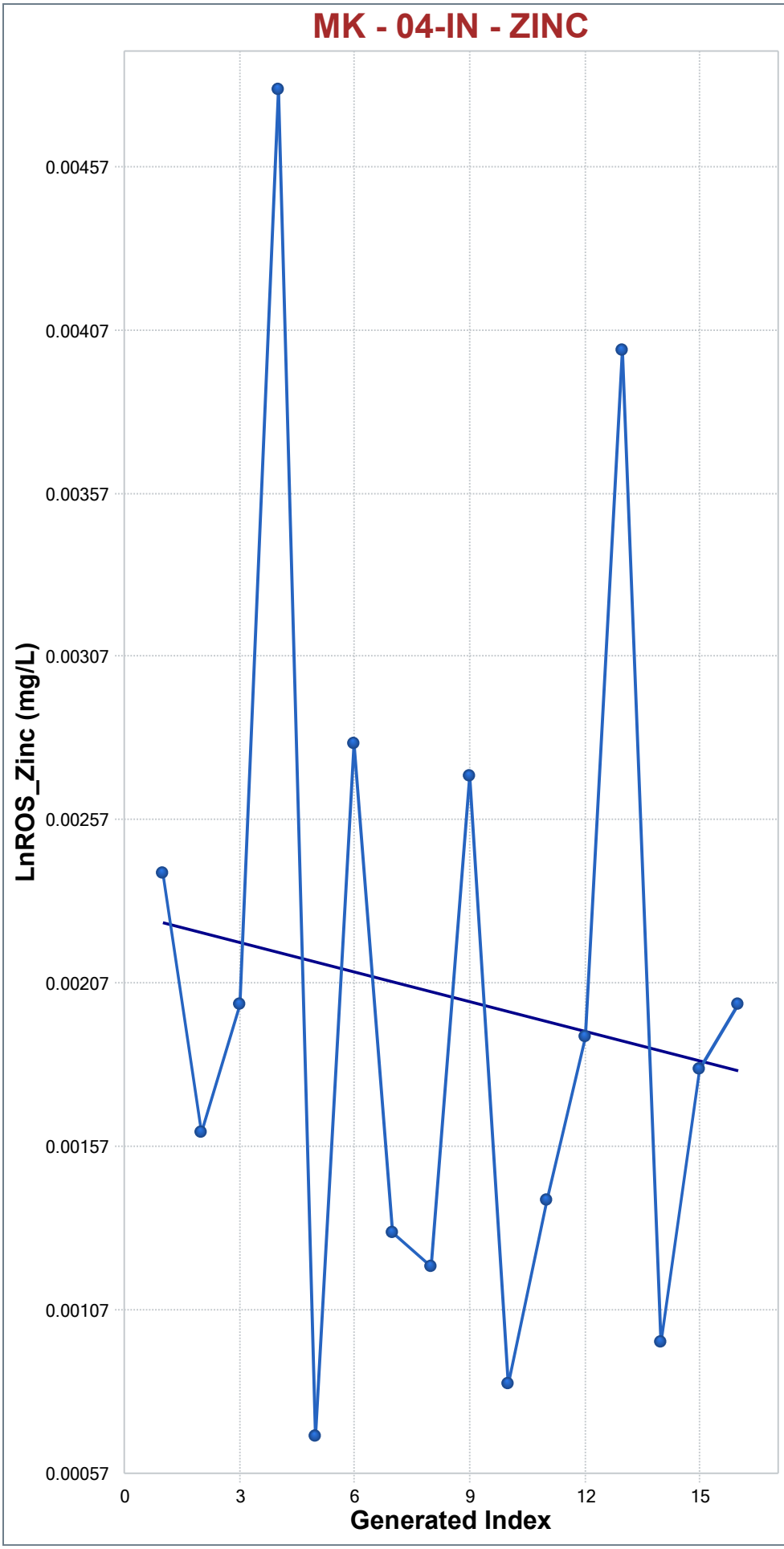
Mann-Kendall Trend Analysis

n	21
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	32.8431
Standardized Value of S	-2.8316
M-K Test Value (S)	-94
Tabulated p-value	0.0020
Approximate p-value	0.0023

OLS Regression Line (Blue)

OLS Regression Slope	-0.0622
OLS Regression Intercept	4.2843

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



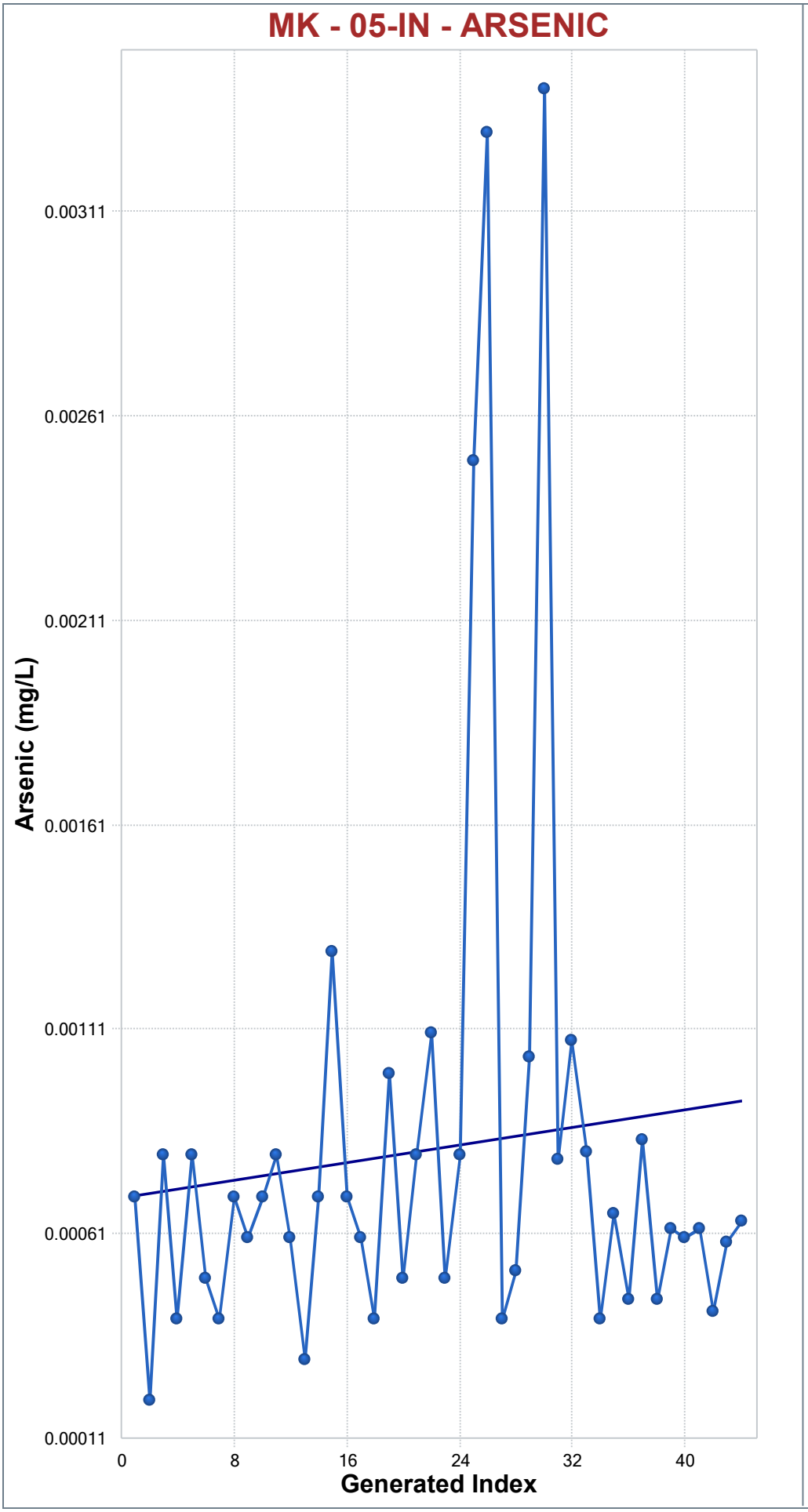
Mann-Kendall Trend Analysis

n	16
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	22.1886
Standardized Value of S	-0.2704
M-K Test Value (S)	-7
Tabulated p-value	0.4120
Approximate p-value	0.3934

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0023

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



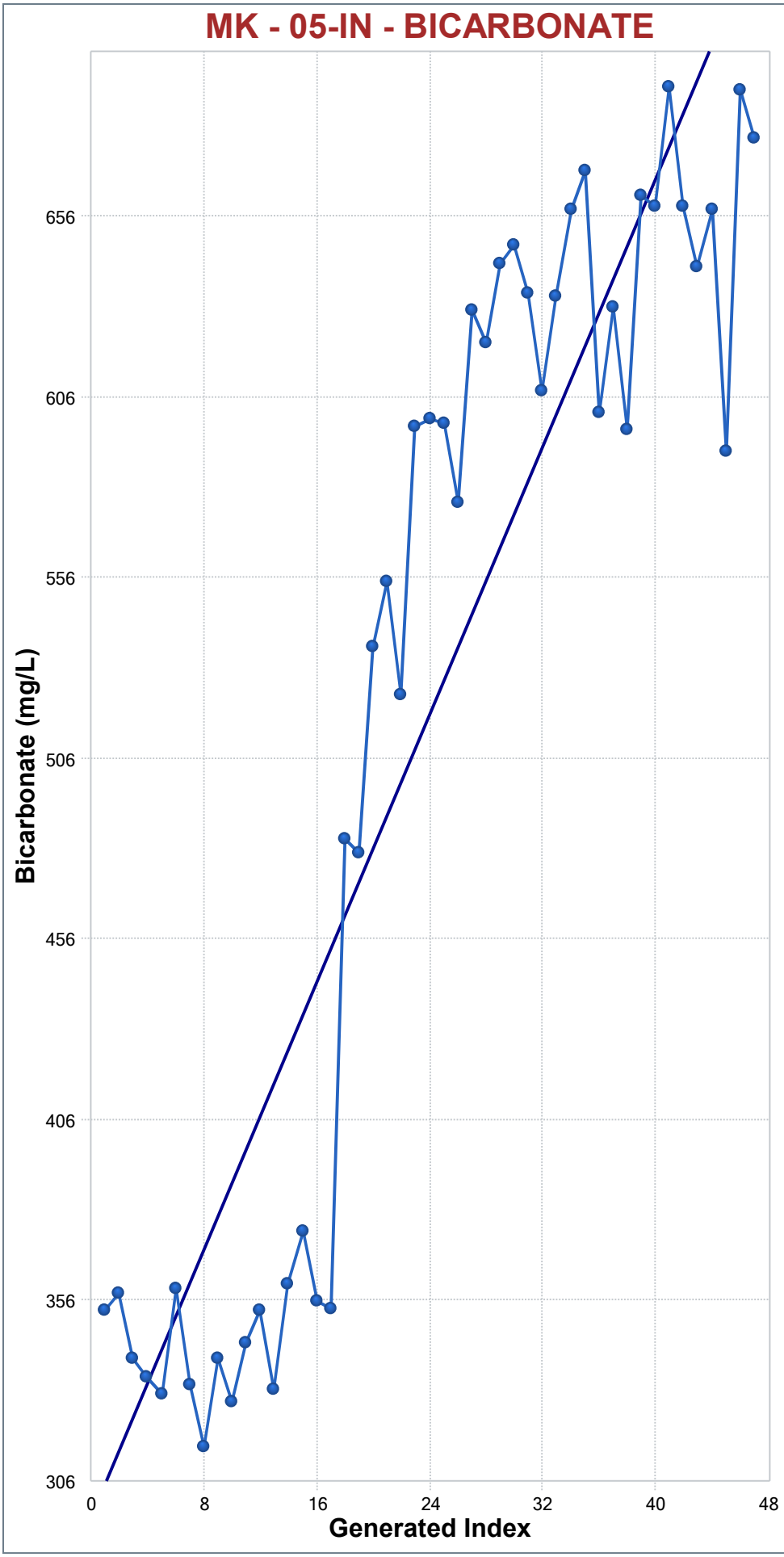
Mann-Kendall Trend Analysis

n	44
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	98.5444
Standardized Value of S	0.4465
M-K Test Value (S)	45
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3276

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0007

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



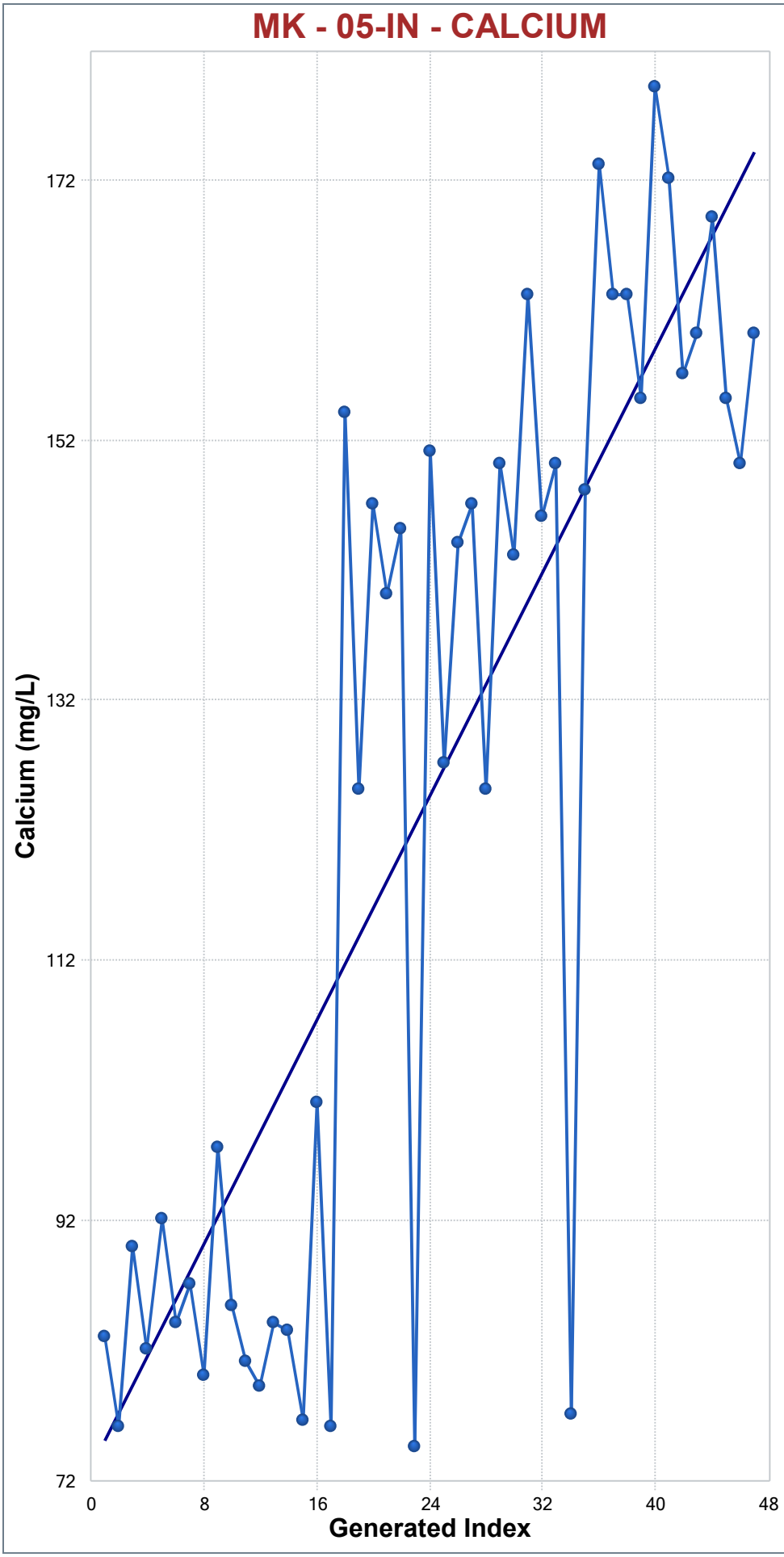
Mann-Kendall Trend Analysis

n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	109.0275
Standardized Value of S	7.2092
M-K Test Value (S)	787
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	9.2711
OLS Regression Intercept	295.1866

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



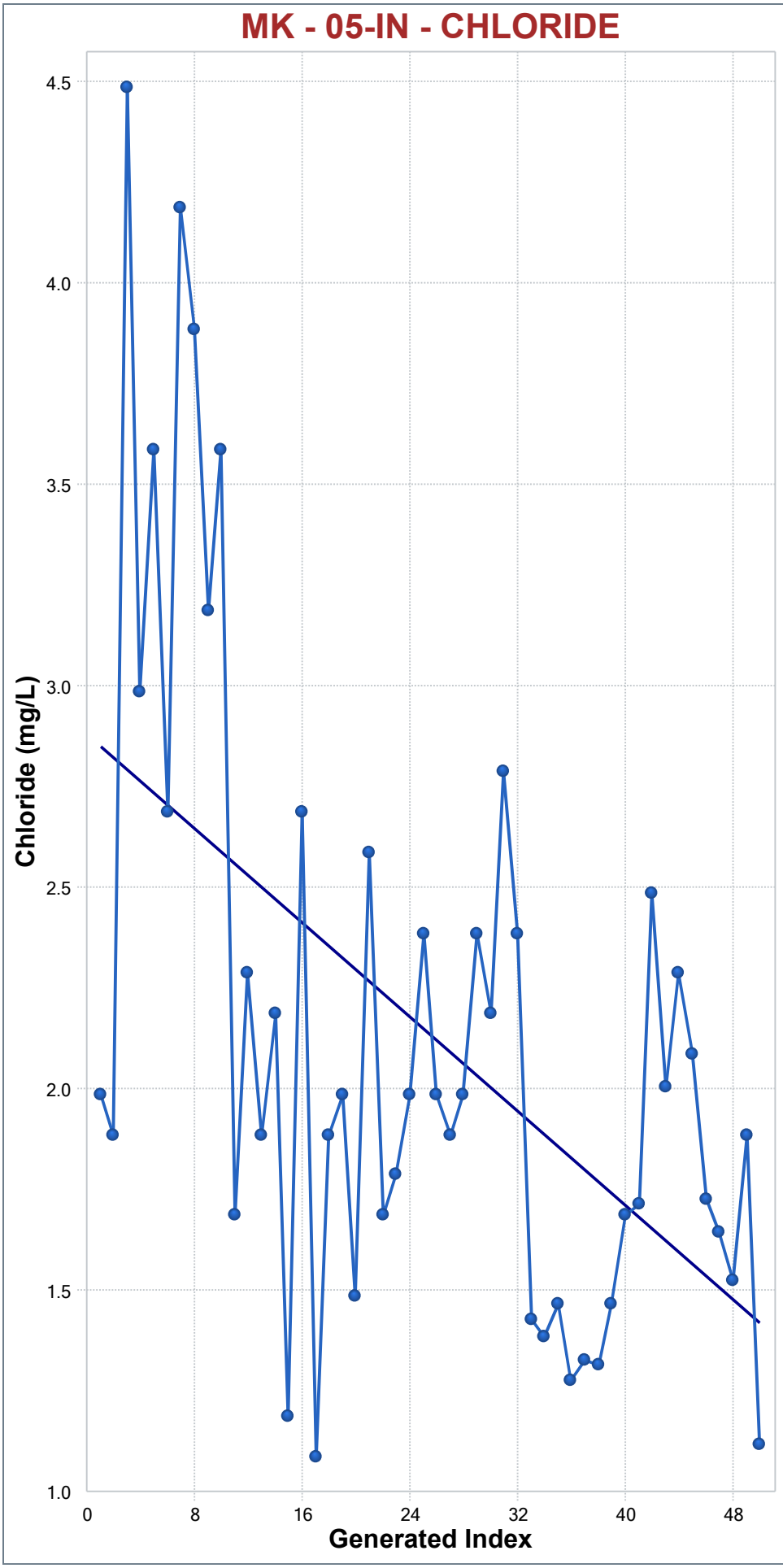
Mann-Kendall Trend Analysis

n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	108.9847
Standardized Value of S	5.6338
M-K Test Value (S)	615
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	2.1500
OLS Regression Intercept	72.8779

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



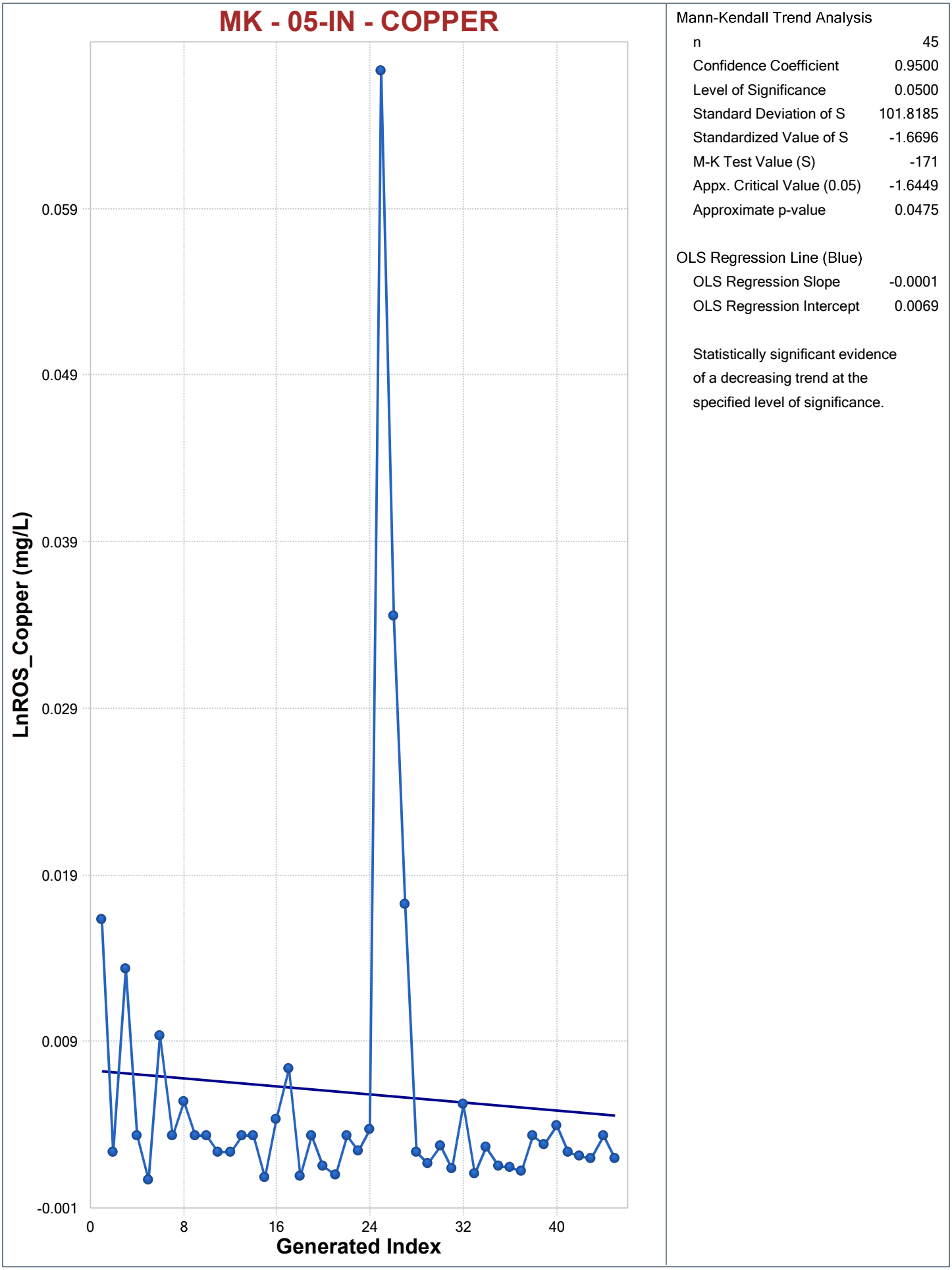
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.3566
Standardized Value of S	-3.3094
M-K Test Value (S)	-396
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0005

OLS Regression Line (Blue)

OLS Regression Slope	-0.0292
OLS Regression Intercept	2.8926

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



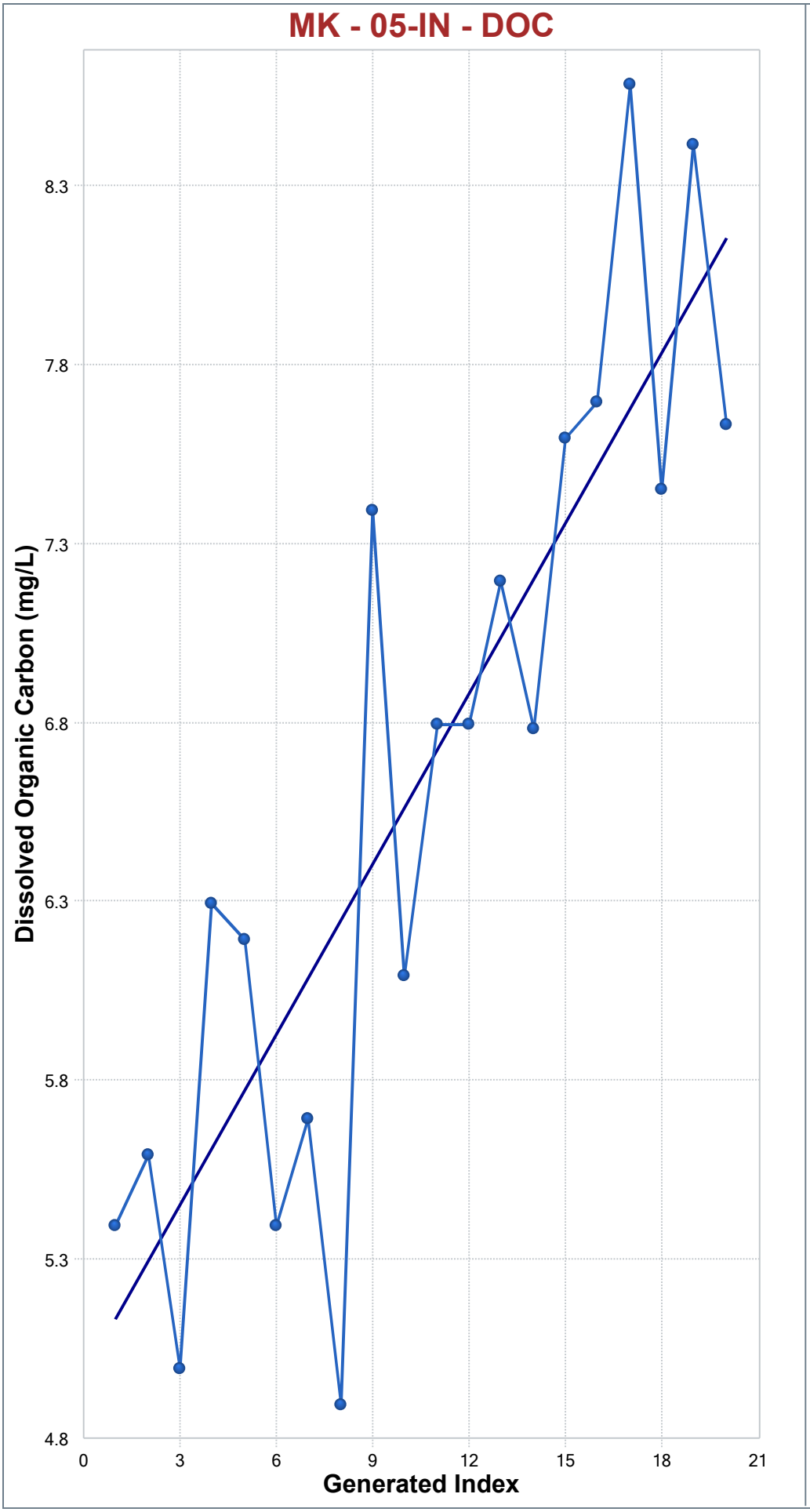
Mann-Kendall Trend Analysis

n	45
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	101.8185
Standardized Value of S	-1.6696
M-K Test Value (S)	-171
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0475

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0069

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



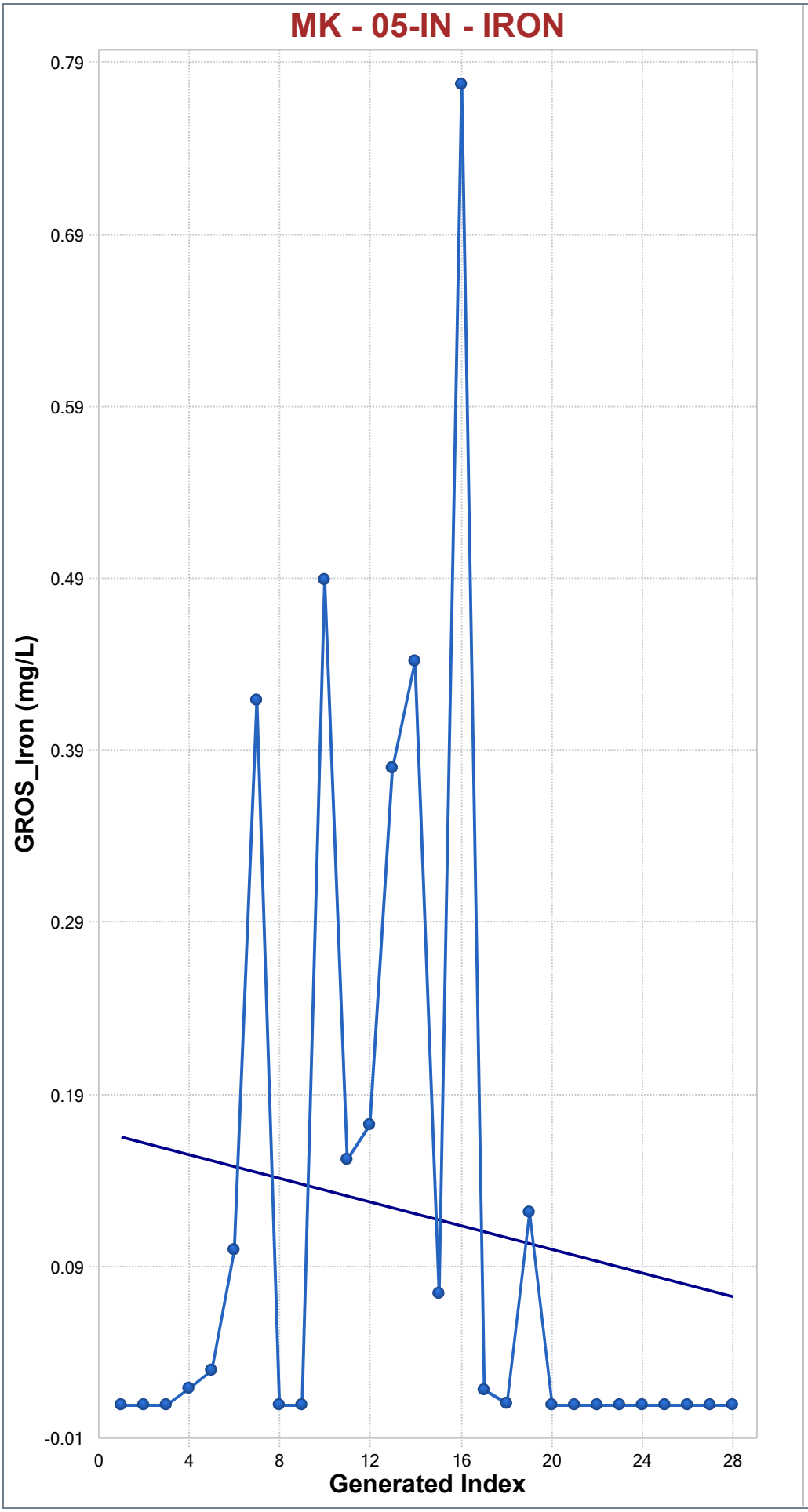
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7896
Standardized Value of S	3.9949
M-K Test Value (S)	124
Tabulated p-value	0.0000
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.1590
OLS Regression Intercept	4.9803

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



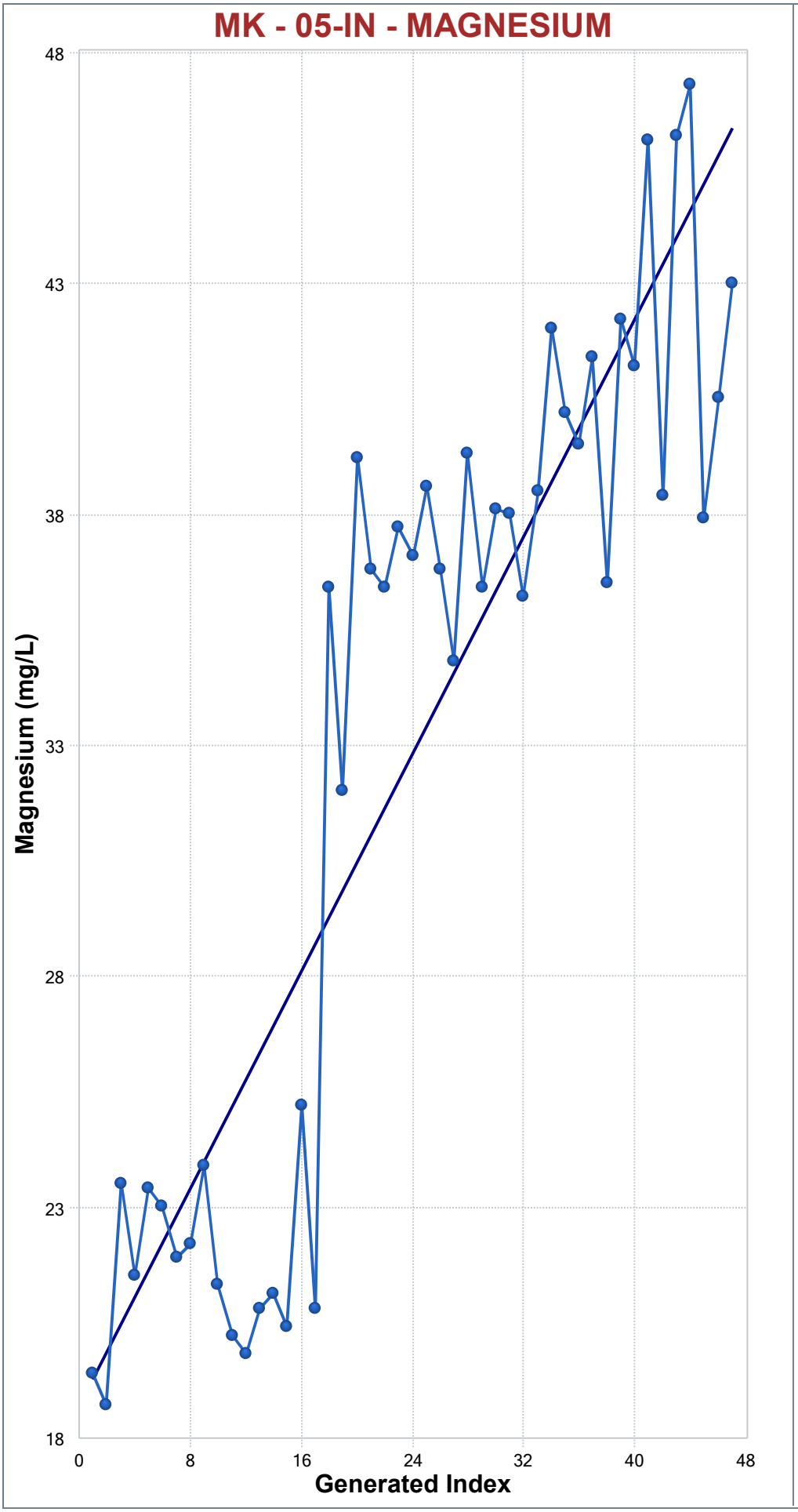
Mann-Kendall Trend Analysis

n	28
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	47.2052
Standardized Value of S	-1.4405
M-K Test Value (S)	-69
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0749

OLS Regression Line (Blue)

OLS Regression Slope	-0.0034
OLS Regression Intercept	0.1695

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



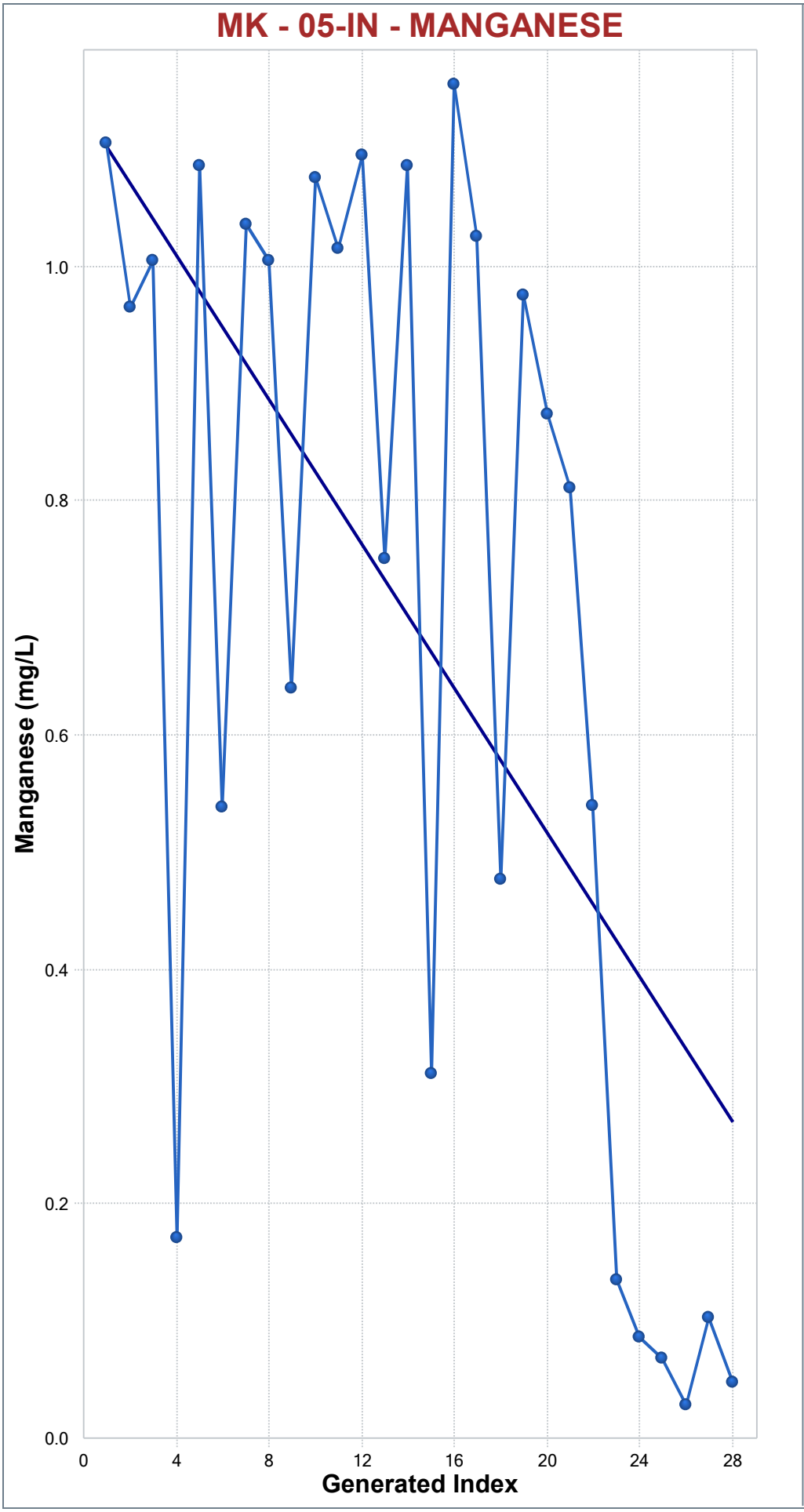
Mann-Kendall Trend Analysis

n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	109.0199
Standardized Value of S	6.5951
M-K Test Value (S)	720
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.5883
OLS Regression Intercept	18.5843

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



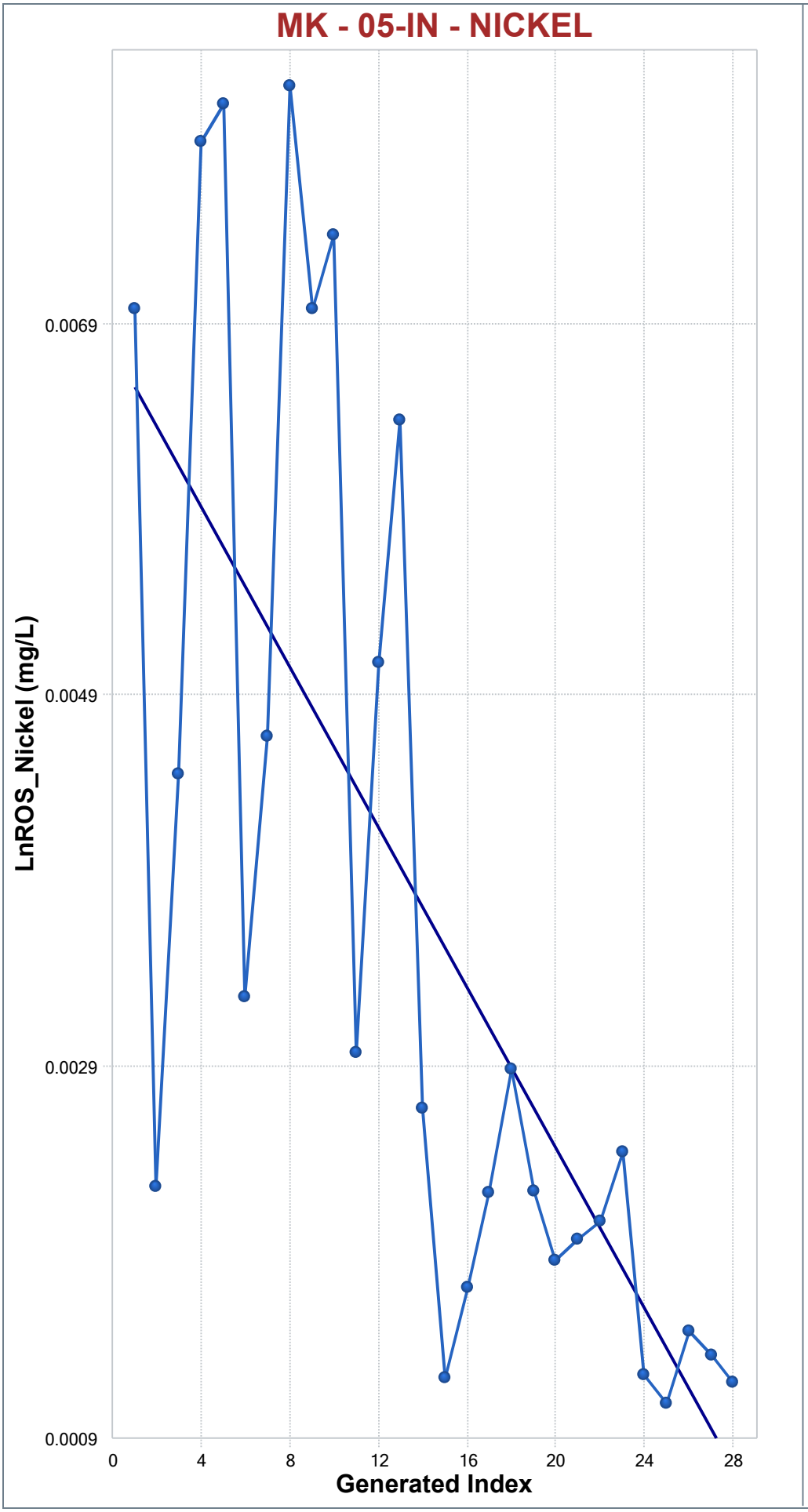
Mann-Kendall Trend Analysis

n	28
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	50.5964
Standardized Value of S	-3.3006
M-K Test Value (S)	-168
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0005

OLS Regression Line (Blue)

OLS Regression Slope	-0.0308
OLS Regression Intercept	1.1774

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



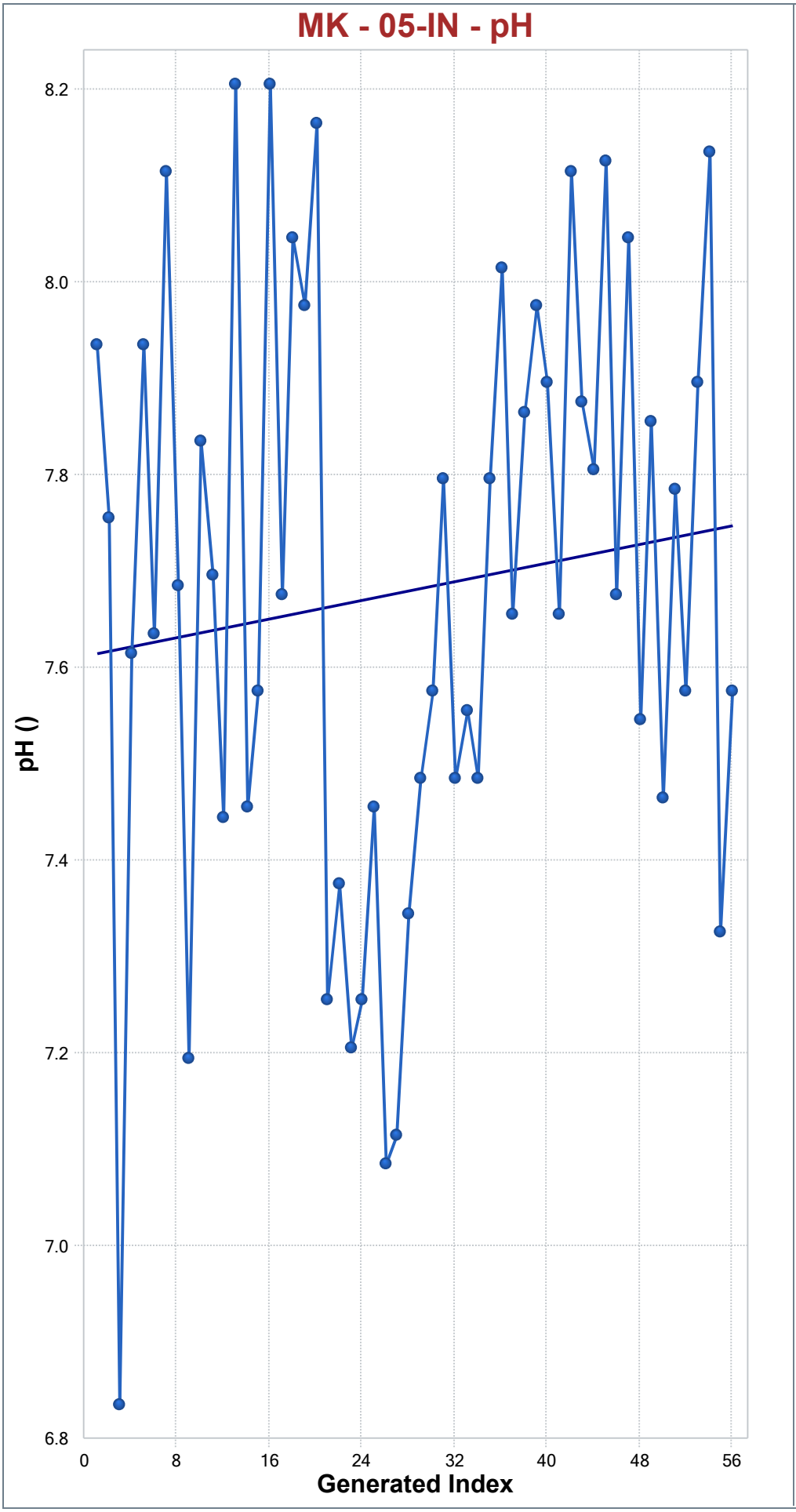
Mann-Kendall Trend Analysis

n	28
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	50.6063
Standardized Value of S	-4.3473
M-K Test Value (S)	-221
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0068

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



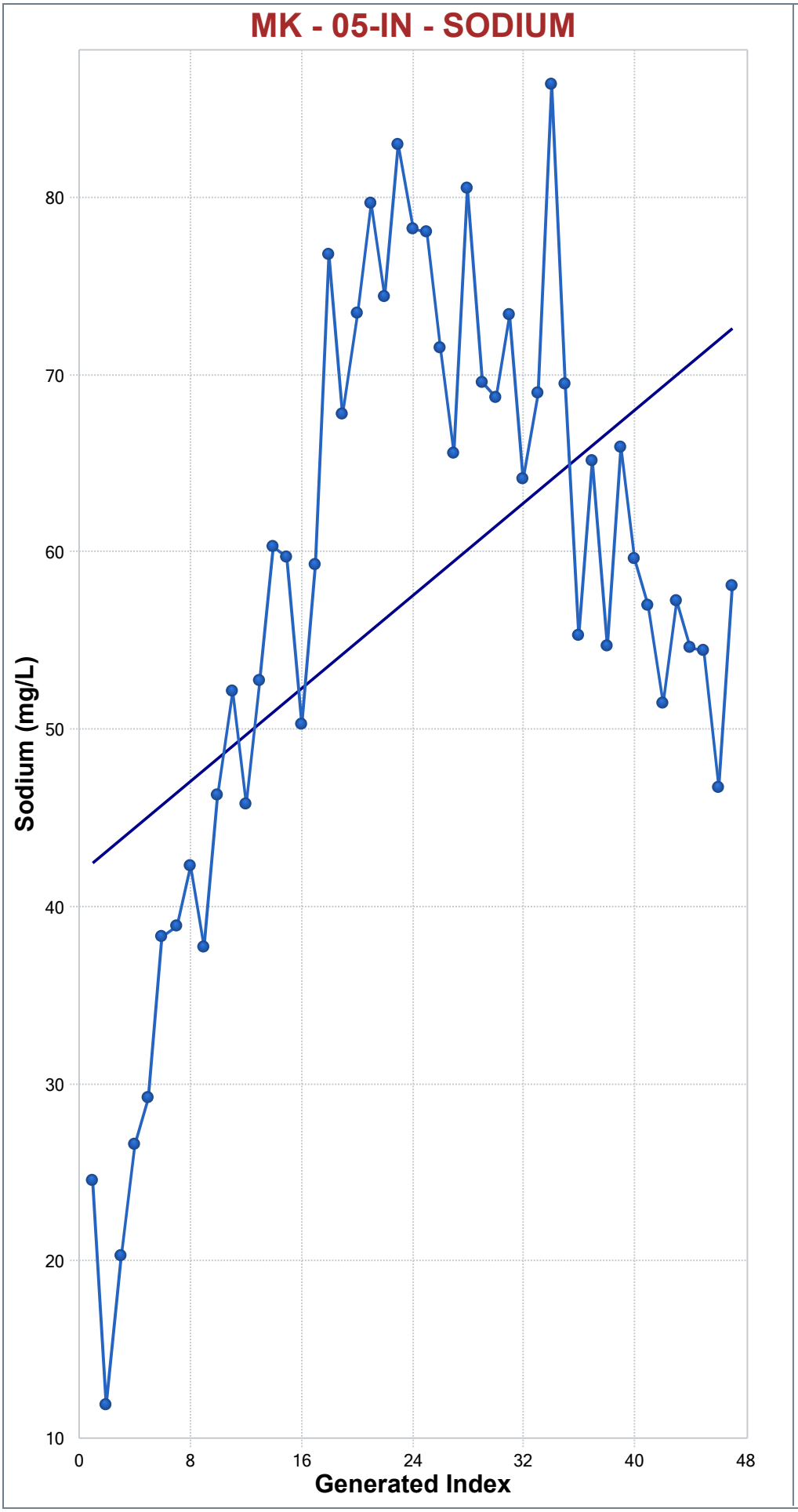
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4096
Standardized Value of S	0.8981
M-K Test Value (S)	128
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1846

OLS Regression Line (Blue)

OLS Regression Slope	0.0024
OLS Regression Intercept	7.6364

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



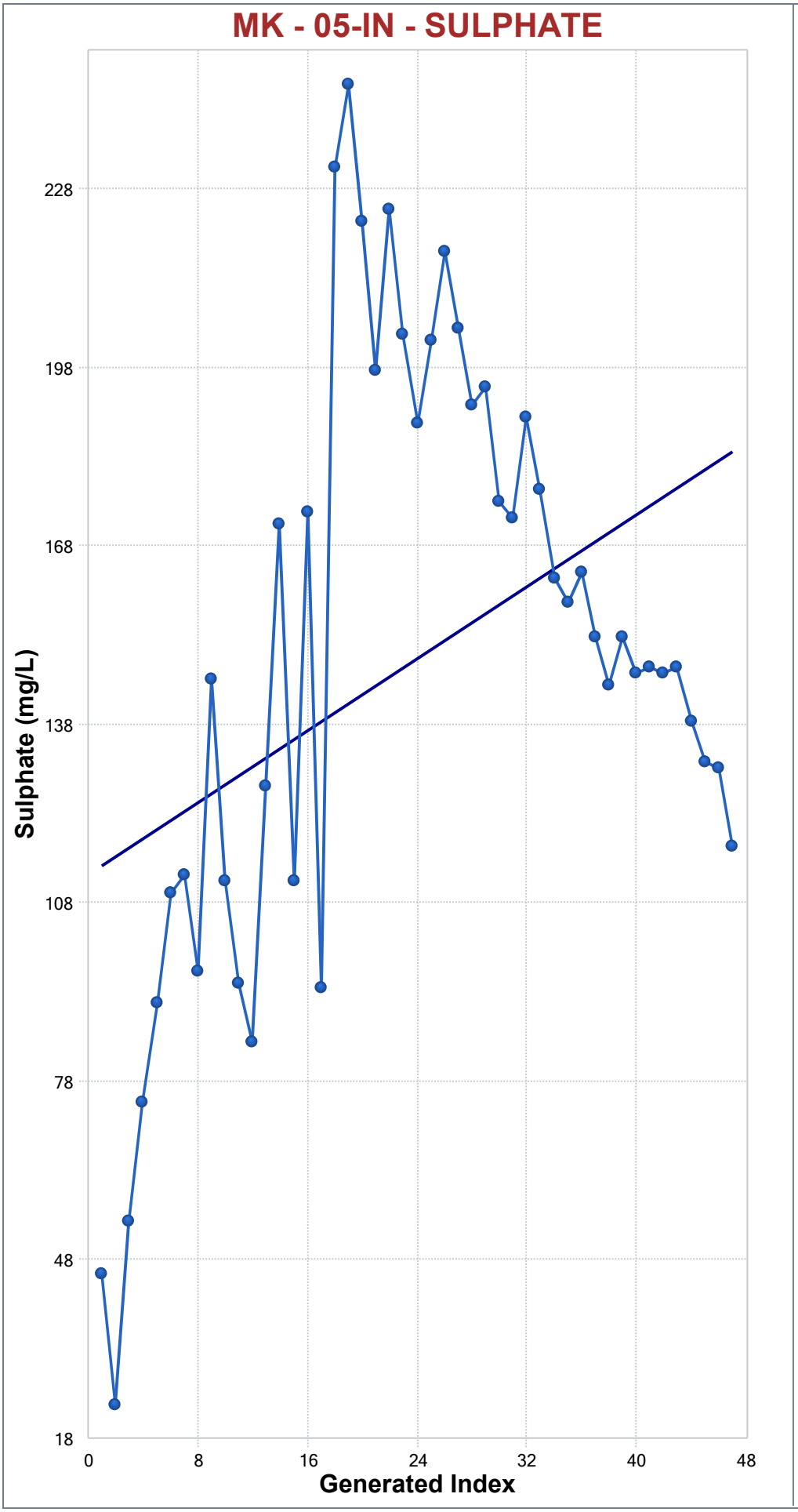
Mann-Kendall Trend Analysis

n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	109.0459
Standardized Value of S	2.6594
M-K Test Value (S)	291
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0039

OLS Regression Line (Blue)

OLS Regression Slope	0.6553
OLS Regression Intercept	41.5628

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



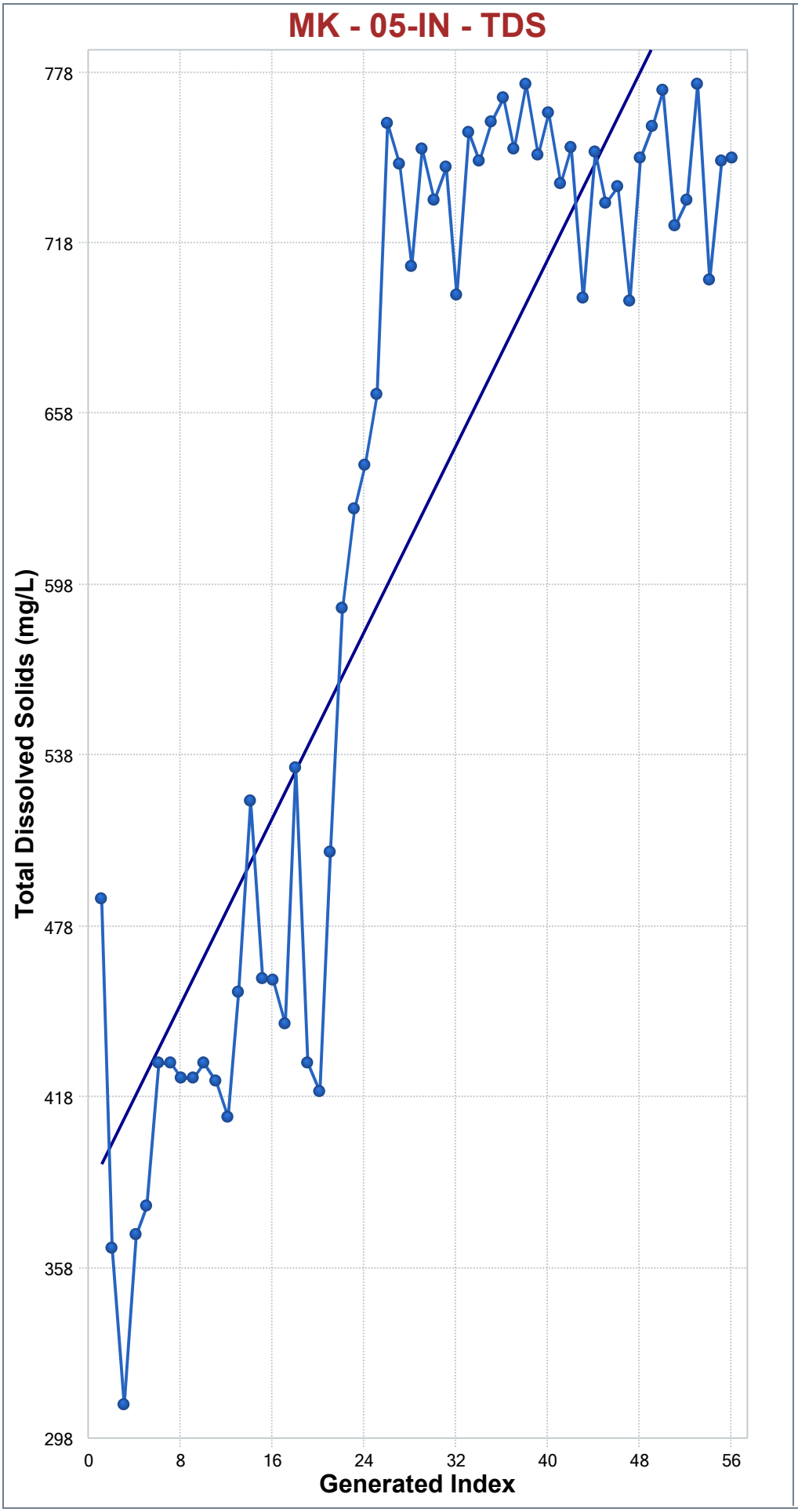
Mann-Kendall Trend Analysis

n	47
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	109.0275
Standardized Value of S	1.3024
M-K Test Value (S)	143
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0964

OLS Regression Line (Blue)

OLS Regression Slope	1.5180
OLS Regression Intercept	113.0046

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



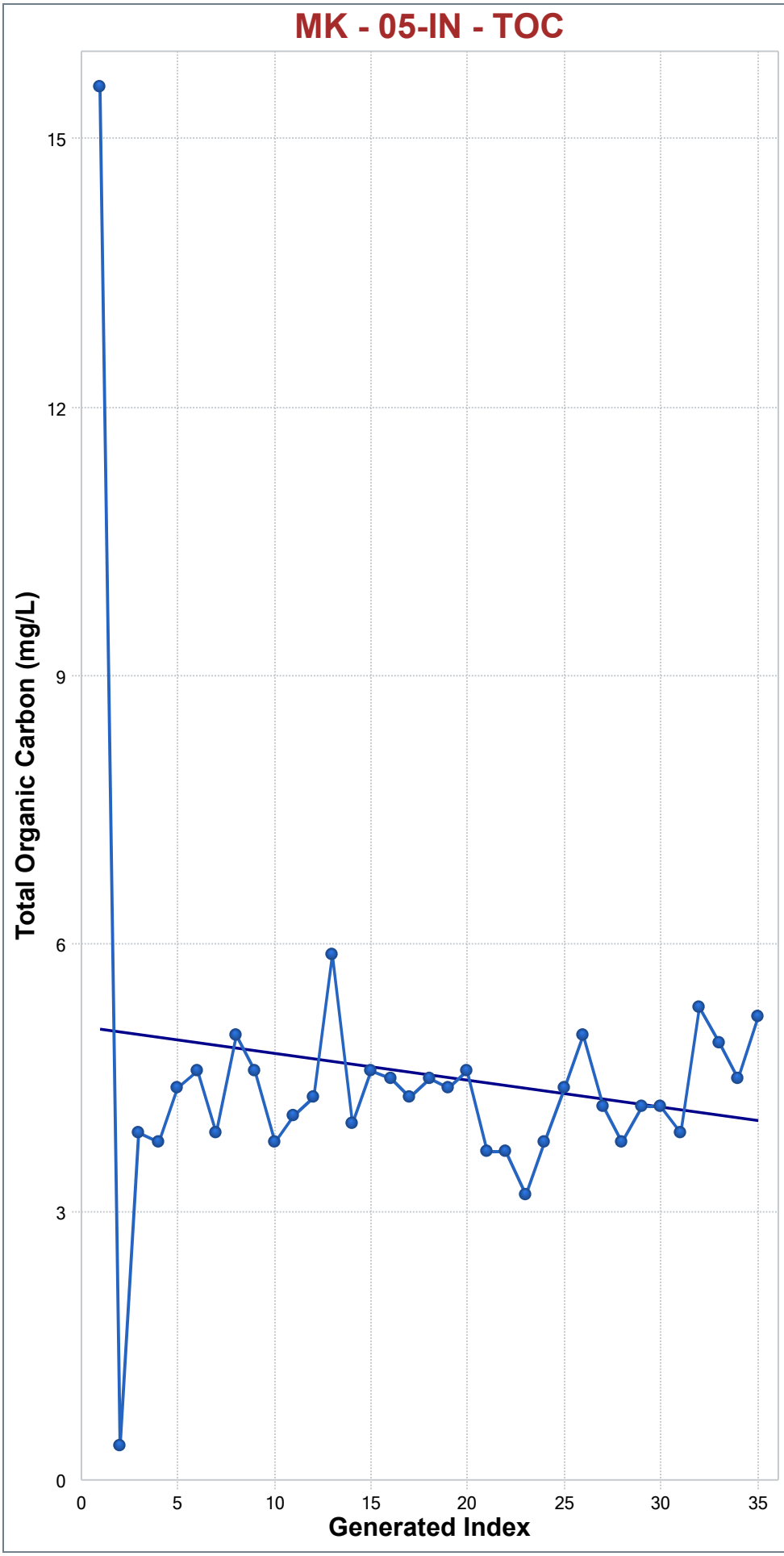
Mann-Kendall Trend Analysis

n	56
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	141.4402
Standardized Value of S	6.5399
M-K Test Value (S)	926
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	8.1603
OLS Regression Intercept	386.5578

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



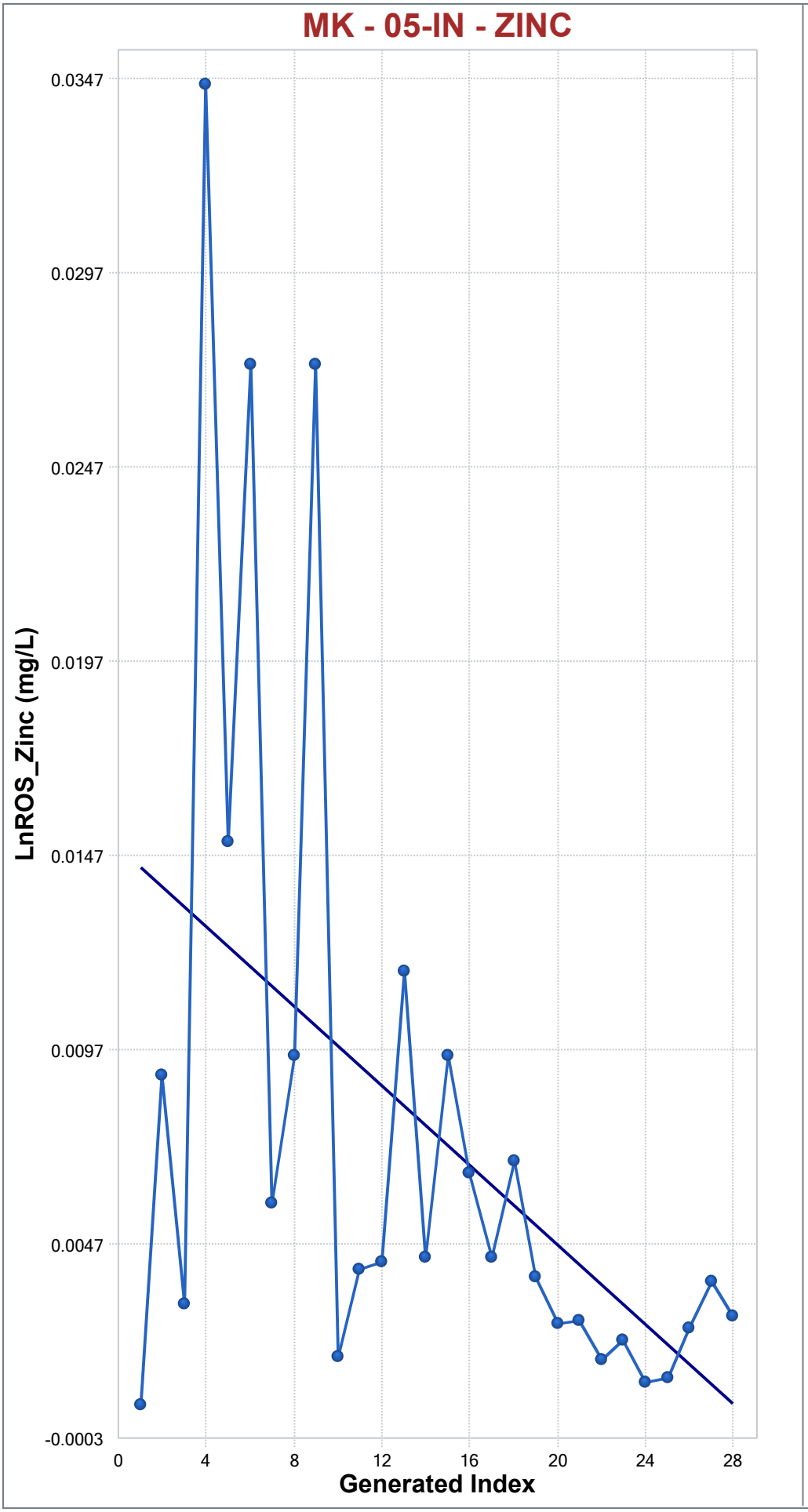
Mann-Kendall Trend Analysis

n	35
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	70.1665
Standardized Value of S	0.5558
M-K Test Value (S)	40
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2892

OLS Regression Line (Blue)

OLS Regression Slope	-0.0300
OLS Regression Intercept	5.4891

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



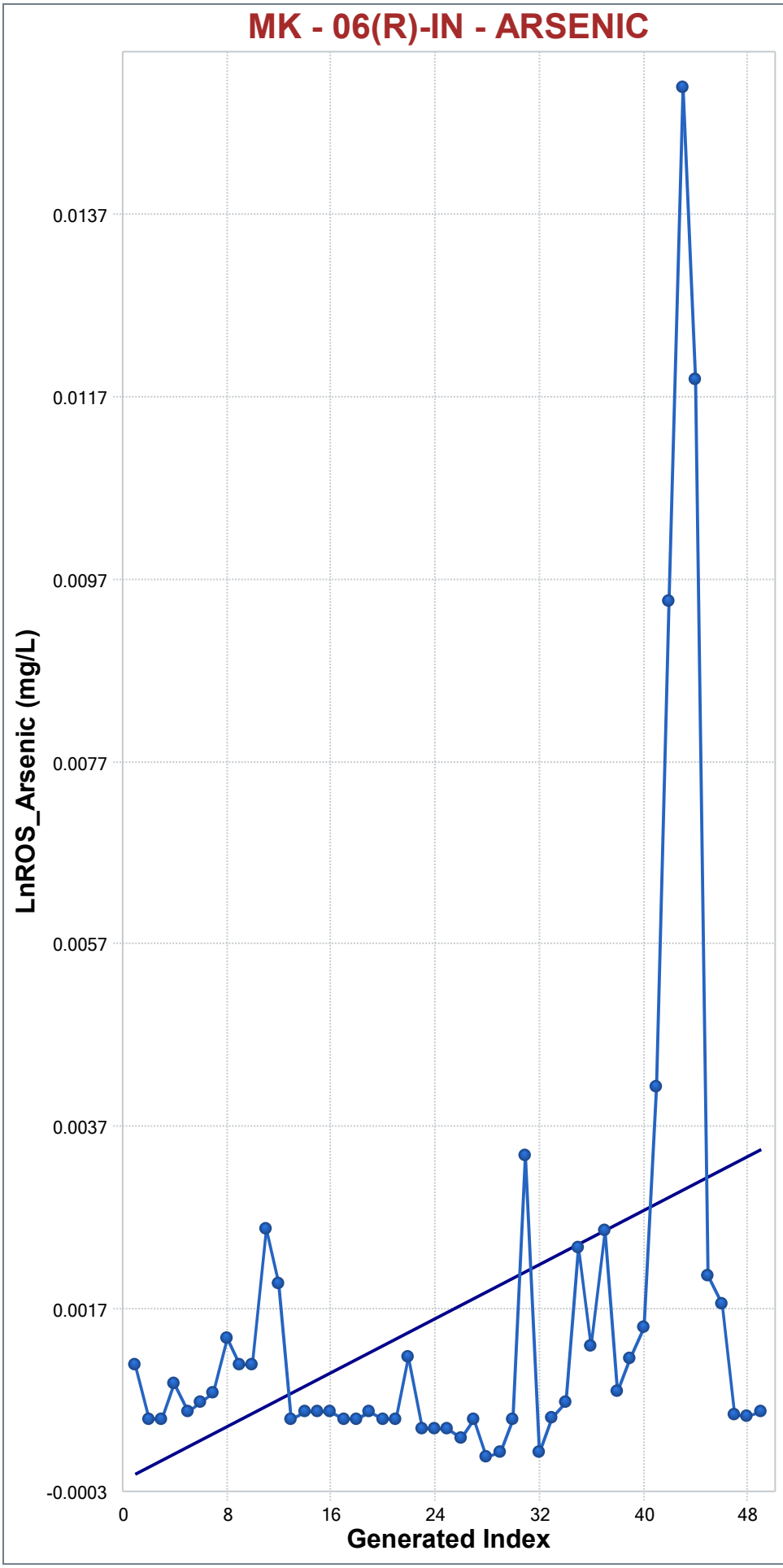
Mann-Kendall Trend Analysis

n	28
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	50.5866
Standardized Value of S	-2.8861
M-K Test Value (S)	-147
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0019

OLS Regression Line (Blue)

OLS Regression Slope	-0.0005
OLS Regression Intercept	0.0149

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



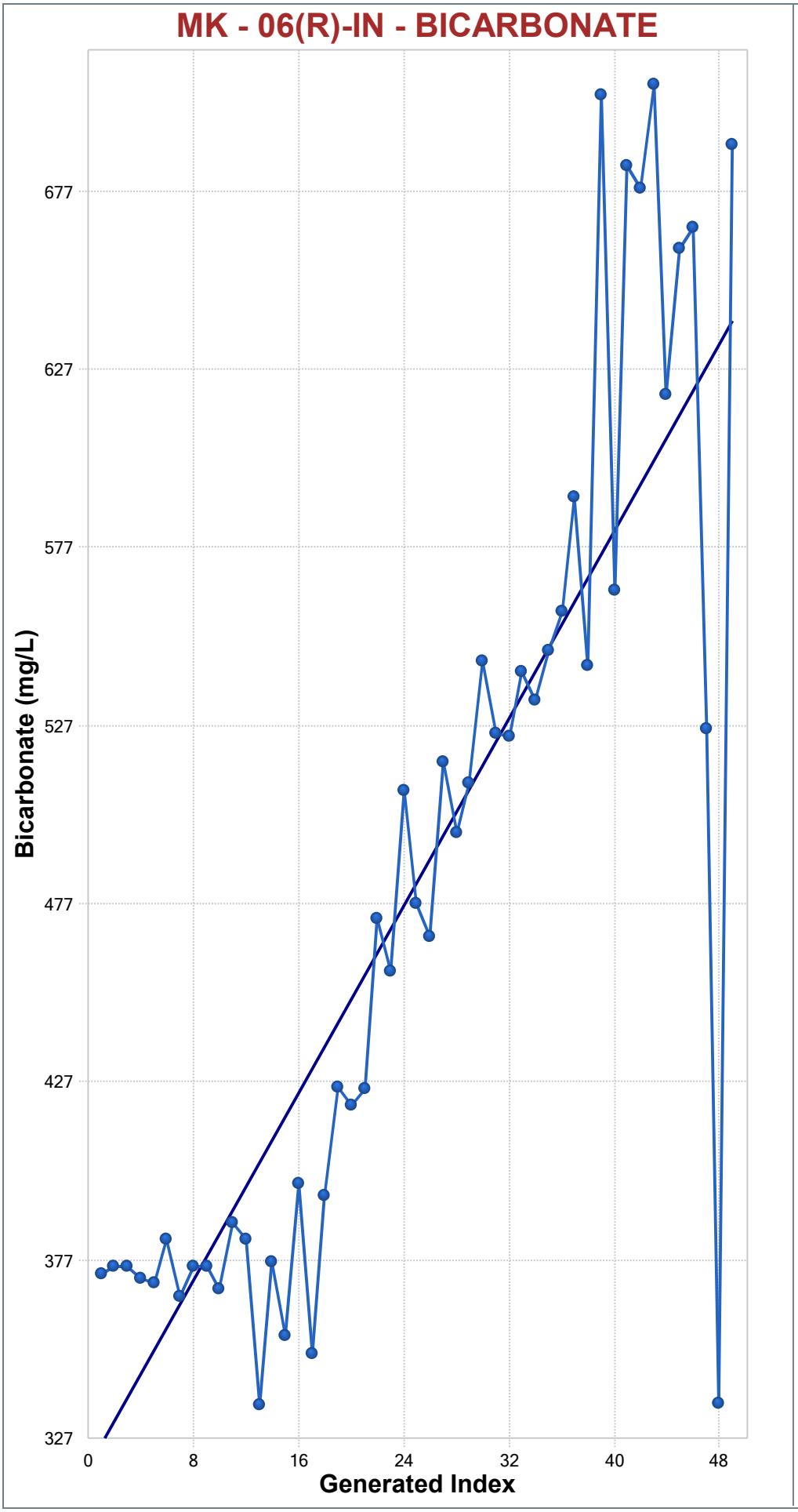
Mann-Kendall Trend Analysis

n	49
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	115.5105
Standardized Value of S	1.2899
M-K Test Value (S)	150
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0985

OLS Regression Line (Blue)

OLS Regression Slope	0.0001
OLS Regression Intercept	-0.0002

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



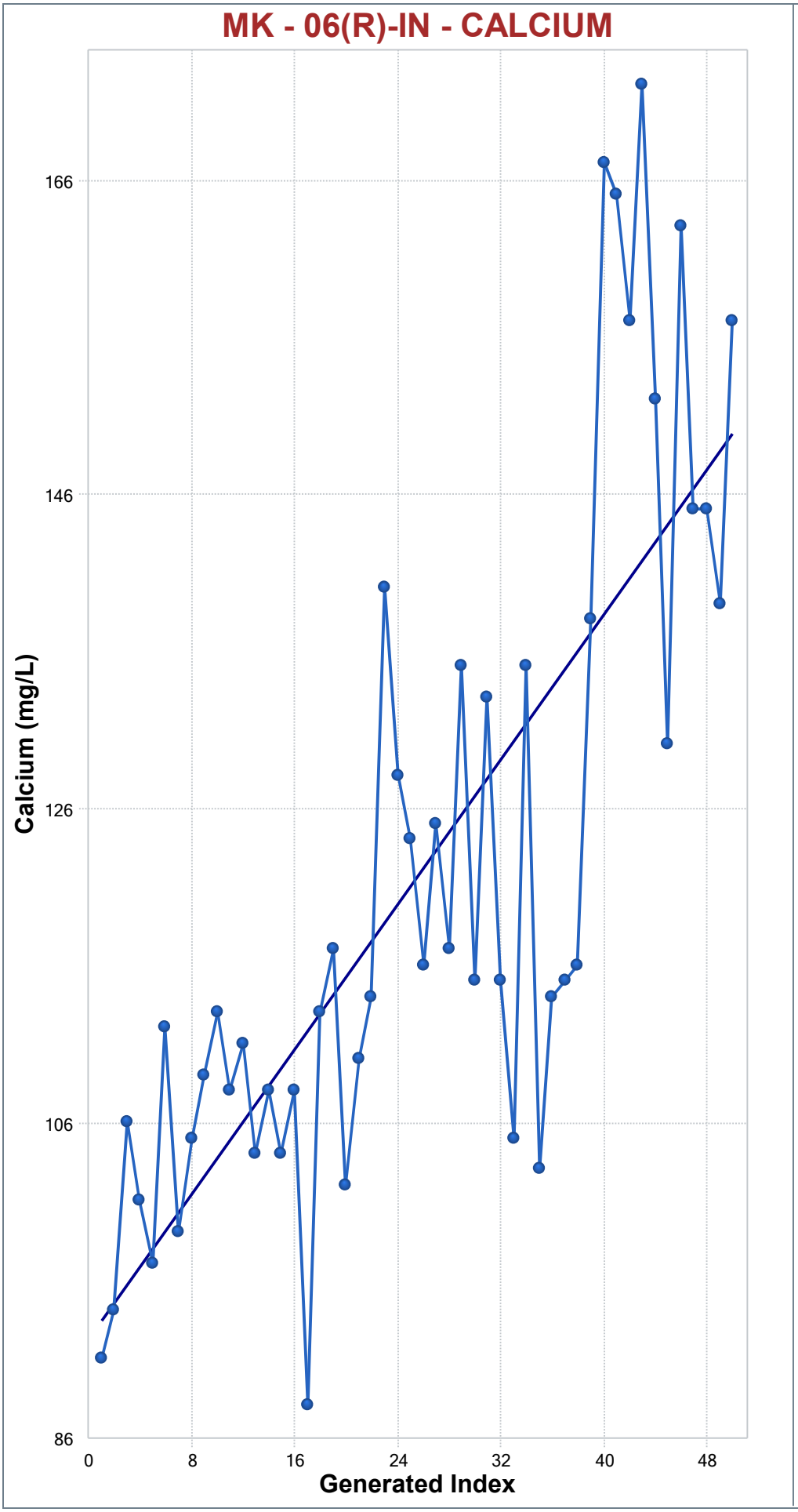
Mann-Kendall Trend Analysis

n	49
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	115.9698
Standardized Value of S	7.1743
M-K Test Value (S)	833
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	6.5877
OLS Regression Intercept	317.9941

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



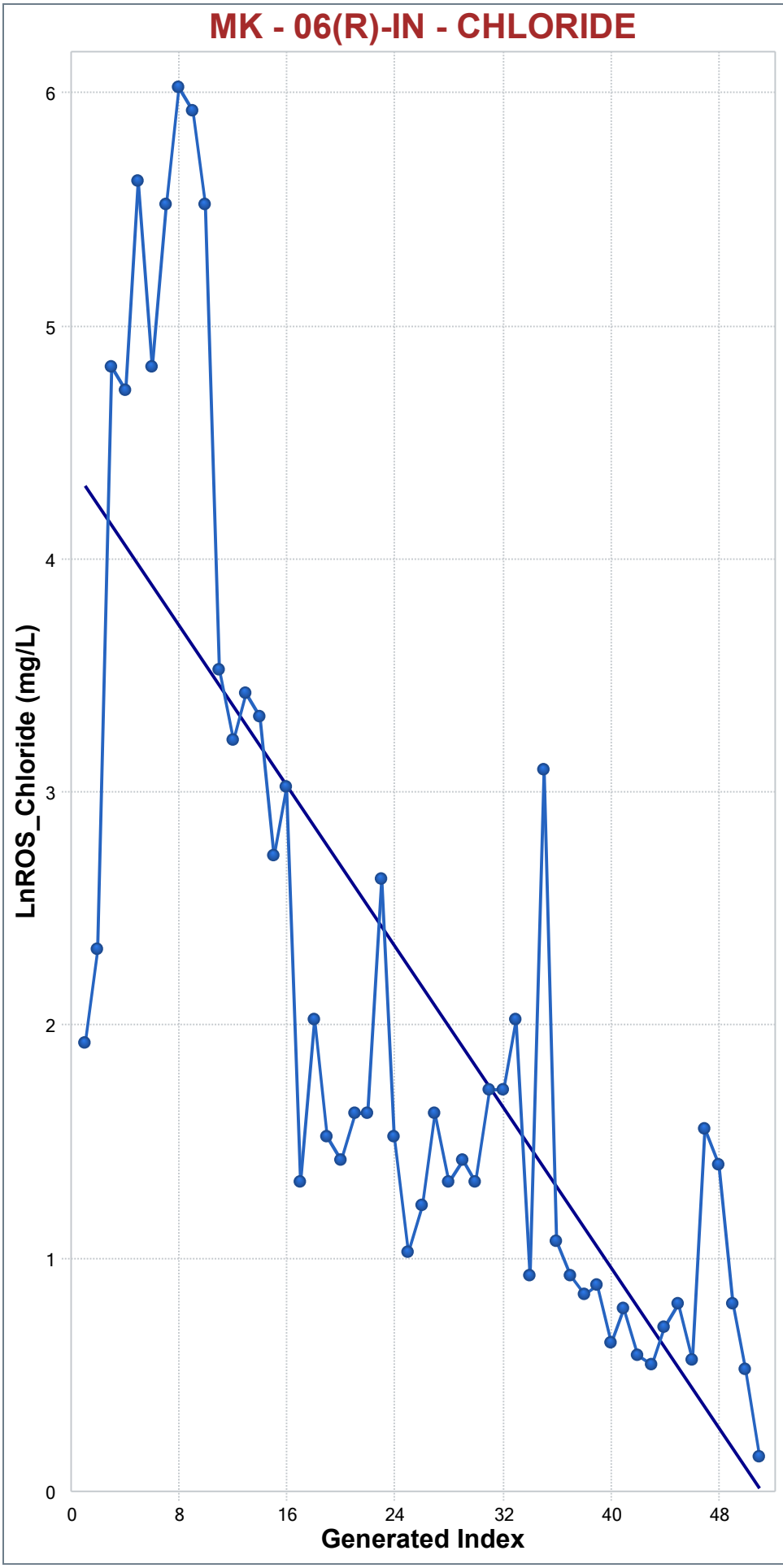
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.4794
Standardized Value of S	6.2354
M-K Test Value (S)	746
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.1513
OLS Regression Intercept	92.2416

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



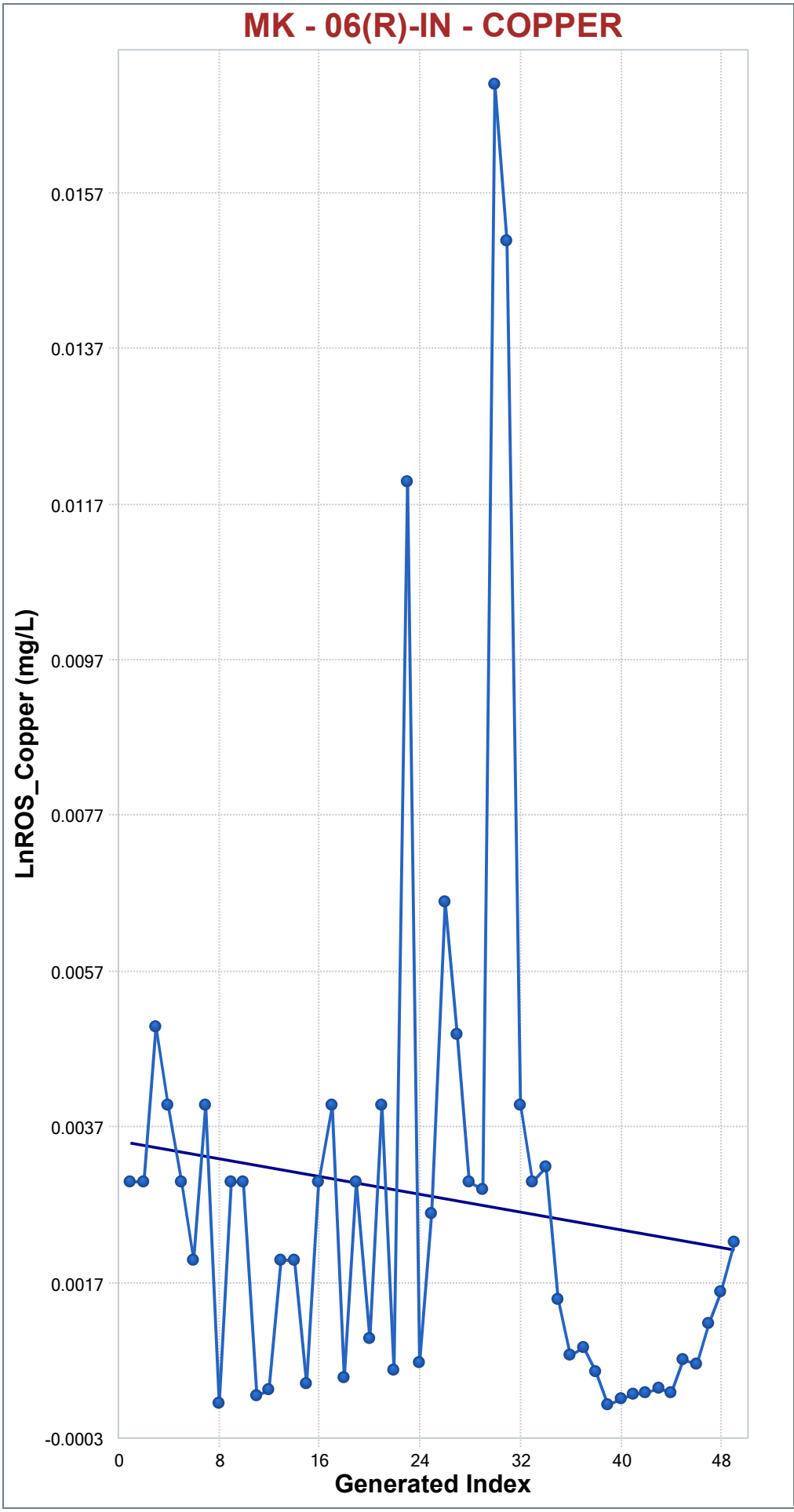
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	123.0569
Standardized Value of S	-6.9236
M-K Test Value (S)	-853
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0860
OLS Regression Intercept	4.6777

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



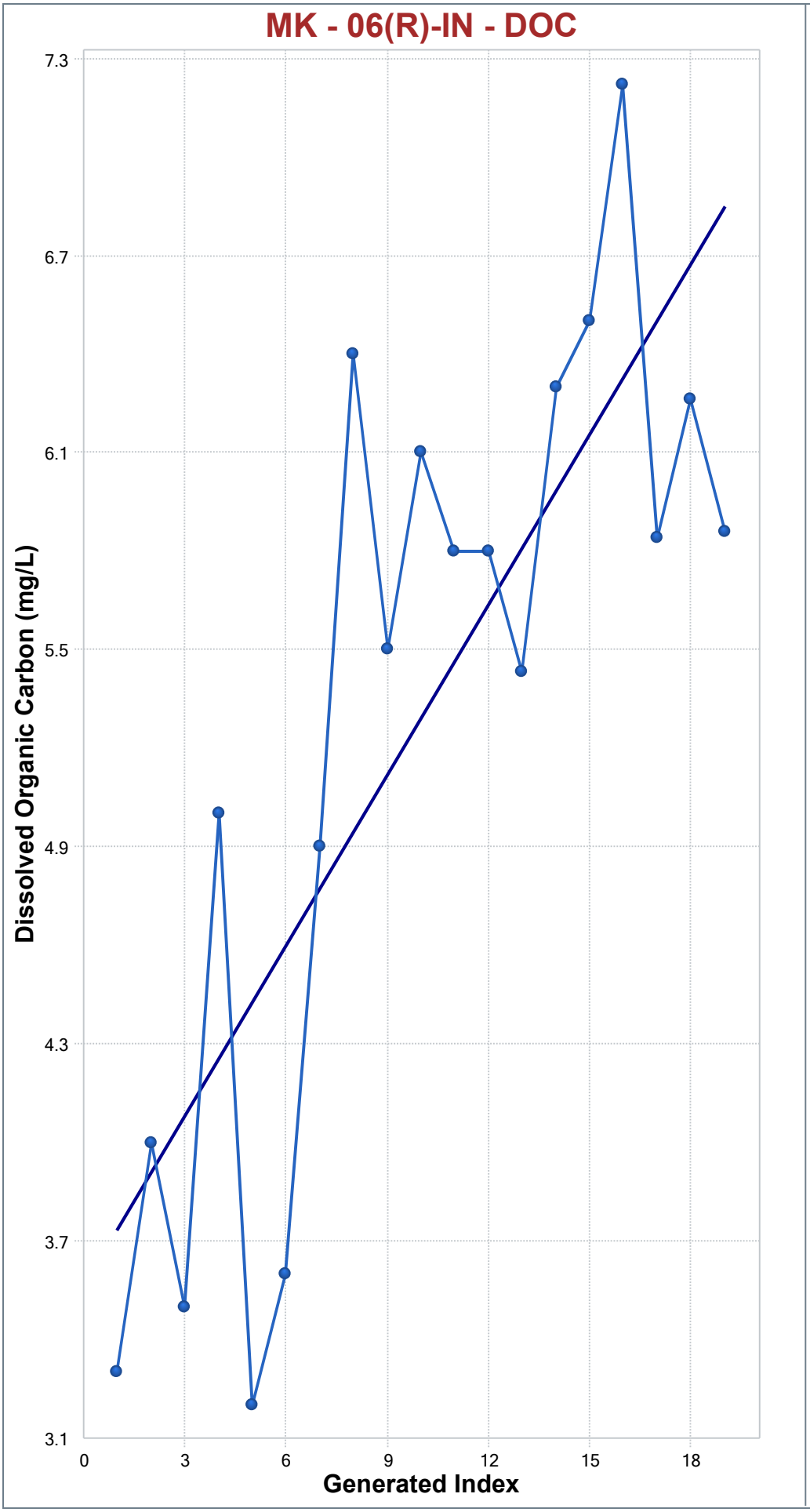
Mann-Kendall Trend Analysis

n	49
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	115.5263
Standardized Value of S	-1.9563
M-K Test Value (S)	-227
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0252

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0035

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



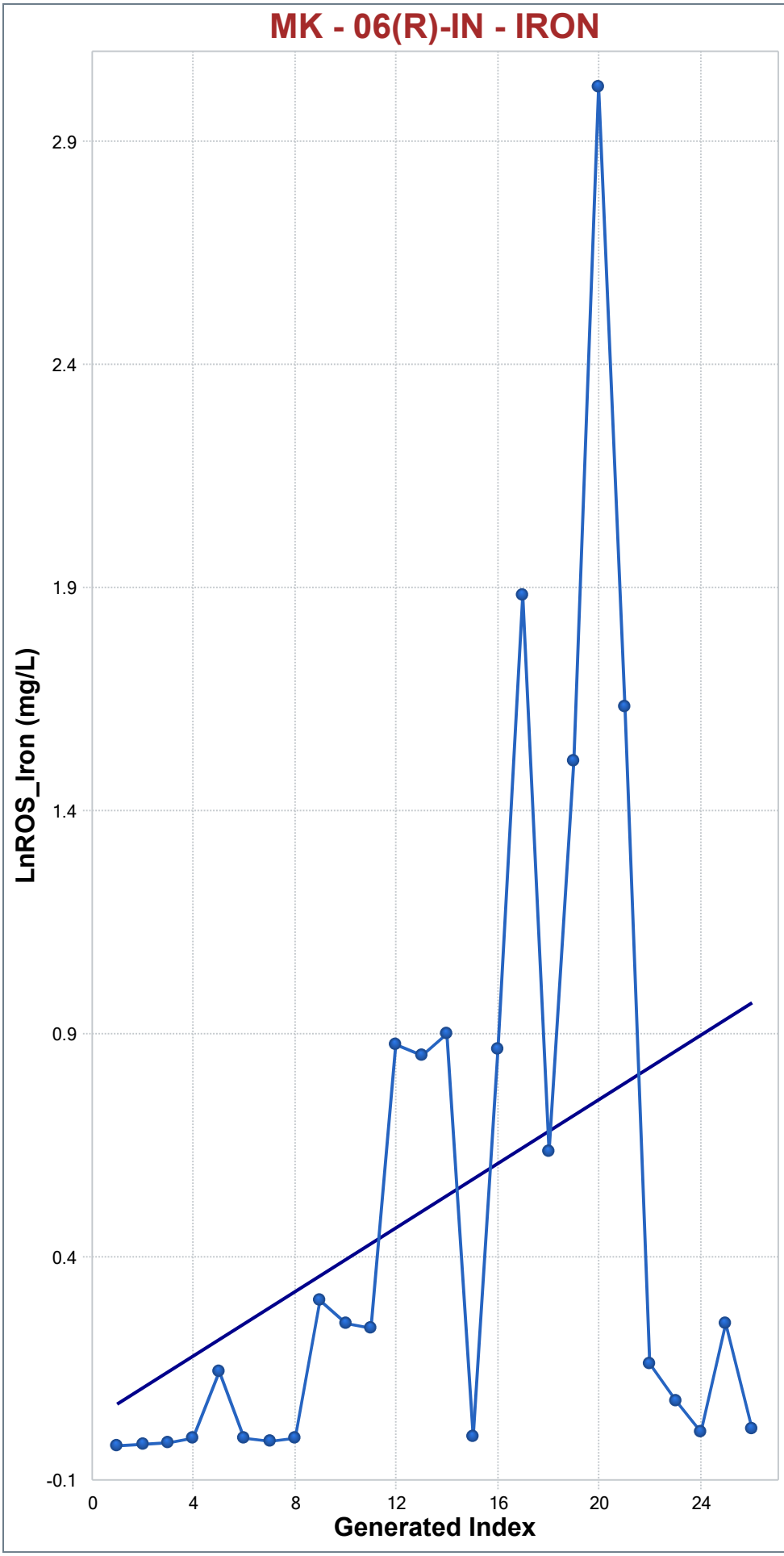
Mann-Kendall Trend Analysis

n	19
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	28.5657
Standardized Value of S	3.4657
M-K Test Value (S)	100
Tabulated p-value	0.0000
Approximate p-value	0.0003

OLS Regression Line (Blue)

OLS Regression Slope	0.1734
OLS Regression Intercept	3.5565

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



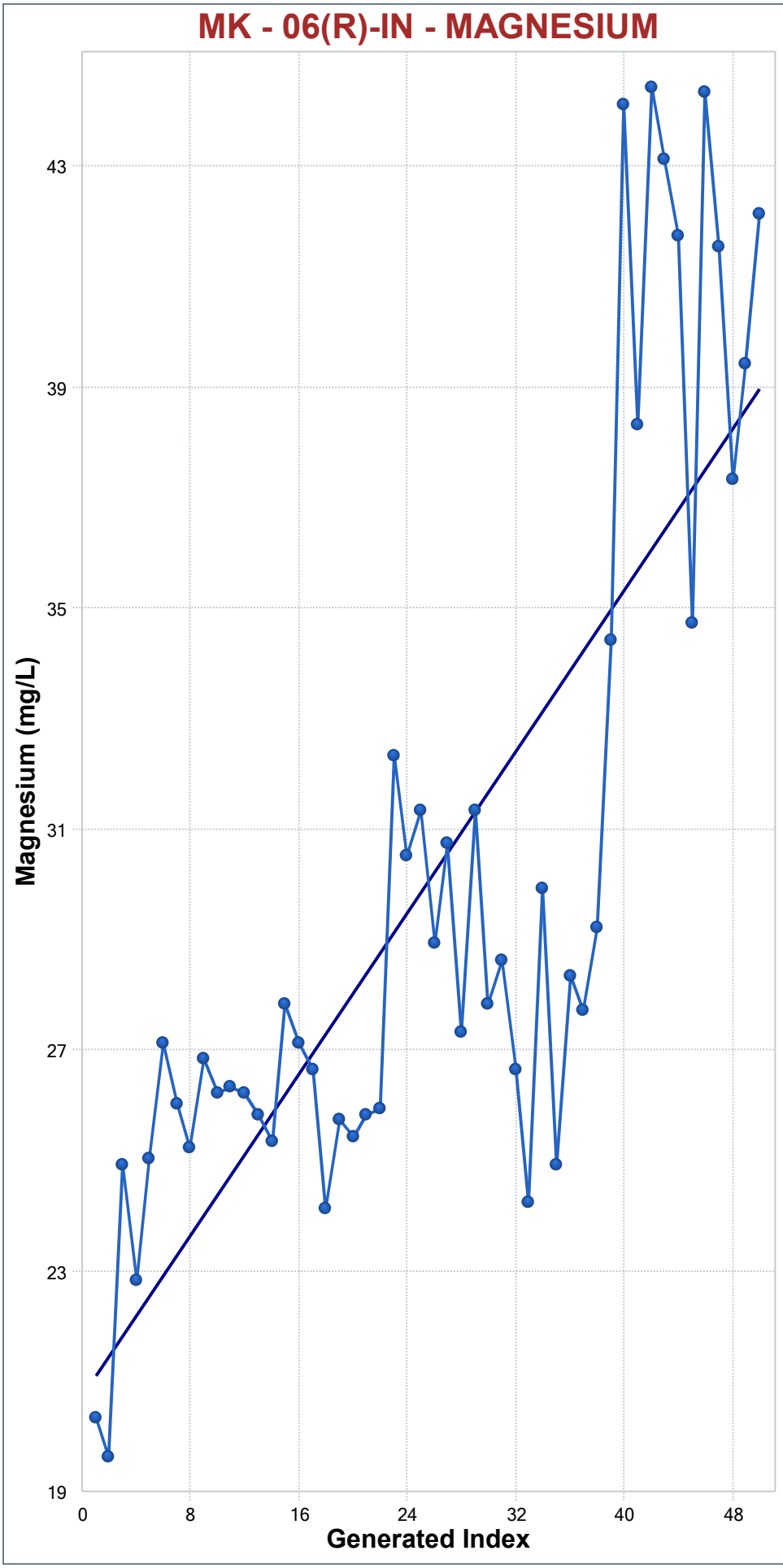
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3578
Standardized Value of S	2.8881
M-K Test Value (S)	132
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0019

OLS Regression Line (Blue)

OLS Regression Slope	0.0360
OLS Regression Intercept	0.0615

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



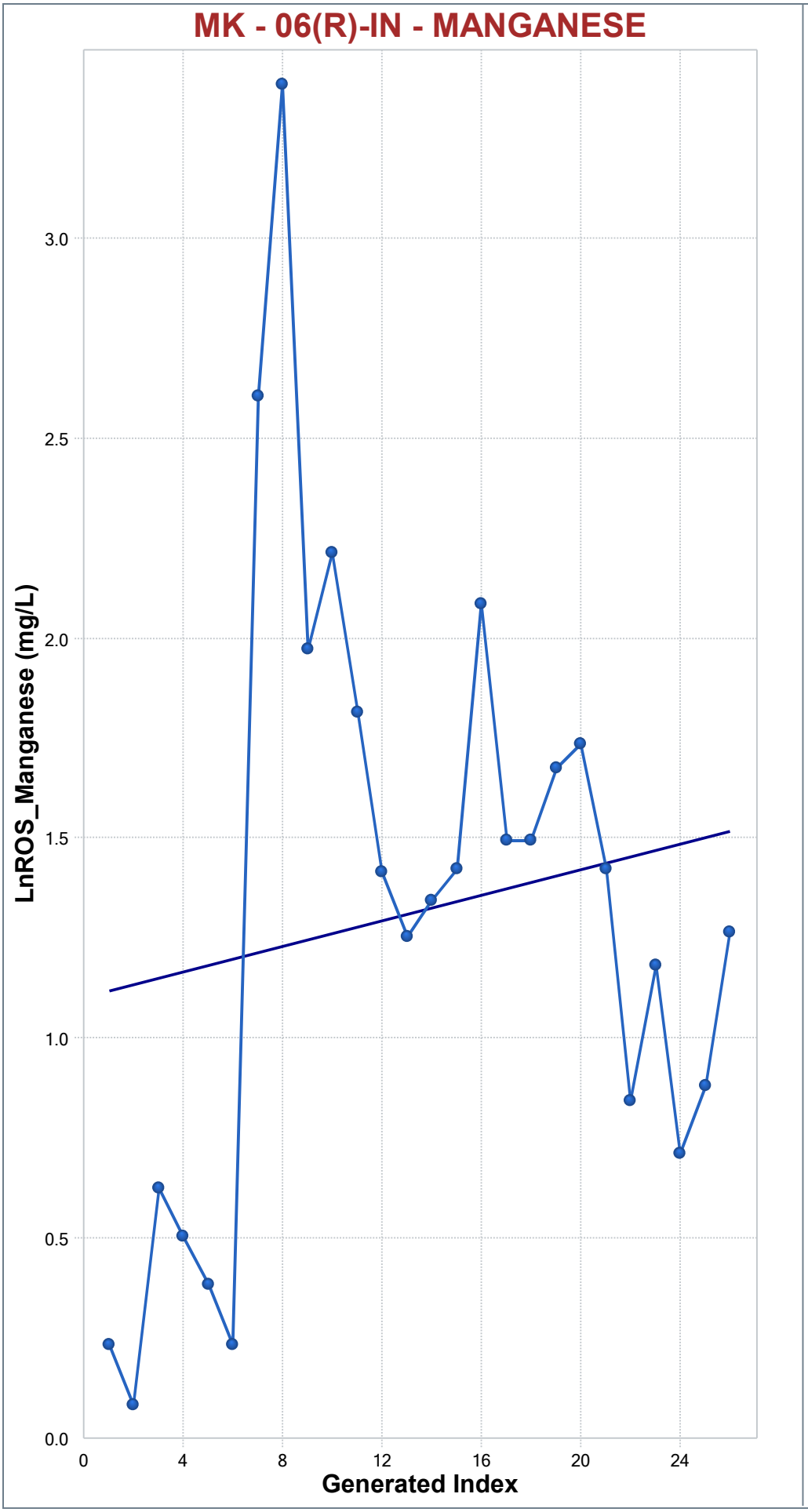
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.5185
Standardized Value of S	6.1162
M-K Test Value (S)	732
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.3646
OLS Regression Intercept	21.1178

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



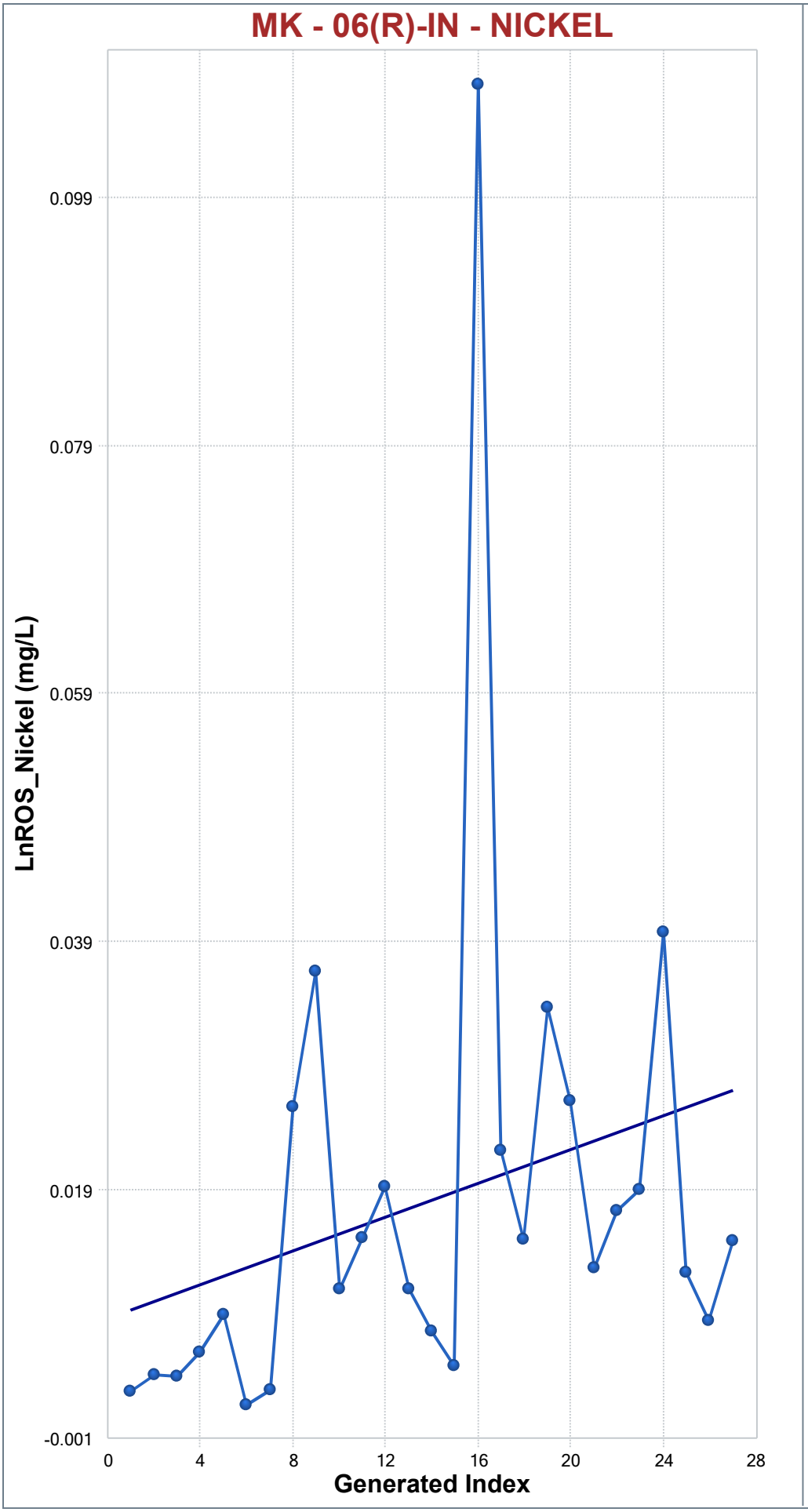
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3358
Standardized Value of S	0.4191
M-K Test Value (S)	20
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3376

OLS Regression Line (Blue)

OLS Regression Slope	0.0159
OLS Regression Intercept	1.0602

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



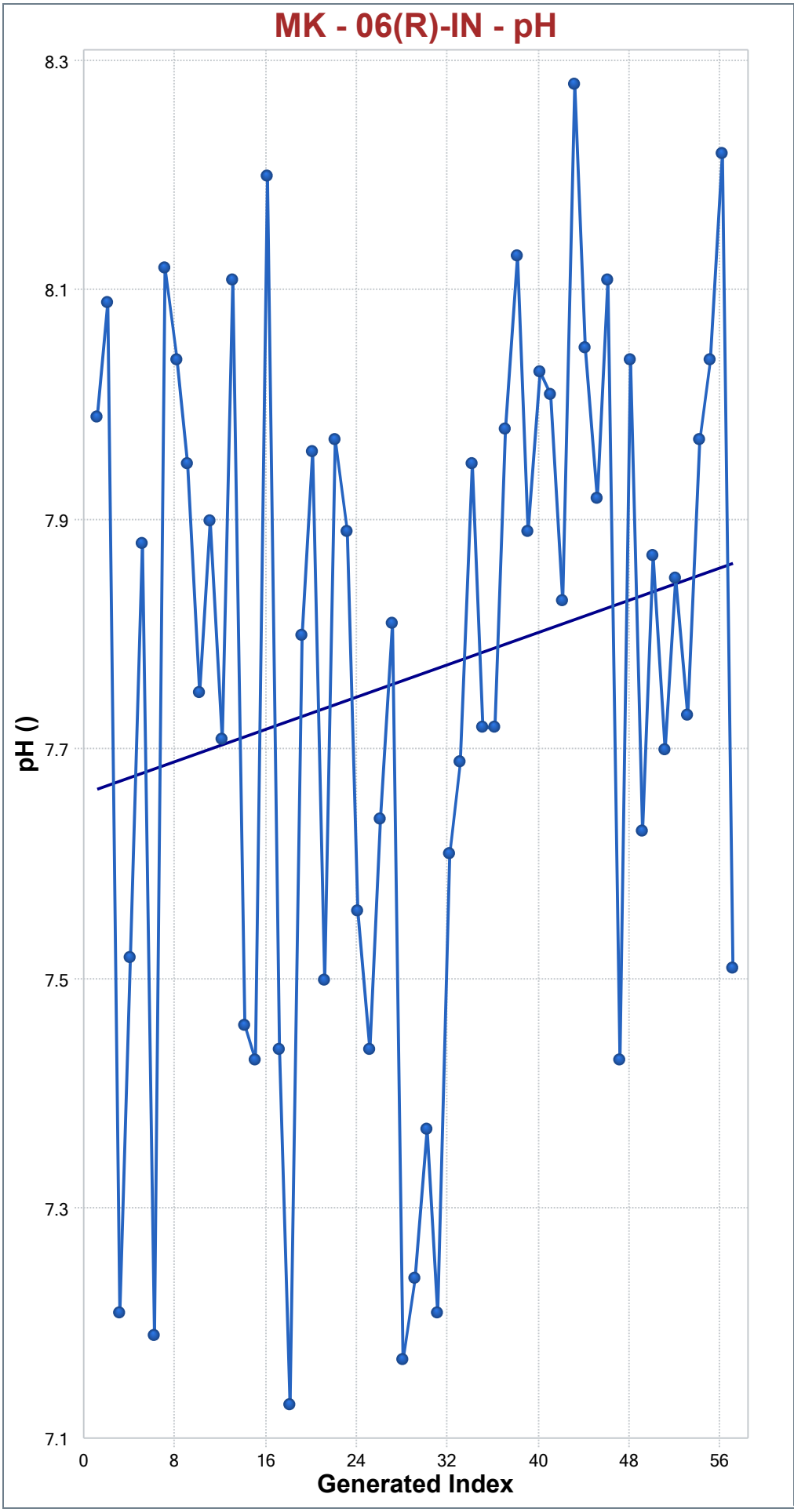
Mann-Kendall Trend Analysis

n	27
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	47.9687
Standardized Value of S	2.4182
M-K Test Value (S)	117
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0078

OLS Regression Line (Blue)

OLS Regression Slope	0.0007
OLS Regression Intercept	0.0085

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



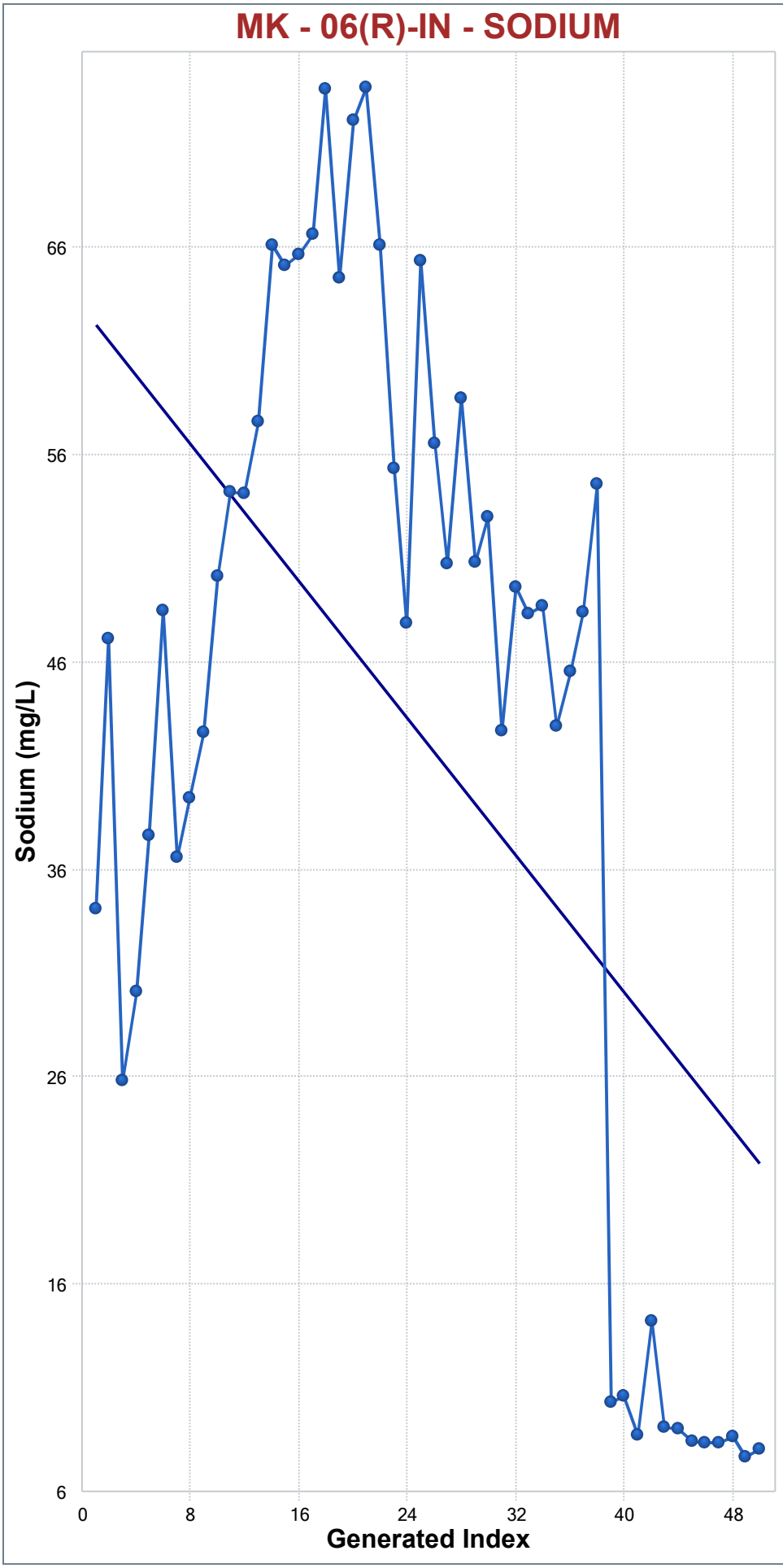
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2274
Standardized Value of S	1.3083
M-K Test Value (S)	191
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0954

OLS Regression Line (Blue)

OLS Regression Slope	0.0035
OLS Regression Intercept	7.6330

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



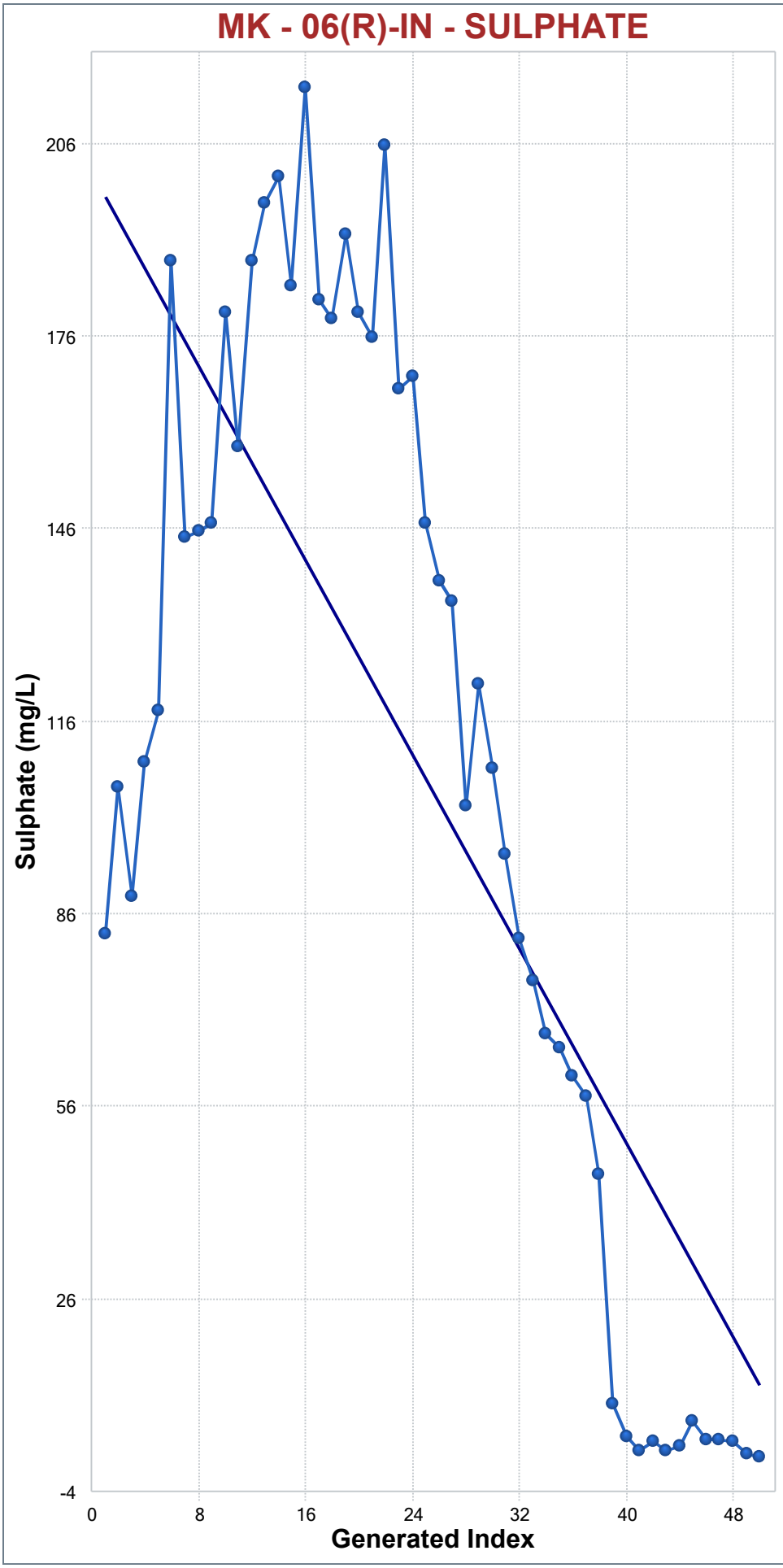
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.5436
Standardized Value of S	-3.3210
M-K Test Value (S)	-398
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	-0.8239
OLS Regression Intercept	62.9357

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



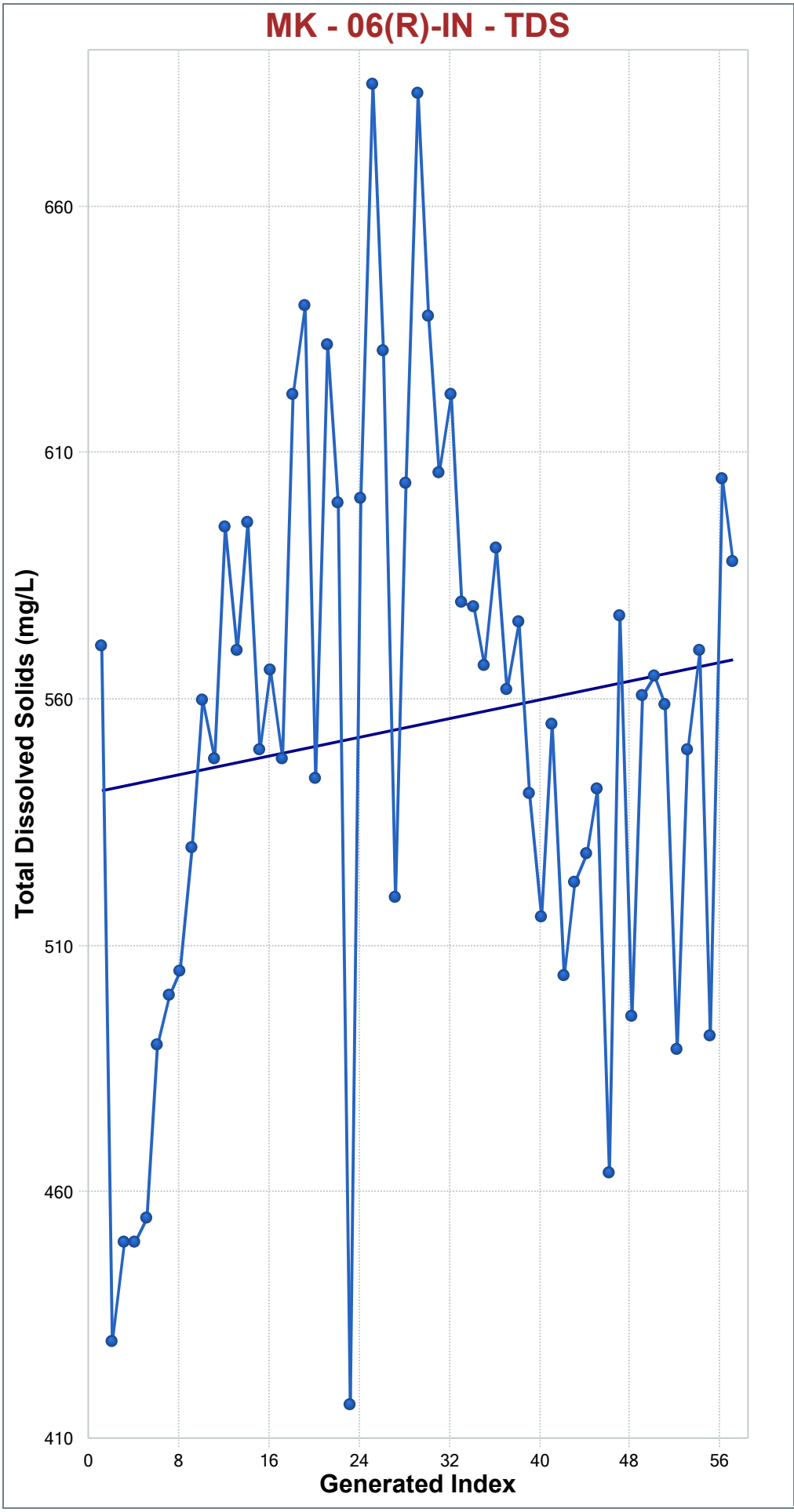
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.5352
Standardized Value of S	-5.9982
M-K Test Value (S)	-718
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-3.7789
OLS Regression Intercept	201.6568

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



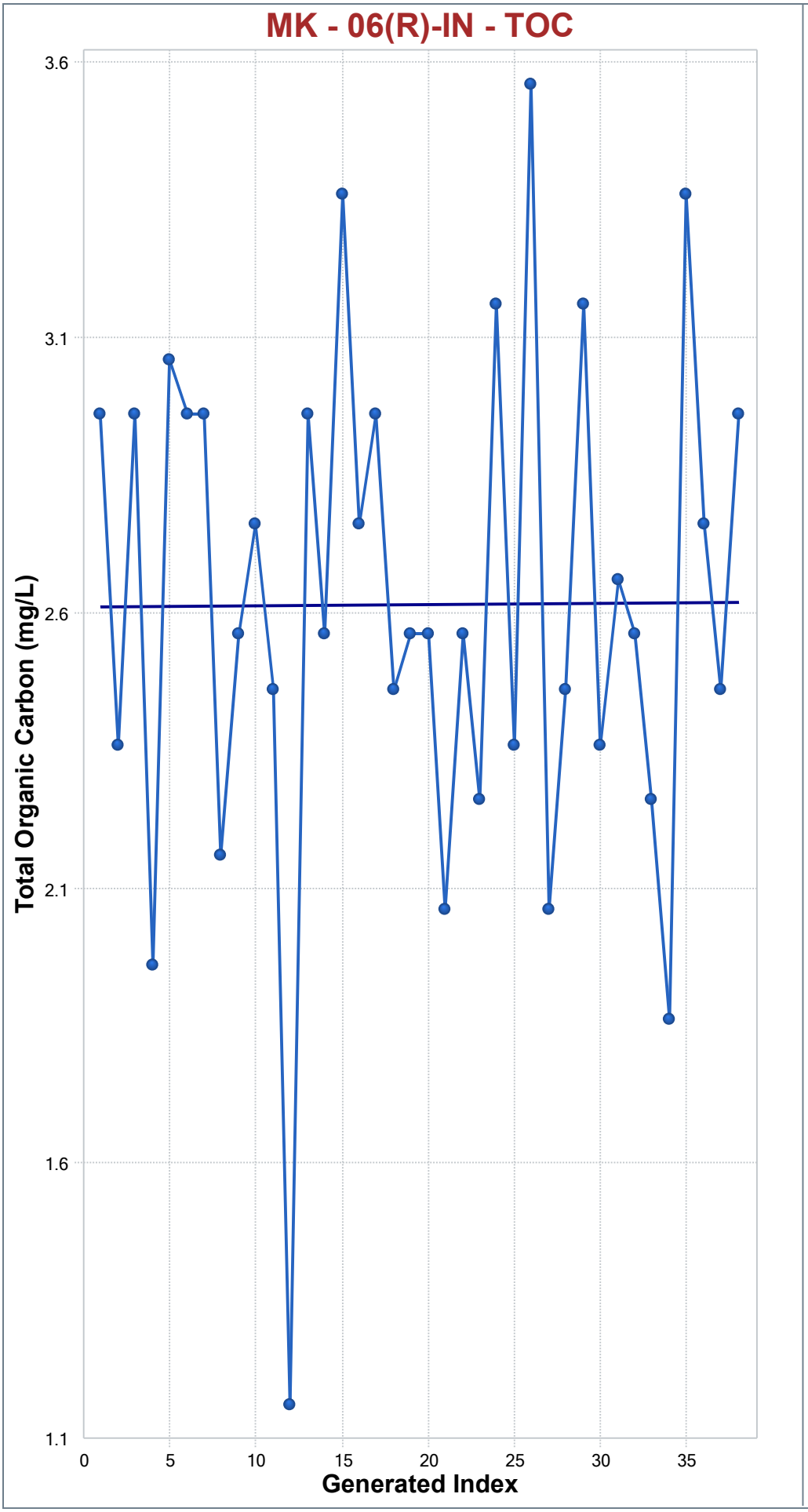
Mann-Kendall Trend Analysis

n	57
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	145.2504
Standardized Value of S	0.5508
M-K Test Value (S)	81
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2909

OLS Regression Line (Blue)

OLS Regression Slope	0.4739
OLS Regression Intercept	541.3434

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



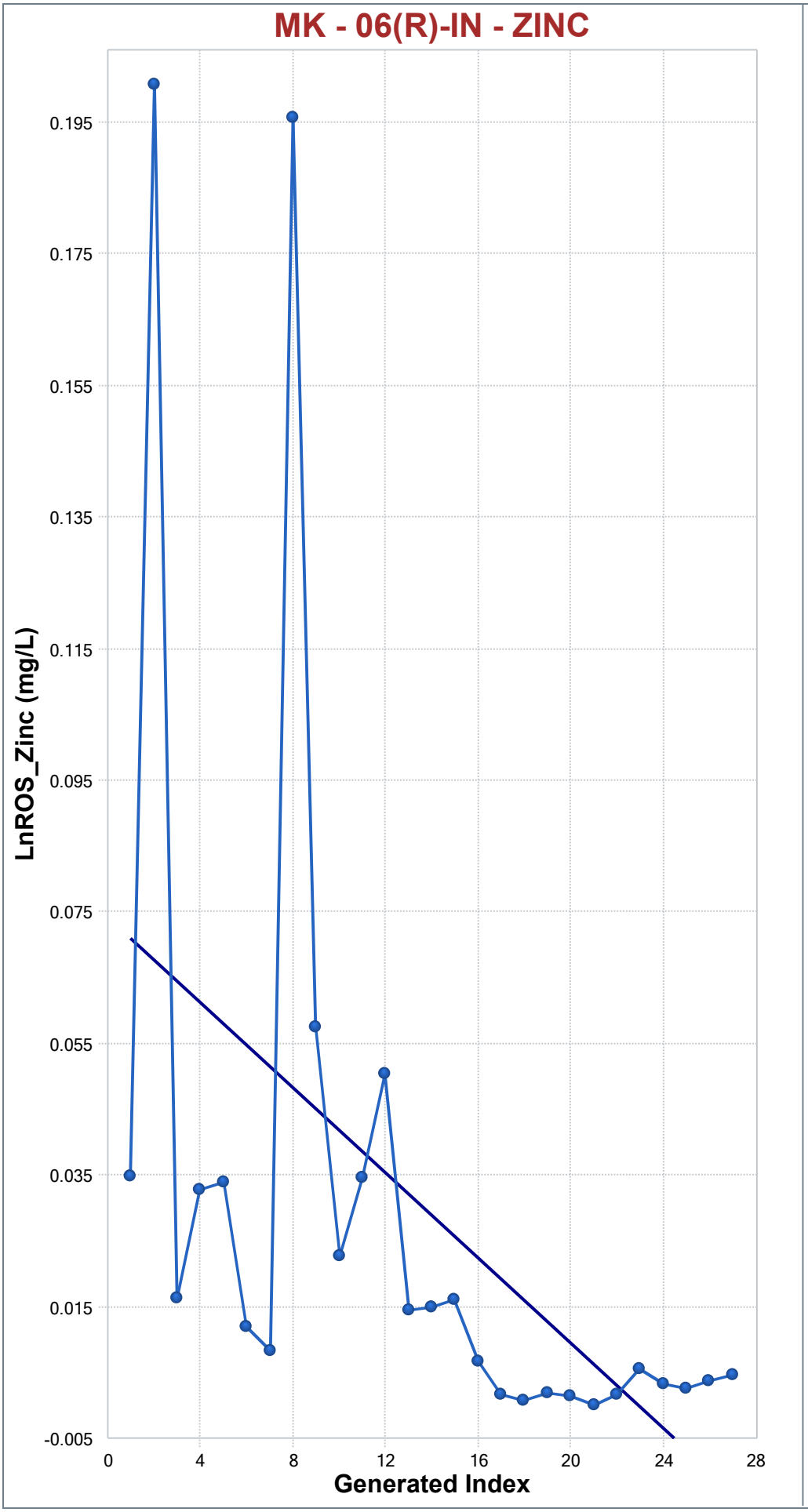
Mann-Kendall Trend Analysis

n	38
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	78.9578
Standardized Value of S	-0.4306
M-K Test Value (S)	-35
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3334

OLS Regression Line (Blue)

OLS Regression Slope	0.0002
OLS Regression Intercept	2.6508

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



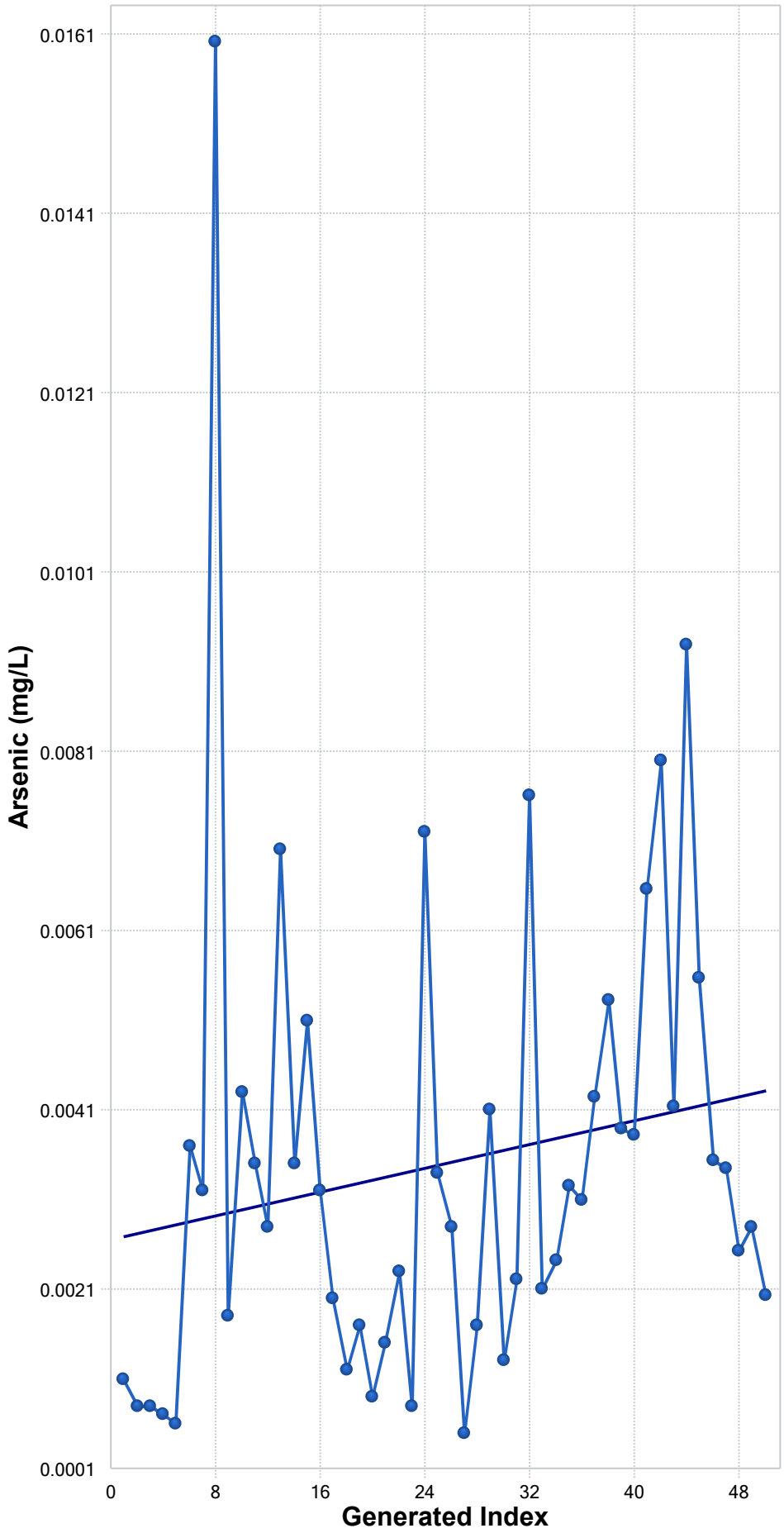
Mann-Kendall Trend Analysis

n	27
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	47.9583
Standardized Value of S	-3.8158
M-K Test Value (S)	-184
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.0032
OLS Regression Intercept	0.0745

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



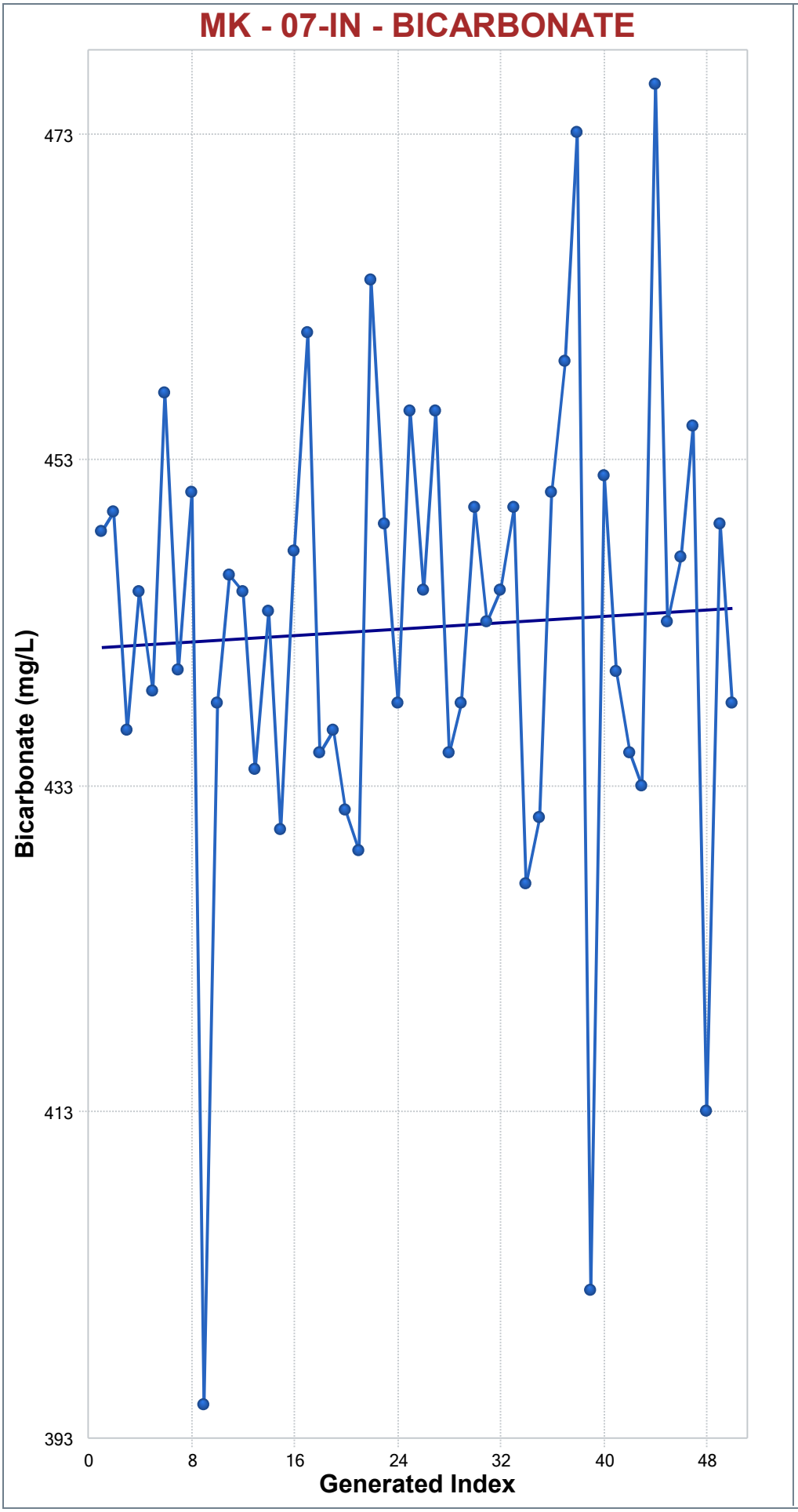
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.5157
Standardized Value of S	2.4014
M-K Test Value (S)	288
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0082

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0027

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



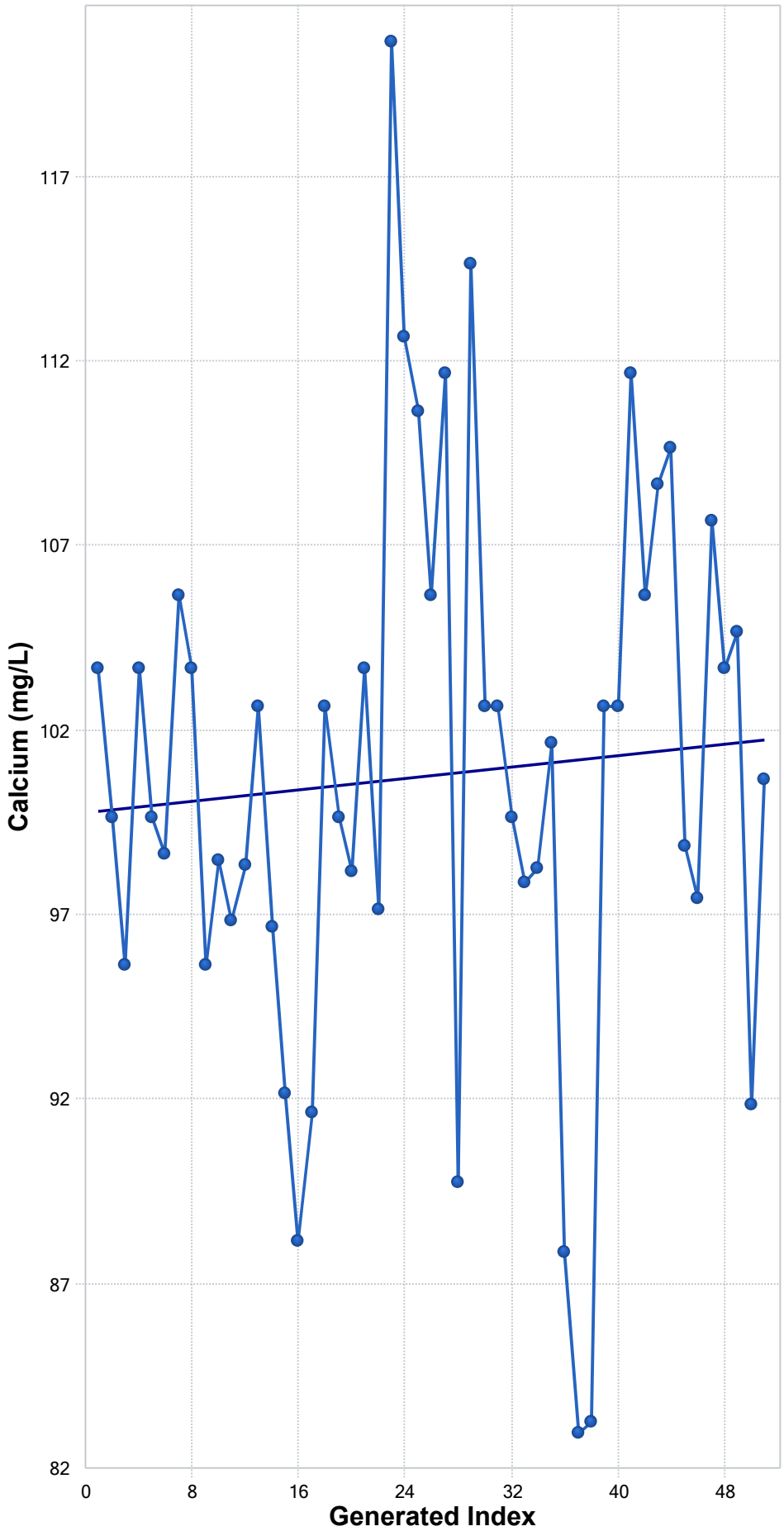
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.4627
Standardized Value of S	0.2428
M-K Test Value (S)	30
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4041

OLS Regression Line (Blue)

OLS Regression Slope	0.0494
OLS Regression Intercept	441.3730

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



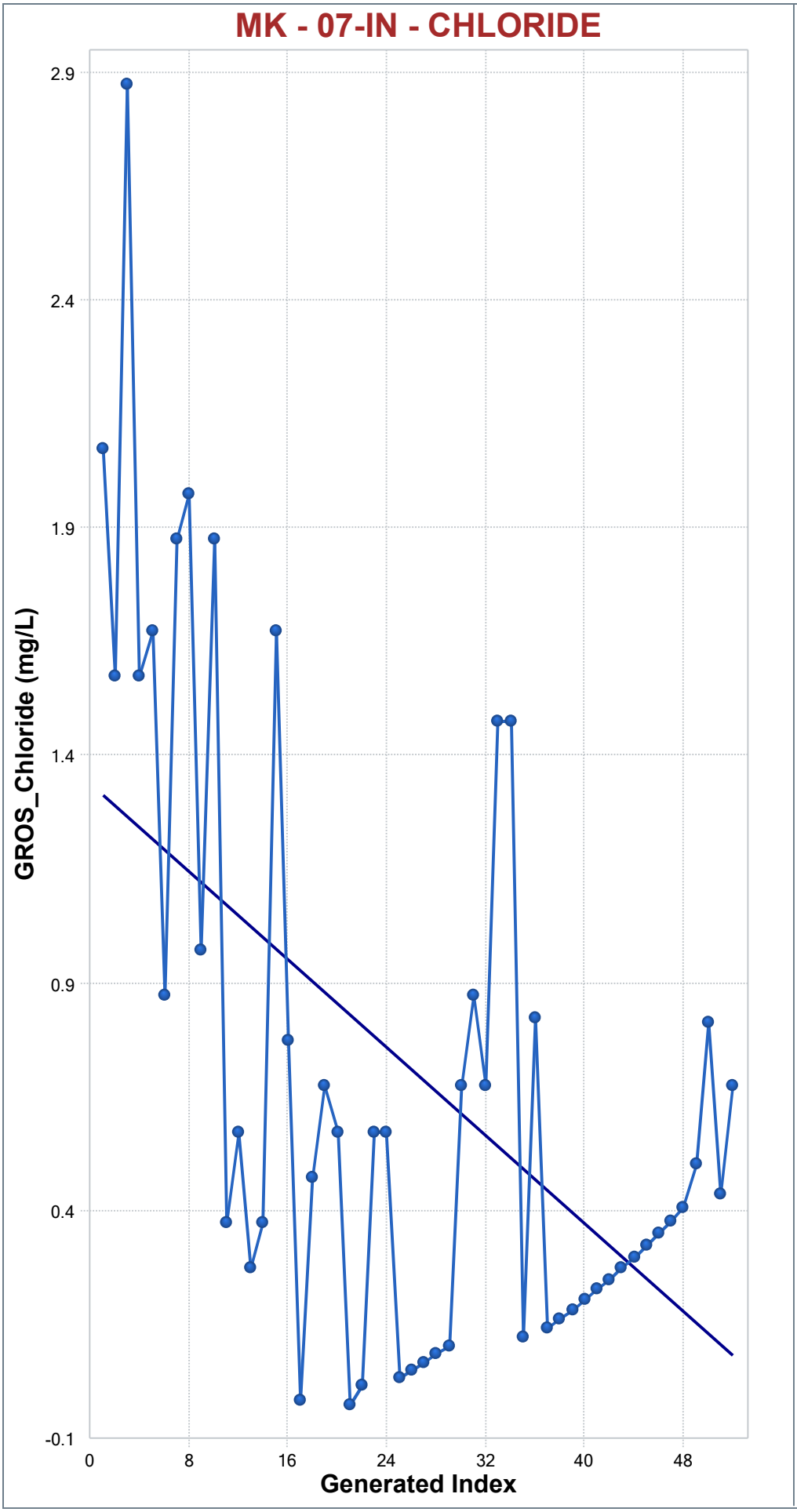
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	122.8780
Standardized Value of S	0.6836
M-K Test Value (S)	85
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2471

OLS Regression Line (Blue)

OLS Regression Slope	0.0386
OLS Regression Intercept	100.1320

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



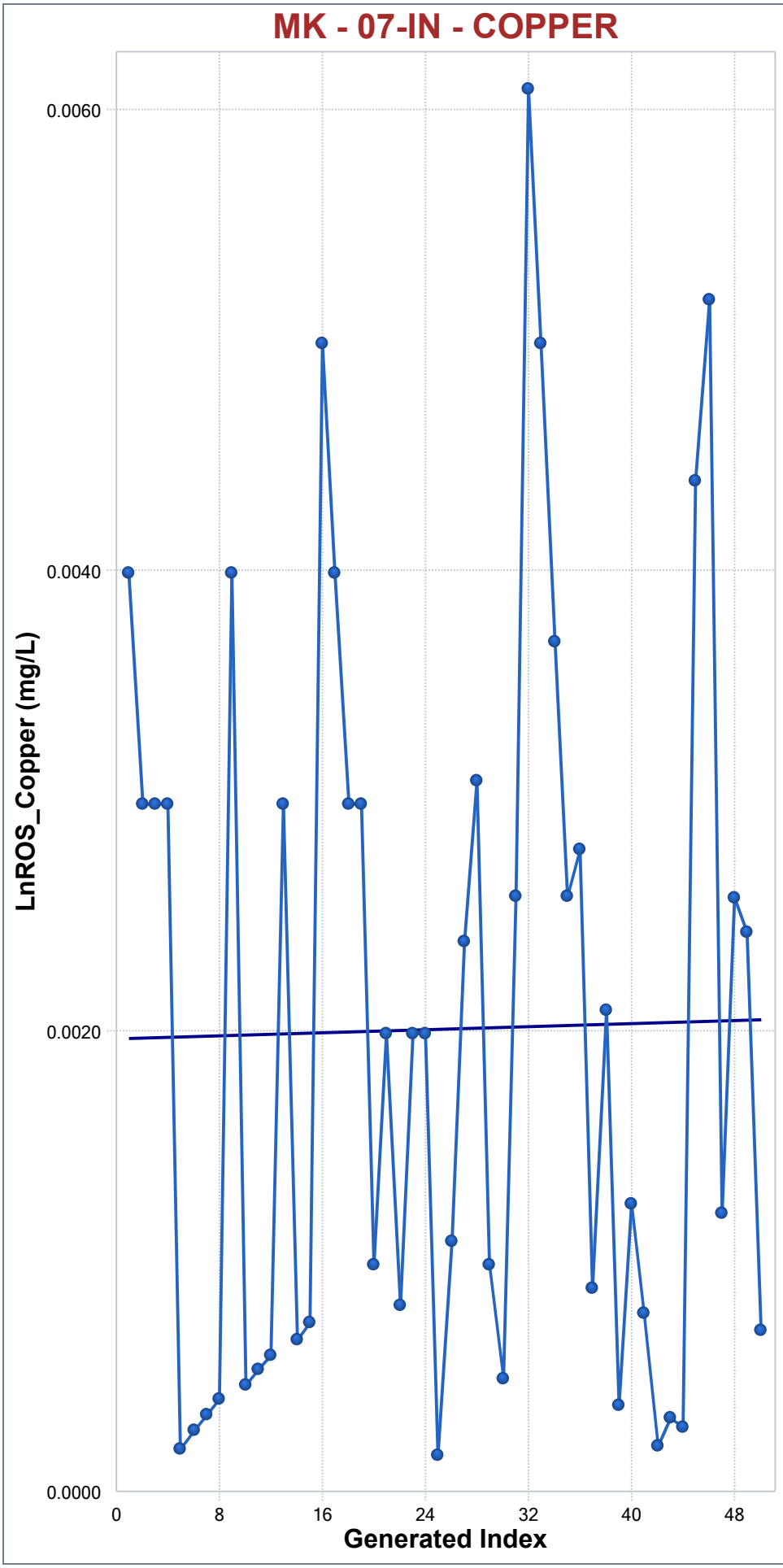
Mann-Kendall Trend Analysis

n	52
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	126.6333
Standardized Value of S	-2.2348
M-K Test Value (S)	-284
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0127

OLS Regression Line (Blue)

OLS Regression Slope	-0.0241
OLS Regression Intercept	1.3634

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



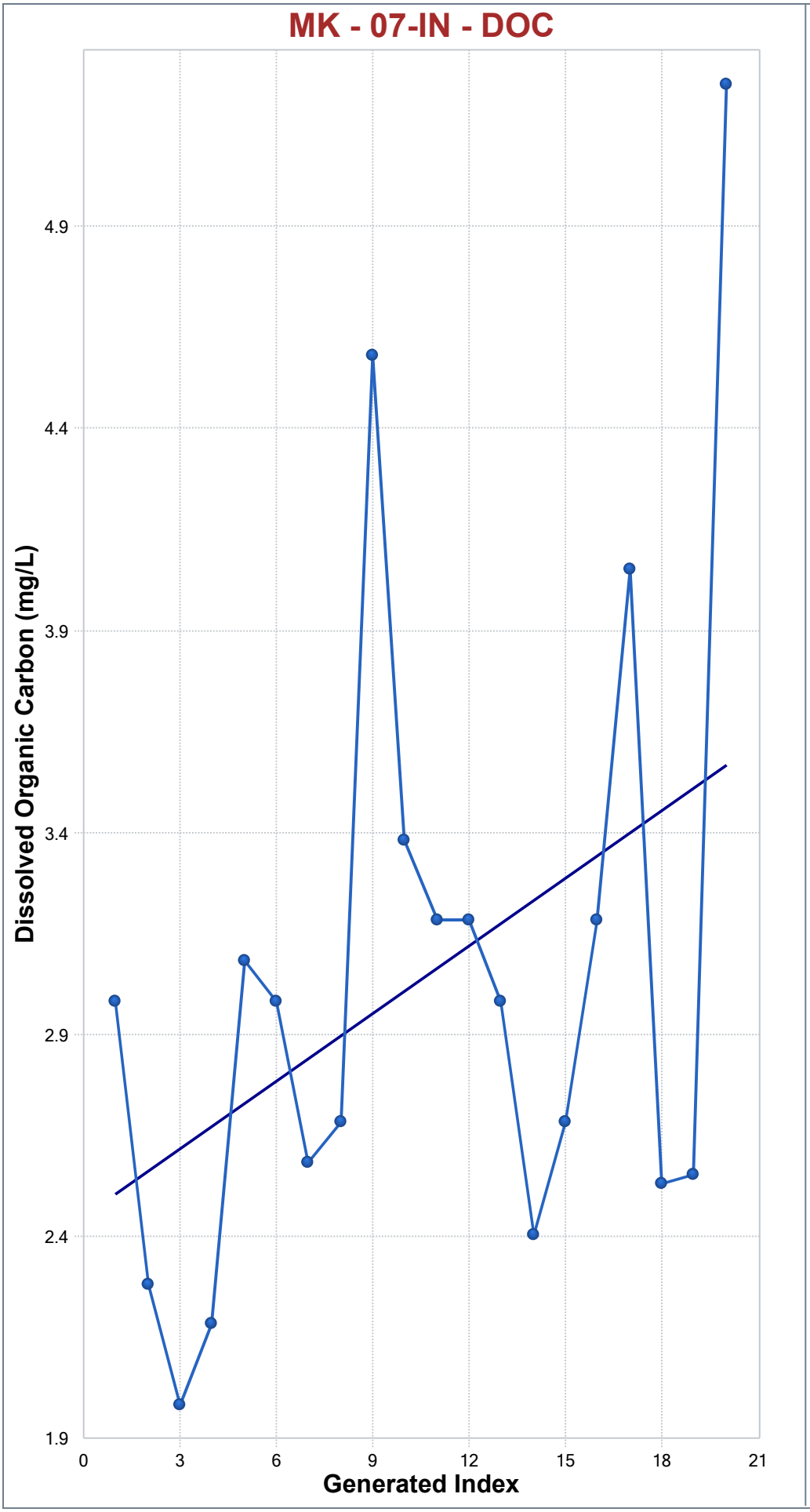
Mann-Kendall Trend Analysis

n	50
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	119.3859
Standardized Value of S	0.1675
M-K Test Value (S)	21
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4335

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0020

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



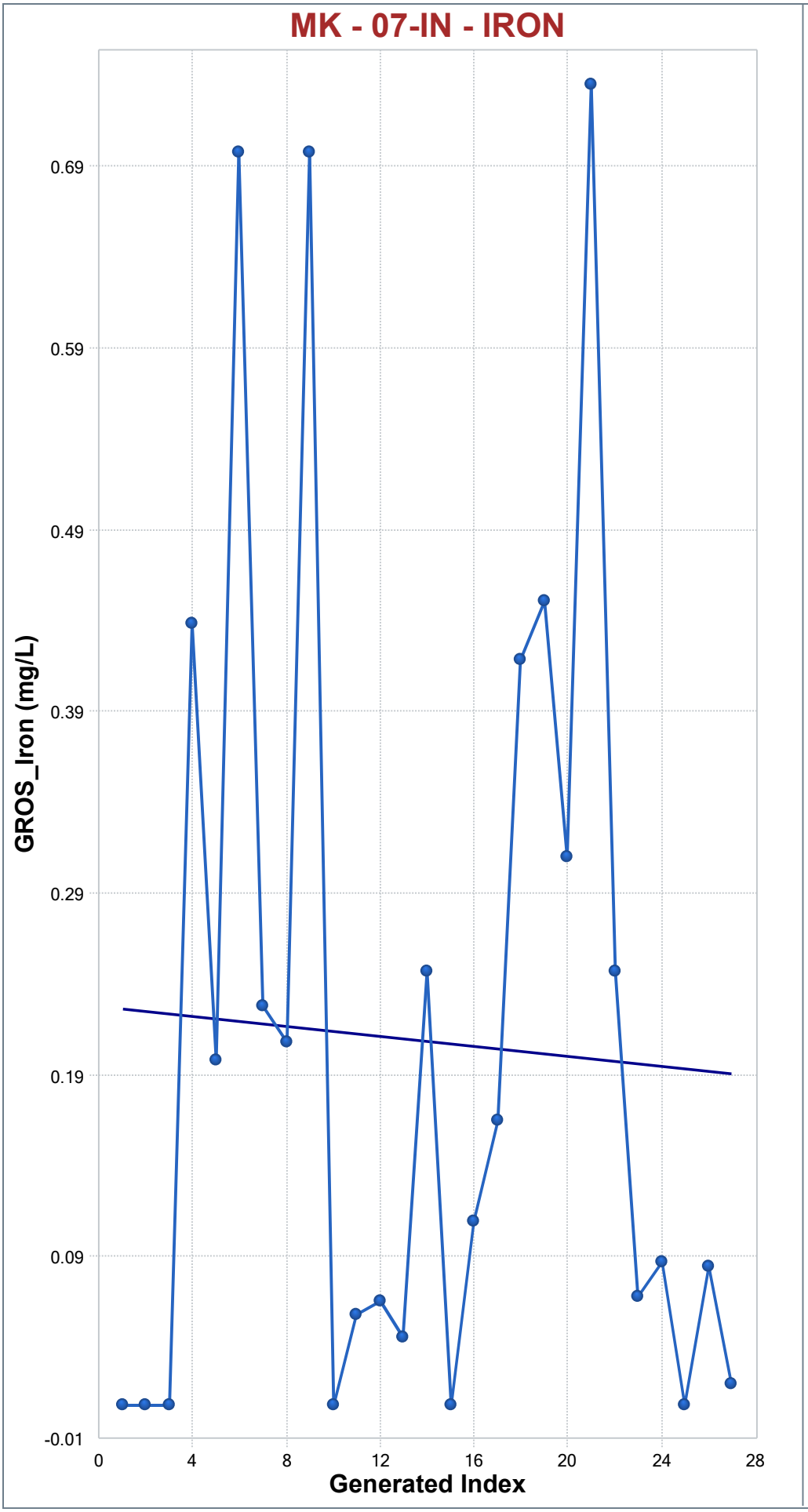
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.6866
Standardized Value of S	1.4339
M-K Test Value (S)	45
Tabulated p-value	0.0820
Approximate p-value	0.0758

OLS Regression Line (Blue)

OLS Regression Slope	0.0560
OLS Regression Intercept	2.4657

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



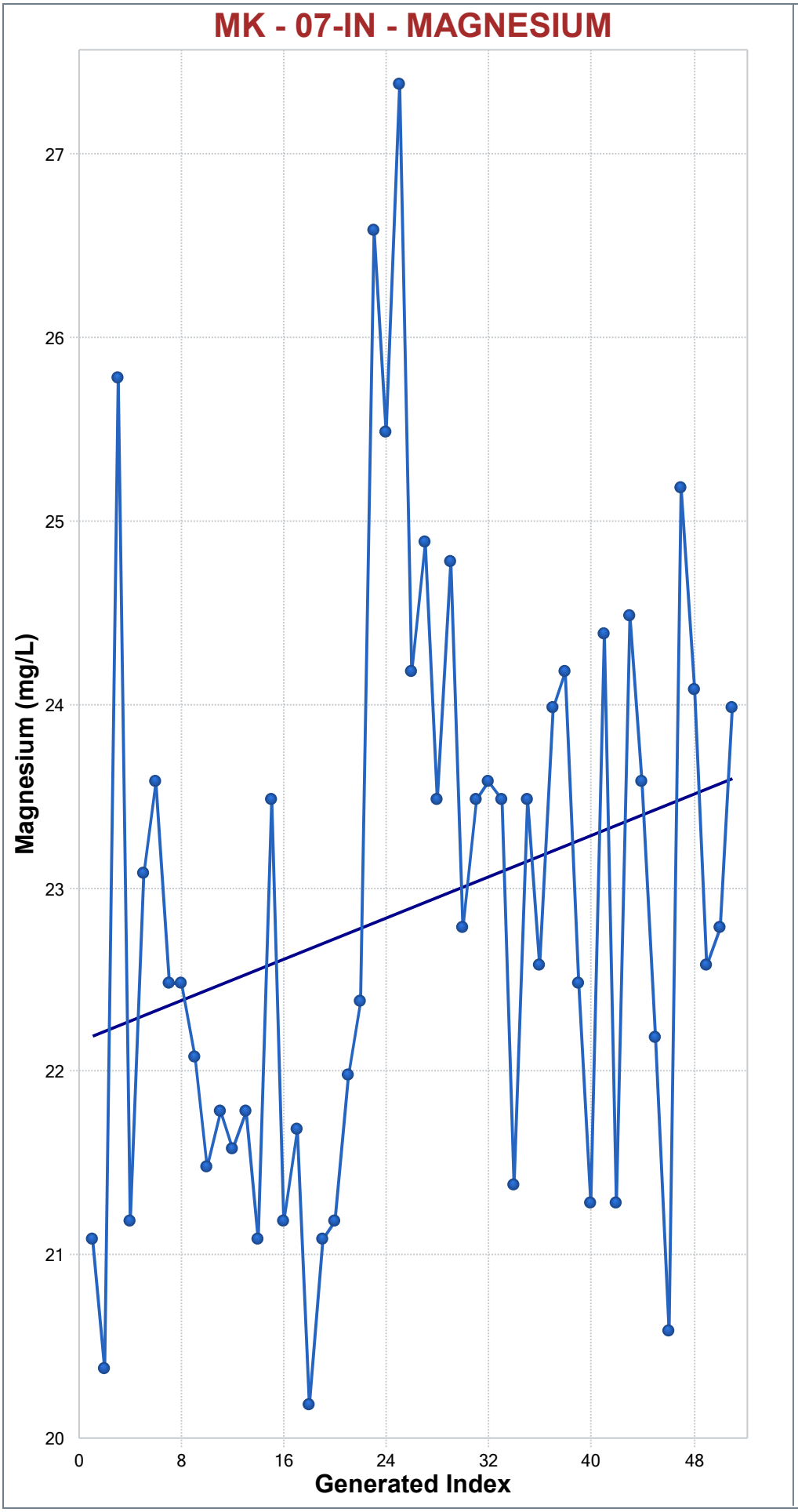
Mann-Kendall Trend Analysis

n	27
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	47.6515
Standardized Value of S	0.3568
M-K Test Value (S)	18
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3606

OLS Regression Line (Blue)

OLS Regression Slope	-0.0014
OLS Regression Intercept	0.2298

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



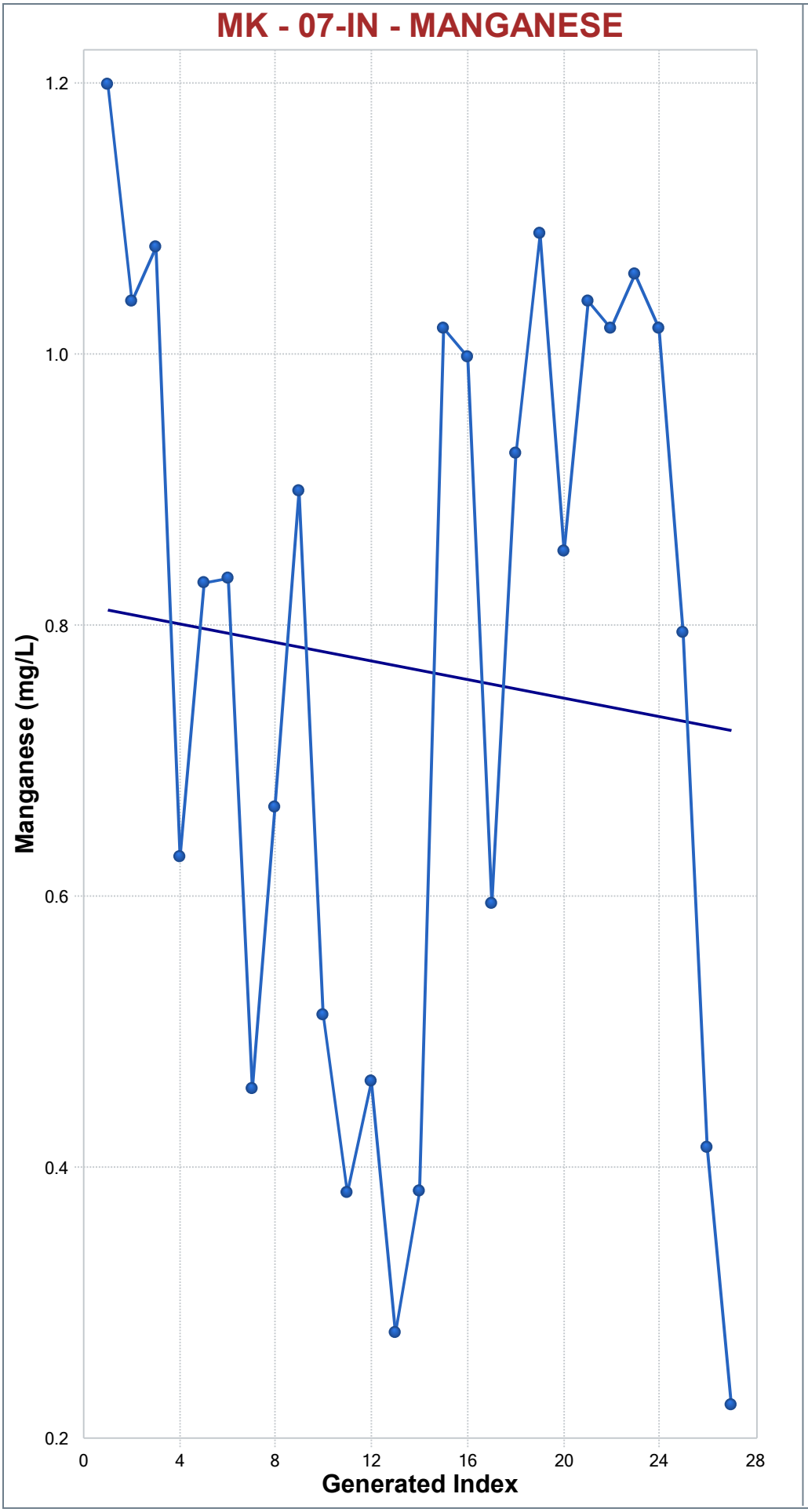
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	122.9675
Standardized Value of S	2.0819
M-K Test Value (S)	257
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0187

OLS Regression Line (Blue)

OLS Regression Slope	0.0281
OLS Regression Intercept	21.9802

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



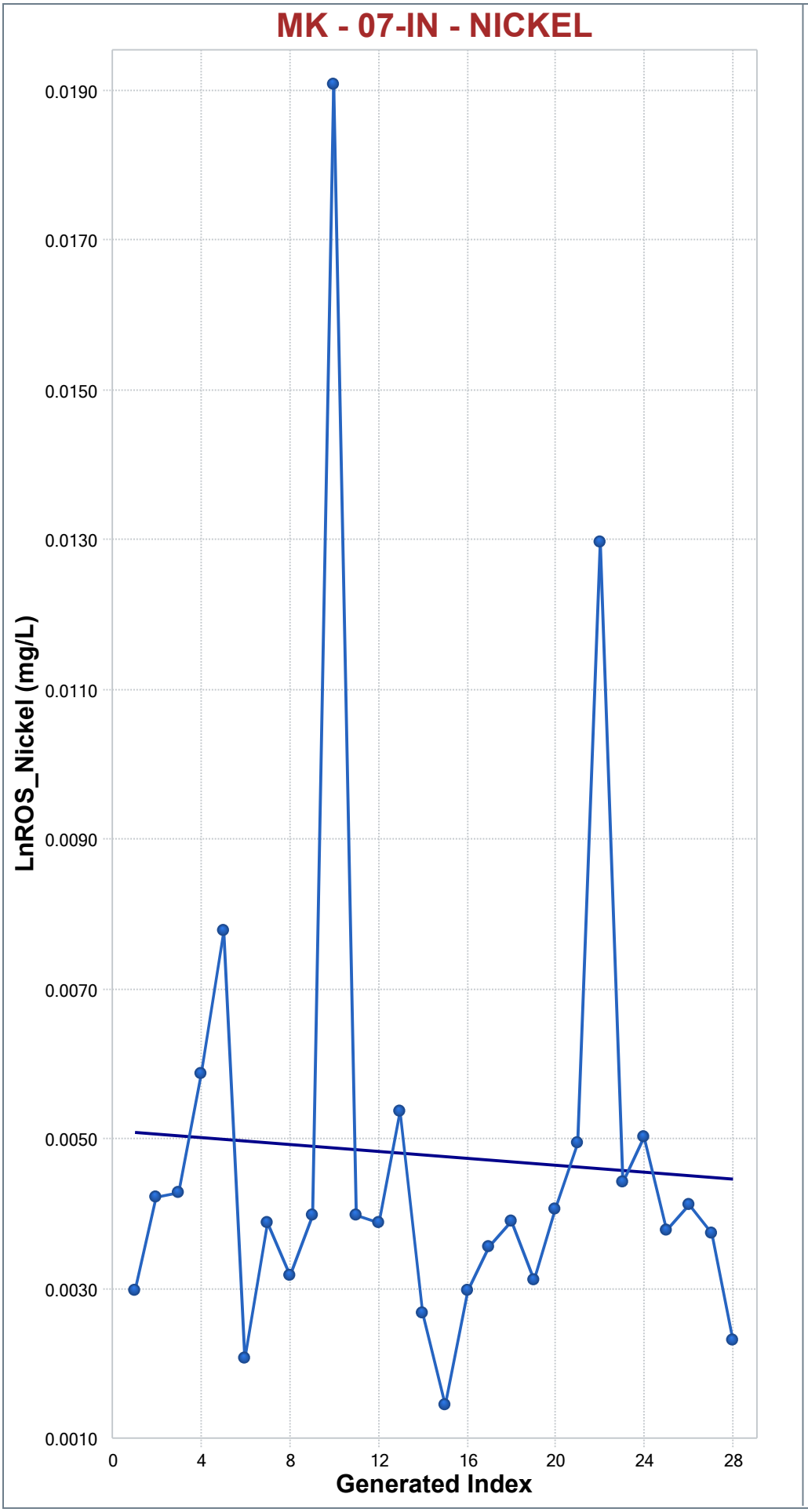
Mann-Kendall Trend Analysis

n	27
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	47.9201
Standardized Value of S	-0.5008
M-K Test Value (S)	-25
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3082

OLS Regression Line (Blue)

OLS Regression Slope	-0.0034
OLS Regression Intercept	0.8155

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



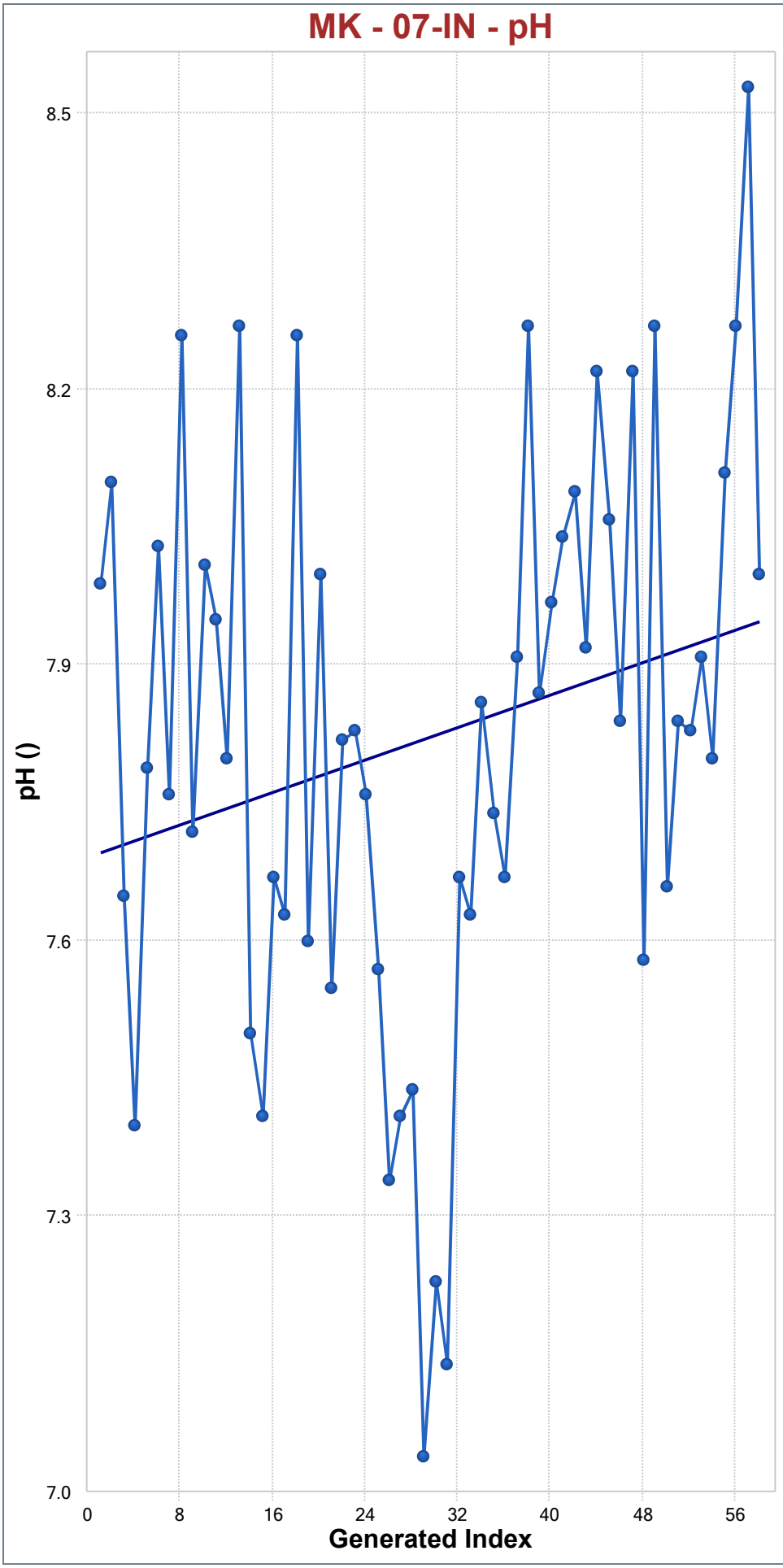
Mann-Kendall Trend Analysis

n	28
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	50.5964
Standardized Value of S	-0.1779
M-K Test Value (S)	-10
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4294

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0051

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



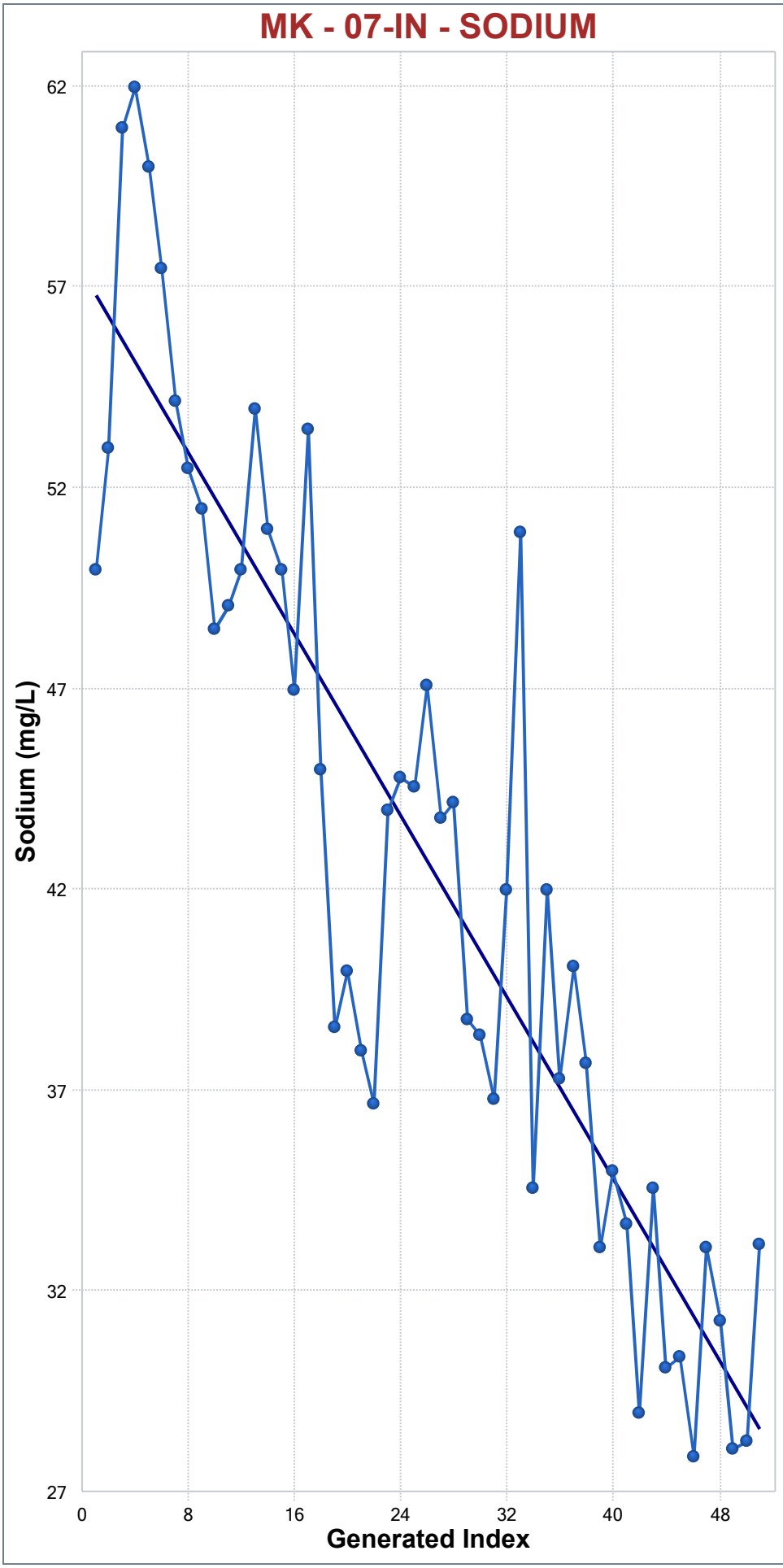
Mann-Kendall Trend Analysis

n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	149.0011
Standardized Value of S	1.9396
M-K Test Value (S)	290
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0262

OLS Regression Line (Blue)

OLS Regression Slope	0.0044
OLS Regression Intercept	7.6523

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



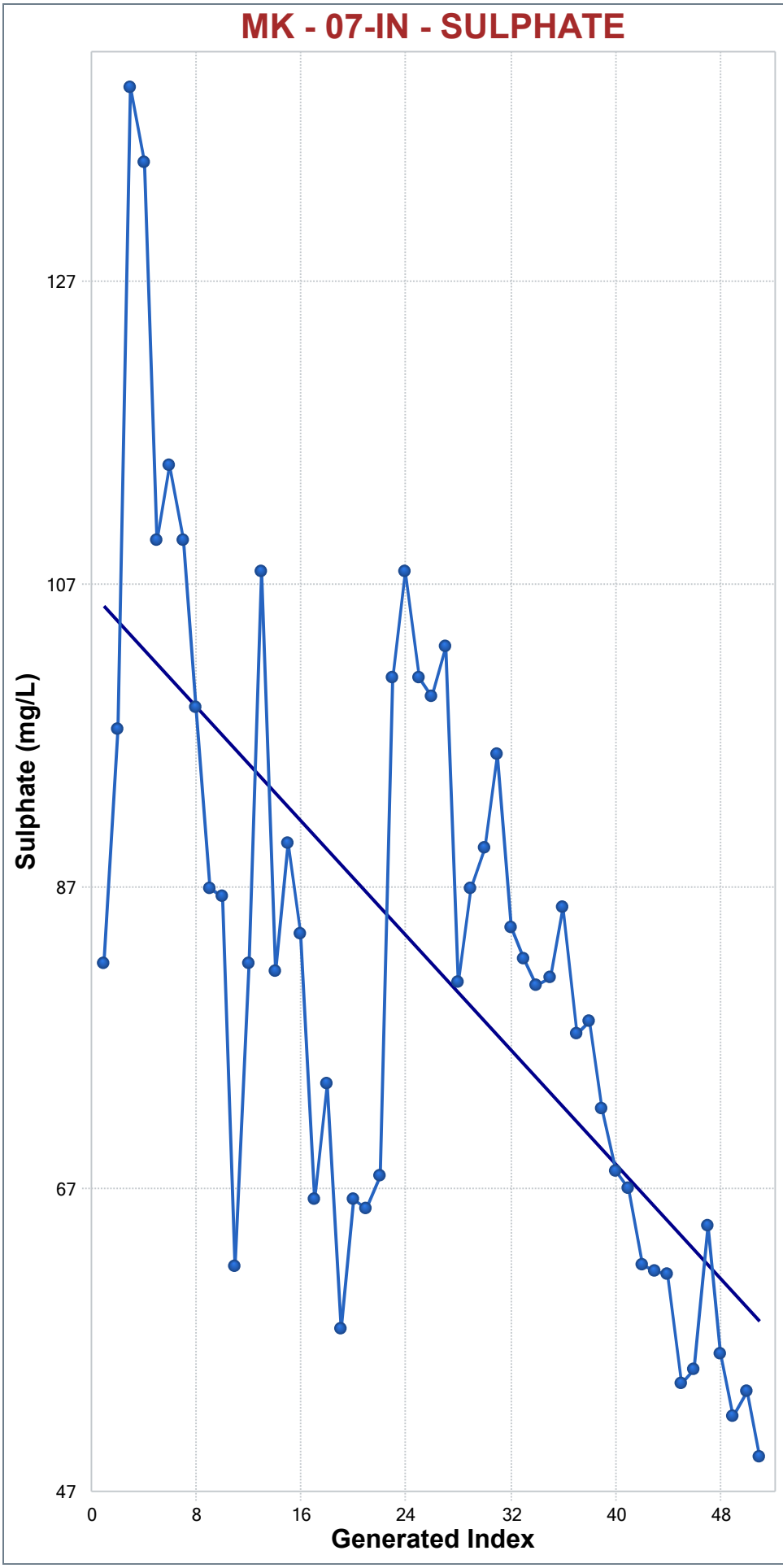
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	123.0921
Standardized Value of S	-7.6853
M-K Test Value (S)	-947
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.5647
OLS Regression Intercept	57.3885

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



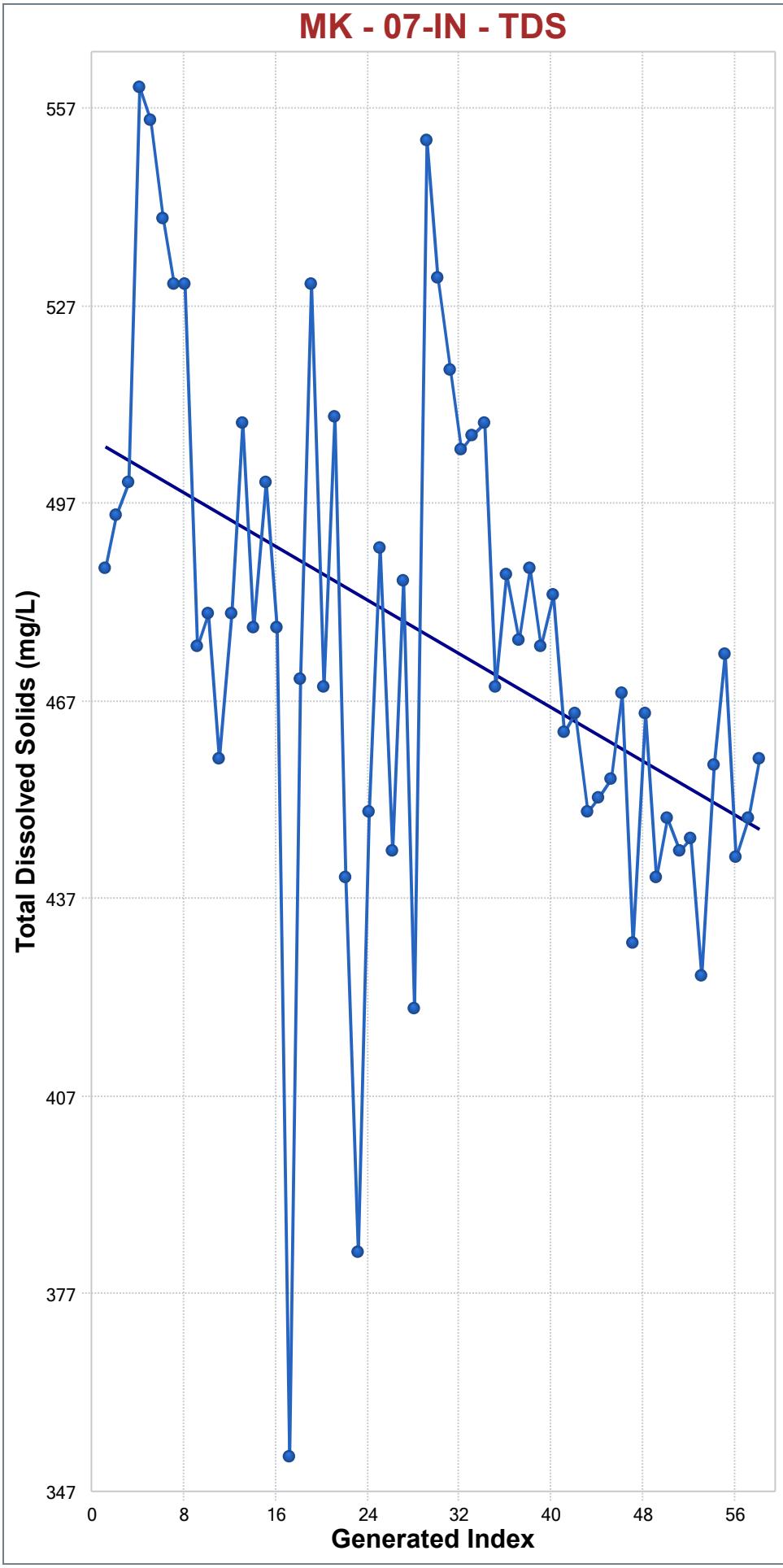
Mann-Kendall Trend Analysis

n	51
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	123.0989
Standardized Value of S	-5.6784
M-K Test Value (S)	-700
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.9460
OLS Regression Intercept	106.6163

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



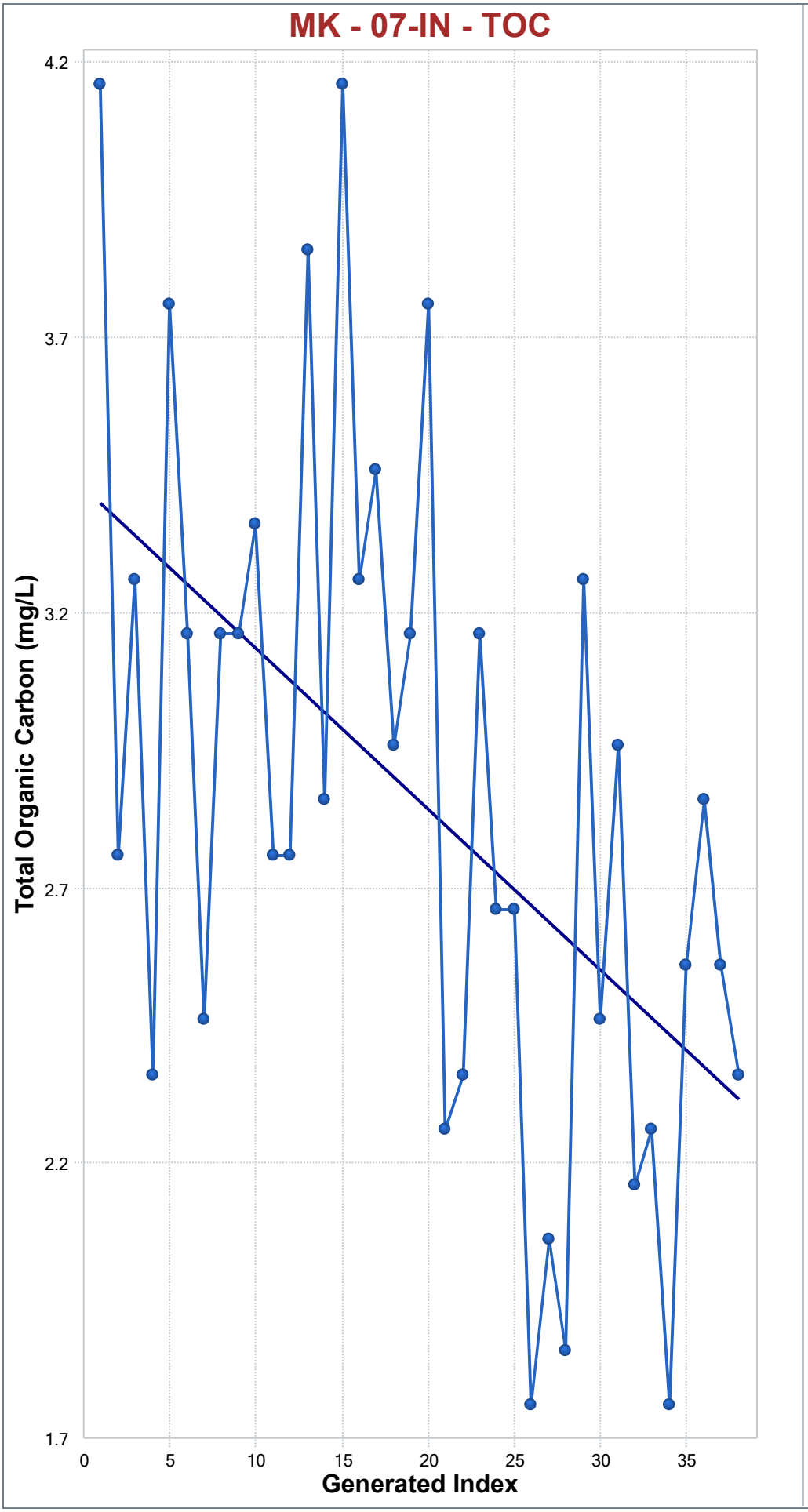
Mann-Kendall Trend Analysis

n	58
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	149.0201
Standardized Value of S	-4.4558
M-K Test Value (S)	-665
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-1.0200
OLS Regression Intercept	506.4174

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



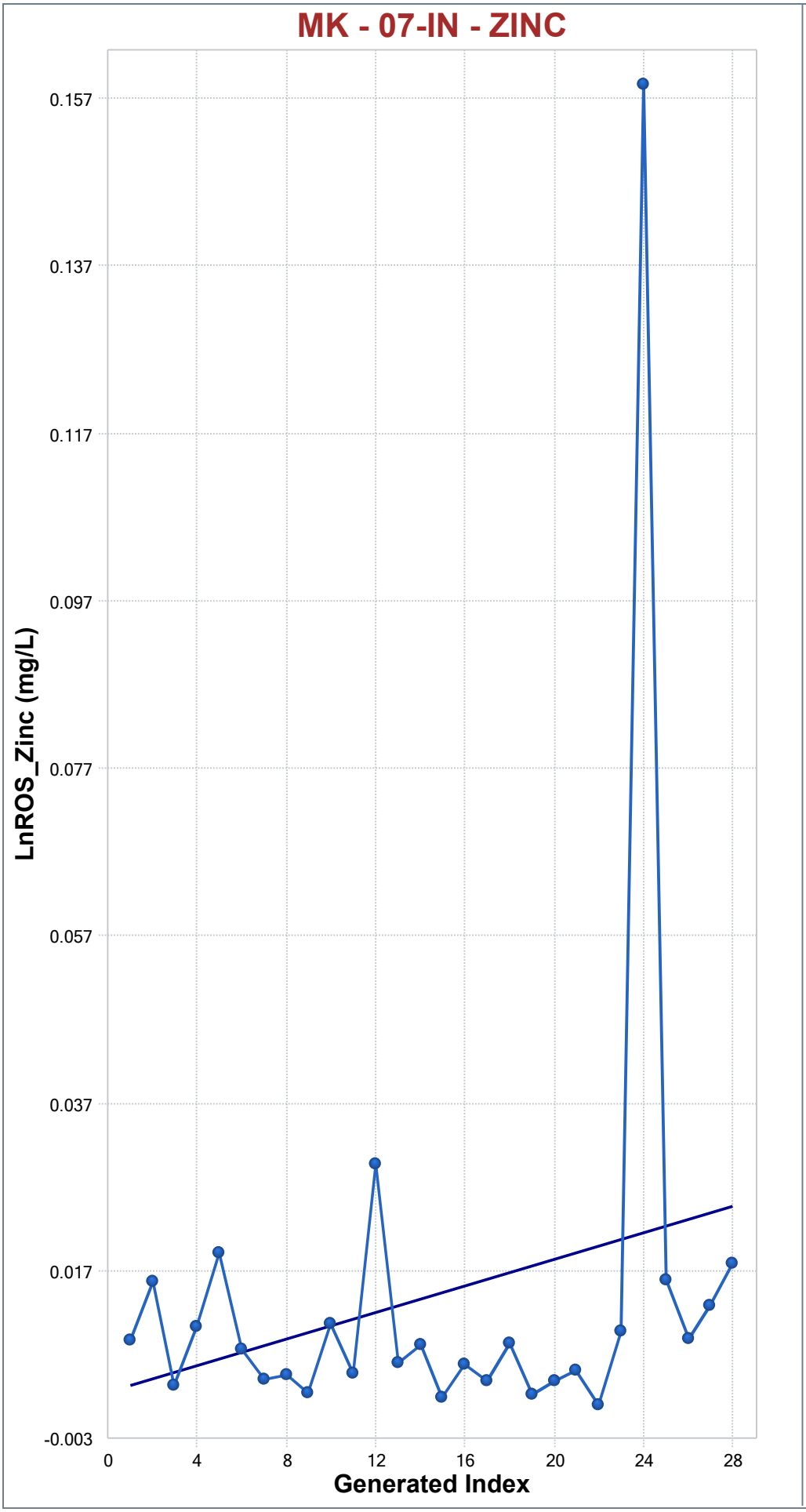
Mann-Kendall Trend Analysis

n	38
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	79.3116
Standardized Value of S	-3.1017
M-K Test Value (S)	-247
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0010

OLS Regression Line (Blue)

OLS Regression Slope	-0.0293
OLS Regression Intercept	3.4694

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



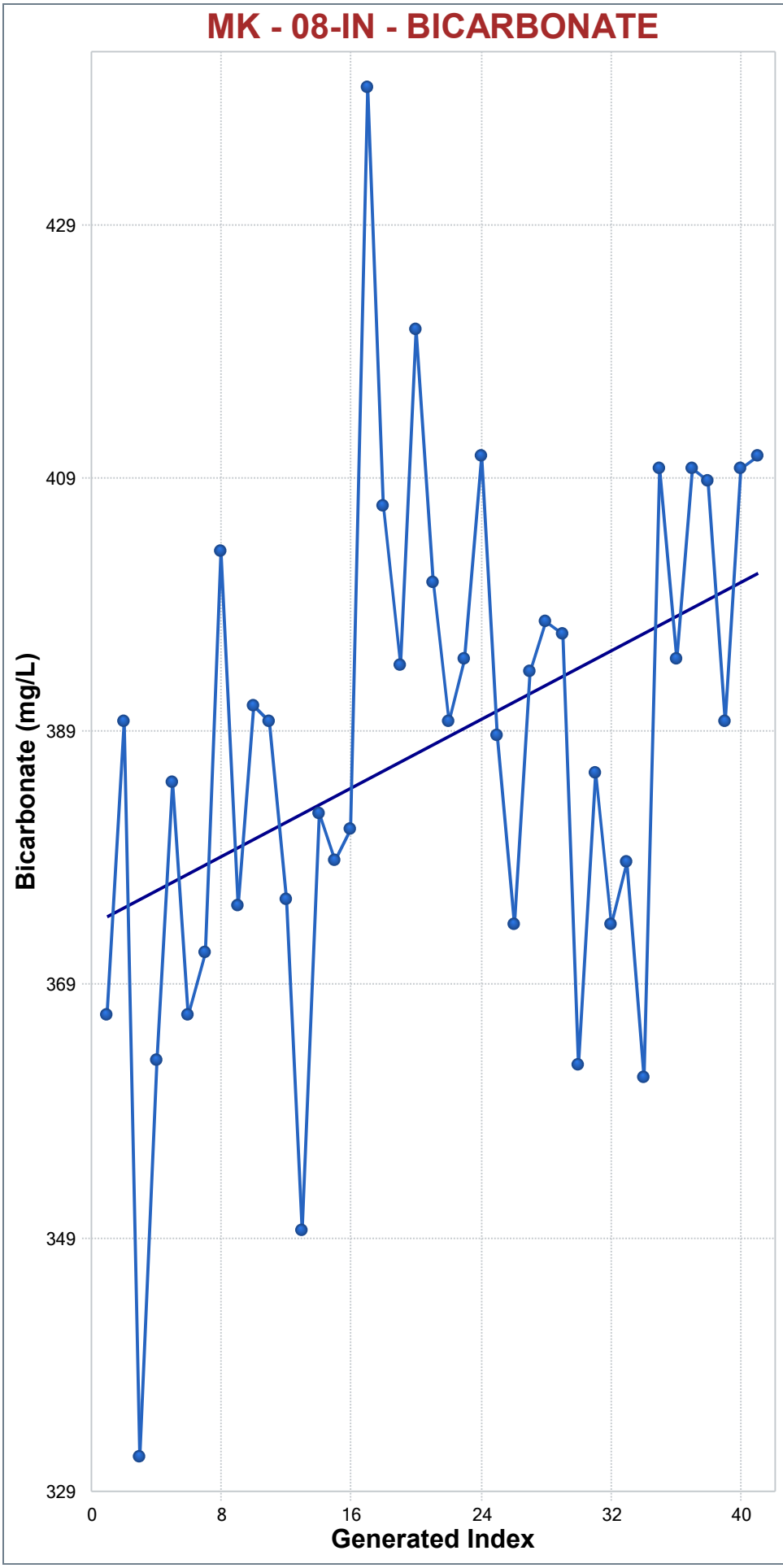
Mann-Kendall Trend Analysis

n	28
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	50.6162
Standardized Value of S	0.5334
M-K Test Value (S)	28
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2969

OLS Regression Line (Blue)

OLS Regression Slope	0.0008
OLS Regression Intercept	0.0028

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



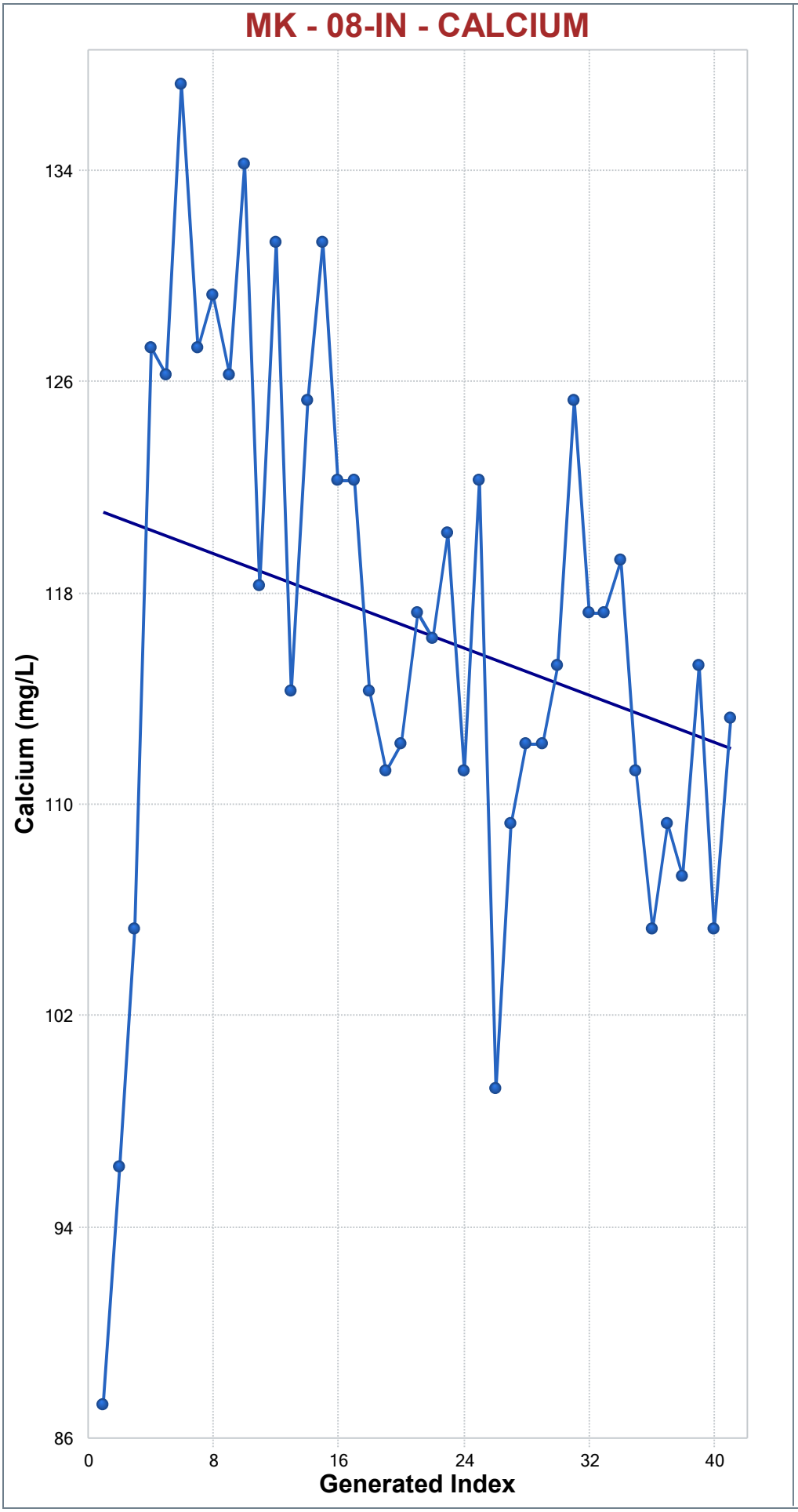
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	88.9775
Standardized Value of S	2.6748
M-K Test Value (S)	239
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0037

OLS Regression Line (Blue)

OLS Regression Slope	0.6796
OLS Regression Intercept	373.9389

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



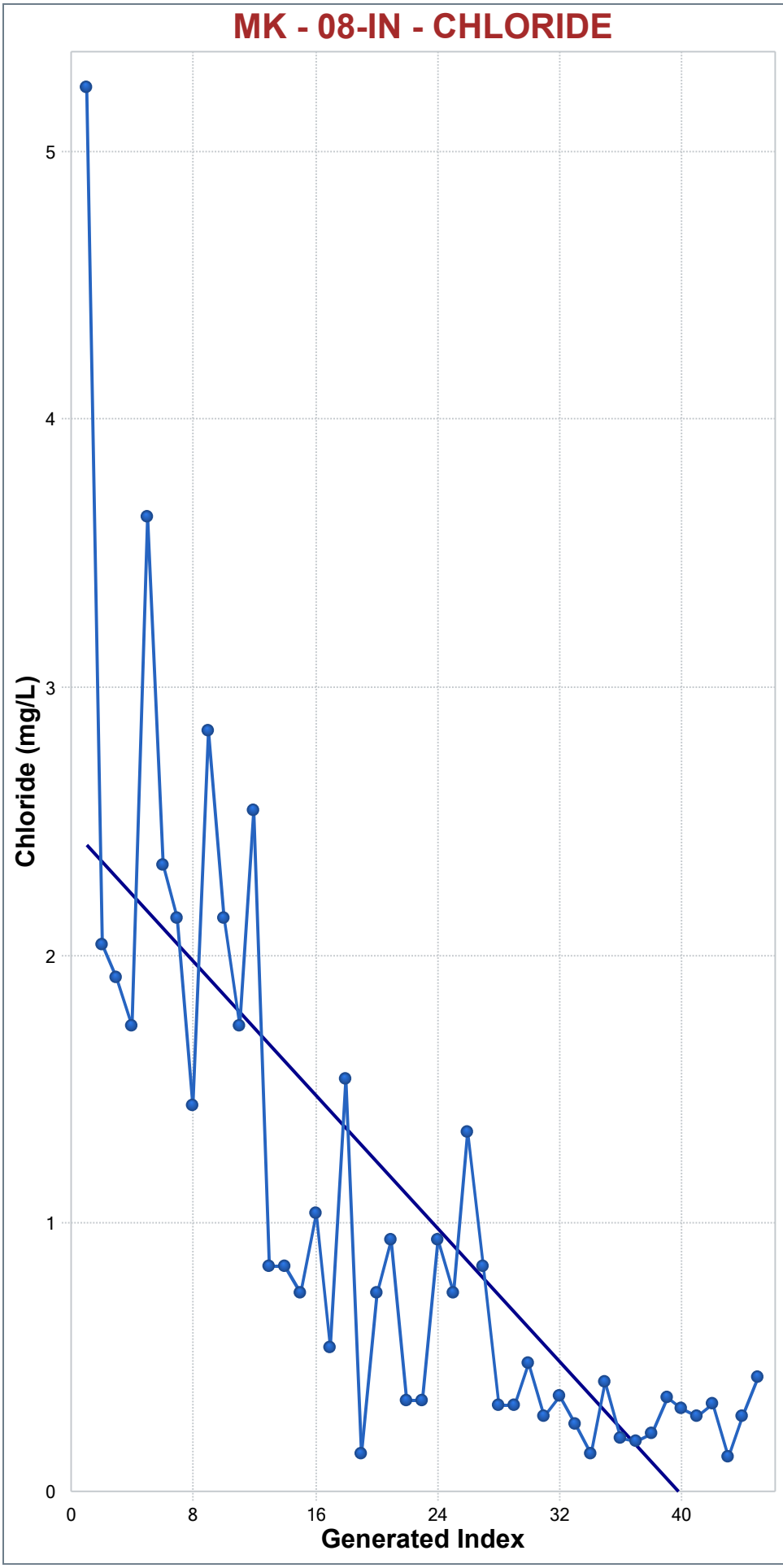
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	88.8894
Standardized Value of S	-2.7787
M-K Test Value (S)	-248
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0027

OLS Regression Line (Blue)

OLS Regression Slope	-0.2239
OLS Regression Intercept	121.0427

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



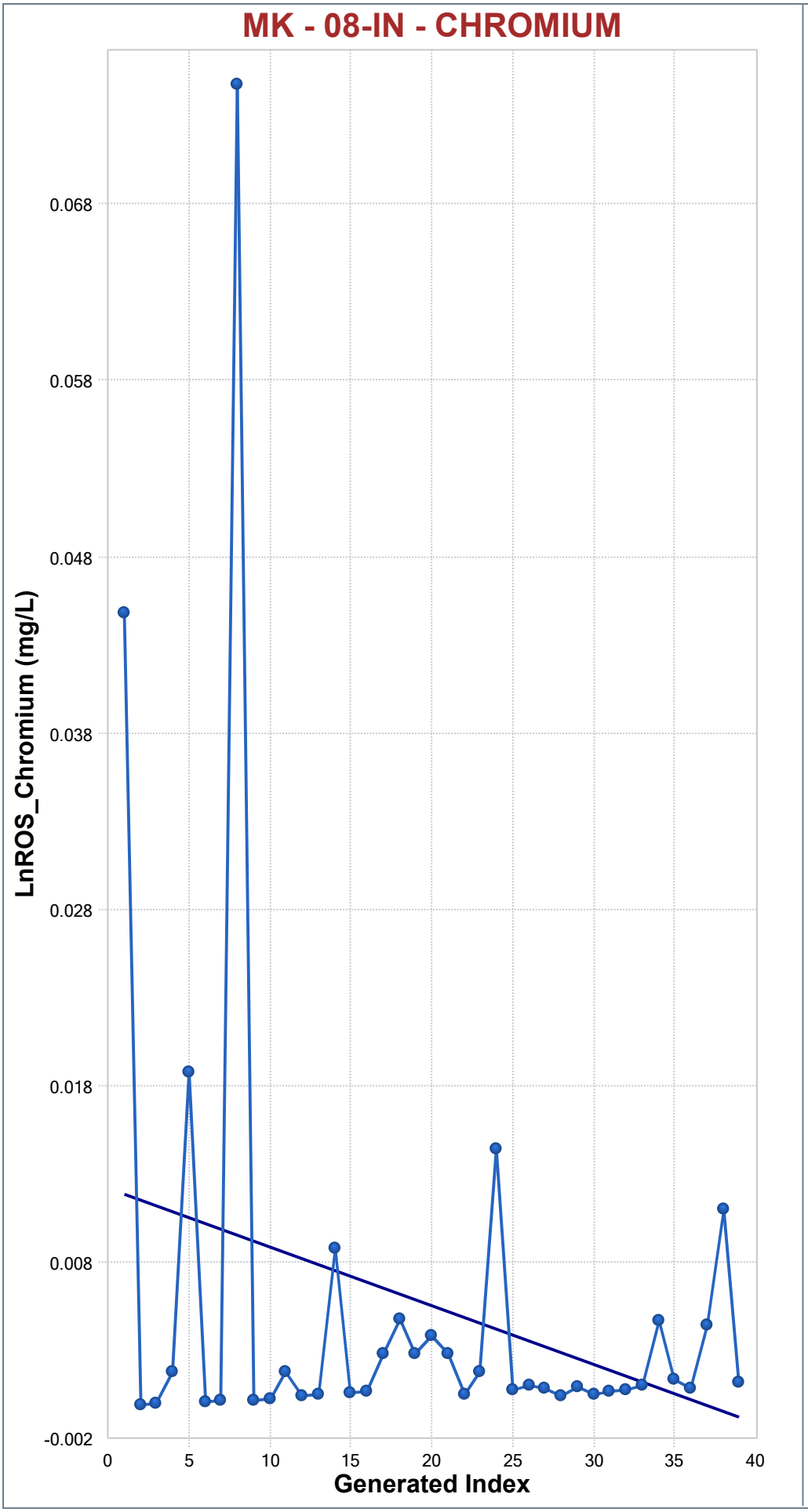
Mann-Kendall Trend Analysis

n	45
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	102.1421
Standardized Value of S	-6.1875
M-K Test Value (S)	-633
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0622
OLS Regression Intercept	2.9347

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



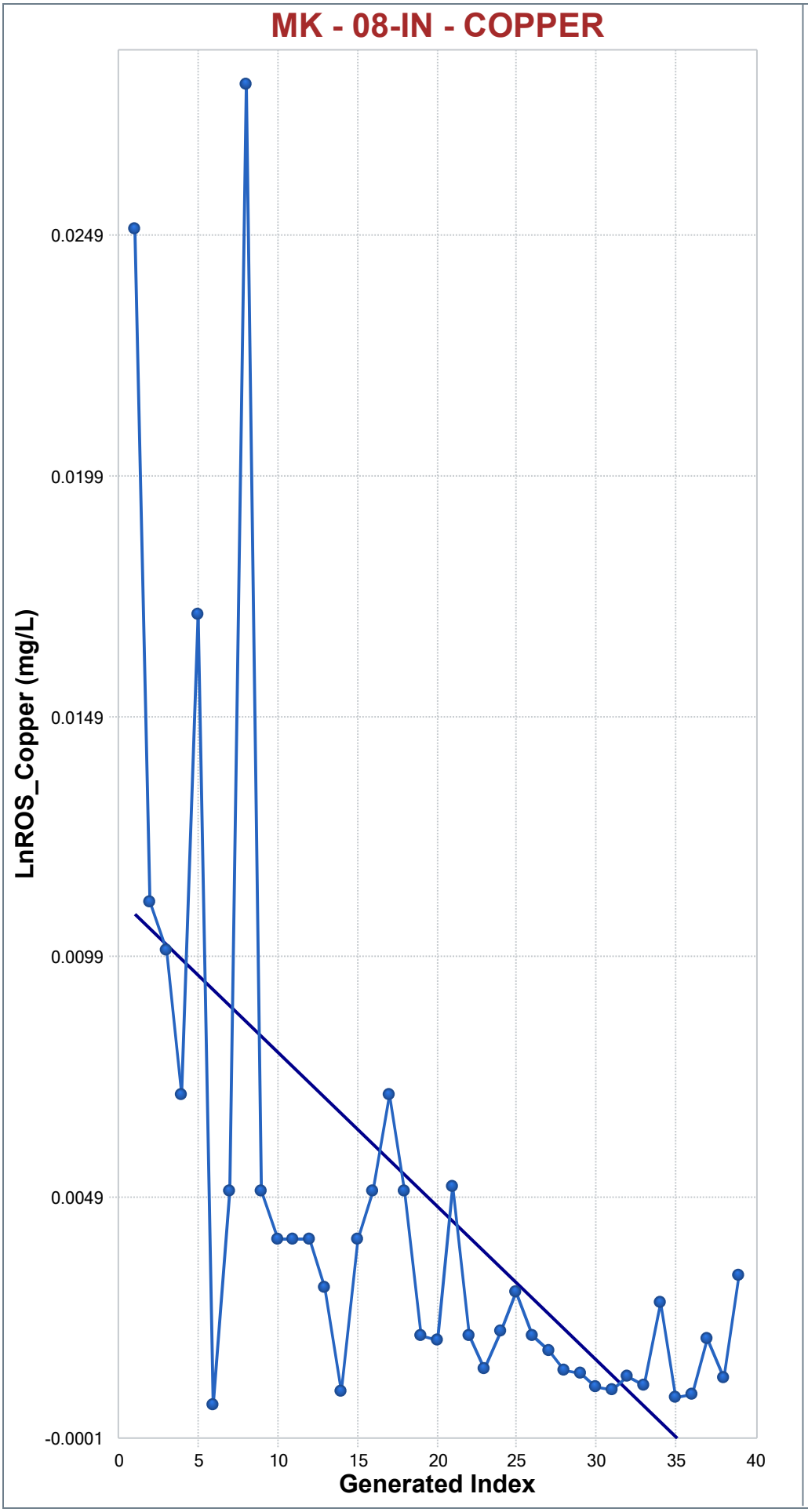
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.6317
Standardized Value of S	1.5127
M-K Test Value (S)	126
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0652

OLS Regression Line (Blue)

OLS Regression Slope	-0.0003
OLS Regression Intercept	0.0124

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



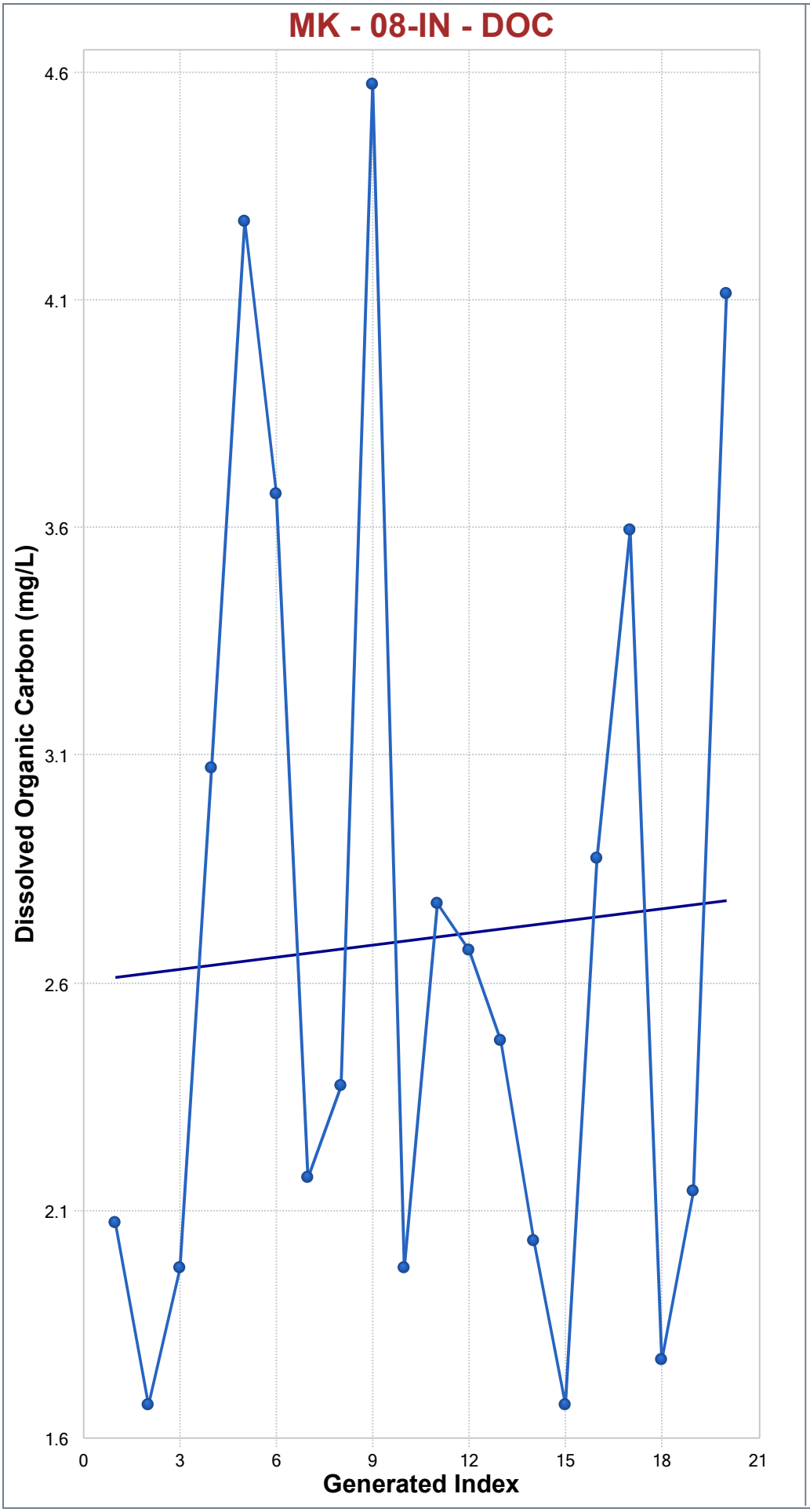
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.5328
Standardized Value of S	-4.8466
M-K Test Value (S)	-401
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0003
OLS Regression Intercept	0.0111

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



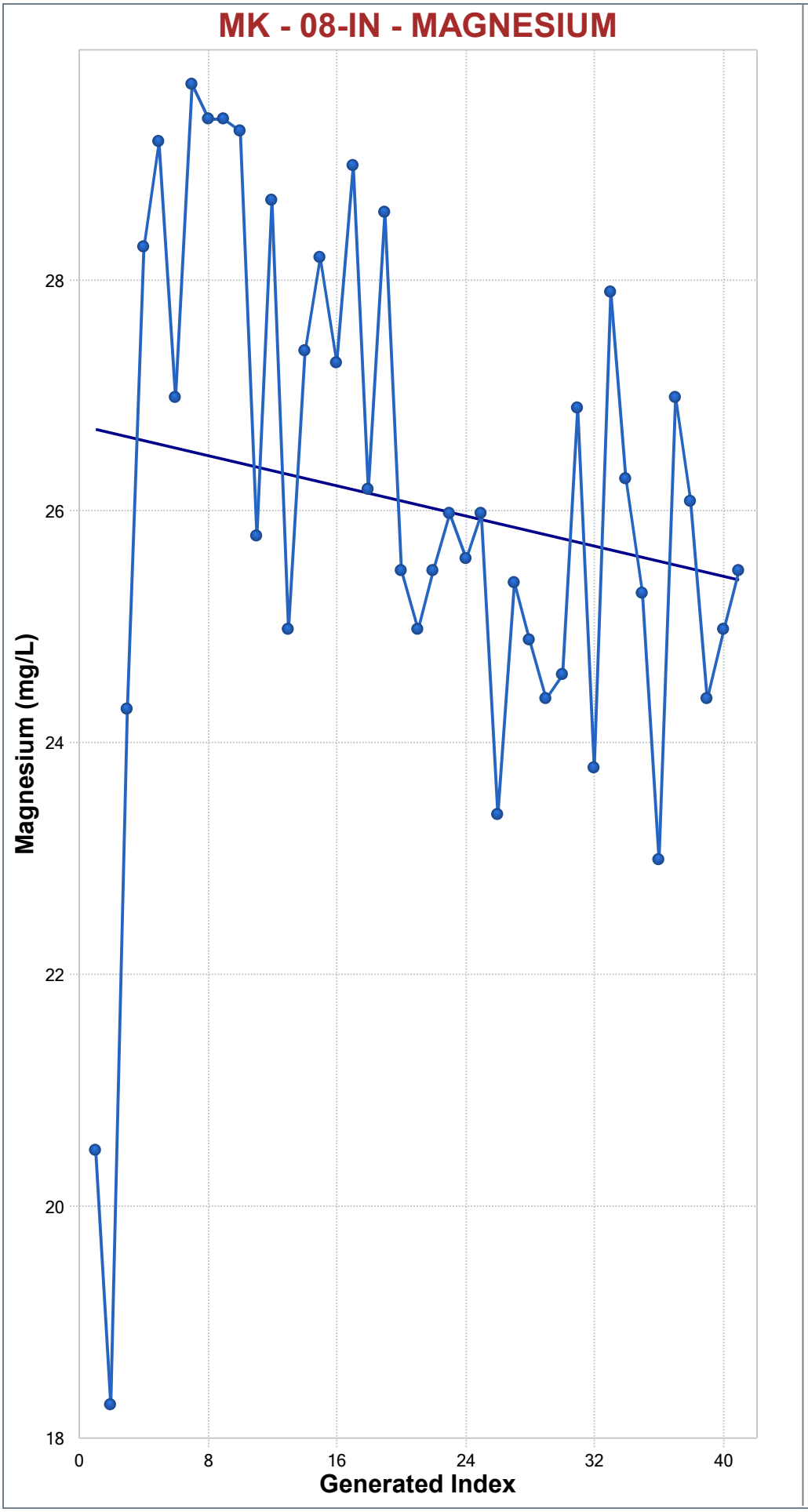
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7896
Standardized Value of S	0.2923
M-K Test Value (S)	10
Tabulated p-value	0.3870
Approximate p-value	0.3850

OLS Regression Line (Blue)

OLS Regression Slope	0.0088
OLS Regression Intercept	2.6319

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



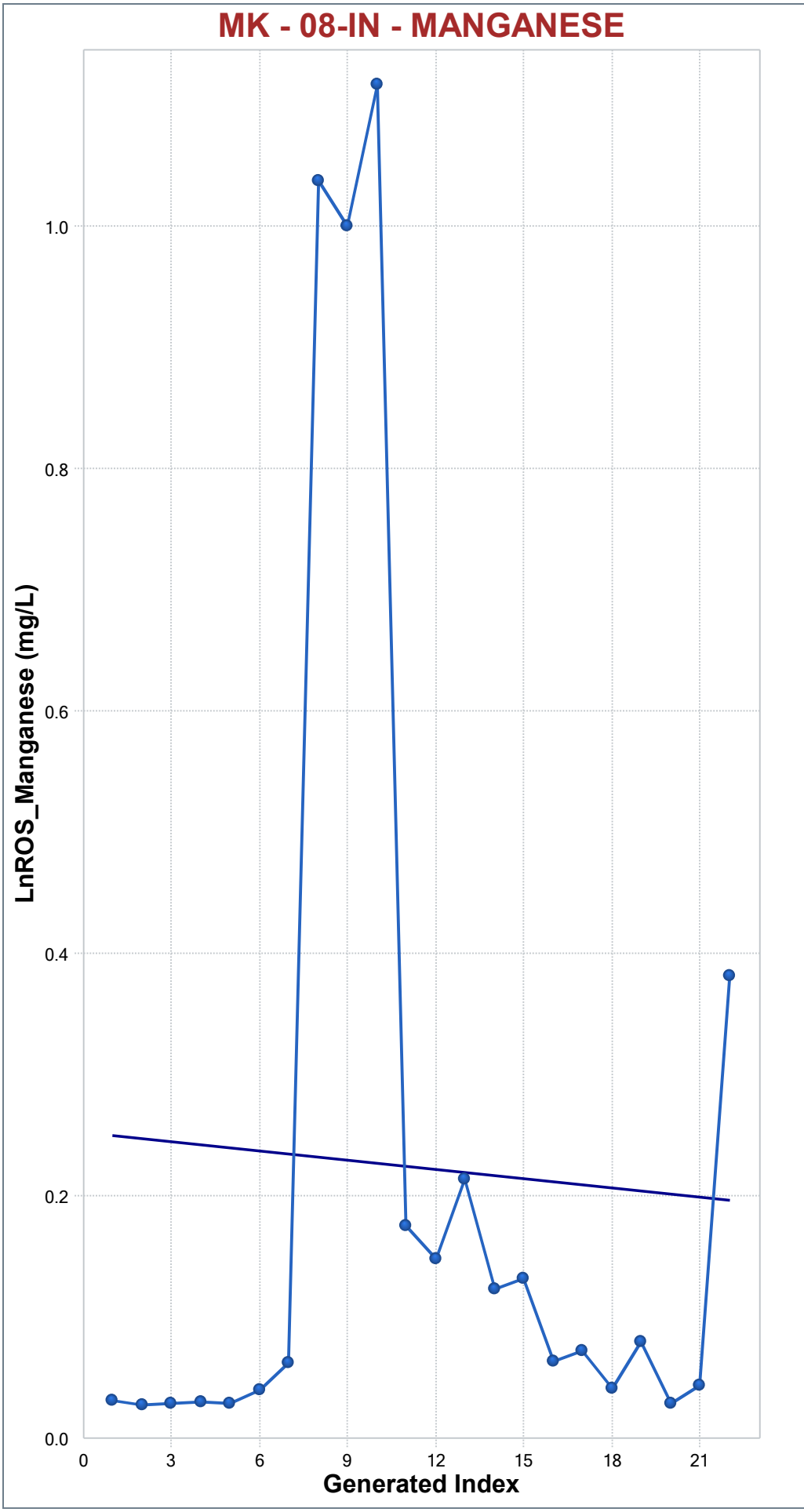
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	88.9682
Standardized Value of S	-2.4616
M-K Test Value (S)	-220
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0069

OLS Regression Line (Blue)

OLS Regression Slope	-0.0326
OLS Regression Intercept	27.0612

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



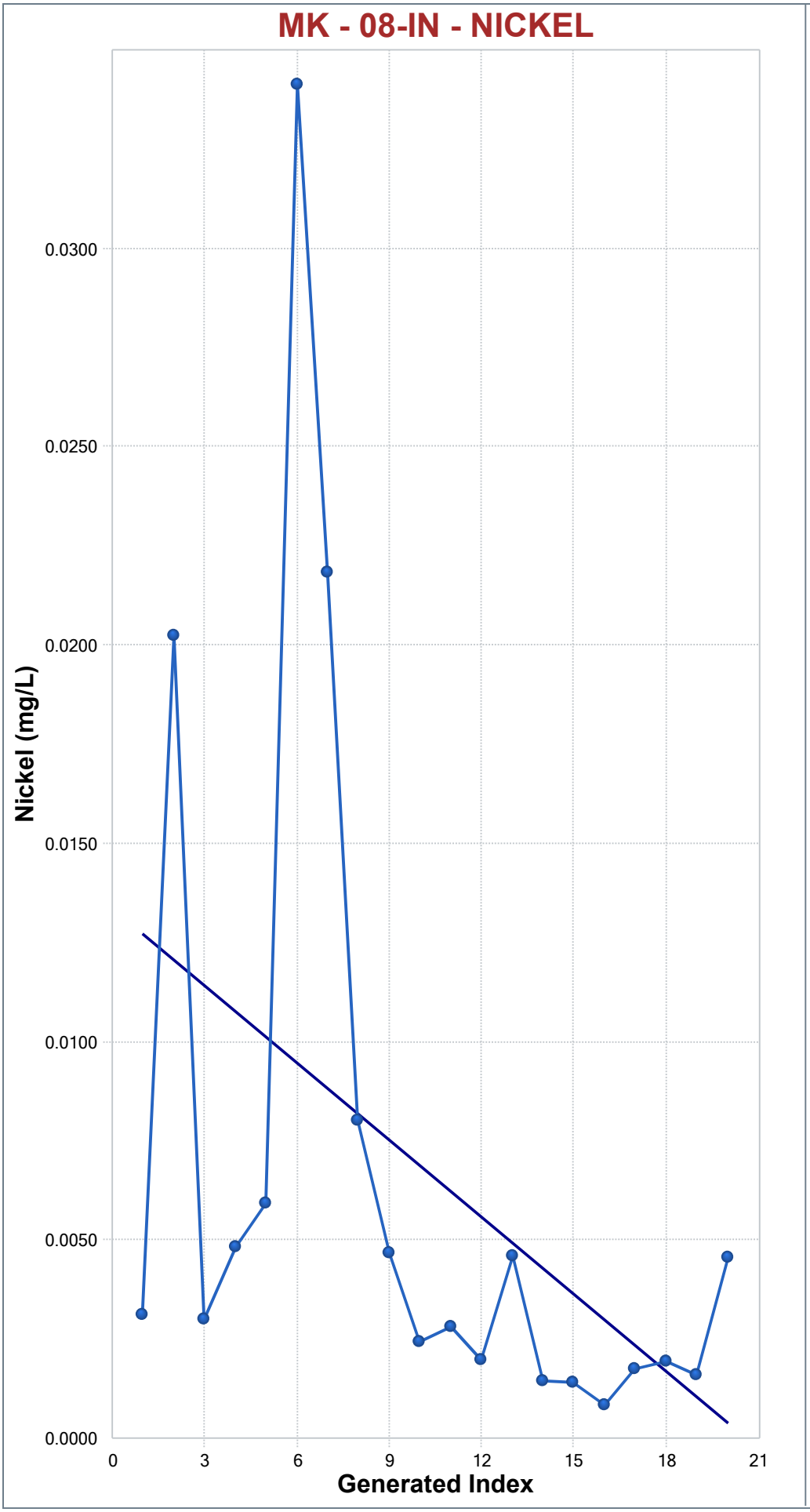
Mann-Kendall Trend Analysis

n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.4636
Standardized Value of S	1.0715
M-K Test Value (S)	39
Tabulated p-value	0.1440
Approximate p-value	0.1420

OLS Regression Line (Blue)

OLS Regression Slope	-0.0026
OLS Regression Intercept	0.2258

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



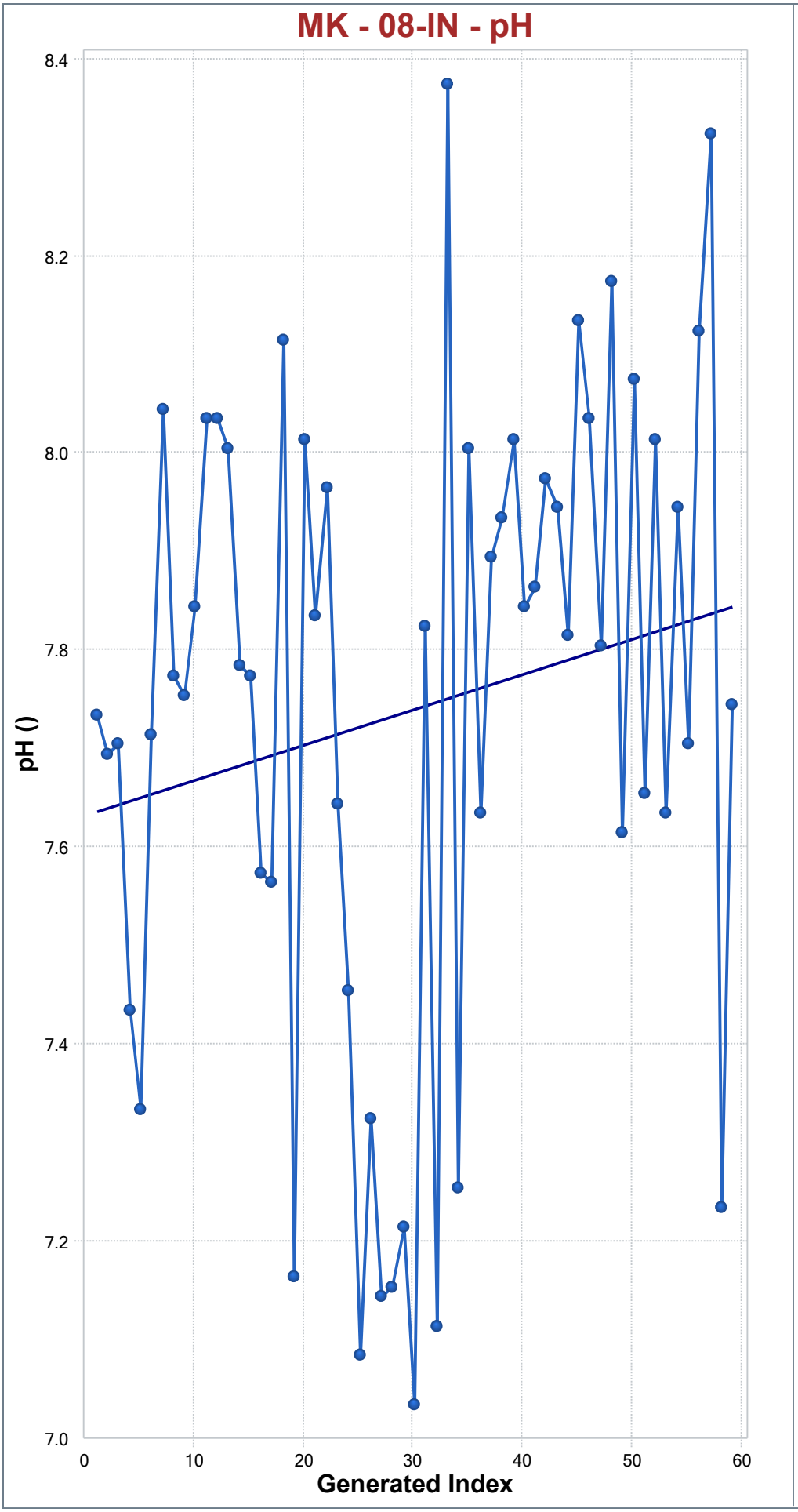
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.8221
Standardized Value of S	-2.9524
M-K Test Value (S)	-92
Tabulated p-value	0.0010
Approximate p-value	0.0016

OLS Regression Line (Blue)

OLS Regression Slope	-0.0006
OLS Regression Intercept	0.0133

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



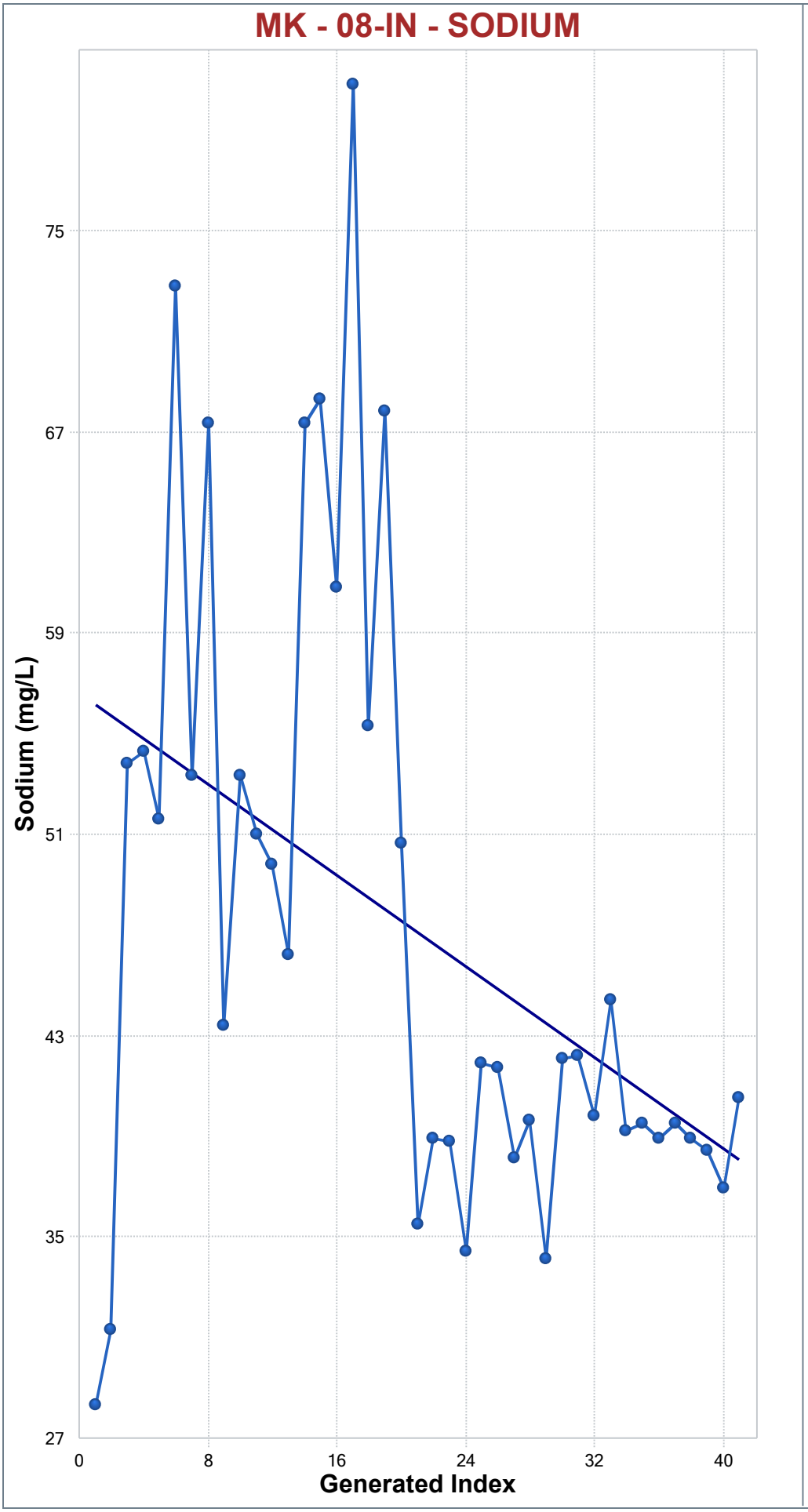
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.8736
Standardized Value of S	1.4783
M-K Test Value (S)	227
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0697

OLS Regression Line (Blue)

OLS Regression Slope	0.0036
OLS Regression Intercept	7.6584

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



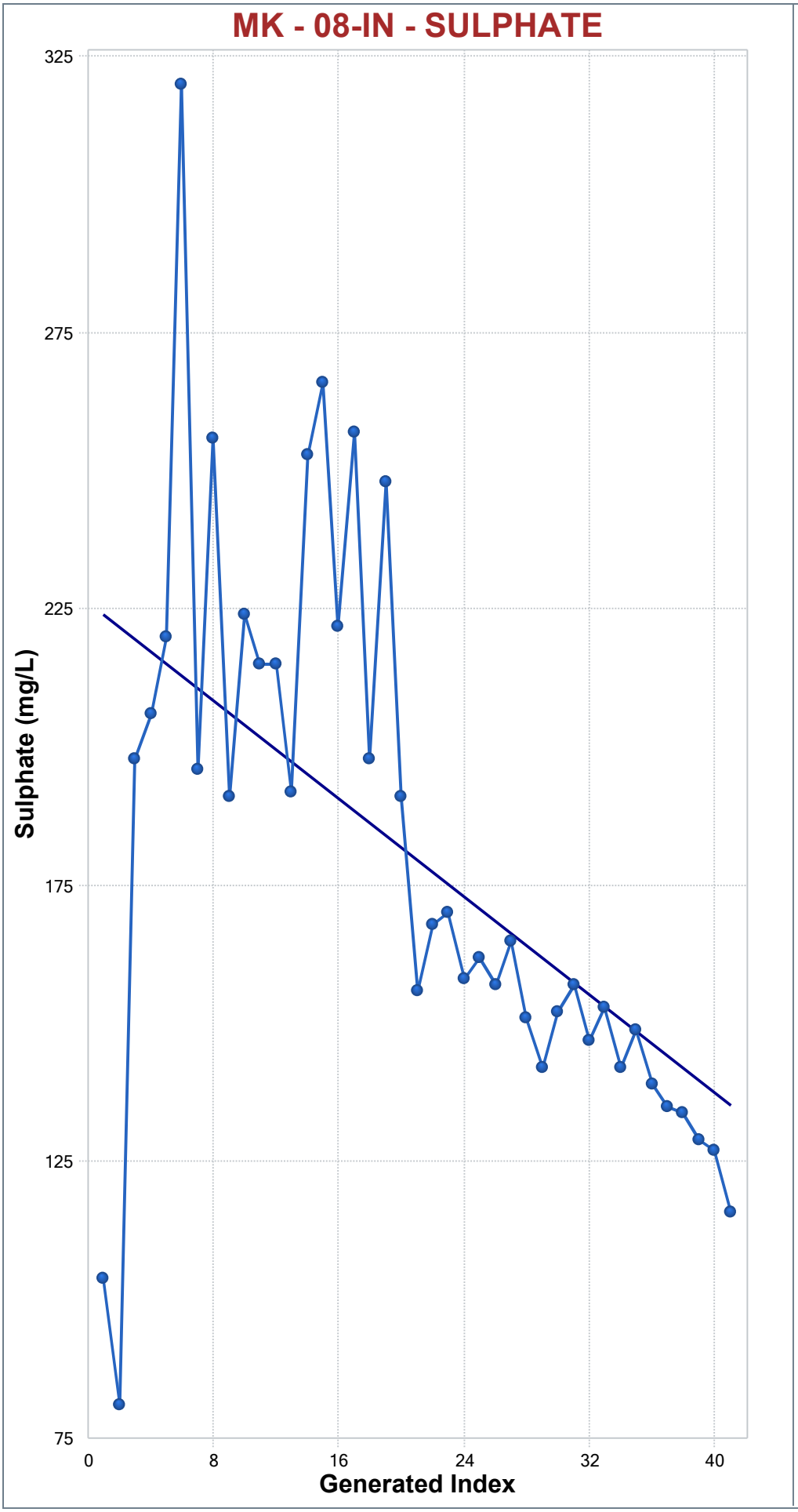
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	88.9944
Standardized Value of S	-3.0676
M-K Test Value (S)	-274
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0011

OLS Regression Line (Blue)

OLS Regression Slope	-0.4527
OLS Regression Intercept	56.7941

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



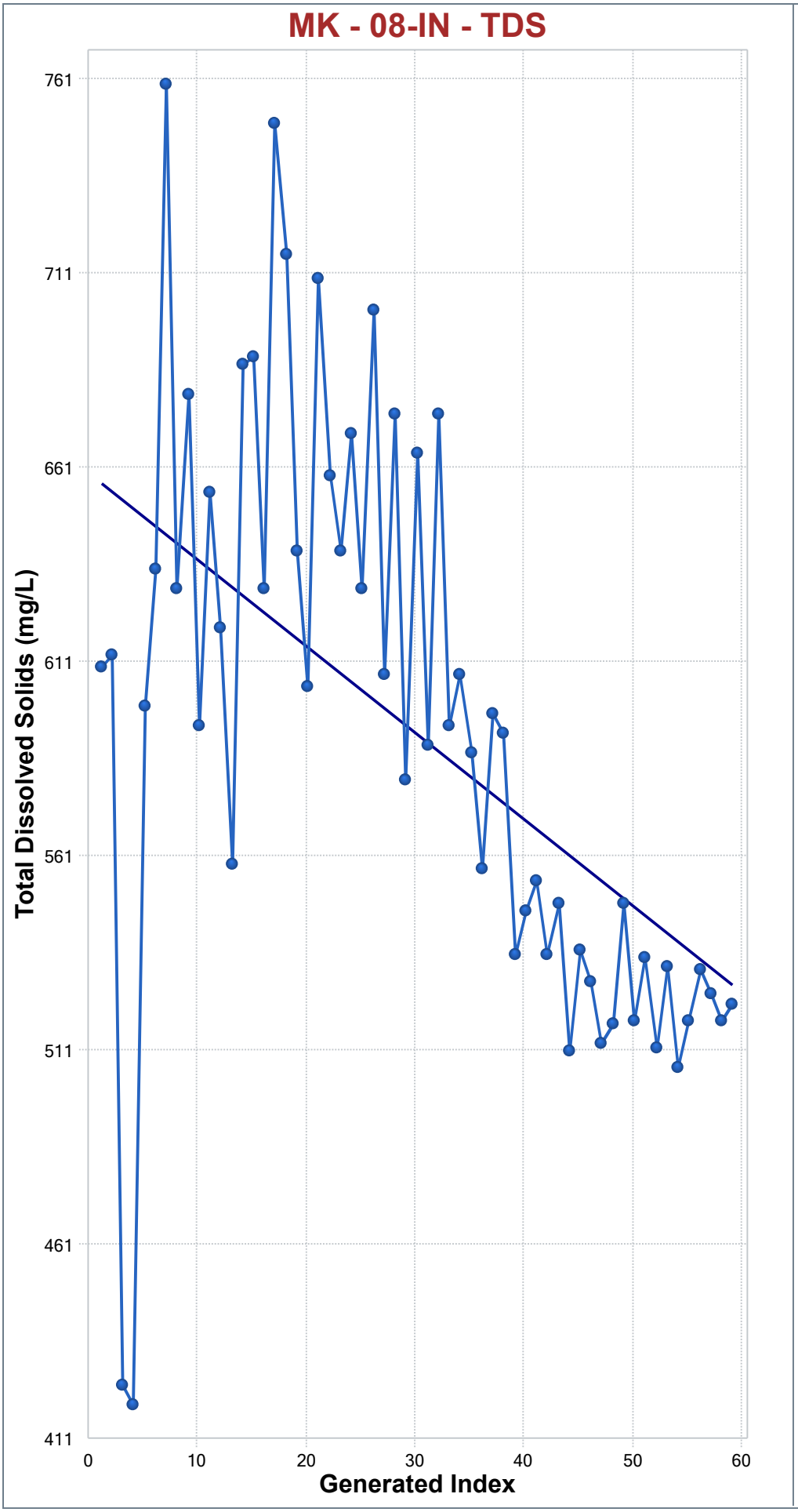
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	89.0037
Standardized Value of S	-5.0784
M-K Test Value (S)	-453
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-2.2197
OLS Regression Intercept	226.1744

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



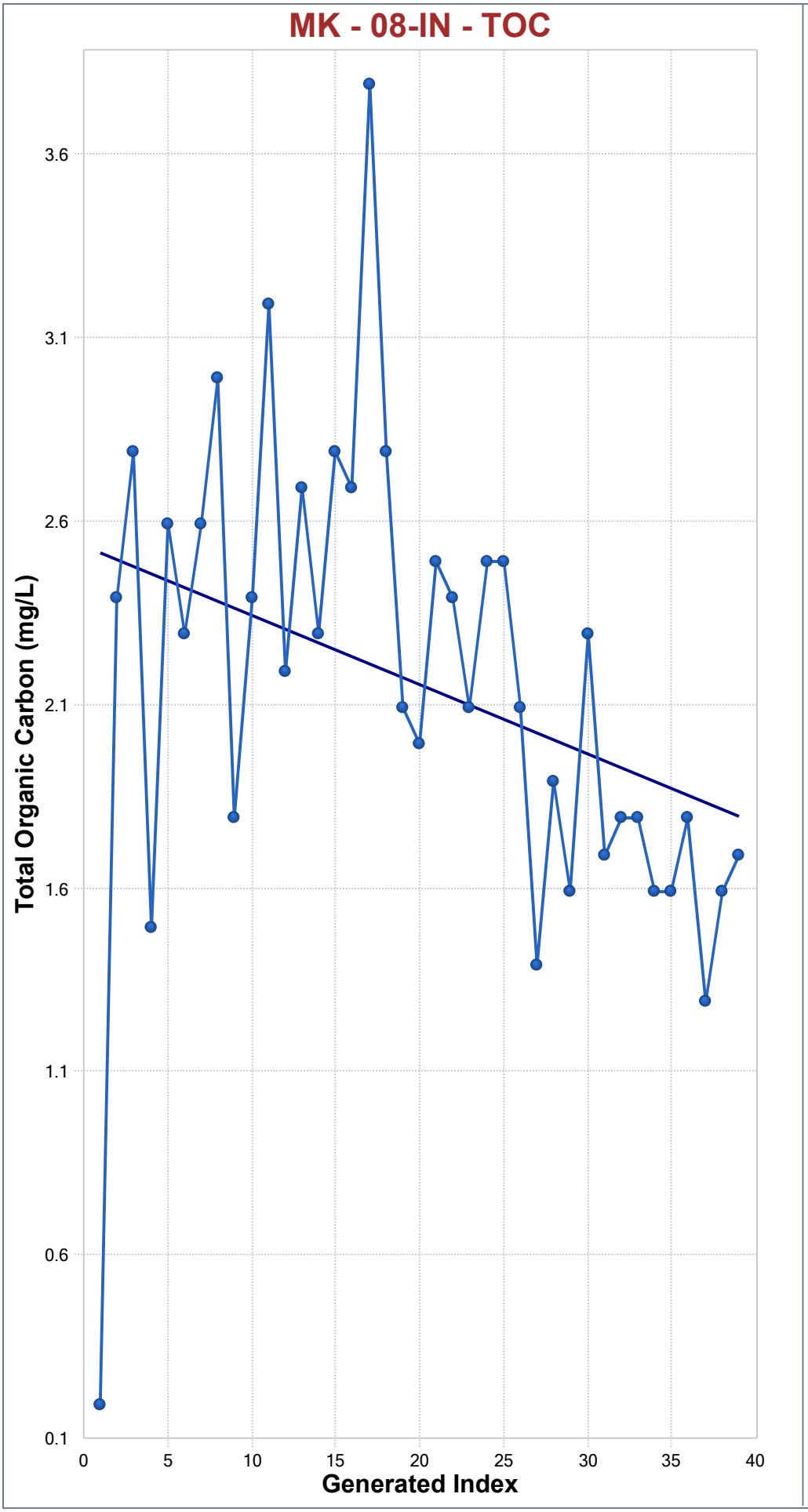
Mann-Kendall Trend Analysis

n	59
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	152.8736
Standardized Value of S	-5.4555
M-K Test Value (S)	-835
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-2.2265
OLS Regression Intercept	659.5248

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



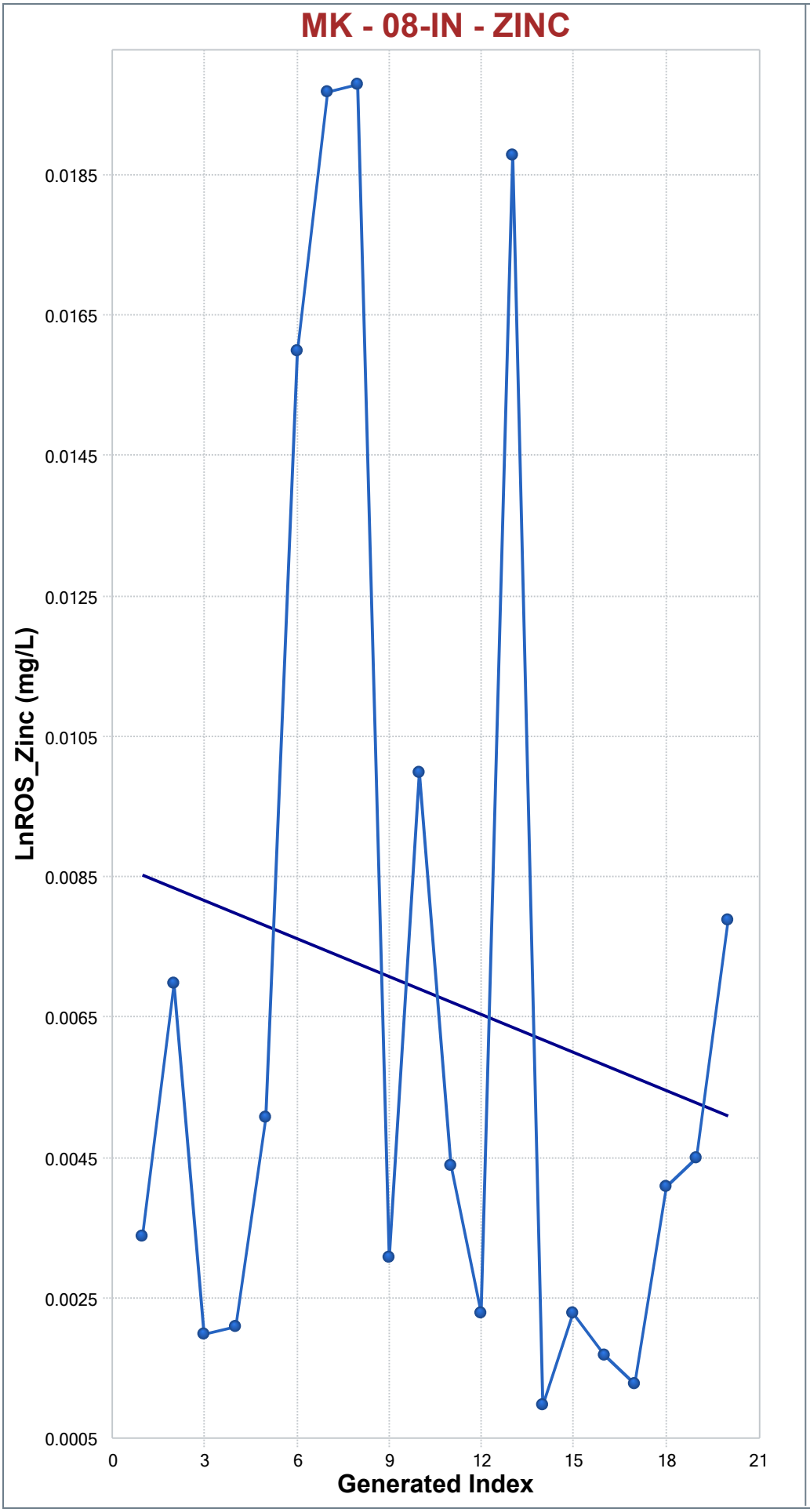
Mann-Kendall Trend Analysis

n	39
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	82.4318
Standardized Value of S	-3.3725
M-K Test Value (S)	-279
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0004

OLS Regression Line (Blue)

OLS Regression Slope	-0.0189
OLS Regression Intercept	2.5414

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



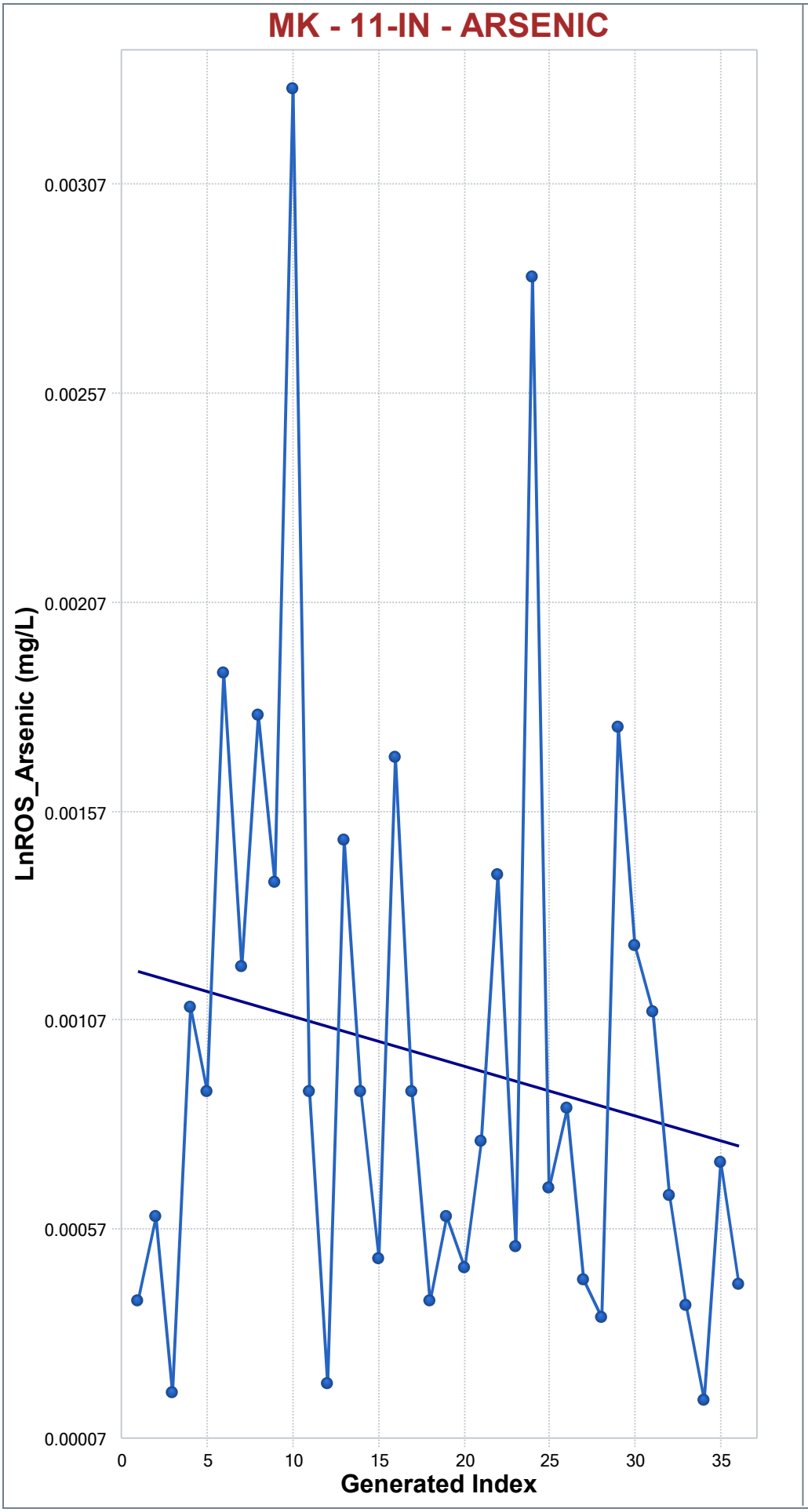
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.8058
Standardized Value of S	-0.5194
M-K Test Value (S)	-17
Tabulated p-value	0.3150
Approximate p-value	0.3017

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0087

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



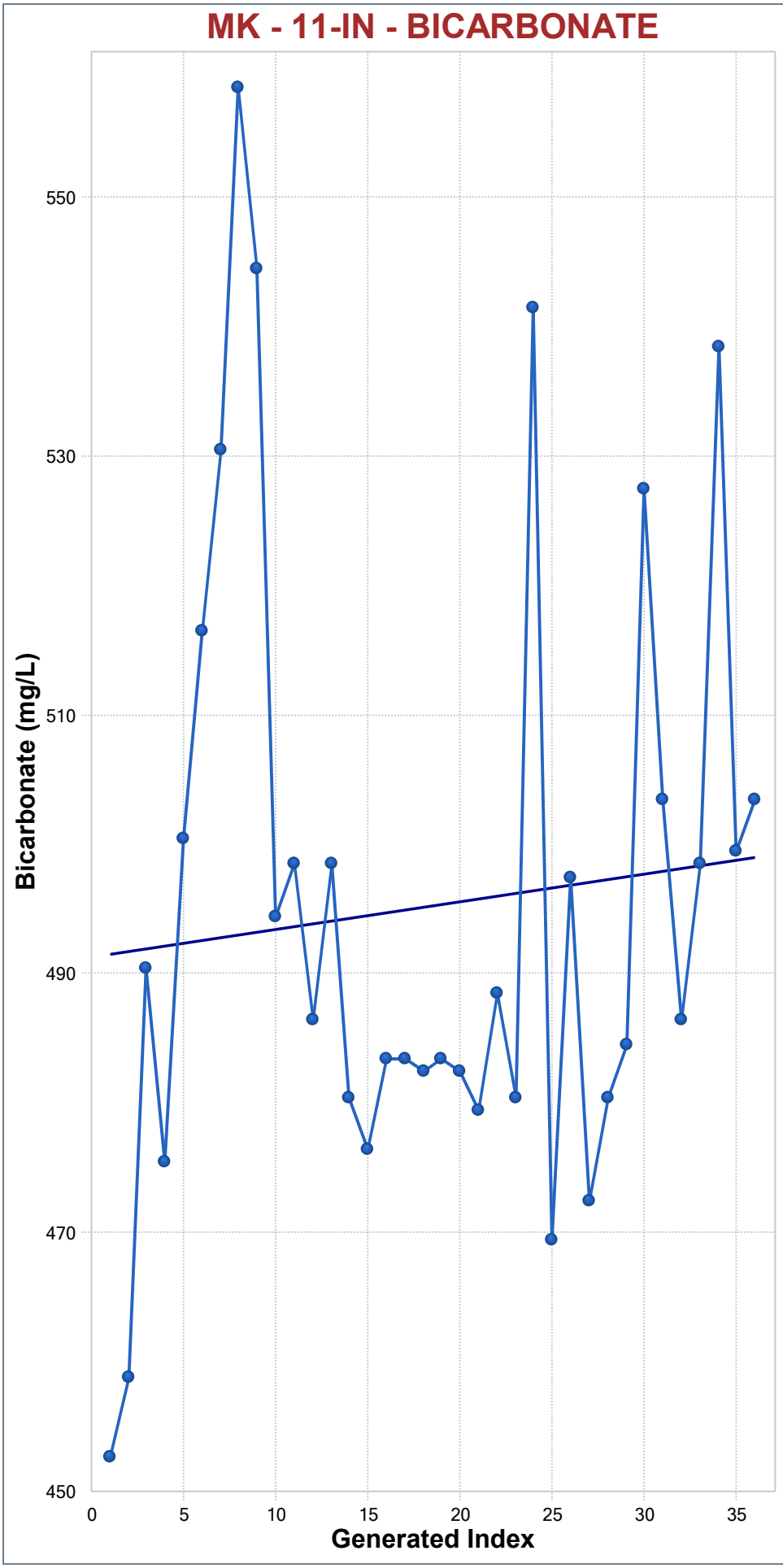
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3439
Standardized Value of S	-1.3225
M-K Test Value (S)	-98
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0930

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0012

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



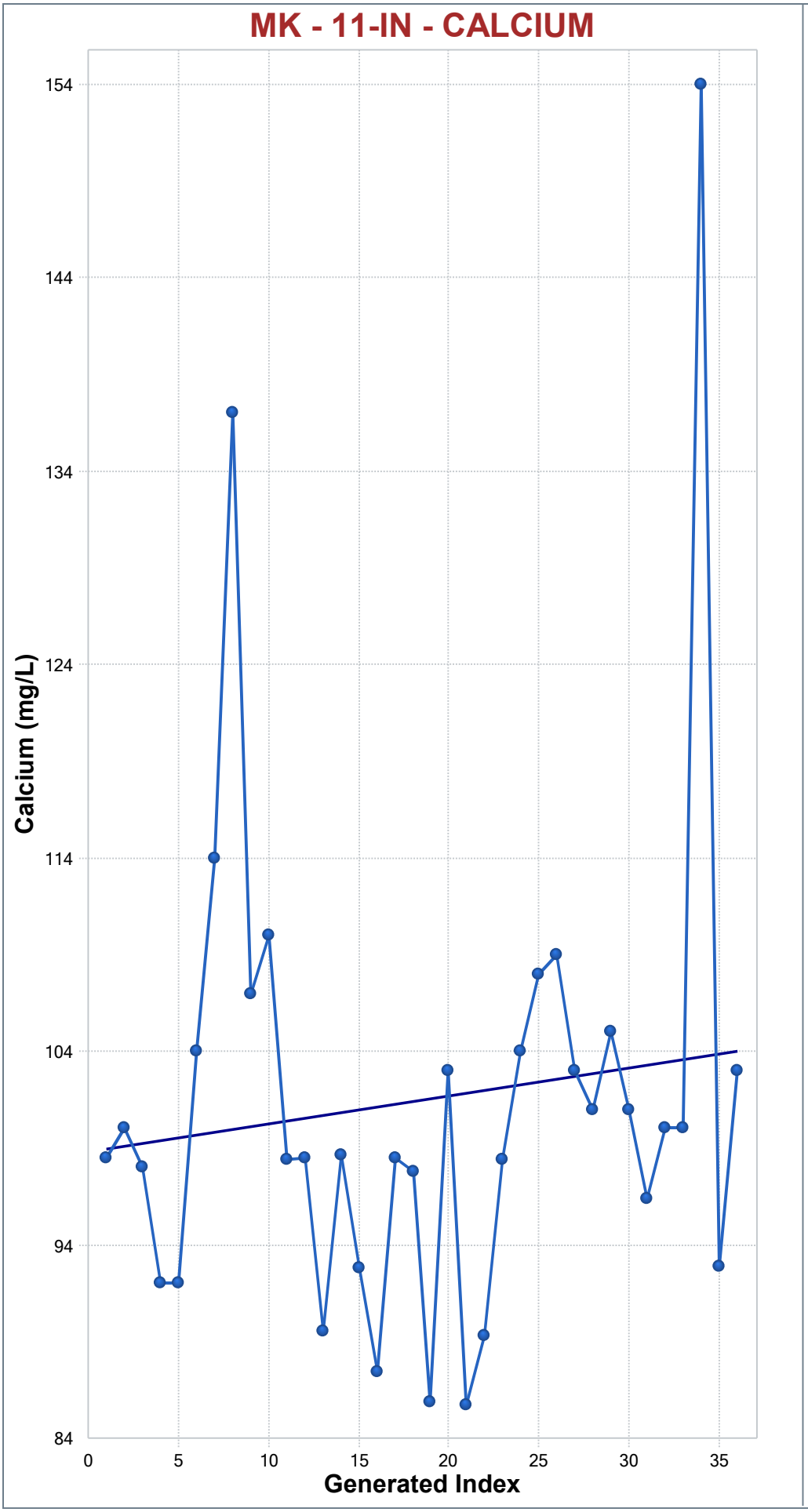
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3212
Standardized Value of S	0.8047
M-K Test Value (S)	60
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2105

OLS Regression Line (Blue)

OLS Regression Slope	0.2135
OLS Regression Intercept	490.8414

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



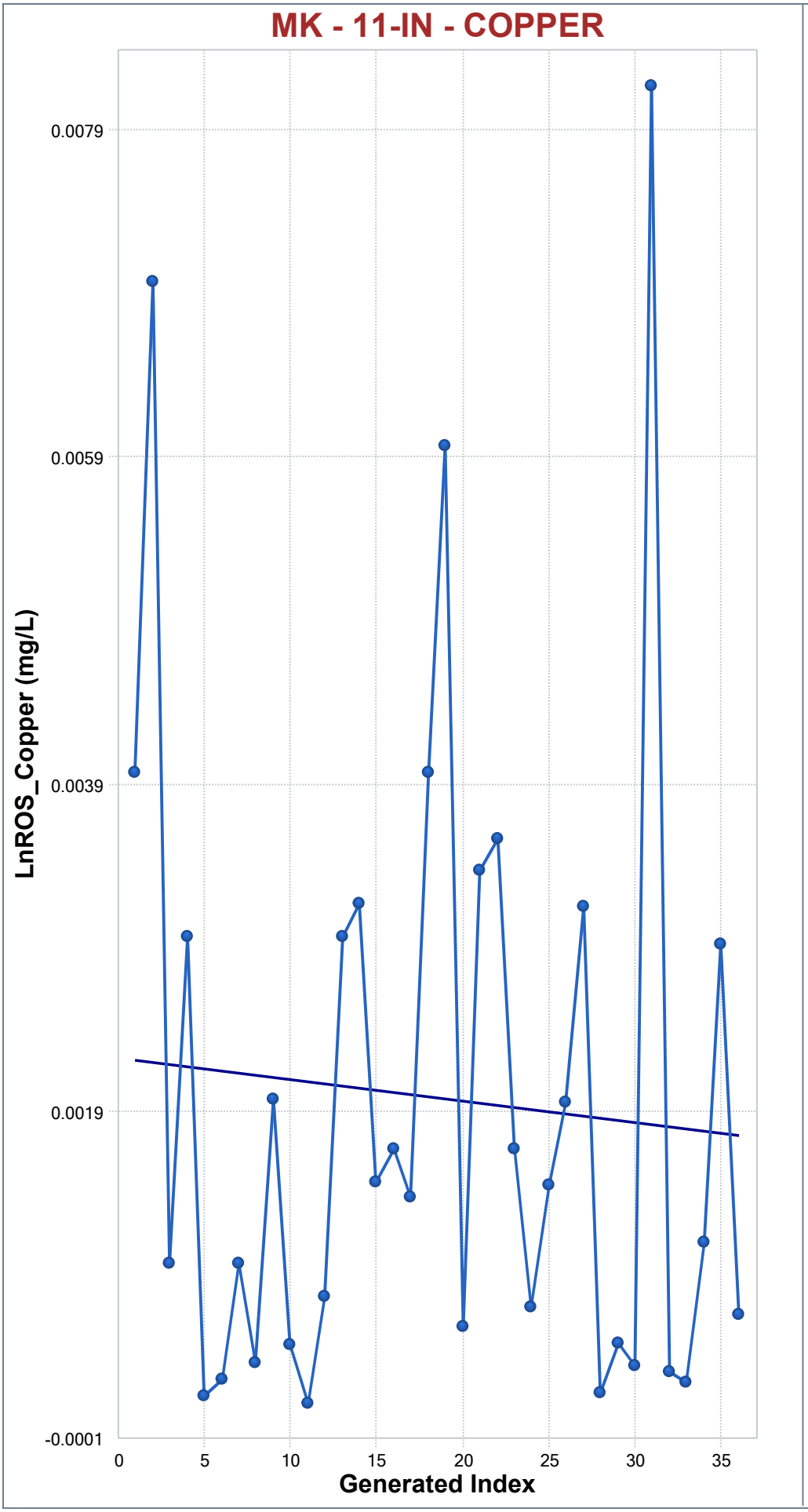
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3144
Standardized Value of S	0.5183
M-K Test Value (S)	39
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3021

OLS Regression Line (Blue)

OLS Regression Slope	0.1444
OLS Regression Intercept	98.8175

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



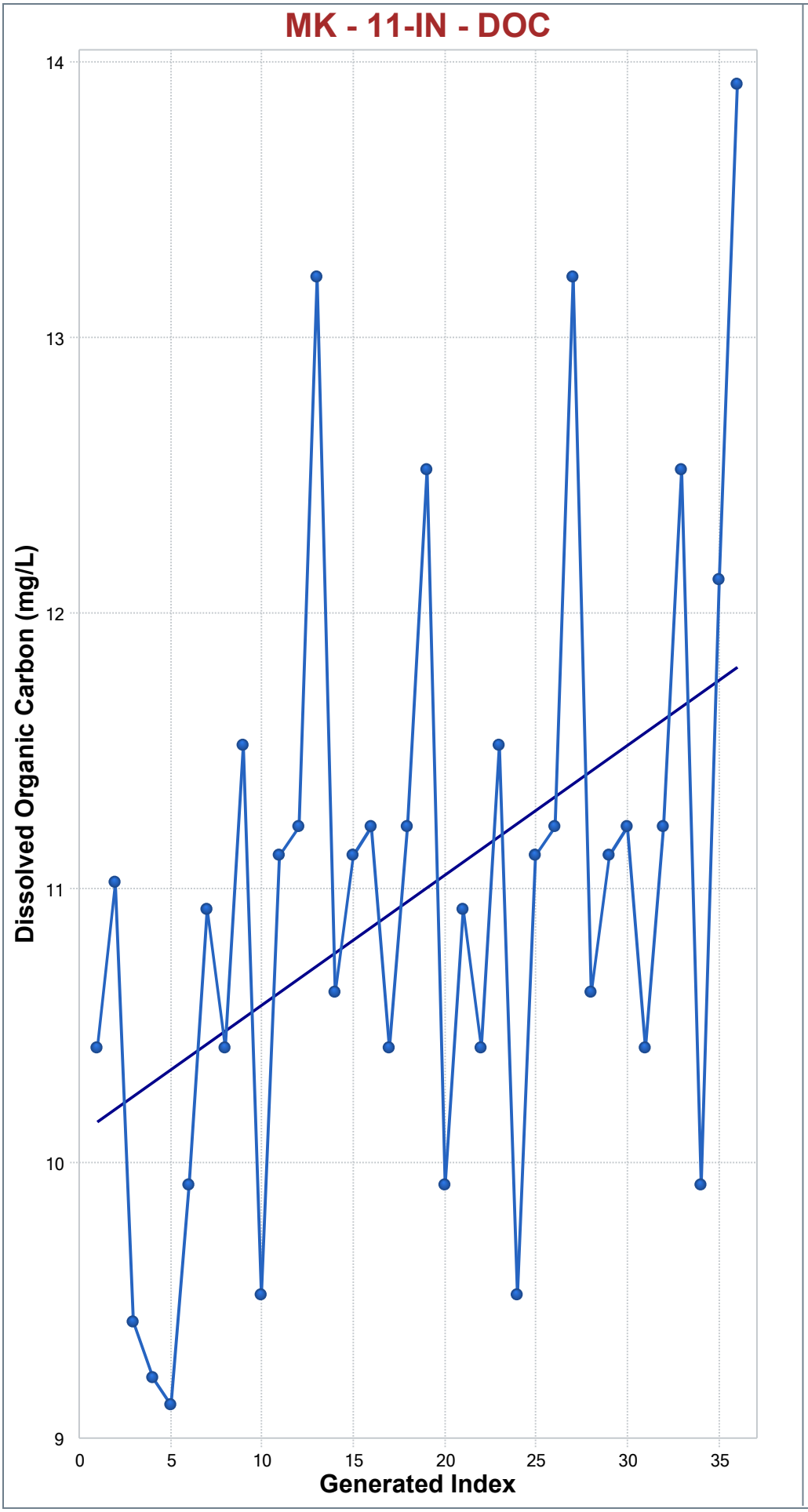
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3894
Standardized Value of S	-0.4769
M-K Test Value (S)	-36
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3167

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0023

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



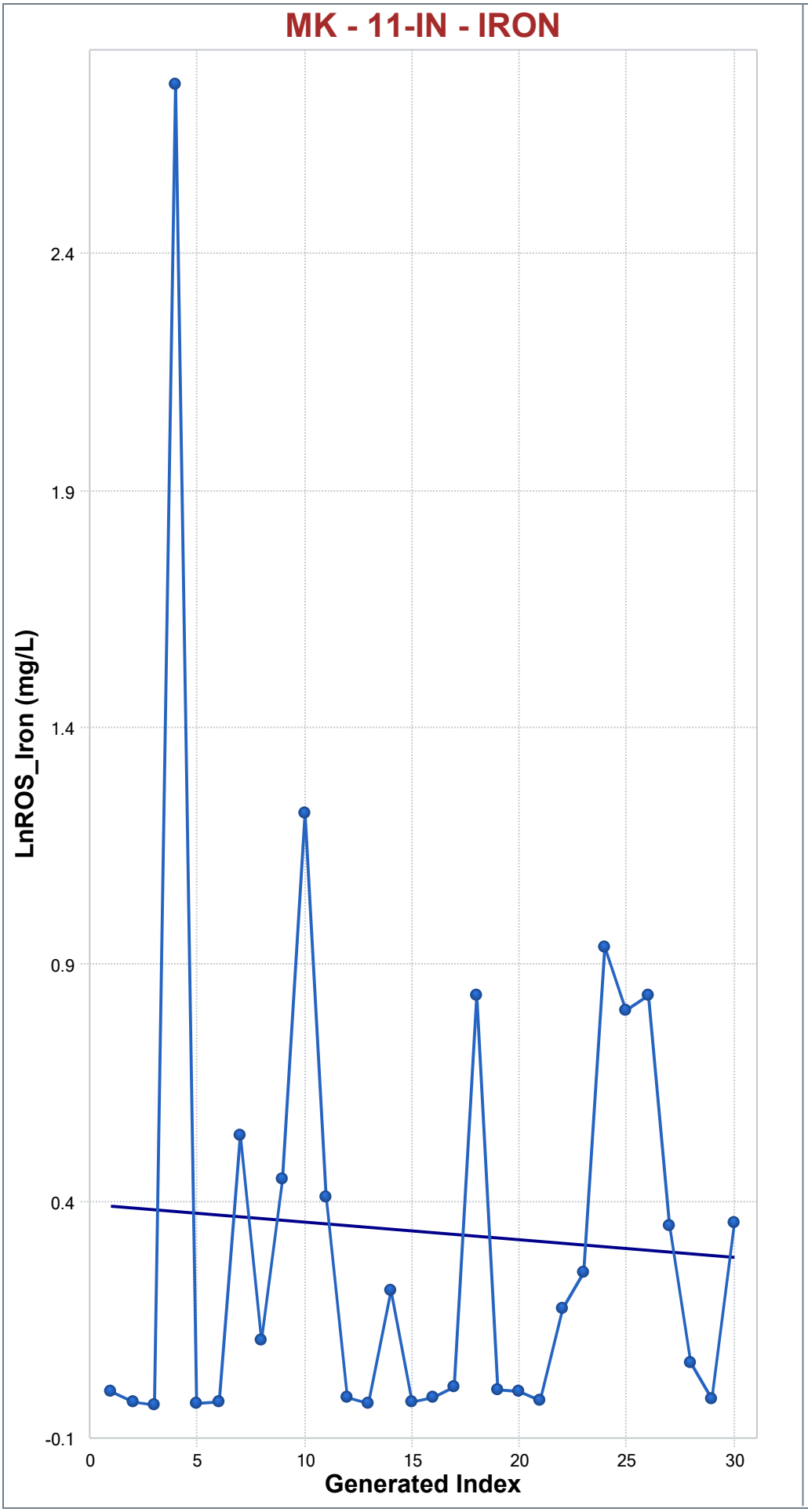
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	72.9840
Standardized Value of S	2.6718
M-K Test Value (S)	196
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0038

OLS Regression Line (Blue)

OLS Regression Slope	0.0473
OLS Regression Intercept	9.9803

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



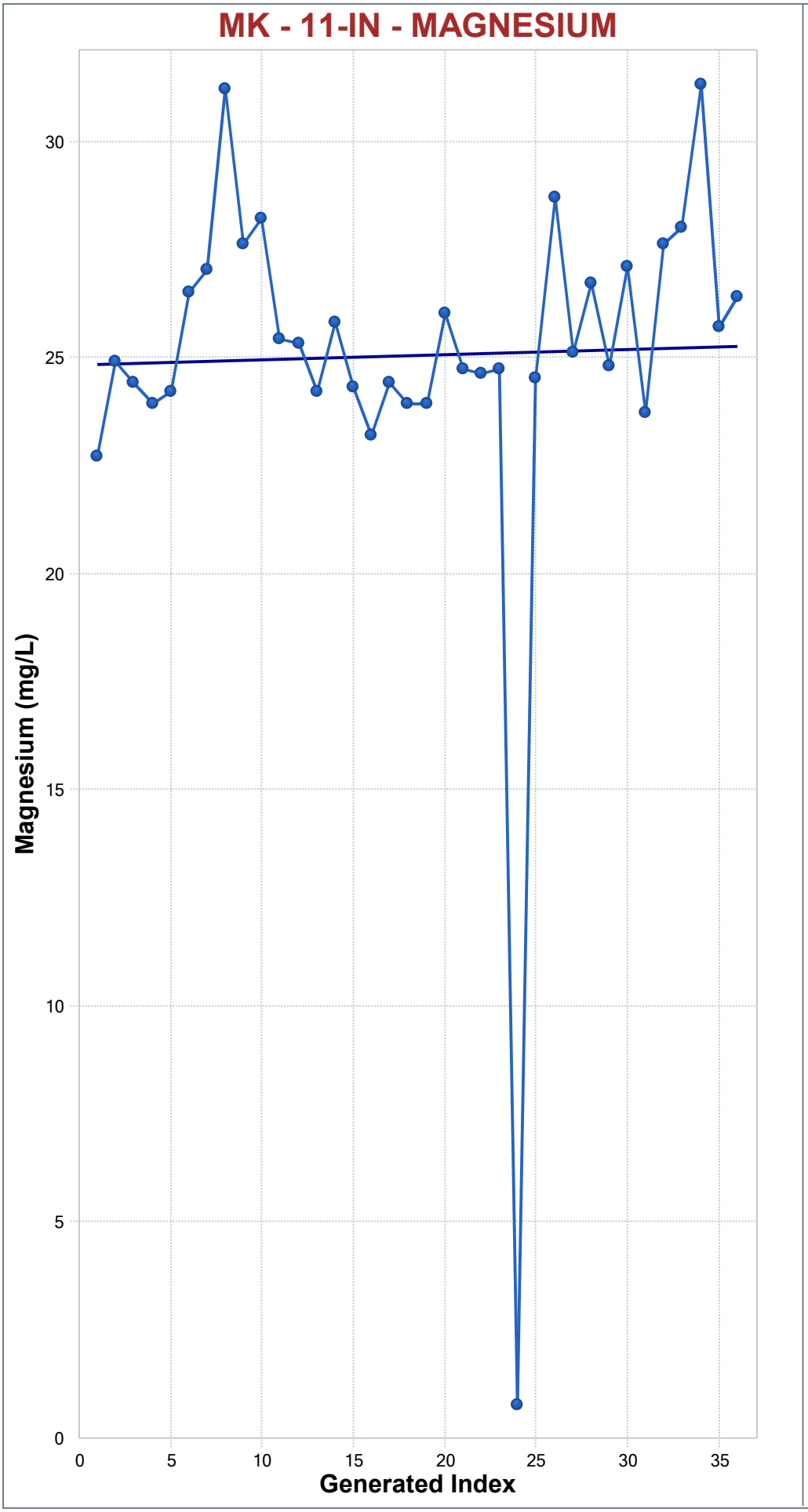
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0417
Standardized Value of S	1.4097
M-K Test Value (S)	80
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0793

OLS Regression Line (Blue)

OLS Regression Slope	-0.0038
OLS Regression Intercept	0.4264

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



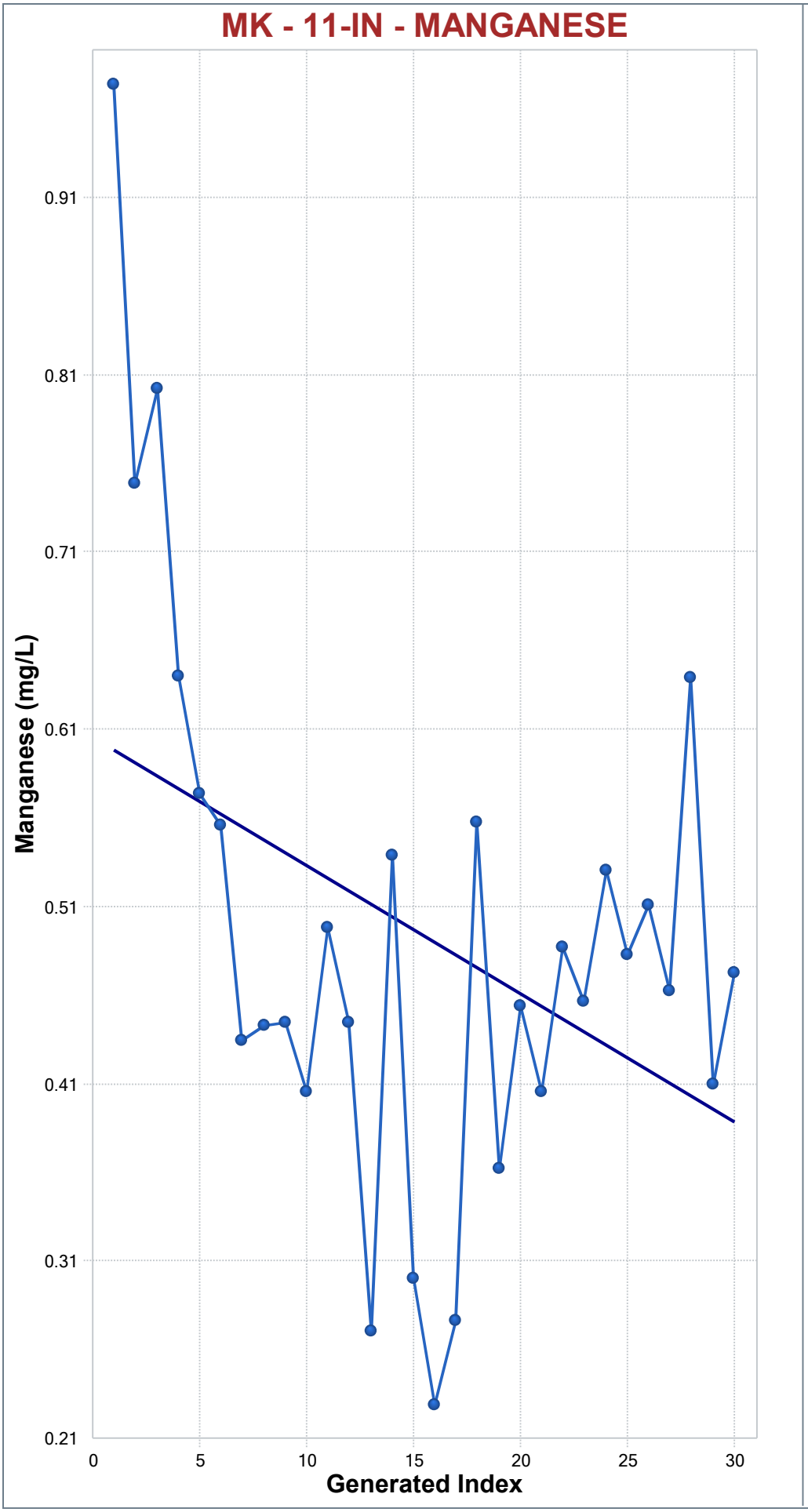
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3644
Standardized Value of S	1.5266
M-K Test Value (S)	113
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0634

OLS Regression Line (Blue)

OLS Regression Slope	0.0121
OLS Regression Intercept	24.6131

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



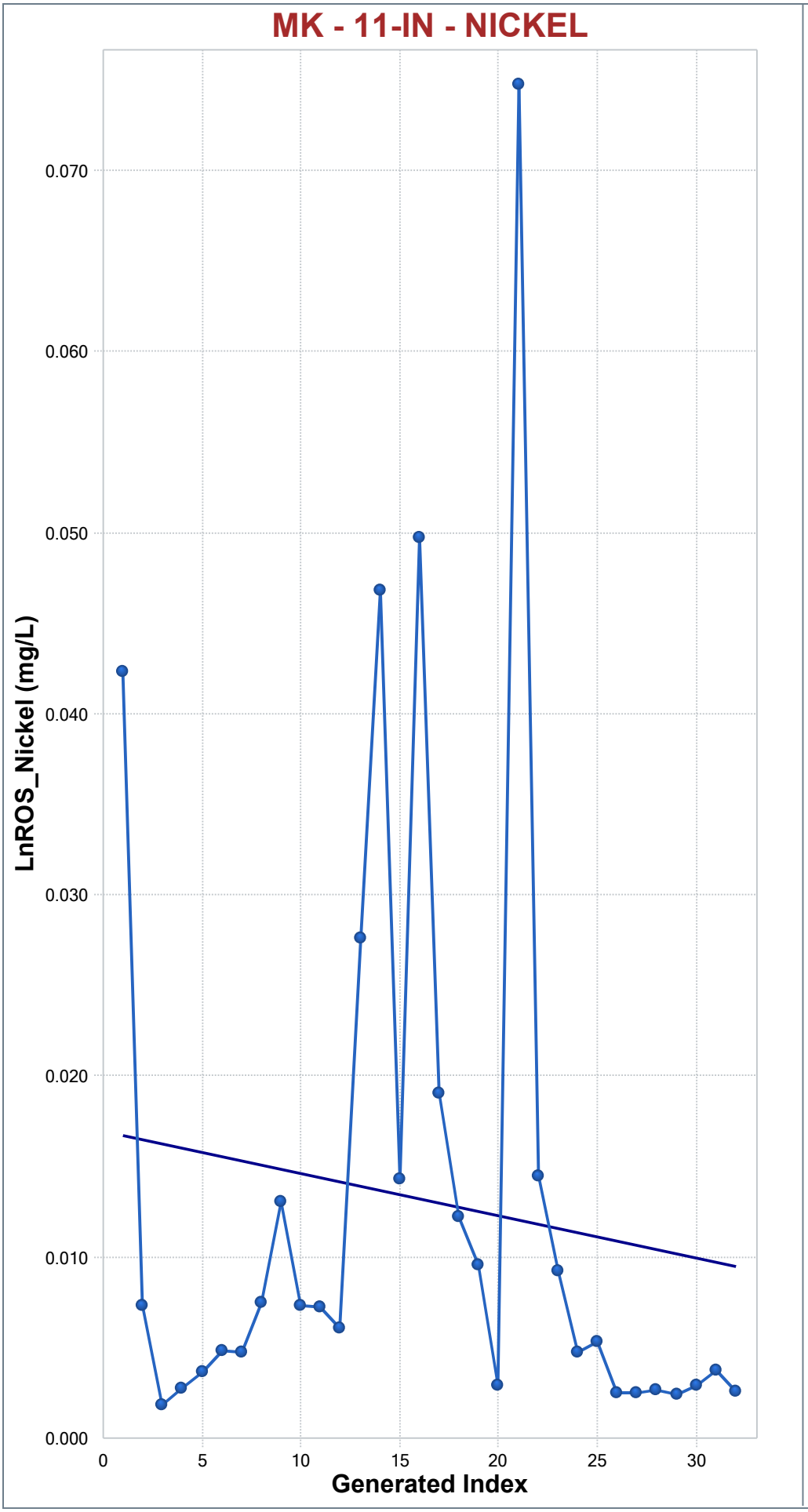
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0327
Standardized Value of S	-1.3564
M-K Test Value (S)	-77
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0875

OLS Regression Line (Blue)

OLS Regression Slope	-0.0072
OLS Regression Intercept	0.6011

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



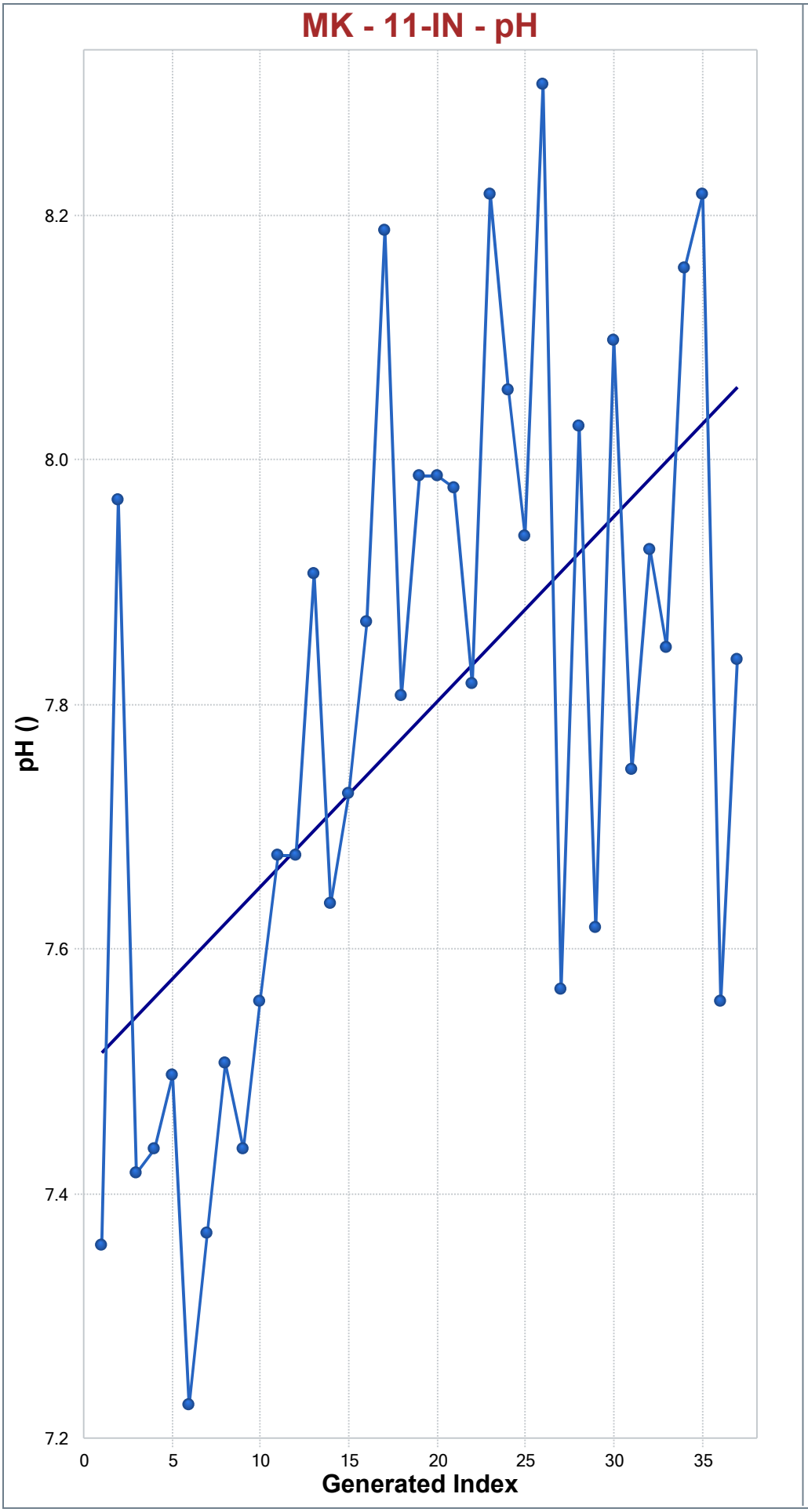
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6495
Standardized Value of S	-1.3788
M-K Test Value (S)	-86
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0840

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0166

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



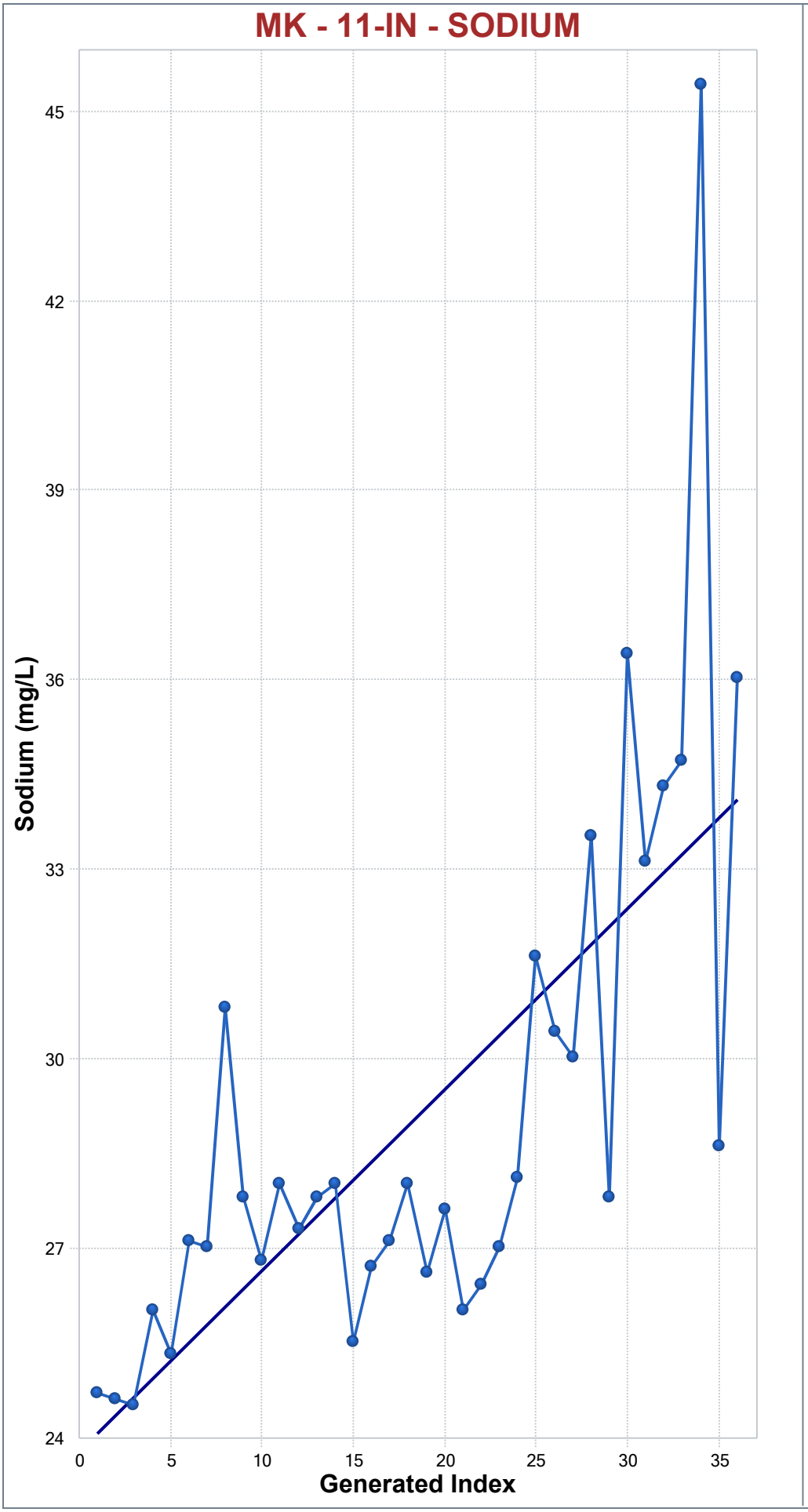
Mann-Kendall Trend Analysis

n	37
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	76.4264
Standardized Value of S	3.8730
M-K Test Value (S)	297
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	0.0151
OLS Regression Intercept	7.5135

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



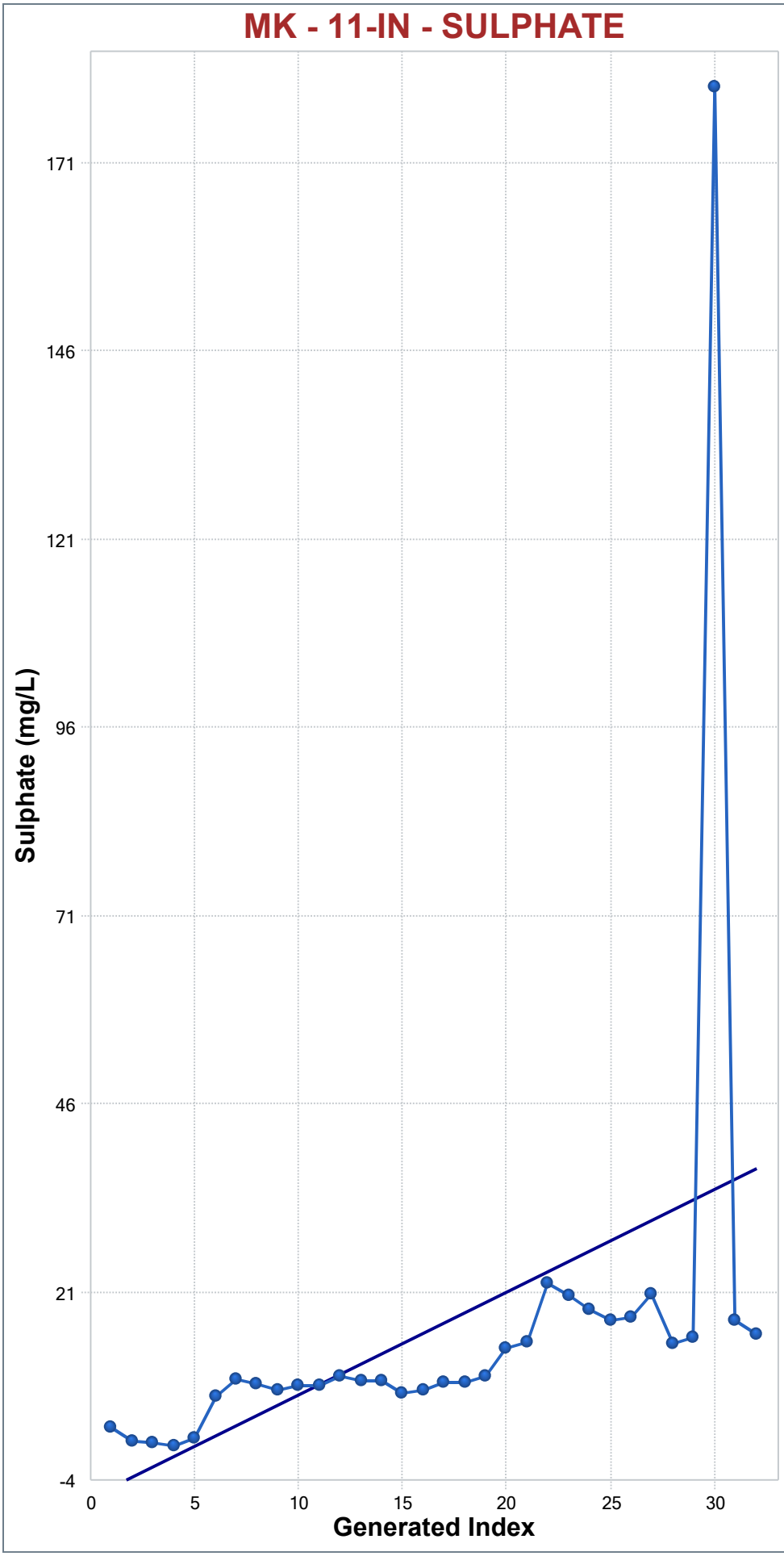
Mann-Kendall Trend Analysis

n	36
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	73.3462
Standardized Value of S	4.9082
M-K Test Value (S)	361
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.2864
OLS Regression Intercept	23.3702

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



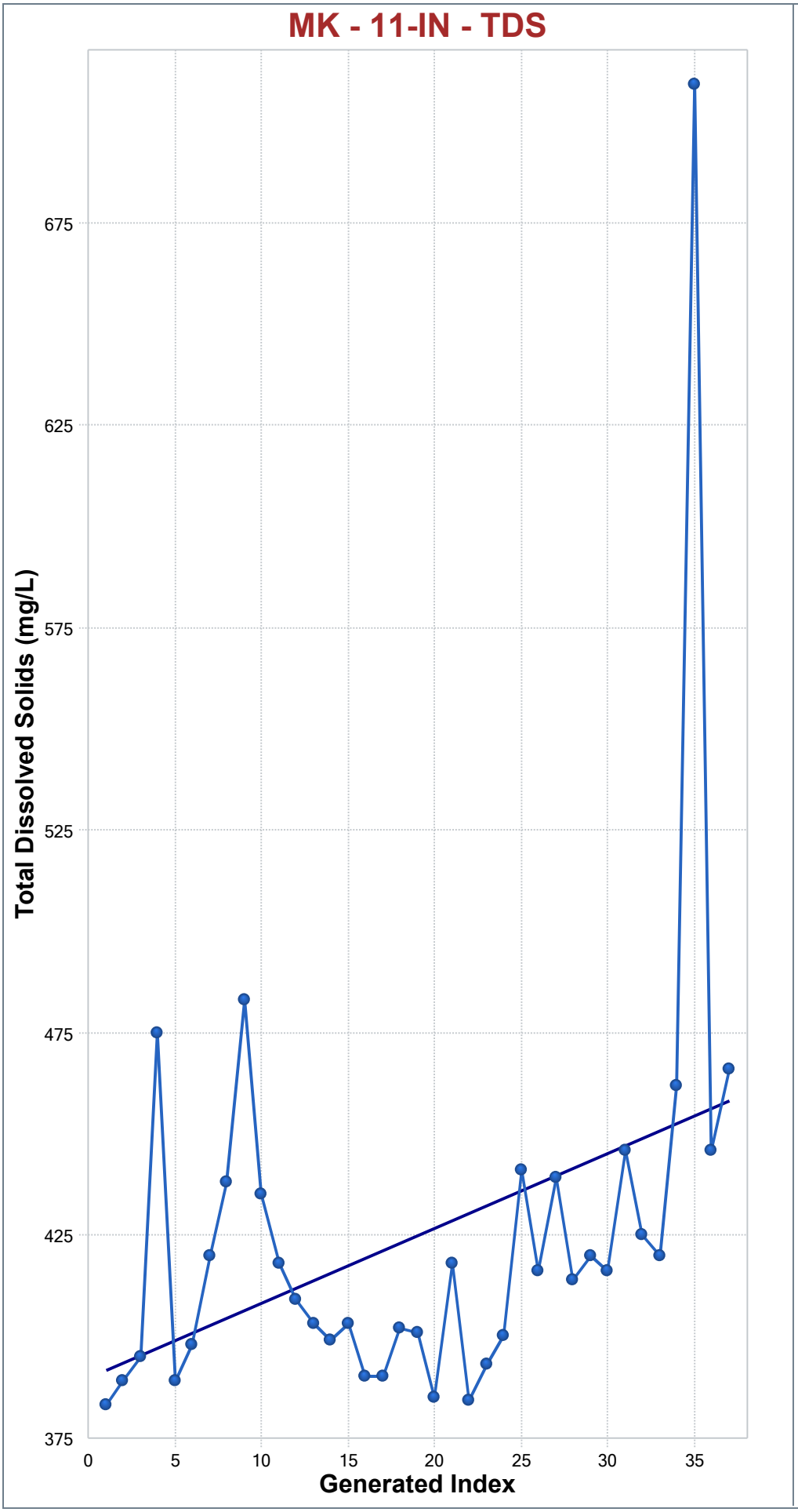
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6577
Standardized Value of S	5.3846
M-K Test Value (S)	333
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	1.3732
OLS Regression Intercept	-6.5450

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



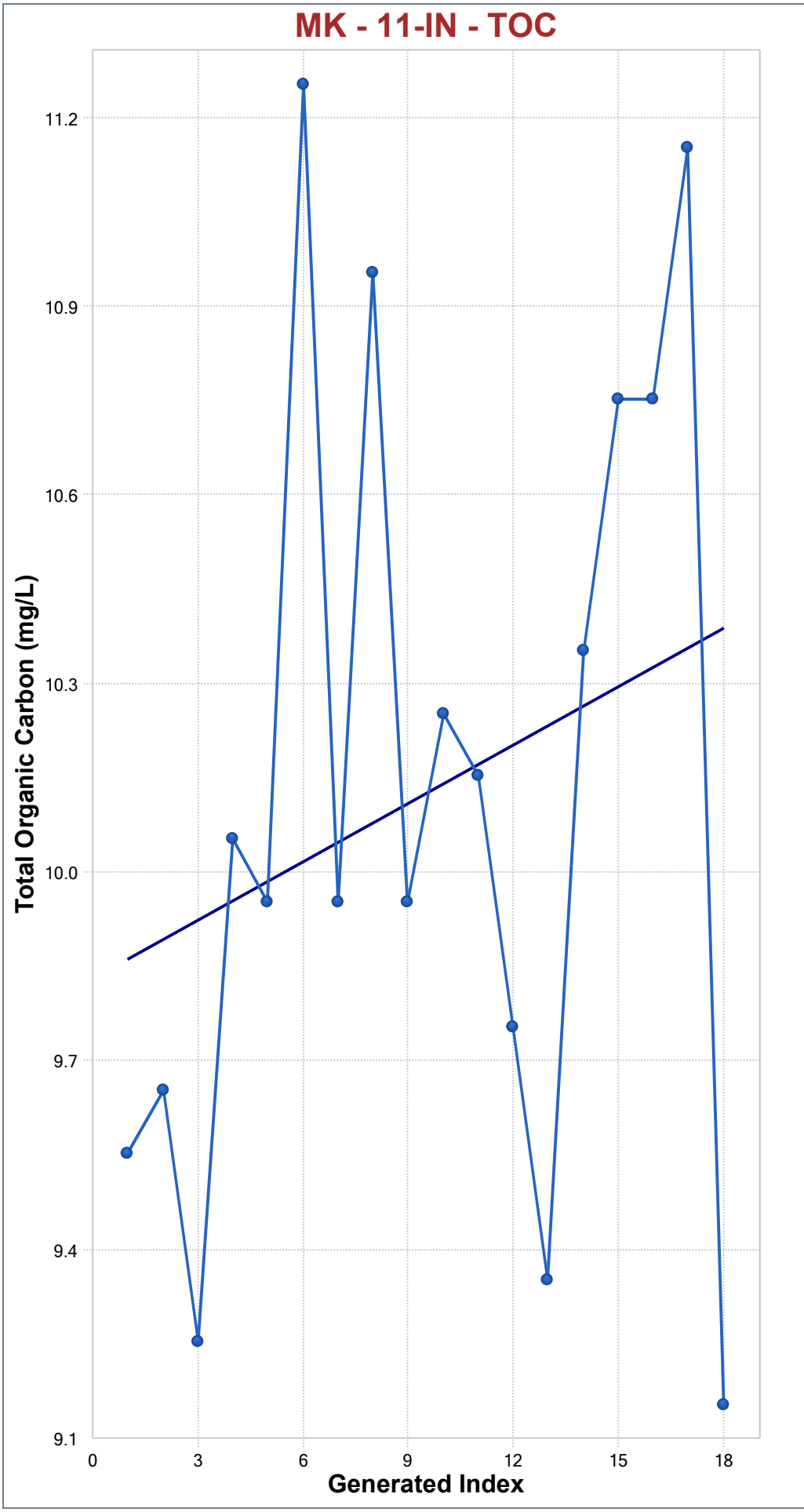
Mann-Kendall Trend Analysis

n	37
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	76.3959
Standardized Value of S	2.8536
M-K Test Value (S)	219
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0022

OLS Regression Line (Blue)

OLS Regression Slope	1.8395
OLS Regression Intercept	389.9144

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



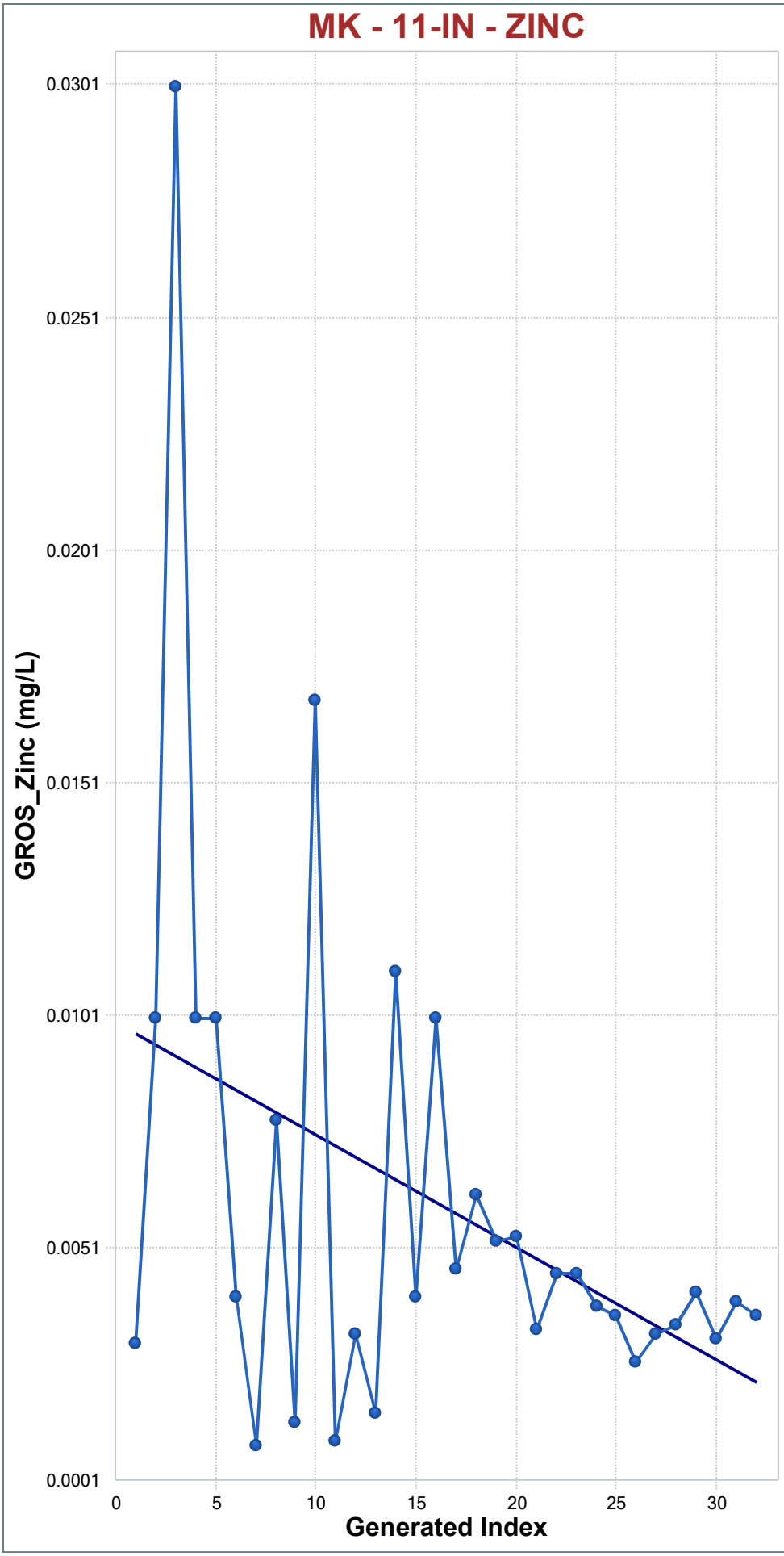
Mann-Kendall Trend Analysis

n	18
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	26.3122
Standardized Value of S	1.2922
M-K Test Value (S)	35
Tabulated p-value	0.1000
Approximate p-value	0.0981

OLS Regression Line (Blue)

OLS Regression Slope	0.0311
OLS Regression Intercept	9.8771

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



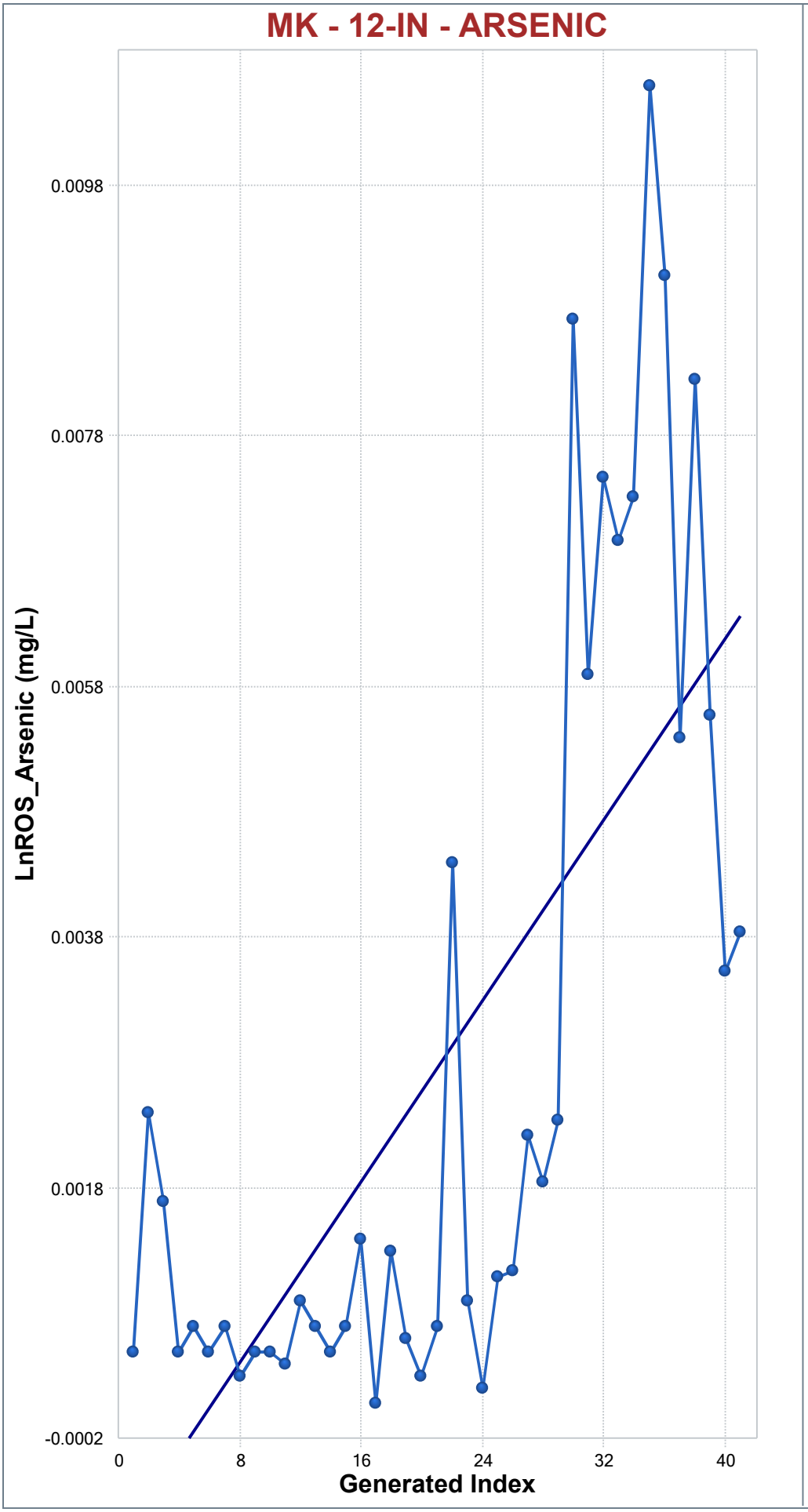
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.5630
Standardized Value of S	-1.7381
M-K Test Value (S)	-108
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0411

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0099

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



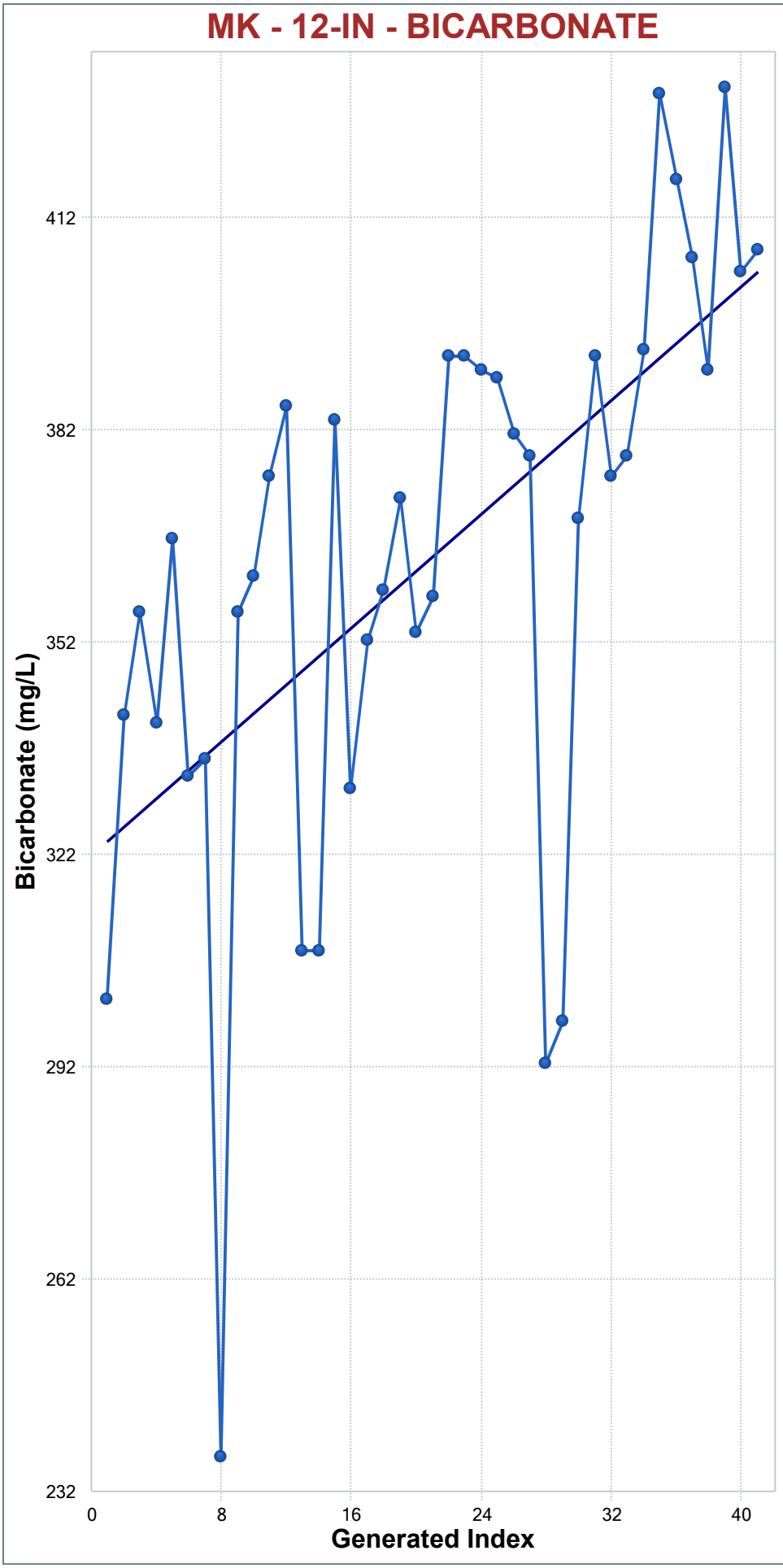
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	88.7675
Standardized Value of S	4.6188
M-K Test Value (S)	411
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.0002
OLS Regression Intercept	-0.0011

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



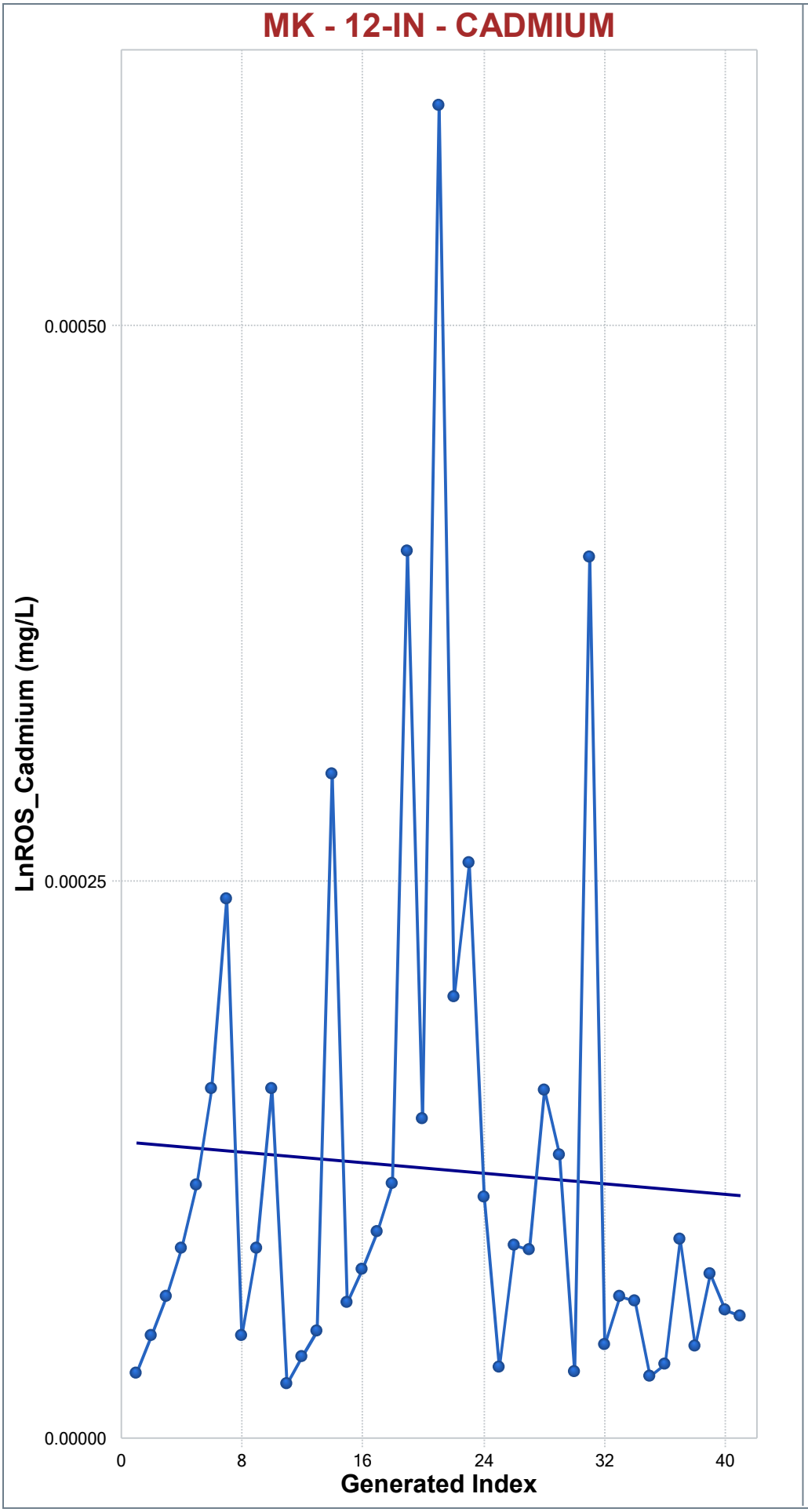
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	88.9831
Standardized Value of S	4.7088
M-K Test Value (S)	420
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	2.0091
OLS Regression Intercept	321.5167

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



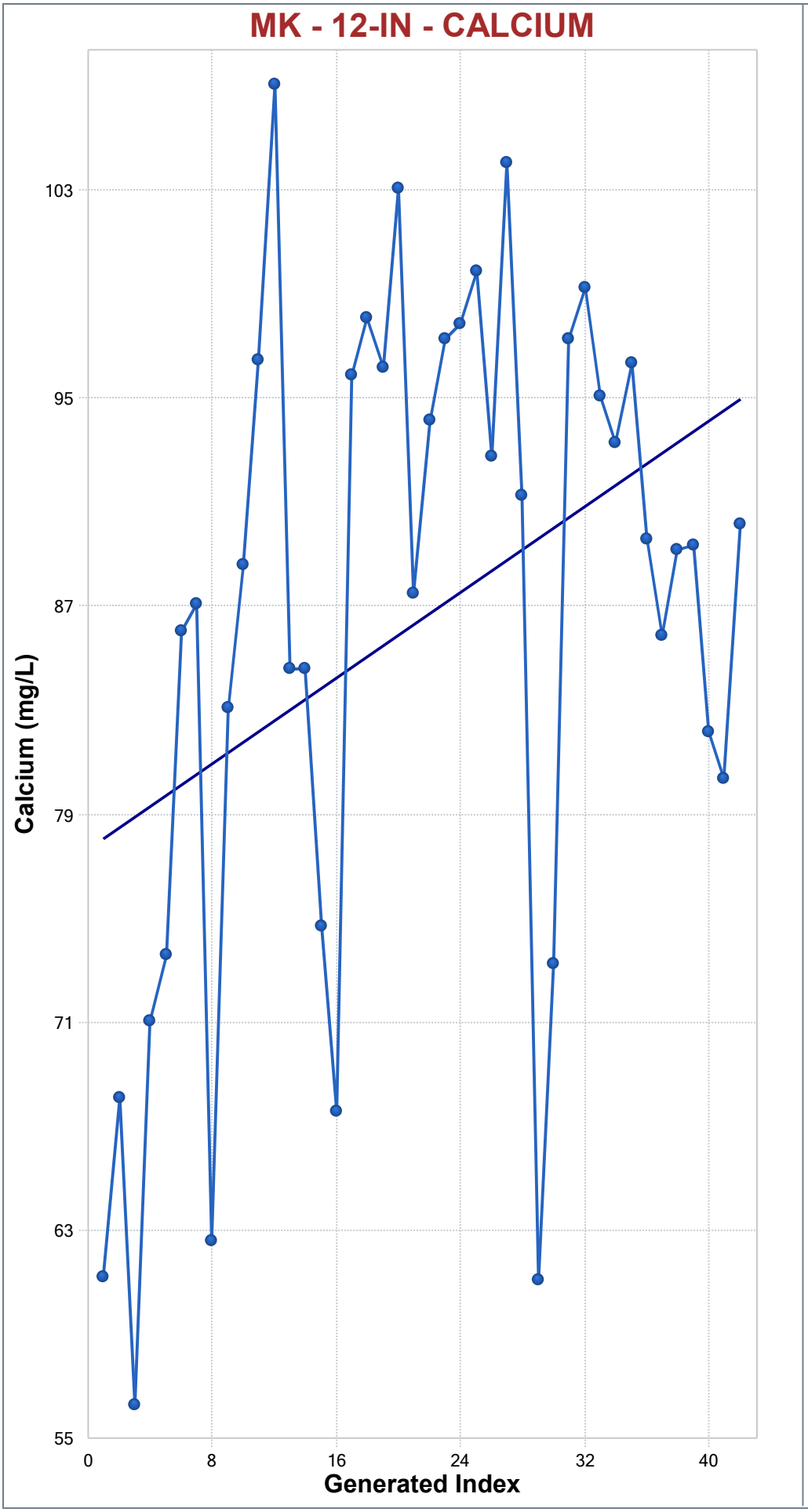
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	89.0150
Standardized Value of S	-0.6291
M-K Test Value (S)	-57
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2646

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0001

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



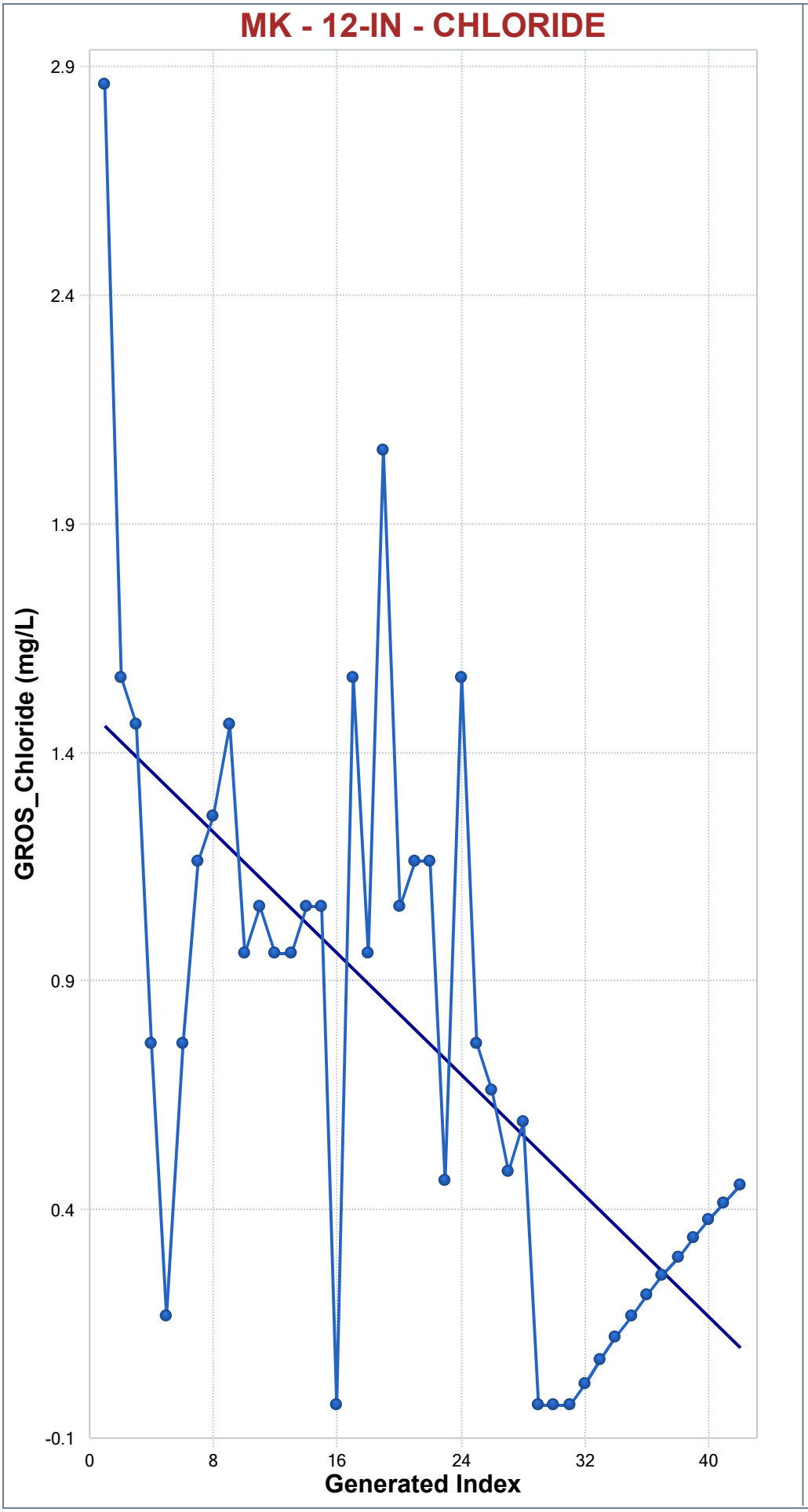
Mann-Kendall Trend Analysis

n	42
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	92.2623
Standardized Value of S	1.9076
M-K Test Value (S)	177
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0282

OLS Regression Line (Blue)

OLS Regression Slope	0.4127
OLS Regression Intercept	77.5477

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



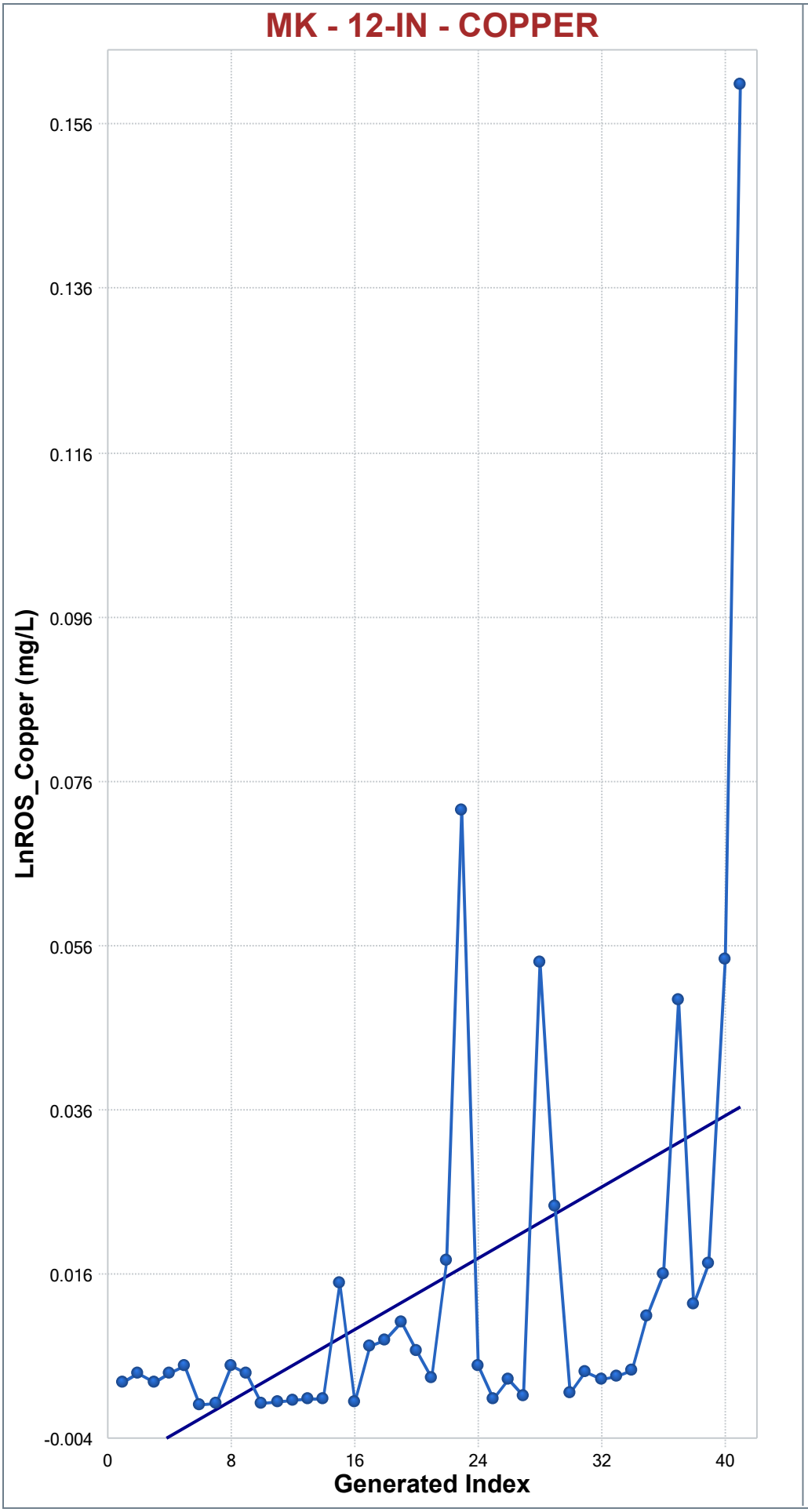
Mann-Kendall Trend Analysis

n	42
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	92.0616
Standardized Value of S	-3.7040
M-K Test Value (S)	-342
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.0332
OLS Regression Intercept	1.5282

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



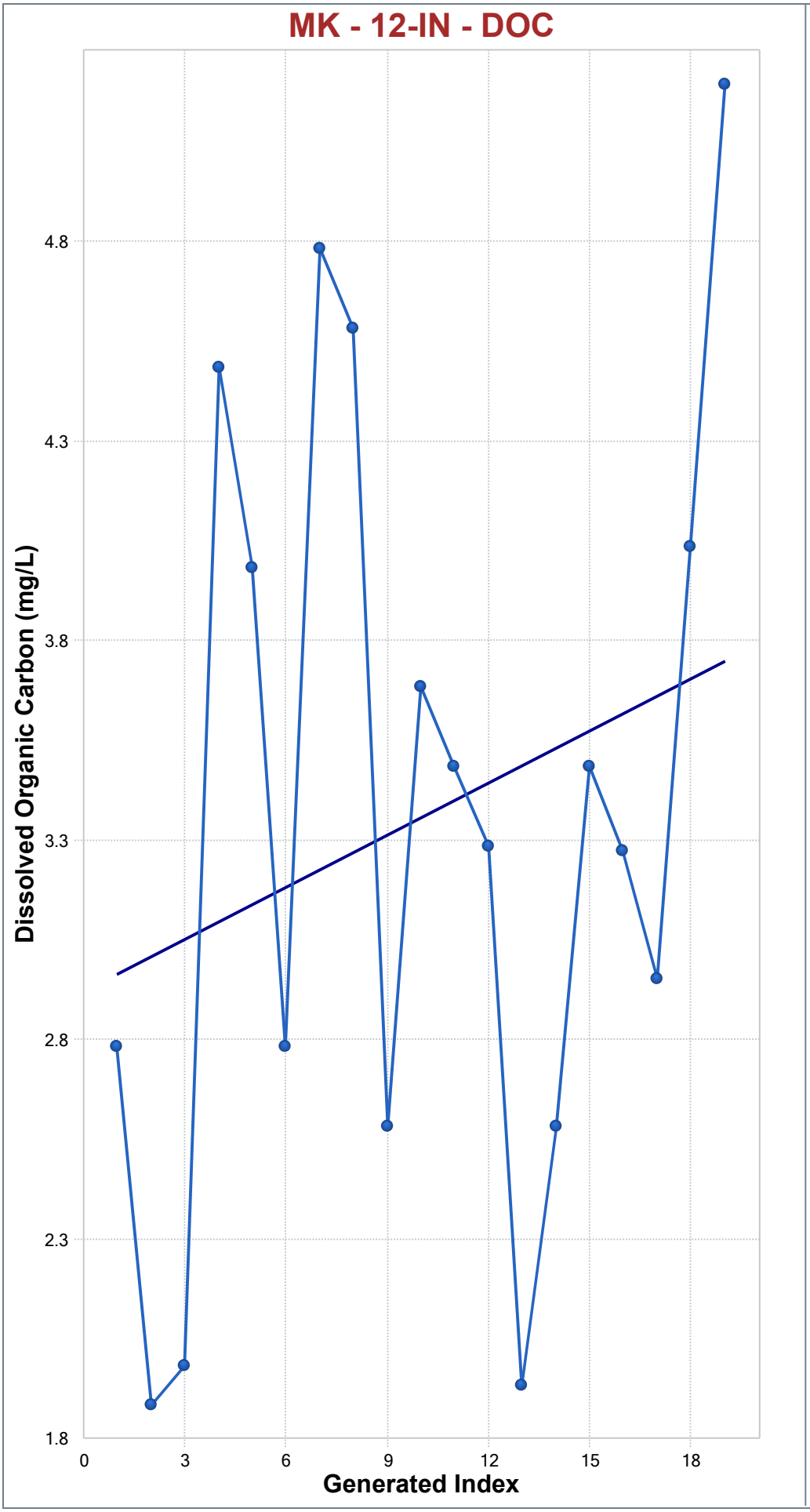
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	88.9794
Standardized Value of S	3.8773
M-K Test Value (S)	346
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	0.0011
OLS Regression Intercept	-0.0083

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



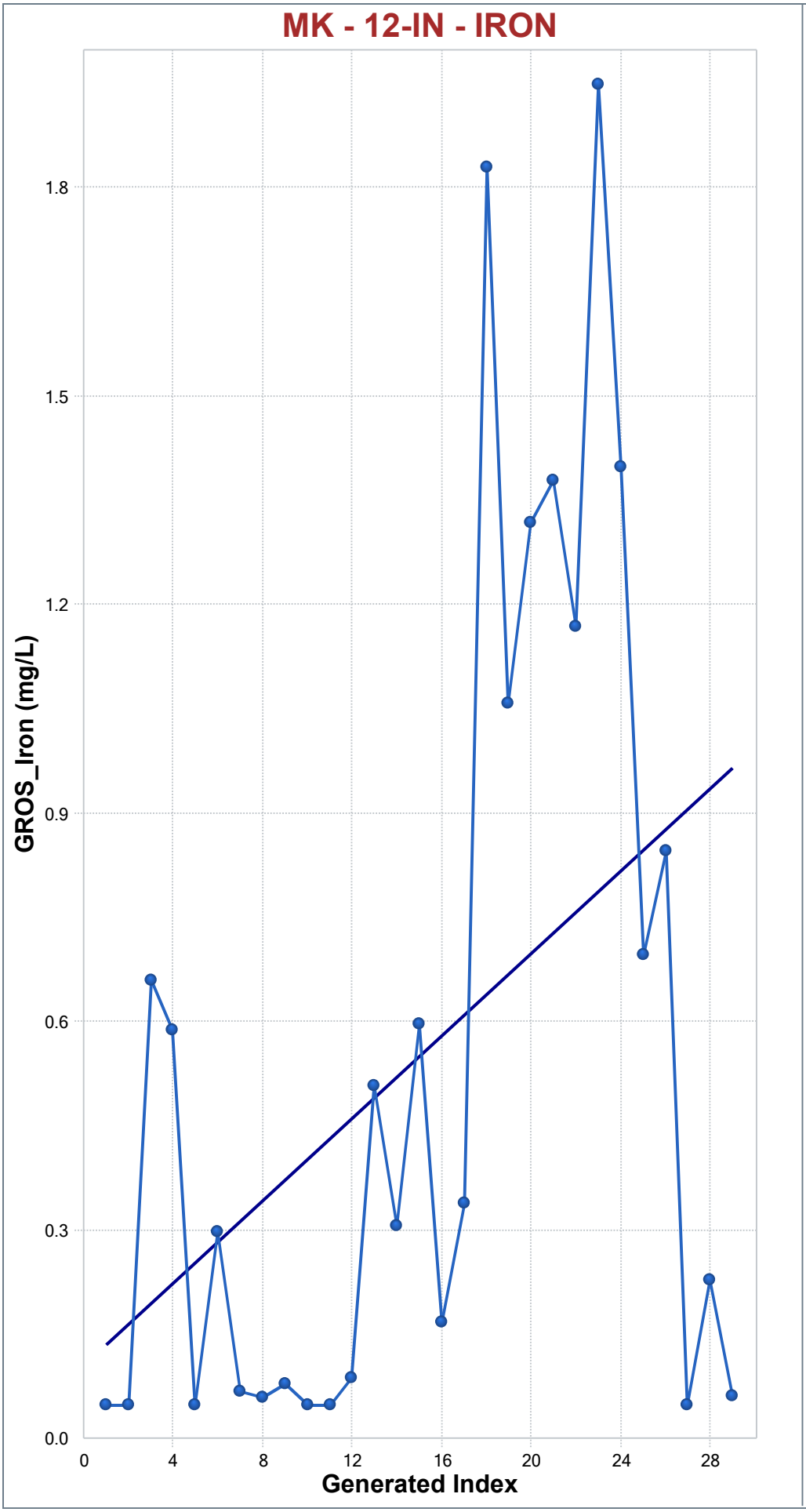
Mann-Kendall Trend Analysis

n	19
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	28.5307
Standardized Value of S	0.8061
M-K Test Value (S)	24
Tabulated p-value	0.2030
Approximate p-value	0.2101

OLS Regression Line (Blue)

OLS Regression Slope	0.0436
OLS Regression Intercept	2.9358

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



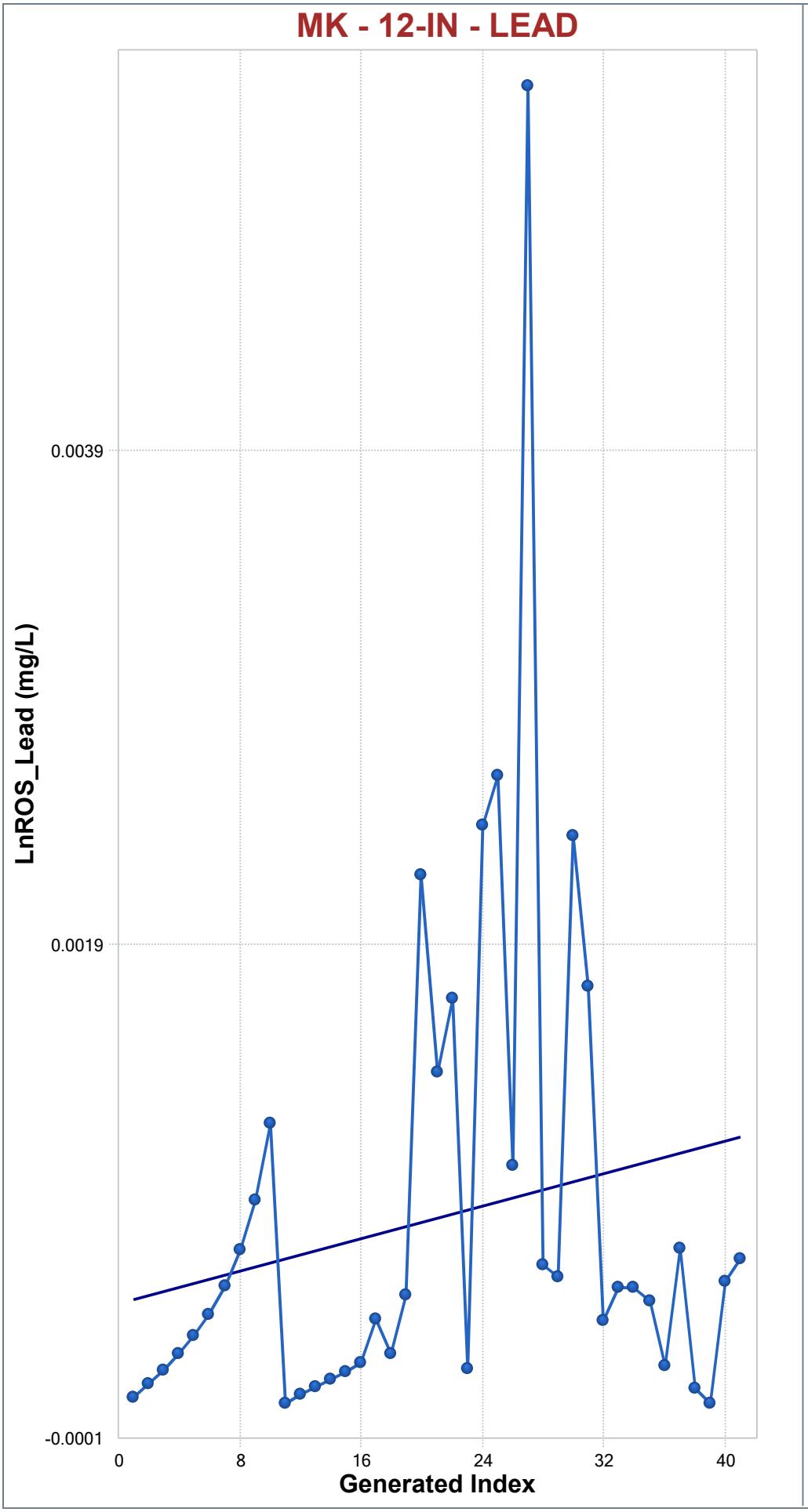
Mann-Kendall Trend Analysis

n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.0440
Standardized Value of S	2.6016
M-K Test Value (S)	139
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0046

OLS Regression Line (Blue)

OLS Regression Slope	0.0296
OLS Regression Intercept	0.0681

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



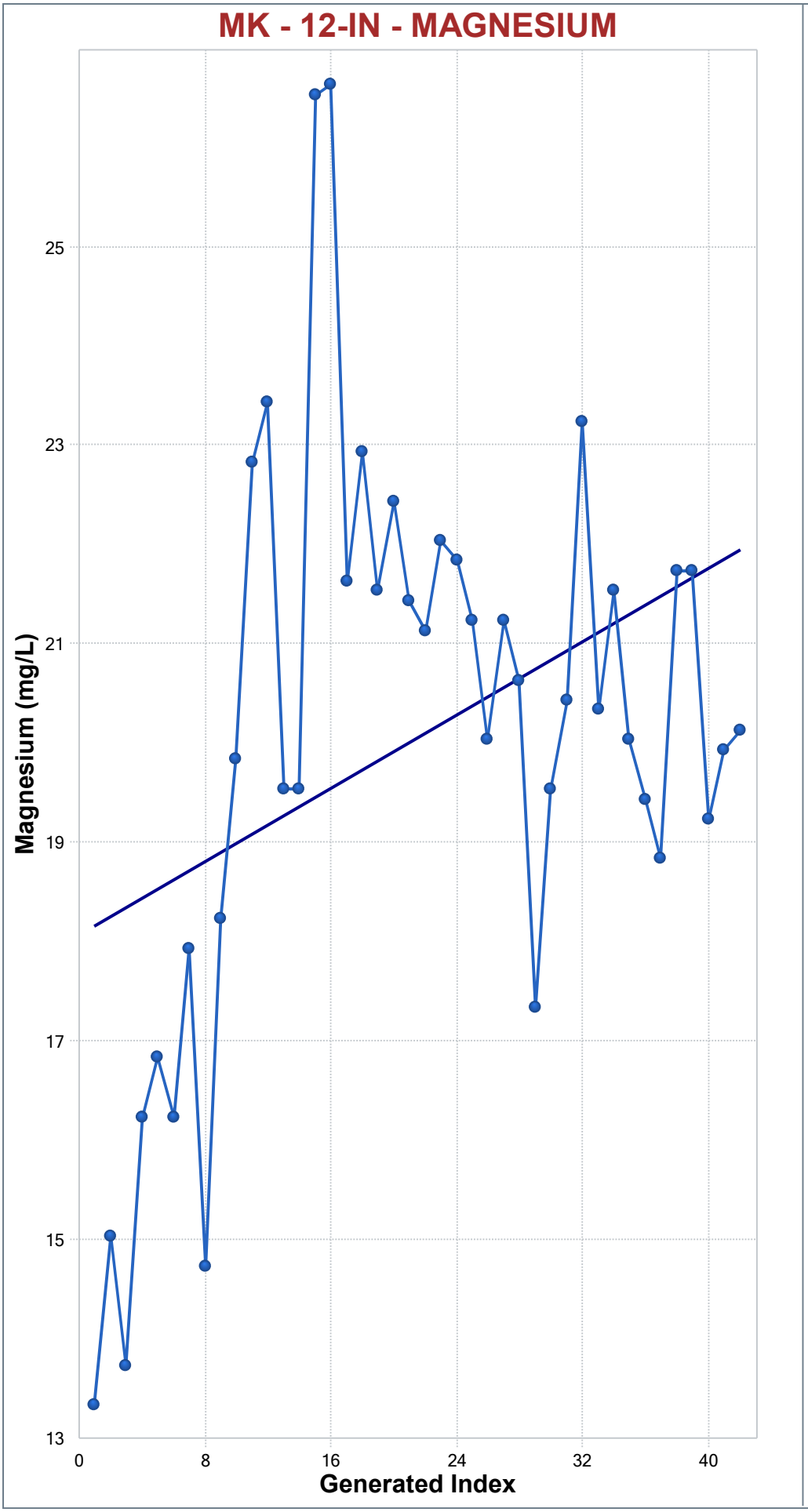
Mann-Kendall Trend Analysis

n	41
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	89.0206
Standardized Value of S	1.9883
M-K Test Value (S)	178
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0234

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0005

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



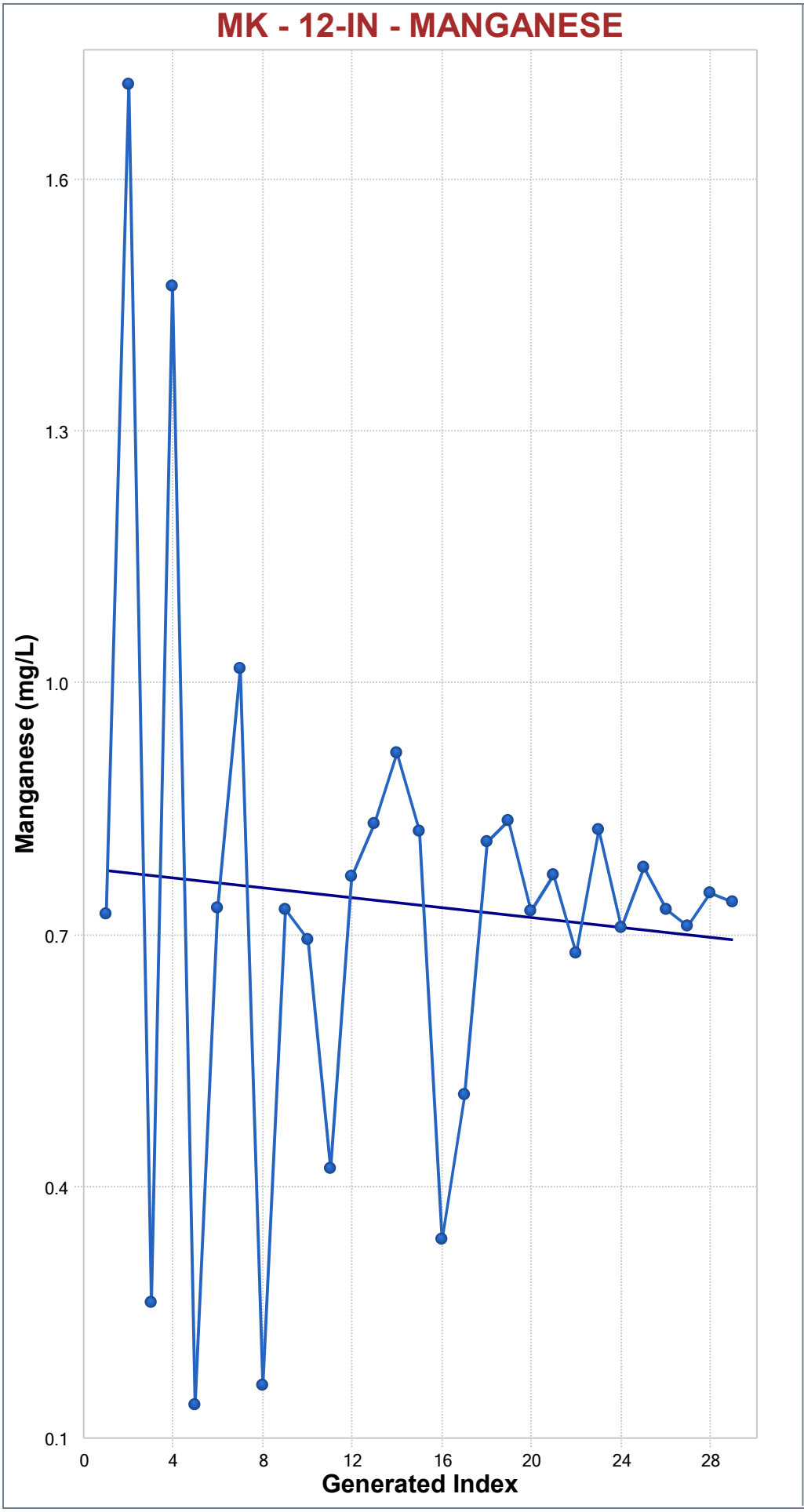
Mann-Kendall Trend Analysis

n	42
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	92.2262
Standardized Value of S	1.5831
M-K Test Value (S)	147
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0567

OLS Regression Line (Blue)

OLS Regression Slope	0.0928
OLS Regression Intercept	17.8246

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



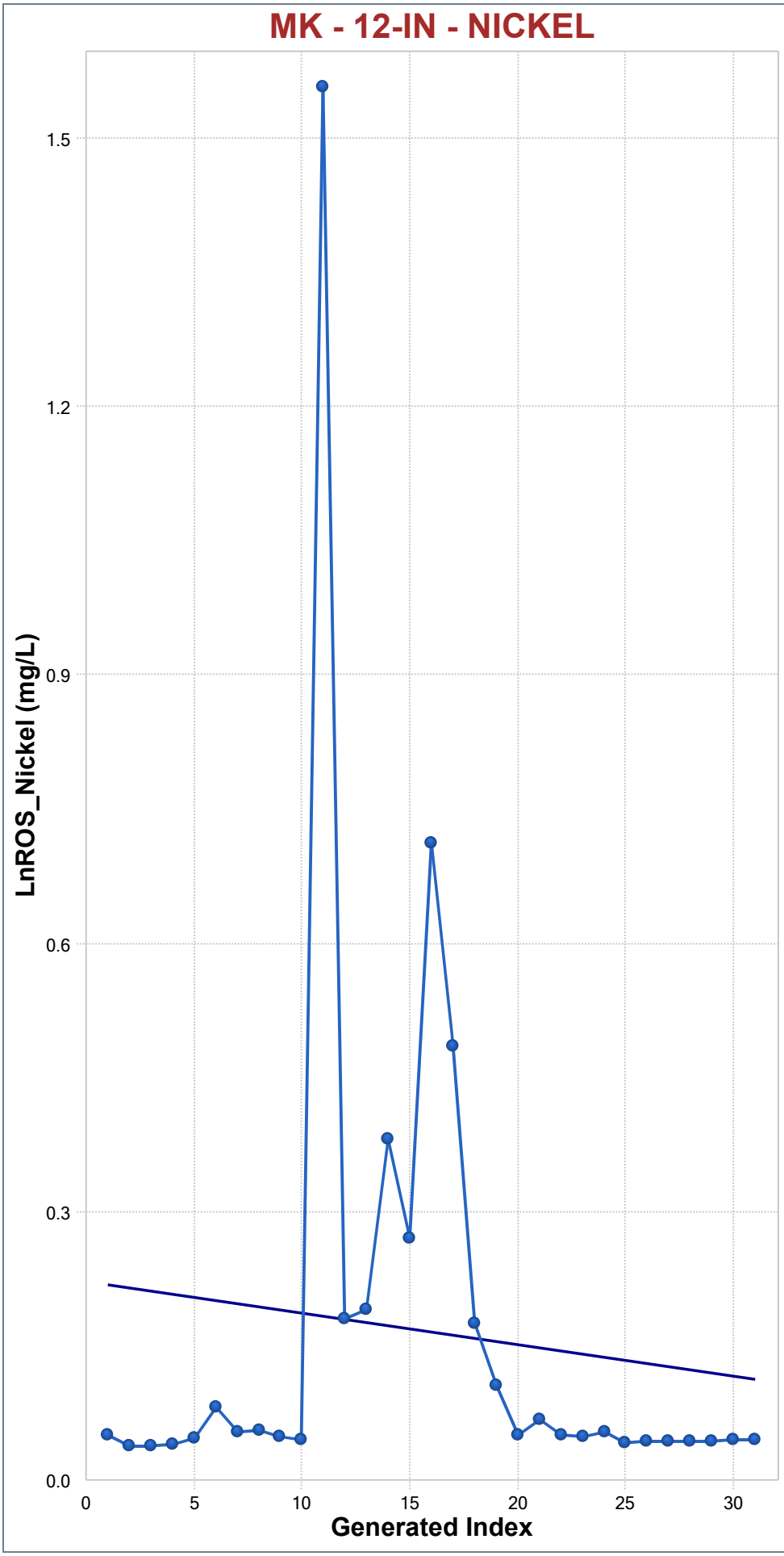
Mann-Kendall Trend Analysis

n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.3010
Standardized Value of S	0.0750
M-K Test Value (S)	5
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4701

OLS Regression Line (Blue)

OLS Regression Slope	-0.0029
OLS Regression Intercept	0.7557

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



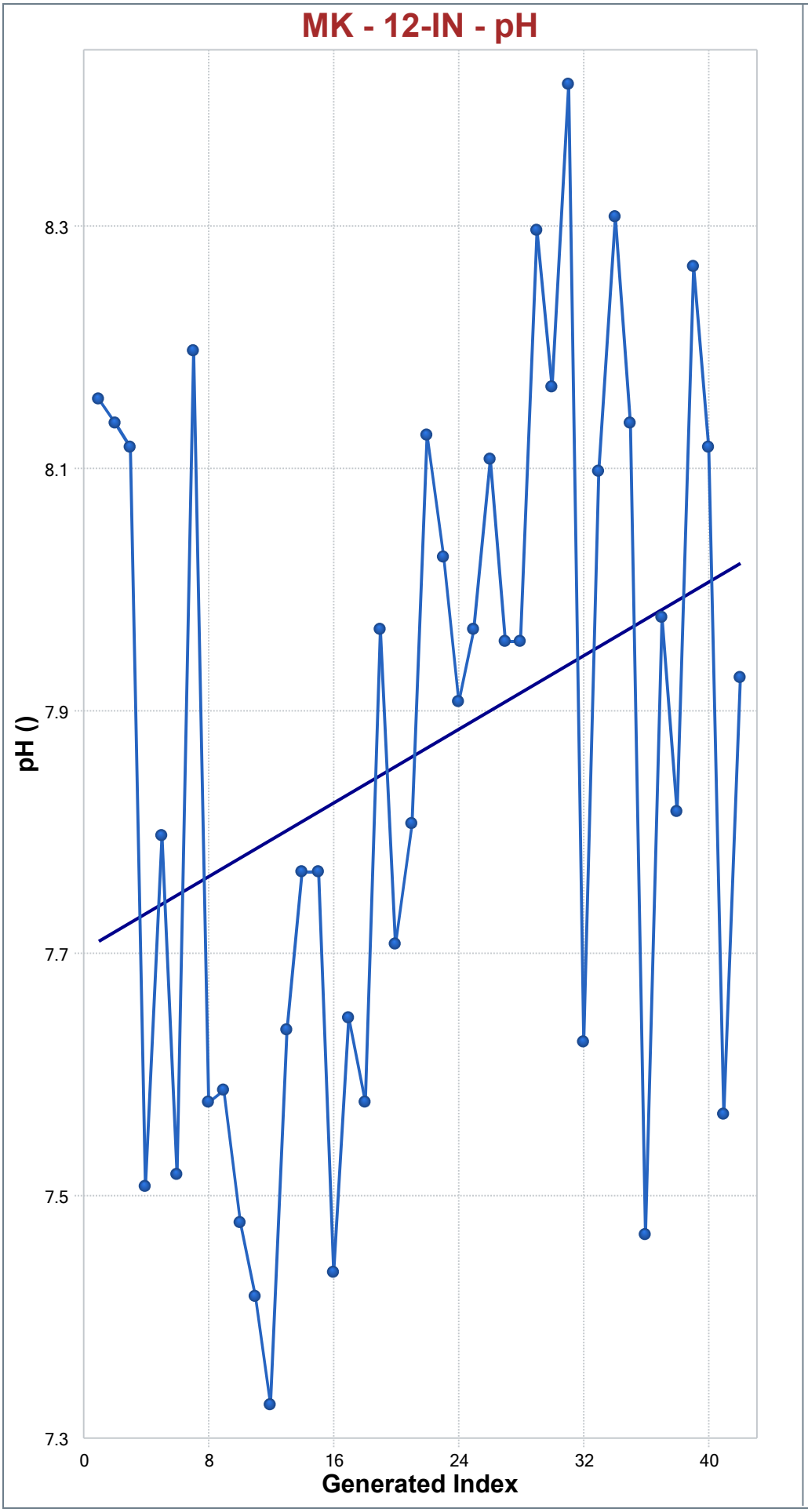
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8359
Standardized Value of S	-0.6799
M-K Test Value (S)	-41
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2483

OLS Regression Line (Blue)

OLS Regression Slope	-0.0036
OLS Regression Intercept	0.1850

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



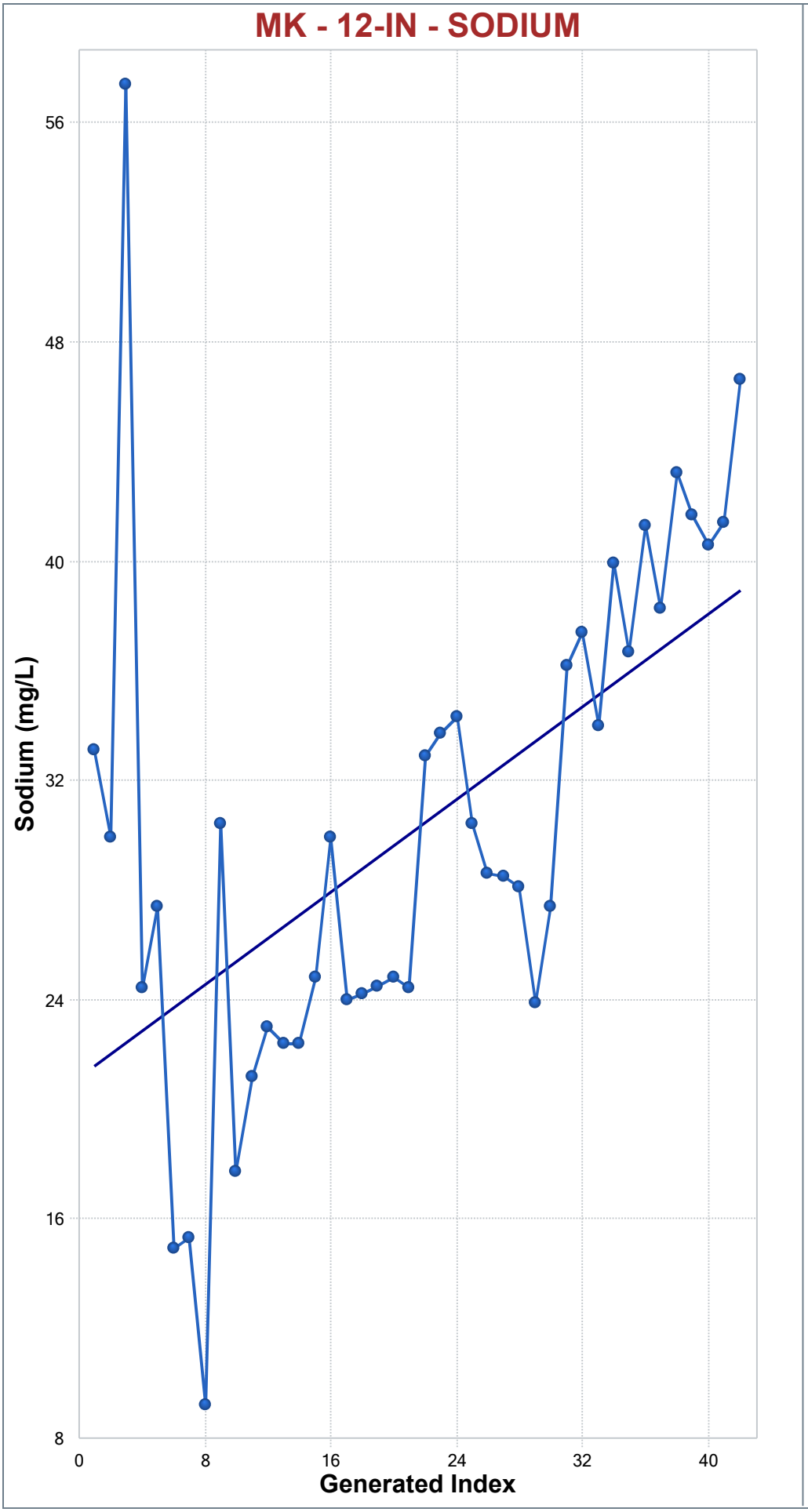
Mann-Kendall Trend Analysis

n	42
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	92.2406
Standardized Value of S	2.1249
M-K Test Value (S)	197
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0168

OLS Regression Line (Blue)

OLS Regression Slope	0.0076
OLS Regression Intercept	7.6947

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



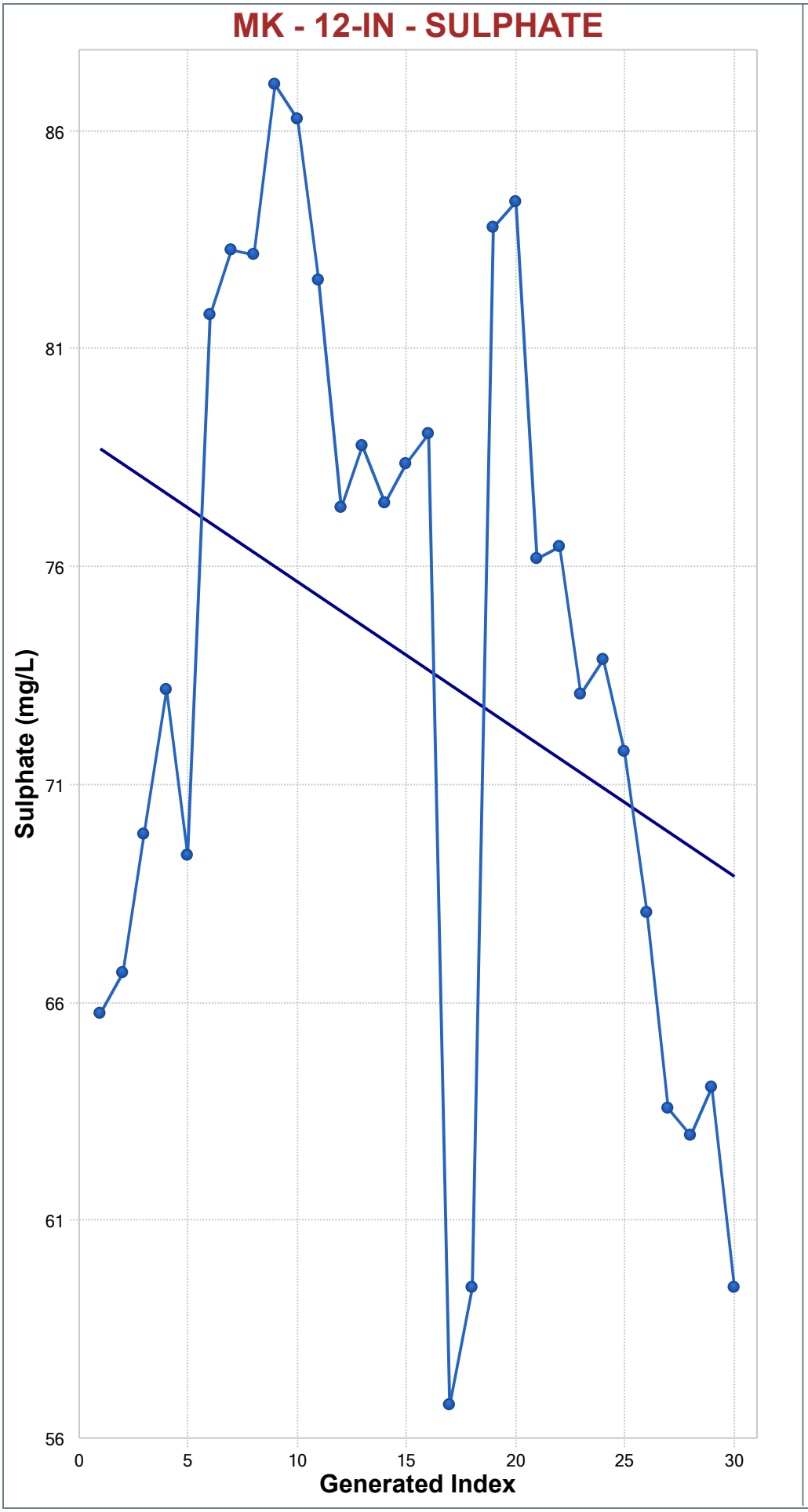
Mann-Kendall Trend Analysis

n	42
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	92.2406
Standardized Value of S	4.9219
M-K Test Value (S)	455
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.4243
OLS Regression Intercept	21.2246

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



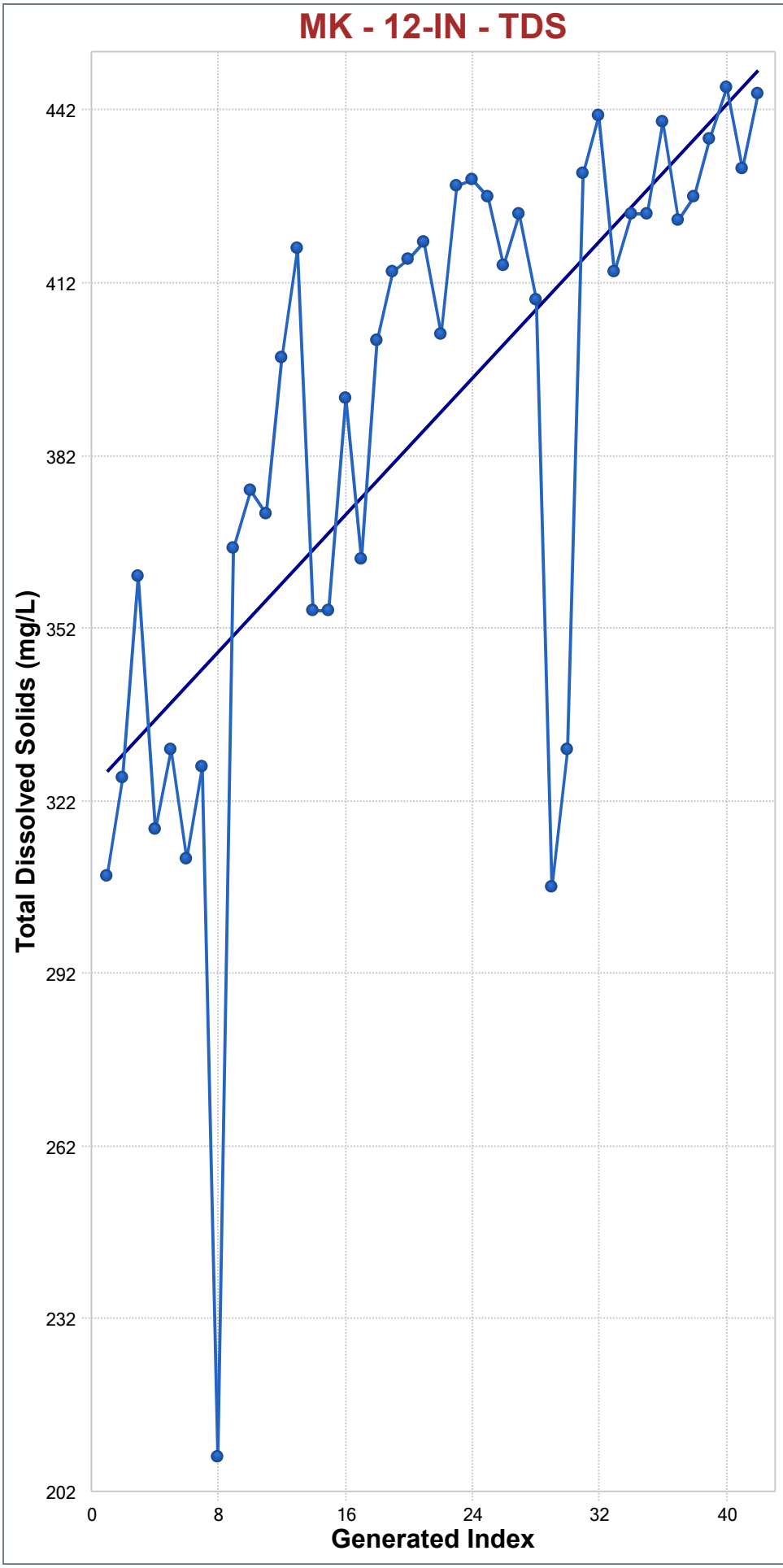
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0417
Standardized Value of S	-1.9450
M-K Test Value (S)	-110
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0259

OLS Regression Line (Blue)

OLS Regression Slope	-0.3383
OLS Regression Intercept	79.0701

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



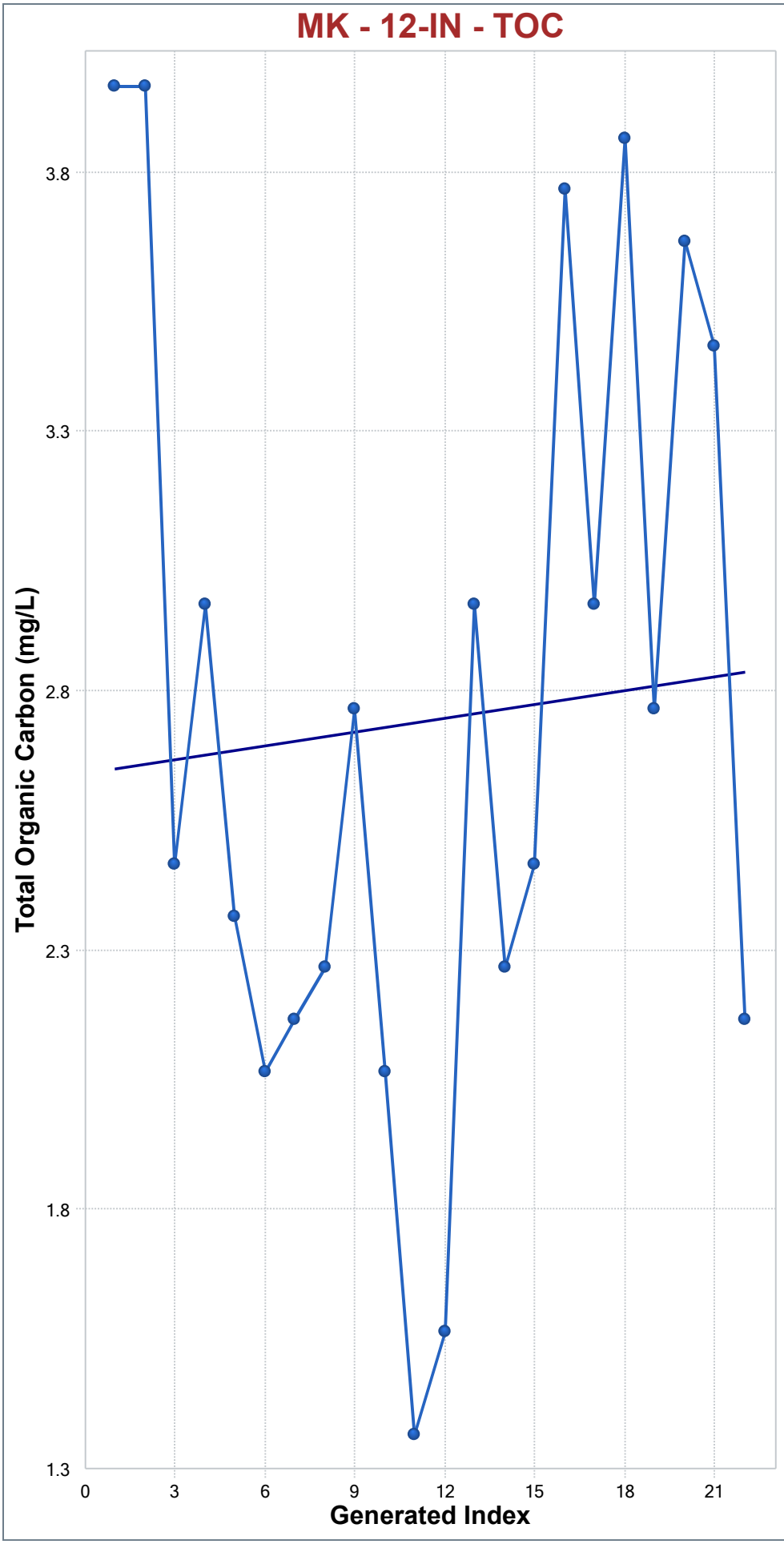
Mann-Kendall Trend Analysis

n	42
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	92.2316
Standardized Value of S	5.9090
M-K Test Value (S)	546
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	2.9752
OLS Regression Intercept	324.1045

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



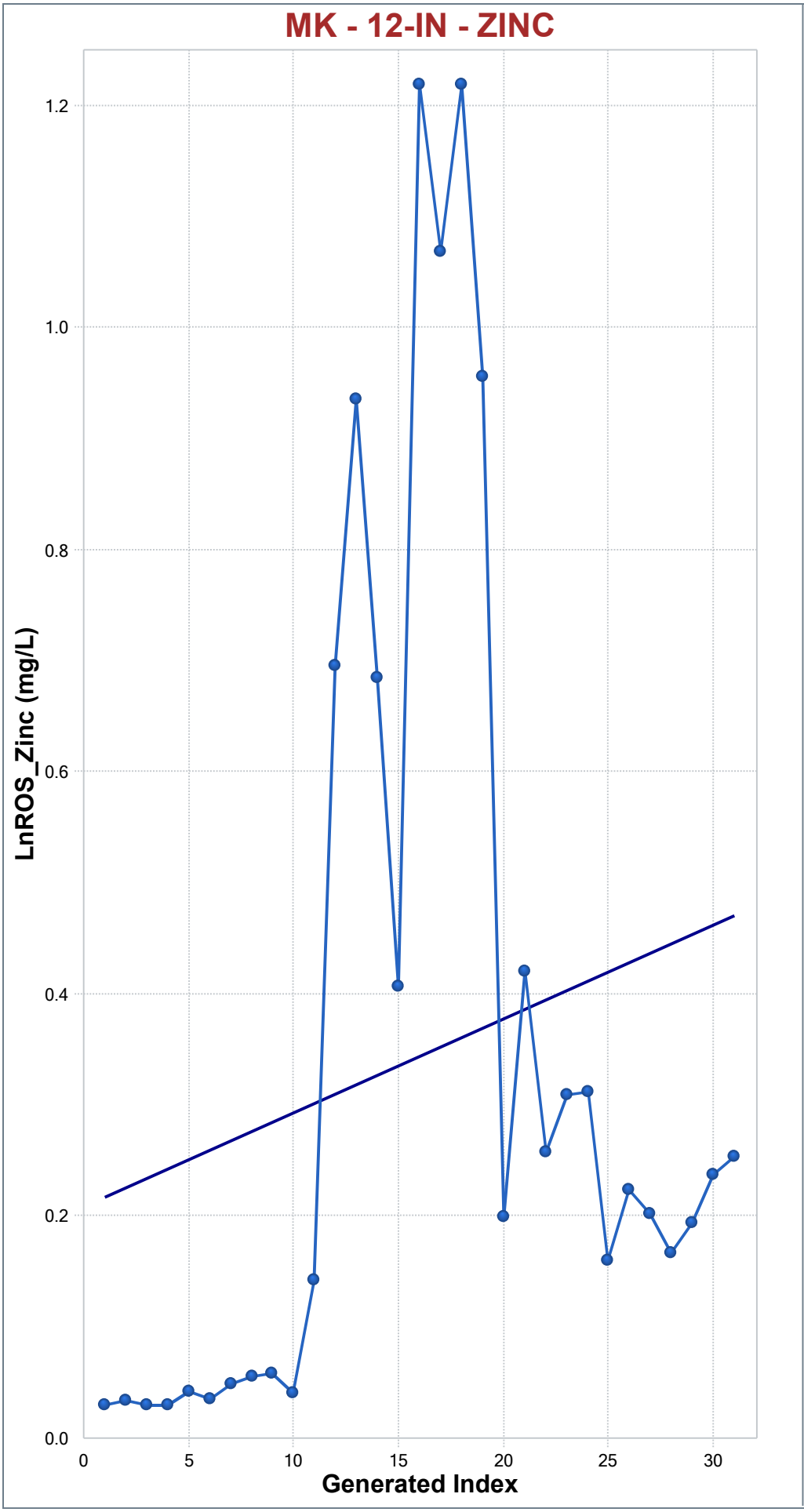
Mann-Kendall Trend Analysis

n	22
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	35.3270
Standardized Value of S	0.1981
M-K Test Value (S)	8
Tabulated p-value	0.4120
Approximate p-value	0.4215

OLS Regression Line (Blue)

OLS Regression Slope	0.0089
OLS Regression Intercept	2.6753

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



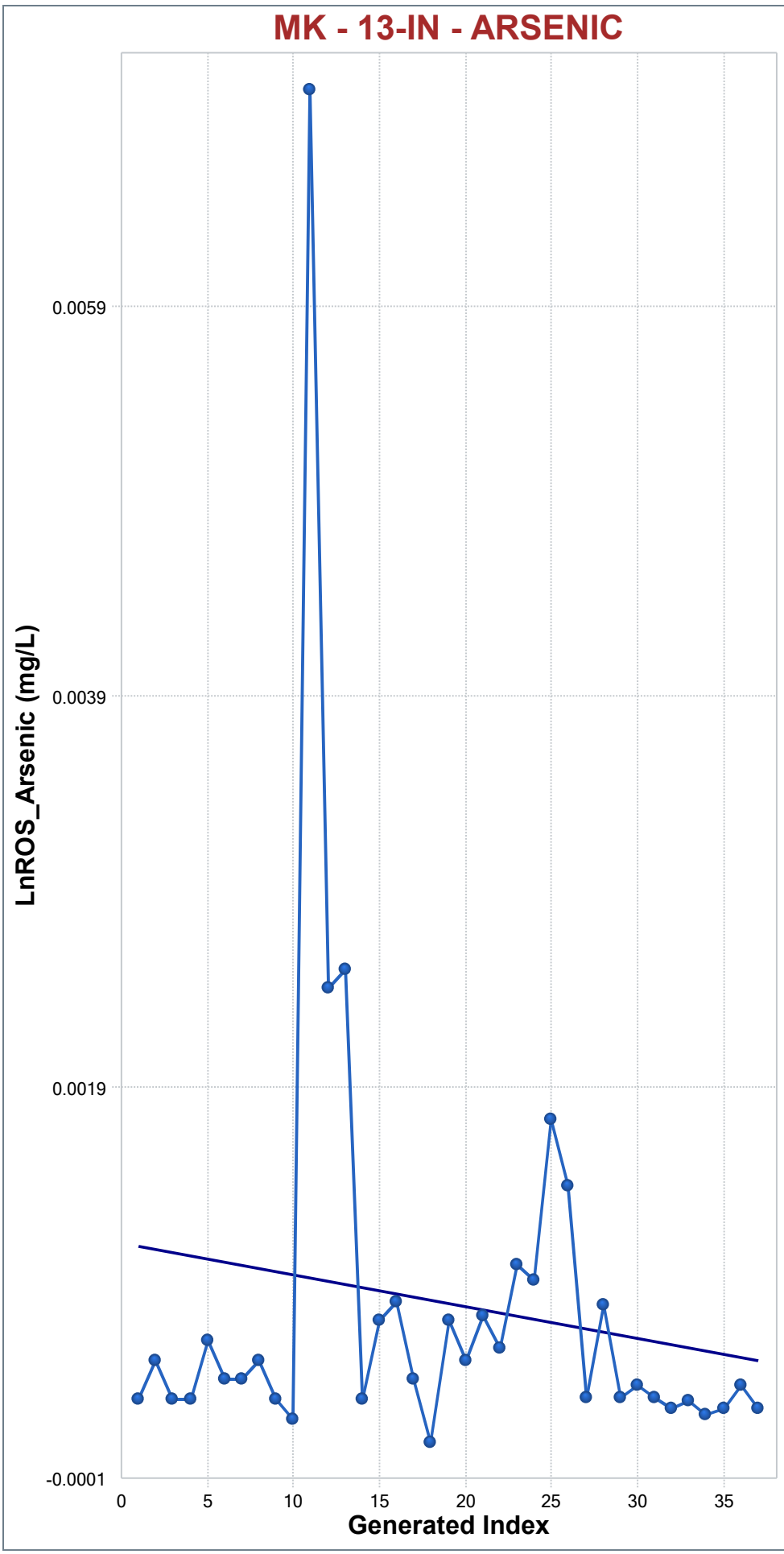
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8189
Standardized Value of S	2.6862
M-K Test Value (S)	159
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0036

OLS Regression Line (Blue)

OLS Regression Slope	0.0084
OLS Regression Intercept	0.1803

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



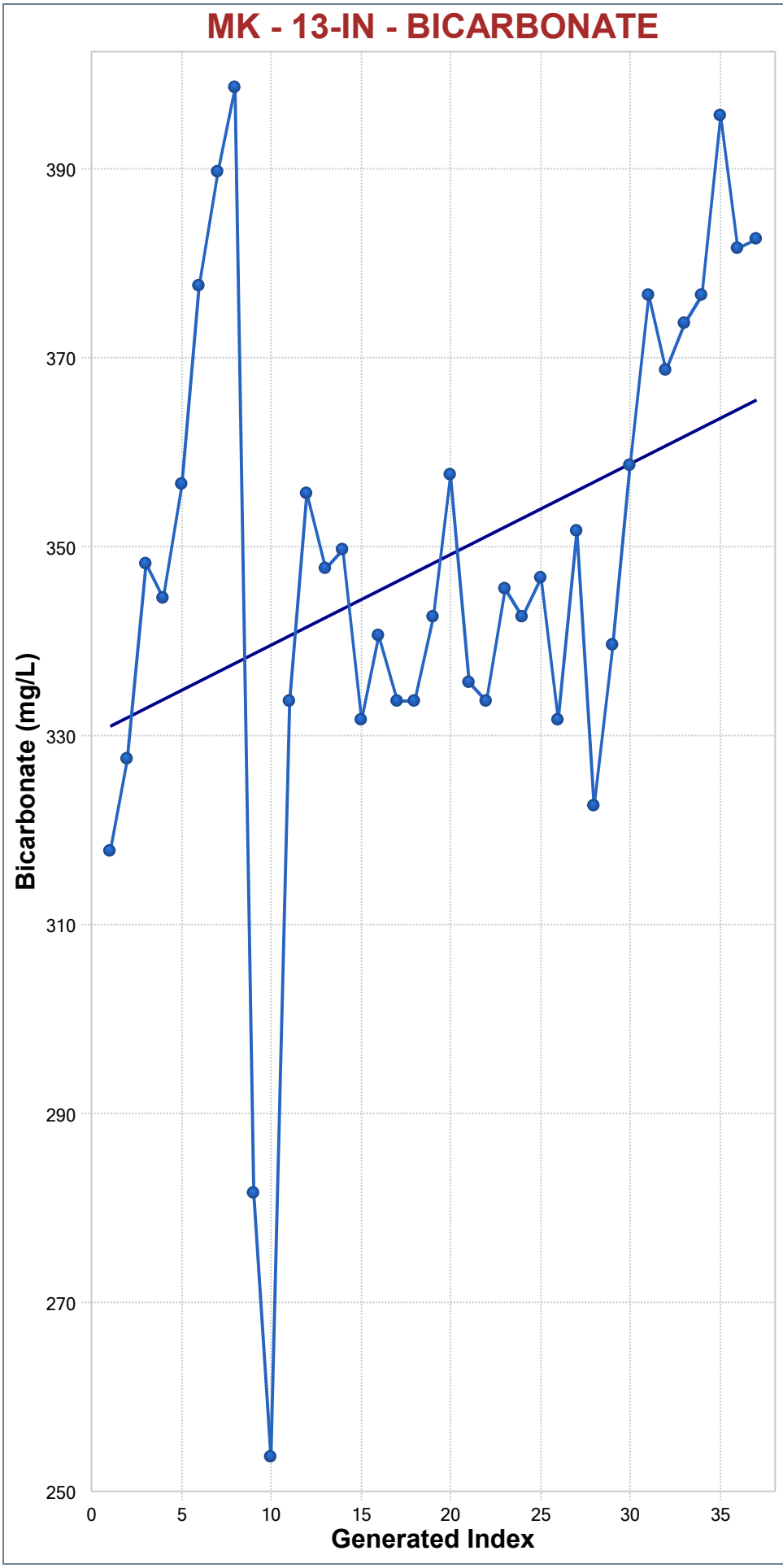
Mann-Kendall Trend Analysis

n	37
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	76.2408
Standardized Value of S	-0.9313
M-K Test Value (S)	-72
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1759

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0011

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



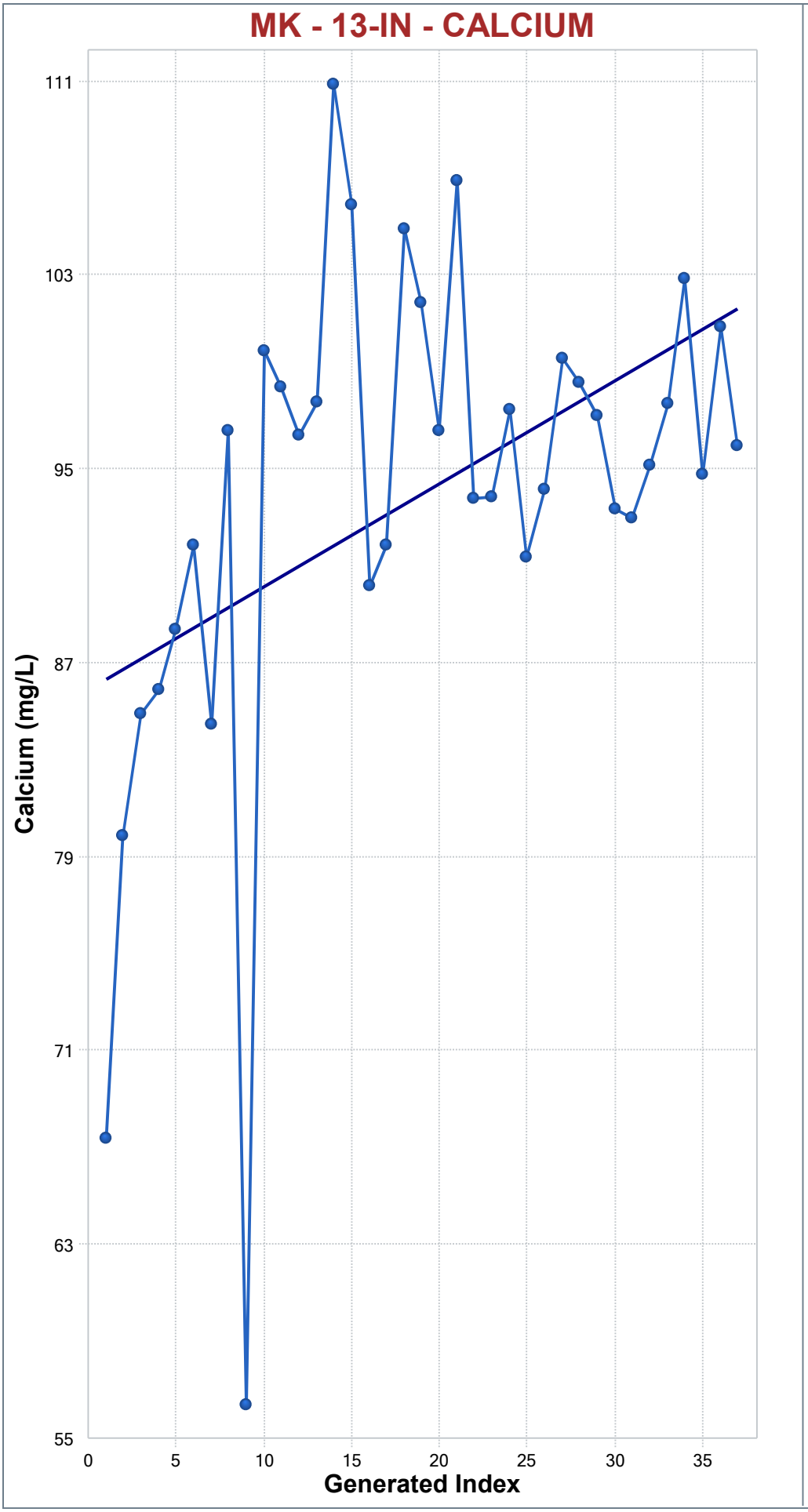
Mann-Kendall Trend Analysis

n	37
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	76.3828
Standardized Value of S	2.4613
M-K Test Value (S)	189
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0069

OLS Regression Line (Blue)

OLS Regression Slope	0.9598
OLS Regression Intercept	330.4041

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



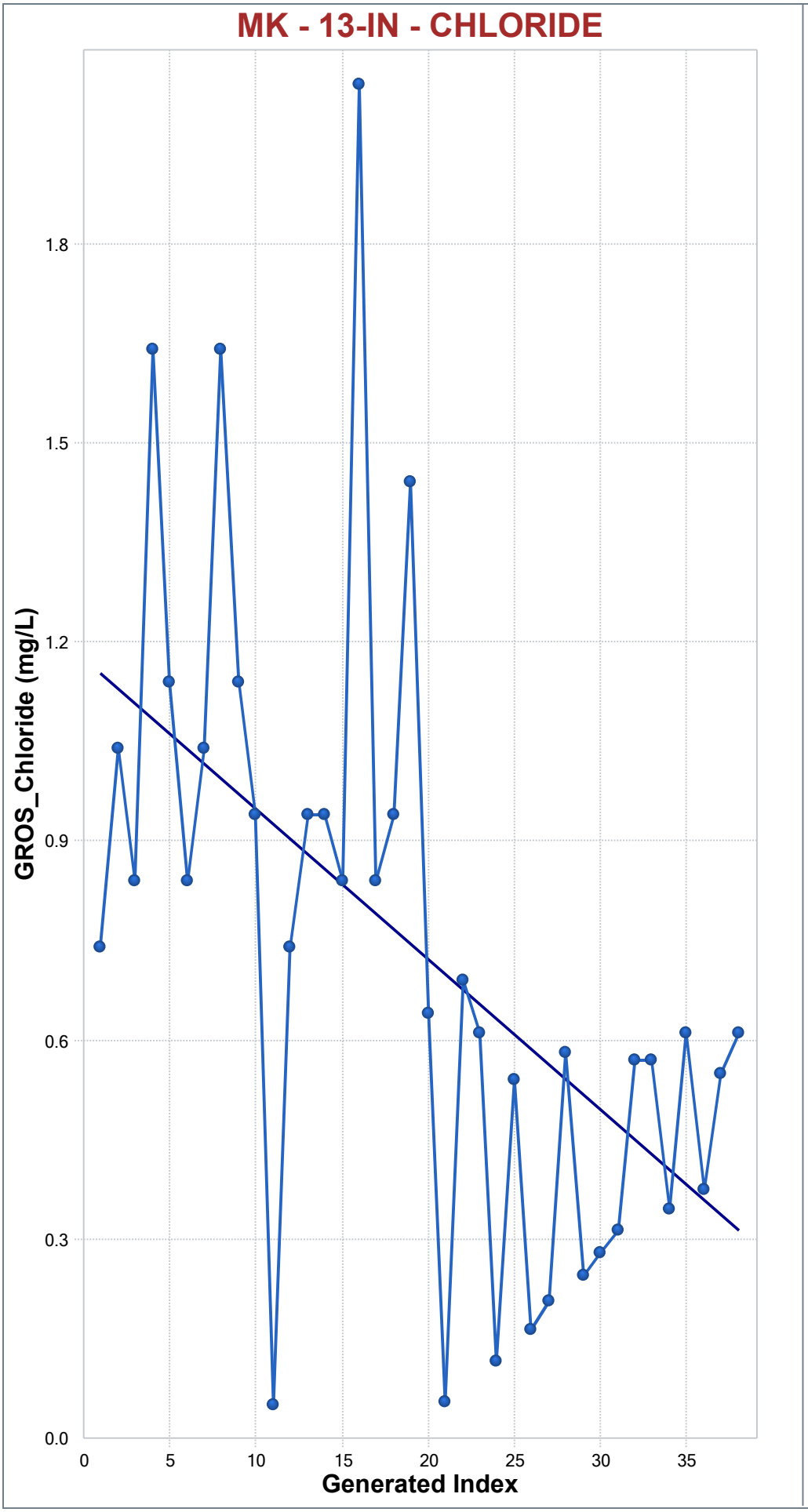
Mann-Kendall Trend Analysis

n	37
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	76.4461
Standardized Value of S	2.4723
M-K Test Value (S)	190
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0067

OLS Regression Line (Blue)

OLS Regression Slope	0.4255
OLS Regression Intercept	86.0077

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



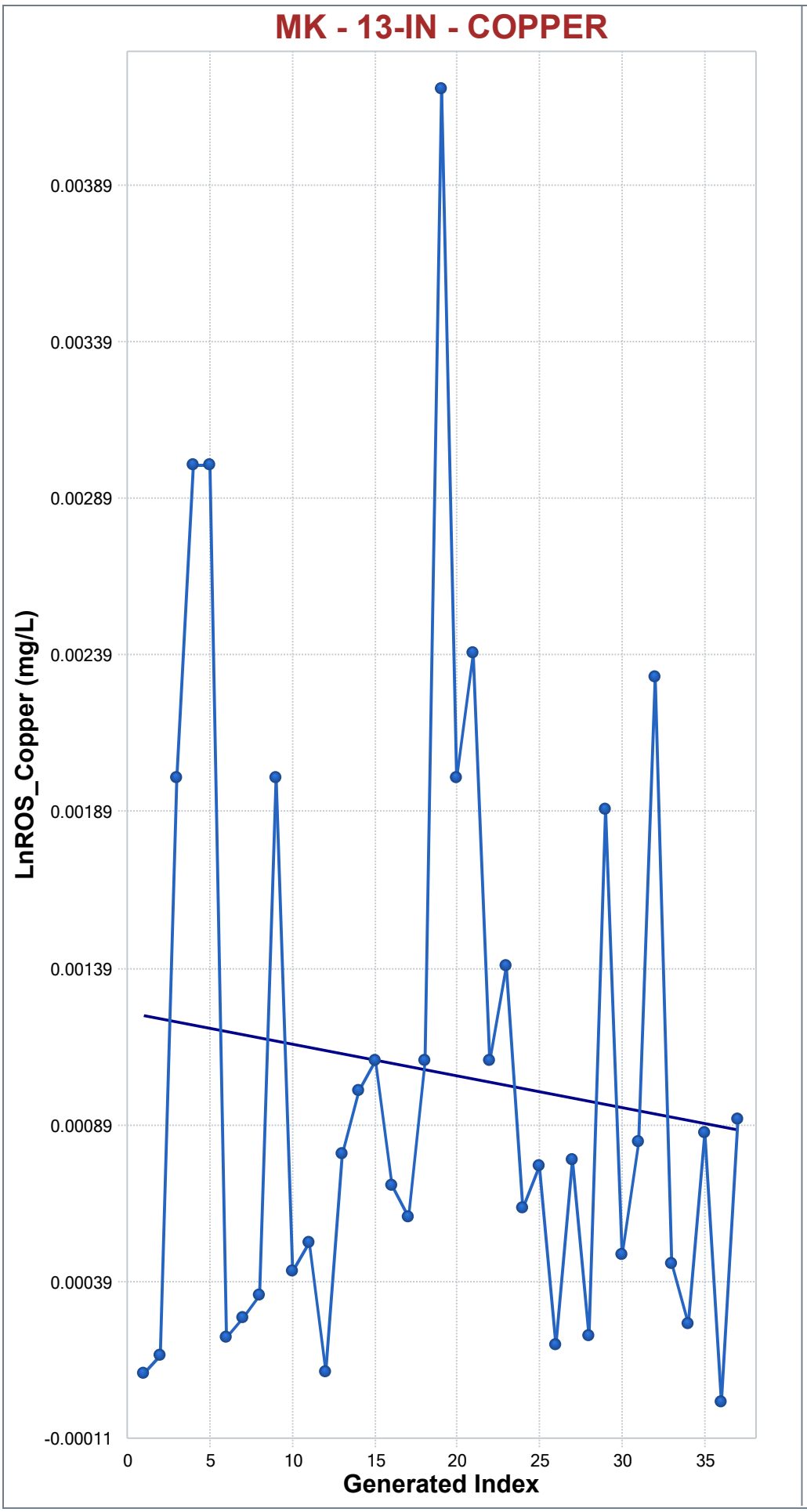
Mann-Kendall Trend Analysis

n	38
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	79.3788
Standardized Value of S	-3.6282
M-K Test Value (S)	-289
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	-0.0227
OLS Regression Intercept	1.1349

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



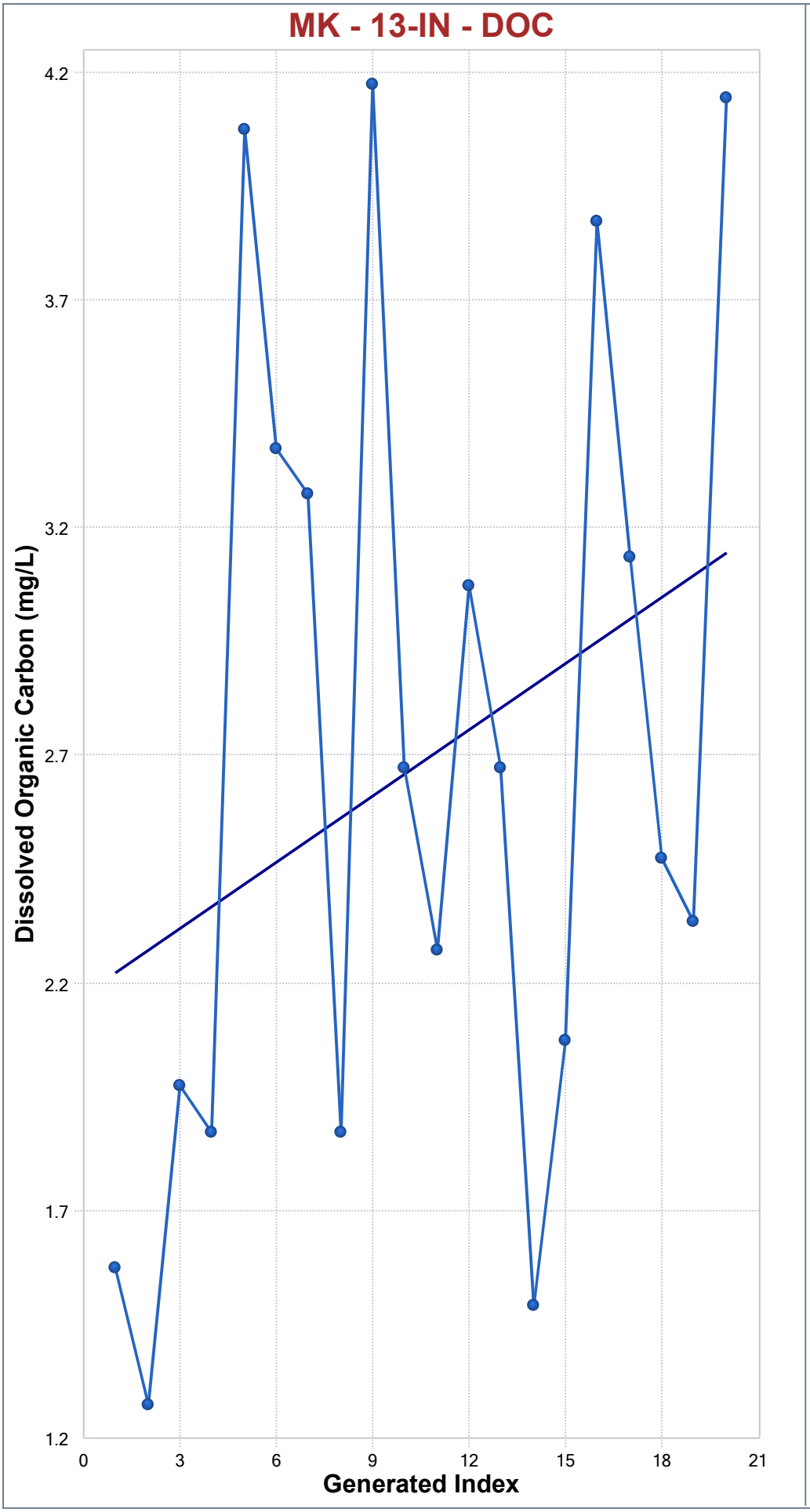
Mann-Kendall Trend Analysis

n	37
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	76.4046
Standardized Value of S	0.2094
M-K Test Value (S)	17
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4171

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0013

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



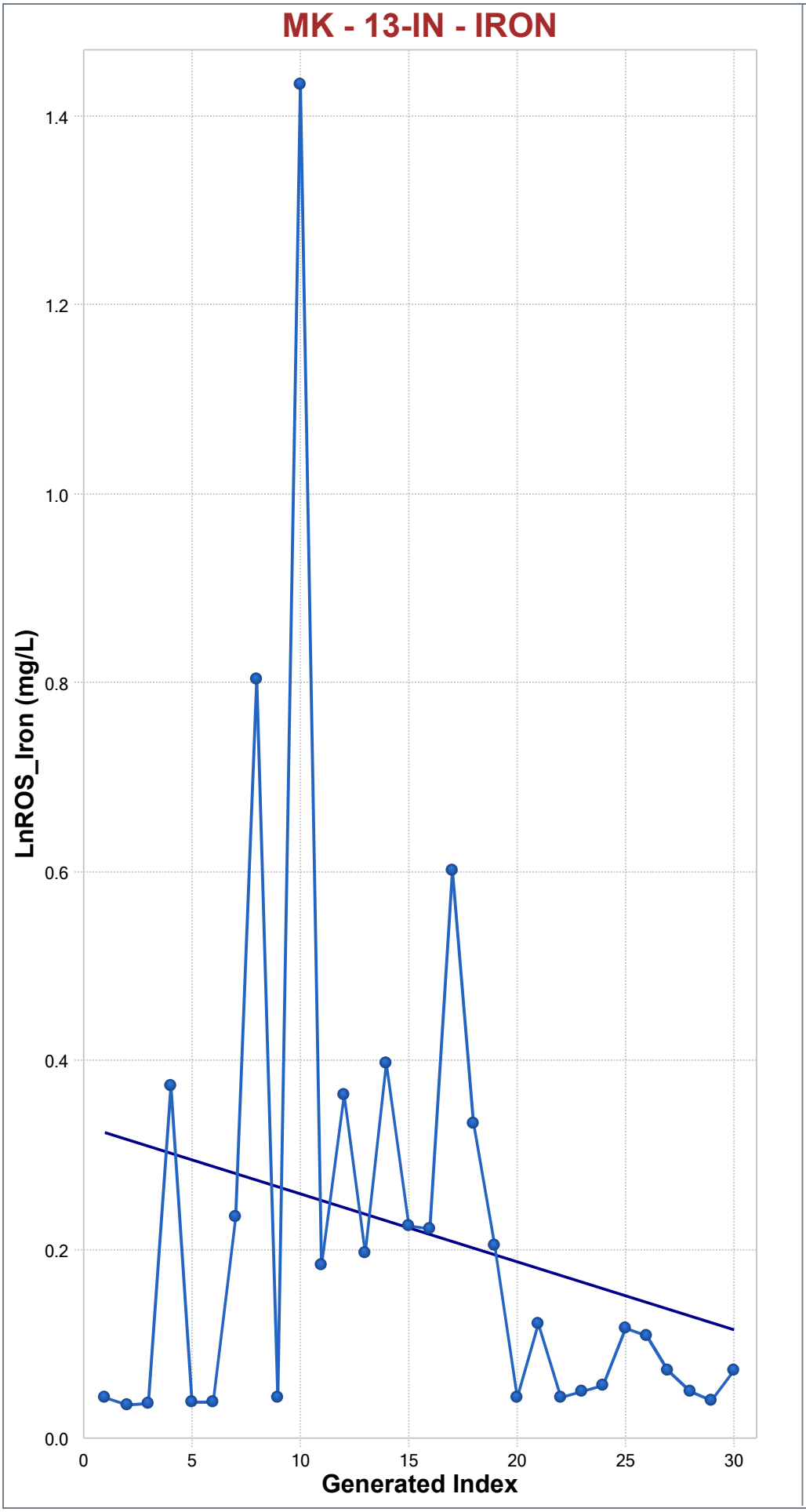
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7896
Standardized Value of S	1.2667
M-K Test Value (S)	40
Tabulated p-value	0.1040
Approximate p-value	0.1026

OLS Regression Line (Blue)

OLS Regression Slope	0.0486
OLS Regression Intercept	2.1999

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



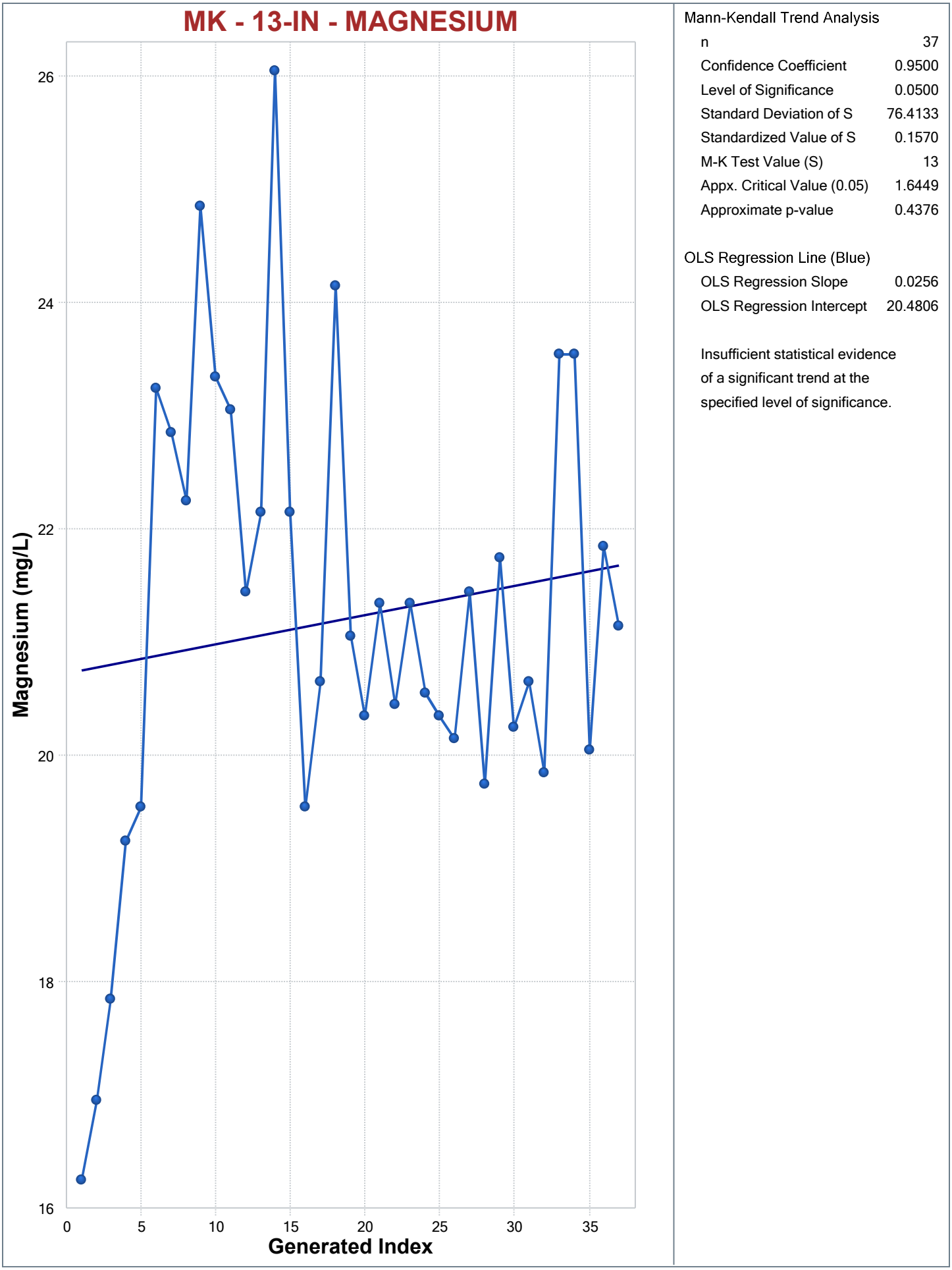
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0089
Standardized Value of S	-0.3571
M-K Test Value (S)	-21
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3605

OLS Regression Line (Blue)

OLS Regression Slope	-0.0072
OLS Regression Intercept	0.2979

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



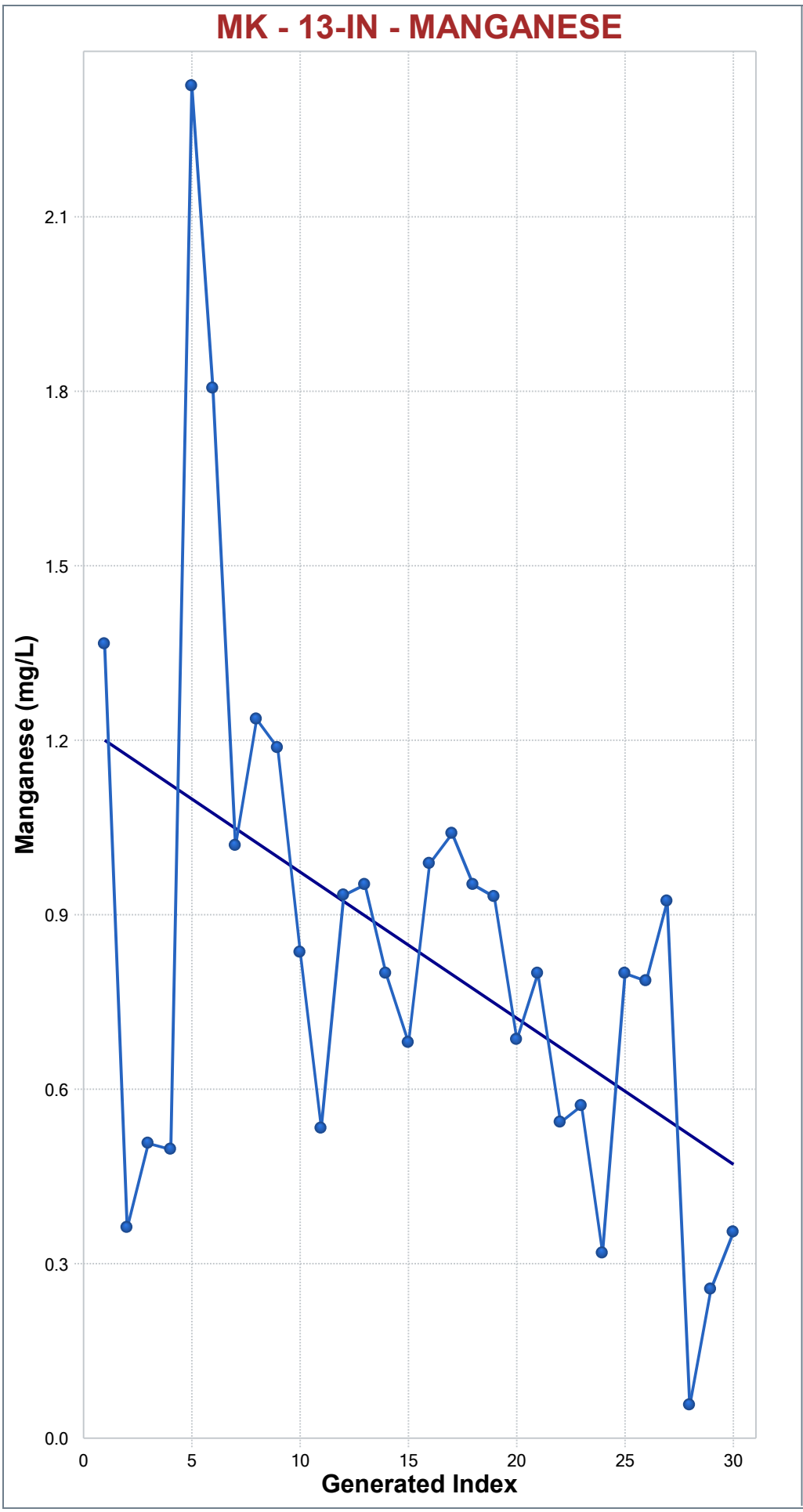
Mann-Kendall Trend Analysis

n	37
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	76.4133
Standardized Value of S	0.1570
M-K Test Value (S)	13
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4376

OLS Regression Line (Blue)

OLS Regression Slope	0.0256
OLS Regression Intercept	20.4806

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



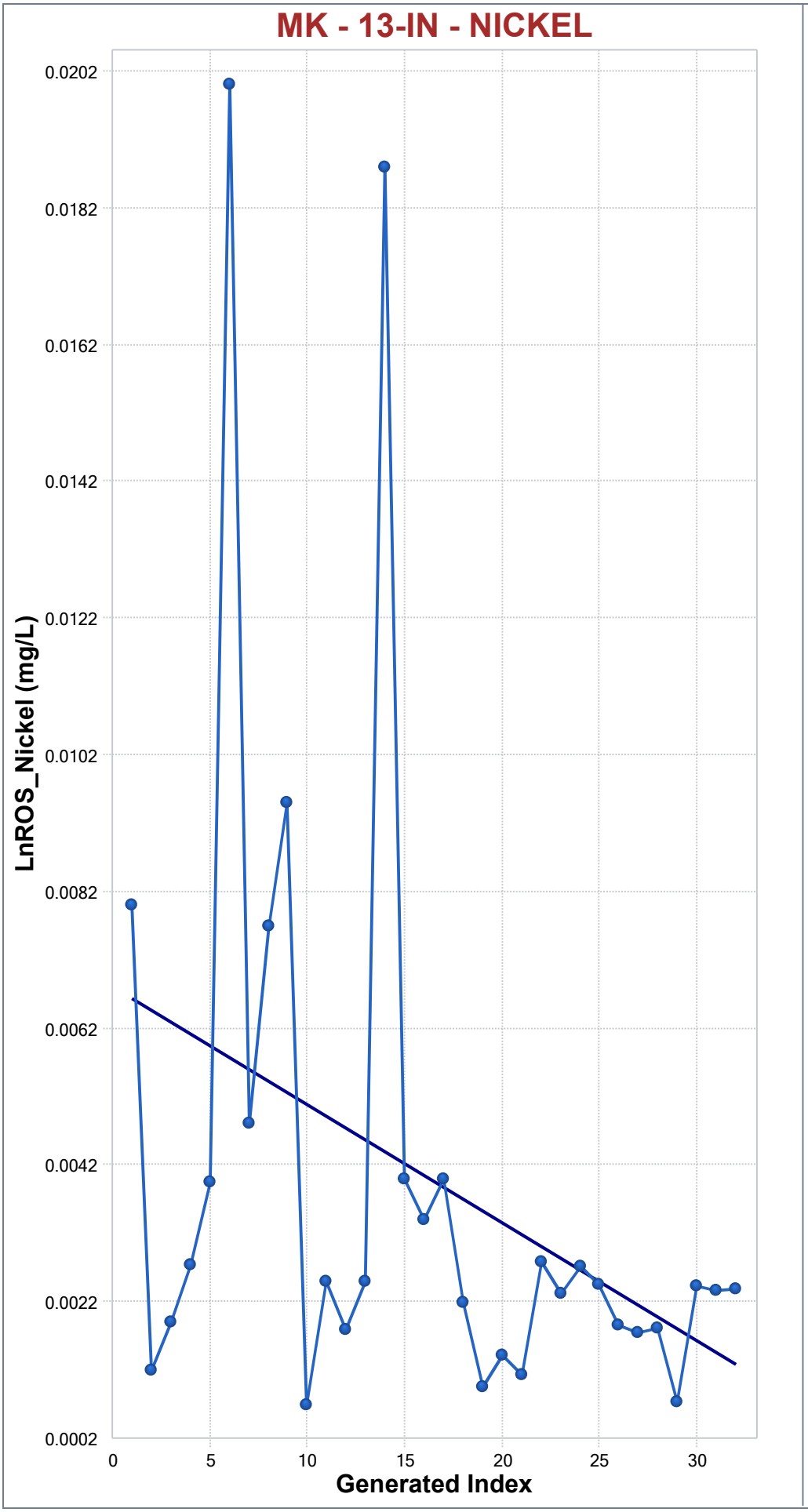
Mann-Kendall Trend Analysis

n	30
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	56.0417
Standardized Value of S	-2.7301
M-K Test Value (S)	-154
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0032

OLS Regression Line (Blue)

OLS Regression Slope	-0.0252
OLS Regression Intercept	1.1792

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



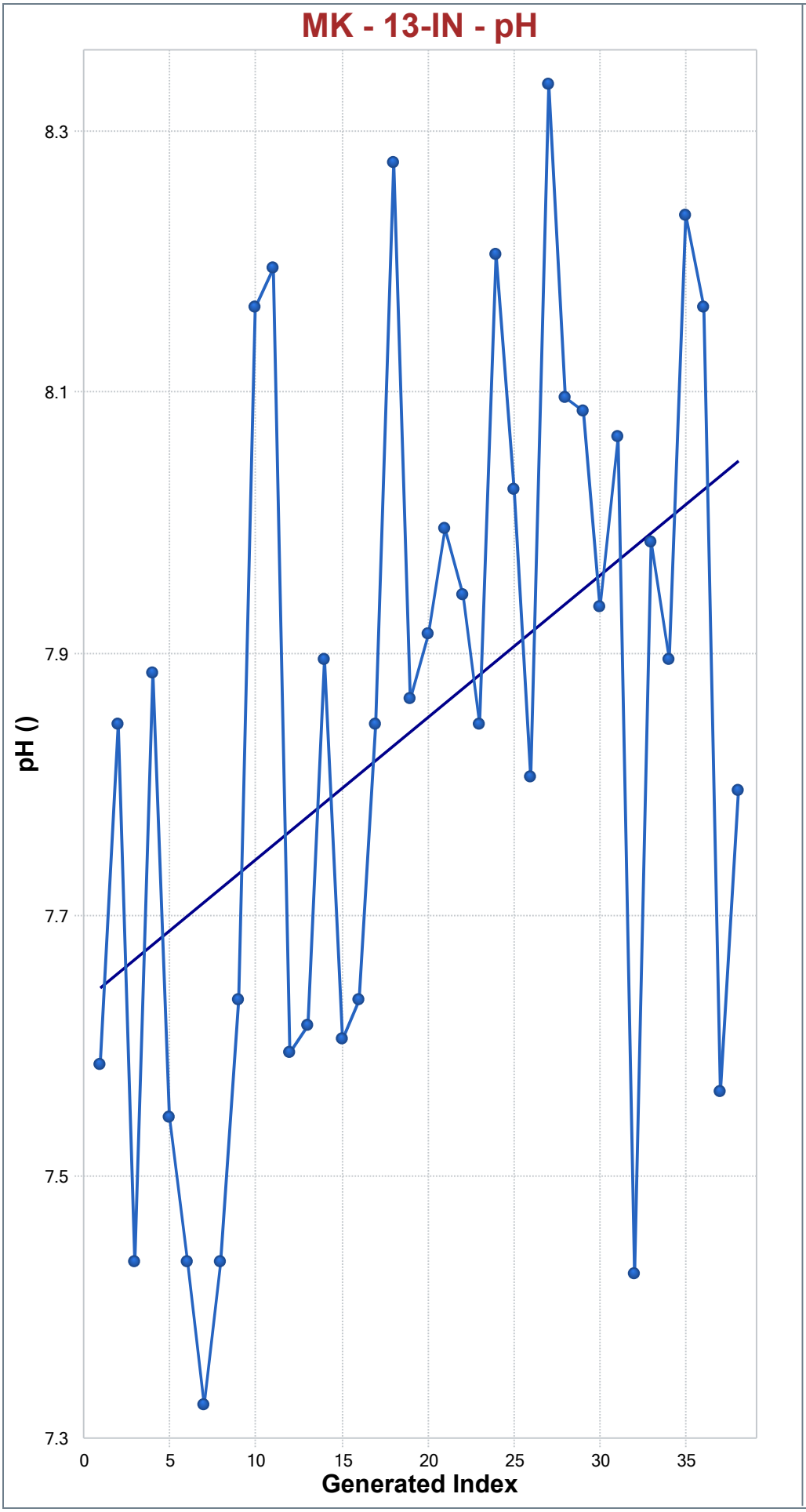
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6495
Standardized Value of S	-2.1574
M-K Test Value (S)	-134
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0155

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0068

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



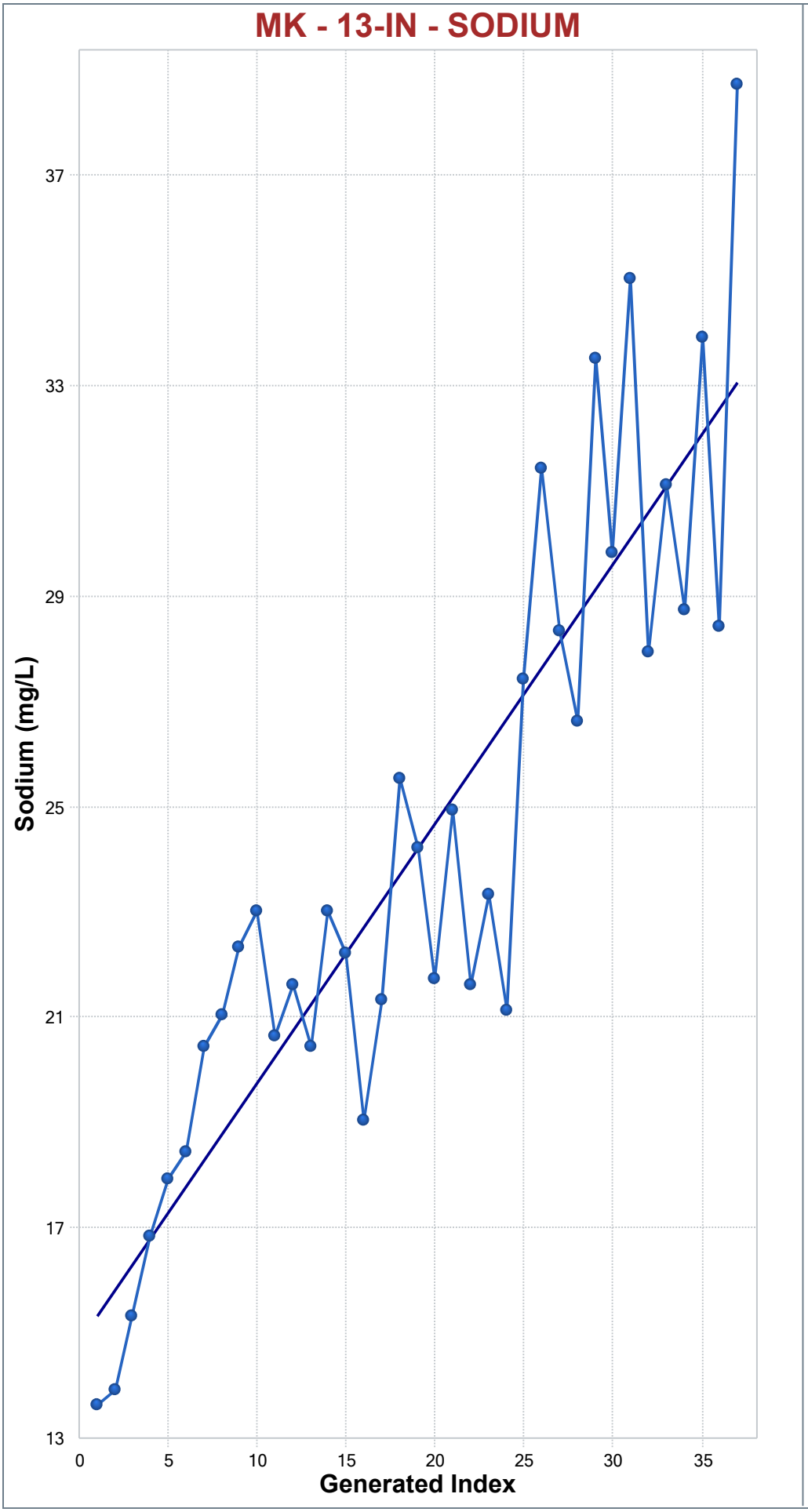
Mann-Kendall Trend Analysis

n	38
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	79.4775
Standardized Value of S	2.8058
M-K Test Value (S)	224
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0025

OLS Regression Line (Blue)

OLS Regression Slope	0.0109
OLS Regression Intercept	7.6381

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



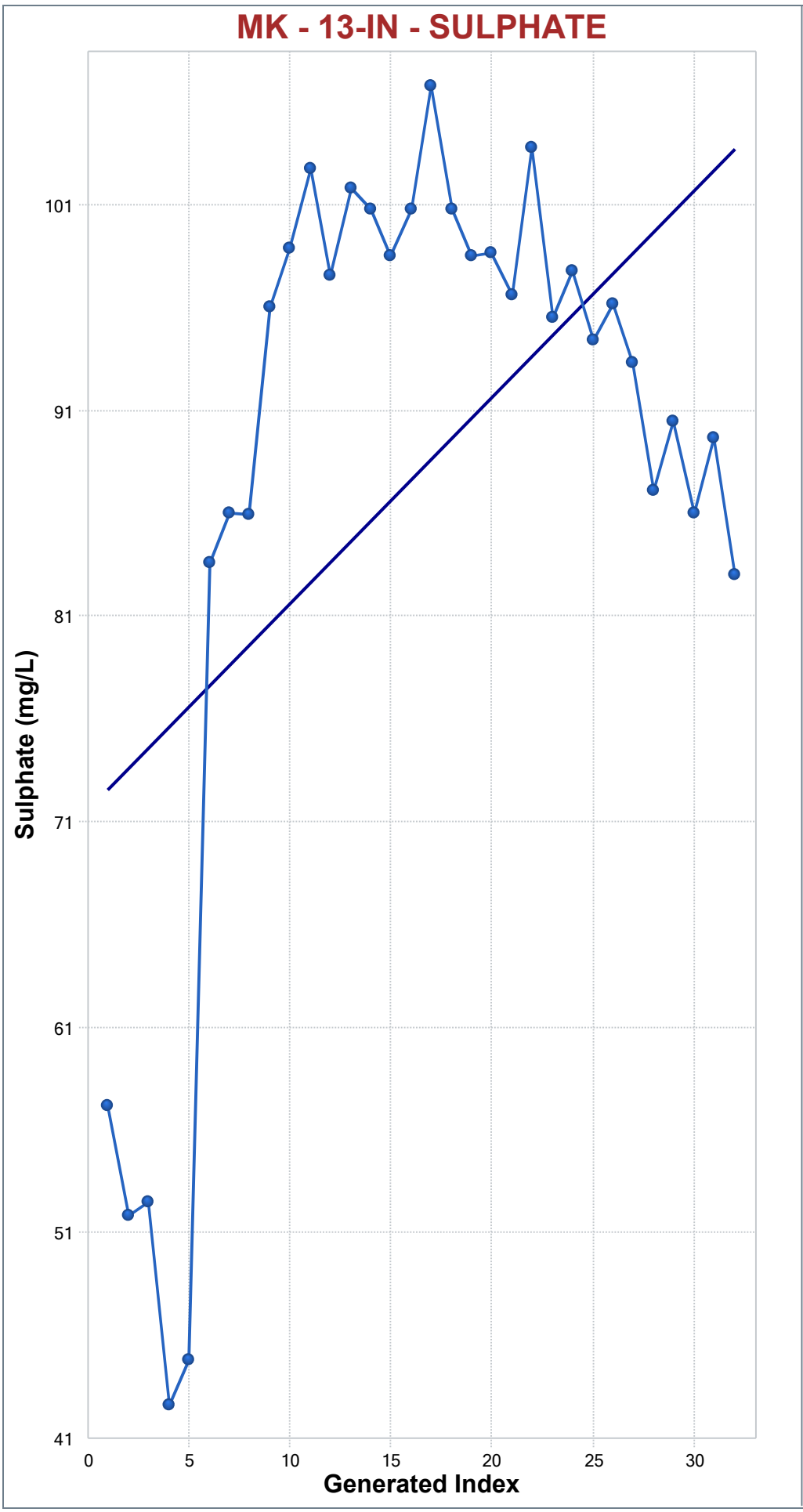
Mann-Kendall Trend Analysis

n	37
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	76.4395
Standardized Value of S	6.4365
M-K Test Value (S)	493
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.4925
OLS Regression Intercept	14.6964

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



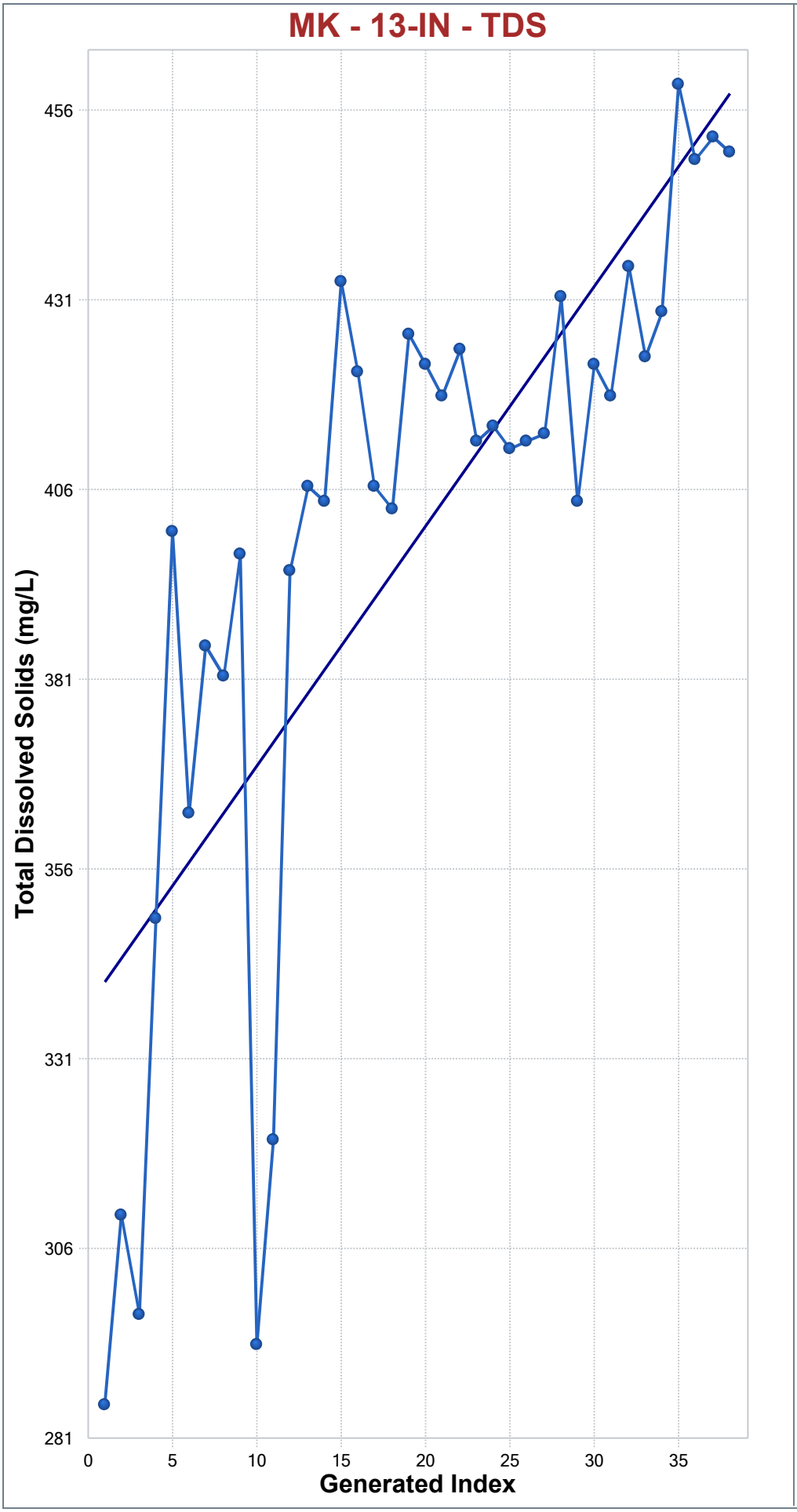
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6198
Standardized Value of S	0.5842
M-K Test Value (S)	37
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2795

OLS Regression Line (Blue)

OLS Regression Slope	1.0045
OLS Regression Intercept	71.7609

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



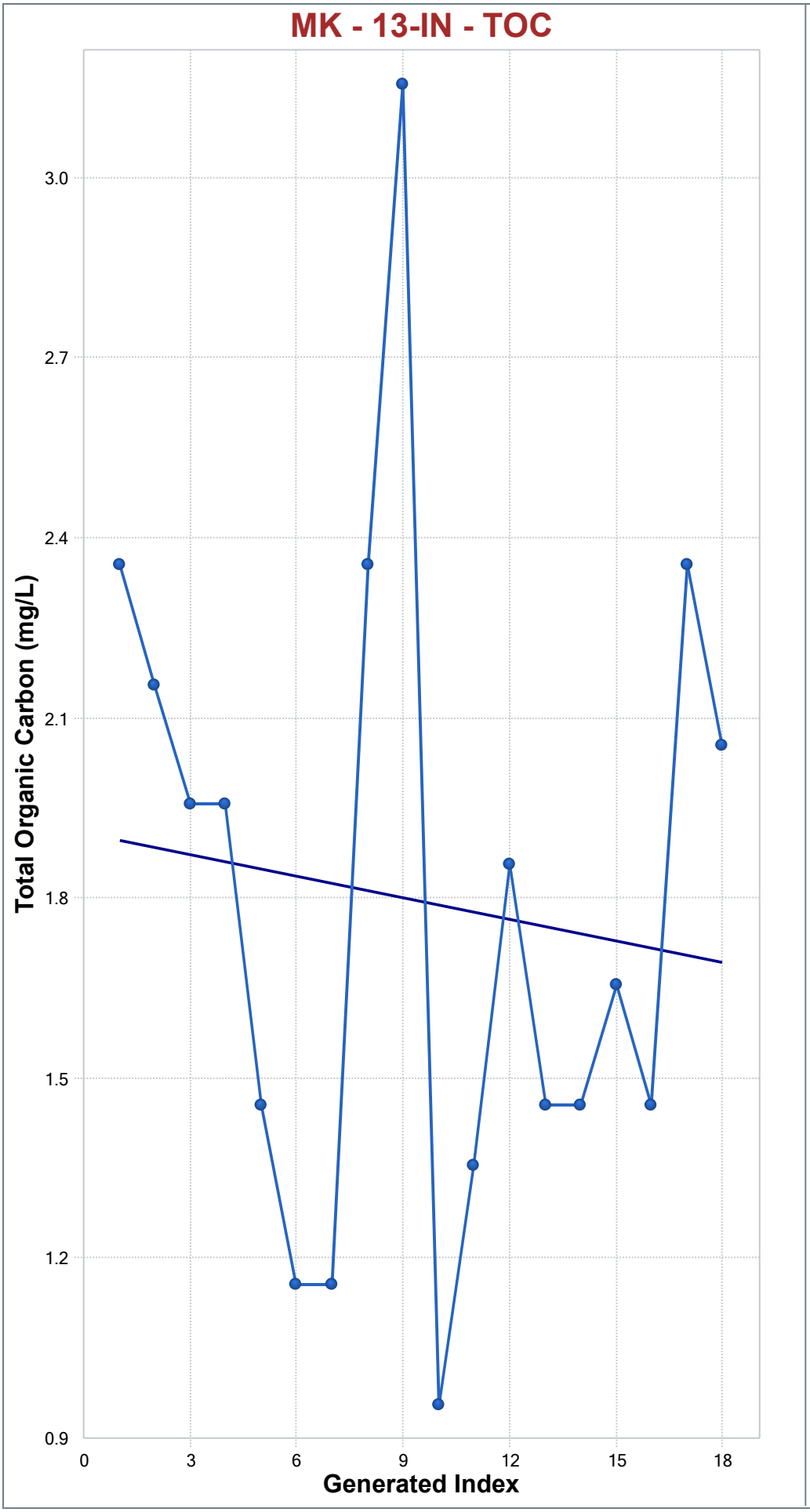
Mann-Kendall Trend Analysis

n	38
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	79.5110
Standardized Value of S	5.9489
M-K Test Value (S)	474
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	3.1629
OLS Regression Intercept	337.5861

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



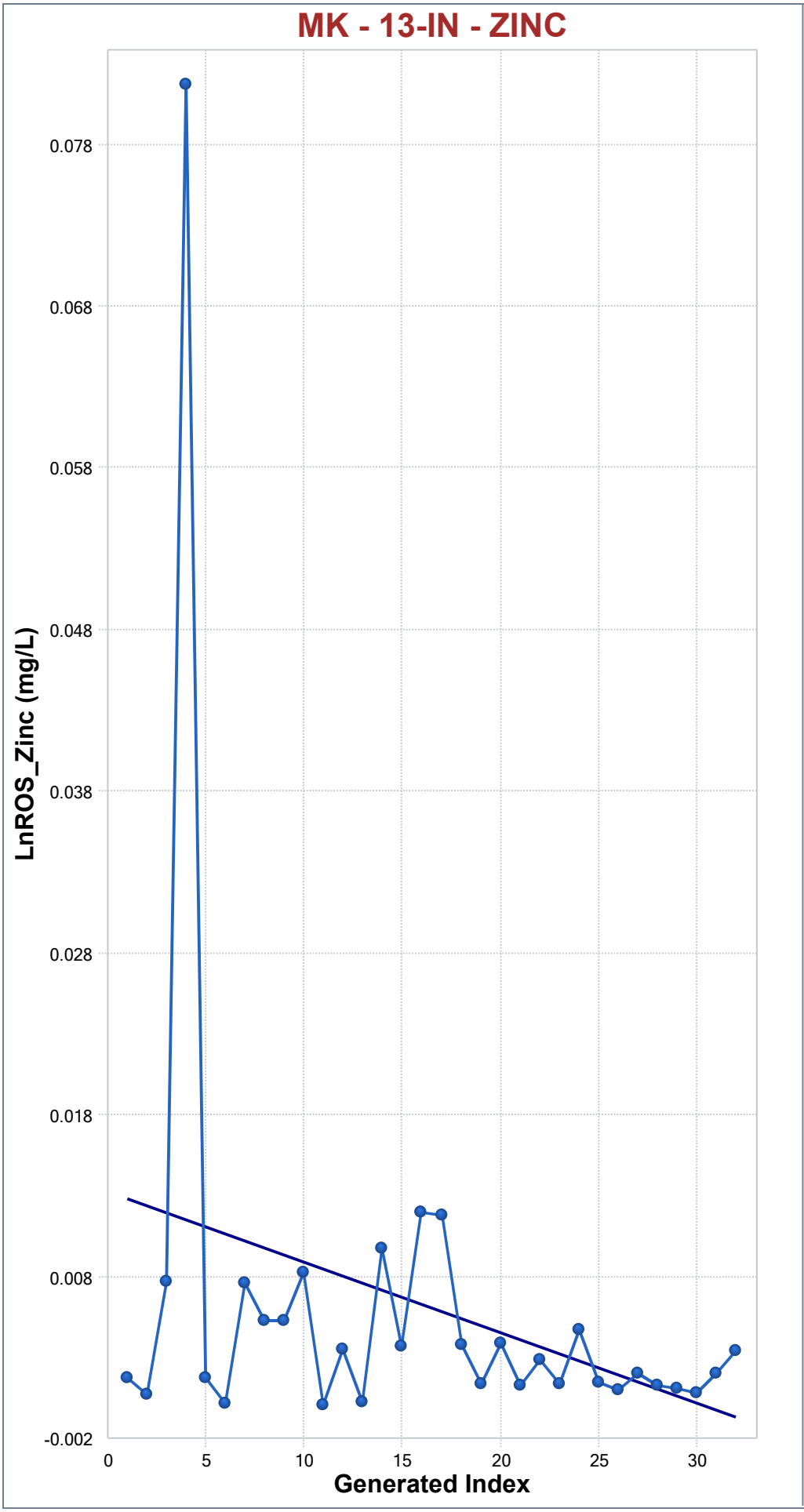
Mann-Kendall Trend Analysis

n	18
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	26.1279
Standardized Value of S	-0.3445
M-K Test Value (S)	-10
Tabulated p-value	0.3540
Approximate p-value	0.3653

OLS Regression Line (Blue)

OLS Regression Slope	-0.0119
OLS Regression Intercept	1.9516

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



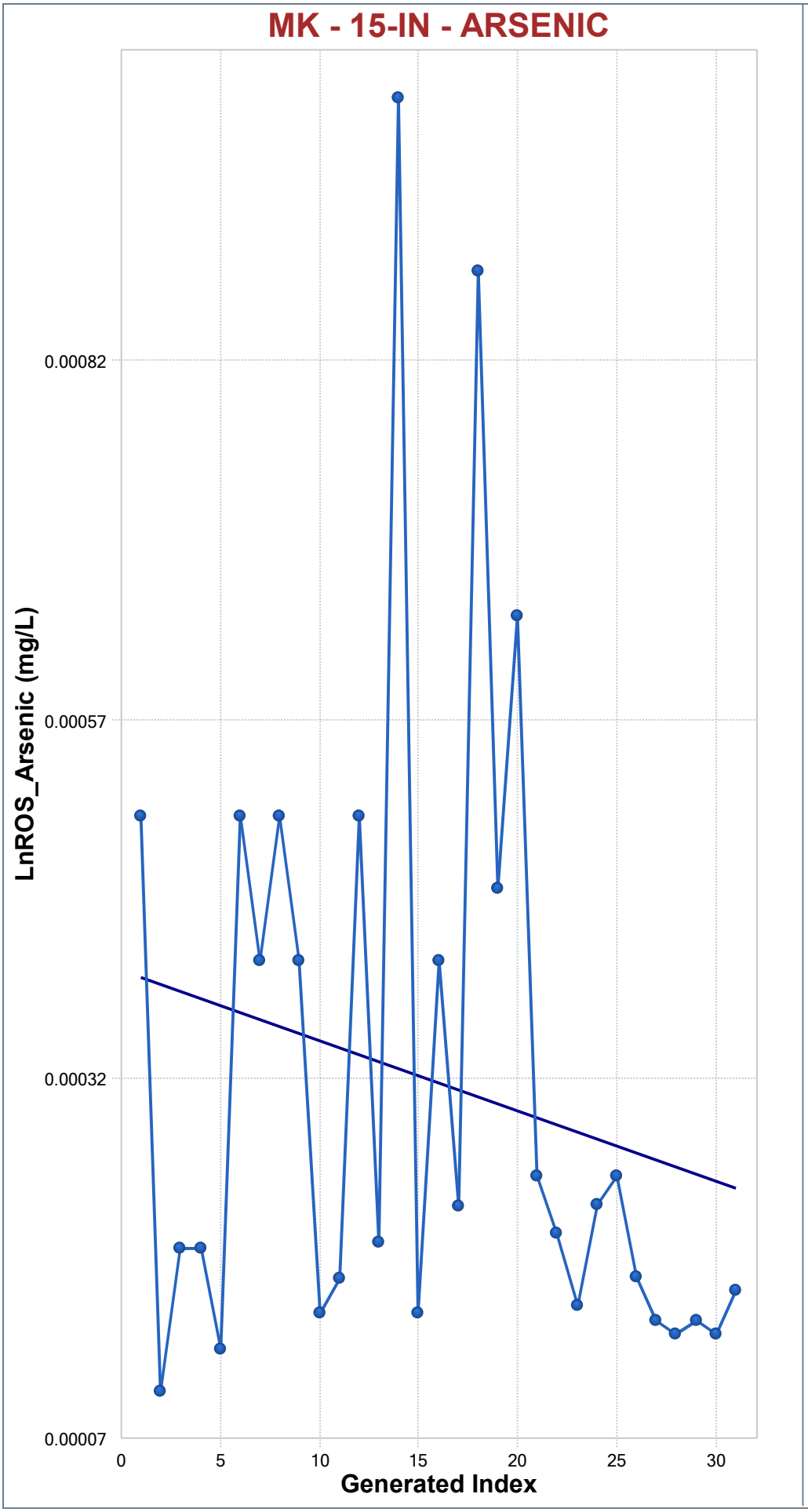
Mann-Kendall Trend Analysis

n	32
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	61.6333
Standardized Value of S	-1.4440
M-K Test Value (S)	-90
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0744

OLS Regression Line (Blue)

OLS Regression Slope	-0.0004
OLS Regression Intercept	0.0135

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



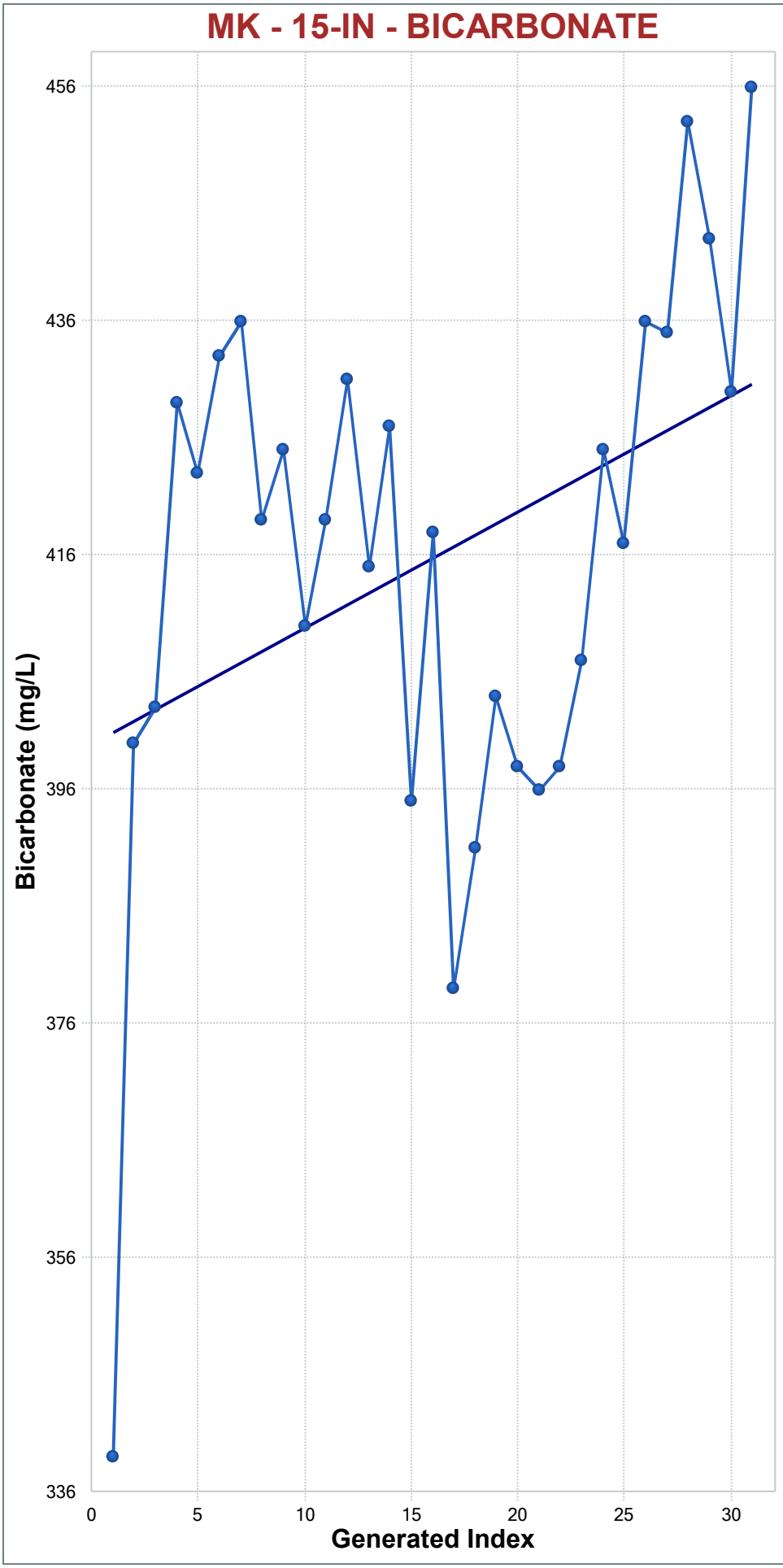
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.6884
Standardized Value of S	-1.4313
M-K Test Value (S)	-85
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0762

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0004

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



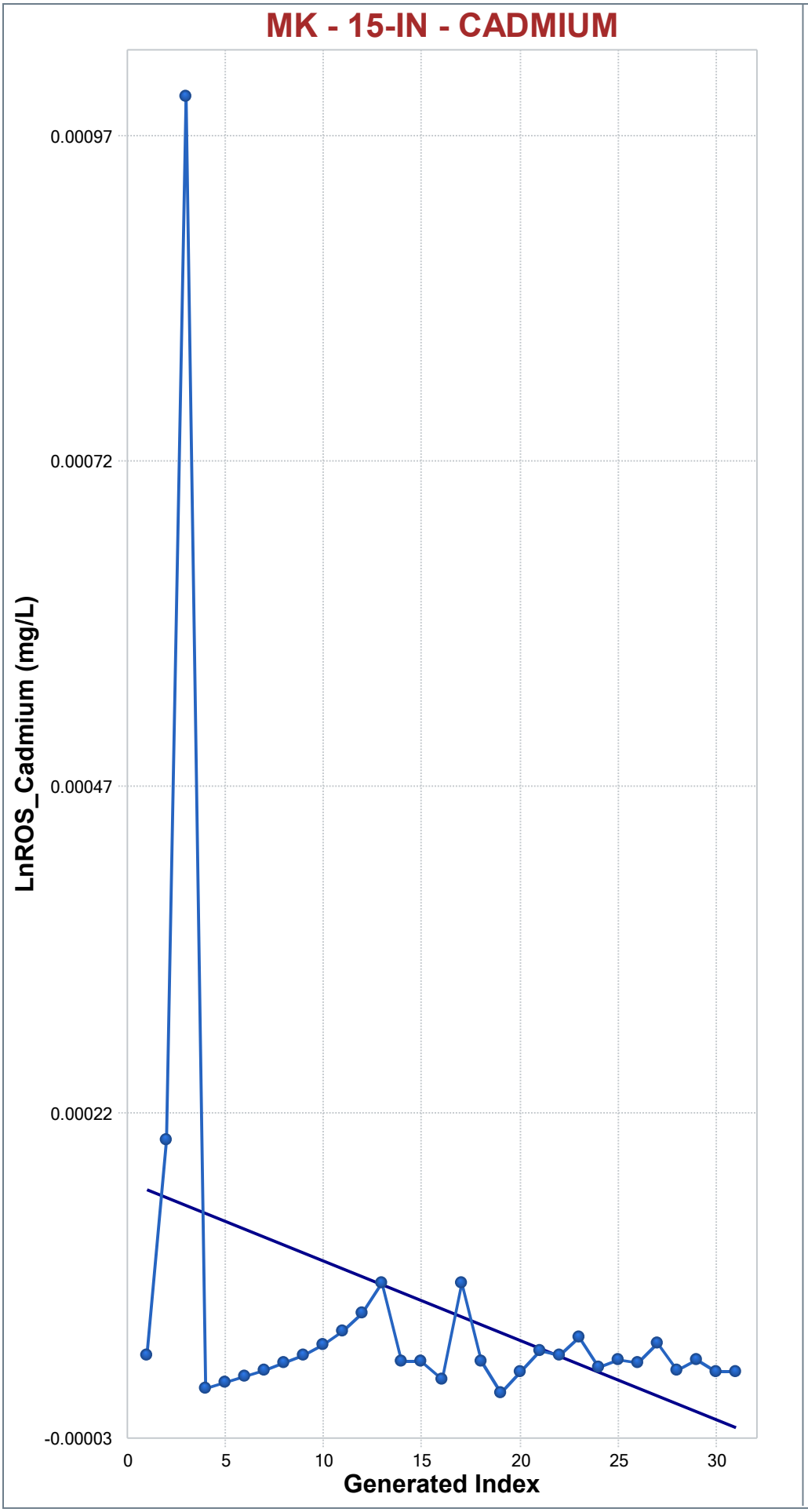
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8019
Standardized Value of S	1.6666
M-K Test Value (S)	99
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0478

OLS Regression Line (Blue)

OLS Regression Slope	0.9903
OLS Regression Intercept	399.9613

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



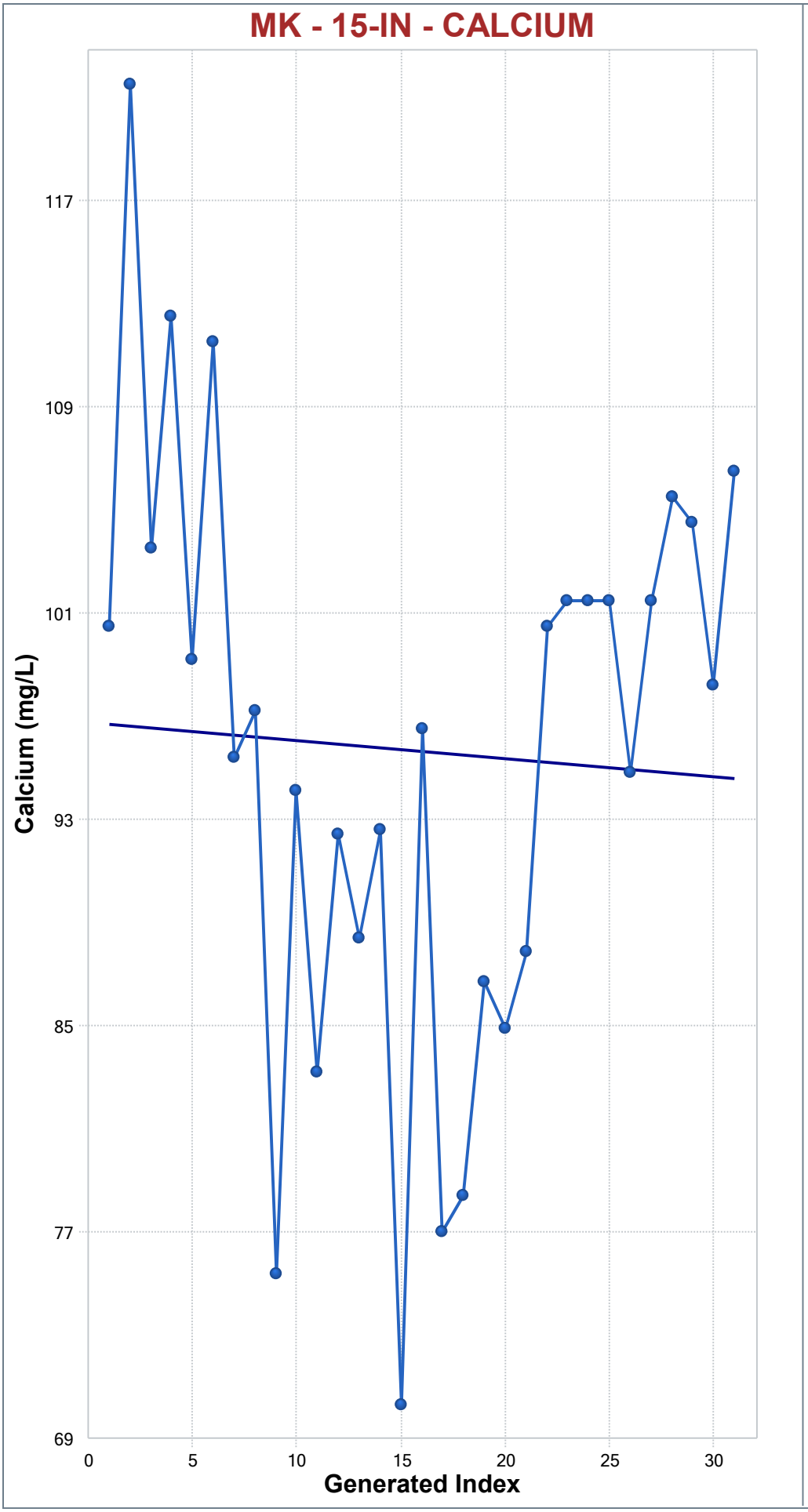
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8274
Standardized Value of S	-0.7649
M-K Test Value (S)	-46
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2222

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0002

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



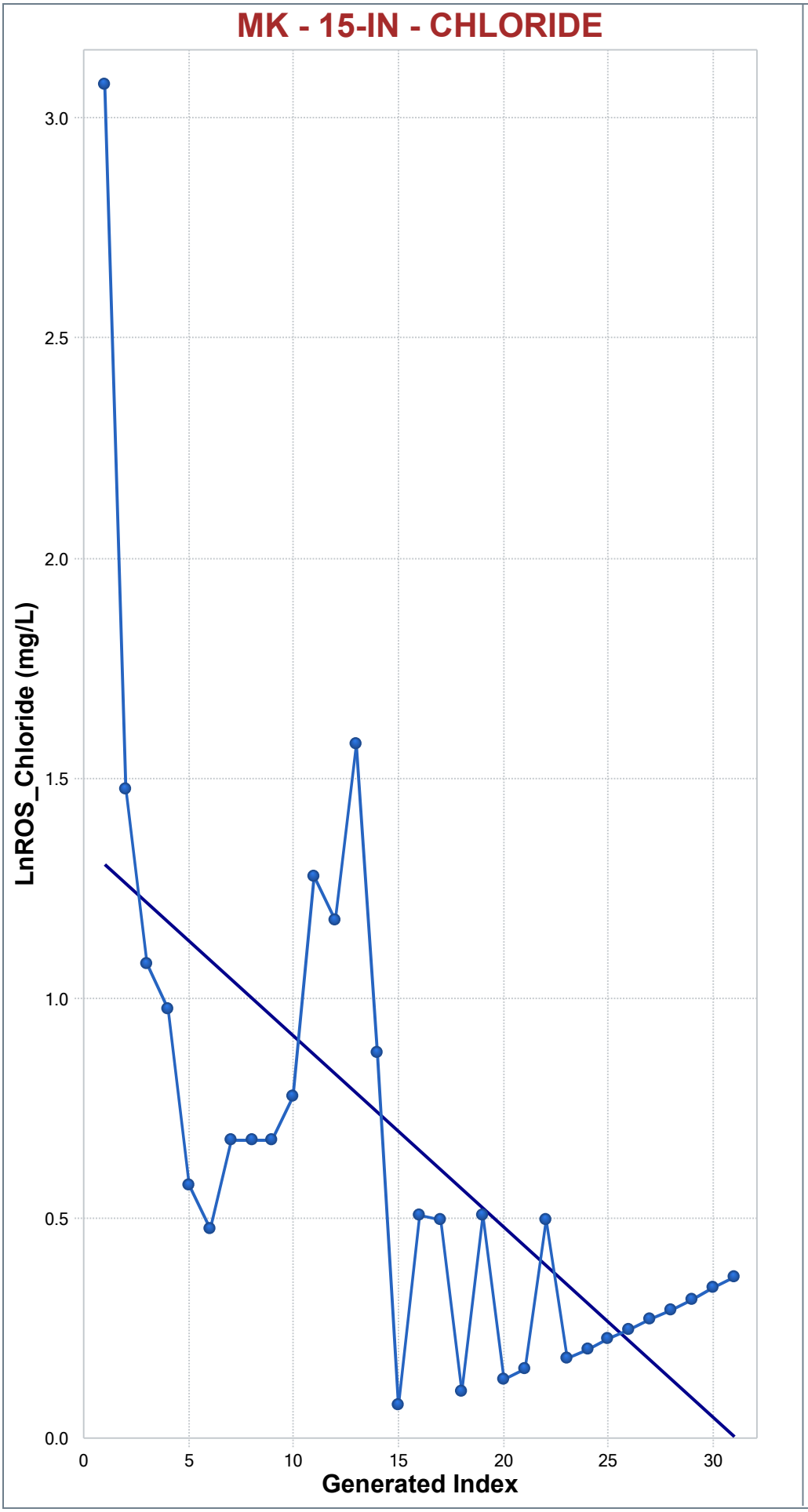
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7537
Standardized Value of S	0.3574
M-K Test Value (S)	22
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3604

OLS Regression Line (Blue)

OLS Regression Slope	-0.0693
OLS Regression Intercept	96.2568

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



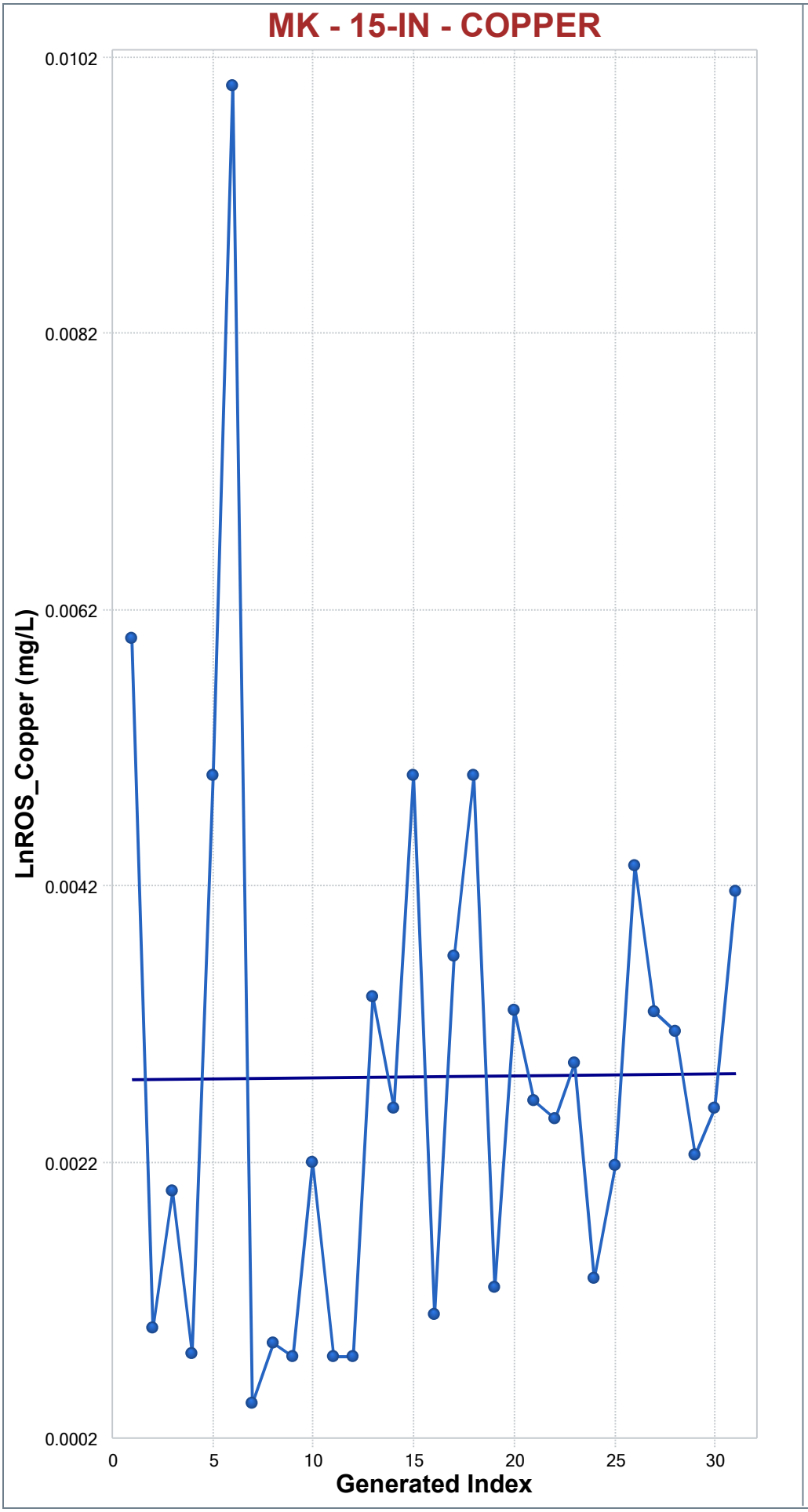
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7878
Standardized Value of S	-3.2150
M-K Test Value (S)	-190
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0007

OLS Regression Line (Blue)

OLS Regression Slope	-0.0433
OLS Regression Intercept	1.3711

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



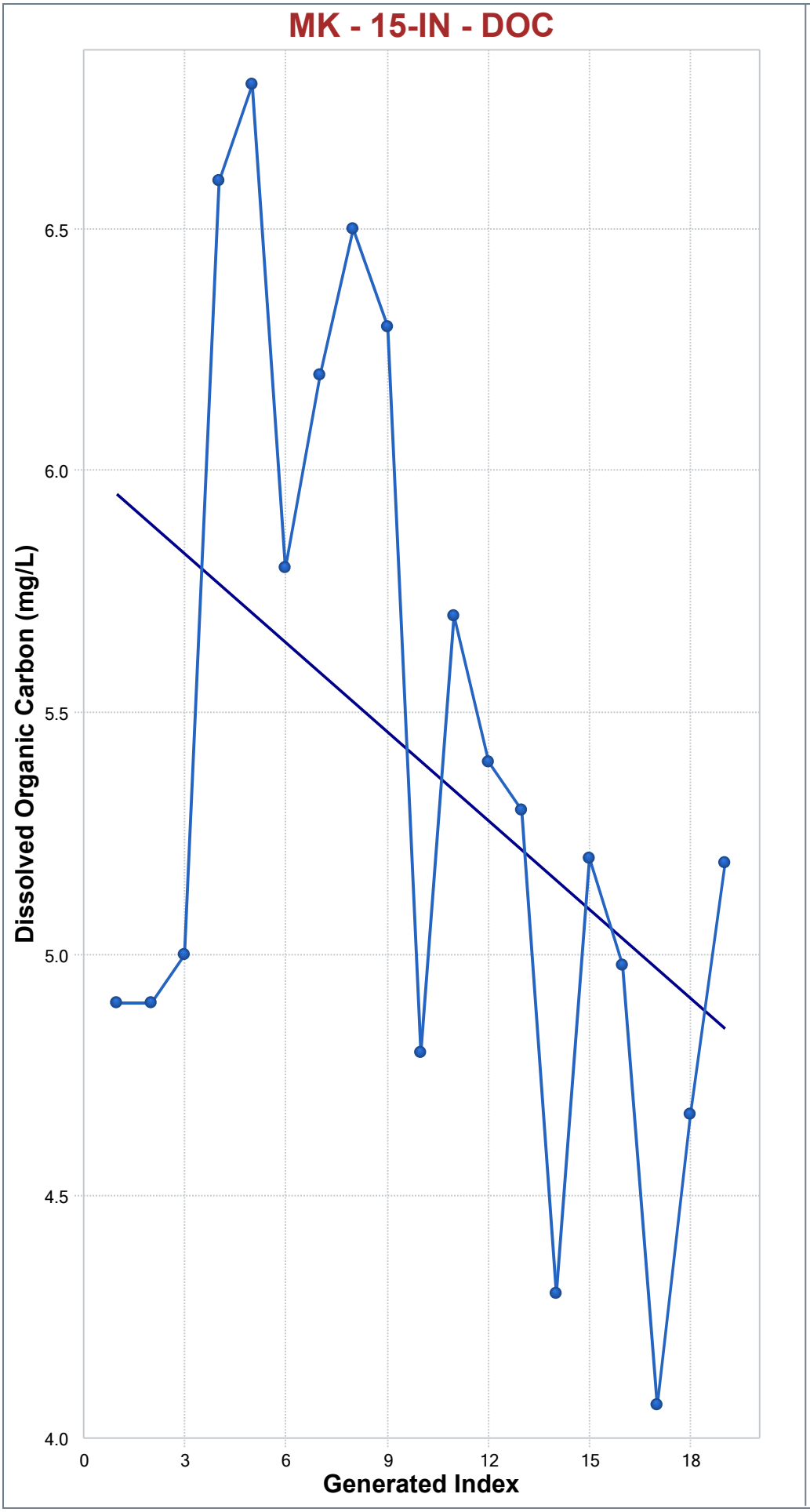
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7651
Standardized Value of S	1.1742
M-K Test Value (S)	70
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1202

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0028

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



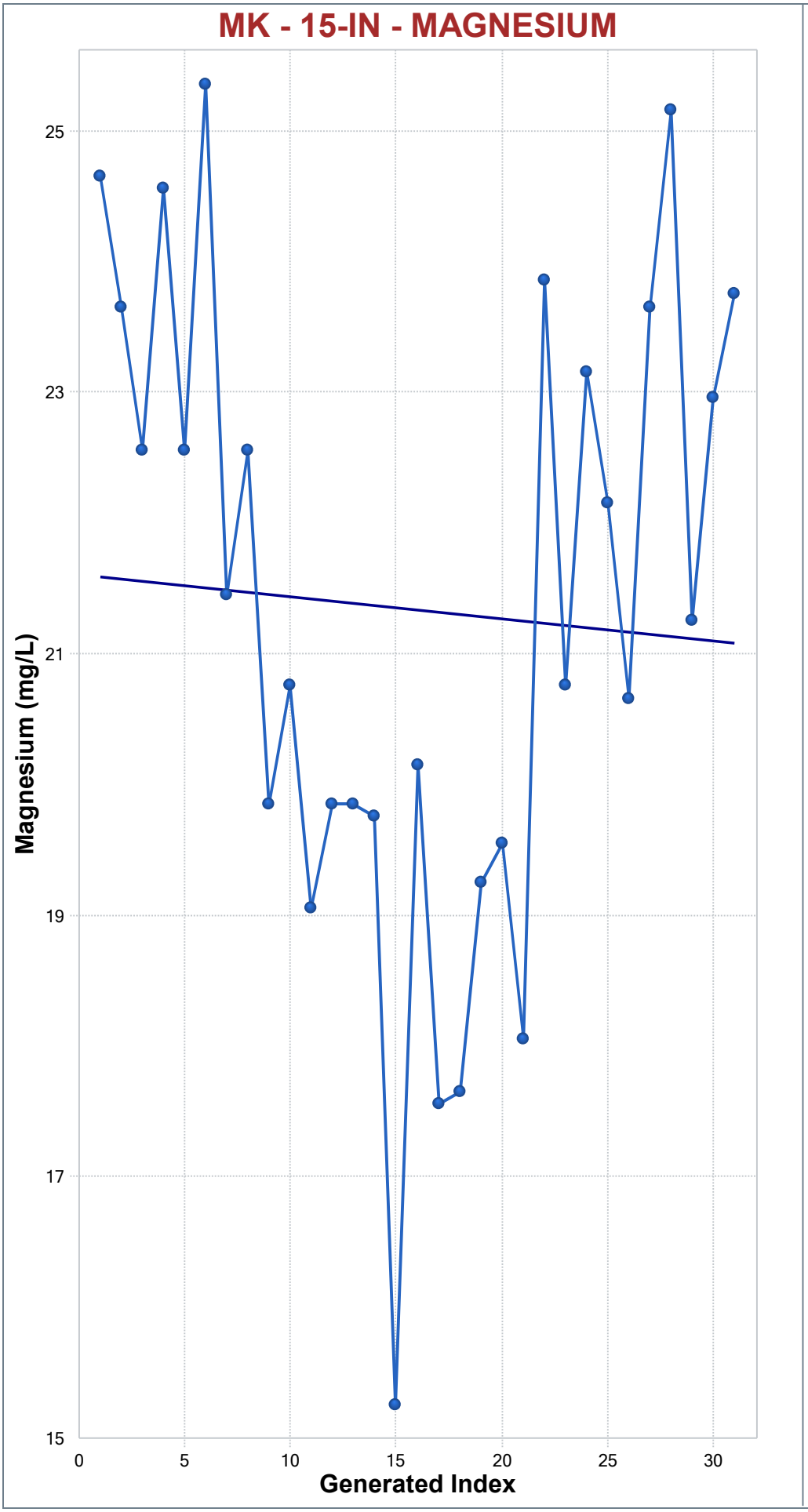
Mann-Kendall Trend Analysis

n	19
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	28.5657
Standardized Value of S	-1.9254
M-K Test Value (S)	-56
Tabulated p-value	0.0250
Approximate p-value	0.0271

OLS Regression Line (Blue)

OLS Regression Slope	-0.0613
OLS Regression Intercept	6.0139

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



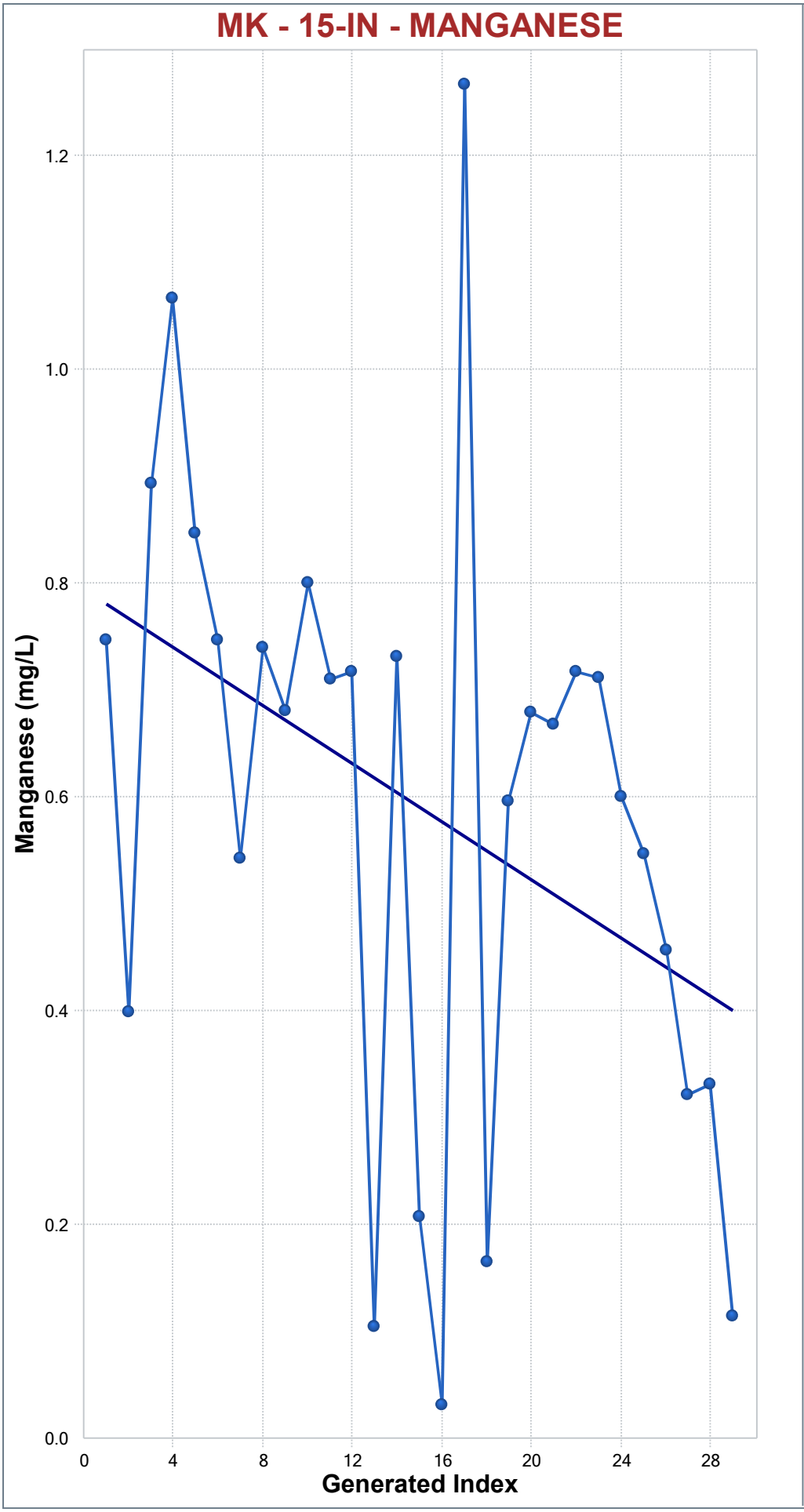
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7566
Standardized Value of S	-0.4085
M-K Test Value (S)	-25
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3415

OLS Regression Line (Blue)

OLS Regression Slope	-0.0169
OLS Regression Intercept	21.9471

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



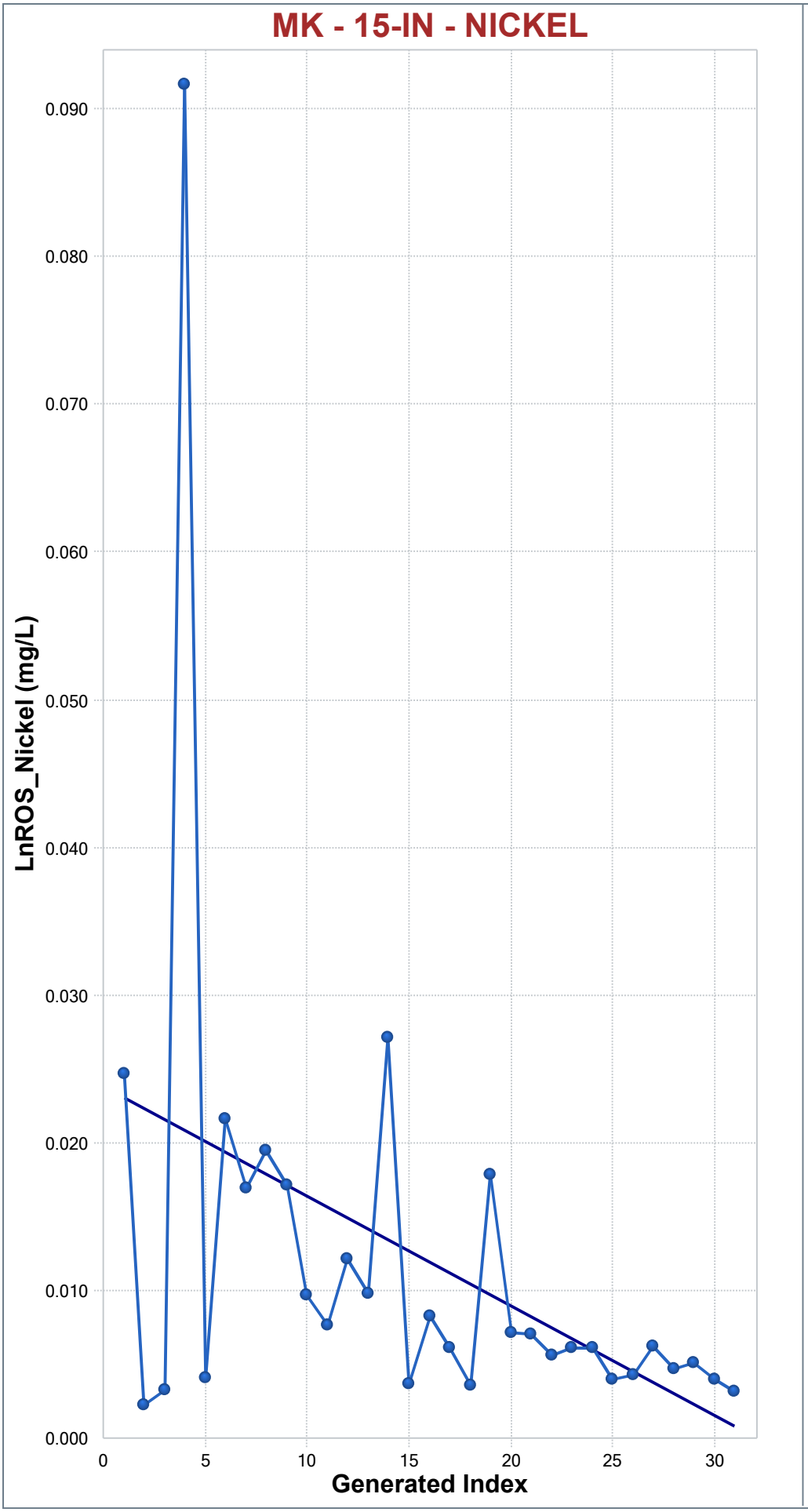
Mann-Kendall Trend Analysis

n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.2917
Standardized Value of S	-2.9836
M-K Test Value (S)	-160
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0014

OLS Regression Line (Blue)

OLS Regression Slope	-0.0136
OLS Regression Intercept	0.8081

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



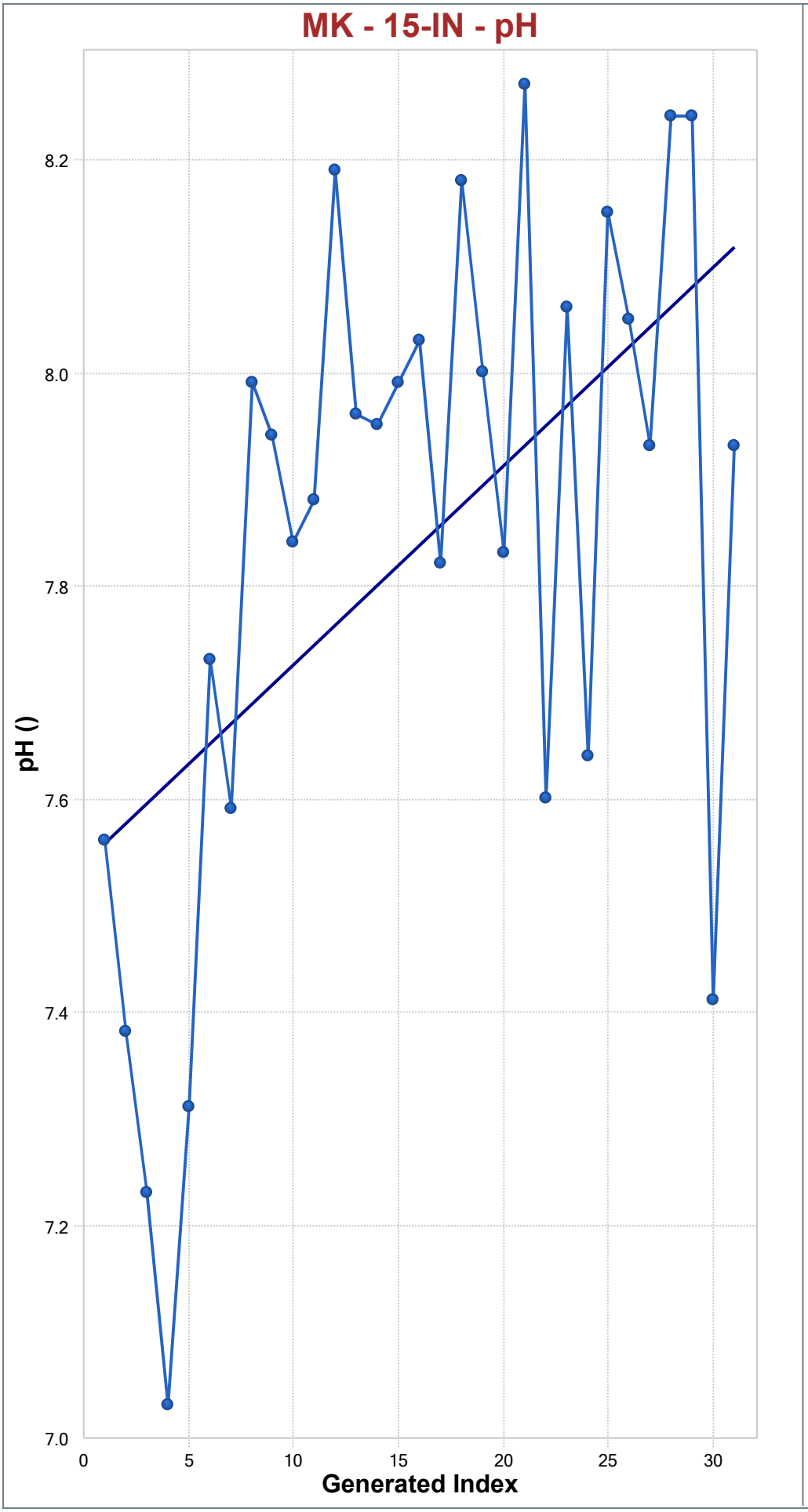
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8274
Standardized Value of S	-2.9748
M-K Test Value (S)	-176
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0015

OLS Regression Line (Blue)

OLS Regression Slope	-0.0007
OLS Regression Intercept	0.0241

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



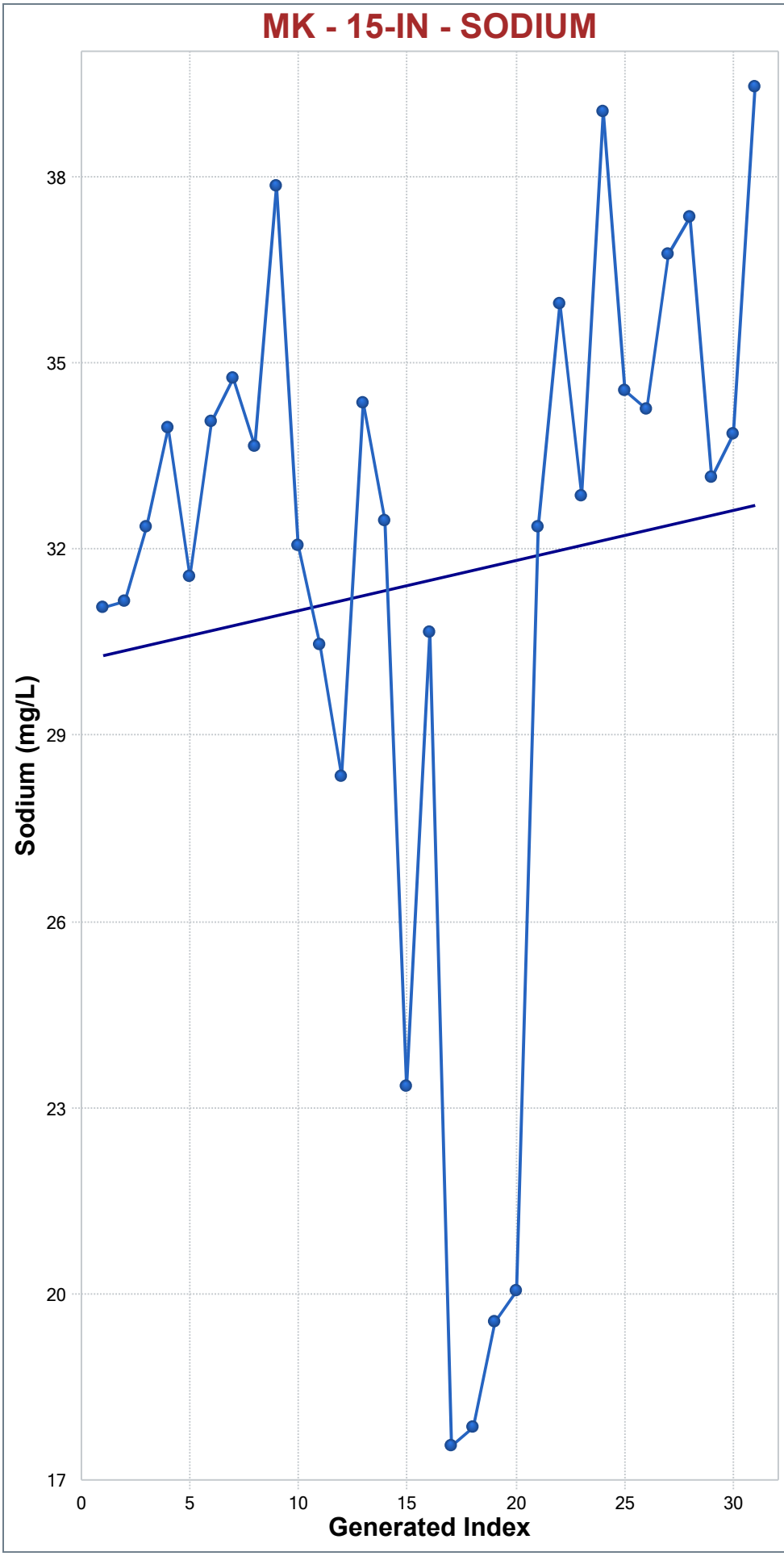
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8104
Standardized Value of S	3.0097
M-K Test Value (S)	178
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0013

OLS Regression Line (Blue)

OLS Regression Slope	0.0186
OLS Regression Intercept	7.5490

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



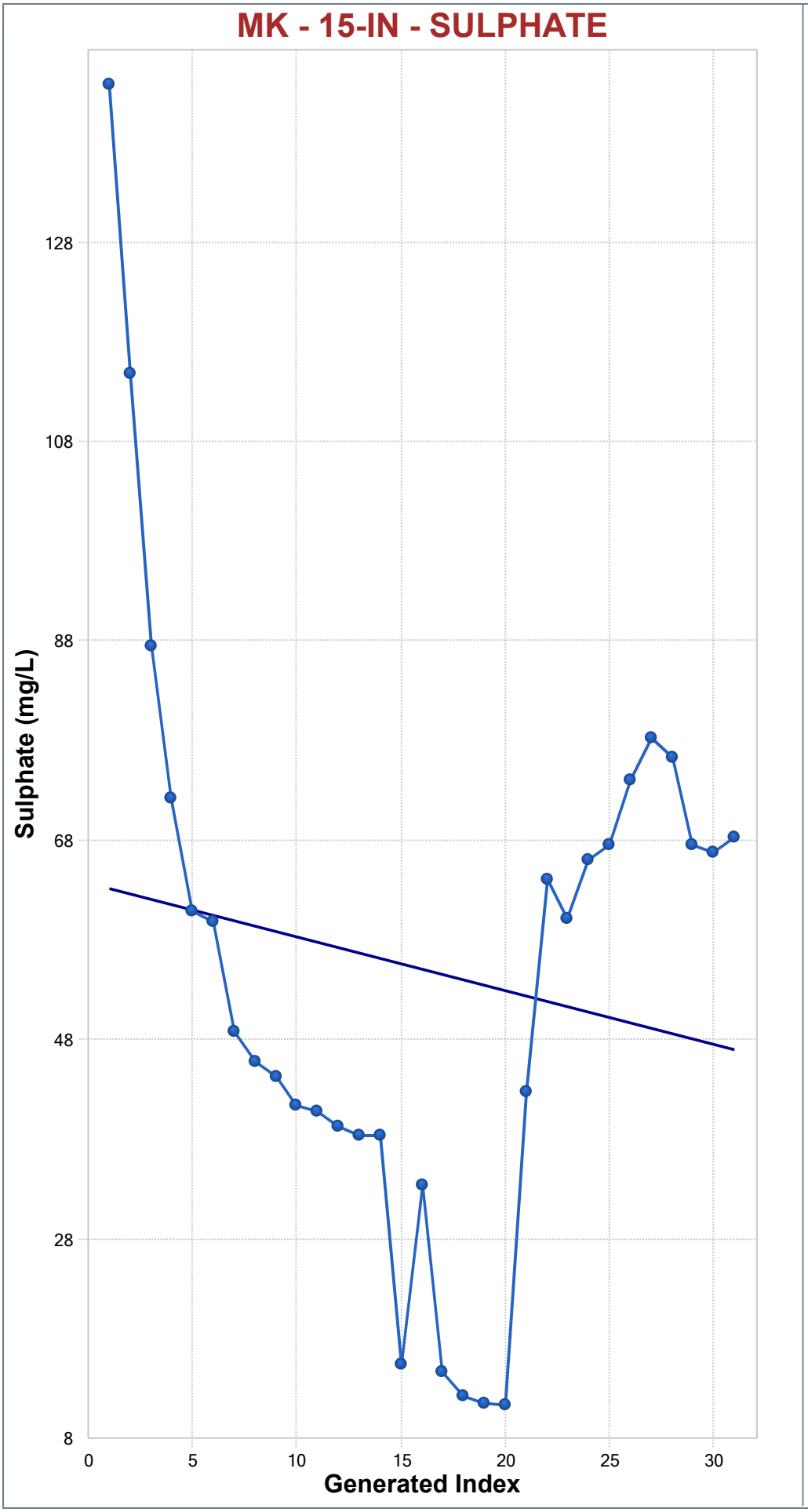
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8274
Standardized Value of S	1.6829
M-K Test Value (S)	100
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0462

OLS Regression Line (Blue)

OLS Regression Slope	0.0810
OLS Regression Intercept	30.1555

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



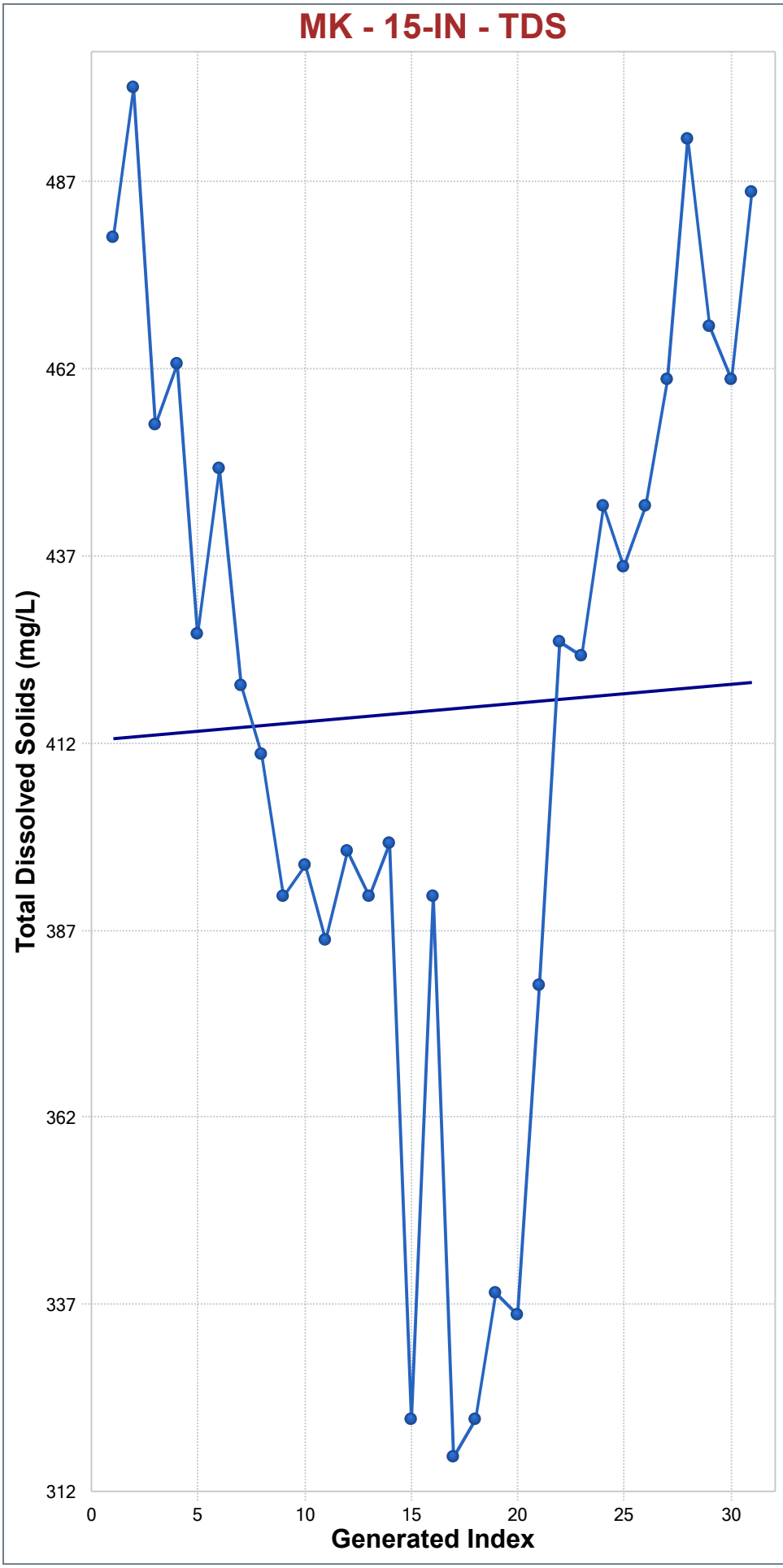
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8189
Standardized Value of S	-0.5440
M-K Test Value (S)	-33
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2932

OLS Regression Line (Blue)

OLS Regression Slope	-0.5409
OLS Regression Intercept	63.8703

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



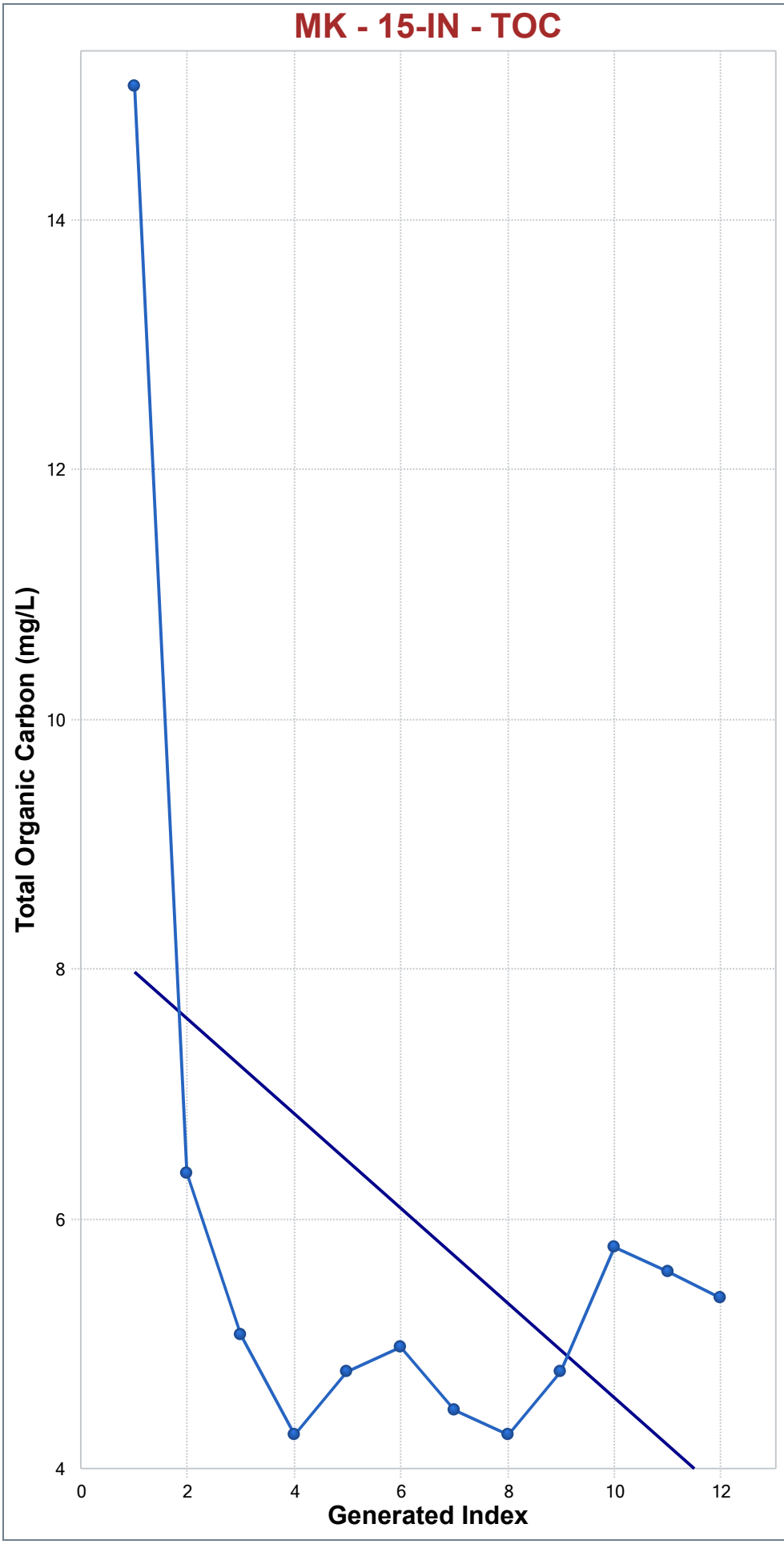
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7792
Standardized Value of S	0.2382
M-K Test Value (S)	15
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4059

OLS Regression Line (Blue)

OLS Regression Slope	0.2472
OLS Regression Intercept	412.7871

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



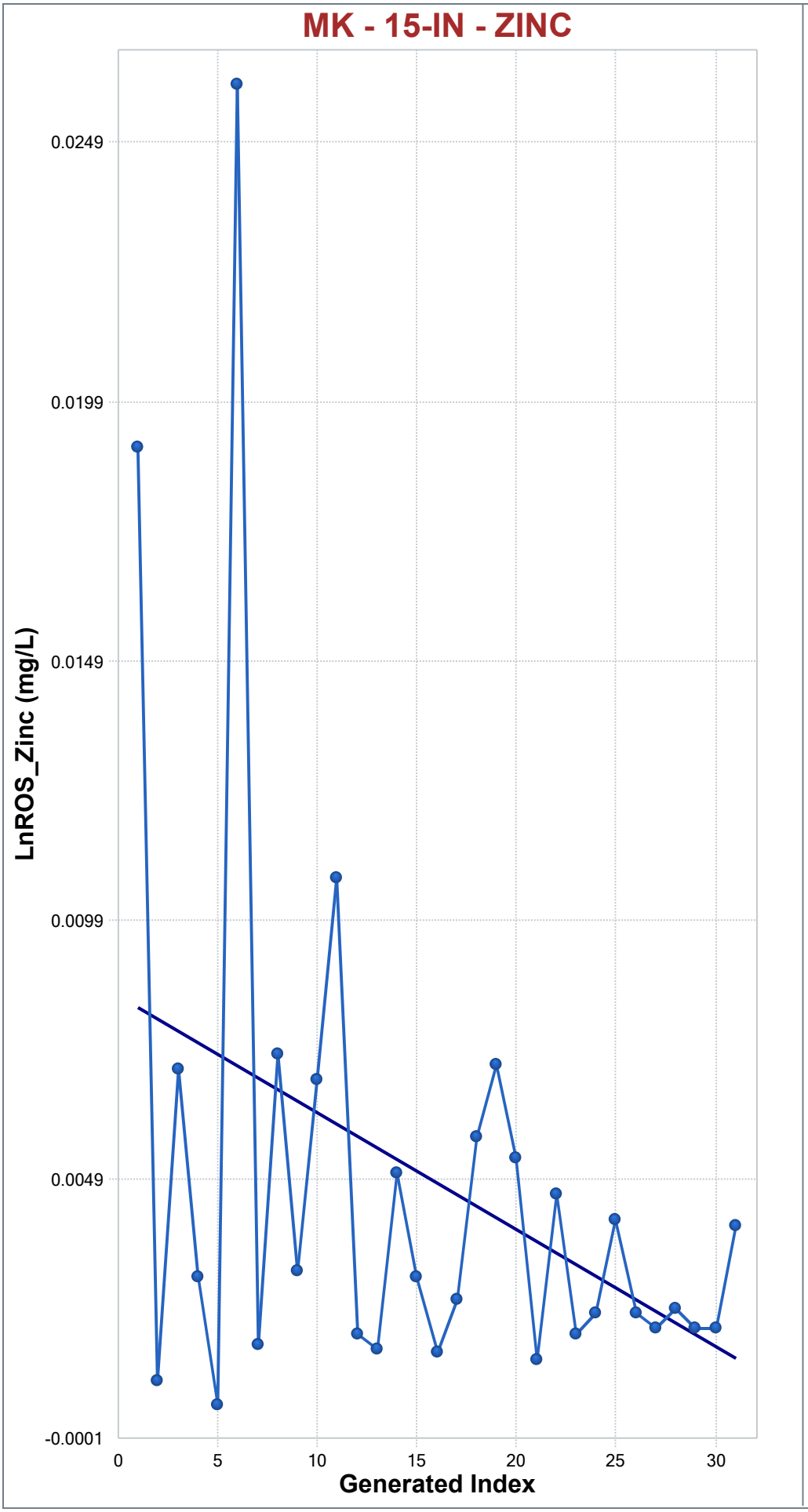
Mann-Kendall Trend Analysis

n	12
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	14.5144
Standardized Value of S	-0.4823
M-K Test Value (S)	-8
Tabulated p-value	0.3190
Approximate p-value	0.3148

OLS Regression Line (Blue)

OLS Regression Slope	-0.3794
OLS Regression Intercept	8.2909

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



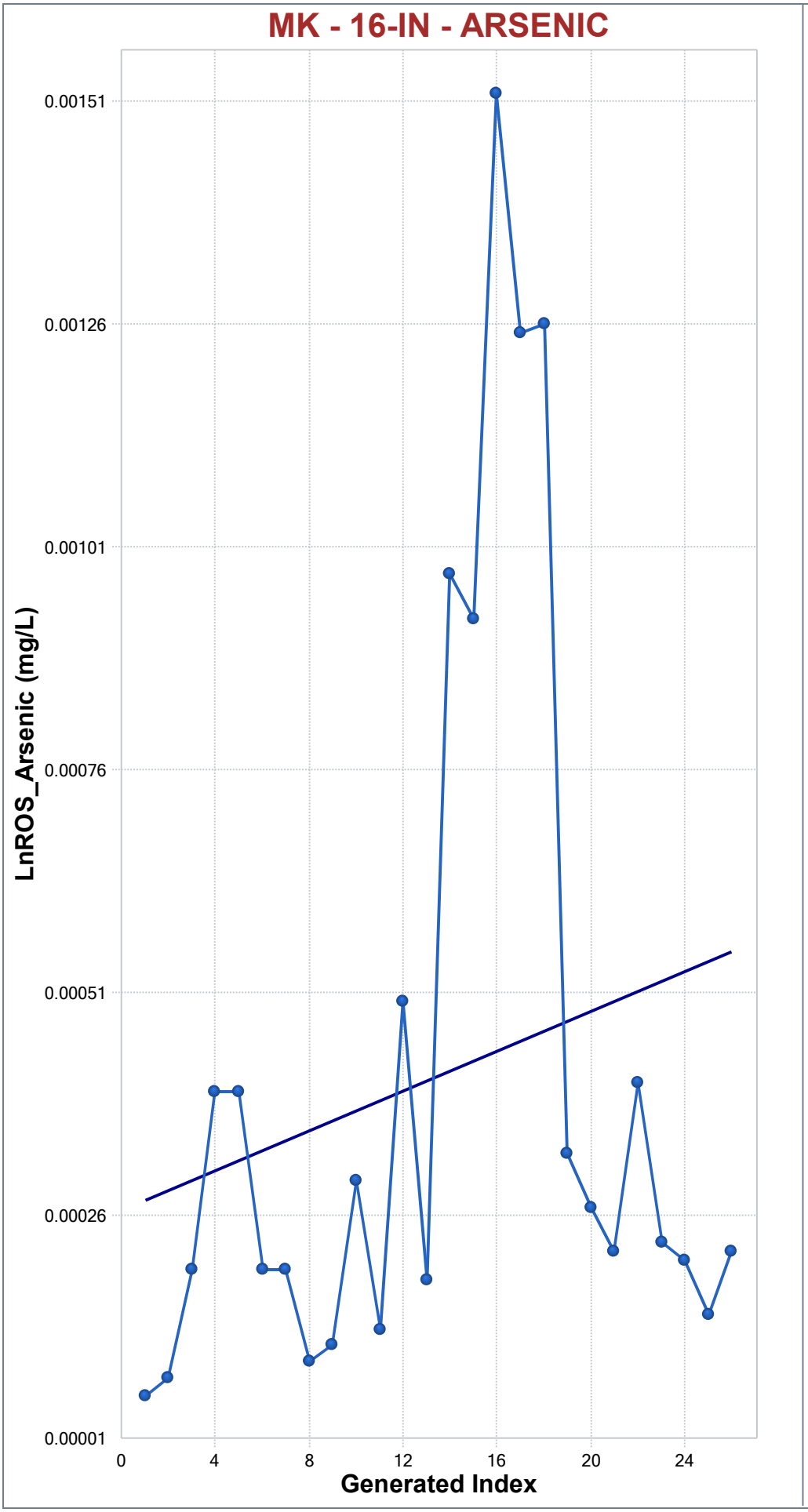
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7792
Standardized Value of S	-1.2249
M-K Test Value (S)	-73
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.1103

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0084

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



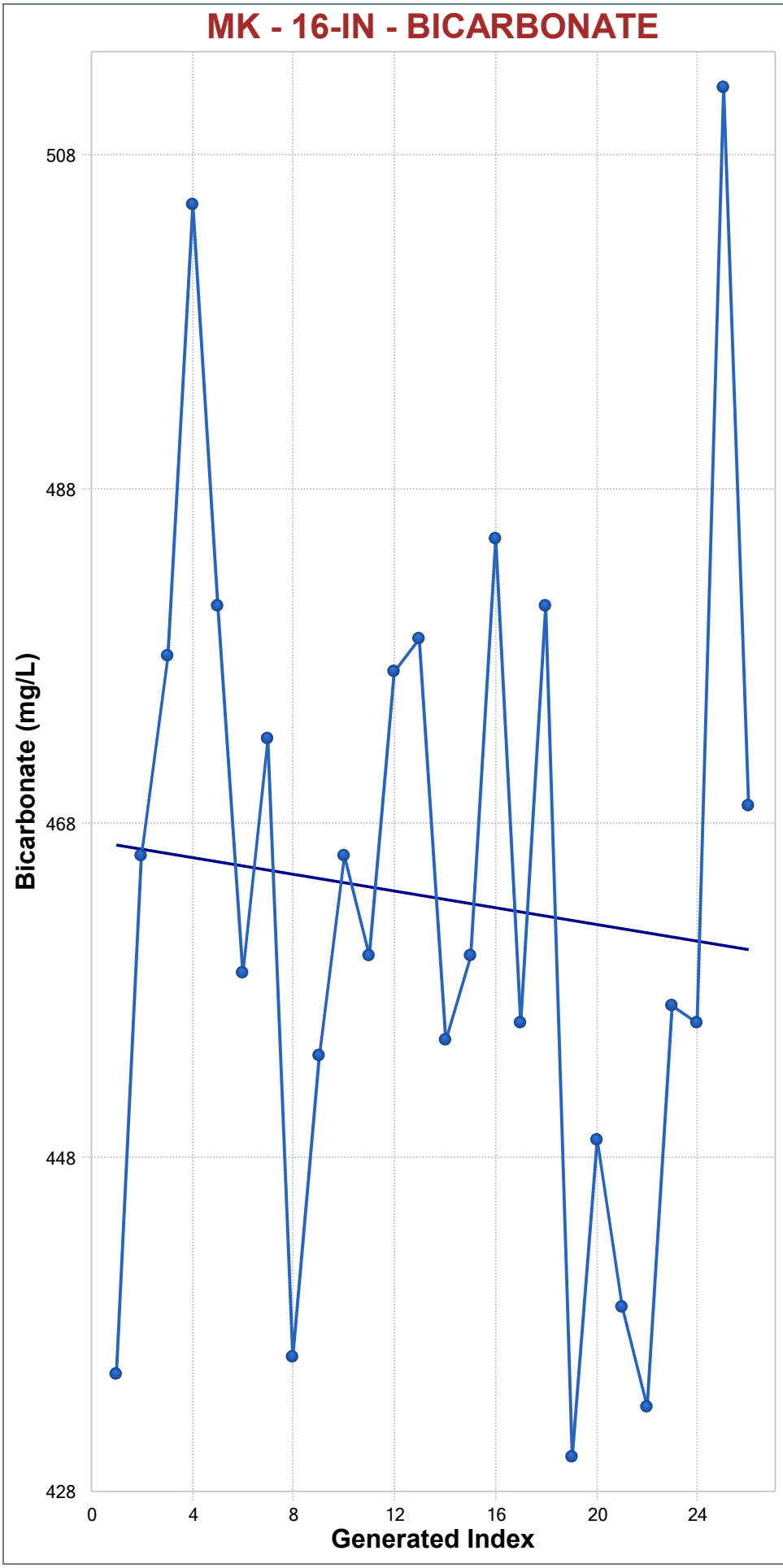
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3064
Standardized Value of S	1.5230
M-K Test Value (S)	70
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0639

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0003

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



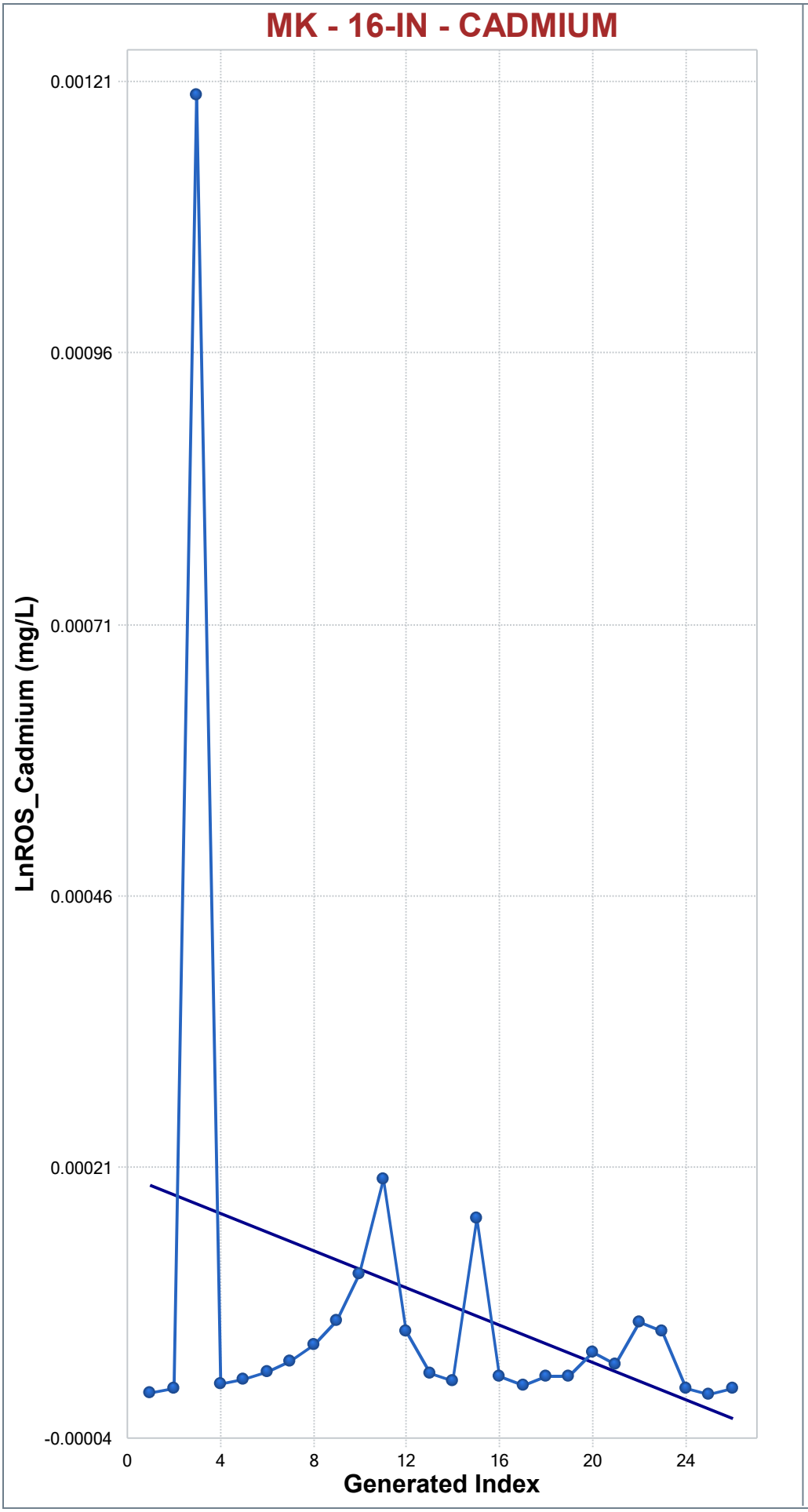
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3248
Standardized Value of S	-0.6178
M-K Test Value (S)	-29
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2684

OLS Regression Line (Blue)

OLS Regression Slope	-0.2520
OLS Regression Intercept	466.9015

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



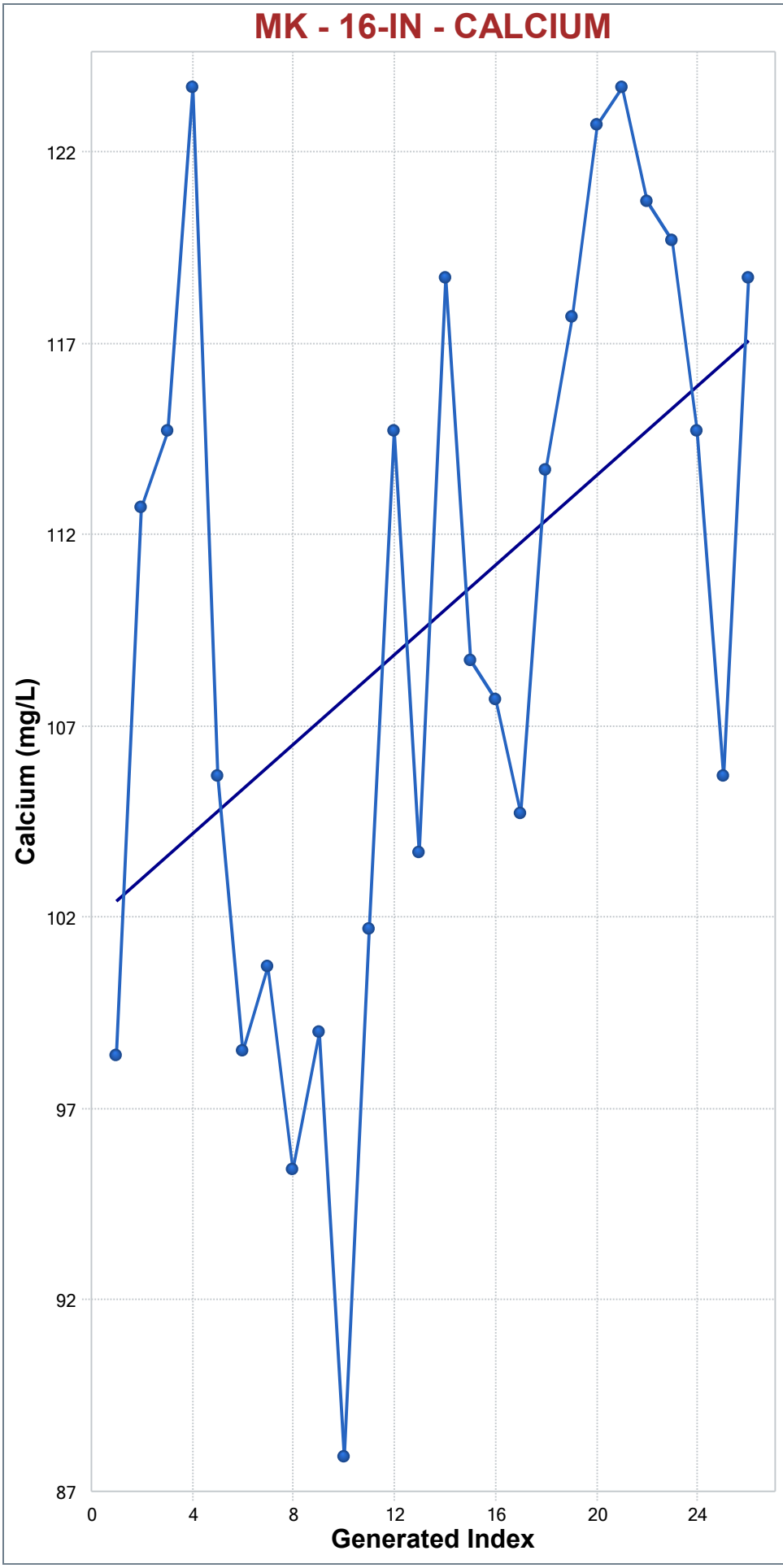
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3578
Standardized Value of S	-0.4630
M-K Test Value (S)	-22
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3217

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0002

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



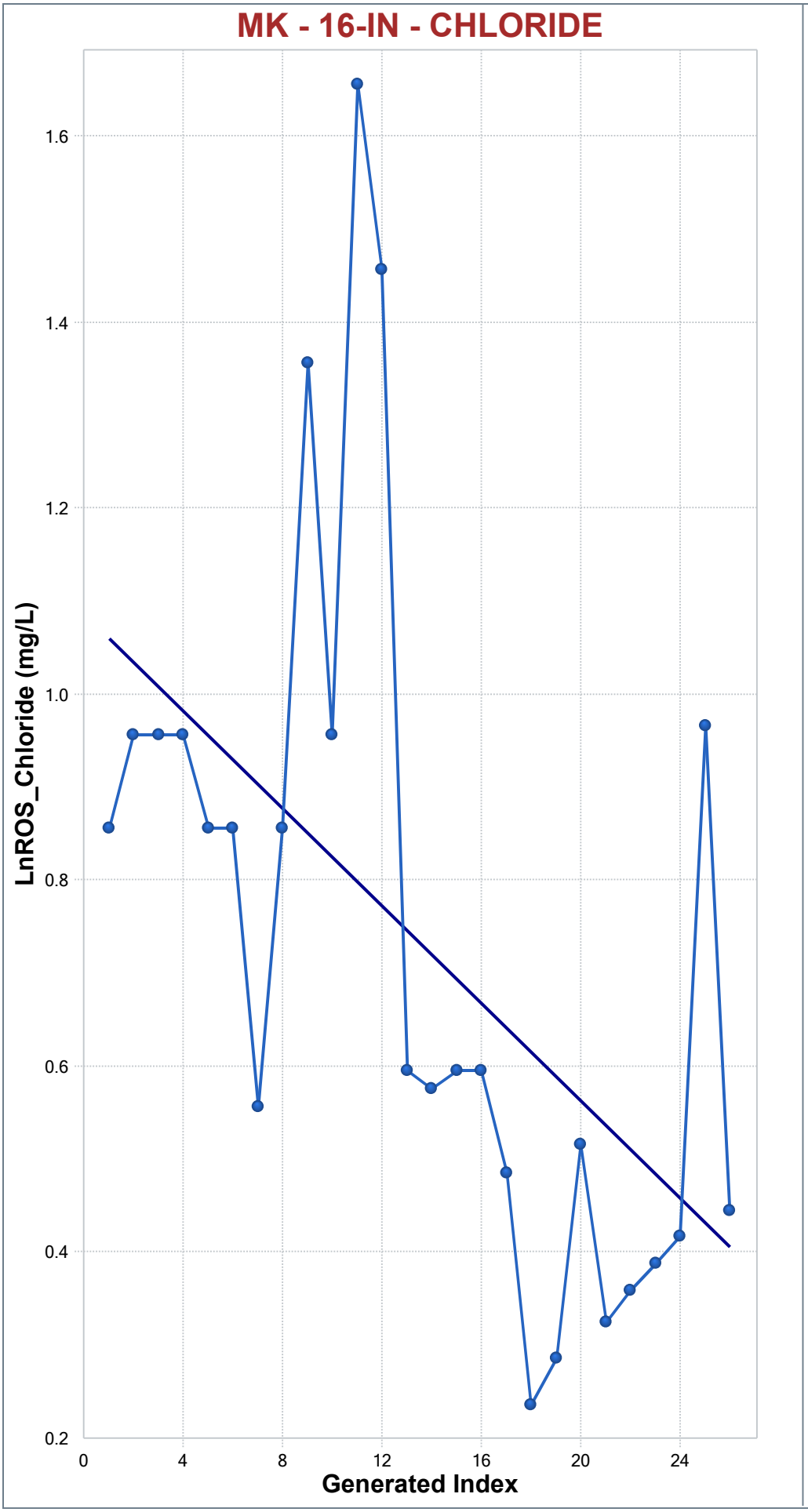
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.2953
Standardized Value of S	2.5168
M-K Test Value (S)	115
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0059

OLS Regression Line (Blue)

OLS Regression Slope	0.5852
OLS Regression Intercept	102.1652

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



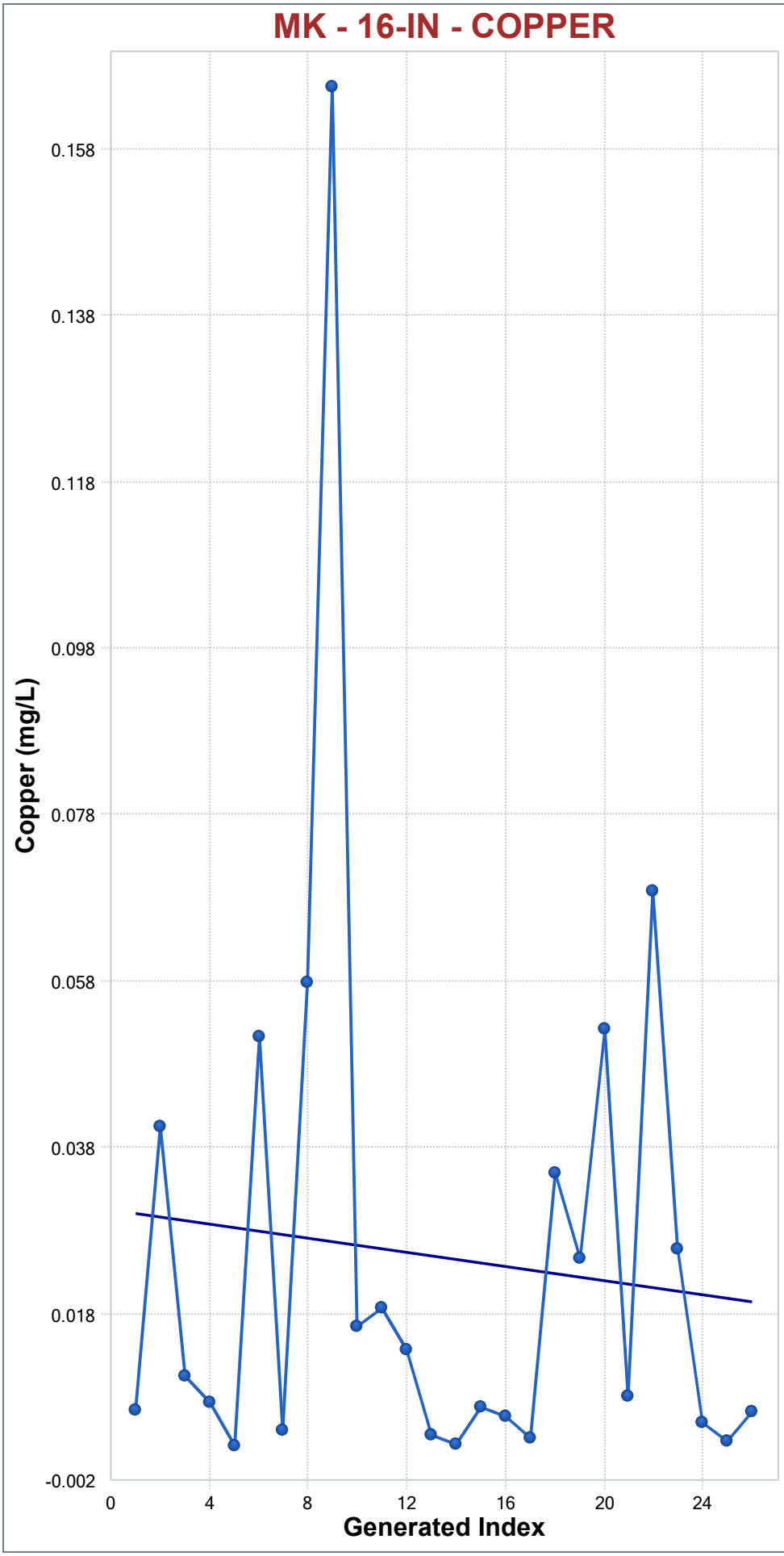
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.1368
Standardized Value of S	-2.9466
M-K Test Value (S)	-134
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0016

OLS Regression Line (Blue)

OLS Regression Slope	-0.0262
OLS Regression Intercept	1.1307

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



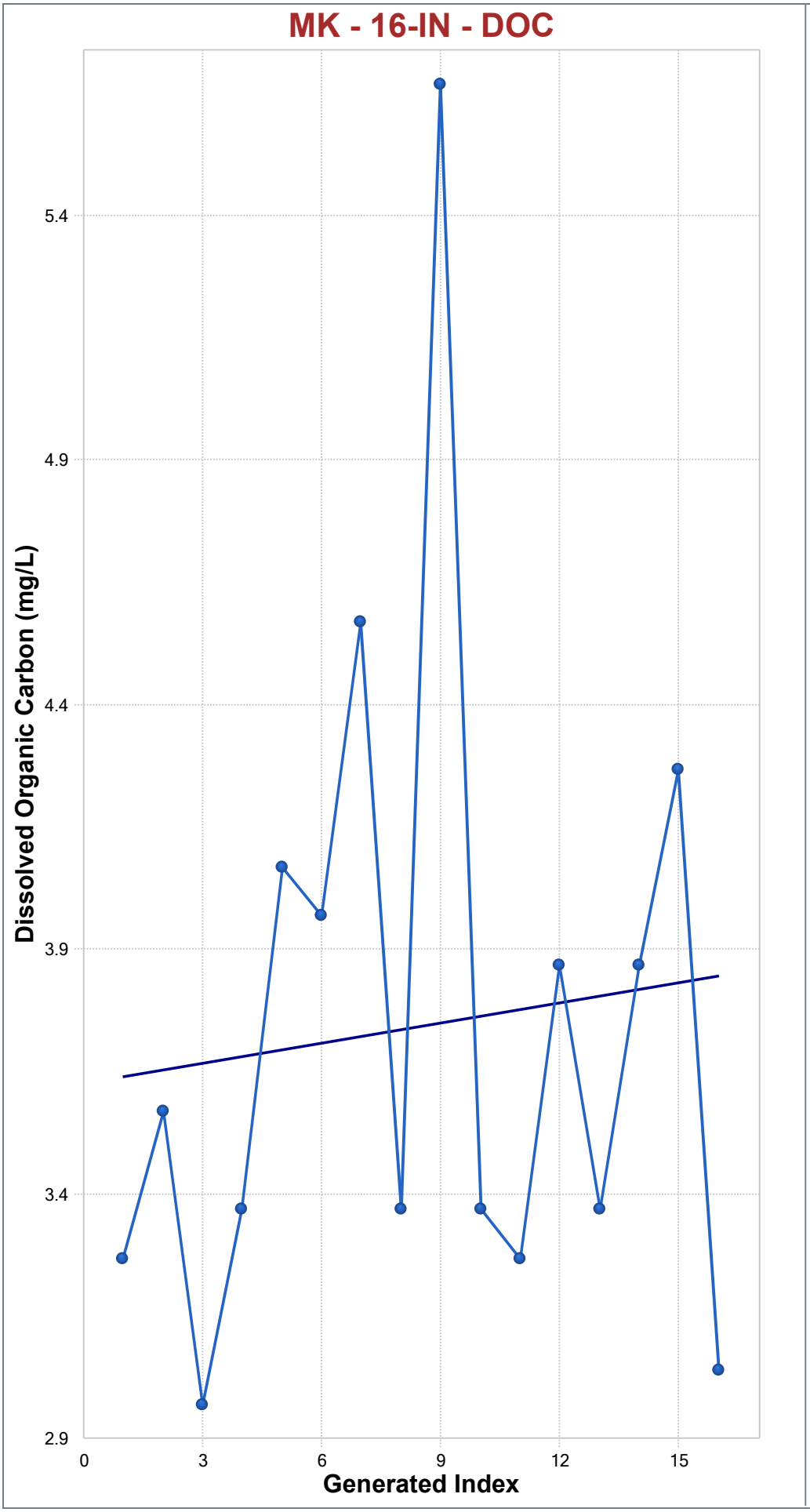
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3689
Standardized Value of S	-0.3086
M-K Test Value (S)	-15
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.3788

OLS Regression Line (Blue)

OLS Regression Slope	-0.0004
OLS Regression Intercept	0.0301

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



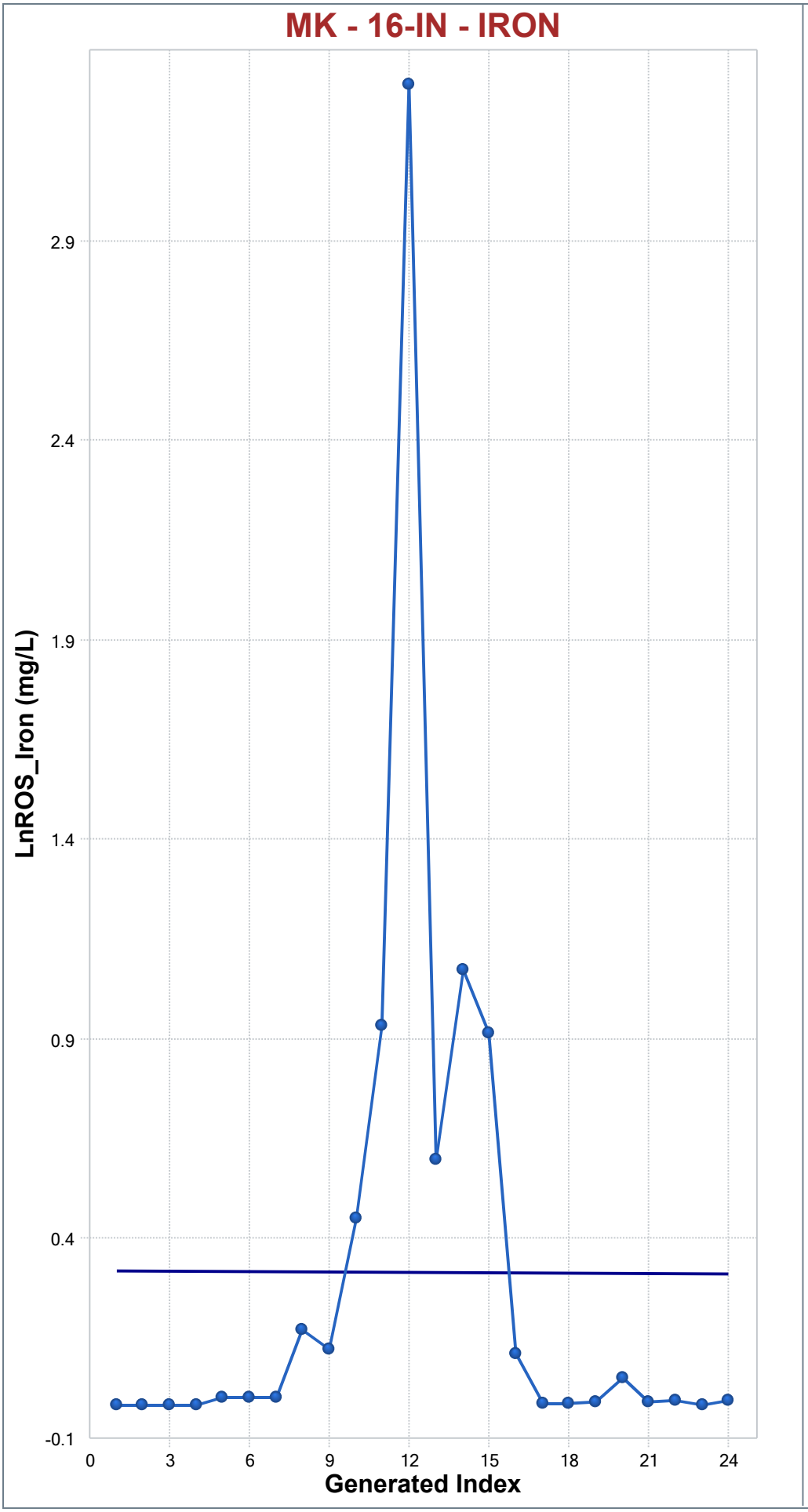
Mann-Kendall Trend Analysis

n	16
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	21.9697
Standardized Value of S	0.4097
M-K Test Value (S)	10
Tabulated p-value	0.3450
Approximate p-value	0.3410

OLS Regression Line (Blue)

OLS Regression Slope	0.0138
OLS Regression Intercept	3.6563

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



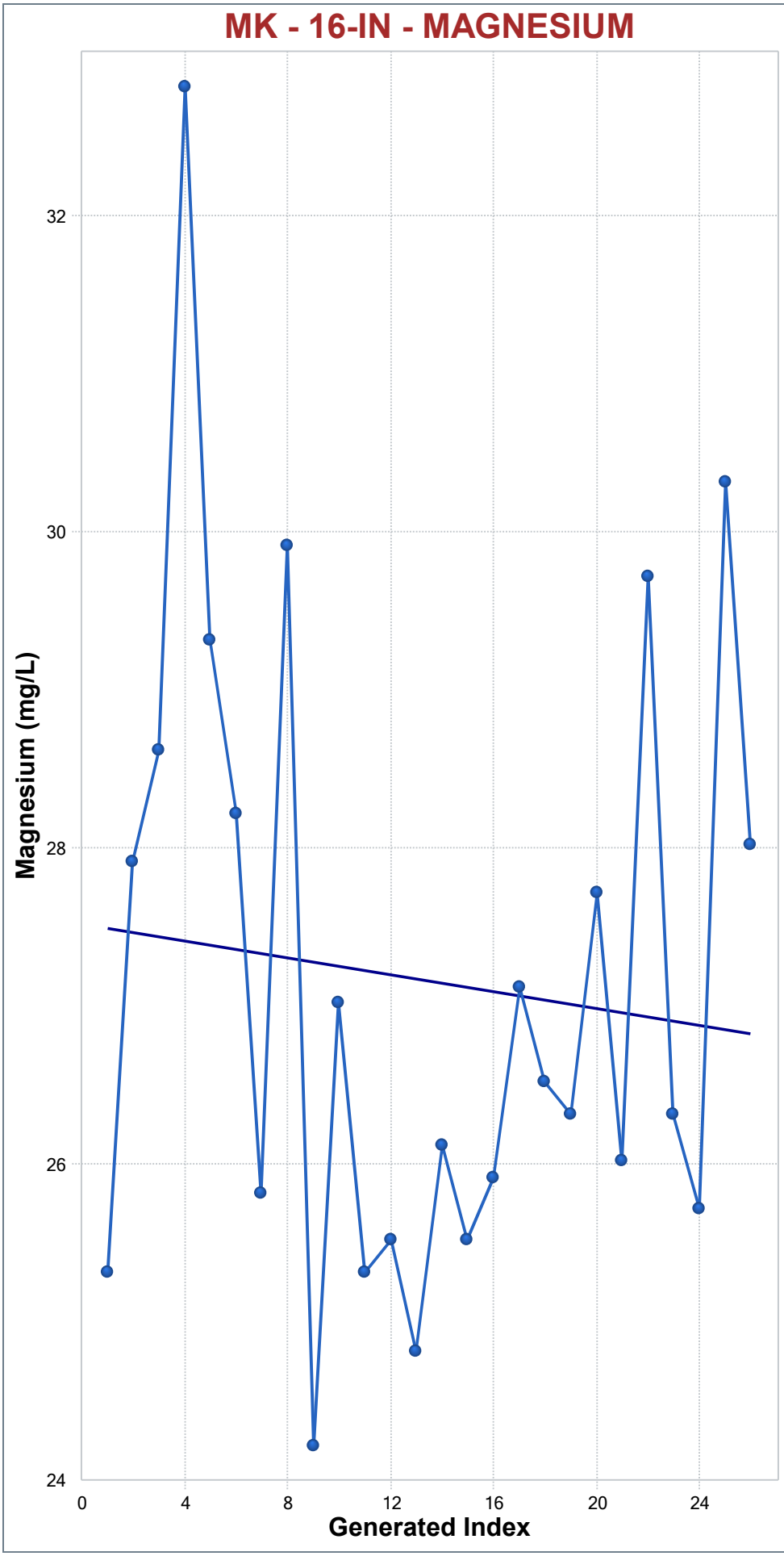
Mann-Kendall Trend Analysis

n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.2699
Standardized Value of S	0.8940
M-K Test Value (S)	37
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1857

OLS Regression Line (Blue)

OLS Regression Slope	-0.0003
OLS Regression Intercept	0.3375

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



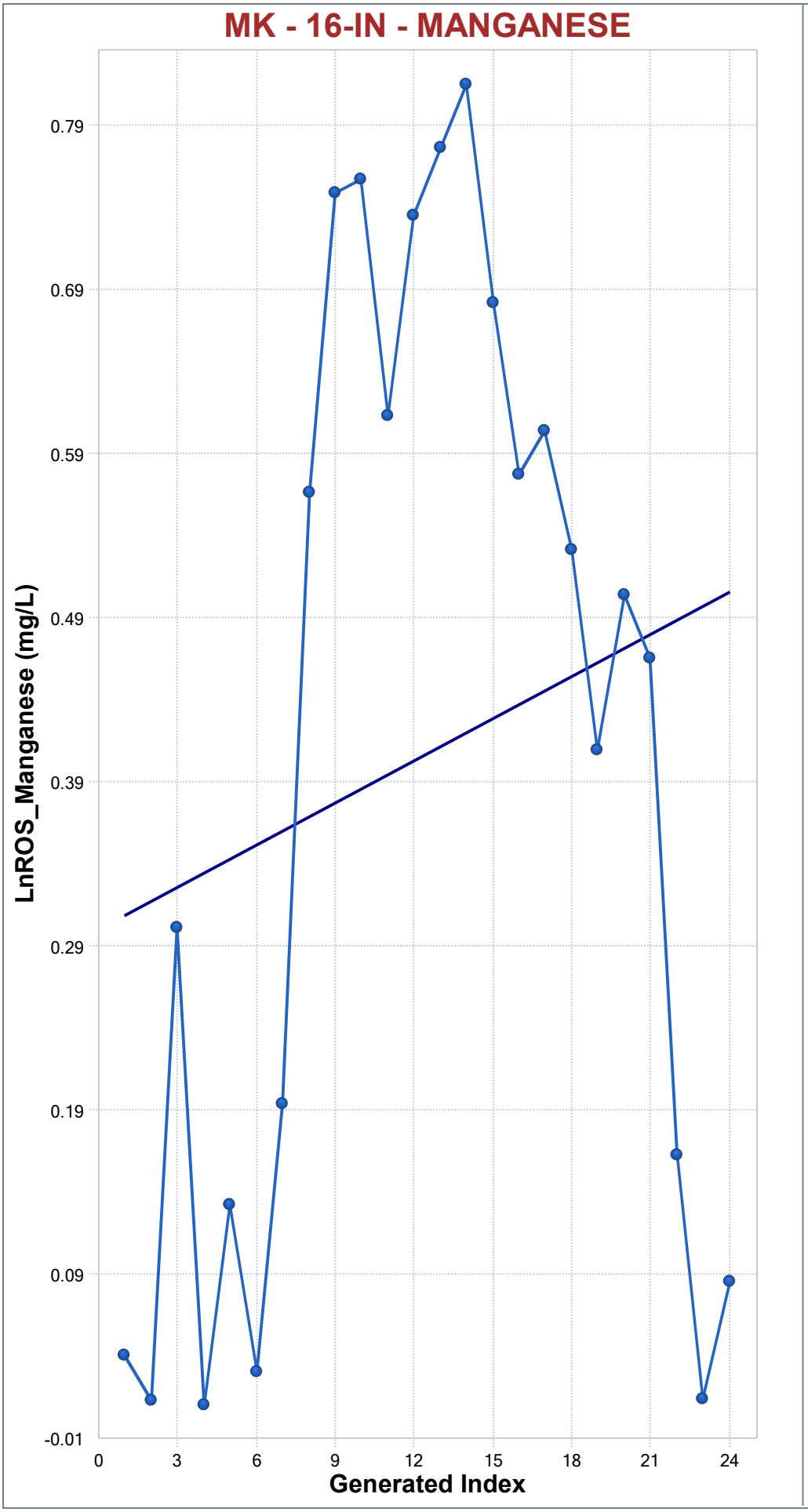
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3358
Standardized Value of S	0.2867
M-K Test Value (S)	14
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3872

OLS Regression Line (Blue)

OLS Regression Slope	-0.0264
OLS Regression Intercept	27.4982

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



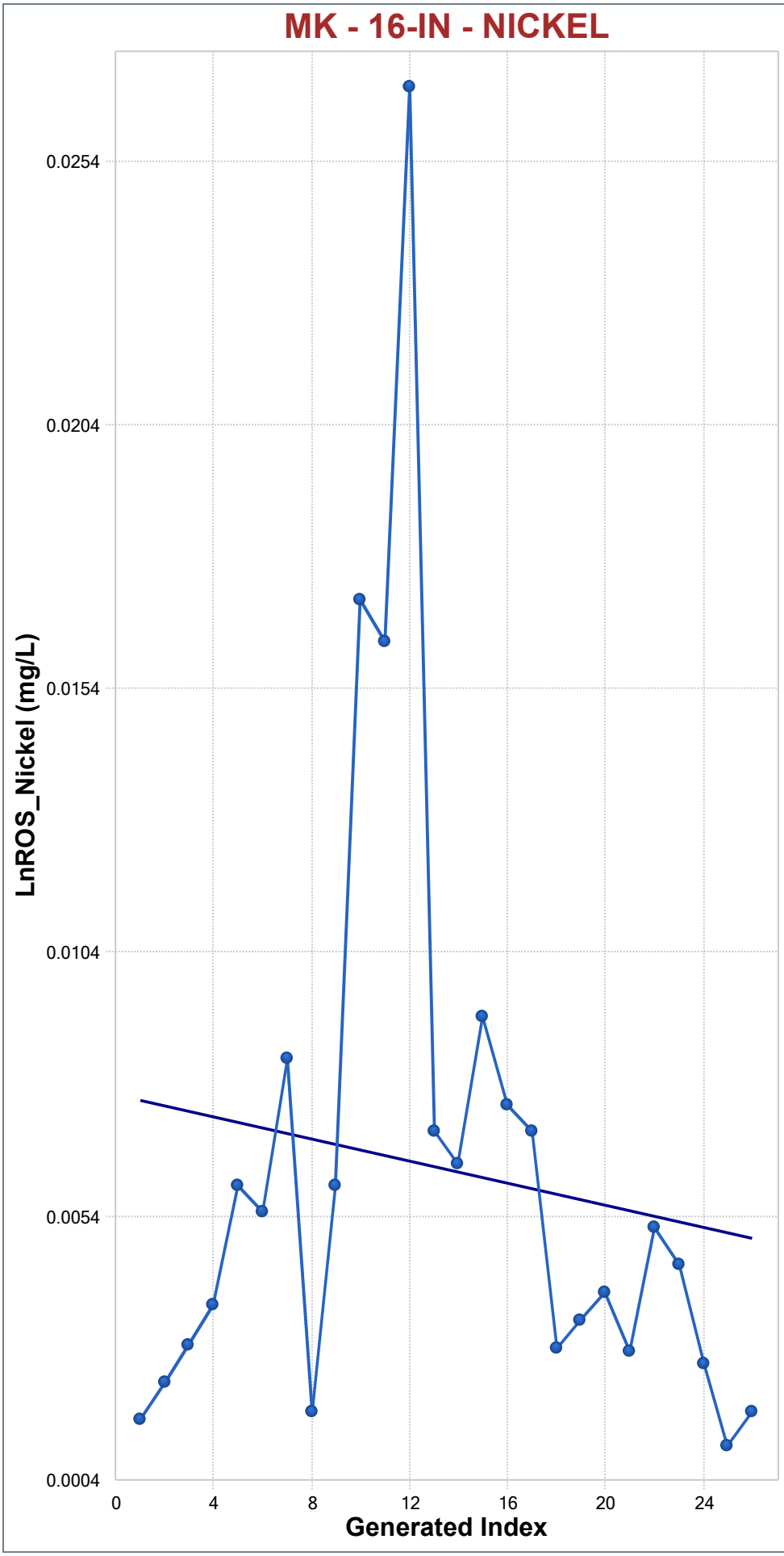
Mann-Kendall Trend Analysis

n	24
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	40.3154
Standardized Value of S	0.3721
M-K Test Value (S)	16
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.3549

OLS Regression Line (Blue)

OLS Regression Slope	0.0086
OLS Regression Intercept	0.2964

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



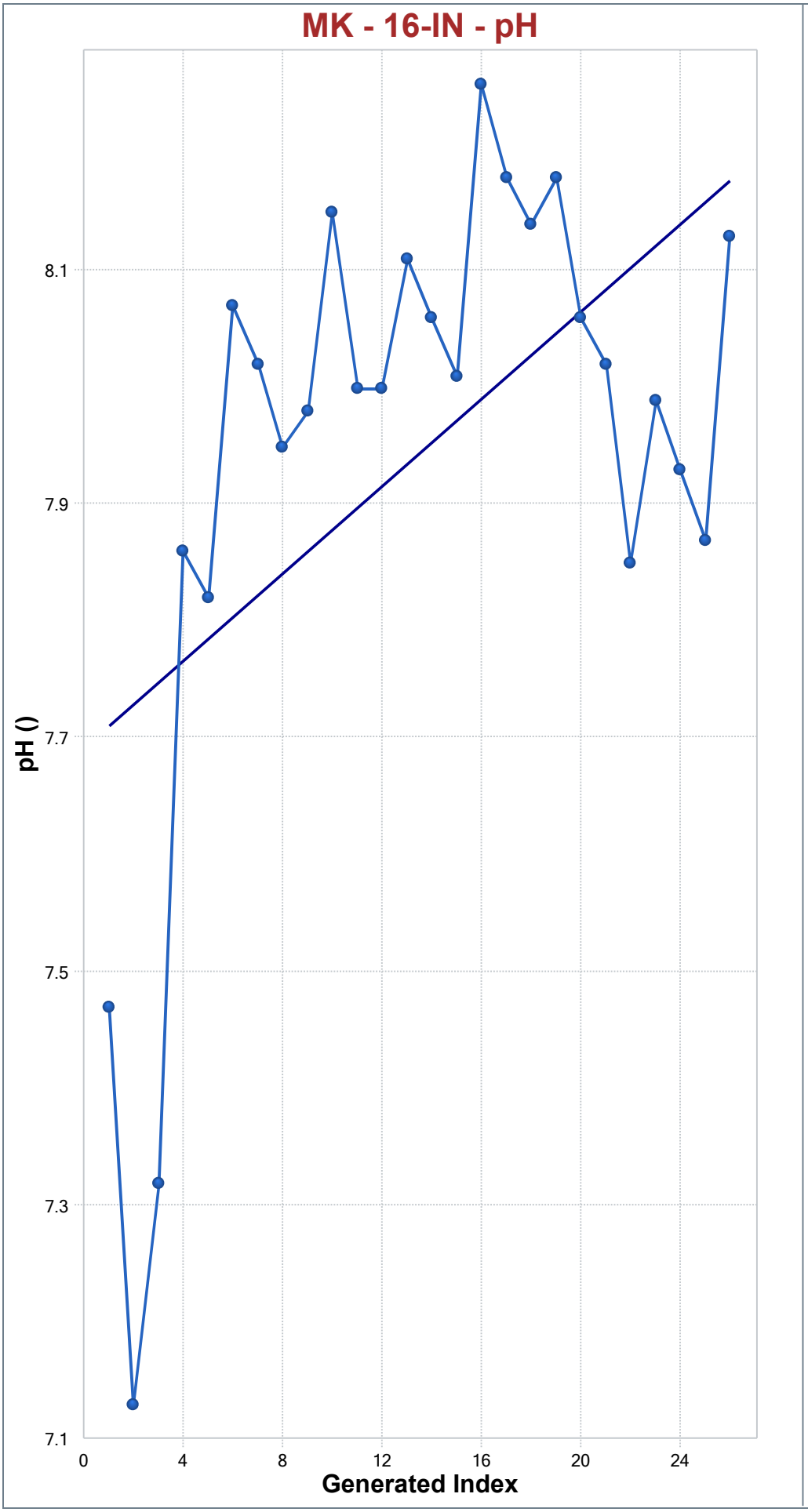
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3468
Standardized Value of S	-0.7939
M-K Test Value (S)	-37
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.2136

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0077

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



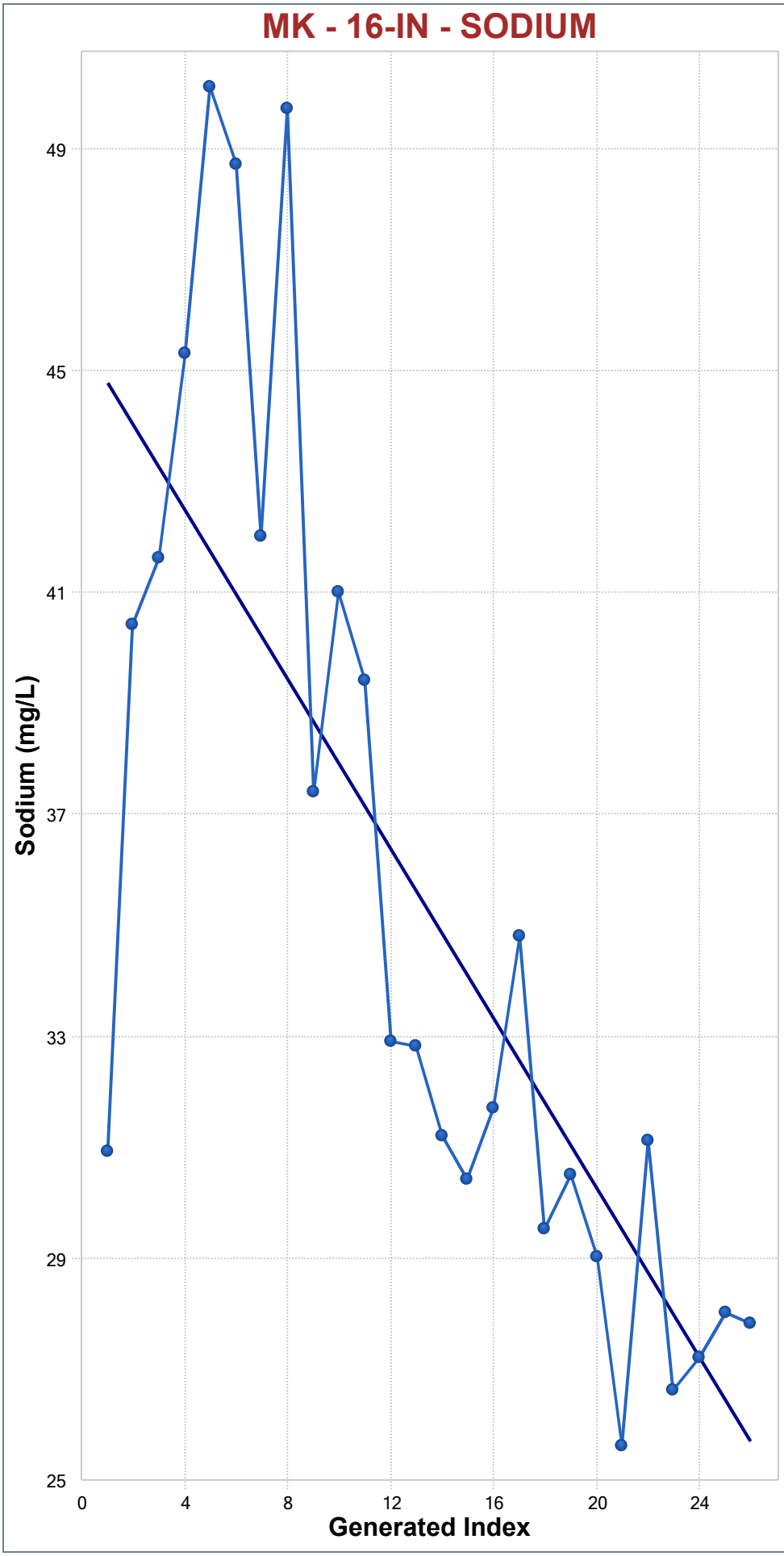
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3248
Standardized Value of S	1.9857
M-K Test Value (S)	91
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0235

OLS Regression Line (Blue)

OLS Regression Slope	0.0186
OLS Regression Intercept	7.6829

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



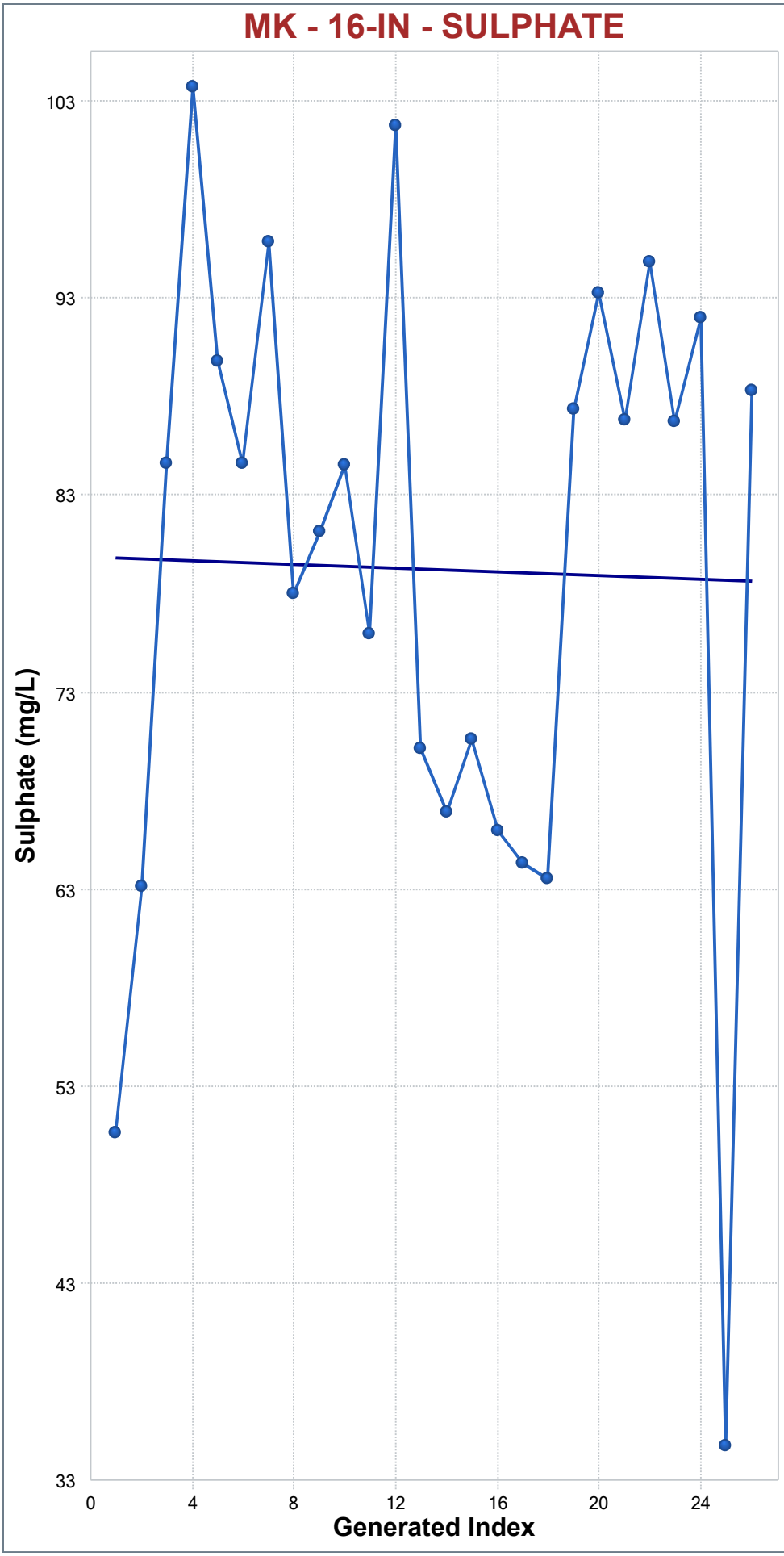
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3689
Standardized Value of S	-4.5846
M-K Test Value (S)	-209
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.7631
OLS Regression Intercept	45.4178

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



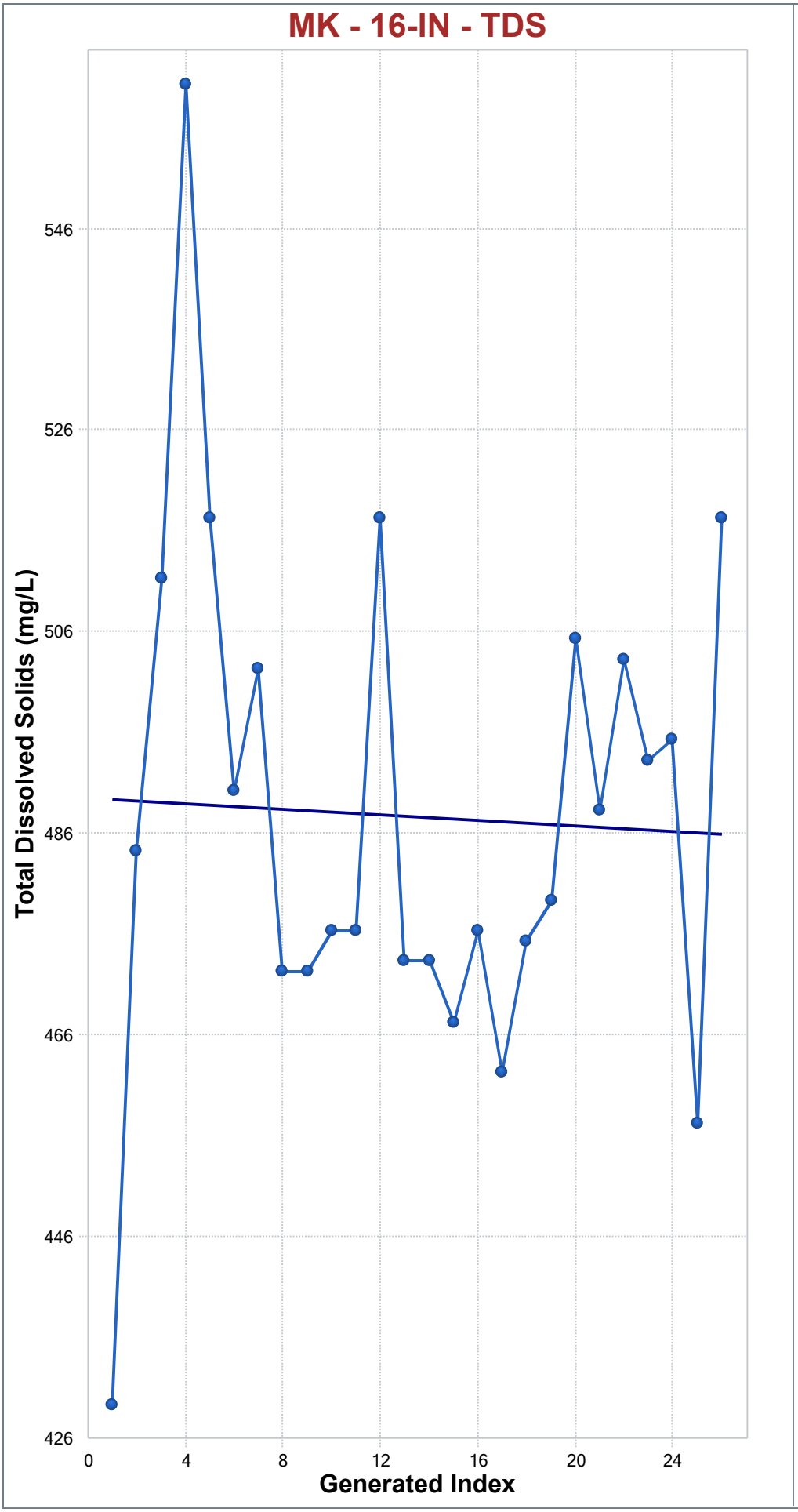
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3578
Standardized Value of S	0.0220
M-K Test Value (S)	2
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4912

OLS Regression Line (Blue)

OLS Regression Slope	-0.0472
OLS Regression Intercept	80.1105

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



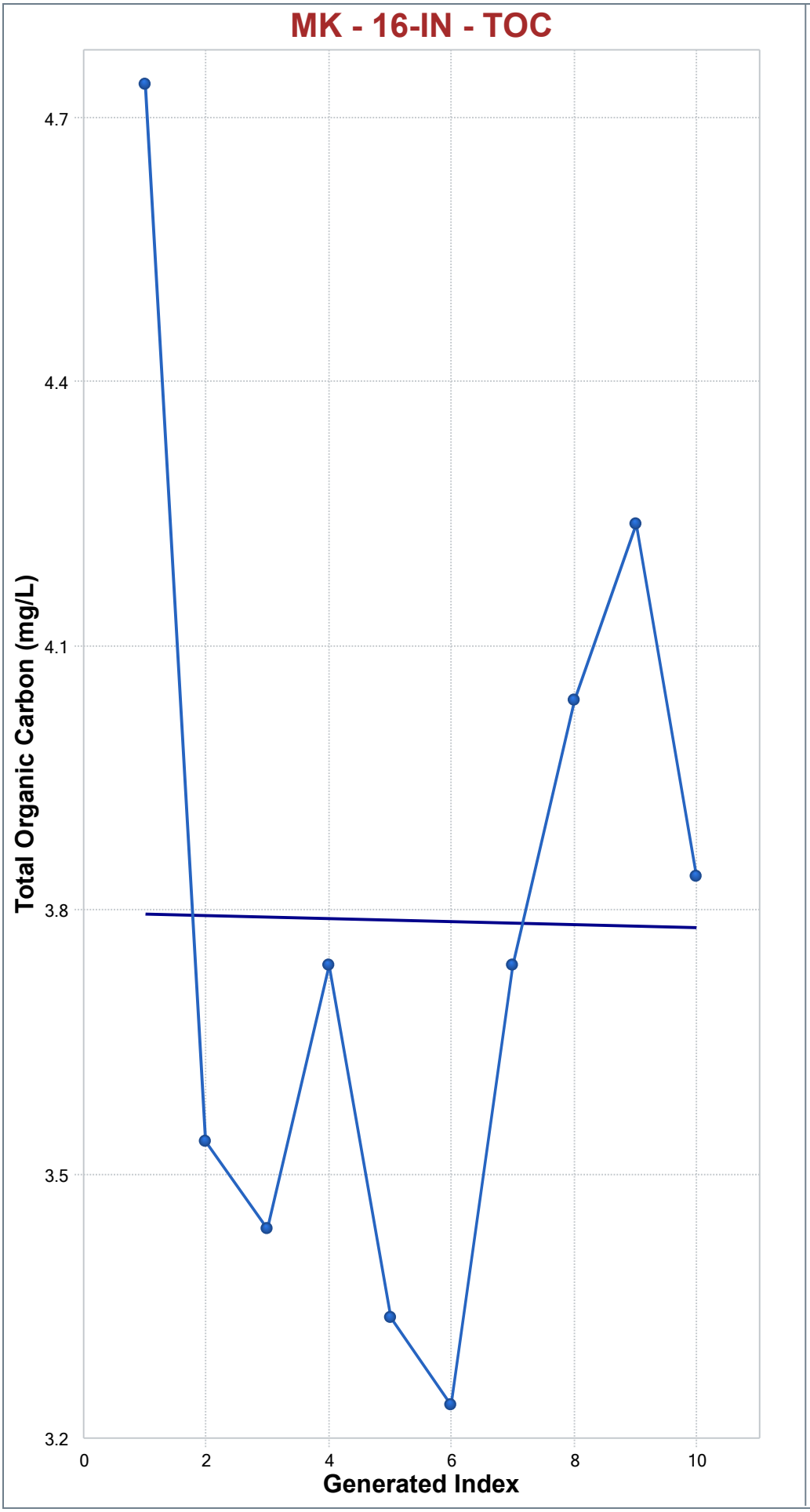
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.2659
Standardized Value of S	0.0884
M-K Test Value (S)	5
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.4648

OLS Regression Line (Blue)

OLS Regression Slope	-0.1378
OLS Regression Intercept	489.1292

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



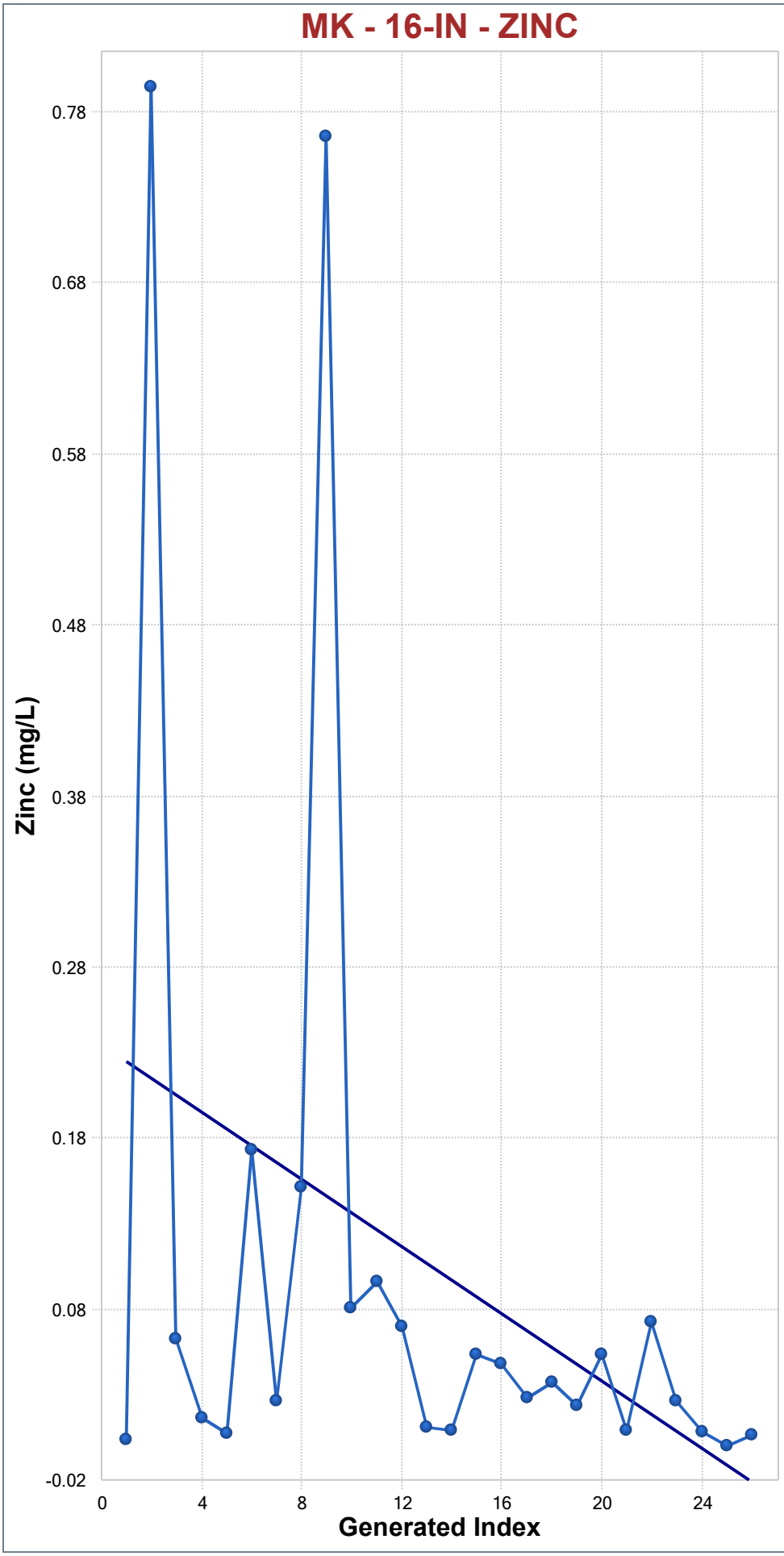
Mann-Kendall Trend Analysis

n	10
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	11.1355
Standardized Value of S	0.4490
M-K Test Value (S)	6
Tabulated p-value	0.3000
Approximate p-value	0.3267

OLS Regression Line (Blue)

OLS Regression Slope	-0.0018
OLS Regression Intercept	3.7600

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



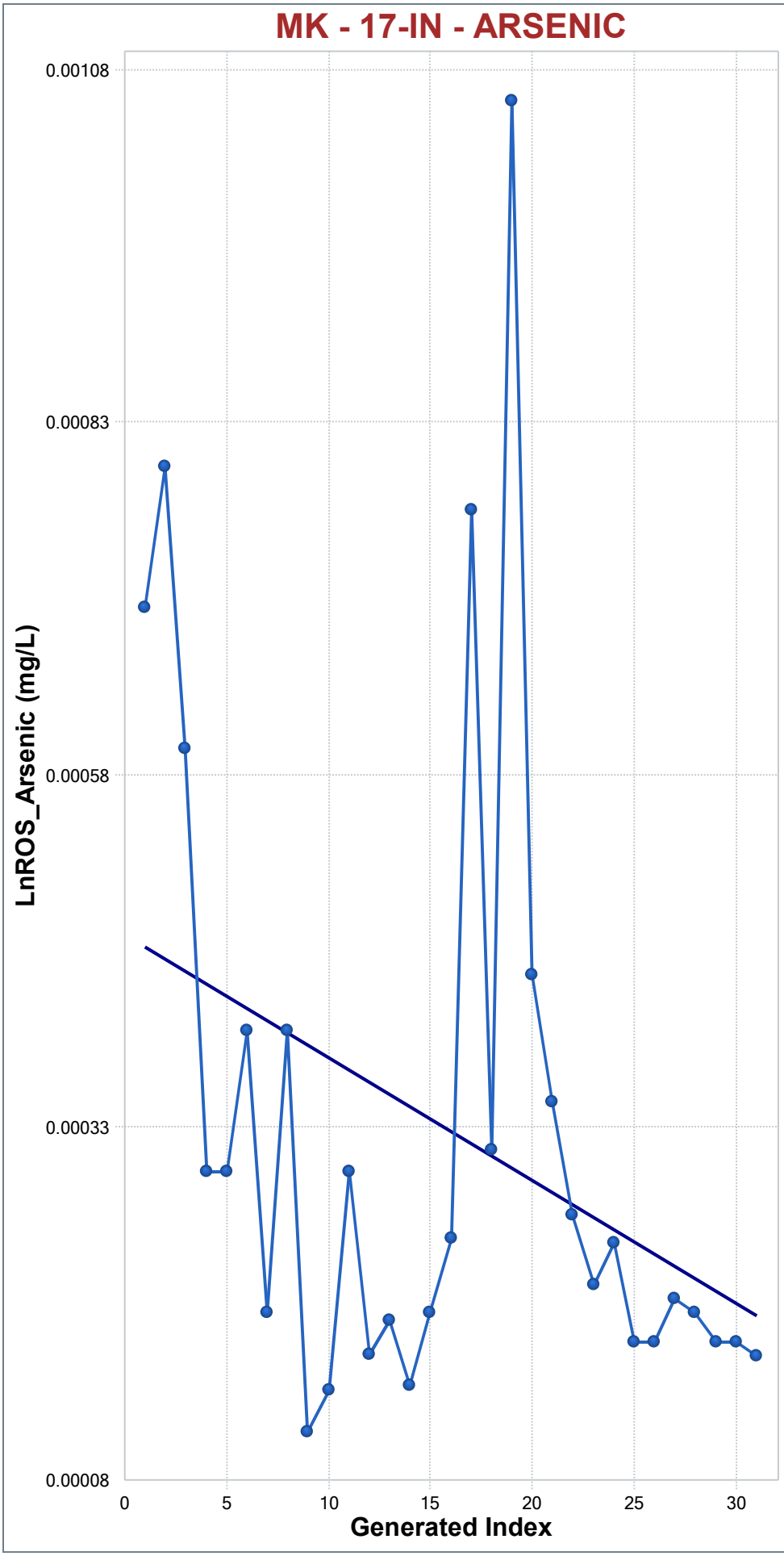
Mann-Kendall Trend Analysis

n	26
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	45.3578
Standardized Value of S	-2.1826
M-K Test Value (S)	-100
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0145

OLS Regression Line (Blue)

OLS Regression Slope	-0.0098
OLS Regression Intercept	0.2355

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



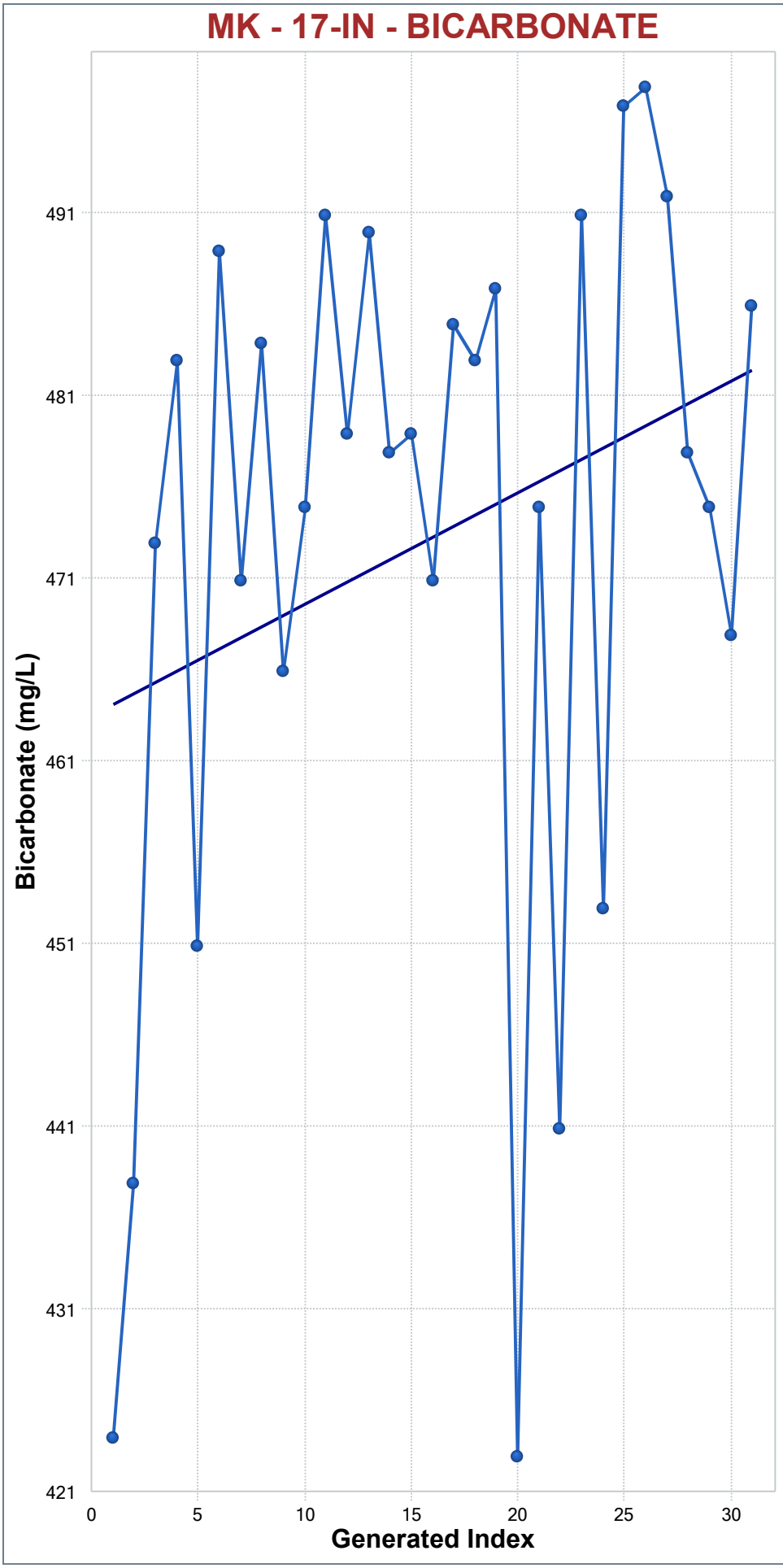
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7140
Standardized Value of S	-2.3333
M-K Test Value (S)	-138
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0098

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0005

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



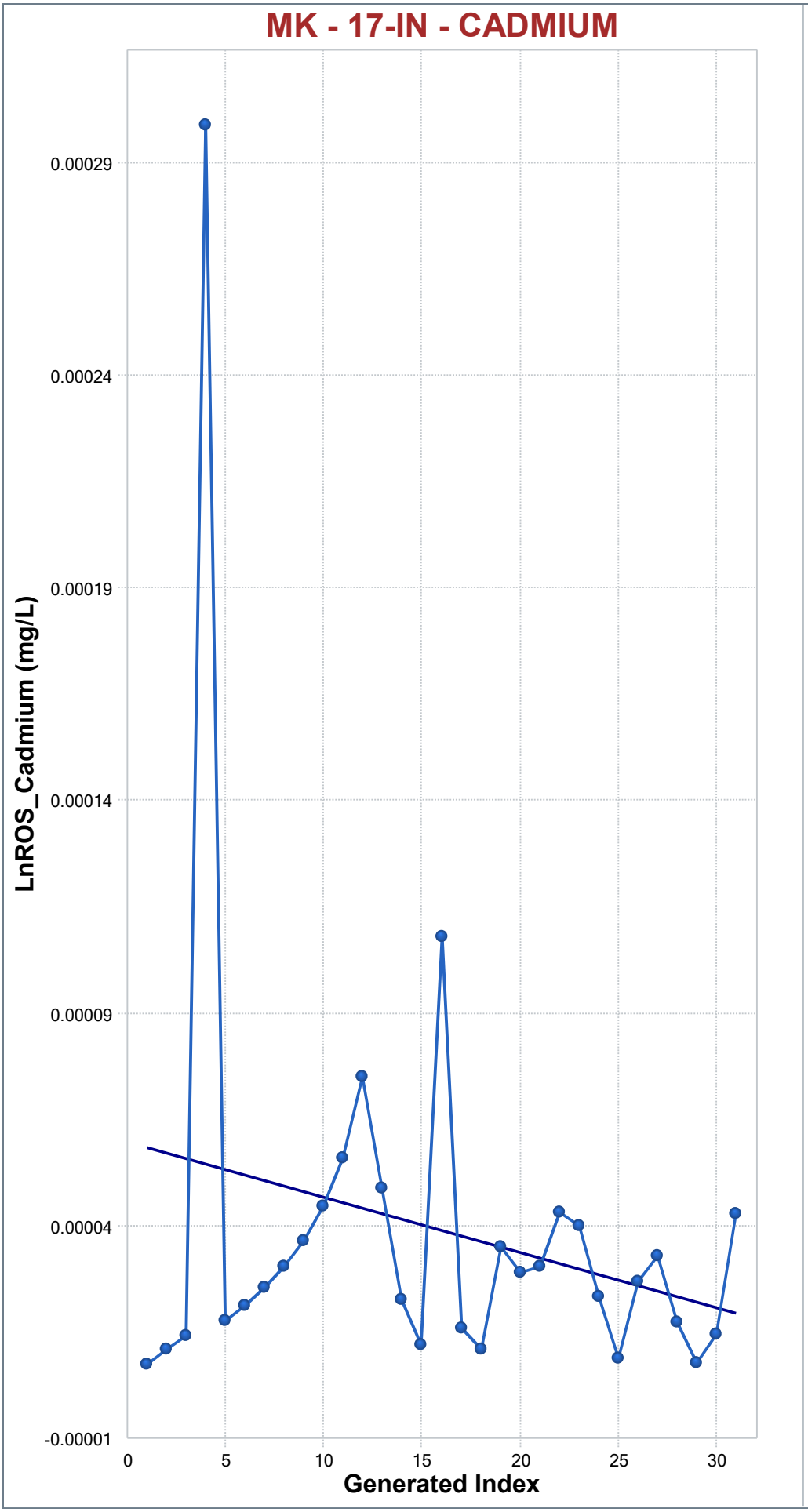
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7622
Standardized Value of S	1.6677
M-K Test Value (S)	99
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0477

OLS Regression Line (Blue)

OLS Regression Slope	0.6117
OLS Regression Intercept	463.5677

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



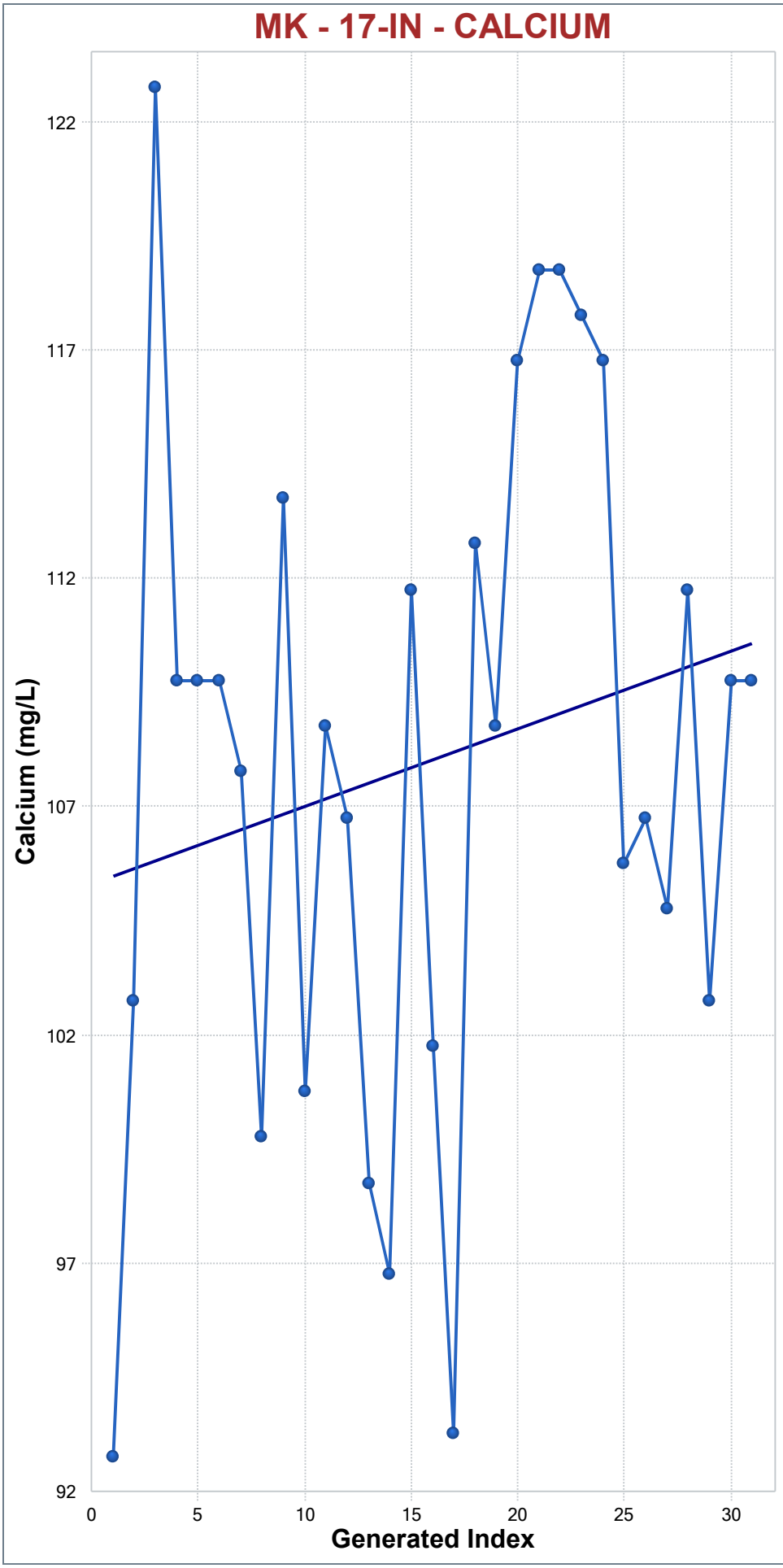
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8359
Standardized Value of S	-0.0340
M-K Test Value (S)	-3
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.4864

OLS Regression Line (Blue)

OLS Regression Slope	0.0000
OLS Regression Intercept	0.0001

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



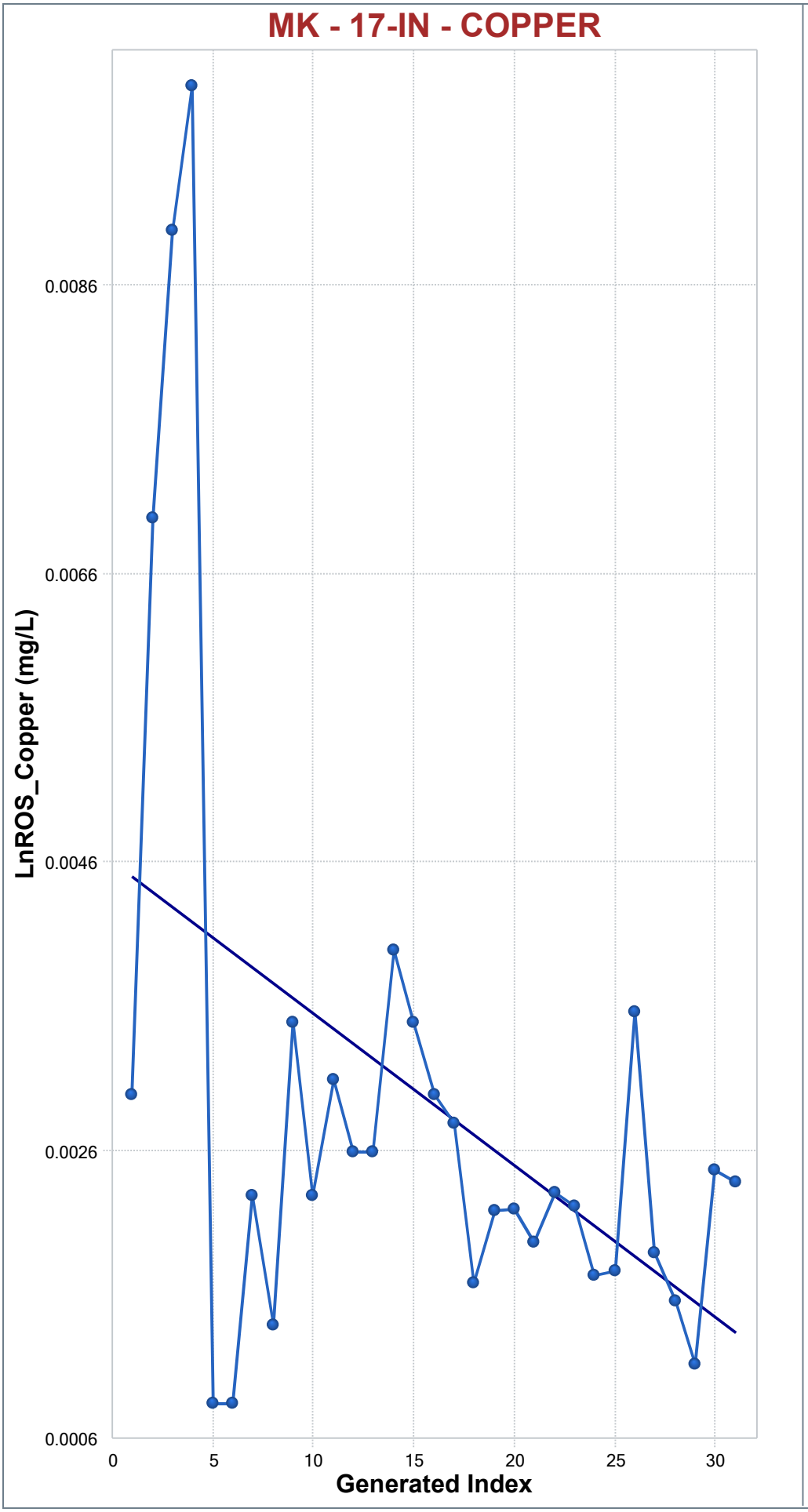
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.6430
Standardized Value of S	0.8526
M-K Test Value (S)	51
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.1969

OLS Regression Line (Blue)

OLS Regression Slope	0.1692
OLS Regression Intercept	105.5677

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



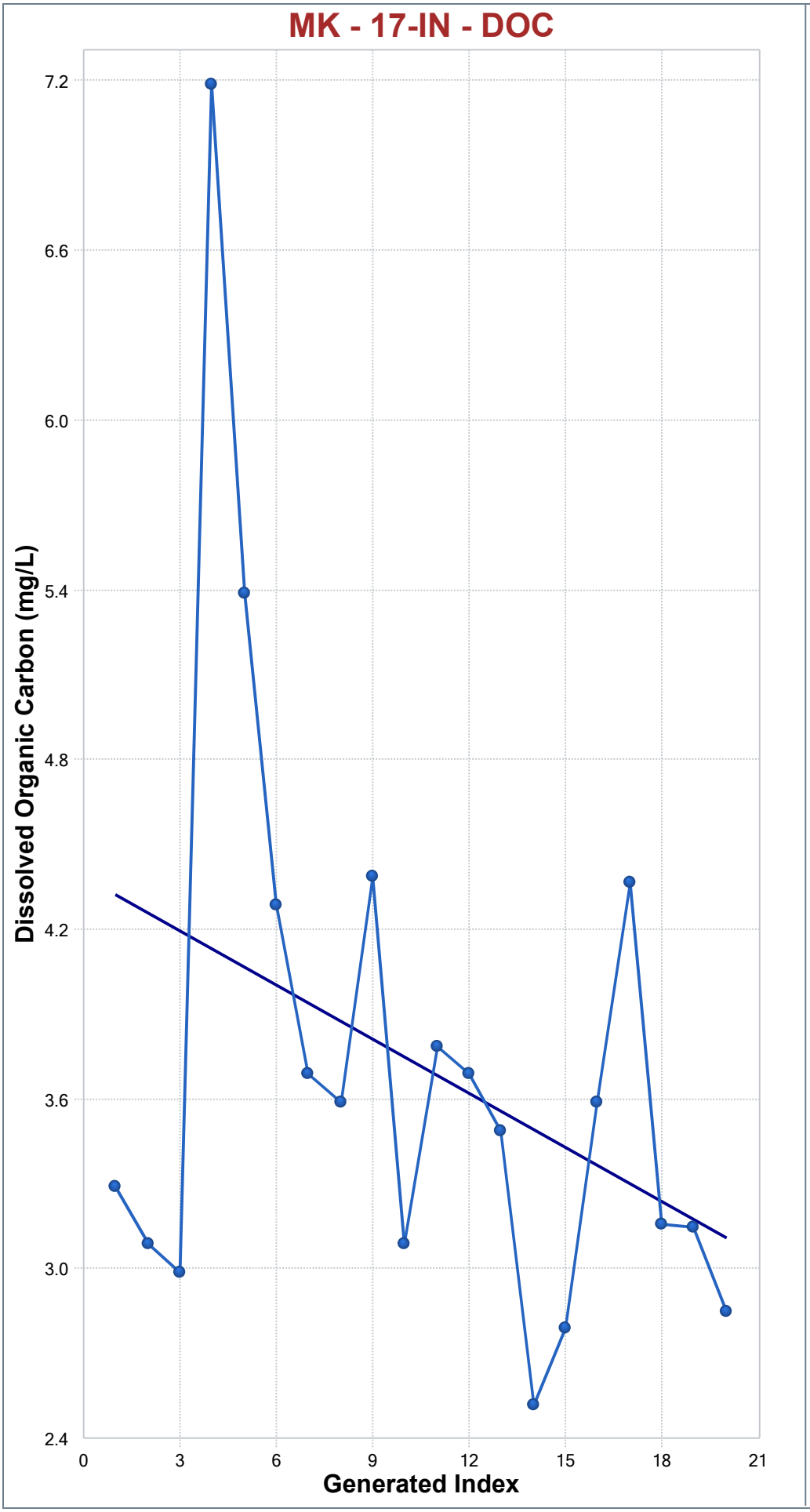
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7934
Standardized Value of S	-1.9560
M-K Test Value (S)	-116
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0252

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0046

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



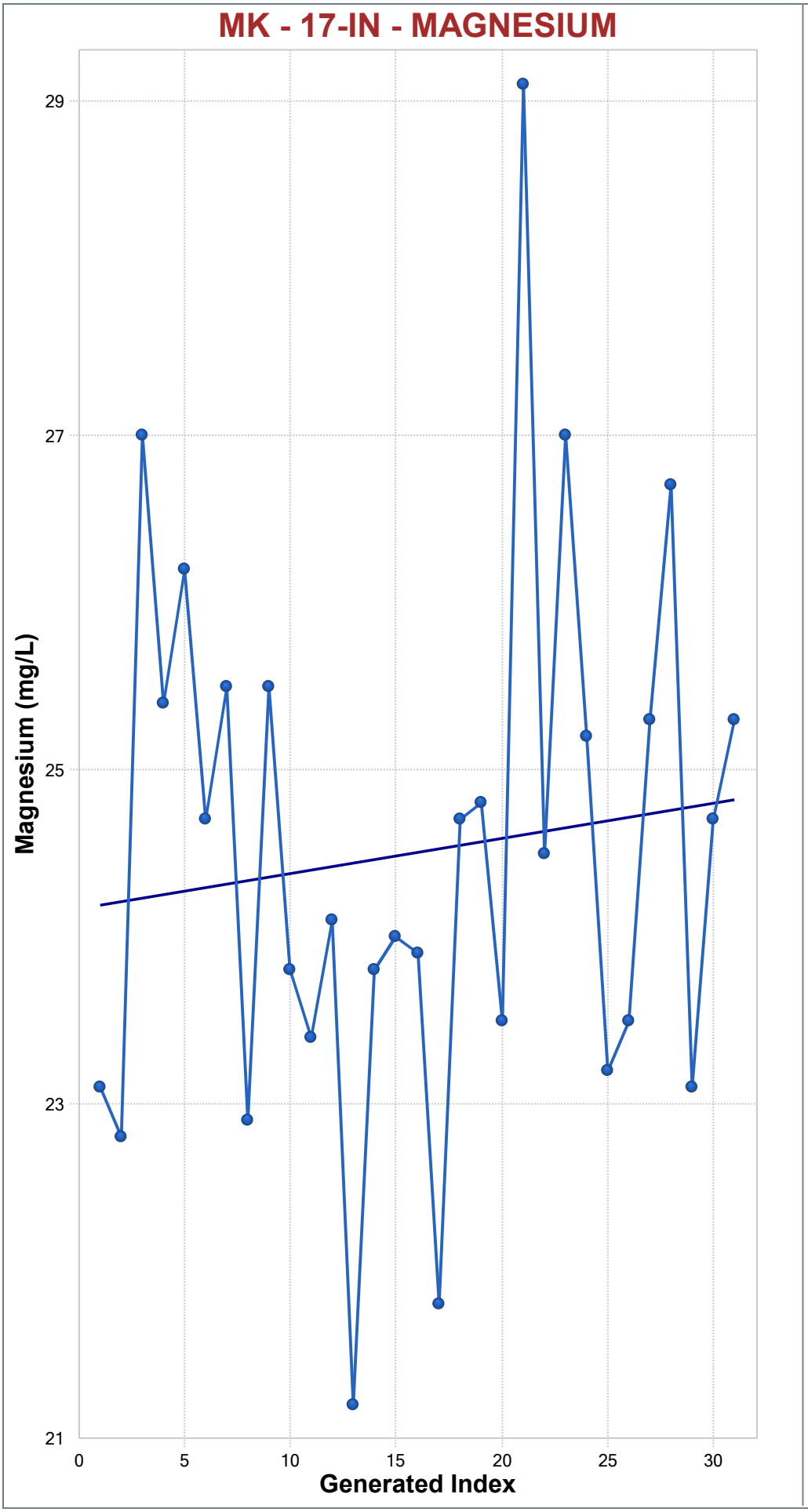
Mann-Kendall Trend Analysis

n	20
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	30.7734
Standardized Value of S	-1.4948
M-K Test Value (S)	-47
Tabulated p-value	0.0730
Approximate p-value	0.0675

OLS Regression Line (Blue)

OLS Regression Slope	-0.0638
OLS Regression Intercept	4.3998

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



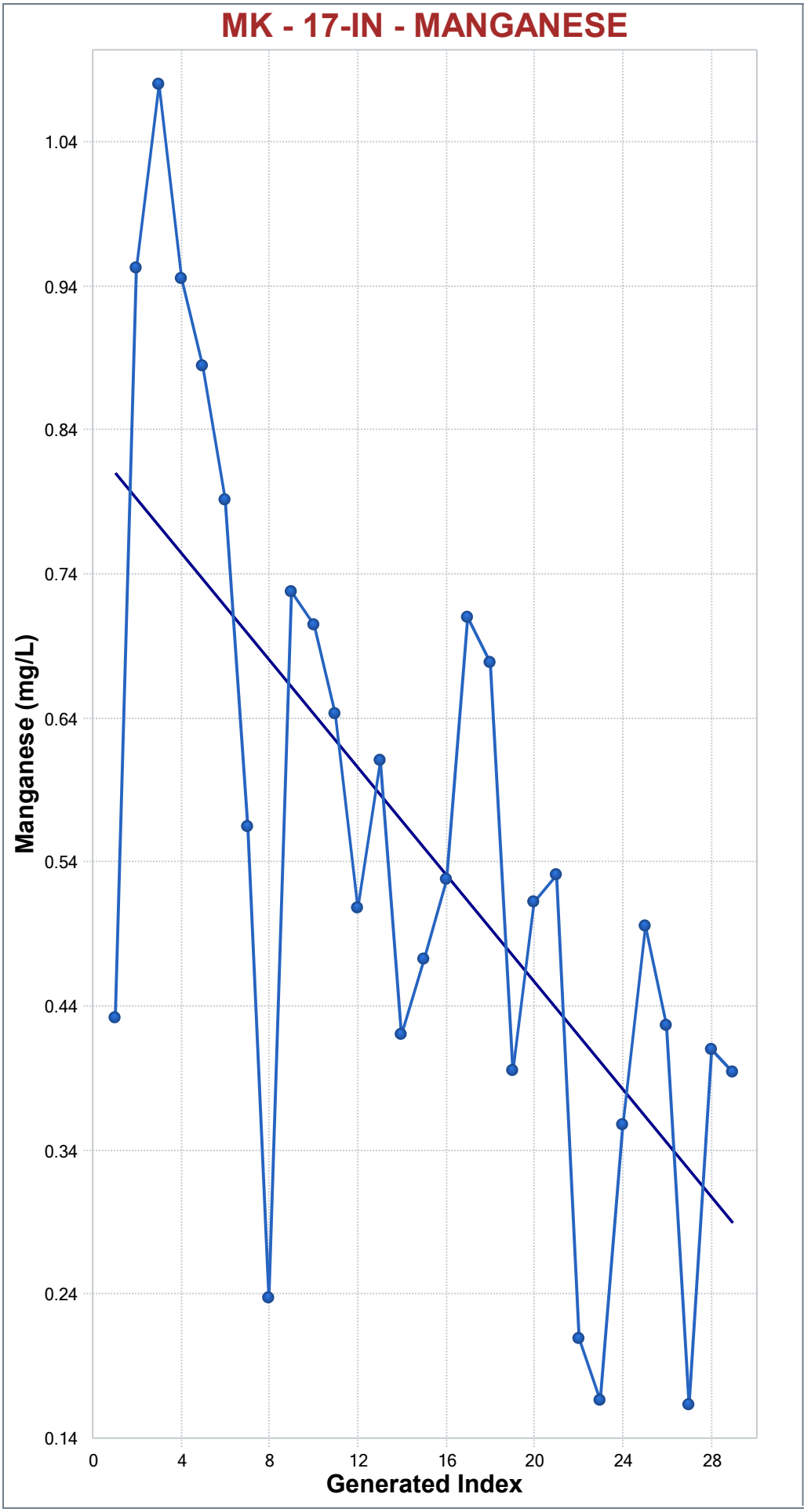
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7537
Standardized Value of S	0.5276
M-K Test Value (S)	32
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.2989

OLS Regression Line (Blue)

OLS Regression Slope	0.0208
OLS Regression Intercept	23.8742

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



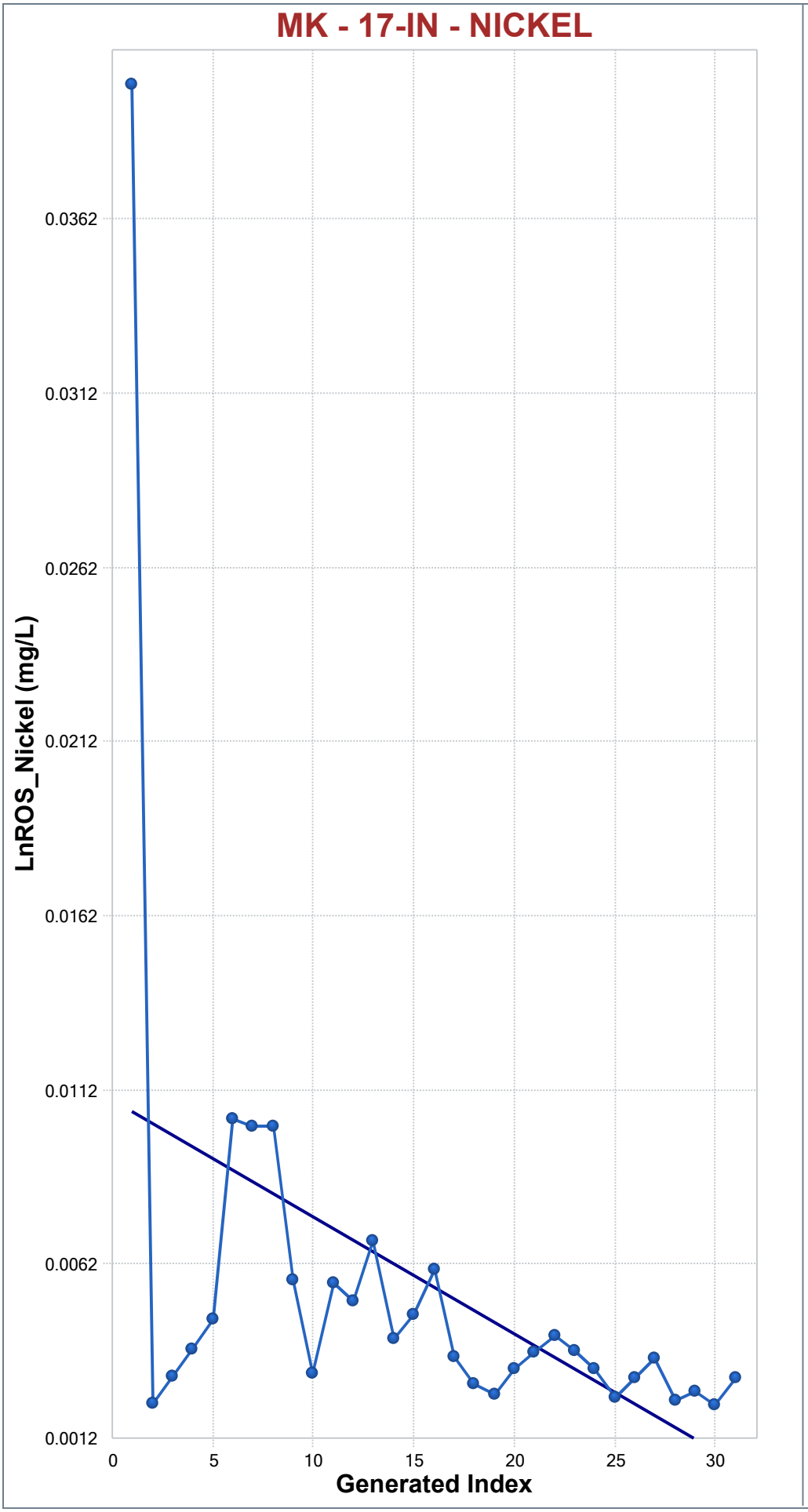
Mann-Kendall Trend Analysis

n	29
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	53.3104
Standardized Value of S	-4.1080
M-K Test Value (S)	-220
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	-0.0186
OLS Regression Intercept	0.8291

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



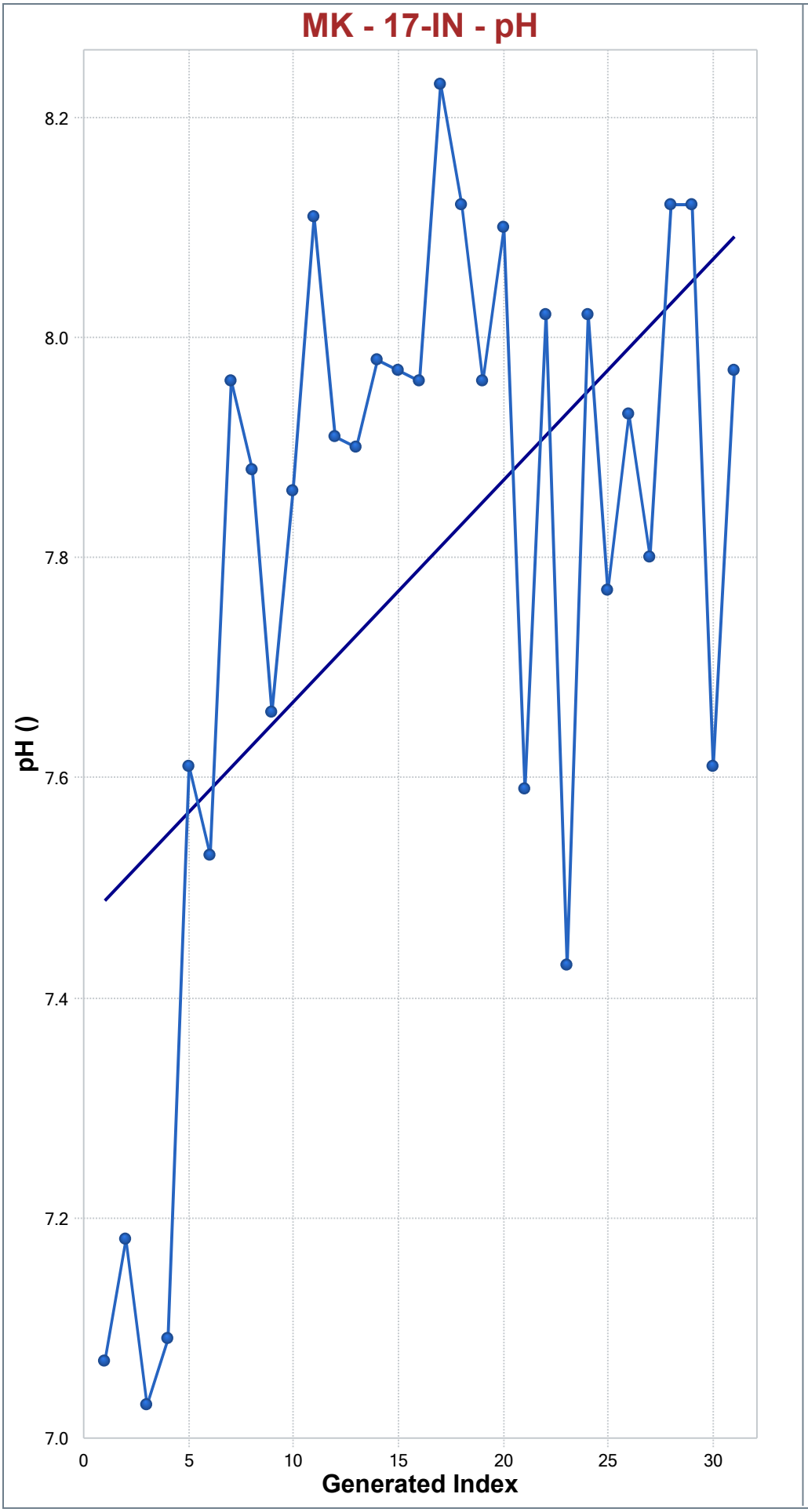
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8274
Standardized Value of S	-3.4848
M-K Test Value (S)	-206
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0002

OLS Regression Line (Blue)

OLS Regression Slope	-0.0003
OLS Regression Intercept	0.0109

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



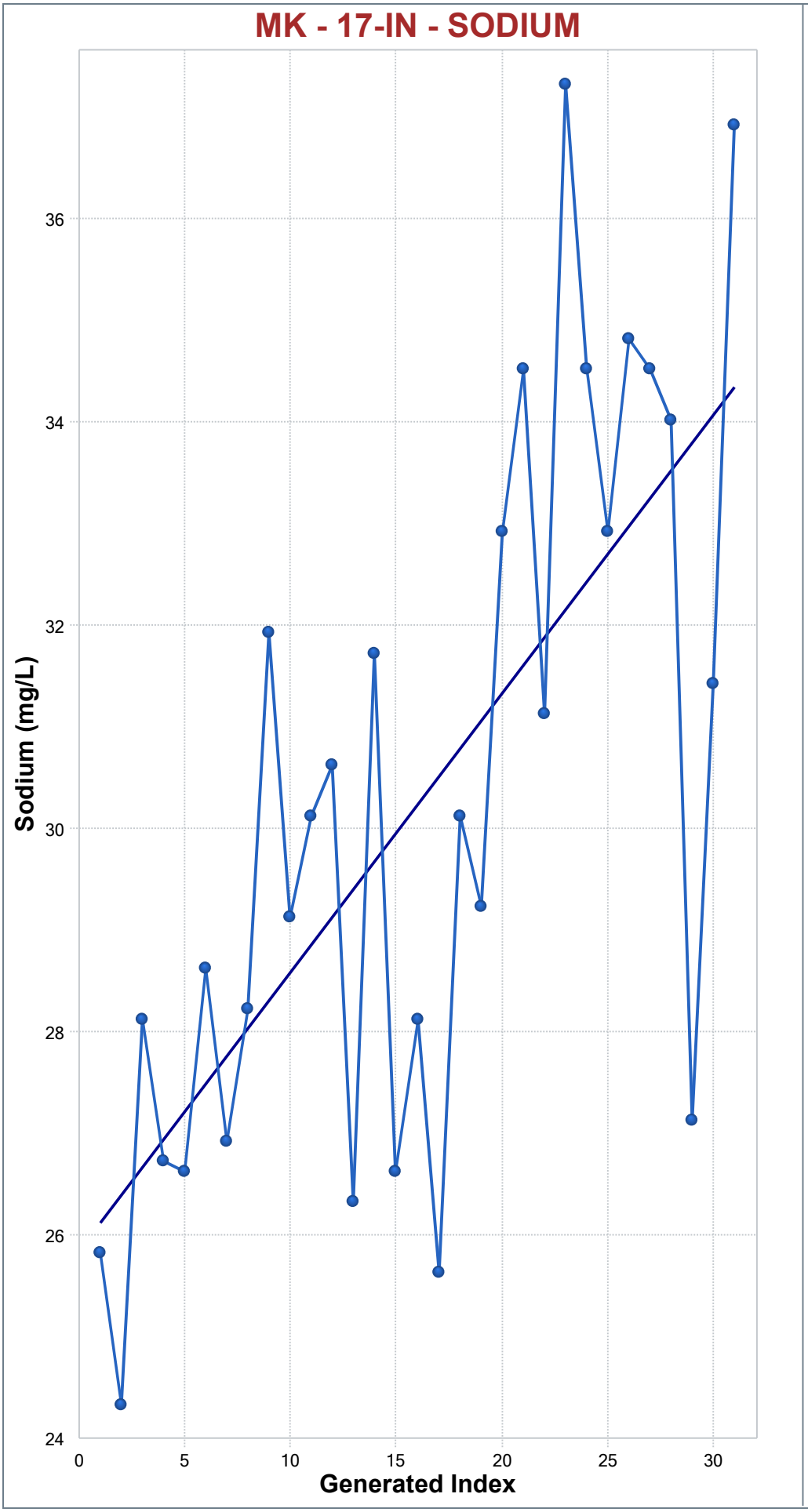
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7480
Standardized Value of S	2.8426
M-K Test Value (S)	168
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0022

OLS Regression Line (Blue)

OLS Regression Slope	0.0201
OLS Regression Intercept	7.4888

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



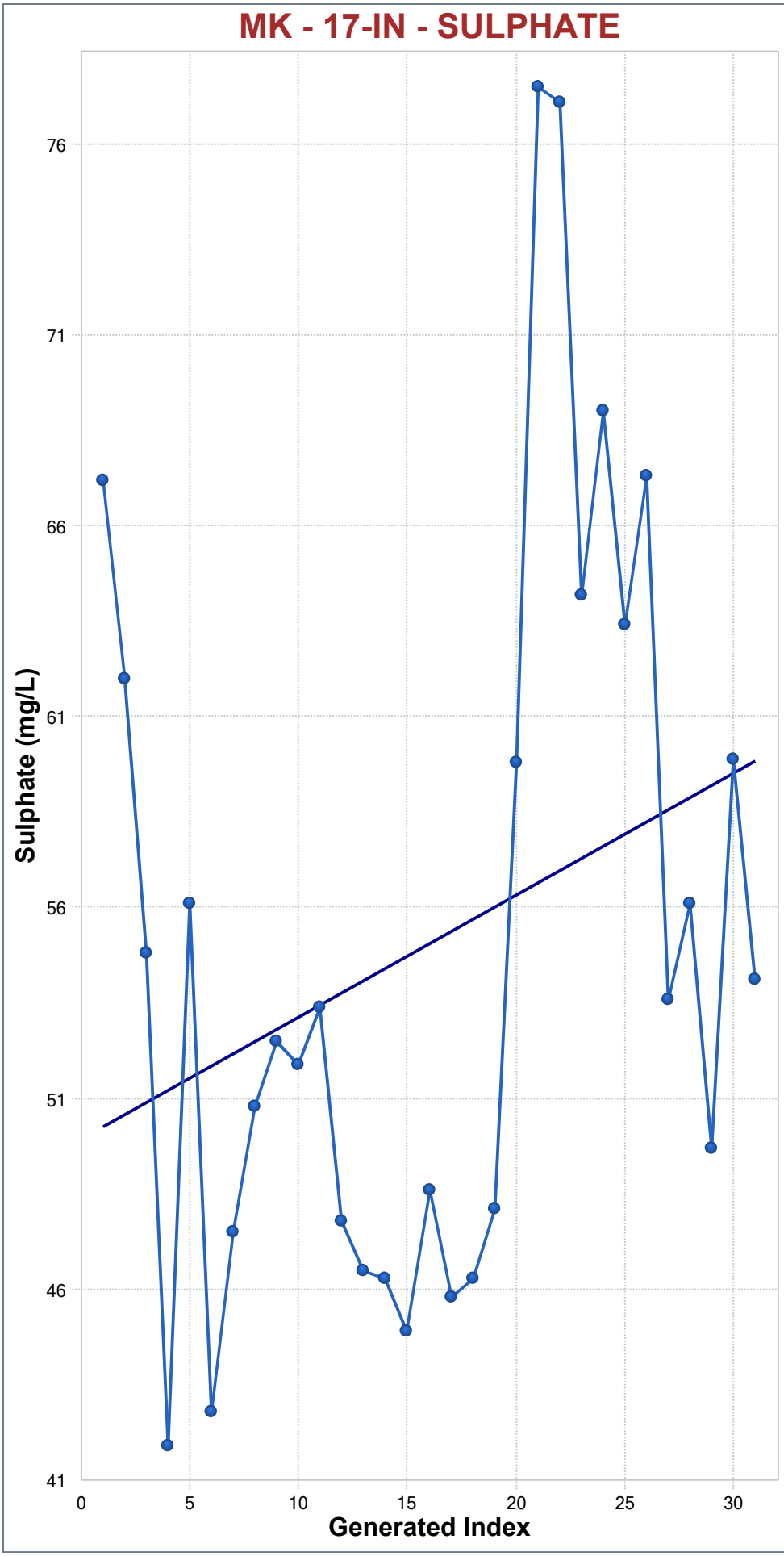
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7707
Standardized Value of S	4.1007
M-K Test Value (S)	242
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0000

OLS Regression Line (Blue)

OLS Regression Slope	0.2739
OLS Regression Intercept	26.1239

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



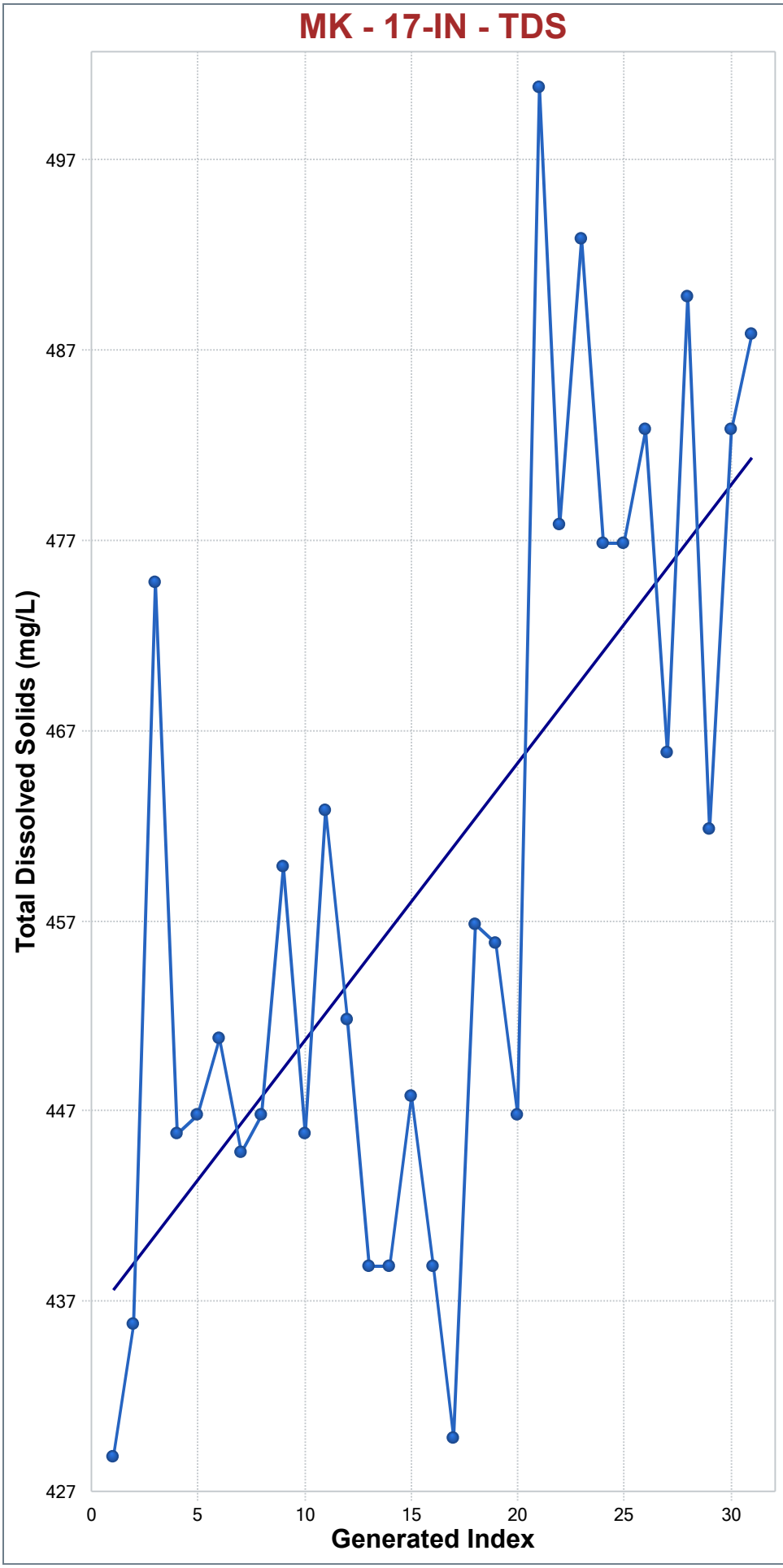
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8189
Standardized Value of S	1.3941
M-K Test Value (S)	83
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0816

OLS Regression Line (Blue)

OLS Regression Slope	0.3192
OLS Regression Intercept	49.9535

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



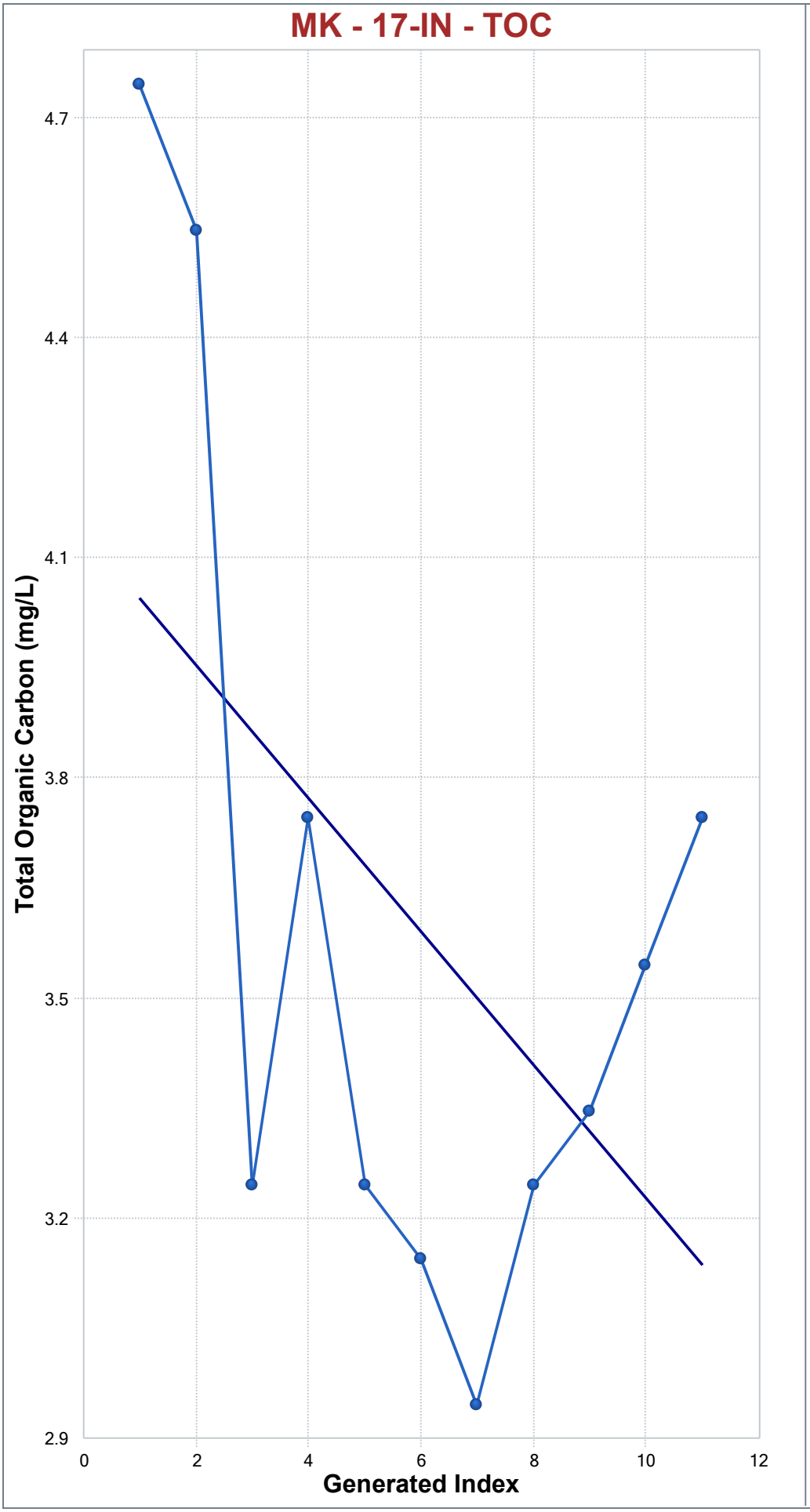
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.7480
Standardized Value of S	3.6597
M-K Test Value (S)	216
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0001

OLS Regression Line (Blue)

OLS Regression Slope	1.4601
OLS Regression Intercept	436.3161

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



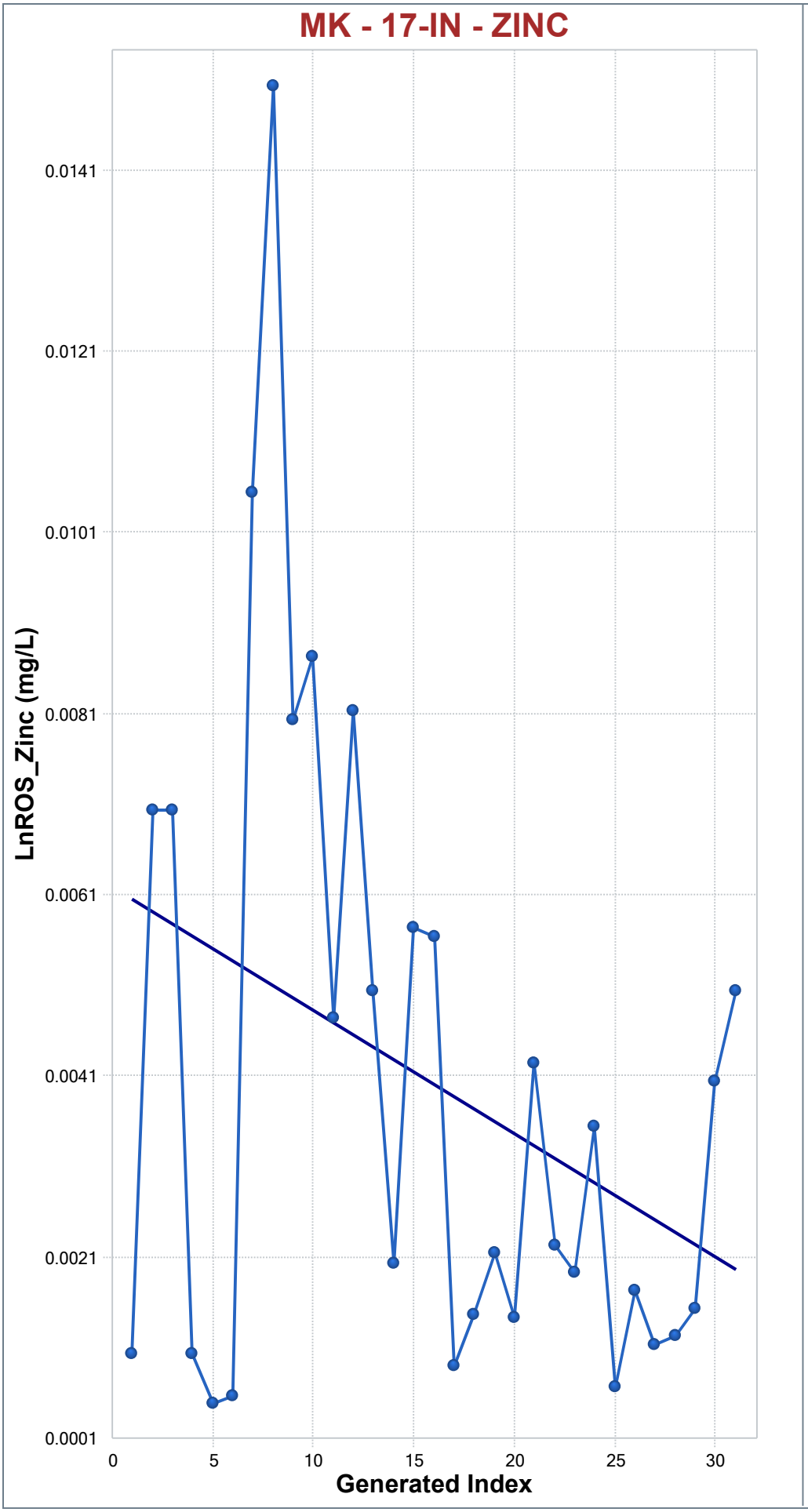
Mann-Kendall Trend Analysis

n	11
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	12.6623
Standardized Value of S	-0.6318
M-K Test Value (S)	-9
Tabulated p-value	0.2710
Approximate p-value	0.2638

OLS Regression Line (Blue)

OLS Regression Slope	-0.0909
OLS Regression Intercept	4.0909

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



Mann-Kendall Trend Analysis

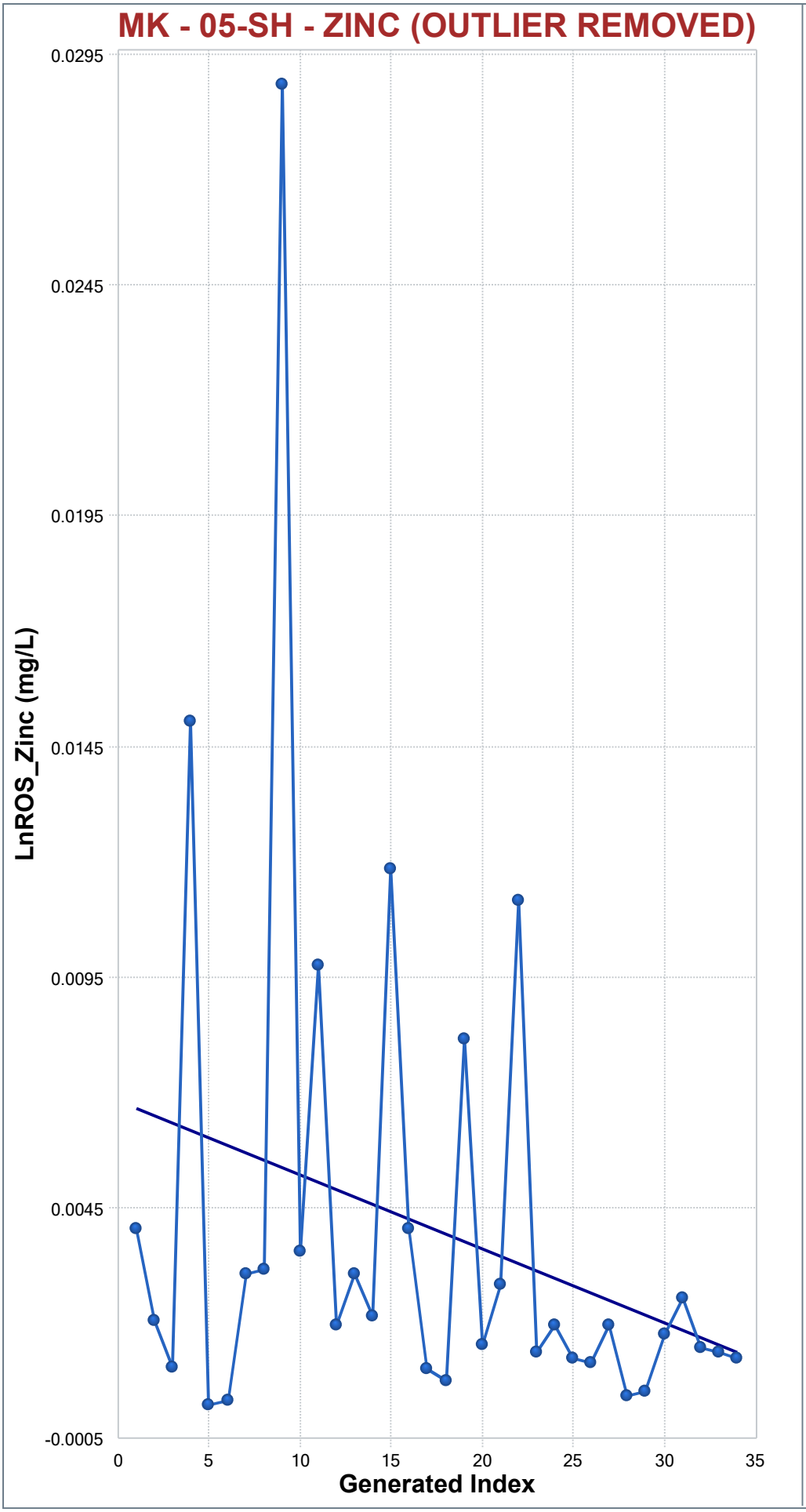
n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8104
Standardized Value of S	-1.4113
M-K Test Value (S)	-84
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0791

OLS Regression Line (Blue)

OLS Regression Slope	-0.0001
OLS Regression Intercept	0.0062

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

App G7 Sen's Slope/Mann-Kendall Trend Analysis Output – Outliers Removed - Shallow



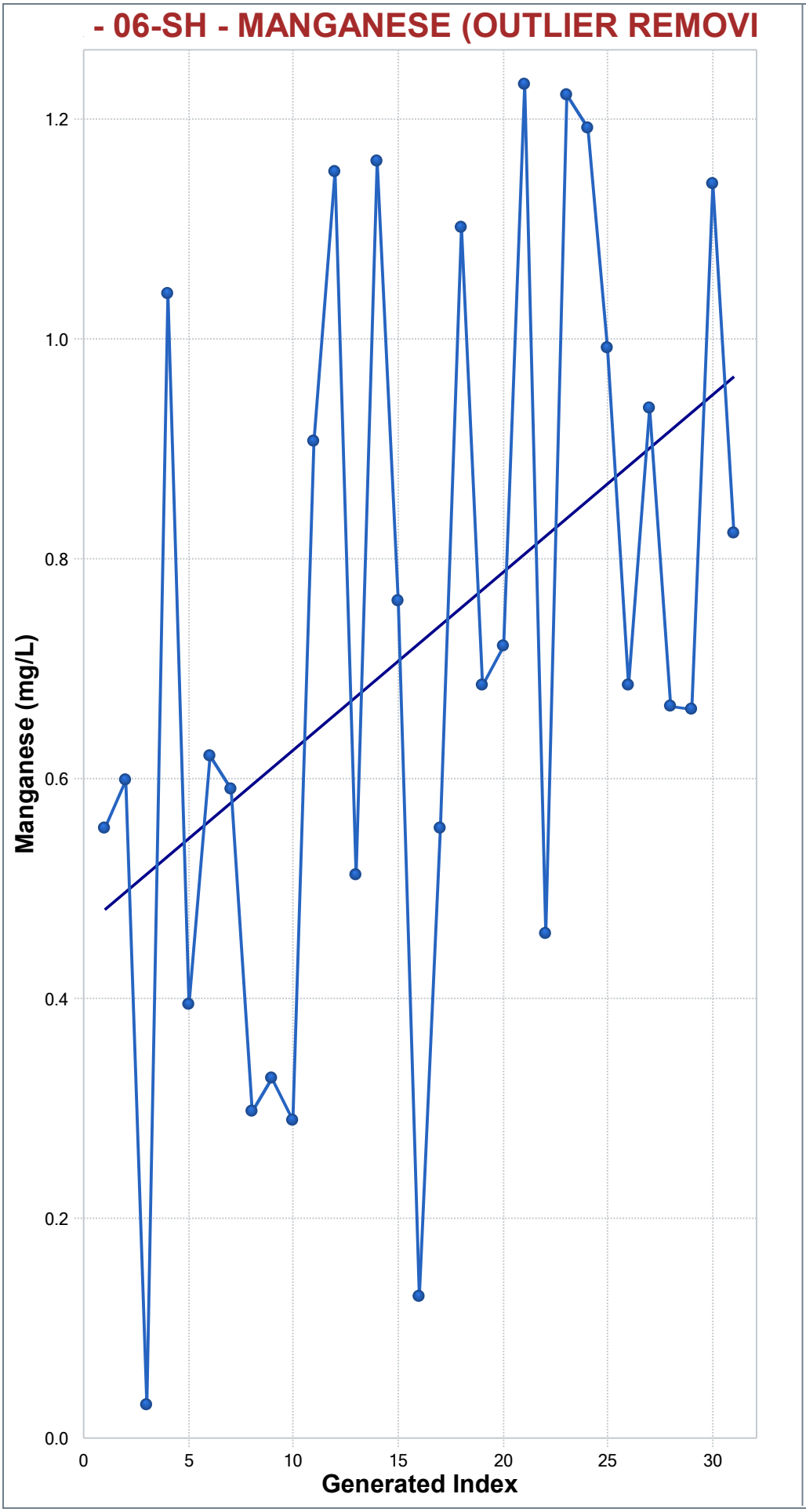
Mann-Kendall Trend Analysis

n	34
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	67.3993
Standardized Value of S	-1.9436
M-K Test Value (S)	-132
Appx. Critical Value (0.05)	-1.6449
Approximate p-value	0.0260

OLS Regression Line (Blue)

OLS Regression Slope	-0.0002
OLS Regression Intercept	0.0068

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



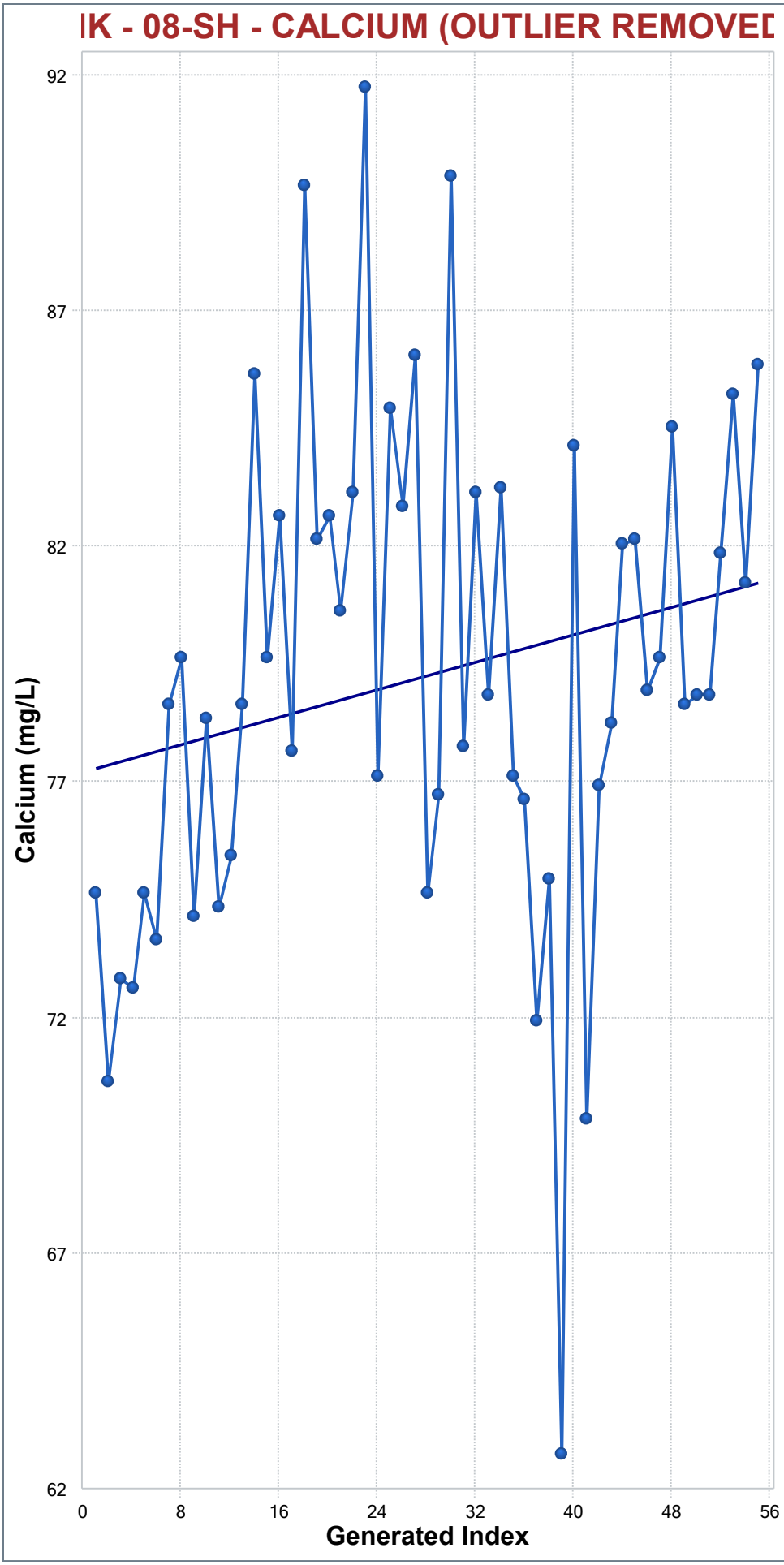
Mann-Kendall Trend Analysis

n	31
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	58.8274
Standardized Value of S	2.1929
M-K Test Value (S)	130
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0142

OLS Regression Line (Blue)

OLS Regression Slope	0.0162
OLS Regression Intercept	0.4939

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



Mann-Kendall Trend Analysis

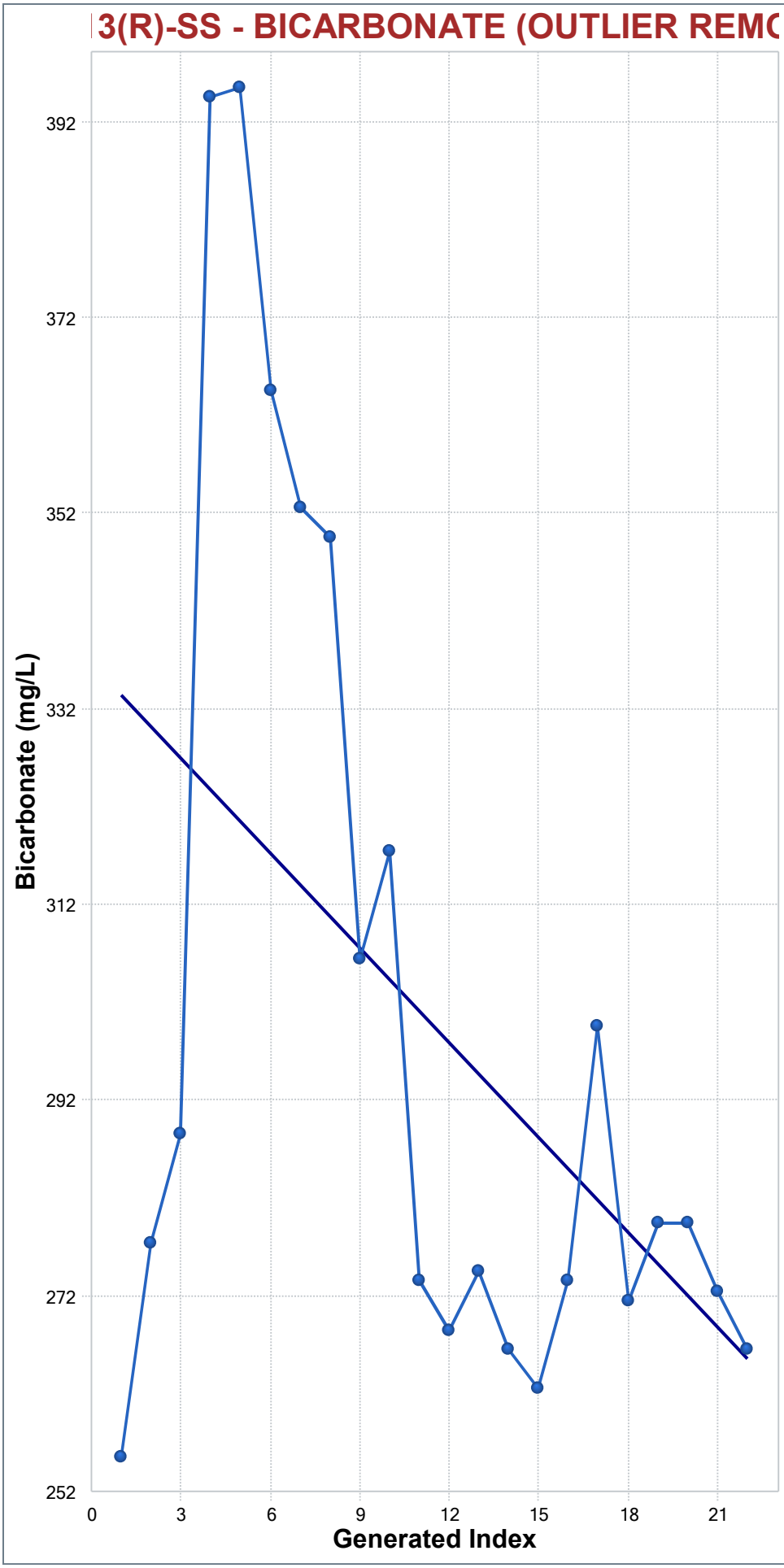
n	55
Confidence Coefficient	0.9500
Level of Significance	0.0500
Standard Deviation of S	137.6820
Standardized Value of S	2.4259
M-K Test Value (S)	335
Appx. Critical Value (0.05)	1.6449
Approximate p-value	0.0076

OLS Regression Line (Blue)

OLS Regression Slope	0.0723
OLS Regression Intercept	77.5937

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

App G8 Sen's Slope/Mann-Kendall Trend Analysis Output – Outliers Removed - Sandstone



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	-2.1738
M-K Test Value (S)	-78
Tabulated p-value	0.0130
Approximate p-value	0.0149

OLS Regression Line (Blue)

OLS Regression Slope	-3.2304
OLS Regression Intercept	337.1909

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