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# Swan Hills Treatment Centre

## 2023 Groundwater Monitoring Report

Veolia Canada Waste Services Inc.

Project number: 60716599

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## Quality information

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# Executive Summary

AECOM Canada Ltd. (AECOM) was retained to conduct the annual groundwater monitoring event in 2023 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 70 metres below ground surface (mBGS).

The groundwater flow in the shallow and intermediate intervals is generally to the east at an estimated velocity of 0.11 metres per year (m/yr) for the shallow till and 0.018 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 2023 is 15.56 m/yr .

Based on the 2023 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 2023.
- Polychlorinated Biphenyl (PCB) Aroclor and total PCB concentrations were below the laboratory detection limit for all wells sampled in 2023.
- Adsorbable Organic Halogen (AOX) results were below the laboratory detection limit for all select wells tested except for 13-SH. This is the first time a concentration above detection limit has been recorded. Future sampling events will be examined to determine if concentrations above detection remain.
- Nine 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 eight wells these concentrations are consistent with baseline and/or historical observations, as well as expected TDS concentrations for a till lithology. For one well (11-IN), the concentration is the highest seen in the well since it was drilled. The result was confirmed by the laboratory. 2024 results will be examined to determine if this increase remains.
- Manganese concentrations exceeding the Alberta Tier II Potable Groundwater Guideline were observed in all monitoring wells except 03-IN, 04-SH, 05-SH, 08-SH, 08-IN, 13-IN, 14-SH, 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 01A-SH and 07-SH. Monitoring well 07-SH is located in a low-lying area adjacent to a road while 01A-SH is located on the plant site. 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 13-SH have increasing trends but both are an order of magnitude below the guideline.
- Monitoring well MW-01A:

- The TDS and major ion groundwater chemistry of 01A-SH and 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.
- Sulphur odour and reduced pH in 01A-SH indicates the presence of sulphur reducing bacteria that is confirmed by the results of the sulphate reducing bacteria (SRB) test conducted in 2015.

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.
- 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. It is recommended to begin replacing the historically dry sandstone wells along the western edge of the Site to assess background groundwater conditions. If the down-gradient sandstone wells show increasing trends in parameters indicative of groundwater contamination in the future, the up-gradient wells will be important in determining if the source of the contamination is the Swan Hills Treatment Centre or oil and gas activity up-gradient of the plant site.
- Replace damaged and compromised well 04-IN, 14-SH, and 14-IN when replacing the dry sandstone wells.
- Review of road salt use at and around the treatment center and alternative measures implemented in 2024 to address chloride increases at selected locations.
- Remove brush/vegetation as needed around nested wells to allow for ease of access and improved mobility around the monitoring wells.
- Alberta Environment and Protected Areas has recommended that dioxin and furan should be sampled for in select shallow wells for three years (2022, 2023 and 2024) as part of the annual monitoring program. Once the three years of data is collected, the monitoring frequency can be adjusted based on the results.
- Conduct groundwater monitoring in the fall 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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# 1. Introduction

## 1.1 Background Information

AECOM Canada Ltd. (AECOM) was retained to conduct the annual groundwater monitoring event in 2023 at the Swan Hills Treatment Centre (the Site). The Site is operated by Veolia North America, LLC. ("Veolia") under Alberta Environment and Protected Areas 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 Alberta Environment and Protected Areas (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 2022 – AECOM). This report presents a summary of the groundwater monitoring activities that were completed at the Site in 2023.

## 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 5$^{th}$ 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 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 Centre'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 in Swan Hills of 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 AEP'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 28 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 | 18 |
| Observation Well/Test Holes/Investigation | 9 |
| Unknown | 1 |
| Pump Test | 4 |

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 18 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 2023 sampling event was using one water supply well, 89-3, located on the east side of the plant with a production interval of 56.7 m to 66.1 m (**Figure 5.1, 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 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 (Worley Parsons, 2012, 2013; **Appendix C**). A geologic cross-section for the vicinity of the Site and borehole locations is provided in **Figures 6.1, 6.2, 6.3, 6.4, 6.5, 6.6 and 6.7** (**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. The 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 5.1, 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 80 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) | $7.6 \times 10^{-7}$ |
| 06-SH | Till (Shallow) | $9.6 \times 10^{-8}$ |
| 13-SH | Till (Shallow) | $1.1 \times 10^{-8}$ |
| 06(R)IN | Till (Intermediate) | $2.2 \times 10^{-7}$ |
| 11-IN | Till (Intermediate) | $4.0 \times 10^{-9}$ |
| 13-IN | Till (Intermediate) | $2.6 \times 10^{-9}$ |
| 07(R)SS | Sandstone | $8.6 \times 10^{-6}$ |
| 15(2R)SS | Sandstone | $1.7 \times 10^{-6}$ |
| 89-3 | Sandstone | $2.2 \times 10^{-5}$ |
| 354695 | Sandstone | $1.83 \times 10^{-4}$ |
| 354696 | Sandstone | Proximal to the well: $1.98 \times 10^{-6}$<br>Influence of a recharge source: $1.23 \times 10^{-5}$ |
| 354697 | Sandstone | Proximal to the well: $8.19 \times 10^{-6}$<br>Influence of a recharge source: $4.68 \times 10^{-5}$ |

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. 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 – $9.3 \times 10^{-8}$ m/s
- Intermediate till – $1.3 \times 10^{-8}$ m/s
- Sandstone – $3.2 \times 10^{-5}$ 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 5.1, Appendix A**), and four decommissioned locations (01, 02, 09, and 10; **Figure 5.2, Appendix A**). The decommissioning details are reported in the Komex 1997 report (Worley Parsons, 2012). At 10 of the 14 locations, all three intervals, shallow, intermediate, and sandstone, are monitored (01A, 04, 05, 07, 08, 11, 12, 13, 14, and 15); the shallow and intermediate intervals are monitored at the four remaining locations (03, 06, 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 2023 groundwater level survey 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 Survey**

| Monitoring Location | Measured in Piezometer | Measured in Well | Lithology |
|---|---|---|---|
| 01A | SH, IN | SS | SH/IN: Till<br>SS: Sandstone |
| 03 | SH, IN | - | SH/IN: Till |
| 04 | SH | IN[1], SS | SH/IN: Till<br>SS: Sandstone |
| 05 | SH | IN[1], SS | SH/IN: Till<br>SS: Sandstone |
| 06 | SH, IN | - | SH/IN: Till |
| 07 | SH, IN | SS | SH/IN: Till<br>SS: Sandstone |
| 08 | IN | SH, SS | SH/IN: Till<br>SS: Sandstone |
| 11 | IN | SH[1], SS | SH/IN: Till<br>SS: Sandstone |
| 12 | SH, IN | SS | SH/IN: Till<br>SS: Sandstone |
| 13 | SH, IN | SS | SH/IN: Till<br>SS: Sandstone |
| 14 | SH, IN | SS | SH/IN: Till<br>SS: Sandstone |
| 15 | IN | SH[2], SS | SH/IN: Till<br>SS: Sandstone |
| 16 | SH, IN | - | SH/IN: Till |
| 17 | SH, IN | - | SH/IN: Till |

[1] Piezometer compromised or blocked by ice
[2] Piezometer dry/damaged

## 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 2023, maintenance was performed on the following piezometers by cutting PVC pipe down to allow protective casings to close and lock.

- 06(R)IN Pz
- 14-SH Pz
- 17-IN Pz

Groundwater levels were recorded first, then the piezometers were cut down and new stick-up data was recorded.

It was noted that the PVC pipe at monitoring well 13-SH was frost heaved approximately 0.45 m above the protective well casing and samples from the well no longer represent shallow groundwater. In 2023, the pneumatic pump from the well was moved to the associated piezometer (13-SH_Pz) in order for a sample to be obtained that is more representative.

### 3.1.2.3 Purging

Purging operations took place from September 12 and 13, 2023 prior to sampling. 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

Sampling operations were conducted from September 27 to 29, 2023. Samples were collected from all wells that were purged except for 13(R)SS, 15(2R)SS and 16-IN (29 wells). While these three wells were purged and water levels taken during the sampling event, samples were unable to be obtained. 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 556 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 29, 2023.

## 3.2 Summary of Changes

There was no change in the 2023 monitoring program compared to the 2022 monitoring program.

## 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 distilled 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, however due to error in the field only one blank was collected in 2023
- Trip blank
- Spiked samples (polychlorinated biphenyls; PCBs)

Field blanks consist of distilled 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 distilled 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 2023 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 field blank and a trip blank submitted to the laboratory for this sampling event were labelled “Field Blank” 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 2023 groundwater monitoring were compared to the Alberta Environment Tier 2 Groundwater Remediation Guidelines for Commercial/Industrial Land Use (August 2022). 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 MW-08 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 2023 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, 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.

EPA 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.
- $\alpha$ = 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 $\alpha = 0.05$).

This trend analysis was conducted on all complete data sets. Identified outliers in 2023 were examined for any transcription or lab errors and examined within the context of spatially and temporally proximal results. If the 2023 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 2023 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 July 2014. 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 six wells (04-SS, 05-SS, 07(R)SS, 11-SS, 13(R)SS, and 15(2R)SS. All remaining sandstone wells are historically dry (01A-SS, 08-SS, 12-SS, and 14-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 2022 groundwater flow). The groundwater flow direction in the sandstone interval is generally to the south/southwest. Shallow monitoring well 14-SH is located on a small topographic high bordered by low marshy land to the north and a small ephemeral stream to the east and south. If the horizontal hydraulic conductivity is higher than the vertical hydraulic conductivity, then the groundwater may be draining into these low-lying areas resulting in a consistently dry intermediate well (14-IN).

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 0.013 metres per metre (m/m) for the shallow wells and 0.015 m/m for the intermediate wells. The horizontal gradient in the sandstone interval is typically calculated between the groundwater elevations recorded in the corresponding wells at the locations 07 and 11, with a result of 0.0057 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 – 0.11 m/yr
- Intermediate till – 0.018 m/yr
- Sandstone – 15.56 m/yr

### 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**). 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 27 to 29, 2023. The historical field parameter measurements are reported in **Table 4.2** (**Appendix D**); the 2023 field parameter measurements are reported in **Table 3.2** (**Appendix D**) and are summarized below:

<u>Shallow Wells</u>

- Field pH ranged from 5.48 (01A-SH) to 7.81 (17-SH) with a geometric mean of 6.99
- The temperature ranged from 6.70°C (04-SH) to 12.20°C (08-SH) with a geometric mean of 9.09°C
- EC ranged from 189 µS /cm (01A-SH) to 1439 µS/cm (07-SH) with a geometric mean of 766 µS/cm

<u>Intermediate Wells</u>

- Field pH ranged from 6.80 (11-IN) to 7.43 (03-IN) with a geometric mean of 7.15
- The temperature ranged from 5.70°C (04-IN) to 11.00°C (08-IN) with a geometric mean of 8.23°C
- EC ranged from 685 µS /cm (12-IN) to 1183 µS /cm (05-IN) with a geometric mean of 809 µS /cm

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

Sandstone Wells

- Field pH ranged from 7.24 (89-3) to 7.56 (05-SS) with a geometric mean of 7.44.
- The temperature ranged from 5.70°C (05-SS) to 17.70°C (89-3) with a geometric mean of 6.27°C. The high temperature from 89-3 was not used in the calculation of the geometric mean.
- EC ranged from 378 µS/cm (89-3) to 743 µS/cm (07(R)SS) with a geometric mean of 499 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 2023 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** Dioxins and Furans
**Table 3.9** QA/QC Results

Historical analytical results (1985 to 2023) 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 2023 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 II Guidelines at each monitoring well in 2023. **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 II 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)

RPD values for manganese exceeded the applicable alert criteria and the difference exceeded 2x the LRL for chromium and copper in 05-SH (duplicate 25-SH). Iron exceeded the applicable alert criteria and the difference exceeded 2x the LRL for arsenic in 05-SS (duplicate 25-SS). Despite these exceedances, results from the groundwater monitoring wells do not exceed the performance guidelines and concentrations are consistent with historical results, so this does not impact the conclusion of this report.

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 29, 2023 (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 1242, 1254 and 1260 and labelled 51-SH and 52-SH.

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

- 51-SH – Aroclor 1242: 0.0011 mg/L, Aroclor 1254: 0.000996 mg/L, Aroclor 1260: 0.000997 mg/L
- 52-SH – Aroclor 1242: 0.000962 mg/L, Aroclor 1254: 0.000879 mg/L, Aroclor 1260: 0.000945 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 2023 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 that resulted in a change in the 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 |
|---|---|---|---|
| 06-SH | Manganese | Increasing | Not Significant |

“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 RockWorks17 (RockWare, 2019).

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. 01A-SH has a low bicarbonate (79.3 mg/L) and sulfate (0.66) concentration and 07-SH has a high chloride concentration (208 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 181 mg/L in 11-IN). **Figure 15.3** (**Appendix A**) shows that the groundwater from the four sandstone wells that were sampled (including 89-3) are calcium bicarbonate type.

### 4.3.4 Specific Parameters

#### 4.3.4.1 pH

All pH results for 2023 were within the guideline apart from 01A-SH with a value of 5.48 and 08-SH with a value of 6.45. Since 2018, pH results for 01A-SH have been below the Tier II Potable Water guideline of 6.5 to 8.5. The pH time series graph for 01-SH (active from 1985 to 1992) and 01A-SH (active from 1993 to present) 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 have been more variable and periodically less than the 6.5 guideline. The Mann-Kendall trend analysis conducted on the combined 01-SH [Decommissioned] and 01A-SH data shows a decreasing trend for pH. The Mann-Kendall trend for pH in 01-IN [Decommissioned] and 01A-IN is also decreasing (2023 pH is 6.86) while all other monitoring wells have increasing or not significant trends. Prior to the 2023 event, historical pH results for 08-SH have all been within the guideline of 6.5 to 8.5. The well shows an increasing trend for pH. 2024 results will be examined to determine if this drop in pH remains.

#### 4.3.4.2 Total Dissolved Solids (TDS)

The 2023 TDS concentration exceeded the Alberta Tier II Potable Guideline (500 mg/L) in:

- Five shallow monitoring wells (03-SH, 05-SH, 07-SH, 11-SH and 13-SH)
  - Concentrations ranged between 560 mg/L (03-SH) and 709 mg/L (07-SH)
- Three intermediate monitoring wells (03-IN, 05-IN and 11-IN)
  - Concentrations ranged between 540 mg/L (03-IN) and 709 mg/L (11-IN)

The 2023 TDS concentration exceeded the Alberta Tier II Aquatic Life Guideline (500 mg/L) in:

- One intermediate well (08-IN)
  - Concentration is 526 mg/L

The TDS concentrations in the shallow and intermediate wells are typical of groundwater from till deposits as till consists primarily of clay and silt sized sediment. 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.

#### 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 II Potable Guideline (0.3 mg/L) in 2023. 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 |
|---|---|---|---|
| 01A-SH | Adjacent to the ERT Fire Training Pad and the Process Make-Up Pond and South Pond | 1.58 | Not Significant |
| 01A-IN | Adjacent to the ERT Fire Training Pad and the Process Make-Up Pond and South Pond | 0.50 | Not Significant |

The 2023 iron concentrations ranged from below the detection limit to 1.58 mg/L (01A-SH). The 2023 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.

#### 4.3.4.4 Dissolved Manganese

The 2023 dissolved manganese concentration exceeded the Alberta Tier II Potable Guideline for Commercial/Industrial Land Use (0.02 mg/L) in all of the monitoring wells except 03-IN, 04-SH, 05-SH, 13-IN, 14-SH, 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 II 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 2023 had concentrations below the applicable Tier 2 guideline.

#### 4.3.4.6 Petroleum Hydrocarbons (BTEX, F1)

**Table 3.5** (**Appendix D**) shows that all groundwater samples in 2023 had concentrations below the laboratory detection limit.

#### 4.3.4.7 Polychlorinated Biphenyls Aroclors

**Table 3.6** (**Appendix D**) shows that all groundwater samples in 2023 had a total PCB concentration below the detection limit (0.000010 mg/L) and Alberta Tier II 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

All groundwater samples tested for adsorbable organic halogens (AOX) in 2023 had concentrations below the detection limit (0.020 mg/L), with the exception of 13-SH, with a concentration of 0.062 mg/L. This is the first time a concentration above detection has been recorded. Future sampling events will be examined to determine if exceedances remain.

#### 4.3.4.9 Dioxin and Furan

In the wells tested, the majority of dioxin and furan concentrations in 2023 were below the various detection limits. All Total Toxic Equivalent (TEQ) values are under the AEP Tier 1 guideline of 120 pg/L for all sampling locations.

### 4.3.5 Other Significant Trends

#### 4.3.5.1 Chloride

The chloride concentration for monitoring wells 01A-SH, 05-SH, 07-SH, 08-SH, 13-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 II Potable Groundwater Guideline for Commercial/Industrial Land Use (250 mg/L) both in 2023 and historically. Monitoring well 07-SH has a 2023 chloride concentration that is elevated (two orders of magnitude) above the other wells (208 mg/L).

The 2023 chloride concentration for 07-IN was above the laboratory detection limit of 0.50 mg/L with a concentration of 0.84 mg/L and has historically been low or below the detection limit (**Figure 12.14, Appendix A**). Monitoring location 07 is located on the northeast side of the Site, proximal and topographically below the 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 be a result of 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 with values of 12.2 mg/L, 21.8 mg/L, 18.5 mg/L,14.7 mg/L, 9.75 mg/L, 6.38 mg/L, 6.17 mg/L and 6.46 mg/L in 2015, 2016, 2017, 2018, 2019, 2020, 2021 and 2022 respectively. In 2023, the chloride concentration was 9.42 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 2023 are:

- 01A-SH – 53.1 mg/L
- 01A-IN – 23.5 mg/L

The TOC concentration in 01-SH/01A-SH and 01-IN/01A-IN had an increase in 1993 (**Figure 12.1 and 12.2, Appendix A)**. This timing was also coincident with sampling at 01A-SH and 01A-IN instead of the corresponding decommissioned monitoring wells (01-SH and 01-IN; **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 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 6.1 and 6.2** (**Appendix A**) show that monitoring well location 01 and 01A are located in approximately the same east-west location; however, 01A is located south of 01. The decommissioning of 01 coincides with the construction of the F.B. & D. Kiln Facility.

The 2023 and the historical results at 01-SH/01A-SH show:

- A TDS concentration (2023 – 178 mg/L) that is significantly lower than the typical TDS for the shallow wells on the Site, and a decreasing Mann Kendall trend (**Table 7.2, Appendix D;** and **Appendix G**)
- Elevated TOC and DOC concentrations in 01A-SH since 1993 (**Figure 12.1, Appendix A**)
- A sulphur odour and white flakes observed during purging and sampling operations
- A pH of 5.48 in 2023, with a decreasing pH trend (**Table 7.2, Appendix D;** and **Appendix G**)
- Elevated iron concentration (1.58 mg/L in 2023), with a trend that is not significant (**Table 7.2, Appendix D;** and **Appendix G**)

Similarly, the results for 01A-IN show:

- A more typical TDS concentration (483 mg/L in 2023), 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 (8.23), with a decreasing trend (**Table 7.2, Appendix D;** and **Appendix G**)
- An elevated iron concentration (0.50 mg/L in 2023), 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 6.1, 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 these wells. 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 source of the elevated TOC and DOC concentrations in both 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). It is noted that no petroleum hydrocarbons or PCBs were detected in these wells.

A sulphur odour was observed while purging and sampling 01A-SH from 2013 to 2023. 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.

### 4.4.2 Dissolved Iron

Elevated iron concentrations were observed at seven of the groundwater monitoring wells in 2018 and 2021, 11 in both 2019 and 2020 and 5 wells in 2022. In 2023, elevated iron concentrations were noted for two groundwater wells (**Section 4.3.4.3**). The highest iron concentrations in 2023 were observed in 01A-SH (1.58 mg/L) and 01A-IN (0.50 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.

# 5. Conclusions

The 2023 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 2023 therefore the groundwater at the Site is not impacted by petroleum hydrocarbons.
- PCB Aroclor and total PCB concentrations were below the laboratory detection limit for all wells sampled in 2023, therefore the groundwater at the Site is not impacted by PCB.
- Nine of the wells completed in the till interval (shallow and intermediate wells) have TDS concentrations above the Alberta Tier II 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 II Potable Groundwater Guideline were observed in all monitoring wells except 03-IN, 04-SH, 05-SH, 08-SH, 08-IN, 13-IN, 14-SH, 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 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, 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 01A-SH, and 07-SH. Monitoring well 07-SH is located in a low-lying area adjacent to a road and parking lot while 01A-SH is located on the plant site. 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.
- MW-01A:
    - The TDS and major ion groundwater chemistry of 01A-SH and 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 indicates the presence of sulphur reducing bacteria that is confirmed by the results of the SRB test conducted in 2015.

# 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 2023 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.
- 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. It is recommended to begin replacing the historically dry sandstone wells along the western edge of the Site to assess background groundwater conditions. If the down-gradient sandstone wells show increasing trends in parameters indicative of groundwater contamination in the future, the up-gradient wells will be important in determining if the source of the contamination is the Swan Hills Treatment Centre or oil and gas activity up-gradient of the plant site.
- Replace damaged and compromised wells 04-IN, 14-SH, 14-IN when replacing the dry sandstone wells.
- Review of road salt use at and around the treatment center and alternative measures implemented in 2024 to address chloride increases at selected locations.
- Remove brush/vegetation as needed around nested wells to allow for ease of access and improved mobility around the monitoring wells.
- Alberta Environment and Parks 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. Once the three years of data is collected, the monitoring frequency can be adjusted based on the results.
- Conduct groundwater monitoring in the fall of 2024 with the sampling event performed a minimum of one week after the purging event to allow monitoring wells to sufficiently recover.

# 7. References

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Worley Parsons (March 2013): 2012 Groundwater, Surface Water, Sediment and Fish Tissue Monitoring – Swan Hills Treatment Centre.

# Appendix A

## Figures

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Checked: ____
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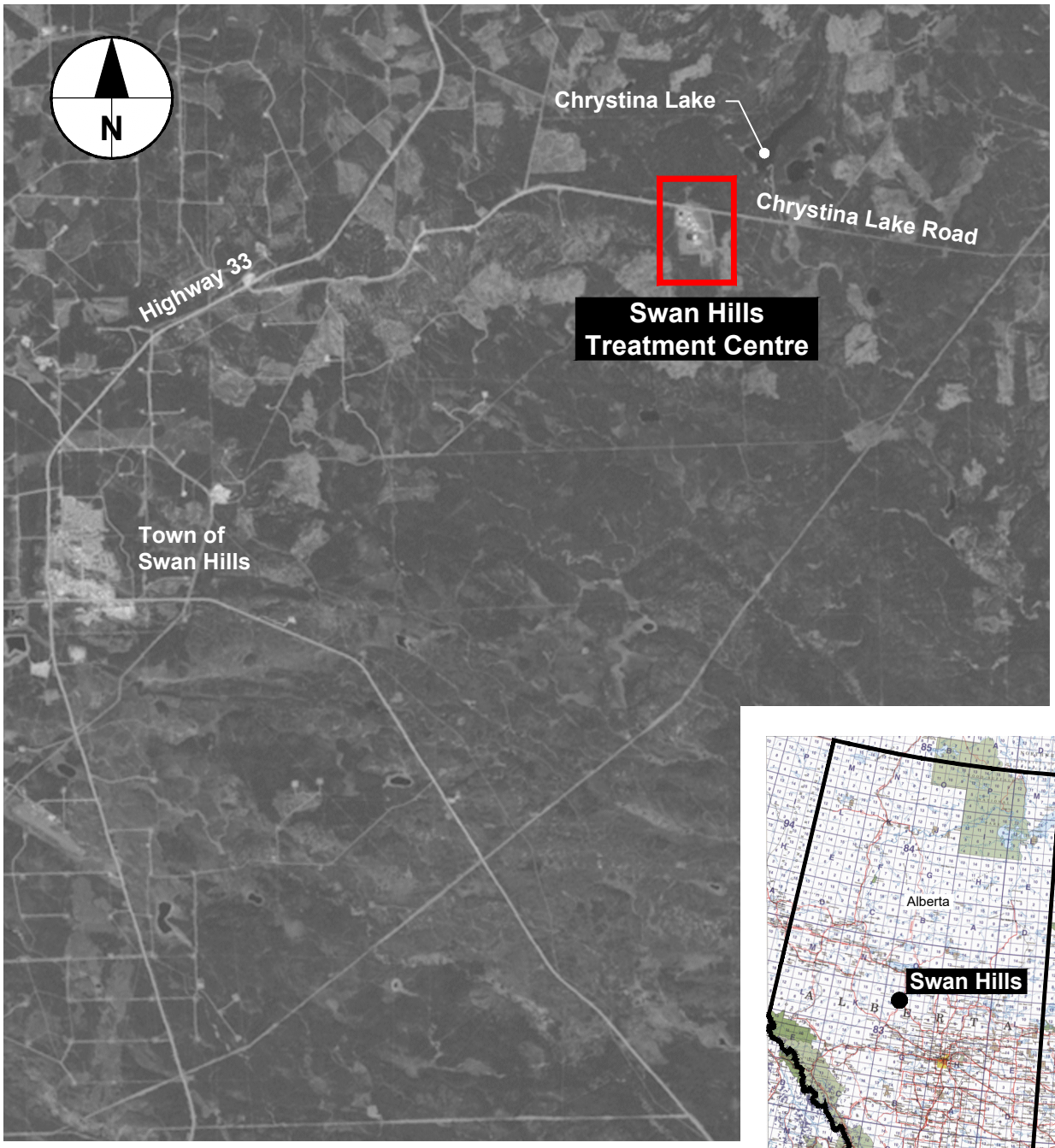


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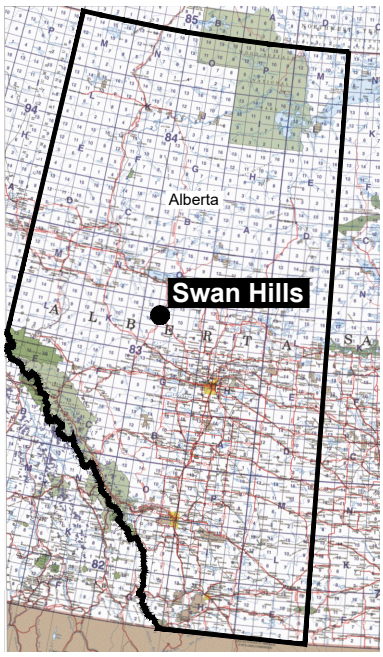


IMAGE SOURCE: Natural Resources Canada

0 3125 6250 m

1:125000

## KEY PLAN

Scale NTS

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Site Location**

AECOM

**Figure 1.0**

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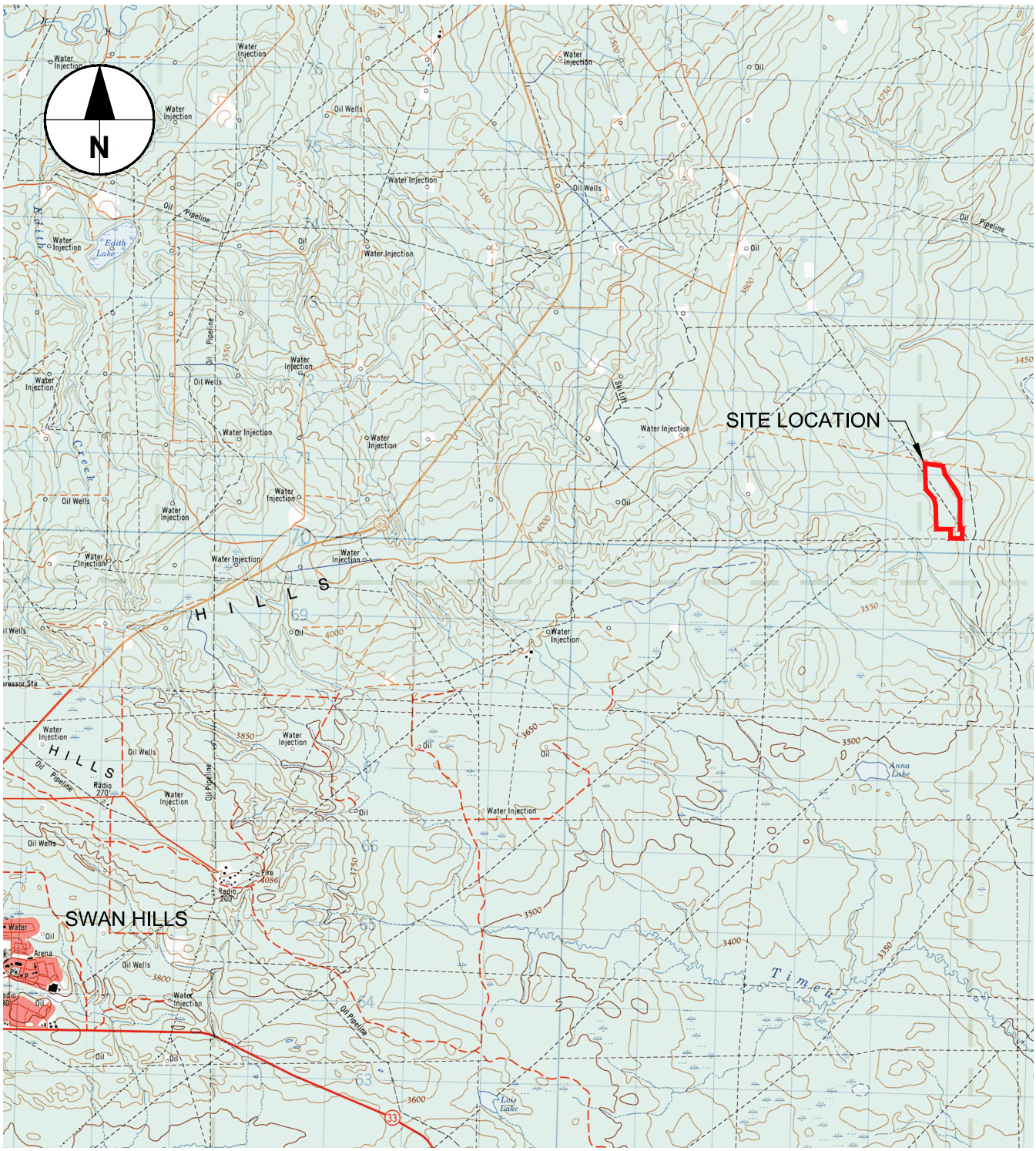


**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Topography**

AECOM

**Figure 2.0**

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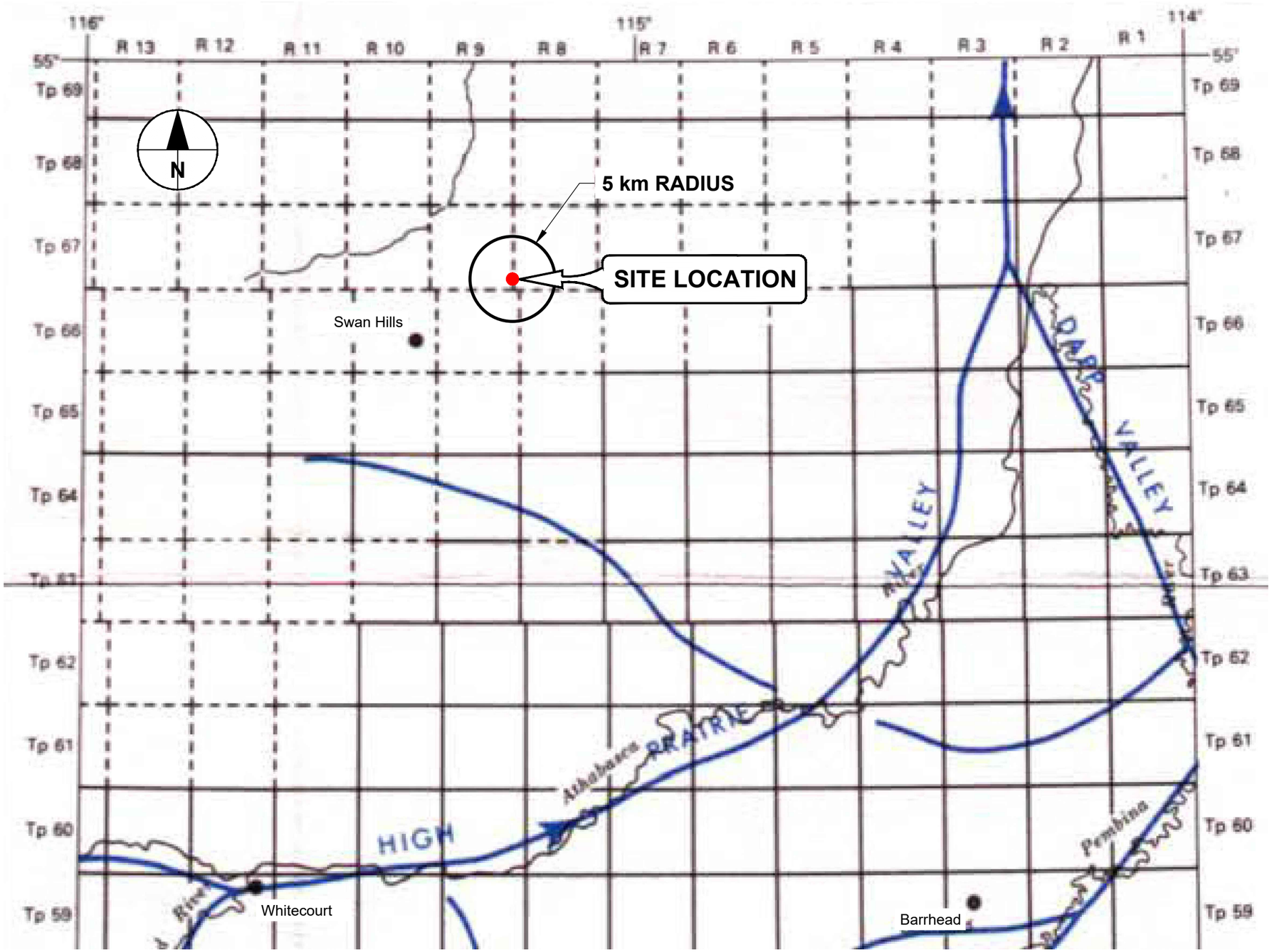


SOURCE:
Alberta Geological Survey (Map 063)

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Buried Bedrock Valleys**

AECOM

**Figure 3.0**

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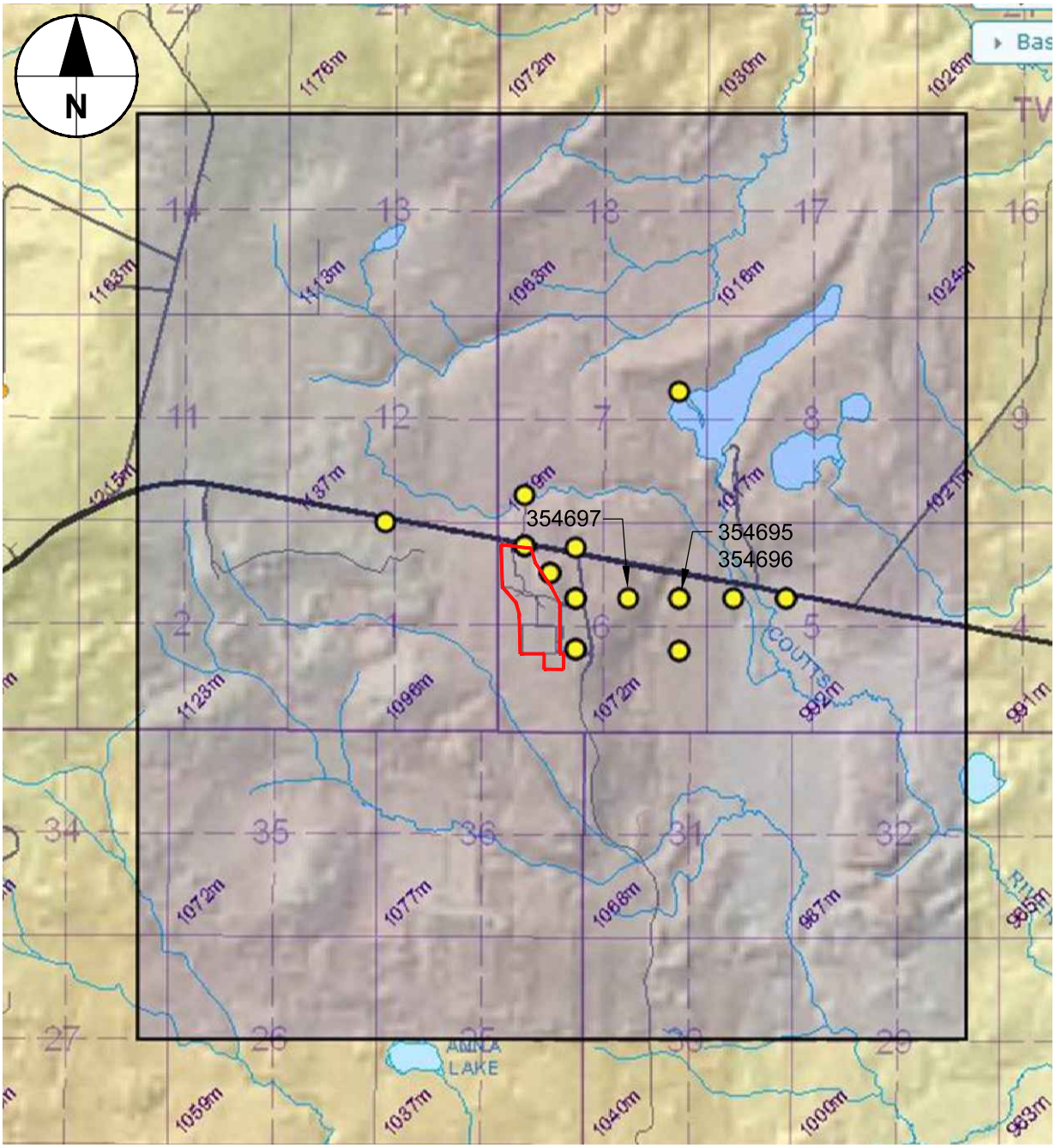


LEGEND:

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**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Historical Groundwater Users**

AECOM

**Figure 4.0**

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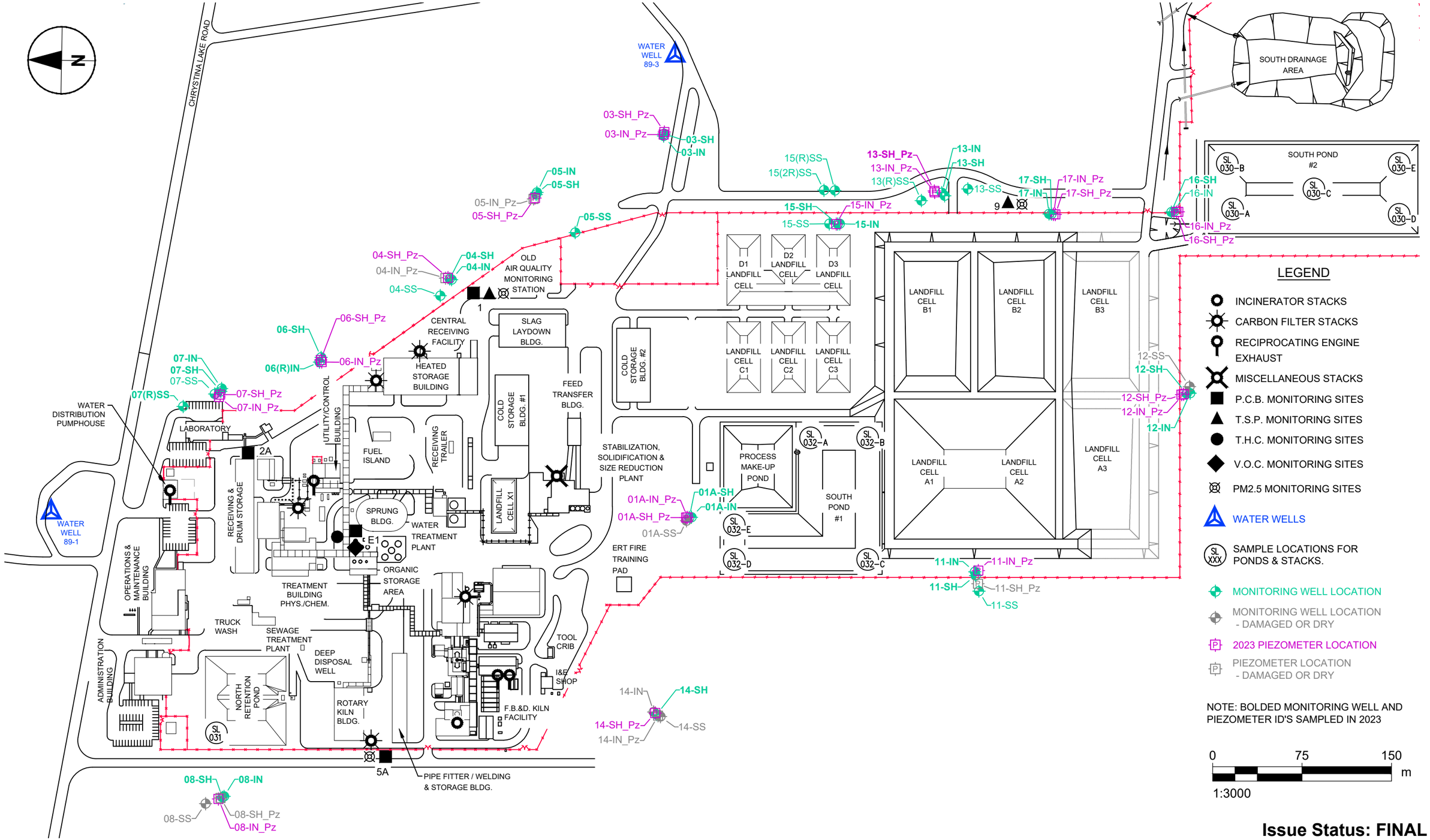


## LEGEND

- 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
- SAMPLE LOCATIONS FOR PONDS & STACKS.
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION - DAMAGED OR DRY
- 2023 PIEZOMETER LOCATION
- PIEZOMETER LOCATION - DAMAGED OR DRY

NOTE: BOLDED MONITORING WELL AND PIEZOMETER ID'S SAMPLED IN 2023

0 75 150 m

1:3000

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Groundwater Monitoring Well Locations**

AECOM

**Figure 5.1**

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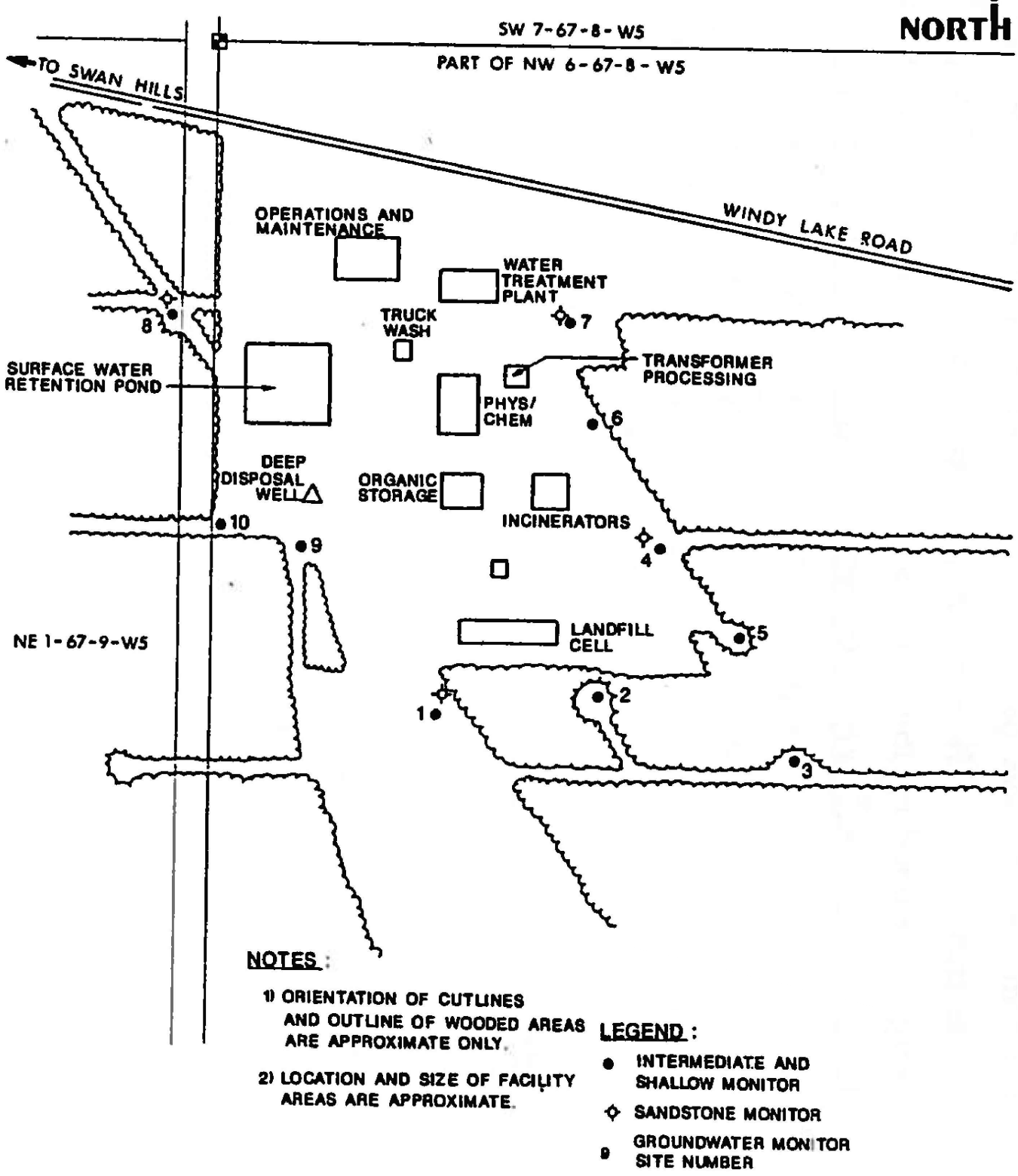


NOTE: MODIFIED FROM STANLEY (1987)

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**1987 Groundwater Monitoring Well Locations**

AECOM

**Figure 5.2**

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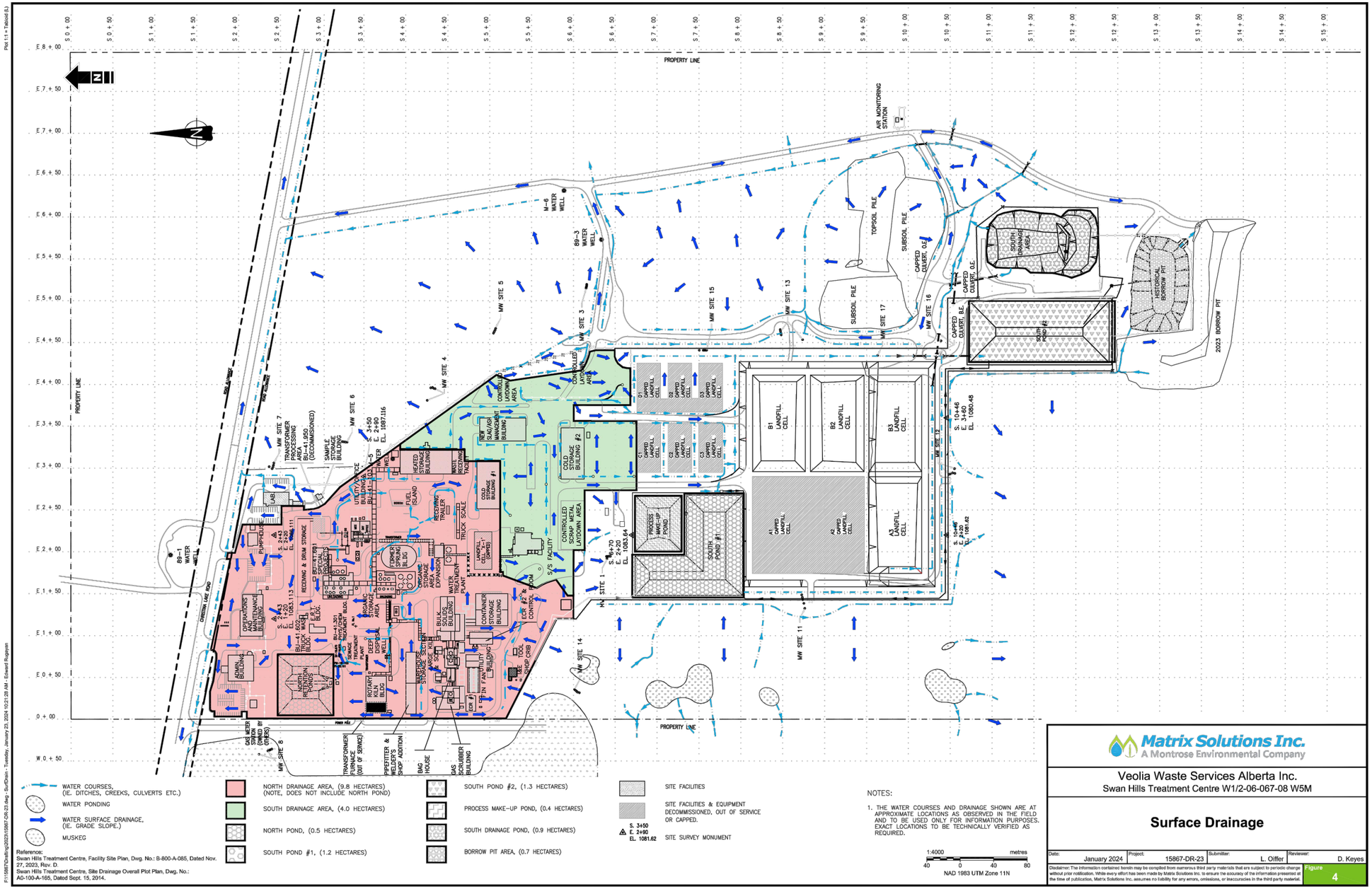


SOURCE:
Drawing No.: A0-100-A-165 - Site Drainage Overall Plot Plan. Swan Hills Treatment Centre General Site, Swan Hills Treatment Centre, September 15, 2014.

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Surface Water Drainage Patterns**

AECOM

**Figure 6.0**

ANSI B 279.4mm x 431.8mm
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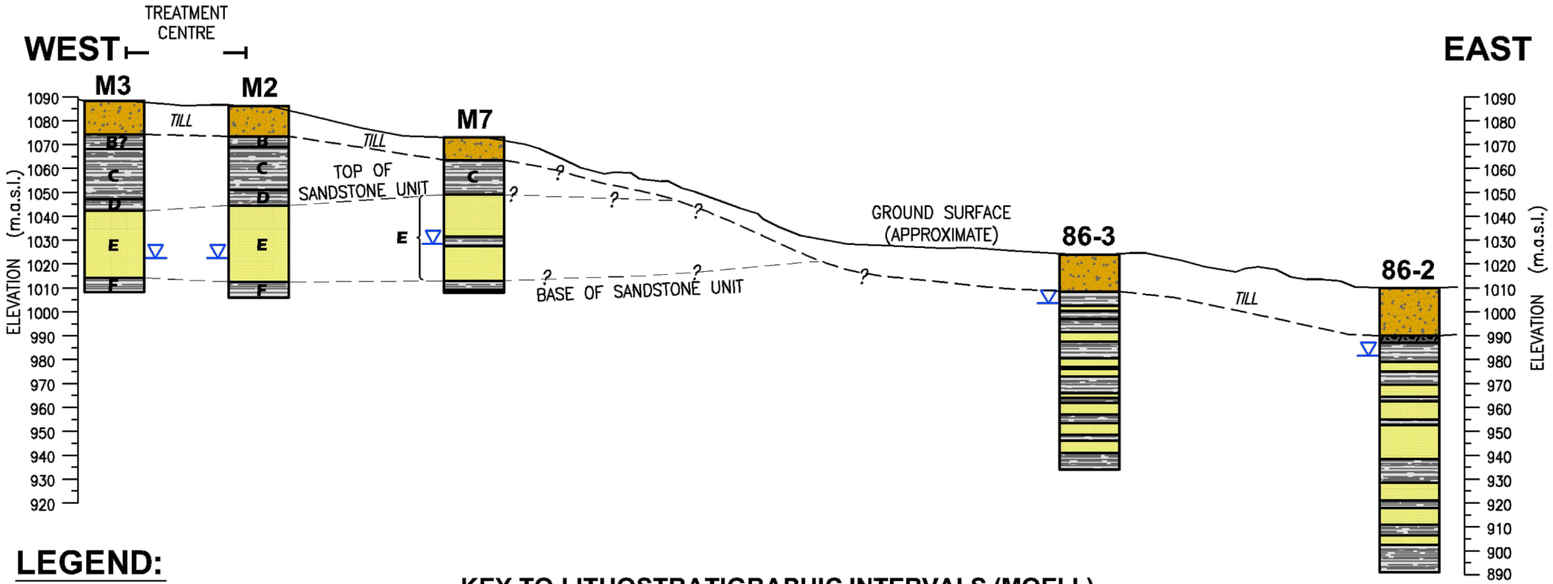


## LEGEND:

- 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**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Geologic Cross-Section**

AECOM

**Figure 6.1**

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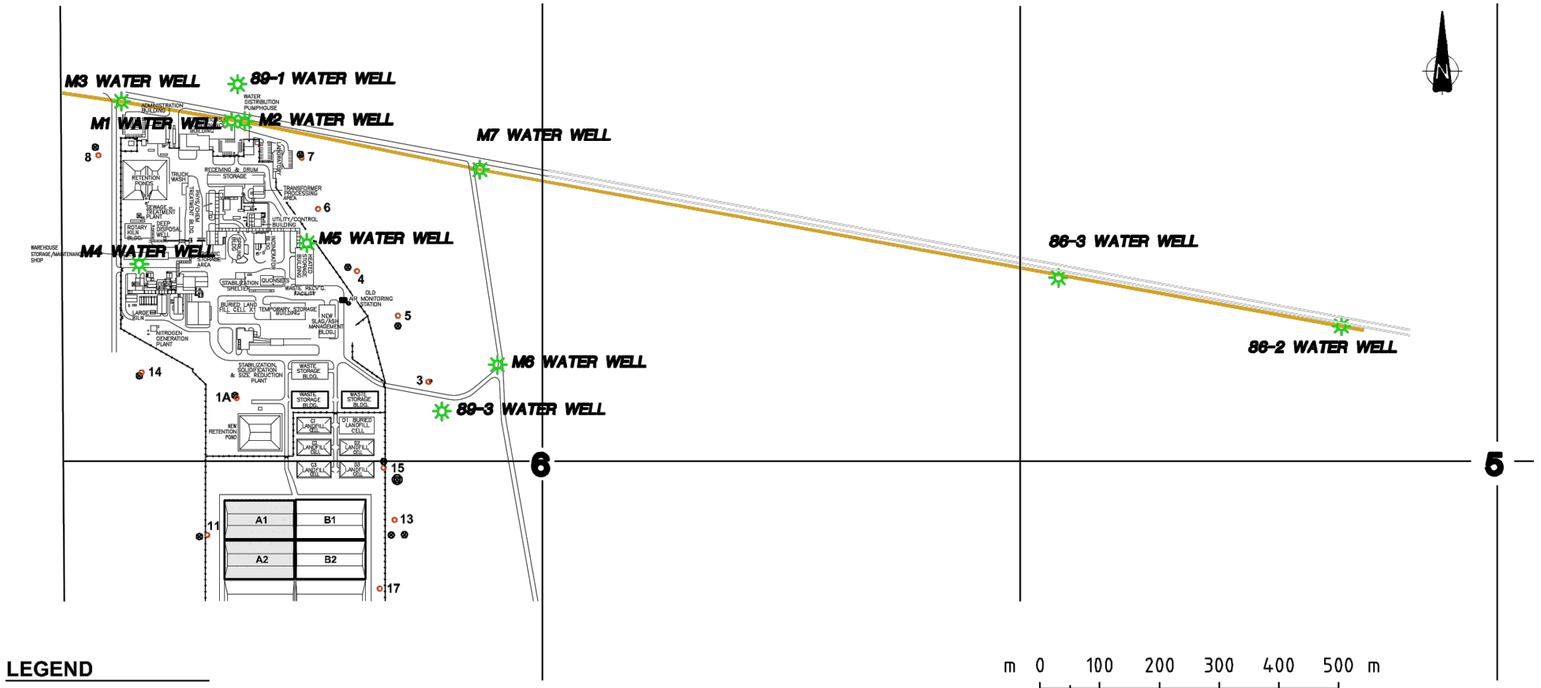


## LEGEND

- 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.

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Cross-Section Location**

AECOM

**Figure 6.2**

Last saved by: SERBIND (2024-03-18) Last Plotted: 2024-03-19
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Project Management Initials: Designer: _____ Checked: _____ Approved: _____ ANSI B 279.4mm x 431.8mm

SOURCE:
Figure 3a from Soil Mgmt Program Report 00001744-2023-15867-503 SMaP R 2024-02-27 draft V0.1

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Borehole Locations**
**Process Area**

AECOM

**Figure 6.3**

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

Last saved by: SERBIND(2024-03-18) Last Plotted: 2024-03-19
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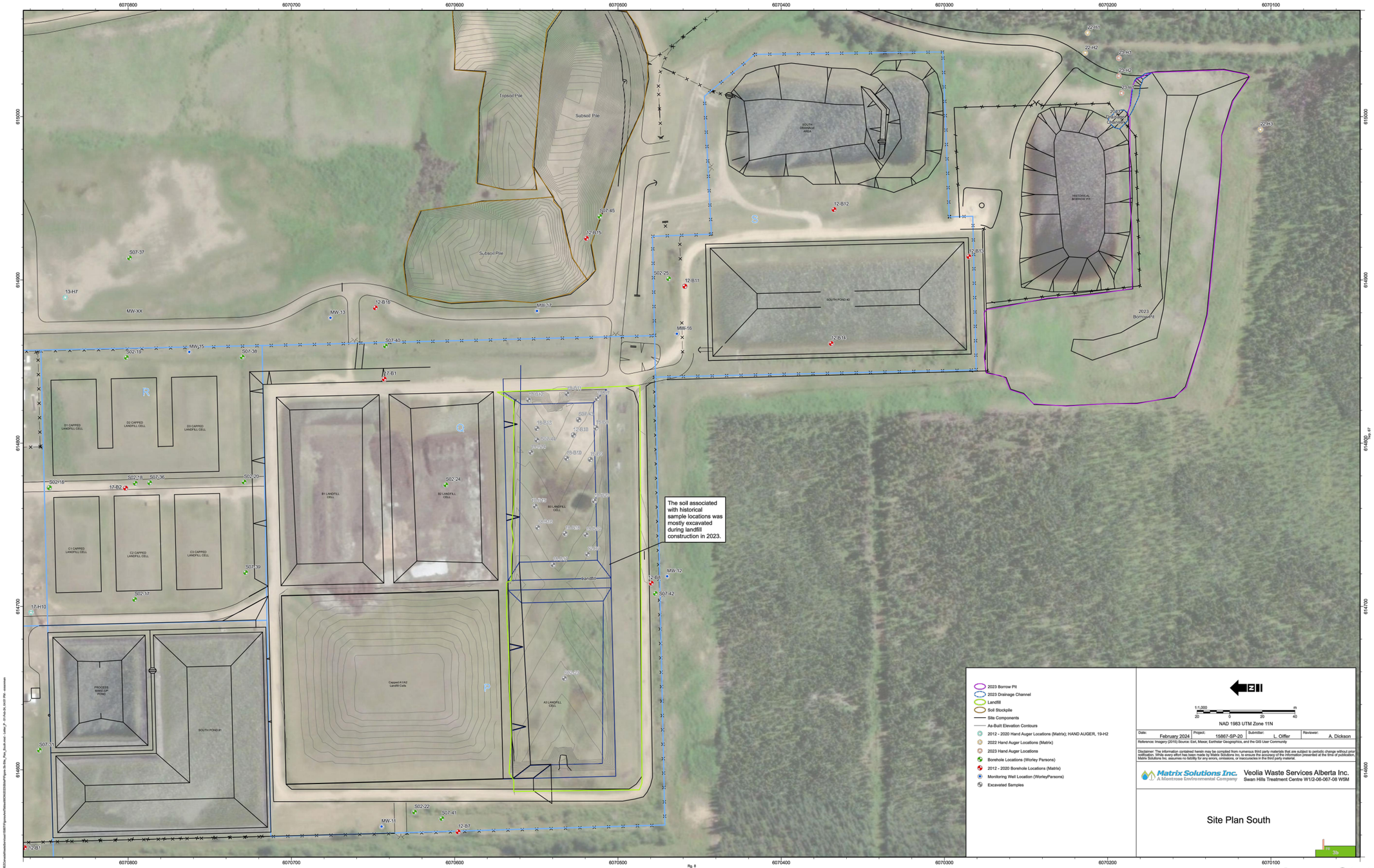


SOURCE:
Figure 3b from Soil Mgmt Program Report 00001744-2023-15867-503 SMaP R 2024-02-27 draft V0.1

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Borehole Locations**
**South Area**

AECOM

**Figure 6.4**

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm
Last saved by: SERBIND(2024-03-18) Last Plotted: 2024-03-19
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SOURCE:
Figure 3c from Soil Mgmt Program Report 00001744-2023-15867-503 SMaP R 2024-02-27 draft V0.1

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Soil Sampling Discharge Area**

AECOM

**Figure 6.5**

F:\15867\Drafting\2023\15867-SP-23.dwg - FutureB3-LF_SQ23 - Tuesday, January 30, 2024 12:58:07 PM - Edward Rugayan

Plot 1:1 = Tabloid (P)

2007 Borehole Locations (WorleyParsons)
Shallow Till / Intermediate Monitoring Well Location (WorleyParsons)
Sandstone Monitoring Well Location (WorleyParsons)
2012 Borehole Location (Matrix)
2017 and onwards Borehole Location (Matrix)
2023 Excavation Sample (Base)
2023 Excavation Sample (Wall)
Sample Excavated
Excavation Sample Depth (m)

**Exceedances (Tier 1 Natural Area and Industrial)**

Total PCBs
Total TEQ
Metals
Meets Guideline
*blank* Parameter Not Tested

Exceeds Tier 1 - Natural Land Use Guidelines
Exceeds Tier 1 - Industrial Land Use Guidelines
Exceeds Both Tier 1 - Natural and Industrial Land Use Guidelines

1:500 metres
5 0 5 10
NAD 1983 UTM Zone 11N

Reference: May 28, 2011 aerial photograph obtained from Valtus Imagery Services

Matrix Solutions Inc.
A Montrose Environmental Company

Veolia Waste Services Alberta Inc.
Swan Hills Treatment Centre W1/2-06-067-08 W5M

**2023 Soil Quality**
**A3 and B3 Landfill Cells (Area Q)**

| Date: | Project: | Submitter: | Reviewer: |
|---|---|---|---|
| January 2024 | 15867-SP-23 | L. Oiffer | D. Keyes |

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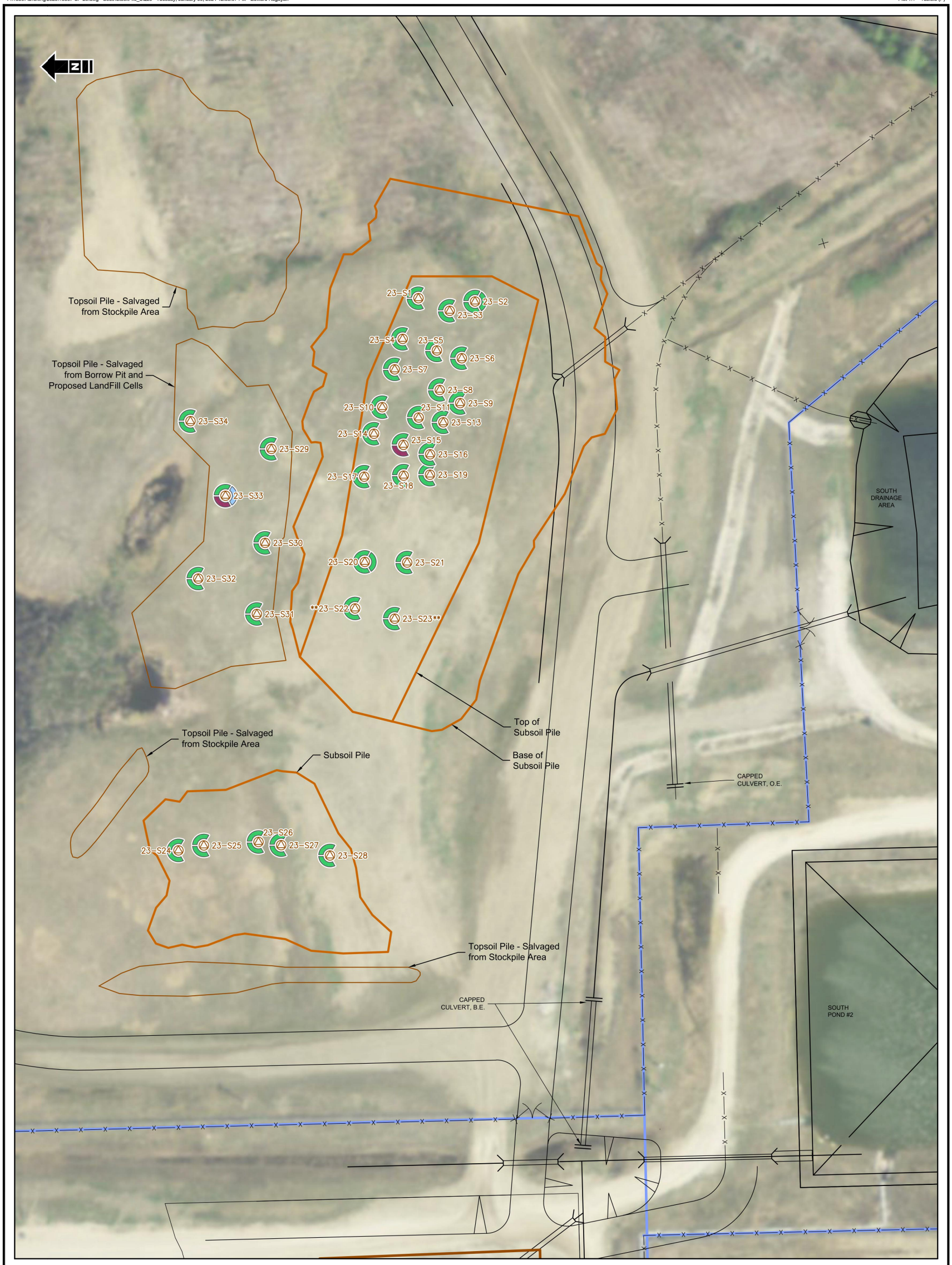
Figure 5a

SOURCE:
Figure 5a from Soil Mgmt Program Report 00001744-2023-15867-503 SMaP R 2024-02-27 draft V0.1

**Issue Status: FINAL**

F:\15867\Drafting\2023\15867-SP-23.dwg - SouthStockPile_SQ23 - Tuesday, January 30, 2024 12:58:07 PM - Edward Rugayan

Plot 1:1 = Tabloid (P)




Stockpile Sample

Approximate Based on Field Sketch

Note:
Stockpile extents depicted as encountered during sampling on June 29, 2023.

**Exceedances (Tier 1 Natural Area and Industrial)**

Total PCBs
Total TEQ
Metals

Meets Guideline

*blank* Parameter Not Tested

Exceeds Tier 1 - Natural Land Use Guidelines

Exceeds Tier 1 - Industrial Land Use Guidelines

Exceeds Both Tier 1 - Natural and Industrial Land Use Guidelines

1:750 metres
7.5 0 7.5 15
NAD 1983 UTM Zone 11N

Reference: May 28, 2011 aerial photograph obtained from Valtus Imagery Services

Matrix Solutions Inc.
A Montrose Environmental Company

Veolia Waste Services Alberta Inc.
Swan Hills Treatment Centre W1/2-06-067-08 W5M

**2023 Soil Quality**
**Soil Stockpiles from A3 and B3 Landfill Cells (Area Q)**

| Date: | Project: | Submitter: | Reviewer: |
|---|---|---|---|
| January 2024 | 15867-SP-23 | L. Oiffer | A. Dickson |

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Figure 5b

SOURCE:
Figure 5b from Soil Mgmt Program Report 00001744-2023-15867-503 SMaP R 2024-02-27 draft V0.1

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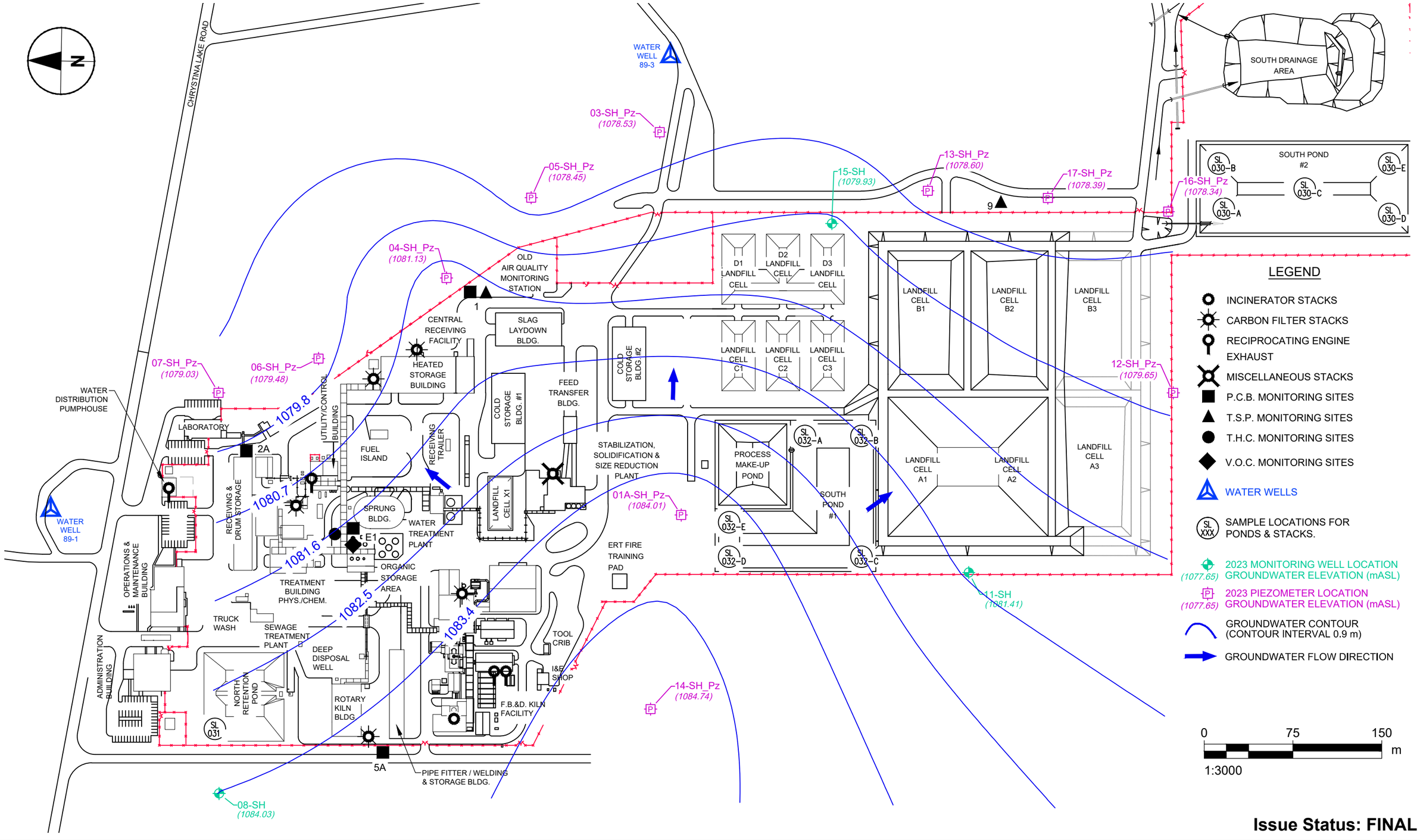


**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**September 2023 Groundwater Flow**
**Shallow Piezometers**

AECOM

**Figure 7.0**

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm
Last saved by: SERBIND(2024-02-27) Last Plotted: 2024-03-19
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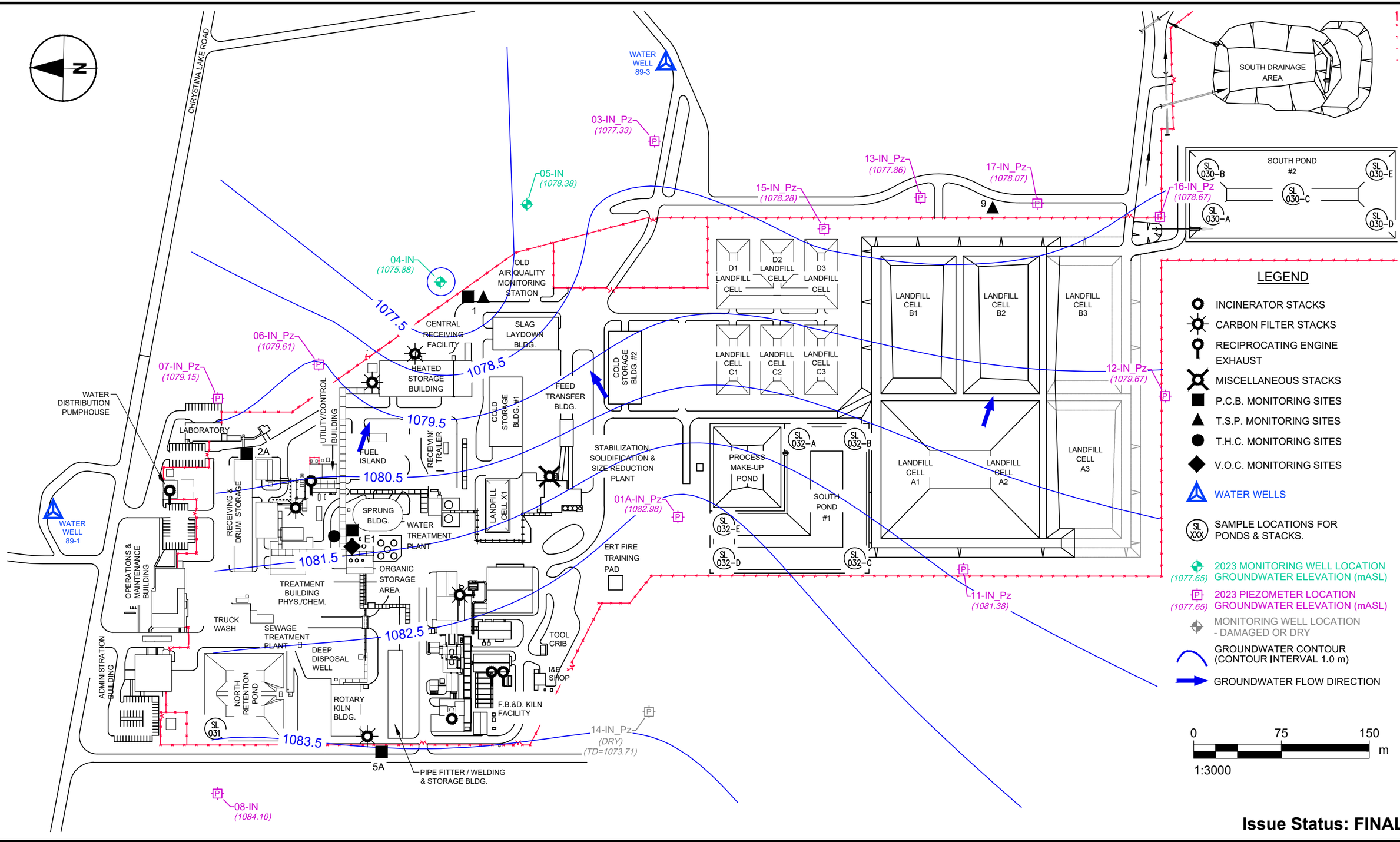


**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**September 2023 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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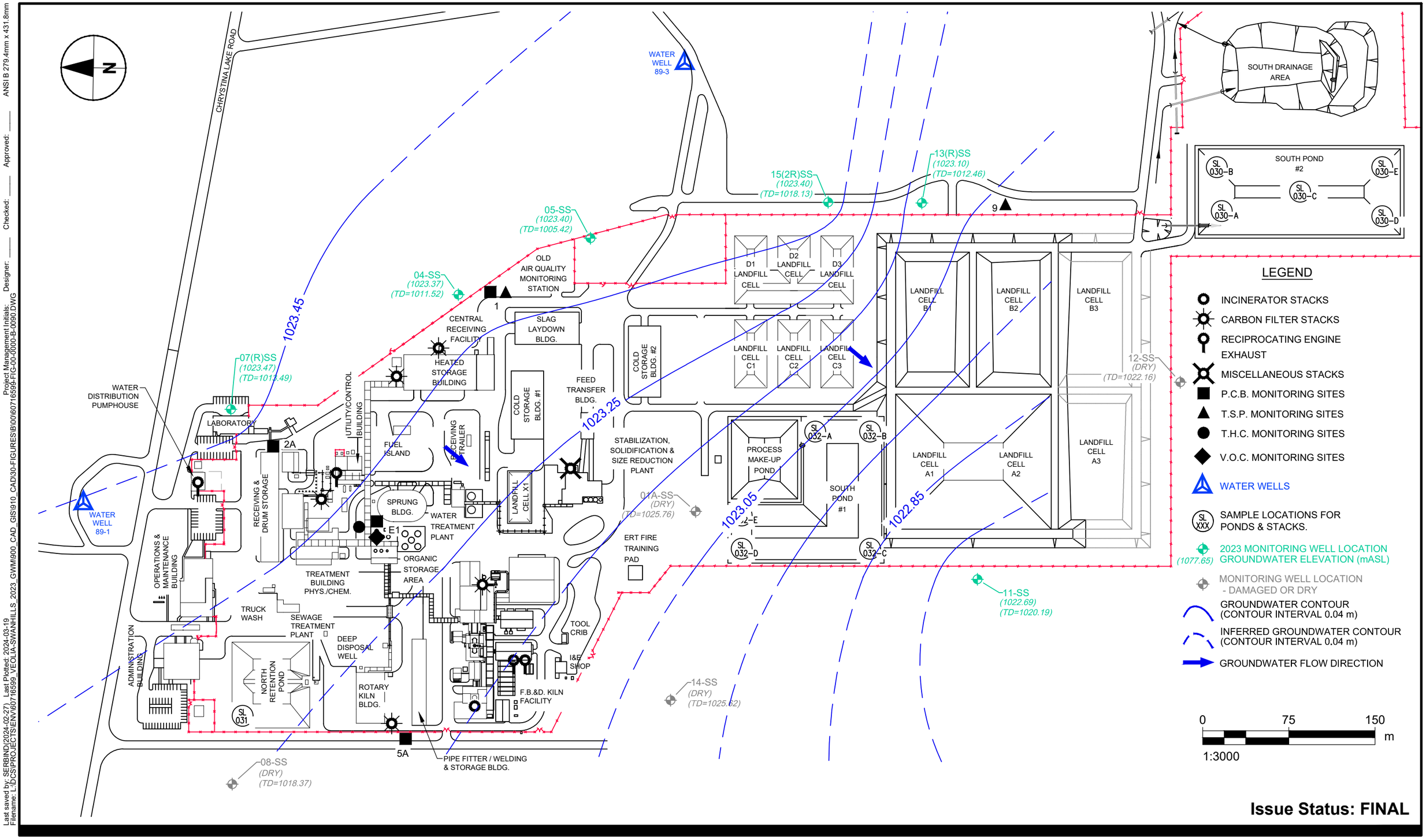



**Issue Status: FINAL**

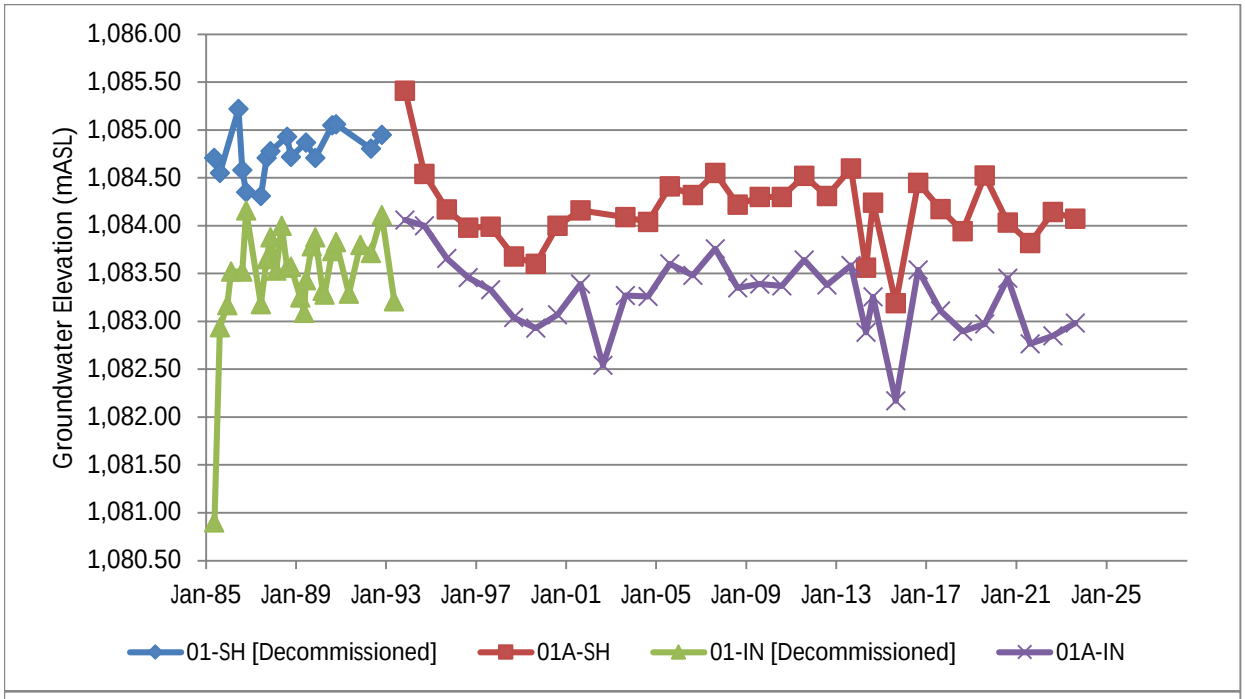
**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-19

**September 2023 Groundwater Flow**
**Sandstone Wells**

AECOM

**Figure 9.0**

**Figure 10.1**
**VEOLIA, Swan Hills Treatment Centre**
**MW-01A Hydrographs**



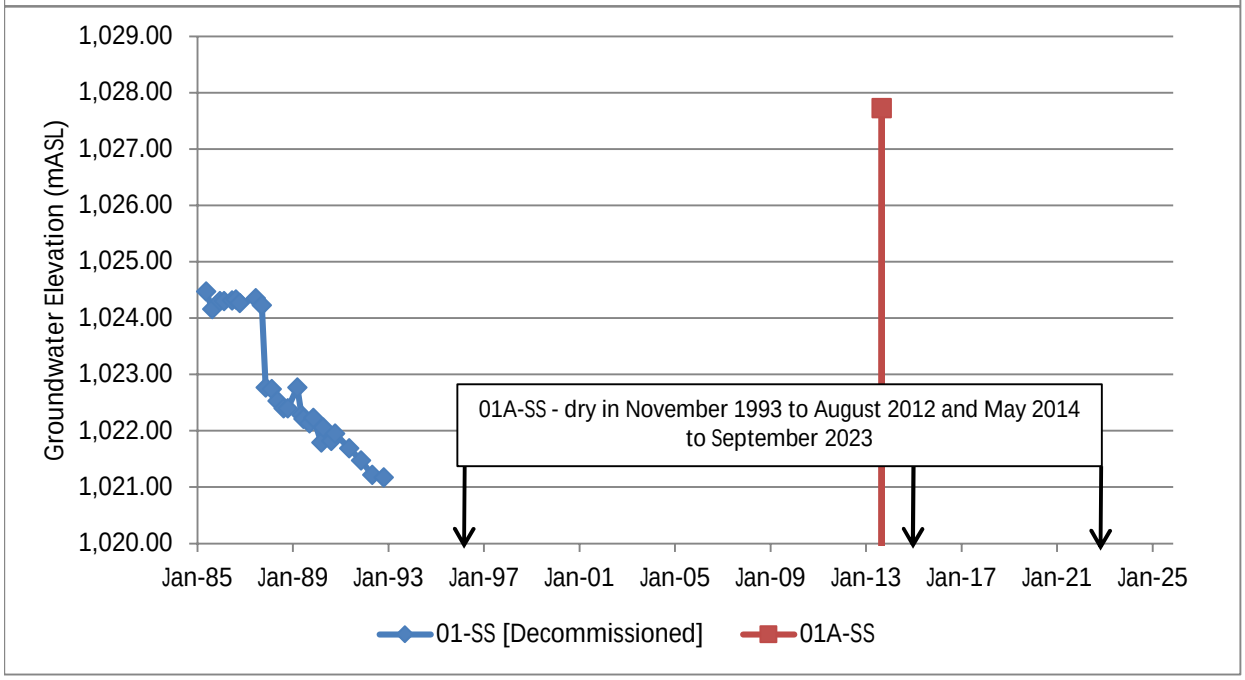



**Figure 10.2**
**VEOLIA, Swan Hills Treatment Centre**
**MW-02 (Decommissioned) Hydrographs**

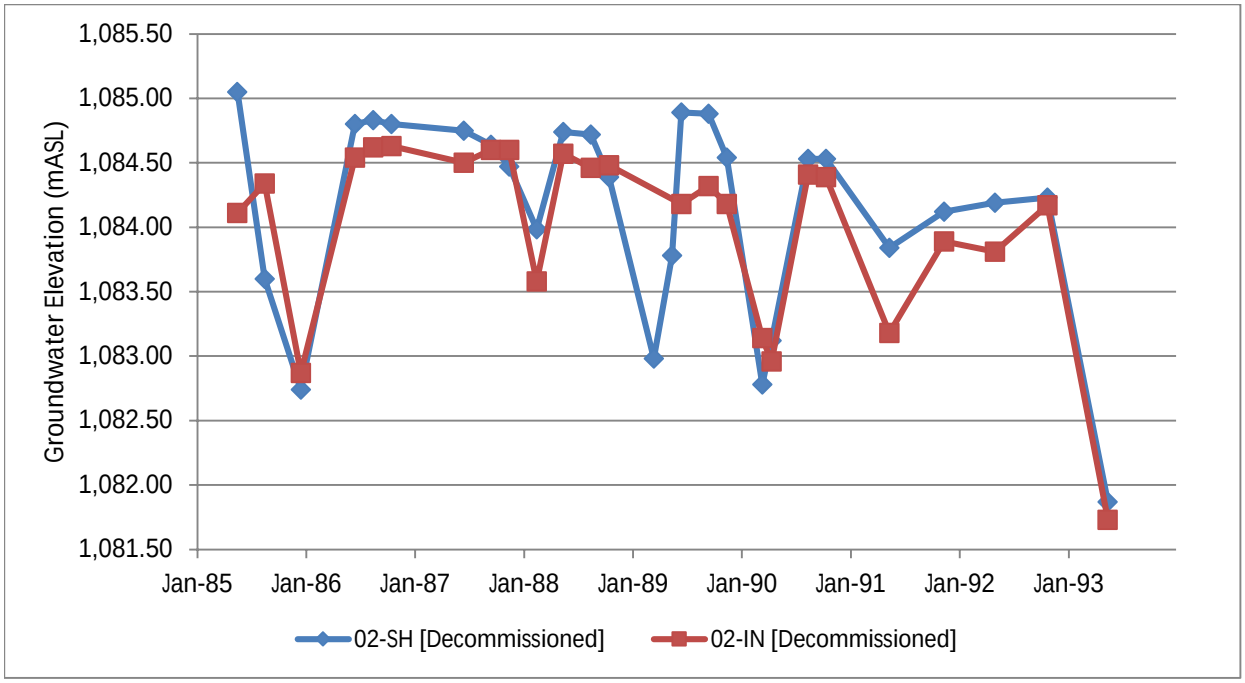


**Figure 10.3**
**VEOLIA, Swan Hills Treatment Centre**
**MW-03 Hydrograph**

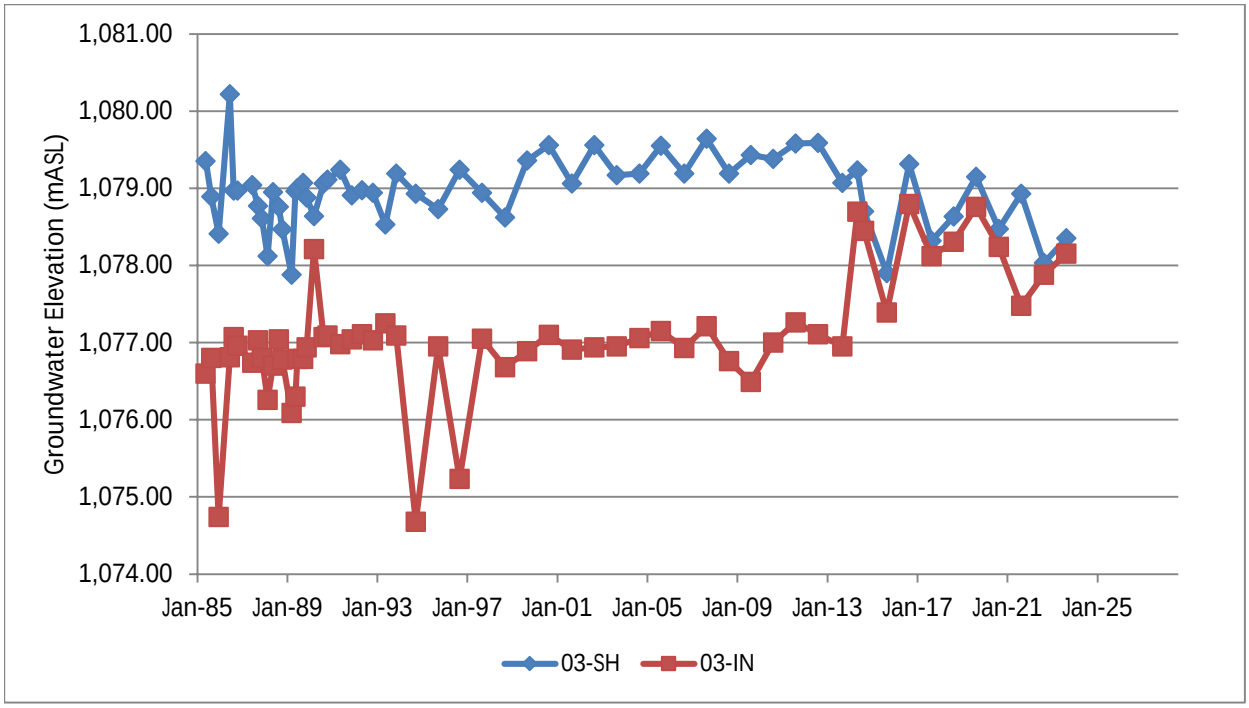


**Figure 10.4**
**VEOLIA, Swan Hills Treatment Centre**
**MW-04 Hydrographs**

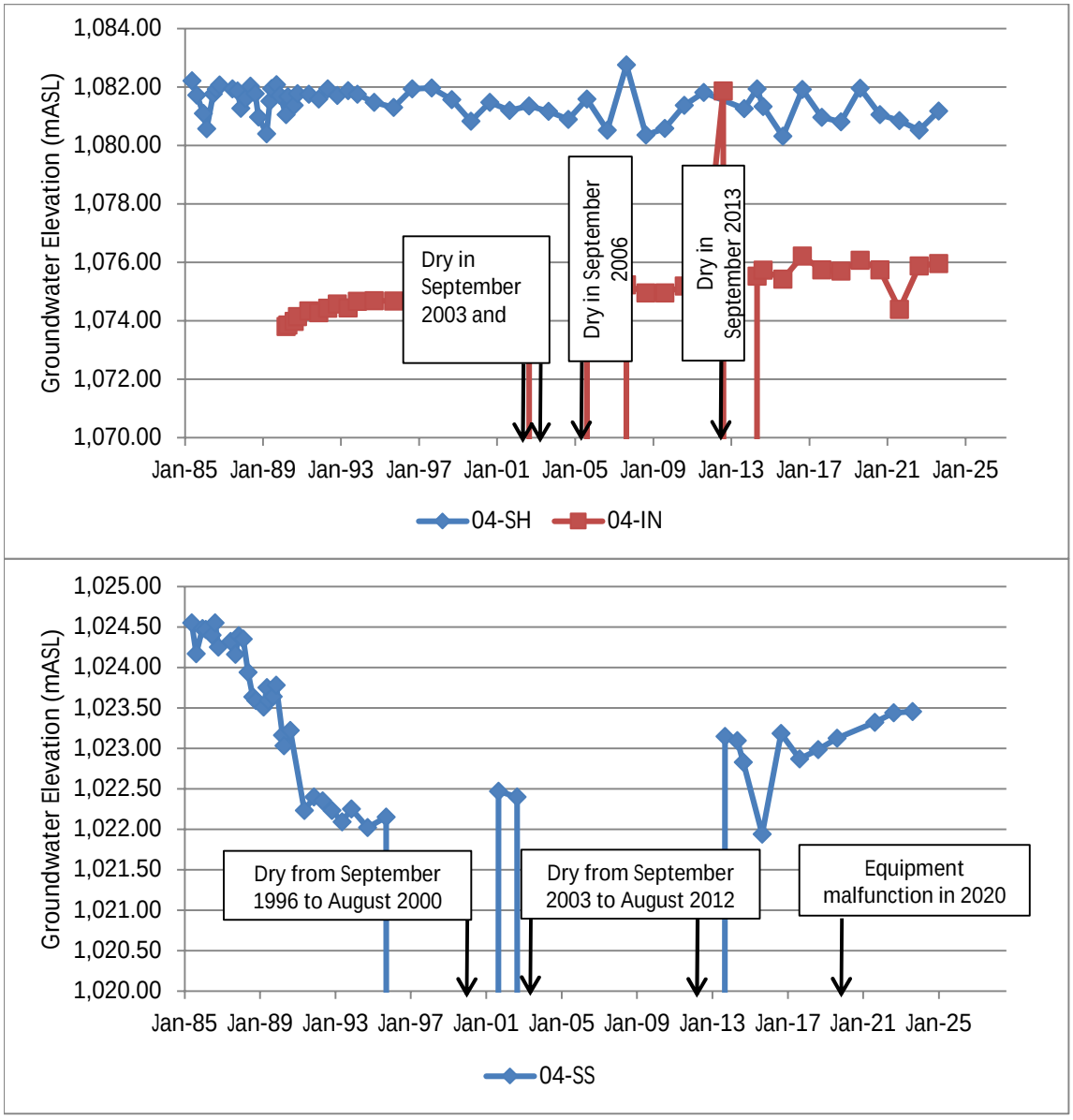
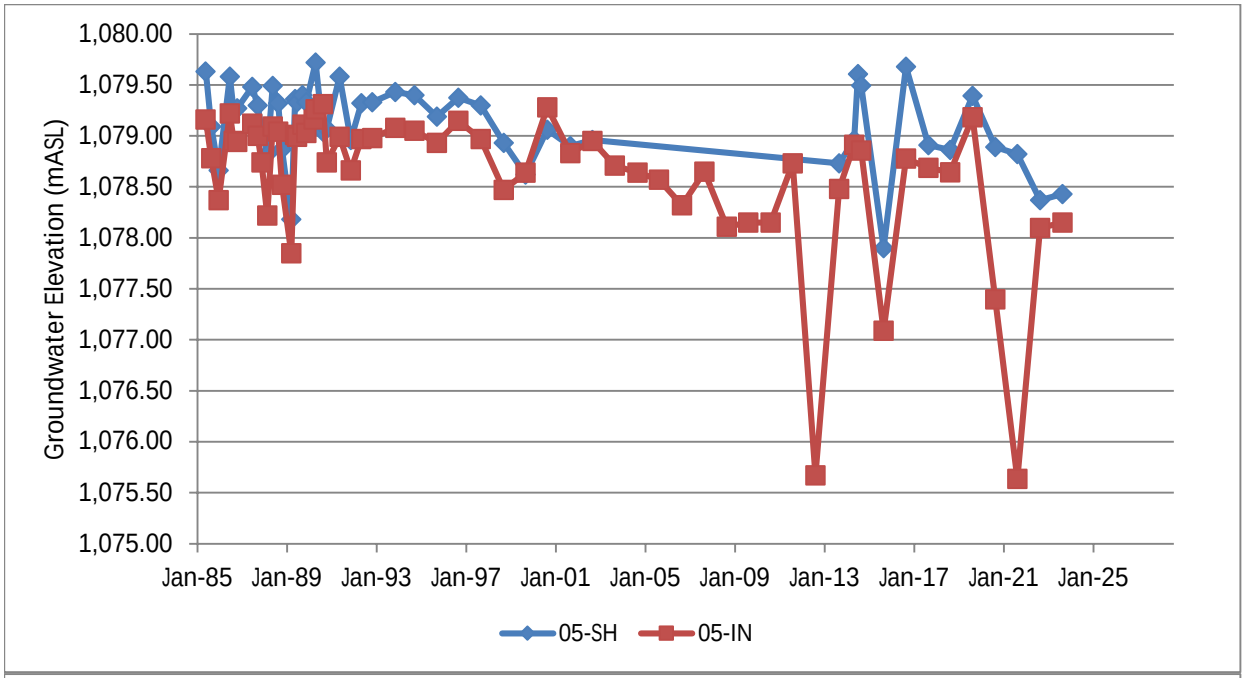


**Figure 10.5**
**VEOLIA, Swan Hills Treatment Centre**
**MW-05 Hydrographs**



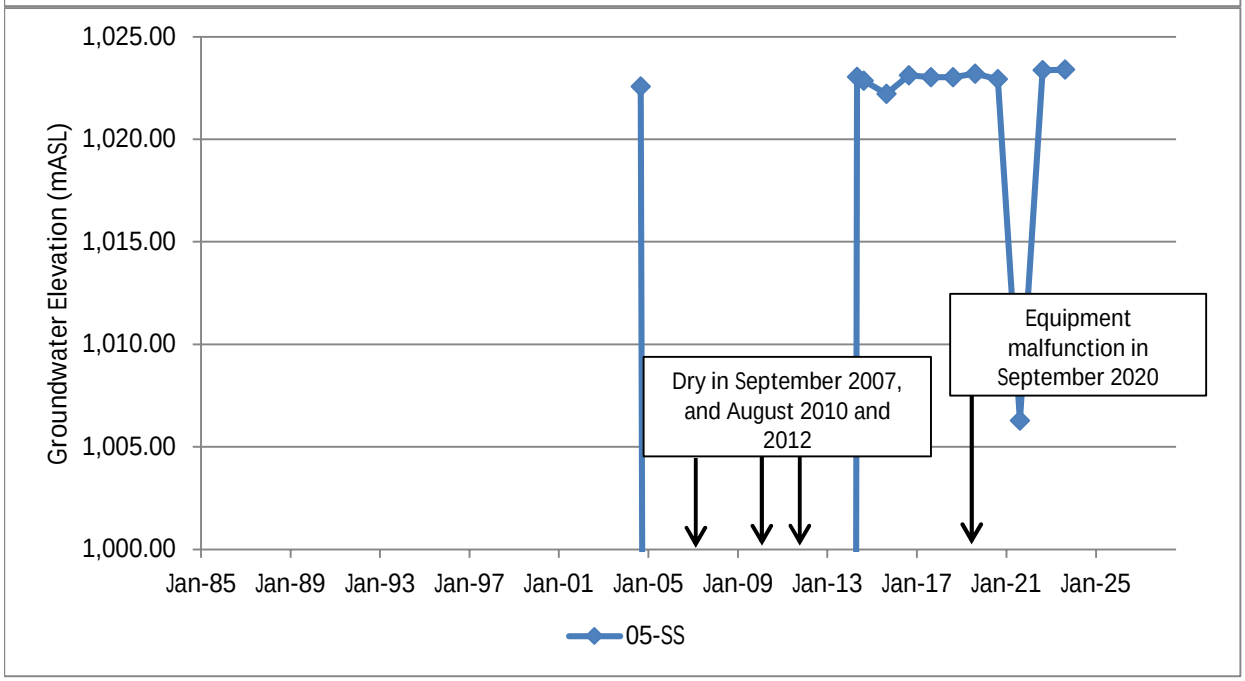



**Figure 10.6**
**VEOLIA, Swan Hills Treatment Centre**
**MW-06 Hydrographs**

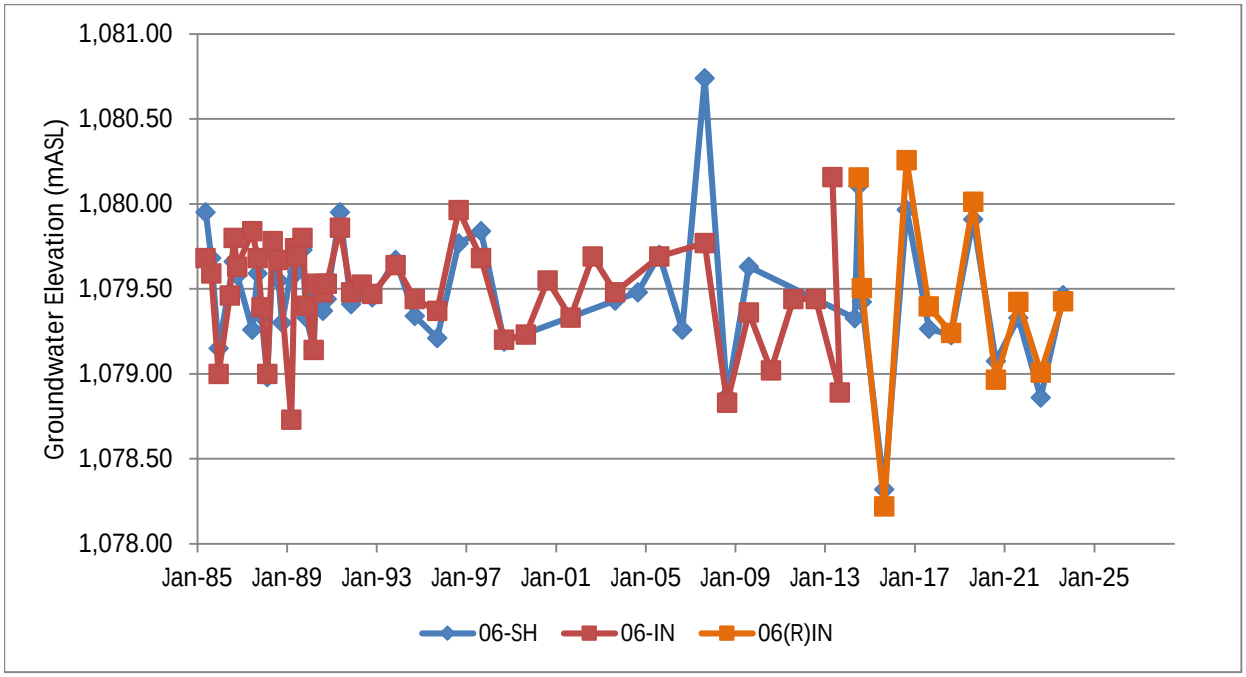


**Figure 10.7**
**VEOLIA, Swan Hills Treatment Centre**
**MW-07 Hydrographs**

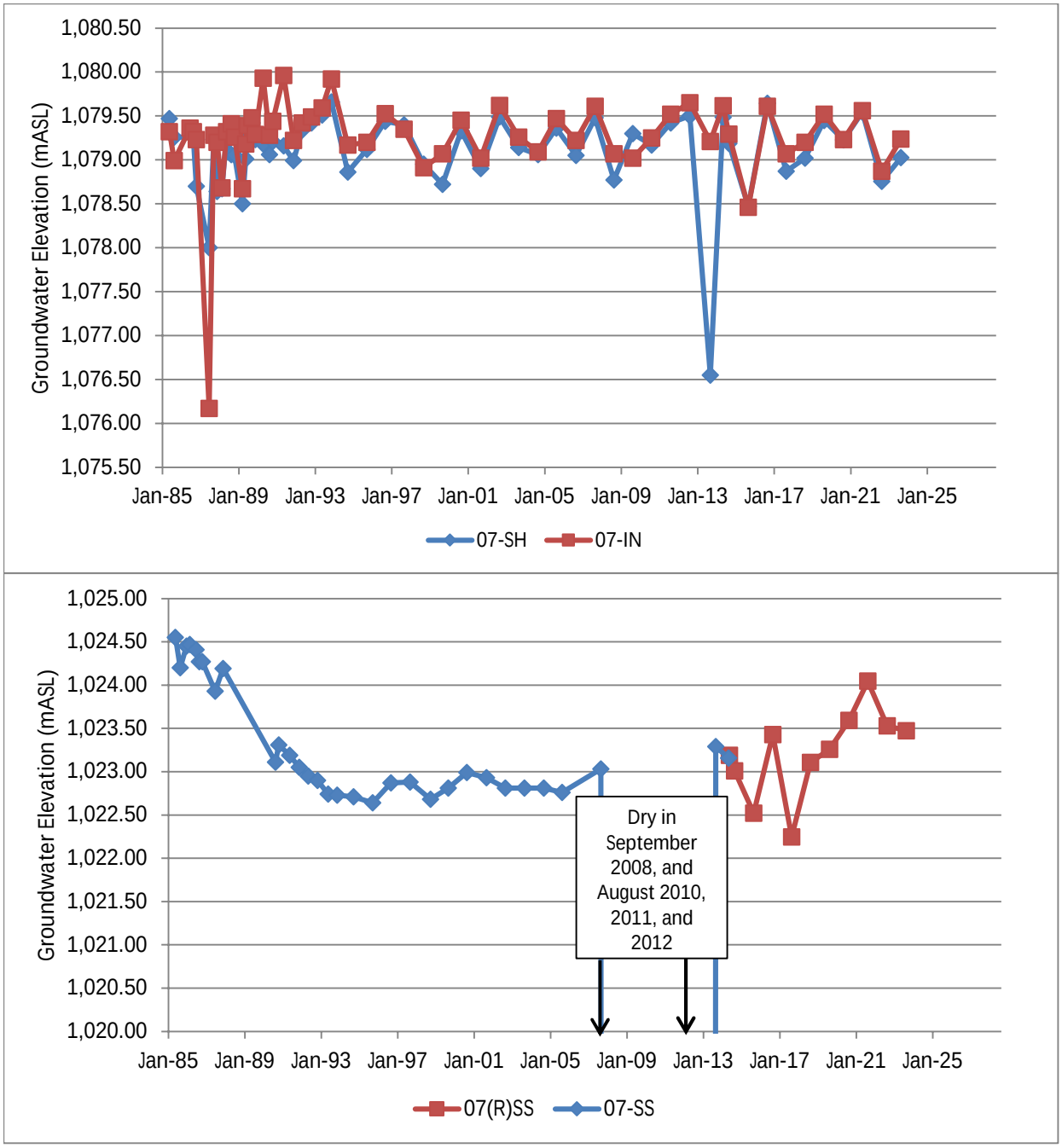
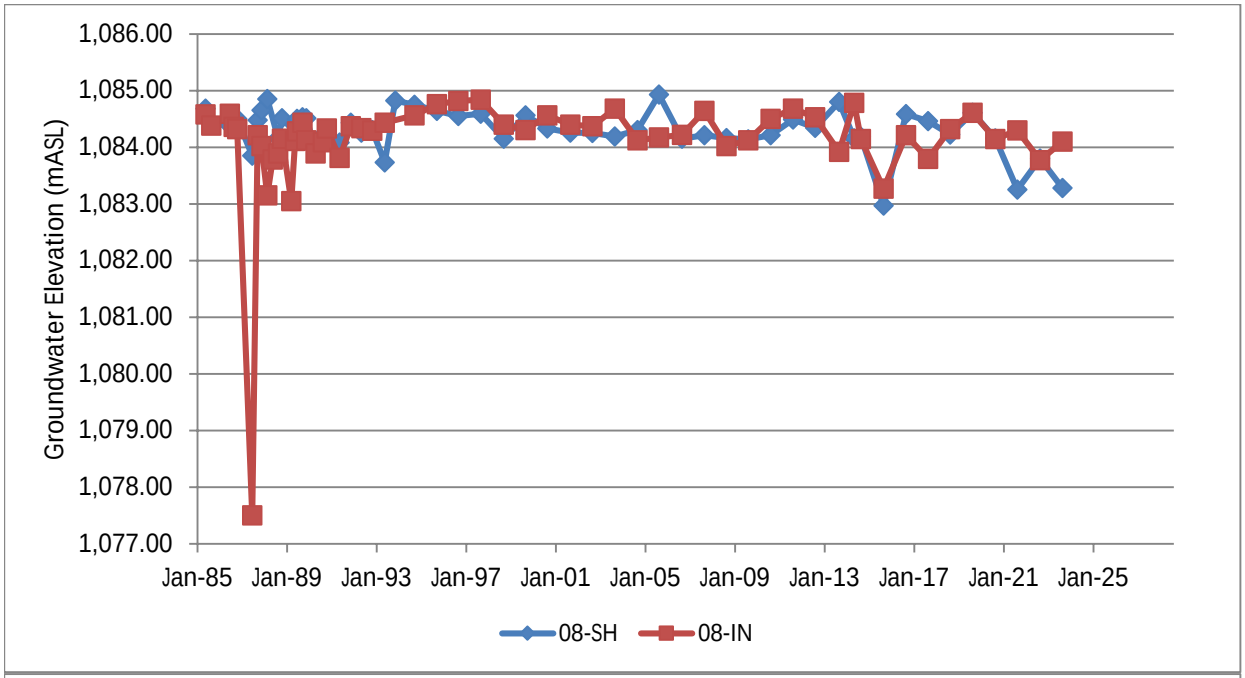


**Figure 10.8**
**VEOLIA, Swan Hills Treatment Centre**
**MW-08 Hydrographs**



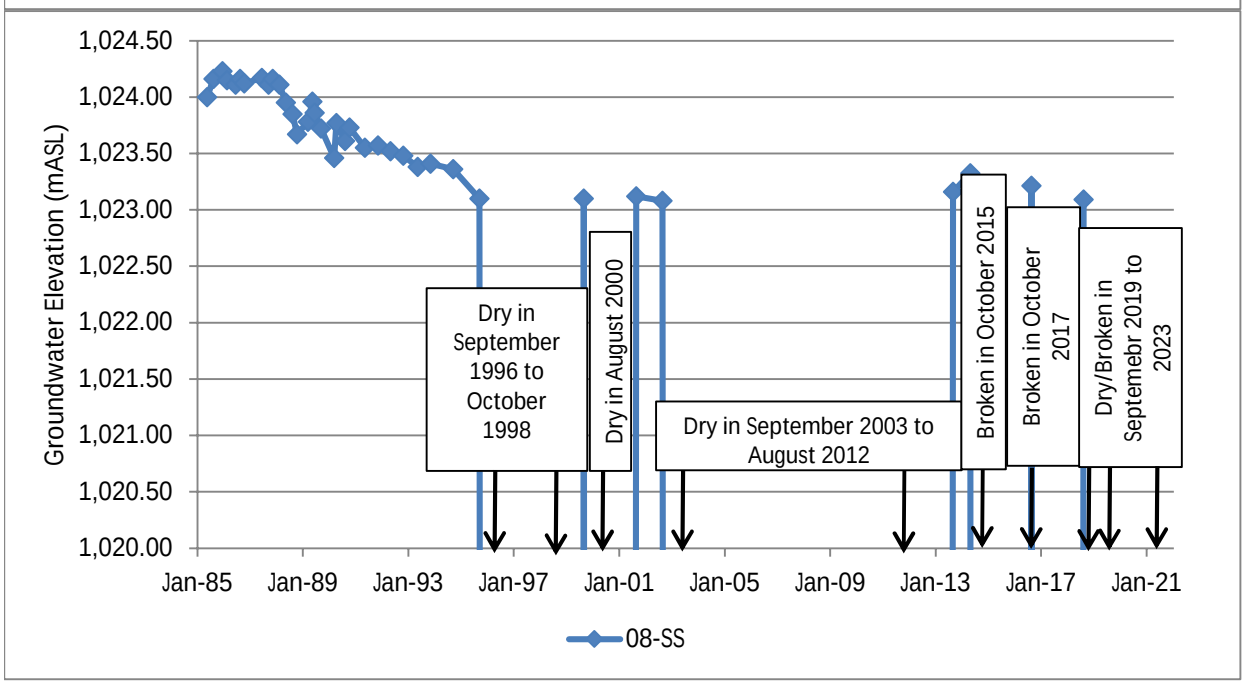



**Figure 10.9**
**VEOLIA, Swan Hills Treatment Centre**
**MW-09 (Decommissioned) Hydrographs**

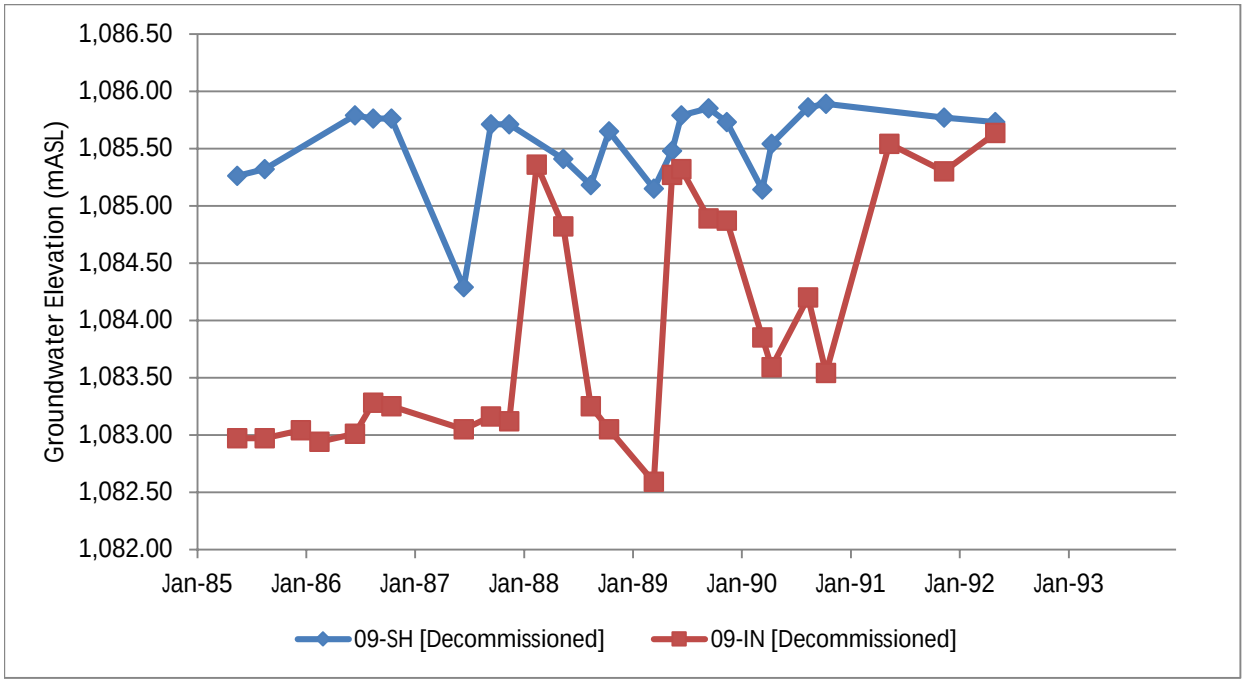


**Figure 10.10**
**VEOLIA, Swan Hills Treatment Centre**
**MW-10 (Decommissioned) Hydrographs**

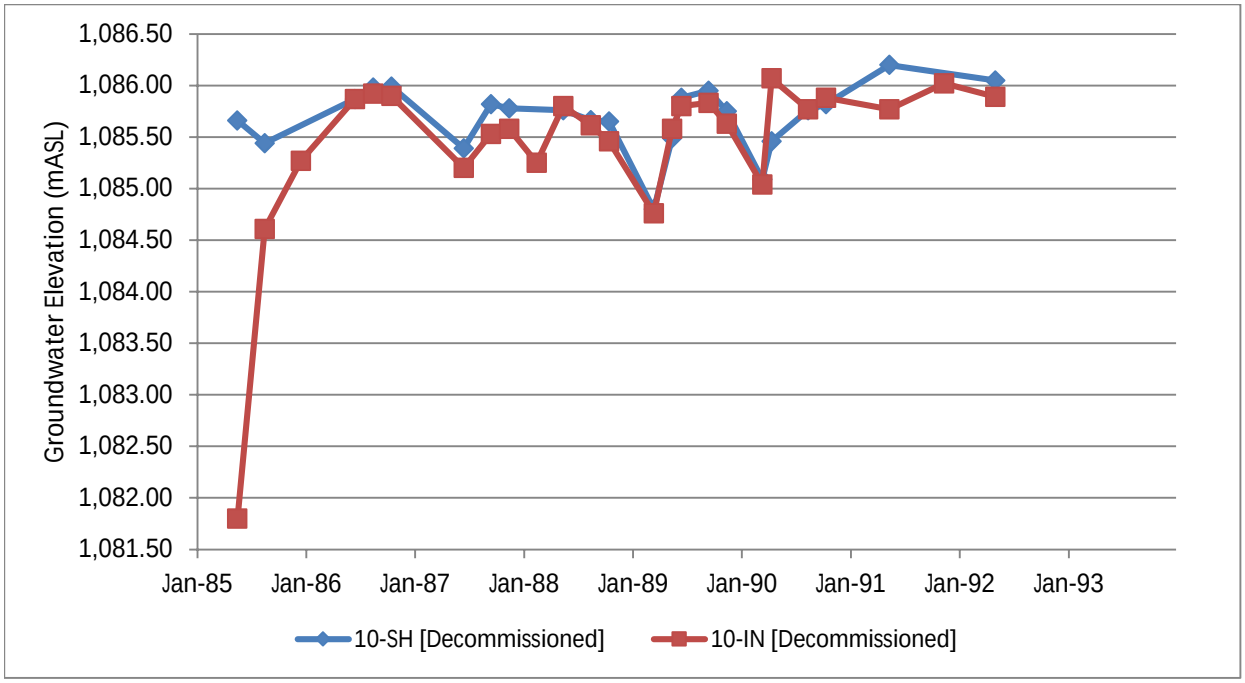


**Figure 10.11**
**VEOLIA, Swan Hills Treatment Centre**
**MW-11 Hydrographs**

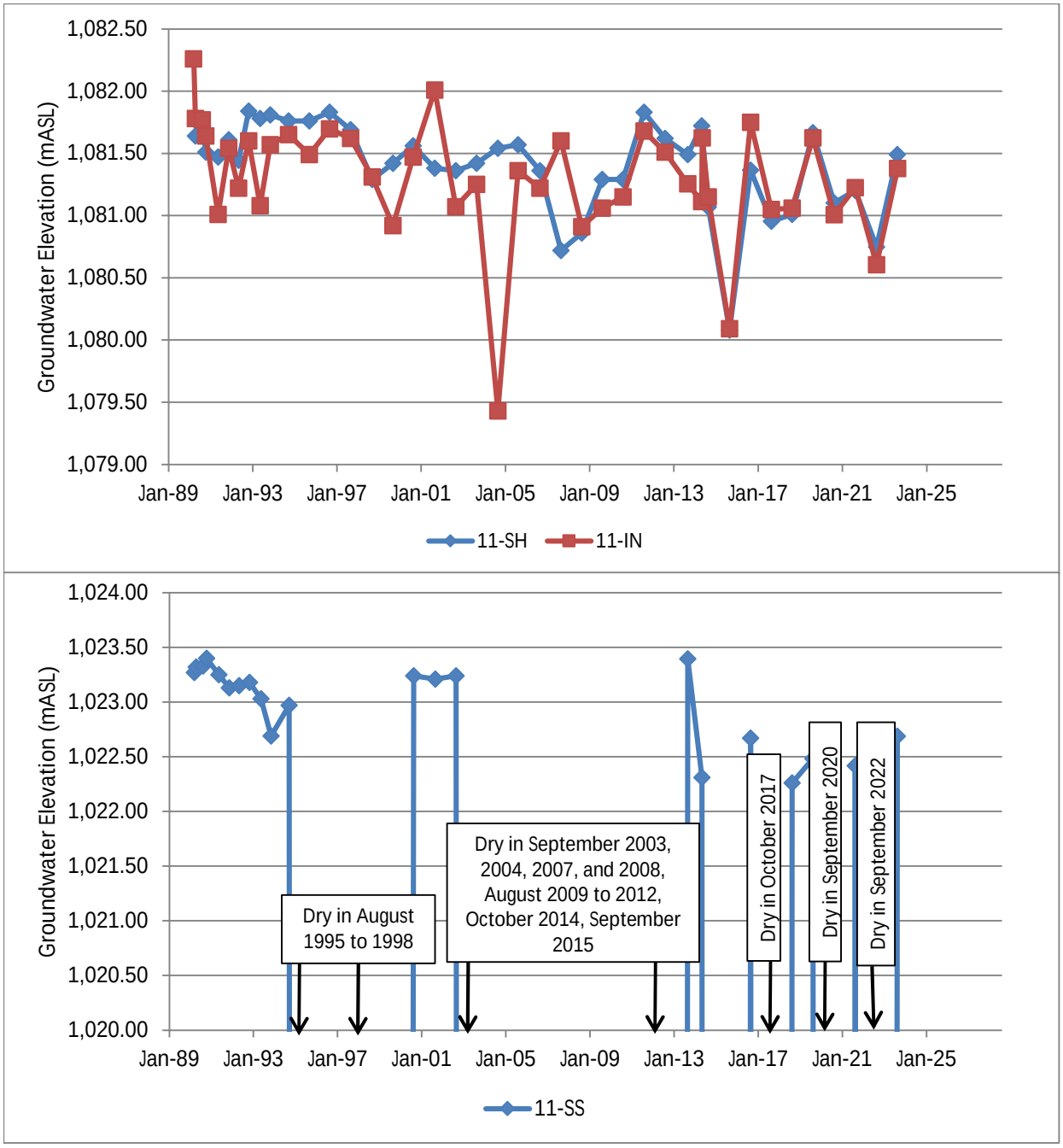


**Figure 10.12**
**VEOLIA, Swan Hills Treatment Centre**
**MW-12 Hydrographs**

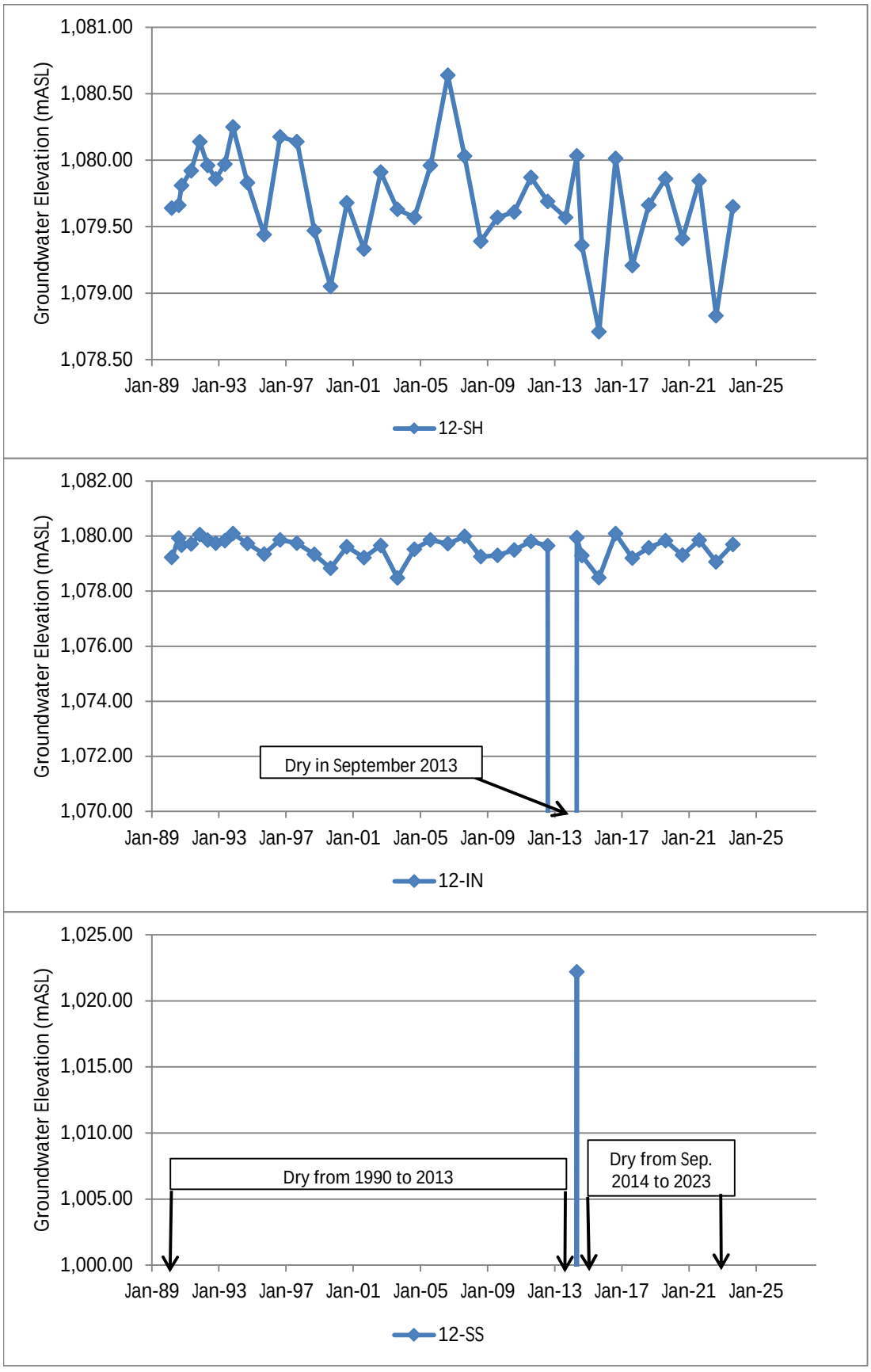


**Figure 10.13**
**VEOLIA, Swan Hills Treatment Centre**
**MW-13 Hydrographs**

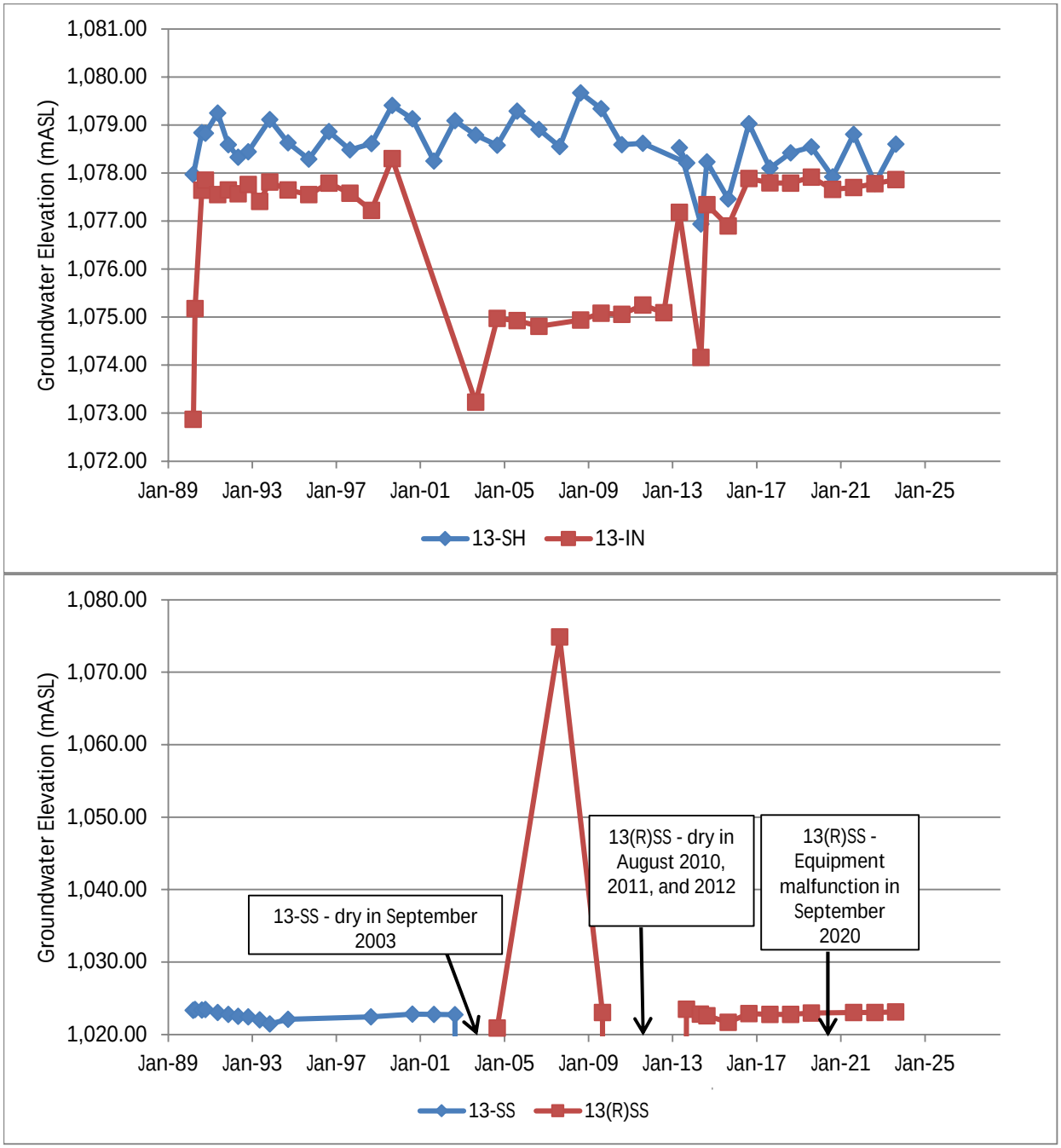
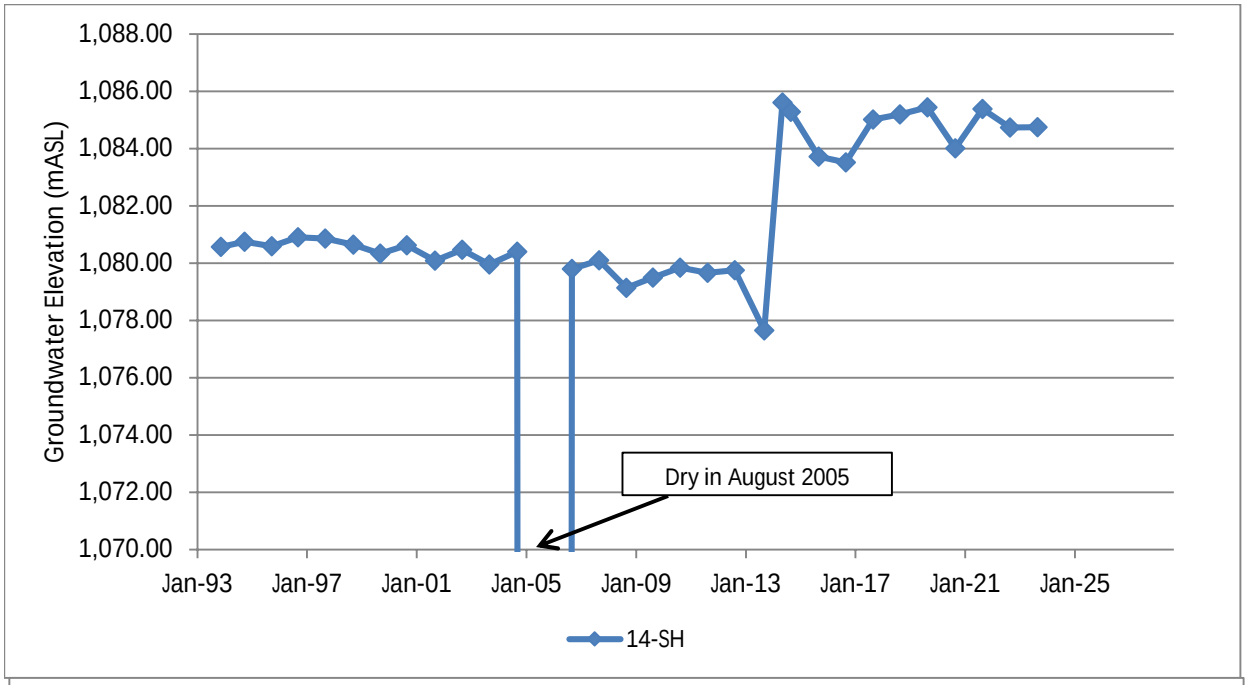


**Figure 10.14**
**VEOLIA, Swan Hills Treatment Centre**
**MW-14 Hydrographs**



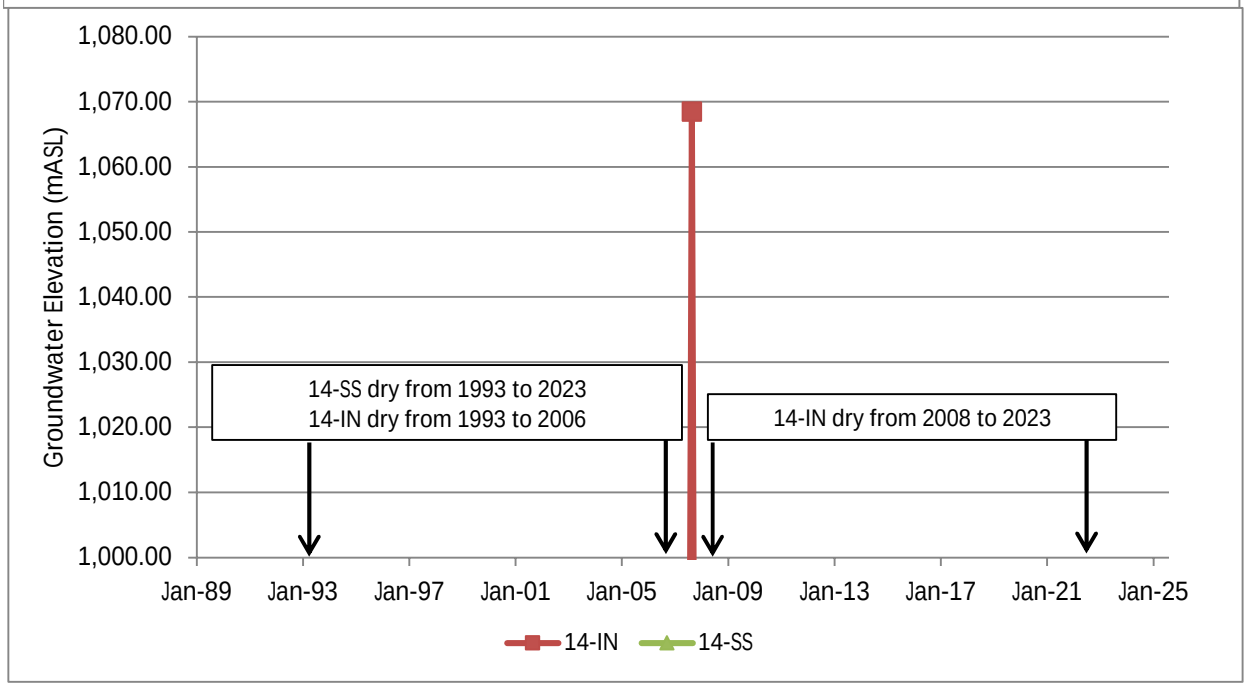
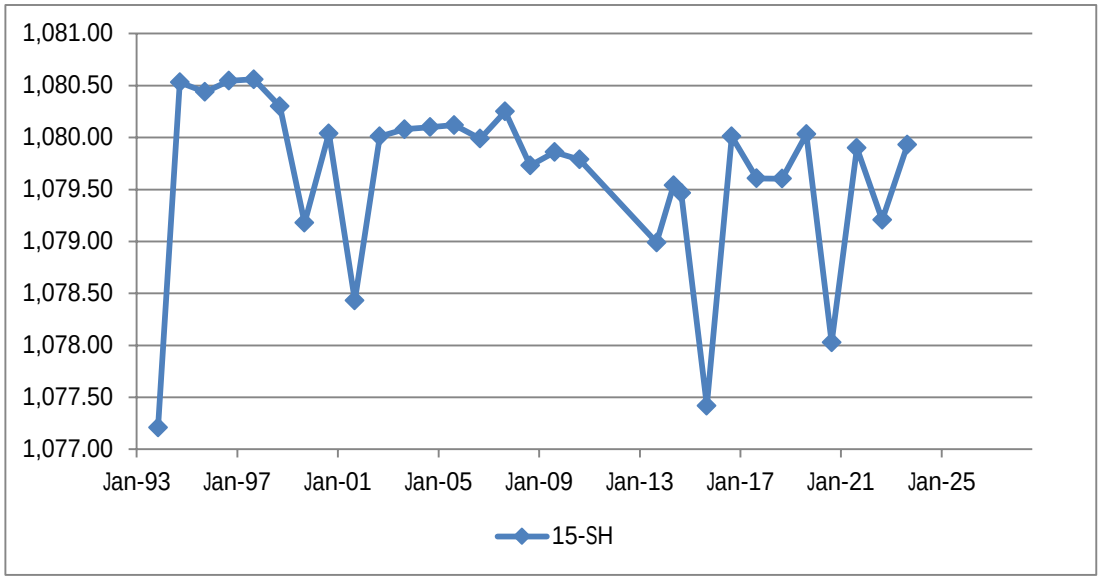
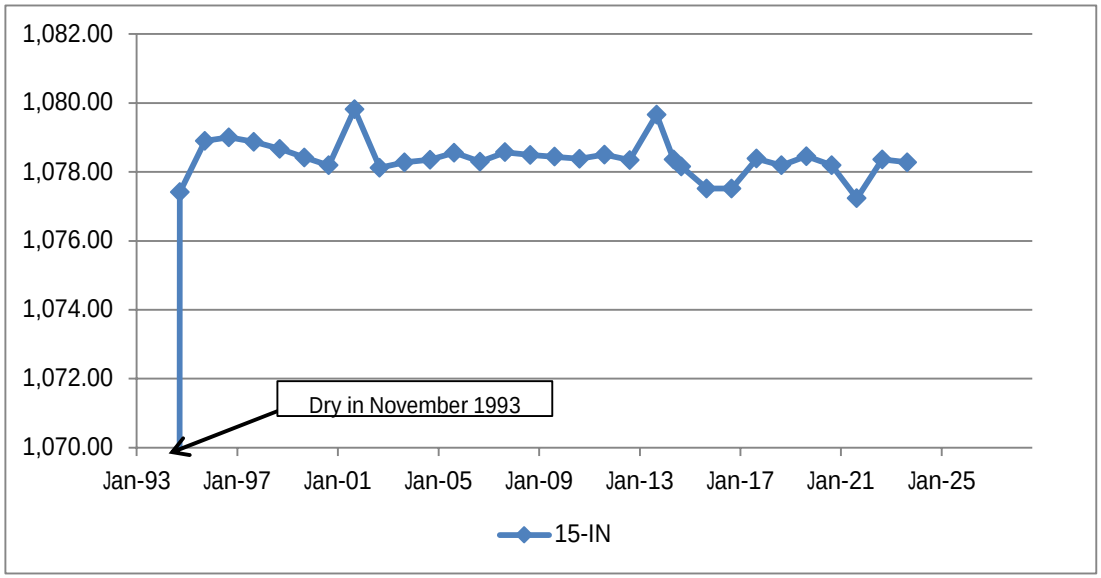



**Figure 10.15**
**VEOLIA, Swan Hills Treatment Centre**
**MW-15 Hydrographs**



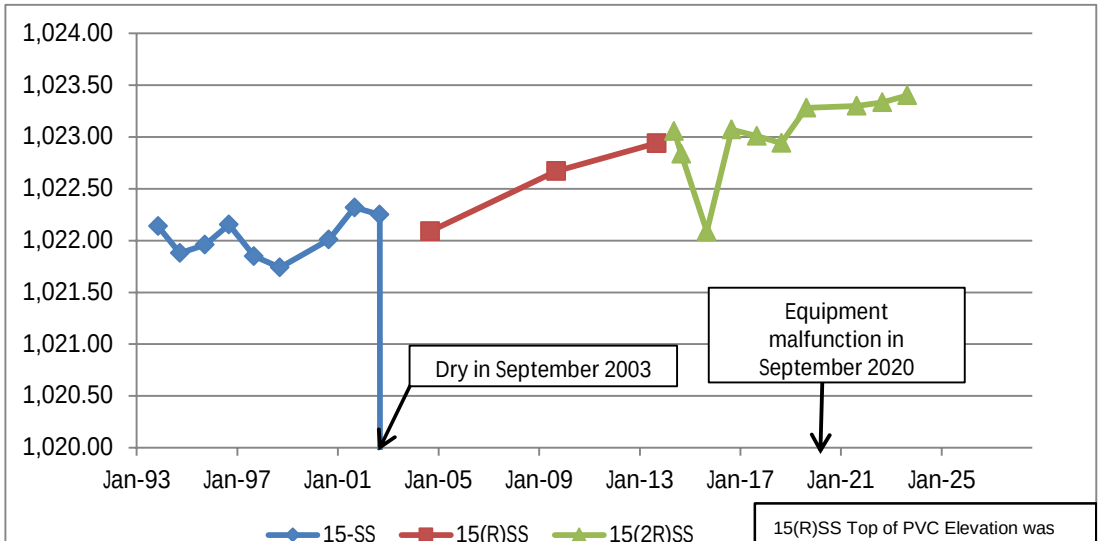




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**Figure 10.16**
**VEOLIA, Swan Hills Treatment Centre**
**MW-16 Hydrographs**

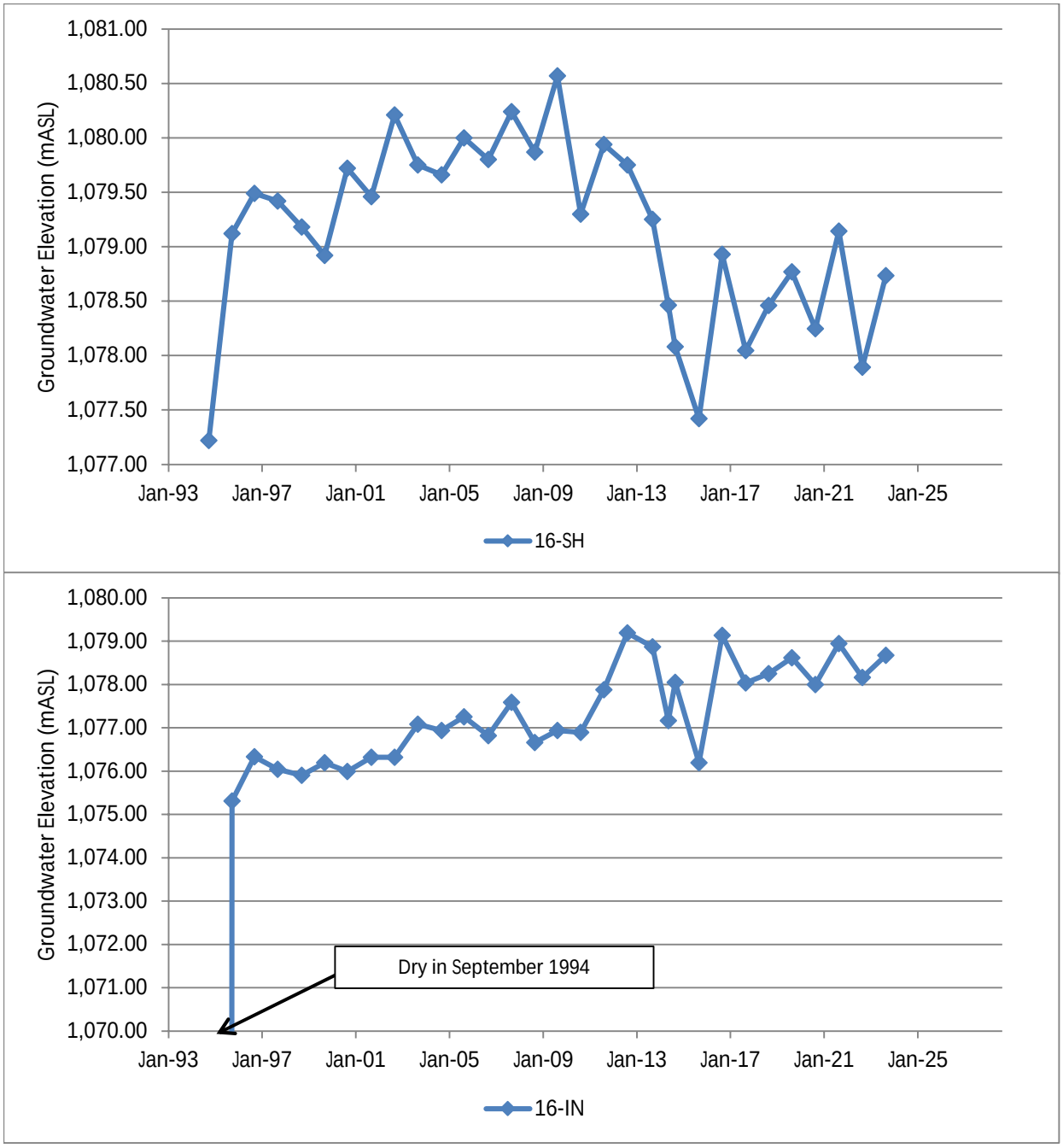
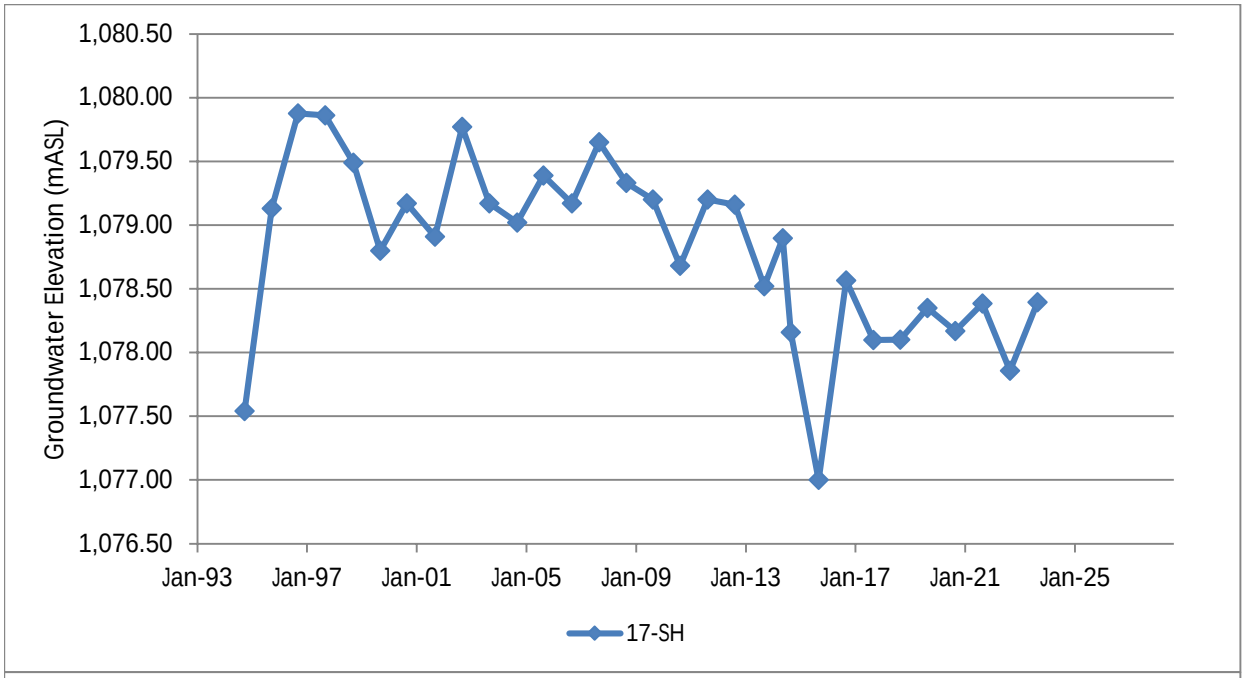
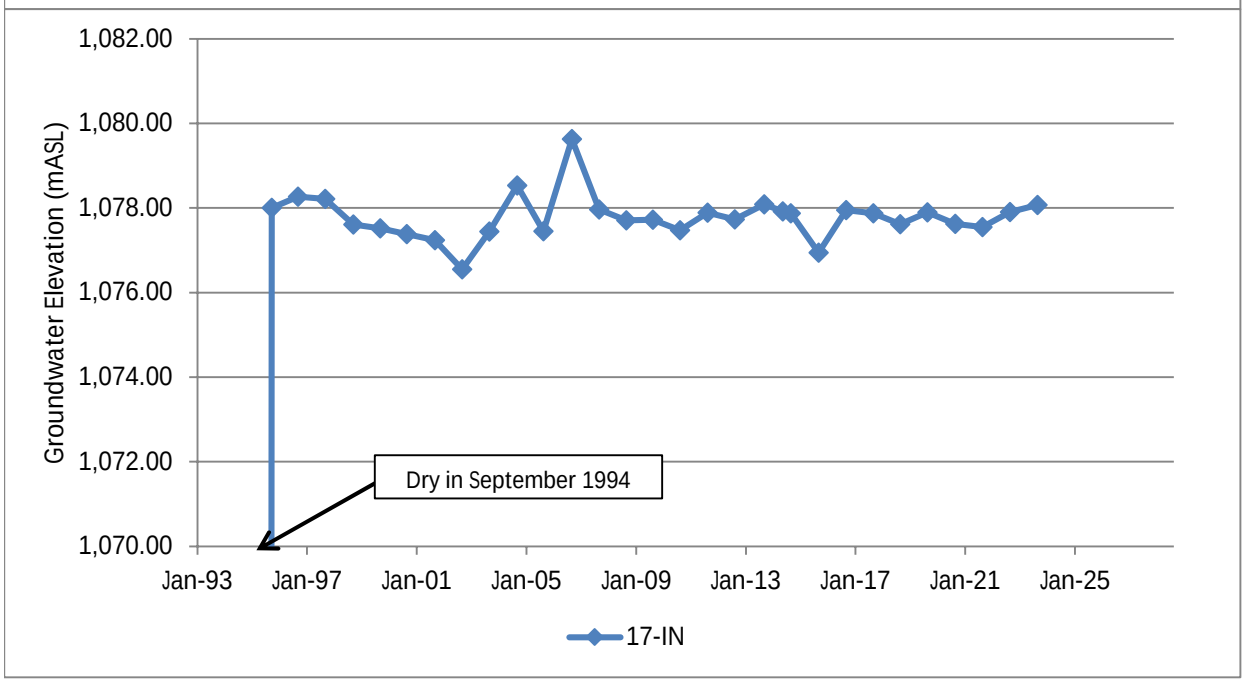


**Figure 10.17**
**VEOLIA, Swan Hills Treatment Centre**
**MW-17 Hydrographs**



ANSI B 279.4mm x 431.8mm
Approved: ____
Checked: ____
Designer: ____
Project Management Initials: ____
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Filename: L:\DCS\PROJECTS\ENV\60716599_VEOLIA-SWANHILLS_2023_GWM900_CAD_GIS\910_CAD\30-FIGURES\B\00\60716599-FIG-00-0000-B-0111.DWG

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 05-SH | TDS | 640 | 500 | Increasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 06-SH | Manganese | 0.69 | 0.02 | Increasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 07-SH | Manganese | 0.648 | 0.02 | Not Significant |
| | TDS | 794 | 500 | Increasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 03-SH | Manganese | 0.026 | 0.02 | Not Significant |
| | TDS | 560 | 500 | Increasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 13-SH_Pz | Manganese | 0.238 | 0.02 | Not Significant |
| | TDS | 626 | 500 | Not Significant |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 15-SH | Manganese | 0.629 | 0.02 | Not Significant |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 12-SH | Manganese | 0.079 | 0.02 | Not Significant |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 01A-SH | pH | 6.24 | 6.5-8.5 | Decreasing |
| | Iron | 1.58 | 0.3 | Not Significant |
| | Manganese | 0.084 | 0.02 | Decreasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 11-SH | Manganese | 0.52 | 0.02 | Not Significant |
| | TDS | 709 | 500 | Increasing |

## 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.
- 2023 MONITORING WELL LOCATION
- PIEZOMETER LOCATION

0 75 150 m
1:3000

**Issue Status: FINAL**

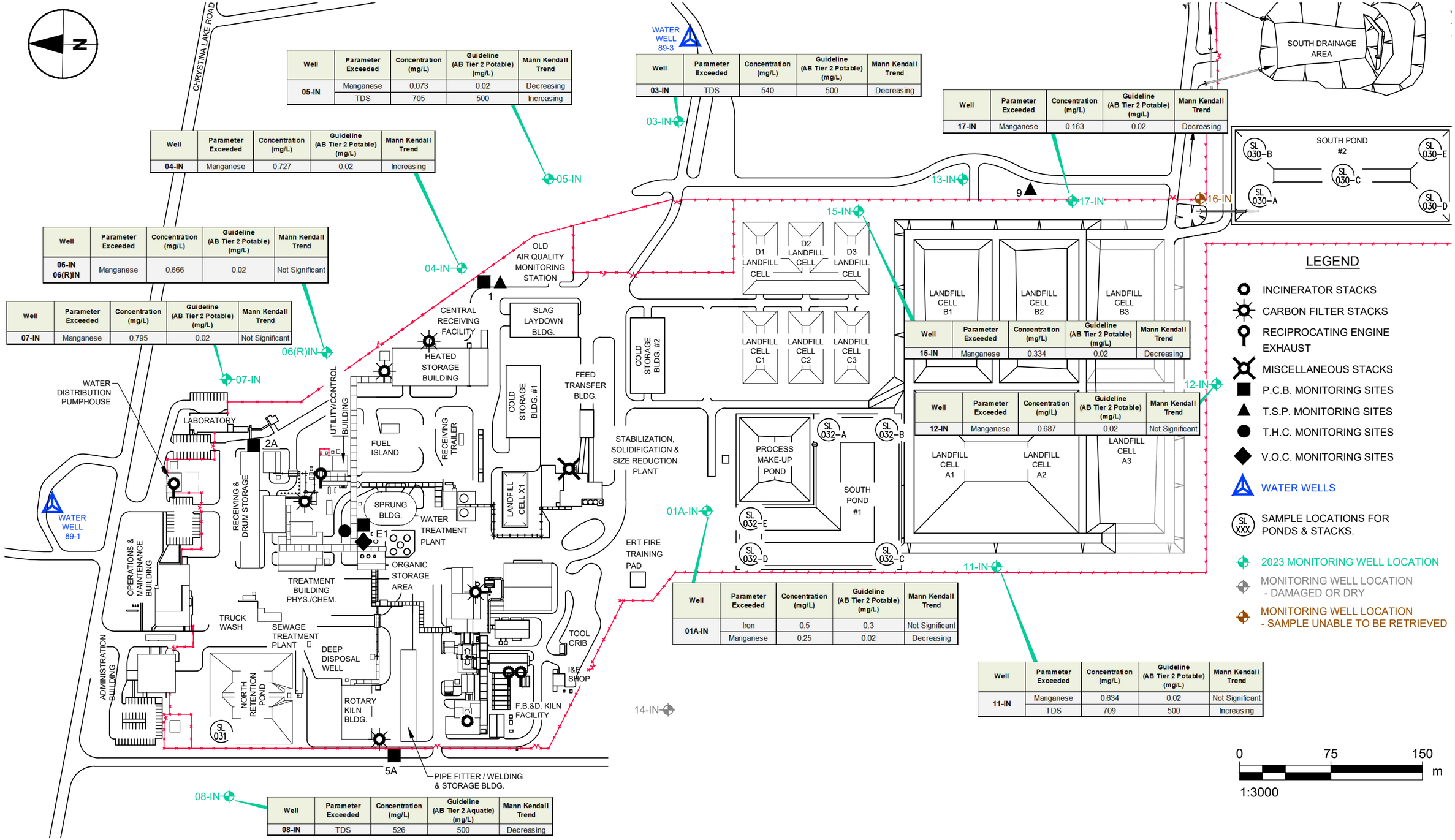
**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**2023 Alberta Tier 2 Potable Groundwater Exceedances**
**Shallow Interval Wells**

AECOM

**Figure 11.1**

Last saved by: SERBIND(2024-02-27) Last Plotted: 2024-03-19
Filename: L:\DCS\PROJECTS\ENV\60716599_VEOLIA-SWANHILLS_2023_GWM\900_CAD_GIS\910_CAD\30-FIGURES\B\00607165 99-FIG-00-0000-B-0112.DWG
Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm




| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 05-IN | Manganese | 0.073 | 0.02 | Decreasing |
| | TDS | 705 | 500 | Increasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 03-IN | TDS | 540 | 500 | Decreasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 17-IN | Manganese | 0.163 | 0.02 | Decreasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 04-IN | Manganese | 0.727 | 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 | 0.666 | 0.02 | Not Significant |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 07-IN | Manganese | 0.795 | 0.02 | Not Significant |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 15-IN | Manganese | 0.334 | 0.02 | Decreasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 12-IN | Manganese | 0.687 | 0.02 | Not Significant |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 01A-IN | Iron | 0.5 | 0.3 | Not Significant |
| | Manganese | 0.25 | 0.02 | Decreasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 11-IN | Manganese | 0.634 | 0.02 | Not Significant |
| | TDS | 709 | 500 | Increasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Aquatic) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 08-IN | TDS | 526 | 500 | Decreasing |

## 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.
- 2023 MONITORING WELL LOCATION
- MONITORING WELL LOCATION - DAMAGED OR DRY
- MONITORING WELL LOCATION - SAMPLE UNABLE TO BE RETRIEVED

**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**2023 Alberta Tier 2 Potable Groundwater Exceedances**
**Intermediate Interval Wells**

AECOM

**Figure 11.2**

ANSI B 279.4mm x 431.8mm
Approved: ____
Checked: ____
Designer: ____
Project Management Initials:
Last Plotted: 2024-03-19
Last saved by: SERBIND(2024-02-27)
Filename: L:\DCS\PROJECTS\ENV\60716599_VEOLIA-SWANHILLS_2023_GWM\900_CAD_GIS\910_CAD\30-FIGURES\B\00\60716599-FIG-00-0000-B-0113.DWG

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 89-3 | Manganese | 1.080 | 0.02 | Increasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 05-SS | Manganese | 0.390 | 0.02 | Increasing |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 04-SS | Manganese | 0.521 | 0.02 | Not Significant |

| Well | Parameter Exceeded | Concentration (mg/L) | Guideline (AB Tier 2 Potable) (mg/L) | Mann Kendall Trend |
|---|---|---|---|---|
| 07-SS 07(R)-SS | Manganese | 0.824 | 0.02 | Not Significant |

CHRYSTINA LAKE ROAD
WATER WELL 89-3
WATER WELL 89-1
WATER DISTRIBUTION PUMPHOUSE
LABORATORY
2A
UTILITY/CONTROL BUILDING
FUEL ISLAND
RECEIVING TRAILER
RECEIVING & DRUM STORAGE
OPERATIONS & MAINTENANCE BUILDING
ADMINISTRATION BUILDING
SPRUNG BLDG.
E1
WATER TREATMENT PLANT
ORGANIC STORAGE AREA
TREATMENT BUILDING PHYS./CHEM.
TRUCK WASH
SEWAGE TREATMENT PLANT
DEEP DISPOSAL WELL
NORTH RETENTION POND
SL 031
ROTARY KILN BLDG.
5A
PIPE FITTER / WELDING & STORAGE BLDG.
TOOL CRIB
I&E SHOP
F.B.&D. KILN FACILITY
OLD AIR QUALITY MONITORING STATION
1
CENTRAL RECEIVING FACILITY
HEATED STORAGE BUILDING
SLAG LAYDOWN BLDG.
COLD STORAGE BLDG. #1
FEED TRANSFER BLDG.
COLD STORAGE BLDG. #2
STABILIZATION, SOLIDIFICATION & SIZE REDUCTION PLANT
ERT FIRE TRAINING PAD
D1 LANDFILL CELL
D2 LANDFILL CELL
D3 LANDFILL CELL
LANDFILL CELL C1
LANDFILL CELL C2
LANDFILL CELL C3
LANDFILL CELL B1
LANDFILL CELL B2
LANDFILL CELL B3
LANDFILL CELL A1
LANDFILL CELL A2
LANDFILL CELL A3
LANDFILL CELL X1
PROCESS MAKE-UP POND
SOUTH POND #1
SL 032-A
SL 032-B
SL 032-C
SL 032-D
SL 032-E
SOUTH DRAINAGE AREA
SOUTH POND #2
SL 030-A
SL 030-B
SL 030-C
SL 030-D
SL 030-E
9
07-SS
07(R)-SS
04-SS
05-SS
15-SS
15(2R)SS
15(R)SS
13-SS
13(R)SS
12-SS
11-SS
14-SS
01A-SS
08-SS

## 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
- SL XXX — SAMPLE LOCATIONS FOR PONDS & STACKS.
- 2023 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**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**2023 Alberta Tier 2 Potable Groundwater Exceedances**
**Sandstone Interval Wells**

AECOM

**Figure 11.3**

AECOM

**Figure 12.1**
**VEOLIA, Swan Hills Treatment Centre**
**01-SH and 01A-SH - Indicators**

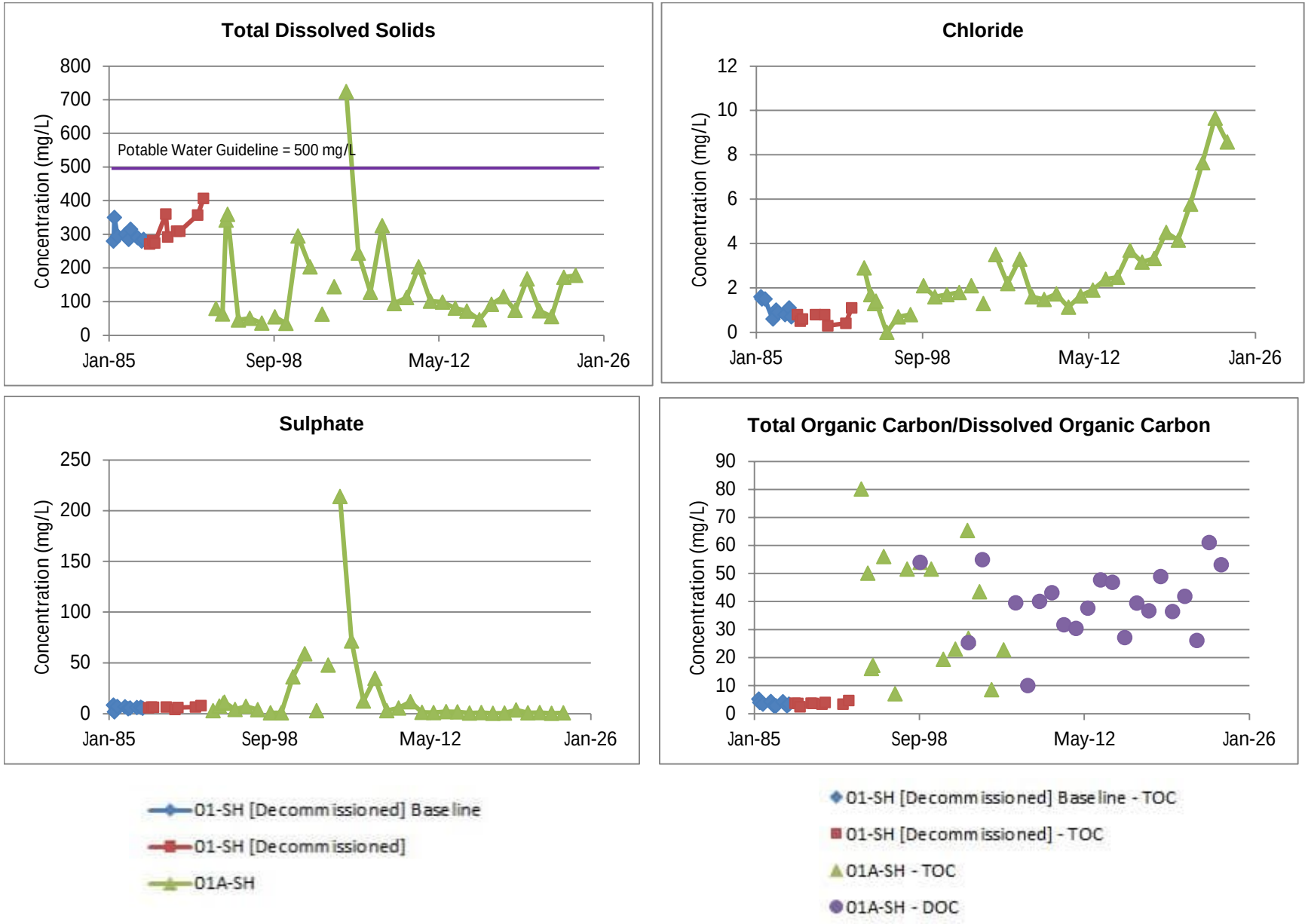


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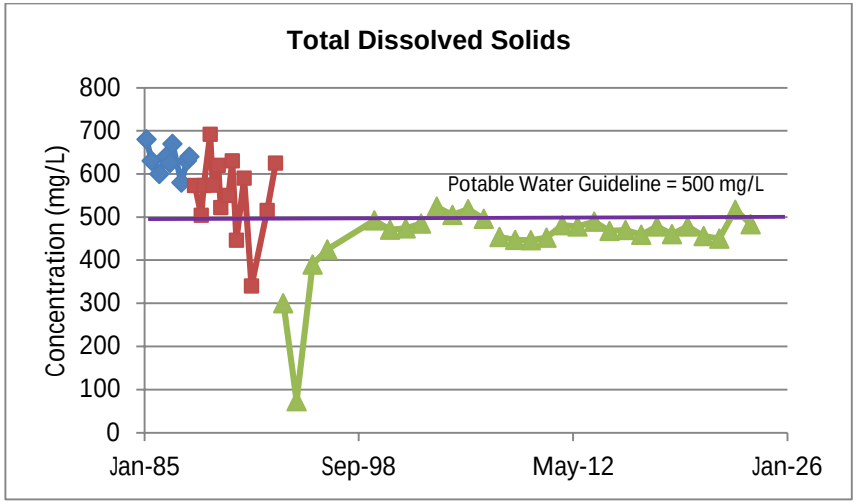
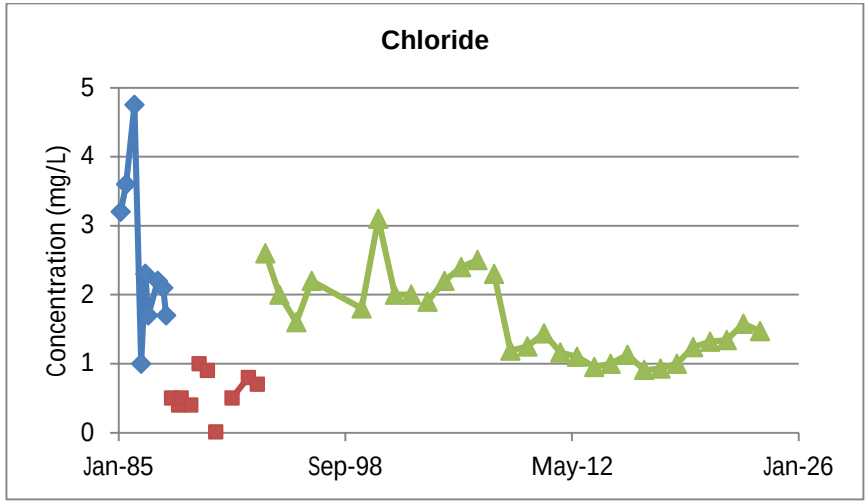
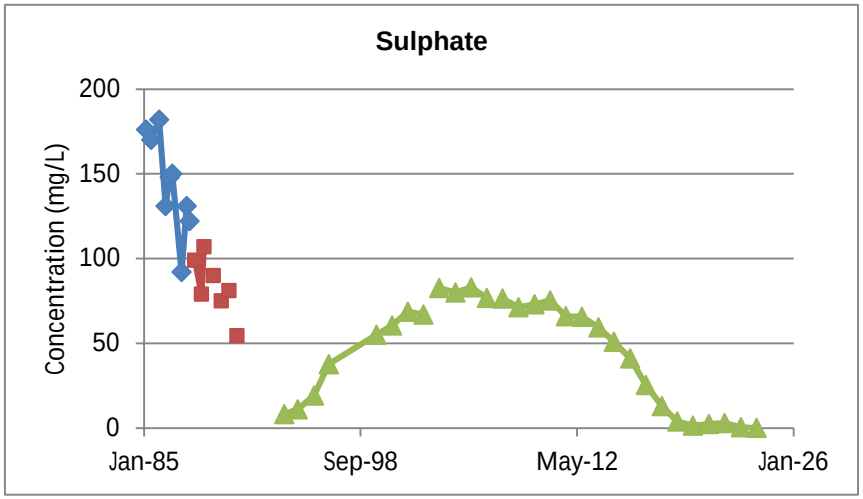
**Figure 12.2**
**VEOLIA, Swan Hills Treatment Centre**
**01-IN and 01A-IN - Indicators**



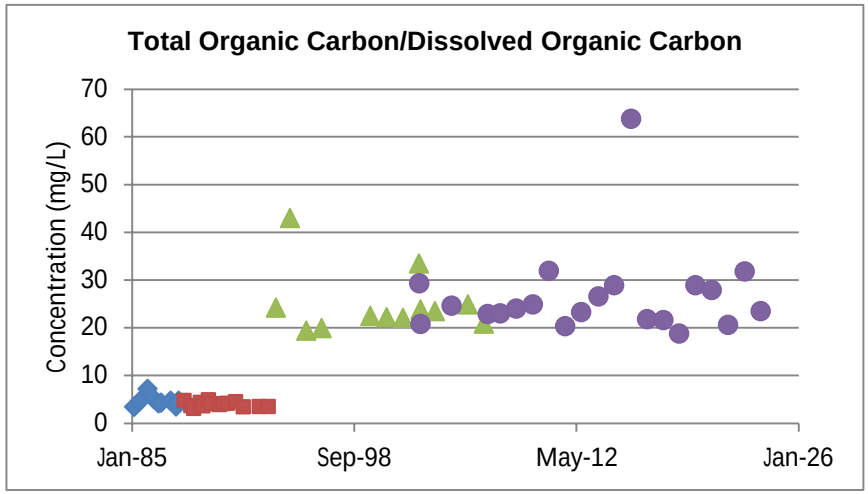



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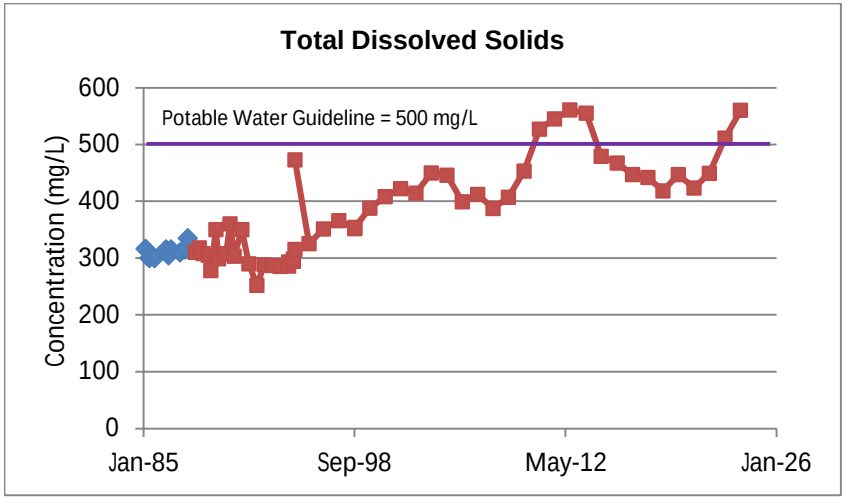
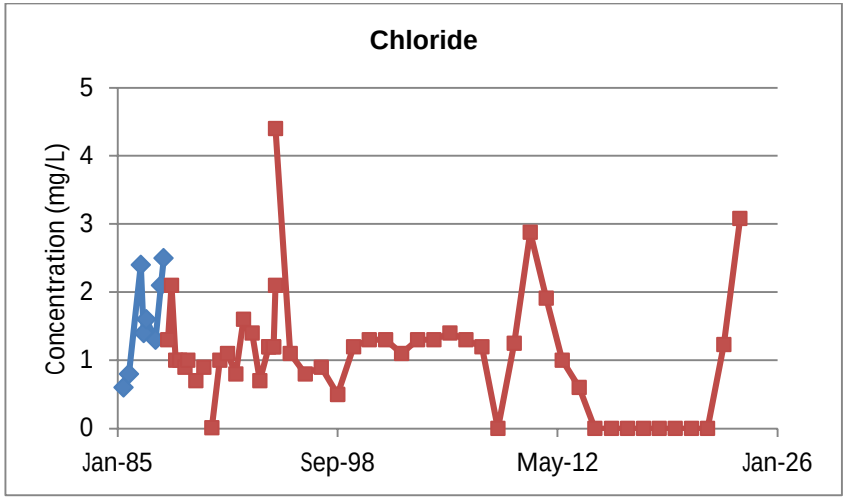
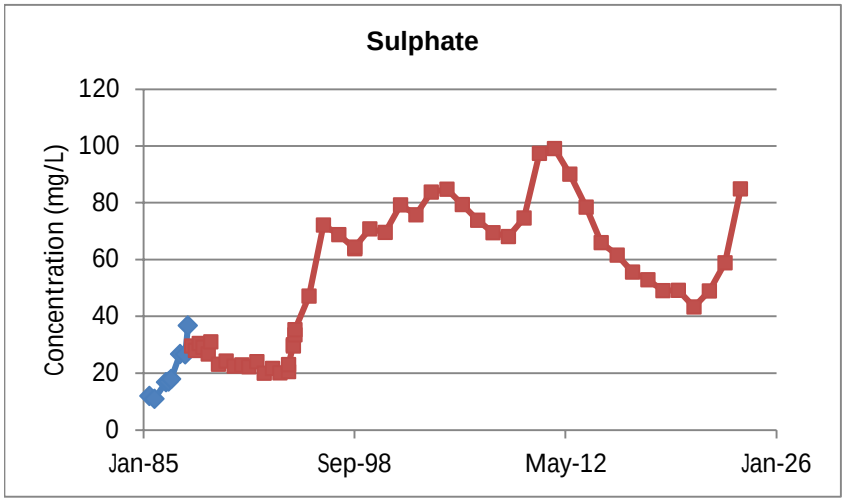
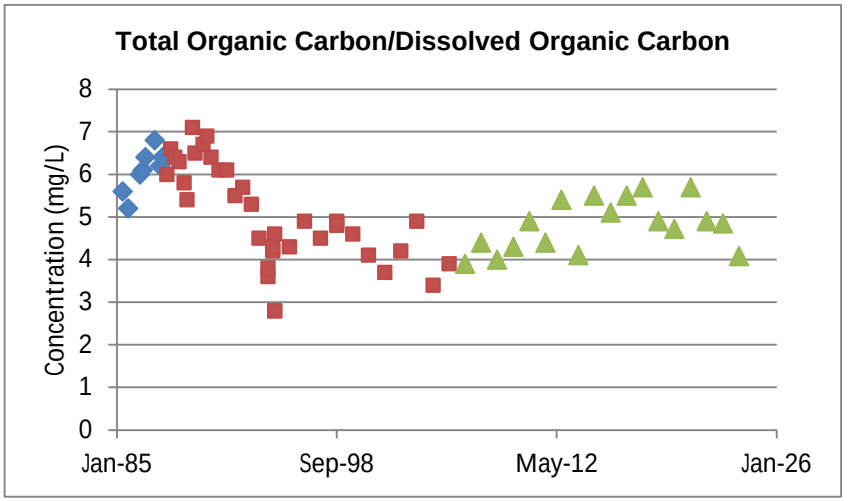
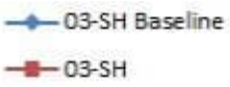
**Figure 12.3**
**VEOLIA, Swan Hills Treatment Centre**
**03-SH - Indicators**



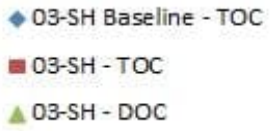



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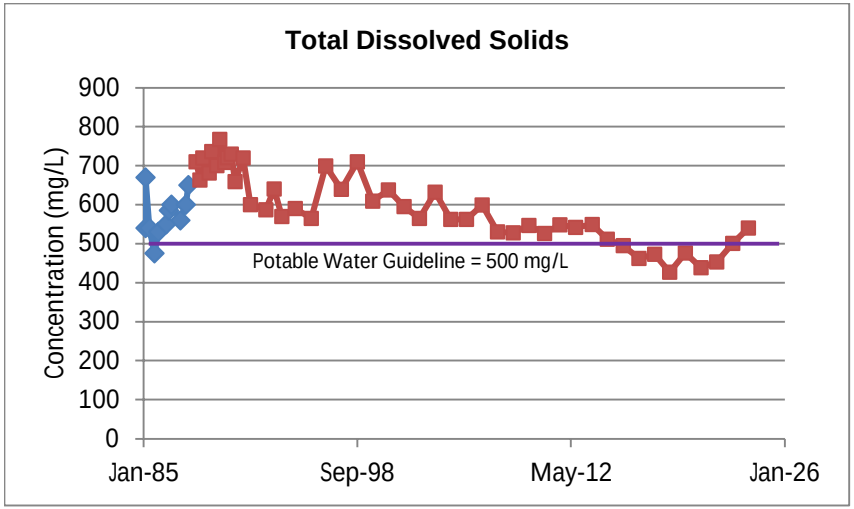
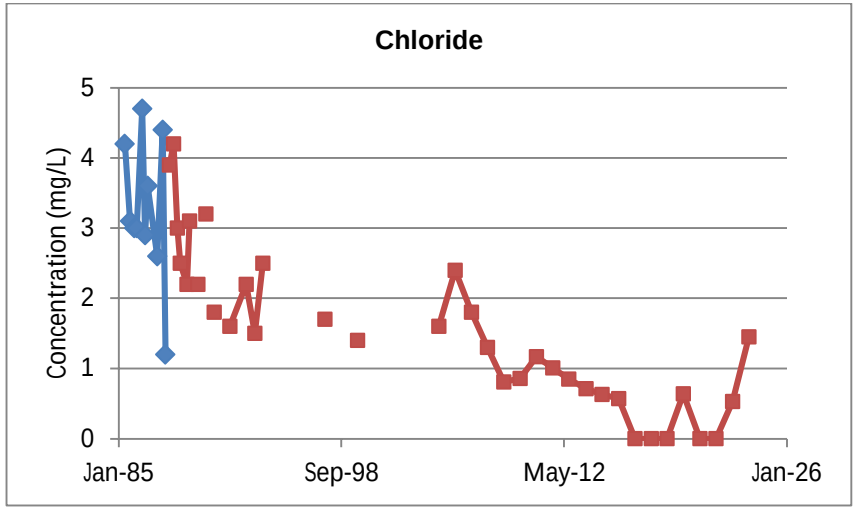
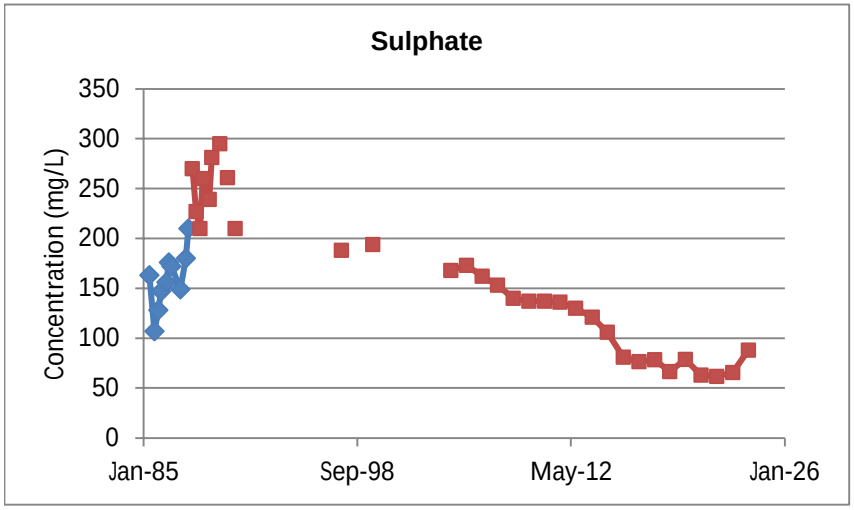
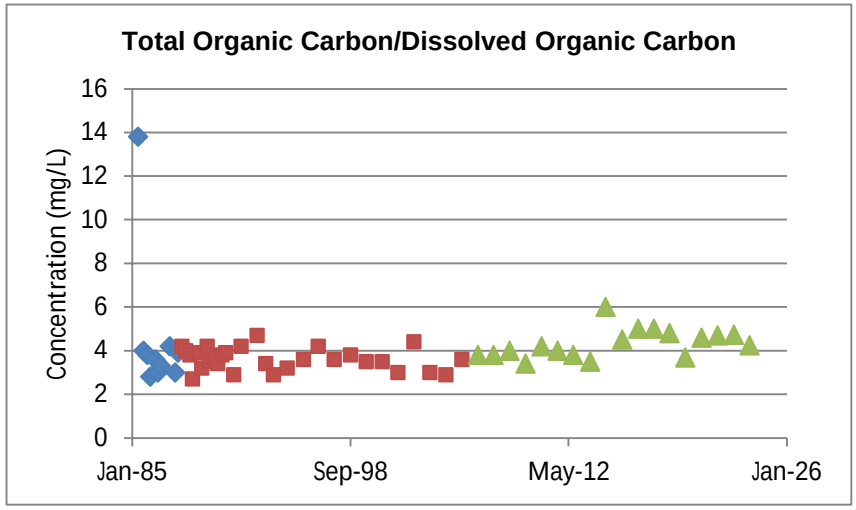
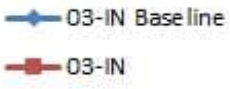
**Figure 12.4**
**VEOLIA, Swan Hills Treatment Centre**
**03-IN - Indicators**



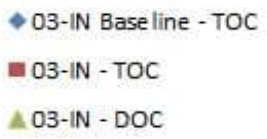



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**Figure 12.5**
**VEOLIA, Swan Hills Treatment Centre**
**04-SH - Indicators**

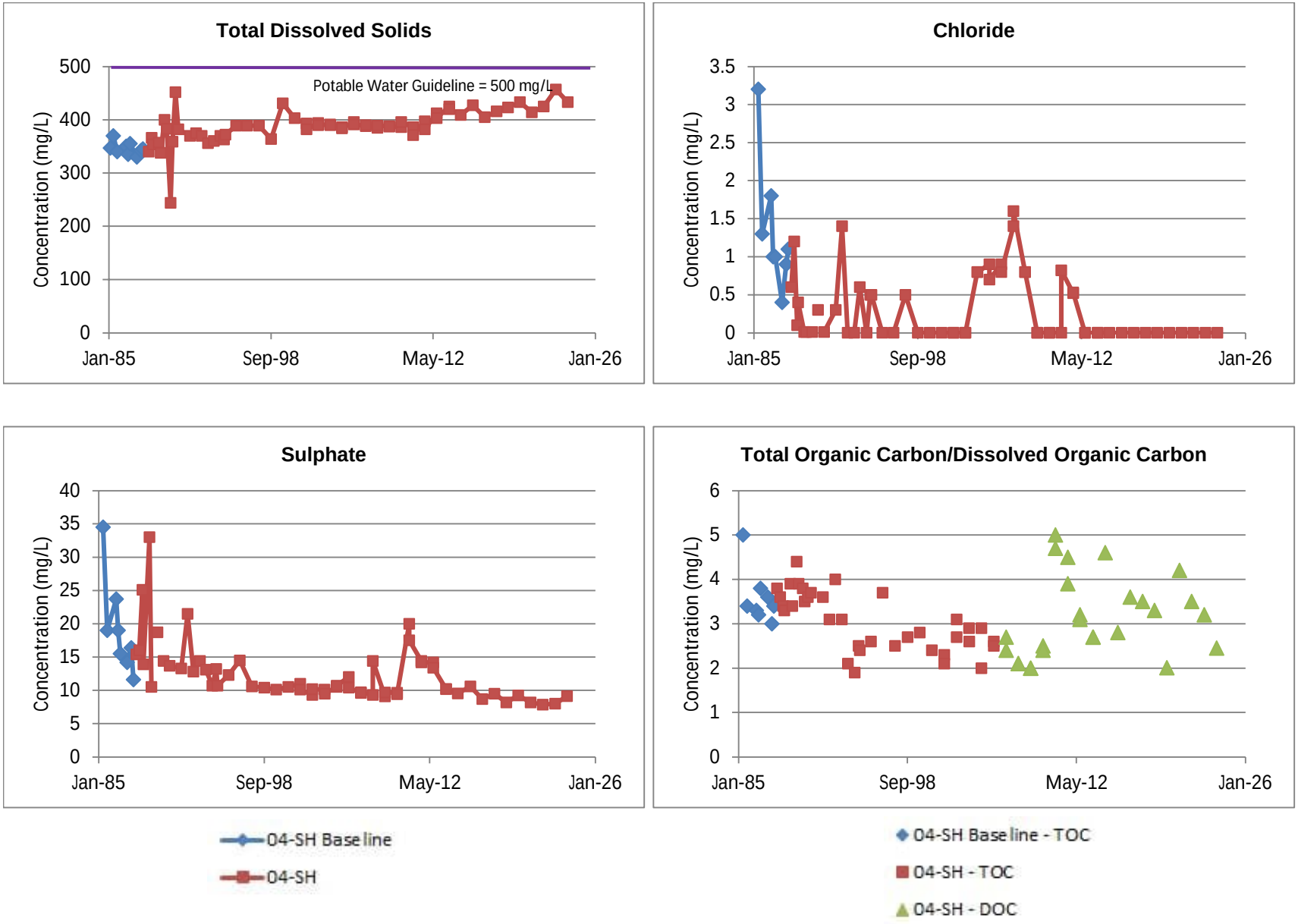

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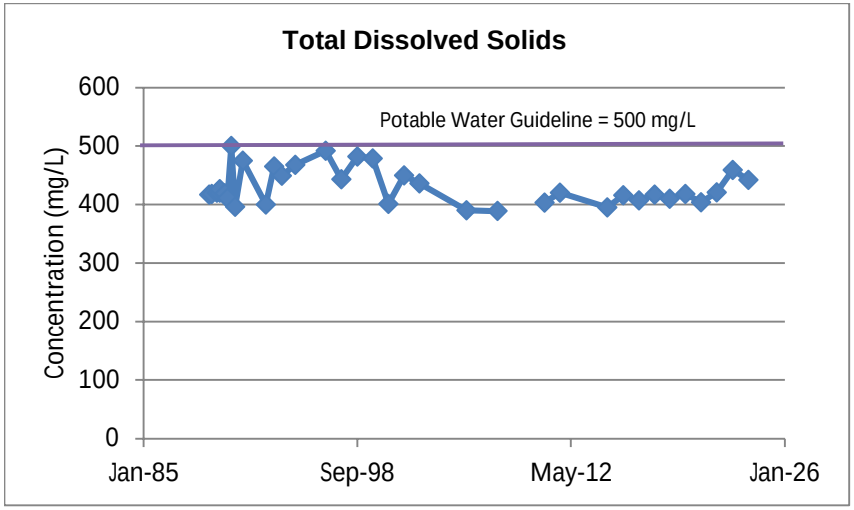
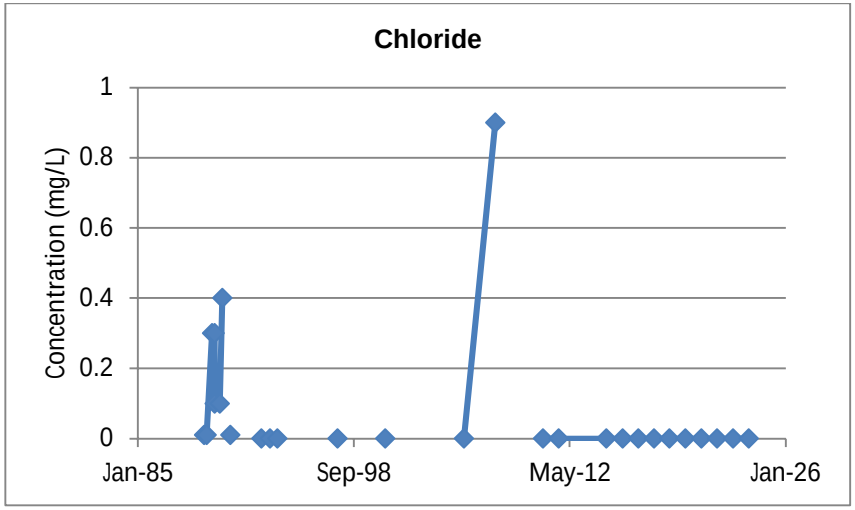
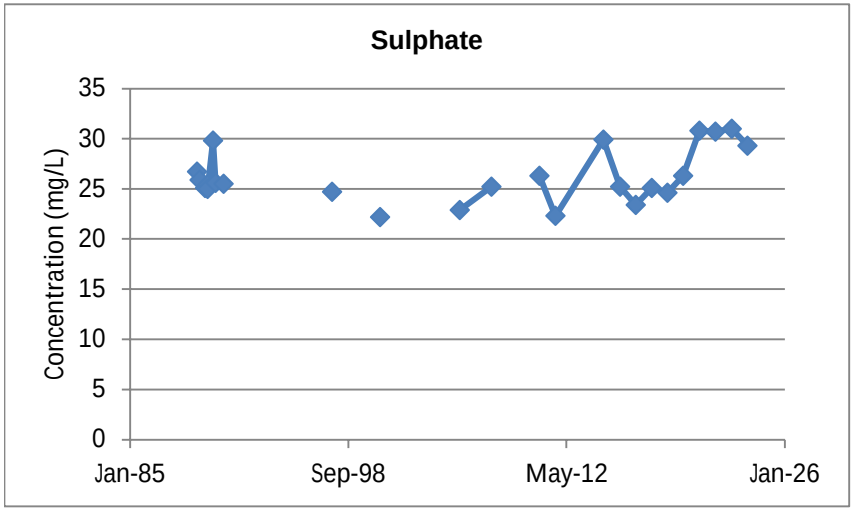
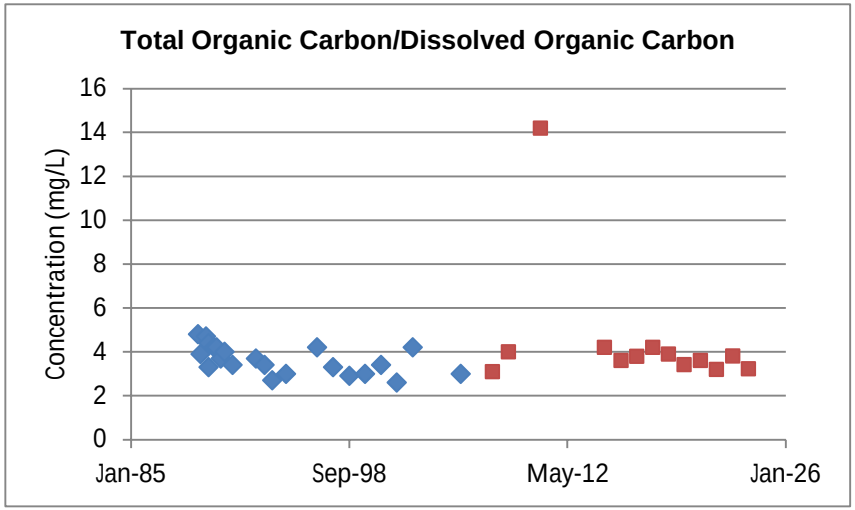
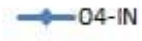
**Figure 12.6**
**VEOIA, Swan Hills Treatment Centre**
**04-IN - Indicators**



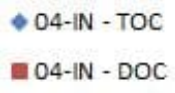



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**Figure 12.7**
**VEOLIA, Swan Hills Treatment Centre**
**04-SS - Indicators**

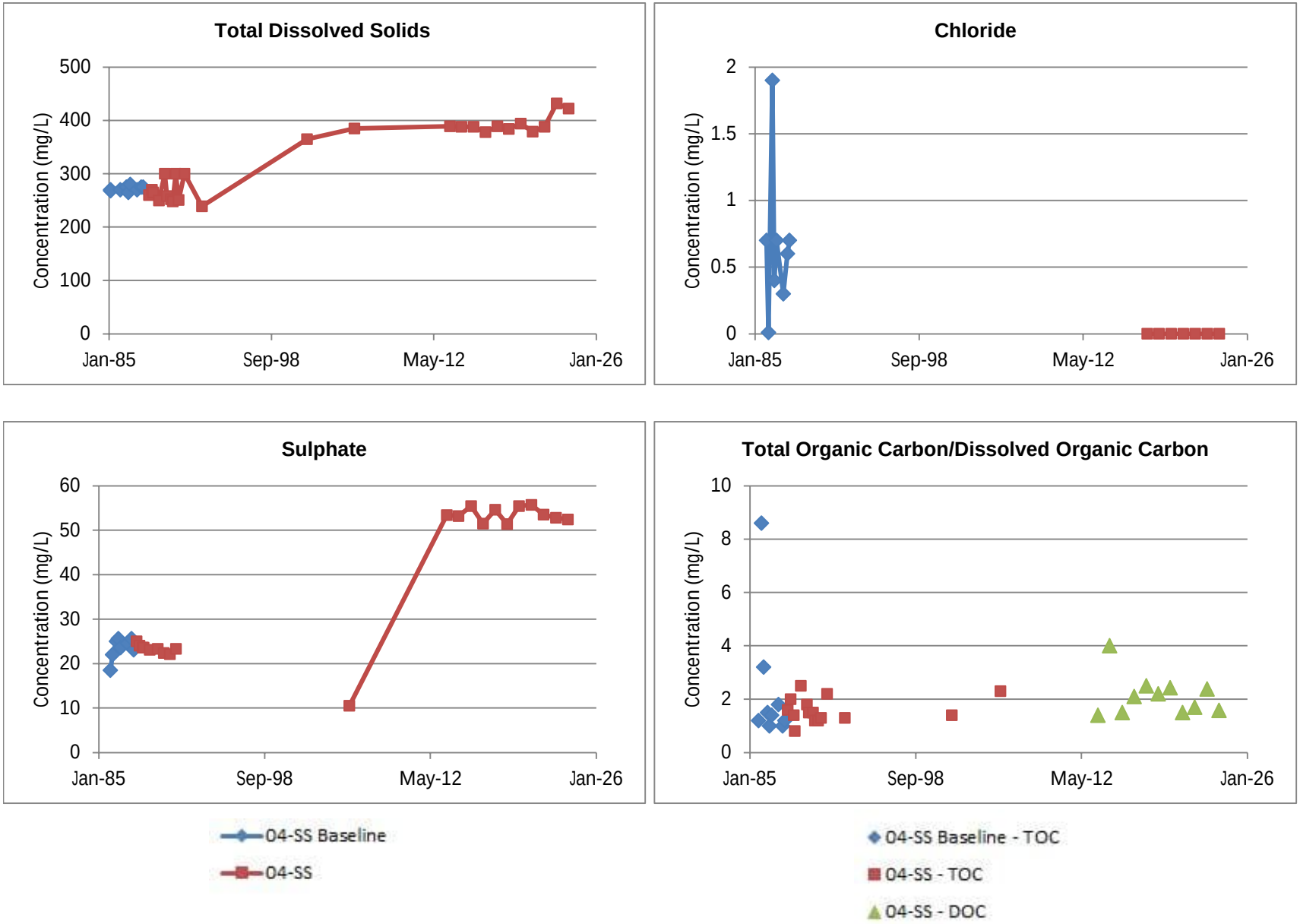

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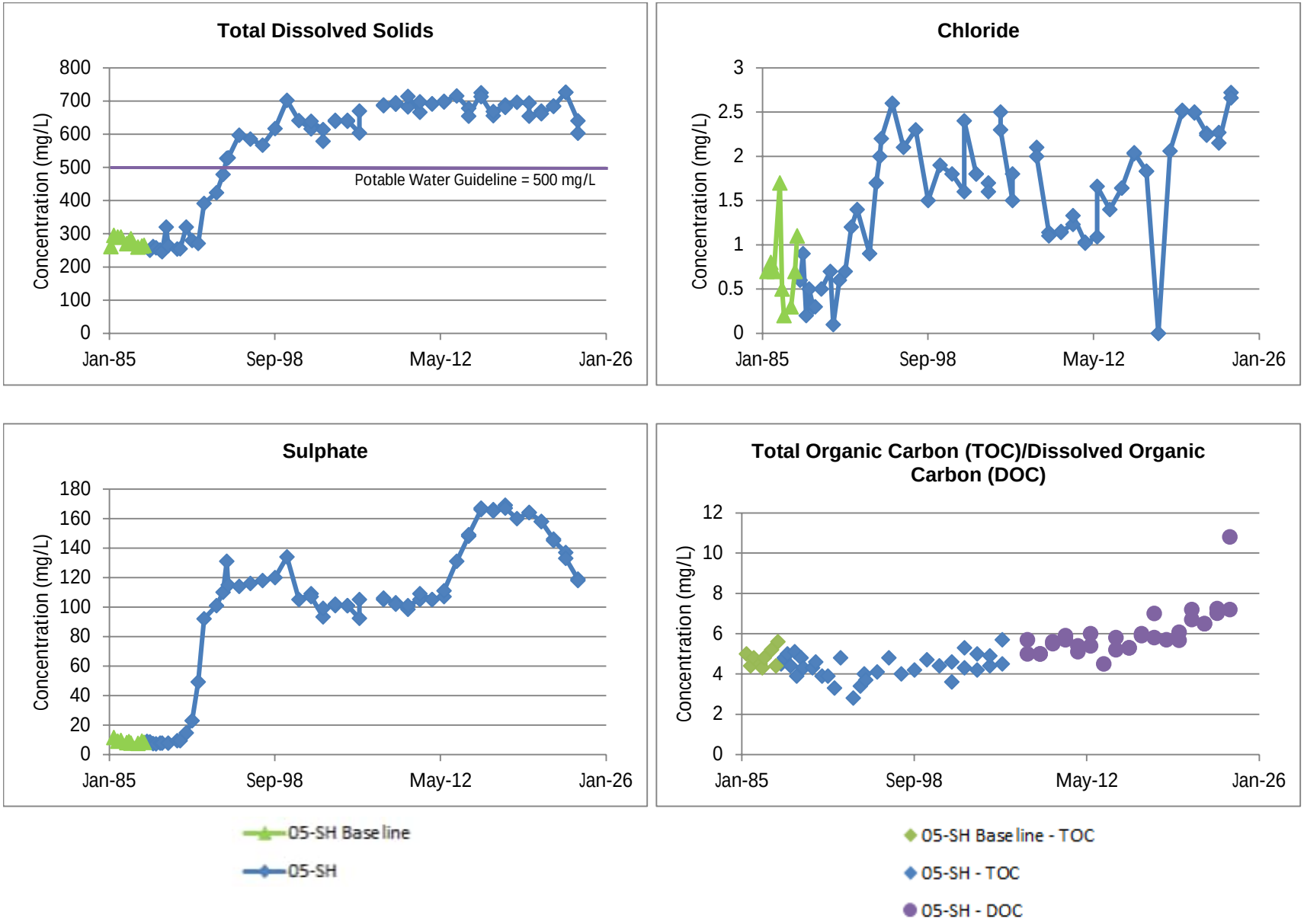
**Figure 12.8**
**VEOLIA, Swan Hills Treatment Centre**
**05-SH - Indicators**



AECOM

**Figure 12.9**
**VEOLIA, Swan Hills Treatment Centre**
**05-IN - Indicators**

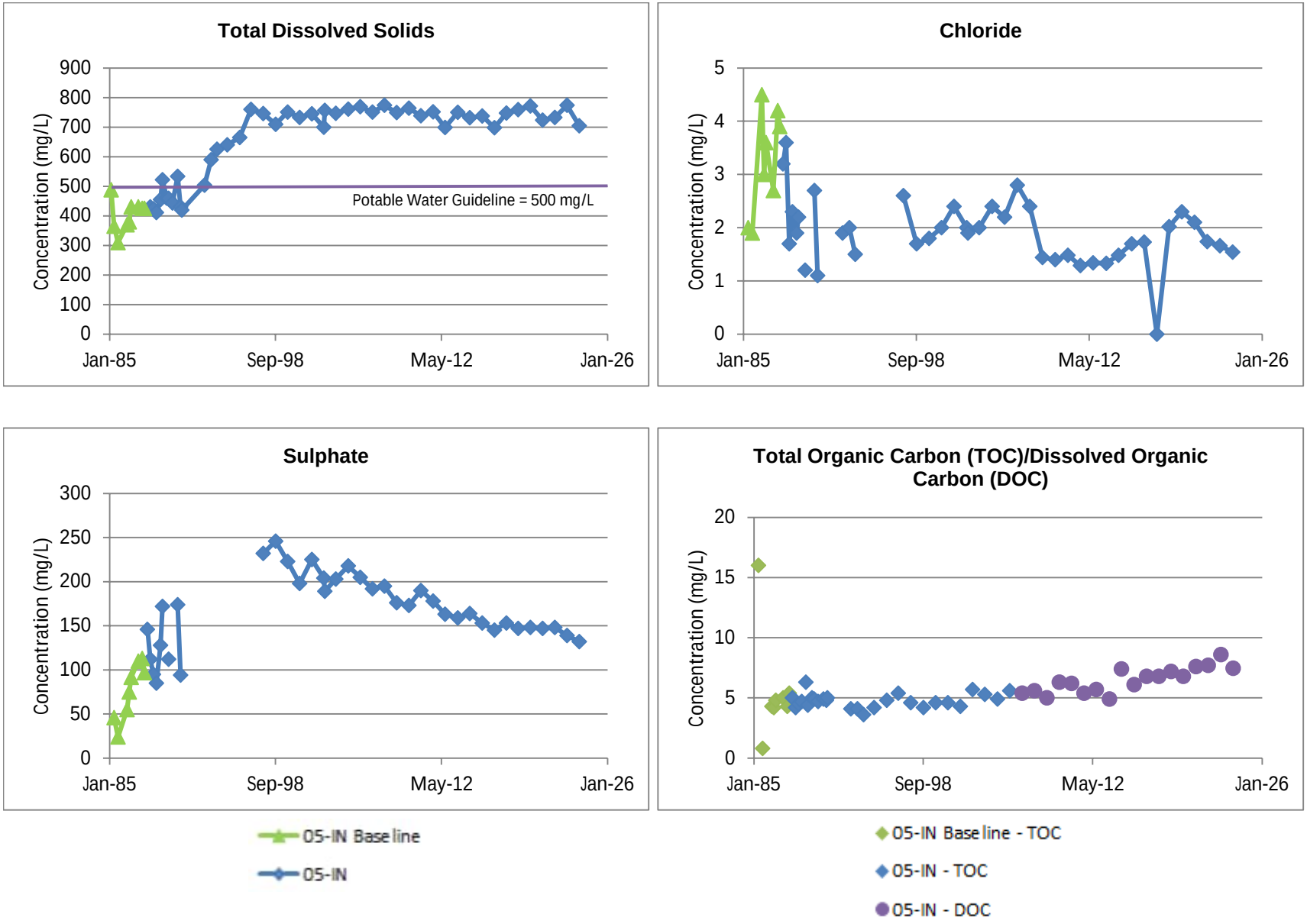


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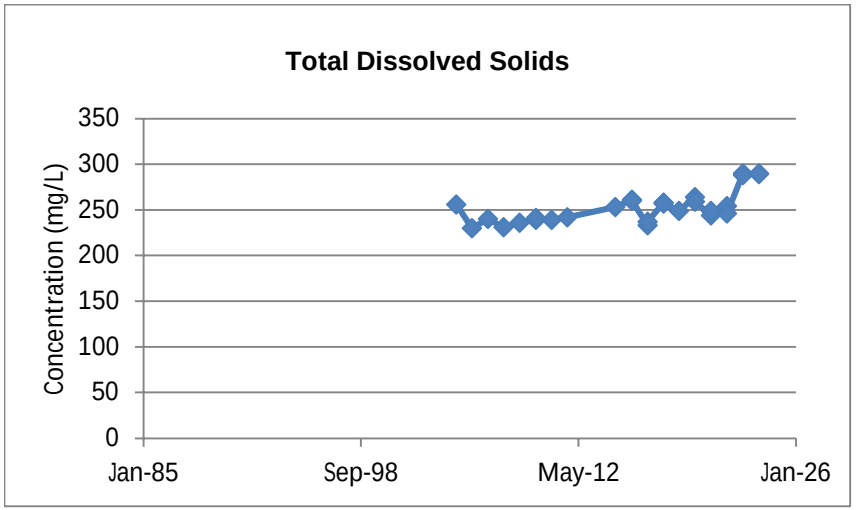
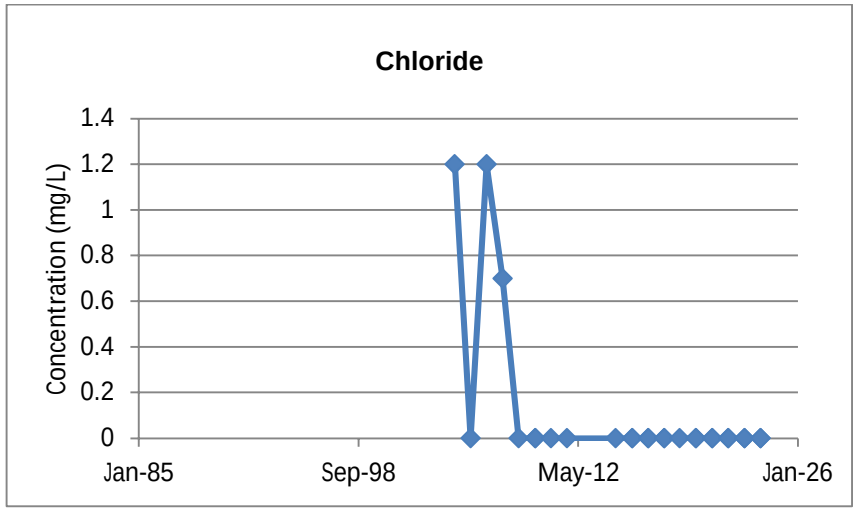
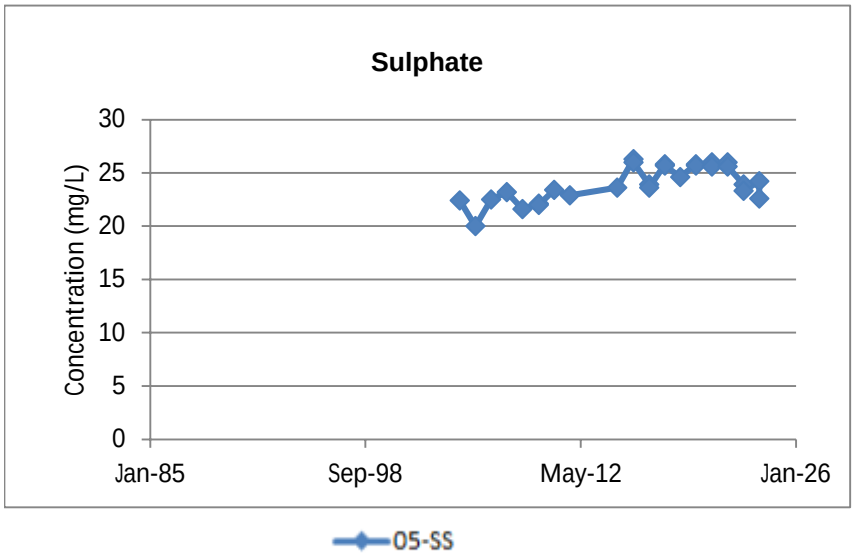
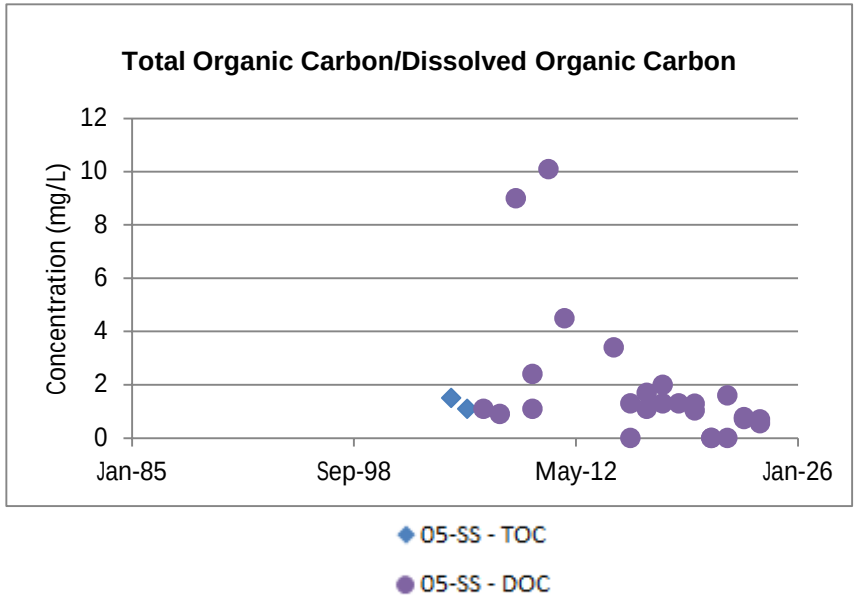
**Figure 12.10**
**VEOLIA, Swan Hills Treatment Centre**
**05-SS - Indicators**



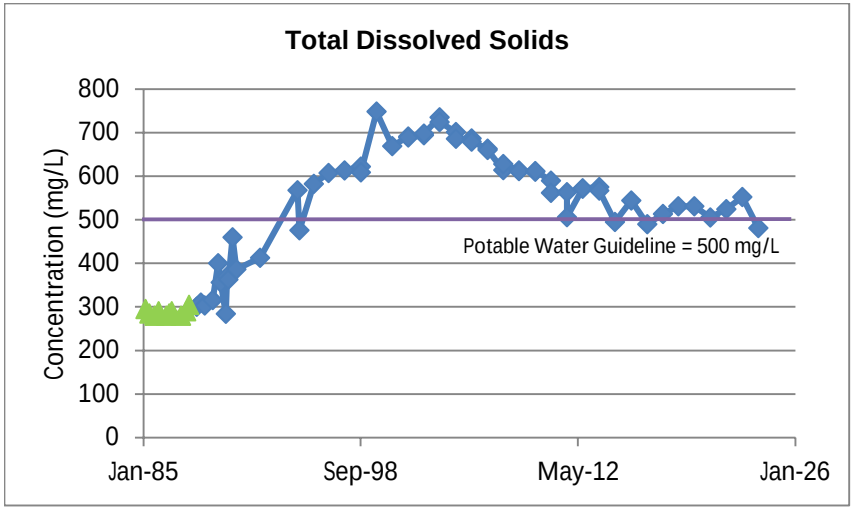



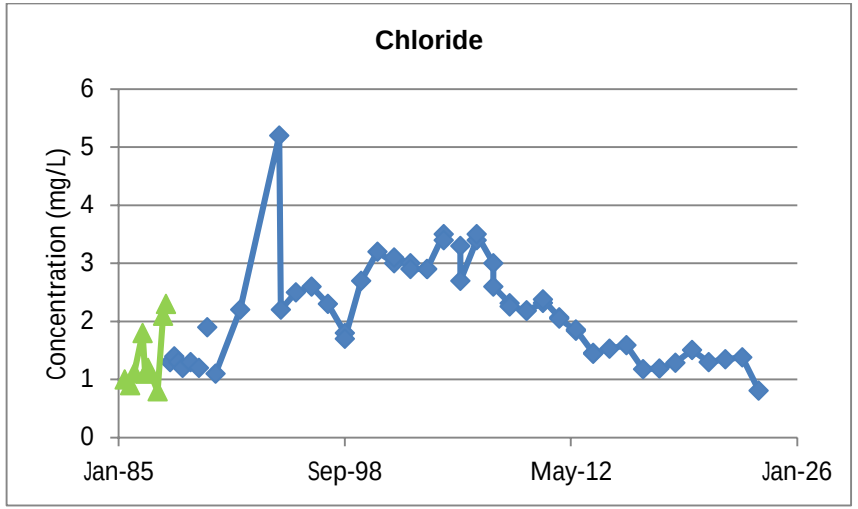



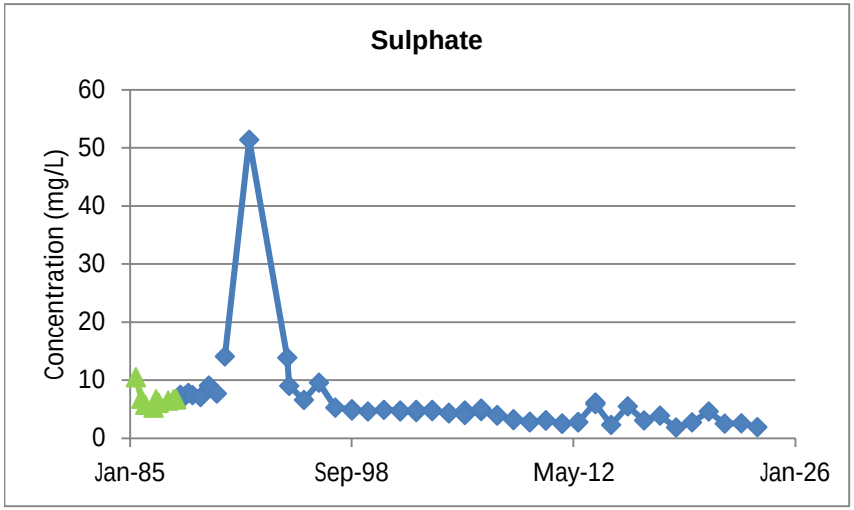



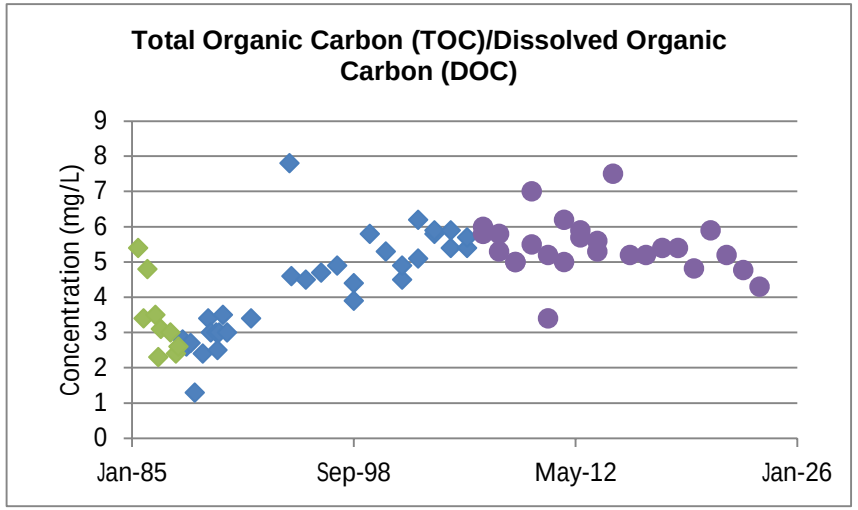
AECOM

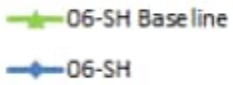
**Figure 12.11**
**VEOLIA, Swan Hills Treatment Centre**
**06-SH - Indicators**



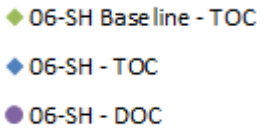



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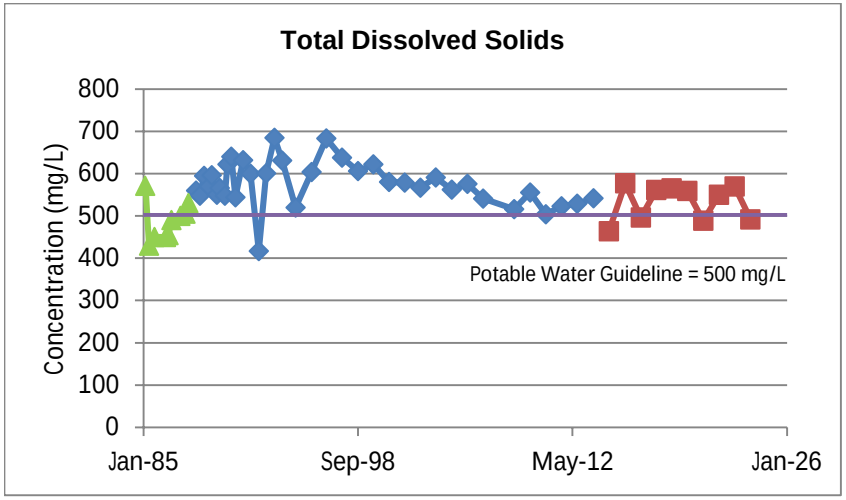
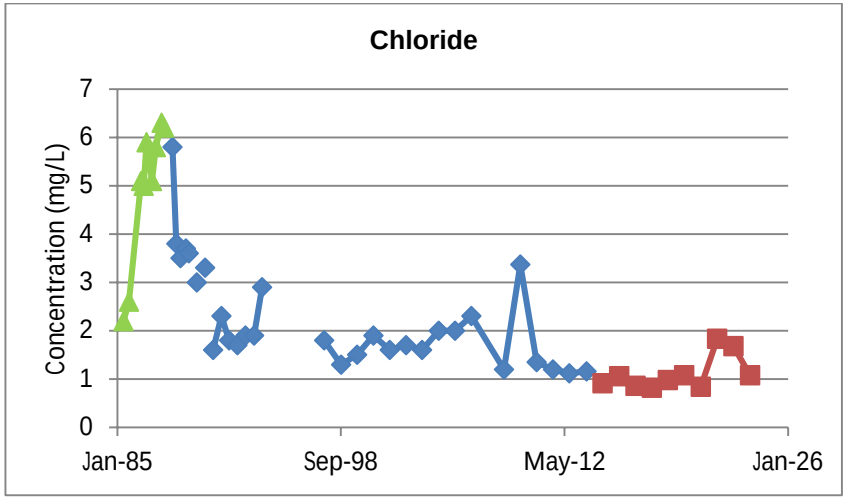
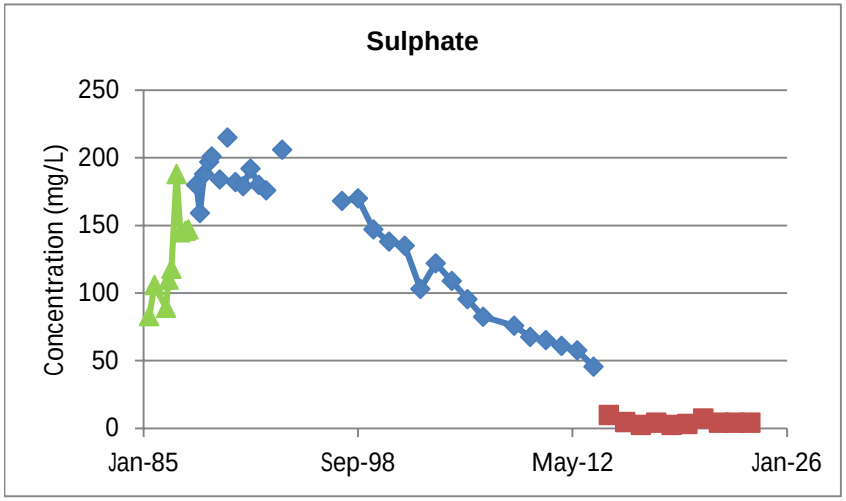
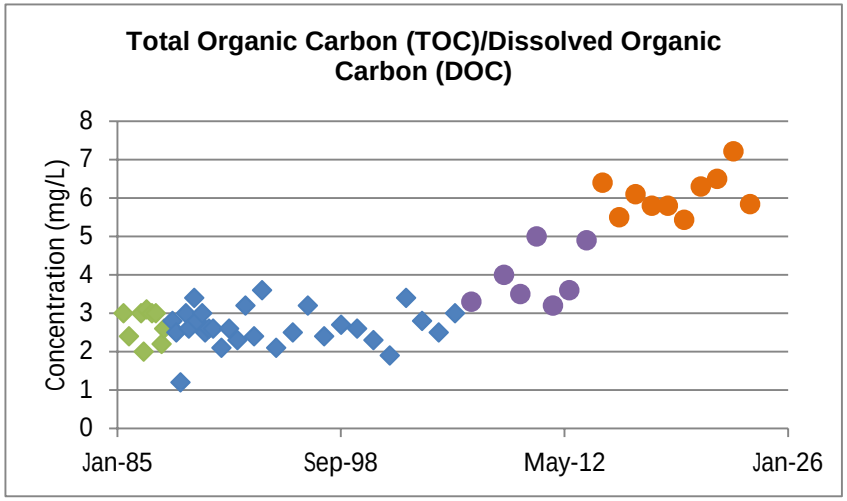
**Figure 12.12**
**VEOLIA, Swan Hills Treatment Centre**
**06-IN and 06(R)IN - Indicators**



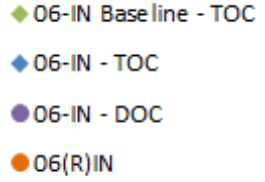


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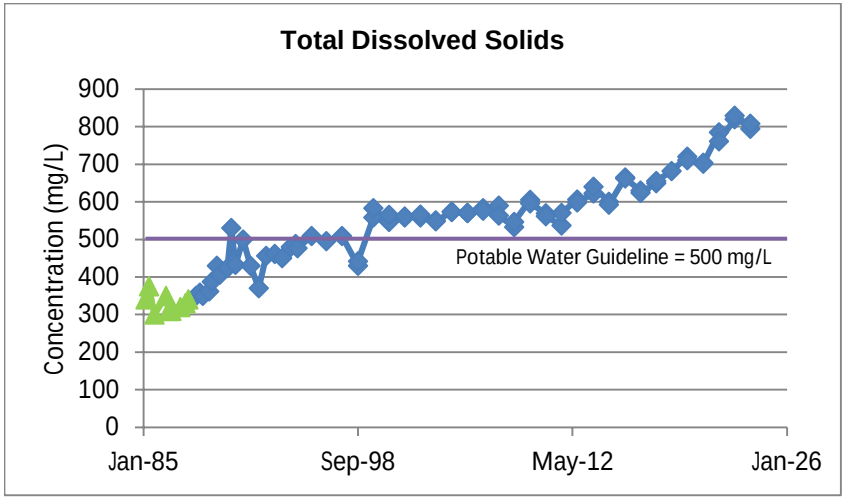
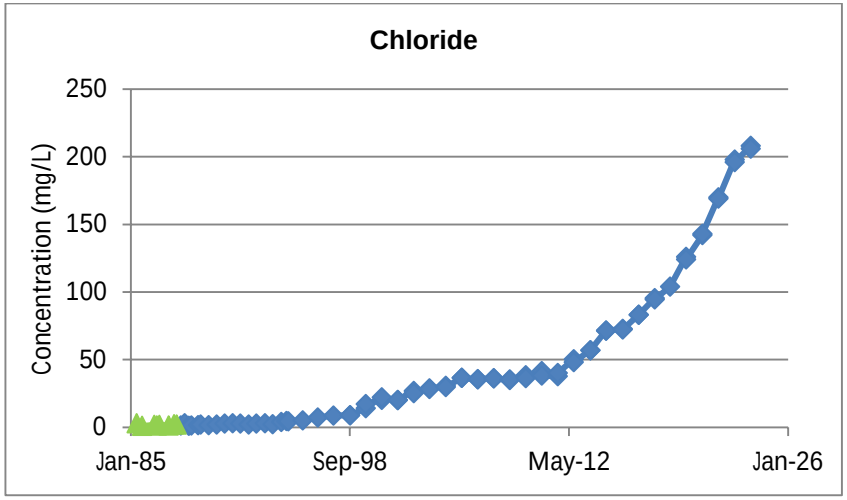
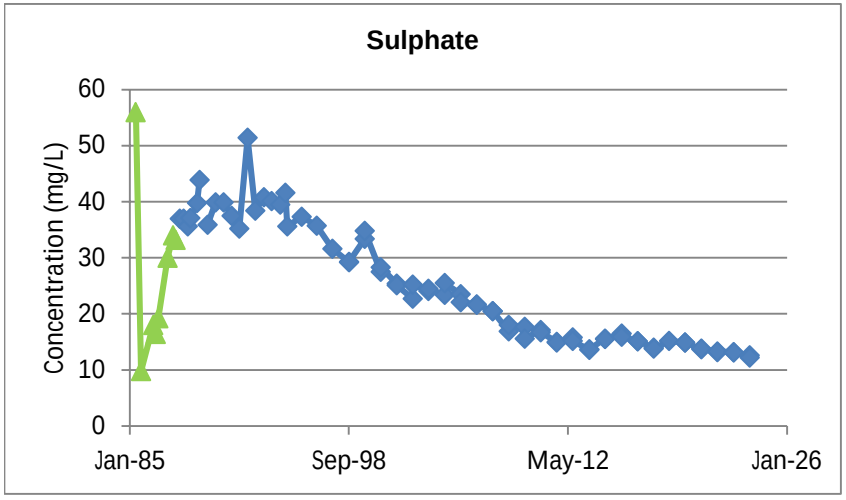
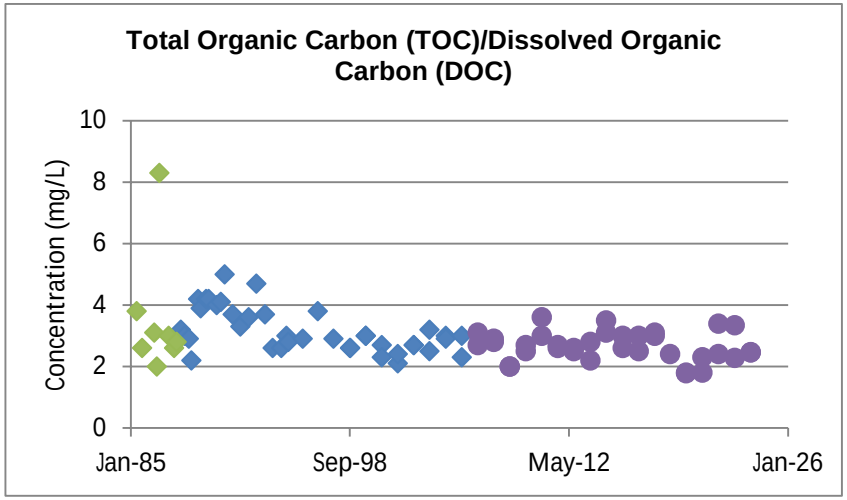
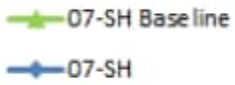
**Figure 12.13**
**VEOLIA, Swan Hills Treatment Centre**
**07-SH - Indicators**



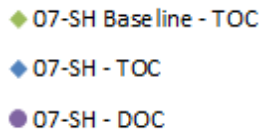



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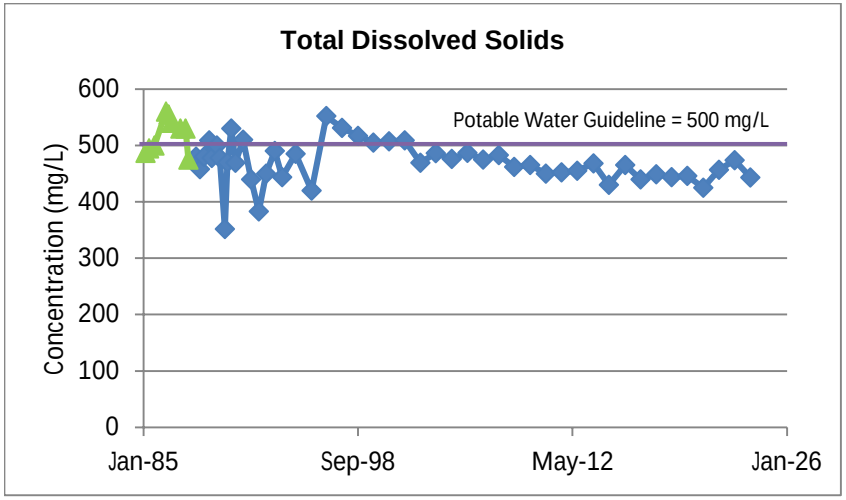
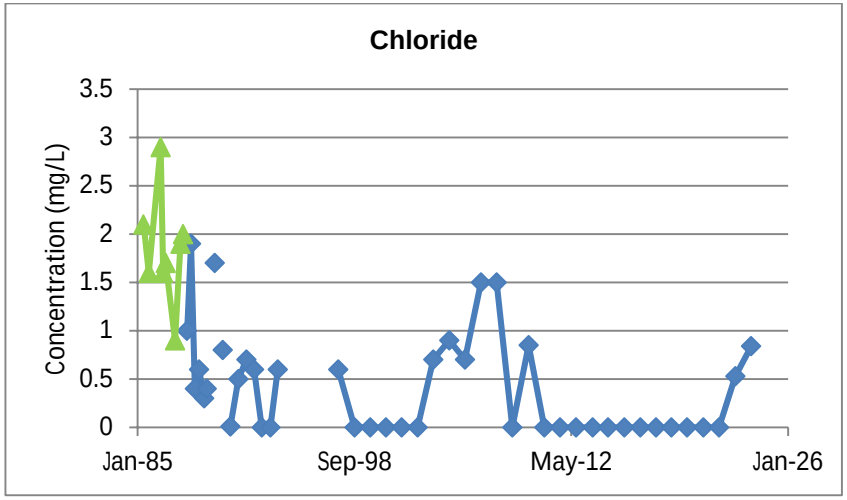
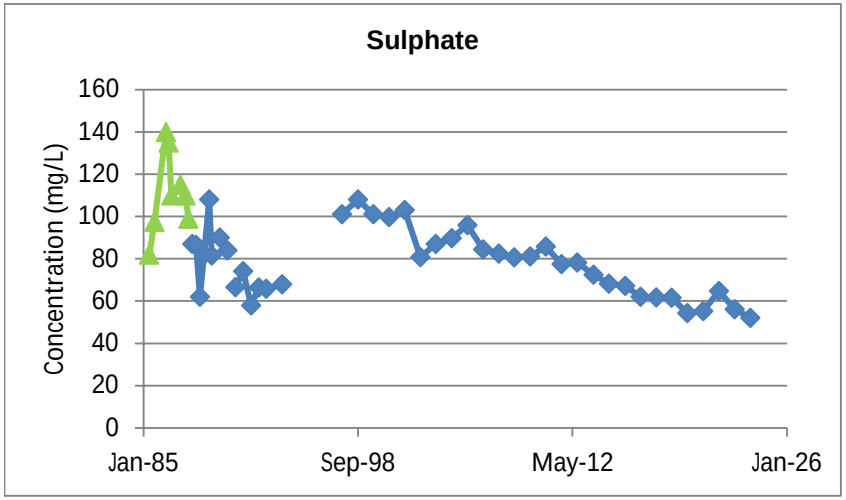
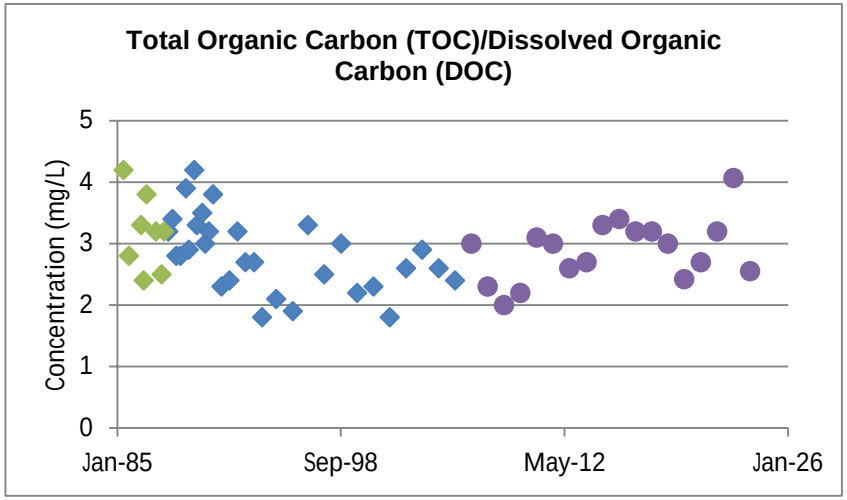
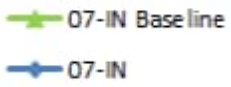
**Figure 12.14**
**VEOLIA, Swan Hills Treatment Centre**
**07-IN - Indicators**

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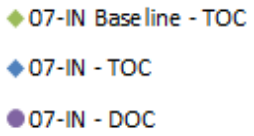

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**Figure 12.15**
**VEOLIA, Swan Hills Treatment Centre**
**07-SS and 07(R)SS - Indicators**

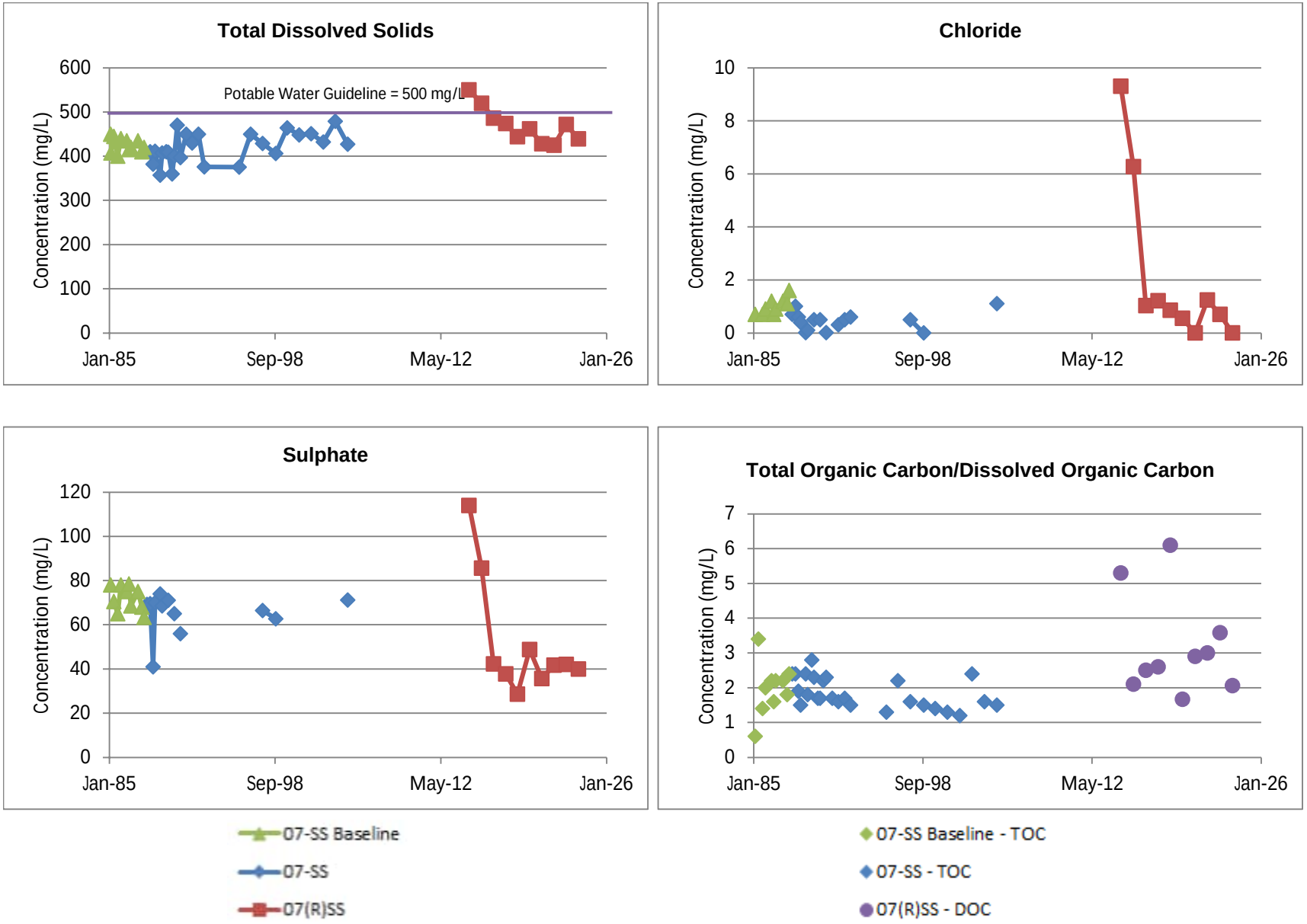

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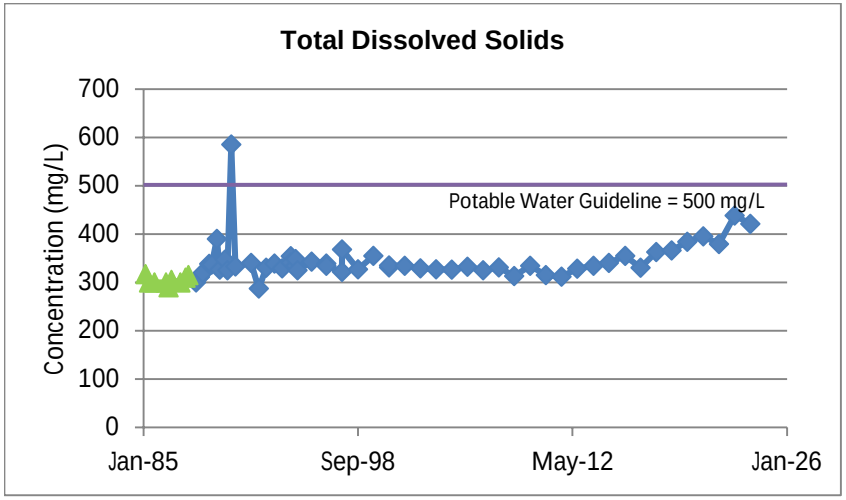
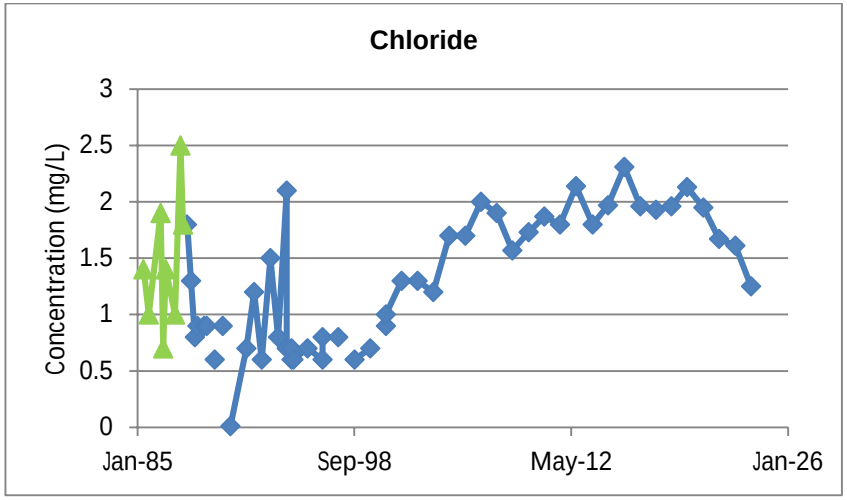
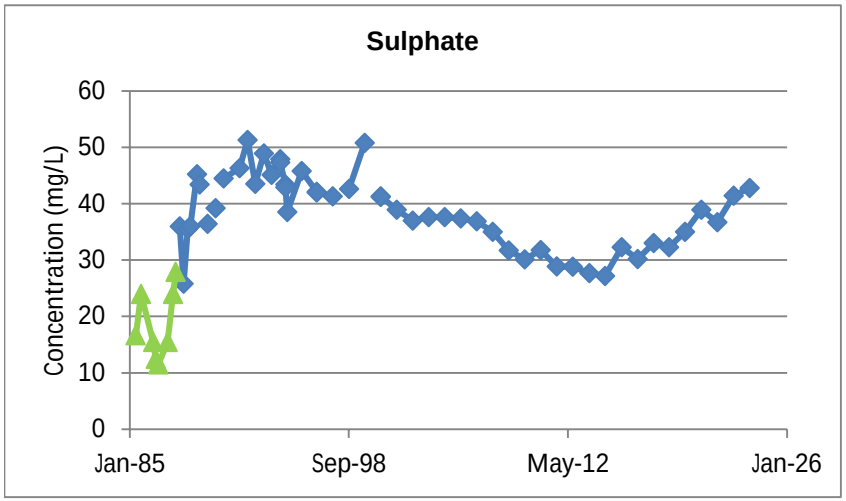
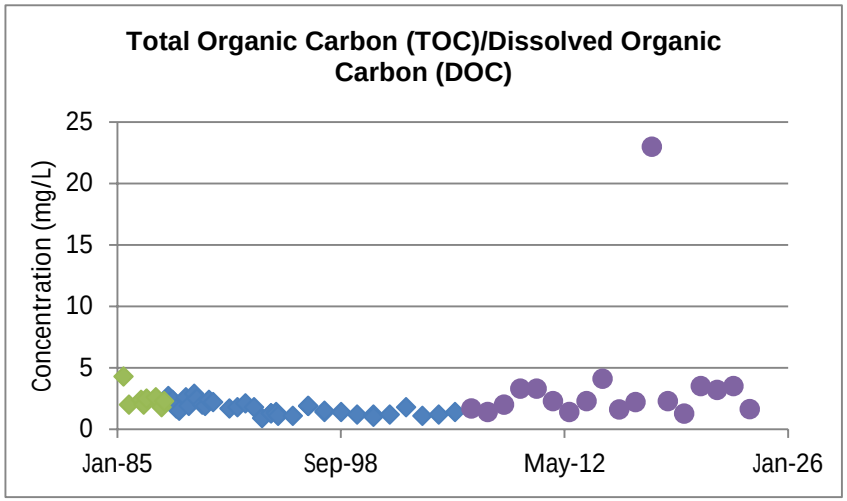
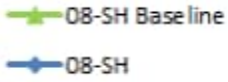
**Figure 12.16**
**VEOLIA, Swan Hills Treatment Centre**
**08-SH - Indicators**



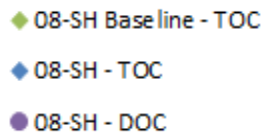



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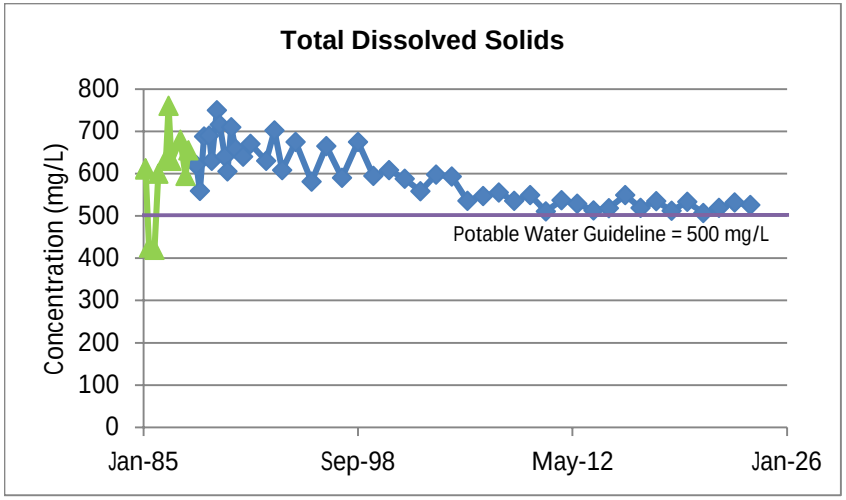
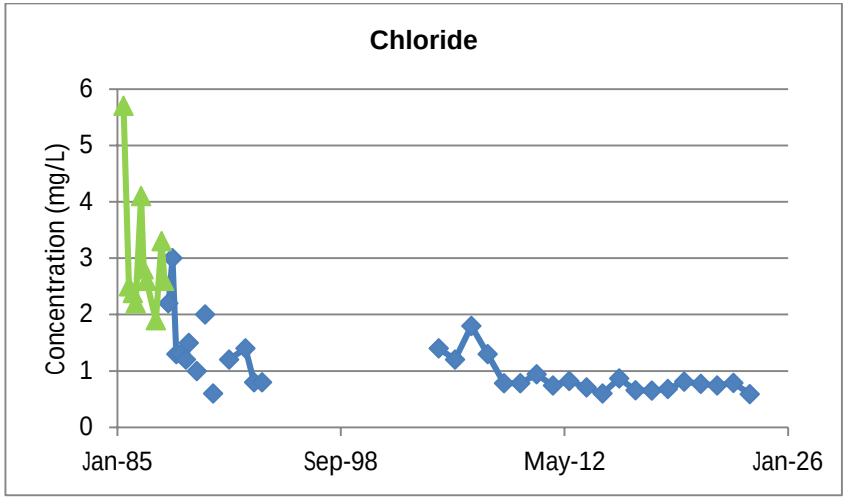
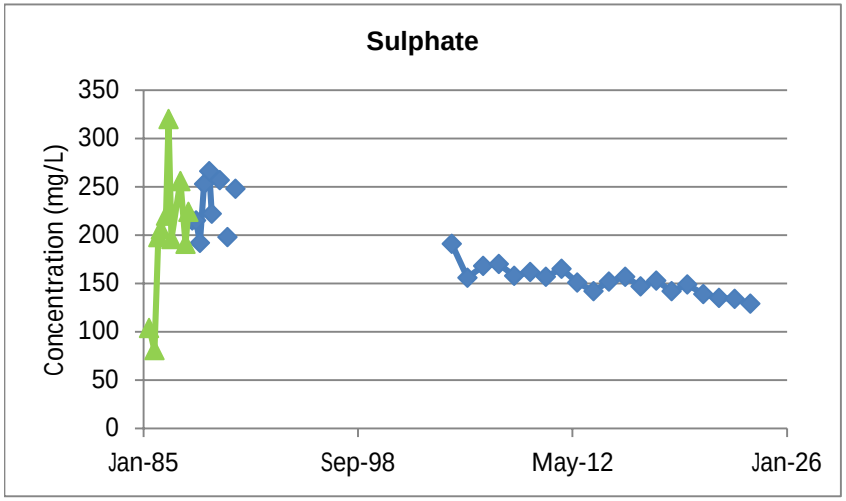
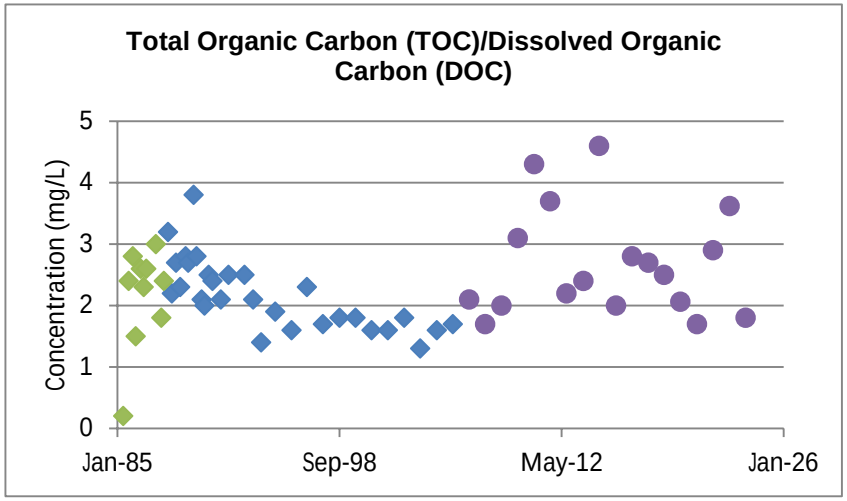
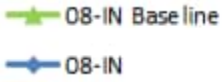
**Figure 12.17**
**VEOLIA, Swan Hills Treatment Centre**
**08-IN - Indicators**



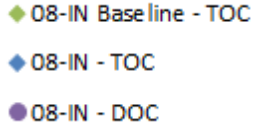



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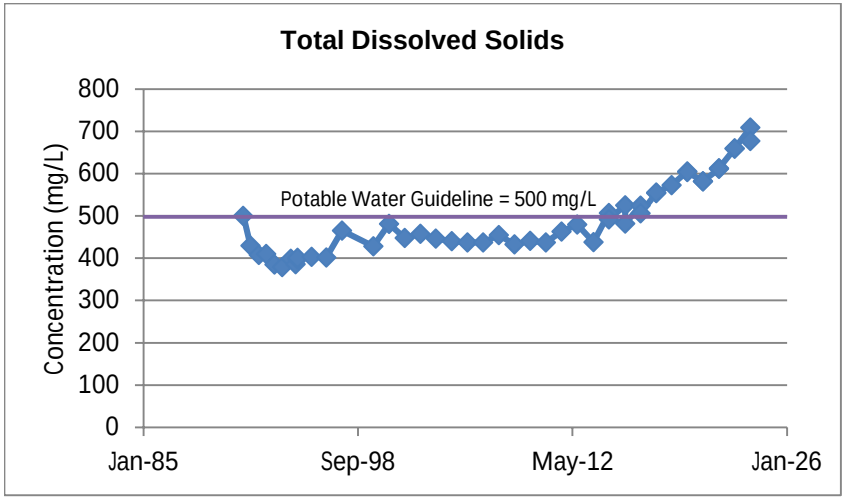
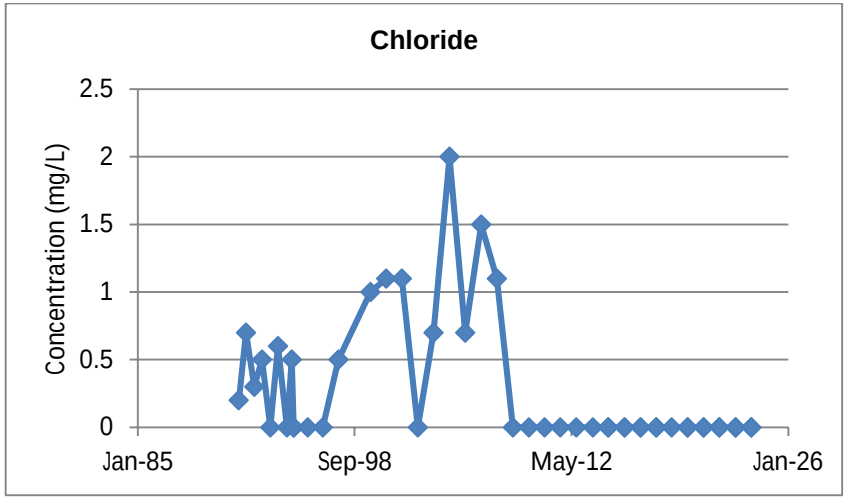
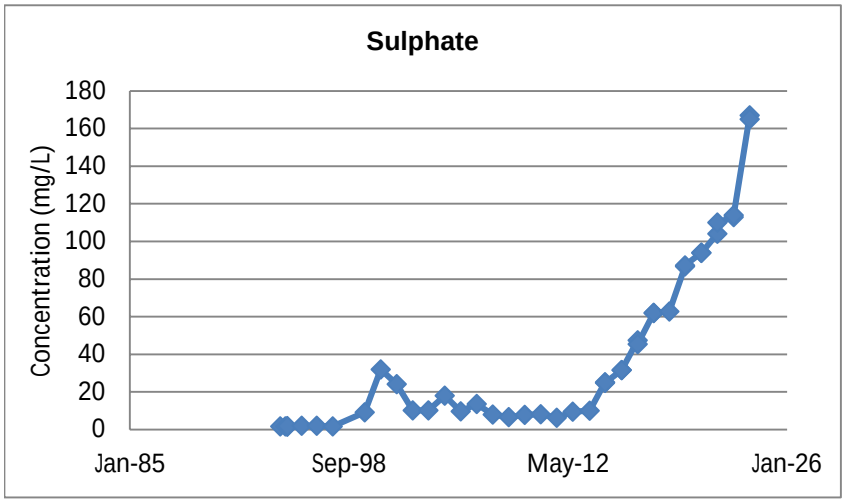
**Figure 12.18**
**VEOLIA, Swan Hills Treatment Centre**
**11-SH - Indicators**



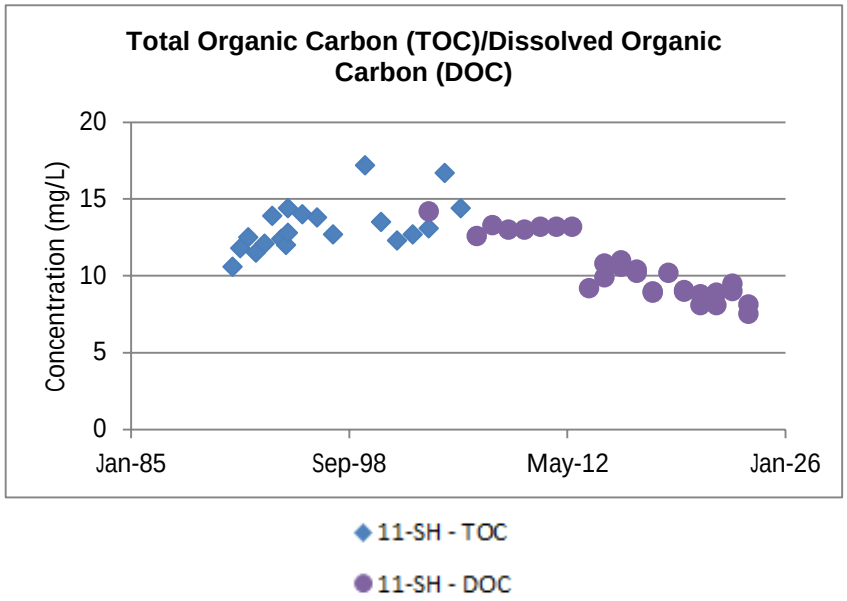



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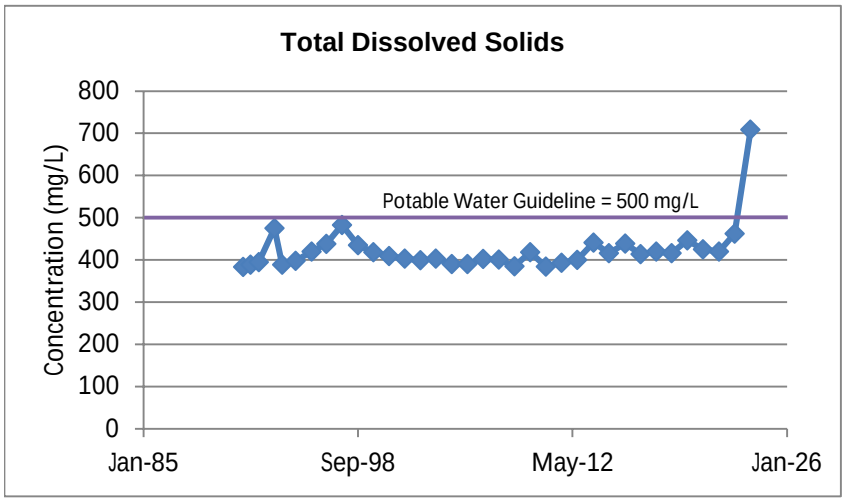
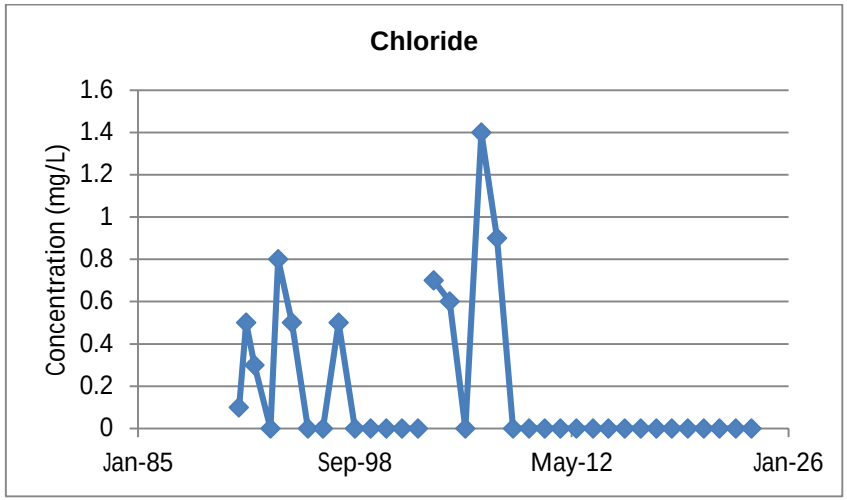
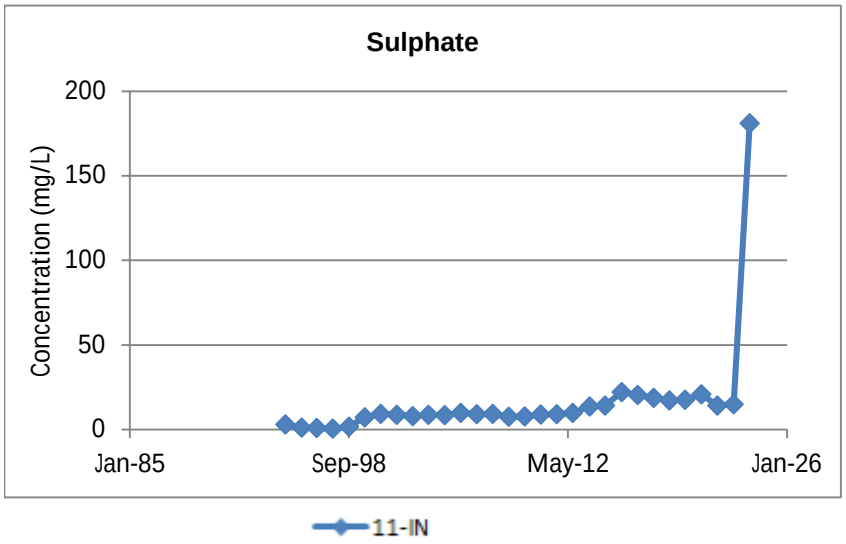
**Figure 12.19**
**VEOLIA, Swan Hills Treatment Centre**
**11-IN - Indicators**



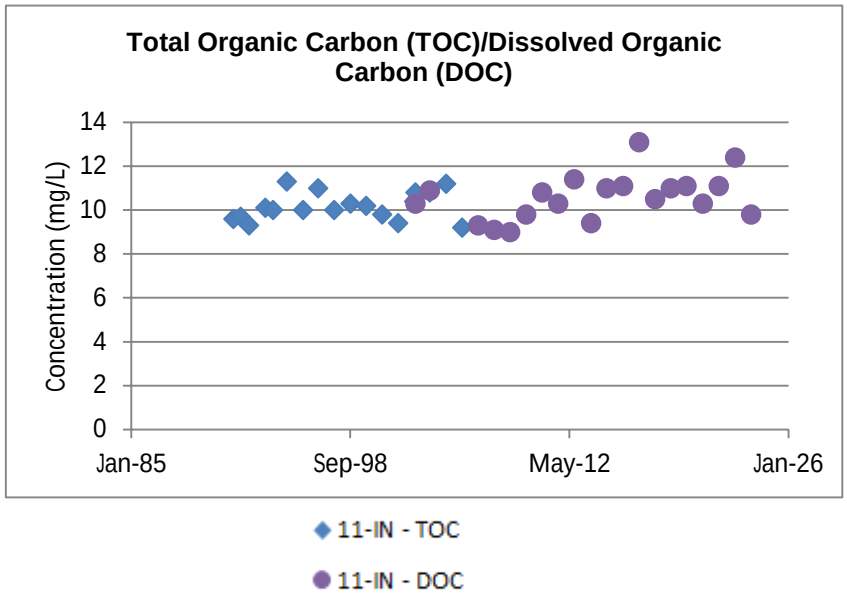



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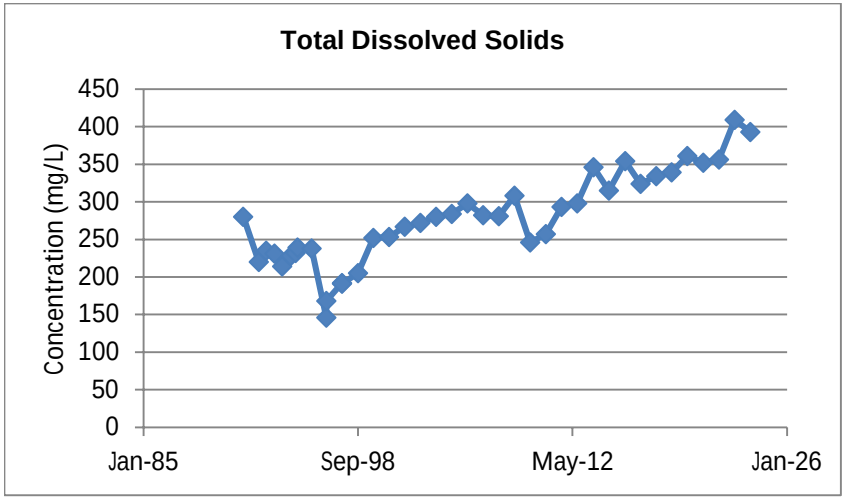
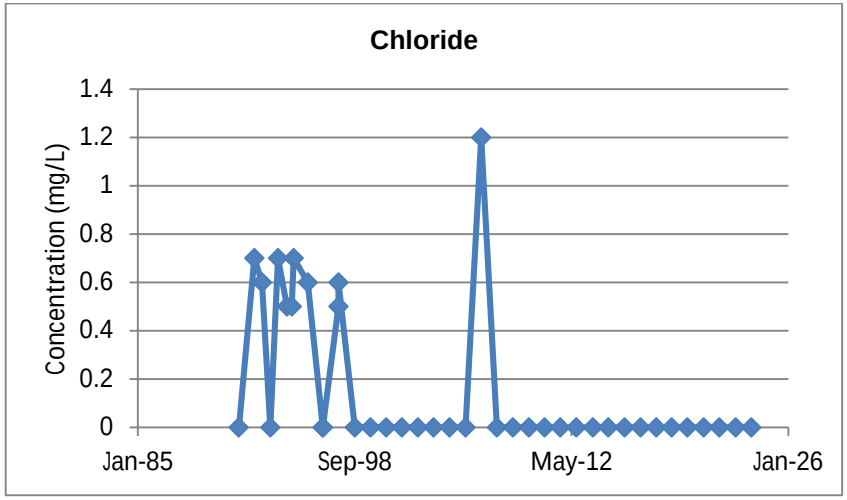
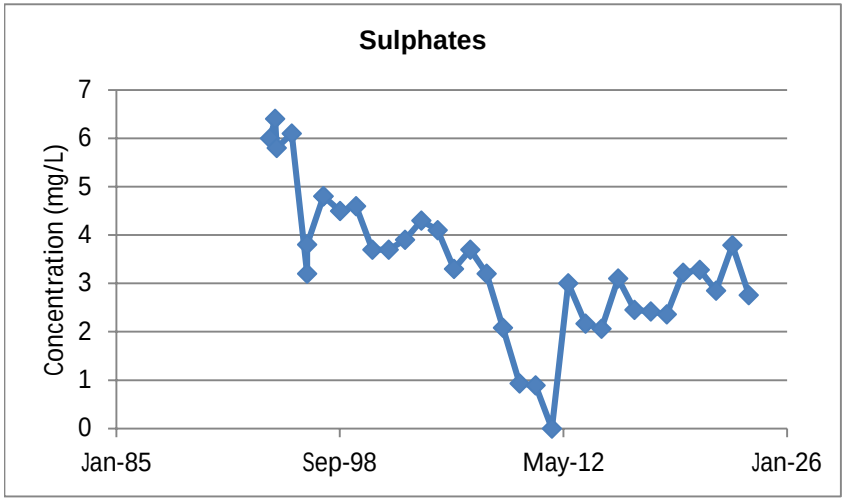
**Figure 12.20**
**VEOLIA, Swan Hills Treatment Centre**
**12-SH - Indicators**



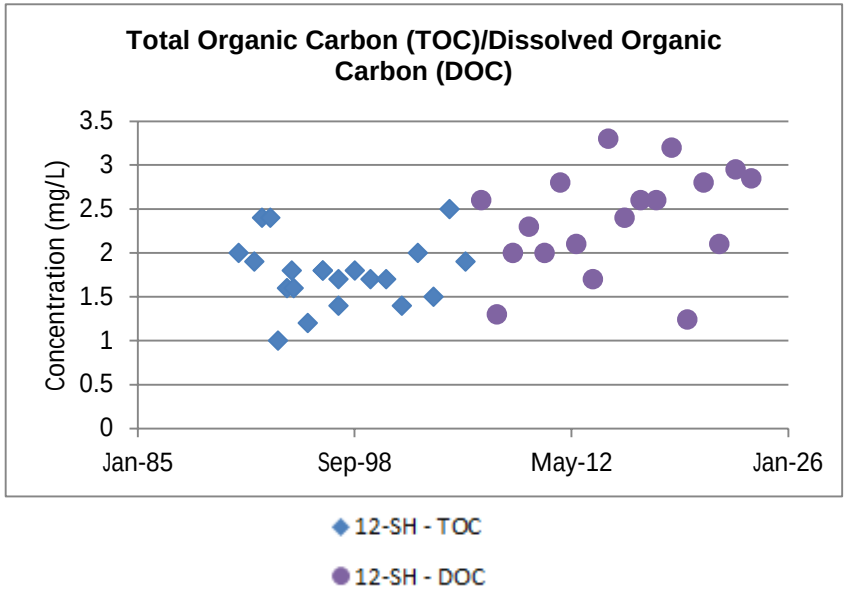



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**Figure 12.21**
**VEOLIA, Swan Hills Treatment Centre**
**12-IN - Indicators**

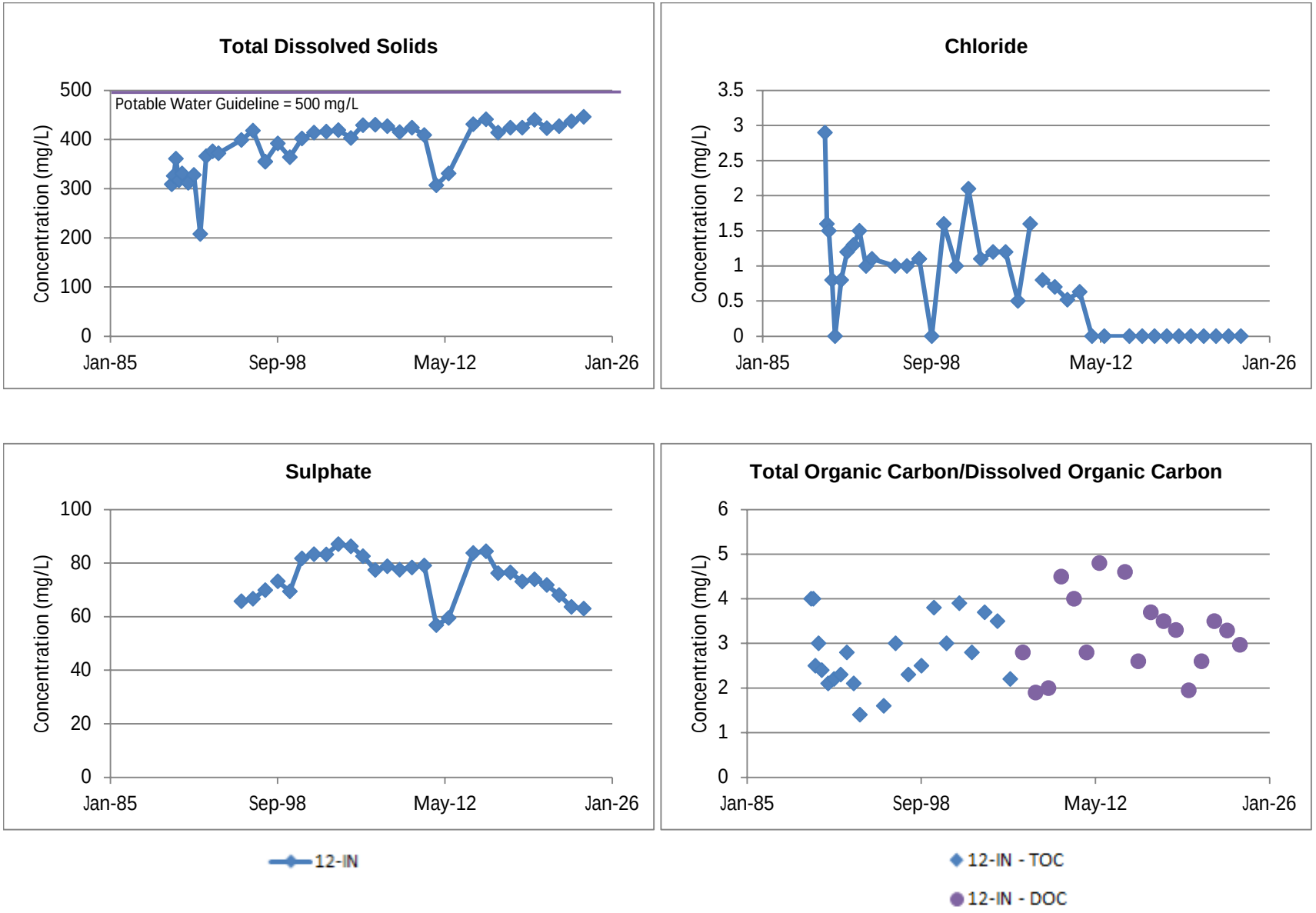

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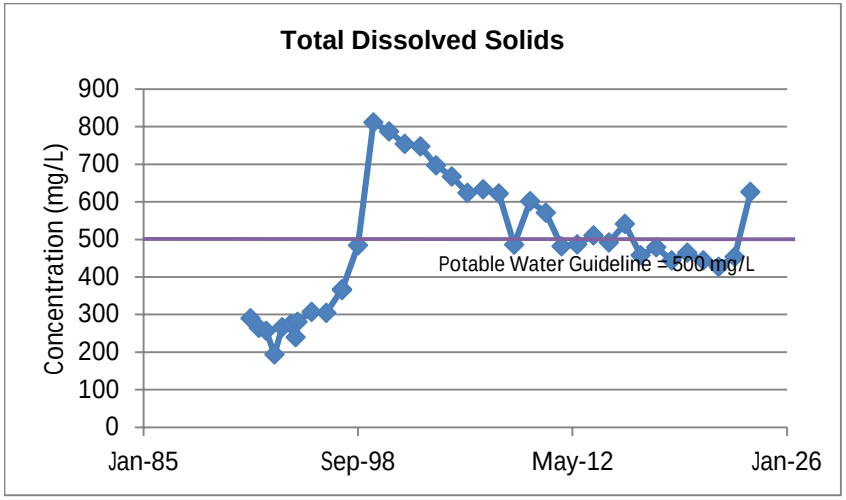
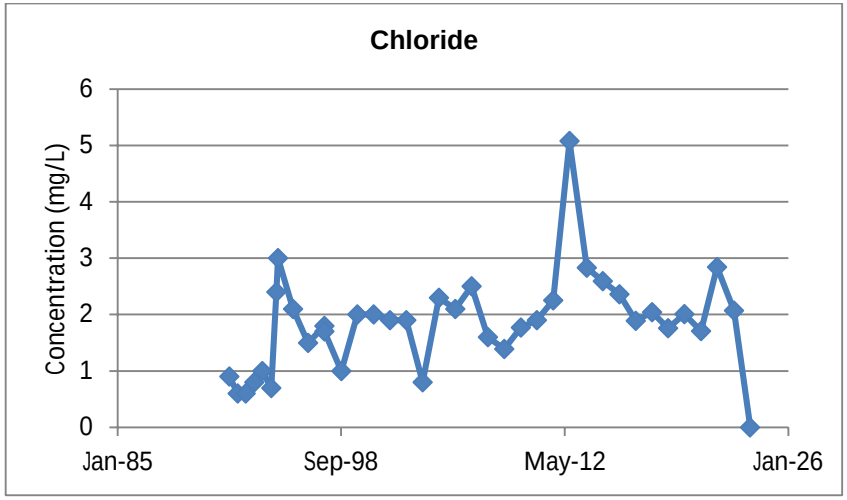
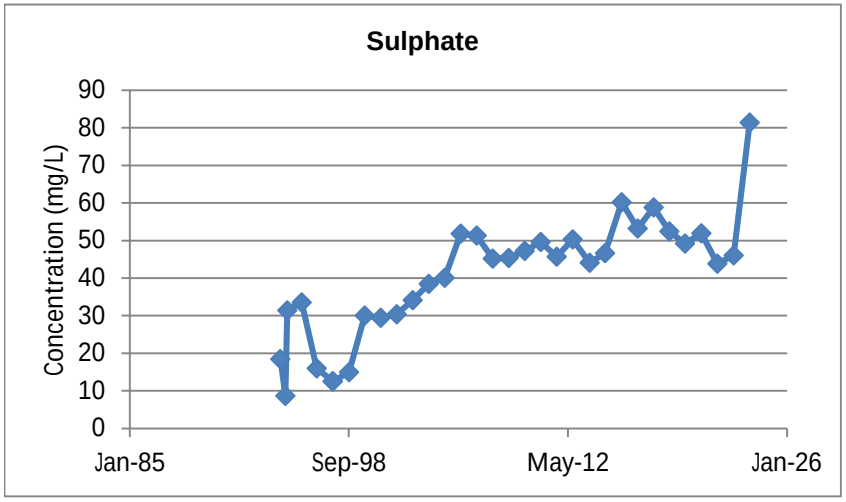
**Figure 12.22**
**VEOLIA, Swan Hills Treatment Centre**
**13-SH - Indicators**



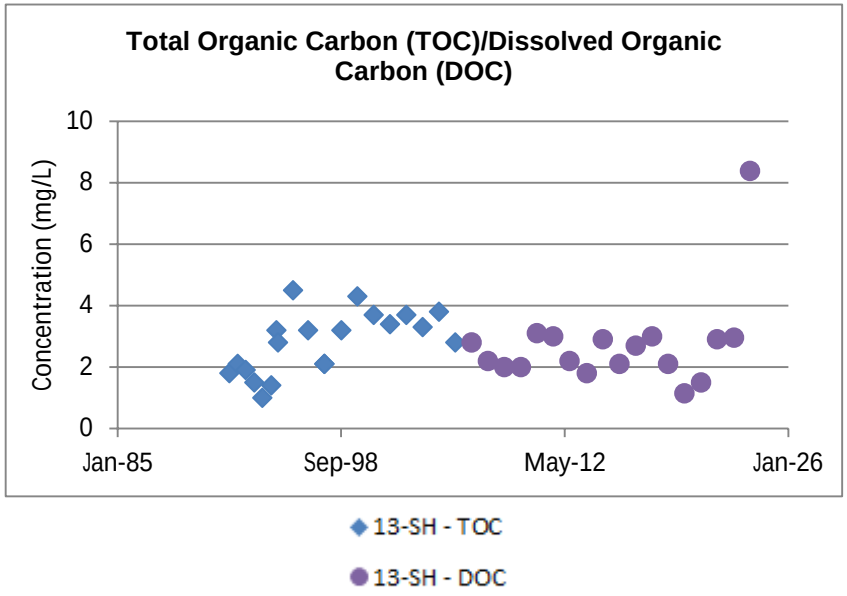



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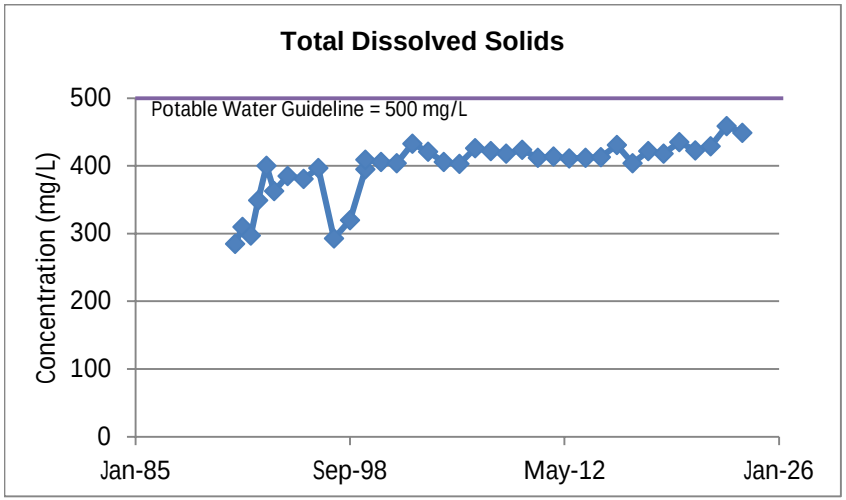
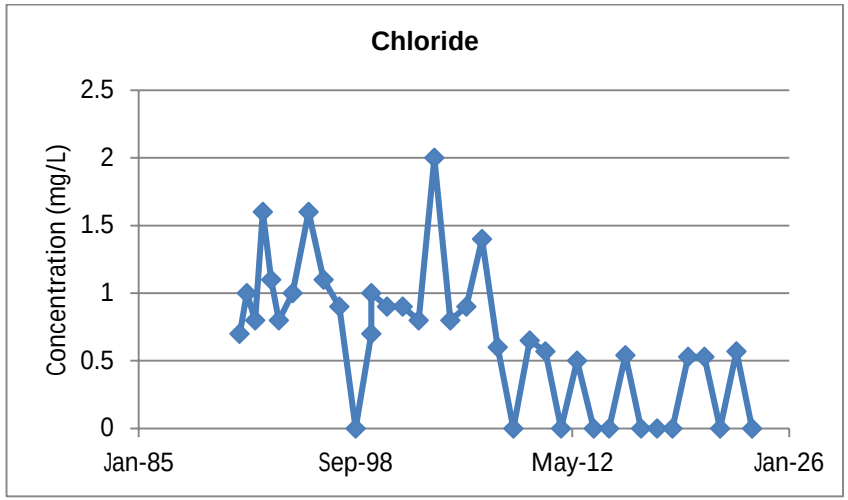
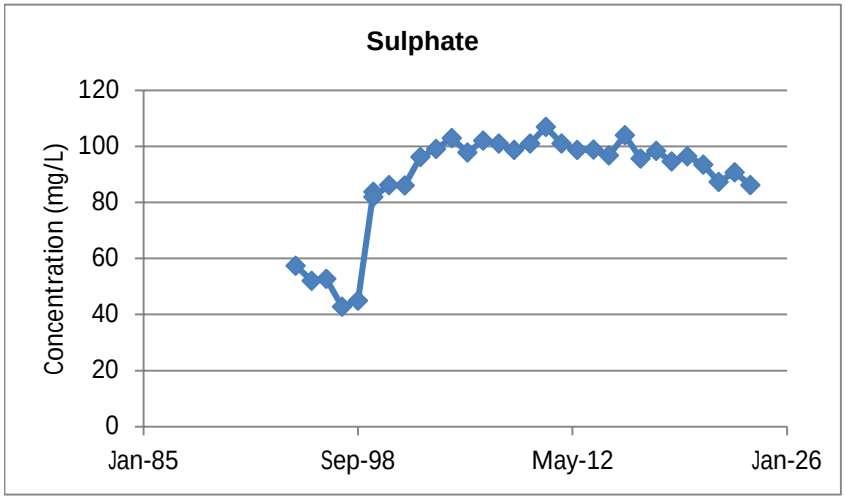
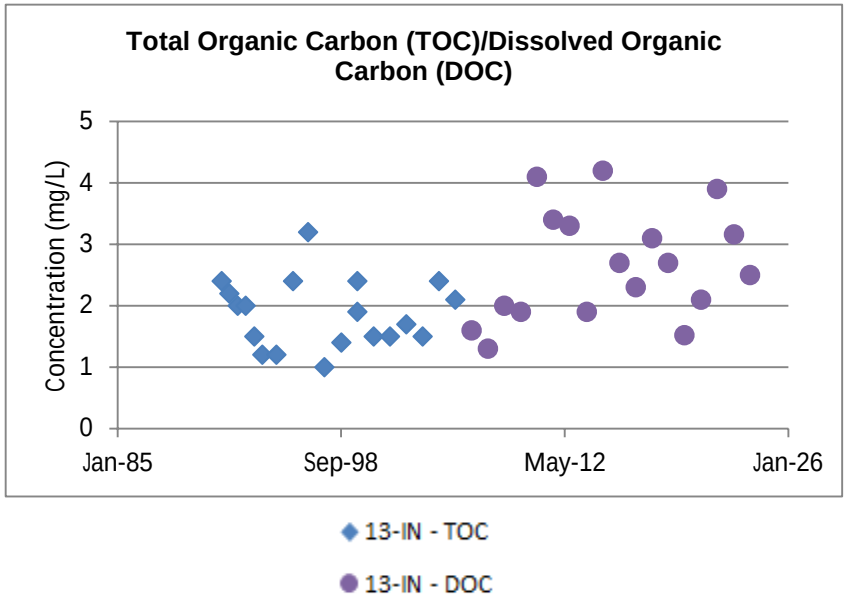
**Figure 12.23**
**VEOLIA, Swan Hills Treatment Centre**
**13-IN - Indicators**



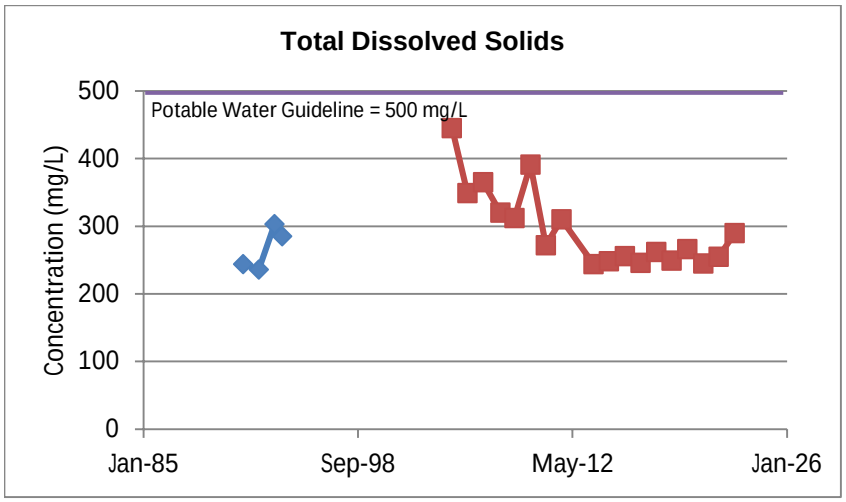



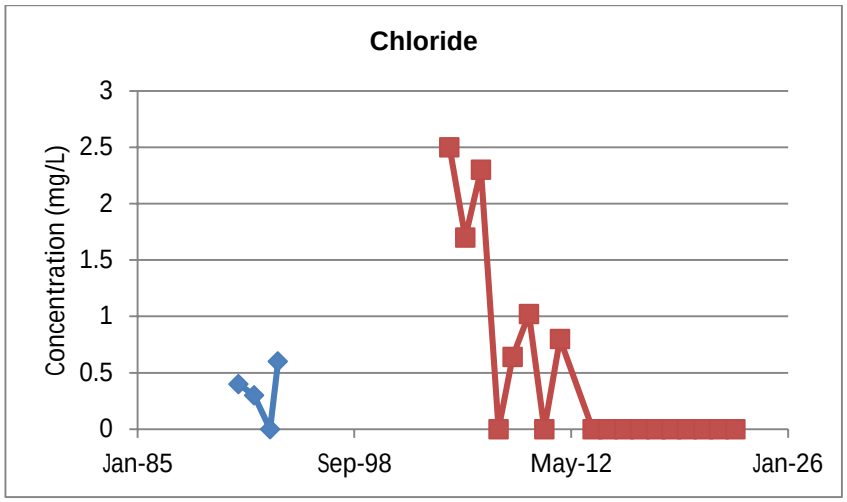



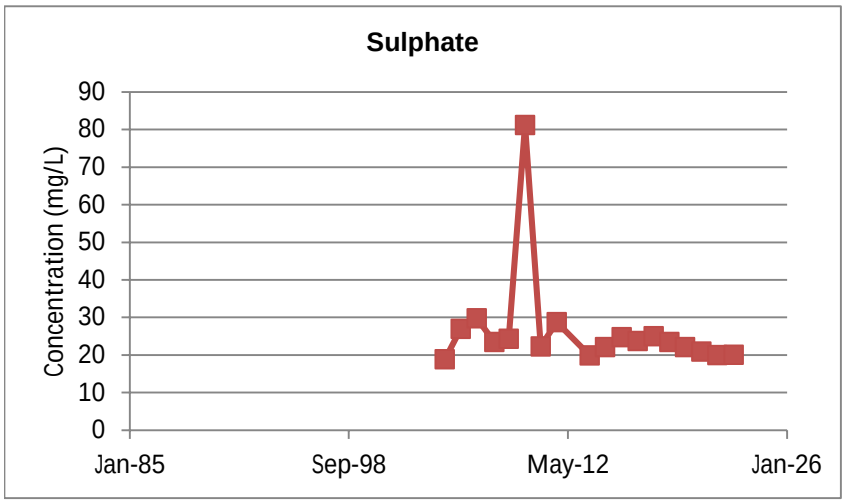



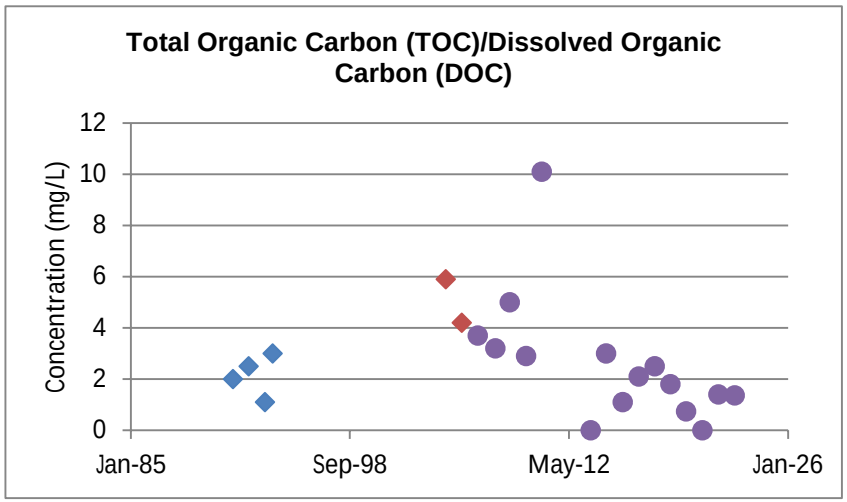
AECOM

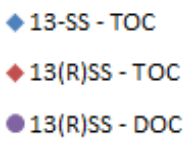
**Figure 12.24**
**VEOLIA, Swan Hills Treatment Centre**
**13-SS and 13(R)SS - Indicators**



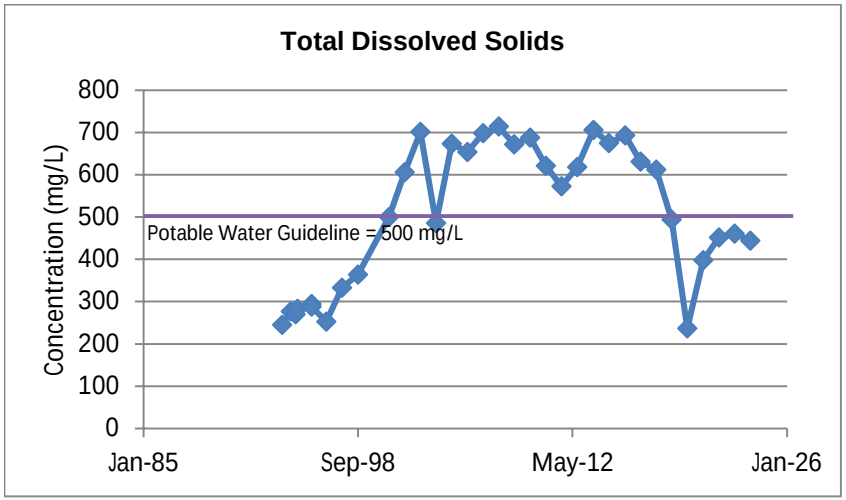



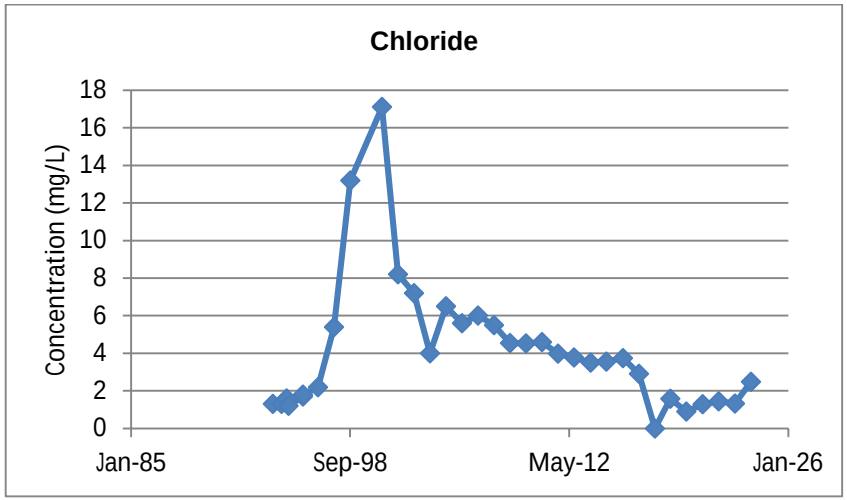



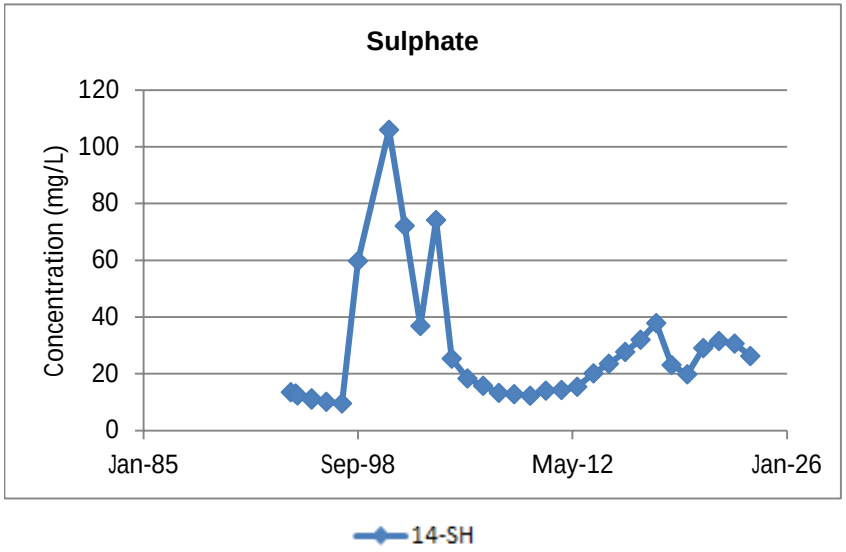


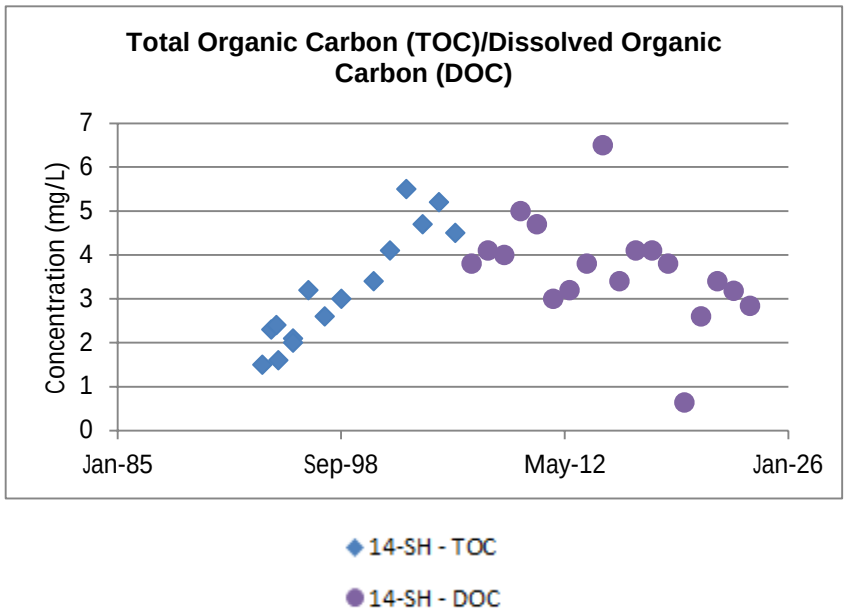
AECOM

**Figure 12.25**
**VEOLIA, Swan Hills Treatment Centre**
**14-SH - Indicators**



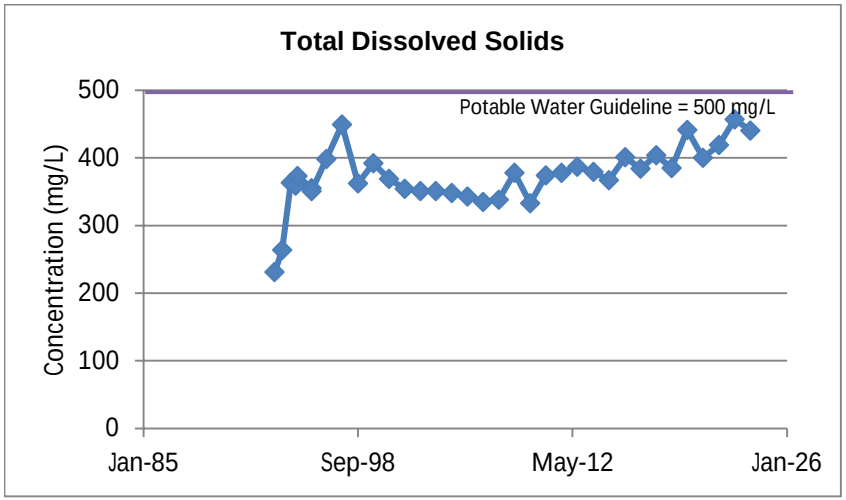



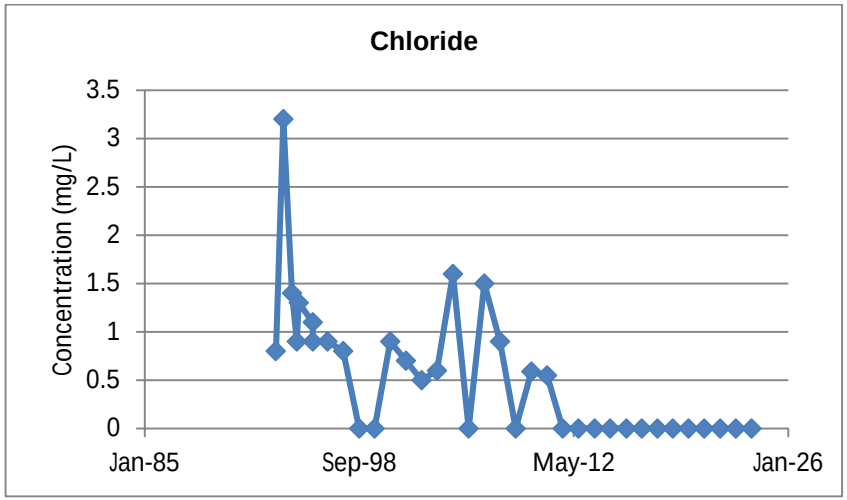



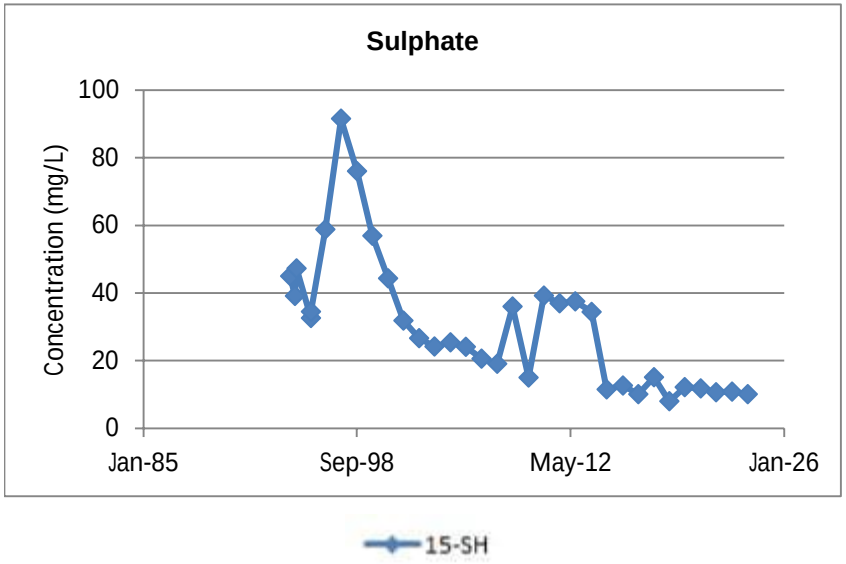



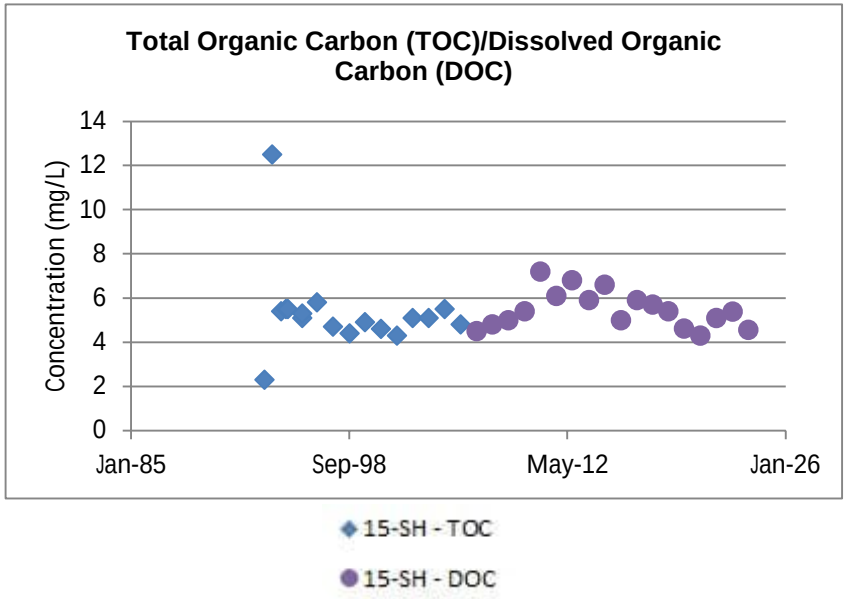
AECOM

**Figure 12.26**
**VEOLIA, Swan Hills Treatment Centre**
**15-SH - Indicators**



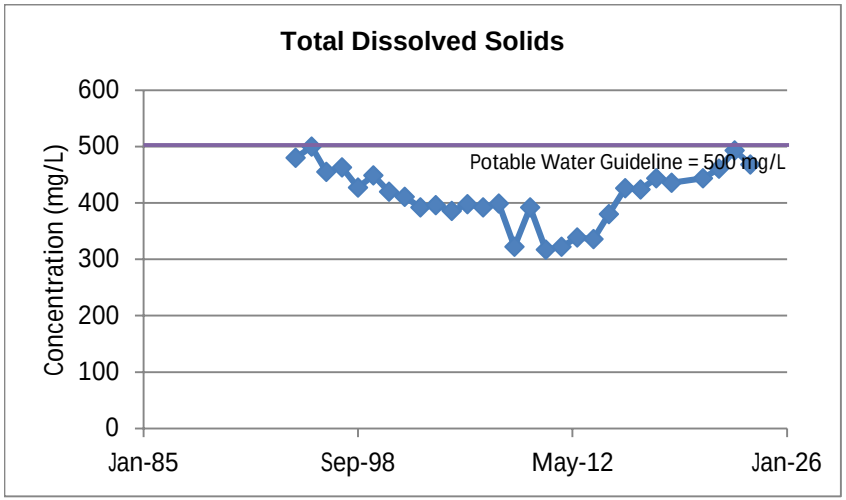



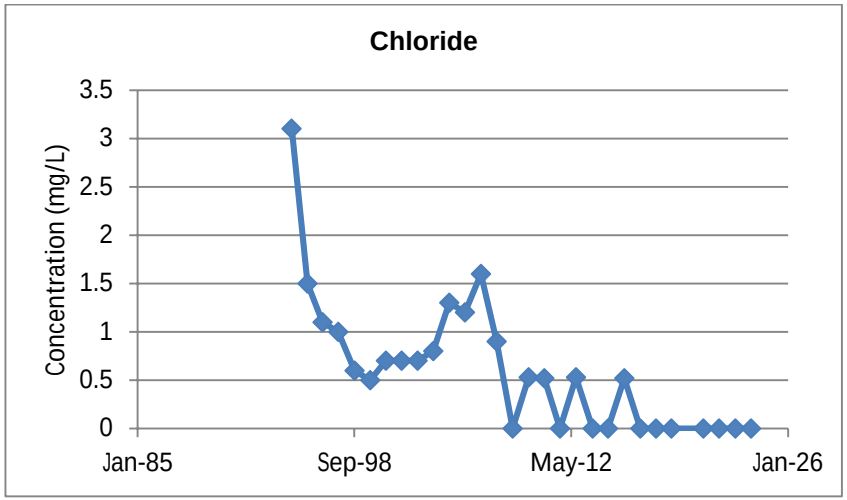



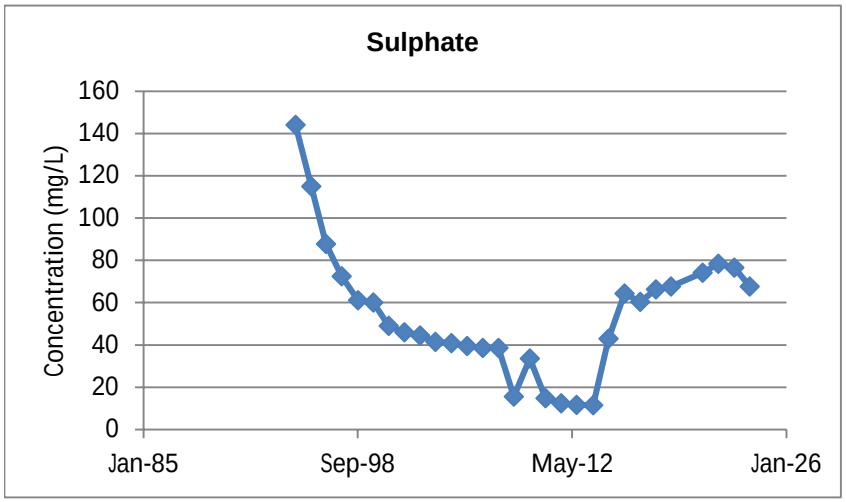



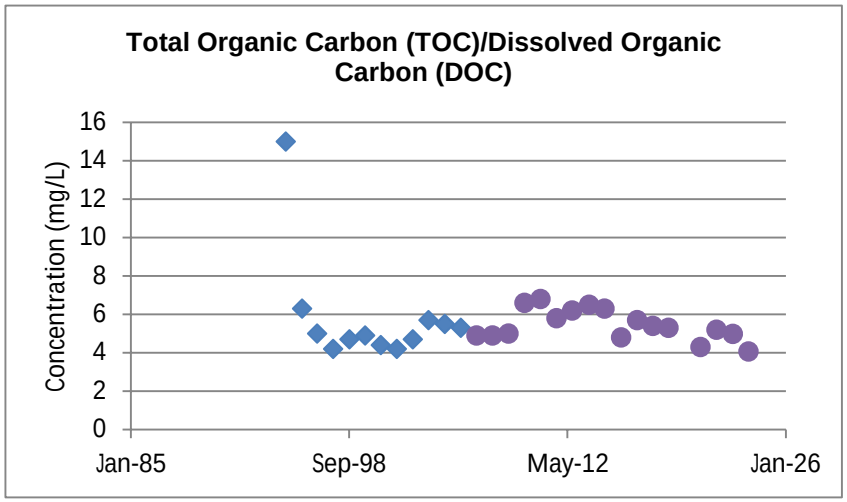
AECOM

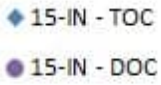
**Figure 12.27**
**VEOLIA, Swan Hills Treatment Centre**
**15-IN - Indicators**



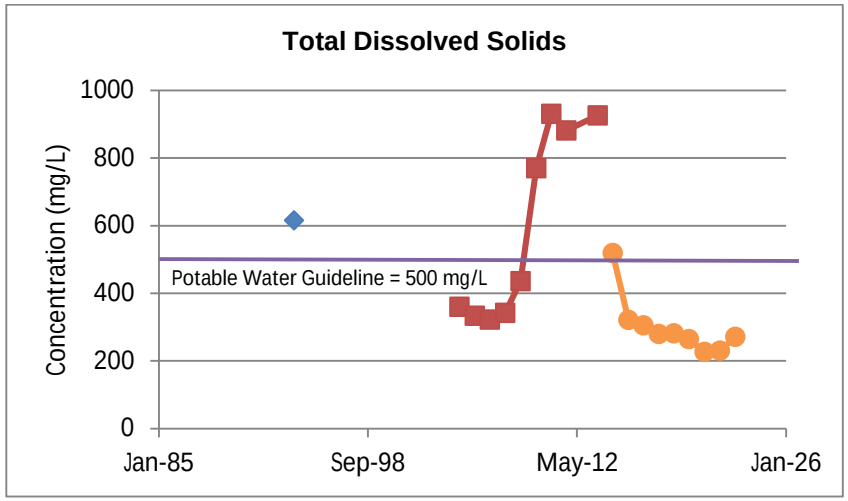



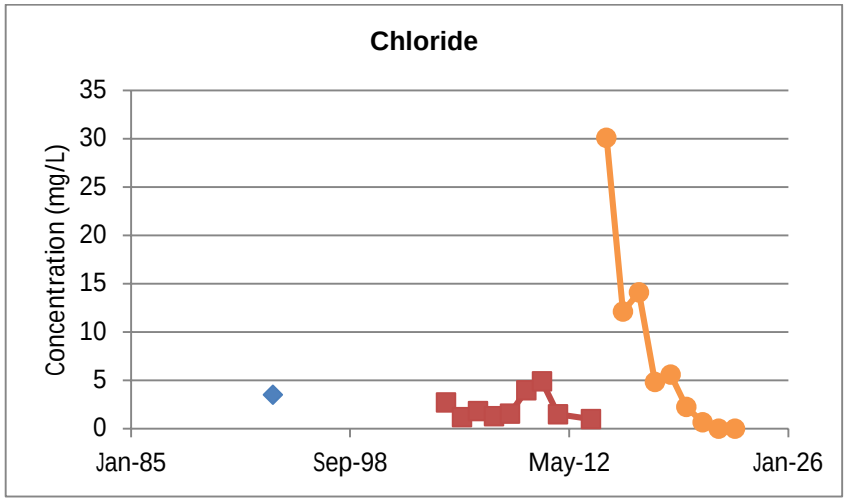



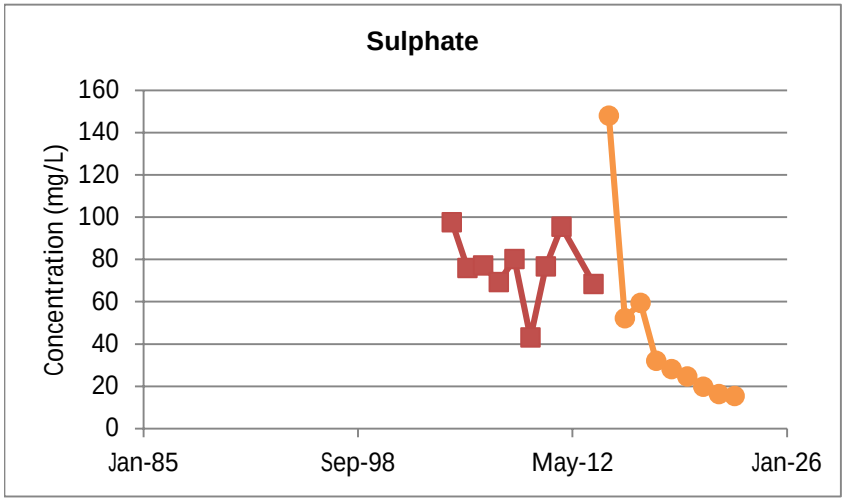


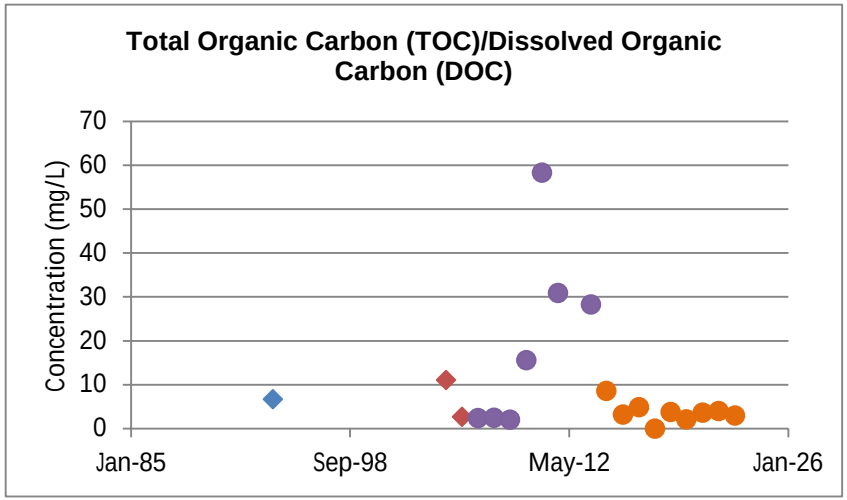
AECOM

**Figure 12.28**
**VEOLIA, Swan Hills Treatment Centre**
**15-SS, 15(R)SS, and 15(2R)SS - Indicators**



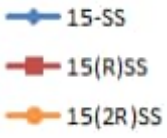



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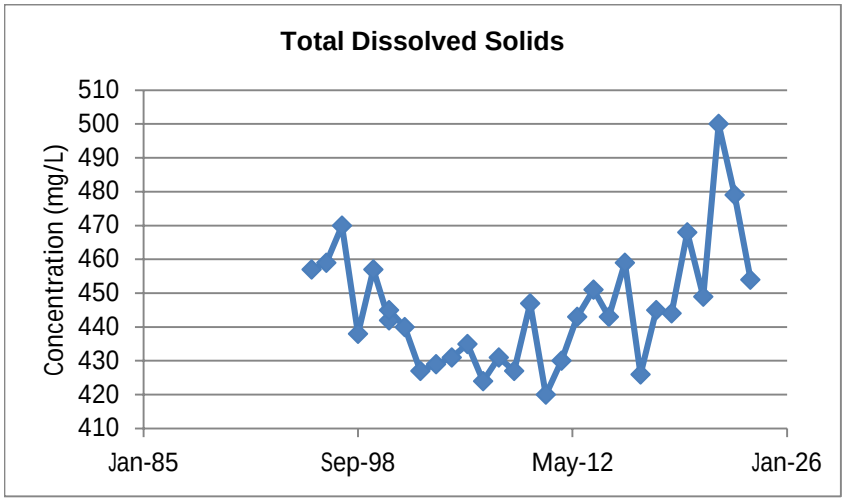
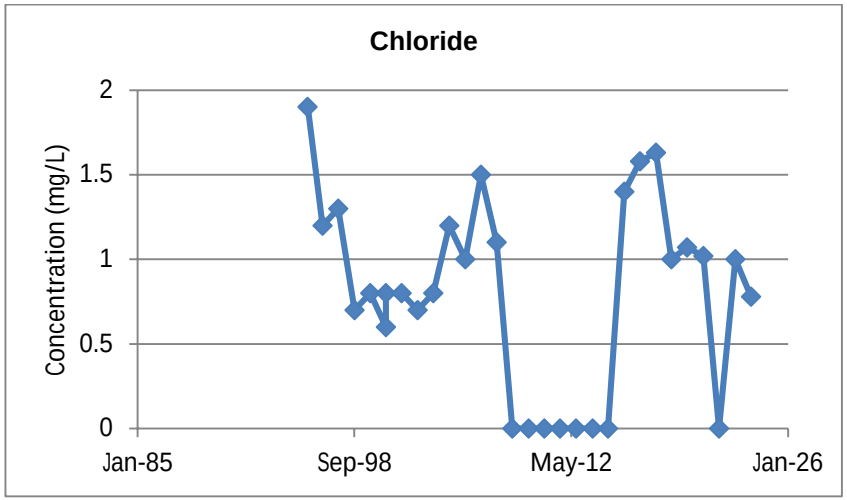
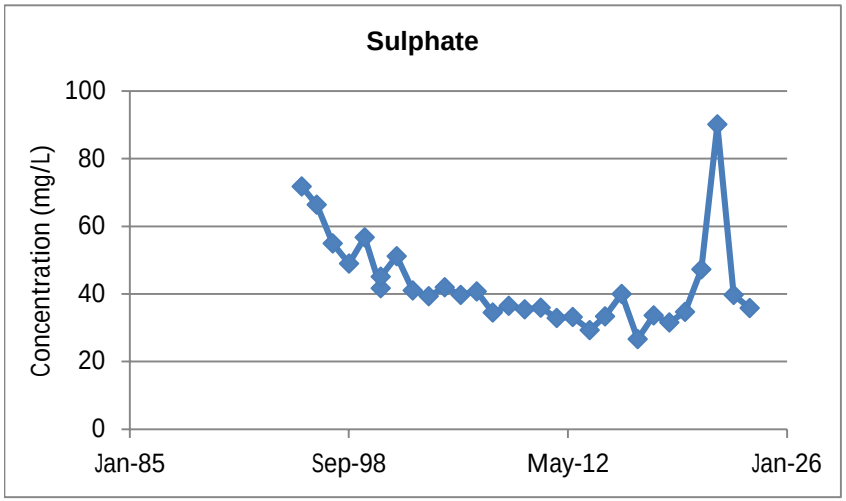
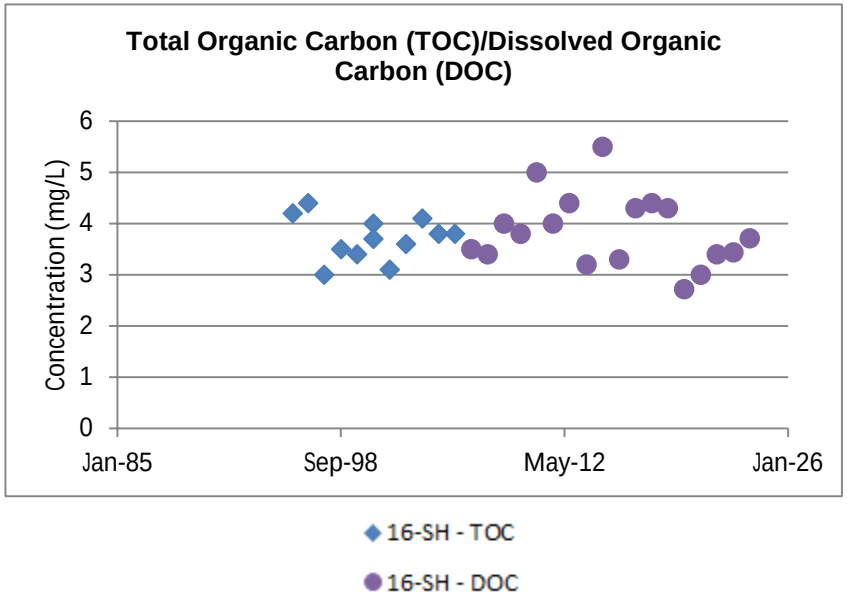
**Figure 12.29**
**VEOLIA, Swan Hills Treatment Centre**
**16-SH - Indicators**



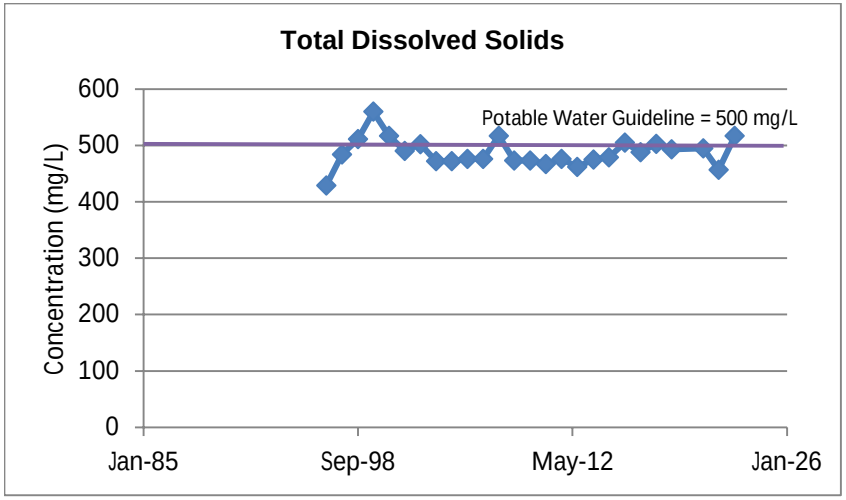



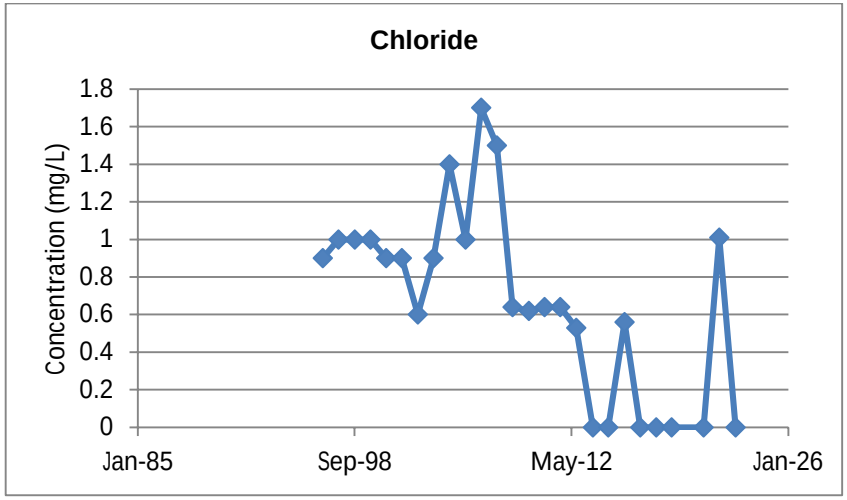



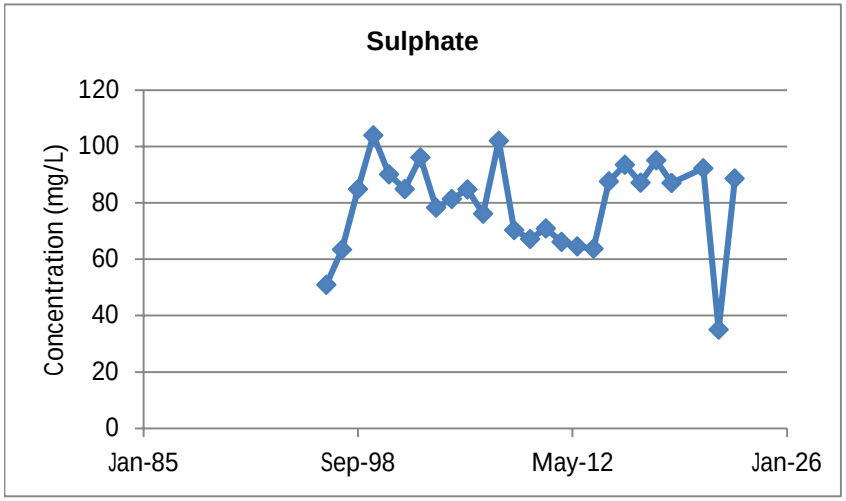



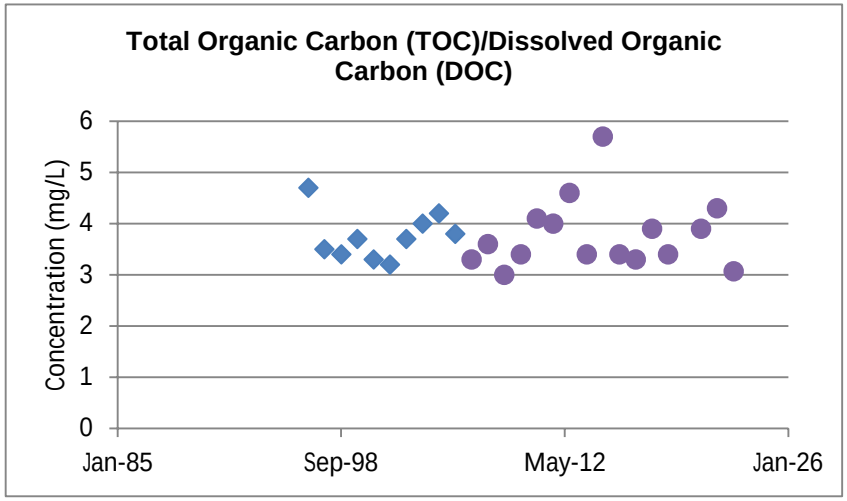
AECOM

**Figure 12.30**
**VEOLIA, Swan Hills Treatment Centre**
**16-IN - Indicators**



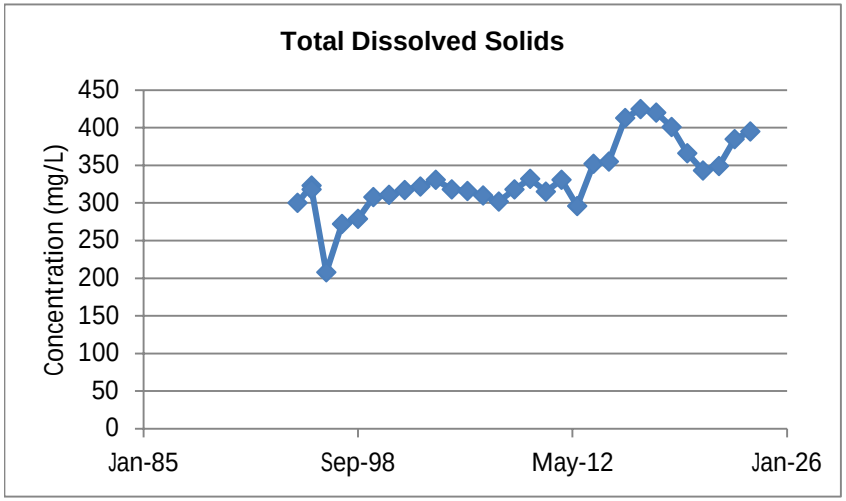

16-IN

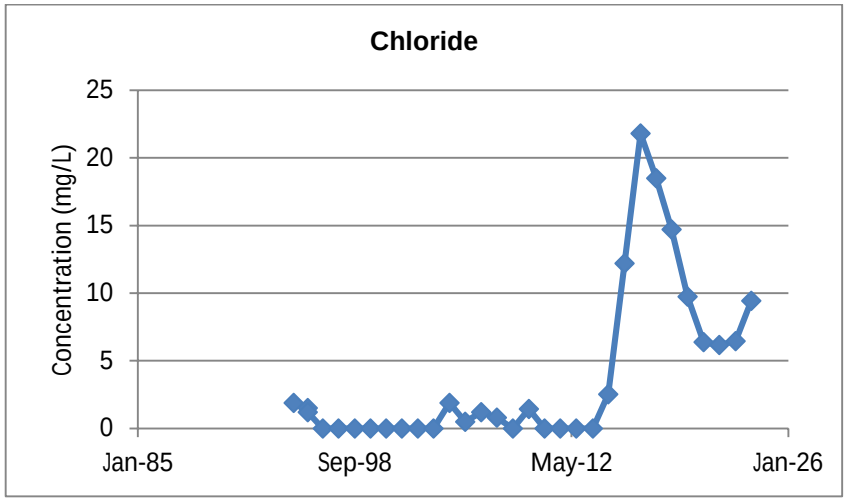
16-IN - TOC

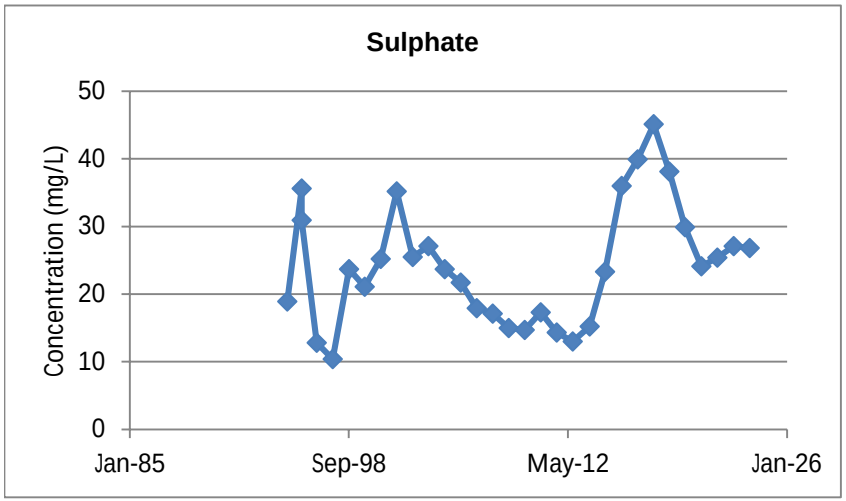
16-IN - DOC

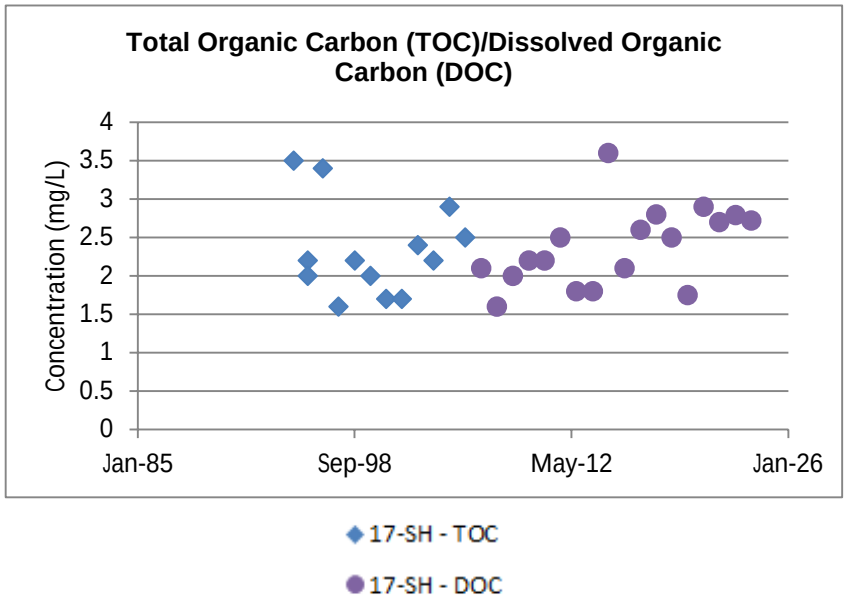
AECOM

**Figure 12.31**
**VEOLIA, Swan Hills Treatment Centre**
**17-SH - Indicators**



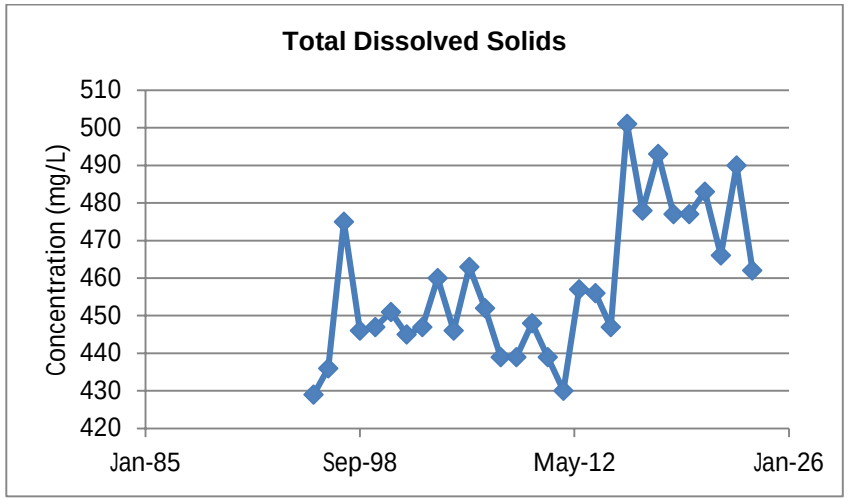



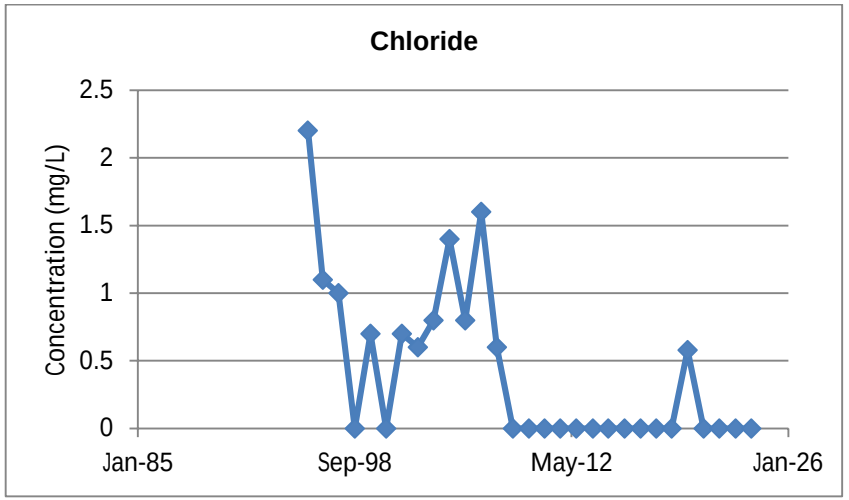



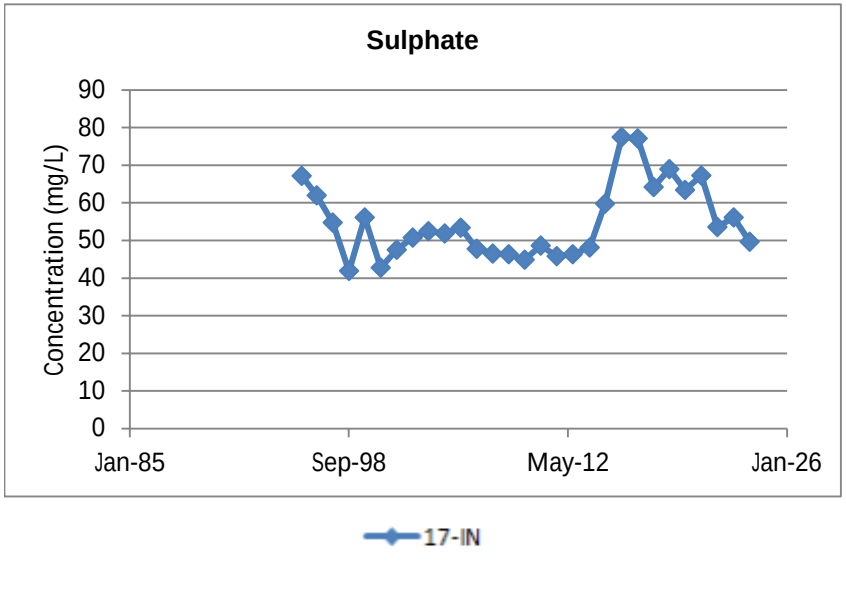



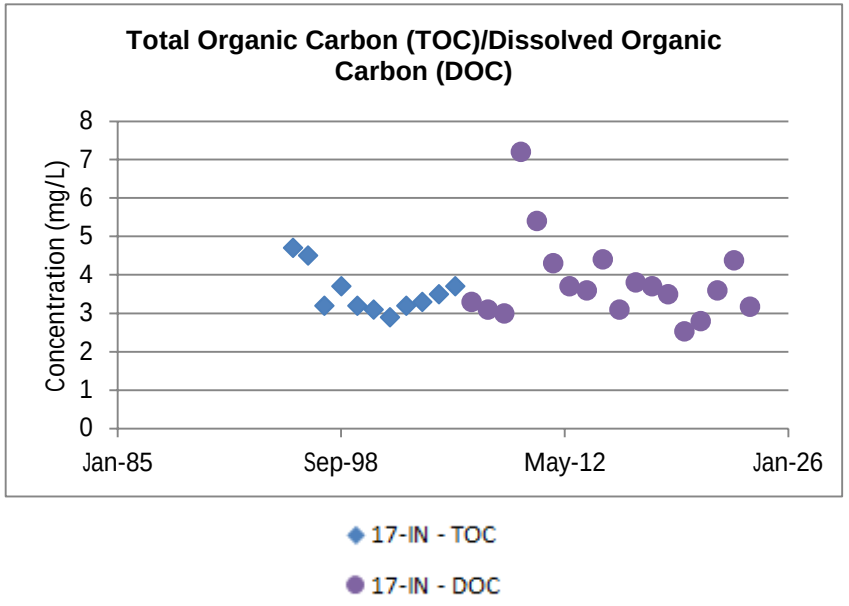
AECOM

**Figure 12.32**
**VEOLIA, Swan Hills Treatment Centre**
**17-IN - Indicators**



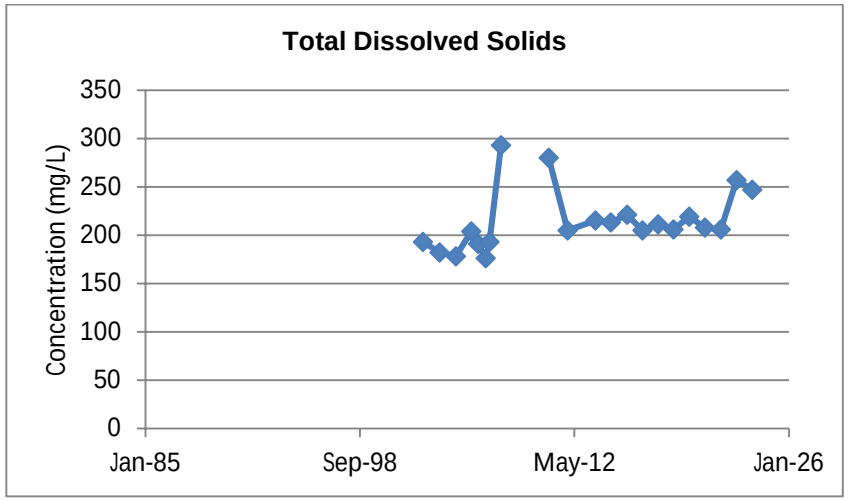



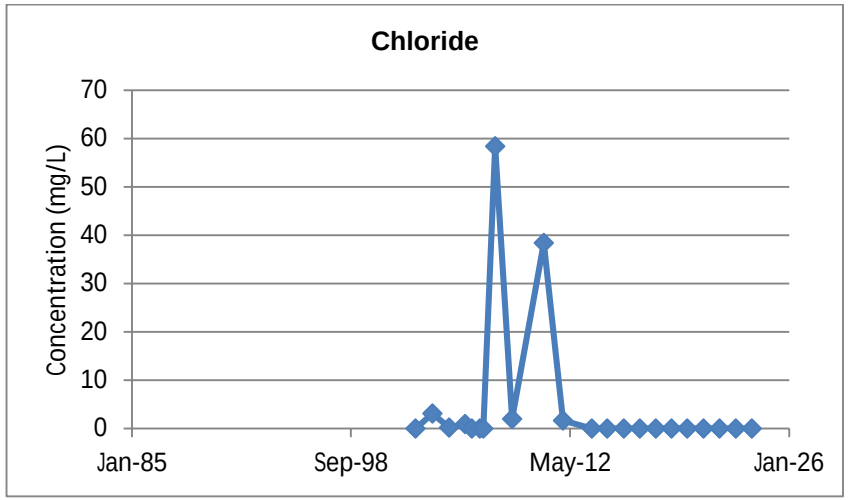



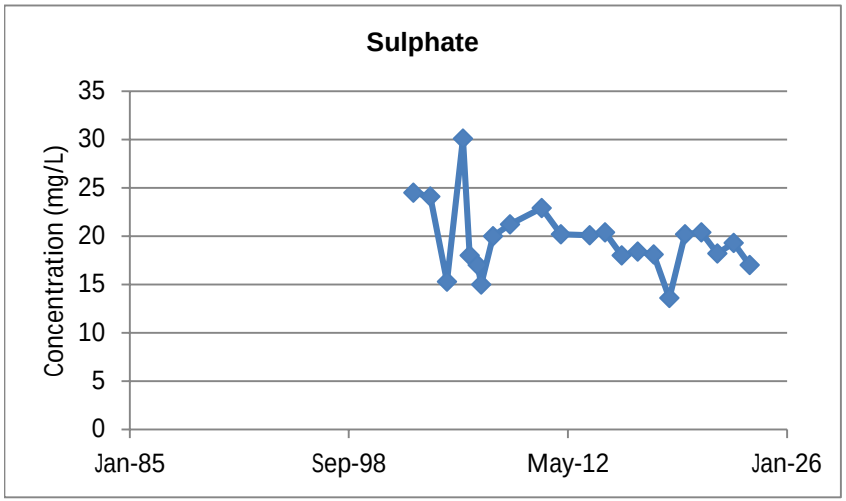



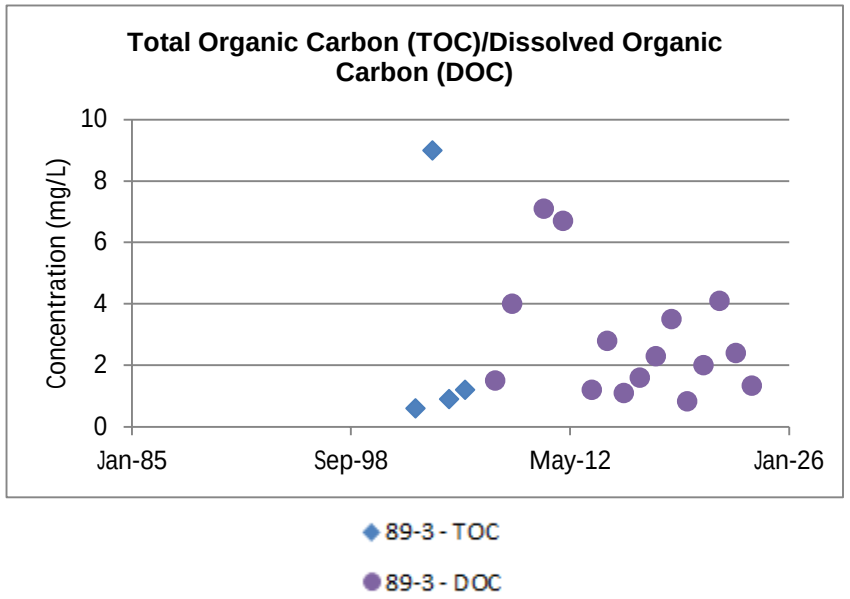
AECOM

**Figure 12.33**
**VEOLIA, Swan Hills Treatment Centre**
**89-3 - Indicators**



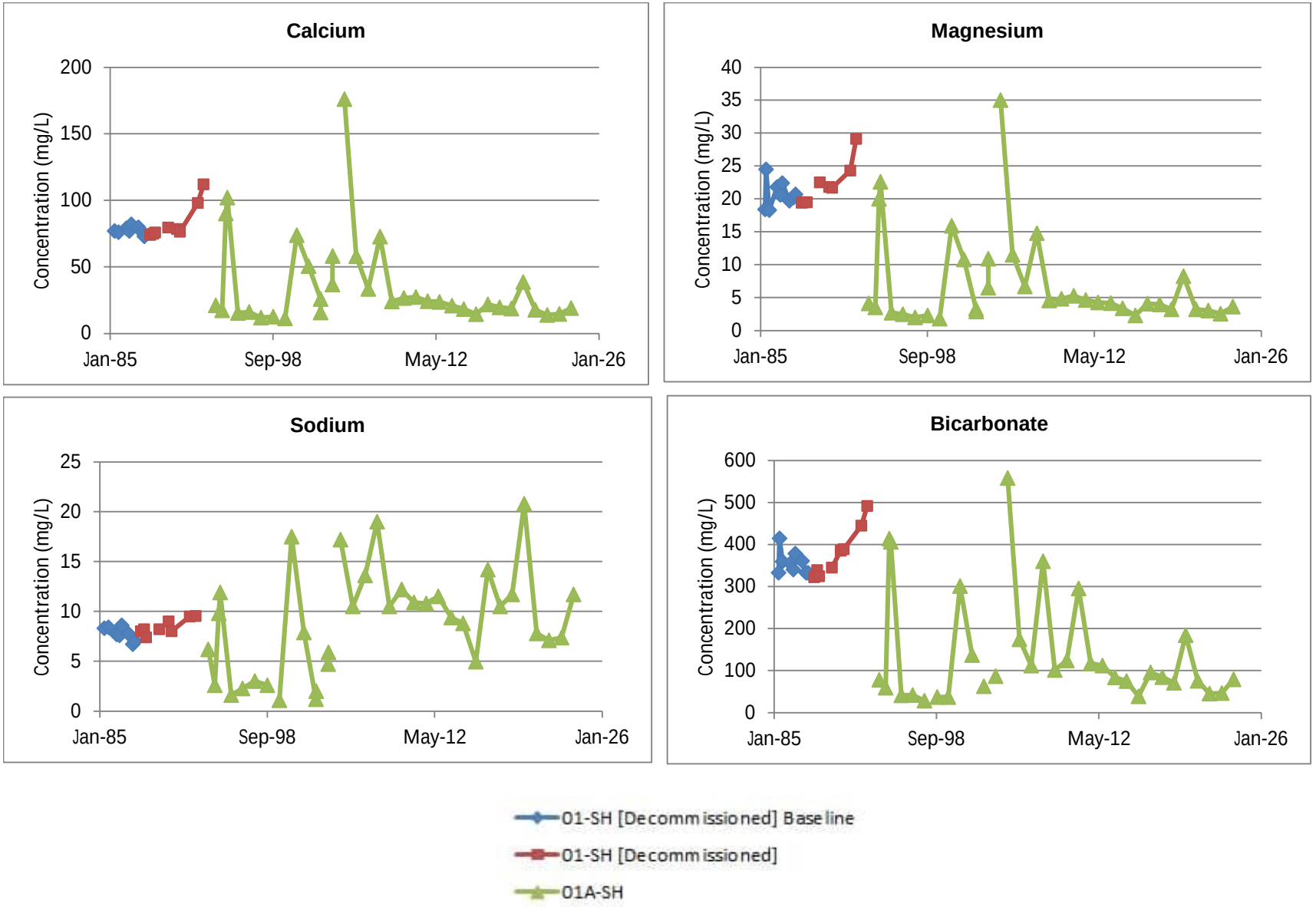



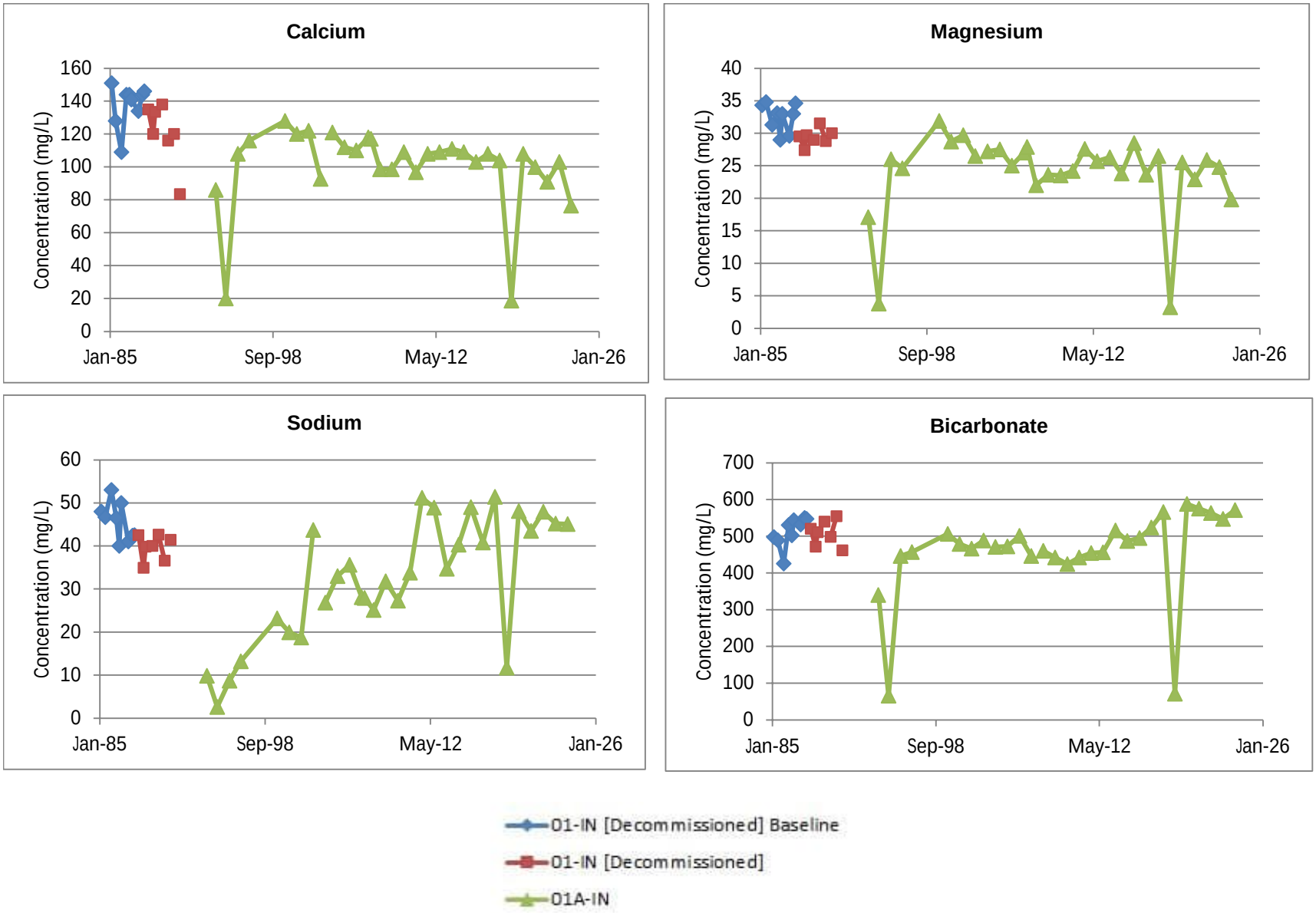
AECOM

**Figure 13.1**
**VEOLIA, Swan Hills Treatment Centre**
**01-SH and 01A-SH - Major Ions**



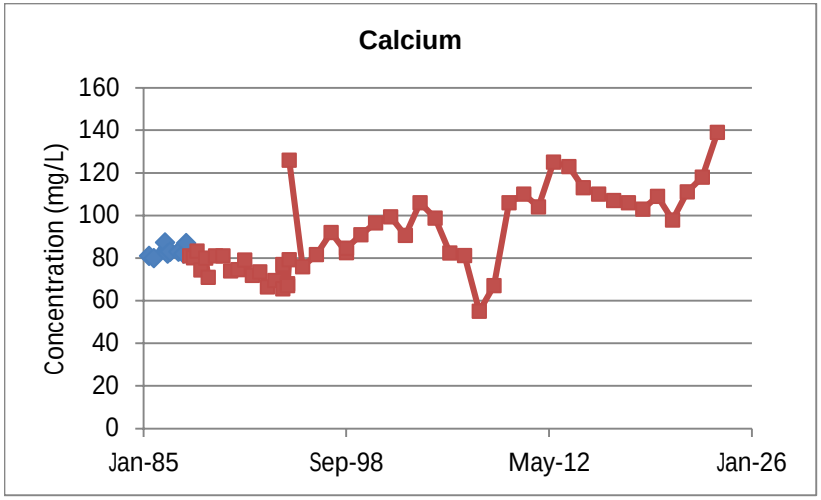
AECOM

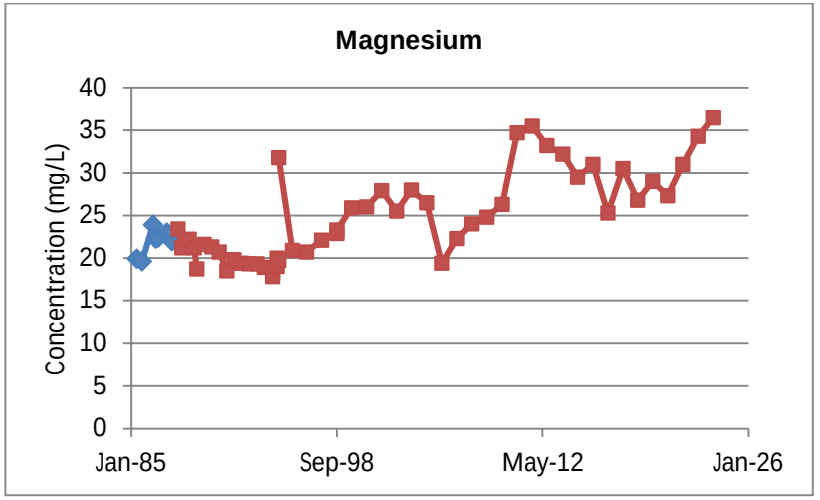
**Figure 13.2**
**VEOLIA, Swan Hills Treatment Centre**
**01-IN and 01A-IN - Major Ions**

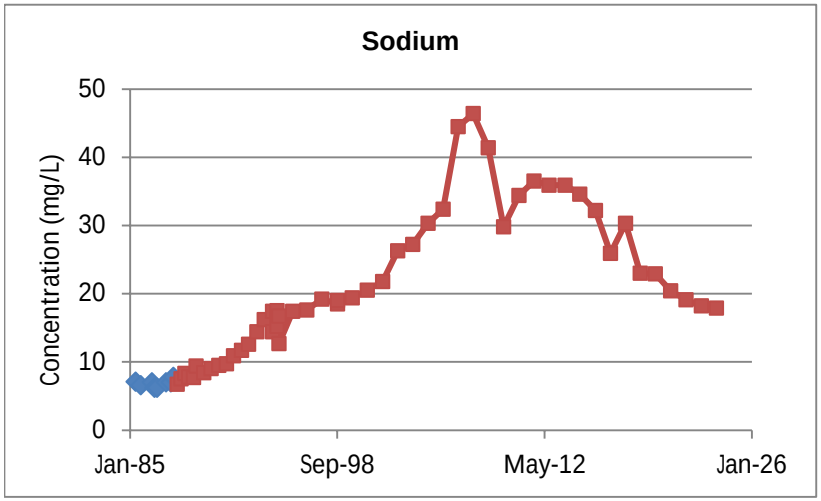


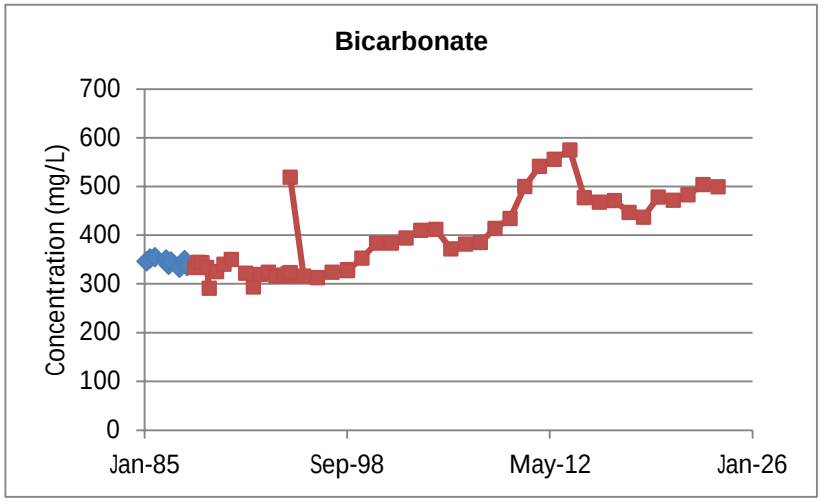
AECOM

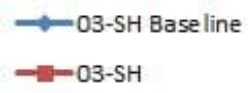
**Figure 13.3**
**VEOLIA, Swan Hills Treatment Centre**
**03-SH - Major Ions**



AECOM

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

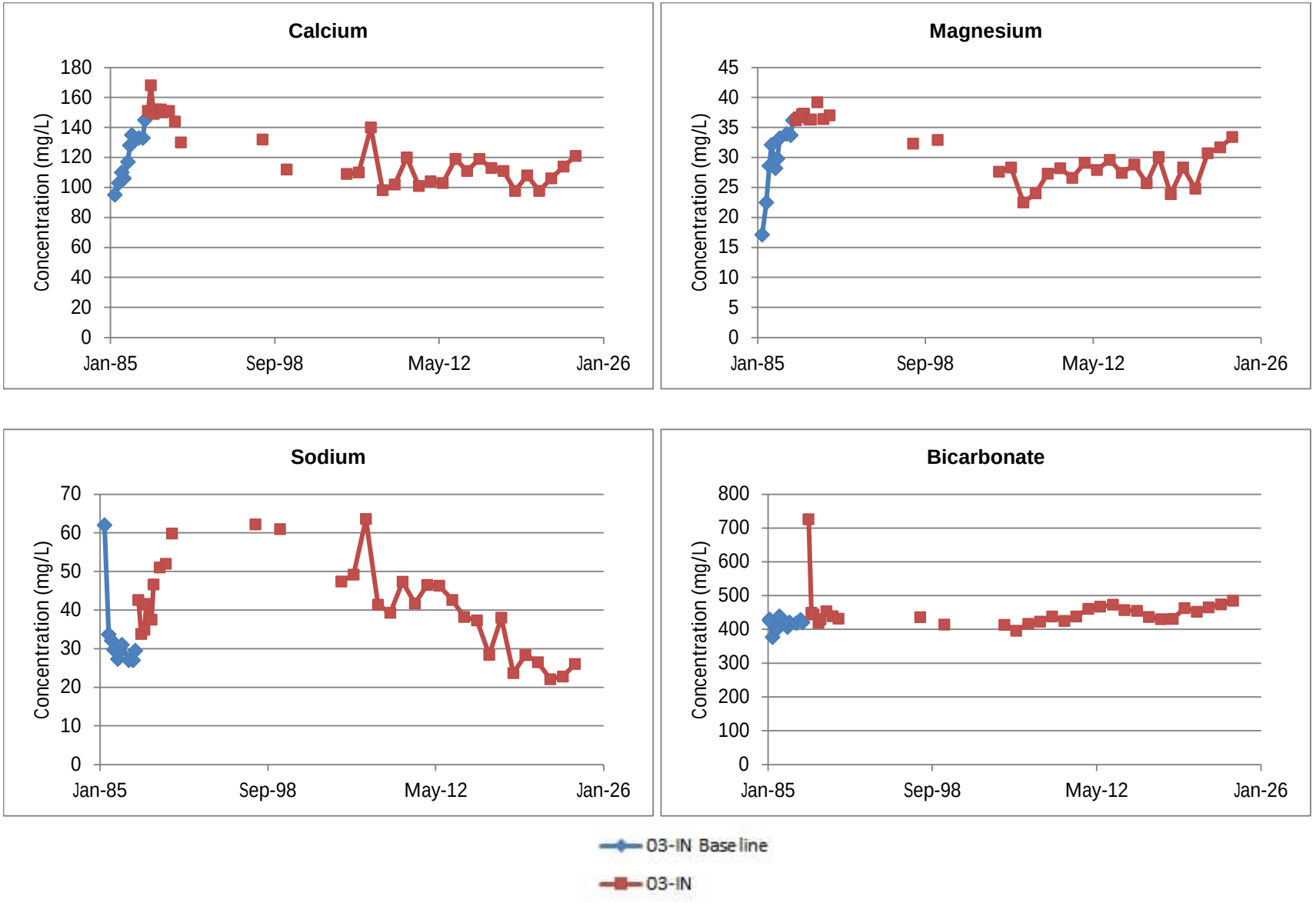


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**Figure 13.5**
**VEOLIA, Swan Hills Treatment Centre**
**04-SH - Major Ions**

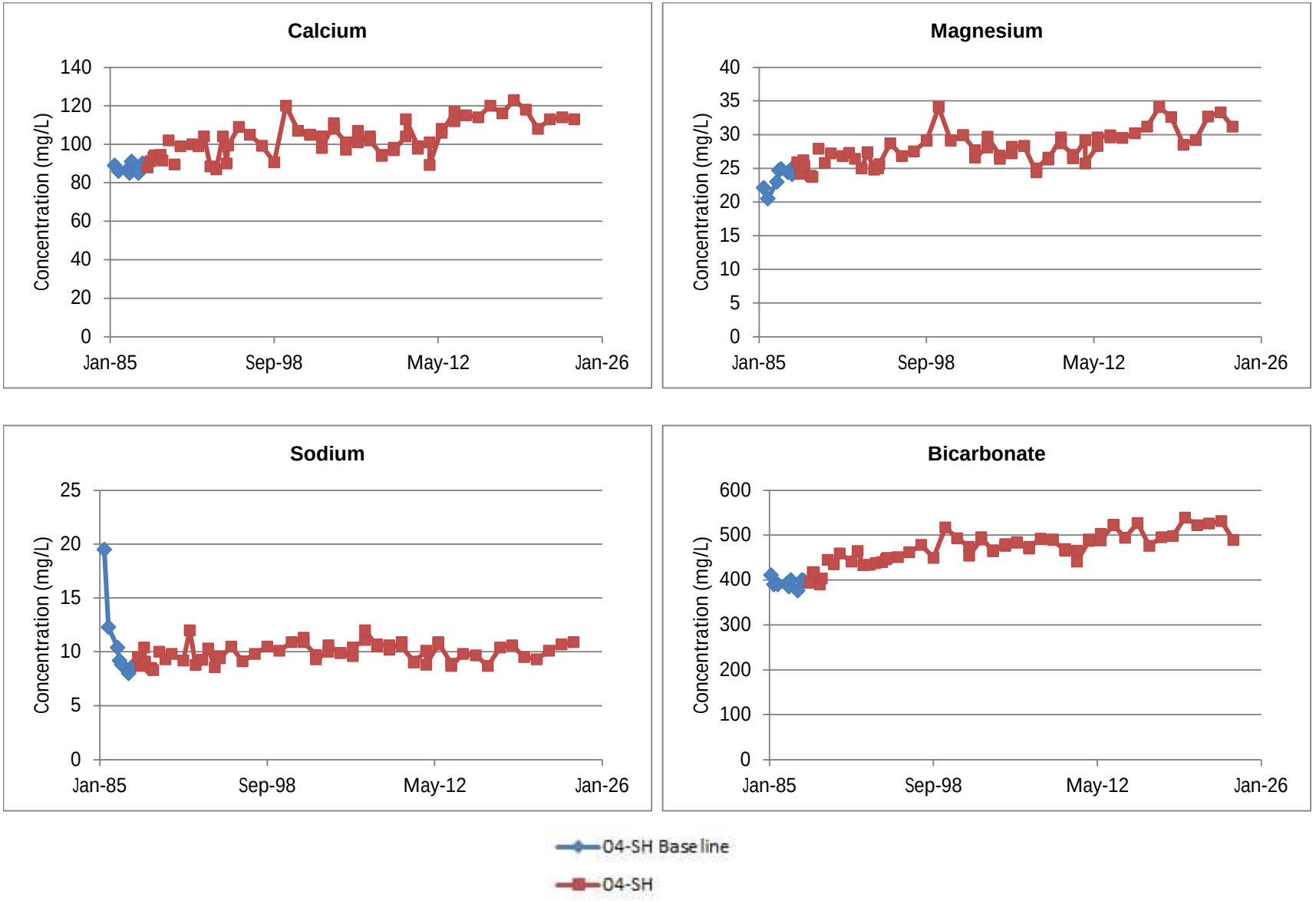

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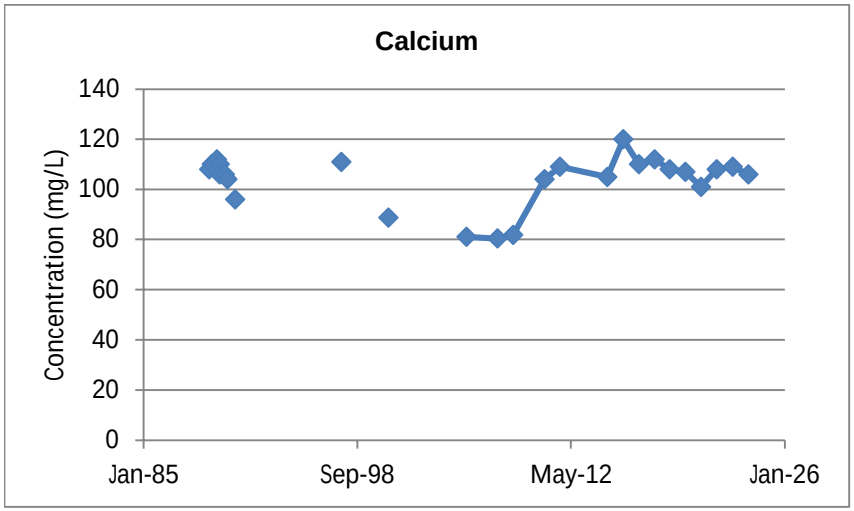
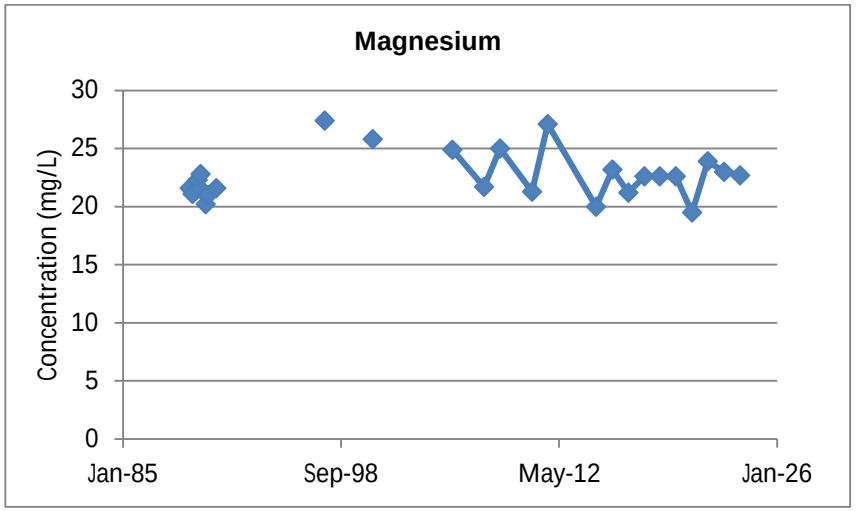
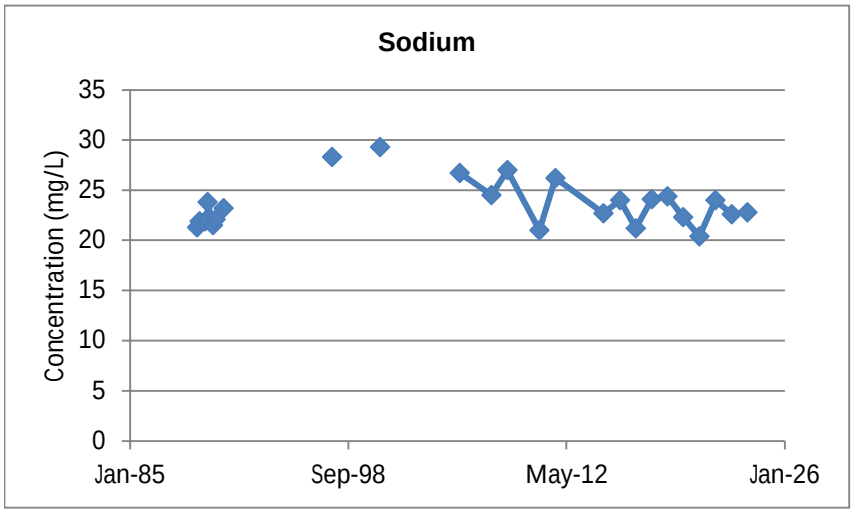
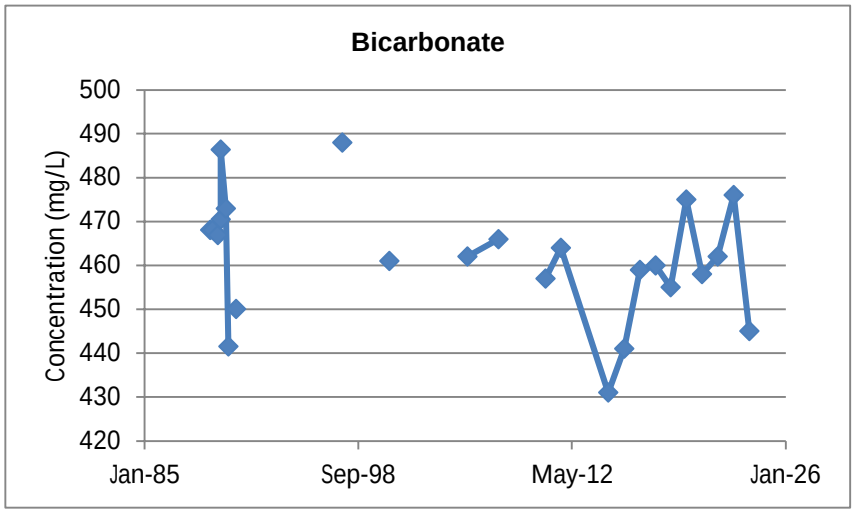
**Table 13.6**
**VEOLIA, Swan Hills Treatment Centre**
**04-IN - Major Ions**




04-IN

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

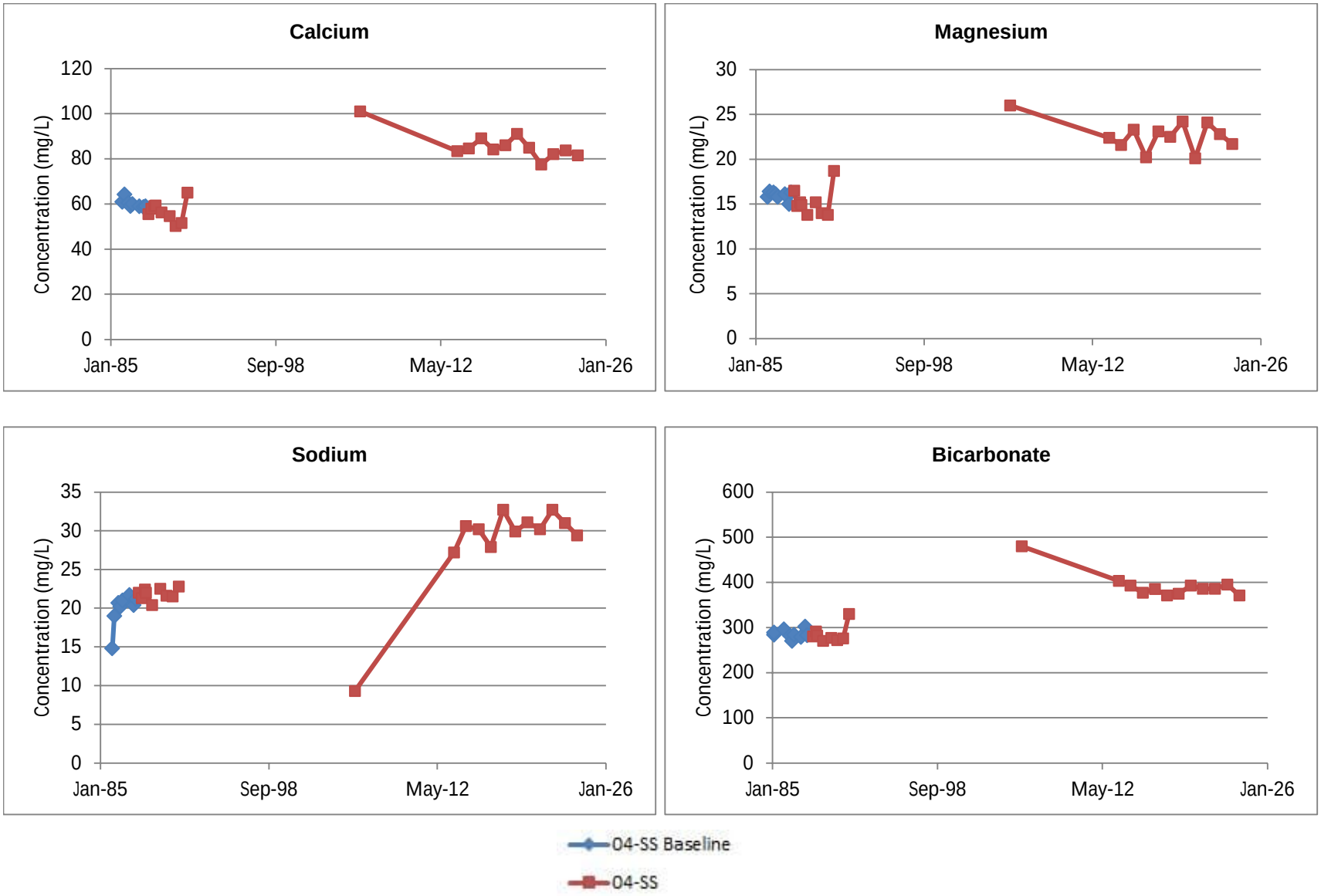

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**Figure 13.8**
**VEOLIA, Swan Hills Treatment Centre**
**05-SH - Major Ions**

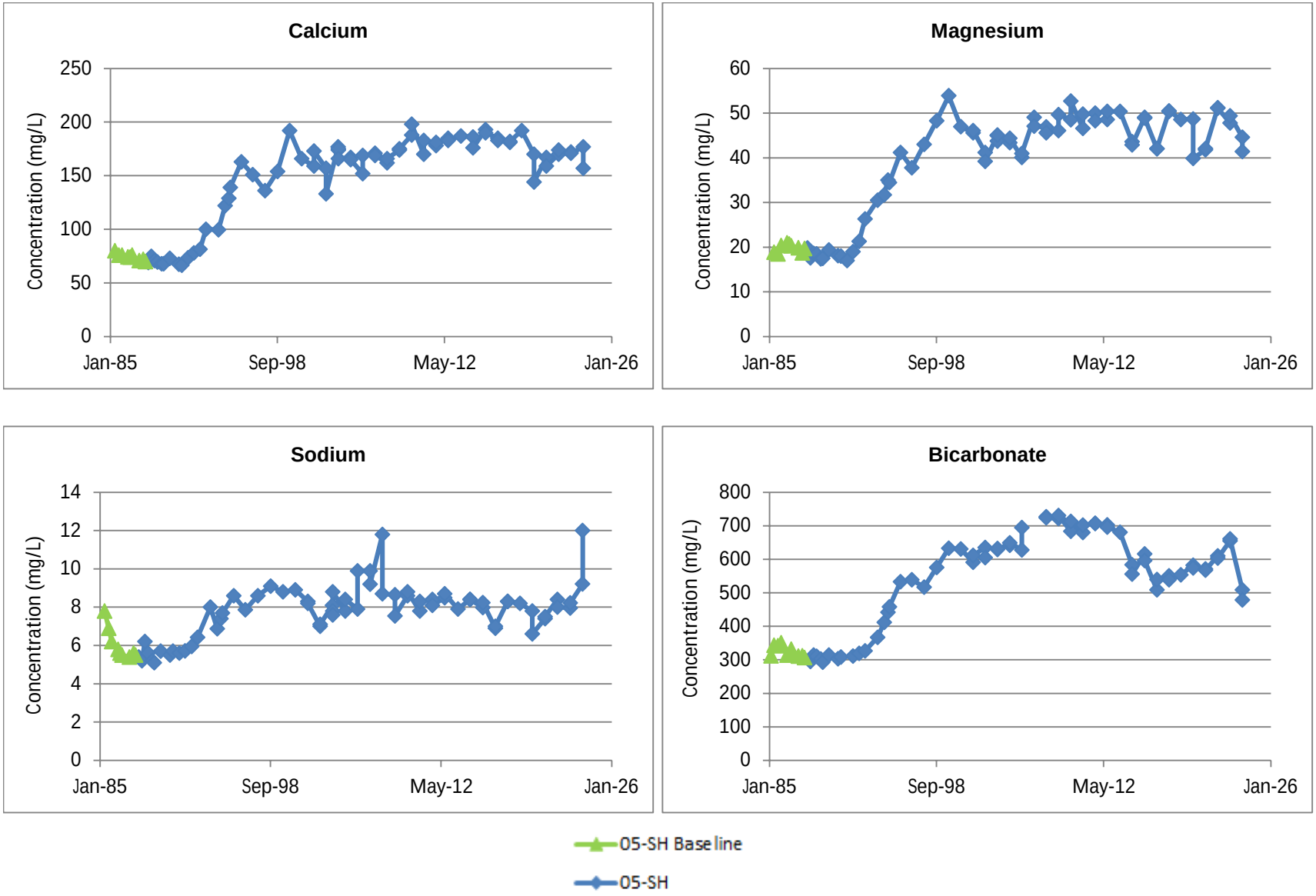

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**Figure 13.9**
**VEOLIA, Swan Hills Treatment Centre**
**05-IN - Major Ions**

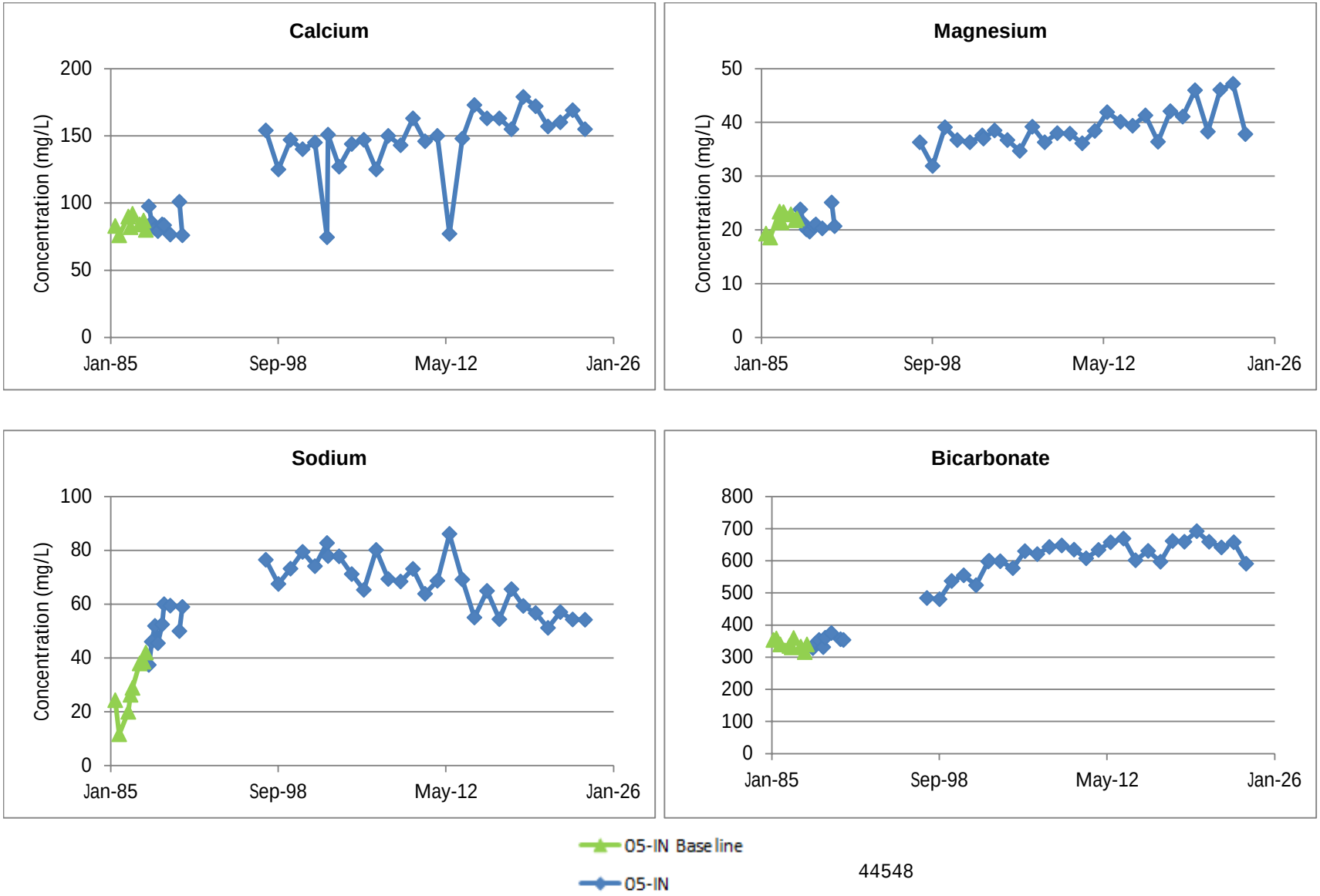


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**Figure 13.10**
**VEOLIA, Swan Hills Treatment Centre**
**05-SS - Major Ions**

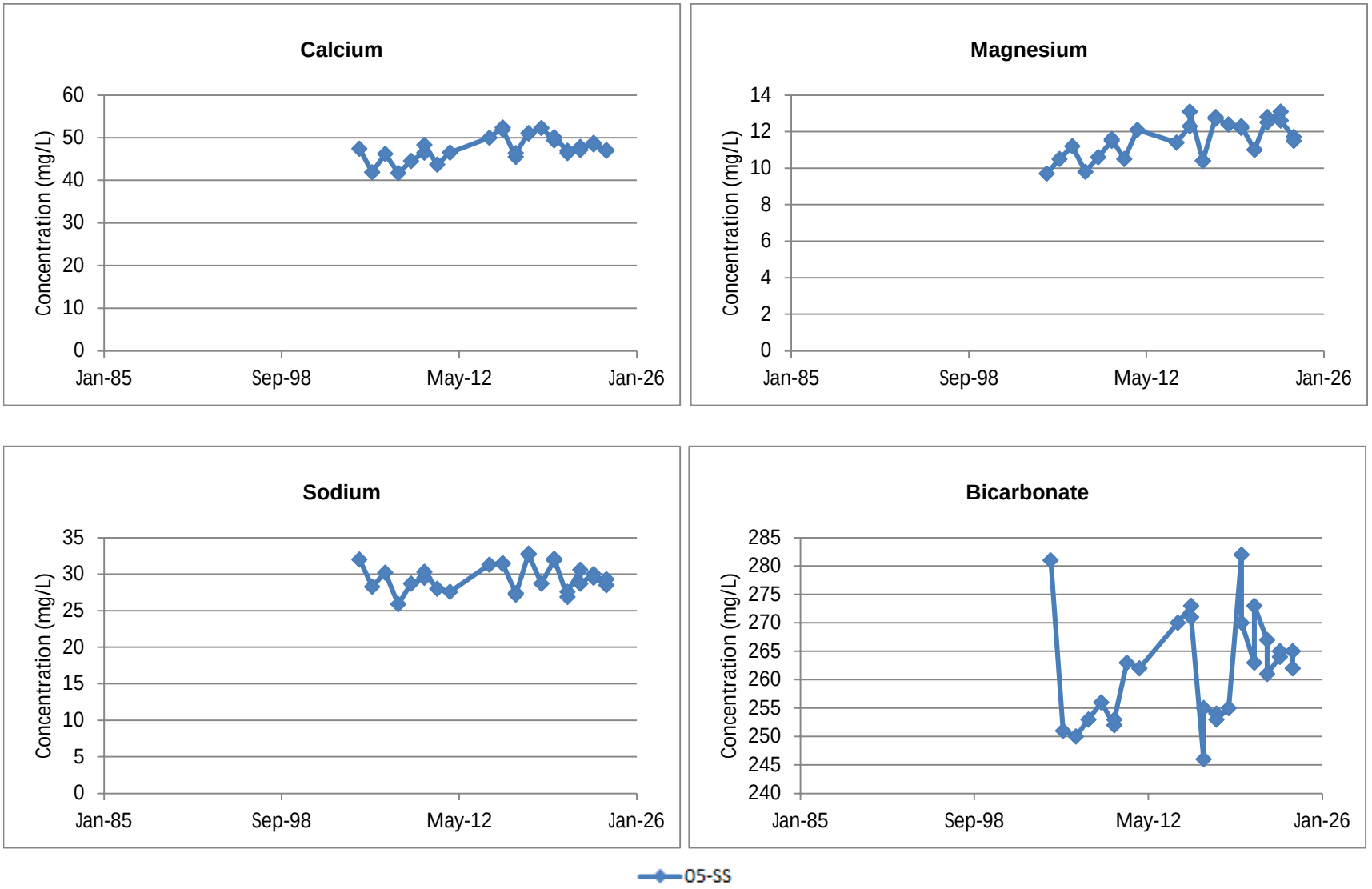

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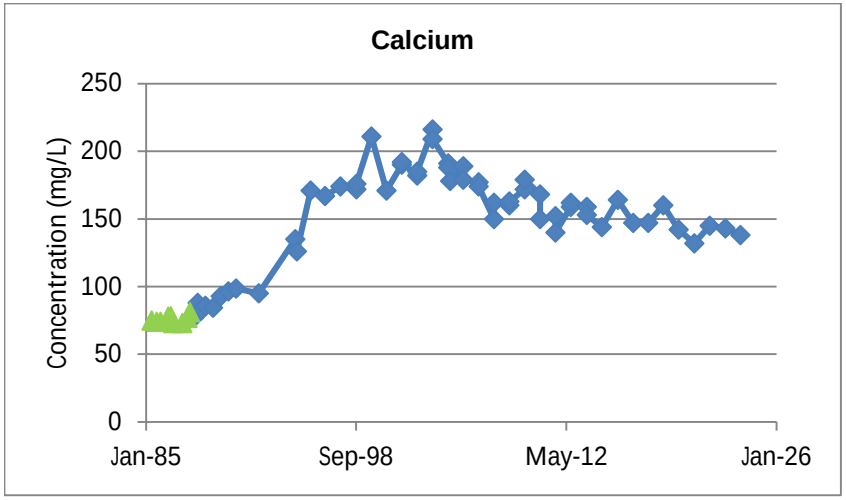
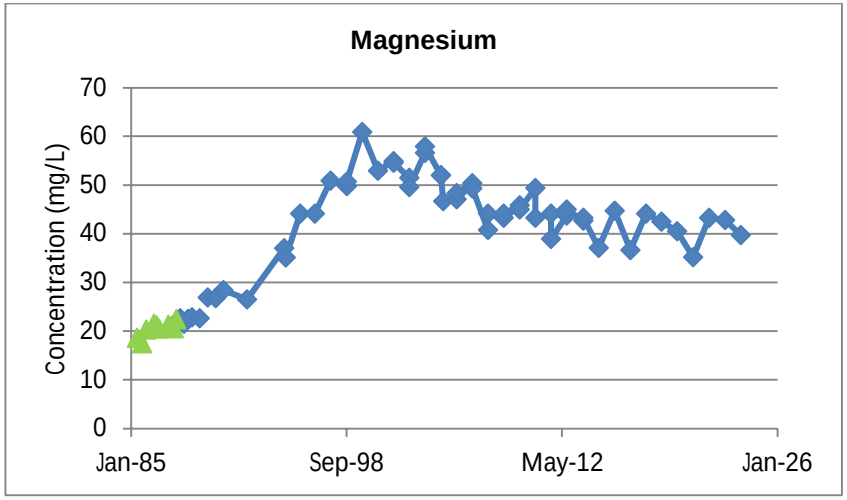
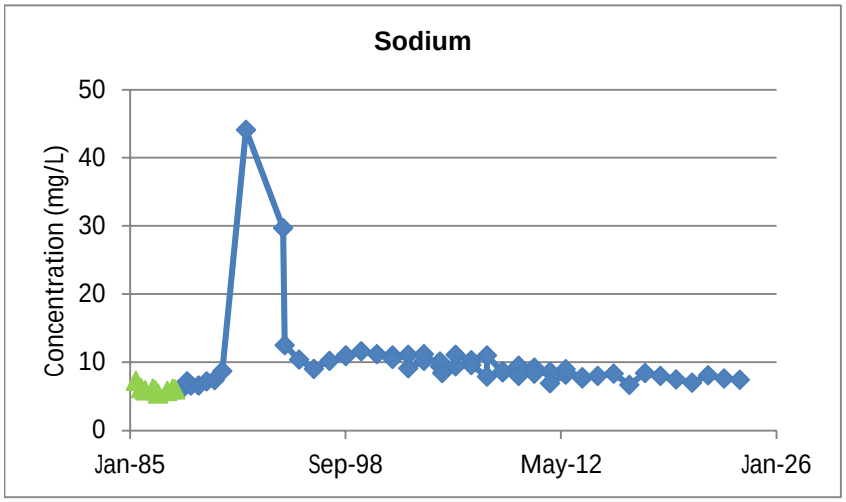
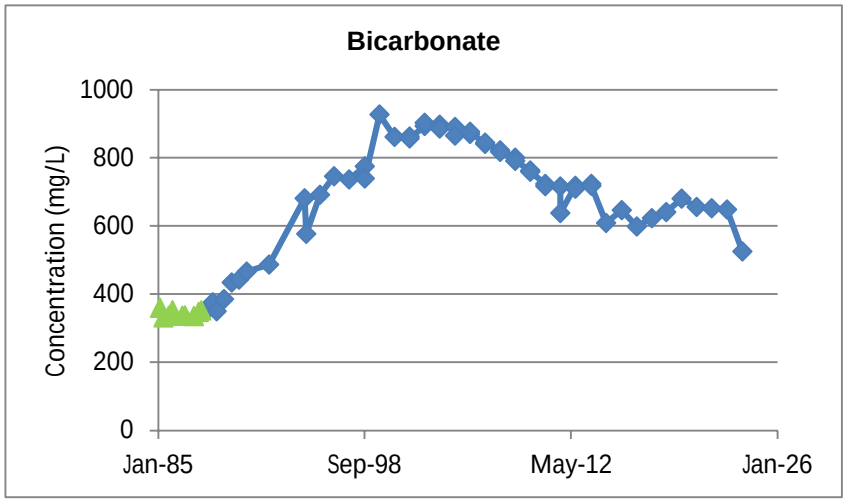
**Figure 13.11**
**VEOLIA, Swan Hills Treatment Centre**
**06-SH - Major Ions**



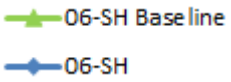



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**Figure 13.12**
**VEOLIA, Swan Hills Treatment Centre**
**06-IN and 06(R)IN - Major Ions**

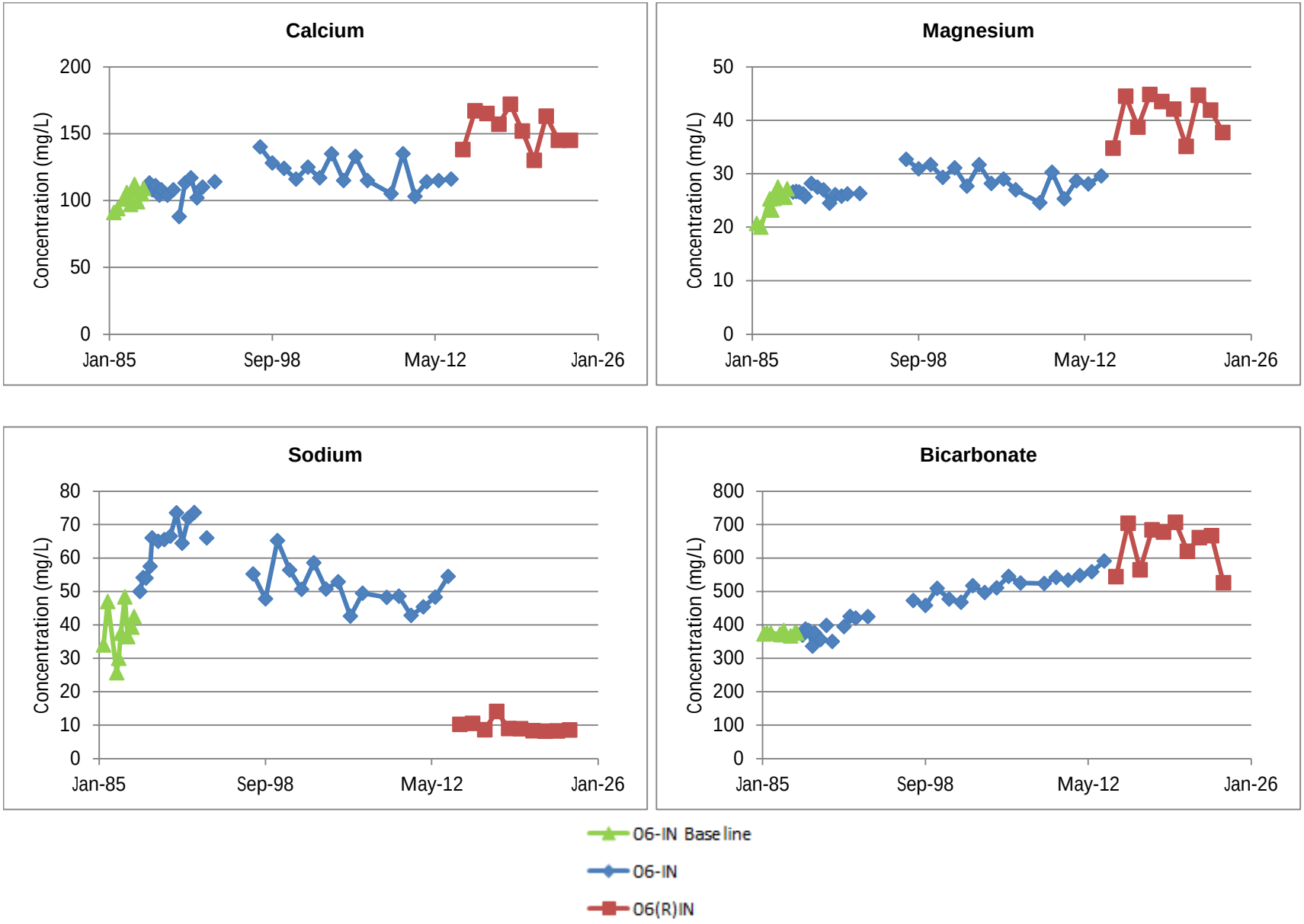

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**Figure 13.13**
**VEOLIA, Swan Hills Treatment Centre**
**07-SH - Major Ions**

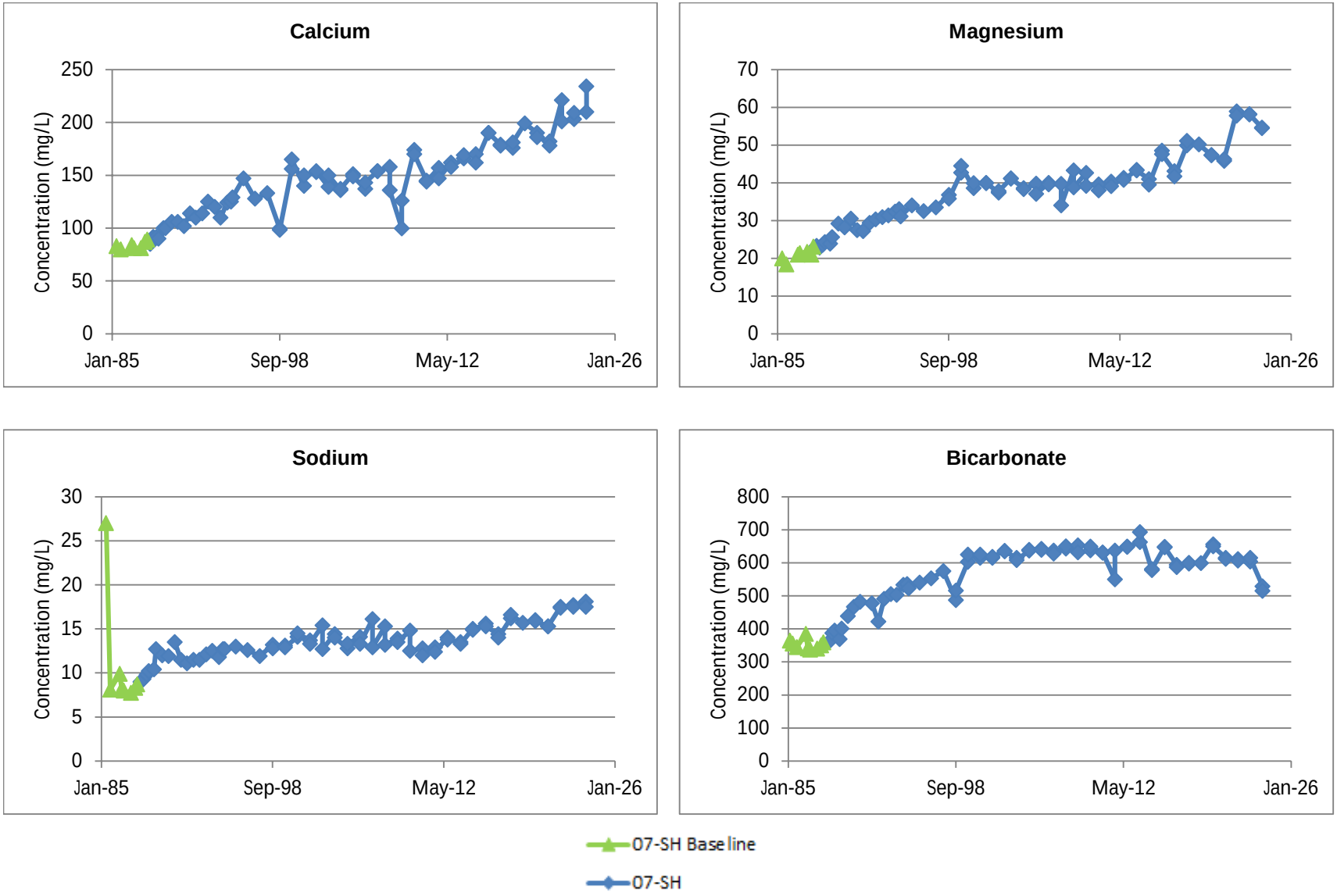

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**Figure 13.14**
**VEOLIA, Swan Hills Treatment Centre**
**07-IN - Major Ions**

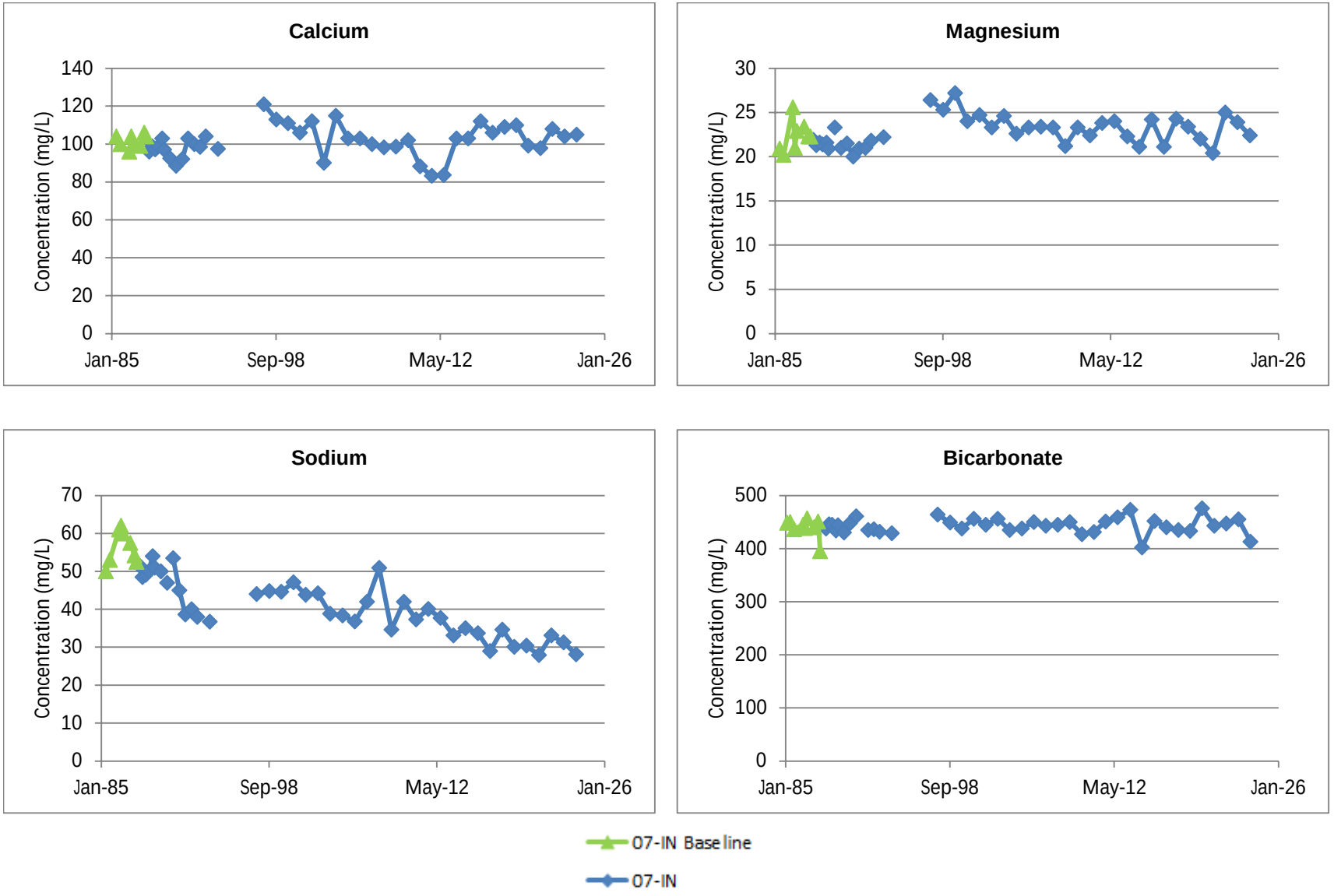

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**Figure 13.15**
**VEOLIA, Swan Hills Treatment Centre**
**07-SS and 07(R)SS - Major Ions**

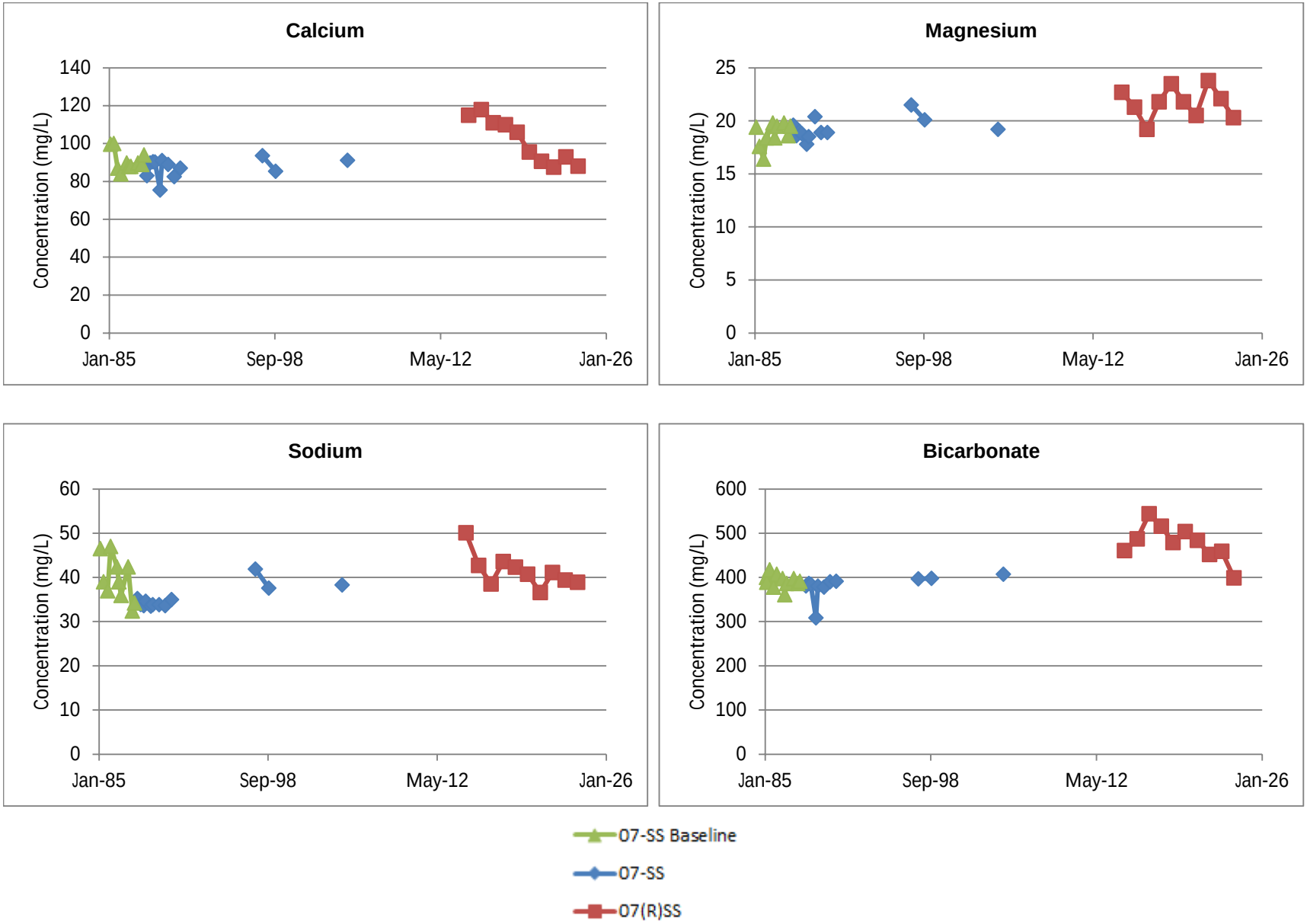

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**Figure 13.16**
**VEOLIA, Swan Hills Treatment Centre**
**08-SH - Major Ions**

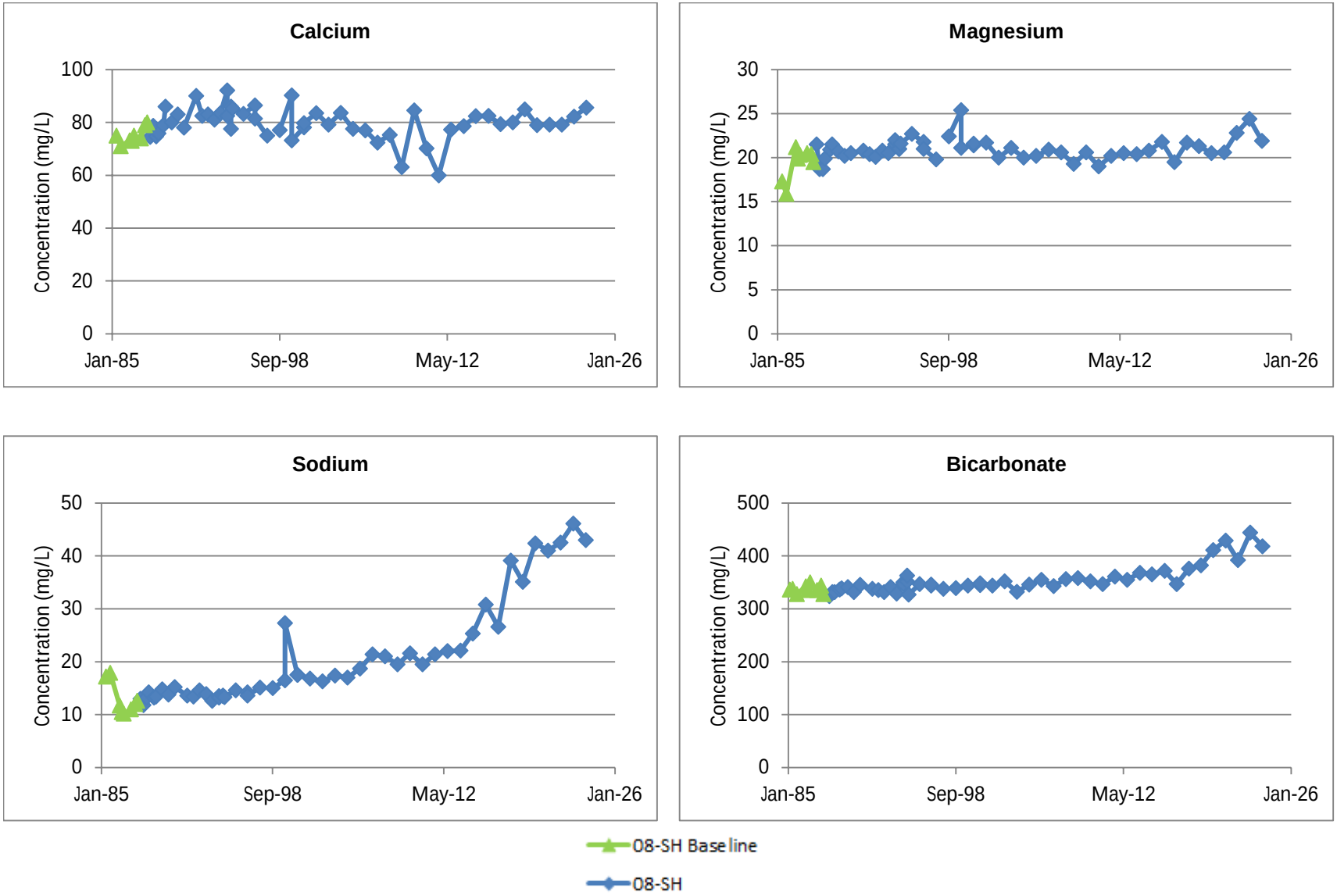

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**Figure 13.17**
**VEOLIA, Swan Hills Treatment Centre**
**08-IN - Major Ions**

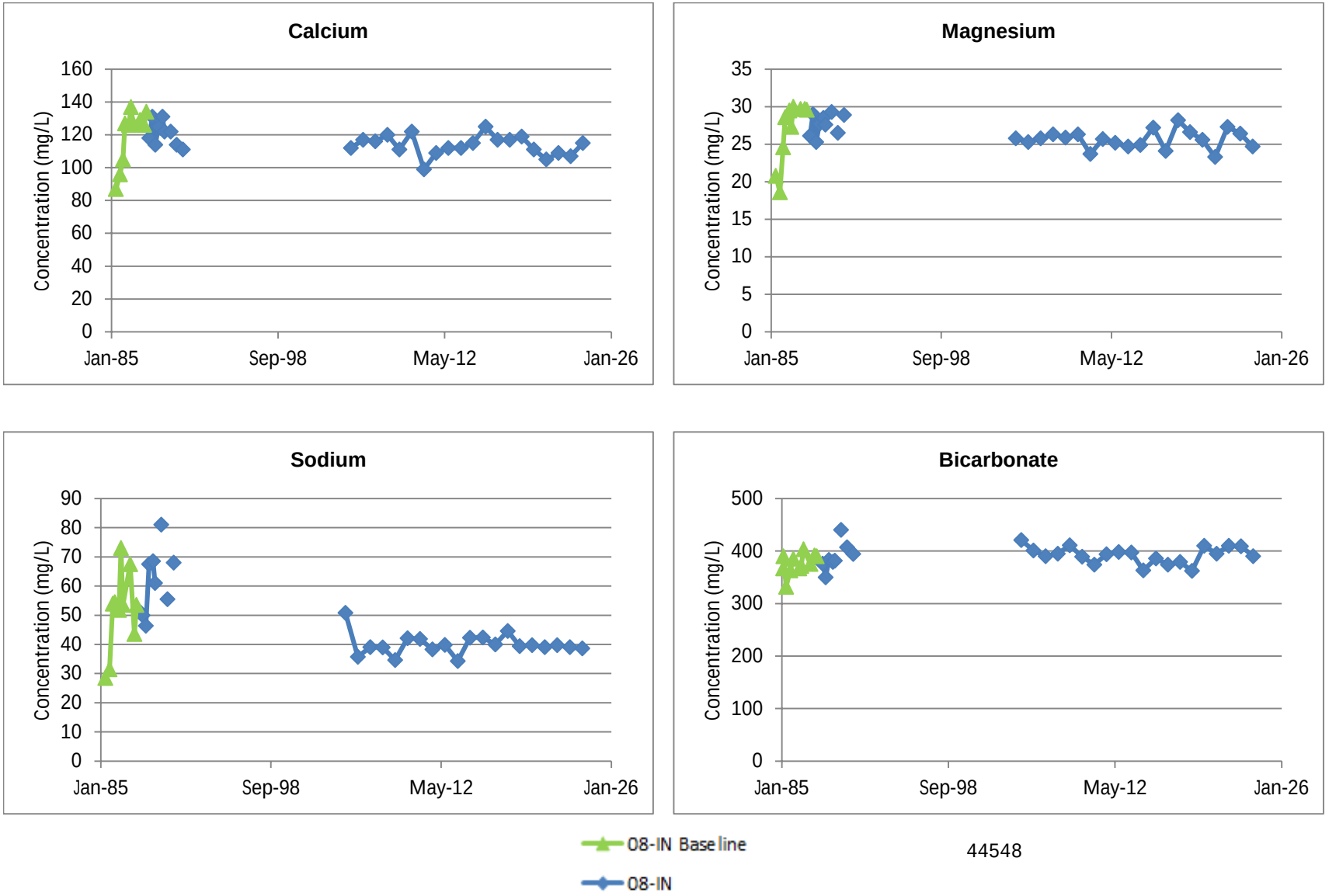


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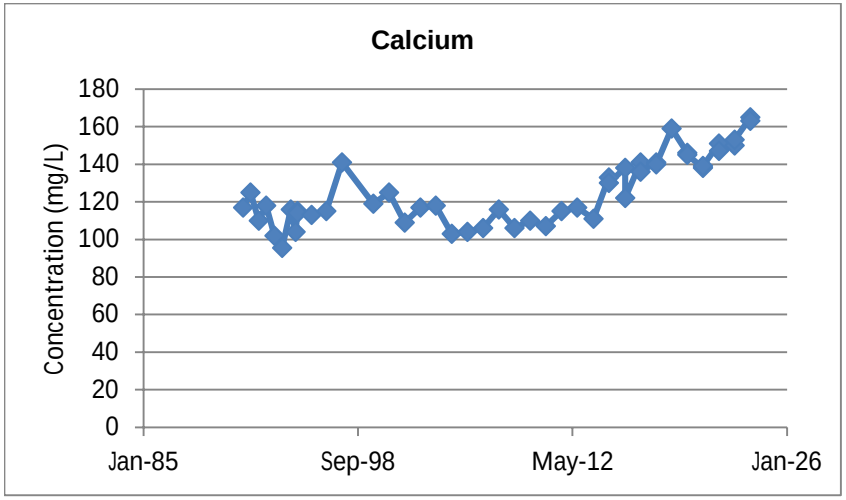
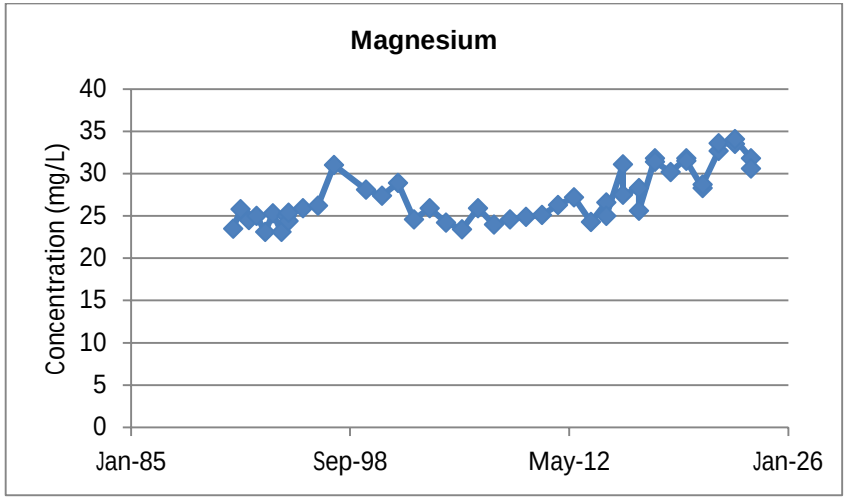
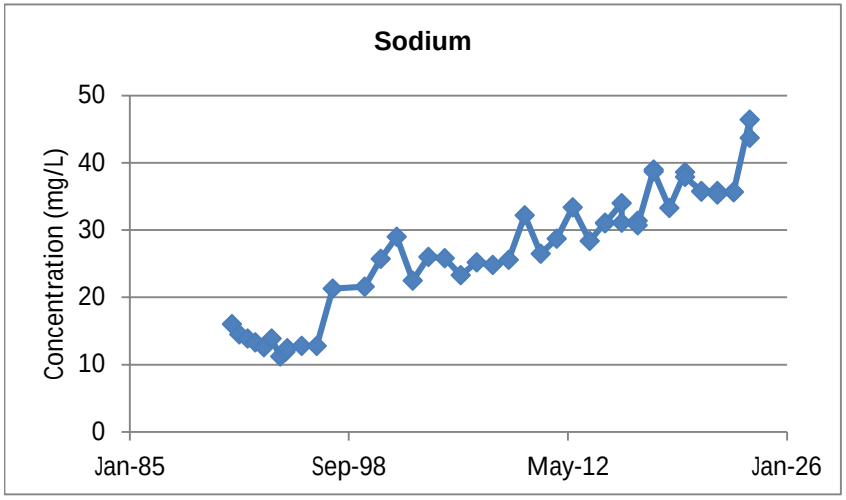
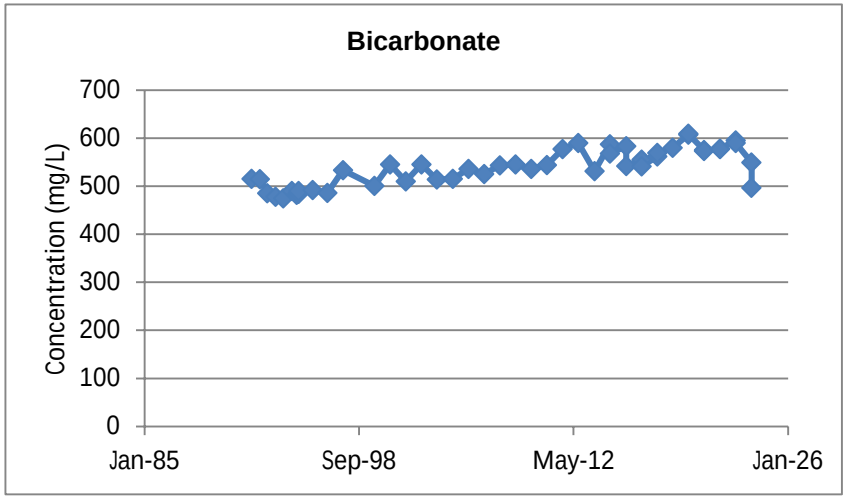
**Figure 13.18**
**VEOLIA, Swan Hills Treatment Centre**
**11-SH - Major Ions**




11-SH

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

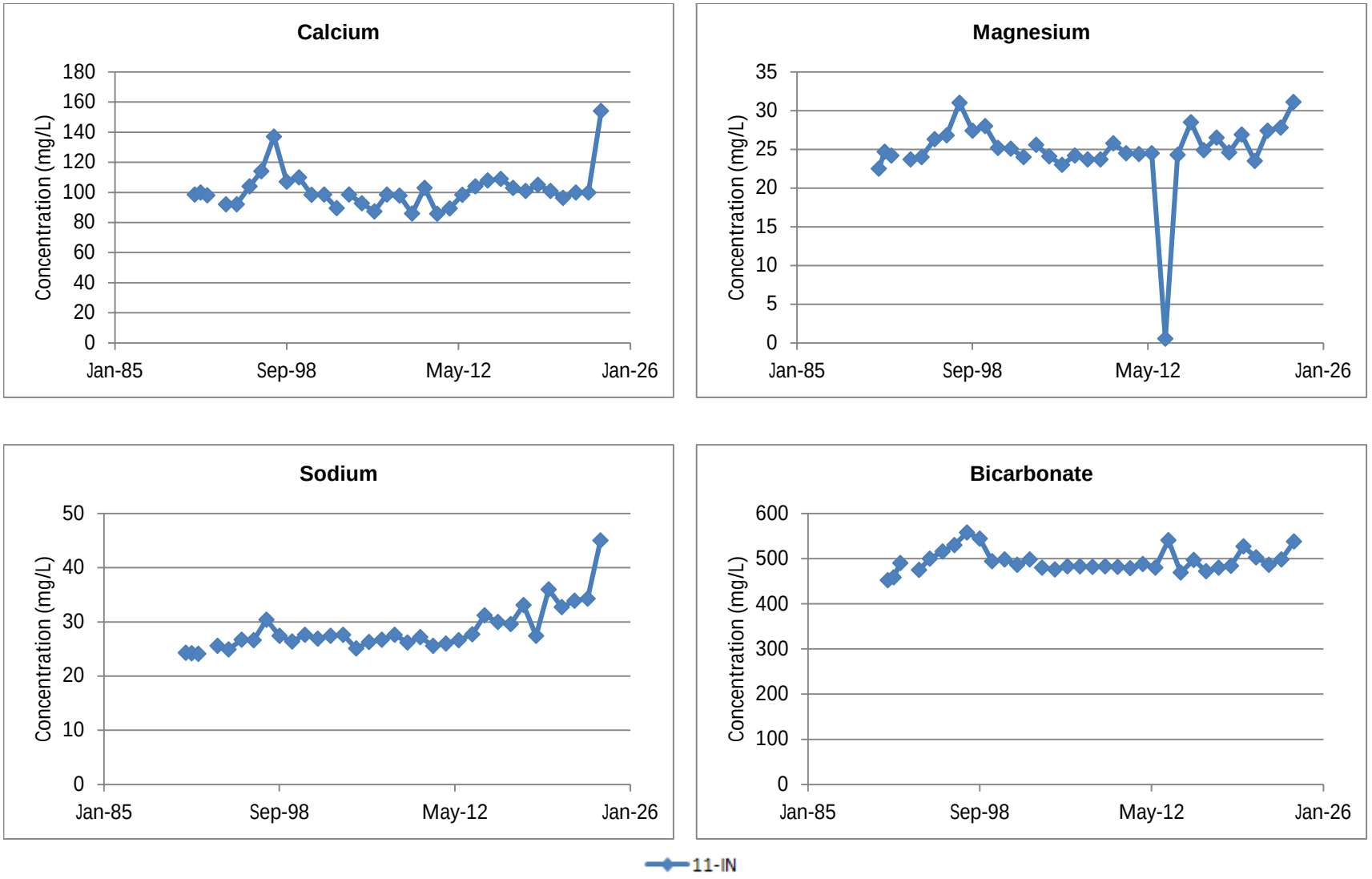

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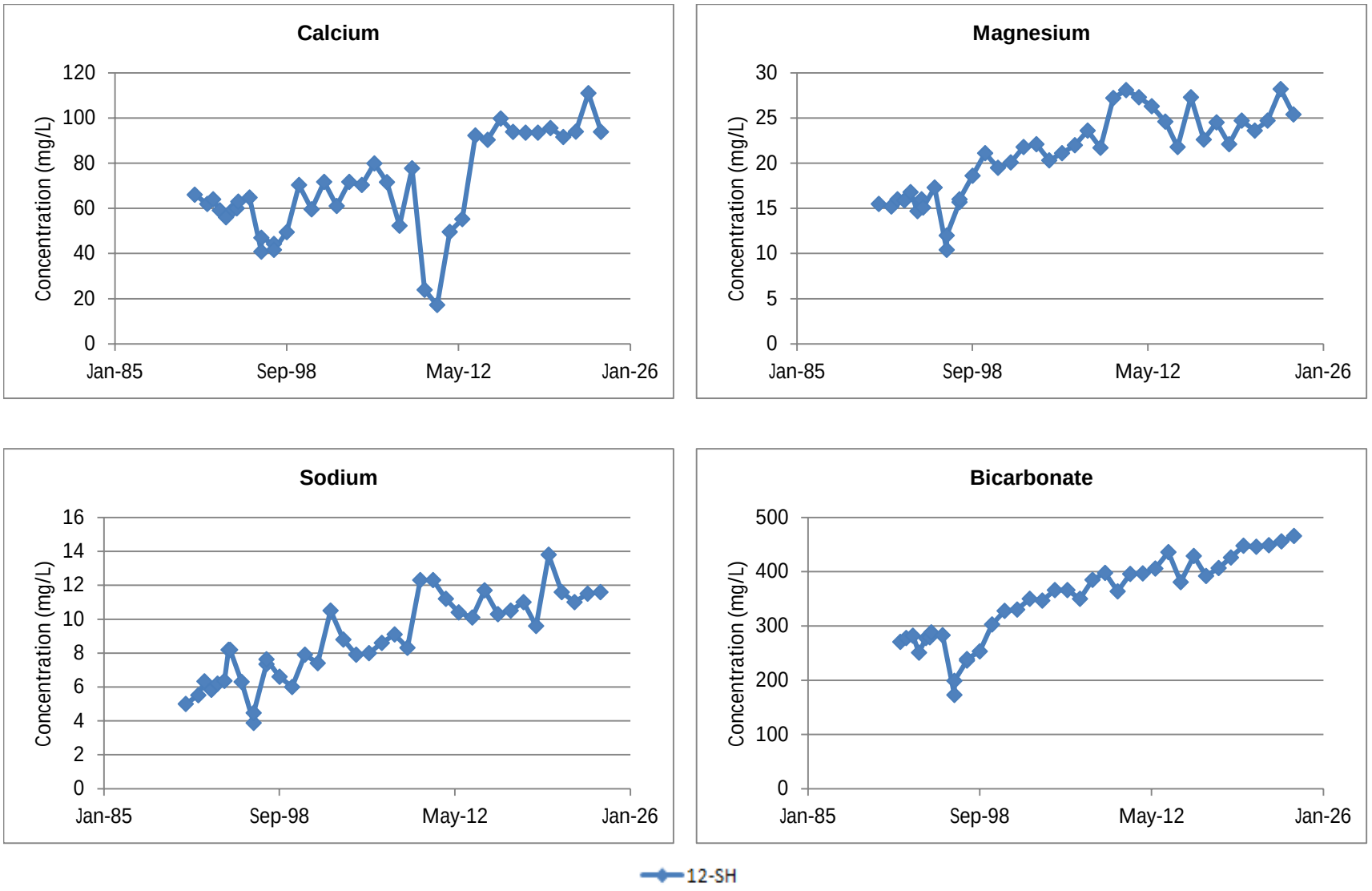
**Figure 13.20**
**VEOLIA, Swan Hills Treatment Centre**
**12-SH - Major Ions**



AECOM

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

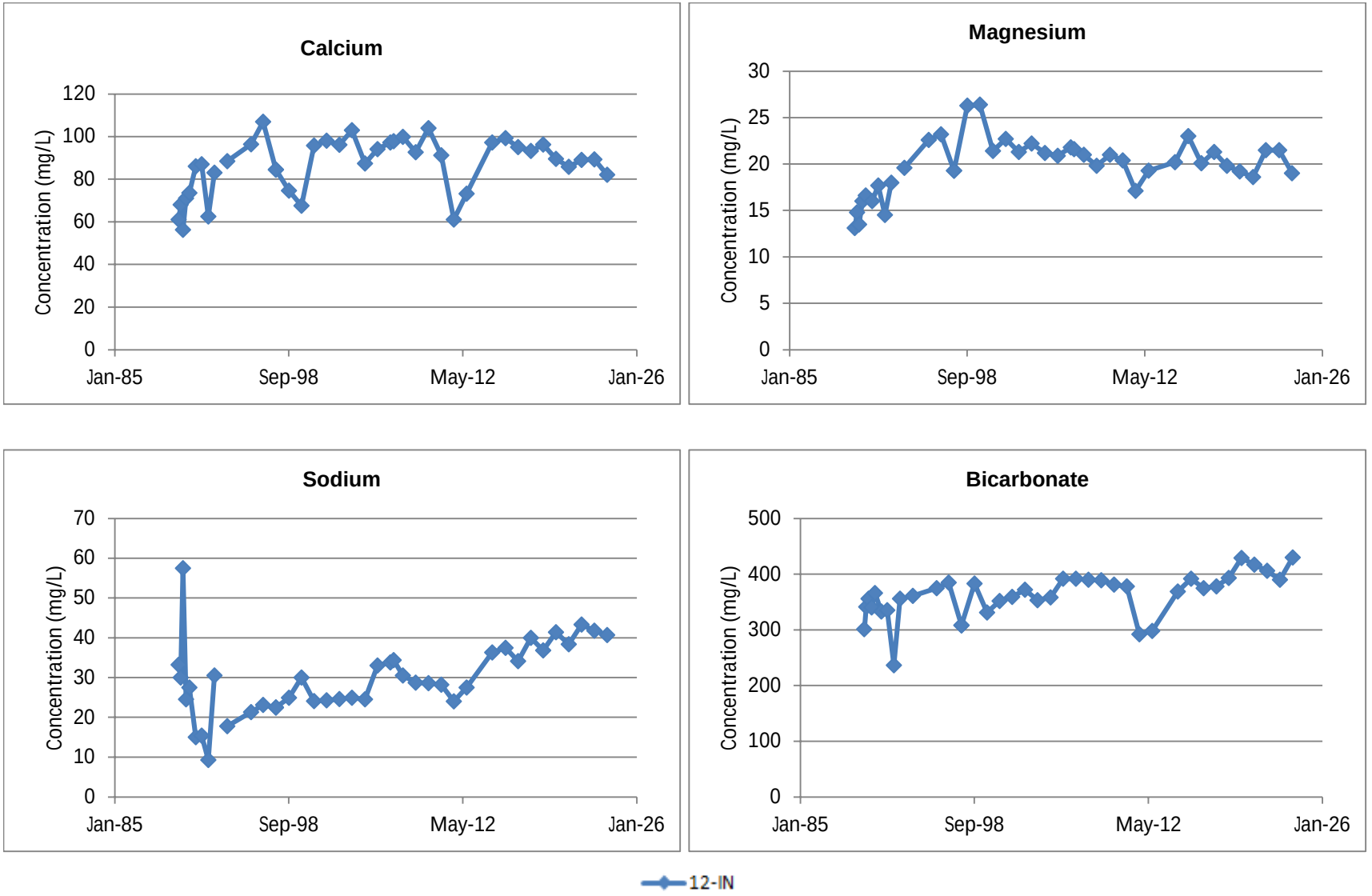


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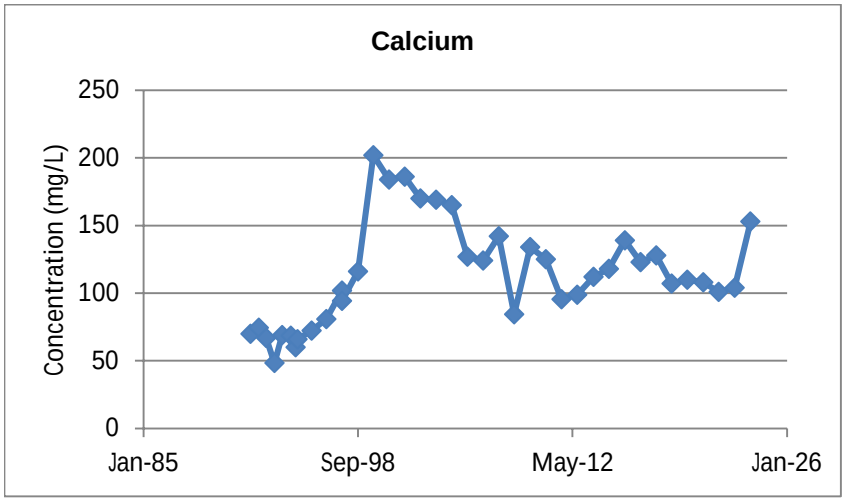
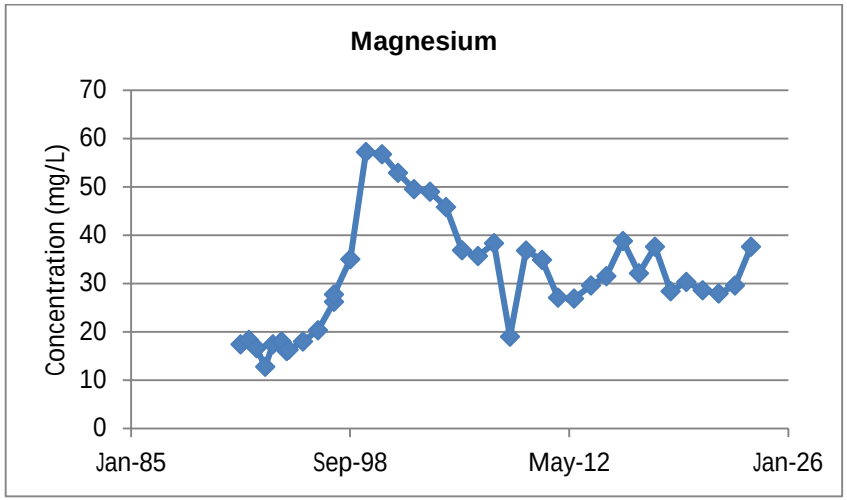
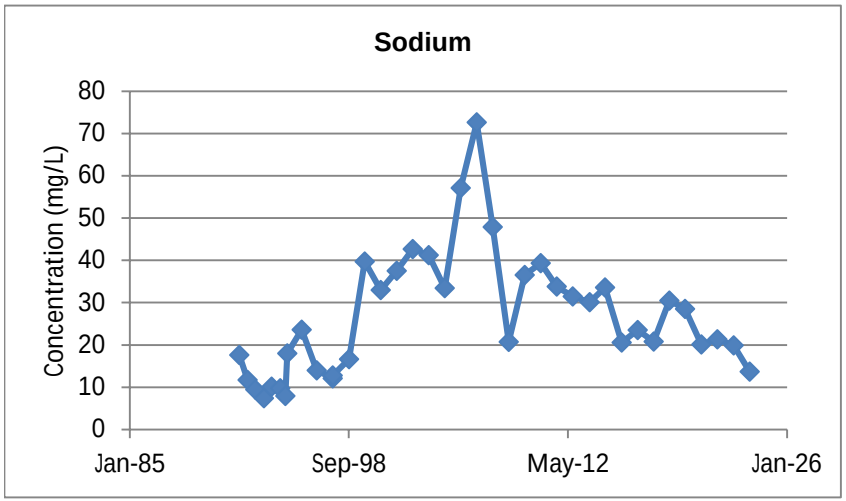
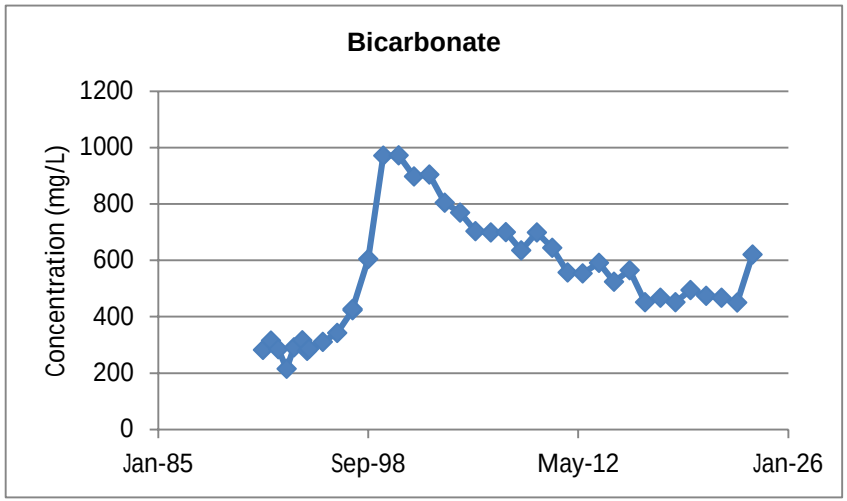
**Figure 13.22**
**VEOLIA, Swan Hills Treatment Centre**
**13-SH - Major Ions**



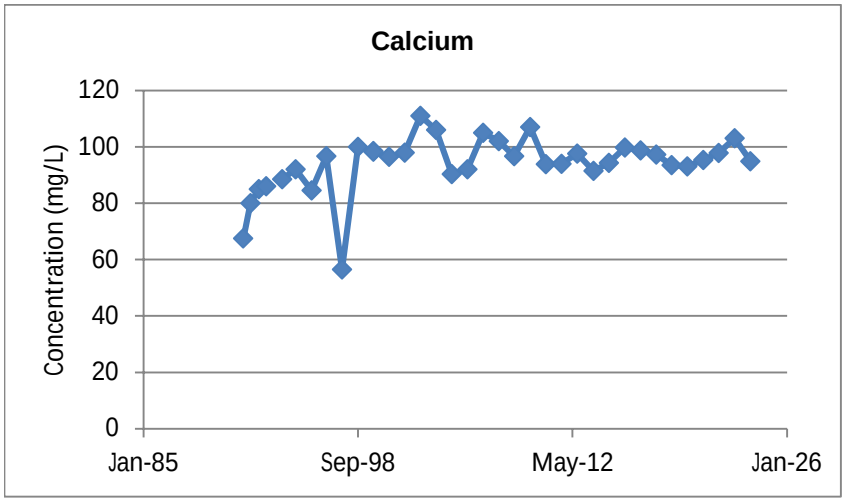



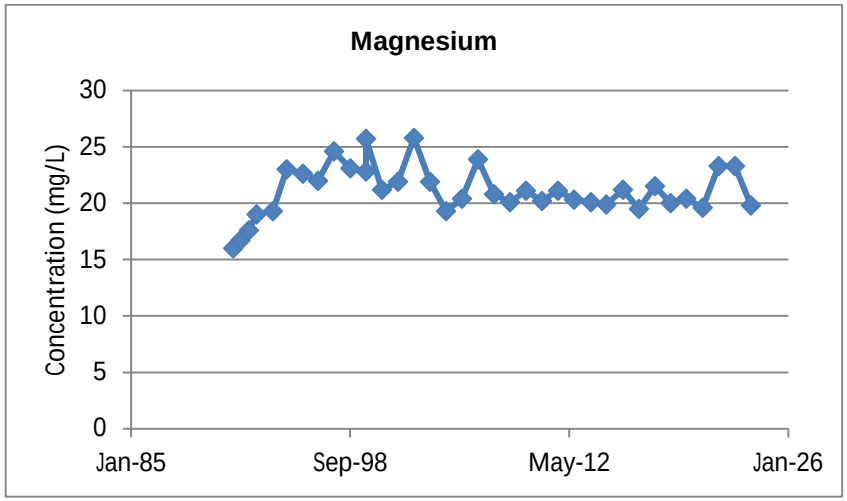



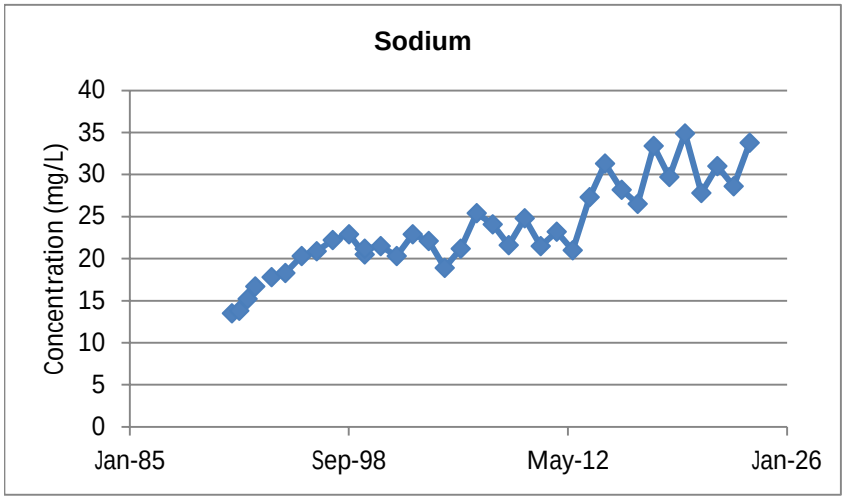

13-SH

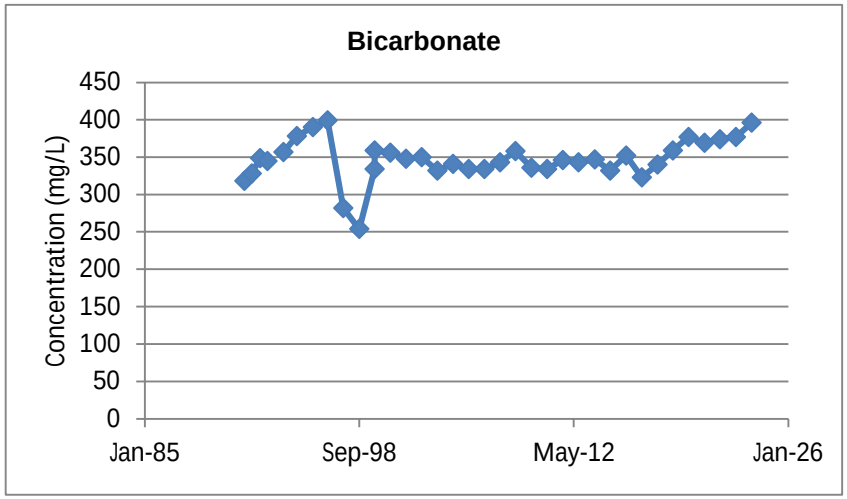
AECOM

**Figure 13.23**
**VEOLIA, Swan Hills Treatment Centre**
**13-IN - Major Ions**



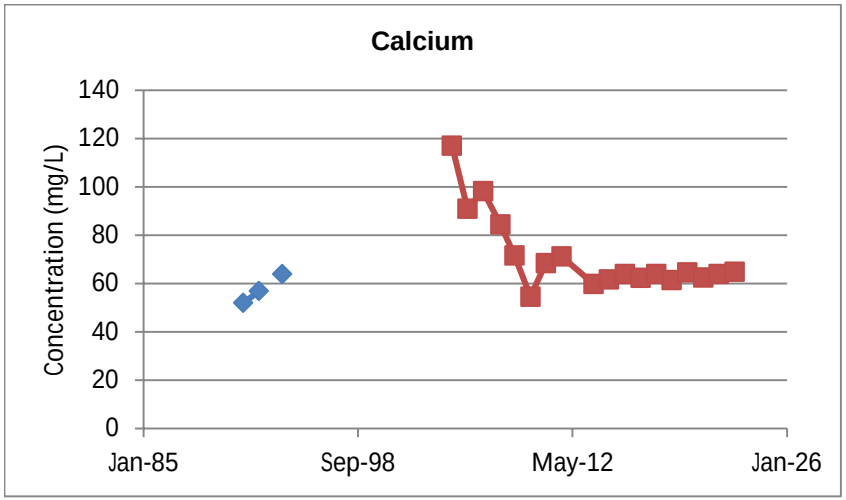



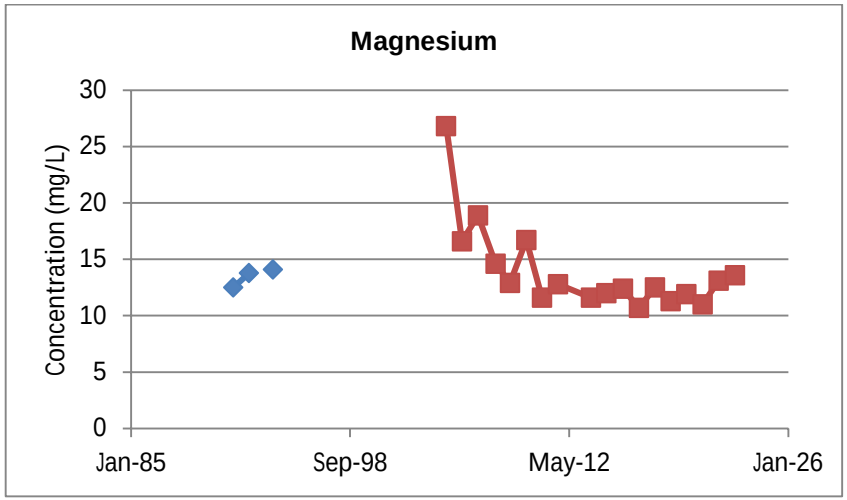



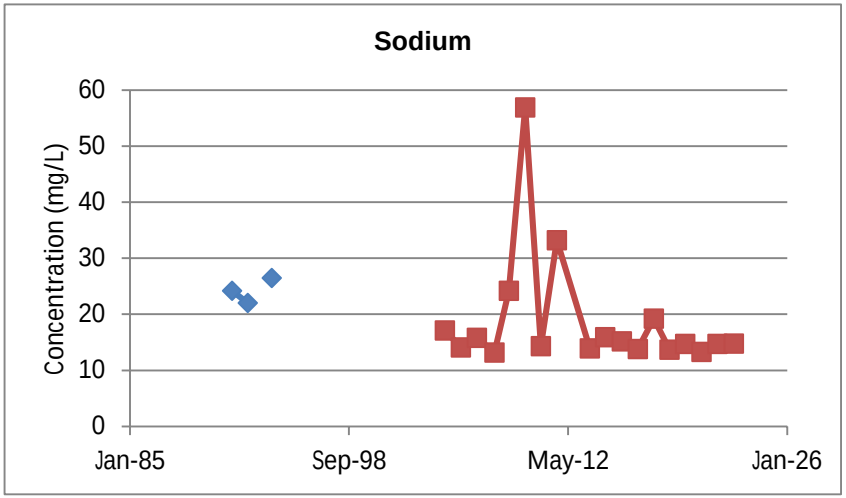

13-IN

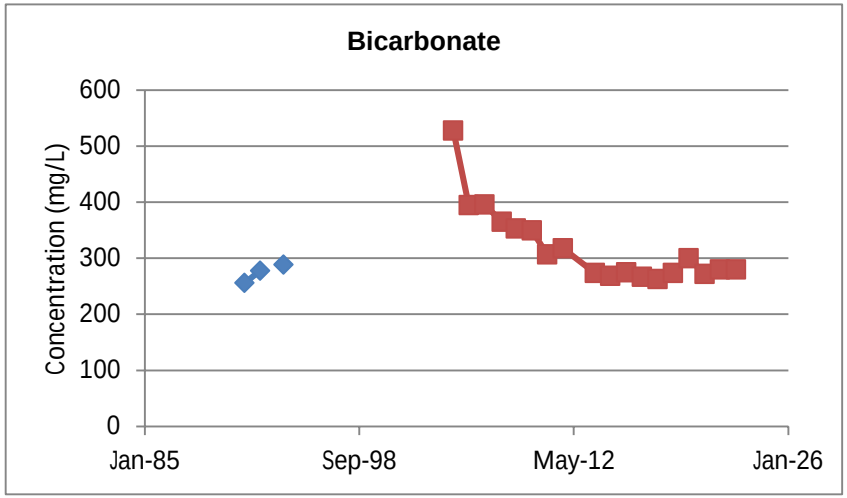
AECOM

**Figure 13.24**
**VEOLIA, Swan Hills Treatment Centre**
**13-SS and 13(R)SS - Major Ions**



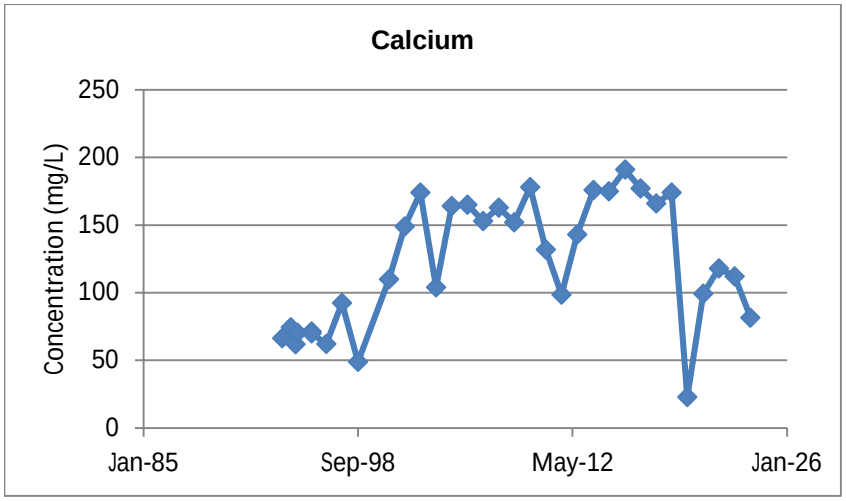



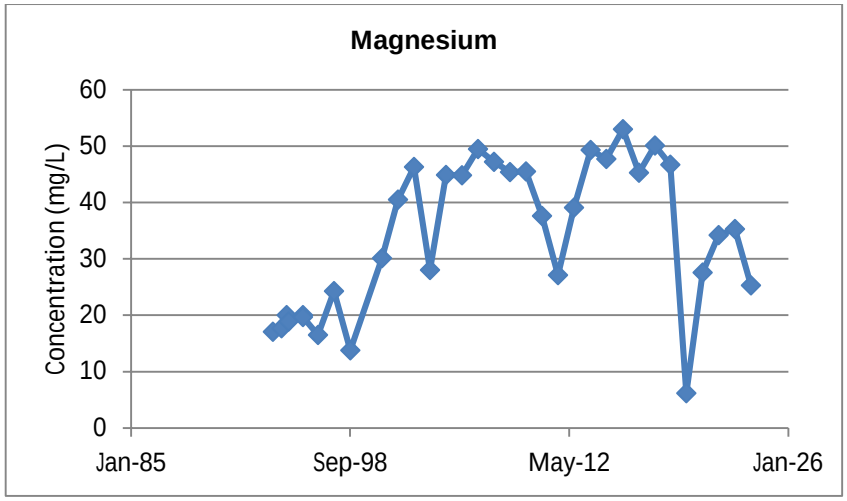



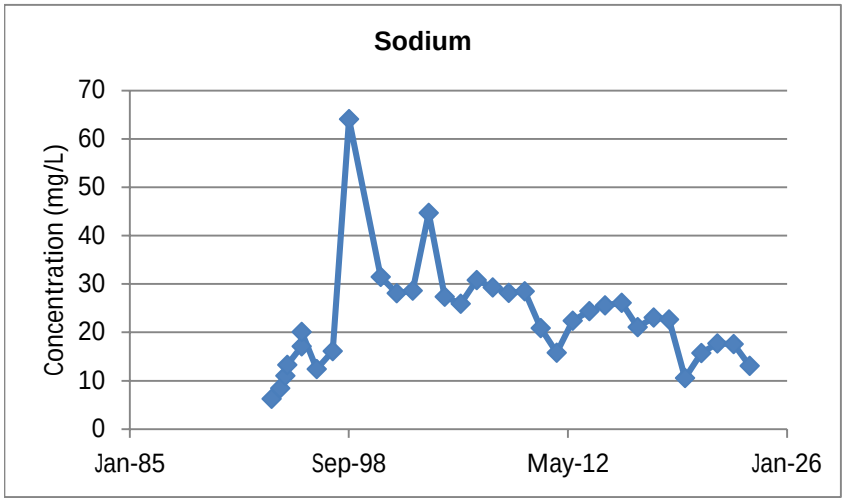

13-SS
13(R)SS

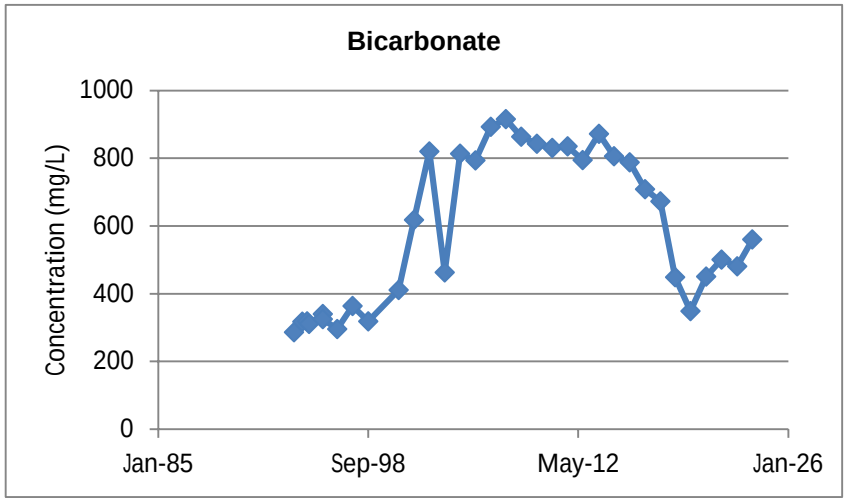
AECOM

**Figure 13.25**
**VEOLIA, Swan Hills Treatment Centre**
**14-SH - Major Ions**



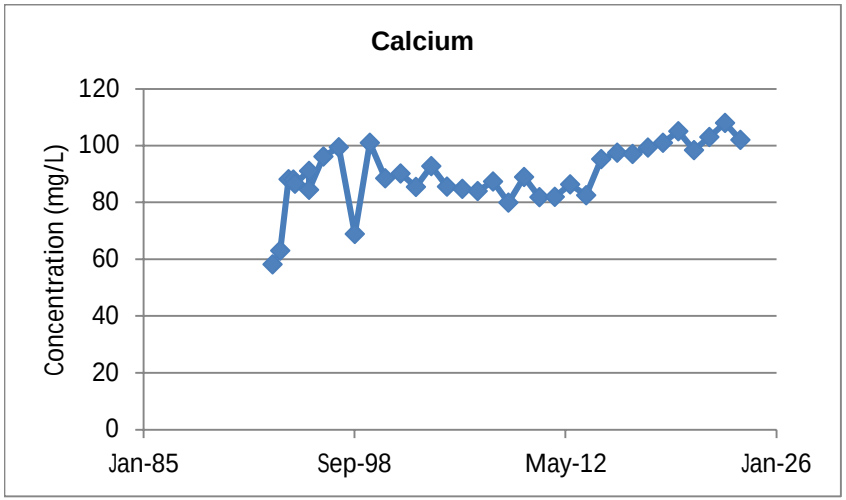



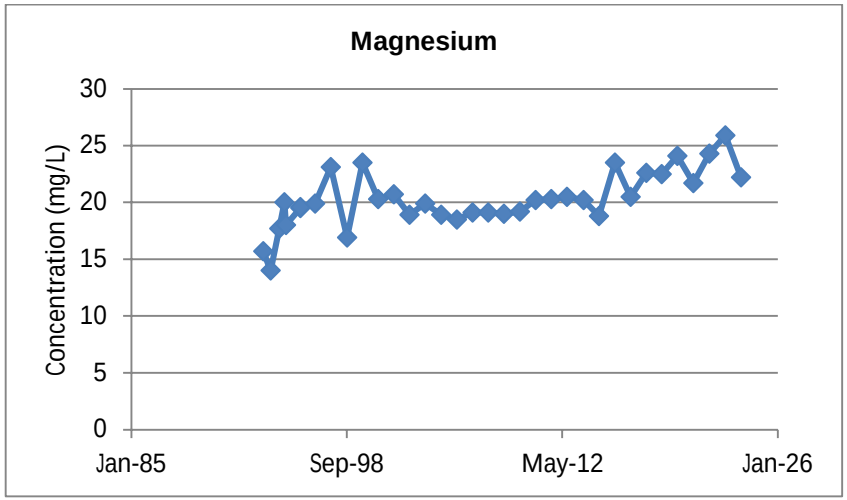



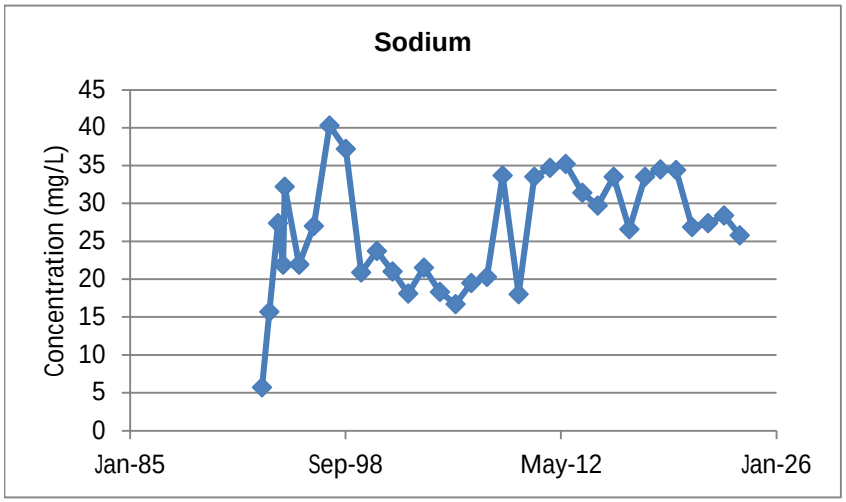

14-SH

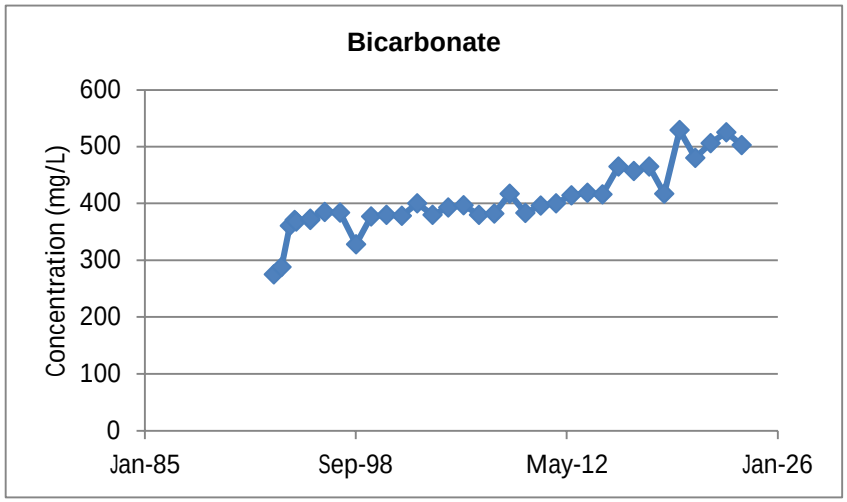
AECOM

**Figure 13.26**
**VEOLIA, Swan Hills Treatment Centre**
**15-SH - Major Ions**



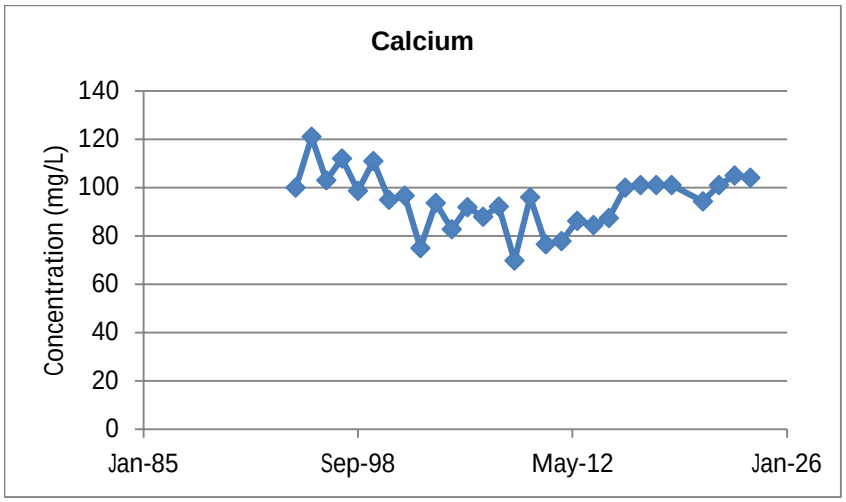



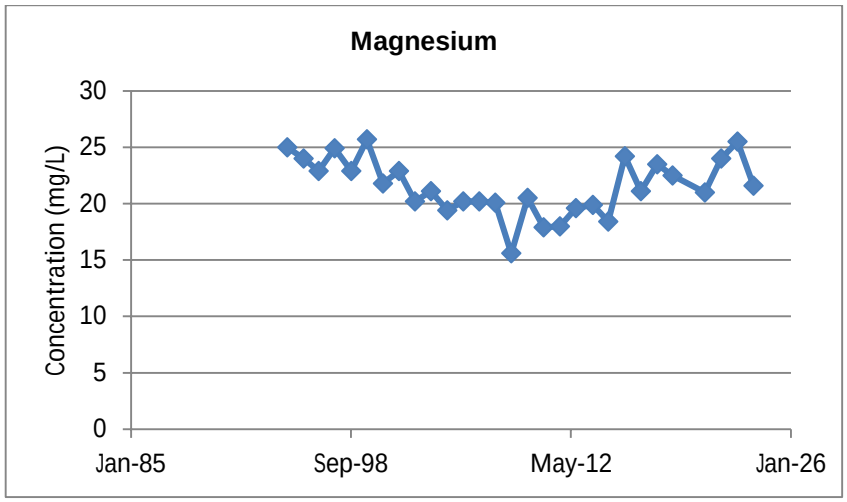



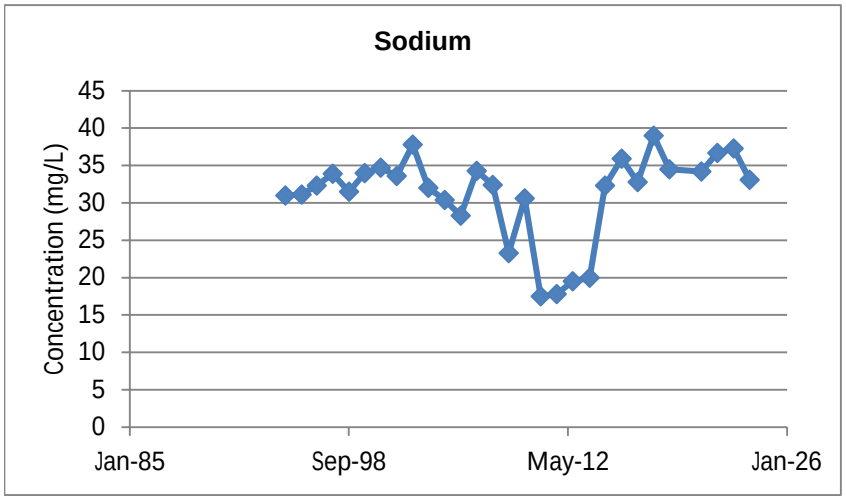

15-SH

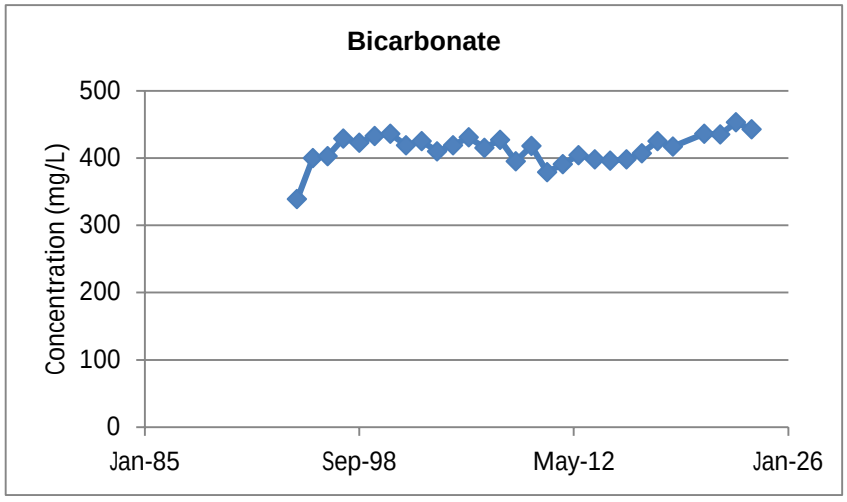
AECOM

**Figure 13.27**
**VEOLIA, Swan Hills Treatment Centre**
**15-IN - Major Ions**



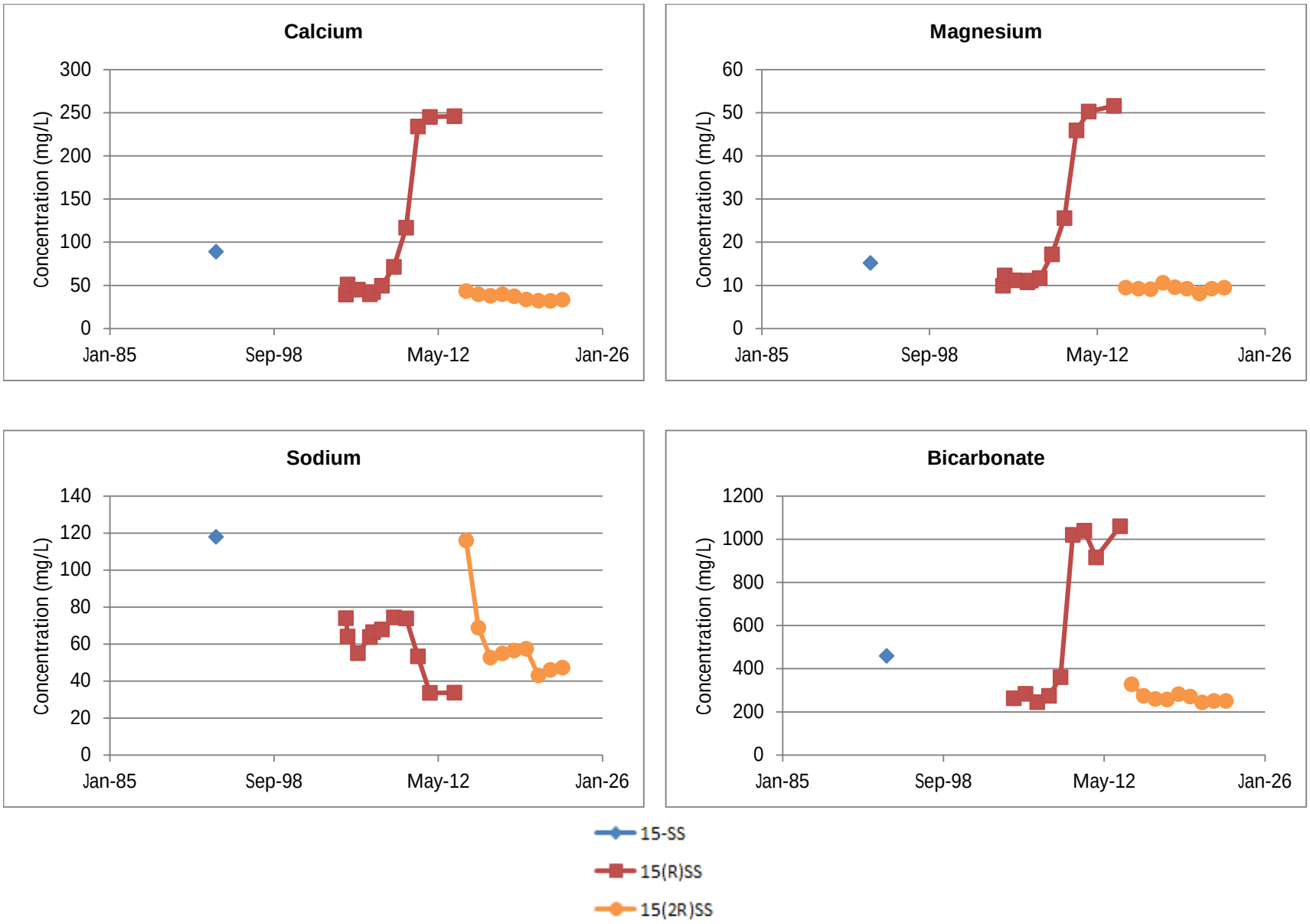




15-IN

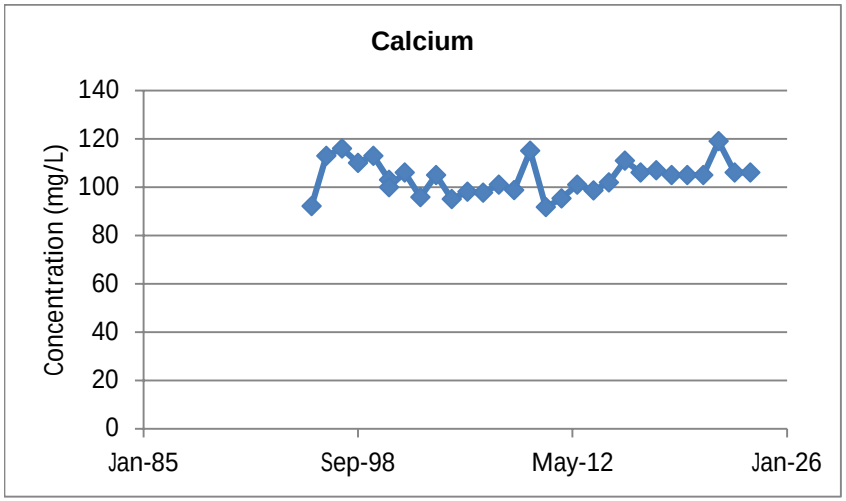
AECOM

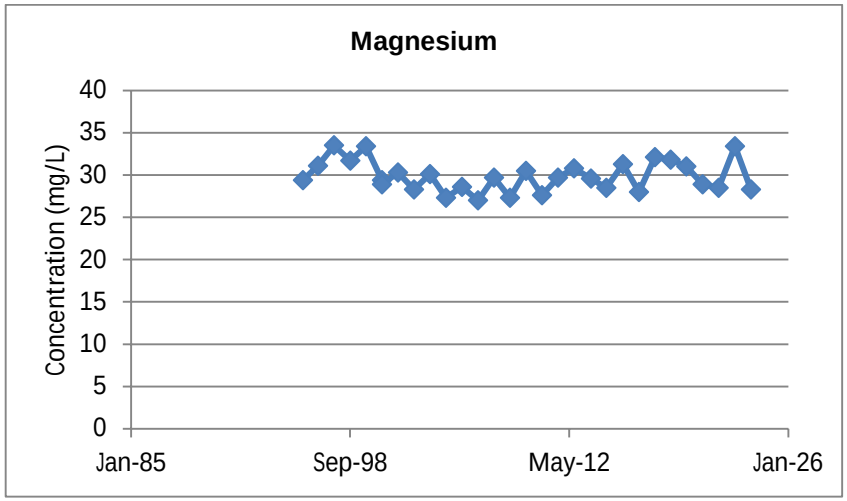
**Figure 13.28**
**VEOLIA, Swan Hills Treatment Centre**
**15-SS, 15(R)SS, and 15(2R)SS - Major Ions**

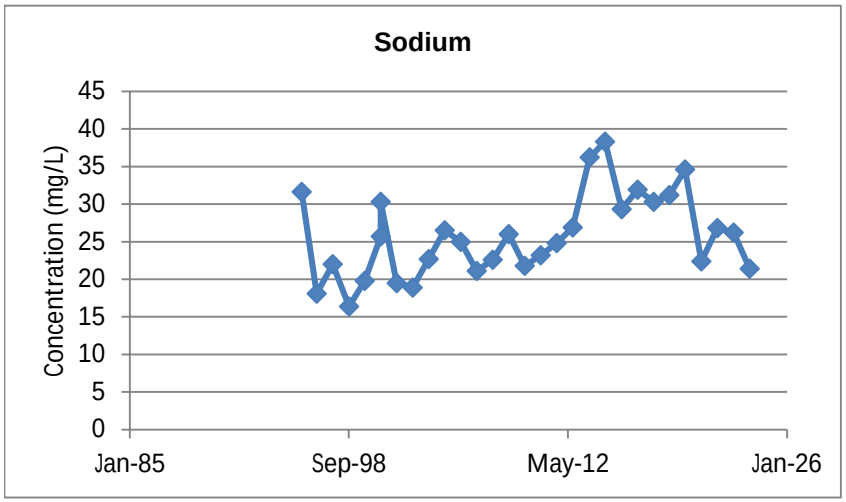


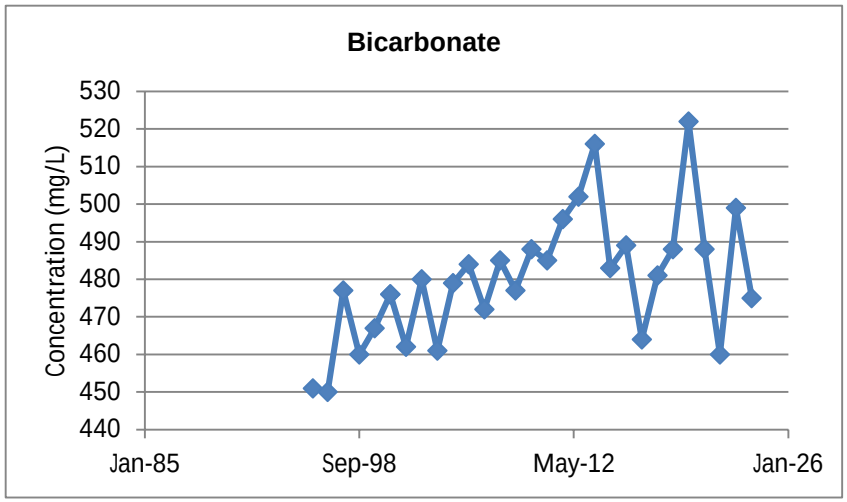
AECOM

**Figure 13.29**
**VEOLIA, Swan Hills Treatment Centre**
**16-SH - Major Ions**



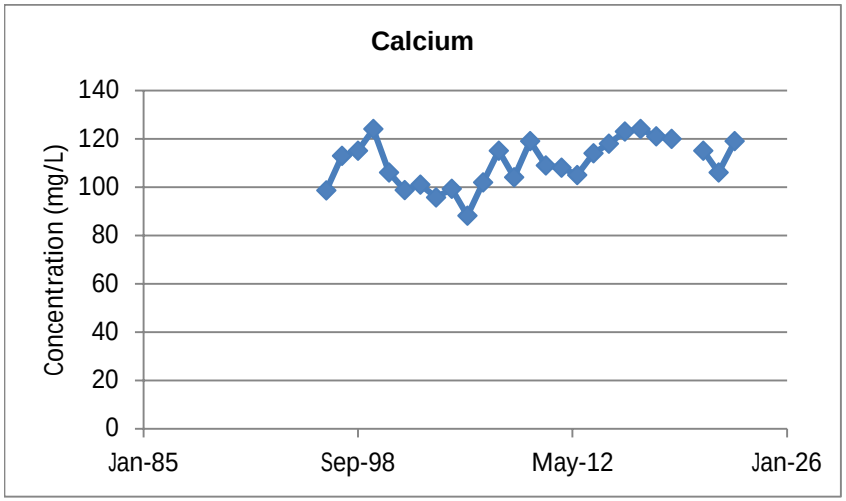



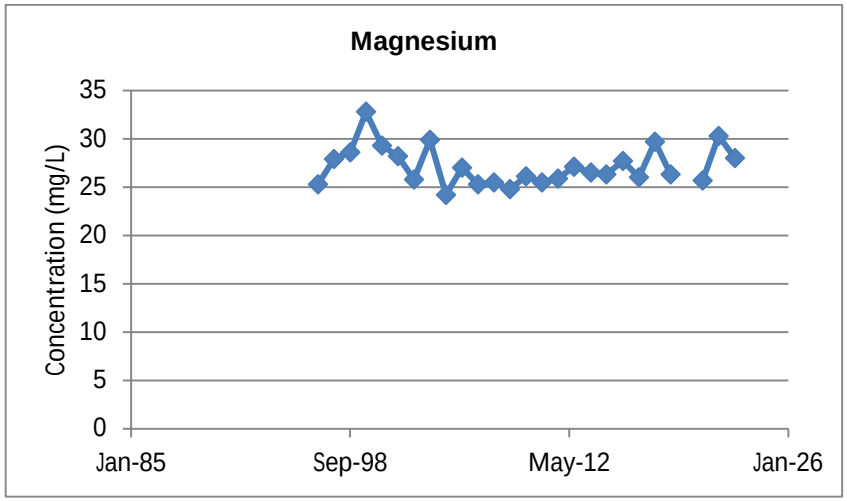



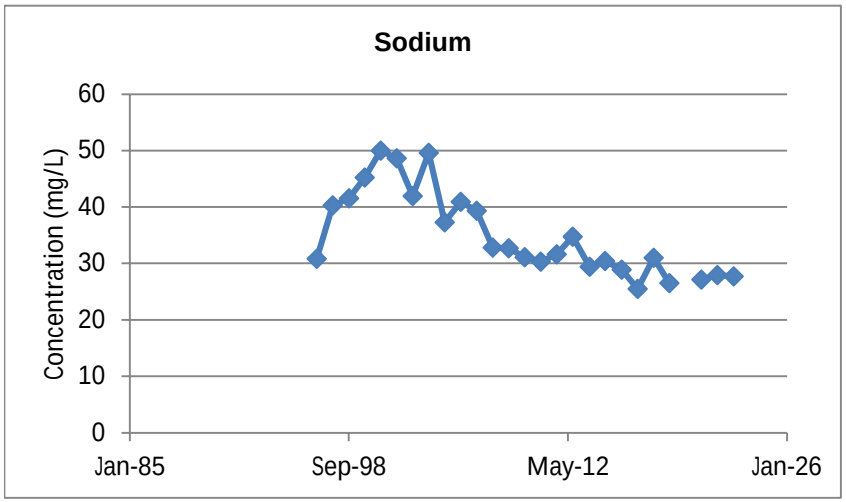

16-SH

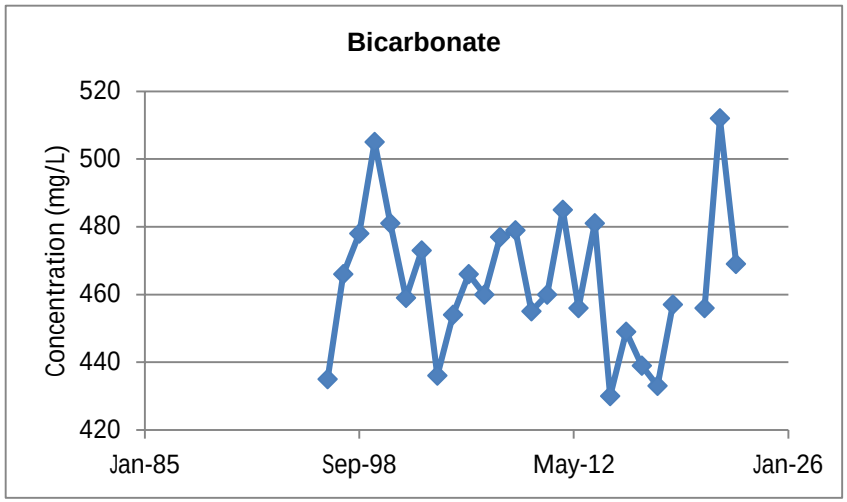
AECOM

**Figure 13.30**
**VEOLIA, Swan Hills Treatment Centre**
**16-IN - Major Ions**



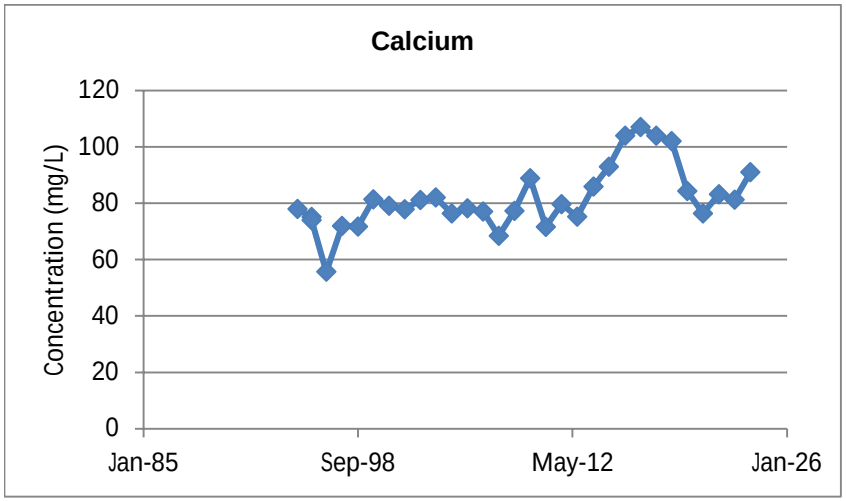



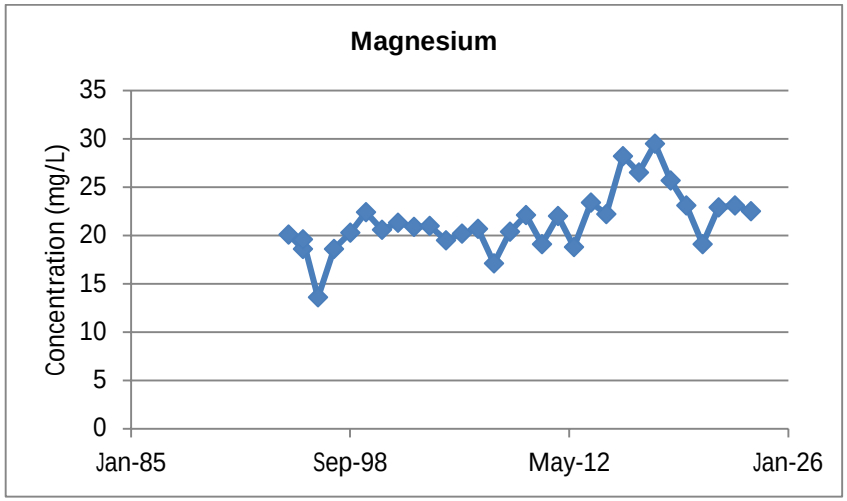

16-IN

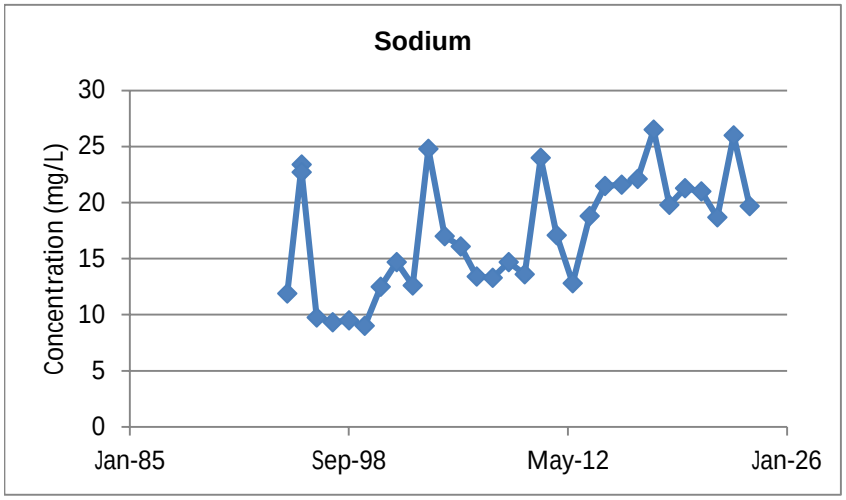
44548

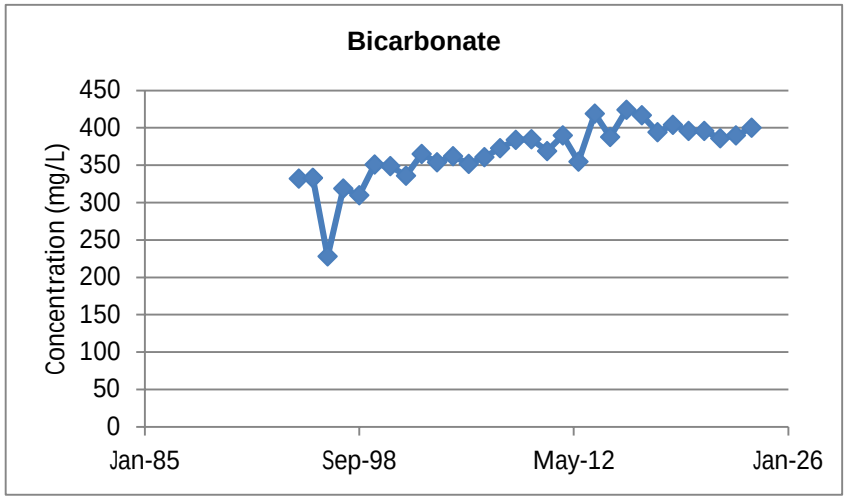
AECOM

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



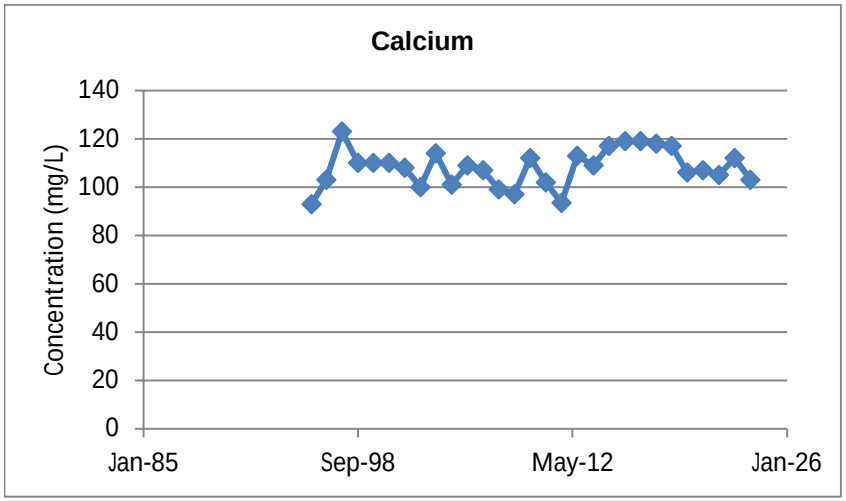



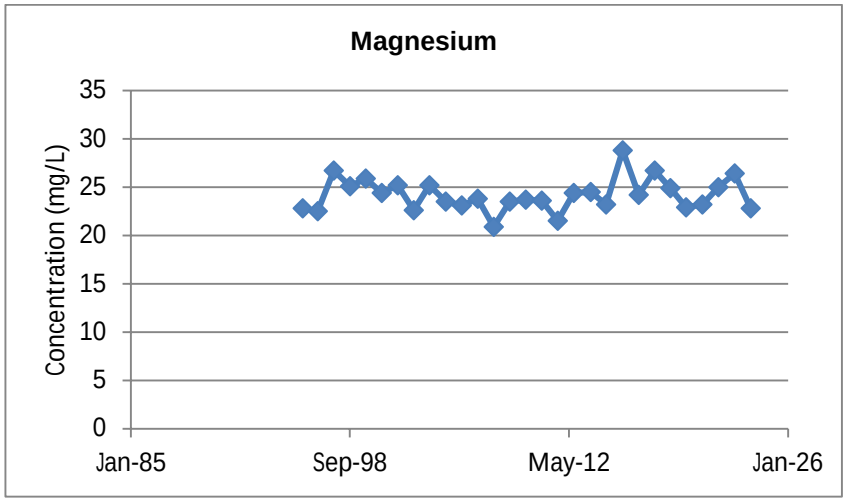



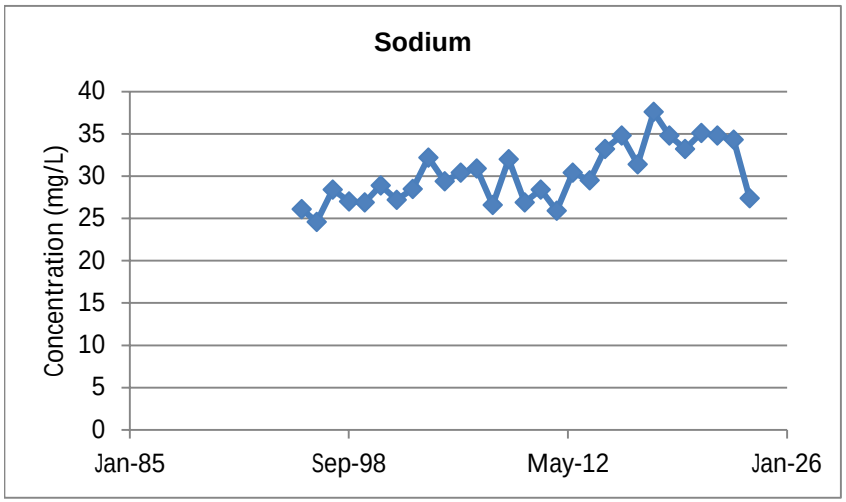

17-SH

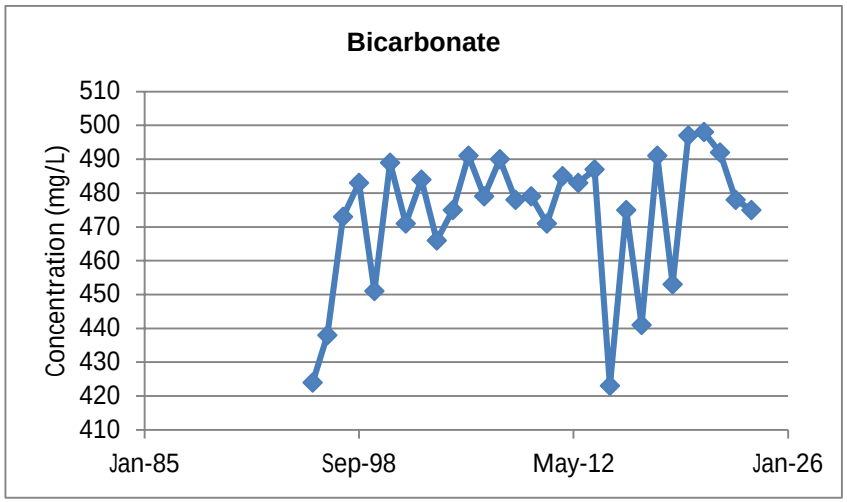
AECOM

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



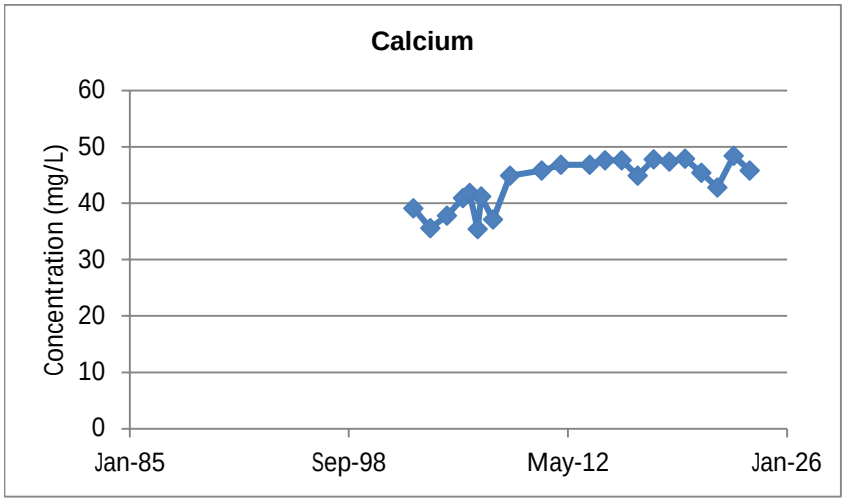



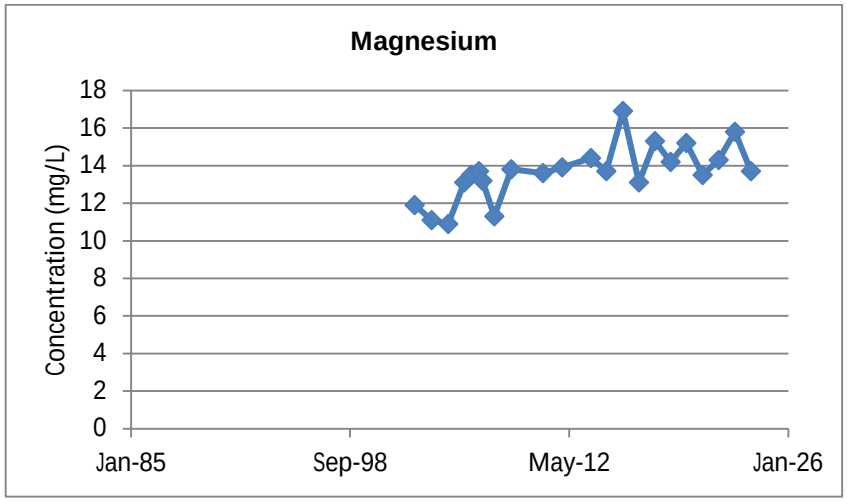



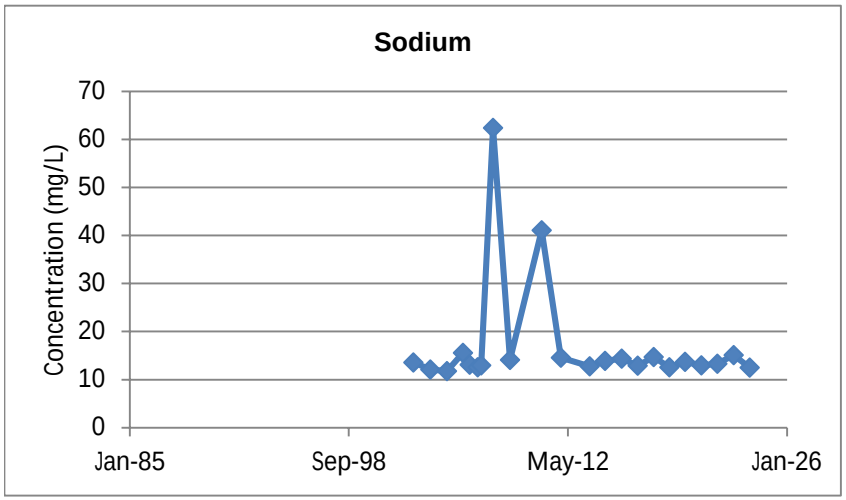

17-IN

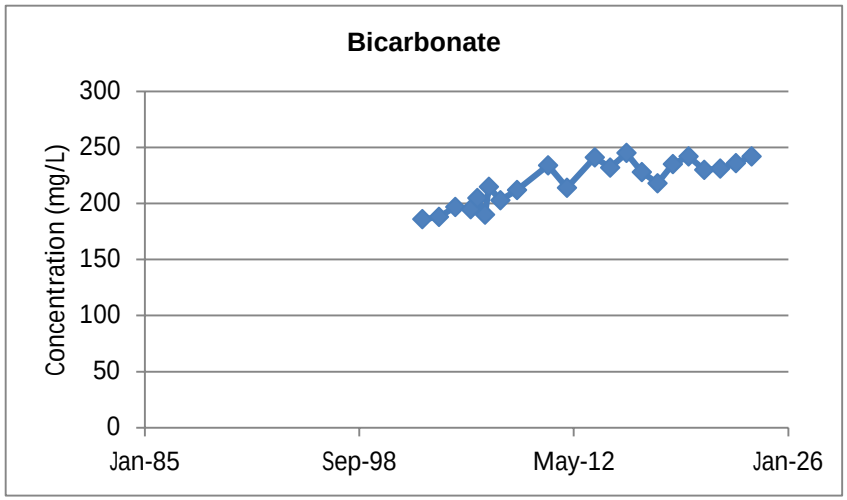
AECOM

**Figure 13.33**
**VEOLIA, Swan Hills Treatment Centre**
**89-3 - Major Ions**



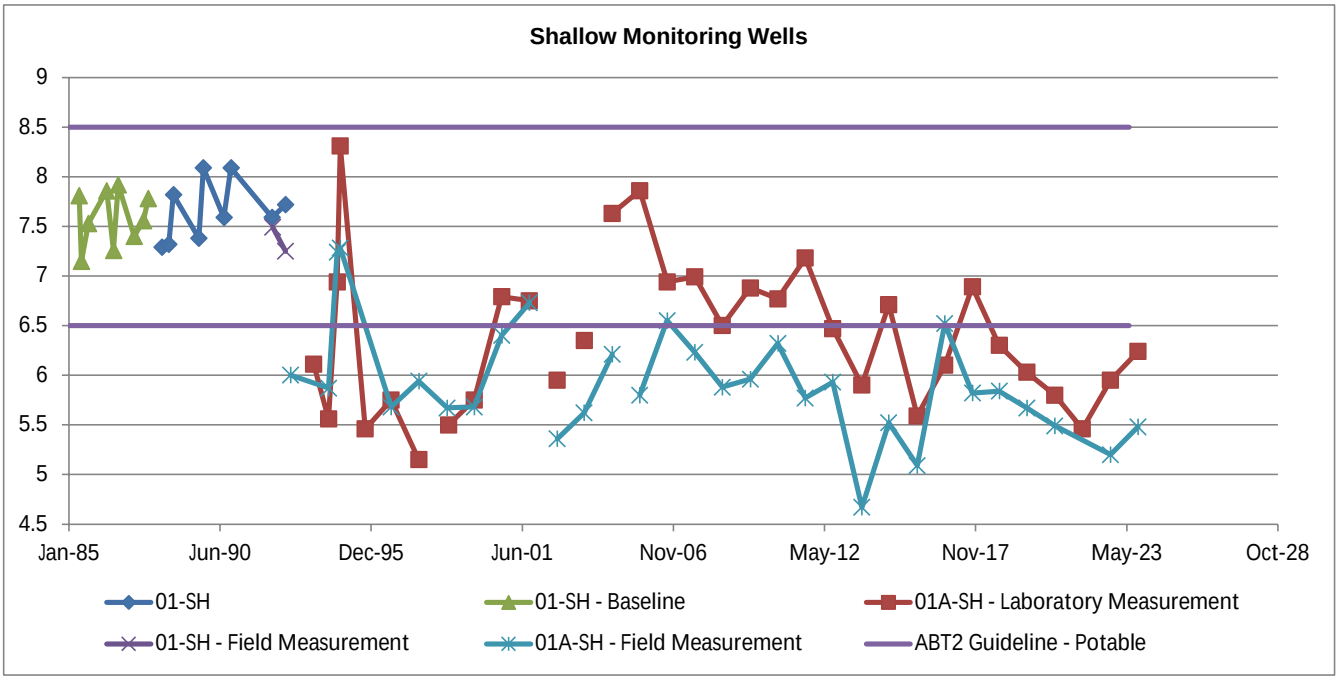



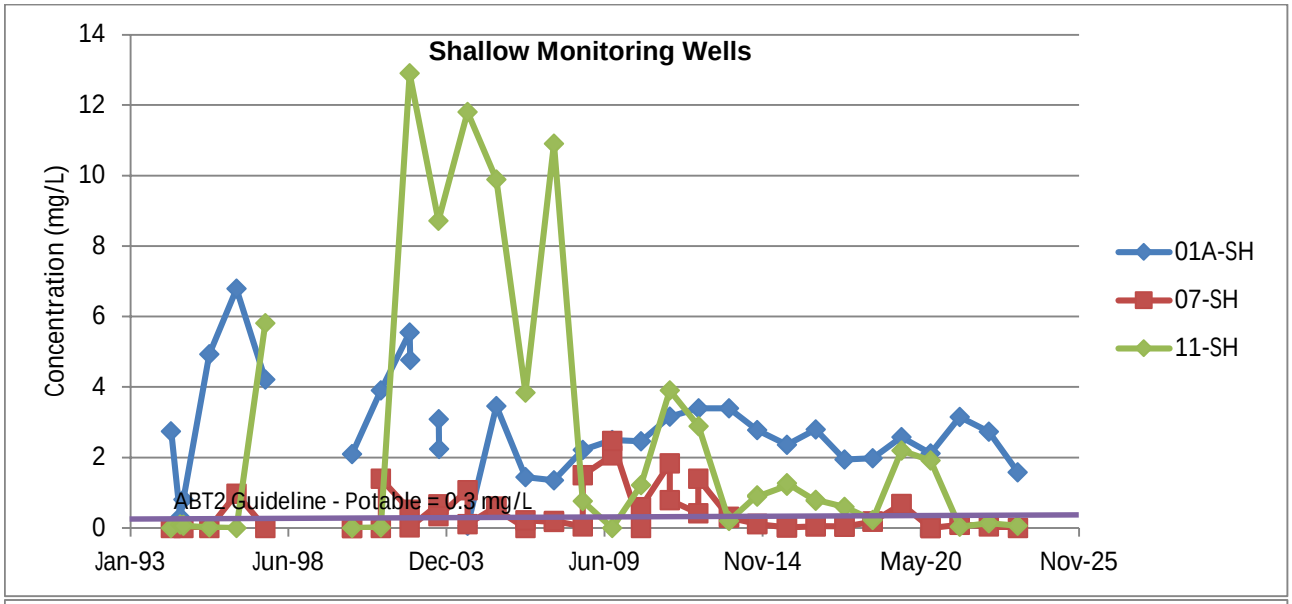

89-3

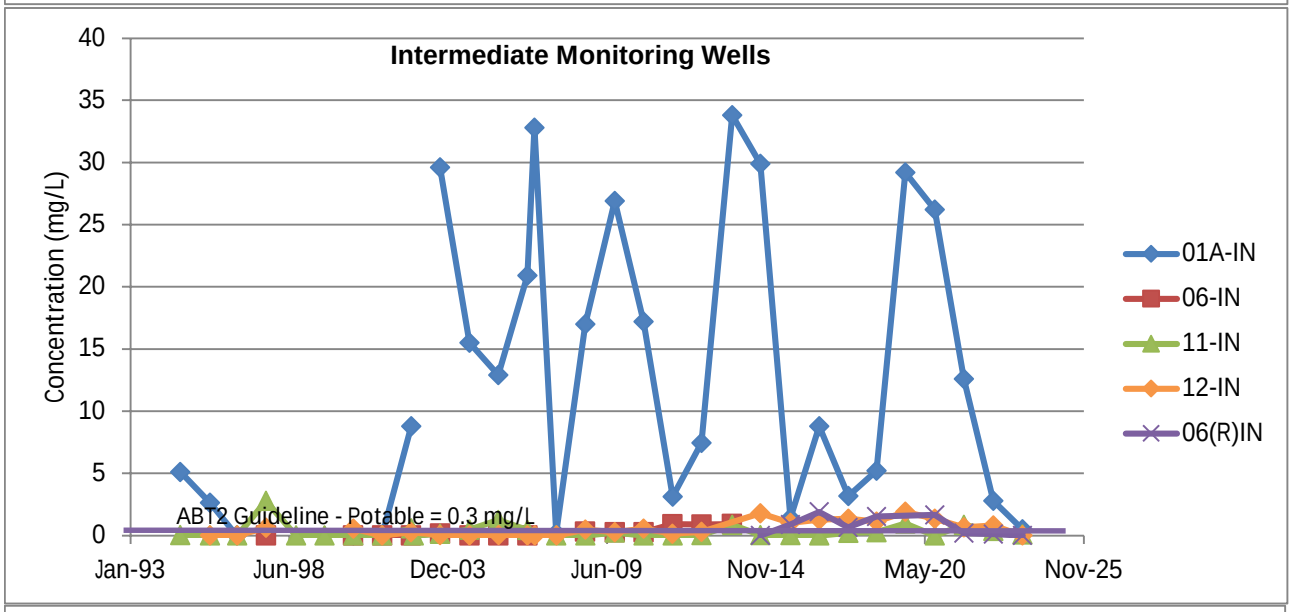
**Figure 14.1**
**VEOLIA, Swan Hills Treatment Centre**
**2023 pH Results**

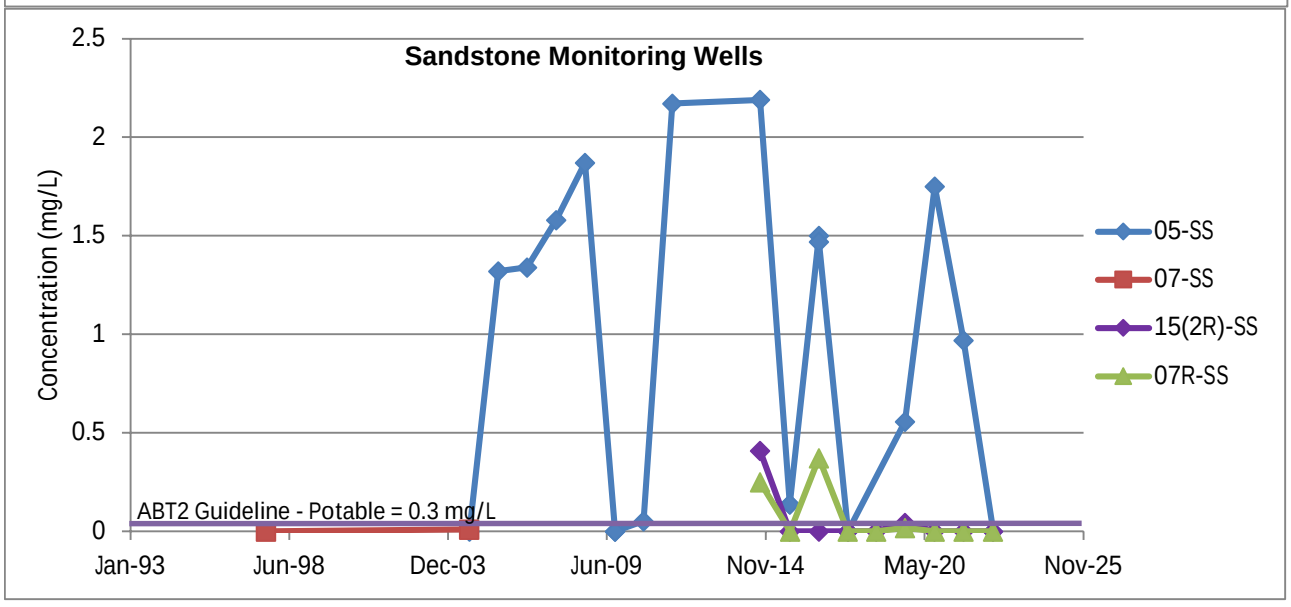


AECOM

**Figure 14.2**
**VEOLIA, Swan Hills Treatment Centre**
**2023 Dissolved Iron Concentrations**

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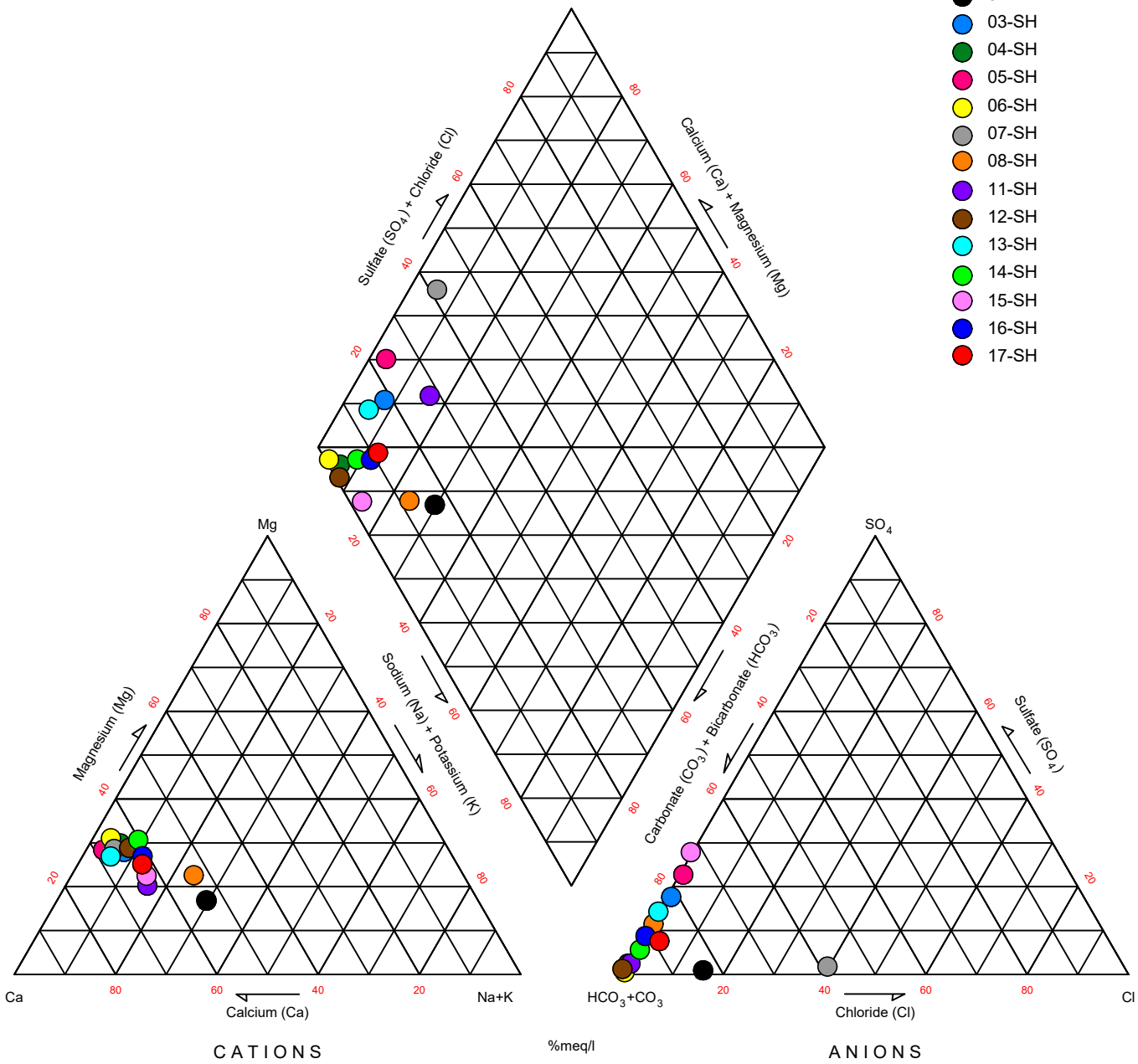
Project Management Initials: Designer: Checked: Approved: ANSI A 215.9mm x 279.4mm

## Shallow Piper Diagram




**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Shallow Piper Plot**

AECOM

**Figure 15.1**

Last saved by: SERBIND(2024-02-27) Last Plotted: 2024-03-18
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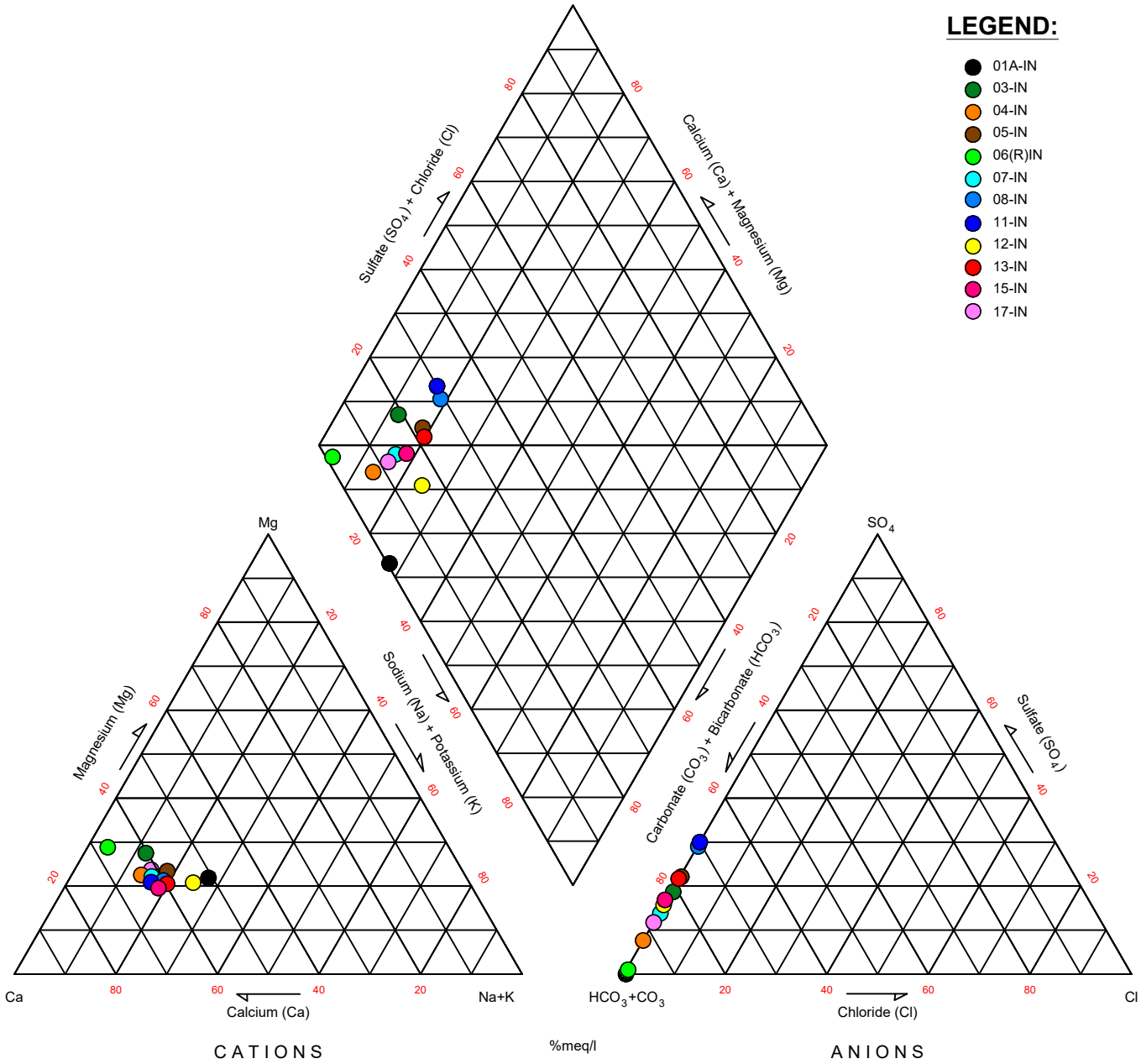
# Intermediate Piper Diagram




**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Intermediate Piper Plot**

AECOM

**Figure 15.2**

Last saved by: SERBIND(2024-02-27) Last Plotted: 2024-03-18
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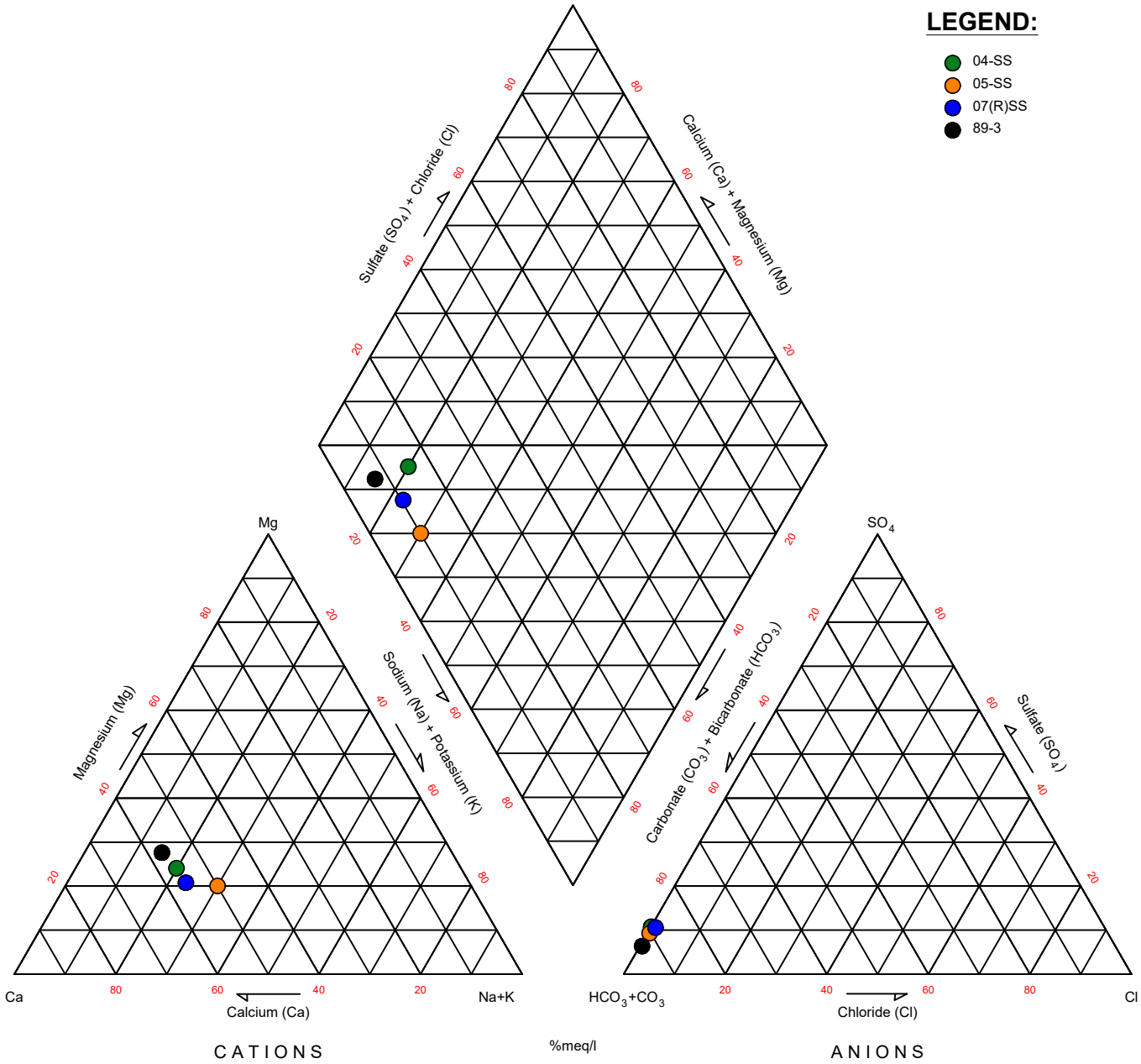
# Sandstone Piper Diagram




**Issue Status: FINAL**

**2023 Groundwater Monitoring Report**
**Swan Hills Treatment Centre**
VEOLIA
Project No.: 60716599 Date: 2024-03-18

**Sandstone Piper Plot**

AECOM

**Figure 15.3**

# Appendix B

## Water Well Drilling Report

# Reconnaissance Report

View in Metric

Export to Excel

## Groundwater Wells

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

# Reconnaissance Report

View in Metric

Export to Excel

| GIC Well ID | LSD | SEC | TWP | RGE | M | DRILLING COMPANY | DATE COMPLETED | DEPTH (ft) | TYPE OF WORK | USE | CHM | LT | PT | WELL OWNER | STATIC LEVEL (ft) | TEST RATE (igpm) | SC_DIA (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 351361 | NW | 6 | 67 | 8 | 5 | MCALLISTER WATERWELLS LTD. | 1990-01-11 | 240.00 | New Well | Observation | | 4 | | ALTA SPECIAL WASTE MGMT | 179.00 | 1.00 | 2.00 |
| 351362 | NW | 6 | 67 | 8 | 5 | MCALLISTER WATERWELLS LTD. | 1990-01-12 | 220.00 | New Well | Observation | | 4 | | ALTA SPECIAL WASTE MGMT | 0.00 | 0.00 | 2.00 |
| 351363 | NW | 6 | 67 | 8 | 5 | MCALLISTER WATERWELLS LTD. | 1990-01-13 | 230.00 | New Well | Observation | | 3 | | ALTA SPECIAL WASTE MGMT | | | 2.00 |
| 353704 | 8 | 6 | 67 | 8 | 5 | HI-RATE DRILLING 1985 LTD. | 1989-12-17 | 259.00 | New Well | Industrial | | 5 | | ALTA SPECIAL WASTE MGMT | | | 7.00 |
| 353705 | 8 | 6 | 67 | 8 | 5 | HI-RATE DRILLING 1985 LTD. | 1989-12-19 | 240.00 | 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 | 275.00 | Test Hole-Decommissioned | Industrial | | 8 | | ALTA SPECIAL WASTE MGMT | 212.00 | 1.00 | 7.00 |
| 354695 | 9 | 6 | 67 | 8 | 5 | MCALLISTER HOLDINGS LTD. | 1985-05-10 | 224.00 | New Well | Industrial | | 8 | 27 | ALTA SPECIAL WASTE MGMT | 168.00 | 44.00 | 5.56 |
| 354696 | 9 | 6 | 67 | 8 | 5 | MCALLISTER HOLDINGS LTD. | 1985-05-19 | 220.00 | New Well | Industrial | | 14 | 27 | ALTA SPECIAL WASTE MGMT | 155.00 | 6.00 | 5.56 |
| 354697 | 10 | 6 | 67 | 8 | 5 | MCALLISTER HOLDINGS LTD. | 1985-05-20 | 249.00 | Reconditioned | Industrial | | 9 | 27 | ALTA SPECIAL WASTE MGMT | 201.00 | 12.00 | 5.56 |
| 356324 | 13 | 6 | 67 | 8 | 5 | HI-RATE DRILLING 1985 LTD. | 1989-10-11 | 1,748.00 | New Well | Industrial | | 5 | | ALTA SPECIAL WASTE MGMT | 1,213.90 | 24.70 | 0.00 |
| 358227 | 11 | 6 | 67 | 8 | 5 | HI-RATE DRILLING 1985 LTD. | 1989-12-19 | 240.00 | 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 | 259.00 | New Well | Industrial | | 5 | | ALTA SPECIAL WASTE MGMT #3 | | | 7.00 |
| 368538 | 6 | 6 | 67 | 8 | 5 | ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION | 1983-12-02 | 499.00 | Test Hole | Observation | | 29 | | ALTA ENV #2239E | 0.00 | 3.00 | 5.56 |
| 395324 | 11 | 5 | 67 | 8 | 5 | MCALLISTER WATERWELLS LTD. | | 400.00 | New Well | Industrial | | 19 | | ALTA SPECIAL WASTE MGMT CORP | 105.00 | 40.00 | 7.00 |
| 395325 | 11 | 5 | 67 | 8 | 5 | MCALLISTER WATERWELLS LTD. | 1986-06-23 | 98.00 | New Well-Decommissioned | Industrial | | 7 | | ALTA SPECIAL WASTE MGMT CORP | 6.00 | | 5.56 |
| 395326 | 12 | 5 | 67 | 8 | 5 | MCALLISTER WATERWELLS LTD. | | 300.00 | New Well | Industrial | | 18 | | ALTA SPECIAL WASTE MGMT CORP | 68.00 | 50.00 | 10.75 |
| 395328 | 6 | 6 | 67 | 8 | 5 | ALBERTA ENVIRONMENT | 1983-12-09 | 211.00 | 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 | 158.00 | New Well | Investigation | | 6 | | ALTA ENV/SOILS BR#2241 | 0.00 | 0.50 | 5.56 |
| 395330 | 11 | 6 | 67 | 8 | 5 | BIG QUILL DRILLING LTD. | 1983-05-19 | 298.00 | New Well | Investigation | | 8 | | C.E. MOELL & ASSOC #2 | 167.00 | 7.00 | 5.56 |
| 395331 | 13 | 6 | 67 | 8 | 5 | BIG QUILL DRILLING LTD. | 1983-05-25 | 298.00 | New Well-Decommissioned | Investigation | | 11 | | C.E. MOELL & ASSOC#TH3 | 0.00 | 2.00 | 0.00 |

# Reconnaissance Report

View in Metric

Export to Excel

| GIC Well ID | LSD | SEC | TWP | RGE | M | DRILLING COMPANY | DATE COMPLETED | DEPTH (ft) | TYPE OF WORK | USE | CHM | LT | PT | WELL OWNER | STATIC LEVEL (ft) | TEST RATE (igpm) | SC_DIA (in) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 395332 | 13 | 6 | 67 | 8 | 5 | ALBERTA ENVIRONMENT | 1983-12-14 | 151.00 | New Well | Investigation | | 5 | | ALTA ENV/SOILS#SWAN HILLS2242E | | | 0.00 |
| 395333 | 13 | 6 | 67 | 8 | 5 | GERALD MCGINN DRILLING LTD. | 1988-03-23 | 267.00 | New Well | Industrial | | 15 | | ALTA SPECIAL WASTE SYSTEMS | 205.00 | 15.00 | 5.56 |
| 395334 | 14 | 6 | 67 | 8 | 5 | BIG QUILL DRILLING LTD. | 1983-05-18 | 298.00 | Test Hole-Decommissioned | Industrial | | 7 | | C.E. MOELL & ASSOC#1 | 152.00 | 6.00 | 0.00 |
| 395335 | 4 | 7 | 67 | 8 | 5 | MCALLISTER DRILLING LTD. | 1986-06-12 | 240.00 | Test Hole-Decommissioned | Industrial | | 6 | | ALTA SPECIAL WASTE MGMT CORP#1 | 51.00 | 4.00 | 5.56 |
| 395339 | 14 | 1 | 67 | 9 | 5 | UNKNOWN DRILLER | 1980-03-03 | 50.00 | 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 | 340.00 | Dry Hole-Decommissioned | Industrial | | 21 | | HUSKY ENERGY | | | 5.56 |
| 2097625 | 11 | 6 | 67 | 8 | 5 | MAHAR DRILLING LTD. | 2022-04-12 | 250.00 | New Well | Industrial | | 10 | 15 | SUEZ SWAN HILLS TREATMENT CENTER | 181.10 | 15.00 | |

# Water Well Drilling Report

View in Metric | 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 Imperial

| 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
ft from
ft from

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

Elevation ft
How Elevation Obtained: Not Obtained

## Drilling Information

**Method of Drilling**: Rotary

**Proposed Well Use**: Industrial

**Type of Work**: New Well

## Formation Log

Measurement in Imperial

| Depth from ground level (ft) | Water Bearing | Lithology Description |
|---|---|---|
| 4.00 | | Brown Till |
| 32.00 | | Gray Till |
| 70.00 | | Brown Shale |
| 85.00 | | Greenish Gray Shale |
| 110.00 | | Green Shale |
| 160.00 | | Brown Sandstone |
| 220.00 | | Brownish Gray Sandstone |
| 224.00 | | Gray Sandstone |

## Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 50.00 igpm

| Test Date | Water Removal Rate (igpm) | Static Water Level (ft) |
|---|---|---|
| 1985/05/10 | 44.00 | 168.00 |

## Well Completion

Measurement in Imperial

| Total Depth Drilled | Finished Well Depth | Start Date | End Date |
|---|---|---|---|
| 224.00 ft | | 1985/05/10 | 1985/05/10 |

**Borehole**

| Diameter (in) | From (ft) | To (ft) |
|---|---|---|
| 0.00 | 0.00 | 224.00 |

**Surface Casing (if applicable)**
Steel
Size OD : 5.56 in
Wall Thickness : 0.188 in
Bottom at : 203.00 ft

**Well Casing/Liner**
Size OD : 0.00 in
Wall Thickness : 0.000 in
Top at : 0.00 ft
Bottom at : 0.00 ft

**Perforations**

| From (ft) | To (ft) | Diameter or Slot Width(in) | Slot Length (in) | Hole or Slot Interval(in) |
|---|---|---|---|---|
| | | | | |

Perforated by

**Annular Seal** Other
Placed from 0.00 ft to 200.00 ft
Amount

Other Seals

| Type | At (ft) |
|---|---|
| | |

**Screen Type** Stainless Steel
Size OD : 4.00 in

| From (ft) | To (ft) | Slot Size (in) |
|---|---|---|
| | | |

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 Metric | 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 Imperial

| 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
ft from
ft from

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

Elevation ft
How Elevation Obtained: Not Obtained

## Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate 50.00 igpm
Recommended Pump Intake Depth (From TOC) 0.00 ft
Pump Installed
Depth ft
Type
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth ft
Gas
Depth ft
Well Disinfected Upon Completion
Geophysical Log Taken Electric
Remedial Action Taken
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 Imperial

| Test Date | Start Time | Static Water Level |
|---|---|---|
| 1985/05/10 | 12:00 AM | 168.00 ft |

**Method of Water Removal**

Type Pump
Removal Rate 44.00 igpm
Depth Withdrawn From 219.00 ft

If water removal period was < 2 hours, explain why

Depth to water level

| Pumping (ft) | Elapsed Time Minutes:Sec | Recovery (ft) |
|---|---|---|
| 168.89 | 0:00 | 179.52 |
| 177.00 | 0:30 | 171.58 |
| 177.82 | 1:00 | 170.99 |
| 178.05 | 1:30 | 170.80 |
| 178.14 | 2:00 | 170.70 |
| 178.31 | 3:00 | 170.57 |
| 178.41 | 4:00 | 170.43 |
| 178.51 | 5:00 | 170.37 |
| 178.60 | 6:00 | 170.30 |
| 178.67 | 7:00 | 170.24 |
| 178.70 | 8:00 | 170.17 |
| 178.77 | 9:00 | 170.11 |
| 178.80 | 10:00 | 170.07 |
| 178.87 | 12:00 | 169.98 |
| 178.90 | 15:00 | 169.88 |
| 179.00 | 18:00 | 169.78 |
| 179.00 | 20:00 | 169.78 |
| 178.96 | 25:00 | 169.71 |
| 179.03 | 30:00 | 169.65 |
| 179.03 | 35:00 | 169.61 |
| 179.10 | 40:00 | 169.58 |
| 179.13 | 50:00 | 169.52 |
| 179.13 | 60:00 | 169.48 |
| 179.13 | 75:00 | 169.42 |
| 179.13 | 90:00 | 169.38 |
| 179.16 | 105:00 | 169.38 |
| 179.13 | 120:00 | 169.35 |

## Water Diverted for Drilling

| Water Source | Amount Taken | Diversion Date & Time |
|---|---|---|
| | ig | |

## 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 Metric | Export to Excel

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

GOWN ID

## Well Identification and Location

Measurement in Imperial

| 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
ft from
ft from

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

Elevation ft
How Elevation Obtained: Not Obtained

## Drilling Information

**Method of Drilling**: Rotary

**Proposed Well Use**: Industrial

**Type of Work**: New Well

## Formation Log

Measurement in Imperial

| Depth from ground level (ft) | Water Bearing | Lithology Description |
|---|---|---|
| 10.00 | | Brown Till |
| 32.00 | | Gray Till |
| 65.00 | | Brown Shale |
| 80.00 | | Gray Shale |
| 117.00 | | Brownish Gray Sandstone |
| 140.00 | | Brown Sandstone & Shale Ledges |
| 153.00 | | Brown Shale |
| 160.00 | | Brownish Gray Sandstone |
| 171.00 | | Brown Sandstone |
| 173.00 | | Gray Shale |
| 208.00 | | Gray Sandstone |
| 215.00 | | Gray Shale |
| 219.00 | | Gray Sandstone |
| 220.00 | | Gray Shale |

## Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 6.00 igpm

| Test Date | Water Removal Rate (igpm) | Static Water Level (ft) |
|---|---|---|
| 1985/05/19 | 6.00 | 155.00 |

## Well Completion

Measurement in Imperial

| Total Depth Drilled | Finished Well Depth | Start Date | End Date |
|---|---|---|---|
| 220.00 ft | | 1985/05/17 | 1985/05/19 |

**Borehole**

| Diameter (in) | From (ft) | To (ft) |
|---|---|---|
| 0.00 | 0.00 | 220.00 |

**Surface Casing (if applicable)**
Steel
Size OD : 5.56 in
Wall Thickness : 0.188 in
Bottom at : 181.00 ft

**Well Casing/Liner**
Size OD : 0.00 in
Wall Thickness : 0.000 in
Top at : 0.00 ft
Bottom at : 0.00 ft

**Perforations**

| From (ft) | To (ft) | Diameter or Slot Width(in) | Slot Length (in) | Hole or Slot Interval(in) |
|---|---|---|---|---|
| | | | | |

Perforated by

**Annular Seal** Unknown
Placed from 0.00 ft to 179.00 ft
Amount

Other Seals

| Type | At (ft) |
|---|---|
| | |

**Screen Type** Stainless Steel
Size OD : 4.00 in

| From (ft) | To (ft) | Slot Size (in) |
|---|---|---|
| 181.00 | 202.00 | 0.025 |

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 Metric | 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.

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

GOWN ID

## Well Identification and Location

Measurement in Imperial

| 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
ft from
ft from

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

Elevation ft
How Elevation Obtained: Not Obtained

## Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate 6.00 igpm
Recommended Pump Intake Depth (From TOC) 0.00 ft
Pump Installed
Depth ft
Type
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth ft
Gas
Depth ft
Well Disinfected Upon Completion
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 Imperial

| Test Date | Start Time | Static Water Level |
|---|---|---|
| 1985/05/19 | 12:00 AM | 155.00 ft |

**Method of Water Removal**

Type Pump
Removal Rate 6.00 igpm
Depth Withdrawn From 213.00 ft

If water removal period was < 2 hours, explain why

Depth to water level

| Pumping (ft) | Elapsed Time Minutes:Sec | Recovery (ft) |
|---|---|---|
| 154.56 | 0:00 | 175.39 |
| 158.85 | 0:30 | 172.50 |
| 0.00 | 1:00 | 170.34 |
| 0.00 | 1:30 | 168.01 |
| 165.15 | 2:00 | 166.17 |
| 167.51 | 3:00 | 0.00 |
| 169.29 | 4:00 | 161.25 |
| 170.57 | 5:00 | 159.90 |
| 0.00 | 6:00 | 158.98 |
| 172.27 | 7:00 | 158.33 |
| 172.86 | 8:00 | 157.87 |
| 173.32 | 9:00 | 157.54 |
| 173.68 | 10:00 | 157.28 |
| 174.21 | 12:00 | 155.77 |
| 174.73 | 15:00 | 156.66 |
| 175.03 | 18:00 | 156.46 |
| 175.19 | 20:00 | 156.36 |
| 175.49 | 25:00 | 156.16 |
| 175.72 | 30:00 | 156.03 |
| 175.88 | 35:00 | 156.03 |
| 176.01 | 40:00 | 155.83 |
| 176.24 | 50:00 | 155.70 |
| 176.41 | 60:00 | 155.61 |
| 176.57 | 75:00 | 155.47 |
| 176.73 | 90:00 | 155.41 |
| 176.83 | 105:00 | 155.34 |
| 176.87 | 120:00 | 155.28 |

## Water Diverted for Drilling

| Water Source | Amount Taken | Diversion Date & Time |
|---|---|---|
| | ig | |

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

## Well Identification and Location

Measurement in Imperial

| 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
ft from
ft from

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

How Location Obtained
Map

Elevation ft

How Elevation Obtained
Not Obtained

## Drilling Information

**Method of Drilling**
Rotary

**Proposed Well Use**
Industrial

**Type of Work**
Reconditioned

## Formation Log

Measurement in Imperial

| Depth from ground level (ft) | Water Bearing | Lithology Description |
|---|---|---|
| 12.00 | | Brown Till |
| 37.00 | | Gray Till |
| 52.00 | | Gray Shale |
| 97.00 | | Brown Shale |
| 114.00 | | Brownish Gray Shale |
| 135.00 | | Gray Shale |
| 234.00 | | Gray Shaly Sandstone & Coal |
| 242.00 | | Gray Sandstone |
| 249.00 | | Brownish Green Shale |

## Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 12.00 igpm

| Test Date | Water Removal Rate (igpm) | Static Water Level (ft) |
|---|---|---|
| 1985/05/20 | 12.00 | 201.00 |

## Well Completion

Measurement in Imperial

| Total Depth Drilled | Finished Well Depth | Start Date | End Date |
|---|---|---|---|
| 249.00 ft | | 1985/05/19 | 1985/05/20 |

**Borehole**

| Diameter (in) | From (ft) | To (ft) |
|---|---|---|
| 0.00 | 0.00 | 249.00 |

**Surface Casing (if applicable)**
Steel
Size OD : 5.56 in
Wall Thickness : 0.188 in
Bottom at : 219.00 ft

**Well Casing/Liner**
Size OD : 0.00 in
Wall Thickness : 0.000 in
Top at : 0.00 ft
Bottom at : 0.00 ft

**Perforations**

| From (ft) | To (ft) | Diameter or Slot Width(in) | Slot Length (in) | Hole or Slot Interval(in) |
|---|---|---|---|---|
| | | | | |

Perforated by

**Annular Seal** Sand Pack
Placed from 0.00 ft to 217.00 ft
Amount

Other Seals

| Type | At (ft) |
|---|---|
| | |

**Screen Type** Stainless Steel
Size OD : 4.00 in

| From (ft) | To (ft) | Slot Size (in) |
|---|---|---|
| 219.00 | 240.00 | 0.020 |

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 Metric | 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.

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

GOWN ID

## Well Identification and Location

Measurement in Imperial

| 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
ft from
ft from

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

Elevation ft
How Elevation Obtained: Not Obtained

## Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate 12.00 igpm
Recommended Pump Intake Depth (From TOC) 0.00 ft
Pump Installed
Depth ft
Type
Make
H.P.
Model (Output Rating)

Did you Encounter Saline Water (>4000 ppm TDS)
Depth ft
Gas
Depth ft
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
Measurement in Imperial

| Test Date | Start Time | Static Water Level |
|---|---|---|
| 1985/05/20 | 12:00 AM | 201.00 ft |

**Method of Water Removal**
Type Pump
Removal Rate 12.00 igpm
Depth Withdrawn From 232.00 ft

If water removal period was < 2 hours, explain why

Depth to water level

| Pumping (ft) | Elapsed Time Minutes:Sec | Recovery (ft) |
|---|---|---|
| 201.04 | 0:00 | 220.27 |
| 206.98 | 0:30 | 215.58 |
| 0.00 | 1:00 | 212.92 |
| 210.79 | 1:30 | 210.95 |
| 211.97 | 2:00 | 209.64 |
| 213.61 | 3:00 | 207.84 |
| 214.73 | 4:00 | 206.74 |
| 215.48 | 5:00 | 206.10 |
| 216.14 | 6:00 | 205.54 |
| 216.56 | 7:00 | 205.11 |
| 216.92 | 8:00 | 204.79 |
| 217.25 | 9:00 | 204.52 |
| 217.51 | 10:00 | 204.33 |
| 218.01 | 12:00 | 203.96 |
| 218.56 | 15:00 | 203.60 |
| 218.96 | 18:00 | 203.31 |
| 219.16 | 20:00 | 203.18 |
| 219.55 | 25:00 | 202.91 |
| 219.88 | 30:00 | 202.72 |
| 220.04 | 35:00 | 202.52 |
| 220.17 | 40:00 | 202.46 |
| 220.43 | 50:00 | 202.29 |
| 220.60 | 60:00 | 202.19 |
| 220.73 | 75:00 | 202.13 |
| 220.80 | 90:00 | 202.06 |
| 220.83 | 105:00 | 202.03 |
| 220.83 | 120:00 | 202.00 |

## Water Diverted for Drilling

| Water Source | Amount Taken | Diversion Date & Time |
|---|---|---|
| | ig | |

## 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 Metric | 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 Imperial

| 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
ft from
ft from

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

Elevation ft
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 Imperial

| Depth from ground level (ft) | Water Bearing | Lithology Description |
|---|---|---|
| 24.00 | | Brown Rocky Clay |
| 40.00 | | Green Shale |
| 102.00 | | Brown Shale |
| 125.00 | | Green Shale |
| 145.00 | | Brown Sandstone |
| 150.00 | | Gray Sandstone |
| 208.00 | | Brown Sandstone |
| 216.00 | Yes | Gray Sandstone |
| 244.00 | Yes | Gray Mixed Shale & Sandstone |
| 250.00 | | Green Shale |

## Yield Test Summary

Measurement in Imperial

Recommended Pump Rate 15.00 igpm

| Test Date | Water Removal Rate (igpm) | Static Water Level (ft) |
|---|---|---|
| 2022/04/13 | 15.00 | 181.10 |

## Well Completion

Measurement in Imperial

| Total Depth Drilled | Finished Well Depth | Start Date | End Date |
|---|---|---|---|
| 250.00 ft | 246.00 ft | 2022/04/11 | 2022/04/12 |

**Borehole**

| Diameter (in) | From (ft) | To (ft) |
|---|---|---|
| 8.00 | 0.00 | 250.00 |

**Surface Casing (if applicable)**
Size OD : in
Wall Thickness : in
Bottom at : ft

**Well Casing/Liner**
Plastic
Size OD : 6.00 in
Wall Thickness : 0.390 in
Top at : 0.00 ft
Bottom at : 201.00 ft

**Perforations**

| From (ft) | To (ft) | Diameter or Slot Width(in) | Slot Length (in) | Hole or Slot Interval(in) |
|---|---|---|---|---|
| | | | | |

Perforated by

**Annular Seal** Bentonite Granular
Placed from 0.00 ft to 195.00 ft
Amount 60.00 Bags

Other Seals

| Type | At (ft) |
|---|---|
| | |

**Screen Type** Stainless Steel
Size OD : 5.00 in

| From (ft) | To (ft) | Slot Size (in) |
|---|---|---|
| 201.00 | 246.00 | 0.010 |

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 Metric | 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.

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 Imperial

| 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
ft from
ft from

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

Elevation ft
How Elevation Obtained: Not Obtained

## Additional Information

Measurement in Imperial

Distance From Top of Casing to Ground Level: 20.00 in
Is Artesian Flow
Rate igpm
Is Flow Control Installed
Describe

Recommended Pump Rate: 15.00 igpm
Recommended Pump Intake Depth (From TOC): 216.00 ft
Pump Installed: Yes
Type: Submersible
Depth: 216.00 ft
Make: FRANKLIN
H.P.: Other
Model (Output Rating): 2HP 15 GPM

Did you Encounter Saline Water (>4000 ppm TDS)
Depth ft
Gas
Depth ft
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 Imperial

Test Date: 2022/04/13
Start Time: 11:00 AM
Static Water Level: 181.10 ft

**Method of Water Removal**
Type: Pump
Removal Rate: 15.00 igpm
Depth Withdrawn From: 216.00 ft

If water removal period was < 2 hours, explain why

Depth to water level

| Pumping (ft) | Elapsed Time Minutes:Sec | Recovery (ft) |
|---|---|---|
| 181.10 | 0:00 | 195.00 |
| 187.00 | 1:00 | 186.20 |
| 191.00 | 2:00 | 183.40 |
| 194.30 | 3:00 | 182.50 |
| 195.00 | 4:00 | 182.20 |
| 195.00 | 5:00 | 181.90 |
| | 6:00 | 181.70 |
| | 7:00 | 181.50 |
| | 8:00 | 181.40 |
| | 9:00 | 181.30 |
| | 10:00 | 181.30 |
| | 12:00 | 181.20 |
| | 14:00 | 181.20 |
| | 16:00 | 181.10 |
| 195.00 | 120:00 | 181.10 |

## Water Diverted for Drilling

| Water Source | Amount Taken | | Diversion Date & Time |
|---|---|---|---|
| SHOP WELL | 1200.00 | ig | 2022/04/06 10:00 AM |

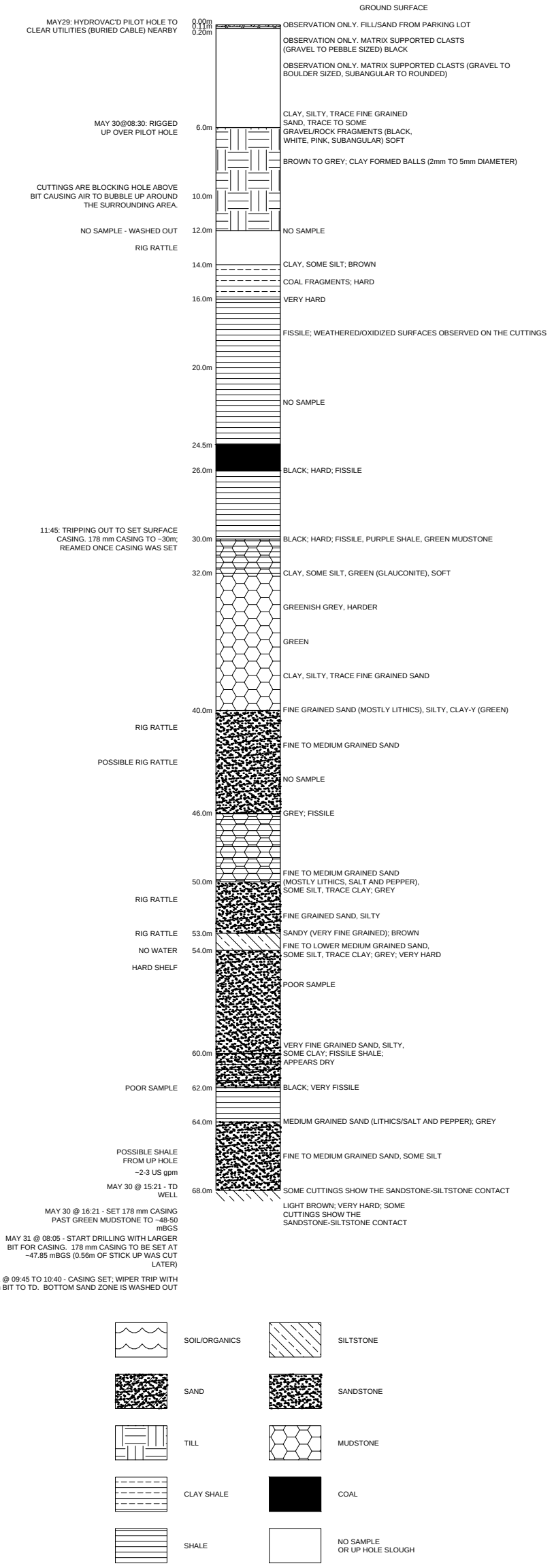
## Contractor Certification

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

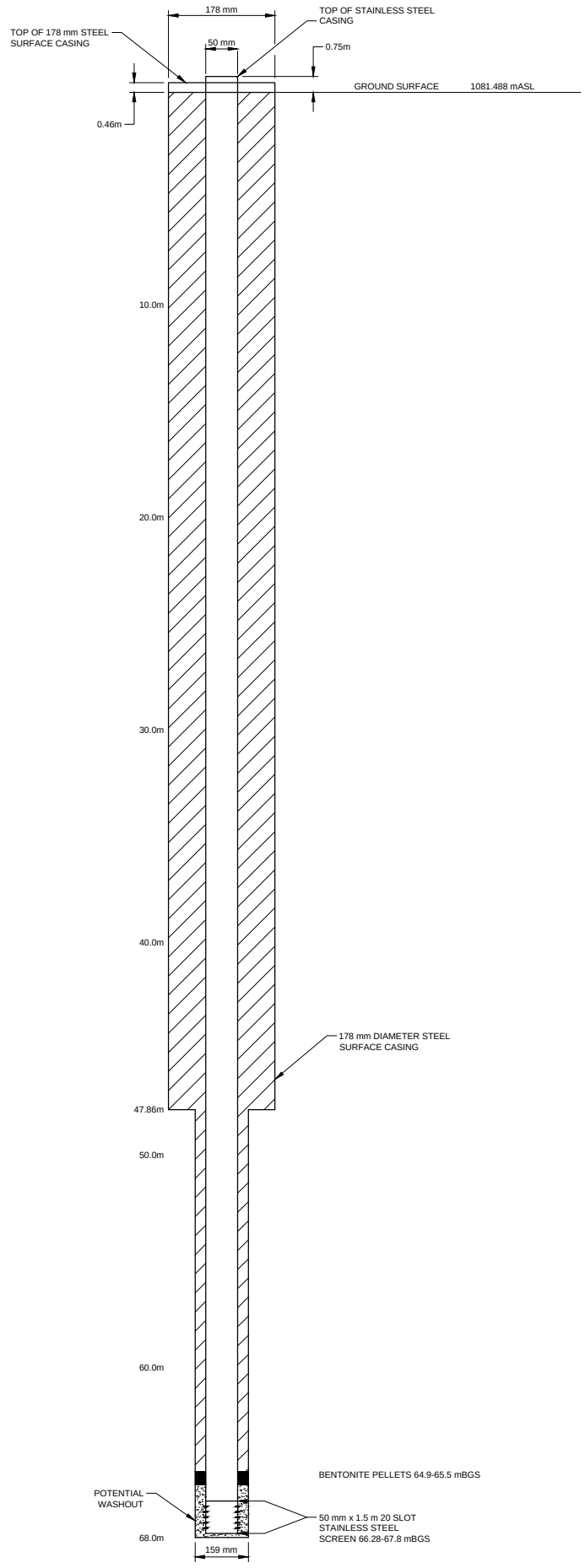
# Appendix C

## Borehole Logs

## SOIL DESCRIPTION




## WELL CONSTRUCTION DETAILS




0 1.5 3 4.5 m SCALE 1:150

NAD83 UTM Zone 11: 6071291.690, 614684.690

**Issue Status: FINAL**

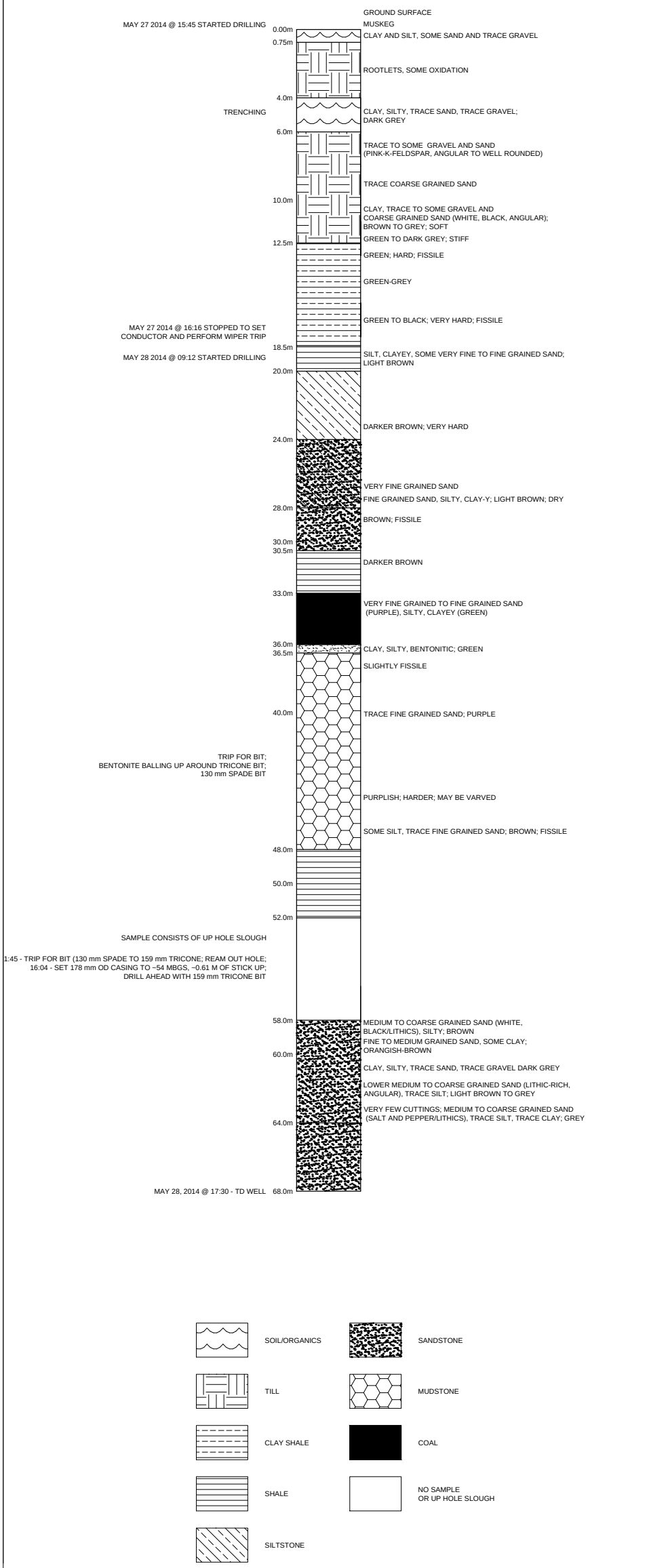
**Swan HillsTreatment Centre Well Maintenance**
**Groundwater Monitoring**
SENA Waste Services Inc. - Swan Hills, Alberta
Project No.: 60320044 Date: 2015/06/24

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

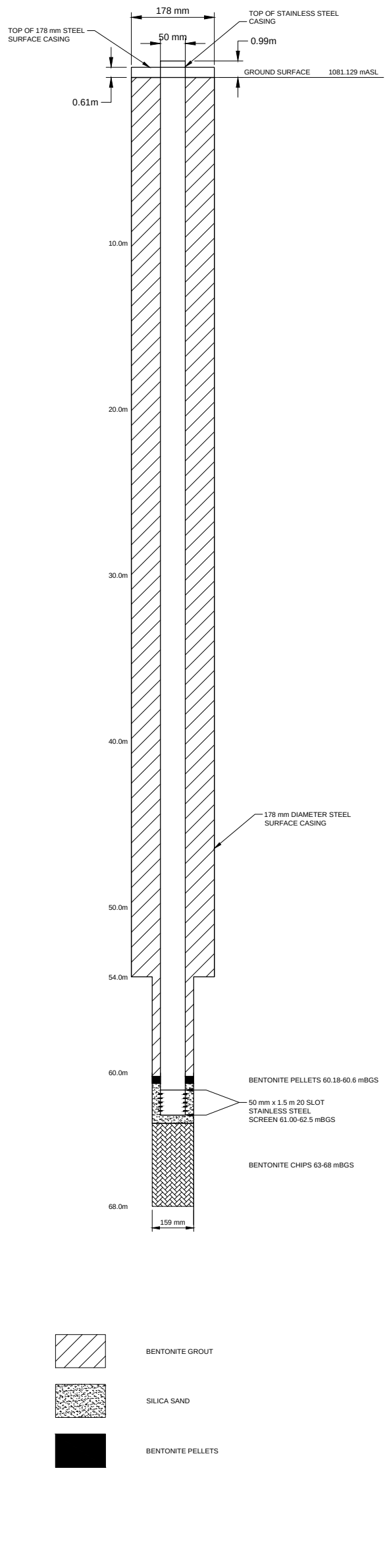
AECOM

**Borehole Log**

## SOIL DESCRIPTION




## WELL CONSTRUCTION DETAILS




m SCALE 1:150
0 1.5 3 4.5

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<br>- hit rocks<br>- 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 |
| | | CI | | CLAY - some silt, grey, damp, stiff, medium plasticity, some oxidation | | | | |
| 3 | | | | | | | | 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) | 06_R_IN | USC | SOIL SYMBOL | SOIL DESCRIPTION | SAMPLE TYPE | SAMPLE # | COMMENTS | ELEVATION (m) |
|---|---|---|---|---|---|---|---|---|
| 0 | | OB | | TOPSOIL - black | | | | 1080 |
| | | | | TILL - clay, silty, trace sand, brown, damp, organic matter (roots) | | | | |
| 1 | | SICL | | - sandy lenses (very thin), light brown, oxidation around roots | | | | 1079 |
| | | | | TILL - trace coarse sand, trace gravel >2mm <5mm diameter, moist | | | | |
| 2 | | | | | | | | 1078 |
| 3 | | | | - trace gravel sub angular to sub rounded (~1cm diameter), oxidized very fine sand pockets (~5mm diameter), trace coal<br>- water on outside of auger | | | | 1077 |
| | | 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) | | | | |
| 4 | | | | | | | | 1076 |
| 5 | | | | - some gravel 0.5-1.5 cm, elongated diameter sub angular to sub rounded | | | | 1075 |
| 6 | | | | - trace oxidized silty pockets, trace green glauconitic pockets (~2mm-5mm) | | | | 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<br>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:

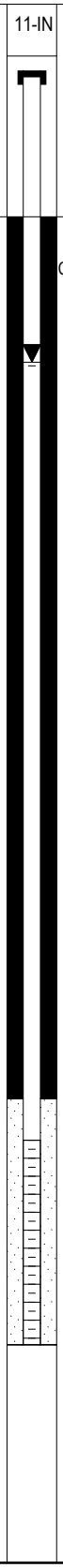
AECOM

| | |
|---|---|
| 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

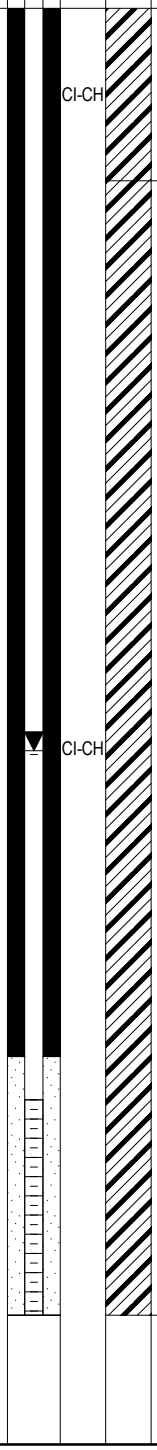
| | |
|---|---|
| LOGGED BY: BB | COMPLETION DEPTH: 8.38 m |
| REVIEWED BY: | COMPLETION DATE: 5/27/2014 |
| PROJECT ENGINEER: | Page 1 of 1 |

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 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<br>- 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<br>- trace gravel, sandy medium grained<br>- 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 | | | | | | | |

AECOM

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

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

# Appendix D

## Tables

**Table 1.0**
**VEOLIA, Swan Hills Treatment Centre**
**2023 Purging Summary**

| Monitoring Location | Monitoring Well | Date | Approx. Well Volume (L) | Approx. 3 Well Volumes (L) | Approx. Purge Volume (L) | Comments |
|---|---|---|---|---|---|---|
| MW-01A | 01A-SH | 13-Sep-2023 | 6 | 18 | 5 | Purged to dry; Colour: brown/yellow tint |
| | 01A-IN | 13-Sep-2023 | 15.7 | 47 | 20 | Purged to dry; Colour: brown tint |
| | 01A-SS | 13-Sep-2023 | - | - | - | Dry. |
| MW-03 | 03-SH | 12-Sep-2023 | 4 | 11 | 11 | Purged to dry; Colour: clear |
| | 03-IN | 12-Sep-2023 | 17 | 50 | 19 | Purged to dry; Colour: clear |
| MW-04 | 04-SH | 13-Sep-2023 | 2 | 7 | 10 | Colour: clear |
| | 04-IN | 13-Sep-2023 | 5 | 15 | 15 | Colour: clear |
| | 04-SS | 13-Sep-2023 | 23.7 | 71.1 | 72 | Colour: clear |
| MW-05 | 05-SH | 13-Sep-2023 | 2.2 | 6.7 | 7 | Purged to dry; Colour: clear |
| | 05-IN | 13-Sep-2023 | 8.1 | 24.3 | 13 | Purged to dry; Colour: clear |
| | 05-SS | 13-Sep-2023 | 36 | 108 | 60 | Colour: clear |
| MW-06 | 06-SH | 13-Sep-2023 | 4.7 | 14 | 11 | Colour: cloudy |
| | 06(R)IN | 13-Sep-2023 | 8.6 | 25.8 | 20 | Colour: cloudy, grey/brown Cut down frost heaved piezometer |
| MW-07 | 07-SH | 13-Sep-2023 | 8 | 24 | 20 | Purged to dry; Colour: clear |
| | 07-IN | 13-Sep-2023 | 16.8 | 50 | 31 | Purged to dry; Colour: clear |
| | 07(R)SS | 13-Sep-2023 | 20 | 60 | 44 | Colour: clear |
| MW-08 | 08-SH | 12-Sep-2023 | 6 | 18 | 8 | Purged to dry; Colour: clear. Well is frost heaved. |
| | 08-IN | 12-Sep-2023 | 12 | 36 | 19 | Purged to dry; Colour: clear |
| | 08-SS | 12-Sep-2023 | - | - | - | Well broken/historically dry |
| MW-11 | 11-SH | 12-Sep-2023 | 5.6 | 17 | 20 | Colour: clear |
| | 11-IN | 13-Sep-2023 | 14 | 43 | 18 | Purged to dry; Colour: clear |
| | 11-SS | 12-Sep-2023 | - | - | - | Insufficient water |
| MW-12 | 12-SH | 12-Sep-2023 | 5.6 | 16.7 | 15 | Colour: clear |
| | 12-IN | 12-Sep-2023 | 13.5 | 40.6 | 18 | Colour: clear |
| | 12-SS | 12-Sep-2023 | - | - | - | Historically dry |
| MW-13 | 13-SH | 13-Sep-2023 | 4.6 | 13 | 13 | *Pneumatic pump switched to piezometer in 2023 |
| | 13-IN | 13-Sep-2023 | 16 | 48 | 60 | Colour: clear |
| | 13(R)SS | 13-Sep-2023 | 21.3 | 63.8 | 65 | Colour: clear |
| MW-14 | 14-SH | 13-Sep-2022 | 3 | 8 | 5 | Purged to dry; Colour: slightly yellow. Well is frost heaved. |
| | 14-IN | 13-Sep-2022 | - | - | - | Historically dry |
| | 14-SS | 13-Sep-2022 | - | - | - | Historically dry |
| MW-15 | 15-SH | 13-Sep-2023 | 7.8 | 23.3 | 20 | Purged to dry; Colour: clear. |
| | 15-IN | 13-Sep-2023 | 12.5 | 37.4 | 32 | Colour: clear |
| | 15(2R)SS | 13-Sep-2023 | 10.5 | 31 | 23 | Colour: clear |
| MW-16 | 16-SH | 12-Sep-2023 | 8.3 | 25 | 18 | Colour: clear |
| | 16-IN | 12-Sep-2023 | 16.9 | 50 | 19 | Purged to dry; Colour: clear |
| MW-17 | 17-SH | 13-Sep-2023 | 5.8 | 17 | 18 | Colour: clear. |
| | 17-IN | 13-Sep-2023 | 13.5 | 40.4 | 32 | Colour: clear. Cut frost heaved piezometer, new lock. |

**Notes:**
1: NR = Value not recorded

**Table 2.0**
**VEOLIA, Swan Hills Treatment Centre**
**2023 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] | | |

**Notes:**
1: Specific parameters outlined in Alberta Environment Approval No. 1744-03-00
2: Tested on select shallow monitoring wells

**Table 3.1**
**VEOLIA, Swan Hills Treatment Centre**
**2023 Groundwater Levels and Elevations**

| Monitoring Location | Ground Elevation (Piezometer) | Ground Elevation (Well) | 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) | |
| 01A-SH | 1,086.250 | 1,086.236 | 1.00 | NM | 13-Sep-2023 | 3.17 | 2.17 | N/A | NM | 1,084.08 | N/A | *Brown/yellow tint, sulphur odour* |
| 01A-IN | 1,086.262 | 1,086.146 | 1.03 | NM | 13-Sep-2023 | 4.31 | 3.28 | N/A | NM | 1,082.98 | N/A | *Brown tint* |
| 01A-SS | N/A | 1,086.256 | N/A | 0.83* | 13-Sep-2023 | N/A | N/A | Dry | Dry | N/A | Dry | *Dry* |
| 03-SH | 1,079.444 | 1,079.457 | 0.84 | NM | 12-Sep-2023 | 1.75 | 0.92 | N/A | NM | 1,078.53 | N/A | *Clear* |
| 03-IN | 1,079.547 | 1,079.609 | 0.89 | NM | 12-Sep-2023 | 2.11 | 1.22 | N/A | NM | 1,078.33 | N/A | *Clear* |
| 04-SH | 1,082.563 | 1,082.520 | 0.64 | NM | 13-Sep-2023 | 2.08 | 1.44 | N/A | NM | 1,081.13 | N/A | *Clear* |
| 04-IN | 1,082.807 | 1,082.457 | NM | 0.63 | 13-Sep-2023 | N/A | N/A | 7.21 | 6.58 | N/A | 1,075.88 | *Clear* |
| 04-SS | N/A | 1,082.849 | N/A | 1.11 | 13-Sep-2023 | N/A | N/A | 60.59 | 59.48 | N/A | 1,023.37 | *Clear* |
| 05-SH | 1,079.856 | 1,079.580 | 0.93 | NM | 13-Sep-2023 | 2.33 | 1.40 | N/A | NM | 1,078.45 | N/A | *Clear* |
| 05-IN | 1,079.755 | 1,079.808 | NM | 1.31 | 13-Sep-2023 | N/A | N/A | 2.74 | 1.43 | N/A | 1,078.38 | *Clear* |
| 05-SS | N/A | 1,085.120 | N/A | 0.90 | 13-Sep-2023 | N/A | N/A | 62.62 | 61.72 | N/A | 1,023.40 | *Clear* |
| 06-SH | 1,080.289 | 1,080.211 | 1.02 | NM | 13-Sep-2023 | 1.83 | 0.81 | N/A | NM | 1,079.48 | N/A | *Cloudy* |
| 06(R)IN | 1,080.570 | 1,080.468 | 1.09 | NM | 13-Sep-2023 | 2.05 | 0.96 | N/A | NM | 1,079.61 | N/A | *Cloudy, grey/brown* |
| 07-SH | 1,079.670 | 1,079.512 | 0.58 | NM | 13-Sep-2023 | 1.22 | 0.64 | N/A | NM | 1,079.03 | N/A | *Clear* |
| 07-IN | 1,079.778 | 1,079.334 | 0.85 | NM | 13-Sep-2023 | 1.48 | 0.63 | N/A | NM | 1,079.15 | N/A | *Clear* |
| 07(R)SS | N/A | 1,081.488 | N/A | 0.70 | 13-Sep-2023 | N/A | N/A | 58.72 | 58.02 | N/A | 1,023.47 | *Clear* |
| 08-SH | 1,084.795 | 1,084.856 | NM | 2.02 | 12-Sep-2023 | N/A | N/A | 2.84 | 0.83 | N/A | 1,084.03 | *Clear* |
| 08-IN | 1,084.798 | 1,084.890 | 1.30 | NM | 12-Sep-2023 | 2.00 | 0.70 | N/A | NM | 1,084.10 | N/A | *Clear* |
| 08-SS | N/A | 1,084.181 | N/A | NM | 12-Sep-2023 | N/A | N/A | Dry | Dry | N/A | Dry | *Well damaged, dry* |
| 11-SH | 1,082.708 | 1,082.685 | NM | 1.02 | 12-Sep-2023 | N/A | N/A | 2.23 | 1.22 | N/A | 1,081.49 | *Clear* |
| 11-IN | 1,082.705 | 1,082.771 | 1.14 | NM | 13-Sep-2023 | 2.47 | 1.32 | N/A | NM | 1,081.38 | N/A | *Clear* |
| 11-SS | N/A | 1,082.557 | N/A | 0.65 | 12-Sep-2023 | N/A | N/A | 60.52 | 59.87 | N/A | 1,022.69 | *No water retrieved for sample* |
| 12-SH | 1,080.384 | 1,080.272 | 0.70 | NM | 12-Sep-2023 | 1.43 | 0.73 | N/A | NM | 1,079.65 | N/A | *Clear* |
| 12-IN | 1,080.362 | 1,080.184 | 0.92 | NM | 12-Sep-2023 | 1.61 | 0.69 | N/A | NM | 1,079.67 | N/A | *Clear* |
| 12-SS | N/A | 1,080.053 | N/A | 1.03* | 12-Sep-2023 | N/A | N/A | Dry | Dry | N/A | Dry | *Dry* |
| 13-SH | 1,079.378 | 1,079.048 | 1.00 | NM | 13-Sep-2023 | 1.78 | 0.78 | N/A | N/A | 1,078.60 | N/A | *Pneumatic pump relocated to piezometer, sample taken from piezometer in 2023* |
| 13-IN | 1,079.338 | 1,079.077 | 0.82 | NM | 13-Sep-2023 | 2.30 | 1.48 | N/A | N/A | 1,077.86 | N/A | *Clear* |
| 13(R)SS | N/A | 1,080.004 | N/A | 1.14 | 13-Sep-2023 | N/A | N/A | 58.04 | 56.90 | N/A | 1,023.10 | *No water retrieved for sample* |
| 14-SH | 1,086.513 | 1,086.515 | 0.28 | NM | 13-Sep-2022 | 2.05 | 1.77 | N/A | NM | 1,084.74 | N/A | *Yellowish* |
| 14-IN | 1,086.539 | 1,086.529 | NM | NM | 13-Sep-2022 | Dry | Dry | N/A | NM | Dry | N/A | *Dry* |
| 14-SS | N/A | 1,086.566 | N/A | NM | 13-Sep-2022 | N/A | N/A | Dry | Dry | N/A | Dry | *Dry* |
| 15-SH | NM | 1,081.264 | NM | 1.14 | 13-Sep-2023 | N/A | N/A | 2.47 | 1.33 | N/A | 1,079.93 | *Clear* |
| 15-IN | 1,081.298 | 1,081.293 | 0.92 | NM | 13-Sep-2023 | 3.94 | 3.02 | N/A | NM | 1,078.28 | N/A | *Clear* |
| 15(2R)SS | N/A | 1,081.129 | N/A | 1.04 | 13-Sep-2023 | N/A | N/A | 58.77 | 57.73 | N/A | 1,023.40 | *No water retrieved for sample* |
| 16-SH | 1,079.888 | 1,079.900 | 0.71 | NM | 12-Sep-2023 | 1.86 | 1.15 | N/A | N/A | 1,078.74 | N/A | *Clear* |
| 16-IN | 1,079.850 | 1,079.790 | 0.79 | NM | 12-Sep-2023 | 1.97 | 1.18 | N/A | N/A | 1,078.67 | N/A | *No water retrieved for sample* |
| 17-SH | 1,079.309 | 1,079.324 | 1.10 | NM | 13-Sep-2023 | 2.02 | 0.92 | N/A | NM | 1,078.39 | N/A | *Clear* |
| 17-IN | 1,079.382 | 1,079.251 | 0.89 | NM | 13-Sep-2023 | 2.20 | 1.31 | N/A | NM | 1,078.07 | N/A | *Clear* |

**NOTES:**

| | |
|---|---|
| NM | Not Measured |
| N/A | Not Applicable |
| mBGS | metres Below Ground Surface |
| mTOC | metres below Top of Casing |
| masl | metres above sea level |
| * | 12-SS: Stick-up measurement used is from 2014 measurement |

**Table 3.2**
**VEOLIA, Swan Hills Treatment Centre**
**2023 Groundwater Monitoring Analytical Results: Field Parameters**

| Monitoring Well | Date | Electrical Conductivity | pH | Temperature | NTU | Sample Comment |
|---|---|---|---|---|---|---|
| | (dd-mmm-yyyy) | (µS/cm) | | (°C) | (NTU) | |
| 01A-SH | 28-Sep-2023 | 189 | 5.48 | 7.40 | 8.90 | Brown/yellow tint before & after filtering, sulphur odour |
| 01A-IN | 28-Sep-2023 | 749 | 6.86 | 8.10 | 7.90 | Brown tint |
| 01A-SS | --- | --- | --- | --- | --- | Dry |
| 03-SH | 29-Sep-2023 | 893 | 7.27 | 8.60 | 3.45 | Clear |
| 03-IN | 29-Sep-2023 | 806 | 7.43 | 7.90 | 2.08 | Clear |
| 04-SH | 29-Sep-2023 | 736 | 7.15 | 6.70 | 0.58 | Clear |
| 04-IN | 29-Sep-2023 | 697 | 7.22 | 5.70 | 4.18 | Clear |
| 04-SS | --- | --- | --- | --- | --- | Dry |
| 05-SH | 28-Sep-2023 | 930 | 7.12 | 8.60 | 3.20 | Clear |
| 05-IN | 28-Sep-2023 | 1183 | 7.02 | 7.90 | 5.10 | Clear |
| 05-SS | 29-Sep-2023 | 443 | 7.56 | 5.70 | 24.3 | Clear |
| 06-SH | 29-Sep-2023 | 863 | 7.01 | 8.00 | 75.5 | Slightly cloudy |
| 06(R)IN | 29-Sep-2023 | 883 | 7.09 | 7.70 | 32.68 | Cloudy grey/brown |
| 07-SH | 29-Sep-2023 | 1439 | 7.02 | 8.40 | 1.42 | Clear |
| 07-IN | 29-Sep-2023 | 720 | 7.25 | 7.60 | 3.75 | Clear |
| 07(R)SS | 29-Sep-2023 | 743 | 7.51 | 6.90 | 4.21 | Clear |
| 08-SH | 27-Sep-2023 | 805 | 6.45 | 12.2 | 7.50 | Clear |
| 08-IN | 27-Sep-2023 | 793 | 6.96 | 11.00 | 7.00 | Clear |
| 08-SS | --- | --- | --- | --- | --- | Damaged/dry |
| 11-SH | 28-Sep-2023 | 1038 | 6.97 | 8.20 | 21.48 | Clear |
| 11-IN | 28-Sep-2023 | 1081 | 6.80 | 8.00 | 20.82 | Clear |
| 11-SS | 28-Sep-2023 | --- | --- | --- | --- | No water retrieved for sample |
| 12-SH | 28-Sep-2023 | 660 | 7.40 | 10.10 | 4.10 | Clear |
| 12-IN | 28-Sep-2023 | 685 | 7.42 | 10.10 | 11.21 | Clear |
| 12-SS | --- | --- | --- | --- | --- | Dry |
| 13-SH | 27-Sep-2023 | 937 | 7.13 | 9.80 | 5.80 | Pneumatic pump relocated to piezometer, sample taken from piezometer in 2023 |
| 13-IN | 27-Sep-2023 | 715 | 7.28 | 7.80 | 9.65 | Clear |
| 13(R)SS | 29-Sep-2023 | --- | --- | --- | --- | No water retrieved for sample |
| 14-SH | 27-Sep-2023 | 898 | 6.87 | 11.30 | 4.60 | Slightly yellow |
| 14-IN | --- | --- | --- | --- | --- | Dry |
| 14-SS | --- | --- | --- | --- | --- | Dry |
| 15-SH | 28-Sep-2023 | 715 | 7.39 | 10.30 | 6.90 | Clear |
| 15-IN | 28-Sep-2023 | 762 | 7.31 | 10.70 | 6.17 | Clear |
| 15(2R)SS | 29-Sep-2023 | --- | --- | --- | --- | No water retrieved for sample |
| 16-SH | 28-Sep-2023 | 750 | 7.15 | 8.70 | 3.25 | Clear |
| 16-IN | 28-Sep-2023 | --- | --- | --- | --- | No water retrieved for sample |
| 17-SH | 28-Sep-2023 | 671 | 7.81 | 10.70 | 5.40 | Clear |
| 17-IN | 28-Sep-2023 | 777 | 7.20 | 7.70 | 5.80 | Clear |
| 89-3 | 29-Sep-2023 | 378 | 7.24 | 17.70 | 47.3 | Clear and sulphur odour |

**Table 3.3**
**VEOLIA, Swan Hills Treatment Centre**
**2023 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 | | | | 0.10 | 2.0 | 0.10 | 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 | 0.050 |
| 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 | --- |
| 01A-SH | 28-Sep-23 | EO2308922-001 | 1A-SH | **5.48** | 167 | **6.24** | 62.6 | 65.0 | 8.58 | 0.66 | **1.58** | **0.084** | 178 | 19.1 | 3.62 | 0.64 | 11.7 | 79.3 | <1.0 | <1.0 | <0.020 | <0.010 | 0.047 | <0.0500 |
| 01A-IN | 28-Sep-23 | EO2308922-002 | 1A-IN | 6.86 | 803 | 8.23 | 272 | 468 | 1.47 | <0.30 | **0.50** | **0.250** | 483 | 76 | 19.8 | 2.86 | 45.1 | 571 | <1.0 | <1.0 | 0.027 | <0.010 | 0.173 | 0.173 |
| 03-SH | 29-Sep-23 | EO2308922-003 | 3-SH | 7.37 | 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 |
| 03-IN | 29-Sep-23 | EO2308922-004 | 3-IN | 7.43 | 815 | 8.23 | 440 | 397 | 1.45 | 88.0 | <0.010 | 0.0013 | **540** | 121 | 33.4 | 3.16 | 26.0 | 485 | <1.0 | <1.0 | 0.210 | <0.010 | 0.093 | 0.0930 |
| 04-SH | 29-Sep-23 | EO2308922-005 | 4-SH | 7.15 | 684 | 8.24 | 411 | 401 | <0.50 | 9.11 | <0.010 | 0.016 | 433 | 113 | 31.2 | 2.82 | 10.9 | 489 | <1.0 | <1.0 | 0.205 | <0.010 | 0.022 | <0.0500 |
| 04-IN | 29-Sep-23 | EO2308922-006 | 4-IN | 7.22 | 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 |
| 04-SS | 29-Sep-23 | EO2308922-007 | 4-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 |
| 05-SH | 28-Sep-23 | EO2308922-008 | 5-SH | 7.12 | 934 | 8.11 | 626 | 418 | 2.72 | 119 | <0.010 | 0.019 | **640** | 177 | 44.6 | 1.23 | 9.2 | 509 | <1.0 | <1.0 | 0.192 | 0.01 | 0.13 | 0.137 |
| 05-IN | 28-Sep-23 | EO2308922-010 | 5-IN | 7.02 | 1040 | 8.16 | 543 | 484 | 1.54 | 132 | <0.010 | **0.073** | **705** | 155 | 37.8 | 3.44 | 54.2 | 591 | <1.0 | <1.0 | 0.157 | <0.010 | 0.142 | 0.142 |
| 05-SS | 28-Sep-23 | EO2308922-011 | 5-SS | 7.56 | 447 | 8.45 | 165 | 227 | <0.50 | 24.2 | 0.245 | **0.390** | 290 | 46.9 | 11.7 | 4.11 | 28.5 | 265 | 5.9 | <1.0 | 0.108 | <0.010 | 0.096 | 0.096 |
| 06-SH | 29-Sep-23 | EO2308922-013 | 6-SH | 7.01 | 732 | 8.00 | 508 | 430 | 0.81 | 1.91 | <0.010 | **0.692** | 481 | 138 | 39.7 | 1.97 | 7.4 | 525 | <1.0 | <1.0 | 0.188 | <0.010 | <0.020 | <0.0500 |
| 06(R)IN | 29-Sep-23 | EO2308922-014 | 6-IN | 7.09 | 750 | 8.01 | 517 | 431 | 1.08 | 4.13 | <0.010 | **0.666** | 492 | 145 | 37.7 | 2.32 | 8.5 | 526 | <1.0 | <1.0 | 0.170 | <0.010 | <0.020 | <0.0500 |
| 07-SH | 29-Sep-23 | EO2308922-015 | 7-SH | 7.02 | 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 |
| 07-IN | 28-Sep-23 | EO2308922-017 | 7-IN | 7.25 | 677 | 8.23 | 354 | 338 | 0.84 | 52.1 | <0.010 | **0.795** | 443 | 105 | 22.4 | 5.40 | 28.1 | 413 | <1.0 | <1.0 | 0.156 | <0.010 | 0.052 | 0.052 |
| 07(R)SS | 29-Sep-23 | EO2308922-018 | 7-SS | 7.51 | 693 | 8.46 | 304 | 343 | <0.50 | 40.0 | <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 |
| 08-SH | 27-Sep-23 | EO2308922-019 | 8-SH | **6.45** | 683 | 8.25 | 304 | 342 | 1.25 | 42.8 | <0.010 | 0.011 | 421 | 85.6 | 21.9 | 2.36 | 43.0 | 418 | <1.0 | <1.0 | 0.230 | <0.010 | 0.021 | <0.0500 |
| 08-IN | 27-Sep-23 | EO2308922-020 | 8-IN | 6.98 | 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-SH | 28-Sep-23 | EO2308922-021 | 11-SH | 6.97 | 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 |
| 11-IN | 28-Sep-23 | EO2308922-023 | 11-IN | 6.80 | 1080 | 8.23 | 513 | 441 | <0.50 | 181 | 0.090 | **0.634** | **709** | 154 | 31.1 | 2.54 | 45.0 | 538 | <1.0 | <1.0 | 0.164 | <0.010 | 0.082 | 0.082 |
| 12-SH | 28-Sep-23 | EO2308922-024 | 12-SH | 7.40 | 614 | 8.27 | 339 | 382 | <0.50 | 2.76 | <0.010 | **0.079** | 393 | 93.9 | 25.4 | 2.10 | 11.6 | 466 | <1.0 | <1.0 | 0.350 | <0.010 | 0.099 | 0.099 |
| 12-IN | 28-Sep-23 | EO2308922-026 | 12-IN | 7.42 | 680 | 8.11 | 283 | 353 | <0.50 | 63.0 | <0.010 | **0.687** | 446 | 82.1 | 19.0 | 3.85 | 40.7 | 430 | <1.0 | <1.0 | 0.226 | <0.010 | 0.099 | 0.099 |
| 13-SH[5] | 28-Sep-23 | EO2308922-027 | 13-SH | 7.13 | 950 | 7.89 | 537 | 509 | <0.50 | 81.4 | <0.010 | **0.238** | **626** | 153 | 37.6 | 2.00 | 13.7 | 621 | <1.0 | <1.0 | 0.136 | <0.010 | <0.020 | <0.0500 |
| 13-IN | 28-Sep-23 | EO2308922-028 | 13-IN | 7.28 | 705 | 8.17 | 318 | 324 | <0.50 | 86.2 | 0.016 | 0.010 | 449 | 94.9 | 19.8 | 3.86 | 33.8 | 396 | <1.0 | <1.0 | 0.167 | <0.010 | <0.020 | <0.0500 |
| 13(R)SS[6] | - | - | 13-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14-SH | 27-Sep-23 | EO2308922-029 | 14-SH | 6.87 | 856 | 8.12 | 308 | 459 | 2.49 | 26.3 | <0.010 | 0.0067 | 444 | 82 | 25.3 | 1.90 | 13.1 | 560 | <1.0 | <1.0 | 0.176 | <0.010 | 0.104 | 0.104 |
| 15-SH | 28-Sep-23 | EO2308922-030 | 15-SH | 7.39 | 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 |
| 15-IN | 28-Sep-23 | EO2308922-031 | 15-IN | 7.31 | 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 |
| 15(2R)SS[6] | - | - | 15-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16-SH | 28-Sep-23 | EO2308922-032 | 16-SH | 7.15 | 734 | 8.21 | 381 | 390 | 0.78 | 35.8 | 0.01 | 0.00123 | 454 | 106 | 28.3 | 3.60 | 21.4 | 475 | <1.0 | <1.0 | 0.217 | <0.010 | 0.186 | 0.186 |
| 16-IN[6] | - | - | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17-SH | 28-Sep-23 | EO2308922-033 | 17-SH | 7.81 | 634 | 8.27 | 320 | 328 | 9.42 | 26.8 | <0.010 | 0.00052 | 395 | 91.0 | 22.5 | 1.90 | 19.7 | 400 | <1.0 | <1.0 | 0.255 | <0.010 | <0.020 | <0.0500 |
| 17-IN | 28-Sep-23 | EO2308922-034 | 17-IN | 7.20 | 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 |
| 89-3 | 29-Sep-23 | EO2308922-035 | 89-3 | 7.24 | 372 | 8.25 | 171 | 198 | <0.50 | 17.0 | <0.010 | **1.080** | 247 | 45.8 | 13.7 | 2.85 | 12.5 | 242 | <1.0 | <1.0 | 0.163 | <0.010 | <0.020 | <0.0500 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Trip Blank | 29-Sep-23 | EO2308922-036 | 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 |
| Field Blank | 29-Sep-23 | EO2308922-037 | 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 |

**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 (August, 2022), 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 (August, 2022), 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 2023.

6: 13(R)SS, 15(2R)SS and 16-IN: No samples collected in 2023 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 |

*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**
**2023 Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | | DISSOLVED METALS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yy) | Lab File | Sample Name | 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) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | | 0.1 | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- | --- | --- | --- | 5.0 |
| **Canadian Drinking 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 | --- |
| **Laboratory 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 |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | | --- | 0.006 | 0.01 | 1 | 5 | 0.005 | --- | 1 | 0.01 | 0.001 | --- | 0.05 | --- | 0.02 | 5 |
| **Alberta Tier 2 Aquatic 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 |
| 01A-SH | 28-Sep-23 | EO2308922-001 | 1A-SH | 0.175 | <0.00010 | 0.00047 | 0.0607 | <0.010 | 0.0000068 | 0.00284 | 0.00082 | 0.000106 | <0.0000050 | 0.00405 | 0.000133 | <0.000010 | 0.000499 | 0.0063 |
| 01A-IN | 28-Sep-23 | EO2308922-002 | 1A-IN | 0.0416 | <0.00010 | 0.00047 | 0.266 | 0.088 | <0.0000050 | 0.00204 | 0.0005 | <0.000050 | <0.0000050 | 0.0018 | 0.000061 | <0.000010 | 0.000337 | 0.0027 |
| 03-SH | 29-Sep-23 | EO2308922-003 | 3-SH | 0.0102 | 0.00015 | 0.00028 | 0.406 | 0.027 | 0.0000383 | 0.00205 | 0.00199 | <0.000050 | <0.0000050 | 0.00273 | 0.000118 | <0.000010 | 0.00603 | 0.0019 |
| 03-IN | 29-Sep-23 | EO2308922-004 | 3-IN | 0.0057 | <0.00010 | 0.00021 | 0.127 | 0.049 | 0.0000554 | 0.00240 | 0.00095 | 0.000058 | <0.0000050 | 0.00162 | 0.000062 | <0.000010 | 0.00451 | 0.0031 |
| 04-SH | 29-Sep-23 | EO2308922-005 | 4-SH | <0.0010 | <0.00010 | 0.00018 | 0.207 | 0.088 | <0.0000050 | 0.00552 | 0.00058 | <0.000050 | <0.0000050 | 0.00335 | 0.000065 | <0.000010 | 0.00860 | <0.0010 |
| 04-IN | 29-Sep-23 | EO2308922-006 | 4-IN | <0.0010 | <0.00010 | 0.00310 | 0.0723 | 0.198 | 0.0000076 | 0.00257 | 0.00039 | <0.000050 | <0.0000050 | 0.00280 | 0.00006 | <0.000010 | 0.00781 | <0.0010 |
| 04-SS | 29-Sep-23 | EO2308922-007 | 4-SS | <0.0010 | <0.00010 | 0.00038 | 0.099 | 0.029 | 0.0000147 | 0.00147 | 0.00054 | <0.000050 | <0.0000050 | 0.00121 | <0.000050 | <0.000010 | 0.000438 | 0.0015 |
| 05-SH | 28-Sep-23 | EO2308922-008 | 5-SH | <0.0010 | <0.00010 | 0.00021 | 0.118 | 0.031 | 0.0000128 | 0.00266 | 0.00090 | <0.000050 | <0.0000050 | 0.00192 | 0.000195 | <0.000010 | 0.00682 | 0.0014 |
| 05-IN | 28-Sep-23 | EO2308922-010 | 5-IN | <0.0010 | <0.00010 | 0.00042 | 0.0586 | 0.051 | 0.0000090 | 0.00176 | 0.00161 | <0.000050 | <0.0000050 | 0.00150 | <0.000050 | <0.000010 | 0.00902 | 0.0025 |
| 05-SS | 28-Sep-23 | EO2308922-011 | 5-SS | 0.0807 | <0.00010 | 0.00067 | 0.099 | 0.022 | 0.0000221 | 0.00153 | 0.00213 | <0.000050 | <0.0000050 | 0.00218 | <0.000050 | <0.000010 | 0.000059 | 0.0316 |
| 06-SH | 29-Sep-23 | EO2308922-013 | 6-SH | <0.0010 | <0.00010 | 0.00032 | 0.545 | 0.046 | 0.0000167 | 0.00158 | 0.00050 | <0.000050 | <0.0000050 | 0.00483 | 0.000055 | <0.000010 | 0.00609 | 0.0018 |
| 06(R)IN | 29-Sep-23 | EO2308922-014 | 6-IN | <0.0010 | <0.00010 | 0.00056 | 0.507 | 0.050 | 0.0000280 | 0.00183 | 0.00119 | <0.000050 | <0.0000050 | 0.0123 | 0.000093 | 0.0001 | 0.0067 | 0.0028 |
| 07-SH | 29-Sep-23 | EO2308922-015 | 7-SH | <0.0010 | <0.00010 | <0.00010 | 0.864 | 0.063 | 0.0000131 | 0.00164 | 0.00027 | <0.000050 | <0.0000050 | 0.00296 | <0.000050 | <0.000010 | 0.00360 | 0.0013 |
| 07-IN | 28-Sep-23 | EO2308922-017 | 7-IN | <0.0010 | <0.00010 | 0.00252 | 0.150 | 0.184 | 0.0001400 | 0.00160 | 0.00259 | <0.000050 | <0.0000050 | 0.00414 | <0.000050 | <0.000010 | 0.00528 | 0.0092 |
| 07(R)SS | 29-Sep-23 | EO2308922-018 | 7-SS | <0.0010 | <0.00010 | 0.00020 | 0.0780 | 0.038 | <0.0000050 | 0.00129 | <0.00020 | <0.000050 | <0.0000050 | 0.00203 | <0.000050 | <0.000010 | 0.000553 | <0.0010 |
| 08-SH | 27-Sep-23 | EO2308922-019 | 8-SH | <0.0010 | <0.00010 | 0.00059 | 0.204 | 0.062 | 0.0000567 | 0.00171 | 0.00058 | <0.000050 | <0.0000050 | 0.00247 | <0.000050 | <0.000010 | 0.00528 | 0.0019 |
| 08-IN | 27-Sep-23 | EO2308922-020 | 8-IN | <0.0010 | <0.00010 | <0.00010 | 0.0572 | 0.172 | 0.0000143 | 0.00460 | 0.00193 | <0.000050 | <0.0000050 | 0.00194 | 0.000095 | <0.000010 | 0.00350 | 0.0041 |
| 11-SH | 28-Sep-23 | EO2308922-021 | 11-SH | 0.0013 | <0.00010 | 0.00018 | 0.244 | 0.133 | 0.0000268 | 0.00145 | 0.00114 | <0.000050 | <0.0000050 | 0.00233 | 0.000099 | <0.000010 | 0.00389 | 0.0030 |
| 11-IN | 28-Sep-23 | EO2308922-023 | 11-IN | <0.0010 | <0.00010 | 0.00016 | 0.288 | 0.129 | 0.0000217 | 0.00135 | 0.00113 | <0.000050 | <0.0000050 | 0.00255 | <0.000050 | <0.000010 | 0.00312 | 0.0031 |
| 12-SH | 28-Sep-23 | EO2308922-024 | 12-SH | <0.0010 | <0.00010 | 0.00082 | 0.390 | 0.040 | 0.0000279 | 0.00182 | 0.00107 | 0.000053 | <0.0000050 | 0.00150 | <0.000050 | <0.000010 | 0.00606 | 0.0307 |
| 12-IN | 28-Sep-23 | EO2308922-026 | 12-IN | 0.0078 | <0.00010 | 0.00558 | 0.143 | 0.128 | 0.0000754 | <0.00050 | 0.0175 | <0.000050 | <0.0000050 | 0.00656 | <0.000050 | <0.000010 | 0.00228 | 0.165 |
| 13-SH[10] | 28-Sep-23 | EO2308922-027 | 13-SH | <0.0010 | 0.00034 | 0.00088 | 0.277 | 0.059 | 0.0001790 | 0.00189 | 0.00116 | <0.000050 | <0.0000050 | 0.0079 | 0.000171 | <0.000010 | 0.00464 | 0.0040 |
| 13-IN | 28-Sep-23 | EO2308922-028 | 13-IN | 0.0020 | <0.00010 | 0.00025 | 0.136 | 0.109 | 0.0000079 | 0.00222 | 0.00087 | <0.000050 | <0.0000050 | 0.00243 | <0.000050 | <0.000010 | 0.00287 | 0.0011 |
| 13(R)SS[11] | - | - | 13-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14-SH | 27-Sep-23 | EO2308922-029 | 14-SH | 0.0049 | 0.00023 | 0.00024 | 0.266 | 0.064 | 0.0031 | 0.00434 | 0.00193 | <0.000050 | <0.0000050 | 0.00660 | 0.000052 | <0.000010 | 0.00530 | 0.0222 |
| 15-SH | 28-Sep-23 | EO2308922-030 | 15-SH | <0.0010 | <0.00010 | 0.00022 | 0.442 | 0.186 | 0.0000116 | 0.00190 | 0.00070 | <0.000050 | <0.0000050 | 0.01620 | 0.000051 | <0.000010 | 0.00195 | 0.0020 |
| 15-IN | 28-Sep-23 | EO2308922-031 | 15-IN | <0.0010 | <0.00010 | 0.00015 | 0.157 | 0.252 | 0.0000304 | 0.00190 | 0.00226 | <0.000050 | <0.0000050 | 0.00549 | 0.000122 | <0.000010 | 0.00426 | 0.0020 |
| 15(2R)SS[11] | - | - | 15-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16-SH | 28-Sep-23 | EO2308922-032 | 16-SH | <0.0010 | <0.00010 | 0.00013 | 0.1500 | 0.100 | 0.0000082 | 0.00436 | 0.00092 | <0.000050 | <0.0000050 | 0.00280 | 0.000502 | <0.000010 | 0.008840 | 0.0023 |
| 16-IN[11] | - | - | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17-SH | 28-Sep-23 | EO2308922-033 | 17-SH | <0.0010 | 0.00011 | 0.00016 | 0.254 | 0.064 | 0.0000139 | 0.00259 | 0.00119 | <0.000050 | <0.0000050 | 0.00218 | 0.000112 | <0.000010 | 0.00443 | 0.0015 |
| 17-IN | 28-Sep-23 | EO2308922-034 | 17-IN | <0.0010 | <0.00010 | 0.00018 | 0.1220 | 0.210 | 0.0000088 | 0.00494 | 0.00113 | <0.000050 | <0.0000050 | 0.00249 | 0.000116 | <0.000010 | 0.00452 | 0.0015 |
| 89-3 | 29-Sep-23 | EO2308922-035 | 89-3 | <0.0010 | <0.00010 | 0.00056 | 0.1010 | 0.023 | <0.0000050 | 0.00226 | <0.00020 | <0.000050 | <0.0000050 | 0.00110 | <0.000050 | <0.000010 | 0.00159 | 0.0079 |
| **QA/QC** | | | | | | | | | | | | | | | | | | |
| Trip Blank | 29-Sep-23 | EO2308922-036 | 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 | 29-Sep-23 | EO2308922-037 | FIELD 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 |

**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 (August, 2022), 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 |

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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: 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 2023.

11: 13(R)SS, 15(2R)SS and 16-IN: No samples collected in 2023 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**
**2023 Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | | 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 | --- | --- |
| **oratory 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 |
| 01A-SH | 28-Sep-23 | EO2308922-001 | 1A-SH | 53.1 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 01A-IN | 28-Sep-23 | EO2308922-002 | 1A-IN | 23.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 03-SH | 29-Sep-23 | EO2308922-003 | 3-SH | 4.08 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 03-IN | 29-Sep-23 | EO2308922-004 | 3-IN | 4.24 | --- | --- | --- | --- | --- | --- | --- | --- |
| 04-SH | 29-Sep-23 | EO2308922-005 | 4-SH | 2.45 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 04-IN | 29-Sep-23 | EO2308922-006 | 4-IN | 3.22 | --- | --- | --- | --- | --- | --- | --- | --- |
| 04-SS | 29-Sep-23 | EO2308922-007 | 4-SS | 1.58 | --- | --- | --- | --- | --- | --- | --- | --- |
| 05-SH | 28-Sep-23 | EO2308922-008 | 5-SH | 7.20 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 05-IN | 28-Sep-23 | EO2308922-010 | 5-IN | 7.46 | --- | --- | --- | --- | --- | --- | --- | --- |
| 05-SS | 28-Sep-23 | EO2308922-011 | 5-SS | 0.70 | --- | --- | --- | --- | --- | --- | --- | --- |
| 06-SH | 29-Sep-23 | EO2308922-013 | 6-SH | 4.3 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 06(R)IN | 29-Sep-23 | EO2308922-014 | 6-IN | 5.84 | --- | --- | --- | --- | --- | --- | --- | --- |
| 07-SH | 29-Sep-23 | EO2308922-015 | 7-SH | 2.46 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 07-IN | 28-Sep-23 | EO2308922-017 | 7-IN | 2.55 | --- | --- | --- | --- | --- | --- | --- | --- |
| 07(R)SS | 29-Sep-23 | EO2308922-018 | 7-SS | 2.06 | --- | --- | --- | --- | --- | --- | --- | --- |
| 08-SH | 27-Sep-23 | EO2308922-019 | 8-SH | 1.64 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 08-IN | 27-Sep-23 | EO2308922-020 | 8-IN | 1.8 | --- | --- | --- | --- | --- | --- | --- | --- |
| 11-SH | 28-Sep-23 | EO2308922-021 | 11-SH | 7.53 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 11-IN | 28-Sep-23 | EO2308922-023 | 11-IN | 9.8 | --- | --- | --- | --- | --- | --- | --- | --- |
| 12-SH | 28-Sep-23 | EO2308922-024 | 12-SH | 2.85 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 12-IN | 28-Sep-23 | EO2308922-026 | 12-IN | 2.97 | --- | --- | --- | --- | --- | --- | --- | --- |
| 13-SH[5] | 28-Sep-23 | EO2308922-027 | 13-SH | 8.39 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 13-IN | 28-Sep-23 | EO2308922-028 | 13-IN | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 13(R)SS[6] | - | - | 13-SS | | --- | --- | --- | --- | --- | --- | --- | --- |
| 14-SH | 27-Sep-23 | EO2308922-029 | 14-SH | 2.84 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 15-SH | 28-Sep-23 | EO2308922-030 | 15-SH | 4.56 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 15-IN | 28-Sep-23 | EO2308922-031 | 15-IN | 4.07 | --- | --- | --- | --- | --- | --- | --- | --- |
| 15(2R)SS[6] | - | - | 15-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16-SH | 28-Sep-23 | EO2308922-032 | 16-SH | 3.71 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 16-IN[6] | - | - | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17-SH | 28-Sep-23 | EO2308922-033 | 17-SH | 2.72 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| 17-IN | 28-Sep-23 | EO2308922-034 | 17-IN | 3.17 | --- | --- | --- | --- | --- | --- | --- | --- |
| 89-3 | 29-Sep-23 | EO2308922-035 | 89-3 | 1.34 | --- | --- | --- | --- | --- | --- | --- | --- |
| **QA/QC** | | | | | | | | | | | | |
| Trip Blank | 29-Sep-23 | EO2308922-036 | TRIP BLANK | <0.50 | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | <0.10 | <0.10 |
| Field Blank 1 | 29-Sep-23 | EO2308922-037 | FIELD BLANK | <0.50 | <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 (August, 2022), 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 |

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 |

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

6: 13(R)SS, 15(2R)SS and 16-IN: No samples collected in 2023 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**
**2023 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]** | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 01A-SH | 28-Sep-23 | EO2308922-001 | 1A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 01A-IN | 28-Sep-23 | EO2308922-002 | 1A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 03-SH | 29-Sep-23 | EO2308922-003 | 3-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 03-IN | 29-Sep-23 | EO2308922-004 | 3-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 04-SH | 29-Sep-23 | EO2308922-005 | 4-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 04-IN | 29-Sep-23 | EO2308922-006 | 4-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 04-SS | 29-Sep-23 | EO2308922-007 | 4-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 05-SH | 28-Sep-23 | EO2308922-008 | 5-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 05-IN | 28-Sep-23 | EO2308922-010 | 5-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 05-SS | 28-Sep-23 | EO2308922-011 | 5-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 06-SH | 29-Sep-23 | EO2308922-013 | 6-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 06(R)IN | 29-Sep-23 | EO2308922-014 | 6-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 07-SH | 29-Sep-23 | EO2308922-015 | 7-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 07-IN | 28-Sep-23 | EO2308922-017 | 7-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 07(R)SS | 29-Sep-23 | EO2308922-018 | 7-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 08-SH | 27-Sep-23 | EO2308922-019 | 8-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 08-IN | 27-Sep-23 | EO2308922-020 | 8-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 11-SH | 28-Sep-23 | EO2308922-021 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 11-IN | 28-Sep-23 | EO2308922-023 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 12-SH | 28-Sep-23 | EO2308922-024 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 12-IN | 28-Sep-23 | EO2308922-026 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 13-SH[3] | 28-Sep-23 | EO2308922-027 | 13-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 13-IN | 28-Sep-23 | EO2308922-028 | 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[4] | - | - | 13-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 14-SH | 27-Sep-23 | EO2308922-029 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 15-SH | 28-Sep-23 | EO2308922-030 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 15-IN | 28-Sep-23 | EO2308922-031 | 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[4] | - | - | 15-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 16-SH | 28-Sep-23 | EO2308922-032 | 16-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 16-IN[4] | - | - | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 17-SH | 28-Sep-23 | EO2308922-033 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 17-IN | 28-Sep-23 | EO2308922-034 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| 89-3 | 29-Sep-23 | EO2308922-035 | 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 | 29-Sep-23 | EO2308922-036 | 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 | 29-Sep-23 | EO2308922-037 | FIELD BLANK | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| Spiked Sample 1[5] | 02-Oct-23 | EO2308922-038 | 51-SH | <0.000050 | <0.000050 | <0.000050 | 0.0011 | <0.000050 | 0.000996 | 0.000997 | <0.000050 | <0.000050 | 0.00309 |
| Spiked Sample 2[6] | 02-Oct-23 | EO2308922-039 | 52-SH | <0.000050 | <0.000050 | <0.000050 | 0.000962 | <0.000050 | 0.000879 | 0.000945 | <0.000050 | <0.000050 | 0.00279 |

**NOTES:**

1: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 (August, 2022), 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 2023.
4: 13(R)SS, 15(2R)SS and 16-IN: No samples collected in 2023 event.
5: ALS spiked sample - 51-SH - Aroclor 1242, 1254, 1260 = 0.001 mg/L
6: ALS spiked sample - 52-SH - Aroclor 1242, 1254, 1260 = 0.001 mg/L

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**
**2023 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 | 29-Sep-23 | EO2308922-003 | 03-SH | <0.020 |
| 08-SH | 27-Sep-23 | EO2308922-019 | 08-SH | <0.020 |
| 12-SH | 28-Sep-23 | EO2308922-024 | 12-SH | <0.020 |
| 13-SH[3] | 28-Sep-23 | EO2308922-027 | 13-SH | 0.062 |
| 15-SH | 28-Sep-23 | EO2308922-030 | 15-SH | <0.020 |
| 16-SH | 28-Sep-23 | EO2308922-032 | 16-SH | <0.020 |
| 17-SH | 28-Sep-23 | EO2308922-033 | 17-SH | <0.020 |

**NOTES:**

**1:** Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 (August, 2022), Table B-4. Groundwater Remediation Guideline Values

| | |
|---|---|
| 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 2023.

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**
**2023 Groundwater Monitoring Analytical Results: Dioxins and Furans**

| Monitoring Well | Date (dd-mmm-yy) | Lab File | Sample Name | Toxicity Equivalence (TEQ)[2] | DIOXINS and FURANS | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2,3,7,8-TCDD | 1,2,3,7,8-PeCDD | 1,2,3,4,7,8-HxCDD | 1,2,3,6,7,8-HxCDD | 1,2,3,7,8,9-HxCDD | 1,2,3,4,6,7,8-HpCDD | OCDD | 2,3,7,8-TCDF | 1,2,3,7,8-PeCDF | 2,3,4,7,8-PeCDF | 1,2,3,4,7,8-HxCDF | 1,2,3,6,7,8-HxCDF | 1,2,3,7,8,9-HxCDF | 2,3,4,6,7,8-HxCDF | 1,2,3,4,6,7,8-HpCDF | 1,2,3,4,7,8,9-HpCDF | OCDF | Total Toxic Equivalency[3] |
| | | | | | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) | (pg/L) |
| **Toxic Equivalency Factors (TEFs)[1]** | | | | | **1.00** | **1.00** | **0.10** | **0.10** | **0.10** | **0.01** | **0.000300** | **0.10** | **0.03** | **0.30** | **0.10** | **0.10** | **0.10** | **0.10** | **0.01** | **0.01** | **0.000300** | **---** |
| **Alberta Tier 2 Potable Groundwater Guideline[4]** | | | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **120** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[5]** | | | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **120** |
| 03-SH | 29-Sep-23 | L2752889-1 | 03-SH | | <0.42 | <0.55 | <0.42 | <0.46 | <0.44 | <0.61 | <1.9 | <0.44 | <0.40 | <0.39 | <0.24 | <0.25 | <0.32 | <0.23 | <0.58 | <0.68 | <1.1 | |
| | | | | TEQ | 0.42 | 0.55 | 0.04 | 0.05 | 0.04 | 0.01 | 0.00057 | 0.04 | 0.01 | 0.117 | 0.024 | 0.025 | 0.032 | 0.023 | 0.0058 | 0.0068 | 0.00033 | 1.399 |
| 08-SH | 27-Sep-23 | L2752889-2 | 08-SH | | <0.52 | <0.56 | <0.58 | <0.60 | <0.58 | <0.48 | <2.0 | <0.34 | <0.40 | <0.36 | <0.27 | <0.29 | <0.36 | <0.27 | <0.46 | <0.54 | <1.7 | |
| | | | | TEQ | 0.52 | 0.56 | 0.06 | 0.06 | 0.06 | 0.0048 | 0.00060 | 0.03 | 0.01 | 0.11 | 0.03 | 0.03 | 0.04 | 0.03 | 0.0046 | 0.01 | 0.00051 | 1.545 |
| 12-SH | 28-Sep-23 | L2752889-3 | 12-SH | | <0.43 | <0.50 | <0.43 | <0.47 | <0.45 | <0.50 | <1.5 | <0.35 | <0.47 | <0.44 | <0.37 | <0.36 | <0.44 | <0.35 | <0.39 | <0.47 | <1.1 | |
| | | | | TEQ | 0.43 | 0.50 | 0.04 | 0.05 | 0.05 | 0.01 | 0.00045 | 0.04 | 0.01 | 0.13 | 0.04 | 0.04 | 0.04 | 0.04 | 0.0039 | 0.0047 | 0.00033 | 1.412 |
| 13-SH[6] | 28-Sep-23 | L2752889-5 | 13-SH | | <0.59 | <0.51 | <0.44 | <0.50 | <0.46 | 1.8 | 13.8 | <0.43 | <0.40 | <0.41 | <0.39 | <0.39 | <0.49 | <0.38 | 0.5 | <0.50 | 1.7 | |
| | | | | TEQ | 0.59 | 0.51 | 0.04 | 0.05 | 0.05 | 0.02 | 0.0041 | 0.04 | 0.01 | 0.12 | 0.04 | 0.04 | 0.05 | 0.04 | 0.01 | 0.01 | 0.00051 | 1.616 |
| 15-SH | 28-Sep-23 | L2752889-6 | 15-SH | | <0.48 | <0.53 | <0.66 | <0.68 | <0.66 | 0.9 | <1.8 | <0.37 | 0.47 | <0.29 | <0.28 | <0.30 | <0.36 | <0.27 | <0.37 | <0.42 | <0.85 | |
| | | | | TEQ | 0.48 | 0.53 | 0.07 | 0.07 | 0.07 | 0.01 | 0.00054 | 0.04 | 0.01 | 0.09 | 0.03 | 0.03 | 0.04 | 0.03 | 0.0037 | 0.0042 | 0.00026 | 1.487 |
| 16-SH | 28-Sep-23 | L2752889-7 | 16-SH | | <0.49 | <0.62 | <0.51 | <0.52 | <0.51 | <0.56 | 2.2 | <0.35 | <0.37 | <0.33 | <0.33 | <0.32 | <0.42 | <0.30 | <0.41 | <0.50 | <1.3 | |
| | | | | TEQ | 0.49 | 0.62 | 0.0510 | 0.0520 | 0.0510 | 0.0056 | 0.00066 | 0.04 | 0.01 | 0.10 | 0.03 | 0.03 | 0.04 | 0.03 | 0.0041 | 0.01 | 0.00039 | 1.562 |
| 17-SH | 28-Sep-23 | L2752889-8 | 17-SH | | <0.49 | <0.60 | <0.45 | <0.45 | <0.44 | <0.47 | <1.3 | <0.39 | <0.46 | <0.43 | <0.31 | <0.34 | <0.40 | <0.31 | <0.36 | <0.43 | <1.1 | |
| | | | | TEQ | 0.49 | 0.60 | 0.05 | 0.05 | 0.04 | 0.0047 | 0.00039 | 0.04 | 0.01 | 0.13 | 0.03 | 0.03 | 0.04 | 0.03 | 0.0036 | 0.0043 | 0.00033 | 1.555 |

**NOTES:**

1: Toxic Equivalency Factors (TEFs) from Van der Berg et al. (2006)

2: Toxic Equivalence (TEQ) values are produced by multiplying the TEF's by the analytical result. Where the result was below detection limit, the value of the detection limit was used in the calculation.

3: Total Toxic Equivalency (TTE) is calculated by summing the TEQ values, this result is then compared to the applicable guidelines

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 |

5: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 |

6: 13-SH: Pneumatic pump moved from well to piezometer in 2023 due to frost heave in well, sample taken from piezometer in 2023.

Detection Limit is greater than the guideline

--- Guideline Row: No guideline for that parameter

--- Results: Parameter was not analyzed

**Table 3.9**
**VEOLIA, Swan Hills Treatment Centre**
**2023 Groundwater Monitoring QA/QC Results**

| | | | | GENERAL | | | INDICATORS | | | | CATIONS AND ANIONS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yy) | Lab File | Sample Name | Electrical Conductivity (µS/cm) | 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** | **0.001** | **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 | 0.002 | 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 | 0.004 | 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 | 0.010 | 0.50 | 0.050 | 0.50 | 0.50 | 10 | 10 | 10 | 0.20 |
| 05-SH | 28-Sep-23 | EO2308922-008 | 05-SH | 934 | 8.11 | 418 | 2.72 | 119 | <0.010 | 0.0187 | 177 | 44.6 | 1.23 | 9.21 | 509 | <1.0 | <1.0 | 0.192 |
| (Duplicate) | 28-Sep-23 | EO2308922-009 | 25-SH | 904 | 8.13 | 393 | 2.66 | 118 | <0.010 | 0.0715 | 157 | 41.4 | 1.1 | 12 | 479 | <1.0 | <1.0 | 0.189 |
| *RPD* [1] | | | | 3.3% | n/c | 6.2% | --- | 1% | --- | 117% | 12.0% | 7.4% | 11.2% | 26.3% | 6.1% | --- | --- | --- |
| *Difference* [2] | | | | --- | --- | --- | 0.06 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.003 |
| 05-SS | 28-Sep-23 | EO2308922-011 | 05-SS | 447 | 8.45 | 227 | <0.50 | 24.2 | 0.245 | 0.39 | 46.9 | 11.7 | 4.11 | 28.5 | 265 | 5.9 | <1.0 | 0.108 |
| (Duplicate) | 28-Sep-23 | EO2308922-012 | 25-SS | 443 | 8.47 | 226 | <0.50 | 22.6 | 0.474 | 0.352 | 47.1 | 11.5 | 4.18 | 29.3 | 262 | 6.8 | <1.0 | 0.108 |
| *RPD* | | | | 0.9% | n/c | 0.4% | --- | 6.8% | 63.7% | 10.2% | 0.4% | 1.7% | 1.7% | 2.8% | 1.1% | --- | --- | --- |
| *Difference* [2] | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.90 | --- | 0 |
| 07-SH | 29-Sep-23 | EO2308922-015 | 07-SH | 1430 | 8.15 | 434 | 208 | 12.6 | <0.010 | 0.648 | 210 | 54.6 | 3.31 | 18.1 | 529 | <1.0 | <1.0 | 0.127 |
| (Duplicate) | 29-Sep-23 | EO2308922-016 | 27-SH | 1400 | 8.1 | 422 | 206 | 12.2 | <0.010 | 0.742 | 234 | 54.5 | 3.3 | 17.5 | 515 | <1.0 | <1.0 | 0.111 |
| *RPD* | | | | 2.1% | n/c | 2.8% | 1.0% | 3% | --- | 13.5% | 10.8% | 0.2% | 0.3% | 3.4% | 2.7% | --- | --- | --- |
| *Difference* [2] | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.0160 |
| 11-SH | 28-Sep-23 | EO2308922-021 | 11-SH | 1030 | 8.11 | 450 | <0.50 | 167 | 0.066 | 0.522 | 165 | 31.8 | 2.68 | 46.4 | 549 | <1.0 | <1.0 | 0.164 |
| (Duplicate) | 28-Sep-23 | EO2308922-021 | 31-SH | 1020 | 8.16 | 408 | <0.50 | 165 | 0.062 | 0.511 | 163 | 30.6 | 2.6 | 43.7 | 497 | <1.0 | <1.0 | 0.168 |
| *RPD* | | | | 1.0% | n/c | 9.8% | --- | 1.2% | --- | 2.1% | 1.2% | 3.8% | 3.0% | 6.0% | 9.9% | --- | --- | --- |
| *Difference* [2] | | | | --- | --- | --- | --- | --- | 0.0040 | --- | --- | --- | --- | --- | --- | --- | --- | 0.004 |
| 12-SH | 28-Sep-23 | EO2308922-024 | 12-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 28-Sep-23 | EO2308922-025 | 32-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *RPD* | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *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 3.9**
**VEOLIA, Swan Hills Treatment Centre**
**2023 Groundwater Monitoring QA/QC Results**

| | | | | 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 | 28-Sep-23 | EO2308922-008 | 05-SH | 0.01 | 0.127 | 0.137 | <0.0010 | <0.00010 | 0.00021 | 0.118 | 0.031 | 0.0000128 | 0.00266 | 0.0009 | <0.000050 | <0.0000050 | 0.00192 | 0.000195 | <0.000010 | 0.00682 | 0.0014 | 7.2 |
| (Duplicate) | 28-Sep-23 | EO2308922-009 | 25-SH | <0.010 | 0.184 | 0.184 | 0.0034 | <0.00010 | 0.0003 | 0.101 | 0.027 | 0.0000237 | 0.00503 | 0.00208 | <0.000050 | <0.0000050 | 0.00202 | 0.000245 | <0.000010 | 0.00618 | 0.0012 | 10.8 |
| *RPD* [1] | | | | --- | --- | --- | --- | --- | --- | 15.5% | --- | --- | --- | --- | --- | --- | --- | --- | --- | 9.8% | --- | 40.0% |
| *Difference* [2] | | | | --- | 0.057 | 0.047 | --- | --- | 0.000090 | --- | 0.0040 | 0.000011 | 0.00237 | 0.00118 | --- | --- | 0.00010 | 0.000050 | --- | --- | 0.0002 | --- |
| 05-SS | 28-Sep-23 | EO2308922-011 | 05-SS | <0.010 | 0.096 | 0.096 | 0.0807 | <0.00010 | 0.00067 | 0.0994 | 0.022 | 0.0000221 | 0.00153 | 0.00213 | <0.000050 | <0.0000050 | 0.00218 | <0.000050 | <0.000010 | 0.000059 | 0.0316 | 0.7 |
| (Duplicate) | 28-Sep-23 | EO2308922-012 | 25-SS | <0.010 | 0.067 | 0.067 | <0.0010 | <0.00010 | 0.00119 | 0.0981 | 0.022 | 0.0000109 | 0.00129 | 0.00265 | <0.000050 | <0.0000050 | 0.00325 | <0.000050 | <0.000010 | 0.000133 | 0.0414 | 0.55 |
| *RPD* | | | | --- | --- | --- | --- | --- | --- | 1.3% | --- | --- | --- | 21.8% | --- | --- | --- | --- | --- | --- | 26.8% | --- |
| *Difference* [2] | | | | --- | 0.029 | 0.029 | --- | --- | 0.00052 | --- | 0 | 0.000011 | 0.00024 | --- | --- | --- | 0.00107 | --- | --- | 0.00007 | --- | 0.15 |
| 07-SH | 29-Sep-23 | EO2308922-015 | 07-SH | <0.010 | <0.020 | <0.0500 | <0.0010 | <0.00010 | <0.00010 | 0.864 | 0.063 | 0.0000131 | 0.00164 | 0.00027 | <0.000050 | <0.0000050 | 0.00296 | <0.000050 | <0.000010 | 0.0036 | 0.0013 | 2.46 |
| (Duplicate) | 29-Sep-23 | EO2308922-016 | 27-SH | <0.010 | 0.02 | <0.0500 | 0.0019 | <0.00010 | <0.00010 | 0.861 | 0.069 | 0.0000068 | 0.00174 | 0.00025 | <0.000050 | <0.0000050 | 0.00319 | <0.000050 | <0.000010 | 0.00426 | 0.0014 | 2.47 |
| *RPD* | | | | --- | --- | --- | --- | --- | --- | 0.3% | --- | --- | --- | --- | --- | --- | --- | --- | --- | 16.8% | --- | --- |
| *Difference* [2] | | | | --- | --- | --- | --- | --- | --- | --- | 0.0060 | 0.0000063 | 0.00010 | 0.000020 | --- | --- | 0.00023 | --- | --- | --- | 0.00010 | 0.01 |
| 11-SH | 28-Sep-23 | EO2308922-021 | 11-SH | <0.010 | 0.151 | 0.151 | 0.0013 | <0.00010 | 0.00018 | 0.244 | 0.133 | 0.0000268 | 0.00145 | 0.00114 | <0.000050 | <0.0000050 | 0.00233 | 0.000099 | <0.000010 | 0.00389 | 0.003 | 7.53 |
| (Duplicate) | 28-Sep-23 | EO2308922-021 | 31-SH | <0.010 | 0.169 | 0.169 | <0.0010 | <0.00010 | 0.00017 | 0.23 | 0.132 | 0.0000259 | 0.00131 | 0.001 | <0.000050 | <0.0000050 | 0.00248 | 0.000118 | <0.000010 | 0.00382 | 0.0025 | 8.13 |
| *RPD* | | | | --- | --- | --- | --- | --- | --- | 5.9% | 0.8% | --- | --- | --- | --- | --- | --- | --- | --- | 1.8% | --- | 7.7% |
| *Difference* [2] | | | | --- | 0.018 | 0.018 | --- | --- | 0.000010 | --- | --- | 0.0000009 | 0.00014 | 0.00014 | --- | --- | 0.00015 | 0.000019 | --- | --- | 0.00050 | --- |
| 12-SH | 28-Sep-23 | EO2308922-024 | 12-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 28-Sep-23 | EO2308922-025 | 32-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *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 3.9**
**VEOLIA, Swan Hills Treatment Centre**
**2023 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 | 28-Sep-23 | EO2308922-008 | 05-SH | <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 | --- |
| (Duplicate) | 28-Sep-23 | EO2308922-009 | 25-SH | <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 | --- |
| *RPD* [1] | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Difference* [2] | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 05-SS | 28-Sep-23 | EO2308922-011 | 05-SS | --- | --- | --- | --- | --- | --- | --- | --- | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 | --- |
| (Duplicate) | 28-Sep-23 | EO2308922-012 | 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 | 29-Sep-23 | EO2308922-015 | 07-SH | <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 | --- |
| (Duplicate) | 29-Sep-23 | EO2308922-016 | 27-SH | <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 | --- |
| *RPD* | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Difference* [2] | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | |
| 11-SH | 28-Sep-23 | EO2308922-021 | 11-SH | <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 | --- |
| (Duplicate) | 28-Sep-23 | EO2308922-021 | 31-SH | <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 | --- |
| *RPD* | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Difference* [2] | | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12-SH | 28-Sep-23 | EO2308922-024 | 12-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | <0.020 |
| (Duplicate) | 28-Sep-23 | EO2308922-025 | 32-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | <0.020 |
| *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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| **01-SH [Decommissioned]** | N/M | 1,086.38 | N/A | 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/A | N/M | *Frozen* |
| | | | | | 15-Nov-1991 | --- | N/A | 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/A | N/M | *Frozen* |
| | | | | | 10-Nov-1993 | --- | N/A | N/M | *Decommissioned* |
| **01A-SH** | N/M | 1,087.20 | N/A | 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 | --- | < 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/A | 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 | 5.53 | 13-Sep-2023 | 3.17 | 2.17 | 1,084.07 | |
| **01-IN [Decommissioned]** | N/M | 1,086.11 | N/A | 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/A | N/M | *Decommissioned* |
| **01A-IN** | N/M | 1,087.27 | N/A | 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/A | 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 | |
| **01-SS [Decommissioned]** | N/M | 1,086.11 | N/A | 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 | |
| | | | | | 29-Oct-1992 | 64.94 | N/M | 1,021.17 | |
| | | | | | 18-May-1993 | --- | N/A | N/M | *Pump Lines Frozen* |
| | | | | | 10-Nov-1993 | --- | N/A | N/M | *Decommissioned* |
| **01A-SS** | N/M | 1,087.40 | N/A | 60.50 | 10-Nov-1993 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 21-Sep-1994 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 20-Sep-1995 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-1996 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 15-Sep-1998 | N/M | --- | < 0.00 | *Dry* |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 28-Aug-2000 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 07-Sep-2001 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 06-Sep-2002 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 03-Sep-2003 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 08-Sep-2004 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2005 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 06-Sep-2006 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 29-Aug-2007 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 04-Sep-2008 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2009 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Well Dry* |
| | | | | | 22-Aug-2011 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 22-Aug-2012 | 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 | --- | < 0.00 | *Dry; Measured in the well* |
| | | | 0.73 | 60.50 | 10-Sep-2014 | N/M | --- | < 0.00 | *Dry; Measured in the well* |
| | | | N/M | 60.50 | 16-Sep-2015 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.83 | 60.50 | 14-Sep-2016 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.83 | 60.50 | 12-Sep-2017 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.83 | 60.50 | 06-Sep-2018 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.83 | 60.50 | 04-Sep-2019 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.83 | 60.50 | 09-Sep-2020 | NM | --- | < 0.00 | *Dry* |
| | | | 0.83 | 60.50 | 08-Sep-2021 | NM | ---- | <0.00 | *Dry* |
| | | | 0.83 | 60.50 | 13-Sep-2022 | NM | ---- | <0.00 | *Dry* |
| **02-SH [Decommissioned]** | N/M | 1,086.42 | N/A | 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/A | N/M | *Decommissioned* |
| **02-IN [Decommissioned]** | N/M | 1,086.38 | N/A | 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/A | N/M | *Decommissioned* |
| **03-SH** | N/M | 1,080.61 | N/A | 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/A | 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* |
| | | | 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 | |
| **03-IN** | N/M | 1,078.74 | N/A | 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 | |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 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/A | 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 | |
| **04-SH** | N/M | 1,083.33 | N/A | 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/A | 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/A | 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 | |
| **04-IN** | N/M | 1,083.65 | N/A | 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 | |
| | | | | | 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 | --- | < 0.00 | *Dry* |
| | | | | | 09-Sep-2004 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2005 | 8.50 | N/M | 1,075.15 | |
| | | | | | 07-Sep-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 07-Sep-2006 | 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 | --- | < 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 | |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| **04-SS** | N/M | 1,084.04 | N/A | 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 | --- | < 0.00 | *Dry* |
| | | | | | 04-Sep-1997 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 15-Sep-1998 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 28-Aug-2000 | 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 | --- | < 0.00 | *Dry* |
| | | | | | 08-Sep-2004 | --- | N/A | N/M | *N/M* |
| | | | | | 25-Aug-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 07-Sep-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 07-Sep-2006 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 29-Aug-2007 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 03-Sep-2008 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2009 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Well Dry* |
| | | | | | 22-Aug-2011 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2012 | 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/A | *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 | |
| **05-SH** | N/M | 1,080.82 | N/A | 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/A | 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/A | N/M | *Blocked* |
| | | | | | 08-Sep-2004 | --- | N/A | N/M | *Blocked* |
| | | | | | 25-Aug-2005 | --- | N/A | N/M | *Blocked* |
| | | | | | 07-Sep-2005 | --- | N/A | N/M | *Blocked* |
| | | | | | 05-Sep-2007 | --- | N/A | N/M | *Blocked* |
| | | | | | 05-Sep-2008 | --- | N/A | N/M | *Blocked* |
| | | | | | 25-Aug-2009 | --- | N/A | N/M | *Blocked* |
| | | | | | 23-Aug-2010 | --- | N/A | N/M | *No water level because could not get tape down* |
| | | | | | 22-Aug-2011 | --- | N/A | N/M | *Dry* |
| | | | | | 23-Aug-2012 | --- | N/A | 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* |
| | | | 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 | |
| **05-IN** | N/M | 1,080.90 | N/A | 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/A | 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 | |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 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/A | 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 | |
| | | | | | | | | | |
| **05-SS** | N/M | 1,086.38 | N/A | N/M | 10-Sep-2004 | 63.80 | N/M | 1,022.58 | |
| | | | | | 25-Aug-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 08-Sep-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 07-Sep-2007 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 04-Sep-2008 | --- | N/A | N/M | *N/M* |
| | | | | | 17-Sep-2009 | --- | N/A | N/M | *N/M* |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Well Dry* |
| | | | | | 23-Aug-2012 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 19-Sep-2013 | 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 | |
| | | | | | | | | | |
| **06-SH** | N/M | 1,081.17 | N/A | 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/A | 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/A | N/M | *Blocked* |
| | | | | | 28-Aug-2000 | --- | N/A | N/M | *Blocked* |
| | | | | | 06-Sep-2001 | --- | N/A | N/M | *Blocked* |
| | | | | | 04-Sep-2002 | --- | N/A | 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/A | 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/A | N/M | *N/M* |
| | | | | | 02-Aug-2011 | --- | N/A | N/M | *Frost Jacked* |
| | | | | | 23-Aug-2012 | --- | N/A | N/M | *N/M* |
| | | | 1.42 | | 19-Sep-2013 | --- | N/A | 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* |
| | | | 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 | |
| | | | | | | | | | |
| **06-IN** | N/M | 1,081.19 | N/A | 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/A | 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/A | N/M | *Blocked* |
| | | | | | 25-Aug-2005 | 1.50 | N/M | 1,079.69 | |
| | | | | | 07-Sep-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 05-Sep-2007 | 1.42 | N/M | 1,079.77 | |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 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 | |
| **07-SH** | N/M | 1,080.42 | N/A | 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/A | 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 | |
| **07-IN** | N/M | 1,080.77 | N/A | 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 | |
| | | | | | 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/A | 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 | |
| **07-SS** | N/M | 1,080.51 | N/A | 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 | |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 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 | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2009 | --- | N/A | N/M | *N/M* |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Well Dry* |
| | | | | | 22-Aug-2011 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2012 | 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 | --- | 1,023.16 | |
| | | | | | | | | | |
| **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 | |
| | | | | | | | | | |
| **08-SH** | N/M | 1,086.10 | N/A | 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/A | 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* |
| | | | 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 | |
| | | | | | | | | | |
| **08-IN** | N/M | 1,086.04 | N/A | 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/A | 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/A | 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/A | 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 | |
| | | | | | | | | | |
| **08-SS** | N/M | 1,085.60 | N/A | 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 | |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 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 | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-1997 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 04-Oct-1998 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 09-Sep-1999 | 62.50 | N/M | 1,023.10 | |
| | | | | | 28-Aug-2000 | 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 | --- | < 0.00 | *Dry* |
| | | | | | 09-Sep-2004 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 26-Aug-2005 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-2007 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 03-Sep-2008 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2009 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Well Dry* |
| | | | | | 23-Aug-2011 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 22-Aug-2012 | 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 | --- | < 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* |
| **09-SH [Decommissioned]** | N/M | 1,087.07 | N/A | 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/A | N/M | *Frozen* |
| | | | | | 15-Nov-1991 | 1.30 | N/M | 1,085.77 | |
| | | | | | 05-May-1992 | 1.34 | N/M | 1,085.73 | |
| | | | | | 28-Oct-1992 | --- | N/A | N/M | *Decommissioned* |
| **09-IN [Decommissioned]** | N/M | 1,087.10 | N/A | 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/A | N/M | *Decommissioned* |
| **10-SH [Decommissioned]** | N/M | 1,087.39 | N/A | 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/A | N/M | *Frozen* |
| | | | | | 05-May-1992 | 1.34 | N/M | 1,086.05 | |
| | | | | | 28-Oct-1992 | --- | N/A | N/M | *Decommissioned* |
| **10-IN [Decommissioned]** | N/M | 1,087.34 | N/A | 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 | |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 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/A | N/M | *Decommissioned* |
| **11-SH** | N/M | 1,084.16 | N/A | 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/A | 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 | |
| **11-IN** | N/M | 1,084.25 | N/A | 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 | |
| | | | | | 07-Sep-2005 | --- | N/A | 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 | |
| **11-SS** | N/M | 1,084.04 | N/A | 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 | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-1996 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-1997 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 15-Sep-1998 | 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 | --- | < 0.00 | *Dry* |
| | | | | | 08-Sep-2004 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 05-Sep-2007 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 04-Sep-2008 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2009 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Well Dry* |
| | | | | | 23-Aug-2011 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 22-Aug-2012 | 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 | --- | < 0.00 | *Dry* |
| | | | N/M | N/M | 16-Sep-2015 | 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 | *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 | --- | --- | --- | *Insufficient water* |
| | | | 0.58 | 62.37 | --- | 60.72 | 60.14 | 1,022.42 | |
| | | | N/M | 62.37 | 12-Sep-2022 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.65 | 62.37 | 12-Sep-2023 | 60.52 | 59.87 | 1,022.69 | |
| **12-SH** | N/M | 1,081.25 | N/A | 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 | |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 08-Sep-2005 | --- | N/A | 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 | |
| **12-IN** | N/M | 1,081.33 | N/A | 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/A | 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 | --- | < 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* |
| | | | 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 | |
| **12-SS** | N/M | N/M | N/A | 58.00 | 15-Mar-1990 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 15-Aug-1990 | --- | N/A | N/M | |
| | | | | | 15-Oct-1990 | --- | N/A | N/M | |
| | | | | | 15-May-1991 | --- | N/A | N/M | |
| | | | | | 15-Nov-1991 | --- | N/A | N/M | |
| | | | | | 05-May-1992 | --- | N/A | N/M | |
| | | | | | 29-Oct-1992 | --- | N/A | N/M | |
| | | | | | 21-Sep-1994 | --- | N/A | N/M | |
| | | | | | 20-Sep-1995 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-1996 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-1997 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 16-Sep-1998 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 28-Aug-2000 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 06-Sep-2001 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 04-Sep-2002 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 04-Sep-2003 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 09-Sep-2004 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2005 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 06-Sep-2006 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 07-Sep-2007 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 27-Aug-2008 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2009 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Well Dry* |
| | | | | | 23-Aug-2011 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 22-Aug-2012 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.96 | 57.96 | 19-Sep-2013 | 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 | --- | < 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/A | N/A | N/A | *Dry* |
| | | | 1.03 | 57.89 | 12-Sep-2017 | N/A | N/A | N/A | *Dry* |
| | | | 1.03 | 57.89 | 06-Sep-2018 | N/A | N/A | N/A | *Dry* |
| | | | 1.03* | 57.89 | 04-Sep-2019 | N/A | N/A | N/A | *Dry* |
| | | | --- | 57.89 | 08-Sep-2020 | N/A | N/A | N/A | *Dry* |
| | | | 1.03 | 57.89 | 07-Sep-2021 | N/A | N/A | N/A | *Dry* |
| | | | N/M | 57.89 | 12-Sep-2022 | N/A | N/A | N/A | *Dry* |
| | | | N/M | 57.89 | 12-Sep-2023 | N/A | N/A | N/A | *Dry* |
| **13-SH** | N/M | 1,080.59 | N/A | 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/A | 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/A | 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/A | 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 | 4.06 | 13-Sep-2023 | 1.78 | 0.78 | 1,078.60 | |
| **13-IN** | N/M | 1,080.33 | N/A | 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 | |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 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/A | N/M | *Blocked* |
| | | | | | 06-Sep-2001 | --- | N/A | N/M | *Blocked* |
| | | | | | 04-Sep-2002 | --- | N/A | 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/A | N/M | *N/M* |
| | | | | | 07-Sep-2006 | 5.52 | N/M | 1,074.81 | |
| | | | | | 05-Sep-2007 | --- | N/A | 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 | |
| **13-SS** | N/M | 1,080.12 | N/A | 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 | |
| | | | | | 20-Sep-1995 | --- | N/A | N/M | *Damaged* |
| | | | | | 05-Sep-1996 | --- | N/A | N/M | *Damaged* |
| | | | | | 04-Sep-1997 | --- | N/A | 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 | --- | < 0.00 | *Dry* |
| | | | | | 09-Sep-2004 | --- | N/A | 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/A | 62.00 | 10-Sep-2004 | 59.25 | N/M | 1,020.87 | |
| | | | | | 25-Aug-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 08-Sep-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 05-Sep-2007 | 5.27 | N/M | 1,074.85 | *Possible Data Entry Error* |
| | | | | | 04-Sep-2008 | --- | N/A | N/M | *N/M* |
| | | | | | 17-Sep-2009 | 57.07 | N/M | 1,023.05 | |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Well Dry* |
| | | | | | 23-Aug-2011 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2012 | N/M | --- | < 0.00 | *Dry* |
| | | | 1.19 | | 19-Sep-2013 | 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/A | *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 | |
| **14-SH** | N/M | 1,082.36 | N/A | 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 | --- | < 0.00 | *Dry* |
| | | | | | 08-Sep-2005 | --- | N/A | 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* |
| **14-IN** | N/M | 1,082.31 | N/A | 12.80 | 10-Nov-1993 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 21-Sep-1994 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 20-Sep-1995 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-1996 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 03-Sep-1997 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 15-Sep-1998 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 09-Sep-1999 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 28-Aug-2000 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 06-Sep-2001 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-2002 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 04-Sep-2003 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 09-Sep-2004 | --- | N/A | N/M | *N/M* |
| | | | | | 25-Aug-2005 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 08-Sep-2005 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 07-Sep-2006 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-2007 | 13.84 | N/M | 1,068.47 | |
| | | | | | 26-Aug-2008 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2009 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2011 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2012 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.83 | | 19-Sep-2013 | N/M | --- | < 0.00 | *Dry* |
| | 1,086.539 | 1,087.342 | 0.80 | 12.82 | 21-May-2014 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.80 | 12.82 | 09-Sep-2014 | N/M | --- | < 0.00 | *Dry* |
| | | | N/M | 12.82 | 15-Sep-2015 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.80 | 12.82 | 13-Sep-2016 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.80 | 12.82 | 11-Sep-2017 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.80 | 12.82 | 05-Sep-2018 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.93 | 12.82 | 05-Sep-2019 | N/M | --- | < 0.00 | *Dry* |
| | | | --- | 12.82 | 09-Sep-2020 | 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* |
| **14-SS** | N/M | 1,082.38 | N/A | 61.00 | 10-Nov-1993 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 21-Sep-1994 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 20-Sep-1995 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-1996 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 03-Sep-1997 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 15-Sep-1998 | N/M | --- | < 0.00 | *Dry* |

**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 | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | | | 28-Aug-2000 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 06-Sep-2001 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-2002 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 04-Sep-2003 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 09-Sep-2004 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 08-Sep-2005 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 07-Sep-2006 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 05-Sep-2007 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 03-Sep-2008 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 25-Aug-2009 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2010 | N/M | --- | < 0.00 | *Well Dry* |
| | | | | | 23-Aug-2011 | N/M | --- | < 0.00 | *Dry* |
| | | | | | 23-Aug-2012 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.75 | 60.35 | 19-Sep-2013 | N/M | --- | < 0.00 | *Dry* |
| | 1,086.566 | 1,087.344 | 0.78 | 60.95 | 21-May-2014 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.79 | 60.95 | 09-Sep-2014 | N/M | --- | < 0.00 | *Dry* |
| | | | N/M | 60.95* | 15-Sep-2015 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.78* | 60.95* | 13-Sep-2016 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.78 | 60.95 | 11-Sep-2017 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.78 | 60.95 | 05-Sep-2018 | N/M | --- | < 0.00 | *Dry* |
| | | | 0.78 | 60.95 | 05-Sep-2019 | N/M | --- | < 0.00 | *Dry* |
| | | | --- | 60.95 | 09-Sep-2020 | 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* |
| | | | | | | | | | |
| **15-SH** | N/M | 1,082.26 | N/A | 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 | |
| | | | | | 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/A | 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/A | N/M | *Blocked @1.0 m, replaced* |
| | | | | | 22-Aug-2012 | --- | N/A | 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 | |
| | | | | | | | | | |
| **15-IN** | N/M | 1,082.14 | N/A | 9.60 | 10-Nov-1993 | 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/A | 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 | |
| | | | | | | | | | |
| **15-SS** | N/M | 1,082.16 | N/A | 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 | --- | < 0.00 | *Dry* |
| | | | | | 08-Sep-2004 | --- | N/A | N/M | *Replaced by 15(R)SS* |
| | | | 0.74 | 61.10 | 19-Sep-2013 | --- | N/A | < 0.00 | *Dry* |
| | | | | | | | | | |
| **15(R)SS** | N/M | N/M | N/A | 62.50 | 10-Sep-2004 | 60.07 | N/M | 1,022.09 | |
| | | | | | 08-Sep-2005 | --- | N/A | N/M | *N/M* |
| | | | | | 04-Sep-2008 | --- | N/A | N/M | *N/M* |
| | | | | | 17-Sep-2009 | 59.49 | N/M | 1,022.67 | |
| | | | | | 23-Aug-2010 | --- | N/A | N/M | *No water level, could not get tape down* |
| | | | | | 23-Aug-2011 | --- | N/A | N/M | *Dry* |
| | | | | | 22-Aug-2012 | --- | N/A | N/M | *Dry* |
| | | | | 65.27 | 19-Sep-2013 | 59.22 | N/M | 1,022.94 | |
| | | | | | | | | | |
| **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/A | *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 | |
| | | | | | | | | | |
| **16-SH** | N/M | 1,081.40 | N/A | 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/A | 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 | |

| Monitoring Well | Ground Elevation | Top of Casing Elevation | Stickup | Total Depth of Well | Date Measured | Depth To Groundwater | Depth To Groundwater2 | Groundwater Surface Elevation | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | *(masl)* | *(masl)* | *(m)* | *(mBGS)* | *(dd-mmm-yyyy)* | *(mTOC)* | *(mBGS)* | *(masl)* | |
| | | | 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 | |
| **16-IN** | N/M | 1,080.88 | N/A | 9.90 | 21-Sep-1994 | 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 | |
| | | | | | 08-Sep-2005 | --- | N/A | 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 | |
| **17-SH** | N/M | 1,080.97 | N/A | 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/A | 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 | |
| **17-IN** | N/M | 1,080.24 | N/A | 8.38 | 21-Sep-1994 | 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/A | 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.* |

| | |
|---|---|
| N/A | Data not available |
| 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** | 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 |
| | | | | | |
| **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 | |
| | | | | | |
| **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** | 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 |
|---|---|---|---|---|---|
| **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 | |
| **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 | |

**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 | |
| **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 | |
| **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 |

**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 | |
| **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 | |
| **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 | |

**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 | |
| **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 | |

**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 | |
| **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 | |
| **07-SS** | 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 | --- | --- | --- | Not sampled - No bladder pump |

**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 | |
| **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 | |
| **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 | |

**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 |
| **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 | |

**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-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 | --- | --- | --- | Damaged |
| | 29-Sep-2022 | --- | --- | --- | Damaged |
| | 28-Sep-2023 | --- | --- | --- | Damaged |
| **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 | |

**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 | |
| | 28-Sep-2023 | 685 | 7.42 | 10.10 | |
| **12-SS** | 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 |

**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-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 | |
| **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 | |

**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-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 |
| **14-SH** | 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 | |

**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-IN** | 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 |
| **14-SS** | 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 |
| **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 | |

**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 | |
| **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 | --- | --- | --- | |
| **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 | |

**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 |
| **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 | |
| **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 | |
| **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 | |

**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 |
|---|---|---|---|---|---|
| **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 | |

**NOTES:** --- Parameter not measured

**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 | 0.003 | --- | --- | --- | --- | --- | --- | --- |
| | 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** | 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 | --- | --- | --- | --- | --- | --- | --- |
| **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 | 0 | 0 | 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 | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.008 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.006 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.004 | 0.003 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1987 | 01-SS [DECOM] | 601 | 7.57 | --- | --- | --- | --- | --- | 0.7 | 38.8 | --- | --- | --- | 52 | 9.3 | 7.25 | 70 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.009 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.1 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.025 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.017 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.009 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.006 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.04 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.006 | 0.006 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 02-SH [DECOM] | 400 | 7.56 | --- | --- | --- | --- | --- | 0.2 | 4 | --- | --- | --- | 60.9 | 15.4 | 1.23 | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.004 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 0.003 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 02-SH [DECOM] | 385 | 7.34 | --- | --- | --- | --- | --- | 0.4 | 3.3 | --- | --- | --- | 52.7 | 14.9 | 1.01 | 4.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.034 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.023 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.007 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.005 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.003 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.017 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 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** | --- | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | 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 | --- | --- | --- | --- | --- | --- |
| **(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 |

**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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 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 | --- | --- | --- | --- | --- |

**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 | 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)** | 11-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 | --- | --- | --- | --- | --- | --- |

**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 | 649 | 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 | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- |

**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 | --- | 74.3 | 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 | --- | --- | --- | --- | --- |

**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 | --- | --- | --- | --- | 1.02 | --- | --- | --- | < 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 | --- | --- | --- | --- | --- | --- | --- | < 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 | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- |

**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-May-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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.006 | 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 | --- | --- | --- | --- | --- | --- | --- | 0.98 | --- | --- | 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 | --- | --- | 476 | 473 | < 0.1 | 2.2 | 9 | 0.03 | **0.628** | **576** | 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 | --- | --- | **746** | 211 | 60.9 | 1.6 | 11.6 | 927 | < 0.5 | < 0.5 | --- | 15.4 | 16.1 | --- | 1.05 | < 0.001 | --- | < 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 | --- | --- | 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 | --- | --- | --- | --- | --- |

**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 | --- | --- | 417 | 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 | --- | --- | --- | --- | --- | --- |

**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 | 752 | 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** | **509** | 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 | < 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 | < 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 | < 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 | < 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 | 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 | --- | --- | 748 | 495 | --- | 198 | 13.2 | 0.043 | **0.334** | **820** | 203 | 58.2 | 

**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[13]** | **0.0019** | --- | --- |
| **07-IN** | 18-Feb-1985 | 07-IN | --- | --- | --- | --- | 330.1 | 368 | --- | --- | --- | --- | --- | 487 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 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 | --- | 0.88 | 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 | --- | --- | --- | --- | --- | --- |
| **07-SS** | 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 | 33.3 | 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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**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** | --- | --- | --- | --- | --- | --- | --- | **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 | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- |

**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 | **3.52** | --- | --- | --- | --- | --- | --- | --- |
| | 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 | --- | --- | --- | --- | --- | --- |
| **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[13]** | **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[7] | --- | --- | 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 | **0.801** | 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 | --- | --- | --- | --- | --- | --- |

**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** | --- | --- | --- | --- | --- | --- | --- | **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-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 | --- | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- |

**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 | --- | < 5.0 | --- | --- | < 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 | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- |

**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 | 0.91 | --- | --- | --- | < 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 | 33.3 | 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 | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **14-SH** | 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 | 27.6 | 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.

**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** | --- | --- |
| **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[5] | --- | --- | 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** | 369 | 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 | 280 | 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 | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- |
| **15-SS** | 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** | 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** | --- | --- | --- | **1.5** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **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** | --- | --- | --- | --- | --- | --- | --- | **1.5** | --- | --- | --- | --- | **0.0050** | **0.0050** | **0.0050** | **Variable** | **3** | --- | --- | --- | **Variable [13]** | **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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | 36.9 | < 0.030 | < 0.0020 | 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 | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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

**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-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 | 46.9 | < 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 | --- | --- | --- | --- | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- |
| **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 | **8.11** | **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 | 

**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** | --- | --- |
| **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 | --- | --- | --- | --- | --- | --- |
| **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 | 0.0056 | <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 | 0.000025 | <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 | 17 | <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 | --- | --- | --- | --- | --- | --- |

**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 (August, 2022), 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

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 Har* | 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 (m* | 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 |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | 0.1 | --- | --- | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | --- |
| **Canadian Drinking 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 | --- | --- | 7.0 | --- | --- | --- | 0.02 | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | 0.006 | 0.01 | 1 | --- | 5 | 0.005 | --- | --- | 1 | 0.01 | --- | 0.001 | --- | --- | | 0.05 | | --- | | --- | --- | --- | 0.02 | --- | 5 | --- |
| **Alberta Tier 2 Aquatic 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-SH [Decommissione** | 15-May-1985 | 01-SH [DECOM] | --- | 0.0002 | 0.0014 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.008 | < 0.002 | --- | < 0.0001 | --- | 0.035 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1985 | 01-SH [DECOM] | --- | 0.0003 | 0.0015 | 0.37 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 01-SH [DECOM] | --- | 0.0008 | 0.0003 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | 0.018 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1986 | 01-SH [DECOM] | --- | 0.0004 | 0.0015 | 0.24 | --- | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | 0.02 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 01-SH [DECOM] | --- | 0.0005 | 0.0029 | 0.27 | --- | --- | --- | 0.005 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | 0.041 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 01-SH [DECOM] | --- | 0.0007 | 0.0019 | 0.25 | --- | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | 0.056 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 01-SH [DECOM] | --- | 0.0006 | 0.0012 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | 0.009 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 01-SH [DECOM] | --- | 0.0002 | 0.002 | 0.24 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.0118 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 01-SH [DECOM] | --- | 0.0002 | 0.0006 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | 0.003 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 01-SH [DECOM] | --- | 0.0002 | 0.0003 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.007 | < 0.002 | --- | < 0.00005 | --- | 0.005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 01-SH [DECOM] | --- | 0.0002 | 0.0015 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.007 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 01-SH [DECOM] | --- | 0.0002 | 0.0005 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 01-SH [DECOM] | --- | 0.0002 | 0.0006 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 01-SH [DECOM] | --- | 0.0002 | 0.13 | 0.28 | 0.002 | --- | < 0.001 | 0.002 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | 0.014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 01-SH [DECOM] | --- | 0.0006 | 0.0027 | 0.26 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | 0.01 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 01-SH [DECOM] | --- | < 0.0002 | 0.001 | 0.18 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.001 | 0.007 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 01-SH [DECOM] | --- | < 0.0002 | 0.0011 | 0.36 | 0.001 | --- | 0.003 | 0.006 | < 0.003 | 0.002 | < 0.002 | --- | < 0.00005 | < 0.003 | 0.015 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **01A-SH** | 13-Nov-1993 | 01A-SH | --- | < 0.0002 | 0.0003 | 0.32 | < 0.001 | --- | < 0.003 | 0.002 | 0.006 | 0.102 | < 0.002 | --- | < 0.00005 | 0.008 | 0.16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 01A-SH | --- | < 0.0002 | < 0.0002 | 0.12 | 0.001 | --- | < 0.003 | < 0.002 | 0.006 | 0.006 | 0.002 | --- | < 0.00005 | < 0.003 | 0.016 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.005 | 0.072 | --- |
| | 22-Sep-1994 | 01A-SH | --- | 0.0004 | 0.0006 | 0.49 | < 0.001 | --- | < 0.003 | 0.004 | 0.008 | 0.005 | 0.001 | --- | 0.00005 | 0.012 | 0.06 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.014 | --- |
| | 02-Nov-1994 | 01A-SH | --- | 0.0008 | 0.0014 | 0.49 | 0.002 | --- | < 0.003 | < 0.002 | 0.003 | 0.003 | < 0.001 | --- | < 0.00005 | 0.009 | 0.065 | --- | < 0.0002 | --- | 0.002 | --- | < 0.001 | --- | --- | --- | 0.005 | 0.099 | --- |
| | 28-Sep-1995 | 01A-SH | --- | 0.0002 | 0.0006 | 0.06 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.001 | 0.0018 | --- | < 0.00005 | < 0.003 | 0.014 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.014 | --- |
| | 04-Sep-1996 | 01A-SH | --- | < 0.0002 | 0.0002 | 0.06 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | 0.0001 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.005 | 0.009 | --- |
| | 05-Sep-1997 | 01A-SH | --- | < 0.0002 | 0.0002 | 0.04 | < 0.001 | --- | < 0.0002 | 0.005 | < 0.003 | 0.005 | 0.0006 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.008 | 0.021 | --- |
| | 16-Sep-1998 | 01A-SH | --- | < 0.0002 | < 0.0002 | 0.06 | 0.004 | --- | < 0.0002 | 0.013 | 0.009 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.018 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.035 | --- |
| | 09-Sep-1999 | 01A-SH | --- | < 0.0002 | < 0.0002 | 0.06 | 0.001 | --- | < 0.0002 | 0.017 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.011 | --- |
| | 06-Sep-2000 | 01A-SH | --- | < 0.0002 | 0.0003 | 0.157 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0007 | 0.0004 | 0.0005 | --- | < 0.00005 | 0.0003 | 0.0033 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0054 | --- |
| | 07-Sep-2001 | 01A-SH | --- | < 0.0002 | 0.0002 | 0.119 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0008 | 0.0013 | 0.0004 | 0.009 | < 0.00005 | 0.0005 | 0.0041 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0208 | --- |
| | 05-Sep-2002 | 01A-SH | 0.184 | 0.0002 | 0.0003 | 0.0784 | < 0.0002 | 0.01 | < 0.0002 | 0.002 | 0.0012 | 0.0014 | 0.0004 | --- | < 0.00005 | < 0.0002 | 0.0042 | --- | < 0.0002 | 13.1 | < 0.0001 | 0.064 | < 0.0002 | < 0.001 | 0.004 | < 0.0004 | < 0.001 | 0.0079 | 0.0005 |
| | 11-Sep-2003 | 01A-SH | 0.079 | < 0.0002 | < 0.0002 | 0.0929 | < 0.0002 | 0.01 | < 0.0002 | < 0.001 | 0.0012 | 0.0007 | < 0.0003 | < 0.004 | < 0.00005 | 0.0022 | 0.0011 | < 0.1 | 0.0003 | 11.4 | < 0.0001 | 0.17 | < 0.0002 | < 0.001 | 0.002 | 0.0005 | < 0.001 | 0.0079 | 0.0012 |
| | 08-Sep-2004 | 01A-SH | 0.105 | < 0.0002 | 0.0003 | 0.0741 | 0.0008 | 0.45 | < 0.0002 | 0.01 | 0.0008 | 0.001 | 0.0003 | 0.018 | < 0.00005 | < 0.0002 | 0.0031 | < 0.1 | 0.0004 | 3.26 | < 0.0001 | 0.59 | < 0.0002 | < 0.001 | 0.01 | 0.0028 | 0.001 | 0.0039 | 0.0011 |
| | 07-Sep-2005 | 01A-SH | 0.016 | < 0.0002 | 0.0004 | 0.13 | < 0.0002 | 0.02 | < 0.0002 | 0.014 | 0.0011 | 0.0008 | < 0.0003 | 0.014 | < 0.00005 | 0.0002 | 0.0021 | < 0.1 | 0.0003 | 9.49 | < 0.0001 | 0.2 | < 0.0002 | < 0.001 | 0.001 | 0.0004 | 0.004 | 0.0041 | 0.0007 |
| | 07-Sep-2006 | 01A-SH | 0.071 | < 0.0002 | < 0.0002 | 0.088 | < 0.0002 | 0.02 | < 0.0002 | < 0.001 | 0.0011 | 0.0006 | < 0.0003 | < 0.004 | < 0.00005 | < 0.0002 | 0.0019 | < 0.1 | < 0.0002 | 11.1 | < 0.0001 | 0.11 | < 0.0002 | < 0.001 | 0.004 | 0.0004 | < 0.001 | 0.0062 | 0.0007 |
| | 06-Sep-2007 | 01A-SH | 0.028 | < 0.0002 | < 0.0002 | 0.17 | < 0.001 | 0.04 | 0.00003 | < 0.001 | 0.0023 | 0.0023 | < 0.0002 | < 0.02 | < 0.00005 | 0.0002 | 0.0091 | < 0.1 | < 0.0002 | 5.4 | < 0.0001 | 0.24 | < 0.0002 | < 0.001 | 0.012 | 0.0014 | < 0.001 | 0.01 | --- |
| | 04-Sep-2008 | 01A-SH | 0.14 | < 0.0004 | 0.0004 | 0.08 | < 0.001 | < 0.05 | < 0.00002 | < 0.005 | < 0.002 | < 0.001 | < 0.0001 | < 0.003 | < 0.00010 | < 0.005 | 0.003 | --- | 0.0005 | --- | < 0.0001 | --- | 0.0001 | < 0.05 | 0.003 | 0.0004 | 0.001 | 0.002 | --- |
| | 10-Sep-2009 | 01A-SH | 0.106 | < 0.00040 | < 0.00040 | 0.0686 | < 0.0010 | < 0.050 | 0.000012 | < 0.0050 | < 0.0020 | < 0.0010 | 0.0002 | < 0.010 | < 0.000020 | < 0.0050 | 0.0025 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0037 | 0.00049 | < 0.0010 | 0.0052 | --- |
| | 09-Sep-2010 | 01A SH | 0.0938 | < 0.00040 | < 0.00040 | 0.0839 | < 0.0010 | < 0.050 | 0.000167 | < 0.0010 | < 0.0020 | 0.0012 | 0.00021 | < 0.010 | < 0.000020 | < 0.0050 | 0.003 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0036 | 0.00051 | < 0.0010 | 0.0064 | --- |
| | 08-Sep-2011 | 01A-SH | 0.122 | < 0.00040 | 0.00049 | 0.0893 | < 0.0010 | < 0.050 | 0.000017 | < 0.0010 | < 0.0020 | 0.0014 | 0.00013 | < 0.010 | < 0.000020 | < 0.0050 | 0.0021 | --- | < 0.00040 | 10.9 | < 0.000020 | --- | < 0.00010 | < 0.050 | 0.0025 | 0.00046 | < 0.0010 | 0.0064 | --- |
| | 06-Sep-2012 | 01A-SH | 0.149 | < 0.00040 | 0.00058 | 0.0807 | < 0.0010 | < 0.050 | < 0.000010 | 0.0012 | < 0.0020 | < 0.0010 | 0.00015 | < 0.010 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 12.6 | < 0.000020 | --- | < 0.00010 | < 0.050 | 0.0028 | 0.00048 | < 0.0010 | 0.0115 | --- |
| | 26-Sep-2013 | 01A-SH | 0.181 | < 0.00040 | 0.00073 | 0.0808 | < 0.0010 | < 0.050 | < 0.000010 | 0.0010 | < 0.0020 | < 0.0010 | 0.00018 | < 0.010 | < 0.000020 | < 0.0050 | < 0.0050 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | 0.0031 | 0.00102 | 0.0010 | 0.0069 | --- |
| | 17-Sep-2014 | 01A-SH | 0.256 | < 0.00010 | 0.00049 | 0.0658 | < 0.00050 | 0.010 | < 0.000010 | 0.00095 | 0.00078 | 0.00024 | 0.000123 | 0.0033 | < 0.0000050 | < 0.000050 | 0.00308 | < 0.30 | 0.00017 | 14.1 | < 0.000010 | 0.0587 | < 0.000050 | < 0.00010 | 0.00342 | 0.000923 | 0.00065 | 0.0052 | --- |
| | 29-Sep-2015 | 01A-SH | 0.502 | <0.00010 | 0.00046 | 0.0513 | --- | 0.010 | 0.0000360 | 0.00230 | --- | 0.00087 | 0.000465 | --- | <0.0000050 | --- | 0.00377 | --- | 0.000107 | --- | <0.000010 | --- | --- | --- | --- | 0.000964 | --- | 0.0133 | --- |
| | 27-Sep-2016 | 01A-SH | 0.198 | <0.00010 | 0.00046 | 0.0728 | --- | 0.016 | 0.0000070 | 0.00090 | --- | <0.00020 | 0.000077 | --- | <0.0000050 | --- | 0.00194 | --- | 0.000155 | --- | <0.000010 | --- | --- | --- | --- | 0.000889 | --- | 0.0031 | --- |
| | 27-Sep-2017 | 01A-SH | 0.160 | <0.00050 | <0.00050 | 0.0722 | --- | <0.050 | <0.000025 | 0.00084 | --- | <0.0010 | <0.00025 | --- | <0.0000050 | --- | 0.00260 | --- | <0.00025 | --- | <0.000050 | --- | --- | --- | --- | 0.000782 | --- | <0.0050 | --- |
| | 18-Sep-2018 | 01A-SH | 0.224 | <0.00050 | <0.00050 | 0.0660 | --- | <0.050 | <0.000025 | 0.00203 | --- | <0.0010 | <0.00025 | --- | <0.0000050 | --- | 0.00310 | --- | <0.00025 | --- | <0.000050 | --- | --- | --- | --- | 0.000738 | --- | 0.0050 | --- |
| | 17-Sep-2019 | 01A-SH | 0.161 | <0.00010 | 0.00046 | 0.1440 | --- | 0.013 | <0.0000050 | 0.00080 | --- | 0.00168 | 0.000148 | --- | <0.0000050 | --- | 0.00204 | --- | 0.000385 | --- | <0.000010 | --- | --- | --- | --- | 0.000836 | --- | 0.0030 | --- |
| | 21-Sep-2020 | 01A-SH | 0.279 | <0.00010 | 0.00047 | 0.0647 | <0.00010 | <0.010 | <0.0000050 | 0.00061 | 0.00076 | 0.00229 | 0.000193 | 0.0034 | <0.0000050 | 0.000119 | 0.00238 | --- | 0.000129 | --- | <0.000010 | --- | <0.000010 | <0.00010 | 0.00187 | 0.000792 | <0.00050 | 0.0050 | --- |
| | 22-Sep-2021 | 01A-SH | 0.215 | <0.00010 | 0.0005 | 0.0521 | <0.00010 | <0.010 | <0.0000050 | 0.00093 | 0.00076 | 0.00042 | 0.000052 | 0.0028 | <0.0000050 | 0.000086 | 0.00273 | --- | 0.000127 | --- | <0.000010 | --- | <0.000010 | <0.00010 | 0.00313 | 0.000725 | 0.00054 | 0.0036 | --- |
| | 29-Sep-2022 | 01A-SH | 0.283 | <0.00010 | 0.00065 | 0.0498 | --- | <0.010 | <0.0000050 | 0.00062 | --- | 0.00038 | 0.000066 | --- | <0.0000050 | --- | 0.00227 | --- | 0.000126 | --- | <0.000010 | --- | --- | --- | --- | 0.000887 | --- | 0.0038 | --- |
| | 28-Sep-2023 | 01A-SH | 0.175 | <0.00010 | 0.00047 | 0.0607 | --- | <0.010 | 0.0000068 | 0.00284 | --- | 0.00082 | 0.000106 | --- | <0.0000050 | --- | 0.00405 | --- | 0.000133 | --- | <0.000010 | --- | --- | --- | --- | 0.000499 | --- | 0.0063 | --- |
| **01-IN [Decommissioned** | 15-Feb-1985 | 01-IN [DECOM] | --- | 0.0008 | 0.0006 | --- | < 0.001 | --- | < 0.001 | 0.004 | --- | 0.018 | 0.004 | --- | < 0.0001 | --- | 0.05 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1985 | 01-IN [DECOM] | --- | 0.0002 | 0.0005 | 0.27 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.009 | < 0.002 | --- | < 0.0001 | --- | 0.038 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 01-IN [DECOM] | --- | 0.0002 | 0.0005 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | 0.003 | --- | < 0.0001 | --- | 0.13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1986 | 01-IN [DECOM] | --- | --- | 0.0005 | 0.1 | --- | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | 0.02 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 01-IN [DECOM] | --- | 0.0005 | 0.0006 | 0.12 | --- | --- | --- | < 0.001 | --- | 0.007 | 0.003 | --- | < 0.0001 | --- | 0.015 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 01-IN [DECOM] | --- | 0.0005 | 0.0004 | 0.13 | --- | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | 0.012 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 01-IN [DECOM] | --- | 0.0004 | 0.0004 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | 0.014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 01-IN [DECOM] | --- | 0.0002 | 0.0007 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | 0.012 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 01-IN [DECOM] | --- | 0.0002 | 0.0004 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | 0.012 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1988 | 01-IN [DECOM] | --- | 0.0002 | 0.0002 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | --- | --- | 0.007 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 01-IN [DECOM] | --- | 0.0002 | 0.0006 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 01-IN [DECOM] | --- | 0.0002 | 0.0003 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | 0.005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 01-IN [DECOM] | --- | 0.0003 | 0.0002 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 01-IN [DECOM] | --- | 0.0002 | 0.0006 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 01-IN [DECOM] | --- | 0.0002 | 0.0002 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.009 | < 0.002 | --- | < 0.00005 | --- | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 01-IN [DECOM] | --- | 0.0046 | 0.0004 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | 0.00092 | --- | 0.006 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **01A-IN** | 13-Nov-1993 | 01A-IN | --- | 0.001 | 0.0004 | 0.51 | 0.001 | --- | < 0.003 | 0.003 | < 0.003 | 0.109 | < 0.002 | --- | < 0.00005 | 0.018 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 01A-IN | --- | < 0.0002 | 0.0009 | 0.11 | 0.001 | --- | < 0.003 | 0.008 | 0.011 | 0.002 | 0.001 | --- | 0.00005 | < 0.003 | 0.036 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.021 | --- |
| | 28-Sep-1995 | 01A-IN | --- | < 0.0002 | 0.0004 | 0.53 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.006 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.015 | 0.011 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.005 | --- |
| | 04-Sep-1996 | 01A-IN | --- | 0.0003 | 0.0006 | 0.47 | < 0.001 | --- | 0.0044 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.013 | 0.026 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.005 | --- |
| | 09-Sep-1999 | 01A-IN | --- | 0.0021 | **0.050** | 0.67 | < 0.001 | --- | < 0.0002 | 0.032 | < 0.003 | 0.005 | 0.0003 | --- | < 0.00005 | 0.012 | 0.02 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | 0.005 | 0.01 | --- |
| | 06-Sep-2000 | 01A-IN | --- | < 0.0002 | 0.0019 | 0.485 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0013 | 0.0003 | < 0.0003 | --- | < 0.00005 | 0.0062 | 0.0063 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0033 | --- |
| | 07-Sep-2001 | 01A-IN | --- | < 0.0002 | **0.0125** | 0.525 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0017 | 0.0006 | < 0.0003 | 0.018 | < 0.00005 | 0.007 | 0.0098 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0069 | --- |
| | 05-Sep-2002 | 01A-IN | 0.006 | < 0.0002 | **0.0103** | 0.411 | < 0.0002 | 0.11 | < 0.0002 | 0.047 | 0.0015 | 0.0019 | < 0.0003 | --- | < 0.00005 | 0.0066 | 0.0123 | 0.2 | 0.0002 | 7.95 | < 0.0001 | 0.606 | < 0.0002 | < 0.001 | 0.002 | 0.0006 | 0.013 | 0.0059 | 0.0004 |
| | 03-Sep-2003 | 01A-IN | 0.005 | < 0.0002 | **0.0335** | 0.565 | < 0.0002 | 0.14 | < 0.0002 | 0.006 | 0.0019 | 0.0008 | 0.0003 | < 0.004 | < 0.00005 | 0.0246 | 0.0051 | 0.3 | < 0.0002 | 9.79 | 0.0009 | 0.73 | < 0.0002 | < 0.001 | < 0.001 | < 0.0004 | < 0.001 | 0.0081 | 0.0009 |
| | 08-Sep-2004 | 01A-IN | 0.057 | < 0.0002 | **0.0384** | 0.694 | 0.0003 | 0.15 | < 0.0002 | 0.002 | 0.001 | 0.0013 | < 0.0003 | 0.014 | < 0.00005 | 0.0057 | 0.0071 | 0.5 | < 0.0002 | 8.6 | < 0.0001 | 0.71 | < 0.0002 | < 0.001 | 0.018 | < 0.0004 | < 0.001 | 0.0067 | 0.0008 |
| | 07-Sep-2005 | 01A-IN | 0.001 | < 0.0002 | **0.0101** | 0.505 | < 0.0002 | 0.11 | < 0.0002 | 0.001 | 0.0011 | 0.0015 | < 0.0003 | 0.021 | < 0.00005 | 0.0047 | 0.0046 | 0.3 | 0.0002 | 8.3 | < 0.0001 | 0.72 | < 0.0002 | < 0.001 | 0.002 | < 0.0004 | < 0.001 | 0.0056 | 0.0009 |
| | 07-Sep-2006 | 01A-IN | 0.003 | < 0.0002 | **0.049** | 0.575 | < 0.0002 | 0.12 | < 0.0002 | 0.001 | 0.0018 | 0.0025 | < 0.0003 | 0.022 | < 0.00005 | 0.0036 | 0.0048 | 0.6 | < 0.0002 | 10.2 | < 0.0001 | 0.75 | < 0.0002 | < 0.001 | 0.004 | < 0.0004 | < 0.001 | 0.0078 | 0.0007 |
| | 04-Dec-2006 | 01A-IN | < 0.04 | 0.0004 | **0.095** | 0.71 | < 0.001 | 0.12 | 0.00006 | < 0.01 | 0.0018 | 0.0018 | < 0.0002 | < 0.02 | < 0.00005 | 0.0039 | 0.0082 | 1.2 | < 0.0002 | 10.7 | < 0.0001 | 0.75 | < 0.0002 | < 0.001 | 0.01 | < 0.0001 | < 0.001 | 0.015 | --- |
| | 06-Sep-2007 | 01A-IN | 0.006 | < 0.0002 | **0.0263** | 0.35 | < 0.001 | 0.11 | 0.00003 | < 0.001 | 0.0034 | 0.003 | < 0.0002 | < 0.02 | < 0.00005 | 0.0024 | 0.0118 | < 0.1 | < 0.0002 | 8.8 | < 0.0001 | 0.62 | < 0.0002 | < 0.001 | 0.016 | < 0.0001 | < 0.001 | 0.014 | --- |
| | 04-Sep-2008 | 01A-IN | < 0.01 | < 0.0004 | **0.013** | 0.503 | < 0.001 | 0.13 | < 0.00005 | < 0.005 | < 0.002 | 0.003 | < 0.0001 | 0.022 | < 0.00010 | < 0.005 | 0.005 | --- | 0.0008 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | 0.001 | < 0.0001 | 0.001 | 0.006 | --- |
| | 10-Sep-2009 | 01A-IN | < 0.0050 | < 0.00040 | **0.0297** | 0.497 | < 0.0010 | 0.126 | 0.000013 | < 0.0050 | < 0.0020 | < 0.0010 | 0.00013 | 0.023 | < 0.000020 | < 0.0050 | 0.0055 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0024 | < 0.00010 | < 0.0010 | 0.0078 | --- |
| | 09-Sep-2010 | 01A IN | < 0.0050 | < 0.00040 | **0.0174** | 0.446 | < 0.0010 | 0.133 | 0.000011 | < 0.0010 | < 0.0020 | 0.0012 | < 0.00010 | 0.025 | < 0.000020 | < 0.0050 | 0.0045 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0025 | 0.00013 | < 0.0010 | 0.0041 | --- |
| | 08-Sep-2011 | 01A-IN | < 0.0050 | < 0.00040 | 0.00151 | 0.377 | < 0.0010 | 0.11 | 0.000013 | < 0.0010 | < 0.0020 | 0.0016 | < 0.00010 | 0.026 | < 0.000020 | < 0.0050 | 0.0028 | --- | < 0.00040 | 11.8 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00031 | < 0.0010 | 0.0051 | --- |
| | 06-Sep-2012 | 01A-IN | < 0.0050 | < 0.00040 | 0.00749 | 0.433 | < 0.0010 | 0.126 | < 0.000010 | < 0.0010 | < 0.0020 | 0.0013 | < 0.00010 | 0.029 | < 0.000020 | < 0.0050 | 0.0022 | --- | < 0.00040 | 12 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00026 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | 01A-IN | 0.0053 | < 0.00040 | **0.0408** | 0.697 | < 0.0010 | 0.123 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.023 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | < 0.00010 | < 0.0010 | 0.0048 | --- |
| | 17-Sep-2014 | 01A-IN | 0.0043 | < 0.00010 | **0.0298** | 0.711 | < 0.00050 | 0.127 | < 0.000010 | 0.00038 | 0.00031 | < 0.00010 | < 0.000050 | 0.024 | < 0.0000050 | 0.000646 | 0.00052 | 1.31 | < 0.00010 | 13.1 | < 0.0000010 | 0.678 | < 0.0000050 | < 0.00010 | 0.00064 | 0.000041 | 0.00065 | 0.0017 | --- |
| | 29-Sep-2015 | 01A-IN | 0.0015 | <0.00010 | 0.00142 | 0.334 | --- | 0.088 | <0.0000050 | 0.00031 | --- | 0.00039 | <0.000050 | --- | 0.0000056 | --- | 0.00121 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000101 | --- | 0.0034 | --- |
| | 27-Sep-2016 | 01A-IN | 0.0021 | <0.00010 | 0.00528 | 0.452 | --- | 0.122 | <0.0000050 | 0.00034 | --- | 0.00027 | <0.000050 | --- | <0.0000050 | --- | 0.00079 | --- | 0.000065 | --- | <0.000010 | --- | --- | --- | --- | 0.000071 | --- | 0.0013 | --- |
| | 27-Sep-2017 | 01A-IN | 0.0012 | <0.00010 | 0.00087 | 0.423 | --- | 0.115 | 0.0000064 | 0.00034 | --- | 0.00054 | <0.000050 | --- | <0.0000050 | --- | 0.00107 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000087 | --- | 0.0016 | --- |
| | 18-Sep-2018 | 01A-IN | 0.0020 | <0.00010 | 0.00173 | 0.380 | --- | 0.123 | <0.0000050 | 0.00041 | --- | 0.00043 | <0.000050 | --- | 0.0000118 | --- | 0.00078 | --- | 0.000062 | --- | <0.000010 | --- | --- | --- | --- | 0.000146 | --- | 0.0014 | --- |
| | 17-Sep-2019 | 01A-IN | 0.0056 | <0.00010 | **0.018** | 0.731 | --- | 0.116 | <0.0000050 | 0.00061 | --- | 0.00053 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | 0.00013 | --- | <0.000010 | --- | --- | --- | --- | 0.000134 | --- | <0.0010 | --- |
| | 21-Sep-2020 | 01A-IN | 0.0039 | <0.00010 | 0.0194 | 0.619 | <0.00010 | 0.110 | <0.0000050 | 0.00054 | <0.00010 | <0.00020 | <0.000050 | 0.0234 | <0.0000050 | 0.000377 | <0.00050 | --- | 0.000072 | --- | <0.000010 | --- | <0.000010 | <0.00010 | 0.00054 | 0.000068 | 0.00071 | <0.0010 | --- |
| | 22-Sep-2021 | 01A-IN | 0.0026 | <0.00010 | 0.00441 | 0.421 | <0.00010 | 0.117 | <0.0000050 | 0.0005 | <0.00010 | 0.00097 | <0.000050 | 0.0261 | <0.0000050 | 0.000297 | <0.00050 | --- | 0.000052 | --- | <0.000010 | --- | <0.000010 | <0.00010 | 0.00036 | 0.00012 | <0.00050 | 0.0013 | --- |
| | 29-Sep-2022 | 01A-IN | 0.0010 | <0.00010 | 0.00380 | 0.379 | --- | 0.112 | <0.0000050 | <0.00050 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | 0.000070 | --- | <0.000010 | --- | --- | --- | --- | 0.000203 | --- | <0.0010 | --- |
| | 28-Sep-2023 | 01A-IN | 0.0416 | <0.00010 | 0.00047 | 0.266 | --- | 0.088 | <0.0000050 | 0.00204 | --- | 0.0005 | <0.000050 | --- | <0.0000050 | --- | 0.0018 | --- | 0.000061 | --- | <0.000010 | --- | --- | --- | --- | 0.000337 | --- | 0.0027 | --- |
| **01-SS [Decommissione** | 15-Jun-1985 | 01-SS [DECOM] | --- | 0.0059 | **0.07** | 0.1 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | 0.037 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jul-1985 | 01-SS [DECOM] | --- | **0.0077** | **0.022** | --- | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.019 | 0.003 | --- | < 0.0001 | --- | 0.041 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 01-SS [DECOM] | --- | 0.0024 | **0.057** | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | 0.019 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1986 | 01-SS [DECOM] | --- | 0.0049 | **0.014** | 0.08 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | 0.028 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 01-SS [DECOM] | --- | 0.0022 | **0.056** | 0.08 | --- | --- | --- | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | 0.032 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 01-SS [DECOM] | --- | 0.0022 | **0.085** | 0.08 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | 0.025 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1987 | 01-SS [DECOM] | --- | 0.0048 | **0.09** | 0.09 | < 0.001 | --- | < 0.001 | 0.002 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | 0.039 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 01-SS [DECOM] | --- | 0.0044 | **0.099** | 0.08 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.03 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 01-SS [DECOM] | --- | 0.0051 | **0.099** | 0.09 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | 0.032 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 01-SS [DECOM] | --- | 0.0003 | **0.107** | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | 0.015 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 15-May-1988 | 01-SS DUP | --- | 0.0058 | **0.096** | 0.09 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | 0.005 | --- | < 0.00005 | --- | 0.018 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 01-SS [DECOM] | --- | 0.0025 | **0.09** | 0.08 | < 0.001 | --- | < 0.001 | 0.005 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.02 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 01-SS [DECOM] | --- | 0.0008 | **0.11** | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.015 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 01-SS [DECOM] | --- | 0.0007 | **0.05** | 0.08 | < 0.001 | --- | < 0.001 | 0.003 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.016 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 01-SS [DECOM] | --- | **0.018** | **0.062** | 0.08 | 0.002 | --- | < 0.001 | 0.003 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 01-SS [DECOM] | --- | **0.0082** | **0.07** | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | 0.005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **02-SH [Decommissione** | 15-May-1985 | 02-SH [DECOM] | --- | 0.0019 | 0.0044 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 02-SH [DECOM] | --- | 0.0002 | 0.0008 | --- | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 02-SH [DECOM] | --- | 0.0002 | 0.0028 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 02-SH [DECOM] | --- | 0.0005 | 0.0039 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 02-SH [DECOM] | --- | 0.0002 | 0.0037 | 0.26 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 02-SH [DECOM] | --- | 0.0002 | 0.0028 | 0.23 | --- | --- | --- | < 0.001 | --- | < 0.001 | 0.005 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 02-SH [DECOM] | --- | 0.0003 | 0.0057 | 0.24 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 02-SH [DECOM] | --- | 0.0002 | 0.006 | 0.23 | --- | --- | < 0.001 | 0.003 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 02-SH [DECOM] | --- | 0.0006 | 0.0055 | 0.22 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 02-SH [DECOM] | --- | 0.0004 | 0.0048 | 0.24 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 02-SH [DECOM] | --- | 0.0002 | 0.0064 | 0.23 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 02-SH [DECOM] | --- | 0.0002 | 0.0019 | 0.24 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 02-SH [DECOM] | --- | 0.0002 | 0.0051 | 0.23 | < 0.001 | --- | < 0.001 | 0.007 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 02-SH [DECOM] | --- | 0.0002 | 0.0039 | 0.24 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 02-SH [DECOM] | --- | 0.0002 | 0.0024 | 0.23 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 02-SH [DECOM] | --- | 0.0002 | 0.0019 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | 0.003 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 02-SH [DECOM] | --- | 0.0002 | **0.025** | 0.23 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 02-SH [DECOM] | --- | 0.0002 | 0.0041 | 0.25 | < 0.001 | --- | < 0.001 | 0.003 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 02-SH [DECOM] | --- | 0.001 | 0.0036 | 0.23 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 02-SH [DECOM] | --- | 0.002 | 0.001 | 0.24 | < 0.001 | --- | < 0.001 | 0.005 | < 0.001 | 0.003 | < 0.002 | --- | < 0.0001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 02-SH [DECOM] | --- | < 0.0002 | 0.0006 | 0.15 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 02-SH [DECOM] | --- | < 0.0002 | 0.0009 | 0.25 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-May-1993 | 02-SH [DECOM] | --- | < 0.0002 | 0.0008 | 0.24 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| Canadian Drinking Water AO Guidelines 2022[1] | | | 0.1 | --- | --- | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | --- |
| Canadian Drinking 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 | --- | --- | 7.0 | --- | --- | --- | 0.02 | --- | --- | --- |
| Alberta Tier 2 Potable Groundwater Guideline[3] | | | --- | 0.006 | 0.01 | 1 | --- | 5 | 0.005 | --- | --- | 1 | 0.01 | --- | 0.001 | --- | --- | | 0.05 | | --- | | --- | --- | --- | 0.02 | --- | 5 | --- |
| Alberta Tier 2 Aquatic 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 | --- |
| 02-IN [Decommissioned] | 15-May-1985 | 02-IN [DECOM] | --- | 0.0007 | 0.0009 | --- | < 0.001 | --- | < 0.001 | 0.002 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 02-IN [DECOM] | --- | 0.0005 | 0.0009 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 02-IN [DECOM] | --- | 0.0004 | 0.0038 | --- | < 0.001 | --- | < 0.001 | 0.004 | --- | 0.002 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 02-IN [DECOM] | --- | 0.0023 | 0.0044 | 0.15 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 02-IN [DECOM] | --- | 0.0002 | 0.0031 | 0.13 | --- | --- | --- | < 0.001 | --- | 0.002 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 02-IN [Decommissioned] | 15-Oct-1986 | 02-IN [DECOM] | --- | 0.0004 | 0.0041 | 0.12 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 02-IN [DECOM] | --- | 0.0002 | 0.0079 | 0.12 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 02-IN [DECOM] | --- | 0.001 | 0.0072 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 02-IN [DECOM] | --- | 0.0005 | 0.0074 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 02-IN [DECOM] | --- | 0.0002 | 0.0067 | 0.12 | < 0.001 | --- | < 0.001 | 0.003 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 02-IN [DECOM] | --- | 0.0002 | 0.0071 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 02-IN [DECOM] | --- | 0.0011 | 0.0081 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 02-IN [DECOM] | --- | 0.0002 | 0.0021 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 02-IN [DECOM] | --- | 0.0002 | 0.0044 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 02-IN [DECOM] | --- | 0.0002 | 0.0018 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 02-IN [DECOM] | --- | 0.0002 | **0.01** | 0.12 | < 0.001 | --- | < 0.001 | 0.003 | --- | < 0.001 | 0.004 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 02-IN [DECOM] | --- | 0.0002 | 0.0034 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 02-IN [DECOM] | --- | 0.0052 | 0.0078 | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 03-SH | 15-May-1985 | 03-SH | --- | 0.001 | 0.0002 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 03-SH | --- | 0.0002 | **0.014** | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.008 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 03-SH | --- | 0.0002 | 0.0004 | 0.27 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.007 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 03-SH | --- | 0.0002 | 0.0002 | 0.26 | --- | --- | --- | < 0.001 | --- | 0.006 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 03-SH | --- | 0.0003 | 0.0005 | 0.26 | --- | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 03-SH | --- | 0.0002 | 0.0004 | 0.25 | --- | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 03-SH | --- | 0.0005 | 0.0004 | 0.26 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 03-SH | --- | 0.0002 | 0.0003 | 0.28 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 03-SH | --- | 0.0002 | 0.0002 | 0.25 | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.008 | 0.008 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 03-SH | --- | 0.0002 | 0.0003 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 03-SH | --- | 0.0002 | 0.0002 | 0.27 | < 0.001 | --- | < 0.001 | 0.01 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 03-SH | --- | 0.0002 | 0.0002 | 0.26 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 03-SH | --- | 0.0002 | 0.0002 | 0.24 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 03-SH | --- | 0.0002 | 0.0002 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 03-SH | --- | 0.0002 | 0.0002 | 0.25 | < 0.001 | --- | < 0.001 | 0.004 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 03-SH | --- | 0.0002 | 0.0002 | 0.24 | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 03-SH | --- | 0.0027 | 0.0003 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 03-SH | --- | 0.0002 | 0.0003 | 0.28 | < 0.001 | --- | < 0.001 | 0.004 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.012 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 03-SH | --- | 0.002 | 0.0004 | 0.26 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 03-SH | --- | 0.0004 | 0.0007 | 0.21 | < 0.001 | --- | < 0.003 | < 0.002 | 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 03-SH | --- | < 0.0002 | 0.0002 | 0.27 | 0.001 | --- | < 0.003 | 0.009 | < 0.003 | 0.004 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 03-SH | --- | < 0.0002 | 0.0002 | 0.26 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.004 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 03-SH | --- | < 0.0002 | < 0.0002 | 0.29 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.005 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 03-SH | --- | < 0.0002 | < 0.0002 | 0.24 | 0.001 | --- | < 0.003 | < 0.002 | 0.003 | 0.002 | < 0.001 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.002 | 0.005 | --- |
| (Duplicate) | 31-May-1994 | 03-SH DUP | --- | < 0.0002 | < 0.0002 | 0.25 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.001 | 0.001 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.003 | 0.003 | --- |
| | 21-Sep-1994 | 03-SH | --- | < 0.0002 | < 0.0002 | 0.26 | 0.002 | --- | < 0.003 | 0.014 | 0.004 | 0.002 | < 0.001 | --- | 0.00005 | 0.004 | 0.015 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.004 | --- |
| (Duplicate) | 21-Sep-1994 | 03-SH DUP | --- | < 0.0002 | < 0.0002 | 0.26 | 0.001 | --- | < 0.003 | < 0.002 | 0.004 | 0.006 | 0.002 | --- | 0.00005 | < 0.003 | 0.006 | --- | < 0.0002 | --- | < 0.002 | --- | 0.001 | --- | --- | --- | 0.002 | 0.01 | --- |
| | 01-Nov-1994 | 03-SH | --- | 0.0002 | 0.0002 | 0.26 | 0.002 | --- | < 0.003 | 0.002 | < 0.003 | 0.005 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.007 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.003 | 0.007 | --- |
| (Duplicate) | 02-Nov-1994 | 03-SH DUP | --- | 0.0006 | 0.0003 | 0.52 | 0.001 | --- | < 0.003 | 0.004 | < 0.003 | 0.002 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.009 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.016 | --- |
| | 28-Sep-1995 | 03-SH | --- | < 0.0002 | < 0.0002 | 0.29 | < 0.001 | --- | < 0.0002 | 0.003 | < 0.003 | 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.006 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.004 | --- |
| | 04-Sep-1996 | 03-SH | --- | < 0.0002 | < 0.0002 | 0.29 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.016 | --- |
| | 04-Sep-1997 | 03-SH | --- | < 0.0002 | < 0.0002 | 0.33 | < 0.001 | --- | < 0.0002 | 0.018 | < 0.003 | 0.004 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.006 | --- |
| | 15-Sep-1998 | 03-SH | --- | < 0.0002 | < 0.0002 | 0.29 | 0.002 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.015 | < 0.0003 | --- | < 0.00005 | 0.004 | < 0.005 | --- | < 0.0002 | --- | 0.01 | --- | < 0.001 | --- | --- | --- | 0.017 | < 0.001 | --- |
| (Duplicate) | 15-Sep-1998 | 03-SH DUP | --- | < 0.0002 | < 0.0002 | 0.3 | 0.002 | --- | 0.0004 | < 0.002 | 0.003 | 0.004 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 09-Sep-1999 | 03-SH | --- | 0.0034 | 0.0002 | 0.32 | < 0.001 | --- | < 0.0002 | 0.018 | 0.011 | 0.009 | < 0.0003 | --- | < 0.00005 | 0.008 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | 0.009 | 0.013 | --- |
| | 05-Sep-2000 | 03-SH | --- | < 0.0002 | 0.0003 | 0.339 | < 0.0002 | --- | < 0.0002 | 0.002 | < 0.0003 | 0.0025 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0077 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0032 | --- |
| | 06-Sep-2001 | 03-SH | --- | < 0.0002 | < 0.0002 | 0.312 | < 0.0002 | --- | < 0.0002 | 0.005 | < 0.0003 | 0.002 | < 0.0003 | 0.027 | < 0.00005 | 0.0012 | 0.0074 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0076 | --- |
| | 04-Sep-2002 | 03-SH | 0.006 | 0.0002 | 0.0011 | 0.29 | < 0.0002 | 0.02 | < 0.0002 | 0.004 | < 0.0003 | 0.0024 | < 0.0003 | --- | < 0.00005 | 0.0016 | 0.0055 | < 0.1 | < 0.0002 | 6.45 | < 0.0001 | 0.354 | < 0.0002 | < 0.001 | < 0.001 | 0.0046 | < 0.001 | 0.0084 | 0.0024 |
| | 03-Sep-2003 | 03-SH | 0.015 | < 0.0002 | 0.0002 | 0.333 | < 0.0002 | 0.03 | < 0.0002 | 0.002 | < 0.0003 | 0.0022 | < 0.0003 | 0.004 | < 0.00005 | 0.0082 | 0.0041 | < 0.1 | < 0.0002 | 7.31 | < 0.0001 | 0.35 | < 0.0002 | < 0.001 | < 0.001 | 0.0039 | < 0.001 | 0.0259 | 0.001 |
| | 09-Sep-2004 | 03-SH | 0.054 | < 0.0002 | < 0.0002 | 0.383 | < 0.0002 | 0.03 | < 0.0002 | 0.008 | < 0.0003 | 0.0032 | < 0.0003 | 0.02 | < 0.00005 | 0.0024 | 0.0148 | < 0.1 | < 0.0002 | 6.95 | < 0.0001 | 0.36 | < 0.0002 | < 0.001 | 0.016 | 0.0046 | < 0.001 | 0.0054 | 0.0006 |
| | 08-Sep-2005 | 03-SH | 0.004 | < 0.0002 | 0.0003 | 0.295 | < 0.0002 | 0.02 | < 0.0002 | < 0.001 | 0.0003 | 0.0034 | < 0.0003 | 0.022 | < 0.00005 | 0.0012 | 0.0132 | < 0.1 | < 0.0002 | 5.88 | < 0.0001 | 0.26 | < 0.0002 | < 0.001 | < 0.001 | 0.0028 | < 0.001 | 0.0072 | 0.0004 |
| | 07-Sep-2006 | 03-SH | 0.002 | < 0.0002 | 0.0013 | 0.305 | < 0.0002 | 0.03 | < 0.0002 | 0.001 | < 0.0003 | 0.0035 | < 0.0003 | 0.03 | 0.00018 | 0.0013 | 0.0034 | < 0.1 | < 0.0002 | 6.98 | < 0.0001 | 0.3 | < 0.0002 | < 0.001 | 0.002 | 0.0031 | < 0.001 | 0.0058 | 0.0004 |
| | 05-Sep-2007 | 03-SH | 0.003 | < 0.0002 | 0.0002 | 0.23 | < 0.001 | 0.03 | < 0.00001 | 0.002 | < 0.0003 | 0.0034 | < 0.0002 | 0.02 | < 0.00005 | 0.0014 | 0.0047 | < 0.1 | < 0.0002 | 7 | < 0.0001 | 0.27 | < 0.0002 | < 0.001 | 0.003 | 0.0032 | < 0.001 | 0.005 | --- |
| | 03-Sep-2008 | 03-SH | < 0.01 | < 0.0004 | < 0.0004 | 0.289 | < 0.001 | < 0.05 | < 0.00005 | < 0.005 | < 0.002 | 0.003 | < 0.0001 | 0.028 | < 0.00010 | < 0.005 | 0.004 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0035 | < 0.001 | 0.007 | --- |
| | 09-Sep-2009 | 03-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.351 | < 0.0010 | < 0.050 | 0.000109 | < 0.0050 | < 0.0020 | 0.0012 | 0.00012 | 0.028 | < 0.000020 | < 0.0050 | 0.005 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00446 | < 0.0010 | 0.0057 | --- |
| | 08-Sep-2010 | 03-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.383 | < 0.0010 | < 0.050 | 0.000136 | < 0.0010 | < 0.0020 | 0.0014 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | 0.01 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.001 | 0.00517 | < 0.0010 | 0.0088 | --- |
| | 07-Sep-2011 | 03-SH | < 0.0050 | < 0.00040 | 0.00167 | 0.389 | < 0.0010 | < 0.050 | 0.000084 | < 0.0010 | < 0.0020 | 0.0018 | < 0.00010 | 0.033 | < 0.000020 | < 0.0050 | 0.0043 | --- | < 0.00040 | 8.29 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00596 | < 0.0010 | 0.0046 | --- |
| | 05-Sep-2012 | 03-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.48 | < 0.0010 | < 0.050 | 0.000053 | < 0.0010 | < 0.0020 | 0.002 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | 0.0038 | --- | < 0.00040 | 8.68 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00563 | < 0.0010 | 0.009 | --- |
| | 26-Sep-2013 | 03-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.464 | < 0.0010 | < 0.050 | 0.000049 | < 0.0010 | < 0.0020 | 0.0021 | < 0.00010 | 0.036 | < 0.000020 | < 0.0050 | 0.0034 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00535 | < 0.0010 | 0.0216 | --- |
| | 16-Sep-2014 | 03-SH | 0.0069 | < 0.00010 | 0.00012 | 0.428 | < 0.00050 | 0.029 | 0.000044 | 0.00033 | < 0.00010 | 0.0020 | < 0.000050 | 0.035 | < 0.0000050 | 0.000838 | 0.00331 | < 0.30 | < 0.00010 | 9.73 | < 0.000010 | 0.399 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00467 | 0.00018 | 0.0028 | --- |
| | 28-Sep-2015 | 03-SH | 0.0022 | <0.00010 | 0.00013 | 0.365 | --- | 0.025 | 0.0000580 | 0.00032 | --- | 0.00225 | <0.000050 | --- | <0.0000050 | --- | 0.00297 | --- | 0.000095 | --- | <0.000010 | --- | --- | --- | --- | 0.00490 | --- | 0.0038 | --- |
| | 28-Sep-2016 | 03-SH | 0.0045 | <0.00010 | 0.00012 | 0.367 | --- | 0.023 | 0.0000333 | 0.00074 | --- | 0.00136 | <0.000050 | --- | <0.0000050 | --- | 0.00218 | --- | 0.000101 | --- | <0.000010 | --- | --- | --- | --- | 0.00441 | --- | 0.0016 | --- |
| | 27-Sep-2017 | 03-SH | 0.0151 | <0.00010 | 0.00013 | 0.413 | --- | 0.025 | 0.0000238 | 0.00118 | --- | 0.00123 | <0.000050 | --- | 0.0000071 | --- | 0.00250 | --- | 0.000089 | | <0.000010 | --- | --- | --- | --- | 0.00408 | --- | 0.0015 | --- |
| | 18-Sep-2018 | 03-SH | 0.0052 | <0.00010 | 0.00013 | 0.374 | --- | 0.027 | 0.0000497 | 0.00122 | --- | 0.00104 | <0.000050 | --- | <0.0000050 | --- | 0.00275 | --- | 0.000174 | --- | <0.000010 | --- | --- | --- | --- | 0.00384 | --- | 0.0022 | --- |
| | 17-Sep-2019 | 03-SH | 0.0393 | <0.00010 | 0.00014 | 0.406 | --- | 0.027 | 0.0000457 | 0.00029 | --- | 0.00156 | <0.000050 | --- | <0.0000050 | --- | 0.00298 | --- | 0.000066 | --- | <0.000010 | --- | --- | --- | --- | 0.00401 | --- | 0.0013 | --- |
| | 22-Sep-2020 | 03-SH | 0.0051 | 0.00010 | 0.00017 | 0.346 | <0.00010 | 0.023 | 0.0000264 | 0.00058 | <0.00010 | 0.00102 | <0.000050 | 0.0313 | <0.0000050 | 0.000919 | 0.00178 | --- | <0.000050 | --- | <0.000010 | --- | 0.000015 | <0.00010 | <0.00030 | 0.00387 | <0.00050 | 0.0021 | --- |
| | 22-Sep-2021 | 03-SH | 0.0029 | <0.00010 | 0.00018 | 0.362 | <0.00010 | 0.024 | 0.0000305 | 0.00058 | <0.00010 | 0.0009 | <0.000050 | 0.0332 | <0.0000050 | 0.00104 | 0.00191 | --- | 0.000081 | --- | <0.000010 | --- | 0.000016 | <0.00010 | <0.00030 | 0.00444 | <0.00050 | <0.0010 | --- |
| | 29-Sep-2022 | 03-SH | 0.0021 | 0.00018 | 0.00027 | 0.364 | --- | 0.027 | 0.0000310 | 0.00098 | --- | 0.00435 | 0.000065 | --- | <0.0000050 | --- | 0.00149 | --- | 0.000169 | --- | <0.000010 | --- | --- | --- | --- | 0.00633 | --- | 0.0030 | --- |
| | 29-Sep-2023 | 03-SH | 0.0102 | 0.00015 | 0.00028 | 0.406 | --- | 0.027 | 0.0000383 | 0.00205 | --- | 0.00199 | <0.000050 | --- | <0.0000050 | --- | 0.00273 | --- | 0.000118 | --- | <0.000010 | --- | --- | --- | --- | 0.00603 | --- | 0.0019 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **03-IN** | 15-May-1985 | 03-IN | --- | 0.0002 | 0.0009 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 03-IN | --- | 0.0002 | 0.0008 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 03-IN | --- | 0.0002 | 0.0005 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.009 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 03-IN | --- | 0.0007 | 0.0009 | --- | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.009 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 03-IN | --- | 0.0002 | 0.0006 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.007 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 03-IN | --- | 0.0002 | 0.0006 | 0.11 | --- | --- | --- | < 0.001 | --- | 0.002 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 03-IN | --- | 0.0004 | 0.0007 | 0.1 | --- | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 03-IN | --- | 0.0002 | 0.0005 | 0.1 | --- | --- | < 0.001 | 0.002 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 03-IN | --- | 0.0005 | 0.0002 | 0.09 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.021 | **0.016** | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 03-IN | --- | 0.0002 | 0.0006 | 0.09 | < 0.001 | --- | < 0.001 | 0.013 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 03-IN | --- | 0.0002 | 0.0003 | 0.08 | < 0.001 | --- | < 0.001 | 0.007 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 03-IN | --- | 0.0002 | 0.0007 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 03-IN | --- | 0.0004 | 0.0005 | 0.06 | < 0.001 | --- | < 0.001 | 0.01 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 03-IN | --- | 0.0002 | 0.0003 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 03-IN | --- | 0.0002 | 0.0002 | 0.06 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 03-IN | --- | 0.0002 | 0.0003 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 03-IN | --- | 0.0002 | 0.0008 | 0.05 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 03-IN | --- | 0.0002 | 0.0006 | 0.05 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 03-IN | --- | 0.0033 | 0.0005 | 0.01 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 03-IN | --- | < 0.0002 | 0.0002 | 0.06 | < 0.001 | --- | < 0.0002 | 0.088 | 0.017 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.004 | 0.036 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | < 0.002 | 0.005 | --- |
| | 07-Sep-2006 | 03-IN | < 0.001 | < 0.0002 | 0.0014 | 0.0481 | < 0.0002 | 0.09 | < 0.0002 | 0.018 | 0.0003 | 0.0027 | < 0.0003 | 0.043 | 0.00028 | 0.0018 | 0.0024 | < 0.1 | < 0.0002 | 6.59 | < 0.0001 | 0.74 | < 0.0002 | < 0.001 | 0.002 | 0.0042 | < 0.001 | 0.0056 | < 0.0002 |
| | 05-Sep-2007 | 03-IN | 0.002 | < 0.0002 | 0.0002 | 0.03 | < 0.001 | 0.07 | 0.00001 | 0.009 | < 0.0003 | 0.007 | < 0.0002 | 0.06 | < 0.00005 | 0.0023 | 0.0075 | < 0.1 | < 0.0002 | 4.8 | < 0.0001 | 0.51 | < 0.0002 | < 0.001 | 0.004 | 0.0038 | < 0.001 | 0.036 | --- |
| | 03-Sep-2008 | 03-IN | < 0.01 | < 0.0004 | < 0.0004 | 0.042 | < 0.001 | 0.07 | < 0.0001 | 0.012 | < 0.002 | 0.004 | < 0.0001 | 0.059 | < 0.00010 | < 0.005 | 0.002 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0043 | < 0.001 | 0.008 | --- |
| | 09-Sep-2009 | 03-IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.0522 | < 0.0010 | 0.07 | 0.00001 | < 0.0050 | < 0.0020 | 0.0015 | < 0.00010 | 0.065 | < 0.000020 | < 0.0050 | 0.0033 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00436 | < 0.0010 | 0.0041 | --- |
| | 08-Sep-2010 | 03-IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.0459 | < 0.0010 | 0.074 | 0.000012 | 0.0101 | < 0.0020 | 0.0024 | < 0.00010 | 0.066 | < 0.000020 | < 0.0050 | 0.0041 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00427 | < 0.0010 | 0.0062 | --- |
| | 07-Sep-2011 | 03-IN | < 0.0050 | < 0.00040 | 0.00245 | 0.0485 | < 0.0010 | 0.069 | 0.00001 | 0.0118 | < 0.0020 | 0.0017 | < 0.00010 | 0.058 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 6.07 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0047 | < 0.0010 | 0.0052 | --- |
| | 05-Sep-2012 | 03-IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.0528 | < 0.0010 | 0.068 | < 0.000010 | 0.0215 | < 0.0020 | 0.0014 | < 0.00010 | 0.065 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 6.24 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00474 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | 03-IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.0662 | < 0.0010 | 0.074 | < 0.000010 | < 0.0010 | < 0.0020 | 0.0011 | < 0.00010 | 0.073 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00475 | < 0.0010 | 0.0045 | --- |
| | 16-Sep-2014 | 03-IN | 0.0271 | < 0.00010 | 0.00019 | 0.0643 | < 0.00050 | 0.059 | 0.000016 | 0.00034 | < 0.00010 | 0.00089 | < 0.000050 | 0.058 | < 0.0000050 | 0.00144 | 0.00246 | < 0.30 | < 0.00010 | 7.6 | < 0.000010 | 0.544 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00441 | 0.00012 | 0.0027 | --- |
| | 28-Sep-2015 | 03-IN | 0.0036 | <0.00010 | 0.00019 | 0.0649 | --- | 0.052 | 0.0000255 | 0.00444 | --- | 0.00091 | <0.000050 | --- | <0.0000050 | --- | 0.00334 | --- | 0.000053 | --- | <0.000010 | --- | --- | --- | --- | 0.00475 | --- | 0.0041 | --- |
| | 28-Sep-2016 | 03-IN | 0.0038 | <0.00010 | 0.00019 | 0.0835 | --- | 0.050 | 0.0000252 | 0.00134 | --- | 0.00100 | <0.000050 | --- | <0.0000050 | --- | 0.00302 | --- | 0.000064 | --- | <0.000010 | --- | --- | --- | --- | 0.00420 | --- | 0.0027 | --- |
| | 27-Sep-2017 | 03-IN | 0.0012 | <0.00010 | 0.00016 | 0.0805 | --- | 0.066 | <0.0000050 | 0.00067 | --- | 0.00075 | <0.000050 | --- | <0.0000050 | --- | 0.00113 | --- | 0.000051 | --- | <0.000010 | --- | --- | --- | --- | 0.00441 | --- | 0.0015 | --- |
| | 18-Sep-2018 | 03-IN | 0.0024 | 0.00014 | 0.00020 | 0.0756 | --- | 0.050 | <0.0000050 | 0.00731 | --- | 0.00061 | <0.000050 | --- | 0.0000206 | --- | 0.00070 | --- | 0.000069 | --- | <0.000010 | --- | --- | --- | --- | 0.00353 | --- | 0.0015 | --- |
| | 17-Sep-2019 | 03-IN | 0.0072 | 0.00011 | 0.00021 | 0.0868 | --- | 0.048 | 0.0000114 | 0.00066 | --- | 0.00089 | 0.00132 | --- | <0.0000050 | --- | 0.00115 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00395 | --- | 0.0011 | --- |
| | 22-Sep-2020 | 03-IN | 0.0032 | 0.00012 | 0.00021 | 0.0883 | <0.00010 | 0.048 | 0.0000079 | 0.00149 | <0.00010 | 0.00280 | 0.000357 | 0.0464 | <0.0000050 | 0.00128 | 0.00084 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00376 | <0.00050 | 0.0016 | --- |
| | 22-Sep-2021 | 03-IN | 0.0019 | 0.0001 | 0.00024 | 0.123 | <0.00010 | 0.04 | <0.0000050 | 0.00149 | <0.00010 | 0.00077 | 0.000294 | 0.0419 | <0.0000050 | 0.000703 | 0.00071 | --- | 0.000067 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00383 | <0.00050 | <0.0010 | --- |
| | 29-Sep-2022 | 03-IN | 0.0044 | 0.00010 | 0.00022 | 0.127 | --- | 0.048 | <0.0000050 | 0.00080 | --- | 0.00169 | 0.000157 | --- | <0.0000050 | --- | 0.00073 | --- | 0.000073 | --- | <0.000010 | --- | --- | --- | --- | 0.00392 | --- | 0.0022 | --- |
| | 29-Sep-2023 | 03-IN | 0.0057 | <0.00010 | 0.00021 | 0.127 | --- | 0.049 | 0.0000554 | 0.0024 | --- | 0.00095 | 0.000058 | --- | <0.0000050 | --- | 0.00162 | --- | 0.000062 | --- | <0.000010 | --- | --- | --- | --- | 0.00451 | --- | 0.0031 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| Canadian Drinking Water AO Guidelines 2022[1] | | | 0.1 | --- | --- | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | --- |
| Canadian Drinking 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 | --- | --- | 7.0 | --- | --- | --- | 0.02 | --- | --- | --- |
| Alberta Tier 2 Potable Groundwater Guideline[3] | | | --- | 0.006 | 0.01 | 1 | --- | 5 | 0.005 | --- | --- | 1 | 0.01 | --- | 0.001 | --- | --- | | 0.05 | | --- | | --- | --- | --- | 0.02 | --- | 5 | --- |
| Alberta Tier 2 Aquatic 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 | --- |
| 04-SH | 15-May-1985 | 04-SH | --- | 0.0004 | 0.0004 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.009 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 04-SH | --- | 0.0003 | 0.0004 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.013 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 04-SH | --- | 0.0002 | 0.0008 | 0.18 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 04-SH | --- | 0.0002 | 0.0005 | 0.15 | --- | --- | --- | < 0.001 | --- | 0.004 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 04-SH | --- | 0.0006 | 0.0008 | 0.16 | --- | --- | < 0.001 | < 0.001 | --- | 0.007 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 04-SH | --- | 0.0005 | 0.0003 | 0.15 | --- | --- | < 0.001 | 0.003 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 04-SH | --- | 0.0002 | 0.0004 | 0.14 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 04-SH | --- | 0.0002 | 0.0003 | 0.15 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 04-SH | --- | 0.0002 | 0.0002 | 0.15 | < 0.001 | --- | < 0.001 | 0.006 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 04-SH | --- | 0.0002 | 0.0003 | 0.14 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 04-SH | --- | 0.0002 | 0.0002 | 0.15 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1988 | 04-SH | --- | 0.0002 | 0.0002 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.007 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 04-SH | --- | 0.0002 | 0.0002 | 0.13 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 04-SH | --- | 0.0002 | 0.0002 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 04-SH | --- | 0.0002 | 0.0002 | 0.17 | < 0.001 | --- | < 0.001 | 0.004 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 04-SH | --- | 0.0002 | 0.0002 | 0.15 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 04-SH | --- | 0.001 | 0.0003 | 0.15 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-1991 | 04-SH | --- | 0.0002 | 0.0002 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 04-SH | --- | 0.0002 | 0.0002 | 0.08 | < 0.001 | --- | < 0.003 | 0.005 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 04-SH | --- | < 0.0002 | 0.0002 | 0.18 | 0.001 | --- | < 0.003 | 0.005 | < 0.003 | 0.004 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 04-SH | --- | < 0.0002 | < 0.0002 | 0.15 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.008 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 04-SH | --- | < 0.0002 | < 0.0002 | 0.17 | < 0.001 | --- | < 0.003 | 0.006 | < 0.003 | 0.006 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 04-SH | --- | < 0.0002 | < 0.0002 | 0.16 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.002 | < 0.001 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.003 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.007 | --- |
| | 21-Sep-1994 | 04-SH | --- | < 0.0002 | < 0.0002 | 0.16 | < 0.001 | --- | < 0.003 | 0.008 | < 0.003 | < 0.001 | < 0.001 | --- | 0.00005 | < 0.003 | 0.013 | --- | < 0.0002 | --- | < 0.002 | --- | 0.001 | --- | --- | --- | < 0.002 | 0.007 | --- |
| | 01-Nov-1994 | 04-SH | --- | < 0.0002 | < 0.0002 | 0.16 | 0.001 | --- | < 0.003 | 0.008 | 0.004 | 0.002 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.018 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.003 | 0.004 | --- |
| | 28-Sep-1995 | 04-SH | --- | < 0.0002 | < 0.0002 | 0.17 | < 0.001 | --- | < 0.0002 | 0.012 | 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.006 | 0.01 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 04-Sep-1996 | 04-SH | --- | < 0.0002 | < 0.0002 | 0.18 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.004 | 0.005 | --- |
| | 03-Sep-1997 | 04-SH | --- | 0.0002 | < 0.0002 | 0.19 | < 0.001 | --- | < 0.0002 | 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 15-Sep-1998 | 04-SH | --- | < 0.0002 | 0.0002 | 0.14 | 0.003 | --- | < 0.0002 | 0.04 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 04-SH | --- | 0.0025 | 0.0002 | 0.2 | < 0.001 | --- | < 0.0002 | 0.006 | < 0.003 | 0.005 | < 0.0003 | --- | < 0.00005 | 0.007 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.004 | --- |
| | 05-Sep-2000 | 04-SH | --- | < 0.0002 | 0.0002 | 0.155 | < 0.0002 | --- | < 0.0002 | 0.004 | < 0.0003 | 0.0007 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0042 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0016 | --- |
| | 06-Sep-2001 | 04-SH | --- | < 0.0002 | < 0.0002 | 0.148 | < 0.0002 | --- | < 0.0002 | 0.021 | < 0.0003 | 0.0014 | < 0.0003 | 0.054 | < 0.00005 | 0.001 | 0.0054 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0081 | --- |
| (Duplicate) | 06-Sep-2001 | 04-SH DUP | --- | < 0.0002 | 0.0002 | 0.152 | < 0.0002 | --- | < 0.0002 | 0.011 | < 0.0003 | 0.0012 | < 0.0003 | --- | < 0.00005 | 0.0006 | 0.0041 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0075 | --- |
| | 04-Sep-2002 | 04-SH | 0.001 | < 0.0002 | 0.0004 | 0.167 | < 0.0002 | 0.09 | < 0.0002 | 0.006 | < 0.0003 | 0.0017 | < 0.0003 | --- | < 0.00005 | 0.0008 | 0.0052 | < 0.1 | < 0.0002 | 6.84 | < 0.0001 | 0.526 | < 0.0002 | < 0.001 | < 0.001 | 0.0063 | < 0.001 | 0.0033 | 0.0009 |
| (Duplicate) | 04-Sep-2002 | 04-SH DUP | 0.002 | 0.0003 | 0.0002 | 0.173 | < 0.0002 | 0.08 | < 0.0002 | 0.011 | < 0.0003 | 0.0017 | < 0.0003 | --- | < 0.00005 | 0.0008 | 0.0038 | < 0.1 | < 0.0002 | 6.61 | < 0.0001 | 0.506 | < 0.0002 | < 0.001 | < 0.001 | 0.0059 | < 0.001 | 0.004 | 0.0026 |
| | 03-Sep-2003 | 04-SH | 0.001 | < 0.0002 | < 0.0002 | 0.152 | < 0.0002 | 0.09 | < 0.0002 | 0.004 | < 0.0003 | 0.0018 | < 0.0003 | 0.025 | < 0.00005 | 0.0029 | 0.0012 | < 0.1 | 0.0003 | 7.24 | < 0.0001 | 0.49 | < 0.0002 | < 0.001 | < 0.001 | 0.0060 | < 0.001 | 0.0029 | 0.0003 |
| (Duplicate) | 11-Sep-2003 | 04-SH DUP | 0.002 | < 0.0002 | < 0.0002 | 0.15 | < 0.0002 | 0.08 | < 0.0002 | 0.015 | < 0.0003 | 0.0012 | 0.0008 | 0.038 | < 0.00005 | 0.0261 | 0.0016 | < 0.1 | < 0.0002 | 7.47 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | < 0.001 | 0.0059 | < 0.001 | 0.0035 | 0.0008 |
| | 08-Sep-2004 | 04-SH | 0.019 | < 0.0002 | < 0.0002 | 0.158 | 0.0005 | 0.23 | < 0.0002 | 0.02 | < 0.0003 | 0.0018 | < 0.0003 | 0.041 | < 0.00005 | 0.0032 | 0.0042 | < 0.1 | < 0.0002 | 6.76 | < 0.0001 | 0.5 | < 0.0002 | < 0.001 | 0.015 | 0.0073 | < 0.001 | 0.0235 | 0.0002 |
| (Duplicate) | 08-Sep-2004 | 04-SH DUP | 0.016 | < 0.0002 | < 0.0002 | 0.166 | 0.0008 | 0.11 | < 0.0002 | 0.025 | < 0.0003 | 0.0014 | < 0.0003 | 0.044 | < 0.00005 | 0.0033 | 0.0026 | < 0.1 | < 0.0002 | 6.8 | < 0.0001 | 0.5 | < 0.0002 | < 0.001 | 0.009 | 0.0077 | < 0.001 | 0.0116 | < 0.0002 |
| | 07-Sep-2005 | 04-SH | < 0.001 | < 0.0002 | 0.0003 | 0.152 | < 0.0002 | 0.08 | < 0.0002 | 0.019 | < 0.0003 | 0.001 | < 0.0003 | 0.047 | 0.00005 | 0.0011 | 0.0027 | < 0.1 | < 0.0002 | 6.9 | < 0.0001 | 0.5 | < 0.0002 | < 0.001 | < 0.001 | 0.0069 | < 0.001 | 0.0029 | < 0.0002 |
| (Duplicate) | 07-Sep-2005 | 04-SH DUP | < 0.001 | < 0.0002 | < 0.0002 | 0.162 | < 0.0002 | 0.08 | < 0.0002 | 0.005 | < 0.0003 | 0.0009 | < 0.0003 | 0.054 | < 0.00005 | 0.0011 | 0.0034 | < 0.1 | < 0.0002 | 6.71 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | 0.001 | 0.0072 | < 0.001 | 0.0045 | < 0.0002 |
| | 07-Sep-2006 | 04-SH | < 0.001 | < 0.0002 | < 0.0002 | 0.162 | < 0.0002 | 0.08 | < 0.0002 | 0.013 | < 0.0003 | 0.0018 | < 0.0003 | 0.054 | 0.0001 | 0.0011 | 0.0039 | < 0.1 | < 0.0002 | 6.94 | < 0.0001 | 0.52 | < 0.0002 | < 0.001 | 0.002 | 0.0072 | < 0.001 | 0.0043 | < 0.0002 |
| (Duplicate) | 07-Sep-2006 | 04-SH DUP | < 0.001 | < 0.0002 | < 0.0002 | 0.163 | < 0.0002 | 0.08 | < 0.0002 | 0.011 | < 0.0003 | 0.0022 | < 0.0003 | 0.05 | < 0.00005 | 0.001 | 0.0034 | < 0.1 | < 0.0002 | 6.86 | < 0.0001 | 0.52 | < 0.0002 | < 0.001 | 0.002 | 0.0071 | < 0.001 | 0.0061 | 0.0015 |
| | 05-Sep-2007 | 04-SH | 0.008 | < 0.0002 | < 0.0002 | 0.15 | < 0.001 | 0.08 | 0.00002 | 0.007 | < 0.0003 | 0.002 | < 0.0002 | 0.04 | < 0.00005 | 0.0009 | 0.0064 | < 0.1 | < 0.0002 | 6.5 | < 0.0001 | 0.48 | < 0.0002 | < 0.001 | 0.006 | 0.0079 | < 0.001 | 0.003 | --- |
| (Duplicate) | 05-Sep-2007 | 04-SH DUP | 0.002 | < 0.0002 | < 0.0002 | 0.15 | < 0.001 | 0.08 | 0.00004 | 0.009 | < 0.0003 | 0.002 | < 0.0002 | 0.04 | < 0.00005 | 0.0007 | 0.0059 | < 0.1 | < 0.0002 | 6.6 | < 0.0001 | 0.47 | < 0.0002 | < 0.001 | 0.003 | 0.0074 | < 0.001 | 0.006 | --- |
| | 03-Sep-2008 | 04-SH | < 0.01 | < 0.0004 | < 0.0004 | 0.164 | < 0.001 | 0.08 | < 0.00005 | 0.015 | < 0.002 | 0.003 | < 0.0001 | 0.055 | < 0.00010 | < 0.005 | 0.003 | --- | 0.0005 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0074 | < 0.001 | 0.002 | --- |
| (Duplicate) | 03-Sep-2008 | 04-SH DUP | < 0.01 | < 0.0004 | < 0.0004 | 0.164 | < 0.001 | 0.09 | < 0.00005 | 0.017 | < 0.002 | 0.003 | < 0.0001 | 0.056 | < 0.00010 | < 0.005 | 0.003 | --- | 0.0005 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0081 | < 0.001 | 0.002 | --- |
| | 09-Sep-2009 | 04-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.152 | < 0.0010 | 0.087 | 0.000023 | 0.0333 | < 0.0020 | 0.0026 | 0.00011 | 0.052 | < 0.000020 | < 0.0050 | 0.004 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0013 | 0.00712 | < 0.0010 | 0.0068 | --- |
| (Duplicate) | 09-Sep-2009 | 04-SH DUP | < 0.0050 | < 0.00040 | < 0.00040 | 0.152 | < 0.0010 | 0.083 | 0.000018 | 0.0214 | < 0.0020 | 0.0019 | < 0.00010 | 0.053 | < 0.000020 | < 0.0050 | 0.0042 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0013 | 0.00734 | < 0.0010 | < 0.0040 | --- |
| | 08-Sep-2010 | 04 SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.157 | < 0.0010 | 0.067 | < 0.000010 | 0.0101 | < 0.0020 | 0.0018 | < 0.00010 | 0.048 | < 0.000020 | < 0.0050 | 0.0046 | --- | 0.00595 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0102 | < 0.0010 | 0.004 | --- |
| (Duplicate) | 08-Sep-2010 | SYLVITE 24 | < 0.0050 | < 0.00040 | < 0.00040 | 0.154 | < 0.0010 | 0.07 | 0.000012 | 0.01 | < 0.0020 | 0.002 | < 0.00010 | 0.048 | < 0.000020 | < 0.0050 | 0.005 | --- | 0.00619 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.001 | 0.00992 | < 0.0010 | 0.0056 | --- |
| | 07-Sep-2011 | 04-SH | < 0.0050 | < 0.00040 | 0.0016 | 0.158 | < 0.0010 | 0.079 | 0.000017 | 0.0126 | < 0.0020 | 0.0012 | < 0.00010 | 0.049 | < 0.000020 | < 0.0050 | 0.003 | --- | 0.00134 | 7.55 | < 0.0000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0095 | < 0.0010 | < 0.0040 | --- |
| (Duplicate) | 07-Sep-2011 | ZIRCON 24 | < 0.0050 | < 0.00040 | < 0.00040 | 0.15 | < 0.0010 | 0.077 | < 0.000010 | 0.0238 | < 0.0020 | 0.0014 | < 0.00010 | 0.045 | < 0.000020 | < 0.0050 | 0.0025 | --- | 0.00229 | 6.94 | < 0.0000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00864 | < 0.0010 | < 0.0040 | --- |
| | 05-Sep-2012 | 04-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.17 | < 0.0010 | 0.081 | 0.000015 | 0.0117 | < 0.0020 | < 0.0010 | < 0.00010 | 0.054 | < 0.000020 | < 0.0050 | 0.0025 | --- | 0.00045 | 7.51 | < 0.0000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00827 | < 0.0010 | < 0.0040 | --- |
| (Duplicate) | 05-Sep-2012 | SPINEL 22 | < 0.0050 | < 0.00040 | < 0.00040 | 0.161 | < 0.0010 | 0.086 | < 0.000010 | 0.0183 | < 0.0020 | < 0.0010 | < 0.00010 | 0.054 | < 0.000020 | < 0.0050 | < 0.0020 | --- | 0.0011 | 8.06 | < 0.0000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00863 | < 0.0010 | 0.0041 | --- |
| | 26-Sep-2013 | 04-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.195 | < 0.0010 | 0.073 | 0.000014 | < 0.0010 | < 0.0020 | 0.0012 | < 0.00010 | 0.054 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.0000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00898 | < 0.0010 | 0.0079 | --- |
| (Duplicate) | 26-Sep-2013 | 24-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.206 | < 0.0010 | 0.072 | < 0.000010 | < 0.0010 | < 0.0020 | 0.0015 | < 0.00010 | 0.052 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.0000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00900 | < 0.0010 | < 0.0040 | --- |
| | 17-Sep-2014 | 04-SH | < 0.0010 | < 0.00010 | 0.00012 | 0.225 | < 0.00050 | 0.073 | < 0.000010 | < 0.00010 | 0.00126 | 0.00228 | < 0.000050 | 0.0501 | < 0.0000050 | 0.000793 | 0.00224 | < 0.30 | < 0.00010 | 8.76 | < 0.000010 | 0.552 | < 0.000050 | < 0.00010 | < 0.00030 | 0.0121 | 0.00021 | 0.0043 | --- |
| | 28-Sep-2015 | 04-SH | 0.0017 | <0.00010 | <0.00010 | 0.234 | --- | 0.082 | 0.0000108 | 0.00138 | --- | 0.00070 | <0.000050 | --- | <0.0000050 | --- | 0.00118 | --- | 0.000087 | --- | 0.000015 | --- | --- | --- | --- | 0.00941 | --- | 0.0016 | --- |
| | 26-Sep-2016 | 04-SH | <0.0010 | <0.00010 | <0.00010 | 0.205 | --- | 0.077 | 0.0000077 | 0.00138 | --- | 0.00069 | <0.000050 | --- | <0.0000050 | --- | 0.00134 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00952 | --- | <0.0010 | --- |
| | 27-Sep-2017 | 04-SH | <0.0010 | <0.00010 | 0.0001 | 0.241 | --- | 0.077 | 0.0000081 | 0.00091 | --- | 0.00068 | <0.000050 | --- | <0.0000050 | --- | 0.00194 | --- | 0.000126 | --- | <0.000010 | --- | --- | --- | --- | 0.00954 | --- | 0.0017 | --- |
| | 17-Sep-2018 | 04-SH | <0.0010 | <0.00010 | 0.00014 | 0.217 | --- | 0.095 | 0.0000224 | 0.00628 | --- | 0.00061 | <0.000050 | --- | 0.0000091 | --- | 0.00334 | --- | 0.000070 | --- | <0.000010 | --- | --- | --- | --- | 0.00824 | --- | 0.0019 | --- |
| | 17-Sep-2019 | 04-SH | <0.0010 | <0.00010 | 0.00012 | 0.214 | --- | 0.077 | 0.0000131 | 0.00068 | --- | 0.00276 | 0.000113 | --- | <0.0000050 | --- | 0.00223 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00786 | --- | 0.0017 | --- |
| | 22-Sep-2020 | 04-SH | <0.0010 | <0.00010 | <0.00010 | 0.209 | <0.00010 | 0.074 | 0.0000134 | 0.00038 | 0.00011 | 0.00077 | <0.000050 | 0.0522 | <0.0000050 | 0.000717 | 0.00264 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00868 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2021 | 04-SH | <0.0010 | <0.00010 | 0.00012 | 0.223 | <0.00010 | 0.082 | 0.0000116 | 0.0007 | <0.00010 | 0.00077 | <0.000050 | 0.0565 | <0.0000050 | 0.000524 | 0.00168 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00912 | <0.00050 | 0.001 | --- |
| | 29-Sep-2022 | 04-SH | <0.0010 | <0.00010 | 0.00014 | 0.214 | --- | 0.089 | 0.0000073 | 0.00100 | --- | 0.00090 | <0.000050 | --- | <0.0000050 | --- | 0.00105 | --- | 0.000073 | --- | <0.000010 | --- | --- | --- | --- | 0.00887 | --- | <0.0010 | --- |
| | 29-Sep-2023 | 04-SH | <0.0010 | <0.00010 | 0.00018 | 0.207 | --- | 0.088 | <0.0000050 | 0.00552 | --- | 0.00058 | <0.000050 | --- | <0.0000050 | --- | 0.00335 | --- | 0.000065 | --- | <0.000010 | --- | --- | --- | --- | 0.0086 | --- | <0.0010 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **04-IN** | 15-Mar-1989 | 04-IN | --- | 0.0002 | 0.0024 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 04-IN | --- | 0.0002 | 0.0019 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 04-IN | --- | 0.0002 | 0.005 | 0.08 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 04-IN | --- | 0.0002 | 0.002 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 15-Nov-1989 | 04-IN DUP | --- | 0.0002 | 0.0024 | 0.07 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 04-IN | --- | 0.0004 | 0.0021 | 0.07 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 04-IN | --- | 0.0002 | 0.0025 | 0.07 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 04-IN | --- | 0.0017 | 0.0025 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 04-IN | --- | < 0.0002 | 0.0052 | 0.0312 | < 0.0002 | --- | < 0.0002 | 0.009 | < 0.0003 | 0.0007 | < 0.0003 | --- | < 0.00005 | 0.0017 | 0.0021 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0024 | --- |
| | 05-Sep-2007 | 04-IN | 0.076 | < 0.0002 | < 0.0002 | 0.04 | < 0.001 | 0.18 | < 0.00001 | 0.003 | 0.0005 | 0.0015 | < 0.0002 | 0.04 | < 0.00005 | 0.0017 | 0.0047 | < 0.1 | 0.0036 | 8.5 | < 0.0001 | 0.61 | < 0.0002 | < 0.001 | 0.009 | 0.0081 | < 0.001 | < 0.003 | --- |
| | 03-Sep-2008 | 04-IN | 0.01 | < 0.0004 | 0.0022 | 0.049 | < 0.001 | 0.19 | < 0.00005 | < 0.005 | < 0.002 | 0.002 | < 0.0001 | 0.044 | < 0.00010 | < 0.005 | < 0.002 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0074 | < 0.001 | 0.002 | --- |
| | 08-Sep-2010 | 04 IN | < 0.0050 | < 0.00040 | 0.00314 | 0.067 | < 0.0010 | 0.201 | 0.000012 | < 0.0010 | < 0.0020 | 0.0025 | < 0.00010 | 0.043 | < 0.000020 | < 0.0050 | 0.0046 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0014 | 0.00778 | < 0.0010 | 0.0048 | --- |
| | 17-Sep-2014 | 04-IN | 0.0022 | < 0.00010 | 0.00390 | 0.0758 | < 0.00050 | 0.199 | < 0.000010 | 0.00073 | < 0.00010 | 0.00077 | < 0.000050 | 0.0504 | < 0.0000050 | 0.000403 | 0.00074 | < 0.30 | < 0.00010 | 10.5 | < 0.000010 | 0.578 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00896 | < 0.00010 | < 0.0010 | --- |
| | 28-Sep-2015 | 04-IN | <0.0010 | <0.00010 | 0.00317 | 0.0654 | --- | 0.177 | 0.0000179 | 0.00067 | --- | 0.00068 | <0.000050 | --- | <0.0000050 | --- | 0.00224 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00903 | --- | 0.0028 | --- |
| | 26-Sep-2016 | 04-IN | <0.0010 | <0.00010 | 0.00274 | 0.0688 | --- | 0.203 | 0.0000292 | 0.00378 | --- | 0.00043 | <0.000050 | --- | <0.0000050 | --- | 0.00152 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00879 | --- | 0.0013 | --- |
| | 27-Sep-2017 | 04-IN | <0.0010 | <0.00010 | 0.00273 | 0.0742 | --- | 0.203 | 0.0000238 | 0.00043 | --- | 0.00026 | <0.000050 | --- | <0.0000050 | --- | 0.00197 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00844 | --- | 0.0012 | --- |
| | 17-Sep-2018 | 04-IN | 0.0013 | <0.00010 | 0.00288 | 0.0642 | --- | 0.213 | 0.0000753 | 0.01240 | --- | 0.00084 | <0.000050 | --- | 0.0000285 | --- | 0.00147 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00891 | --- | 0.0027 | --- |
| | 17-Sep-2019 | 04-IN | <0.0010 | <0.00010 | 0.00312 | 0.0760 | --- | 0.196 | <0.0000050 | 0.00103 | --- | 0.00034 | <0.000050 | --- | <0.0000050 | --- | 0.00142 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00775 | --- | <0.0010 | --- |
| | 22-Sep-2020 | 04-IN | <0.0010 | <0.00010 | 0.00341 | 0.0716 | <0.00010 | 0.192 | 0.0000065 | 0.00020 | 0.00090 | 0.00221 | <0.000050 | 0.0401 | <0.0000050 | 0.00265 | 0.00235 | --- | 0.000054 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00785 | <0.00050 | 0.0014 | --- |
| | 22-Sep-2021 | 04-IN | <0.0010 | <0.00010 | 0.00298 | 0.0786 | <0.00010 | 0.192 | 0.0000074 | 0.00027 | 0.00073 | 0.00097 | <0.000050 | 0.0373 | <0.0000050 | 0.00226 | 0.00189 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00799 | <0.00050 | 0.0019 | --- |
| | 29-Sep-2022 | 04-IN | 0.0025 | <0.00010 | 0.00290 | 0.0726 | --- | 0.201 | 0.0000428 | <0.00050 | --- | 0.00480 | 0.000104 | --- | <0.0000050 | --- | 0.00189 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00878 | --- | 0.0040 | --- |
| | 29-Sep-2023 | 04-IN | <0.0010 | <0.00010 | 0.0031 | 0.0723 | --- | 0.198 | 0.0000076 | 0.00257 | --- | 0.00039 | <0.000050 | --- | <0.0000050 | --- | 0.0028 | --- | 0.00006 | --- | <0.000010 | --- | --- | --- | --- | 0.00781 | --- | <0.0010 | --- |
| **04-SS** | 15-May-1985 | 04-SS | --- | 0.0023 | **0.029** | --- | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.014 | < 0.002 | --- | **0.0012** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 04-SS | --- | 0.0002 | 0.0004 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 04-SS | --- | 0.0002 | 0.0074 | --- | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.005 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 04-SS | --- | 0.0008 | 0.0018 | --- | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.005 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 04-SS | --- | 0.0002 | 0.002 | 0.09 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 04-SS | --- | 0.0002 | **0.011** | 0.08 | --- | --- | --- | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 04-SS | --- | 0.0007 | **0.012** | 0.07 | --- | --- | < 0.001 | 0.002 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 04-SS | --- | 0.0005 | 0.0004 | 0.06 | --- | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 04-SS | --- | 0.0002 | 0.0008 | 0.06 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 04-SS | --- | 0.0005 | 0.0006 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 04-SS | --- | 0.0002 | 0.0003 | 0.06 | < 0.001 | --- | < 0.001 | 0.004 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 04-SS | --- | 0.0002 | 0.0006 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 04-SS | --- | 0.0002 | 0.001 | 0.06 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1988 | 04-SS | --- | 0.0002 | 0.0002 | 0.06 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 04-SS | --- | 0.0002 | 0.0004 | 0.06 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 04-SS | --- | 0.0002 | 0.0008 | 0.06 | < 0.001 | --- | < 0.001 | 0.005 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 04-SS | --- | 0.0002 | 0.0032 | 0.06 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 04-SS | --- | 0.0039 | 0.0016 | 0.06 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 04-SS | < 0.0050 | < 0.00040 | 0.00064 | 0.108 | < 0.0010 | < 0.050 | 0.000023 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.101 | < 0.000020 | < 0.0050 | 0.0054 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | < 0.00010 | < 0.0010 | 0.0108 | --- |
| | 16-Sep-2014 | 04-SS | < 0.0010 | < 0.00010 | 0.00202 | 0.114 | < 0.00050 | 0.02 | < 0.000010 | < 0.00010 | < 0.00010 | 0.00170 | 0.000055 | 0.105 | < 0.0000050 | 0.000324 | 0.00028 | < 0.30 | < 0.00010 | 14.5 | < 0.000010 | 0.389 | < 0.000050 | < 0.00010 | < 0.00030 | 0.000034 | < 0.00010 | 0.0030 | --- |
| | 28-Sep-2015 | 04-SS | <0.0010 | <0.00010 | 0.00038 | 0.0891 | --- | 0.017 | 0.0000083 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.00071 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000061 | --- | 0.0217 | --- |
| | 27-Sep-2016 | 04-SS | <0.0010 | <0.00010 | 0.00044 | 0.0960 | --- | 0.023 | 0.0000125 | <0.00010 | --- | 0.00027 | <0.000050 | --- | <0.0000050 | --- | 0.00082 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000045 | --- | 0.0022 | --- |
| | 26-Sep-2017 | 04-SS | <0.0010 | <0.00010 | 0.00041 | 0.1060 | --- | 0.021 | 0.0000698 | <0.00010 | --- | 0.00023 | <0.000050 | --- | <0.0000050 | --- | 0.00077 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000037 | --- | 0.0045 | --- |
| | 17-Sep-2018 | 04-SS | <0.0010 | <0.00010 | 0.00054 | 0.1020 | --- | 0.027 | 0.0000175 | <0.00010 | --- | 0.00038 | <0.000050 | --- | <0.0000050 | --- | 0.00182 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000075 | --- | 0.0021 | --- |
| | 17-Sep-2019 | 04-SS | 0.0048 | <0.00010 | 0.00069 | 0.1180 | --- | 0.023 | 0.0000405 | 0.00047 | --- | 0.00096 | <0.000050 | --- | <0.0000050 | --- | 0.00405 | --- | <0.000050 | --- | 0.00371 | --- | --- | --- | --- | 0.000256 | --- | 0.0046 | --- |
| | 22-Sep-2020 | 04-SS | <0.0010 | <0.00010 | 0.00162 | 0.104 | <0.00010 | 0.020 | <0.0000050 | <0.00010 | <0.00010 | 0.00201 | <0.000050 | 0.101 | <0.0000050 | 0.000391 | 0.00066 | --- | <0.000050 | --- | 0.000079 | --- | <0.000010 | <0.00010 | <0.00030 | 0.000045 | <0.00050 | 0.0020 | --- |
| | 22-Sep-2021 | 04-SS | 0.0017 | <0.00010 | 0.00057 | 0.117 | <0.00010 | 0.031 | 0.0000635 | <0.00010 | 0.00015 | 0.00152 | <0.000050 | 0.111 | <0.0000050 | 0.000434 | 0.00249 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.000167 | <0.00050 | 0.0061 | --- |
| | 29-Sep-2022 | 04-SS | <0.0010 | <0.00010 | 0.00058 | 0.104 | --- | 0.027 | 0.0000114 | <0.00050 | --- | 0.00060 | <0.000050 | --- | <0.0000050 | --- | 0.00058 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000129 | --- | 0.0018 | --- |
| | 29-Sep-2023 | 04-SS | <0.0010 | <0.00010 | 0.00038 | 0.0989 | --- | 0.029 | 0.0000147 | 0.00147 | --- | 0.00054 | <0.000050 | --- | <0.0000050 | --- | 0.00121 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000438 | --- | 0.0015 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| Canadian Drinking Water AO Guidelines 2022[1] | | | 0.1 | --- | --- | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | --- |
| Canadian Drinking 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 | --- | --- | 7.0 | --- | --- | --- | 0.02 | --- | --- | --- |
| Alberta Tier 2 Potable Groundwater Guideline[3] | | | --- | 0.006 | 0.01 | 1 | --- | 5 | 0.005 | --- | --- | 1 | 0.01 | --- | 0.001 | --- | --- | | 0.05 | | --- | | --- | --- | --- | 0.02 | --- | 5 | --- |
| Alberta Tier 2 Aquatic 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 | --- |
| 05-SH | 15-May-1985 | 05-SH | --- | 0.0005 | 0.0006 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 05-SH | --- | 0.0002 | 0.0014 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 05-SH | --- | 0.0002 | 0.0004 | --- | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.008 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 05-SH | --- | 0.0002 | 0.0007 | 0.27 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 05-SH | --- | 0.0002 | 0.0005 | 0.26 | --- | --- | --- | < 0.001 | --- | 0.005 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 05-SH | --- | 0.0006 | 0.0005 | 0.27 | --- | --- | < 0.001 | < 0.001 | --- | 0.009 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 05-SH | --- | 0.0003 | 0.0002 | 0.23 | --- | --- | < 0.001 | < 0.001 | --- | 0.009 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 05-SH | --- | 0.0002 | 0.0005 | 0.14 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 05-SH | --- | 0.0002 | 0.0004 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 05-SH | --- | 0.0003 | 0.0002 | 0.24 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 05-SH | --- | 0.0002 | 0.0005 | 0.24 | < 0.001 | --- | 0.01 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 05-SH | --- | 0.0002 | 0.0002 | 0.27 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 05-SH | --- | 0.0002 | 0.0002 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 05-SH | --- | 0.0002 | 0.0002 | 0.24 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 05-SH | --- | 0.0002 | 0.0002 | 0.22 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 05-SH | --- | 0.0002 | 0.0004 | 0.25 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 05-SH | --- | 0.0002 | 0.0005 | 0.24 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 05-SH | --- | 0.0009 | 0.0002 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 05-SH | --- | 0.0002 | < 0.0002 | 0.27 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.0001 | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 05-SH | --- | 0.0002 | 0.0003 | 0.28 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | --- | < 0.0001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 05-SH | --- | < 0.0002 | 0.0003 | 0.18 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 05-SH | --- | < 0.0002 | 0.0002 | 0.4 | 0.001 | --- | 0.003 | 0.006 | < 0.003 | 0.006 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 05-SH | --- | < 0.0002 | 0.0003 | 0.51 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.002 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 05-SH | --- | < 0.0002 | < 0.0002 | 0.41 | 0.002 | --- | < 0.003 | < 0.002 | 0.003 | 0.004 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.006 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.002 | 0.078 | --- |
| | 21-Sep-1994 | 05-SH | --- | < 0.0002 | < 0.0002 | 0.4 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.002 | < 0.001 | --- | 0.00005 | < 0.003 | 0.015 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.004 | --- |
| | 01-Nov-1994 | 05-SH | --- | < 0.0002 | 0.0002 | 0.42 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.003 | < 0.001 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.002 | --- |
| | 28-Sep-1995 | 05-SH | --- | < 0.0002 | 0.0002 | 0.38 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 04-Sep-1996 | 05-SH | --- | < 0.0002 | < 0.0002 | 0.33 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.015 | --- |
| | 03-Sep-1997 | 05-SH | --- | < 0.0002 | < 0.0002 | 0.38 | < 0.001 | --- | < 0.0002 | 0.033 | 0.004 | 0.005 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 16-Sep-1998 | 05-SH | --- | < 0.0002 | 0.0002 | 0.26 | 0.002 | --- | 0.0007 | 0.045 | < 0.003 | 0.004 | < 0.0003 | --- | < 0.00005 | 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 05-SH | --- | < 0.0002 | < 0.0002 | 0.32 | < 0.001 | --- | < 0.0002 | 0.023 | 0.006 | 0.002 | < 0.0003 | --- | < 0.00005 | 0.005 | 0.014 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.003 | --- |
| | 05-Sep-2000 | 05-SH | --- | < 0.0002 | 0.0003 | 0.26 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0009 | 0.0012 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0062 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0031 | --- |
| | 06-Sep-2001 | 05-SH | --- | < 0.0002 | < 0.0002 | 0.239 | < 0.0002 | --- | < 0.0002 | 0.002 | 0.0009 | 0.0011 | < 0.0003 | 0.027 | < 0.00005 | 0.0007 | 0.0076 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0288 | --- |
| (Duplicate) | 06-Sep-2001 | 05-SH DUP | --- | < 0.0002 | < 0.0002 | 0.235 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0007 | 0.0009 | < 0.0003 | --- | < 0.00005 | 0.0005 | 0.0067 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0073 | --- |
| | 09-Sep-1999 | 05-SH | --- | < 0.0002 | < 0.0002 | 0.32 | < 0.001 | --- | < 0.0002 | 0.023 | 0.006 | 0.002 | < 0.0003 | --- | < 0.00005 | 0.005 | 0.014 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.003 | --- |
| | 05-Sep-2000 | 05-SH | --- | < 0.0002 | 0.0003 | 0.26 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0009 | 0.0012 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0062 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0031 | --- |
| | 06-Sep-2001 | 05-SH | --- | < 0.0002 | < 0.0002 | 0.239 | < 0.0002 | --- | < 0.0002 | 0.002 | 0.0009 | 0.0011 | < 0.0003 | 0.027 | < 0.00005 | 0.0007 | 0.0076 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0288 | --- |
| (Duplicate) | 06-Sep-2001 | 05-SH DUP | --- | < 0.0002 | < 0.0002 | 0.235 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0007 | 0.0009 | < 0.0003 | --- | < 0.00005 | 0.0005 | 0.0067 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0073 | --- |
| | 04-Sep-2002 | 05-SH | 0.002 | < 0.0002 | 0.0005 | 0.228 | < 0.0002 | 0.04 | < 0.0002 | 0.009 | 0.0006 | 0.0011 | < 0.0003 | --- | < 0.00005 | 0.0006 | 0.004 | < 0.1 | < 0.0002 | 7.74 | < 0.0001 | 0.5 | < 0.0002 | < 0.001 | < 0.001 | 0.0043 | < 0.001 | 0.0035 | 0.0009 |
| (Duplicate) | 04-Sep-2002 | 05-SH DUP | 0.002 | 0.0003 | 0.0002 | 0.197 | < 0.0002 | 0.04 | < 0.0002 | 0.004 | < 0.0003 | 0.0013 | < 0.0003 | --- | < 0.00005 | 0.0007 | 0.0028 | < 0.1 | < 0.0002 | 7.28 | < 0.0001 | 0.47 | < 0.0002 | < 0.001 | < 0.001 | 0.0041 | < 0.001 | 0.0056 | 0.0004 |
| | 03-Sep-2003 | 05-SH | 0.003 | 0.0002 | < 0.0002 | 0.208 | < 0.0002 | 0.04 | < 0.0002 | 0.001 | 0.0006 | 0.0015 | < 0.0003 | 0.005 | < 0.00005 | 0.0019 | 0.0022 | < 0.1 | 0.0002 | 8.65 | < 0.0001 | 0.5 | < 0.0002 | < 0.001 | < 0.001 | 0.0045 | < 0.001 | 0.0097 | 0.0004 |
| (Duplicate) | 11-Sep-2003 | 05-SH DUP | < 0.001 | 0.0004 | < 0.0002 | 0.191 | < 0.0002 | 0.04 | < 0.0002 | 0.001 | < 0.0003 | 0.0014 | < 0.0003 | 0.014 | < 0.00005 | 0.0009 | 0.0015 | < 0.1 | 0.0003 | 8.5 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | < 0.001 | 0.0043 | < 0.001 | 0.0019 | 0.0002 |
| | 08-Sep-2004 | 05-SH | 0.028 | < 0.0002 | < 0.0002 | 0.192 | 0.0006 | 0.33 | < 0.0002 | 0.006 | 0.0006 | 0.0014 | < 0.0003 | 0.02 | < 0.00005 | 0.001 | 0.004 | < 0.1 | < 0.0002 | 8.38 | < 0.0001 | 0.51 | < 0.0002 | < 0.001 | 0.026 | 0.0054 | < 0.001 | 0.003 | 0.0004 |
| (Duplicate) | 08-Sep-2004 | 05-SH DUP | 0.024 | < 0.0002 | < 0.0002 | 0.206 | 0.001 | 0.08 | < 0.0002 | 0.011 | < 0.0003 | 0.0015 | 0.0004 | 0.024 | < 0.00005 | 0.0013 | 0.0022 | < 0.1 | < 0.0002 | 8.5 | < 0.0001 | 0.52 | < 0.0002 | < 0.001 | 0.014 | 0.0056 | < 0.001 | 0.0128 | 0.0005 |
| | 07-Sep-2005 | 05-SH | < 0.001 | 0.0003 | 0.0004 | 0.22 | < 0.0002 | 0.03 | < 0.0002 | < 0.001 | 0.0004 | 0.001 | < 0.0003 | 0.025 | < 0.00005 | 0.0005 | 0.0027 | < 0.1 | 0.0005 | 7.42 | < 0.0001 | 0.51 | < 0.0002 | < 0.001 | 0.001 | 0.0054 | < 0.001 | 0.0021 | 0.0008 |
| (Duplicate) | 07-Sep-2005 | 05-SH DUP | 0.001 | < 0.0002 | 0.0004 | 0.195 | < 0.0002 | 0.03 | < 0.0002 | 0.001 | < 0.0003 | 0.0027 | < 0.0003 | 0.027 | 0.00006 | 0.0004 | 0.0022 | 0.1 | 0.0004 | 7.21 | < 0.0001 | 0.47 | < 0.0002 | < 0.001 | 0.001 | 0.0052 | < 0.001 | 0.0024 | < 0.0002 |
| | 07-Sep-2006 | 05-SH | 0.002 | < 0.0002 | < 0.0002 | 0.213 | < 0.0002 | 0.03 | < 0.0002 | 0.008 | 0.0004 | 0.0021 | < 0.0003 | 0.033 | 0.0001 | 0.0007 | 0.0037 | < 0.1 | < 0.0002 | 8.77 | < 0.0001 | 0.54 | < 0.0002 | 0.001 | 0.002 | 0.0068 | < 0.001 | 0.0118 | 0.0028 |
| (Duplicate) | 07-Sep-2006 | 05-SH DUP | 0.001 | < 0.0002 | < 0.0002 | 0.205 | < 0.0002 | 0.05 | < 0.0002 | 0.008 | 0.0007 | 0.0022 | < 0.0003 | 0.031 | 0.00016 | 0.0007 | 0.004 | < 0.1 | < 0.0002 | 8.4 | < 0.0001 | 0.54 | < 0.0002 | < 0.001 | 0.003 | 0.0059 | < 0.001 | 0.0049 | 0.0009 |
| | 05-Sep-2007 | 05-SH | 0.001 | < 0.0002 | < 0.0002 | 0.2 | < 0.001 | 0.03 | 0.00003 | 0.007 | 0.0004 | 0.0026 | < 0.0002 | 0.03 | < 0.00005 | 0.0007 | 0.0069 | 0.1 | < 0.0002 | 8.4 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | 0.006 | 0.0062 | < 0.001 | 0.004 | --- |
| (Duplicate) | 05-Sep-2007 | 05-SH DUP | 0.005 | < 0.0002 | < 0.0002 | 0.21 | < 0.001 | 0.03 | 0.00007 | 0.007 | 0.0005 | 0.0016 | < 0.0002 | 0.03 | < 0.00005 | 0.0003 | 0.0069 | < 0.1 | < 0.0002 | 8.3 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | 0.005 | 0.0062 | < 0.001 | 0.003 | --- |
| | 05-Sep-2008 | 05-SH | < 0.01 | < 0.0004 | < 0.0004 | 0.228 | < 0.001 | < 0.05 | < 0.0001 | < 0.005 | < 0.002 | 0.001 | < 0.0001 | 0.029 | < 0.00010 | < 0.005 | 0.003 | --- | 0.0007 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0061 | < 0.001 | < 0.002 | --- |
| (Duplicate) | 05-Sep-2008 | 05-SH DUP | < 0.01 | < 0.0004 | < 0.0004 | 0.217 | < 0.001 | < 0.05 | < 0.0001 | < 0.005 | < 0.002 | 0.003 | < 0.0001 | 0.035 | < 0.00010 | < 0.005 | 0.003 | --- | 0.0008 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0066 | < 0.001 | 0.005 | --- |
| | 09-Sep-2009 | 05-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.214 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0050 | < 0.0020 | 0.0011 | 0.00011 | 0.032 | < 0.000020 | < 0.0050 | 0.0059 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0012 | 0.00582 | < 0.0010 | < 0.0040 | --- |
| (Duplicate) | 09-Sep-2009 | 05-SH DUP | < 0.0050 | < 0.00040 | < 0.00040 | 0.193 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0050 | < 0.0020 | 0.0022 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | 0.0047 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0015 | 0.00567 | < 0.0010 | 0.0057 | --- |
| | 08-Sep-2010 | 05 SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.202 | < 0.0010 | < 0.050 | < 0.000010 | 0.0053 | < 0.0020 | 0.0011 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | 0.006 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0014 | 0.00558 | < 0.0010 | 0.0081 | --- |
| (Duplicate) | 08-Sep-2010 | SYLVITE 25 | < 0.0050 | < 0.00040 | < 0.00040 | 0.206 | < 0.0010 | < 0.050 | < 0.000010 | 0.0028 | < 0.0020 | < 0.0010 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | 0.0082 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0015 | 0.0056 | < 0.0010 | < 0.0040 | --- |
| | 07-Sep-2011 | 05-SH | < 0.0050 | < 0.00040 | 0.0019 | 0.213 | < 0.0010 | < 0.050 | < 0.000010 | 0.0015 | < 0.0020 | < 0.0010 | < 0.00010 | 0.03 | < 0.000020 | < 0.0050 | 0.0029 | --- | < 0.00040 | 9.71 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00583 | < 0.0010 | < 0.0040 | --- |
| (Duplicate) | 07-Sep-2011 | ZIRCON 25 | < 0.0050 | < 0.00040 | 0.00051 | 0.229 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | 0.0032 | < 0.0010 | < 0.00010 | 0.028 | < 0.000020 | < 0.0050 | 0.0048 | --- | < 0.00040 | 9.39 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00546 | < 0.0010 | < 0.0040 | --- |
| | 05-Sep-2012 | 05-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.214 | < 0.0010 | 0.052 | < 0.000010 | < 0.0010 | 0.0031 | < 0.0010 | < 0.00010 | 0.032 | < 0.000020 | < 0.0050 | 0.0042 | --- | < 0.00040 | 10.5 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00545 | < 0.0010 | < 0.0040 | --- |
| (Duplicate) | 05-Sep-2012 | SPINEL 23 | < 0.0050 | < 0.00040 | < 0.00040 | 0.208 | < 0.0010 | 0.06 | 0.000013 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.033 | < 0.000020 | < 0.0050 | 0.0026 | --- | < 0.00040 | 10.5 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00536 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | 05-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.215 | < 0.0010 | < 0.050 | 0.000018 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.035 | < 0.000020 | < 0.0050 | 0.0032 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00542 | < 0.0010 | 0.0111 | --- |
| | 17-Sep-2014 | 05-SH | 0.0037 | < 0.00010 | 0.00023 | 0.213 | < 0.00050 | 0.034 | 0.000075 | 0.00021 | 0.00066 | 0.00121 | < 0.000050 | 0.033 | < 0.0000050 | 0.000391 | 0.00447 | < 0.30 | < 0.00010 | 10.1 | < 0.000010 | 0.552 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00554 | 0.00015 | 0.0013 | --- |
| (Duplicate) | 17-Sep-2014 | 25-SH | 0.0036 | < 0.00010 | 0.00021 | 0.213 | < 0.00050 | 0.035 | 0.000074 | 0.00019 | 0.00066 | 0.00130 | < 0.000050 | 0.031 | < 0.0000050 | 0.000408 | 0.00446 | < 0.30 | < 0.00010 | 10.2 | < 0.000010 | 0.538 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00580 | 0.00018 | 0.0015 | --- |
| | 28-Sep-2015 | 05-SH | 0.0031 | <0.00010 | 0.00016 | 0.182 | --- | 0.026 | 0.0000584 | 0.00018 | --- | 0.00095 | <0.000050 | --- | <0.0000050 | --- | 0.00204 | --- | 0.000064 | --- | <0.000010 | --- | --- | --- | --- | 0.00650 | --- | 0.0019 | --- |
| (Duplicate) | 28-Sep-2015 | 25-SH | 0.0025 | <0.00010 | 0.00018 | 0.177 | --- | 0.025 | 0.0000602 | 0.00023 | --- | 0.00104 | 0.000055 | --- | <0.0000050 | --- | 0.00205 | --- | 0.000083 | --- | <0.000010 | --- | --- | --- | --- | 0.00666 | --- | 0.0039 | --- |
| | 28-Sep-2016 | 05-SH | 0.0019 | <0.00010 | 0.00017 | 0.158 | --- | 0.030 | 0.0000377 | 0.00040 | --- | 0.00102 | <0.000050 | --- | <0.0000050 | --- | 0.00111 | --- | 0.000127 | --- | <0.000010 | --- | --- | --- | --- | 0.00590 | --- | 0.0012 | --- |
| (Duplicate) | 28-Sep-2016 | 25-SH | 0.0013 | <0.00010 | 0.00019 | 0.157 | --- | 0.029 | 0.0000318 | 0.00044 | --- | 0.00104 | <0.000050 | --- | <0.0000050 | --- | 0.00110 | --- | 0.000114 | --- | <0.000010 | --- | --- | --- | --- | 0.00580 | --- | 0.0011 | --- |
| | 27-Sep-2017 | 05-SH | 0.0013 | <0.00010 | 0.00015 | 0.177 | --- | 0.030 | 0.0000180 | 0.00083 | --- | 0.00072 | <0.000050 | --- | <0.0000050 | --- | 0.00102 | --- | 0.000114 | --- | <0.000010 | --- | --- | --- | --- | 0.00553 | --- | 0.0011 | --- |
| (Duplicate) | 27-Sep-2017 | 25-SH | 0.0015 | <0.00010 | 0.00016 | 0.182 | --- | 0.030 | 0.0000187 | 0.00062 | --- | 0.00074 | <0.000050 | --- | <0.0000050 | --- | 0.00102 | --- | 0.000095 | --- | <0.000010 | --- | --- | --- | --- | 0.00565 | --- | 0.0079 | --- |
| | 17-Sep-2018 | 05-SH | 0.0014 | <0.00010 | 0.00021 | 0.155 | --- | 0.030 | 0.0000811 | 0.00053 | --- | 0.00105 | <0.000050 | --- | <0.0000050 | --- | 0.00132 | --- | 0.000162 | --- | <0.000010 | --- | --- | --- | --- | 0.00612 | --- | 0.0019 | --- |
| (Duplicate) | 17-Sep-2018 | 25-SH | 0.0014 | <0.00010 | 0.00022 | 0.148 | --- | 0.030 | 0.0000814 | 0.00045 | --- | 0.00102 | <0.000050 | --- | 0.000009 | --- | 0.00136 | --- | 0.000179 | --- | <0.000010 | --- | --- | --- | --- | 0.00613 | --- | 0.0016 | --- |
| | 17-Sep-2019 | 05-SH | 0.0038 | <0.00010 | 0.00019 | 0.154 | --- | 0.029 | 0.0000178 | 0.00075 | --- | 0.00104 | <0.000050 | --- | <0.0000050 | --- | 0.00117 | --- | 0.000145 | --- | <0.000010 | --- | --- | --- | --- | 0.00578 | --- | <0.0010 | --- |
| (Duplicate) | 17-Sep-2019 | 25-SH | 0.0014 | <0.00010 | 0.00022 | 0.148 | --- | 0.030 | 0.0000814 | 0.00045 | --- | 0.00102 | <0.000050 | --- | 0.000009 | --- | 0.00136 | --- | 0.000179 | --- | <0.000010 | --- | --- | --- | --- | 0.00613 | --- | 0.0016 | --- |
| | 22-Sep-2020 | 05-SH | 0.0020 | <0.00010 | 0.00018 | 0.136 | <0.00010 | 0.024 | 0.0000131 | 0.00119 | <0.00010 | 0.00135 | <0.000050 | 0.0300 | <0.0000050 | 0.000317 | 0.00074 | --- | 0.000133 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00606 | <0.00050 | <0.0010 | --- |
| (Duplicate) | 22-Sep-2020 | 25-SH | 0.0022 | <0.00010 | 0.00017 | 0.134 | <0.00010 | 0.023 | 0.0000147 | 0.00121 | <0.00010 | 0.00072 | <0.000050 | 0.0298 | <0.0000050 | 0.000333 | 0.00071 | --- | 0.000176 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00590 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2021 | 05-SH | 0.0036 | <0.00010 | 0.00023 | 0.14 | <0.00010 | 0.033 | 0.0000276 | 0.00352 | <0.00010 | 0.00191 | <0.000050 | 0.0307 | <0.0000050 | 0.000402 | 0.00129 | --- | 0.000186 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00635 | <0.00050 | 0.0017 | --- |
| (Duplicate) | 22-Sep-2021 | 25-SH | 0.0029 | <0.00010 | 0.00019 | 0.148 | <0.00010 | 0.032 | 0.0000299 | 0.00364 | <0.00010 | 0.00092 | <0.000050 | 0.0309 | <0.0000050 | 0.000414 | 0.00112 | --- | 0.000169 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.0064 | <0.00050 | <0.0010 | --- |
| | 29-Sep-2022 | 05-SH | 0.0023 | 0.00333 | 0.00022 | 0.126 | --- | 0.034 | 0.0000571 | 0.00306 | --- | 0.00428 | 0.000102 | --- | <0.0000050 | --- | 0.00197 | --- | 0.000165 | --- | <0.000010 | --- | --- | --- | --- | 0.00716 | --- | 0.0025 | --- |
| (Duplicate) | 29-Sep-2022 | 25-SH | 0.0019 | <0.00010 | 0.00019 | 0.135 | --- | 0.031 | 0.0000613 | 0.00298 | --- | 0.00225 | <0.000050 | --- | <0.0000050 | --- | 0.00197 | --- | 0.000164 | --- | <0.000010 | --- | --- | --- | --- | 0.00693 | --- | 0.0014 | --- |
| | 28-Sep-2023 | 05-SH | <0.0010 | <0.00010 | 0.00021 | 0.118 | --- | 0.031 | 0.0000128 | 0.00266 | --- | 0.00090 | <0.000050 | --- | <0.0000050 | --- | 0.00192 | --- | 0.000195 | --- | <0.000010 | --- | --- | --- | --- | 0.00682 | --- | 0.0014 | --- |
| (Duplicate) | 28-Sep-2023 | 25-SH | 0.0034 | <0.00010 | 0.0003 | 0.101 | --- | 0.027 | 0.0000237 | 0.00503 | --- | 0.00208 | <0.000050 | --- | <0.0000050 | --- | 0.00202 | --- | 0.000245 | --- | <0.000010 | --- | --- | --- | --- | 0.00618 | --- | 0.0012 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **2.9** | **0.006** | **0.010** | **2.0** | --- | **5** | **0.007** | **0.05** | --- | **2** | **0.005** | --- | **0.001** | --- | --- | --- | --- | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **05-IN** | 15-May-1985 | 05-IN | --- | 0.0002 | 0.0007 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.016 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 05-IN | --- | 0.0002 | 0.0002 | --- | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 05-IN | --- | 0.0002 | 0.0008 | 0.22 | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.013 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 05-IN | --- | 0.0002 | 0.0004 | 0.21 | --- | --- | --- | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 05-IN | --- | 0.0006 | 0.0008 | 0.21 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 05-IN | --- | 0.0003 | 0.0005 | 0.17 | --- | --- | < 0.001 | 0.008 | --- | 0.009 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 05-IN | --- | --- | 0.0004 | 0.17 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 05-IN | --- | 0.0002 | 0.0007 | 0.17 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 05-IN | --- | 0.0002 | 0.0006 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 05-IN | --- | 0.0002 | 0.0007 | 0.16 | < 0.001 | --- | < 0.001 | 0.007 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 05-IN | --- | 0.0002 | 0.0008 | 0.15 | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 05-IN | --- | 0.0002 | 0.0006 | 0.14 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 05-IN | --- | 0.0002 | 0.0003 | 0.14 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 05-IN | --- | 0.0002 | 0.0007 | 0.14 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 05-IN | --- | 0.0002 | 0.0013 | 0.11 | < 0.001 | --- | < 0.001 | 0.004 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 05-IN | --- | 0.0002 | 0.0007 | 0.09 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 05-IN | --- | 0.001 | 0.0006 | 0.09 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.007 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 05-IN | --- | < 0.0002 | 0.0004 | 0.07 | 0.007 | --- | 0.0009 | < 0.002 | 0.007 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.007 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 05-IN | --- | < 0.0002 | 0.001 | 0.06 | < 0.001 | --- | < 0.0002 | 0.007 | < 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | 0.005 | 0.009 | --- |
| | 05-Sep-2000 | 05-IN | --- | < 0.0002 | 0.0005 | 0.0578 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0014 | 0.0012 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0045 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.0001 | 0.0031 | --- |
| | 06-Sep-2001 | 05-IN | --- | < 0.0002 | 0.0008 | 0.064 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0013 | 0.0006 | < 0.0003 | 0.047 | < 0.00005 | 0.0015 | 0.0079 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0345 | --- |
| | 04-Sep-2002 | 05-IN | 0.002 | < 0.0002 | 0.0011 | 0.0355 | < 0.0002 | 0.04 | < 0.0002 | 0.033 | 0.0004 | 0.003 | < 0.0003 | --- | < 0.00005 | 0.0013 | 0.0081 | < 0.1 | < 0.0002 | 6.72 | --- | 0.546 | < 0.0002 | < 0.001 | 0.001 | 0.0048 | 0.009 | 0.015 | < 0.0002 |
| | 03-Sep-2003 | 05-IN | 0.007 | < 0.0002 | 0.0005 | 0.0433 | < 0.0002 | 0.05 | < 0.0002 | < 0.001 | 0.0005 | 0.0021 | < 0.0003 | 0.029 | < 0.00005 | 0.0129 | 0.0033 | < 0.1 | < 0.0002 | 7.35 | < 0.0001 | 0.58 | < 0.0002 | < 0.001 | < 0.001 | 0.0046 | < 0.001 | 0.0273 | 0.0002 |
| | 08-Sep-2004 | 05-IN | 0.058 | < 0.0002 | 0.0008 | 0.0559 | < 0.0002 | 0.07 | < 0.0002 | < 0.001 | 0.0014 | 0.0034 | < 0.0003 | 0.044 | < 0.00005 | 0.0015 | 0.0047 | < 0.1 | < 0.0002 | 6.99 | < 0.0001 | 0.63 | < 0.0002 | < 0.001 | 0.021 | 0.0066 | < 0.001 | 0.0057 | 0.0004 |
| | 07-Sep-2005 | 05-IN | < 0.001 | < 0.0002 | 0.0025 | 0.055 | < 0.0002 | 0.05 | < 0.0002 | < 0.001 | 0.0009 | 0.0669 | < 0.0003 | 0.048 | < 0.00005 | 0.0013 | 0.0082 | 0.2 | 0.0004 | 6.85 | < 0.0001 | 0.61 | < 0.0002 | < 0.001 | 0.001 | 0.0055 | < 0.001 | 0.0095 | 0.0004 |
| | 07-Sep-2006 | 05-IN | 0.002 | < 0.0002 | 0.0033 | 0.0503 | < 0.0002 | 0.05 | < 0.0002 | < 0.001 | 0.0009 | 0.0342 | < 0.0003 | 0.059 | 0.00019 | 0.0016 | 0.007 | < 0.1 | < 0.0002 | 7.05 | < 0.0001 | 0.63 | < 0.0002 | < 0.001 | 0.001 | 0.0069 | < 0.001 | 0.0273 | 0.001 |
| | 05-Sep-2007 | 05-IN | 0.033 | < 0.0002 | < 0.0002 | 0.06 | < 0.001 | 0.05 | < 0.00001 | < 0.001 | 0.0017 | 0.0169 | < 0.0002 | 0.05 | < 0.00005 | 0.0014 | 0.0074 | 0.1 | < 0.0002 | 7.2 | < 0.0001 | 0.65 | < 0.0002 | < 0.001 | 0.011 | 0.0068 | < 0.001 | < 0.003 | --- |
| | 05-Sep-2008 | 05-IN | < 0.01 | < 0.0004 | 0.0004 | 0.06 | < 0.001 | < 0.05 | < 0.0001 | < 0.005 | < 0.002 | 0.002 | < 0.0001 | 0.045 | < 0.00010 | < 0.005 | 0.003 | --- | 0.0007 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0074 | < 0.001 | 0.004 | --- |
| | 09-Sep-2009 | 05-IN | < 0.0050 | < 0.00040 | 0.00052 | 0.0549 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0050 | < 0.0020 | 0.0013 | 0.00011 | 0.055 | < 0.000020 | < 0.0050 | 0.0051 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0012 | 0.00667 | < 0.0010 | 0.0042 | --- |
| | 08-Sep-2010 | 05 IN | < 0.0050 | < 0.00040 | 0.00104 | 0.0564 | < 0.0010 | 0.053 | < 0.000010 | < 0.0010 | < 0.0020 | 0.0024 | < 0.00010 | 0.06 | < 0.000020 | < 0.0050 | 0.0064 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0011 | 0.00642 | < 0.0010 | 0.0117 | --- |
| | 07-Sep-2011 | 05-IN | < 0.0050 | < 0.00040 | 0.00341 | 0.0575 | < 0.0010 | < 0.050 | 0.000011 | < 0.0010 | < 0.0020 | 0.001 | < 0.00010 | 0.048 | < 0.000020 | < 0.0050 | 0.0027 | --- | < 0.00040 | 8.19 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00663 | < 0.0010 | 0.0043 | --- |
| | 05-Sep-2012 | 05-IN | < 0.0050 | < 0.00040 | 0.00079 | 0.0337 | < 0.0010 | 0.055 | 0.000019 | < 0.0010 | < 0.0020 | 0.0049 | < 0.00010 | 0.057 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 8.58 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00612 | < 0.0010 | 0.0095 | --- |
| | 26-Sep-2013 | 05-IN | < 0.0050 | < 0.00040 | 0.00108 | 0.0647 | < 0.0010 | < 0.050 | 0.000012 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.055 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0103 | < 0.0010 | 0.0065 | --- |
| | 17-Sep-2014 | 05-IN | 0.0102 | 0.00011 | 0.00081 | 0.100 | < 0.00050 | 0.045 | 0.000037 | < 0.00010 | 0.00126 | 0.00228 | < 0.000050 | 0.0501 | < 0.0000050 | 0.000793 | 0.00224 | < 0.30 | < 0.00010 | 9.95 | < 0.0000010 | 0.671 | < 0.000050 | < 0.00010 | < 0.00030 | 0.0121 | 0.00021 | 0.0043 | --- |
| | 28-Sep-2015 | 05-IN | 0.0039 | <0.00010 | 0.00040 | 0.0584 | --- | 0.039 | 0.0000217 | 0.00035 | --- | 0.00116 | <0.000050 | --- | <0.0000050 | --- | 0.00291 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.0118 | --- | 0.0068 | --- |
| | 28-Sep-2016 | 05-IN | 0.0016 | <0.00010 | 0.00066 | 0.0713 | --- | 0.043 | 0.0000193 | <0.00010 | --- | 0.00112 | <0.000050 | --- | <0.0000050 | --- | 0.00225 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.0086 | --- | 0.0038 | --- |
| | 27-Sep-2017 | 05-IN | 0.0014 | <0.00010 | 0.00045 | 0.0614 | --- | 0.049 | 0.0000226 | <0.00010 | --- | 0.00089 | <0.000050 | --- | <0.0000050 | --- | 0.00188 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.0085 | --- | 0.0026 | --- |
| | 17-Sep-2018 | 05-IN | 0.0020 | <0.00010 | 0.00084 | 0.0689 | --- | 0.052 | 0.0000256 | 0.00015 | --- | 0.00302 | <0.000050 | --- | 0.000101 | --- | 0.00199 | --- | 0.000051 | --- | <0.000010 | --- | --- | --- | --- | 0.0083 | --- | 0.0027 | --- |
| | 17-Sep-2019 | 05-IN | 0.0029 | <0.00010 | 0.00045 | 0.0854 | --- | 0.043 | 0.0000239 | 0.00016 | --- | 0.00245 | <0.000050 | --- | <0.0000050 | --- | 0.00209 | --- | 0.000058 | --- | <0.000010 | --- | --- | --- | --- | 0.0083 | --- | 0.0017 | --- |
| | 22-Sep-2020 | 05-IN | 0.0023 | <0.00010 | 0.00062 | 0.0699 | <0.00010 | 0.040 | 0.0000104 | 0.00015 | 0.00012 | 0.00362 | <0.000050 | 0.0481 | <0.0000050 | 0.000699 | 0.00246 | --- | 0.000059 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00816 | <0.00050 | 0.0022 | --- |
| | 22-Sep-2021 | 05-IN | 0.0018 | <0.00010 | 0.0006 | 0.0725 | <0.00010 | 0.048 | 0.0000193 | 0.00021 | <0.00010 | 0.002 | <0.000050 | 0.0504 | <0.0000050 | 0.00065 | 0.00126 | --- | 0.000052 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00813 | <0.00050 | 0.0011 | --- |
| | 29-Sep-2022 | 05-IN | 0.0016 | <0.00010 | 0.00062 | 0.0705 | --- | 0.049 | 0.0000059 | <0.00050 | --- | 0.00177 | <0.000050 | --- | <0.0000050 | --- | 0.00111 | --- | 0.000070 | --- | <0.000010 | --- | --- | --- | --- | 0.00870 | --- | 0.0012 | --- |
| | 28-Sep-2023 | 05-IN | <0.0010 | <0.00010 | 0.00042 | 0.0586 | --- | 0.051 | 0.0000090 | 0.00176 | --- | 0.00161 | <0.000050 | --- | <0.0000050 | --- | 0.00150 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00902 | --- | 0.0025 | --- |
| **05-SS** | 10-Sep-2004 | 05-SS | 0.042 | < 0.0002 | 0.0011 | 0.093 | 0.0002 | 0.04 | < 0.0002 | < 0.001 | 0.0013 | 0.0026 | 0.0004 | 0.052 | < 0.00005 | 0.0011 | 0.0033 | < 0.1 | < 0.0002 | 9.12 | < 0.0001 | 0.26 | < 0.0002 | < 0.001 | 0.004 | < 0.0004 | < 0.001 | 0.0295 | 0.0002 |
| | 08-Sep-2005 | 05-SS | 0.012 | < 0.0002 | 0.0097 | 0.106 | < 0.0002 | 0.02 | < 0.0002 | < 0.001 | 0.0008 | 0.001 | < 0.0003 | 0.055 | < 0.00005 | 0.0007 | 0.272 | < 0.1 | < 0.0002 | 11.7 | < 0.0001 | 0.23 | < 0.0002 | < 0.001 | 0.001 | < 0.0004 | < 0.001 | 0.0106 | < 0.0002 |
| | 12-Apr-2006 | 05-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.0285 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 12-Apr-2006 | 05-SS DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.0287 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 05-SS | 0.003 | < 0.0002 | 0.0066 | 0.105 | < 0.0002 | 0.02 | < 0.0002 | < 0.001 | 0.0007 | 0.0032 | < 0.0003 | 0.06 | 0.00013 | 0.0006 | 0.0077 | < 0.1 | < 0.0002 | 12.3 | < 0.0001 | 0.24 | < 0.0002 | < 0.001 | 0.002 | < 0.0004 | < 0.001 | 0.0168 | < 0.0002 |
| | 07-Sep-2007 | 05-SS | 0.004 | < 0.0002 | 0.0066 | 0.09 | < 0.001 | 0.02 | < 0.00001 | < 0.001 | 0.0004 | 0.0004 | 0.0003 | 0.05 | < 0.00005 | 0.0005 | 0.0102 | < 0.1 | < 0.0002 | 11.6 | < 0.0001 | 0.22 | < 0.0002 | < 0.001 | 0.004 | < 0.0001 | < 0.001 | 0.027 | --- |
| | 04-Sep-2008 | 05-SS | < 0.01 | < 0.0004 | 0.0034 | 0.106 | < 0.001 | < 0.05 | < 0.00002 | < 0.005 | < 0.002 | 0.013 | 0.0004 | 0.05 | < 0.00010 | 0.008 | 0.007 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | < 0.0001 | 0.004 | 0.029 | --- |
| | 17-Sep-2009 | 05-SS | < 0.0050 | < 0.00040 | 0.00043 | 0.0919 | < 0.0010 | < 0.050 | 0.000011 | < 0.0050 | < 0.0020 | 0.0039 | 0.00014 | 0.058 | < 0.000020 | < 0.0050 | 0.0054 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0015 | < 0.00010 | < 0.0010 | 0.0197 | --- |
| (Duplicate) | 17-Sep-2009 | 05-SS DUP | < 0.0050 | < 0.00040 | 0.00043 | 0.0937 | < 0.0010 | < 0.050 | 0.000011 | < 0.0050 | < 0.0020 | 0.0018 | < 0.00010 | 0.056 | < 0.000020 | < 0.0050 | 0.0055 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0016 | < 0.00010 | < 0.0010 | 0.0145 | --- |
| | 09-Sep-2010 | 05 (R) SS | < 0.0050 | < 0.00040 | < 0.00040 | 0.0993 | < 0.0010 | < 0.050 | 0.000113 | < 0.0010 | < 0.0020 | 0.101 | 0.00046 | 0.062 | < 0.000020 | < 0.0050 | 0.185 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0017 | 0.00022 | < 0.0010 | 0.667 | --- |
| | 08-Sep-2011 | 05-SS | < 0.0050 | < 0.00040 | 0.00787 | 0.112 | < 0.0010 | < 0.050 | 0.000018 | < 0.0010 | < 0.0020 | 0.0103 | 0.00223 | 0.052 | < 0.000020 | < 0.0050 | 0.0071 | --- | < 0.00040 | 13.6 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | < 0.00010 | < 0.0010 | 0.0838 | --- |
| | 16-Sep-2014 | 05-SS | < 0.0010 | < 0.00010 | 0.00403 | 0.113 | < 0.00050 | 0.023 | < 0.000010 | < 0.00010 | 0.00014 | 0.00247 | 0.000055 | 0.0624 | < 0.0000050 | 0.000427 | 0.00046 | < 0.30 | < 0.00010 | 14.4 | < 0.0000010 | 0.250 | < 0.000050 | < 0.00010 | < 0.00030 | 0.000072 | < 0.00010 | 0.0044 | --- |
| | 28-Sep-2015 | 05-SS | 0.0012 | <0.00010 | 0.00071 | 0.101 | --- | 0.018 | 0.0000116 | <0.00010 | --- | 0.00600 | <0.000050 | --- | <0.0000050 | --- | 0.00208 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000076 | --- | 0.0306 | --- |
| (Duplicate) | 28-Sep-2015 | 25-SS | <0.0010 | <0.00010 | 0.00069 | 0.101 | --- | 0.018 | 0.0000143 | <0.00010 | --- | 0.00589 | <0.000050 | --- | <0.0000050 | --- | 0.00211 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000073 | --- | 0.0322 | --- |
| | 28-Sep-2016 | 05-SS | <0.0010 | <0.00010 | 0.00205 | 0.104 | --- | 0.020 | 0.0000111 | <0.00010 | --- | 0.00574 | <0.000050 | --- | <0.0000050 | --- | 0.00190 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000094 | --- | 0.0297 | --- |
| (Duplicate) | 28-Sep-2016 | 25-SS | <0.0010 | <0.00010 | 0.00194 | 0.104 | --- | 0.022 | 0.0000138 | <0.00010 | --- | 0.00559 | <0.000050 | --- | <0.0000050 | --- | 0.00185 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000091 | --- | 0.0293 | --- |
| | 27-Sep-2017 | 05-SS | <0.0010 | <0.00010 | 0.00030 | 0.117 | --- | 0.025 | 0.0000072 | <0.00010 | --- | 0.00215 | <0.000050 | --- | <0.0000050 | --- | 0.00075 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000048 | --- | 0.0087 | --- |
| (Duplicate) | 27-Sep-2017 | 25-SS | <0.0010 | <0.00010 | 0.00031 | 0.116 | --- | 0.023 | 0.0000075 | <0.00010 | --- | 0.00210 | <0.000050 | --- | <0.0000050 | --- | 0.00074 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000043 | --- | 0.0082 | --- |
| | 17-Sep-2018 | 05-SS | <0.0010 | <0.00010 | 0.00031 | 0.116 | --- | 0.026 | 0.0000860 | <0.00010 | --- | 0.00229 | <0.000050 | --- | 0.0000373 | --- | 0.00177 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000076 | --- | 0.0242 | --- |
| (Duplicate) | 17-Sep-2018 | 25-SS | <0.0010 | <0.00010 | 0.00034 | 0.117 | --- | 0.026 | 0.0000940 | <0.00010 | --- | 0.00226 | <0.000050 | --- | 0.0000206 | --- | 0.00176 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000061 | --- | 0.0247 | --- |
| | 17-Sep-2019 | 05-SS | <0.0010 | 0.00015 | 0.00064 | 0.107 | --- | 0.022 | 0.0000220 | <0.00010 | --- | 0.01240 | 0.000166 | --- | <0.0000050 | --- | 0.00286 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000566 | --- | 0.0869 | --- |
| (Duplicate) | 17-Sep-2019 | 25-SS | <0.0010 | 0.00015 | 0.00069 | 0.109 | --- | 0.022 | 0.0000254 | <0.00010 | --- | 0.01260 | 0.000163 | --- | <0.0000050 | --- | 0.00286 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000592 | --- | 0.0888 | --- |
| | 23-Sep-2020 | 05-SS | <0.0010 | <0.00010 | 0.00351 | 0.105 | <0.00010 | 0.016 | <0.0000050 | <0.00010 | 0.00018 | 0.00045 | <0.000050 | 0.0568 | <0.0000050 | 0.000472 | 0.00075 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.000052 | <0.00050 | 0.0032 | --- |
| (Duplicate) | 23-Sep-2020 | 25-SS | 0.0021 | <0.00010 | 0.00363 | 0.105 | <0.00010 | 0.016 | <0.0000050 | <0.00010 | 0.00018 | 0.00047 | <0.000050 | 0.0563 | <0.0000050 | 0.000432 | 0.00075 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.000054 | <0.00050 | 0.0032 | --- |
| | 22-Sep-2021 | 05-SS | <0.0010 | <0.00010 | 0.00168 | 0.108 | <0.00010 | 0.024 | 0.0000095 | <0.00010 | 0.00019 | 0.00121 | <0.000050 | 0.0621 | <0.0000050 | 0.000477 | 0.00316 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.000048 | <0.00050 | 0.0454 | --- |
| (Duplicate) | 22-Sep-2021 | 25-SS | <0.0010 | <0.00010 | 0.00187 | 0.106 | <0.00010 | 0.018 | 0.0000096 | <0.00010 | 0.00019 | 0.00118 | <0.000050 | 0.0583 | <0.0000050 | 0.000506 | 0.00299 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.000046 | <0.00050 | 0.043 | --- |
| | 29-Sep-2022 | 05-SS | 0.0011 | <0.00010 | 0.00019 | 0.113 | --- | 0.024 | <0.0000050 | <0.00050 | --- | 0.00158 | <0.000050 | --- | <0.0000050 | --- | 0.00070 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000166 | --- | 0.0208 | --- |
| (Duplicate) | 29-Sep-2022 | 25-SS | <0.0010 | <0.00010 | 0.00018 | 0.133 | --- | 0.023 | 0.0000073 | <0.00050 | --- | 0.00255 | <0.000050 | --- | <0.0000050 | --- | 0.00086 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000141 | --- | 0.0228 | --- |
| | 28-Sep-2023 | 05-SS | 0.0807 | <0.00010 | 0.00067 | 0.0994 | --- | 0.022 | 0.0000221 | 0.00153 | --- | 0.00213 | <0.000050 | --- | <0.0000050 | --- | 0.00218 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000059 | --- | 0.0316 | --- |
| (Duplicate) | 28-Sep-2023 | 25-SS | <0.0010 | <0.00010 | 0.00119 | 0.0981 | --- | 0.022 | 0.0000109 | 0.00129 | --- | 0.00265 | <0.000050 | --- | <0.0000050 | --- | 0.00325 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000133 | --- | 0.0414 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **06-SH** | 15-May-1985 | 06-SH | --- | 0.0003 | 0.001 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 06-SH | --- | 0.0004 | 0.0011 | --- | < 0.001 | --- | < 0.001 | 0.003 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 06-SH | --- | 0.0002 | 0.0003 | --- | < 0.001 | --- | < 0.001 | 0.004 | --- | 0.006 | 0.008 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 06-SH | --- | 0.0002 | 0.0009 | 0.29 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 06-SH | --- | 0.0002 | 0.0006 | 0.27 | --- | --- | --- | < 0.001 | --- | 0.006 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 06-SH | --- | 0.0004 | 0.0002 | 0.28 | --- | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 06-SH | --- | 0.0002 | 0.0004 | 0.26 | --- | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 06-SH | --- | 0.0004 | 0.0004 | 0.29 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 06-SH | --- | 0.0002 | 0.0004 | 0.31 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 06-SH | --- | 0.0002 | 0.0002 | 0.3 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 06-SH | --- | 0.0002 | 0.0004 | 0.3 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 06-SH | --- | 0.0002 | 0.0002 | 0.31 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 06-SH | --- | 0.0002 | 0.0009 | 0.32 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 06-SH | --- | 0.0002 | 0.0003 | 0.34 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 06-SH | --- | 0.0002 | 0.0005 | 0.34 | < 0.001 | --- | < 0.001 | 0.002 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 06-SH | --- | 0.0002 | 0.0002 | 0.32 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.003 | 0.004 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 06-SH | --- | 0.0002 | 0.0003 | 0.39 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 06-SH | --- | < 0.0002 | 0.0005 | 0.19 | < 0.001 | --- | < 0.003 | < 0.001 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 06-SH | --- | 0.0003 | 0.0007 | 0.56 | 0.001 | --- | < 0.003 | < 0.002 | 0.008 | 0.128 | < 0.001 | --- | 0.00005 | 0.005 | 0.167 | --- | 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.004 | 0.054 | --- |
| | 01-Nov-1994 | 06-SH | --- | < 0.0002 | 0.0004 | 0.44 | 0.002 | --- | < 0.003 | 0.002 | < 0.003 | 0.037 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.026 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.017 | --- |
| | 28-Sep-1995 | 06-SH | --- | < 0.0002 | 0.0002 | 0.58 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.005 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 04-Sep-1996 | 06-SH | --- | < 0.0002 | < 0.0002 | 0.64 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.004 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.01 | --- |
| | 03-Sep-1997 | 06-SH | --- | < 0.0002 | 0.0002 | 0.65 | < 0.001 | --- | < 0.0002 | 0.024 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.003 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 15-Sep-1998 | 06-SH | --- | < 0.0002 | 0.0002 | 0.66 | 0.005 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.006 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| **(Duplicate)** | 15-Sep-1998 | 06-SH DUP | --- | < 0.0002 | 0.0002 | 0.68 | 0.004 | --- | 0.0011 | 0.017 | 0.009 | 0.007 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.002 | --- | < 0.001 | --- | --- | --- | 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 06-SH | --- | 0.0005 | 0.0002 | 0.86 | < 0.001 | --- | < 0.0002 | 0.011 | 0.005 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.002 | --- |
| | 05-Sep-2000 | 06-SH | --- | < 0.0002 | 0.0005 | 0.654 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0004 | 0.0014 | < 0.0003 | --- | < 0.00005 | 0.0003 | 0.0085 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0043 | --- |
| | 06-Sep-2001 | 06-SH | --- | < 0.0002 | < 0.0002 | 0.731 | < 0.0002 | --- | < 0.0002 | 0.01 | 0.0014 | 0.0013 | < 0.0003 | 0.036 | < 0.00005 | 0.0006 | 0.0102 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0123 | --- |
| **(Duplicate)** | 06-Sep-2001 | 06-SH DUP | --- | 0.0003 | < 0.0002 | 0.718 | < 0.0002 | --- | < 0.0002 | 0.018 | 0.0006 | 0.0013 | < 0.0003 | --- | < 0.00005 | 0.0008 | 0.0091 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0077 | --- |
| | 04-Sep-2002 | 06-SH | 0.006 | < 0.0002 | 0.0005 | 0.761 | < 0.0002 | 0.06 | < 0.0002 | 0.005 | 0.0006 | 0.002 | < 0.0003 | --- | < 0.00005 | 0.0006 | 0.0081 | < 0.1 | < 0.0002 | 10.1 | < 0.0001 | 0.692 | < 0.0002 | < 0.001 | 0.001 | 0.0061 | < 0.001 | 0.0042 | 0.0007 |
| **(Duplicate)** | 04-Sep-2002 | 06-SH DUP | 0.002 | 0.0002 | 0.0004 | 0.809 | < 0.0002 | 0.06 | < 0.0002 | 0.004 | 0.0006 | 0.002 | < 0.0003 | --- | < 0.00005 | 0.0007 | 0.0086 | --- | < 0.0002 | 10.1 | < 0.0001 | 0.707 | < 0.0002 | < 0.001 | < 0.001 | 0.006 | < 0.001 | 0.0048 | 0.0005 |
| | 03-Sep-2003 | 06-SH | 0.002 | < 0.0002 | < 0.0002 | 0.772 | < 0.0002 | 0.07 | < 0.0002 | 0.007 | 0.0005 | 0.0019 | < 0.0003 | 0.015 | < 0.00005 | 0.0044 | 0.0064 | < 0.1 | < 0.0002 | 11.3 | < 0.0001 | 0.73 | < 0.0002 | < 0.001 | < 0.001 | 0.0065 | < 0.001 | 0.006 | 0.0003 |
| **(Duplicate)** | 03-Sep-2003 | 06-SH DUP | 0.001 | 0.0004 | < 0.0002 | 0.75 | < 0.0002 | 0.08 | < 0.0002 | 0.014 | < 0.0003 | 0.0018 | 0.0004 | 0.026 | < 0.00005 | 0.0195 | 0.0052 | < 0.1 | < 0.0002 | 11.3 | < 0.0001 | 0.79 | < 0.0002 | < 0.001 | < 0.001 | 0.0064 | < 0.001 | 0.0049 | 0.0007 |
| | 08-Sep-2004 | 06-SH | 0.058 | < 0.0002 | < 0.0002 | 0.915 | < 0.0002 | 0.08 | < 0.0002 | 0.061 | 0.001 | 0.0018 | < 0.0003 | 0.03 | < 0.00005 | 0.0076 | 0.0075 | < 0.1 | < 0.0002 | 10.5 | < 0.0001 | 0.74 | < 0.0002 | < 0.001 | 0.031 | 0.0087 | < 0.001 | 0.0031 | 0.0004 |
| **(Duplicate)** | 08-Sep-2004 | 06-SH DUP | 0.016 | < 0.0002 | < 0.0002 | 0.825 | 0.0019 | 0.11 | < 0.0002 | 0.072 | < 0.0003 | 0.0014 | 0.0004 | 0.033 | < 0.00005 | 0.0072 | 0.0027 | < 0.1 | < 0.0002 | 10.6 | < 0.0001 | 0.72 | < 0.0002 | < 0.001 | 0.018 | 0.0085 | < 0.001 | 0.0072 | 0.0003 |
| | 30-Oct-2004 | 06-SH | 0.017 | < 0.0002 | < 0.0002 | 0.75 | < 0.0002 | 0.14 | < 0.0002 | 0.001 | 0.0021 | 0.0025 | < 0.0003 | 0.029 | < 0.00005 | 0.0004 | 0.0102 | < 0.1 | < 0.0002 | 9.78 | < 0.0001 | 0.7 | < 0.0002 | < 0.001 | 0.016 | 0.0073 | 0.001 | 0.0069 | 0.0003 |
| | 07-Sep-2005 | 06-SH | 0.001 | 0.0003 | 0.0007 | 0.849 | < 0.0002 | 0.04 | < 0.0002 | 0.003 | 0.0038 | 0.0018 | < 0.0003 | 0.034 | 0.00005 | 0.0038 | 0.0494 | < 0.1 | 0.0004 | 9.7 | < 0.0001 | 0.65 | < 0.0002 | < 0.001 | 0.001 | 0.0066 | < 0.001 | 0.005 | 0.0004 |
| **(Duplicate)** | 07-Sep-2005 | 06-SH DUP | < 0.001 | < 0.0002 | 0.0003 | 0.713 | < 0.0002 | 0.05 | < 0.0002 | 0.015 | 0.0021 | 0.0013 | < 0.0003 | 0.034 | 0.00005 | 0.0043 | 0.0422 | < 0.1 | 0.0004 | 9.46 | < 0.0001 | 0.66 | < 0.0002 | < 0.001 | 0.002 | 0.0061 | < 0.001 | 0.0022 | 0.0005 |
| | 07-Sep-2006 | 06-SH | 0.002 | < 0.0002 | 0.0004 | 0.698 | < 0.0002 | 0.05 | < 0.0002 | < 0.001 | 0.0025 | 0.0027 | < 0.0003 | 0.039 | 0.00009 | 0.001 | 0.0116 | < 0.1 | < 0.0002 | 10.2 | < 0.0001 | 0.69 | < 0.0002 | < 0.001 | 0.002 | 0.0084 | < 0.001 | 0.0016 | 0.0004 |
| **(Duplicate)** | 07-Sep-2006 | 06-SH DUP | 0.002 | < 0.0002 | < 0.0002 | 0.767 | < 0.0002 | 0.07 | < 0.0002 | < 0.001 | 0.0026 | 0.003 | < 0.0003 | 0.036 | 0.00011 | 0.001 | 0.0131 | < 0.1 | < 0.0002 | 10.1 | < 0.0001 | 0.68 | < 0.0002 | < 0.001 | 0.004 | 0.0072 | < 0.001 | 0.0061 | 0.0005 |
| | 05-Sep-2007 | 06-SH | 0.002 | < 0.0002 | 0.0005 | 0.57 | < 0.001 | 0.05 | 0.00007 | < 0.001 | 0.0031 | 0.0012 | < 0.0002 | 0.03 | < 0.00005 | 0.001 | 0.029 | 0.2 | 0.0004 | 9.4 | < 0.0001 | 0.61 | < 0.0002 | < 0.001 | 0.009 | 0.0072 | < 0.001 | < 0.003 | --- |
| **(Duplicate)** | 05-Sep-2007 | 06-SH DUP | 0.001 | < 0.0002 | 0.0003 | 0.7 | < 0.001 | 0.04 | 0.00011 | 0.002 | 0.0013 | 0.0027 | < 0.0002 | 0.03 | < 0.00005 | 0.001 | 0.0332 | < 0.1 | < 0.0002 | 9.9 | < 0.0001 | 0.61 | < 0.0002 | < 0.001 | 0.006 | 0.0061 | < 0.001 | 0.005 | --- |
| | 03-Sep-2008 | 06-SH | < 0.01 | < 0.0004 | < 0.0004 | 0.684 | < 0.001 | < 0.05 | < 0.0001 | < 0.005 | 0.003 | 0.003 | < 0.0001 | 0.032 | < 0.00010 | < 0.005 | 0.008 | --- | 0.0007 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0078 | < 0.001 | 0.003 | --- |
| **(Duplicate)** | 03-Sep-2008 | 06-SH DUP | < 0.01 | < 0.0004 | < 0.0004 | 0.688 | < 0.001 | 0.05 | < 0.0001 | < 0.005 | 0.003 | 0.003 | < 0.0001 | 0.036 | < 0.00010 | < 0.005 | 0.008 | --- | 0.0007 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0081 | < 0.001 | 0.003 | --- |
| | 09-Sep-2009 | 06-SH | < 0.0050 | < 0.00040 | 0.00049 | 0.584 | < 0.0010 | < 0.050 | 0.000038 | < 0.0050 | < 0.0020 | 0.0017 | 0.00013 | 0.034 | < 0.000020 | < 0.0050 | 0.0091 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0016 | 0.00588 | < 0.0010 | 0.0047 | --- |
| **(Duplicate)** | 09-Sep-2009 | 06-SH DUP | < 0.0050 | < 0.00040 | < 0.00040 | 0.609 | < 0.0010 | < 0.050 | 0.000024 | < 0.0050 | 0.0026 | < 0.0010 | 0.00011 | 0.037 | < 0.000020 | < 0.0050 | 0.0081 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0018 | 0.00714 | < 0.0010 | < 0.0040 | --- |
| | 08-Sep-2010 | 06 SH | < 0.0050 | < 0.00040 | 0.0013 | 0.503 | < 0.0010 | < 0.050 | 0.000033 | < 0.0010 | < 0.0020 | 0.0015 | < 0.00010 | 0.03 | < 0.000020 | < 0.0050 | 0.0083 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0015 | 0.00578 | < 0.0010 | 0.0063 | --- |
| **(Duplicate)** | 08-Sep-2010 | SYLVITE 26 | < 0.0050 | < 0.00040 | 0.00186 | 0.586 | < 0.0010 | 0.052 | 0.00004 | < 0.0010 | < 0.0020 | 0.0012 | 0.00024 | 0.034 | < 0.000020 | < 0.0050 | 0.0096 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0018 | 0.0072 | < 0.0010 | 0.0112 | --- |
| | 07-Sep-2011 | 06-SH | < 0.0050 | < 0.00040 | 0.00208 | 0.569 | < 0.0010 | < 0.050 | 0.000056 | < 0.0010 | < 0.0020 | 0.0014 | < 0.00010 | 0.028 | < 0.000020 | < 0.0050 | 0.0063 | --- | < 0.00040 | 10.5 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0059 | < 0.0010 | < 0.0040 | --- |
| **(Duplicate)** | 07-Sep-2011 | ZIRCON 26 | < 0.0050 | < 0.00040 | 0.00118 | 0.683 | < 0.0010 | 0.05 | 0.000041 | < 0.0010 | 0.002 | < 0.0010 | < 0.00010 | 0.03 | < 0.000020 | < 0.0050 | 0.0061 | --- | < 0.00040 | 10.1 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00654 | < 0.0010 | < 0.0040 | --- |
| | 05-Sep-2012 | 06-SH | < 0.0050 | < 0.00040 | 0.00073 | 0.627 | < 0.0010 | 0.051 | 0.000023 | < 0.0010 | 0.0021 | < 0.0010 | < 0.00010 | 0.037 | < 0.000020 | < 0.0050 | 0.0041 | --- | < 0.00040 | 10.9 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00666 | < 0.0010 | < 0.0040 | --- |
| **(Duplicate)** | 05-Sep-2012 | SPINEL 25 | < 0.0050 | < 0.00040 | 0.00084 | 0.615 | < 0.0010 | 0.05 | 0.000029 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.035 | < 0.000020 | < 0.0050 | 0.0044 | --- | < 0.00040 | 11.8 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00645 | < 0.0010 | < 0.0040 | --- |
| | 25-Sep-2013 | 06-SH | <0.0050 | 0.00057 | 0.00112 | 0.645 | <0.0010 | 0.051 | 0.000064 | <0.0010 | <0.0020 | <0.0010 | 0.00014 | 0.032 | <0.000020 | <0.0050 | 0.0269 | --- | <0.00040 | --- | <0.000020 | --- | <0.00010 | <0.050 | <0.0010 | 0.00568 | <0.0010 | <0.0040 | --- |
| **(Duplicate)** | 25-Sep-2013 | 26-SH | <0.0050 | 0.00069 | 0.00138 | 0.655 | <0.0010 | <0.050 | 0.000065 | <0.0010 | <0.0020 | 0.0013 | 0.00022 | 0.031 | <0.000020 | <0.0050 | 0.0258 | --- | <0.00040 | --- | <0.000020 | --- | <0.00010 | <0.050 | <0.0010 | 0.00570 | <0.0010 | 0.0174 | --- |
| | 17-Sep-2014 | 06-SH | 0.0010 | 0.00074 | 0.00076 | 0.636 | <0.00050 | 0.048 | 0.000090 | 0.00032 | 0.00105 | 0.00177 | 0.000149 | 0.0307 | 0.0000052 | 0.00146 | 0.00868 | <0.30 | 0.00019 | 11.0 | <0.000010 | 0.584 | <0.000050 | <0.00010 | <0.00030 | 0.00547 | 0.00016 | 0.0029 | --- |
| | 29-Sep-2015 | 06-SH | 0.0014 | 0.00014 | 0.00040 | 0.519 | --- | 0.039 | 0.0000285 | 0.00014 | --- | 0.00081 | <0.000050 | --- | <0.0000050 | --- | 0.00733 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00744 | --- | 0.0021 | --- |
| | 28-Sep-2016 | 06-SH | 0.0062 | 0.00042 | 0.00105 | 0.608 | --- | 0.042 | 0.0000196 | 0.00288 | --- | 0.00053 | 0.000056 | --- | <0.0000050 | --- | 0.00583 | --- | 0.000057 | --- | <0.000010 | --- | --- | --- | --- | 0.00555 | --- | 0.0017 | --- |
| | 26-Sep-2017 | 06-SH | 0.0016 | <0.00010 | 0.00025 | 0.639 | --- | 0.047 | 0.0000091 | <0.00010 | --- | 0.00060 | <0.000050 | --- | <0.0000050 | --- | 0.00507 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00652 | --- | 0.0023 | --- |
| | 17-Sep-2018 | 06-SH | <0.0010 | 0.00016 | 0.00057 | 0.623 | --- | 0.054 | 0.0000164 | <0.00010 | --- | 0.00024 | <0.000050 | --- | 0.0000081 | --- | 0.00510 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00634 | --- | 0.0024 | --- |
| | 17-Sep-2019 | 06-SH | 0.0020 | 0.00027 | 0.00103 | 0.592 | --- | 0.045 | 0.0000230 | 0.00015 | --- | 0.00205 | 0.000142 | --- | <0.0000050 | --- | 0.00467 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00535 | --- | 0.0030 | --- |
| | 22-Sep-2020 | 06-SH | 0.0010 | 0.00036 | 0.00067 | 0.547 | <0.00010 | 0.038 | 0.0000293 | <0.00010 | 0.00117 | 0.00066 | <0.000050 | 0.0301 | <0.0000050 | 0.00129 | 0.00452 | --- | 0.000079 | --- | <0.000010 | --- | 0.000020 | <0.00010 | <0.00030 | 0.00579 | <0.00050 | 0.0014 | --- |
| | 22-Sep-2021 | 06-SH | 0.0043 | <0.00010 | 0.00027 | 0.6 | <0.00010 | 0.044 | 0.0000123 | 0.0002 | 0.00159 | 0.00079 | <0.000050 | 0.031 | <0.0000050 | 0.000611 | 0.00432 | --- | <0.000050 | --- | <0.000010 | --- | 0.000014 | <0.00010 | <0.00030 | 0.00623 | <0.00050 | 0.0023 | --- |
| | 28-Sep-2022 | 06-SH | <0.0010 | 0.00027 | 0.00077 | 0.614 | --- | 0.048 | 0.0000120 | <0.00050 | --- | 0.00048 | <0.000050 | --- | <0.0000050 | --- | 0.00453 | --- | 0.000071 | --- | <0.000010 | --- | --- | --- | --- | 0.00582 | --- | 0.0016 | --- |
| | 29-Sep-2023 | 06-SH | <0.0010 | <0.00010 | 0.00032 | 0.545 | --- | 0.046 | 0.0000167 | 0.00158 | --- | 0.0005 | <0.000050 | --- | <0.0000050 | --- | 0.00483 | --- | 0.000055 | --- | <0.000010 | --- | --- | --- | --- | 0.00609 | --- | 0.0018 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **06-IN** | 15-May-1985 | 06-IN | --- | 0.001 | 0.0011 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 06-IN | --- | 0.0002 | 0.0005 | --- | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 06-IN | --- | 0.0002 | 0.0005 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 06-IN | --- | 0.0002 | 0.0009 | 0.19 | --- | --- | --- | 0.002 | --- | 0.004 | 0.005 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 06-IN | --- | 0.0002 | 0.0006 | 0.19 | --- | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1987 | 06-IN | --- | 0.0002 | 0.0007 | 0.17 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 06-IN | --- | 0.0002 | 0.0008 | 0.17 | --- | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 06-IN | --- | 0.001 | 0.0014 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 06-IN | --- | 0.0002 | 0.0011 | 0.17 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 06-IN | --- | 0.0002 | 0.0011 | 0.15 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 06-IN | --- | 0.0002 | 0.0026 | 0.14 | < 0.001 | --- | < 0.001 | 0.009 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 06-IN | --- | 0.0002 | 0.002 | 0.13 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 06-IN | --- | 0.0002 | 0.0005 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 06-IN | --- | 0.0002 | 0.0006 | 0.12 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 06-IN | --- | 0.0002 | 0.0006 | 0.1 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 06-IN | --- | 0.0002 | 0.0006 | 0.09 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 06-IN | --- | 0.0014 | 0.0005 | 0.04 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1991 | 06-IN | --- | 0.0002 | 0.0005 | 0.08 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | --- | < 0.00005 | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-1991 | 06-IN | --- | 0.0002 | 0.0006 | 0.08 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 06-IN | --- | < 0.0002 | 0.0005 | 0.05 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 06-IN | --- | < 0.0002 | 0.0005 | 0.08 | 0.001 | --- | < 0.003 | 0.011 | < 0.003 | 0.004 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 06-IN | --- | < 0.0002 | 0.0012 | 0.12 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | < 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 06-IN | --- | --- | --- | --- | --- | --- | < 0.0002 | --- | --- | --- | < 0.0003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 06-IN | --- | < 0.0002 | 0.0004 | 0.07 | 0.002 | --- | < 0.0002 | 0.016 | < 0.003 | 0.012 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.035 | --- |
| | 09-Sep-1999 | 06-IN | --- | < 0.0002 | 0.0004 | 0.1 | < 0.001 | --- | < 0.0002 | 0.016 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | < 0.002 | 0.201 | --- |
| | 05-Sep-2000 | 06-IN | --- | < 0.0002 | 0.0004 | 0.0747 | < 0.0002 | --- | < 0.0002 | 0.005 | < 0.0003 | 0.0026 | < 0.0003 | --- | < 0.00005 | 0.0003 | 0.0039 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0165 | --- |
| | 06-Sep-2001 | 06-IN | --- | < 0.0002 | 0.0003 | 0.0778 | 0.0002 | --- | < 0.0002 | 0.041 | < 0.0003 | 0.0066 | 0.0009 | 0.042 | < 0.00005 | 0.0021 | 0.0058 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.033 | --- |
| | 04-Sep-2002 | 06-IN | 0.003 | 0.0002 | 0.0005 | 0.0831 | < 0.0002 | 0.07 | < 0.0002 | 0.044 | 0.0007 | 0.0049 | < 0.0003 | --- | < 0.00005 | 0.0019 | 0.0089 | < 0.1 | < 0.0002 | 6.44 | < 0.0001 | 0.574 | < 0.0002 | < 0.001 | 0.002 | 0.0056 | 0.01 | 0.0341 | < 0.0002 |
| | 03-Sep-2003 | 06-IN | 0.002 | 0.0005 | < 0.0002 | 0.138 | < 0.0002 | 0.08 | < 0.0002 | 0.017 | 0.0003 | 0.003 | < 0.0003 | 0.041 | < 0.00005 | 0.0025 | 0.0016 | < 0.1 | < 0.0002 | 7.14 | < 0.0001 | 0.58 | < 0.0002 | < 0.001 | < 0.001 | 0.0046 | < 0.001 | 0.0121 | < 0.0002 |
| | 08-Sep-2004 | 06-IN | 0.044 | < 0.0002 | < 0.0002 | 0.0806 | < 0.0002 | 0.08 | < 0.0002 | 0.026 | < 0.0003 | 0.0029 | 0.0004 | 0.037 | < 0.00005 | 0.0019 | 0.0028 | < 0.1 | < 0.0002 | 6.19 | < 0.0001 | 0.58 | < 0.0002 | < 0.001 | 0.017 | 0.0058 | < 0.001 | 0.0085 | 0.0002 |
| | 07-Sep-2005 | 06-IN | < 0.001 | 0.0003 | 0.0005 | 0.131 | 0.0002 | 0.09 | 0.0004 | 0.001 | 0.0004 | 0.0171 | < 0.0003 | 0.044 | < 0.00005 | 0.0056 | 0.0256 | < 0.1 | 0.0003 | 6.41 | 0.0003 | 0.59 | < 0.0002 | < 0.001 | < 0.001 | 0.0051 | < 0.001 | 0.196 | 0.0016 |
| | 07-Sep-2006 | 06-IN | 0.001 | < 0.0002 | 0.0034 | 0.111 | < 0.0002 | 0.07 | < 0.0002 | < 0.001 | 0.001 | 0.0151 | < 0.0003 | 0.047 | 0.00009 | 0.0045 | 0.0366 | < 0.1 | < 0.0002 | 6.06 | < 0.0001 | 0.56 | < 0.0002 | < 0.001 | < 0.001 | 0.0063 | < 0.001 | 0.0577 | 0.0002 |
| | 03-Sep-2008 | 06-IN | < 0.01 | < 0.0004 | < 0.0004 | 0.108 | < 0.001 | 0.07 | < 0.0001 | < 0.005 | 0.002 | 0.004 | < 0.0001 | 0.043 | < 0.00010 | < 0.005 | 0.011 | --- | 0.0007 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0064 | < 0.001 | 0.023 | --- |
| | 09-Sep-2009 | 06-IN | < 0.0050 | < 0.00040 | 0.00052 | 0.149 | < 0.0010 | 0.067 | 0.000016 | < 0.0050 | 0.0023 | 0.003 | 0.00011 | 0.045 | < 0.000020 | < 0.0050 | 0.0151 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0011 | 0.00575 | < 0.0010 | 0.0348 | --- |
| | 08-Sep-2010 | 06 IN | < 0.0050 | < 0.00040 | 0.00069 | 0.0919 | < 0.0010 | 0.073 | 0.000014 | < 0.0010 | 0.0027 | 0.0032 | < 0.00010 | 0.048 | < 0.000020 | < 0.0050 | 0.0192 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.001 | 0.00574 | < 0.0010 | 0.0507 | --- |
| | 07-Sep-2011 | 06-IN | < 0.0050 | < 0.00040 | 0.00239 | 0.138 | < 0.0010 | 0.069 | < 0.000010 | < 0.0010 | 0.0022 | 0.0015 | < 0.00010 | 0.042 | < 0.000020 | < 0.0050 | 0.0109 | --- | < 0.00040 | 7.44 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00672 | < 0.0010 | 0.0147 | --- |
| | 05-Sep-2012 | 06-IN | < 0.0050 | < 0.00040 | 0.00131 | 0.111 | < 0.0010 | 0.067 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.046 | < 0.000020 | < 0.0050 | 0.0076 | --- | < 0.00040 | 7.83 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00599 | < 0.0010 | 0.0153 | --- |
| | 25-Sep-2013 | 06-IN | < 0.0050 | < 0.00040 | 0.00258 | 0.121 | < 0.0010 | 0.069 | < 0.000010 | < 0.0010 | 0.0035 | < 0.0010 | < 0.00010 | 0.052 | < 0.000020 | < 0.0050 | 0.0048 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00665 | < 0.0010 | 0.0163 | --- |
| **06(R)IN** | 17-Sep-2014 | 06(R)IN | 0.0020 | 0.00038 | 0.00082 | 0.387 | < 0.00050 | 0.059 | 0.000151 | 0.00054 | 0.00482 | 0.00057 | 0.000098 | 0.0316 | < 0.0000050 | 0.00911 | 0.108 | < 0.30 | 0.00014 | 10.7 | < 0.000010 | 0.541 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00884 | 0.00055 | 0.0070 | --- |
| | 29-Sep-2015 | 06(R)IN | 0.0030 | 0.00010 | 0.00117 | 0.420 | --- | 0.047 | 0.0000111 | 0.00021 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.0221 | --- | 0.000123 | --- | <0.000010 | --- | --- | --- | --- | 0.00658 | --- | 0.0019 | --- |
| | 28-Sep-2016 | 06(R)IN | <0.0010 | 0.00013 | 0.00152 | 0.646 | --- | 0.056 | <0.0000050 | 0.00032 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.0149 | --- | 0.000057 | --- | <0.000010 | --- | --- | --- | --- | 0.01230 | --- | 0.0011 | --- |
| | 26-Sep-2017 | 06(R)IN | 0.0011 | 0.00029 | 0.00415 | 0.640 | --- | 0.053 | 0.0000243 | <0.00010 | --- | 0.00027 | <0.000050 | --- | <0.0000050 | --- | 0.0336 | --- | 0.000067 | --- | <0.000010 | --- | --- | --- | --- | **0.02070** | --- | 0.0021 | --- |
| | 17-Sep-2018 | 06(R)IN | 0.0033 | 0.00026 | 0.00948 | 0.659 | --- | 0.062 | 0.0000235 | 0.00015 | --- | <0.00020 | <0.000050 | --- | 0.0000057 | --- | 0.0261 | --- | 0.000114 | --- | <0.000010 | --- | --- | --- | --- | **0.02000** | --- | 0.0016 | --- |
| | 17-Sep-2019 | 06(R)IN | 0.0013 | <0.00010 | **0.01510** | 0.705 | --- | 0.058 | 0.0000084 | 0.00030 | --- | 0.00036 | <0.000050 | --- | <0.0000050 | --- | 0.0127 | --- | 0.000051 | --- | <0.000010 | --- | --- | --- | --- | **0.0451** | --- | <0.0010 | --- |
| | 22-Sep-2020 | 06(R)IN | 0.0022 | 0.00011 | 0.0119 | 0.558 | <0.00010 | 0.055 | 0.0000104 | <0.00010 | 0.00170 | 0.00030 | <0.000050 | 0.0336 | <0.0000050 | 0.00405 | 0.0172 | --- | 0.000061 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | **0.0326** | <0.00050 | 0.0019 | --- |
| | 22-Sep-2021 | 06(R)IN | 0.0012 | 0.00017 | **0.00208** | 0.667 | <0.00010 | 0.053 | 0.0000546 | <0.00010 | 0.00266 | 0.00072 | <0.000050 | <0.000050 | <0.0000050 | 0.00157 | 0.0189 | --- | 0.000089 | --- | <0.000010 | --- | 0.00001 | <0.00010 | <0.00030 | 0.0097 | <0.00050 | 0.0059 | --- |
| | 28-Sep-2022 | 06(R)IN | <0.0010 | 0.00010 | 0.00178 | 0.564 | --- | 0.064 | 0.0000287 | <0.00050 | --- | 0.00067 | <0.000050 | --- | <0.0000050 | --- | 0.0397 | --- | 0.000057 | --- | 0.000061 | --- | --- | --- | --- | 0.0090 | --- | 0.0036 | |
| | 29-Sep-2023 | 06(R)IN | <0.0010 | <0.00010 | 0.00056 | 0.507 | --- | 0.05 | 0.000028 | 0.00183 | --- | 0.00119 | <0.000050 | --- | <0.0000050 | --- | 0.0123 | --- | 0.000093 | --- | 0.0001 | --- | --- | --- | --- | 0.00669 | --- | 0.0028 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **07-SH** | 15-May-1985 | 07-SH | --- | 0.0011 | 0.0008 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.012 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 07-SH | --- | 0.0004 | 0.0007 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.007 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 07-SH | --- | 0.0002 | 0.0009 | 0.4 | < 0.001 | --- | < 0.001 | 0.018 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 07-SH | --- | 0.0002 | 0.0005 | 0.36 | --- | --- | --- | 0.003 | --- | 0.006 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 07-SH | --- | 0.0005 | 0.0008 | 0.37 | --- | --- | < 0.001 | < 0.001 | --- | 0.007 | 0.005 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 07-SH | --- | 0.0002 | 0.0003 | 0.33 | --- | --- | < 0.001 | 0.004 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 07-SH | --- | 0.0007 | 0.0009 | 0.36 | < 0.001 | --- | < 0.001 | 0.004 | --- | 0.008 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 07-SH | --- | 0.0002 | 0.0005 | 0.39 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 07-SH | --- | 0.0002 | 0.0008 | 0.38 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 07-SH | --- | 0.0002 | 0.0003 | 0.38 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 07-SH | --- | 0.0002 | 0.0002 | 0.4 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 07-SH | --- | 0.0002 | 0.0008 | 0.41 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 07-SH | --- | 0.0002 | 0.0005 | 0.38 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 07-SH | --- | 0.0002 | 0.0004 | 0.44 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 07-SH | --- | 0.0002 | 0.0004 | 0.44 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 07-SH | --- | 0.0002 | 0.0003 | 0.44 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 07-SH | --- | 0.0022 | 0.0004 | 0.52 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1991 | 07-SH | --- | 0.002 | 0.0006 | 0.49 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.013 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-1991 | 07-SH | --- | 0.002 | 0.0006 | 0.5 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 07-SH | --- | < 0.0002 | 0.0008 | 0.3 | 0.001 | --- | < 0.003 | 0.004 | < 0.003 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 07-SH | --- | < 0.0002 | 0.0005 | 0.56 | 0.001 | --- | < 0.003 | 0.011 | < 0.003 | 0.004 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 20-May-1993 | 07-SH | --- | < 0.0002 | 0.0004 | 0.56 | 0.001 | --- | < 0.003 | 0.01 | < 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 07-SH | --- | < 0.0002 | 0.0003 | 0.57 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.004 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 07-SH | --- | < 0.0002 | 0.0002 | 0.55 | 0.002 | --- | < 0.003 | < 0.002 | < 0.003 | 0.002 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.013 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.004 | --- |
| | 21-Sep-1994 | 07-SH | --- | 0.0002 | 0.0002 | 0.58 | 0.002 | --- | < 0.003 | < 0.002 | < 0.003 | 0.004 | < 0.001 | --- | 0.00005 | < 0.003 | 0.017 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.005 | --- |
| | 02-Nov-1994 | 07-SH | --- | 0.0015 | 0.0003 | 0.52 | 0.002 | --- | < 0.003 | 0.01 | 0.003 | 0.003 | < 0.001 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.002 | 0.01 | --- |
| | 28-Sep-1995 | 07-SH | --- | < 0.0002 | 0.0002 | 0.56 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.01 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 04-Sep-1996 | 07-SH | --- | 0.0004 | 0.0006 | 0.58 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.006 | 0.005 | 0.0006 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.004 | 0.026 | --- |
| | 03-Sep-1997 | 07-SH | --- | 0.0002 | < 0.0002 | 0.56 | < 0.001 | --- | < 0.0002 | 0.022 | < 0.003 | 0.002 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.003 | --- |
| | 15-Sep-1998 | 07-SH | --- | 0.0003 | < 0.0002 | 0.46 | 0.002 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| **(Duplicate)** | 15-Sep-1998 | 07-SH DUP | --- | < 0.0002 | 0.0002 | 0.45 | 0.002 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 07-SH | --- | < 0.0002 | 0.0003 | 0.69 | < 0.001 | --- | < 0.0002 | 0.017 | 0.005 | 0.035 | < 0.0003 | --- | < 0.00005 | 0.023 | < 0.005 | --- | < 0.0002 | --- | 0.023 | --- | --- | --- | --- | --- | 0.043 | 0.011 | --- |
| **(Duplicate)** | 09-Sep-1999 | 07-SH DUP | --- | 0.0002 | 0.0011 | 0.71 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.005 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.002 | --- |
| | 05-Sep-2000 | 07-SH | --- | < 0.0002 | 0.0004 | 0.78 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0005 | < 0.0002 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.005 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0029 | --- |
| **(Duplicate)** | 05-Sep-2000 | 07-SH DUP | --- | 0.0004 | 0.001 | 0.837 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0008 | < 0.0002 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0047 | --- | 0.0004 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0034 | --- |
| | 06-Sep-2001 | 07-SH | --- | < 0.0002 | 0.0002 | 0.574 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0005 | 0.0005 | < 0.0003 | 0.027 | < 0.00005 | 0.0009 | 0.006 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0086 | --- |
| **(Duplicate)** | 06-Sep-2001 | 07-SH DUP | --- | < 0.0002 | < 0.0002 | 0.546 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0006 | 0.0007 | < 0.0003 | --- | < 0.00005 | 0.0007 | 0.0056 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0067 | --- |
| | 04-Sep-2002 | 07-SH | < 0.001 | < 0.0002 | 0.0012 | 0.532 | < 0.0002 | 0.08 | < 0.0002 | < 0.001 | 0.0003 | 0.0014 | < 0.0003 | --- | < 0.00005 | 0.001 | 0.002 | < 0.1 | < 0.0002 | 6.82 | < 0.0001 | 0.676 | < 0.0002 | < 0.001 | < 0.001 | 0.0031 | < 0.001 | 0.0033 | 0.0004 |
| **(Duplicate)** | 04-Sep-2002 | 07-SH DUP | 0.002 | 0.0003 | 0.0007 | 0.558 | < 0.0002 | 0.07 | < 0.0002 | < 0.001 | 0.0003 | 0.0013 | < 0.0003 | --- | < 0.00005 | 0.001 | 0.002 | < 0.1 | < 0.0002 | 7.09 | < 0.0001 | 0.678 | < 0.0002 | < 0.001 | < 0.001 | 0.0032 | < 0.001 | 0.0043 | 0.0003 |
| | 03-Sep-2003 | 07-SH | 0.004 | < 0.0002 | < 0.0002 | 0.505 | < 0.0002 | 0.08 | < 0.0002 | < 0.001 | < 0.0003 | 0.0013 | 0.0005 | 0.007 | < 0.00005 | 0.0229 | 0.0009 | < 0.1 | < 0.0002 | 7.46 | 0.0001 | 0.66 | < 0.0002 | < 0.001 | < 0.001 | 0.0027 | < 0.001 | 0.0111 | < 0.0002 |
| **(Duplicate)** | 03-Sep-2003 | 07-SH DUP | 0.005 | 0.0005 | < 0.0002 | 0.51 | < 0.0002 | 0.07 | < 0.0002 | < 0.001 | < 0.0003 | 0.0012 | < 0.0003 | 0.02 | < 0.00005 | 0.004 | 0.0006 | < 0.1 | < 0.0002 | 7.39 | < 0.0001 | 0.7 | < 0.0002 | < 0.001 | < 0.001 | 0.0028 | < 0.001 | 0.0106 | < 0.0002 |
| | 08-Sep-2004 | 07-SH | 0.111 | < 0.0002 | 0.0002 | 0.765 | < 0.0002 | 0.09 | < 0.0002 | < 0.001 | 0.0008 | 0.0011 | < 0.0003 | 0.022 | 0.00026 | 0.001 | 0.004 | < 0.1 | < 0.0002 | 6.96 | < 0.0001 | 0.68 | < 0.0002 | < 0.001 | 0.024 | 0.0041 | < 0.001 | 0.0061 | 0.0002 |
| **(Duplicate)** | 08-Sep-2004 | 07-SH DUP | 0.055 | < 0.0002 | 0.0045 | 0.327 | 0.0022 | 0.19 | < 0.0002 | 0.002 | 0.0021 | 0.0009 | 0.0005 | 0.027 | < 0.00005 | 0.0007 | 0.0026 | < 0.1 | < 0.0002 | 7.02 | < 0.0001 | 0.68 | < 0.0002 | < 0.001 | 0.019 | 0.0009 | < 0.001 | 0.0044 | 0.0009 |
| | 07-Sep-2005 | 07-SH | < 0.001 | 0.0004 | 0.0005 | 0.589 | 0.0002 | 0.06 | 0.0003 | < 0.001 | < 0.0003 | 0.0012 | < 0.0003 | 0.033 | 0.00006 | 0.0013 | 0.0022 | < 0.1 | 0.0003 | 7.04 | 0.0003 | 0.68 | < 0.0002 | < 0.001 | < 0.001 | 0.0035 | < 0.001 | 0.0054 | 0.0019 |
| **(Duplicate)** | 07-Sep-2005 | 07-SH DUP | < 0.001 | < 0.0002 | 0.0004 | 0.555 | < 0.0002 | 0.07 | < 0.0002 | < 0.001 | < 0.0003 | 0.0008 | < 0.0003 | 0.03 | < 0.00005 | 0.001 | 0.0019 | < 0.1 | 0.0002 | 6.46 | < 0.0001 | 0.63 | < 0.0002 | < 0.001 | 0.002 | 0.0035 | < 0.001 | 0.0024 | 0.0002 |
| | 07-Sep-2006 | 07-SH | 0.001 | < 0.0002 | < 0.0002 | 0.536 | < 0.0002 | 0.07 | < 0.0002 | < 0.001 | < 0.0003 | 0.0024 | < 0.0003 | 0.035 | 0.00021 | 0.0008 | 0.0026 | < 0.1 | < 0.0002 | 6.88 | < 0.0001 | 0.71 | < 0.0002 | < 0.001 | 0.001 | 0.0042 | < 0.001 | 0.0026 | 0.0029 |
| **(Duplicate)** | 07-Sep-2006 | 07-SH DUP | < 0.001 | < 0.0002 | < 0.0002 | 0.598 | < 0.0002 | 0.08 | < 0.0002 | < 0.001 | 0.0005 | 0.0017 | < 0.0003 | 0.033 | < 0.00005 | 0.0007 | 0.0031 | < 0.1 | < 0.0002 | 6.83 | < 0.0001 | 0.7 | < 0.0002 | < 0.001 | 0.003 | 0.0036 | < 0.001 | 0.0022 | < 0.0002 |
| | 05-Sep-2007 | 07-SH | 0.005 | < 0.0002 | < 0.0002 | 0.59 | < 0.001 | 0.07 | 0.00001 | < 0.001 | 0.0004 | 0.0021 | < 0.0002 | 0.03 | < 0.00005 | 0.0007 | 0.0056 | < 0.1 | < 0.0002 | 7.3 | < 0.0001 | 0.69 | < 0.0002 | < 0.001 | 0.006 | 0.0039 | < 0.001 | < 0.003 | --- |
| **(Duplicate)** | 05-Sep-2007 | 07-SH DUP | 0.012 | < 0.0002 | < 0.0002 | 0.53 | < 0.001 | 0.06 | 0.00006 | < 0.001 | 0.0028 | 0.0047 | < 0.0002 | 0.03 | < 0.00005 | 0.0009 | 0.0258 | < 0.1 | < 0.0002 | 6.4 | < 0.0001 | 0.64 | < 0.0002 | < 0.001 | 0.013 | 0.0036 | < 0.001 | 0.009 | --- |
| | 03-Sep-2008 | 07-SH | < 0.01 | < 0.0004 | < 0.0004 | 0.459 | < 0.001 | 0.06 | < 0.0001 | < 0.005 | < 0.002 | 0.003 | < 0.0001 | 0.033 | < 0.00010 | < 0.005 | < 0.002 | --- | 0.0005 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0034 | < 0.001 | 0.005 | --- |
| **(Duplicate)** | 03-Sep-2008 | 07-SH DUP | < 0.01 | < 0.0004 | < 0.0004 | 0.594 | < 0.001 | 0.06 | < 0.0001 | < 0.005 | < 0.002 | < 0.001 | < 0.0001 | 0.031 | < 0.00010 | < 0.005 | 0.002 | --- | 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0037 | < 0.001 | < 0.002 | --- |
| | 09-Sep-2009 | 07-SH | < 0.0050 | < 0.00040 | 0.00054 | 0.589 | < 0.0010 | 0.062 | < 0.000010 | < 0.0050 | < 0.0020 | < 0.0010 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | 0.0036 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0012 | 0.00344 | < 0.0010 | < 0.0040 | --- |
| **(Duplicate)** | 09-Sep-2009 | 07-SH DUP | < 0.0050 | < 0.00040 | 0.00056 | 0.649 | < 0.0010 | 0.063 | < 0.000010 | < 0.0050 | < 0.0020 | < 0.0010 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | 0.0045 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0013 | 0.00331 | < 0.0010 | < 0.0040 | --- |
| | 08-Sep-2010 | 07 SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.591 | < 0.0010 | 0.071 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | 0.0055 | --- | 0.0006 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0013 | 0.00385 | < 0.0010 | 0.0086 | --- |
| **(Duplicate)** | 08-Sep-2010 | SYLVITE 27 | < 0.0050 | < 0.00040 | 0.0004 | 0.629 | < 0.0010 | 0.07 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | 0.0052 | --- | 0.00052 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0014 | 0.00375 | < 0.0010 | 0.0058 | --- |
| | 07-Sep-2011 | 07-SH | < 0.0050 | < 0.00040 | 0.00066 | 0.719 | < 0.0010 | 0.069 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 8.15 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0034 | < 0.0010 | < 0.0040 | --- |
| **(Duplicate)** | 07-Sep-2011 | ZIRCON 27 | < 0.0050 | < 0.00040 | < 0.00040 | 0.683 | < 0.0010 | 0.065 | 0.000011 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.03 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 7.93 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00347 | < 0.0010 | < 0.0040 | --- |
| | 05-Sep-2012 | 07-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.715 | < 0.0010 | 0.081 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 8.59 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00326 | < 0.0010 | 0.0053 | --- |
| **(Duplicate)** | 05-Sep-2012 | SPINEL 27 | < 0.0050 | < 0.00040 | < 0.00040 | 0.145 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | < 0.010 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 8.61 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00065 | < 0.0010 | < 0.0040 | --- |
| | 25-Sep-2013 | 07-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.733 | < 0.0010 | 0.066 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.038 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00371 | < 0.0010 | < 0.0040 | --- |
| **(Duplicate)** | 25-Sep-2013 | 27-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.736 | < 0.0010 | 0.067 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.040 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00382 | < 0.0010 | 0.0049 | --- |
| | 17-Sep-2014 | 07-SH | 0.0073 | < 0.00010 | 0.00020 | 0.785 | < 0.00050 | 0.066 | < 0.000010 | 0.00019 | 0.00028 | 0.00026 | < 0.000050 | 0.0355 | < 0.0000050 | 0.000788 | 0.00144 | < 0.30 | < 0.00010 | 9.24 | < 0.000010 | 0.717 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00394 | < 0.00010 | 0.0019 | --- |
| **(Duplicate)** | 17-Sep-2014 | 27-SH | 0.0074 | < 0.00010 | 0.00024 | 0.773 | < 0.00050 | 0.062 | < 0.000010 | 0.00019 | 0.00027 | 0.00027 | < 0.000050 | 0.0335 | < 0.0000050 | 0.000687 | 0.00137 | < 0.30 | < 0.00010 | 9.14 | < 0.000010 | 0.722 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00383 | < 0.00010 | 0.0017 | --- |
| | 29-Sep-2015 | 07-SH | 0.0021 | <0.00010 | 0.00012 | 0.648 | --- | 0.051 | 0.0000113 | 0.00012 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.00145 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00413 | --- | 0.0021 | --- |
| **(Duplicate)** | 29-Sep-2015 | 27-SH | 0.0014 | <0.00010 | 0.00013 | 0.665 | --- | 0.049 | 0.0000124 | 0.00015 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.00139 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00411 | --- | 0.0021 | --- |
| | 27-Sep-2016 | 07-SH | 0.0012 | <0.00010 | 0.00012 | 0.815 | --- | 0.064 | 0.0000087 | 0.00018 | --- | 0.00031 | <0.000050 | --- | <0.0000050 | --- | 0.00098 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00384 | --- | 0.0017 | --- |
| **(Duplicate)** | 27-Sep-2016 | 27-SH | 0.0016 | <0.00010 | 0.00011 | 0.830 | --- | 0.058 | 0.0000137 | 0.00024 | --- | 0.00031 | <0.000050 | --- | <0.0000050 | --- | 0.00093 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00390 | --- | 0.0015 | --- |
| | 26-Sep-2017 | 07-SH | <0.0010 | <0.00010 | <0.00010 | 0.838 | --- | 0.061 | 0.0000398 | 0.00028 | --- | 0.00036 | <0.000050 | --- | <0.0000050 | --- | 0.00110 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00398 | --- | 0.0018 | --- |
| **(Duplicate)** | 26-Sep-2017 | 27-SH | <0.0010 | <0.00010 | <0.00010 | 0.884 | --- | 0.065 | 0.0000476 | 0.00018 | --- | 0.00037 | <0.000050 | --- | <0.0000050 | --- | 0.00117 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00396 | --- | 0.0018 | --- |
| | 17-Sep-2018 | 07-SH | <0.0010 | <0.00010 | <0.00010 | 0.850 | --- | 0.073 | 0.0000185 | <0.00010 | --- | 0.00022 | <0.000050 | --- | 0.0000178 | --- | 0.00156 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00374 | --- | 0.0018 | --- |
| **(Duplicate)** | 17-Sep-2018 | 27-SH | <0.0010 | <0.00010 | <0.00010 | 0.829 | --- | 0.067 | 0.0000239 | <0.00010 | --- | 0.00022 | <0.000050 | --- | 0.0000115 | --- | 0.00160 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00355 | --- | 0.0020 | --- |
| | 16-Sep-2019 | 07-SH | 0.0036 | <0.00010 | 0.00022 | 0.955 | --- | 0.065 | 0.0000108 | 0.00014 | --- | 0.00212 | 0.000055 | --- | <0.0000050 | --- | 0.00209 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00344 | --- | 0.0037 | --- |
| **(Duplicate)** | 16-Sep-2019 | 27-SH | 0.0021 | <0.00010 | 0.00019 | 0.954 | --- | 0.065 | 0.0000078 | 0.00010 | --- | 0.00064 | <0.000050 | --- | <0.0000050 | --- | 0.00206 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00348 | --- | 0.0025 | --- |
| | 22-Sep-2020 | 07-SH | <0.0010 | <0.00010 | 0.00011 | 0.811 | <0.00010 | 0.060 | 0.0000059 | <0.00010 | 0.00033 | 0.00047 | <0.000050 | 0.0376 | <0.0000050 | 0.000722 | 0.00151 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00365 | <0.00050 | 0.0011 | --- |
| **(Duplicate)** | 22-Sep-2020 | 27-SH | 0.0018 | <0.00010 | 0.00011 | 0.804 | <0.00010 | 0.061 | 0.0000067 | <0.00010 | 0.00035 | 0.00210 | <0.000050 | 0.0376 | <0.0000050 | 0.000752 | 0.00176 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00360 | <0.00050 | 0.0018 | --- |
| | 22-Sep-2021 | 07-SH | <0.0010 | <0.00010 | <0.00010 | 0.928 | <0.00010 | 0.061 | 0.0000345 | <0.00010 | 0.00056 | 0.00039 | <0.000050 | 0.0363 | <0.0000050 | 0.000772 | 0.0053 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00363 | <0.00050 | 0.0017 | --- |
| **(Duplicate)** | 22-Sep-2021 | 27-SH | <0.0010 | <0.00010 | <0.00010 | 0.925 | <0.00010 | 0.063 | 0.0000261 | <0.00010 | 0.00057 | 0.00031 | <0.000050 | 0.0366 | <0.0000050 | 0.000762 | 0.00525 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00353 | <0.00050 | 0.0017 | --- |
| | 28-Sep-2022 | 07-SH | <0.0010 | <0.00010 | <0.00010 | 0.919 | --- | 0.070 | <0.0000050 | <0.00050 | --- | 0.00027 | <0.000050 | --- | <0.0000050 | --- | 0.00190 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00385 | --- | 0.0010 | --- |
| **(Duplicate)** | 28-Sep-2022 | 27-SH | <0.0010 | <0.00010 | <0.00010 | 0.988 | --- | 0.070 | <0.0000050 | <0.00050 | --- | 0.00029 | <0.000050 | --- | <0.0000050 | --- | 0.00187 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00380 | --- | 0.0029 | --- |
| | 29-Sep-2023 | 07-SH | <0.0010 | <0.00010 | <0.00010 | 0.864 | --- | 0.063 | 0.0000131 | 0.00164 | --- | 0.00027 | <0.000050 | --- | <0.0000050 | --- | <0.000050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.0036 | --- | 0.0013 | --- |
| **(Duplicate)** | 29-Sep-2023 | 27-SH | 0.0019 | <0.00010 | <0.00010 | 0.861 | --- | 0.069 | 0.0000068 | 0.00174 | --- | 0.00025 | <0.000050 | --- | <0.0000050 | --- | 0.00319 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00426 | --- | 0.0014 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| Canadian Drinking Water AO Guidelines 2022[1] | | | 0.1 | --- | --- | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | --- |
| Canadian Drinking 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 | --- | --- | 7.0 | --- | --- | --- | 0.02 | --- | --- | --- |
| Alberta Tier 2 Potable Groundwater Guideline[3] | | | --- | 0.006 | 0.01 | 1 | --- | 5 | 0.005 | --- | --- | 1 | 0.01 | --- | 0.001 | --- | --- | | 0.05 | | --- | | --- | --- | --- | 0.02 | --- | 5 | --- |
| Alberta Tier 2 Aquatic 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 | --- |
| 07-IN | 15-May-1985 | 07-IN | --- | 0.0006 | 0.0011 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 07-IN | --- | 0.0008 | 0.0008 | --- | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 07-IN | --- | 0.0002 | 0.0008 | 0.2 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 07-IN | --- | 0.0002 | 0.0007 | 0.17 | --- | --- | --- | 0.002 | --- | 0.003 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 07-IN | --- | 0.0003 | 0.0006 | 0.17 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 07-IN | --- | 0.0002 | 0.0037 | 0.16 | --- | --- | < 0.001 | 0.004 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 07-IN | --- | 0.0007 | 0.0032 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 07-IN | --- | 0.0002 | **0.016** | 0.17 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 07-IN | --- | 0.0002 | 0.0018 | 0.16 | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 07-IN | --- | 0.0006 | 0.0043 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 07-IN | --- | 0.0005 | 0.0035 | 0.17 | < 0.001 | --- | < 0.001 | 0.005 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 07-IN | --- | 0.0002 | 0.0028 | 0.16 | < 0.001 | --- | < 0.001 | 0.003 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 07-IN | --- | 0.0002 | 0.007 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 07-IN | --- | 0.0002 | 0.0035 | 0.17 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 07-IN | --- | 0.0002 | 0.0051 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 07-IN | --- | 0.0002 | 0.0032 | 0.15 | < 0.001 | --- | < 0.001 | 0.004 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 07-IN | --- | 0.001 | 0.002 | 0.13 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1991 | 07-IN | --- | 0.002 | 0.0012 | 0.16 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | --- | < 0.00005 | 0.014 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1991 | 07-IN | --- | 0.002 | 0.0017 | 0.16 | < 0.001 | --- | < 0.001 | 0.007 | < 0.001 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 07-IN | --- | < 0.0002 | 0.0009 | 0.09 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 07-IN | --- | < 0.0002 | 0.0015 | 0.17 | 0.001 | --- | < 0.003 | 0.008 | < 0.003 | 0.002 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 07-IN | --- | 0.0002 | 0.0023 | 0.18 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | < 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 07-IN | --- | < 0.0002 | 0.0008 | 0.15 | 0.002 | --- | < 0.0002 | < 0.002 | 0.003 | 0.002 | < 0.0003 | --- | < 0.00005 | 0.004 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.009 | --- |
| | 09-Sep-1999 | 07-IN | --- | 0.0028 | 0.0072 | 0.17 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.002 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | < 0.002 | 0.016 | --- |
| | 05-Sep-2000 | 07-IN | --- | < 0.0002 | 0.0034 | 0.158 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0017 | < 0.0002 | < 0.0003 | --- | < 0.00005 | 0.0014 | 0.0043 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0037 | --- |
| | 06-Sep-2001 | 07-IN | --- | < 0.0002 | 0.0028 | 0.16 | 0.0002 | --- | < 0.0002 | < 0.001 | 0.0013 | 0.0011 | < 0.0003 | 0.04 | < 0.00005 | 0.003 | 0.0059 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0107 | --- |
| | 04-Sep-2002 | 07-IN | 0.003 | 0.0002 | 0.0005 | 0.144 | < 0.0002 | 0.18 | < 0.0002 | 0.032 | 0.001 | 0.0024 | < 0.0003 | --- | < 0.00005 | 0.0028 | 0.0078 | < 0.1 | < 0.0002 | 6.96 | < 0.0001 | 0.611 | < 0.0002 | < 0.001 | < 0.001 | 0.0058 | 0.009 | 0.0195 | 0.0006 |
| | 03-Sep-2003 | 07-IN | 0.001 | < 0.0002 | 0.0017 | 0.166 | < 0.0002 | 0.21 | < 0.0002 | < 0.001 | 0.0007 | 0.0031 | < 0.0003 | 0.016 | < 0.00005 | 0.0035 | 0.0021 | < 0.1 | < 0.0002 | 7.53 | < 0.0001 | 0.58 | < 0.0002 | < 0.001 | < 0.001 | 0.0046 | < 0.001 | 0.008 | 0.0005 |
| | 08-Sep-2004 | 07-IN | 0.071 | < 0.0002 | 0.0041 | 0.141 | 0.0003 | 0.23 | < 0.0002 | < 0.001 | 0.0013 | 0.001 | < 0.0003 | 0.032 | < 0.00005 | 0.0033 | 0.0039 | < 0.1 | < 0.0002 | 7.05 | < 0.0001 | 0.59 | < 0.0002 | < 0.001 | 0.014 | 0.0058 | < 0.001 | 0.0043 | 0.0006 |
| | 07-Sep-2005 | 07-IN | < 0.001 | < 0.0002 | 0.0013 | 0.212 | < 0.0002 | 0.18 | 0.0003 | < 0.001 | 0.0006 | 0.0005 | < 0.0003 | 0.036 | < 0.00005 | 0.0029 | 0.0032 | < 0.1 | < 0.0002 | 6.67 | 0.0003 | 0.6 | < 0.0002 | < 0.001 | < 0.001 | 0.0059 | < 0.001 | 0.0049 | 0.0017 |
| | 07-Sep-2006 | 07-IN | < 0.001 | < 0.0002 | 0.0022 | 0.151 | < 0.0002 | 0.15 | < 0.0002 | < 0.001 | 0.0011 | 0.0026 | < 0.0003 | 0.045 | 0.00021 | 0.0032 | 0.004 | < 0.1 | < 0.0002 | 7.13 | < 0.0001 | 0.59 | < 0.0002 | < 0.001 | 0.001 | 0.0069 | < 0.001 | 0.0027 | 0.0013 |
| | 05-Sep-2007 | 07-IN | 0.026 | < 0.0002 | 0.0076 | 0.15 | < 0.001 | 0.18 | 0.00007 | < 0.001 | 0.0028 | 0.0061 | < 0.0002 | 0.04 | < 0.00005 | 0.0032 | 0.0191 | < 0.1 | < 0.0002 | 7.4 | < 0.0001 | 0.58 | < 0.0002 | < 0.001 | 0.01 | 0.0061 | < 0.001 | 0.011 | --- |
| | 03-Sep-2008 | 07-IN | < 0.01 | < 0.0004 | 0.0021 | 0.16 | < 0.001 | 0.18 | < 0.00005 | < 0.005 | < 0.002 | 0.005 | < 0.0001 | 0.041 | < 0.00010 | < 0.005 | 0.004 | --- | 0.0006 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0057 | < 0.001 | 0.005 | --- |
| | 09-Sep-2009 | 07-IN | < 0.0050 | < 0.00040 | 0.00242 | 0.13 | < 0.0010 | 0.172 | 0.000015 | < 0.0050 | < 0.0020 | 0.0037 | 0.00013 | 0.042 | < 0.000020 | < 0.0050 | 0.0039 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00582 | < 0.0010 | 0.0301 | --- |
| | 08-Sep-2010 | 07 IN | < 0.0050 | < 0.00040 | 0.00325 | 0.131 | < 0.0010 | 0.189 | 0.000012 | < 0.0010 | < 0.0020 | 0.0026 | < 0.00010 | 0.044 | < 0.000020 | < 0.0050 | 0.0054 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0011 | 0.00601 | < 0.0010 | 0.0064 | --- |
| | 07-Sep-2011 | 07-IN | < 0.0050 | < 0.00040 | 0.0031 | 0.131 | < 0.0010 | 0.182 | 0.000034 | < 0.0010 | < 0.0020 | 0.0028 | < 0.00010 | 0.038 | < 0.000020 | < 0.0050 | 0.0027 | --- | < 0.00040 | 7.68 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00608 | < 0.0010 | 0.0085 | --- |
| | 05-Sep-2012 | 07-IN | < 0.0050 | < 0.00040 | 0.00424 | 0.12 | < 0.0010 | 0.19 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.037 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 8.03 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00524 | < 0.0010 | < 0.0040 | --- |
| | 25-Sep-2013 | 07-IN | < 0.0050 | < 0.00040 | 0.00532 | 0.169 | < 0.0010 | 0.178 | 0.000012 | < 0.0010 | < 0.0020 | 0.0021 | < 0.00010 | 0.040 | < 0.000020 | < 0.0050 | 0.0030 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00654 | < 0.0010 | 0.0061 | --- |
| | 17-Sep-2014 | 07-IN | < 0.0010 | < 0.00010 | 0.00389 | 0.192 | < 0.00050 | 0.180 | 0.000011 | < 0.00010 | 0.00145 | 0.00039 | < 0.000050 | 0.0403 | < 0.0000050 | 0.00329 | 0.00359 | < 0.30 | < 0.00010 | 8.21 | < 0.000010 | 0.587 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00621 | 0.00019 | 0.0041 | --- |
| | 29-Sep-2015 | 07-IN | <0.0010 | <0.00010 | 0.00381 | 0.149 | --- | 0.170 | 0.0000258 | 0.00055 | --- | 0.00126 | <0.000050 | --- | <0.0000050 | --- | 0.00392 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00672 | --- | 0.0086 | --- |
| | 27-Sep-2016 | 07-IN | 0.0035 | <0.00010 | 0.00656 | 0.163 | --- | 0.177 | 0.0000226 | 0.00040 | --- | 0.00079 | <0.000050 | --- | <0.0000050 | --- | 0.00315 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00467 | --- | 0.0025 | --- |
| | 26-Sep-2017 | 07-IN | 0.0011 | <0.00010 | 0.00800 | 0.185 | --- | 0.181 | 0.0000059 | 0.00040 | --- | 0.00021 | <0.000050 | --- | <0.0000050 | --- | 0.00408 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00721 | --- | 0.0042 | --- |
| | 17-Sep-2018 | 07-IN | <0.0010 | <0.00010 | 0.00414 | 0.164 | --- | 0.205 | 0.0000939 | 0.00056 | --- | 0.00033 | <0.000050 | --- | 0.0000094 | --- | 0.00497 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00587 | --- | 0.0055 | --- |
| | 16-Sep-2019 | 07-IN | 0.0018 | <0.00010 | 0.00929 | 0.163 | --- | 0.186 | 0.0000072 | 0.00058 | --- | 0.00029 | <0.000050 | --- | <0.0000050 | --- | 0.01300 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00637 | --- | 0.0013 | --- |
| | 22-Sep-2020 | 07-IN | 0.0031 | <0.00010 | 0.00557 | 0.163 | <0.00010 | 0.180 | 0.0000225 | 0.00016 | 0.00143 | 0.00440 | <0.000050 | 0.0358 | <0.0000050 | 0.00342 | 0.00446 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00589 | <0.00050 | 0.0102 | --- |
| | 22-Sep-2021 | 07-IN | 0.0023 | <0.00010 | 0.00353 | 0.185 | <0.00010 | 0.183 | 0.0000928 | <0.00010 | 0.00159 | 0.00519 | <0.000050 | 0.0372 | <0.0000050 | 0.00359 | 0.00506 | --- | <0.000050 | --- | <0.000010 | --- | 0.000014 | <0.00010 | <0.00030 | 0.00857 | <0.00050 | 0.159 | --- |
| | 28-Sep-2022 | 07-IN | <0.0010 | <0.00010 | 0.00344 | 0.172 | --- | 0.196 | 0.0000965 | <0.00050 | --- | 0.00122 | <0.000050 | --- | <0.0000050 | --- | 0.00380 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00742 | --- | 0.0163 | --- |
| | 29-Sep-2023 | 07-IN | <0.0010 | <0.00010 | 0.00252 | 0.15 | --- | 0.184 | 0.00014 | 0.0016 | --- | 0.00259 | <0.000050 | --- | <0.0000050 | --- | 0.00414 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00528 | --- | 0.0092 | --- |
| 07-SS | 15-Feb-1985 | 07-SS | --- | 0.0004 | 0.0029 | --- | < 0.001 | --- | < 0.001 | 0.004 | --- | 0.003 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1985 | 07-SS | --- | 0.001 | 0.0012 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.009 | < 0.002 | --- | 0.0000013 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 07-SS | --- | 0.0007 | 0.0008 | --- | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 07-SS | --- | 0.0002 | 0.0018 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | 0.005 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 07-SS | --- | 0.0002 | 0.0008 | 0.08 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 07-SS | --- | 0.0002 | 0.0022 | 0.06 | --- | --- | --- | < 0.001 | --- | 0.007 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 07-SS | --- | 0.0005 | 0.0008 | 0.06 | --- | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 07-SS | --- | 0.0002 | 0.0034 | 0.06 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 07-SS | --- | 0.0007 | 0.0031 | 0.05 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 07-SS | --- | 0.0003 | 0.0029 | 0.06 | < 0.001 | --- | < 0.001 | 0.003 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 07-SS | --- | 0.0002 | 0.0019 | 0.05 | < 0.001 | --- | < 0.001 | 0.005 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 07-SS | --- | 0.0002 | 0.0008 | 0.05 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 07-SS | --- | 0.0002 | 0.0006 | 0.06 | < 0.001 | --- | < 0.001 | 0.012 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 07-SS | --- | 0.0002 | 0.0002 | 0.05 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 07-SS | --- | 0.0002 | 0.0007 | 0.05 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 07-SS | --- | 0.0002 | 0.0008 | 0.06 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 07-SS | --- | 0.0002 | 0.0005 | 0.05 | < 0.001 | --- | < 0.001 | 0.002 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 07-SS | --- | 0.0002 | 0.0005 | 0.05 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 07-SS | --- | 0.0016 | 0.0002 | 0.05 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 07-SS | --- | --- | --- | --- | --- | --- | < 0.0002 | --- | --- | --- | < 0.0003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Oct-1998 | 07-SS | --- | < 0.0002 | 0.0011 | 0.05 | 0.004 | --- | < 0.0002 | 0.021 | 0.018 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.026 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| Canadian Drinking Water AO Guidelines 2022[1] | | | 0.1 | --- | --- | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | --- |
| Canadian Drinking 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 | --- | --- | 7.0 | --- | --- | --- | 0.02 | --- | --- | --- |
| Alberta Tier 2 Potable Groundwater Guideline[3] | | | --- | 0.006 | 0.01 | 1 | --- | 5 | 0.005 | --- | --- | 1 | 0.01 | --- | 0.001 | --- | --- | | 0.05 | | --- | | --- | --- | --- | 0.02 | --- | 5 | --- |
| Alberta Tier 2 Aquatic 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 | --- |
| 07(R)SS | 16-Sep-2014 | 07(R)SS | 0.0036 | 0.00039 | 0.00303 | 0.0627 | < 0.00050 | 0.038 | 0.000029 | 0.00015 | 0.00529 | 0.00017 | 0.000063 | 0.0714 | < 0.0000050 | 0.00363 | 0.0196 | < 0.30 | 0.00015 | 9.56 | < 0.000010 | 0.428 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00183 | < 0.00010 | 0.0043 | --- |
| | 29-Sep-2015 | 07(R)SS | 0.0023 | 0.00014 | 0.00131 | 0.0546 | --- | 0.028 | 0.0000261 | <0.00010 | --- | 0.00034 | <0.000050 | --- | <0.0000050 | --- | 0.0103 | --- | 0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00196 | --- | 0.0040 | --- |
| | 27-Sep-2016 | 07(R)SS | 0.0016 | <0.00010 | 0.00116 | 0.0644 | --- | 0.035 | 0.0000078 | 0.00018 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.0065 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00218 | --- | 0.0012 | --- |
| | 26-Sep-2017 | 07(R)SS | <0.0010 | <0.00010 | 0.00093 | 0.0705 | --- | 0.036 | 0.0000113 | <0.00010 | --- | 0.00025 | <0.000050 | --- | <0.0000050 | --- | 0.0046 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00148 | --- | 0.0015 | --- |
| | 17-Sep-2018 | 07(R)SS | 0.0031 | <0.00010 | 0.00057 | 0.0899 | --- | 0.040 | 0.0003640 | <0.00010 | --- | 0.00029 | <0.000050 | --- | 0.0000189 | --- | 0.0024 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00088 | --- | 0.0033 | --- |
| | 16-Sep-2019 | 07(R)SS | <0.0010 | <0.00010 | 0.00088 | 0.0931 | --- | 0.038 | 0.0000691 | 0.00014 | --- | 0.00134 | <0.000050 | --- | <0.0000050 | --- | 0.0026 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00070 | --- | 0.0016 | --- |
| | 23-Sep-2020 | 07(R)SS | 0.0015 | <0.00010 | 0.00380 | 0.0971 | <0.00010 | 0.032 | <0.0000050 | <0.00010 | 0.00156 | <0.00020 | <0.000050 | 0.118 | <0.0000050 | 0.000483 | 0.00171 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.000533 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2021 | 07(R)SS | 0.001 | <0.00010 | 0.00023 | 0.092 | <0.00010 | 0.036 | 0.0000068 | <0.00010 | 0.0013 | 0.00027 | <0.000050 | 0.123 | <0.0000050 | 0.000728 | 0.00175 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.000621 | <0.00050 | 0.001 | --- |
| | 28-Sep-2022 | 07(R)SS | 0.0056 | <0.00010 | 0.00018 | 0.0832 | --- | 0.040 | 0.0000055 | <0.00050 | --- | 0.00035 | <0.000050 | --- | <0.0000050 | --- | 0.00191 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000716 | --- | 0.0010 | --- |
| | 29-Sep-2023 | 07(R)SS | <0.0010 | <0.00010 | 0.0002 | 0.078 | --- | 0.038 | <0.0000050 | 0.00129 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.00203 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000553 | --- | <0.0010 | --- |
| 08-SH | 15-May-1985 | 08-SH | --- | 0.001 | 0.0022 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | **0.012** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 08-SH | --- | 0.0005 | 0.0019 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | **0.008** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 08-SH | --- | 0.0002 | 0.0015 | 0.3 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 08-SH | --- | 0.0002 | 0.0019 | 0.28 | --- | --- | --- | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 08-SH | --- | 0.0004 | 0.0013 | 0.29 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 08-SH | --- | 0.0011 | 0.0012 | 0.27 | --- | --- | < 0.001 | < 0.001 | --- | **0.008** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 08-SH | --- | 0.0005 | 0.0014 | 0.27 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 08-SH | --- | 0.0002 | 0.0011 | 0.29 | < 0.001 | --- | < 0.001 | < 0.001 | --- | **0.007** | 0.005 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 08-SH | --- | 0.0003 | 0.0006 | 0.3 | < 0.001 | --- | < 0.001 | 0.004 | --- | **0.01** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 08-SH | --- | 0.0005 | 0.0008 | 0.29 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 08-SH | --- | 0.0002 | 0.0008 | 0.3 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 08-SH | --- | 0.0002 | 0.001 | 0.3 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 08-SH | --- | 0.0002 | 0.0005 | 0.28 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 08-SH | --- | 0.0002 | 0.0006 | 0.28 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 08-SH | --- | 0.0002 | 0.0007 | 0.28 | < 0.001 | --- | < 0.001 | 0.004 | --- | 0.002 | 0.005 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 08-SH | --- | 0.0002 | 0.0006 | 0.25 | < 0.001 | --- | < 0.001 | 0.005 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 08-SH | --- | 0.0012 | 0.0008 | 0.3 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1991 | 08-SH | --- | 0.0002 | 0.0015 | 0.3 | < 0.001 | --- | < 0.001 | **0.015** | < 0.001 | 0.005 | 0.003 | --- | < 0.00005 | 0.019 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-May-1992 | 08-SH | --- | 0.0003 | 0.0005 | 0.21 | 0.001 | --- | < 0.003 | < 0.001 | < 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | 0.007 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 08-SH | --- | < 0.0002 | 0.0005 | 0.31 | 0.001 | --- | < 0.003 | 0.008 | < 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-May-1993 | 08-SH | --- | 0.0002 | 0.0004 | 0.29 | 0.001 | --- | < 0.003 | 0.004 | < 0.003 | 0.004 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-1993 | 08-SH | --- | < 0.0002 | 0.0005 | 0.29 | 0.001 | --- | **0.003** | 0.004 | < 0.003 | **0.008** | < 0.002 | --- | < 0.00005 | 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 08-SH | --- | < 0.0002 | 0.0003 | 0.28 | 0.001 | --- | **0.003** | < 0.002 | < 0.003 | 0.002 | 0.001 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.005 | --- |
| (Duplicate) | 31-May-1994 | 08-SH DUP | --- | < 0.0002 | 0.0004 | 0.28 | 0.001 | --- | < 0.003 | 0.003 | < 0.003 | 0.003 | < 0.001 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.003 | 0.008 | --- |
| | 22-Sep-1994 | 08-SH | --- | < 0.0002 | 0.0007 | 0.29 | < 0.001 | --- | < 0.003 | < 0.002 | 0.007 | < 0.001 | < 0.001 | --- | **0.00005** | < 0.003 | 0.016 | --- | < 0.0002 | --- | < 0.002 | --- | 0.001 | --- | --- | --- | < 0.002 | 0.004 | --- |
| (Duplicate) | 22-Sep-1994 | 08-SH DUP | --- | < 0.0002 | 0.0008 | 0.29 | 0.002 | --- | < 0.003 | **0.01** | 0.011 | 0.002 | < 0.001 | --- | **0.00005** | 0.007 | 0.019 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.005 | --- |
| | 02-Nov-1994 | 08-SH | --- | 0.0006 | 0.0011 | 0.27 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.003 | < 0.001 | --- | < 0.00005 | 0.004 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.005 | 0.014 | --- |
| | 28-Sep-1995 | 08-SH | --- | < 0.0002 | 0.0003 | 0.3 | < 0.001 | --- | < 0.0002 | 0.004 | 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.005 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 05-Sep-1996 | 08-SH | --- | < 0.0002 | 0.0004 | 0.28 | < 0.001 | --- | < 0.0002 | **0.023** | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.004 | --- |
| (Duplicate) | 05-Sep-1996 | 08-SH DUP | --- | < 0.0002 | 0.0003 | 0.26 | < 0.001 | --- | < 0.0002 | **0.018** | < 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.003 | 0.004 | --- |
| | 05-Sep-1997 | 08-SH | --- | < 0.0002 | 0.0002 | 0.23 | 0.002 | --- | < 0.0002 | < 0.002 | 0.013 | 0.004 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.002 | --- |
| | 15-Sep-1998 | 08-SH | --- | < 0.0002 | 0.0005 | 0.24 | 0.001 | --- | **0.0014** | **0.027** | 0.005 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.011 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 08-SH | --- | 0.0046 | 0.0003 | 0.31 | < 0.001 | --- | < 0.0002 | **0.016** | 0.013 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.013 | --- |
| (Duplicate) | 09-Sep-1999 | 08-SH DUP | --- | 0.0004 | 0.0002 | 0.24 | 0.027 | --- | 0.0002 | **0.025** | < 0.003 | 0.002 | < 0.0003 | --- | < 0.00005 | 0.025 | 0.013 | --- | < 0.0002 | --- | **0.016** | --- | --- | --- | --- | --- | < 0.002 | 0.005 | --- |
| | 05-Sep-2000 | 08-SH | --- | < 0.0002 | 0.0004 | 0.227 | < 0.0002 | --- | < 0.0002 | **0.022** | 0.0004 | 0.0006 | < 0.0003 | --- | < 0.00005 | 0.0009 | 0.0027 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | < 0.0006 | --- |
| (Duplicate) | 05-Sep-2000 | 08-SH DUP | --- | < 0.0002 | 0.0004 | 0.228 | < 0.0002 | --- | < 0.0002 | **0.039** | 0.0009 | 0.0012 | < 0.0003 | --- | < 0.00005 | 0.0008 | < 0.0005 | --- | 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | < 0.0006 | --- |
| | 06-Sep-2001 | 08-SH | --- | < 0.0002 | 0.0003 | 0.235 | < 0.0002 | --- | < 0.0002 | **0.017** | < 0.0003 | 0.0009 | < 0.0003 | 0.02 | < 0.00005 | 0.0023 | 0.0036 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0092 | --- |
| | 05-Sep-2002 | 08-SH | 0.002 | < 0.0002 | 0.0008 | 0.25 | < 0.0002 | 0.07 | < 0.0002 | **0.013** | < 0.0003 | 0.0014 | < 0.0003 | --- | < 0.00005 | 0.0016 | 0.002 | < 0.1 | < 0.0002 | 4.69 | < 0.0001 | 0.38 | < 0.0002 | < 0.001 | < 0.001 | 0.0024 | < 0.001 | 0.0041 | 0.0034 |
| | 04-Sep-2003 | 08-SH | < 0.001 | 0.0002 | < 0.0002 | 0.223 | < 0.0002 | 0.08 | < 0.0002 | **0.012** | < 0.0003 | 0.0008 | < 0.0003 | < 0.004 | < 0.00005 | 0.0145 | 0.0005 | < 0.1 | < 0.0002 | 5.15 | < 0.0001 | 0.36 | < 0.0002 | < 0.001 | < 0.001 | 0.0021 | < 0.001 | 0.002 | 0.0002 |
| | 09-Sep-2004 | 08-SH | 0.079 | < 0.0002 | < 0.0002 | 0.242 | < 0.0002 | 0.09 | < 0.0002 | **0.018** | < 0.0003 | **0.0123** | < 0.0003 | 0.014 | **0.00026** | 0.0035 | 0.0033 | < 0.1 | < 0.0002 | 4.89 | < 0.0001 | 0.37 | < 0.0002 | < 0.001 | 0.011 | 0.0026 | < 0.001 | 0.0179 | 0.0003 |
| | 08-Sep-2005 | 08-SH | < 0.001 | 0.0003 | 0.0003 | 0.246 | 0.0002 | 0.07 | 0.0003 | **0.013** | < 0.0003 | 0.0015 | < 0.0003 | 0.024 | < 0.00005 | 0.0022 | 0.0019 | < 0.1 | < 0.0002 | 4.74 | **0.0003** | 0.37 | < 0.0002 | < 0.001 | < 0.001 | 0.0027 | < 0.001 | 0.0062 | 0.0016 |
| | 07-Sep-2006 | 08-SH | 0.003 | < 0.0002 | 0.0007 | 0.226 | < 0.0002 | 0.07 | < 0.0002 | **0.012** | < 0.0003 | 0.0042 | < 0.0003 | 0.024 | **0.00024** | 0.0027 | 0.0022 | < 0.1 | < 0.0002 | 4.8 | < 0.0001 | 0.36 | < 0.0002 | < 0.001 | 0.001 | 0.0031 | < 0.001 | 0.0111 | 0.0006 |
| | 05-Sep-2007 | 08-SH | 0.032 | < 0.0002 | 0.0003 | 0.23 | < 0.001 | 0.07 | 0.00006 | 0.007 | 0.0012 | 0.004 | < 0.0002 | 0.02 | < 0.00005 | 0.0022 | 0.013 | < 0.1 | < 0.0002 | 5.2 | < 0.0001 | 0.36 | < 0.0002 | < 0.001 | 0.005 | 0.0027 | < 0.001 | 0.011 | --- |
| | 03-Sep-2008 | 08-SH | < 0.01 | < 0.0004 | < 0.0004 | 0.219 | < 0.001 | 0.06 | < 0.00005 | **0.009** | < 0.002 | 0.002 | < 0.0001 | 0.023 | < 0.00010 | < 0.005 | < 0.002 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0028 | < 0.001 | 0.002 | --- |
| | 09-Sep-2009 | 08-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.215 | < 0.0010 | 0.065 | 0.000016 | < 0.0050 | < 0.0020 | < 0.0010 | < 0.00010 | 0.023 | < 0.000020 | < 0.0050 | 0.0023 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00257 | < 0.0010 | < 0.0040 | --- |
| | 08-Sep-2010 | 8 SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.211 | < 0.0010 | 0.068 | 0.000091 | **0.0095** | < 0.0020 | 0.0011 | < 0.00010 | 0.023 | < 0.000020 | < 0.0050 | 0.0034 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00271 | < 0.0010 | 0.0043 | --- |
| | 08-Sep-2011 | 08-SH | < 0.0050 | < 0.00040 | 0.00135 | 0.198 | < 0.0010 | 0.065 | 0.000014 | **0.019** | < 0.0020 | 0.0017 | < 0.00010 | 0.021 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 5.29 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00271 | < 0.0010 | < 0.0040 | --- |
| | 05-Sep-2012 | 08-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.251 | < 0.0010 | 0.064 | 0.000078 | 0.0051 | < 0.0020 | 0.0015 | < 0.00010 | 0.024 | < 0.000020 | < 0.0050 | 0.0335 | --- | < 0.00040 | 5.62 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00288 | < 0.0010 | < 0.0040 | --- |
| | 25-Sep-2013 | 08-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.281 | < 0.0010 | 0.063 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.025 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00245 | < 0.0010 | 0.0041 | --- |
| | 16-Sep-2014 | 08-SH | 0.0077 | < 0.00010 | 0.00022 | 0.295 | < 0.00050 | 0.074 | 0.000060 | 0.00041 | 0.00013 | 0.00155 | < 0.000050 | 0.0259 | < 0.0000050 | 0.00273 | 0.0182 | < 0.30 | < 0.00010 | 6.21 | < 0.0000010 | 0.380 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00284 | < 0.00010 | 0.0054 | --- |
| | 29-Sep-2015 | 08-SH | 0.0029 | <0.00010 | 0.00021 | 0.221 | --- | 0.050 | 0.0000496 | 0.00013 | --- | 0.00132 | <0.000050 | --- | <0.0000050 | --- | 0.00961 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00373 | --- | 0.0046 | --- |
| | 27-Sep-2016 | 08-SH | 0.0084 | <0.00010 | 0.00021 | 0.242 | --- | 0.066 | 0.0000249 | <0.00010 | --- | 0.00052 | <0.000050 | --- | <0.0000050 | --- | 0.00429 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00342 | --- | 0.0017 | --- |
| | 26-Sep-2017 | 08-SH | 0.0041 | <0.00010 | 0.00023 | 0.244 | --- | 0.063 | 0.0000412 | 0.00052 | --- | 0.00066 | <0.000050 | --- | <0.0000050 | --- | 0.00215 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00427 | --- | 0.0013 | --- |
| | 17-Sep-2018 | 08-SH | 0.0028 | <0.00010 | 0.00030 | 0.230 | --- | 0.066 | 0.0000285 | 0.00062 | --- | 0.00078 | <0.000050 | --- | **0.0000052** | --- | 0.00264 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00421 | --- | 0.0014 | --- |
| | 16-Sep-2019 | 08-SH | 0.0029 | <0.00010 | 0.00061 | 0.231 | --- | 0.065 | 0.0000159 | 0.00037 | --- | 0.00229 | 0.000067 | --- | <0.0000050 | --- | 0.00372 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00459 | --- | 0.0023 | --- |
| | 22-Sep-2020 | 08-SH | 0.0029 | 0.00040 | 0.00075 | 0.225 | <0.00010 | 0.059 | <0.0000050 | 0.00117 | <0.00010 | 0.00118 | <0.000050 | 0.0296 | <0.0000050 | 0.00322 | 0.00398 | --- | 0.000109 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00578 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2021 | 08-SH | 0.0014 | 0.00016 | 0.00087 | 0.212 | <0.00010 | 0.059 | 0.0000138 | 0.00024 | 0.00017 | 0.00044 | <0.000050 | 0.0312 | <0.0000050 | 0.00336 | 0.0027 | --- | <0.000050 | --- | <0.000010 | --- | 0.000016 | <0.00010 | <0.00030 | 0.00501 | <0.00050 | <0.0010 | --- |
| | 28-Sep-2022 | 08-SH | 0.0025 | 0.00026 | 0.00107 | 0.239 | --- | 0.066 | 0.0000074 | <0.00050 | --- | 0.00058 | <0.000050 | --- | <0.0000050 | --- | 0.00157 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00604 | --- | <0.0010 | --- |
| | 27-Sep-2023 | 08-SH | <0.0010 | <0.00010 | 0.00059 | 0.204 | --- | 0.062 | 0.0000567 | 0.00171 | --- | 0.00058 | <0.000050 | --- | <0.0000050 | --- | 0.00247 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00528 | --- | 0.0019 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **2.9** | **0.006** | **0.010** | **2.0** | --- | **5** | **0.007** | **0.05** | --- | **2** | **0.005** | --- | **0.001** | --- | --- | --- | --- | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **08-IN** | 15-May-1985 | 08-IN | --- | 0.0002 | 0.0004 | --- | < 0.001 | --- | < 0.001 | **0.045** | --- | **0.025** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 08-IN | --- | 0.0002 | 0.0009 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | **0.011** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 08-IN | --- | 0.0054 | 0.0004 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | **0.01** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 08-IN | --- | 0.0008 | 0.0011 | --- | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.007 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 08-IN | --- | 0.0002 | 0.0005 | 0.17 | < 0.001 | --- | < 0.001 | **0.019** | --- | **0.017** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 08-IN | --- | 0.0002 | < 0.0002 | 0.12 | --- | --- | --- | < 0.001 | --- | < 0.001 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 08-IN | --- | 0.0006 | < 0.0002 | 0.11 | --- | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 08-IN | --- | 0.0002 | 0.0003 | 0.1 | --- | --- | < 0.001 | **0.075** | --- | **0.028** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 08-IN | --- | 0.0006 | 0.0007 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 08-IN | --- | 0.0002 | 0.0003 | 0.08 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | **0.007** | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 08-IN | --- | 0.0002 | < 0.0002 | 0.07 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 08-IN | --- | 0.0002 | < 0.0002 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 08-IN | --- | 0.0002 | < 0.0002 | 0.06 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 08-IN | --- | 0.0002 | 0.0004 | 0.06 | < 0.001 | --- | < 0.001 | **0.009** | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 08-IN | --- | 0.0002 | < 0.0002 | 0.07 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 08-IN | --- | 0.0002 | < 0.0002 | 0.06 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 08-IN | --- | 0.0002 | 0.0003 | 0.07 | < 0.001 | --- | < 0.001 | 0.003 | --- | **0.007** | 0.005 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 08-IN | --- | 0.0002 | 0.0004 | 0.06 | < 0.001 | --- | < 0.001 | 0.005 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 08-IN | --- | 0.0048 | 0.0005 | 0.06 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 08-IN | --- | --- | --- | --- | --- | --- | < 0.0002 | --- | --- | --- | < 0.0003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 08-IN | 0.001 | < 0.0002 | 0.0005 | 0.0565 | < 0.0002 | 0.14 | < 0.0002 | 0.004 | < 0.0003 | 0.0019 | < 0.0003 | 0.041 | **0.00013** | 0.0006 | 0.0031 | < 0.1 | < 0.0002 | 4.63 | < 0.0001 | 0.67 | < 0.0002 | < 0.001 | < 0.001 | 0.0039 | < 0.001 | 0.0034 | 0.0004 |
| | 05-Sep-2007 | 08-IN | 0.076 | < 0.0002 | < 0.0002 | 0.06 | < 0.001 | 0.17 | 0.00004 | 0.003 | 0.002 | 0.0051 | < 0.0002 | 0.04 | < 0.00005 | 0.0005 | 0.0202 | < 0.1 | < 0.0002 | 4.9 | < 0.0001 | 0.66 | < 0.0002 | < 0.001 | 0.014 | 0.0033 | < 0.001 | 0.007 | --- |
| | 03-Sep-2008 | 08-IN | < 0.01 | < 0.0004 | < 0.0004 | 0.056 | < 0.001 | 0.17 | < 0.0001 | < 0.005 | < 0.002 | 0.002 | < 0.0001 | 0.037 | < 0.00010 | < 0.005 | 0.003 | --- | 0.0006 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0034 | < 0.001 | 0.002 | --- |
| | 09-Sep-2009 | 08-IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.0493 | < 0.0010 | 0.171 | 0.00001 | < 0.0050 | < 0.0020 | 0.0013 | 0.0001 | 0.04 | < 0.000020 | < 0.0050 | 0.0048 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00304 | < 0.0010 | < 0.0040 | --- |
| | 08-Sep-2010 | 8 IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.0509 | < 0.0010 | 0.168 | 0.000124 | **0.0146** | < 0.0020 | 0.0021 | < 0.00010 | 0.045 | < 0.000020 | < 0.0050 | 0.0059 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00418 | < 0.0010 | 0.0051 | --- |
| | 08-Sep-2011 | 08-IN | < 0.0050 | < 0.00040 | 0.00126 | 0.054 | < 0.0010 | 0.178 | 0.000126 | 0.001 | < 0.0020 | 0.0029 | < 0.00010 | 0.037 | < 0.000020 | < 0.0050 | 0.0341 | --- | < 0.00040 | 5.31 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00305 | < 0.0010 | 0.016 | --- |
| | 05-Sep-2012 | 08-IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.0546 | < 0.0010 | 0.18 | 0.000074 | 0.0012 | < 0.0020 | 0.002 | < 0.00010 | 0.04 | < 0.000020 | < 0.0050 | 0.0218 | --- | < 0.00040 | 5.64 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00282 | < 0.0010 | 0.0197 | --- |
| | 25-Sep-2013 | 08-IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.0639 | < 0.0010 | 0.162 | 0.000033 | < 0.0010 | < 0.0020 | 0.0017 | < 0.00010 | 0.040 | < 0.000020 | < 0.0050 | 0.0080 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00289 | < 0.0010 | 0.0198 | --- |
| | 16-Sep-2014 | 08-IN | 0.0014 | < 0.00010 | < 0.00010 | 0.0605 | < 0.00050 | 0.185 | 0.000013 | 0.00066 | 0.00012 | 0.00129 | < 0.000050 | 0.0437 | **0.0000059** | 0.00108 | 0.00465 | < 0.30 | 0.00015 | 5.77 | < 0.000010 | 0.645 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00370 | < 0.00010 | 0.0031 | --- |
| | 29-Sep-2015 | 08-IN | <0.0010 | <0.00010 | <0.00010 | 0.0547 | --- | 0.156 | 0.0000189 | 0.00114 | --- | 0.00122 | <0.000050 | --- | <0.0000050 | --- | 0.00242 | --- | 0.000132 | --- | <0.000010 | --- | --- | --- | --- | 0.00389 | --- | 0.0100 | --- |
| | 27-Sep-2016 | 08-IN | <0.0010 | <0.00010 | <0.00010 | 0.0591 | --- | 0.167 | 0.0000337 | 0.00068 | --- | 0.00094 | <0.000050 | --- | <0.0000050 | --- | 0.00280 | --- | 0.000157 | --- | <0.000010 | --- | --- | --- | --- | 0.00379 | --- | 0.0044 | --- |
| | 26-Sep-2017 | 08-IN | <0.0010 | <0.00010 | 0.0001 | 0.0576 | --- | 0.169 | 0.0000160 | 0.00089 | --- | 0.00086 | <0.000050 | --- | <0.0000050 | --- | 0.00195 | --- | 0.000098 | --- | <0.000010 | --- | --- | --- | --- | 0.00372 | --- | 0.0023 | --- |
| | 17-Sep-2018 | 08-IN | <0.0010 | <0.00010 | 0.00011 | 0.0581 | --- | 0.193 | 0.0000312 | 0.00096 | --- | 0.00115 | <0.000050 | --- | **0.0000123** | --- | 0.00458 | --- | 0.000098 | --- | <0.000010 | --- | --- | --- | --- | 0.00332 | --- | 0.0188 | --- |
| | 16-Sep-2019 | 08-IN | <0.0010 | <0.00010 | <0.00010 | 0.0699 | --- | 0.170 | <0.0000050 | 0.00124 | --- | 0.00095 | <0.000050 | --- | <0.0000050 | --- | 0.00144 | --- | 0.000128 | --- | <0.000010 | --- | --- | --- | --- | 0.00435 | --- | 0.0010 | --- |
| | 22-Sep-2020 | 08-IN | 0.0024 | <0.00010 | 0.00012 | 0.0588 | <0.00010 | 0.164 | 0.0000106 | 0.00493 | <0.00010 | 0.00268 | <0.000050 | 0.0387 | <0.0000050 | 0.000998 | 0.00139 | --- | 0.000112 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00551 | <0.00050 | 0.0023 | --- |
| | 22-Sep-2021 | 08-IN | <0.0010 | <0.00010 | <0.00010 | 0.0584 | <0.00010 | 0.179 | <0.0000050 | 0.00155 | <0.00010 | 0.00072 | <0.000050 | 0.0433 | <0.0000050 | 0.000725 | 0.00083 | --- | 0.000112 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00346 | <0.00050 | 0.0017 | --- |
| | 28-Sep-2022 | 08-IN | <0.0010 | <0.00010 | <0.00010 | 0.0651 | --- | 0.178 | 0.0000084 | 0.00102 | --- | 0.00077 | <0.000050 | --- | <0.0000050 | --- | 0.00175 | --- | 0.000159 | --- | <0.000010 | --- | --- | --- | --- | 0.00428 | --- | 0.0013 | --- |
| | 27-Sep-2023 | 08-IN | <0.0010 | <0.00010 | <0.00010 | 0.0572 | --- | 0.172 | 0.0000143 | 0.0046 | --- | 0.00193 | <0.000050 | --- | <0.0000050 | --- | 0.00194 | --- | 0.000095 | --- | <0.000010 | --- | --- | --- | --- | 0.0035 | --- | 0.0041 | --- |
| **08-SS** | 15-May-1985 | 08-SS | --- | 0.0043 | **0.0086** | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | **0.014** | 0.003 | --- | **0.0014** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 08-SS | --- | 0.0002 | **0.023** | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 08-SS | --- | 0.0002 | **0.032** | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **08-SS (continued)** | 15-Feb-1986 | 08-SS | --- | 0.0016 | **0.025** | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 08-SS | --- | 0.0034 | **0.037** | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 08-SS | --- | 0.0014 | **0.032** | 0.09 | --- | --- | --- | < 0.001 | --- | 0.004 | 0.003 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 08-SS | --- | 0.0026 | **0.034** | 0.09 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 08-SS | --- | 0.0012 | **0.027** | 0.09 | --- | --- | < 0.001 | < 0.001 | --- | **0.01** | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 08-SS | --- | 0.005 | **0.017** | 0.08 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 08-SS | --- | 0.0016 | **0.018** | 0.1 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 08-SS | --- | 0.0013 | **0.02** | 0.11 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 08-SS | --- | 0.0021 | **0.016** | 0.1 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 08-SS | --- | 0.0002 | **0.012** | 0.1 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 08-SS | --- | 0.0005 | **0.012** | 0.09 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 08-SS | --- | 0.0002 | **0.018** | 0.09 | < 0.001 | --- | < 0.001 | 0.004 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 08-SS | --- | 0.0024 | **0.026** | 0.09 | < 0.001 | --- | < 0.001 | 0.004 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 08-SS | --- | 0.0037 | **0.03** | 0.08 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 08-SS | --- | --- | --- | --- | --- | --- | < 0.0002 | --- | --- | --- | < 0.0003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | 0.1 | --- | --- | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 5.0 | --- |
| **Canadian Drinking 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 | --- | --- | 7.0 | --- | --- | --- | 0.02 | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | 0.006 | 0.01 | 1 | --- | 5 | 0.005 | --- | --- | 1 | 0.01 | --- | 0.001 | --- | --- | | 0.05 | | --- | | --- | --- | --- | 0.02 | --- | 5 | --- |
| **Alberta Tier 2 Aquatic 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 | --- |
| **09-SH [Decommissione** | 15-May-1985 | 09-SH [DECOM] | --- | 0.0002 | 0.001 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 09-SH [DECOM] | --- | 0.001 | 0.0059 | --- | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.007 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 09-SH [DECOM] | --- | 0.0002 | 0.0014 | 0.43 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.016 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 09-SH [DECOM] | --- | 0.0002 | 0.0012 | 0.42 | --- | --- | --- | < 0.001 | --- | 0.009 | 0.006 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 09-SH [DECOM] | --- | 0.0005 | 0.0016 | 0.42 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 09-SH [DECOM] | --- | 0.0002 | 0.0021 | 0.38 | --- | --- | < 0.001 | 0.002 | --- | 0.006 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 09-SH [DECOM] | --- | 0.0006 | 0.0018 | 0.37 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 09-SH [DECOM] | --- | 0.0002 | 0.0017 | 0.4 | < 0.001 | --- | < 0.001 | 0.002 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 09-SH [DECOM] | --- | 0.0002 | 0.0015 | 0.36 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 09-SH [DECOM] | --- | 0.0002 | 0.0015 | 0.37 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 09-SH [DECOM] | --- | 0.0002 | 0.0023 | 0.33 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | 0.003 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 09-SH [DECOM] | --- | 0.0002 | 0.0014 | 0.26 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.013 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 09-SH [DECOM] | --- | 0.0002 | 0.0011 | 0.27 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 09-SH [DECOM] | --- | 0.0002 | 0.0015 | 0.32 | < 0.001 | --- | < 0.001 | 0.005 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 09-SH [DECOM] | --- | 0.0002 | 0.0024 | 0.31 | 0.002 | --- | < 0.001 | 0.004 | --- | 0.002 | 0.004 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 09-SH [DECOM] | --- | 0.0004 | 0.0015 | 0.4 | < 0.001 | --- | < 0.001 | 0.002 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Nov-1991 | 09-SH [DECOM] | --- | 0.0002 | 0.0015 | 0.34 | < 0.001 | --- | < 0.001 | 0.006 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 09-SH [DECOM] | --- | < 0.0002 | 0.0012 | 0.17 | < 0.001 | --- | 0.007 | 0.006 | < 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-Aug-1992 | 09-SH [DECOM] | --- | < 0.0002 | 0.0004 | 0.3 | 0.002 | --- | < 0.003 | 0.003 | < 0.003 | 0.01 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **09-IN [Decommissioned** | 15-May-1985 | 09-IN [DECOM] | --- | 0.0004 | 0.0009 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.012 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 09-IN [DECOM] | --- | 0.0007 | 0.0013 | --- | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.006 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 09-IN [DECOM] | --- | 0.0002 | 0.0007 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 09-IN [DECOM] | --- | 0.0007 | 0.002 | --- | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.003 | 0.006 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 09-IN [DECOM] | --- | 0.0002 | 0.0031 | 0.47 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 09-IN [DECOM] | --- | 0.0005 | 0.0048 | 0.48 | --- | --- | --- | 0.003 | --- | < 0.001 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 09-IN [DECOM] | --- | 0.0005 | 0.0048 | 0.45 | --- | --- | < 0.001 | 0.021 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 09-IN [DECOM] | --- | 0.0003 | 0.009 | 0.43 | --- | --- | < 0.001 | 0.003 | --- | 0.01 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 09-IN [DECOM] | --- | 0.0006 | 0.0098 | 0.39 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 09-IN [DECOM] | --- | 0.0012 | 0.0018 | 0.48 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 09-IN [DECOM] | --- | 0.0003 | 0.0005 | 0.44 | < 0.001 | --- | < 0.001 | 0.004 | --- | 0.011 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 09-IN [DECOM] | --- | 0.0012 | **0.023** | 0.47 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 09-IN [DECOM] | --- | 0.003 | **0.018** | 0.44 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 09-IN [DECOM] | --- | 0.0002 | **0.012** | 0.41 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 09-IN [DECOM] | --- | 0.0002 | **0.025** | 0.41 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 09-IN [DECOM] | --- | 0.0002 | **0.013** | 0.4 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 09-IN [DECOM] | --- | 0.0004 | **0.033** | 0.42 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 09-IN [DECOM] | --- | 0.0017 | **0.037** | 0.43 | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.002 | 0.004 | --- | 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 09-IN [DECOM] | --- | 0.0036 | **0.035** | 0.42 | < 0.001 | --- | < 0.001 | 0.005 | --- | < 0.001 | < 0.002 | --- | 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-Aug-1992 | 09-IN [DECOM] | --- | 0.0002 | 0.0004 | 0.42 | 0.002 | --- | < 0.003 | 0.006 | 0.005 | 0.009 | < 0.002 | --- | < 0.00005 | 0.04 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **09-PEAT** | 15-Nov-1987 | 09-PEAT | --- | 0.0002 | 0.0007 | 0.03 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | 0.005 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 09-PEAT | --- | 0.0002 | 0.0004 | 0.04 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.008 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 09-PEAT | --- | 0.0006 | 0.0008 | 0.04 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 09-PEAT | --- | 0.0002 | 0.0006 | 0.04 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 09-PEAT | --- | 0.0002 | < 0.0002 | 0.03 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.002 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 09-PEAT | --- | 0.0002 | 0.0005 | 0.04 | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.003 | 0.006 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 09-PEAT | --- | 0.0002 | < 0.0002 | 0.03 | < 0.001 | --- | < 0.001 | 0.007 | --- | 0.007 | 0.003 | --- | 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 09-PEAT | --- | 0.0042 | < 0.0002 | 0.02 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **10-SH [Decommissione** | 15-May-1985 | 10-SH [DECOM] | --- | 0.0005 | 0.0026 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.009 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 10-SH [DECOM] | --- | 0.0003 | 0.0008 | --- | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.008 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 10-SH [DECOM] | --- | 0.0002 | 0.0019 | 0.41 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.003 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 10-SH [DECOM] | --- | 0.0005 | 0.0027 | 0.39 | --- | --- | --- | < 0.001 | --- | 0.003 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 10-SH [DECOM] | --- | 0.0003 | 0.0072 | 0.4 | --- | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 10-SH [DECOM] | --- | 0.0002 | 0.003 | 0.35 | --- | --- | < 0.001 | 0.002 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 10-SH [DECOM] | --- | 0.0013 | 0.0047 | 0.36 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 10-SH [DECOM] | --- | 0.0002 | 0.0018 | 0.36 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.002 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 10-SH [DECOM] | --- | 0.0002 | 0.0019 | 0.36 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 10-SH [DECOM] | --- | 0.0002 | 0.0048 | 0.36 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 10-SH [DECOM] | --- | 0.0002 | 0.0011 | 0.34 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 10-SH [DECOM] | --- | 0.0002 | 0.001 | 0.36 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 10-SH [DECOM] | --- | 0.0002 | 0.0006 | 0.33 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 10-SH [DECOM] | --- | 0.0002 | 0.0008 | 0.35 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.003 | 0.005 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 10-SH [DECOM] | --- | 0.0002 | 0.0005 | 0.33 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.006 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 10-SH [DECOM] | --- | 0.0032 | 0.0004 | 0.39 | < 0.001 | --- | < 0.001 | < 0.001 | --- | < 0.001 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-May-1991 | 10-SH [DECOM] | --- | 0.0002 | 0.0004 | 0.39 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.011 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 10-SH [DECOM] | --- | 0.0007 | 0.0013 | 0.29 | 0.001 | --- | < 0.003 | < 0.002 | 0.004 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Sep-1992 | 10-SH [DECOM] | --- | < 0.0002 | 0.0016 | 0.54 | 0.002 | --- | < 0.003 | < 0.002 | < 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | 0.004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **10-IN [Decommissioned]** | 15-Dec-1985 | 10-IN [DECOM] | --- | 0.0002 | 0.0004 | --- | < 0.001 | --- | < 0.001 | 0.023 | --- | 0.01 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 10-IN [DECOM] | --- | 0.0005 | 0.0005 | --- | < 0.001 | --- | < 0.001 | 0.005 | --- | 0.003 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 10-IN [DECOM] | --- | 0.0002 | 0.0004 | 0.22 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 10-IN [DECOM] | --- | 0.0002 | 0.0005 | 0.2 | --- | --- | --- | < 0.001 | --- | 0.007 | 0.004 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 10-IN [DECOM] | --- | 0.0005 | 0.0007 | 0.22 | --- | --- | < 0.001 | < 0.001 | --- | 0.006 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 10-IN [DECOM] | --- | 0.0002 | 0.0004 | 0.19 | --- | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 10-IN [DECOM] | --- | 0.0005 | 0.0006 | 0.17 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 10-IN [DECOM] | --- | 0.0002 | 0.0005 | 0.21 | < 0.001 | --- | < 0.001 | 0.008 | --- | 0.005 | < 0.002 | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 10-IN [DECOM] | --- | 0.0005 | < 0.0002 | 0.19 | < 0.001 | --- | < 0.001 | 0.016 | --- | 0.006 | **0.02** | --- | < 0.0001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 10-IN [DECOM] | --- | 0.0002 | 0.0003 | 0.19 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 10-IN [DECOM] | --- | 0.0002 | < 0.0002 | 0.18 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 10-IN [DECOM] | --- | 0.0002 | 0.0004 | 0.18 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 10-IN [DECOM] | --- | 0.0002 | < 0.0002 | 0.17 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.013 | < 0.002 | --- | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 10-IN [DECOM] | --- | 0.0002 | < 0.0002 | 0.17 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 10-IN [DECOM] | --- | 0.0002 | 0.0004 | 0.16 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.003 | 0.003 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 10-IN [DECOM] | --- | 0.0002 | < 0.0002 | 0.15 | < 0.001 | --- | < 0.001 | 0.006 | --- | 0.021 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 10-IN [DECOM] | --- | 0.0049 | 0.0003 | 0.15 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.006 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-May-1991 | 10-IN [DECOM] | --- | 0.0002 | 0.0002 | 0.15 | < 0.001 | --- | < 0.001 | 0.008 | < 0.001 | 0.006 | < 0.002 | --- | < 0.00005 | 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Nov-1991 | 10-IN [DECOM] | --- | 0.0002 | 0.0002 | 0.15 | < 0.001 | --- | < 0.001 | 0.005 | < 0.001 | 0.004 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 10-IN [DECOM] | --- | 0.0002 | 0.0002 | 0.1 | 0.001 | --- | < 0.003 | 0.003 | < 0.003 | 0.004 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Sep-1992 | 10-IN [DECOM] | --- | < 0.0002 | 0.0003 | 0.2 | 0.002 | --- | < 0.003 | 0.006 | < 0.003 | 0.012 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **11-SH** | 17-May-1991 | 11-SH | --- | 0.0002 | 0.0003 | 0.47 | < 0.001 | --- | < 0.001 | 0.019 | 0.004 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.02 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 11-SH | --- | 0.0002 | 0.0005 | 0.47 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | --- | < 0.00005 | 0.007 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 11-SH | --- | 0.0019 | 0.0003 | 0.28 | 0.001 | --- | < 0.003 | 0.002 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 11-SH | --- | < 0.0002 | 0.0004 | 0.47 | 0.001 | --- | < 0.003 | 0.015 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 11-SH | --- | < 0.0002 | 0.0005 | 0.46 | 0.001 | --- | 0.003 | 0.006 | < 0.003 | 0.007 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 11-SH | --- | < 0.0002 | 0.0004 | 0.49 | 0.001 | --- | < 0.003 | < 0.002 | 0.004 | 0.007 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 11-SH | --- | < 0.0002 | 0.0009 | 0.38 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.003 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.01 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.004 | --- |
| | 22-Sep-1994 | 11-SH | --- | < 0.0002 | < 0.0002 | 0.42 | 0.002 | --- | < 0.003 | 0.011 | 0.004 | 0.005 | < 0.001 | --- | 0.00005 | 0.006 | 0.027 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.006 | --- |
| | 02-Nov-1994 | 11-SH | --- | 0.0013 | 0.0013 | 0.42 | 0.001 | --- | < 0.003 | < 0.002 | 0.005 | 0.001 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.012 | --- | < 0.0002 | --- | 0.002 [3] | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.097 | --- |
| **(Duplicate)** | 02-Nov-1994 | 11-SH DUP | --- | 0.0003 | 0.001 | 0.42 | 0.002 | --- | < 0.003 | < 0.002 | 0.007 | 0.002 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.014 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.02 | --- |
| | 28-Sep-1995 | 11-SH | --- | < 0.0002 | 0.0006 | 0.45 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.001 | < 0.0003 | --- | < 0.00005 | 0.008 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.004 | --- |
| | 05-Sep-1996 | 11-SH | --- | < 0.0002 | 0.0003 | 0.41 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.004 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.007 | --- |
| | 05-Sep-1997 | 11-SH | --- | < 0.0002 | 0.003 | 0.33 | 0.002 | --- | < 0.0002 | 0.004 | 0.007 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 11-SH | --- | 0.001 | **0.013** | 0.6 | < 0.001 | --- | < 0.0002 | 0.014 | 0.017 | 0.004 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.01 | --- |
| | 06-Sep-2000 | 11-SH | --- | 0.0003 | 0.0016 | 0.502 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.002 | < 0.0002 | < 0.0003 | --- | < 0.00005 | 0.0021 | 0.006 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0016 | --- |
| | 06-Sep-2001 | 11-SH | --- | < 0.0002 | 0.0011 | 0.385 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0012 | 0.0028 | < 0.0003 | 0.019 | < 0.00005 | 0.0026 | 0.0069 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0146 | --- |
| | 05-Sep-2002 | 11-SH | 0.021 | < 0.0002 | 0.0046 | 0.508 | < 0.0002 | 0.1 | < 0.0002 | 0.002 | 0.0014 | 0.0008 | < 0.0003 | --- | < 0.00005 | 0.0025 | 0.0027 | < 0.1 | < 0.0002 | 6.66 | < 0.0001 | 0.576 | 0.0003 | < 0.001 | 0.001 | 0.0017 | < 0.001 | 0.0031 | 0.0041 |
| | 03-Sep-2003 | 11-SH | 0.002 | < 0.0002 | 0.0044 | 0.443 | < 0.0002 | 0.14 | < 0.0002 | < 0.001 | 0.0012 | 0.0011 | < 0.0003 | < 0.004 | < 0.00005 | 0.0116 | 0.0041 | < 0.1 | < 0.0002 | 7.01 | 0.0001 | 0.59 | < 0.0002 | < 0.001 | < 0.001 | 0.0015 | < 0.001 | 0.0072 | 0.0005 |
| | 08-Sep-2004 | 11-SH | 0.017 | < 0.0002 | 0.0079 | 0.533 | 0.0009 | 0.44 | < 0.0002 | 0.002 | 0.0014 | 0.0011 | < 0.0003 | 0.012 | < 0.00005 | 0.0035 | 0.0057 | < 0.1 | < 0.0002 | 6.79 | < 0.0001 | 0.54 | < 0.0002 | < 0.001 | 0.014 | 0.0016 | < 0.001 | 0.0038 | 0.0007 |
| | 07-Sep-2005 | 11-SH | < 0.001 | < 0.0002 | 0.0036 | 0.499 | 0.0002 | 0.11 | 0.0003 | 0.002 | 0.0011 | 0.0009 | < 0.0003 | 0.018 | < 0.00005 | 0.0034 | 0.005 | < 0.1 | < 0.0002 | 6.33 | 0.0003 | 0.56 | < 0.0002 | < 0.001 | 0.001 | 0.0016 | < 0.001 | 0.0065 | 0.002 |
| | 07-Sep-2006 | 11-SH | 0.005 | < 0.0002 | 0.0045 | 0.353 | < 0.0002 | 0.11 | < 0.0002 | < 0.001 | 0.0012 | 0.0027 | < 0.0003 | 0.023 | 0.00011 | 0.0029 | 0.0041 | < 0.1 | < 0.0002 | 6.29 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | 0.001 | 0.0014 | < 0.001 | 0.0107 | 0.0007 |
| | 06-Sep-2007 | 11-SH | 0.004 | < 0.0002 | **0.0111** | 0.49 | < 0.001 | 0.11 | 0.00005 | < 0.001 | 0.003 | 0.0042 | < 0.0002 | < 0.02 | < 0.00005 | 0.0025 | 0.0213 | 0.2 | < 0.0002 | 7.5 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | 0.01 | 0.001 | < 0.001 | 0.011 | --- |
| | 04-Sep-2008 | 11-SH | < 0.01 | < 0.0004 | 0.0005 | 0.366 | < 0.001 | 0.11 | < 0.0001 | < 0.005 | < 0.002 | 0.006 | < 0.0001 | 0.024 | < 0.00010 | < 0.005 | 0.004 | --- | 0.0006 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.001 | < 0.001 | 0.005 | --- |
| | 10-Sep-2009 | 11-SH | < 0.0050 | < 0.00040 | 0.00048 | 0.325 | < 0.0010 | 0.112 | 0.00001 | < 0.0050 | < 0.0020 | 0.0048 | 0.00011 | 0.024 | < 0.000020 | < 0.0050 | 0.0042 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.001 | 0.00117 | < 0.0010 | 0.0078 | --- |
| | 09-Sep-2010 | 11 SH | < 0.0050 | < 0.00040 | 0.00052 | 0.402 | < 0.0010 | 0.123 | 0.000078 | < 0.0010 | < 0.0020 | 0.0029 | < 0.00010 | 0.024 | < 0.000020 | < 0.0050 | 0.0055 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0012 | 0.00124 | < 0.0010 | 0.0041 | --- |
| | 08-Sep-2011 | 11-SH | < 0.0050 | < 0.00040 | 0.00158 | 0.478 | < 0.0010 | 0.126 | 0.000013 | < 0.0010 | < 0.0020 | 0.0023 | < 0.00010 | 0.021 | < 0.000020 | < 0.0050 | 0.0025 | --- | < 0.00040 | 8.27 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00131 | < 0.0010 | 0.0068 | --- |
| | 06-Sep-2012 | 11-SH | < 0.0050 | < 0.00040 | 0.00064 | 0.464 | < 0.0010 | 0.128 | < 0.000010 | < 0.0010 | < 0.0020 | 0.0011 | < 0.00010 | 0.024 | < 0.000020 | < 0.0050 | 0.0029 | --- | < 0.00040 | 8.42 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00115 | < 0.0010 | 0.0051 | --- |
| | 26-Sep-2013 | 11-SH | < 0.0050 | 0.00044 | 0.00084 | 0.691 | < 0.0010 | 0.148 | 0.000032 | < 0.0010 | 0.0060 | 0.0017 | < 0.00010 | 0.024 | < 0.000020 | < 0.0050 | 0.0172 | --- | < 0.00040 | --- | < 0.000020 | --- | 0.00011 | < 0.050 | < 0.0010 | 0.0150 | < 0.0010 | 0.0122 | --- |
| | 17-Sep-2014 | 11-SH | < 0.0010 | < 0.00010 | 0.00032 | 0.687 | < 0.00050 | 0.135 | 0.000047 | < 0.00010 | 0.00283 | 0.00238 | < 0.000050 | 0.0259 | < 0.0000050 | 0.00127 | 0.0060 | < 0.30 | 0.00012 | 7.31 | < 0.0000010 | 0.633 | 0.000056 | < 0.00010 | < 0.00030 | 0.00382 | < 0.00010 | 0.0080 | --- |
| **(Duplicate)** | 17-Sep-2014 | 31-SH | < 0.0010 | < 0.00010 | 0.00028 | 0.692 | < 0.00050 | 0.125 | 0.000048 | < 0.00010 | 0.00280 | 0.00235 | < 0.000050 | 0.0247 | < 0.0000050 | 0.00121 | 0.00591 | < 0.30 | 0.00011 | 7.23 | < 0.0000010 | 0.621 | 0.000056 | < 0.00010 | < 0.00030 | 0.00381 | < 0.00010 | 0.0079 | --- |
| | 29-Sep-2015 | 11-SH | <0.0010 | <0.00010 | 0.00017 | 0.513 | --- | 0.090 | 0.0000299 | <0.00010 | --- | 0.00268 | <0.000050 | --- | <0.0000050 | --- | 0.00342 | --- | 0.000074 | --- | <0.0000010 | --- | --- | --- | --- | 0.00315 | --- | 0.0059 | --- |
| **(Duplicate)** | 29-Sep-2015 | 31-SH | <0.0010 | <0.00010 | 0.00019 | 0.623 | --- | 0.116 | 0.0000348 | <0.00010 | --- | 0.00230 | <0.000050 | --- | <0.0000050 | --- | 0.00320 | --- | 0.000084 | --- | <0.0000010 | --- | --- | --- | --- | 0.00268 | --- | 0.0052 | --- |
| | 27-Sep-2016 | 11-SH | 0.0068 | <0.00010 | 0.00034 | 0.651 | --- | 0.137 | 0.0000426 | <0.00010 | --- | 0.00262 | <0.000050 | --- | <0.0000050 | --- | 0.00322 | --- | 0.000065 | --- | <0.0000010 | --- | --- | --- | --- | 0.00225 | --- | 0.0063 | --- |
| **(Duplicate)** | 27-Sep-2016 | 31-SH | 0.0026 | <0.00010 | 0.00032 | 0.662 | --- | 0.114 | 0.0000362 | <0.00010 | --- | 0.00266 | <0.000050 | --- | <0.0000050 | --- | 0.00233 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00223 | --- | 0.0059 | --- |
| | 27-Sep-2017 | 11-SH | <0.0010 | <0.00010 | 0.00033 | 0.694 | --- | 0.118 | 0.0000484 | <0.00010 | --- | 0.00217 | <0.000050 | --- | <0.0000050 | --- | 0.00194 | --- | 0.000067 | --- | <0.0000010 | --- | --- | --- | --- | 0.00222 | --- | 0.0065 | --- |
| **(Duplicate)** | 27-Sep-2017 | 31-SH | <0.0010 | <0.00010 | 0.00032 | 0.698 | --- | 0.120 | 0.0000449 | <0.00010 | --- | 0.00225 | <0.000050 | --- | <0.0000050 | --- | 0.00198 | --- | 0.000054 | --- | <0.0000010 | --- | --- | --- | --- | 0.00216 | --- | 0.0073 | --- |
| | 18-Sep-2018 | 11-SH | <0.0010 | <0.00010 | <0.00010 | 0.850 | --- | 0.073 | 0.0000185 | <0.00010 | --- | 0.00022 | <0.000050 | --- | 0.0000178 | --- | 0.00156 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00374 | --- | 0.0018 | --- |
| **(Duplicate)** | 18-Sep-2018 | 31-SH | <0.0010 | <0.00010 | <0.00010 | 0.829 | --- | 0.067 | 0.0000239 | <0.00010 | --- | 0.00022 | <0.000050 | --- | 0.0000115 | --- | 0.00160 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00355 | --- | 0.0020 | --- |
| | 17-Sep-2019 | 11-SH | <0.0010 | <0.00010 | 0.00068 | 0.684 | --- | 0.125 | 0.0000304 | 0.00013 | --- | 0.00212 | <0.000050 | --- | <0.0000050 | --- | 0.00229 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00183 | --- | 0.0056 | --- |
| **(Duplicate)** | 17-Sep-2019 | 31-SH | 0.0013 | <0.00010 | 0.00066 | 0.676 | --- | 0.127 | 0.0000307 | 0.00010 | --- | 0.00232 | <0.000050 | --- | <0.0000050 | --- | 0.00231 | --- | 0.000063 | --- | <0.0000010 | --- | --- | --- | --- | 0.00181 | --- | 0.0061 | --- |
| | 21-Sep-2020 | 11-SH | 0.0013 | <0.00010 | 0.00016 | 0.595 | <0.00010 | 0.123 | 0.0000130 | <0.00010 | 0.00168 | 0.00231 | <0.000050 | 0.0255 | <0.0000050 | 0.000623 | 0.00223 | --- | 0.000068 | --- | <0.0000010 | --- | 0.000011 | <0.00010 | <0.00030 | 0.00171 | <0.00050 | 0.0034 | --- |
| **(Duplicate)** | 21-Sep-2020 | 31-SH | <0.0010 | <0.00010 | 0.00016 | 0.604 | <0.00010 | 0.120 | 0.0000128 | <0.00010 | 0.00168 | 0.00078 | <0.000050 | 0.0254 | <0.0000050 | 0.000602 | 0.00225 | --- | 0.000069 | --- | <0.0000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00169 | <0.00050 | 0.0025 | --- |
| | 22-Sep-2021 | 11-SH | 0.0012 | <0.00010 | 0.00013 | 0.683 | <0.00010 | 0.131 | 0.0000533 | <0.00010 | 0.00117 | 0.00226 | <0.000050 | 0.0267 | <0.0000050 | 0.000649 | 0.00168 | --- | 0.000074 | --- | <0.0000010 | --- | 0.000011 | <0.00010 | <0.00030 | 0.00189 | <0.00050 | 0.0039 | --- |
| **(Duplicate)** | 22-Sep-2021 | 31-SH | <0.0010 | <0.00010 | 0.00013 | 0.641 | <0.00010 | 0.138 | 0.0000451 | <0.00010 | 0.0012 | 0.00216 | <0.000050 | 0.0275 | <0.0000050 | 0.000662 | 0.0017 | --- | 0.000083 | --- | <0.0000010 | --- | 0.000013 | <0.00010 | <0.00030 | 0.00186 | <0.00050 | 0.0037 | --- |
| | 29-Sep-2022 | 11-SH | <0.0010 | <0.00010 | 0.00015 | 0.488 | --- | 0.124 | 0.0000317 | <0.00050 | --- | 0.00111 | <0.000050 | --- | <0.0000050 | --- | 0.00204 | --- | 0.000067 | --- | <0.0000010 | --- | --- | --- | --- | 0.00214 | --- | 0.0028 | --- |
| **(Duplicate)** | 29-Sep-2022 | 31-SH | <0.0010 | <0.00010 | 0.00017 | 0.500 | --- | 0.126 | 0.0000298 | <0.00050 | --- | 0.00108 | <0.000050 | --- | <0.0000050 | --- | 0.00207 | --- | 0.000054 | --- | <0.0000010 | --- | --- | --- | --- | 0.00214 | --- | 0.0028 | --- |
| | 28-Sep-2023 | 11-SH | 0.0013 | <0.00010 | 0.00018 | 0.244 | --- | 0.133 | 0.0000268 | 0.00145 | --- | 0.00114 | <0.000050 | --- | <0.0000050 | --- | 0.00233 | --- | 0.000099 | --- | <0.0000010 | --- | --- | --- | --- | 0.00389 | --- | 0.003 | --- |
| | 28-Sep-2023 | 31-SH | <0.0010 | <0.00010 | 0.00017 | 0.23 | --- | 0.132 | 0.0000259 | 0.00131 | --- | 0.001 | <0.000050 | --- | <0.0000050 | --- | 0.00248 | --- | 0.000118 | --- | <0.0000010 | --- | --- | --- | --- | 0.00382 | --- | 0.0025 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **11-IN** | 17-May-1991 | 11-IN | --- | 0.0002 | 0.0004 | 0.31 | < 0.001 | --- | < 0.001 | 0.006 | 0.006 | 0.004 | < 0.002 | --- | < 0.00005 | 0.01 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 11-IN | --- | 0.0002 | 0.0006 | 0.3 | 0.002 | --- | < 0.001 | < 0.001 | 0.003 | 0.007 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 11-IN | --- | 0.0005 | < 0.0002 | 0.2 | 0.001 | --- | < 0.003 | < 0.002 | 0.004 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 11-IN | --- | < 0.0002 | 0.0011 | 0.31 | 0.002 | --- | 0.005 | < 0.002 | 0.006 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 11-IN | --- | < 0.0002 | 0.0009 | 0.32 | 0.002 | --- | < 0.003 | 0.008 | 0.006 | < 0.001 | < 0.001 | --- | 0.00005 | 0.007 | 0.042 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.003 | --- |
| | 28-Sep-1995 | 11-IN | --- | < 0.0002 | 0.0019 | 0.32 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.008 | 0.007 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 05-Sep-1996 | 11-IN | --- | < 0.0002 | 0.0012 | 0.31 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.001 | 0.0006 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.03 | --- |
| | 05-Sep-1997 | 11-IN | --- | < 0.0002 | 0.0018 | 0.26 | 0.003 | --- | < 0.0002 | 0.007 | 0.01 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 16-Sep-1998 | 11-IN | --- | < 0.0002 | 0.0014 | 0.29 | 0.003 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.002 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.003 | < 0.001 | --- |
| | 09-Sep-1999 | 11-IN | --- | 0.0002 | 0.0033 | 0.4 | < 0.001 | --- | < 0.0002 | 0.019 | 0.01 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | < 0.002 | 0.004 | --- |
| | 06-Sep-2000 | 11-IN | --- | < 0.0002 | 0.0009 | 0.305 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0009 | < 0.0002 | < 0.0003 | --- | < 0.00005 | 0.0027 | 0.0044 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0008 | --- |
| | 06-Sep-2001 | 11-IN | --- | < 0.0002 | 0.0002 | 0.278 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0007 | 0.0008 | < 0.0003 | 0.03 | < 0.00005 | 0.0038 | 0.0071 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0078 | --- |
| | 05-Sep-2002 | 11-IN | 0.004 | < 0.0002 | 0.0015 | 0.288 | < 0.0002 | 0.24 | < 0.0002 | 0.035 | 0.001 | 0.003 | < 0.0003 | --- | < 0.00005 | 0.0042 | 0.0127 | < 0.1 | < 0.0002 | 6.14 | < 0.0001 | 0.603 | < 0.0002 | < 0.001 | 0.001 | 0.0043 | 0.01 | 0.0013 | < 0.0002 |
| | 03-Sep-2003 | 11-IN | 0.007 | < 0.0002 | 0.0009 | 0.26 | < 0.0002 | 0.27 | < 0.0002 | < 0.001 | 0.0007 | 0.0032 | < 0.0003 | 0.007 | < 0.00005 | 0.0154 | 0.007 | < 0.1 | 0.0005 | 6.59 | < 0.0001 | 0.6 | < 0.0002 | < 0.001 | 0.001 | 0.0031 | < 0.001 | 0.0168 | < 0.0002 |
| | 08-Sep-2004 | 11-IN | 0.03 | < 0.0002 | 0.0005 | 0.276 | 0.0004 | 0.27 | < 0.0002 | < 0.001 | 0.0009 | 0.0015 | < 0.0003 | 0.021 | 0.0002 | 0.0044 | 0.0069 | < 0.1 | < 0.0002 | 6.08 | < 0.0001 | 0.6 | < 0.0002 | < 0.001 | 0.013 | 0.0036 | < 0.001 | 0.0009 | 0.0002 |
| | 07-Sep-2005 | 11-IN | < 0.001 | < 0.0002 | 0.0017 | 0.299 | < 0.0002 | 0.19 | 0.0003 | < 0.001 | 0.0004 | 0.0017 | < 0.0003 | 0.026 | 0.00008 | 0.0039 | 0.0057 | < 0.1 | < 0.0002 | 5.99 | 0.0003 | 0.59 | < 0.0002 | < 0.001 | < 0.001 | 0.0033 | < 0.001 | 0.0032 | 0.0016 |
| | 07-Sep-2006 | 11-IN | 0.002 | < 0.0002 | 0.0009 | 0.275 | < 0.0002 | 0.2 | < 0.0002 | < 0.001 | 0.001 | 0.0014 | < 0.0003 | 0.034 | 0.00022 | 0.0038 | 0.0273 | < 0.1 | < 0.0002 | 6.62 | < 0.0001 | 0.61 | < 0.0002 | < 0.001 | 0.001 | 0.0032 | < 0.001 | 0.0015 | < 0.0002 |
| | 06-Sep-2007 | 11-IN | 0.006 | < 0.0002 | 0.0004 | 0.25 | < 0.001 | 0.23 | 0.00003 | < 0.001 | 0.0023 | 0.004 | < 0.0002 | 0.03 | < 0.00005 | 0.0036 | 0.0465 | < 0.1 | < 0.0002 | 6.8 | < 0.0001 | 0.59 | < 0.0002 | < 0.001 | 0.009 | 0.0027 | < 0.001 | 0.011 | --- |
| | 04-Sep-2008 | 11-IN | 0.01 | < 0.0004 | 0.0006 | 0.238 | < 0.001 | 0.23 | < 0.00005 | < 0.005 | < 0.002 | 0.006 | < 0.0001 | 0.035 | < 0.00010 | < 0.005 | 0.014 | --- | 0.0006 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0032 | < 0.001 | 0.004 | --- |
| | 10-Sep-2009 | 11-IN | < 0.0050 | < 0.00040 | 0.00048 | 0.251 | < 0.0010 | 0.23 | 0.000014 | < 0.0050 | 0.0029 | < 0.0010 | < 0.00010 | 0.032 | < 0.000020 | < 0.0050 | 0.0494 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0011 | 0.00254 | < 0.0010 | < 0.0040 | --- |
| | 09-Sep-2010 | 11 IN | < 0.0050 | < 0.00040 | 0.00078 | 0.218 | < 0.0010 | 0.247 | 0.000071 | < 0.0010 | < 0.0020 | 0.0034 | < 0.00010 | 0.032 | < 0.000020 | < 0.0050 | 0.0187 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00282 | < 0.0010 | 0.0046 | --- |
| | 08-Sep-2011 | 11-IN | < 0.0050 | < 0.00040 | 0.00142 | 0.241 | < 0.0010 | 0.248 | 0.000019 | < 0.0010 | < 0.0020 | 0.0036 | < 0.00010 | 0.03 | < 0.000020 | < 0.0050 | 0.0119 | --- | < 0.00040 | 7.15 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00265 | < 0.0010 | 0.0062 | --- |
| | 06-Sep-2012 | 11-IN | < 0.0050 | < 0.00040 | 0.00053 | 0.258 | < 0.0010 | 0.259 | 0.000012 | < 0.0010 | < 0.0020 | 0.0017 | < 0.00010 | 0.033 | < 0.000020 | < 0.0050 | 0.0092 | --- | < 0.00040 | 7.54 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00248 | < 0.0010 | 0.0052 | --- |
| | 26-Sep-2013 | 11-IN | < 0.0050 | < 0.00040 | 0.00285 | 0.279 | < 0.0010 | 0.273 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.033 | < 0.000020 | 0.0054 | 0.0026 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00285 | < 0.0010 | 0.0053 | --- |
| | 17-Sep-2014 | 11-IN | < 0.0010 | 0.00031 | 0.00067 | 0.417 | < 0.00050 | 0.236 | 0.000018 | < 0.00010 | 0.0308 | 0.00148 | < 0.000050 | 0.0316 | < 0.0000050 | 0.00787 | 0.0744 | < 0.30 | 0.00025 | 5.58 | < 0.000010 | 0.640 | 0.000081 | < 0.00010 | < 0.00030 | 0.00416 | 0.00017 | 0.0033 | --- |
| | 29-Sep-2015 | 11-IN | <0.0010 | <0.00010 | 0.00086 | 0.297 | --- | 0.217 | 0.0000188 | <0.00010 | --- | 0.00198 | <0.000050 | --- | 0.0000059 | --- | 0.0141 | --- | 0.000095 | --- | <0.000010 | --- | --- | --- | --- | 0.00338 | --- | 0.0045 | --- |
| | 27-Sep-2016 | 11-IN | <0.0010 | <0.00010 | 0.00045 | 0.317 | --- | 0.238 | 0.0000384 | <0.00010 | --- | 0.00318 | <0.000050 | --- | <0.0000050 | --- | 0.0089 | --- | 0.000095 | --- | <0.000010 | --- | --- | --- | --- | 0.00283 | --- | 0.0045 | --- |
| | 27-Sep-2017 | 11-IN | <0.0010 | <0.00010 | 0.00036 | 0.329 | --- | 0.230 | 0.0000245 | 0.00015 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.0044 | --- | 0.000062 | --- | <0.000010 | --- | --- | --- | --- | 0.00289 | --- | 0.0038 | --- |
| | 18-Sep-2018 | 11-IN | 0.0075 | <0.00010 | 0.00177 | 0.298 | --- | 0.267 | 0.0000110 | 0.00046 | --- | 0.00051 | <0.000050 | --- | <0.0000050 | --- | 0.0050 | --- | 0.000074 | --- | <0.000010 | --- | --- | --- | --- | 0.00269 | --- | 0.0036 | --- |
| | 17-Sep-2019 | 11-IN | <0.0010 | <0.00010 | 0.00125 | 0.335 | --- | 0.238 | <0.0000050 | 0.00017 | --- | 0.00037 | <0.000050 | --- | <0.0000050 | --- | 0.0021 | --- | 0.000086 | --- | <0.000010 | --- | --- | --- | --- | 0.00309 | --- | 0.0026 | --- |
| | 21-Sep-2020 | 11-IN | 0.0015 | <0.00010 | 0.00109 | 0.291 | <0.00010 | 0.234 | 0.0000109 | 0.00017 | 0.00159 | 0.00820 | <0.000050 | 0.0296 | <0.0000050 | 0.00492 | 0.00217 | --- | 0.000058 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00321 | <0.00050 | 0.0032 | --- |
| | 22-Sep-2021 | 11-IN | 0.0014 | <0.00010 | 0.00065 | 0.329 | <0.00010 | 0.253 | 0.0000251 | <0.00010 | 0.00162 | 0.00034 | <0.000050 | 0.0325 | <0.0000050 | 0.00479 | 0.00232 | --- | 0.000094 | --- | <0.000010 | --- | 0.00001 | <0.00010 | <0.00030 | 0.00314 | <0.00050 | 0.0034 | --- |
| | 29-Sep-2022 | 11-IN | 0.0227 | <0.00010 | 0.00039 | 0.296 | --- | 0.243 | 0.0000058 | <0.00050 | --- | 0.00027 | <0.000050 | --- | <0.0000050 | --- | 0.00203 | --- | 0.000074 | --- | <0.000010 | --- | --- | --- | --- | 0.00320 | --- | 0.0041 | --- |
| | 28-Sep-2023 | 11-IN | <0.0010 | <0.00010 | 0.00016 | 0.288 | --- | 0.129 | 0.0000217 | 0.00135 | --- | 0.00113 | <0.000050 | --- | <0.0000050 | --- | 0.00255 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00312 | --- | 0.0031 | --- |
| **11-SS** | 17-May-1991 | 11-SS | --- | 0.0002 | **0.012** | 0.08 | < 0.001 | --- | < 0.001 | < 0.001 | 0.002 | 0.002 | < 0.002 | --- | < 0.00005 | 0.008 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 11-SS | --- | 0.0014 | 0.0032 | 0.06 | < 0.001 | --- | < 0.003 | < 0.001 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **12-SH** | 17-May-1991 | 12-SH | --- | 0.0002 | 0.0002 | 0.25 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.009 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 12-SH | --- | 0.0005 | 0.0008 | 0.21 | 0.001 | --- | < 0.003 | < 0.001 | < 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 12-SH | --- | < 0.0002 | 0.0004 | 0.27 | 0.001 | --- | < 0.003 | 0.022 | < 0.003 | 0.005 | < 0.002 | --- | < 0.00005 | 0.005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 12-SH | --- | 0.0003 | 0.0004 | 0.25 | 0.001 | --- | 0.003 | < 0.002 | < 0.003 | 0.012 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 12-SH | --- | < 0.0002 | 0.0004 | 0.23 | 0.002 | --- | < 0.003 | < 0.002 | < 0.003 | < 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 12-SH | --- | < 0.0002 | 0.0002 | 0.24 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.003 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.01 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.004 | 0.014 | --- |
| | 22-Sep-1994 | 12-SH | --- | < 0.0002 | 0.0006 | 0.28 | 0.001 | --- | < 0.003 | 0.003 | < 0.003 | 0.007 | < 0.001 | --- | 0.00005 | 0.006 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.004 | 0.016 | --- |
| | 01-Nov-1994 | 12-SH | --- | 0.0031 | 0.0003 | 0.24 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.006 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.009 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.004 | 0.02 | --- |
| | 28-Sep-1995 | 12-SH | --- | < 0.0002 | 0.0004 | 0.27 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.001 | < 0.0003 | --- | < 0.00005 | 0.004 | 0.01 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.006 | --- |
| | 05-Sep-1996 | 12-SH | --- | < 0.0002 | 0.0006 | 0.26 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.017 | --- |
| **(Duplicate)** | 05-Sep-1996 | 12-SH DUP | --- | < 0.0002 | 0.0005 | 0.25 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.002 | 0.004 | --- |
| | 05-Sep-1997 | 12-SH | --- | < 0.0002 | 0.0005 | 0.17 | 0.002 | --- | < 0.0002 | < 0.002 | 0.004 | 0.011 | 0.0007 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.003 | --- | < 0.001 | --- | --- | --- | 0.008 | 0.007 | --- |
| **(Duplicate)** | 05-Sep-1997 | 12-SH DUP | --- | < 0.0002 | 0.0005 | 0.16 | 0.002 | --- | < 0.0002 | 0.003 | 0.005 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.006 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.004 | --- |
| | 16-Sep-1998 | 12-SH | --- | 0.0002 | 0.0004 | 0.21 | 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.005 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 12-SH | --- | 0.0021 | < 0.0002 | 0.31 | < 0.001 | --- | < 0.0002 | 0.023 | 0.003 | 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.015 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | 0.005 | 0.001 | --- |
| | 06-Sep-2000 | 12-SH | --- | < 0.0002 | 0.0007 | 0.233 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0006 | < 0.0002 | < 0.0003 | --- | < 0.00005 | 0.0002 | 0.0029 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0008 | --- |
| | 06-Sep-2001 | 12-SH | --- | < 0.0002 | 0.0011 | 0.255 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0004 | 0.0009 | < 0.0003 | 0.017 | < 0.00005 | 0.0015 | 0.0026 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.008 | --- |
| | 04-Sep-2002 | 12-SH | 0.005 | < 0.0002 | 0.0011 | 0.236 | < 0.0002 | 0.04 | < 0.0002 | < 0.001 | < 0.0003 | 0.0023 | < 0.0003 | --- | < 0.00005 | 0.0015 | 0.0016 | < 0.1 | < 0.0002 | 7 | < 0.0001 | 0.348 | < 0.0002 | < 0.001 | < 0.001 | 0.0032 | < 0.001 | 0.0064 | 0.0017 |
| | 04-Sep-2003 | 12-SH | 0.002 | < 0.0002 | 0.0006 | 0.262 | < 0.0002 | 0.05 | < 0.0002 | < 0.001 | < 0.0003 | 0.0015 | 0.0006 | < 0.004 | < 0.00005 | 0.023 | < 0.0005 | < 0.1 | < 0.0002 | 7.53 | < 0.0001 | 0.33 | < 0.0002 | < 0.001 | < 0.001 | 0.0032 | < 0.001 | 0.0055 | < 0.0002 |
| | 09-Sep-2004 | 12-SH | 0.093 | < 0.0002 | 0.0007 | 0.281 | < 0.0002 | 0.05 | < 0.0002 | < 0.001 | < 0.0003 | 0.0016 | < 0.0003 | 0.013 | < 0.00005 | 0.0017 | 0.0013 | < 0.1 | < 0.0002 | 6.99 | < 0.0001 | 0.34 | < 0.0002 | < 0.001 | 0.011 | 0.0042 | < 0.001 | 0.0226 | < 0.0002 |
| | 08-Sep-2005 | 12-SH | 0.003 | < 0.0002 | 0.0012 | 0.212 | 0.0002 | 0.04 | 0.0003 | < 0.001 | < 0.0003 | 0.0028 | < 0.0003 | 0.025 | 0.00008 | 0.002 | 0.0009 | < 0.1 | < 0.0002 | 7.5 | 0.0003 | 0.38 | < 0.0002 | < 0.001 | 0.002 | 0.0044 | < 0.001 | 0.012 | 0.0015 |
| | 07-Sep-2006 | 12-SH | 0.002 | < 0.0002 | 0.0017 | 0.233 | < 0.0002 | 0.04 | < 0.0002 | < 0.001 | < 0.0003 | 0.0042 | < 0.0003 | 0.025 | 0.00043 | 0.002 | 0.0011 | < 0.1 | < 0.0002 | 6.85 | < 0.0001 | 0.34 | < 0.0002 | < 0.001 | 0.001 | 0.0051 | < 0.001 | 0.0038 | 0.0025 |
| | 07-Sep-2007 | 12-SH | 0.005 | < 0.0002 | 0.0017 | 0.22 | < 0.001 | 0.03 | 0.00004 | 0.003 | 0.0017 | 0.0025 | < 0.0002 | 0.02 | < 0.00005 | 0.0027 | 0.0153 | < 0.1 | < 0.0002 | 6.8 | < 0.0001 | 0.3 | < 0.0002 | < 0.001 | 0.007 | 0.0018 | < 0.001 | 0.008 | --- |
| | 05-Sep-2008 | 12-SH | < 0.01 | < 0.0004 | 0.0011 | 0.293 | < 0.001 | < 0.05 | < 0.00005 | < 0.005 | < 0.002 | 0.003 | < 0.0001 | 0.027 | < 0.00010 | < 0.005 | 0.002 | --- | 0.0005 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.006 | < 0.001 | 0.003 | --- |
| | 10-Sep-2009 | 12-SH | < 0.0050 | < 0.00040 | 0.00163 | 0.136 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0050 | < 0.0020 | < 0.0010 | < 0.00010 | 0.029 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0011 | 0.00494 | < 0.0010 | < 0.0040 | --- |
| | 09-Sep-2010 | 12 SH | 0.0072 | < 0.00040 | 0.00209 | 0.0902 | < 0.0010 | < 0.050 | 0.000018 | 0.0028 | < 0.0020 | 0.001 | < 0.00010 | 0.031 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00383 | < 0.0010 | < 0.0040 | --- |
| | 07-Sep-2011 | 12-SH | < 0.0050 | < 0.00040 | 0.00182 | 0.234 | < 0.0010 | < 0.050 | 0.00001 | < 0.0010 | < 0.0020 | 0.0015 | < 0.00010 | 0.024 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 7.18 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00521 | < 0.0010 | < 0.0040 | --- |
| | 05-Sep-2012 | 12-SH | < 0.0050 | < 0.00040 | 0.00109 | 0.269 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | < 0.0020 | 0.0013 | < 0.00010 | 0.025 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 7.63 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00595 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | 12-SH | < 0.0050 | < 0.00040 | 0.00090 | 0.454 | < 0.0010 | < 0.050 | 0.000012 | < 0.0010 | < 0.0020 | 0.0012 | < 0.00010 | 0.027 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00555 | < 0.0010 | 0.0048 | --- |
| | 17-Sep-2014 | 12-SH | < 0.0010 | < 0.00010 | 0.00068 | 0.455 | < 0.00050 | 0.040 | 0.000020 | < 0.00010 | 0.00090 | 0.00079 | < 0.000050 | 0.0264 | < 0.0000050 | 0.00136 | 0.00194 | < 0.30 | < 0.00010 | 9.55 | < 0.000010 | 0.400 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00481 | 0.00012 | 0.0027 | --- |
| | 29-Sep-2015 | 12-SH | <0.0010 | <0.00010 | 0.00061 | 0.374 | --- | 0.032 | 0.0000163 | <0.00010 | --- | 0.00078 | <0.000050 | --- | <0.0000050 | --- | 0.00160 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00630 | --- | 0.0044 | --- |
| | 27-Sep-2016 | 12-SH | <0.0010 | <0.00010 | 0.00072 | 0.388 | --- | 0.040 | 0.0000087 | <0.00010 | --- | 0.00079 | <0.000050 | --- | <0.0000050 | --- | 0.00074 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00528 | --- | 0.0025 | --- |
| | 27-Sep-2017 | 12-SH | <0.0010 | <0.00010 | 0.00235 | 0.462 | --- | 0.033 | 0.0000107 | <0.00010 | --- | 0.00064 | <0.000050 | --- | <0.0000050 | --- | 0.00090 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00567 | --- | 0.0017 | --- |
| | 18-Sep-2018 | 12-SH | <0.0010 | <0.00010 | 0.00282 | 0.405 | --- | 0.042 | 0.0000133 | 0.00029 | --- | 0.00043 | <0.000050 | --- | <0.0000050 | --- | 0.00092 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00933 | --- | 0.0027 | --- |
| | 16-Sep-2019 | 12-SH | <0.0010 | <0.00010 | 0.00078 | 0.467 | --- | 0.037 | 0.0000159 | 0.00015 | --- | 0.00095 | <0.000050 | --- | <0.0000050 | --- | 0.00099 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00541 | --- | 0.0018 | --- |
| | 22-Sep-2020 | 12-SH | 0.0010 | <0.00010 | 0.00063 | 0.402 | <0.00010 | 0.037 | 0.0000082 | <0.00010 | 0.00030 | 0.00059 | <0.000050 | 0.0271 | <0.0000050 | 0.00104 | 0.00092 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00551 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2021 | 12-SH | 0.0014 | <0.00010 | 0.00056 | 0.397 | <0.00010 | 0.033 | 0.0000434 | <0.00010 | 0.00029 | 0.00047 | <0.000050 | 0.0258 | <0.0000050 | 0.00127 | 0.00066 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00541 | <0.00050 | 0.0024 | --- |
| | 28-Sep-2022 | 12-SH | <0.0010 | <0.00010 | 0.00070 | 0.437 | --- | 0.043 | 0.0000177 | <0.00050 | --- | 0.00113 | <0.000050 | --- | <0.0000050 | --- | 0.00126 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00654 | --- | 0.0040 | --- |
| | 28-Sep-2023 | 12-SH | <0.0010 | <0.00010 | 0.00082 | 0.39 | --- | 0.04 | 0.0000279 | 0.00182 | --- | 0.00107 | 0.000053 | --- | <0.0000050 | --- | 0.0015 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00606 | --- | 0.0307 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **12-IN** | 15-Jan-1990 | 12-IN | --- | 0.0002 | 0.0005 | 0.17 | < 0.001 | --- | < 0.001 | 0.003 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 12-IN | --- | 0.0003 | 0.0024 | 0.18 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 12-IN | --- | 0.0003 | 0.0017 | 0.17 | < 0.001 | --- | < 0.001 | 0.002 | --- | 0.003 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 12-IN | --- | 0.0002 | 0.0005 | 0.18 | < 0.001 | --- | < 0.001 | 0.005 | --- | 0.004 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 12-IN | --- | --- | 0.0007 | 0.17 | < 0.001 | --- | < 0.001 | < 0.001 | --- | 0.005 | < 0.002 | --- | < 0.00005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-May-1991 | 12-IN | --- | 0.0002 | 0.0005 | 0.2 | < 0.001 | --- | < 0.001 | 0.007 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.013 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 12-IN | --- | 0.0002 | 0.0007 | 0.19 | < 0.001 | --- | < 0.001 | 0.005 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 12-IN | --- | 0.0004 | 0.0003 | 0.09 | 0.001 | --- | < 0.003 | 0.004 | < 0.003 | 0.005 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 12-IN | --- | < 0.0002 | 0.0005 | 0.18 | 0.001 | --- | < 0.003 | 0.006 | < 0.003 | 0.004 | < 0.002 | --- | < 0.00005 | 0.004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 12-IN | --- | < 0.0002 | 0.0005 | 0.17 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 12-IN | --- | < 0.0002 | 0.0004 | 0.19 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.004 | 0.013 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 05-Sep-1996 | 12-IN | --- | 0.0003 | 0.0009 | 0.17 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.005 | --- |
| | 05-Sep-1997 | 12-IN | --- | < 0.0002 | 0.0007 | 0.12 | 0.001 | --- | < 0.0002 | 0.007 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 16-Sep-1998 | 12-IN | --- | < 0.0002 | 0.0005 | 0.12 | 0.001 | --- | 0.0003 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.004 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 12-IN | --- | 0.0006 | 0.0007 | 0.16 | 0.018 | --- | < 0.0002 | 0.008 | < 0.003 | 0.015 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.01 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | < 0.002 | 0.013 | --- |
| | 06-Sep-2000 | 12-IN | --- | < 0.0002 | 0.0014 | 0.188 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0052 | < 0.0002 | < 0.0003 | --- | < 0.00005 | 0.0021 | 0.0448 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.007 | --- |
| | 06-Sep-2001 | 12-IN | --- | < 0.0002 | < 0.0002 | 0.172 | 0.0002 | --- | < 0.0002 | < 0.001 | 0.0007 | 0.0073 | 0.0004 | 0.033 | < 0.00005 | 0.003 | 0.0171 | 0.4 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0193 | --- |
| | 04-Sep-2002 | 12-IN | 0.004 | 0.0002 | 0.0013 | 0.18 | < 0.0002 | 0.13 | < 0.0002 | 0.028 | 0.0016 | 0.008 | < 0.0003 | --- | < 0.00005 | 0.0036 | 0.0176 | 0.1 | < 0.0002 | 5.57 | < 0.0001 | 0.555 | < 0.0002 | < 0.001 | 0.002 | 0.0027 | 0.007 | 0.0271 | 0.0002 |
| | 04-Sep-2003 | 12-IN | 0.002 | < 0.0002 | 0.0006 | 0.154 | < 0.0002 | 0.16 | 0.0004 | < 0.001 | 0.0016 | 0.0103 | 0.0005 | 0.009 | < 0.00005 | 0.025 | 0.0111 | 0.3 | < 0.0002 | 5.93 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | < 0.001 | 0.002 | < 0.001 | 0.0295 | < 0.0002 |
| | 09-Sep-2004 | 12-IN | 0.171 | < 0.0002 | 0.0003 | 0.158 | 0.0002 | 0.16 | < 0.0002 | 0.001 | < 0.0003 | 0.0067 | 0.0022 | 0.025 | < 0.00005 | 0.0034 | 0.007 | 0.1 | < 0.0002 | 5.56 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | 0.012 | 0.0025 | < 0.001 | 0.0114 | < 0.0002 |
| | 08-Sep-2005 | 12-IN | < 0.001 | 0.0005 | 0.0007 | 0.209 | 0.0002 | 0.13 | 0.0006 | < 0.001 | 0.0031 | 0.0035 | 0.0014 | 0.039 | 0.00009 | 0.0062 | 1.52 | < 0.1 | < 0.0002 | 5.84 | 0.0003 | 0.7 | < 0.0002 | < 0.001 | < 0.001 | 0.0033 | < 0.001 | 0.114 | 0.0015 |
| | 12-Apr-2006 | 12-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.113 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 12-Apr-2006 | 12-IN DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.108 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 12-Apr-2006 | 12-IN DUP2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.155 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 12-IN | 0.003 | < 0.0002 | 0.0044 | 0.179 | < 0.0002 | 0.12 | 0.0002 | < 0.001 | 0.0013 | 0.0177 | 0.0017 | 0.036 | 0.00012 | 0.0038 | 0.143 | < 0.1 | < 0.0002 | 5.91 | < 0.0001 | 0.54 | < 0.0002 | < 0.001 | 0.001 | 0.0031 | < 0.001 | 0.667 | 0.0026 |
| | 10-Dec-2006 | 12-IN | 0.004 | 0.0004 | 0.0009 | 0.18 | < 0.001 | 0.13 | 0.00026 | < 0.001 | 0.0011 | 0.0726 | 0.0002 | 0.03 | --- | 0.0037 | 0.153 | < 0.1 | < 0.0002 | 6.8 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | 0.004 | 0.0028 | < 0.001 | 0.907 | --- |
| | 07-Sep-2007 | 12-IN | 0.005 | < 0.0002 | 0.0002 | 0.17 | < 0.001 | 0.13 | 0.00011 | 0.001 | 0.0036 | 0.005 | 0.0024 | 0.03 | < 0.00005 | 0.0038 | 0.344 | < 0.1 | < 0.0002 | 6.4 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | 0.009 | 0.0025 | < 0.001 | 0.656 | --- |
| | 05-Sep-2008 | 12-IN | < 0.01 | < 0.0004 | 0.0011 | 0.176 | < 0.001 | 0.13 | < 0.00005 | < 0.005 | 0.003 | 0.001 | 0.0026 | 0.036 | < 0.00010 | < 0.005 | 0.232 | --- | 0.0006 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0025 | < 0.001 | 0.378 | --- |
| | 11-Sep-2009 | 12-IN | < 0.0050 | < 0.00040 | 0.00114 | 0.166 | < 0.0010 | 0.121 | 0.000088 | < 0.0050 | 0.0028 | 0.0033 | 0.00102 | 0.035 | < 0.000020 | < 0.0050 | 0.675 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0012 | 0.00244 | < 0.0010 | 1.19 | --- |
| | 09-Sep-2010 | 12 IN | < 0.0050 | < 0.00040 | 0.00222 | 0.162 | < 0.0010 | 0.133 | 0.000086 | 0.0011 | 0.0028 | 0.0013 | 0.00539 | 0.036 | < 0.000020 | < 0.0050 | 0.448 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00232 | < 0.0010 | 1.04 | --- |
| | 07-Sep-2011 | 12-IN | 0.0051 | 0.00073 | 0.00185 | 0.127 | < 0.0010 | 0.101 | 0.000158 | < 0.0010 | < 0.0020 | 0.0541 | 0.00062 | 0.026 | < 0.000020 | < 0.0050 | 0.137 | --- | < 0.00040 | 7.75 | 0.000349 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00172 | < 0.0010 | 1.19 | --- |
| | 06-Sep-2012 | 12-IN | 0.0055 | 0.00059 | 0.00234 | 0.145 | < 0.0010 | 0.12 | 0.000129 | < 0.0010 | < 0.0020 | 0.0244 | 0.00057 | 0.031 | < 0.000020 | < 0.0050 | 0.0687 | --- | < 0.00040 | 6.16 | 0.000312 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00181 | < 0.0010 | 0.927 | --- |
| | 17-Sep-2014 | 12-IN | 0.0030 | < 0.00010 | 0.00874 | 0.191 | < 0.00050 | 0.136 | 0.000031 | < 0.00010 | 0.00125 | 0.00159 | 0.00236 | 0.0363 | < 0.0000050 | 0.00345 | 0.0129 | < 0.30 | < 0.00010 | 7.09 | < 0.0000010 | 0.531 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00216 | < 0.00010 | 0.1710 | --- |
| | 29-Sep-2015 | 12-IN | 0.0034 | 0.00025 | 0.00590 | 0.160 | --- | 0.095 | 0.000397 | <0.00010 | --- | 0.00429 | 0.00175 | --- | <0.0000050 | --- | 0.0304 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00248 | --- | 0.391 | --- |
| | 27-Sep-2016 | 12-IN | 0.0039 | 0.00012 | 0.00747 | 0.164 | --- | 0.130 | 0.000043 | <0.00010 | --- | 0.00333 | 0.00039 | --- | <0.0000050 | --- | 0.0132 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00247 | --- | 0.229 | --- |
| | 27-Sep-2017 | 12-IN | 0.0032 | <0.00010 | 0.00697 | 0.196 | --- | 0.121 | 0.000065 | <0.00010 | --- | 0.00360 | 0.00053 | --- | <0.0000050 | --- | 0.0109 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00255 | --- | 0.280 | --- |
| | 18-Sep-2018 | 12-IN | 0.0029 | 0.00011 | 0.00732 | 0.173 | --- | 0.147 | 0.000063 | 0.00012 | --- | 0.00438 | 0.00053 | --- | 0.0000221 | --- | 0.0164 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00251 | --- | 0.283 | --- |
| | 16-Sep-2019 | 12-IN | 0.0058 | <0.00010 | **0.01060** | 0.182 | --- | 0.125 | 0.000029 | 0.00013 | --- | 0.01100 | 0.00047 | --- | <0.0000050 | --- | 0.0044 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00240 | --- | 0.131 | --- |
| | 22-Sep-2020 | 12-IN | 0.0027 | <0.00010 | 0.00908 | 0.159 | <0.00010 | 0.124 | 0.0000348 | <0.00010 | 0.00103 | 0.0161 | 0.000210 | 0.0337 | <0.0000050 | 0.00459 | 0.00524 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00239 | <0.00050 | 0.195 | --- |
| | 22-Sep-2021 | 12-IN | 0.0038 | <0.00010 | 0.00539 | 0.18 | <0.00010 | 0.129 | 0.0000907 | <0.00010 | 0.00111 | 0.0495 | 0.000688 | 0.0348 | <0.0000050 | 0.0046 | 0.00549 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00237 | <0.00050 | 0.173 | --- |
| | 28-Sep-2022 | 12-IN | 0.0020 | <0.00010 | 0.00826 | 0.169 | --- | 0.131 | 0.0000427 | <0.00050 | --- | | 0.0125 | 0.000121 | <0.0000050 | --- | 0.00520 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00264 | --- | 0.138 | --- |
| | 28-Sep-2023 | 12-IN | 0.0078 | <0.00010 | 0.00558 | 0.143 | --- | 0.128 | 0.0000754 | <0.00050 | --- | 0.0175 | <0.000050 | --- | <0.0000050 | --- | 0.00656 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00228 | --- | 0.165 | --- |
| **13-SH** | 04-Nov-1991 | 13-SH | --- | 0.0002 | 0.0007 | 0.27 | < 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.008 | < 0.002 | --- | < 0.00005 | 0.011 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 13-SH | --- | < 0.0002 | 0.0005 | 0.19 | < 0.001 | --- | < 0.003 | < 0.001 | < 0.003 | 0.002 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 13-SH | --- | < 0.0002 | 0.0008 | 0.25 | 0.001 | --- | < 0.003 | 0.02 | < 0.003 | 0.005 | < 0.002 | --- | < 0.00005 | 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 13-SH | --- | < 0.0002 | 0.0002 | 0.19 | < 0.001 | --- | < 0.003 | 0.005 | < 0.003 | 0.006 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 13-SH | --- | < 0.0002 | 0.0005 | 0.26 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 13-SH | --- | < 0.0002 | 0.0002 | 0.26 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.001 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.007 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.003 | 0.008 | --- |
| | 22-Sep-1994 | 13-SH | --- | 0.0002 | 0.0016 | 0.21 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.103 | < 0.001 | --- | 0.00005 | < 0.003 | 0.034 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.003 | 0.024 | --- |
| | 01-Nov-1994 | 13-SH | --- | 0.0009 | 0.0005 | 0.19 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.042 | < 0.001 | --- | < 0.00005 | 0.009 | 0.02 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.044 | --- |
| | 28-Sep-1995 | 13-SH | --- | < 0.0002 | 0.0005 | 0.27 | < 0.001 | --- | 0.0003 | < 0.002 | < 0.003 | 0.004 | < 0.0003 | --- | < 0.00005 | 0.011 | 0.007 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.004 | --- |
| | 04-Sep-1996 | 13-SH | --- | < 0.0002 | 0.0005 | 0.29 | < 0.001 | --- | 0.002 | < 0.002 | < 0.003 | 0.004 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.004 | 0.004 | --- |
| | 04-Sep-1997 | 13-SH | --- | < 0.0002 | 0.0003 | 0.45 | 0.001 | --- | < 0.0002 | < 0.002 | 0.006 | 0.006 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.003 | --- |
| **(Duplicate)** | 04-Sep-1997 | 13-SH DUP | --- | < 0.0002 | 0.0004 | 0.45 | < 0.001 | --- | < 0.0002 | 0.004 | < 0.003 | 0.009 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.011 | 0.003 | --- |
| | 16-Sep-1998 | 13-SH | --- | 0.0002 | 0.0005 | 0.45 | 0.007 | --- | 0.0004 | 0.01 | 0.015 | 0.009 | < 0.0003 | --- | < 0.00005 | 0.006 | 0.008 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.006 | < 0.001 | --- |
| | 09-Sep-1999 | 13-SH | --- | 0.0006 | 0.0006 | 0.85 | < 0.001 | --- | < 0.0002 | 0.016 | < 0.003 | 0.007 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | 0.004 | < 0.001 | --- |
| | 05-Sep-2000 | 13-SH | --- | 0.0004 | 0.001 | 0.797 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0005 | < 0.0002 | < 0.0003 | --- | < 0.00005 | 0.0005 | 0.0052 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | < 0.0006 | --- |
| | 06-Sep-2001 | 13-SH | --- | 0.0002 | 0.0013 | 0.739 | 0.0004 | --- | < 0.0002 | < 0.001 | 0.0007 | 0.0016 | 0.0013 | 0.032 | 0.00005 | 0.0014 | 0.0079 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0068 | --- |
| | 04-Sep-2002 | 13-SH | 0.007 | 0.0003 | 0.001 | 0.597 | < 0.0002 | 0.07 | < 0.0002 | 0.005 | < 0.0003 | 0.0016 | < 0.0003 | --- | < 0.00005 | 0.0022 | 0.0038 | < 0.1 | < 0.0002 | 9.45 | < 0.0001 | 0.863 | < 0.0002 | < 0.001 | < 0.001 | 0.0072 | < 0.001 | 0.004 | 0.0008 |
| | 04-Sep-2003 | 13-SH | 0.007 | 0.0004 | 0.0009 | 0.563 | < 0.0002 | 0.08 | < 0.0002 | 0.013 | < 0.0003 | 0.0013 | 0.0004 | 0.011 | < 0.00005 | 0.0132 | 0.0015 | < 0.1 | 0.0003 | 10.3 | < 0.0001 | 0.82 | < 0.0002 | < 0.001 | < 0.001 | 0.0064 | < 0.001 | 0.0161 | 0.0002 |
| | 09-Sep-2004 | 13-SH | 0.113 | 0.0004 | 0.0005 | 0.774 | < 0.0002 | 0.08 | < 0.0002 | 0.019 | 0.0004 | 0.0017 | 0.0003 | 0.025 | < 0.00005 | 0.004 | 0.0055 | < 0.1 | < 0.0002 | 10.7 | < 0.0001 | 0.73 | < 0.0002 | < 0.001 | 0.025 | 0.0063 | < 0.001 | < 0.0006 | 0.0004 |
| | 08-Sep-2005 | 13-SH | 0.008 | 0.0009 | 0.0014 | 0.415 | 0.0002 | 0.07 | 0.0003 | 0.012 | < 0.0003 | 0.0016 | < 0.0003 | 0.041 | < 0.00005 | 0.0034 | 0.0029 | < 0.1 | 0.0004 | 10.3 | 0.0003 | 1.11 | < 0.0002 | < 0.001 | 0.002 | 0.0093 | < 0.001 | 0.0057 | 0.0016 |
| | 07-Sep-2006 | 13-SH | 0.003 | 0.0011 | 0.0008 | 0.301 | < 0.0002 | 0.07 | < 0.0002 | 0.022 | < 0.0003 | 0.0022 | < 0.0003 | 0.044 | 0.00022 | 0.0053 | 0.0035 | < 0.1 | < 0.0002 | 9.27 | < 0.0001 | 0.91 | < 0.0002 | < 0.001 | 0.002 | 0.0131 | < 0.001 | 0.0071 | 0.0005 |
| | 05-Sep-2007 | 13-SH | 0.02 | 0.0008 | 0.0016 | 0.36 | < 0.001 | 0.06 | 0.00007 | 0.004 | 0.0024 | 0.0052 | < 0.0002 | 0.03 | < 0.00005 | 0.0035 | 0.0293 | < 0.1 | < 0.0002 | 10.2 | < 0.0001 | 0.87 | < 0.0002 | < 0.001 | 0.019 | 0.0068 | < 0.001 | 0.019 | --- |
| | 03-Sep-2008 | 13-SH | < 0.01 | 0.0007 | 0.0011 | 0.274 | < 0.001 | < 0.05 | < 0.00005 | 0.015 | < 0.002 | 0.003 | < 0.0001 | 0.018 | < 0.00010 | < 0.005 | 0.003 | --- | 0.0006 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.004 | < 0.001 | 0.007 | --- |
| | 10-Sep-2009 | 13-SH | < 0.0050 | 0.00088 | 0.00175 | 0.338 | < 0.0010 | < 0.050 | 0.000022 | 0.0081 | < 0.0020 | 0.0036 | 0.00011 | 0.031 | < 0.000020 | < 0.0050 | 0.0046 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0015 | 0.00655 | < 0.0010 | 0.0321 | --- |
| | 08-Sep-2010 | 13 SH | < 0.0050 | 0.00085 | 0.00193 | 0.277 | < 0.0010 | 0.052 | 0.000027 | 0.0065 | < 0.0020 | 0.0037 | < 0.00010 | 0.031 | < 0.000020 | < 0.0050 | 0.0053 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0014 | 0.00551 | < 0.0010 | 0.029 | --- |
| | 07-Sep-2011 | 13-SH | < 0.0050 | 0.00077 | 0.00307 | 0.262 | < 0.0010 | < 0.050 | 0.000049 | 0.0011 | < 0.0020 | 0.0064 | < 0.00010 | 0.022 | < 0.000020 | < 0.0050 | 0.0043 | --- | < 0.00040 | 8.38 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0044 | < 0.0010 | 0.112 | --- |
| | 05-Sep-2012 | 13-SH | < 0.0050 | 0.00073 | 0.00312 | 0.25 | < 0.0010 | < 0.050 | 0.000037 | 0.0011 | < 0.0020 | 0.0059 | < 0.00010 | 0.024 | < 0.000020 | < 0.0050 | 0.0048 | --- | < 0.00040 | 9.68 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00316 | < 0.0010 | 0.102 | --- |
| | 26-Sep-2013 | 13-SH | < 0.0050 | 0.00086 | 0.00284 | 0.279 | < 0.0010 | < 0.050 | 0.000181 | < 0.0010 | < 0.0020 | 0.0130 | < 0.00010 | 0.026 | < 0.000020 | < 0.0050 | 0.0071 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00268 | < 0.0010 | 0.245 | --- |
| | 16-Sep-2014 | 13-SH | 0.0043 | 0.00056 | 0.00262 | 0.312 | < 0.00050 | 0.054 | 0.000016 | 0.00053 | < 0.00010 | 0.00123 | < 0.000050 | 0.0268 | < 0.0000050 | 0.00242 | 0.00163 | < 0.30 | < 0.00010 | 11.8 | < 0.0000010 | 0.584 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00342 | < 0.00010 | 0.0132 | --- |
| | 28-Sep-2015 | 13-SH | 0.0012 | 0.00026 | 0.00111 | 0.430 | --- | 0.040 | 0.0000175 | 0.00022 | --- | 0.00094 | <0.000050 | --- | <0.0000050 | --- | 0.00270 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00381 | --- | 0.0128 | --- |
| | 26-Sep-2016 | 13-SH | 0.0136 | 0.00041 | 0.00274 | 0.327 | --- | 0.044 | 0.0000187 | 0.00037 | --- | 0.00063 | 0.000056 | --- | <0.0000050 | --- | 0.00178 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00324 | --- | 0.0037 | --- |
| | 27-Sep-2017 | 13-SH | 0.0019 | 0.00028 | 0.00124 | 0.513 | --- | 0.049 | 0.0001770 | 0.01350 | --- | 0.00045 | <0.000050 | --- | <0.0000050 | --- | 0.00184 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00406 | --- | 0.0031 | --- |
| | 18-Sep-2018 | 13-SH | 0.0027 | 0.00077 | 0.00355 | 0.200 | --- | 0.052 | 0.0000520 | 0.00039 | --- | 0.00095 | <0.000050 | --- | 0.0000072 | --- | 0.00397 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00298 | --- | 0.0038 | --- |
| | 16-Sep-2019 | 13-SH | 0.0013 | 0.00059 | 0.00259 | 0.273 | --- | 0.046 | 0.0000294 | 0.00034 | --- | 0.00073 | <0.000050 | --- | <0.0000050 | --- | 0.00228 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00287 | --- | 0.0022 | --- |
| | 22-Sep-2020 | 13-SH | 0.0061 | 0.00049 | 0.00149 | 0.319 | <0.00010 | 0.043 | 0.0000272 | 0.00026 | 0.00031 | 0.00245 | 0.000090 | 0.0231 | <0.0000050 | 0.00494 | 0.0247 | --- | 0.000062 | --- | <0.0000010 | --- | 0.000042 | <0.00010 | <0.00030 | 0.00301 | <0.00050 | 0.0041 | --- |
| | 21-Sep-2021 | 13-SH | 0.0111 | 0.00049 | 0.00196 | 0.229 | <0.00010 | 0.037 | 0.0000553 | <0.00010 | <0.00010 | 0.00068 | <0.000050 | 0.0212 | <0.0000050 | 0.00357 | 0.00894 | --- | <0.0000050 | --- | <0.0000010 | --- | 0.000035 | <0.00010 | <0.00030 | 0.00256 | <0.00050 | 0.0028 | --- |
| | 29-Sep-2022 | 13-SH | <0.0010 | 0.00060 | 0.00201 | 0.285 | --- | 0.048 | 0.0000488 | 0.00199 | --- | 0.00055 | <0.000050 | --- | <0.0000050 | --- | 0.0032 | --- | 0.000072 | --- | <0.0000010 | --- | --- | --- | --- | 0.00343 | --- | 0.0016 | --- |
| | 28-Sep-2023 | 13-SH | <0.0010 | 0.00034 | 0.00088 | 0.277 | --- | 0.059 | 0.000179 | 0.00189 | --- | 0.00116 | <0.000050 | --- | <0.0000050 | --- | 0.00788 | --- | 0.000171 | --- | <0.0000010 | --- | --- | --- | --- | 0.00464 | --- | 0.004 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | **---** | **---** | **7.0** | **---** | **---** | **---** | **0.02** | **---** | **---** | **---** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **---** | **0.006** | **0.01** | **1** | **---** | **5** | **0.005** | **---** | **---** | **1** | **0.01** | **---** | **0.001** | **---** | **---** | | **0.05** | | **---** | | **---** | **---** | **---** | **0.02** | **---** | **5** | **---** |
| **Alberta Tier 2 Aquatic 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** | **---** |
| **13-IN** | 17-May-1991 | 13-IN | --- | 0.0002 | 0.0003 | 0.2 | < 0.001 | --- | < 0.001 | 0.004 | 0.002 | < 0.001 | < 0.002 | --- | < 0.00005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 13-IN | --- | 0.0002 | 0.0005 | 0.18 | < 0.001 | --- | < 0.001 | 0.005 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 13-IN | --- | 0.0005 | 0.0003 | 0.13 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.001 | 0.002 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 13-IN | --- | < 0.0002 | 0.0003 | 0.19 | < 0.001 | --- | < 0.003 | 0.012 | < 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 13-IN | --- | < 0.0002 | 0.0006 | 0.19 | 0.013 | --- | < 0.003 | < 0.002 | 0.003 | 0.003 | < 0.002 | --- | < 0.00005 | 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 13-IN | --- | < 0.0002 | 0.0004 | 0.19 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | < 0.001 | < 0.001 | --- | 0.00005 | < 0.003 | 0.008 | --- | < 0.0002 | --- | < 0.0002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.002 | --- |
| | 28-Sep-1995 | 13-IN | --- | < 0.0002 | 0.0004 | 0.17 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | 0.005 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 04-Sep-1996 | 13-IN | --- | < 0.0002 | 0.0005 | 0.18 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.008 | --- |
| | 04-Sep-1997 | 13-IN | --- | < 0.0002 | 0.0003 | 0.17 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.002 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.004 | --- | < 0.001 | --- | --- | --- | 0.008 | 0.082 | --- |
| | 16-Sep-1998 | 13-IN | --- | < 0.0002 | 0.0002 | 0.15 | 0.007 | --- | < 0.0002 | < 0.002 | 0.007 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.002 | --- |
| | 09-Sep-1999 | 13-IN | --- | < 0.0002 | 0.007 | 0.25 | < 0.001 | --- | < 0.0002 | 0.021 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.02 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| (Duplicate) | 09-Sep-1999 | 13-IN DUP | --- | 0.0009 | 0.0008 | 0.2 | < 0.001 | --- | < 0.0002 | 0.027 | 0.012 | 0.007 | < 0.0003 | --- | < 0.00005 | 0.008 | 0.017 | --- | < 0.0002 | --- | 0.002 | --- | --- | --- | --- | --- | 0.005 | 0.017 | --- |
| | 05-Sep-2000 | 13-IN | --- | < 0.0002 | 0.0024 | 0.176 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0019 | < 0.0002 | < 0.0003 | --- | < 0.00005 | 0.0019 | 0.0048 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0079 | --- |
| | 06-Sep-2001 | 13-IN | --- | < 0.0002 | 0.0025 | 0.206 | 0.0002 | --- | < 0.0002 | < 0.001 | 0.0009 | 0.0008 | < 0.0003 | 0.027 | < 0.00005 | 0.0019 | 0.0077 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0056 | --- |
| | 04-Sep-2002 | 13-IN | 0.007 | < 0.0002 | 0.0003 | 0.302 | < 0.0002 | 0.11 | < 0.0002 | 0.036 | 0.0007 | 0.001 | < 0.0003 | --- | < 0.00005 | 0.0018 | 0.0095 | < 0.1 | < 0.0002 | 5.83 | < 0.0001 | 0.601 | < 0.0002 | < 0.001 | 0.001 | 0.0047 | 0.01 | 0.0056 | < 0.0002 |
| | 04-Sep-2003 | 13-IN | 0.007 | < 0.0002 | 0.0007 | 0.153 | < 0.0002 | 0.14 | < 0.0002 | < 0.001 | 0.0007 | 0.0011 | 0.0006 | 0.006 | < 0.00005 | 0.0182 | 0.0007 | < 0.1 | < 0.0002 | 5.31 | < 0.0001 | 0.57 | < 0.0002 | < 0.001 | < 0.001 | 0.0027 | < 0.001 | 0.0086 | 0.0012 |
| | 09-Sep-2004 | 13-IN | 0.026 | < 0.0002 | 0.0008 | 0.138 | 0.0002 | 0.16 | < 0.0002 | < 0.001 | 0.0004 | 0.0007 | < 0.0003 | 0.021 | < 0.00005 | 0.0017 | 0.0025 | < 0.1 | < 0.0002 | 4.84 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | 0.011 | 0.0031 | < 0.001 | < 0.0006 | < 0.0002 |
| | 08-Sep-2005 | 13-IN | < 0.001 | 0.0003 | 0.0004 | 0.127 | 0.0002 | 0.12 | 0.0003 | < 0.001 | < 0.0003 | 0.0006 | < 0.0003 | 0.031 | < 0.00005 | 0.0021 | 0.0018 | 0.1 | < 0.0002 | 5.29 | 0.0003 | 0.58 | < 0.0002 | < 0.001 | < 0.001 | 0.0044 | < 0.001 | 0.0038 | 0.0014 |
| | 07-Sep-2006 | 13-IN | 0.002 | < 0.0002 | < 0.0002 | 0.218 | < 0.0002 | 0.12 | < 0.0002 | < 0.001 | 0.0006 | 0.0011 | < 0.0003 | 0.033 | < 0.00005 | 0.0019 | 0.0025 | < 0.1 | < 0.0002 | 5.8 | < 0.0001 | 0.59 | < 0.0002 | < 0.001 | 0.001 | 0.0046 | < 0.001 | < 0.0006 | 0.0015 |
| | 05-Sep-2007 | 13-IN | 0.036 | < 0.0002 | 0.0007 | 0.16 | < 0.001 | 0.12 | 0.00002 | < 0.001 | 0.0023 | 0.0042 | < 0.0002 | 0.03 | < 0.00005 | 0.0017 | 0.0188 | < 0.1 | < 0.0002 | 5.3 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | 0.008 | 0.0031 | < 0.001 | 0.01 | --- |
| | 03-Sep-2008 | 13-IN | < 0.01 | < 0.0004 | 0.0005 | 0.157 | < 0.001 | 0.12 | < 0.00005 | < 0.005 | < 0.002 | 0.002 | < 0.0001 | 0.031 | < 0.00010 | < 0.005 | 0.004 | --- | 0.0005 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0034 | < 0.001 | 0.004 | --- |
| | 10-Sep-2009 | 13-IN | 0.0057 | < 0.00040 | 0.00073 | 0.154 | < 0.0010 | 0.103 | 0.000016 | < 0.0050 | < 0.0020 | 0.0024 | 0.00017 | 0.03 | < 0.000020 | < 0.0050 | 0.0034 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00303 | < 0.0010 | 0.0123 | --- |
| | 08-Sep-2010 | 13 IN | < 0.0050 | < 0.00040 | 0.00056 | 0.145 | < 0.0010 | 0.124 | < 0.000010 | < 0.0010 | < 0.0020 | 0.0011 | < 0.00010 | 0.032 | < 0.000020 | < 0.0050 | 0.004 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00271 | < 0.0010 | 0.0121 | --- |
| | 07-Sep-2011 | 13-IN | < 0.0050 | < 0.00040 | 0.00099 | 0.158 | < 0.0010 | 0.118 | 0.000015 | < 0.0010 | < 0.0020 | 0.0014 | < 0.00010 | 0.026 | < 0.000020 | < 0.0050 | 0.0022 | --- | < 0.00040 | 5.82 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00271 | < 0.0010 | 0.0041 | --- |
| | 05-Sep-2012 | 13-IN | < 0.0050 | < 0.00040 | 0.00091 | 0.156 | < 0.0010 | 0.129 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.03 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 5.91 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00284 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | 13-IN | < 0.0050 | < 0.00040 | 0.00173 | 0.150 | < 0.0010 | 0.107 | 0.000014 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.028 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00277 | < 0.0010 | 0.0042 | --- |
| | 16-Sep-2014 | 13-IN | 0.0029 | < 0.00010 | 0.00139 | 0.154 | < 0.00050 | 0.114 | < 0.000010 | < 0.00010 | 0.00089 | 0.00019 | < 0.000050 | 0.0299 | < 0.0000050 | 0.0025 | 0.00114 | < 0.30 | < 0.00010 | 5.86 | < 0.000010 | 0.529 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00303 | < 0.00010 | 0.0016 | --- |
| | 28-Sep-2015 | 13-IN | 0.0013 | <0.00010 | 0.00031 | 0.137 | --- | 0.087 | 0.0000168 | <0.00010 | --- | 0.00078 | <0.000050 | --- | <0.0000050 | --- | 0.00279 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00340 | --- | 0.0032 | --- |
| | 26-Sep-2016 | 13-IN | 0.0061 | <0.00010 | 0.00078 | 0.141 | --- | 0.112 | 0.0000183 | 0.00011 | --- | 0.00022 | <0.000050 | --- | <0.0000050 | --- | 0.00232 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00296 | --- | 0.0017 | --- |
| | 27-Sep-2017 | 13-IN | 0.0011 | <0.00010 | 0.00031 | 0.156 | --- | 0.110 | 0.0001280 | 0.00024 | --- | 0.00190 | 0.000161 | --- | 0.000005 | --- | 0.00272 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00287 | --- | 0.0050 | --- |
| | 18-Sep-2018 | 13-IN | 0.0018 | <0.00010 | 0.00037 | 0.142 | --- | 0.113 | 0.0000181 | 0.00011 | --- | 0.00048 | <0.000050 | --- | 0.0000463 | --- | 0.00246 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00264 | --- | 0.0018 | --- |
| | 16-Sep-2019 | 13-IN | 0.0016 | <0.00010 | 0.00031 | 0.156 | --- | 0.102 | 0.0000079 | 0.00027 | --- | 0.00084 | <0.000050 | --- | <0.0000050 | --- | 0.00185 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00262 | --- | 0.0013 | --- |
| | 22-Sep-2020 | 13-IN | 0.0013 | <0.00010 | 0.00025 | 0.143 | <0.00010 | 0.114 | 0.0000063 | <0.00010 | 0.00049 | 0.00232 | <0.000050 | 0.0302 | <0.0000050 | 0.00221 | 0.00176 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00275 | <0.00050 | 0.0023 | --- |
| | 21-Sep-2021 | 13-IN | 0.0014 | <0.00010 | 0.00029 | 0.16 | <0.00010 | 0.112 | 0.0000097 | <0.00010 | 0.00055 | 0.00045 | <0.000050 | 0.0316 | <0.0000050 | 0.00199 | 0.00181 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00281 | <0.00050 | 0.0016 | --- |
| | 29-Sep-2022 | 13-IN | 0.0037 | <0.00010 | 0.00022 | 0.153 | --- | 0.127 | 0.0000130 | <0.00050 | --- | 0.00026 | <0.000050 | --- | <0.0000050 | --- | 0.00074 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00294 | --- | 0.0014 | --- |
| | 28-Sep-2023 | 13-IN | 0.002 | <0.00010 | 0.00025 | 0.136 | --- | 0.109 | 0.0000079 | 0.00222 | --- | 0.00087 | <0.000050 | --- | <0.0000050 | --- | 0.00243 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00287 | --- | 0.0011 | --- |
| **13-SS** | 17-May-1991 | 13-SS | --- | 0.0009 | **0.0145** | 0.12 | < 0.001 | --- | < 0.001 | 0.007 | < 0.001 | < 0.001 | < 0.002 | --- | < 0.00005 | 0.025 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-May-1992 | 13-SS | --- | 0.0003 | **0.056** | 0.06 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.001 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 13-SS | --- | 0.0004 | **0.043** | 0.1 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.008 | < 0.002 | --- | < 0.00005 | 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **13(R)SS** | 10-Sep-2004 | 13(R)SS | 0.021 | < 0.0002 | 0.0013 | 0.57 | 0.0005 | 0.08 | < 0.0002 | < 0.001 | 0.0008 | 0.0032 | 0.0005 | 0.009 | < 0.00005 | 0.0041 | 0.004 | < 0.1 | < 0.0002 | 7.61 | < 0.0001 | 0.52 | < 0.0002 | < 0.001 | 0.01 | 0.0021 | < 0.001 | 0.0935 | 0.0004 |
| | 08-Sep-2005 | 13(R)SS | < 0.001 | 0.0004 | 0.0012 | 0.159 | < 0.0002 | 0.06 | 0.0005 | < 0.001 | < 0.0003 | 0.0747 | < 0.0003 | 0.055 | 0.00005 | 0.0024 | 0.0209 | < 0.1 | 0.0003 | 10.1 | 0.0003 | 0.53 | < 0.0002 | < 0.001 | 0.001 | 0.0023 | < 0.001 | 0.665 | 0.0015 |
| | 07-Sep-2006 | 13(R)SS | 0.004 | < 0.0002 | 0.0006 | 0.156 | < 0.0002 | 0.07 | < 0.0002 | < 0.001 | 0.0009 | 0.0406 | 0.0004 | 0.049 | 0.00009 | 0.0026 | 0.0126 | < 0.1 | < 0.0002 | 9.8 | < 0.0001 | 0.52 | < 0.0002 | < 0.001 | 0.002 | 0.0023 | < 0.001 | 0.488 | 0.0005 |
| | 16-Oct-2007 | 13(R)SS | 0.01 | 0.0003 | 0.0011 | 0.11 | < 0.001 | 0.06 | 0.00033 | < 0.001 | 0.0023 | 0.0298 | < 0.0002 | 0.04 | --- | 0.0025 | 0.0227 | < 0.1 | < 0.0002 | 9.7 | < 0.0001 | 0.48 | < 0.0002 | < 0.001 | 0.014 | 0.0016 | < 0.001 | 0.341 | --- |
| | 04-Sep-2008 | 13(R)SS | < 0.01 | < 0.0004 | 0.0007 | 0.095 | < 0.001 | 0.06 | 0.00028 | < 0.005 | < 0.002 | 0.083 | 0.0002 | 0.062 | < 0.00010 | < 0.005 | 0.017 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0017 | < 0.001 | 1.61 | --- |
| | 17-Sep-2009 | 13(R)SS | 0.006 | 0.00174 | 0.00431 | 0.0395 | < 0.0010 | 0.093 | 0.000091 | < 0.0050 | < 0.0020 | 0.003 | 0.00315 | 0.081 | < 0.000020 | 0.0143 | 0.003 | --- | 0.00508 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0155 | < 0.0010 | 0.0129 | --- |
| | 09-Sep-2010 | 13(R)SS | < 0.0050 | < 0.00040 | 0.00066 | 0.0854 | < 0.0010 | < 0.050 | 0.000146 | < 0.0010 | < 0.0020 | 0.0291 | < 0.00010 | 0.054 | < 0.000020 | < 0.0050 | 0.0119 | --- | < 0.00040 | --- | 0.00036 | --- | < 0.00010 | < 0.050 | 0.0015 | 0.00063 | < 0.0010 | 0.304 | --- |
| | 26-Sep-2013 | 13(R)SS | < 0.0050 | < 0.00040 | 0.00049 | 0.0727 | < 0.0010 | < 0.050 | 0.000051 | 0.0011 | < 0.0020 | 0.0109 | < 0.00010 | 0.058 | < 0.000020 | < 0.0050 | 0.0036 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00034 | < 0.0010 | 0.101 | --- |
| | 16-Sep-2014 | 13(R)SS | 0.0020 | < 0.00010 | 0.00049 | 0.0872 | < 0.00050 | 0.019 | 0.000045 | 0.00046 | 0.00082 | 0.00354 | < 0.000050 | 0.0577 | < 0.0000050 | 0.000565 | 0.00402 | < 0.30 | < 0.00010 | 11.7 | < 0.000010 | 0.296 | 0.000066 | < 0.00010 | < 0.00030 | 0.000396 | < 0.00010 | 0.0177 | --- |
| | 28-Sep-2015 | 13(R)SS | <0.0010 | <0.00010 | 0.00049 | 0.0794 | --- | 0.014 | 0.0000948 | 0.00022 | --- | 0.00952 | <0.000050 | --- | <0.0000050 | --- | 0.00607 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000302 | --- | 0.101 | --- |
| | 26-Sep-2016 | 13(R)SS | <0.0010 | <0.00010 | 0.00042 | 0.0804 | --- | 0.017 | 0.0000428 | 0.00021 | --- | 0.00284 | <0.000050 | --- | <0.0000050 | --- | 0.00436 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000325 | --- | 0.034 | --- |
| | 27-Sep-2017 | 13(R)SS | 0.0017 | <0.00010 | 0.00045 | 0.0753 | --- | 0.027 | 0.0000304 | 0.00088 | --- | 0.00403 | <0.000050 | --- | 0.0000086 | --- | 0.00373 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000378 | --- | 0.039 | --- |
| | 18-Sep-2018 | 13(R)SS | <0.0010 | <0.00010 | 0.00051 | 0.0859 | --- | 0.019 | 0.0000315 | 0.00013 | --- | 0.00171 | <0.000050 | --- | 0.0000621 | --- | 0.00346 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000310 | --- | 0.032 | --- |
| | 16-Sep-2019 | 13(R)SS | 0.0018 | <0.00010 | 0.00056 | 0.0918 | --- | 0.017 | 0.0000223 | 0.00018 | --- | 0.00306 | 0.000075 | --- | <0.0000050 | --- | 0.00293 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000343 | --- | 0.014 | --- |
| | 22-Sep-2020 | 13(R)SS | 0.0016 | <0.00010 | 0.00052 | 0.0868 | <0.00010 | 0.015 | 0.0000359 | 0.00014 | 0.00145 | 0.00349 | 0.000057 | 0.0546 | <0.0000050 | 0.000675 | 0.00401 | --- | <0.000050 | --- | <0.000010 | --- | 0.000079 | <0.00010 | <0.00030 | 0.000342 | <0.00050 | 0.0064 | --- |
| | 21-Sep-2021 | 13(R)SS | <0.0010 | <0.00010 | 0.00053 | 0.101 | <0.00010 | 0.018 | 0.0000143 | <0.00010 | <0.00010 | 0.00217 | <0.000050 | 0.0589 | <0.0000050 | 0.000271 | 0.00176 | --- | <0.00050 | --- | <0.000010 | --- | 0.000093 | <0.00010 | <0.00030 | 0.000377 | <0.00050 | 0.0154 | --- |
| | 29-Sep-2022 | 13(R)SS | 0.0011 | <0.00010 | 0.00050 | 0.0802 | --- | 0.020 | <0.0000050 | <0.00050 | --- | 0.00171 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000510 | --- | 0.0044 | --- |
| **Could not obtain sa** | 28-Sep-2023 | 13(R)SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **14-SH** | 13-Nov-1993 | 14-SH | --- | < 0.0002 | 0.0002 | 0.23 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.008 | < 0.002 | --- | < 0.00005 | 0.005 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 14-SH | --- | < 0.0002 | 0.0002 | 0.19 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.003 | < 0.001 | --- | < 0.00005 | 0.003 | 0.03 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.015 | --- |
| | 22-Sep-1994 | 14-SH | --- | < 0.0002 | 0.0005 | 0.19 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.009 | 0.001 | --- | 0.00005 | 0.006 | 0.057 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.003 | 0.018 | --- |
| | 02-Nov-1994 | 14-SH | --- | 0.0005 | 0.0004 | 0.18 | 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.008 | < 0.001 | --- | < 0.00005 | 0.003 | 0.032 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.03 | --- |
| | 28-Sep-1995 | 14-SH | --- | < 0.0002 | 0.0005 | 0.2 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | 0.006 | 0.012 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.006 | --- |
| (Duplicate) | 28-Sep-1995 | 14-SH DUP | --- | < 0.0002 | 0.0004 | 0.21 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.001 | < 0.0003 | --- | < 0.00005 | 0.009 | 0.006 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.006 | --- |
| | 05-Sep-1996 | 14-SH | --- | < 0.0002 | < 0.0002 | 0.17 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.01 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.013 | --- |
| | 05-Sep-1997 | 14-SH | --- | 0.0002 | < 0.0002 | 0.16 | 0.002 | --- | < 0.0002 | 0.01 | 0.007 | 0.002 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.007 | --- |
| | 15-Sep-1998 | 14-SH | --- | < 0.0002 | 0.0002 | 0.09 | 0.001 | --- | 0.0006 | < 0.002 | < 0.003 | 0.006 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.005 | 0.002 | --- |
| | 05-Sep-2000 | 14-SH | --- | < 0.0002 | 0.0005 | 0.158 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0028 | 0.0007 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.022 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0051 | --- |
| | 06-Sep-2001 | 14-SH | --- | < 0.0002 | 0.0002 | 0.188 | 0.0004 | --- | < 0.0002 | < 0.001 | 0.0007 | 0.0027 | < 0.0003 | 0.032 | < 0.00005 | 0.0007 | 0.0244 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0117 | --- |
| | 05-Sep-2002 | 14-SH | 0.005 | < 0.0002 | 0.0002 | 0.198 | < 0.0002 | 0.04 | < 0.0002 | 0.001 | 0.0003 | 0.0023 | < 0.0003 | --- | < 0.00005 | 0.0007 | 0.0147 | < 0.1 | < 0.0002 | 8.72 | < 0.0001 | 0.77 | < 0.0002 | < 0.001 | < 0.001 | 0.0042 | < 0.001 | 0.0163 | 0.0003 |
| | 04-Sep-2003 | 14-SH | 0.004 | < 0.0002 | < 0.0002 | 0.13 | < 0.0002 | 0.05 | < 0.0002 | 0.002 | < 0.0003 | 0.002 | < 0.0003 | 0.023 | < 0.00005 | 0.0076 | 0.0033 | < 0.1 | < 0.0002 | 6.24 | < 0.0001 | 0.41 | < 0.0002 | < 0.001 | < 0.001 | 0.0022 | < 0.001 | 0.0051 | 0.0003 |
| | 09-Sep-2004 | 14-SH | < 0.001 | < 0.0002 | < 0.0002 | 0.268 | < 0.0002 | 0.08 | < 0.0002 | 0.016 | < 0.0003 | 0.0014 | < 0.0003 | 0.034 | < 0.00005 | 0.0024 | 0.0024 | 0.1 | < 0.0002 | 6.78 | < 0.0001 | 0.71 | < 0.0002 | < 0.001 | 0.01 | 0.0087 | < 0.001 | 0.0856 | 0.0011 |
| | 08-Sep-2005 | 14-SH | < 0.001 | 0.0003 | 0.0005 | 0.35 | < 0.0002 | 0.08 | 0.0004 | 0.011 | < 0.0003 | 0.0006 | < 0.0003 | 0.045 | < 0.00005 | 0.0023 | 0.0026 | < 0.1 | 0.0003 | 8.03 | 0.0003 | 0.73 | < 0.0002 | < 0.001 | 0.002 | 0.0117 | < 0.001 | 0.0032 | 0.002 |
| | 07-Sep-2006 | 14-SH | 0.001 | < 0.0002 | 0.0012 | 0.351 | < 0.0002 | 0.1 | < 0.0002 | 0.006 | 0.0005 | 0.0034 | < 0.0003 | 0.046 | 0.00014 | 0.0013 | 0.0038 | < 0.1 | < 0.0002 | 8.4 | < 0.0001 | 0.79 | < 0.0002 | < 0.001 | 0.002 | 0.0137 | < 0.001 | 0.0021 | 0.0004 |
| | 05-Sep-2007 | 14-SH | 0.024 | < 0.0002 | 0.0006 | 0.39 | < 0.001 | 0.09 | 0.00009 | 0.003 | 0.0029 | 0.0071 | < 0.0002 | 0.05 | < 0.00005 | 0.0013 | 0.0334 | 0.2 | < 0.0002 | 8.7 | < 0.0001 | 0.76 | < 0.0002 | < 0.001 | 0.02 | 0.0123 | < 0.001 | 0.01 | --- |
| | 03-Sep-2008 | 14-SH | < 0.01 | < 0.0004 | 0.0005 | 0.385 | < 0.001 | 0.09 | < 0.0001 | < 0.005 | < 0.002 | 0.002 | < 0.0001 | 0.051 | < 0.00010 | < 0.005 | 0.003 | --- | 0.0006 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0141 | < 0.001 | < 0.002 | --- |
| | 09-Sep-2009 | 14-SH | < 0.0050 | < 0.00040 | 0.00042 | 0.413 | < 0.0010 | 0.078 | 0.000017 | < 0.0050 | < 0.0020 | 0.0012 | < 0.00010 | 0.048 | < 0.000020 | < 0.0050 | 0.0048 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0015 | 0.0119 | < 0.0010 | < 0.0040 | --- |
| | 09-Sep-2010 | 14 SH | < 0.0050 | < 0.00040 | 0.00049 | 0.327 | < 0.0010 | 0.085 | 0.000074 | 0.0051 | < 0.0020 | 0.0022 | < 0.00010 | 0.044 | < 0.000020 | < 0.0050 | 0.0051 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0013 | 0.00942 | < 0.0010 | 0.0092 | --- |
| | 08-Sep-2011 | 14-SH | < 0.0050 | < 0.00040 | 0.00059 | 0.292 | < 0.0010 | 0.05 | 0.000036 | 0.0022 | < 0.0020 | 0.0035 | < 0.00010 | 0.027 | < 0.000020 | < 0.0050 | 0.0032 | --- | < 0.00040 | 5.67 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0064 | < 0.0010 | 0.1 | --- |
| | 05-Sep-2012 | 14-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.377 | < 0.0010 | 0.098 | 0.000014 | 0.0098 | < 0.0020 | 0.0019 | < 0.00010 | 0.04 | < 0.000020 | < 0.0050 | 0.0029 | --- | < 0.00040 | 8.84 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00883 | < 0.0010 | 0.0844 | --- |
| | 25-Sep-2013 | 14-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.494 | < 0.0010 | 0.092 | 0.000057 | 0.0025 | < 0.0020 | 0.0082 | < 0.00010 | 0.053 | < 0.000020 | < 0.0050 | 0.0039 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0103 | < 0.0010 | 0.211 | --- |
| | 16-Sep-2014 | 14-SH | 0.0027 | < 0.00010 | 0.00023 | 0.515 | < 0.00050 | 0.096 | 0.000055 | 0.00058 | 0.00029 | 0.00736 | < 0.000050 | 0.054 | < 0.0000050 | 0.000651 | 0.00314 | < 0.30 | < 0.00010 | 12.1 | < 0.0000010 | 0.753 | < 0.000050 | < 0.00010 | < 0.00030 | 0.0101 | < 0.00010 | 0.0775 | --- |
| | 29-Sep-2015 | 14-SH | 0.0028 | <0.00010 | 0.00021 | 0.413 | --- | 0.075 | 0.0000947 | 0.00053 | --- | 0.00160 | <0.000050 | --- | <0.0000050 | --- | 0.00242 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.0106 | --- | 0.0277 | --- |
| | 27-Sep-2016 | 14-SH | 0.0014 | <0.00010 | 0.00019 | 0.481 | --- | 0.085 | 0.0000160 | 0.00395 | --- | 0.00114 | <0.000050 | --- | <0.0000050 | --- | 0.00159 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.0098 | --- | 0.0104 | --- |
| | 26-Sep-2017 | 14-SH | <0.0010 | <0.00010 | 0.00022 | 0.524 | --- | 0.081 | 0.0000334 | 0.00520 | --- | 0.00151 | <0.000050 | --- | <0.0000050 | --- | 0.00171 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.0093 | --- | 0.0138 | --- |
| | 17-Sep-2018 | 14-SH | 0.0025 | <0.00010 | 0.00026 | 0.503 | --- | 0.089 | 0.0002560 | 0.00171 | --- | 0.00098 | <0.000050 | --- | 0.0000153 | --- | 0.00229 | --- | 0.000062 | --- | <0.0000010 | --- | --- | --- | --- | 0.0091 | --- | 0.0091 | --- |
| | 16-Sep-2019 | 14-SH | 0.0037 | 0.00018 | 0.00017 | 0.095 | --- | 0.013 | 0.0001370 | 0.00417 | --- | 0.00121 | <0.000050 | --- | <0.0000050 | --- | <0.000050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.0009 | --- | 0.0011 | --- |
| | 22-Sep-2020 | 14-SH | 0.0012 | 0.00034 | 0.00028 | 0.327 | <0.00010 | 0.059 | 0.000261 | 0.00186 | <0.00010 | 0.00099 | <0.000050 | 0.0300 | <0.0000050 | 0.00171 | 0.00173 | --- | 0.000067 | --- | <0.0000010 | --- | 0.000023 | <0.00010 | <0.00030 | 0.00634 | <0.00050 | 0.0032 | --- |
| | 22-Sep-2021 | 14-SH | <0.0010 | 0.0003 | 0.00032 | 0.362 | <0.00010 | 0.06 | 0.000514 | 0.00105 | <0.00010 | 0.00097 | <0.000050 | 0.0344 | <0.0000050 | 0.00149 | 0.00232 | --- | 0.000051 | --- | <0.0000010 | --- | 0.00002 | <0.00010 | <0.00030 | 0.00662 | <0.00050 | 0.0059 | --- |
| | 28-Sep-2022 | 14-SH | 0.0018 | 0.00037 | 0.00038 | 0.315 | --- | 0.075 | 0.000666 | 0.00576 | --- | 0.00087 | <0.000050 | --- | <0.0000050 | --- | 0.00227 | --- | 0.000061 | --- | <0.000010 | --- | --- | --- | --- | 0.00738 | --- | 0.0077 | --- |
| | 27-Sep-2023 | 14-SH | 0.0049 | 0.00023 | 0.00024 | 0.266 | --- | 0.064 | 0.0031 | 0.00434 | --- | 0.00193 | <0.000050 | --- | <0.0000050 | --- | 0.0066 | --- | 0.000052 | --- | <0.000010 | --- | --- | --- | --- | 0.0053 | --- | 0.0222 | --- |
| **15-SH** | 18-May-1993 | 15-SH | --- | < 0.0002 | 0.0003 | 0.25 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.007 | < 0.002 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-1993 | 15-SH | --- | 0.0013 | 0.0009 | 0.26 | < 0.001 | --- | < 0.003 | < 0.002 | < 0.003 | 0.006 | < 0.002 | --- | < 0.00005 | 0.027 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 15-SH | --- | < 0.0002 | 0.0002 | 0.32 | 0.001 | --- | < 0.003 | < 0.002 | 0.003 | 0.013 | < 0.001 | --- | < 0.00005 | 0.01 | 0.033 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.013 | --- |
| | 22-Sep-1994 | 15-SH | --- | 0.0002 | 0.0003 | 0.35 | 0.001 | --- | < 0.003 | 0.016 | < 0.003 | 0.013 | < 0.001 | --- | 0.00005 | 0.006 | 0.023 | --- | 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.007 | --- |
| | 01-Nov-1994 | 15-SH | --- | < 0.0002 | < 0.0002 | 0.31 | 0.002 | --- | < 0.003 | 0.006 | < 0.003 | 0.018 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.019 | --- | < 0.0002 | --- | 0.003 | --- | < 0.001 | --- | --- | --- | 0.005 | 0.02 | --- |
| | 28-Sep-1995 | 15-SH | --- | 0.0002 | 0.0002 | 0.37 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.004 | 0.0007 | --- | < 0.00005 | 0.004 | 0.01 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.006 | --- |
| (Duplicate) | 28-Sep-1995 | 15-SH DUP | --- | 0.0002 | 0.0003 | 0.36 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.001 | < 0.0003 | --- | < 0.00005 | 0.004 | 0.011 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 04-Sep-1996 | 15-SH | --- | < 0.0002 | < 0.0002 | 0.35 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.006 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.02 | --- |
| (Duplicate) | 04-Sep-1996 | 15-SH DUP | --- | < 0.0002 | < 0.0002 | 0.35 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.006 | < 0.0003 | --- | < 0.00005 | < 0.003 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 15-SH | --- | 0.0002 | < 0.0002 | 0.23 | < 0.001 | --- | < 0.0002 | 0.01 | 0.005 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.006 | --- |
| | 16-Sep-1998 | 15-SH | --- | < 0.0002 | < 0.0002 | 0.14 | 0.002 | --- | 0.0005 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 09-Sep-1999 | 15-SH | --- | 0.0005 | < 0.0002 | 0.32 | < 0.001 | --- | < 0.0002 | 0.035 | < 0.003 | 0.004 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.024 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | 0.009 | 0.003 | --- |
| | 06-Sep-2000 | 15-SH | --- | < 0.0002 | 0.0002 | 0.268 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0004 | 0.0016 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0041 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0015 | --- |
| | 07-Sep-2001 | 15-SH | --- | < 0.0002 | 0.0002 | 0.282 | < 0.0002 | --- | < 0.0002 | 0.002 | 0.0006 | 0.0034 | < 0.0003 | 0.026 | < 0.00005 | 0.0015 | 0.0048 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0059 | --- |
| | 05-Sep-2002 | 15-SH | 0.007 | 0.0002 | < 0.0002 | 0.333 | < 0.0002 | 0.15 | < 0.0002 | < 0.001 | < 0.0003 | 0.0044 | < 0.0003 | --- | < 0.00005 | 0.0011 | 0.0029 | < 0.1 | < 0.0002 | 4.94 | < 0.0001 | 0.489 | < 0.0002 | < 0.001 | < 0.001 | 0.0013 | < 0.001 | 0.0019 | 0.0005 |
| | 03-Sep-2003 | 15-SH | 0.003 | < 0.0002 | < 0.0002 | 0.28 | < 0.0002 | 0.19 | < 0.0002 | 0.002 | 0.0003 | 0.0028 | < 0.0003 | 0.014 | < 0.00005 | 0.0025 | 0.0032 | < 0.1 | < 0.0002 | 5.22 | 0.0002 | 0.51 | < 0.0002 | < 0.001 | < 0.001 | 0.0016 | < 0.001 | 0.0044 | 0.0003 |
| | 08-Sep-2004 | 15-SH | 0.021 | < 0.0002 | < 0.0002 | 0.3 | < 0.0002 | 0.16 | < 0.0002 | 0.008 | < 0.0003 | 0.0025 | < 0.0003 | 0.023 | < 0.00005 | 0.0015 | 0.002 | < 0.1 | < 0.0002 | 4.89 | < 0.0001 | 0.48 | < 0.0002 | < 0.001 | 0.007 | 0.002 | < 0.001 | 0.0148 | 0.0005 |
| | 07-Sep-2005 | 15-SH | 0.002 | < 0.0002 | < 0.0002 | 0.286 | < 0.0002 | 0.15 | < 0.0002 | < 0.001 | < 0.0003 | 0.0034 | < 0.0003 | 0.026 | < 0.00005 | 0.0016 | 0.0055 | < 0.1 | < 0.0002 | 5.31 | < 0.0001 | 0.49 | < 0.0002 | < 0.001 | 0.001 | 0.0016 | < 0.001 | 0.005 | < 0.0002 |
| | 07-Sep-2006 | 15-SH | 0.001 | < 0.0002 | 0.0008 | 0.271 | < 0.0002 | 0.16 | < 0.0002 | 0.005 | 0.0005 | 0.0031 | < 0.0003 | 0.029 | < 0.00005 | 0.0016 | 0.0044 | < 0.1 | < 0.0002 | 5.27 | < 0.0001 | 0.49 | < 0.0002 | < 0.001 | < 0.001 | 0.0021 | < 0.001 | < 0.0006 | 0.0002 |
| | 06-Sep-2007 | 15-SH | 0.011 | < 0.0002 | < 0.0002 | 0.28 | < 0.001 | 0.17 | 0.00003 | 0.002 | 0.0015 | 0.0053 | < 0.0002 | 0.03 | < 0.00005 | 0.0018 | 0.0182 | < 0.1 | < 0.0002 | 5.9 | < 0.0001 | 0.48 | < 0.0002 | < 0.001 | 0.008 | 0.0015 | < 0.001 | 0.007 | --- |
| | 04-Sep-2008 | 15-SH | < 0.01 | < 0.0004 | 0.0005 | 0.128 | < 0.001 | 0.24 | < 0.00005 | < 0.005 | < 0.002 | 0.004 | < 0.0001 | 0.041 | < 0.00010 | < 0.005 | 0.007 | --- | 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0061 | < 0.001 | 0.004 | --- |
| | 10-Sep-2009 | 15-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.283 | < 0.0010 | 0.146 | 0.000015 | < 0.0050 | < 0.0020 | 0.0036 | 0.00011 | 0.028 | < 0.000020 | < 0.0050 | 0.0068 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0014 | < 0.0010 | 0.0064 | --- |
| | 09-Sep-2010 | 15 SH | < 0.0050 | < 0.00040 | 0.00058 | 0.121 | < 0.0010 | 0.246 | 0.00006 | < 0.0010 | < 0.0020 | 0.0015 | < 0.00010 | 0.037 | < 0.000020 | < 0.0050 | 0.0077 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00524 | < 0.0010 | < 0.0040 | --- |
| | 08-Sep-2011 | 15-SH | < 0.0050 | < 0.00040 | 0.00111 | 0.14 | < 0.0010 | 0.237 | 0.000014 | < 0.0010 | < 0.0020 | 0.0022 | < 0.00010 | 0.032 | < 0.000020 | < 0.0050 | 0.0054 | --- | < 0.00040 | 5.46 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00485 | < 0.0010 | < 0.0040 | --- |
| | 06-Sep-2012 | 15-SH | < 0.0050 | < 0.00040 | 0.00093 | 0.138 | < 0.0010 | 0.261 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.037 | < 0.000020 | < 0.0050 | 0.0052 | --- | < 0.00040 | 5.91 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00474 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | 15-SH | < 0.0050 | < 0.00040 | 0.00144 | 0.136 | < 0.0010 | 0.242 | 0.000016 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.035 | < 0.000020 | < 0.0050 | 0.0047 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00451 | < 0.0010 | < 0.0040 | --- |
| (Previously labeled | 17-Sep-2014 | 15-SH | 0.0016 | < 0.00010 | 0.00028 | 0.392 | < 0.00050 | 0.170 | 0.000014 | 0.00015 | 0.00052 | 0.00330 | < 0.000050 | 0.0314 | < 0.0000050 | 0.00215 | 0.00438 | < 0.30 | 0.00034 | 4.94 | < 0.0000010 | 0.508 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00204 | < 0.00010 | 0.0031 | --- |
| | 29-Sep-2015 | 15-SH | 0.0015 | <0.00010 | 0.00020 | 0.358 | --- | 0.153 | 0.0000269 | 0.00036 | --- | 0.00266 | <0.000050 | --- | <0.0000050 | --- | 0.00531 | --- | 0.000070 | --- | <0.0000010 | --- | --- | --- | --- | 0.00209 | --- | 0.0046 | --- |
| | 27-Sep-2016 | 15-SH | <0.0010 | <0.00010 | 0.00020 | 0.403 | --- | 0.168 | 0.0000164 | 0.00031 | --- | 0.00329 | <0.000050 | --- | <0.0000050 | --- | 0.00389 | --- | 0.000097 | --- | <0.0000010 | --- | --- | --- | --- | 0.00199 | --- | 0.0027 | --- |
| | 27-Sep-2017 | 15-SH | <0.0010 | <0.00010 | 0.00016 | 0.505 | --- | 0.156 | 0.0000142 | 0.00022 | --- | 0.00302 | <0.000050 | --- | <0.0000050 | --- | 0.00224 | --- | 0.000147 | --- | <0.0000010 | --- | --- | --- | --- | 0.00217 | --- | 0.0020 | --- |
| | 18-Sep-2018 | 15-SH | <0.0010 | <0.00010 | 0.00025 | 0.451 | --- | 0.183 | 0.0000202 | 0.00011 | --- | 0.00051 | <0.000050 | --- | 0.0000151 | --- | 0.00340 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.00167 | --- | 0.0017 | --- |
| | 16-Sep-2019 | 15-SH | <0.0010 | <0.00010 | 0.00019 | 0.517 | --- | 0.169 | <0.0000050 | 0.00050 | --- | 0.00449 | 0.000066 | --- | <0.0000050 | --- | 0.00266 | --- | 0.000116 | --- | <0.0000010 | --- | --- | --- | --- | 0.00225 | --- | 0.0020 | --- |
| | 21-Sep-2020 | 15-SH | <0.0010 | <0.00010 | 0.00016 | 0.446 | <0.00010 | 0.164 | 0.0000084 | 0.00018 | <0.00010 | 0.00484 | 0.000065 | 0.0307 | <0.0000050 | 0.000825 | 0.00284 | --- | 0.000147 | --- | <0.0000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00216 | <0.00050 | 0.0018 | --- |
| | 22-Sep-2021 | 15-SH | 0.0012 | <0.00010 | 0.00016 | 0.506 | <0.00010 | 0.16 | 0.0000078 | 0.00022 | 0.00032 | 0.00225 | <0.000050 | 0.0313 | <0.0000050 | 0.000741 | 0.00296 | --- | 0.000074 | --- | <0.0000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.0019 | <0.00050 | 0.0013 | --- |
| | 29-Sep-2022 | 15-SH | 0.0012 | <0.00010 | 0.00027 | 0.531 | --- | 0.176 | 0.0000074 | <0.00050 | --- | 0.00056 | <0.000050 | --- | <0.0000050 | --- | 0.06260 | --- | 0.000136 | --- | <0.0000010 | --- | --- | --- | --- | 0.00246 | --- | 0.0012 | --- |
| | 28-Sep-2023 | 15-SH | <0.0010 | <0.00010 | 0.00022 | 0.442 | --- | 0.186 | 0.0000116 | 0.0019 | --- | 0.0007 | <0.000050 | --- | <0.0000050 | --- | 0.0162 | --- | 0.000051 | --- | <0.0000010 | --- | --- | --- | --- | 0.00195 | --- | 0.002 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | --- | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **15-IN** | 22-Sep-1994 | 15-IN | --- | 0.0008 | 0.0005 | 0.11 | 0.001 | --- | < 0.003 | 0.004 | < 0.003 | 0.006 | < 0.001 | --- | 0.00005 | 0.008 | 0.025 | --- | 0.0008 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.019 | --- |
| | 28-Sep-1995 | 15-IN | --- | 0.0003 | < 0.0002 | 0.1 | < 0.001 | --- | 0.0002 | < 0.002 | 0.003 | 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 04-Sep-1996 | 15-IN | --- | < 0.0002 | 0.0002 | 0.12 | < 0.001 | --- | 0.001 | < 0.002 | < 0.003 | 0.002 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.007 | --- |
| | 04-Sep-1997 | 15-IN | --- | < 0.0002 | 0.0002 | 0.13 | < 0.001 | --- | < 0.0002 | 0.01 | 0.008 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.092 | --- | < 0.0002 | --- | 0.003 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.003 | --- |
| | 16-Sep-1998 | 15-IN | --- | < 0.0002 | < 0.0002 | 0.12 | 0.002 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.005 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.004 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 15-IN | --- | 0.0023 | 0.0005 | 0.13 | 0.003 | --- | < 0.0002 | 0.015 | < 0.003 | 0.01 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.022 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | 0.011 | 0.026 | --- |
| | 06-Sep-2000 | 15-IN | --- | < 0.0002 | 0.0004 | 0.162 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0023 | < 0.0002 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0173 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0017 | --- |
| | 06-Sep-2001 | 15-IN | --- | < 0.0002 | 0.0005 | 0.123 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0022 | 0.0009 | < 0.0003 | 0.034 | < 0.00005 | 0.002 | 0.0198 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0073 | --- |
| | 05-Sep-2002 | 15-IN | 0.006 | 0.0002 | 0.0004 | 0.121 | < 0.0002 | 0.23 | < 0.0002 | 0.032 | 0.002 | 0.0008 | < 0.0003 | --- | < 0.00005 | 0.0018 | 0.0175 | < 0.1 | < 0.0002 | 4.22 | < 0.0001 | 0.546 | < 0.0002 | < 0.001 | 0.002 | 0.0094 | 0.009 | 0.0031 | 0.0008 |
| | 03-Sep-2003 | 15-IN | 0.004 | < 0.0002 | < 0.0002 | 0.12 | < 0.0002 | 0.26 | < 0.0002 | < 0.001 | 0.0019 | 0.0022 | < 0.0003 | 0.024 | < 0.00005 | 0.0063 | 0.01 | < 0.1 | < 0.0002 | 4.59 | < 0.0001 | 0.57 | < 0.0002 | < 0.001 | < 0.001 | 0.0038 | < 0.001 | 0.0068 | < 0.0002 |
| | 08-Sep-2004 | 15-IN | 0.015 | < 0.0002 | < 0.0002 | 0.104 | < 0.0002 | 0.25 | < 0.0002 | < 0.001 | 0.001 | 0.0008 | 0.0004 | 0.03 | < 0.00005 | 0.0018 | 0.008 | < 0.1 | < 0.0002 | 4.13 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | 0.005 | 0.0045 | < 0.001 | 0.0107 | < 0.0002 |
| | 07-Sep-2005 | 15-IN | 0.001 | < 0.0002 | 0.0005 | 0.139 | < 0.0002 | 0.23 | < 0.0002 | < 0.001 | 0.0025 | 0.0008 | < 0.0003 | 0.033 | 0.00005[3] | 0.0018 | 0.0125 | < 0.1 | < 0.0002 | 4.66 | < 0.0001 | 0.57 | < 0.0002 | < 0.001 | < 0.001 | 0.0042 | < 0.001 | 0.0019 | 0.0006 |
| | 07-Sep-2006 | 15-IN | 0.002 | < 0.0002 | < 0.0002 | 0.133 | < 0.0002 | 0.23 | < 0.0002 | < 0.001 | 0.0027 | 0.0034 | < 0.0003 | 0.036 | < 0.00005 | 0.0016 | 0.0101 | < 0.1 | < 0.0002 | 4.62 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | < 0.001 | 0.0055 | < 0.001 | 0.0016 | < 0.0002 |
| | 06-Sep-2007 | 15-IN | 0.005 | < 0.0002 | 0.001 | 0.13 | < 0.001 | 0.24 | 0.00003 | 0.001 | 0.0034 | 0.0026 | < 0.0002 | 0.04 | < 0.00005 | 0.0018 | 0.0275 | < 0.1 | < 0.0002 | 5 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | 0.007 | 0.0071 | < 0.001 | 0.005 | --- |
| | 04-Sep-2008 | 15-IN | < 0.01 | < 0.0004 | < 0.0004 | 0.247 | < 0.001 | 0.14 | < 0.00005 | 0.007 | < 0.002 | 0.005 | < 0.0001 | 0.025 | < 0.00010 | < 0.005 | 0.004 | --- | 0.0005 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0015 | < 0.001 | 0.003 | --- |
| | 10-Sep-2009 | 15-IN | < 0.0050 | < 0.00040 | 0.0004 | 0.13 | < 0.0010 | 0.216 | 0.000016 | < 0.0050 | < 0.0020 | 0.0011 | < 0.00010 | 0.036 | < 0.000020 | < 0.0050 | 0.0086 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00475 | < 0.0010 | < 0.0040 | --- |
| | 09-Sep-2010 | 15 IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.251 | < 0.0010 | 0.174 | 0.00009 | 0.0031 | < 0.0020 | 0.0037 | < 0.00010 | 0.028 | < 0.000020 | < 0.0050 | 0.0065 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00137 | < 0.0010 | < 0.0040 | --- |
| | 08-Sep-2011 | 15-IN | < 0.0050 | < 0.00040 | 0.00088 | 0.286 | < 0.0010 | 0.166 | 0.00003 | 0.0045 | < 0.0020 | 0.005 | < 0.00010 | 0.024 | < 0.000020 | < 0.0050 | 0.0039 | --- | < 0.00040 | 5.85 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0014 | < 0.0010 | 0.0057 | --- |
| | 06-Sep-2012 | 15-IN | < 0.0050 | < 0.00040 | 0.00045 | 0.436 | < 0.0010 | 0.173 | < 0.000010 | < 0.0010 | 0.0039 | 0.0013 | < 0.00010 | 0.028 | < 0.000020 | < 0.0050 | 0.0182 | --- | < 0.00040 | 6.63 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00134 | < 0.0010 | 0.0071 | --- |
| | 26-Sep-2013 | 15-IN | < 0.0050 | < 0.00040 | 0.00064 | 0.383 | < 0.0010 | 0.167 | 0.000022 | < 0.0010 | < 0.0020 | 0.0033 | < 0.00010 | 0.028 | < 0.000020 | < 0.0050 | 0.0075 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00172 | < 0.0010 | 0.0053 | --- |
| **(Previously labeled '** | 17-Sep-2014 | 15-IN | < 0.0010 | < 0.00010 | 0.00025 | 0.140 | < 0.00050 | 0.257 | 0.000038 | < 0.00010 | 0.00114 | 0.00265 | < 0.000050 | 0.0378 | < 0.0000050 | 0.00160 | 0.00733 | < 0.30 | < 0.00010 | 5.23 | < 0.000010 | 0.532 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00380 | 0.00014 | 0.0014 | --- |
| | 29-Sep-2015 | 15-IN | 0.0026 | <0.00010 | 0.00021 | 0.134 | --- | 0.213 | 0.0000343 | <0.00010 | --- | 0.00252 | <0.000050 | --- | <0.0000050 | --- | 0.00593 | --- | 0.000069 | --- | <0.000010 | --- | --- | --- | --- | 0.00478 | --- | 0.0046 | --- |
| | 27-Sep-2016 | 15-IN | 0.0026 | <0.00010 | 0.00016 | 0.136 | --- | 0.244 | 0.0000476 | 0.00017 | --- | 0.00292 | <0.000050 | --- | <0.0000050 | --- | 0.00650 | --- | 0.000090 | --- | <0.000010 | --- | --- | --- | --- | 0.00449 | --- | 0.0019 | --- |
| | 27-Sep-2017 | 15-IN | 0.0028 | <0.00010 | 0.00023 | 0.165 | --- | 0.236 | 0.0000247 | 0.00044 | --- | 0.00136 | <0.000050 | --- | <0.0000050 | --- | 0.00648 | --- | 0.000060 | --- | <0.000010 | --- | --- | --- | --- | 0.00453 | --- | 0.0023 | --- |
| | 18-Sep-2018 | 15-IN | 0.0031 | <0.00010 | 0.00025 | 0.146 | --- | 0.260 | 0.0000312 | 0.00018 | --- | 0.00218 | <0.000050 | --- | 0.0000348 | --- | 0.00436 | --- | 0.000105 | --- | <0.000010 | --- | --- | --- | --- | 0.00423 | --- | 0.0041 | --- |
| **Dry** | 16-Sep-2019 | 15-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2020 | 15-IN | 0.0019 | <0.00010 | 0.00018 | 0.130 | <0.00010 | 0.239 | 0.0000279 | 0.00011 | 0.00050 | 0.00435 | 0.000052 | 0.0365 | <0.0000050 | 0.00147 | 0.00460 | --- | 0.000102 | --- | <0.000010 | --- | 0.000011 | <0.00010 | <0.00030 | 0.00428 | <0.00050 | 0.0023 | --- |
| | 22-Sep-2021 | 15-IN | 0.0015 | <0.00010 | 0.00015 | 0.144 | <0.00010 | 0.236 | 0.0000438 | 0.00052 | 0.0002 | 0.00329 | <0.000050 | 0.0394 | <0.0000050 | 0.00128 | 0.00654 | --- | 0.000158 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00414 | <0.00050 | 0.002 | --- |
| | 29-Sep-2022 | 15-IN | 0.001 | <0.00010 | 0.00014 | 0.148 | --- | 0.254 | 0.0000223 | <0.00050 | --- | 0.00315 | <0.000050 | --- | <0.0000050 | --- | 0.00504 | --- | 0.000143 | --- | <0.000010 | --- | --- | --- | --- | 0.00492 | --- | 0.0024 | --- |
| | 28-Sep-2023 | 15-IN | <0.0010 | <0.00010 | 0.00015 | 0.157 | --- | 0.252 | 0.0000304 | 0.0019 | --- | 0.00226 | <0.000050 | --- | <0.0000050 | --- | 0.00549 | --- | 0.000122 | --- | <0.000010 | --- | --- | --- | --- | 0.00426 | --- | 0.002 | --- |
| **15-SS** | 12-Nov-1993 | 15-SS | --- | 0.001 | 0.0056 | 0.08 | < 0.001 | --- | < 0.003 | 0.013 | < 0.003 | 0.005 | < 0.002 | --- | < 0.00005 | 0.041 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **15(R)SS** | 10-Sep-2004 | 15(R)-SS | 0.009 | 0.0026 | **0.0136** | 0.0608 | 0.0006 | 0.7 | 0.0004 | 0.005 | 0.0017 | 0.13 | 0.001 | 0.04 | < 0.00005 | 0.402 | 0.0257 | < 0.1 | 0.0013 | 4.91 | < 0.0001 | 0.22 | < 0.0002 | < 0.001 | 0.004 | 0.0172 | < 0.001 | 0.101 | 0.0013 |
| | 30-Oct-2004 | 15(R)-SS | 0.005 | 0.0017 | 0.0095 | 0.0786 | 0.0004 | 0.38 | 0.0003 | 0.003 | 0.002 | 0.132 | 0.0006 | 0.043 | 0.00008 | 0.268 | 0.025 | < 0.1 | 0.0007 | 5.12 | < 0.0001 | 0.25 | < 0.0002 | < 0.001 | 0.005 | 0.0163 | < 0.001 | 0.099 | 0.0006 |
| | 08-Sep-2005 | 15(R)-SS | < 0.001 | 0.0008 | **0.0493** | 0.0717 | < 0.0002 | 0.03 | 0.0004 | < 0.001 | 0.0017 | 0.454 | < 0.0003 | 0.054 | 0.00007 | 0.0568 | 0.723 | < 0.1 | 0.0003 | 5.01 | < 0.0001 | 0.25 | < 0.0002 | < 0.001 | < 0.001 | **0.0309** | < 0.001 | 1.85 | 0.0005 |
| | 12-Apr-2006 | 15(R)-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.0381 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 12-Apr-2006 | 15(R)-SS DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 0.0377 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 15(R)-SS | 0.005 | < 0.0002 | < 0.0002 | 0.0771 | < 0.0002 | 0.03 | < 0.0002 | < 0.001 | 0.0007 | 0.009 | < 0.0003 | 0.053 | 0.00021 | 0.0944 | 0.0321 | < 0.1 | < 0.0002 | 5.58 | < 0.0001 | 0.23 | < 0.0002 | < 0.001 | 0.001 | **0.0505** | < 0.001 | 0.0144 | 0.0006 |
| | 10-Dec-2006 | 15(R)-SS | 0.01 | 0.0007 | **0.0765** | 0.08 | < 0.001 | 0.04 | 0.00007 | < 0.001 | 0.0013 | 0.0174 | < 0.0002 | 0.06 | --- | 0.0931 | 0.103 | < 0.1 | < 0.0002 | 6 | < 0.0001 | 0.24 | < 0.0002 | < 0.001 | 0.004 | **0.0437** | < 0.001 | 0.078 | --- |
| | 07-Sep-2007 | 15(R)-SS | 0.004 | < 0.0002 | **0.073** | 0.08 | < 0.001 | 0.03 | 0.00005 | < 0.001 | 0.0019 | 0.0034 | < 0.0002 | 0.05 | < 0.00005 | 0.142 | 0.0444 | 0.1 | < 0.0002 | 6.6 | < 0.0001 | 0.27 | < 0.0002 | < 0.001 | 0.007 | **0.0389** | < 0.001 | 0.02 | --- |
| | 04-Sep-2008 | 15(R)-SS | < 0.01 | < 0.0004 | **0.0354** | 0.095 | < 0.001 | < 0.05 | < 0.00005 | < 0.005 | < 0.002 | 0.005 | < 0.0001 | 0.065 | < 0.00010 | 0.071 | 0.022 | --- | 0.0006 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | **0.0297** | < 0.001 | 0.006 | --- |
| | 17-Sep-2009 | 15(R)-SS | < 0.0050 | < 0.00040 | **0.0257** | 0.108 | < 0.0010 | < 0.050 | 0.00009 | < 0.0050 | 0.0055 | 0.0016 | 0.00013 | 0.053 | < 0.000020 | 0.0506 | 0.0739 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0014 | **0.0224** | < 0.0010 | 0.0204 | --- |
| | 09-Sep-2010 | 15 (R) SS | < 0.0050 | < 0.00040 | 0.00651 | 0.282 | < 0.0010 | < 0.050 | 0.000015 | 0.0022 | 0.0119 | < 0.0010 | < 0.00010 | 0.03 | < 0.000020 | 0.006 | 0.0404 | --- | 0.00067 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0029 | 0.00673 | < 0.0010 | 0.0074 | --- |
| | 08-Sep-2011 | 15 (R)-SS | < 0.0050 | < 0.00040 | 0.00802 | 0.359 | < 0.0010 | < 0.050 | < 0.000010 | 0.0011 | 0.0077 | < 0.0010 | < 0.00010 | 0.019 | < 0.000020 | 0.0077 | 0.0219 | --- | < 0.00040 | 11.7 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00484 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | 15(R)SS | < 0.0050 | < 0.00040 | **0.0220** | 0.213 | < 0.0010 | < 0.050 | < 0.000010 | 0.0012 | 0.0088 | 0.0021 | < 0.00010 | 0.023 | < 0.000020 | 0.0096 | 0.0276 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00416 | < 0.0010 | 0.0358 | --- |
| **15(2R)SS** | 16-Sep-2014 | 15(2R)SS | 0.0058 | 0.00041 | 0.00834 | 0.0419 | < 0.00050 | 0.041 | 0.000020 | 0.00018 | 0.00201 | 0.00013 | 0.000060 | 0.0168 | 0.0000079 | 0.0595 | 0.0105 | < 0.30 | 0.00016 | 10.3 | < 0.000010 | 0.199 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00561 | 0.00027 | 0.0016 | --- |
| | 28-Sep-2015 | 15(2R)SS | 0.0024 | 0.00013 | 0.00613 | 0.0258 | --- | 0.030 | 0.0000354 | <0.00010 | --- | 0.00035 | <0.000050 | --- | <0.0000050 | --- | 0.00659 | --- | 0.000071 | --- | <0.000010 | --- | --- | --- | --- | 0.00990 | --- | 0.0062 | --- |
| | 26-Sep-2016 | 15(2R)SS | 0.0010 | <0.00010 | 0.00428 | 0.0265 | --- | 0.030 | 0.0000193 | 0.00021 | --- | 0.00049 | <0.000050 | --- | <0.0000050 | --- | 0.00445 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00583 | --- | 0.0026 | --- |
| | 27-Sep-2017 | 15(2R)SS | 0.0011 | <0.00010 | 0.00420 | 0.0295 | --- | 0.029 | 0.0000114 | <0.00010 | --- | 0.00026 | <0.000050 | --- | 0.0000055 | --- | 0.00152 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00326 | --- | <0.0010 | --- |
| | 18-Sep-2018 | 15(2R)SS | <0.0010 | <0.00010 | 0.00501 | 0.0386 | --- | 0.033 | 0.0000231 | <0.00010 | --- | <0.00020 | <0.000050 | --- | 0.0000065 | --- | 0.00167 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00316 | --- | 0.0028 | --- |
| | 16-Sep-2019 | 15(2R)SS | 0.0770 | <0.00010 | 0.00406 | 0.0369 | --- | 0.031 | 0.0000078 | 0.00018 | --- | 0.00147 | <0.000050 | --- | <0.0000050 | --- | 0.00127 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00182 | --- | 0.0024 | --- |
| | 22-Sep-2020 | 15(2R)SS | 0.0018 | <0.00010 | 0.00495 | 0.0323 | <0.00010 | 0.028 | <0.0000050 | <0.00010 | 0.00042 | <0.00020 | <0.000050 | 0.0374 | <0.0000050 | 0.00256 | 0.00101 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.000765 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2021 | 15(2R)SS | 0.0031 | <0.00010 | 0.00292 | 0.0331 | <0.00010 | 0.024 | <0.0000050 | <0.00010 | 0.00027 | 0.00031 | <0.000050 | 0.0395 | <0.0000050 | 0.00255 | 0.00082 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00105 | <0.00050 | <0.0010 | --- |
| | 29-Sep-2022 | 15(2R)SS | 0.0032 | <0.00010 | 0.00316 | 0.0350 | --- | 0.034 | 0.0000052 | <0.00050 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.00087 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.001420 | --- | <0.0010 | --- |
| **Could not obtain sa** | 29-Sep-2023 | 15(2R)SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **16-SH** | 28-Sep-1995 | 16-SH | --- | 0.0002 | 0.0002 | 0.18 | < 0.001 | --- | < 0.0002 | 0.005 | 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | 0.01 | 0.014 | --- | 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 05-Sep-1996 | 16-SH | --- | < 0.0002 | < 0.0002 | 0.17 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.003 | 0.031 | < 0.0003 | --- | < 0.00005 | < 0.003 | 0.058 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.004 | 0.02 | --- |
| | 04-Sep-1997 | 16-SH | --- | 0.0002 | < 0.0002 | 0.17 | < 0.001 | --- | < 0.0002 | 0.008 | < 0.003 | 0.013 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.006 | --- |
| | 15-Sep-1998 | 16-SH | --- | 0.0002 | < 0.0002 | 0.15 | 0.002 | --- | < 0.0002 | < 0.002 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 09-Sep-1999 | 16-SH | --- | 0.0005 | < 0.0002 | 0.17 | < 0.001 | --- | < 0.0002 | 0.036 | 0.005 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.002 | --- |
| | 05-Sep-2000 | 16-SH | --- | < 0.0002 | 0.0003 | 0.147 | < 0.0002 | --- | < 0.0002 | < 0.001 | < 0.0003 | 0.0006 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0028 | --- | 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0016 | --- |
| (Duplicate) | 05-Sep-2000 | 16-SH DUP | --- | 0.0004 | 0.0002 | 0.145 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0003 | 0.0015 | < 0.0003 | --- | < 0.00005 | 0.0008 | 0.0031 | --- | 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | < 0.0006 | --- |
| | 06-Sep-2001 | 16-SH | --- | < 0.0002 | < 0.0002 | 0.148 | 0.0004 | --- | < 0.0002 | 0.004 | < 0.0003 | 0.0029 | < 0.0003 | 0.056 | < 0.00005 | 0.0012 | 0.0064 | < 0.1 | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0062 | --- |
| | 04-Sep-2002 | 16-SH | 0.007 | 0.0003 | 0.0003 | 0.163 | < 0.0002 | 0.09 | < 0.0002 | 0.016 | < 0.0003 | 0.0041 | < 0.0003 | --- | < 0.00005 | 0.0013 | 0.0064 | < 0.1 | < 0.0002 | 5.88 | < 0.0001 | 0.531 | < 0.0002 | < 0.001 | < 0.001 | 0.0061 | < 0.001 | 0.0143 | 0.0003 |
| | 04-Sep-2003 | 16-SH | 0.003 | < 0.0002 | < 0.0002 | 0.14 | < 0.0002 | 0.11 | < 0.0002 | 0.002 | < 0.0003 | 0.0042 | 0.0005 | 0.05 | < 0.00005 | 0.0158 | 0.003 | < 0.1 | < 0.0002 | 6.56 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | < 0.001 | 0.0063 | < 0.001 | 0.0074 | < 0.0002 |
| | 08-Sep-2004 | 16-SH | 0.017 | < 0.0002 | < 0.0002 | 0.136 | < 0.0002 | 0.08 | < 0.0002 | 0.007 | < 0.0003 | 0.0021 | < 0.0003 | 0.053 | < 0.00005 | 0.0012 | 0.0021 | < 0.1 | < 0.0002 | 6.64 | < 0.0001 | 0.5 | < 0.0002 | < 0.001 | 0.007 | 0.0068 | < 0.001 | 0.0026 | < 0.0002 |
| | 08-Sep-2005 | 16-SH | < 0.001 | < 0.0002 | 0.0002 | 0.153 | < 0.0002 | 0.08 | < 0.0002 | 0.002 | < 0.0003 | 0.002 | < 0.0003 | 0.06 | 0.00007 | 0.0011 | 0.0026 | < 0.1 | 0.0007 | 6.29 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | 0.001 | 0.008 | < 0.001 | 0.002 | < 0.0002 |
| | 07-Sep-2006 | 16-SH | < 0.001 | < 0.0002 | < 0.0002 | 0.149 | < 0.0002 | 0.08 | < 0.0002 | 0.013 | < 0.0003 | 0.0044 | < 0.0003 | 0.058 | 0.0003 | 0.001 | 0.0031 | < 0.1 | < 0.0002 | 5.93 | < 0.0001 | 0.52 | < 0.0002 | < 0.001 | 0.002 | 0.0081 | < 0.001 | 0.0081 | < 0.0002 |
| | 05-Sep-2007 | 16-SH | 0.027 | < 0.0002 | < 0.0002 | 0.15 | < 0.001 | 0.09 | 0.00007 | 0.016 | 0.0018 | 0.0052 | < 0.0002 | 0.06 | < 0.00005 | 0.0012 | 0.0202 | < 0.1 | 0.0002 | 6.7 | < 0.0001 | 0.53 | < 0.0002 | < 0.001 | 0.014 | 0.0077 | < 0.001 | 0.008 | --- |
| | 03-Sep-2008 | 16-SH | < 0.01 | < 0.0004 | < 0.0004 | 0.16 | < 0.001 | 0.08 | < 0.00005 | < 0.005 | < 0.002 | 0.002 | < 0.0001 | 0.064 | < 0.00010 | < 0.005 | < 0.002 | --- | 0.0011 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0096 | < 0.001 | < 0.002 | --- |
| | 10-Sep-2009 | 16-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.15 | < 0.0010 | 0.078 | 0.000013 | < 0.0050 | < 0.0020 | 0.0021 | 0.00011 | 0.061 | < 0.000020 | < 0.0050 | 0.0033 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0011 | 0.00807 | < 0.0010 | 0.0044 | --- |
| | 08-Sep-2010 | 16 SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.151 | < 0.0010 | 0.081 | < 0.000010 | 0.0124 | < 0.0020 | 0.0022 | < 0.00010 | 0.061 | < 0.000020 | < 0.0050 | 0.0041 | --- | 0.00058 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0013 | 0.00899 | < 0.0010 | 0.0105 | --- |
| | 07-Sep-2011 | 16-SH | < 0.0050 | < 0.00040 | 0.00058 | 0.151 | < 0.0010 | 0.078 | 0.000019 | 0.0174 | < 0.0020 | 0.0039 | < 0.00010 | 0.054 | < 0.000020 | < 0.0050 | 0.004 | --- | 0.00057 | 7.41 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00815 | < 0.0010 | 0.0055 | --- |
| | 05-Sep-2012 | 16-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.15 | < 0.0010 | 0.085 | < 0.000010 | 0.0157 | < 0.0020 | 0.0023 | < 0.00010 | 0.062 | < 0.000020 | < 0.0050 | < 0.0020 | --- | 0.00079 | 8.01 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00853 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | 16-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.157 | < 0.0010 | 0.071 | < 0.000010 | 0.0066 | < 0.0020 | 0.0019 | < 0.00010 | 0.061 | < 0.000020 | < 0.0050 | < 0.0020 | --- | 0.00259 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00926 | < 0.0010 | 0.0262 | --- |
| | 16-Sep-2014 | 16-SH | 0.0010 | < 0.00010 | 0.00016 | 0.166 | < 0.00050 | 0.079 | < 0.000010 | 0.00656 | < 0.00010 | 0.00134 | < 0.000050 | 0.0641 | < 0.0000050 | 0.000832 | 0.00031 | < 0.30 | 0.00096 | 8.08 | < 0.000010 | 0.497 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00971 | < 0.00010 | 0.0018 | --- |
| | 28-Sep-2015 | 16-SH | 0.0023 | <0.00010 | 0.00014 | 0.157 | --- | 0.070 | <0.0000050 | 0.00121 | --- | 0.00135 | <0.000050 | --- | <0.0000050 | --- | 0.00100 | --- | 0.000361 | --- | <0.000010 | --- | --- | --- | --- | 0.00891 | --- | 0.0061 | --- |
| | 26-Sep-2016 | 16-SH | <0.0010 | <0.00010 | 0.00016 | 0.157 | --- | 0.072 | <0.0000050 | 0.00125 | --- | 0.00130 | <0.000050 | --- | <0.0000050 | --- | 0.00084 | --- | 0.000658 | --- | <0.000010 | --- | --- | --- | --- | 0.00924 | --- | 0.0010 | --- |
| | 27-Sep-2017 | 16-SH | <0.0010 | <0.00010 | 0.00014 | 0.188 | --- | 0.083 | 0.0000064 | 0.00104 | --- | 0.00114 | <0.000050 | --- | <0.0000050 | --- | 0.00102 | --- | 0.000269 | --- | <0.000010 | --- | --- | --- | --- | 0.00899 | --- | 0.0016 | --- |
| | 18-Sep-2018 | 16-SH | 0.0011 | 0.00011 | 0.00016 | 0.204 | --- | 0.087 | 0.0000243 | 0.00440 | --- | 0.00183 | <0.000050 | --- | 0.0000335 | --- | 0.00153 | --- | 0.000232 | --- | <0.000010 | --- | --- | --- | --- | 0.00866 | --- | 0.0032 | --- |
| | 16-Sep-2019 | 16-SH | 0.0017 | <0.00010 | 0.00017 | 0.181 | --- | 0.072 | <0.0000050 | 0.00089 | --- | 0.00306 | 0.000056 | --- | <0.0000050 | --- | 0.00097 | --- | 0.000417 | --- | <0.000010 | --- | --- | --- | --- | 0.01050 | --- | 0.0021 | --- |
| | 22-Sep-2020 | 16-SH | 0.0010 | <0.00010 | 0.00016 | 0.156 | <0.00010 | 0.080 | <0.0000050 | 0.00208 | <0.00010 | 0.00302 | <0.000050 | 0.0596 | <0.0000050 | 0.000796 | 0.00111 | --- | 0.000763 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.0102 | <0.00050 | 0.0015 | --- |
| | 21-Sep-2021 | 16-SH | 0.0109 | <0.00010 | 0.00018 | 0.0905 | <0.00010 | 0.206 | 0.0000114 | 0.00062 | <0.00010 | 0.00648 | <0.000050 | 0.0634 | <0.0000050 | 0.000646 | 0.00267 | --- | 0.000391 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00424 | <0.00050 | 0.0151 | --- |
| | 28-Sep-2022 | 16-SH | <0.0010 | <0.00010 | 0.00016 | 0.181 | --- | 0.094 | <0.0000050 | 0.00286 | --- | 0.00216 | <0.000050 | --- | <0.0000050 | --- | 0.00148 | --- | 0.000296 | --- | <0.000010 | --- | --- | --- | --- | 0.0101 | --- | 0.0016 | --- |
| | 28-Sep-2023 | 16-SH | <0.0010 | <0.00010 | 0.00013 | 0.15 | --- | 0.1 | 0.0000082 | 0.00436 | --- | 0.00092 | <0.000050 | --- | <0.0000050 | --- | 0.0028 | --- | 0.000502 | --- | <0.000010 | --- | --- | --- | --- | 0.00884 | --- | 0.0023 | --- |
| **16-IN** | 05-Sep-1996 | 16-IN | --- | < 0.0002 | < 0.0002 | 0.17 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.006 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.005 | --- |
| | 04-Sep-1997 | 16-IN | --- | < 0.0002 | < 0.0002 | 0.14 | < 0.001 | --- | < 0.0002 | 0.004 | 0.004 | 0.04 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.796 | --- |
| | 15-Sep-1998 | 16-IN | --- | < 0.0002 | 0.0002 | 0.13 | 0.003 | --- | 0.0012 | < 0.002 | 0.006 | 0.01 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.064 | --- |
| | 09-Sep-1999 | 16-IN | --- | 0.0006 | 0.0004 | 0.16 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.007 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.002 | --- | < 0.0002 | --- | --- | --- | < 0.002 | 0.018 | --- |
| | 05-Sep-2000 | 16-IN | --- | < 0.0002 | 0.0004 | 0.139 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0008 | 0.0017 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.006 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0083 | --- |
| | 06-Sep-2001 | 16-IN | --- | < 0.0002 | 0.0002 | 0.197 | < 0.0002 | --- | < 0.0002 | 0.003 | < 0.0003 | 0.0508 | 0.0004 | --- | < 0.00005 | 0.0015 | 0.0055 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.174 | --- |
| | 04-Sep-2002 | 16-IN | 0.006 | 0.0004 | 0.0002 | 0.136 | < 0.0002 | 0.07 | < 0.0002 | 0.041 | 0.0003 | 0.0035 | < 0.0003 | --- | < 0.00005 | 0.0017 | 0.0084 | < 0.1 | < 0.0002 | 5.69 | < 0.0001 | 0.481 | < 0.0002 | < 0.001 | < 0.001 | 0.0059 | 0.011 | 0.0277 | 0.0004 |
| | 04-Sep-2003 | 16-IN | 0.003 | < 0.0002 | < 0.0002 | 0.149 | < 0.0002 | 0.04 | < 0.0002 | 0.006 | < 0.0003 | 0.0573 | 0.0005 | 0.03 | < 0.00005 | 0.0141 | 0.0017 | < 0.1 | < 0.0002 | 6.59 | < 0.0001 | 0.43 | < 0.0002 | < 0.001 | < 0.001 | 0.0046 | < 0.001 | 0.153 | < 0.0002 |
| | 08-Sep-2004 | 16-IN | 0.055 | < 0.0002 | < 0.0002 | 0.157 | < 0.0002 | 0.21 | < 0.0002 | 0.003 | 0.0005 | 0.165 | 0.0004 | 0.049 | < 0.00005 | 0.0032 | 0.006 | < 0.1 | < 0.0002 | 5.27 | < 0.0001 | 0.56 | < 0.0002 | < 0.001 | 0.012 | 0.0079 | < 0.001 | 0.767 | 0.0014 |
| | 08-Sep-2005 | 16-IN | < 0.001 | < 0.0002 | 0.0003 | 0.106 | < 0.0002 | 0.11 | < 0.0002 | < 0.001 | 0.0008 | 0.016 | < 0.0003 | 0.051 | < 0.00005 | 0.0032 | 0.0171 | < 0.1 | 0.0002 | 5.86 | < 0.0001 | 0.52 | < 0.0002 | < 0.001 | < 0.001 | 0.005 | < 0.001 | 0.0817 | 0.0005 |
| | 07-Sep-2006 | 16-IN | 0.001 | < 0.0002 | < 0.0002 | 0.0961 | < 0.0002 | 0.18 | 0.0002 | < 0.001 | 0.0015 | 0.0182 | < 0.0003 | 0.058 | < 0.00005 | 0.0027 | 0.0163 | < 0.1 | < 0.0002 | 5.47 | < 0.0001 | 0.59 | < 0.0002 | < 0.001 | 0.002 | 0.0051 | < 0.001 | 0.0975 | < 0.0002 |
| | 05-Sep-2007 | 16-IN | 0.033 | < 0.0002 | 0.0005 | 0.1 | < 0.001 | 0.17 | 0.00006 | < 0.001 | 0.0037 | 0.0132 | < 0.0002 | 0.05 | < 0.00005 | 0.0021 | 0.0268 | 0.1 | < 0.0002 | 5.9 | < 0.0001 | 0.61 | < 0.0002 | < 0.001 | 0.008 | 0.0046 | < 0.001 | 0.071 | --- |
| | 03-Sep-2008 | 16-IN | < 0.01 | < 0.0004 | < 0.0004 | 0.092 | < 0.001 | 0.17 | < 0.0001 | < 0.005 | < 0.002 | 0.003 | < 0.0001 | 0.062 | < 0.00010 | < 0.005 | 0.007 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0053 | < 0.001 | 0.012 | --- |
| | 10-Sep-2009 | 16-IN | < 0.0050 | < 0.00040 | 0.00098 | 0.0936 | < 0.0010 | 0.17 | 0.000014 | < 0.0050 | < 0.0020 | 0.0019 | < 0.00010 | 0.059 | < 0.000020 | < 0.0050 | 0.0064 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0048 | < 0.0010 | 0.0106 | --- |
| | 08-Sep-2010 | 16 IN | < 0.0050 | < 0.00040 | 0.00093 | 0.0879 | < 0.0010 | 0.197 | 0.000164 | 0.0022 | 0.0025 | 0.0064 | < 0.00010 | 0.061 | < 0.000020 | < 0.0050 | 0.0092 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00451 | < 0.0010 | 0.0545 | --- |
| | 07-Sep-2011 | 16-IN | < 0.0050 | < 0.00040 | 0.00152 | 0.0966 | < 0.0010 | 0.191 | 0.000019 | < 0.0010 | 0.0025 | 0.0052 | < 0.00010 | 0.051 | < 0.000020 | < 0.0050 | 0.0075 | --- | < 0.00040 | 6.89 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.0027 | < 0.0010 | 0.0492 | --- |
| | 05-Sep-2012 | 16-IN | < 0.0050 | < 0.00040 | 0.00125 | 0.0885 | < 0.0010 | 0.209 | 0.000011 | < 0.0010 | < 0.0020 | 0.0026 | < 0.00010 | 0.062 | < 0.000020 | < 0.0050 | 0.007 | --- | < 0.00040 | 7 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00524 | < 0.0010 | 0.0297 | --- |
| | 26-Sep-2013 | 16-IN | < 0.0050 | < 0.00040 | 0.00126 | 0.0907 | < 0.0010 | 0.180 | 0.000019 | < 0.0010 | < 0.0020 | 0.0344 | < 0.00010 | 0.065 | < 0.000020 | < 0.0050 | 0.0029 | --- | 0.00056 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00862 | < 0.0010 | 0.0386 | --- |
| | 16-Sep-2014 | 16-IN | 0.0025 | < 0.00010 | 0.00033 | 0.105 | < 0.00050 | 0.205 | 0.000018 | < 0.00010 | 0.00115 | 0.0243 | < 0.000050 | 0.0643 | < 0.0000050 | 0.00149 | 0.00342 | < 0.30 | 0.00050 | 5.27 | < 0.000010 | 0.630 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00460 | < 0.00010 | 0.0247 | --- |
| | 28-Sep-2015 | 16-IN | 0.0036 | <0.00010 | 0.00027 | 0.0912 | --- | 0.196 | 0.0000409 | <0.00010 | --- | 0.0517 | <0.000050 | --- | <0.0000050 | --- | 0.00397 | --- | 0.000431 | --- | <0.000010 | --- | --- | --- | --- | 0.00490 | --- | 0.0546 | --- |
| | 26-Sep-2016 | 16-IN | 0.0044 | <0.00010 | 0.00022 | 0.0898 | --- | 0.203 | 0.0000292 | 0.00016 | --- | 0.0077 | <0.000050 | --- | <0.0000050 | --- | 0.00284 | --- | 0.000715 | --- | <0.000010 | --- | --- | --- | --- | 0.00473 | --- | 0.0106 | --- |
| | 27-Sep-2017 | 16-IN | 0.1720 | <0.00010 | 0.00041 | 0.1040 | --- | 0.213 | 0.0000681 | 0.00076 | --- | 0.0683 | 0.000096 | --- | <0.0000050 | --- | 0.00519 | --- | 0.000217 | --- | <0.000010 | --- | --- | --- | --- | 0.00430 | --- | 0.0737 | --- |
| | 18-Sep-2018 | 16-IN | 0.0022 | <0.00010 | 0.00023 | 0.0967 | --- | 0.226 | 0.0000601 | 0.00052 | --- | 0.0253 | <0.000050 | --- | <0.0000050 | --- | 0.00448 | --- | 0.000126 | --- | <0.000010 | --- | --- | --- | --- | 0.00422 | --- | 0.0275 | --- |
| **Dry** | 16-Sep-2019 | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 16-IN | 0.0029 | <0.00010 | 0.00021 | 0.0908 | <0.00010 | 0.197 | 0.0000074 | 0.00036 | 0.00015 | 0.00454 | <0.000050 | 0.0597 | <0.0000050 | 0.000640 | 0.00261 | --- | 0.000898 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00477 | <0.00050 | 0.0093 | --- |
| | 21-Sep-2021 | 16-IN | <0.0010 | <0.00010 | 0.00015 | 0.179 | <0.00010 | 0.075 | <0.0000050 | 0.00227 | <0.00010 | 0.00224 | <0.000050 | 0.0656 | <0.0000050 | 0.00064 | 0.00106 | --- | 0.000916 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00914 | <0.00050 | 0.0012 | --- |
| | 28-Sep-2022 | 16-IN | 0.0016 | <0.00010 | 0.00022 | 0.1060 | --- | 0.215 | 0.0000070 | 0.00053 | --- | 0.00577 | <0.000050 | --- | <0.0000050 | --- | 0.00169 | --- | 0.001090 | --- | <0.000010 | --- | --- | --- | --- | 0.00502 | --- | 0.0076 | --- |
| **Dry** | 28-Sep-2023 | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | --- | --- | **7.0** | --- | --- | --- | **0.02** | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | **0.006** | **0.01** | **1** | --- | **5** | **0.005** | --- | --- | **1** | **0.01** | --- | **0.001** | --- | --- | | **0.05** | | --- | | --- | --- | --- | **0.02** | --- | **5** | --- |
| **Alberta Tier 2 Aquatic 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** | --- |
| **17-SH** | 01-Nov-1994 | 17-SH | --- | 0.0013 | 0.0004 | 0.2 | < 0.001 | --- | < 0.003 | < 0.002 | 0.003 | 0.045 | < 0.001 | --- | < 0.00005 | < 0.003 | 0.015 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.002 | 0.016 | --- |
| | 28-Sep-1995 | 17-SH | --- | 0.0002 | 0.0004 | 0.22 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.007 | < 0.0003 | --- | < 0.00005 | 0.007 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.013 | --- |
| **(Duplicate)** | 28-Sep-1995 | 17-SH DUP | --- | 0.0002 | 0.0003 | 0.22 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.005 | 0.003 | < 0.0003 | --- | < 0.00005 | 0.007 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.006 | --- |
| | 04-Sep-1996 | 17-SH | --- | < 0.0002 | 0.0002 | 0.17 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.007 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.002 | 0.016 | --- |
| | 04-Sep-1997 | 17-SH | --- | < 0.0002 | < 0.0002 | 0.23 | < 0.001 | --- | < 0.0002 | < 0.002 | 0.005 | 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.006 | --- |
| | 16-Sep-1998 | 17-SH | --- | < 0.0002 | 0.0002 | 0.21 | 0.001 | --- | 0.0002 | < 0.002 | < 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.002 | --- |
| | 09-Sep-1999 | 17-SH | --- | 0.0003 | 0.0002 | 0.24 | < 0.001 | --- | < 0.0002 | 0.024 | < 0.003 | 0.002 | < 0.0003 | --- | < 0.00005 | 0.005 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | --- | --- | --- | --- | < 0.002 | 0.003 | --- |
| | 06-Sep-2000 | 17-SH | --- | < 0.0002 | 0.0002 | 0.214 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0004 | 0.0008 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0028 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0012 | --- |
| | 06-Sep-2001 | 17-SH | --- | < 0.0002 | 0.0002 | 0.229 | 0.0002 | --- | 0.0003 | < 0.001 | 0.0004 | 0.0034 | 0.0006 | --- | < 0.00005 | 0.0024 | 0.0037 | --- | < 0.0002 | --- | 0.0003 | --- | 0.0003 | --- | --- | --- | < 0.001 | 0.0114 | --- |
| | 05-Sep-2002 | 17-SH | 0.007 | 0.0003 | 0.0003 | 0.234 | < 0.0002 | 0.08 | < 0.0002 | < 0.001 | < 0.0003 | 0.0031 | < 0.0003 | --- | < 0.00005 | 0.0014 | 0.0025 | --- | < 0.0002 | 6.06 | < 0.0001 | 0.373 | < 0.0002 | < 0.001 | < 0.001 | 0.0045 | < 0.001 | 0.0034 | 0.0005 |
| | 03-Sep-2003 | 17-SH | 0.005 | < 0.0002 | < 0.0002 | 0.206 | < 0.0002 | 0.06 | < 0.0002 | < 0.001 | < 0.0003 | 0.0025 | 0.0006 | 0.018 | < 0.00005 | 0.0136 | < 0.0005 | < 0.1 | < 0.0002 | 7.23 | < 0.0001 | 0.35 | < 0.0002 | < 0.001 | < 0.001 | 0.0046 | < 0.001 | 0.0142 | < 0.0002 |
| | 08-Sep-2004 | 17-SH | 0.009 | < 0.0002 | < 0.0002 | 0.226 | 0.0008 | 0.63 | < 0.0002 | 0.005 | < 0.0003 | 0.0038 | < 0.0003 | 0.026 | < 0.00005 | 0.0022 | 0.0021 | < 0.1 | 0.0006 | 6.5 | < 0.0001 | 0.34 | < 0.0002 | < 0.001 | 0.007 | 0.0051 | < 0.001 | 0.0053 | 0.0008 |
| | 07-Sep-2005 | 17-SH | 0.006 | < 0.0002 | < 0.0002 | 0.204 | < 0.0002 | 0.06 | < 0.0002 | 0.002 | < 0.0003 | 0.0027 | < 0.0003 | 0.031 | < 0.00005 | 0.0014 | 0.0012 | < 0.1 | 0.0009 | 6.29 | < 0.0001 | 0.35 | < 0.0002 | < 0.001 | 0.001 | 0.0046 | < 0.001 | 0.003 | 0.0002 |
| | 07-Sep-2006 | 17-SH | 0.002 | < 0.0002 | < 0.0002 | 0.229 | < 0.0002 | 0.07 | < 0.0002 | 0.002 | < 0.0003 | 0.0059 | < 0.0003 | 0.03 | < 0.00005 | 0.0015 | 0.0018 | < 0.1 | < 0.0002 | 6.47 | < 0.0001 | 0.33 | < 0.0002 | < 0.001 | 0.002 | 0.0045 | < 0.001 | 0.009 | < 0.0002 |
| | 06-Sep-2007 | 17-SH | 0.006 | < 0.0002 | < 0.0002 | 0.2 | < 0.001 | 0.05 | 0.00004 | 0.002 | 0.0012 | 0.0043 | < 0.0002 | 0.02 | < 0.00005 | 0.0011 | 0.0132 | < 0.1 | 0.0002 | 5.8 | < 0.0001 | 0.28 | < 0.0002 | < 0.001 | 0.01 | 0.0037 | < 0.001 | 0.009 | --- |
| | 04-Sep-2008 | 17-SH | < 0.01 | < 0.0004 | < 0.0004 | 0.248 | < 0.001 | 0.05 | < 0.00005 | < 0.005 | < 0.002 | 0.004 | < 0.0001 | 0.033 | < 0.00010 | < 0.005 | < 0.002 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0052 | < 0.001 | 0.004 | --- |
| | 10-Sep-2009 | 17-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.247 | < 0.0010 | 0.055 | 0.000027 | < 0.0050 | < 0.0020 | 0.0024 | 0.00011 | 0.032 | < 0.000020 | < 0.0050 | 0.0026 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0011 | 0.00455 | < 0.0010 | 0.0052 | --- |
| | 09-Sep-2010 | 17 SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.236 | < 0.0010 | 0.056 | 0.000159 | 0.0014 | < 0.0020 | 0.0024 | < 0.00010 | 0.032 | < 0.000020 | < 0.0050 | 0.0031 | --- | 0.00165 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0011 | 0.00467 | < 0.0010 | < 0.0040 | --- |
| | 08-Sep-2011 | 17-SH | 0.0391 | < 0.00040 | < 0.00040 | 0.275 | < 0.0010 | 0.052 | 0.000023 | < 0.0010 | < 0.0020 | 0.0026 | < 0.00010 | 0.028 | < 0.000020 | < 0.0050 | < 0.0020 | --- | 0.00054 | 8.72 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00431 | < 0.0010 | 0.0041 | --- |
| | 06-Sep-2012 | 17-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.235 | < 0.0010 | 0.051 | 0.000019 | 0.0034 | < 0.0020 | 0.0025 | < 0.00010 | 0.026 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | 6.68 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00378 | < 0.0010 | 0.0051 | --- |
| | 26-Sep-2013 | 17-SH | < 0.0050 | < 0.00040 | < 0.00040 | 0.281 | < 0.0010 | 0.071 | 0.000026 | < 0.0010 | < 0.0020 | 0.0028 | < 0.00010 | 0.034 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00410 | < 0.0010 | 0.0046 | --- |
| | 17-Sep-2014 | 17-SH | < 0.0010 | < 0.00010 | 0.00013 | 0.293 | < 0.00050 | 0.069 | 0.000020 | 0.00023 | < 0.00010 | 0.00174 | < 0.000050 | 0.0355 | < 0.000050 | 0.000877 | 0.00020 | < 0.30 | < 0.00010 | 9.03 | < 0.000010 | 0.400 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00446 | 0.00011 | 0.0020 | --- |
| | 29-Sep-2015 | 17-SH | 0.0080 | <0.00010 | 0.00010 | 0.263 | --- | 0.054 | 0.0000216 | 0.00029 | --- | 0.00155 | <0.000050 | --- | <0.0000050 | --- | 0.00108 | --- | 0.000088 | --- | <0.000010 | --- | --- | --- | --- | 0.00587 | --- | 0.0043 | --- |
| | 27-Sep-2016 | 17-SH | <0.0010 | <0.00010 | 0.00013 | 0.306 | --- | 0.072 | 0.0000216 | 0.00037 | --- | 0.00119 | <0.000050 | --- | <0.0000050 | --- | 0.00106 | --- | 0.000079 | --- | <0.000010 | --- | --- | --- | --- | 0.00548 | --- | 0.0016 | --- |
| | 27-Sep-2017 | 17-SH | <0.0010 | <0.00010 | 0.00011 | 0.340 | --- | 0.059 | 0.0000155 | 0.00040 | --- | 0.00126 | <0.000050 | --- | <0.0000050 | --- | 0.00096 | --- | 0.000071 | --- | <0.000010 | --- | --- | --- | --- | 0.00486 | --- | 0.0016 | --- |
| | 18-Sep-2018 | 17-SH | <0.0010 | <0.00010 | 0.00012 | 0.321 | --- | 0.076 | 0.0000182 | 0.00052 | --- | 0.00109 | <0.000050 | --- | 0.0000165 | --- | 0.00115 | --- | 0.000096 | --- | <0.000010 | --- | --- | --- | --- | 0.00523 | --- | 0.0020 | --- |
| | 17-Sep-2019 | 17-SH | 0.0063 | 0.00012 | 0.00015 | 0.289 | --- | 0.059 | 0.0000139 | 0.00061 | --- | 0.00273 | <0.000050 | --- | <0.0000050 | --- | 0.00073 | --- | 0.000102 | --- | <0.000010 | --- | --- | --- | --- | 0.00376 | --- | 0.0049 | --- |
| | 21-Sep-2020 | 17-SH | 0.0013 | 0.00013 | 0.00020 | 0.244 | <0.00010 | 0.053 | 0.0000123 | 0.00057 | <0.00010 | 0.00108 | <0.000050 | 0.0300 | <0.0000050 | 0.00135 | 0.00063 | --- | 0.000072 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00337 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2021 | 17-SH | <0.0010 | 0.00011 | 0.00012 | 0.257 | <0.00010 | 0.055 | 0.000008 | 0.00066 | <0.00010 | 0.00111 | <0.000050 | 0.033 | <0.0000050 | 0.00113 | 0.00062 | --- | 0.000221 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00366 | <0.00050 | <0.0010 | --- |
| | 29-Sep-2022 | 17-SH | 0.0840 | 0.00031 | 0.00040 | 0.259 | --- | 0.060 | 0.0000114 | 0.00078 | --- | 0.00179 | <0.000050 | --- | <0.0000050 | --- | 0.00087 | --- | 0.000161 | --- | <0.000010 | --- | --- | --- | --- | 0.00494 | --- | 0.0012 | --- |
| | 28-Sep-2023 | 17-SH | <0.0010 | 0.00011 | 0.00016 | 0.254 | --- | 0.064 | 0.0000139 | 0.00259 | --- | 0.00119 | <0.000050 | --- | <0.0000050 | --- | 0.00218 | --- | 0.000112 | --- | <0.000010 | --- | --- | --- | --- | 0.00443 | --- | 0.0015 | --- |
| **17-IN** | 28-Sep-1995 | 17-IN | --- | 0.0006 | 0.0007 | 0.11 | < 0.001 | --- | < 0.0002 | 0.003 | < 0.003 | 0.003 | < 0.0003 | --- | < 0.00005 | 0.01 | 0.04 | --- | 0.0002 | --- | < 0.002 | --- | < 0.0003 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 04-Sep-1996 | 17-IN | --- | < 0.0002 | 0.0008 | 0.1 | < 0.001 | --- | < 0.0002 | < 0.002 | < 0.003 | 0.007 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | 0.002 | 0.007 | --- |
| | 04-Sep-1997 | 17-IN | --- | < 0.0002 | 0.0006 | 0.09 | 0.001 | --- | < 0.0002 | 0.012 | 0.006 | 0.009 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | 0.006 | --- | < 0.001 | --- | --- | --- | 0.005 | 0.007 | --- |
| | 16-Sep-1998 | 17-IN | --- | < 0.0002 | 0.0003 | 0.08 | 0.003 | --- | 0.0003 | < 0.002 | 0.004 | 0.01 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.001 | --- | --- | --- | < 0.002 | 0.001 | --- |
| | 09-Sep-1999 | 17-IN | --- | 0.0005 | 0.0003 | 0.1 | 0.001 | --- | < 0.0002 | 0.005 | < 0.003 | < 0.001 | < 0.0003 | --- | < 0.00005 | < 0.003 | < 0.005 | --- | < 0.0002 | --- | < 0.002 | --- | < 0.0002 | --- | --- | --- | < 0.002 | < 0.001 | --- |
| | 06-Sep-2000 | 17-IN | --- | < 0.0002 | 0.0004 | 0.0694 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0015 | < 0.0002 | < 0.0003 | --- | < 0.00005 | < 0.0002 | 0.0103 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | < 0.0006 | --- |
| | 06-Sep-2001 | 17-IN | --- | < 0.0002 | 0.0002 | 0.109 | < 0.0002 | --- | < 0.0002 | < 0.001 | 0.0016 | 0.0023 | < 0.0003 | --- | < 0.00005 | 0.0018 | 0.0101 | --- | < 0.0002 | --- | < 0.0001 | --- | < 0.0002 | --- | --- | --- | < 0.001 | 0.0105 | --- |
| | 05-Sep-2002 | 17-IN | 0.009 | 0.0008 | 0.0004 | 0.0825 | < 0.0002 | 0.24 | < 0.0002 | 0.039 | 0.0022 | 0.0014 | < 0.0003 | --- | < 0.00005 | 0.0015 | 0.0101 | < 0.1 | < 0.0002 | 5.11 | < 0.0001 | 0.583 | < 0.0002 | < 0.001 | 0.001 | 0.0045 | 0.011 | 0.015 | 0.0002 |
| | 03-Sep-2003 | 17-IN | < 0.001 | < 0.0002 | < 0.0002 | 0.0757 | < 0.0002 | 0.29 | < 0.0002 | < 0.001 | 0.0006 | 0.0035 | < 0.0003 | 0.03 | < 0.00005 | 0.0071 | 0.0057 | < 0.1 | < 0.0002 | 5.29 | < 0.0001 | 0.64 | < 0.0002 | < 0.001 | < 0.001 | 0.0037 | < 0.001 | 0.008 | < 0.0002 |
| | 08-Sep-2004 | 17-IN | 0.019 | < 0.0002 | < 0.0002 | 0.0782 | 0.0017 | 0.32 | < 0.0002 | 0.001 | 0.0005 | 0.0023 | 0.0003 | 0.037 | < 0.00005 | 0.0015 | 0.003 | < 0.1 | < 0.0002 | 4.97 | < 0.0001 | 0.6 | < 0.0002 | < 0.001 | 0.009 | 0.0047 | < 0.001 | 0.0087 | 0.0002 |
| | 07-Sep-2005 | 17-IN | 0.003 | < 0.0002 | 0.0003 | 0.0728 | < 0.0002 | 0.25 | < 0.0002 | < 0.001 | 0.0009 | 0.0031 | < 0.0003 | 0.044 | 0.00005 | 0.0015 | 0.0056 | < 0.1 | < 0.0002 | 5.11 | < 0.0001 | 0.61 | < 0.0002 | < 0.001 | 0.001 | 0.0043 | < 0.001 | 0.0047 | < 0.0002 |
| | 07-Sep-2006 | 17-IN | 0.001 | < 0.0002 | < 0.0002 | 0.0745 | < 0.0002 | 0.29 | < 0.0002 | < 0.001 | 0.0017 | 0.0026 | < 0.0003 | 0.043 | 0.00015 | 0.0016 | 0.0051 | < 0.1 | < 0.0002 | 5.39 | < 0.0001 | 0.6 | < 0.0002 | < 0.001 | 0.002 | 0.0045 | < 0.001 | 0.0081 | 0.0027 |
| | 06-Sep-2007 | 17-IN | 0.002 | < 0.0002 | < 0.0002 | 0.06 | < 0.001 | 0.23 | 0.00005 | 0.001 | 0.0015 | 0.0026 | < 0.0002 | 0.03 | < 0.00005 | 0.0012 | 0.0068 | < 0.1 | < 0.0002 | 5.2 | < 0.0001 | 0.55 | < 0.0002 | < 0.001 | 0.004 | 0.004 | < 0.001 | 0.005 | --- |
| | 04-Sep-2008 | 17-IN | < 0.01 | < 0.0004 | < 0.0004 | 0.071 | < 0.001 | 0.25 | < 0.00005 | < 0.005 | < 0.002 | 0.004 | < 0.0001 | 0.045 | < 0.00010 | < 0.005 | 0.004 | --- | 0.0005 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0049 | < 0.001 | 0.002 | --- |
| | 10-Sep-2009 | 17-IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.069 | < 0.0010 | 0.244 | 0.000013 | < 0.0050 | < 0.0020 | 0.0035 | 0.0001 | 0.043 | < 0.000020 | < 0.0050 | 0.0047 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00422 | < 0.0010 | 0.0057 | --- |
| | 09-Sep-2010 | 17 IN | 0.009 | < 0.00040 | < 0.00040 | 0.0664 | < 0.0010 | 0.266 | 0.000109 | < 0.0010 | < 0.0020 | 0.003 | < 0.00010 | 0.045 | < 0.000020 | < 0.0050 | 0.006 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00414 | < 0.0010 | 0.0056 | --- |
| | 08-Sep-2011 | 17-IN | < 0.0050 | < 0.00040 | 0.00077 | 0.0748 | < 0.0010 | 0.261 | 0.000017 | < 0.0010 | < 0.0020 | 0.0028 | < 0.00010 | 0.038 | < 0.000020 | < 0.0050 | 0.0035 | --- | < 0.00040 | 6.08 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00424 | < 0.0010 | < 0.0040 | --- |
| | 06-Sep-2012 | 17-IN | < 0.0050 | < 0.00040 | < 0.00040 | 0.0695 | < 0.0010 | 0.275 | 0.000012 | < 0.0010 | < 0.0020 | 0.0017 | < 0.00010 | 0.044 | < 0.000020 | < 0.0050 | 0.0027 | --- | < 0.00040 | 6.81 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00415 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | 17-IN | < 0.0050 | < 0.00040 | 0.00106 | 0.0831 | < 0.0010 | 0.247 | 0.000036 | < 0.0010 | < 0.0020 | 0.0022 | < 0.00010 | 0.046 | < 0.000020 | < 0.0050 | 0.0024 | --- | 0.00096 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00576 | < 0.0010 | < 0.0040 | --- |
| | 17-Sep-2014 | 17-IN | < 0.0010 | < 0.00010 | 0.00044 | 0.0785 | < 0.00050 | 0.253 | 0.000030 | < 0.00010 | 0.00099 | 0.00221 | < 0.000050 | 0.0490 | 0.0000076 | 0.00199 | 0.00316 | < 0.30 | 0.00059 | 5.04 | < 0.000010 | 0.646 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00493 | < 0.00010 | 0.0014 | --- |
| | 29-Sep-2015 | 17-IN | 0.0021 | <0.00010 | 0.00035 | 0.0711 | --- | 0.232 | 0.0000314 | <0.00010 | --- | 0.00198 | <0.000050 | --- | 0.0000050 | --- | 0.00360 | --- | 0.000105 | --- | <0.000010 | --- | --- | --- | --- | 0.00515 | --- | 0.0042 | --- |
| | 27-Sep-2016 | 17-IN | 0.0023 | <0.00010 | 0.00027 | 0.0772 | --- | 0.262 | 0.0000443 | 0.00027 | --- | 0.00232 | <0.000050 | --- | <0.0000050 | --- | 0.00410 | --- | 0.000171 | --- | <0.000010 | --- | --- | --- | --- | 0.00497 | --- | 0.0022 | --- |
| | 27-Sep-2017 | 17-IN | <0.0010 | <0.00010 | 0.00022 | 0.0768 | --- | 0.248 | 0.0000412 | 0.00024 | --- | 0.00223 | <0.000050 | --- | <0.0000050 | --- | 0.00364 | --- | 0.000076 | --- | <0.000010 | --- | --- | --- | --- | 0.00482 | --- | 0.0019 | --- |
| | 18-Sep-2018 | 17-IN | 0.0018 | <0.00010 | 0.00025 | 0.0831 | --- | 0.280 | 0.0000246 | 0.001 | --- | 0.00175 | <0.000050 | --- | 0.0000068 | --- | 0.00314 | --- | 0.000091 | --- | <0.000010 | --- | --- | --- | --- | 0.00461 | --- | 0.0035 | --- |
| | 17-Sep-2019 | 17-IN | 0.0013 | <0.00010 | 0.00018 | 0.0698 | --- | 0.244 | 0.0000101 | 0.00019 | --- | 0.00178 | <0.000050 | --- | <0.0000050 | --- | 0.00232 | --- | 0.000178 | --- | <0.000010 | --- | --- | --- | --- | 0.00476 | --- | <0.0010 | --- |
| | 21-Sep-2020 | 17-IN | 0.0016 | <0.00010 | 0.00018 | 0.0735 | <0.00010 | 0.262 | 0.0000279 | 0.00090 | 0.00023 | 0.00357 | <0.000050 | 0.0430 | <0.0000050 | 0.000847 | 0.00288 | --- | 0.000106 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00441 | <0.00050 | 0.0017 | --- |
| | 22-Sep-2021 | 17-IN | <0.0010 | <0.00010 | 0.00021 | 0.0746 | <0.00010 | 0.249 | 0.000034 | 0.00025 | 0.00028 | 0.0019 | <0.000050 | 0.0452 | <0.0000050 | 0.000904 | 0.00346 | --- | 0.000069 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00405 | <0.00050 | 0.0011 | --- |
| | 29-Sep-2022 | 17-IN | <0.0010 | <0.00010 | 0.00020 | 0.0758 | --- | 0.264 | 0.0000185 | <0.00050 | --- | 0.00157 | <0.000050 | --- | <0.0000050 | --- | 0.00223 | --- | 0.000093 | --- | <0.000010 | --- | --- | --- | --- | 0.00471 | --- | 0.0012 | --- |
| | 28-Sep-2023 | 17-IN | <0.0010 | <0.00010 | 0.00018 | 0.122 | --- | 0.21 | 0.0000088 | 0.00494 | --- | 0.00113 | <0.000050 | --- | <0.0000050 | --- | 0.00249 | --- | 0.000116 | --- | <0.000010 | --- | --- | --- | --- | 0.00452 | --- | 0.0015 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | **---** | **---** | **7.0** | **---** | **---** | **---** | **0.02** | **---** | **---** | **---** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **---** | **0.006** | **0.01** | **1** | **---** | **5** | **0.005** | **---** | **---** | **1** | **0.01** | **---** | **0.001** | **---** | **---** | | **0.05** | | **---** | | **---** | **---** | **---** | **0.02** | **---** | **5** | **---** |
| **Alberta Tier 2 Aquatic 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** | **---** |
| **M-5** | 01-Oct-2001 | M-5 | < 0.001 | < 0.0002 | 0.0027 | 0.0452 | 0.0003 | < 0.01 | < 0.0002 | 0.013 | < 0.0003 | 0.0002 | < 0.0003 | 0.077 | < 0.00005 | 0.0004 | 0.0006 | < 0.1 | < 0.0002 | 11.4 | < 0.0001 | 0.338 | < 0.0002 | < 0.001 | < 0.001 | < 0.0004 | 0.004 | 0.0039 | 0.0006 |
| | 23-Sep-2002 | M-5 | < 0.001 | < 0.0002 | 0.0027 | 0.128 | < 0.0002 | 0.03 | < 0.0002 | < 0.001 | 0.0003 | 0.0026 | 0.0019 | 0.09 | < 0.00005 | 0.0004 | 0.0018 | 0.2 | < 0.0002 | 12.7 | < 0.0001 | 0.346 | < 0.0002 | < 0.001 | < 0.001 | < 0.0004 | < 0.001 | 0.61 | 0.0006 |
| | 18-Oct-2003 | M-5 | 0.002 | < 0.0002 | 0.0008 | 0.0493 | < 0.0002 | 0.98 | < 0.0002 | < 0.001 | 0.0006 | 0.0007 | < 0.0003 | 0.017 | < 0.00005 | 0.0024 | 0.0039 | < 0.1 | < 0.0002 | 4.7 | < 0.0001 | 0.15 | < 0.0002 | < 0.001 | < 0.001 | < 0.0004 | < 0.001 | 1.97 | 0.0057 |
| | 26-Oct-2004 | M-5 | 0.013 | < 0.0002 | 0.0002 | 0.109 | < 0.0002 | 0.19 | < 0.0002 | 0.008 | 0.0005 | 0.0035 | 0.0003 | 0.05 | < 0.00005 | 0.001 | 0.0052 | < 0.1 | < 0.0002 | 10.1 | 0.0005 | 0.33 | < 0.0002 | < 0.001 | 0.007 | 0.0006 | < 0.001 | 1.81 | < 0.0002 |
| | 24-Oct-2005 | M-5 | 0.003 | < 0.0002 | 0.0002 | 0.0677 | < 0.0002 | 0.02 | < 0.0002 | < 0.001 | 0.0006 | 0.0051 | < 0.0003 | 0.055 | < 0.00005 | 0.0065 | 0.0017 | < 0.1 | < 0.0002 | 1.08 | < 0.0001 | 0.2 | < 0.0002 | < 0.001 | < 0.001 | < 0.0004 | < 0.001 | 0.0144 | 0.0003 |
| | 12-Sep-2007 | M-5 | 0.005 | < 0.0002 | < 0.0002 | 0.08 | < 0.001 | < 0.02 | < 0.00001 | < 0.001 | 0.0038 | 0.0048 | < 0.0002 | 0.07 | 0.00001 | 0.0006 | 0.0099 | < 0.1 | < 0.0002 | 10 | < 0.0001 | 0.25 | < 0.0002 | < 0.001 | 0.004 | < 0.0001 | < 0.001 | **8.04** | --- |
| | 08-Oct-2008 | M-5 | < 0.01 | < 0.0004 | < 0.0004 | 0.079 | < 0.001 | < 0.05 | < 0.0001 | < 0.005 | < 0.002 | 0.002 | 0.0001 | 0.087 | < 0.00010 | < 0.005 | < 0.002 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | < 0.0001 | < 0.001 | 0.511 | --- |
| | 11-Sep-2009 | M-5 | < 0.0050 | < 0.00040 | < 0.00040 | 0.0816 | < 0.0010 | < 0.050 | 0.000012 | < 0.0050 | < 0.0020 | 0.0013 | 0.00013 | 0.076 | < 0.000020 | < 0.0050 | 0.0023 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | 0.0019 | < 0.00010 | < 0.0010 | 1.05 | --- |
| **M-6** | 02-Oct-2001 | M-6 | 0.006 | < 0.0002 | 0.0034 | 0.123 | 0.0004 | < 0.01 | < 0.0002 | < 0.001 | 0.0004 | 0.0009 | 0.0019 | 0.042 | < 0.00005 | 0.0005 | 0.002 | < 0.1 | < 0.0002 | 13 | < 0.0001 | 0.244 | < 0.0002 | < 0.001 | 0.001 | < 0.0004 | < 0.001 | 0.601 | < 0.0002 |
| | 29-Sep-2010 | M-6 | < 0.0050 | < 0.00040 | 0.00046 | 0.168 | < 0.0010 | < 0.050 | 0.000366 | < 0.0010 | 0.0027 | 0.0035 | < 0.00010 | 0.035 | < 0.000020 | < 0.0050 | 0.0072 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | < 0.00010 | < 0.0010 | 0.828 | --- |
| | 16-Dec-2011 | M6 | 0.0062 | < 0.00040 | **0.0236** | 0.0869 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | 0.0068 | < 0.0010 | 0.00027 | < 0.010 | < 0.000020 | < 0.0050 | 0.0174 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00063 | < 0.0010 | 0.979 | --- |
| **89-1** | 27-Jun-2006 | 89-1 | < 0.001 | --- | < 0.005 | --- | --- | --- | --- | --- | --- | < 0.005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Oct-2008 | 89-1 | < 0.01 | < 0.0004 | < 0.0004 | 0.043 | < 0.001 | 2.94 | < 0.0001 | < 0.005 | < 0.002 | 0.003 | 0.0002 | 0.053 | < 0.00010 | < 0.005 | 0.004 | --- | < 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0001 | < 0.001 | 0.005 | --- |
| **99-1** | 27-Jun-2006 | 99-1 | < 0.001 | --- | < 0.005 | --- | --- | --- | --- | --- | --- | < 0.005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **86-2** | 27-Jun-2006 | 86-2 | < 0.001 | --- | < 0.005 | --- | --- | --- | --- | --- | --- | < 0.005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **86-3** | 27-Jun-2006 | 86-3 | < 0.001 | --- | < 0.005 | --- | --- | --- | --- | --- | --- | < 0.005 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **89-3** | 24-Sep-2002 | 89-3 | 0.095 | < 0.0002 | 0.0036 | 0.108 | < 0.0002 | 0.02 | 0.0169 | 0.009 | 0.0061 | 0.0033 | **0.134** | 0.054 | < 0.00005 | 0.0003 | 0.0287 | 0.2 | < 0.0002 | 12.5 | < 0.0001 | 0.203 | 0.0057 | < 0.001 | 0.002 | 0.0007 | 0.005 | 4.23 | 0.0004 |
| | 14-Oct-2003 | 89-3 | 0.001 | 0.0006 | 0.0002 | 0.0645 | < 0.0002 | 0.02 | < 0.0002 | < 0.001 | 0.0013 | < 0.0002 | < 0.0003 | 0.018 | < 0.00005 | 0.0074 | 0.0084 | < 0.1 | < 0.0002 | 8.56 | < 0.0001 | 0.17 | < 0.0002 | < 0.001 | 0.001 | 0.0023 | < 0.001 | 0.0241 | 0.0018 |
| | 26-Oct-2004 | 89-3 | 0.029 | < 0.0002 | 0.001 | 0.0842 | < 0.0002 | 0.03 | < 0.0002 | < 0.001 | < 0.0003 | 0.0011 | < 0.0003 | 0.033 | < 0.00005 | 0.0008 | 0.003 | < 0.1 | < 0.0002 | 11.1 | 0.0001 | 0.19 | < 0.0002 | < 0.001 | 0.005 | < 0.0004 | < 0.001 | 0.362 | < 0.0002 |
| | 25-Oct-2005 | 89-3 | 0.005 | < 0.0002 | 0.0019 | 0.0857 | < 0.0002 | 0.02 | < 0.0002 | < 0.001 | 0.0007 | 0.0027 | < 0.0003 | 0.043 | < 0.00005 | 0.0025 | 0.0048 | < 0.1 | < 0.0002 | 11.2 | 0.0003 | 0.21 | < 0.0002 | < 0.001 | 0.002 | 0.0007 | < 0.001 | 0.0354 | 0.0013 |
| | 13-Sep-2007 | 89-3 | 0.005 | < 0.0002 | < 0.0002 | 0.1 | < 0.001 | < 0.02 | 0.00075 | 0.001 | 0.0011 | 0.0053 | 0.0002 | 0.04 | 0.000024 | 0.0012 | 0.0064 | < 0.1 | 0.0007 | 11.2 | < 0.0001 | 0.19 | 0.0003 | < 0.001 | 0.004 | 0.001 | < 0.001 | 0.909 | --- |
| | 08-Oct-2008 | 89-3 | < 0.01 | < 0.0004 | 0.003 | 0.108 | < 0.001 | < 0.05 | < 0.0001 | < 0.005 | < 0.002 | < 0.001 | < 0.0001 | 0.042 | < 0.00010 | < 0.005 | 0.006 | --- | 0.0004 | --- | < 0.0001 | --- | < 0.0001 | < 0.05 | < 0.001 | 0.0016 | < 0.001 | 0.126 | --- |
| | 28-Sep-2010 | 89-3 | < 0.0050 | < 0.00040 | 0.00267 | 0.162 | < 0.0010 | < 0.050 | 0.000564 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.041 | < 0.000020 | < 0.0050 | 0.0029 | --- | < 0.00040 | --- | < 0.00010 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00051 | < 0.0010 | 0.657 | --- |
| | 14-Dec-2011 | 89-3 | < 0.0050 | < 0.00040 | 0.00273 | 0.124 | < 0.0010 | < 0.050 | 0.000339 | 0.0012 | < 0.0020 | < 0.0010 | 0.00025 | 0.042 | < 0.000020 | < 0.0050 | 0.0022 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00035 | < 0.0010 | 0.218 | --- |
| | 26-Sep-2013 | 89-3 | < 0.0050 | < 0.00040 | 0.00112 | 0.127 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | 0.044 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | 0.00138 | < 0.0010 | 0.480 | --- |
| | 17-Sep-2014 | 89-3 | < 0.0010 | < 0.00010 | 0.00118 | 0.132 | < 0.00050 | 0.017 | < 0.00010 | < 0.00010 | 0.00014 | < 0.00010 | < 0.000050 | 0.0472 | < 0.0000050 | 0.000629 | 0.00048 | < 0.30 | 0.00012 | 13.2 | < 0.000010 | 0.225 | < 0.000050 | < 0.00010 | < 0.00030 | 0.00165 | < 0.00010 | 0.0570 | --- |
| | 29-Sep-2015 | PW | <0.0010 | <0.00010 | 0.00105 | 0.129 | --- | 0.016 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000705 | --- | 0.0029 | --- |
| | 27-Sep-2016 | PW | <0.0010 | <0.00010 | 0.00161 | 0.135 | --- | 0.021 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.000989 | --- | 0.0015 | --- |
| | 27-Sep-2017 | PW | <0.0010 | <0.00010 | 0.00168 | 0.139 | --- | 0.015 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.001470 | --- | 0.0081 | --- |
| | 18-Sep-2018 | 89-3 | <0.0010 | <0.00010 | 0.00235 | 0.143 | --- | 0.021 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | 0.0000121 | --- | <0.00050 | --- | 0.000161 | --- | <0.000010 | --- | --- | --- | --- | 0.000753 | --- | 0.0011 | --- |
| | 17-Sep-2019 | 89-3 | 0.0012 | <0.00010 | 0.00293 | 0.130 | --- | 0.017 | <0.0000050 | <0.00010 | --- | 0.00054 | <0.000050 | --- | <0.0000050 | --- | 0.00057 | --- | 0.000054 | --- | <0.000010 | --- | --- | --- | --- | 0.002400 | --- | 0.0086 | --- |
| | 21-Sep-2020 | 89-3 | <0.0010 | <0.00010 | <0.00010 | 0.0981 | <0.00010 | 0.021 | 0.0000065 | <0.00010 | 0.00015 | 0.00213 | <0.000050 | 0.0433 | <0.0000050 | 0.000547 | 0.00094 | --- | 0.000165 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00209 | <0.00050 | 0.0882 | --- |
| | 22-Sep-2021 | 89-3 | <0.0010 | <0.00010 | <0.00010 | 0.0942 | <0.00010 | 0.016 | <0.0000050 | <0.00010 | <0.00010 | <0.00020 | <0.000050 | 0.0472 | <0.0000050 | 0.000484 | <0.00050 | --- | 0.000182 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | 0.00194 | <0.00050 | 0.0345 | --- |
| | 29-Sep-2022 | 89-3 | <0.0010 | <0.00010 | 0.00025 | 0.1240 | --- | 0.024 | <0.0000050 | <0.00050 | --- | 0.00564 | <0.000050 | --- | <0.0000050 | --- | 0.00090 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00092 | --- | 0.0043 | --- |
| | 29-Sep-2023 | 89-3 | <0.0010 | <0.00010 | 0.00056 | 0.101 | --- | 0.023 | <0.0000050 | 0.00226 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | 0.0011 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | 0.00159 | --- | 0.0079 | --- |
| **QA/QC** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Trip Blank** | 05-Sep-2012 | SPINEL 1 | < 0.0050 | < 0.00040 | < 0.00040 | < 0.0030 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | < 0.010 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | < 0.10 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | < 0.00010 | < 0.0010 | < 0.0040 | --- |
| | 05-Sep-2012 | SPINEL 18 | < 0.0050 | < 0.00040 | < 0.00040 | < 0.0030 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | < 0.010 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | < 0.10 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | < 0.00010 | < 0.0010 | < 0.0040 | --- |
| | 05-Sep-2012 | SPINEL 28 | < 0.0050 | < 0.00040 | < 0.00040 | < 0.0030 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | < 0.010 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | < 0.10 | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | < 0.00010 | < 0.0010 | < 0.0040 | --- |
| | 26-Sep-2013 | TRIP BLANK | < 0.0050 | < 0.00040 | < 0.00040 | < 0.0030 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | < 0.010 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | < 0.00010 | < 0.0010 | < 0.0040 | --- |
| | 16-Sep-2014 | TRIP BLANK | < 0.0010 | < 0.00010 | < 0.00010 | < 0.000050 | < 0.00050 | < 0.010 | < 0.000010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.000050 | < 0.0030 | < 0.0000050 | < 0.000050 | < 0.00010 | < 0.30 | < 0.00010 | < 0.050 | < 0.000010 | < 0.00010 | < 0.000050 | < 0.00010 | < 0.00030 | < 0.000010 | < 0.00010 | < 0.0010 | --- |
| | 29-Sep-2015 | TRIP BLANK | <0.0010 | <0.00010 | <0.00010 | <0.000050 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 28-Sep-2016 | TRIP BLANK | <0.0010 | <0.00010 | <0.00010 | <0.000050 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 27-Sep-2017 | TRIP BLANK | <0.0010 | <0.00010 | <0.00010 | <0.000050 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 19-Sep-2018 | TRIP BLANK | <0.0010 | <0.00010 | <0.00010 | <0.000050 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 16-Sep-2019 | TRIP BLANK | <0.0010 | <0.00010 | <0.00010 | <0.00010 | --- | <0.010 | <0.0000050 | 0.00015 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 23-Sep-2020 | TRIP BLANK | 0.0010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.010 | <0.0000050 | <0.00010 | <0.00010 | <0.00020 | <0.000050 | <0.0010 | <0.0000050 | <0.000050 | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | <0.000010 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2021 | TRIP BLANK | <0.0010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.010 | <0.0000050 | <0.00010 | <0.00010 | <0.00020 | <0.000050 | <0.0010 | <0.0000050 | <0.000050 | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | <0.000010 | <0.00010 | <0.00030 | <0.000010 | <0.00050 | <0.0010 | --- |
| | 28-Sep-2022 | TRIP BLANK | <0.0010 | <0.00010 | <0.00010 | 0.00096 | --- | <0.010 | <0.0000050 | <0.00050 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 29-Sep-2023 | 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 | --- |

**Table 4.4**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date | Sample Name | Aluminum | Antimony | Arsenic | Barium | Beryllium | Boron | Cadmium | Chromium | Cobalt | Copper | Lead | Lithium | Mercury | Molybdenum | Nickel | Phosphorus | Selenium | Silicon | Silver | Strontium | Thallium | Tin | Titanium | Uranium | Vanadium | Zinc | Zirconium |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **0.1** | --- | --- | --- | --- | --- | --- | --- | --- | **1.0** | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | **5.0** | --- |
| **Canadian Drinking 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** | **---** | **---** | **7.0** | **---** | **---** | **---** | **0.02** | **---** | **---** | **---** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **---** | **0.006** | **0.01** | **1** | **---** | **5** | **0.005** | **---** | **---** | **1** | **0.01** | **---** | **0.001** | **---** | **---** | | **0.05** | | **---** | | **---** | **---** | **---** | **0.02** | **---** | **5** | **---** |
| **Alberta Tier 2 Aquatic 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** | **---** |
| **Field Blank** | 25-Sep-2013 | 20-SH | < 0.0050 | < 0.00040 | < 0.00040 | < 0.0030 | < 0.0010 | < 0.050 | < 0.000010 | < 0.0010 | < 0.0020 | < 0.0010 | < 0.00010 | < 0.010 | < 0.000020 | < 0.0050 | < 0.0020 | --- | < 0.00040 | --- | < 0.000020 | --- | < 0.00010 | < 0.050 | < 0.0010 | < 0.00010 | < 0.0010 | < 0.0040 | --- |
| | 16-Sep-2014 | 41-SH | < 0.0010 | < 0.00010 | < 0.00010 | < 0.000050 | - | < 0.010 | < 0.000010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.000050 | < 0.0030 | < 0.0000050 | < 0.000050 | < 0.00010 | < 0.30 | < 0.00010 | < 0.050 | < 0.0000010 | < 0.00010 | < 0.000050 | < 0.00010 | < 0.00030 | < 0.000010 | < 0.00010 | < 0.0010 | --- |
| | 17-Sep-2014 | 42-SH | < 0.0010 | < 0.00010 | < 0.00010 | < 0.000050 | < 0.00050 | < 0.010 | < 0.000010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.000050 | < 0.0030 | < 0.0000050 | < 0.000050 | < 0.00010 | < 0.30 | < 0.00010 | < 0.050 | < 0.0000010 | < 0.00010 | < 0.000050 | < 0.00010 | < 0.00030 | < 0.000010 | < 0.00010 | < 0.0010 | --- |
| | 28-Sep-2015 | FIELD BLANK 1 | <0.0010 | <0.00010 | <0.00010 | <0.000050 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 29-Sep-2015 | FIELD BLANK 2 | <0.0010 | <0.00010 | <0.00010 | 0.000197 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | 0.0013 | --- |
| | 26-Sep-2016 | 10-SH | <0.0010 | <0.00010 | <0.00010 | <0.000050 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 28-Sep-2016 | 20-SH | <0.0010 | <0.00010 | <0.00010 | 0.000072 | --- | <0.010 | <0.0000050 | <0.00010 | --- | 0.00074 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 27-Sep-2017 | 10-SH | <0.0010 | <0.00010 | <0.00010 | 0.00013 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 27-Sep-2017 | 20-SH | <0.0010 | <0.00010 | <0.00010 | 0.000182 | --- | <0.010 | <0.0000050 | <0.00010 | --- | 0.00039 | <0.000050 | --- | 0.000006 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | 0.0019 | --- |
| | 18-Sep-2018 | 10-SH | <0.0010 | <0.00010 | <0.00010 | 0.00013 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 18-Sep-2018 | 20-SH | <0.0010 | <0.00010 | <0.00010 | 0.000182 | --- | <0.010 | <0.0000050 | <0.00010 | --- | 0.00039 | <0.000050 | --- | 0.000006 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | 0.0019 | --- |
| | 16-Sep-2019 | 10-SH | <0.0010 | <0.00010 | <0.00010 | <0.00010 | --- | <0.010 | <0.0000050 | <0.00010 | --- | <0.00020 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 17-Sep-2019 | 20-SH | 0.0019 | 0.00011 | 0.00012 | 0.001750 | --- | <0.010 | <0.0000050 | 0.00036 | --- | 0.00157 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | 0.000027 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 21-Sep-2020 | 10-SH | <0.0010 | <0.00010 | <0.00010 | 0.00018 | <0.00010 | <0.010 | <0.0000050 | <0.00010 | <0.00010 | 0.00090 | <0.000050 | <0.0010 | <0.0000050 | <0.000050 | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | <0.000010 | <0.00010 | <0.00030 | <0.000010 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2020 | 20-SH | <0.0010 | <0.00010 | <0.00010 | 0.00010 | <0.00010 | <0.010 | <0.0000050 | <0.00010 | <0.00010 | 0.00068 | <0.000050 | <0.0010 | <0.0000050 | 0.000076 | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | <0.000010 | <0.00010 | <0.00030 | <0.000010 | <0.00050 | <0.0010 | --- |
| | 23-Sep-2020 | 30-SH | <0.0010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.010 | <0.0000050 | <0.00010 | <0.00010 | 0.00038 | <0.000050 | <0.0010 | <0.0000050 | <0.000050 | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | <0.000010 | <0.00010 | <0.00030 | <0.000010 | <0.00050 | <0.0010 | --- |
| | 21-Sep-2021 | 10-SH | <0.0010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.010 | <0.0000050 | <0.00010 | <0.00010 | <0.00020 | <0.000050 | <0.0010 | <0.0000050 | <0.000050 | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | <0.000010 | <0.00010 | <0.00030 | <0.000010 | <0.00050 | <0.0010 | --- |
| | 22-Sep-2021 | 20-SH | <0.0010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.010 | <0.0000050 | <0.00010 | <0.00010 | <0.00020 | <0.000050 | <0.0010 | <0.0000050 | <0.000050 | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | <0.000010 | <0.00010 | <0.00030 | <0.000010 | <0.00050 | <0.0010 | --- |
| | 28-Sep-2022 | 10-SH | <0.0010 | <0.00010 | <0.00010 | 0.00103 | --- | <0.010 | 0.0000512 | <0.00050 | --- | 0.00021 | <0.000050 | --- | <0.0000050 | --- | <0.00050 | --- | <0.000050 | --- | <0.0000010 | --- | --- | --- | --- | 0.000082 | --- | 0.0016 | --- |
| | 29-Sep-2022 | 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 | --- | <0.0000010 | --- | --- | --- | --- | <0.000010 | --- | <0.0010 | --- |
| | 29-Sep-2023 | Field 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 | --- | <0.0000010 | --- | --- | --- | --- | <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 (August, 2022), 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 |

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 |

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 (Cronic)

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 (Cronic)

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 (Cronic)

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 (Cronic)

Detection Limit is greater than the guideline

--- Guideline Row: No guideline for that parameter

--- Results: Parameter was not analyzed

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| **01-SH [Decommissioned]** | 15-May-1985 | 01-SH [DECOM] | --- | 5.2 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1985 | 01-SH [DECOM] | --- | 4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 01-SH [DECOM] | --- | 3.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1986 | 01-SH [DECOM] | --- | 4.3 | 21 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 01-SH [DECOM] | --- | 2.8 | 38 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 01-SH [DECOM] | --- | 2.8 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 01-SH [DECOM] | --- | 4.2 | 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 01-SH [DECOM] | --- | 2.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 01-SH [DECOM] | --- | 3.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 01-SH [DECOM] | --- | 3.7 | 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 01-SH [DECOM] | --- | 3.6 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 01-SH [DECOM] | --- | 2.4 | 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 01-SH [DECOM] | --- | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 01-SH [DECOM] | --- | 3.6 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 01-SH [DECOM] | --- | 3.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 01-SH [DECOM] | --- | 4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 01-SH [DECOM] | --- | 3.4 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 01-SH [DECOM] | --- | 4.7 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **01A-SH** | 13-Nov-1993 | 01A-SH | --- | 80.1 | 209 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 01A-SH | --- | 50.1 | 184 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 01A-SH | --- | 16.1 | 39 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-1994 | 01A-SH | --- | 17.2 | 5 | --- | --- | --- | --- | --- | --- | 0.3 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 01A-SH | --- | 56 | 250 | --- | < 0.001 | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 01A-SH | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 01A-SH | --- | --- | 152 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 01A-SH | --- | 7.1 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 01A-SH | --- | 51.6 | 200 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 01A-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 01A-SH | --- | --- | 140 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Oct-1998 | 01A-SH | --- | 54 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Oct-1998 | 01A-SH | 54 | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 01A-SH | --- | 51.6 | 133 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 01A-SH | --- | 19.4 | 38 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2001 | 01A-SH | --- | 23 | 62 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Oct-2001 | 01A-SH | --- | --- | --- | --- | --- | --- | --- | --- | 0.0017 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Oct-2001 | 01A-SH | --- | --- | --- | < 0.0004 | 0.0005 | < 0.0004 | 0.001 | 0.0005 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 09-May-2002 | 01A-SH | --- | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 05-Sep-2002 | 01A-SH | --- | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | < 0.002 | < 0.1 | --- | --- | < 0.1 | --- |
| | 11-Sep-2002 | 01A-SH | --- | 65.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Oct-2002 | 01A-SH | 25.3 | 26.9 | --- | < 0.0004 | 0.0008 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | < 1 |
| | 07-Sep-2003 | 01A-SH | --- | 43.5 | --- | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | --- | --- |
| | 14-Oct-2003 | 01A-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 14-Oct-2003 | 01A-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Dec-2003 | 01A-SH | 54.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 01A-SH | --- | 8.5 | 17 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 07-Sep-2005 | 01A-SH | --- | 22.7 | 64 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 01A-SH | 39.5 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 06-Sep-2007 | 01A-SH | 10 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 04-Sep-2008 | 01A-SH | 40 | --- | --- | < 0.00050 | 0.00052 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 09-Oct-2008 | 01A-SH | --- | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | --- | --- | --- |
| | 21-Oct-2008 | 01A-SH | --- | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | --- | --- | --- |
| **(Duplicate)** | 21-Oct-2008 | 01A-SH DUP | --- | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | --- | --- | --- |
| | 10-Sep-2009 | 01A-SH | 43.1 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 09-Sep-2010 | 01A SH | 31.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2011 | 01A-SH | 30.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 06-Sep-2012 | 01A-SH | 37.6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 01A-SH | 47.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 17-Sep-2014 | 01A-SH | 46.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | 01A-SH | 27.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2016 | 01A-SH | 39.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 01A-SH | 36.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 01A-SH | 48.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2019 | 01A-SH | 36.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 21-Sep-2020 | 01A-SH | 41.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 01A-SH | 26.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 29-Sep-2022 | 01A-SH | 61.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 28-Sep-2023 | 01A-SH | 53.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **01-IN [Decommissioned]** | 15-Feb-1985 | 01-IN [DECOM] | --- | 3.4 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1985 | 01-IN [DECOM] | --- | 4.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 01-IN [DECOM] | --- | 7.2 | 30 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1986 | 01-IN [DECOM] | --- | 5 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 01-IN [DECOM] | --- | 4.2 | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 01-IN [DECOM] | --- | 4.3 | 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 01-IN [DECOM] | --- | 4.7 | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 01-IN [DECOM] | --- | 3.5 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 01-IN [DECOM] | --- | 4.7 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1988 | 01-IN [DECOM] | --- | 4.8 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 01-IN [DECOM] | --- | 3.7 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 01-IN [DECOM] | --- | 3.1 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 01-IN [DECOM] | --- | 4.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 01-IN [DECOM] | --- | 3.6 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 01-IN [DECOM] | --- | 4.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 01-IN [DECOM] | --- | 4.1 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 01-IN [DECOM] | --- | 3.9 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 01-IN [DECOM] | --- | 4.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 01-IN [DECOM] | --- | 4.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 01-IN [DECOM] | --- | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Nov-1991 | 01-IN [DECOM] | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 01-IN [DECOM] | --- | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-May-1993 | 01-IN [DECOM] | --- | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **01A-IN** | 13-Nov-1993 | 01A-IN | --- | 24.2 | 70 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 01A-IN | --- | 43 | 116 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 01A-IN | --- | 19.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 01A-IN | --- | 19.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 01A-IN | --- | 22.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 01A-IN | --- | 22.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2001 | 01A-IN | --- | 22.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2002 | 01A-IN | --- | 33.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Sep-2002 | 01A-IN | 29.3 | --- | --- | < 0.0009 | < 0.0009 | < 0.0009 | < 0.002 | < 0.0009 | < 0.0029 | --- | --- | --- | --- | --- | < 0.1 | < 0.5 |
| | 08-Oct-2002 | 01A-IN | 20.8 | 23.8 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | < 0.5 |
| | 03-Sep-2003 | 01A-IN | --- | 23.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 01A-IN | 24.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 01A-IN | --- | 24.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2005 | 01A-IN | --- | 20.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 01A-IN | 22.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2007 | 01A-IN | 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2008 | 01A-IN | 24 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Sep-2009 | 01A-IN | 24.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2010 | 01A IN | 31.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 08-Sep-2011 | 01A-IN | 20.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2012 | 01A-IN | 23.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 01A-IN | 26.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2014 | 01A-IN | 28.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2015 | 01A-IN | 63.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | 01A-IN | 21.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 01A-IN | 21.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 01A-IN | 18.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 01A-IN | 28.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2020 | 01A-IN | 27.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 01A-IN | 20.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 01A-IN | 31.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2023 | 01A-IN | 23.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **01-SS [Decommissioned]** | 15-Jun-1985 | 01-SS [DECOM] | --- | 1.6 | 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jul-1985 | 01-SS [DECOM] | --- | 6.5 | 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 01-SS [DECOM] | --- | 2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1986 | 01-SS [DECOM] | --- | 6.6 | 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 01-SS [DECOM] | --- | 1.5 | 37 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 01-SS [DECOM] | --- | 1.8 | 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1987 | 01-SS [DECOM] | --- | 2 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 01-SS [DECOM] | --- | 1.2 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 01-SS [DECOM] | --- | 1.7 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 01-SS [DECOM] | --- | 1.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 15-May-1988 | 01-SS DUP | --- | 1.4 | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 01-SS [DECOM] | --- | 2.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 01-SS [DECOM] | --- | 1 | 21 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 01-SS [DECOM] | --- | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 01-SS [DECOM] | --- | 1.7 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 01-SS [DECOM] | --- | 1.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 01-SS [DECOM] | --- | 1.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 01-SS [DECOM] | --- | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Nov-1991 | 01-SS [DECOM] | --- | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 01-SS [DECOM] | --- | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **02-SH [Decommissioned]** | 15-May-1985 | 02-SH [DECOM] | --- | 3 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 02-SH [DECOM] | --- | 2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 02-SH [DECOM] | --- | 2.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 02-SH [DECOM] | --- | 1.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 02-SH [DECOM] | --- | 2.3 | 26 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 02-SH [DECOM] | --- | 2 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 02-SH [DECOM] | --- | 1.9 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 02-SH [DECOM] | --- | 3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 02-SH [DECOM] | --- | 2 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 02-SH [DECOM] | --- | 2.7 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 02-SH [DECOM] | --- | 2.7 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 02-SH [DECOM] | --- | 2.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 02-SH [DECOM] | --- | 2.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 02-SH [DECOM] | --- | 1.6 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 02-SH [DECOM] | --- | 2.8 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 02-SH [DECOM] | --- | 2.1 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 02-SH [DECOM] | --- | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 02-SH [DECOM] | --- | 2.3 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 02-SH [DECOM] | --- | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 02-SH [DECOM] | --- | 2.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 02-SH [DECOM] | --- | 2.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 02-SH [DECOM] | --- | 2.1 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 02-SH [DECOM] | --- | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 02-SH [DECOM] | --- | 2.4 | < 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 02-SH [DECOM] | --- | 2.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 02-SH [DECOM] | --- | 1.7 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-May-1993 | 02-SH [DECOM] | --- | 2.1 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **02-IN [Decommissioned]** | 15-May-1985 | 02-IN [DECOM] | --- | 3 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 02-IN [DECOM] | --- | 5.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 02-IN [DECOM] | --- | 2.6 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 02-IN [DECOM] | --- | 3.5 | 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 02-IN [DECOM] | --- | 3.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 02-IN [DECOM] | --- | 3.7 | 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 02-IN [DECOM] | --- | 4.8 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 02-IN [DECOM] | --- | 3.2 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 02-IN [DECOM] | --- | 4.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 02-IN [DECOM] | --- | 3.7 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 02-IN [DECOM] | --- | 4.6 | 13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 02-IN [DECOM] | --- | 3.8 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 02-IN [DECOM] | --- | 3.4 | 40 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 02-IN [DECOM] | --- | 4.7 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 02-IN [DECOM] | --- | 3.7 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 02-IN [DECOM] | --- | 4.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 02-IN [DECOM] | --- | 3.9 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 02-IN [DECOM] | --- | 4.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 02-IN [DECOM] | --- | 4.1 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 02-IN [DECOM] | --- | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 02-IN [DECOM] | --- | 3.9 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 02-IN [DECOM] | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 02-IN [DECOM] | --- | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 02-IN [DECOM] | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-May-1993 | 02-IN [DECOM] | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **03-SH** | 15-May-1985 | 03-SH | --- | 5.6 | 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 03-SH | --- | 5.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 03-SH | --- | 6 | 37 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 03-SH | --- | 6.1 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 03-SH | --- | 6.4 | 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 03-SH | --- | 6.8 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 03-SH | --- | 6.2 | 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 03-SH | --- | 6.4 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 03-SH | --- | 6 | 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 03-SH | --- | 6.6 | 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 03-SH | --- | 6.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 03-SH | --- | 6.3 | 56 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 03-SH | --- | 5.8 | 36 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 03-SH | --- | 5.4 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 03-SH | --- | 7.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 03-SH | --- | 6.5 | 30 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 03-SH | --- | 6.7 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 03-SH | --- | 6.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 03-SH | --- | 6.4 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 03-SH | --- | 6.1 | 27 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 03-SH | --- | 6.1 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 03-SH | --- | 5.5 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 03-SH | --- | 5.7 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 18-May-1993 | 03-SH | --- | 5.3 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 03-SH | --- | 4.5 | 28 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 03-SH | --- | 3.6 | 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 31-May-1994 | 03-SH DUP | --- | 3.8 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 03-SH | --- | 4.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 21-Sep-1994 | 03-SH DUP | --- | --- | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 21-Sep-1994 | 03-SH DUP | --- | 4.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Nov-1994 | 03-SH | --- | 4.6 | 6 | --- | --- | --- | --- | --- | --- | 0.6 | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 01-Nov-1994 | 03-SH DUP | --- | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 02-Nov-1994 | 03-SH DUP | --- | 2.8 | 5 | --- | --- | --- | --- | --- | --- | 0.2 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 03-SH | --- | --- | 7 | --- | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 03-SH | --- | 4.3 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 03-SH | --- | --- | 15 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 03-SH | --- | 4.9 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 03-SH | --- | 4.5 | 7 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 03-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 03-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 03-SH | --- | 4.9 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 15-Sep-1998 | 03-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 15-Sep-1998 | 03-SH DUP | --- | 4.8 | 14 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 03-SH | --- | 4.6 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 03-SH | --- | 4.1 | 9 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 03-SH | --- | 3.7 | 7 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 04-Sep-2002 | 03-SH | --- | 4.2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | < 0.002 | < 0.1 | --- | --- | < 0.1 | --- |
| | 03-Sep-2003 | 03-SH | --- | 4.9 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 09-Sep-2004 | 03-SH | --- | 3.4 | 6 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2005 | 03-SH | --- | 3.9 | 7 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 03-SH | 3.9 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2007 | 03-SH | 4.4 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 03-Sep-2008 | 03-SH | 4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 09-Sep-2009 | 03-SH | 4.3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2010 | 03-SH | 4.9 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 07-Sep-2011 | 03-SH | 4.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 03-SH | 5.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 03-SH | 4.1 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 16-Sep-2014 | 03-SH | 5.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 28-Sep-2015 | 03-SH | 5.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2016 | 03-SH | 5.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 03-SH | 5.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 03-SH | 4.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2019 | 03-SH | 4.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 03-SH | 5.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 03-SH | 4.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 29-Sep-2022 | 03-SH | 4.85 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 29-Sep-2023 | 03-SH | 4.08 | | | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **03-IN** | 15-May-1985 | 03-IN | --- | 13.8 | 30 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 03-IN | --- | 4 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 03-IN | --- | 3.8 | 35 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 03-IN | --- | 2.8 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 03-IN | --- | 3.6 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 03-IN | --- | 3 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 03-IN | --- | 3.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 03-IN | --- | 4.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 03-IN | --- | 3 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 03-IN | --- | 3.9 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 03-IN | --- | 4.2 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 03-IN | --- | 4 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 03-IN | --- | 3.8 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 03-IN | --- | 2.7 | 46 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 03-IN | --- | 3.9 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 03-IN | --- | 3.2 | 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 03-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 03-IN | --- | 3.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 03-IN | --- | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 03-IN | --- | 3.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 03-IN | --- | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 03-IN | --- | 3.9 | 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 03-IN | --- | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 03-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 03-IN | --- | 4.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 03-IN | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 03-IN | --- | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 03-IN | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 03-IN | --- | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 03-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 03-IN | --- | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 03-IN | --- | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 03-IN | --- | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 03-IN | --- | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 03-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 03-IN | --- | 4.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 03-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2004 | 03-IN | --- | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2005 | 03-IN | --- | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 03-IN | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2007 | 03-IN | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2008 | 03-IN | 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2009 | 03-IN | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2010 | 03-IN | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2011 | 03-IN | 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2012 | 03-IN | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 03-IN | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2014 | 03-IN | 6.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2015 | 03-IN | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2016 | 03-IN | 5.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 03-IN | 5.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 03-IN | 4.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 03-IN | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 03-IN | 4.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 03-IN | 4.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 03-IN | 4.73 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2023 | 03-IN | 4.24 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **04-SH** | 15-May-1985 | 04-SH | --- | 5 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 04-SH | --- | 3.4 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 04-SH | --- | 3.3 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 04-SH | --- | 3.2 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 04-SH | --- | 3.8 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 04-SH | --- | 3.6 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 04-SH | --- | 3 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 15-Nov-1987 | 04-SH | --- | 3.4 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 04-SH | --- | 3.8 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 04-SH | --- | 3.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 04-SH | --- | 3.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1988 | 04-SH | --- | 3.3 | 13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 04-SH | --- | 3.9 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 04-SH | --- | 3.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 04-SH | --- | 4.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 04-SH | --- | 3.9 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 04-SH | --- | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 04-SH | --- | 3.5 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 04-SH | --- | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 04-SH | --- | 3.7 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-1991 | 04-SH | --- | 3.6 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 04-SH | --- | 3.1 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 04-SH | --- | 4 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 04-SH | --- | 3.1 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 04-SH | --- | 2.1 | 28 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 04-SH | --- | 1.9 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 04-SH | --- | 2.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Nov-1994 | 04-SH | --- | 2.4 | 5 | --- | --- | --- | --- | --- | --- | 0.5 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 04-SH | --- | --- | 9 | --- | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 04-SH | --- | 2.6 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 04-SH | --- | --- | 5 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 04-SH | --- | 3.7 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 04-SH | --- | 2.5 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 04-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 04-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 04-SH | --- | 2.7 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 04-SH | --- | 2.8 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 04-SH | --- | 2.4 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 04-SH | --- | 2.3 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 06-Sep-2001 | 04-SH DUP | --- | 2.1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 06-Sep-2001 | 04-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 04-SH | --- | 3.1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | 0.003 | < 0.1 | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 04-Sep-2002 | 04-SH DUP | --- | 2.7 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 11-Sep-2002 | 04-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 04-SH | --- | 2.9 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 07-Sep-2003 | 04-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 07-Sep-2003 | 04-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 11-Sep-2003 | 04-SH DUP | --- | 2.6 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2004 | 04-SH | --- | 2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 08-Sep-2004 | 04-SH DUP | --- | 2.9 | 20 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 07-Sep-2005 | 04-SH | --- | 2.6 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| **(Duplicate)** | 07-Sep-2005 | 04-SH DUP | --- | 2.5 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 04-SH | 2.4 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| **(Duplicate)** | 07-Sep-2006 | 04-SH DUP | 2.7 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2007 | 04-SH | 2.1 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| **(Duplicate)** | 05-Sep-2007 | 04-SH DUP | 2.1 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 03-Sep-2008 | 04-SH | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| **(Duplicate)** | 03-Sep-2008 | 04-SH DUP | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 09-Sep-2009 | 04-SH | 2.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| **(Duplicate)** | 09-Sep-2009 | 04-SH DUP | 2.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2010 | 04 SH | 5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| **(Duplicate)** | 08-Sep-2010 | SYLVITE 24 | 4.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 07-Sep-2011 | 04-SH | 3.9 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 07-Sep-2011 | ZIRCON 24 | 4.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 04-SH | 3.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 05-Sep-2012 | SPINEL 22 | 3.1 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 04-SH | 2.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 26-Sep-2013 | 24-SH | 2.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 17-Sep-2014 | 04-SH | 4.6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 28-Sep-2015 | 04-SH | 2.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 26-Sep-2016 | 04-SH | 3.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 04-SH | 3.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2018 | 04-SH | 3.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2019 | 04-SH | 2.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 04-SH | 4.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 04-SH | 3.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 29-Sep-2022 | 04-SH | 3.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 29-Sep-2023 | 04-SH | 2.45 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **04-IN** | 15-Mar-1989 | 04-IN | --- | 4.8 | 13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 04-IN | --- | 3.9 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 04-IN | --- | 4.7 | 49 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 04-IN | --- | 3.3 | 27 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 15-Nov-1989 | 04-IN DUP | --- | 4.4 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 04-IN | --- | 4.2 | 49 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 04-IN | --- | 4.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 04-IN | --- | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 04-IN | --- | 4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1991 | 04-IN | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 04-IN | --- | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 04-IN | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 04-IN | --- | 2.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 04-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 04-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 04-IN | --- | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 04-IN | --- | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 04-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 04-IN | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 04-IN | --- | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 04-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2005 | 04-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2007 | 04-IN | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2008 | 04-IN | 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2010 | 04 IN | 14.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2014 | 04-IN | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2015 | 04-IN | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2016 | 04-IN | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 04-IN | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2018 | 04-IN | 3.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 04-IN | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 04-IN | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 04-IN | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 04-IN | 3.81 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2023 | 04-IN | 3.22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **04-SS** | 15-Sep-1985 | 04-SS | --- | 1.2 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 04-SS | --- | 8.6 | 35 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 04-SS | --- | 3.2 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 15-Jun-1986 | 04-SS | --- | 1.5 | 27 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 04-SS | --- | 1 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 04-SS | --- | 1.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 04-SS | --- | 1.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 04-SS | --- | 1 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 04-SS | --- | 1.2 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 04-SS | --- | 1.6 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 04-SS | --- | 2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 04-SS | --- | 1.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1988 | 04-SS | --- | 0.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 04-SS | --- | 2.5 | 19 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 04-SS | --- | 1.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 04-SS | --- | 1.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 04-SS | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 04-SS | --- | 1.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 04-SS | --- | 1.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 04-SS | --- | 1.3 | 27 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1991 | 04-SS | --- | 2.2 | 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 04-SS | --- | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 04-SS | --- | 1.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2005 | 04-SS | --- | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 04-SS | 1.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2014 | 04-SS | 4.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2015 | 04-SS | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | 04-SS | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2017 | 04-SS | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2018 | 04-SS | 2.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 04-SS | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 04-SS | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 04-SS | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 04-SS | 2.38 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2023 | 04-SS | 1.58 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **05-SH** | 15-May-1985 | 05-SH | --- | 5 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 05-SH | --- | 4.4 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 05-SH | --- | 4.8 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 05-SH | --- | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 05-SH | --- | 4.3 | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 05-SH | --- | 4.8 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 05-SH | --- | 5.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 05-SH | --- | 4.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 05-SH | --- | 5.6 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 05-SH | --- | 4.5 | 13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 05-SH | --- | 4.8 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 05-SH | --- | 5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 05-SH | --- | 4.4 | 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 05-SH | --- | 5.1 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 05-SH | --- | 3.9 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 05-SH | --- | 4.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 05-SH | --- | 4.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 05-SH | --- | 4.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 05-SH | --- | 4.6 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 05-SH | --- | 3.9 | 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 05-SH | --- | 3.9 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 05-SH | --- | 3.3 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 05-SH | --- | 4.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 05-SH | --- | 2.8 | 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 05-SH | --- | 3.4 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 05-SH | --- | 4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Nov-1994 | 05-SH | --- | 3.7 | 5 | --- | --- | --- | --- | --- | --- | 0.7 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 05-SH | --- | --- | 5 | --- | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 05-SH | --- | 4.1 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 05-SH | --- | --- | 5 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 05-SH | --- | 4.8 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 05-SH | --- | 4 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 05-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 05-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 05-SH | --- | 4.2 | 7 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 05-SH | --- | 4.7 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 05-SH | --- | 4.4 | 9 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 05-SH | --- | 3.6 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 06-Sep-2001 | 05-SH DUP | --- | 4.6 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 06-Sep-2001 | 05-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 05-SH | --- | 5.3 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | < 0.002 | < 0.1 | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 04-Sep-2002 | 05-SH DUP | --- | 4.3 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 03-Sep-2003 | 05-SH | --- | --- | 11 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 07-Sep-2003 | 05-SH | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2003 | 05-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 07-Sep-2003 | 05-SH DUP | --- | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 11-Sep-2003 | 05-SH DUP | --- | --- | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2004 | 05-SH | --- | 4.4 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 08-Sep-2004 | 05-SH DUP | --- | 4.9 | 13 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 07-Sep-2005 | 05-SH | --- | 4.5 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| **(Duplicate)** | 07-Sep-2005 | 05-SH DUP | --- | 5.7 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 05-SH | --- | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| **(Duplicate)** | 07-Sep-2006 | 05-SH DUP | --- | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2007 | 05-SH | 5 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| **(Duplicate)** | 05-Sep-2007 | 05-SH DUP | 5.7 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2008 | 05-SH | 5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| **(Duplicate)** | 05-Sep-2008 | 05-SH DUP | 5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 09-Sep-2009 | 05-SH | 5.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| **(Duplicate)** | 09-Sep-2009 | 05-SH DUP | 5.6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2010 | 05 SH | 5.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| **(Duplicate)** | 08-Sep-2010 | SYLVITE 25 | 5.9 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 07-Sep-2011 | 05-SH | 5.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 07-Sep-2011 | ZIRCON 25 | 5.1 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 05-SH | 5.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 05-Sep-2012 | SPINEL 23 | 6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 05-SH | 4.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 17-Sep-2014 | 05-SH | 5.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 17-Sep-2014 | 25-SH | 5.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 28-Sep-2015 | 05-SH | 5.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-2015 | 25-SH | 5.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2016 | 05-SH | 6.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-2016 | 25-SH | 5.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 05-SH | 5.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 27-Sep-2017 | 25-SH | 7.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2018 | 05-SH | 5.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 17-Sep-2018 | 25-SH | 6.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2019 | 05-SH | 5.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 17-Sep-2019 | 25-SH | 6.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 22-Sep-2020 | 05-SH | 7.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 22-Sep-2020 | 25-SH | 6.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 05-SH | 6.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 22-Sep-2021 | 25-SH | 6.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 29-Sep-2022 | 05-SH | 7.02 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| **(Duplicate)** | 29-Sep-2022 | 25-SH | 7.24 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 28-Sep-2023 | 05-SH | 7.20 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2023 | 25-SH | 10.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **05-IN** | 15-May-1985 | 05-IN | --- | 16 | 54 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 05-IN | --- | 0.8 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 05-IN | --- | 4.3 | 13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 05-IN | --- | 4.2 | 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 05-IN | --- | 4.8 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 05-IN | --- | 5 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 05-IN | --- | 4.3 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 05-IN | --- | 5.4 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 05-IN | --- | 5 | 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 05-IN | --- | 4.2 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 05-IN | --- | 4.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 05-IN | --- | 4.7 | 24 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 05-IN | --- | 6.3 | 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 05-IN | --- | 4.4 | 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 05-IN | --- | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 05-IN | --- | 4.9 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 05-IN | --- | 4.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 05-IN | --- | 4.9 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 05-IN | --- | 4.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1990 | 05-IN | --- | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 05-IN | --- | 4.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 05-IN | --- | 4.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 05-IN | --- | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 05-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 05-IN | --- | 4.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 05-IN | --- | 5.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 05-IN | --- | 4.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 05-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 05-IN | --- | 4.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 05-IN | --- | 4.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 05-IN | --- | 4.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 05-IN | --- | 5.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 05-IN | --- | 5.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 05-IN | --- | 4.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2005 | 05-IN | --- | 5.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 05-IN | 5.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2007 | 05-IN | 5.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2008 | 05-IN | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2009 | 05-IN | 6.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2010 | 05 IN | 6.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2011 | 05-IN | 5.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2012 | 05-IN | 5.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 05-IN | 4.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2014 | 05-IN | 7.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2015 | 05-IN | 6.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2016 | 05-IN | 6.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 05-IN | 6.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2018 | 05-IN | 7.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 05-IN | 6.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 05-IN | 7.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 05-IN | 7.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 05-IN | 8.59 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2023 | 05-IN | 7.46 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **05-SS** | 10-Sep-2004 | 05-SS | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Nov-2004 | 05-SS | --- | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 08-Sep-2005 | 05-SS | --- | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 05-SS | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2007 | 05-SS | 0.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2008 | 05-SS | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2009 | 05-SS | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 17-Sep-2009 | 05-SS DUP | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2010 | 05 (R) SS | 10.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2011 | 05-SS | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2014 | 05-SS | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2015 | 05-SS | <1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-2015 | 25-SS | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2016 | 05-SS | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-2016 | 25-SS | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 05-SS | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 27-Sep-2017 | 25-SS | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2018 | 05-SS | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 17-Sep-2018 | 25-SS | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 05-SS | 1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 17-Sep-2019 | 25-SS | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 23-Sep-2020 | 05-SS | <1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 23-Sep-2020 | 25-SS | <1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 05-SS | <1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 22-Sep-2021 | 25-SS | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 05-SS | 0.78 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 29-Sep-2022 | 25-SS | 0.71 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2023 | 05-SS | 0.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2023 | 25-SS | 0.55 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **06-SH** | 15-May-1985 | 06-SH | --- | 5.4 | 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 06-SH | --- | 3.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 06-SH | --- | 4.8 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 06-SH | --- | 3.5 | 19 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 06-SH | --- | 2.3 | 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 06-SH | --- | 3.1 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 06-SH | --- | 3 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 06-SH | --- | 2.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 06-SH | --- | 2.6 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 06-SH | --- | 2.8 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 06-SH | --- | 2.6 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 06-SH | --- | 2.7 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 06-SH | --- | 1.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 06-SH | --- | 2.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 06-SH | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 06-SH | --- | 3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 06-SH | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Apr-1990 | 06-SH | --- | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 06-SH | --- | 3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 15-Aug-1990 | 06-SH | --- | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 06-SH | --- | 3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 06-SH | --- | 3.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 06-SH | --- | 7.8 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Nov-1994 | 06-SH | --- | 4.6 | 6 | --- | --- | --- | --- | --- | --- | 0.4 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 06-SH | --- | --- | 5 | --- | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 06-SH | --- | 4.5 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 06-SH | --- | --- | 5 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 06-SH | --- | 4.7 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 06-SH | --- | 4.9 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 06-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 06-SH | --- | 4.4 | 16 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 15-Sep-1998 | 06-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 15-Sep-1998 | 06-SH DUP | --- | 3.9 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 06-SH | --- | 5.8 | 7 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 06-SH | --- | 5.3 | 13 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 06-SH | --- | 4.5 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| (Duplicate) | 06-Sep-2001 | 06-SH DUP | --- | 4.9 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| (Duplicate) | 06-Sep-2001 | 06-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 06-SH | --- | 6.2 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | 0.003 | < 0.1 | --- | --- | < 0.1 | --- |
| (Duplicate) | 04-Sep-2002 | 06-SH DUP | --- | 5.1 | 12 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 03-Sep-2003 | 06-SH | --- | 5.8 | 14 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| (Duplicate) | 03-Sep-2003 | 06-SH DUP | --- | 5.9 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 14-Oct-2003 | 06-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 14-Oct-2003 | 06-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 06-SH | --- | 5.4 | 10 | < 0.0004 | 0.0005 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| (Duplicate) | 08-Sep-2004 | 06-SH DUP | --- | 5.9 | 15 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 30-Sep-2004 | 06-SH | --- | --- | --- | < 0.0004 | 0.0008 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 30-Oct-2004 | 06-SH | --- | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | --- | --- |
| | 07-Sep-2005 | 06-SH | --- | 5.4 | 8 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| (Duplicate) | 07-Sep-2005 | 06-SH DUP | --- | 5.7 | 13 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 06-SH | 5.8 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| (Duplicate) | 07-Sep-2006 | 06-SH DUP | 6 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2007 | 06-SH | 5.3 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| (Duplicate) | 05-Sep-2007 | 06-SH DUP | 5.8 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 03-Sep-2008 | 06-SH | 5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| (Duplicate) | 03-Sep-2008 | 06-SH DUP | 5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 09-Sep-2009 | 06-SH | 5.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| (Duplicate) | 09-Sep-2009 | 06-SH DUP | 7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2010 | 06 SH | 3.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| (Duplicate) | 08-Sep-2010 | SYLVITE 26 | 5.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 07-Sep-2011 | 06-SH | 5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| (Duplicate) | 07-Sep-2011 | ZIRCON 26 | 6.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 06-SH | 5.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| (Duplicate) | 05-Sep-2012 | SPINEL 25 | 5.9 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 25-Sep-2013 | 06-SH | 5.6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| (Duplicate) | 25-Sep-2013 | 26-SH | 5.3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 17-Sep-2014 | 06-SH | 7.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | 06-SH | 5.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2016 | 06-SH | 5.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 26-Sep-2017 | 06-SH | 5.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2018 | 06-SH | 5.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2019 | 06-SH | 4.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 06-SH | 5.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 06-SH | 5.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2022 | 06-SH | 4.77 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 29-Sep-2023 | 06-SH | 4.30 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **06-IN** | 15-May-1985 | 06-IN | --- | 3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 06-IN | --- | 2.4 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 06-IN | --- | 3 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 06-IN | --- | 2 | 37 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 06-IN | --- | 3.1 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1987 | 06-IN | --- | 3 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 06-IN | --- | 3 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 06-IN | --- | 2.2 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 06-IN | --- | 2.6 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 06-IN | --- | 2.8 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 06-IN | --- | 2.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 06-IN | --- | 1.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 06-IN | --- | 3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 06-IN | --- | 2.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 06-IN | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 06-IN | --- | 2.8 | 43 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 06-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 06-IN | --- | 2.5 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 06-IN | --- | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 06-IN | --- | 2.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1991 | 06-IN | --- | 2.1 | 14 | < 0.001 | < 0.001 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-1991 | 06-IN | --- | 2.6 | < 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 06-IN | --- | 2.3 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 06-IN | --- | 3.2 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 06-IN | --- | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 06-IN | --- | 3.6 | 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 06-IN | --- | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 06-IN | --- | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 06-IN | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 06-IN | --- | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 06-IN | --- | 2.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 06-IN | --- | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 06-IN | --- | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 06-IN | --- | 1.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 06-IN | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 06-IN | --- | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 06-IN | --- | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2005 | 06-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 06-IN | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2008 | 06-IN | 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2009 | 06-IN | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2010 | 06 IN | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2011 | 06-IN | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2012 | 06-IN | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 25-Sep-2013 | 06-IN | 4.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **06(R)IN** | 17-Sep-2014 | 06(R)IN | 6.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2015 | 06(R)IN | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2016 | 06(R)IN | 6.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2017 | 06(R)IN | 5.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2018 | 06(R)IN | 5.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 06(R)IN | 5.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 06(R)IN | 6.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

AECOM

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 22-Sep-2021 | 06(R)IN | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2022 | 06(R)IN | 7.22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2023 | 06(R)IN | 5.84 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **07-SH** | 15-May-1985 | 07-SH | --- | 3.8 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 07-SH | --- | 2.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 07-SH | --- | 3.1 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 07-SH | --- | 2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 07-SH | --- | 8.3 | 28 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 07-SH | --- | 3 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 07-SH | --- | 2.6 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 07-SH | --- | 2.8 | 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 07-SH | --- | 3.2 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 07-SH | --- | 3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 07-SH | --- | 2.9 | 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 07-SH | --- | 2.2 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 07-SH | --- | 4.2 | 19 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 07-SH | --- | 3.9 | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 07-SH | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 07-SH | --- | 4.2 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 07-SH | --- | 4 | 49 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 07-SH | --- | 4.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 07-SH | --- | 5 | 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1991 | 07-SH | --- | 3.7 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-1991 | 07-SH | --- | 3.3 | < 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 07-SH | --- | 3.6 | 60 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 07-SH | --- | 4.7 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 20-May-1993 | 07-SH | --- | 3.7 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 07-SH | --- | 2.6 | 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 07-SH | --- | 2.6 | 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 07-SH | --- | 3 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-1994 | 07-SH | --- | 2.8 | 5 | --- | --- | --- | --- | --- | --- | 0.4 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 07-SH | --- | --- | 5 | --- | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 07-SH | --- | 2.9 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 07-SH | --- | --- | 15 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 07-SH | --- | 3.8 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 07-SH | --- | 2.9 | 6 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 07-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 07-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 07-SH | --- | 2.6 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 15-Sep-1998 | 07-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 15-Sep-1998 | 07-SH DUP | --- | 2.6 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 07-SH | --- | 3 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 09-Sep-1999 | 07-SH DUP | --- | 3 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 07-SH | --- | 2.7 | 7 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 05-Sep-2000 | 07-SH DUP | --- | 2.3 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 07-SH | --- | 2.1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 06-Sep-2001 | 07-SH DUP | --- | 2.4 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 06-Sep-2001 | 07-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 07-SH | --- | 2.7 | 6 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | 0.004 | < 0.1 | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 04-Sep-2002 | 07-SH DUP | --- | 2.7 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 03-Sep-2003 | 07-SH | --- | 2.5 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 03-Sep-2003 | 07-SH DUP | --- | 3.2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 14-Oct-2003 | 07-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 07-SH | --- | 3 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 08-Sep-2004 | 07-SH DUP | --- | 2.9 | 17 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 07-Sep-2005 | 07-SH | --- | 3 | 6 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| **(Duplicate)** | 07-Sep-2005 | 07-SH DUP | --- | 2.3 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 07-SH | 2.7 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| **(Duplicate)** | 07-Sep-2006 | 07-SH DUP | 3.1 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2007 | 07-SH | 2.9 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| **(Duplicate)** | 05-Sep-2007 | 07-SH DUP | 2.8 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 03-Sep-2008 | 07-SH | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| **(Duplicate)** | 03-Sep-2008 | 07-SH DUP | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 09-Sep-2009 | 07-SH | 2.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| **(Duplicate)** | 09-Sep-2009 | 07-SH DUP | 2.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2010 | 07 SH | 3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| **(Duplicate)** | 08-Sep-2010 | SYLVITE 27 | 3.6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 07-Sep-2011 | 07-SH | 2.6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 07-Sep-2011 | ZIRCON 27 | 2.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 07-SH | 2.6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 05-Sep-2012 | SPINEL 27 | 2.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 25-Sep-2013 | 07-SH | 2.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 25-Sep-2013 | 27-SH | 2.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **07-SH (continued)** | 17-Sep-2014 | 07-SH | 3.1 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 17-Sep-2014 | 27-SH | 3.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | 07-SH | 2.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 29-Sep-2015 | 27-SH | 3.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2016 | 07-SH | 3.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 27-Sep-2016 | 27-SH | 2.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 26-Sep-2017 | 07-SH | 3.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 26-Sep-2017 | 27-SH | 3.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2018 | 07-SH | 2.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 17-Sep-2018 | 27-SH | 2.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 16-Sep-2019 | 07-SH | 1.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 16-Sep-2019 | 27-SH | 1.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 07-SH | 1.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 22-Sep-2020 | 27-SH | 2.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 07-SH | 3.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 22-Sep-2021 | 27-SH | 2.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2022 | 07-SH | 2.48 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-2022 | 27-SH | 3.34 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 29-Sep-2023 | 07-SH | 2.46 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 29-Sep-2023 | 27-SH | 2.47 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **07-IN** | 15-May-1985 | 07-IN | --- | 4.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 07-IN | --- | 2.8 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 07-IN | --- | 3.3 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 07-IN | --- | 2.4 | 36 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 07-IN | --- | 3.8 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 07-IN | --- | 3.2 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 07-IN | --- | 2.5 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 07-IN | --- | 3.2 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 07-IN | --- | 3.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 07-IN | --- | 3.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 07-IN | --- | 2.8 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 07-IN | --- | 2.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 07-IN | --- | 3.9 | 21 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 07-IN | --- | 2.9 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 07-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 07-IN | --- | 3.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 15-Mar-1990 | 07-IN | --- | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 07-IN | --- | 3 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 07-IN | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 07-IN | --- | 3.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1991 | 07-IN | --- | 2.3 | 11 | < 0.001 | 0.002 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1991 | 07-IN | --- | 2.4 | < 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 07-IN | --- | 3.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 07-IN | --- | 2.7 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 20-May-1993 | 07-IN | --- | 2.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Nov-1993 | 07-IN | --- | 1.8 | 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-1994 | 07-IN | --- | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 07-IN | --- | 1.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 07-IN | --- | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 07-IN | --- | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 07-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 07-IN | --- | 2.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 07-IN | --- | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 07-IN | --- | 1.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 07-IN | --- | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 07-IN | --- | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 07-IN | --- | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2005 | 07-IN | --- | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 07-IN | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2007 | 07-IN | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2008 | 07-IN | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2009 | 07-IN | 2.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2010 | 07 IN | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2011 | 07-IN | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2012 | 07-IN | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 25-Sep-2013 | 07-IN | 2.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2014 | 07-IN | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2015 | 07-IN | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | 07-IN | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2017 | 07-IN | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2018 | 07-IN | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2019 | 07-IN | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 07-IN | 2.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 07-IN | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2022 | 07-IN | 4.07 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2023 | 07-IN | 2.55 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **07-SS** | 15-Feb-1985 | 07-SS | --- | 0.6 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1985 | 07-SS | --- | 3.4 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 07-SS | --- | 1.4 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 07-SS | --- | 2 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 07-SS | --- | 2.2 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 07-SS | --- | 1.6 | 48 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 07-SS | --- | 2.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 07-SS | --- | 2.2 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 07-SS | --- | 1.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 07-SS | --- | 2.4 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 07-SS | --- | 2.4 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 07-SS | --- | 2.4 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 07-SS | --- | 1.9 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 07-SS | --- | 1.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 07-SS | --- | 2.4 | 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 07-SS | --- | 1.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 07-SS | --- | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 07-SS | --- | 2.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 07-SS | --- | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 07-SS | --- | 1.7 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 07-SS | --- | 2.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 07-SS | --- | 2.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1991 | 07-SS | --- | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-1991 | 07-SS | --- | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 14-May-1992 | 07-SS | --- | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 07-SS | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 07-SS | --- | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 07-SS | --- | 2.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-1997 | 07-SS | --- | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Oct-1998 | 07-SS | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 07-SS | --- | 1.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 07-SS | --- | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 07-SS | --- | 1.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 07-SS | --- | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 07-SS | --- | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 07-SS | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **07(R)SS** | 16-Sep-2014 | 07(R)SS | 5.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2015 | 07(R)SS | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | 07(R)SS | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2017 | 07(R)SS | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2018 | 07(R)SS | 6.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2019 | 07(R)SS | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 23-Sep-2020 | 07(R)SS | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 07(R)SS | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2022 | 07(R)SS | 3.58 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2023 | 07(R)SS | 2.06 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **08-SH** | 15-May-1985 | 08-SH | --- | 4.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 08-SH | --- | 2 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 08-SH | --- | 2.4 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 08-SH | --- | 2 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 08-SH | --- | 2.5 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 08-SH | --- | 2.6 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 08-SH | --- | 1.8 | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 08-SH | --- | 2.3 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 08-SH | --- | 2.7 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 08-SH | --- | 2.4 | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 08-SH | --- | 1.7 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 08-SH | --- | 1.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 08-SH | --- | 2.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 08-SH | --- | 1.9 | 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 08-SH | --- | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 08-SH | --- | 2.5 | 13 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 08-SH | --- | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 08-SH | --- | 1.9 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 08-SH | --- | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 08-SH | --- | 2.2 | 60 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1991 | 08-SH | --- | 1.7 | < 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-May-1992 | 08-SH | --- | 1.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 03-Nov-1992 | 08-SH | --- | 2.1 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-May-1993 | 08-SH | --- | 1.8 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-1993 | 08-SH | --- | 0.9 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 08-SH | --- | 1.3 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 31-May-1994 | 08-SH DUP | --- | 1.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 08-SH | --- | 1.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 22-Sep-1994 | 08-SH DUP | --- | 1.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-1994 | 08-SH | --- | 1.1 | 5 | --- | --- | --- | --- | --- | --- | < 0.2 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 08-SH | --- | --- | 5 | --- | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 08-SH | --- | 1.1 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 08-SH | --- | --- | 5 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 08-SH | --- | 1.9 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 05-Sep-1996 | 08-SH DUP | --- | --- | 5 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 05-Sep-1996 | 08-SH DUP | --- | 1.9 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 08-SH | --- | 1.4 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 05-Sep-1997 | 08-SH DUP | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 08-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0029 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 08-SH | --- | 1.4 | < 5 | < 0.0009 | < 0.0009 | < 0.0009 | < 0.002 | < 0.0009 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 08-SH | --- | 1.2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 09-Sep-1999 | 08-SH DUP | --- | --- | 7 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 08-SH | --- | 1.2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| (Duplicate) | 05-Sep-2000 | 08-SH DUP | --- | 1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 08-SH | --- | 1.2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| (Duplicate) | 05-Sep-2000 | 08-SH DUP | --- | 1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 08-SH | --- | 1.2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 05-Sep-2002 | 08-SH | --- | 1.8 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | 0.004 | < 0.1 | --- | --- | < 0.1 | --- |
| | 04-Sep-2003 | 08-SH | --- | 1.1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 09-Sep-2004 | 08-SH | --- | 1.2 | 15 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2005 | 08-SH | --- | 1.4 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 08-SH | 1.7 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2007 | 08-SH | 1.4 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 03-Sep-2008 | 08-SH | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 09-Sep-2009 | 08-SH | 3.3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2010 | 8 SH | 3.3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2011 | 08-SH | 2.3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 08-SH | 1.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 25-Sep-2013 | 08-SH | 2.3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 16-Sep-2014 | 08-SH | 4.1 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | 08-SH | 1.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2016 | 08-SH | 2.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 26-Sep-2017 | 08-SH | 23.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2018 | 08-SH | 2.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 16-Sep-2019 | 08-SH | 1.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 08-SH | 3.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 08-SH | 3.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2022 | 08-SH | 3.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 27-Sep-2023 | 08-SH | 1.64 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **08-IN** | 15-May-1985 | 08-IN | --- | 0.2 | 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 08-IN | --- | 2.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 08-IN | --- | 2.8 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 08-IN | --- | 1.5 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 08-IN | --- | 2.6 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 08-IN | --- | 2.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 08-IN | --- | 2.6 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 08-IN | --- | 3 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 08-IN | --- | 1.8 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 08-IN | --- | 2.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 08-IN | --- | 3.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 08-IN | --- | 2.2 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 08-IN | --- | 2.7 | 30 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 08-IN | --- | 2.3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 08-IN | --- | 2.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 08-IN | --- | 2.7 | 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 08-IN | --- | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 08-IN | --- | 2.8 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 08-IN | --- | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 08-IN | --- | 2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 08-IN | --- | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 08-IN | --- | 2.4 | 71 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-May-1991 | 08-IN | --- | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Nov-1991 | 08-IN | --- | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 08-IN | --- | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-May-1993 | 08-IN | --- | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-1993 | 08-IN | --- | 1.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 08-IN | --- | 1.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 08-IN | --- | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 08-IN | --- | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 08-IN | --- | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 08-IN | --- | 1.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 08-IN | --- | 1.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 08-IN | --- | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 08-IN | --- | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2002 | 08-IN | --- | 1.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2003 | 08-IN | --- | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2004 | 08-IN | --- | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2005 | 08-IN | --- | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 08-IN | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2007 | 08-IN | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2008 | 08-IN | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2009 | 08-IN | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2010 | 8 IN | 4.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2011 | 08-IN | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2012 | 08-IN | 2.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 25-Sep-2013 | 08-IN | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2014 | 08-IN | 4.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2015 | 08-IN | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | 08-IN | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2017 | 08-IN | 2.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2018 | 08-IN | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2019 | 08-IN | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 08-IN | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 08-IN | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2022 | 08-IN | 3.62 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2023 | 08-IN | 1.80 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **08-SS** | 15-May-1985 | 08-SS | --- | 3.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 08-SS | --- | 1.7 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 08-SS | --- | 1.6 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 08-SS | --- | 0.6 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 08-SS | --- | 1.6 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 08-SS | --- | 1.4 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 08-SS | --- | 1.6 | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

Table 4.5
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| Alberta Tier 2 Potable Groundwater Guideline[3] | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 15-May-1987 | 08-SS | --- | 1.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 08-SS | --- | 1.2 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 08-SS | --- | 2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 08-SS | --- | 1.8 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 08-SS | --- | 2.2 | 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 08-SS | --- | 0.4 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 08-SS | --- | 1.9 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 08-SS | --- | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 08-SS | --- | 2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 08-SS | --- | 1.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 08-SS | --- | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 08-SS | --- | 1.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-May-1991 | 08-SS | --- | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Nov-1992 | 08-SS | --- | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-1993 | 08-SS | --- | 0.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 08-SS | --- | 0.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 08-SS | --- | 0.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Oct-1998 | 08-SS | --- | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 08-SS | --- | 0.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 08-SS | --- | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2003 | 08-SS | --- | 0.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2004 | 08-SS | --- | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 09-SH [Decommissioned] | 15-May-1985 | 09-SH [DECOM] | --- | 32.5 | 106 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 09-SH [DECOM] | --- | 31.3 | 81 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 09-SH [DECOM] | --- | 40 | 105 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 09-SH [DECOM] | --- | 44 | 82 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 09-SH [DECOM] | --- | 38 | 100 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 09-SH [DECOM] | --- | 38 | 110 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 09-SH [DECOM] | --- | 43 | 110 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 09-SH [DECOM] | --- | 46.5 | 128 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 09-SH [DECOM] | --- | 42 | 110 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 09-SH [DECOM] | --- | 41 | 120 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 09-SH [DECOM] | --- | 46.6 | 131 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 09-SH [DECOM] | --- | 47 | 28 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 09-SH [DECOM] | --- | 43 | 123 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 09-SH [DECOM] | --- | 45.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 09-SH [DECOM] | --- | 43.4 | 66 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 09-SH [DECOM] | --- | 44.5 | 109 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 09-SH [DECOM] | --- | 47.2 | 155 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Nov-1991 | 09-SH [DECOM] | --- | 49.8 | 114 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 09-SH [DECOM] | --- | 48.6 | 120 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-Aug-1992 | 09-SH [DECOM] | --- | 39.2 | 90 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 09-IN [Decommissioned] | 15-May-1985 | 09-IN [DECOM] | --- | 16.2 | 56 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 09-IN [DECOM] | --- | 14 | 24 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Dec-1985 | 09-IN [DECOM] | --- | 14.8 | 50 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 09-IN [DECOM] | --- | 15 | 50 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 09-IN [DECOM] | --- | 17 | 44 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 09-IN [DECOM] | --- | 17.6 | 34 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 09-IN [DECOM] | --- | 18.2 | 47 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 09-IN [DECOM] | --- | 19.6 | 41 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 09-IN [DECOM] | --- | 17.8 | 44 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 09-IN [DECOM] | --- | 22 | 59 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 09-IN [DECOM] | --- | 17.6 | 58 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 09-IN [DECOM] | --- | 20 | 54 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 09-IN [DECOM] | --- | 20.1 | 54 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 09-IN [DECOM] | --- | 19.7 | 56 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 09-IN [DECOM] | --- | 19.3 | 40 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 09-IN [DECOM] | --- | 20.2 | 39 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 09-IN [DECOM] | --- | 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 09-IN [DECOM] | --- | 20.3 | 44 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 09-IN [DECOM] | --- | 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 09-IN [DECOM] | --- | 21.2 | 59 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 09-IN [DECOM] | --- | 21.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 09-IN [DECOM] | --- | 19.9 | 74 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-May-1991 | 09-IN [DECOM] | --- | 21.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 09-IN [Decommissioned] | 06-Nov-1991 | 09-IN [DECOM] | --- | 21 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-Aug-1992 | 09-IN [DECOM] | --- | 20.6 | 30 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 09-PEAT | 15-Nov-1987 | 09-PEAT | --- | 90 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 09-PEAT | --- | 60 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 09-PEAT | --- | 74 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1988 | 09-PEAT | --- | 70 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 09-PEAT | --- | 46.6 | 148 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 09-PEAT | --- | 69 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 09-PEAT | --- | 62.5 | 560 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 09-PEAT | --- | 62.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 09-PEAT | --- | 55.5 | 178 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 09-PEAT | --- | 57.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 09-PEAT | --- | 64.2 | 220 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10-SH [Decommissioned] | 15-May-1985 | 10-SH [DECOM] | --- | 5.7 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1985 | 10-SH [DECOM] | --- | 4.6 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 10-SH [DECOM] | --- | 5.4 | 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 10-SH [DECOM] | --- | 5 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 10-SH [DECOM] | --- | 4.9 | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 10-SH [DECOM] | --- | 6 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 10-SH [DECOM] | --- | 4.8 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1987 | 10-SH [DECOM] | --- | 6.3 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 10-SH [DECOM] | --- | 5 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 10-SH [DECOM] | --- | 5.1 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 10-SH [DECOM] | --- | 4.2 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 10-SH [DECOM] | --- | 5.7 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 10-SH [DECOM] | --- | 4.7 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 10-SH [DECOM] | --- | 5.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 10-SH [DECOM] | --- | 5.5 | 38 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 10-SH [DECOM] | --- | 5.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 10-SH [DECOM] | --- | 5.2 | 40 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 10-SH [DECOM] | --- | 5.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 10-SH [DECOM] | --- | 5.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-May-1991 | 10-SH [DECOM] | --- | 4.4 | 27 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 10-SH [DECOM] | --- | 3.9 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Sep-1992 | 10-SH [DECOM] | --- | 4.3 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10-IN [Decommissioned] | 15-Dec-1985 | 10-IN [DECOM] | --- | 13 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1986 | 10-IN [DECOM] | --- | 4.4 | 25 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Jun-1986 | 10-IN [DECOM] | --- | 5.4 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1986 | 10-IN [DECOM] | --- | 4.8 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Oct-1986 | 10-IN [DECOM] | --- | 5.2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1987 | 10-IN [DECOM] | --- | 6.6 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1987 | 10-IN [DECOM] | --- | 5 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

Table 4.5
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 15-Nov-1987 | 10-IN [DECOM] | --- | 6.1 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Feb-1988 | 10-IN [DECOM] | --- | 5.4 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1988 | 10-IN [DECOM] | --- | 5.6 | 8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1988 | 10-IN [DECOM] | --- | 4.6 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1988 | 10-IN [DECOM] | --- | 4.5 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1989 | 10-IN [DECOM] | --- | 5.6 | 18 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1989 | 10-IN [DECOM] | --- | 5.3 | 23 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1989 | 10-IN [DECOM] | --- | 6.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1989 | 10-IN [DECOM] | --- | 6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 10-IN [DECOM] | --- | 5.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 10-IN [DECOM] | --- | 5 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 10-IN [DECOM] | --- | 5.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 10-IN [DECOM] | --- | 5.5 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-May-1991 | 10-IN [DECOM] | --- | 8.3 | 44 | < 0.001 | < 0.001 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Nov-1991 | 10-IN [DECOM] | --- | 8.1 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 10-IN [DECOM] | --- | 4.8 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Sep-1992 | 10-IN [DECOM] | --- | 5.1 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **11-SH** | 17-May-1991 | 11-SH | --- | 10.6 | 35 | < 0.001 | < 0.001 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 11-SH | --- | 11.8 | 14.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 11-SH | --- | 12.5 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 11-SH | --- | 11.5 | 30 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 11-SH | --- | 12.1 | 17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 11-SH | --- | 13.9 | 63 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 11-SH | --- | 12.4 | 32 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 11-SH | --- | 12 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-1994 | 11-SH | --- | 12.8 | 37 | --- | --- | --- | --- | --- | --- | 0.3 | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 02-Nov-1994 | 11-SH DUP | --- | 14.4 | 5 | --- | --- | --- | --- | --- | --- | 0.4 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 11-SH | --- | 14 | 43 | --- | < 0.001 | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 11-SH | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 11-SH | --- | --- | 29 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 11-SH | --- | 13.8 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 11-SH | --- | 12.7 | 37 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 11-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 11-SH | --- | 17.2 | 38 | 0.0026 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 11-SH | --- | 13.5 | 47 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 11-SH | --- | 12.3 | 20 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 05-Sep-2002 | 11-SH | --- | 12.7 | 34 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | 0.012 | < 0.1 | --- | --- | < 0.1 | --- |
| | 03-Sep-2003 | 11-SH | --- | 13.1 | 36 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 03-Sep-2003 | 11-SH | 14.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 11-SH | --- | 16.7 | 44 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 07-Sep-2005 | 11-SH | --- | 14.4 | 37 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 11-SH | 12.6 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 06-Sep-2007 | 11-SH | 13.3 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 04-Sep-2008 | 11-SH | 13 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 10-Sep-2009 | 11-SH | 13 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 09-Sep-2010 | 11 SH | 13.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2011 | 11-SH | 13.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 06-Sep-2012 | 11-SH | 13.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 11-SH | 9.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 17-Sep-2014 | 11-SH | 9.9 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 17-Sep-2014 | 31-SH | 10.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | 11-SH | 11.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 29-Sep-2015 | 31-SH | 10.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2016 | 11-SH | 10.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 27-Sep-2016 | 31-SH | 10.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 11-SH | 8.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 27-Sep-2017 | 31-SH | 9.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 11-SH | 10.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 18-Sep-2018 | 31-SH | 10.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2019 | 11-SH | 9.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 17-Sep-2019 | 31-SH | 9.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 21-Sep-2020 | 11-SH | 8.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 21-Sep-2020 | 31-SH | 8.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 11-SH | 8.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **(Duplicate)** | 22-Sep-2021 | 31-SH | 8.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 29-Sep-2022 | 11-SH | 9.49 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| **(Duplicate)** | 29-Sep-2022 | 31-SH | 9.02 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 28-Sep-2023 | 11-SH | 7.53 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2023 | 31-SH | 8.13 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **11-IN** | 17-May-1991 | 11-IN | --- | 9.6 | 36 | < 0.001 | < 0.001 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 11-IN | --- | 9.7 | 14.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 11-IN | --- | 9.3 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 11-IN | --- | 10.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 11-IN | --- | 10 | 41 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 11-IN | --- | 11.3 | 22 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 11-IN | --- | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 11-IN | --- | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 11-IN | --- | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 11-IN | --- | 10.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 11-IN | --- | 10.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 11-IN | --- | 9.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 11-IN | --- | 9.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2002 | 11-IN | --- | 10.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Oct-2002 | 11-IN | 10.3 | 10.8 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | < 0.5 |
| | 03-Sep-2003 | 11-IN | --- | 10.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 11-IN | 10.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 11-IN | --- | 11.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2005 | 11-IN | --- | 9.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 11-IN | 9.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2007 | 11-IN | 9.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2008 | 11-IN | 9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Sep-2009 | 11-IN | 9.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2010 | 11 IN | 10.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2011 | 11-IN | 10.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2012 | 11-IN | 11.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 11-IN | 9.40 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2014 | 11-IN | 11.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2015 | 11-IN | 11.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | 11-IN | 13.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 11-IN | 10.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 11-IN | 10.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 11-IN | 11.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2020 | 11-IN | 10.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 11-IN | 11.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 11-IN | 12.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2023 | 11-IN | 9.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **11-SS** | 17-May-1991 | 11-SS | --- | 2.3 | 20 | < 0.001 | < 0.001 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 11-SS | --- | 1.7 | 60 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| **12-SH** | 17-May-1991 | 12-SH | --- | 2 | 11 | < 0.001 | < 0.001 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 12-SH | --- | 1.9 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 12-SH | --- | 2.4 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 12-SH | --- | 2.4 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 12-SH | --- | 1 | 20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 12-SH | --- | 1.6 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 12-SH | --- | 1.8 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Nov-1994 | 12-SH | --- | 1.6 | 5 | --- | --- | --- | --- | --- | --- | 0.8 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 12-SH | --- | --- | 12 | --- | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 12-SH | --- | 1.2 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 12-SH | --- | --- | 5 | < 0.0009 | --- | < 0.0009 | < 0.0009 | < 0.0009 | < 0.0018 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 12-SH | --- | 1.8 | --- | --- | < 0.0009 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 05-Sep-1996 | 12-SH DUP | --- | 1.8 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 12-SH | --- | 1.7 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 12-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 05-Sep-1997 | 12-SH DUP | --- | 1.4 | 11 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 05-Sep-1997 | 12-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 12-SH | --- | 1.8 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 12-SH | --- | 1.7 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 12-SH | --- | 1.7 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 12-SH | --- | 1.4 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 04-Sep-2002 | 12-SH | --- | 2 | < 5 | < 0.0004 | 0.0005 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | 0.007 | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Oct-2002 | 12-SH | --- | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 04-Sep-2003 | 12-SH | --- | 1.5 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 09-Sep-2004 | 12-SH | --- | 2.5 | 9 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2005 | 12-SH | --- | 1.9 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 12-SH | 2.6 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2007 | 12-SH | 1.3 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2008 | 12-SH | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 10-Sep-2009 | 12-SH | 2.3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 09-Sep-2010 | 12 SH | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 07-Sep-2011 | 12-SH | 2.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 12-SH | 2.1 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 12-SH | 1.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 17-Sep-2014 | 12-SH | 3.3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | 12-SH | 2.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2016 | 12-SH | 2.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 12-SH | 2.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 12-SH | 3.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 16-Sep-2019 | 12-SH | 1.2 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 12-SH | 2.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 12-SH | 2.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2022 | 12-SH | 2.95 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 28-Sep-2023 | 12-SH | 2.85 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **12-IN** | 15-Jan-1990 | 12-IN | --- | 4 | 31 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Mar-1990 | 12-IN | --- | 4 | 29 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-May-1990 | 12-IN | --- | 2.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Aug-1990 | 12-IN | --- | 3 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Nov-1990 | 12-IN | --- | 2.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-May-1991 | 12-IN | --- | 2.1 | 11 | < 0.001 | < 0.001 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 12-IN | --- | 2.2 | < 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 12-IN | --- | 2.3 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 12-IN | --- | 2.8 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 12-IN | --- | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 12-IN | --- | 1.4 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 12-IN | --- | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 12-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 12-IN | --- | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 12-IN | --- | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 12-IN | --- | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 12-IN | --- | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 12-IN | --- | 3.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 12-IN | --- | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2003 | 12-IN | --- | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2004 | 12-IN | --- | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Nov-2004 | 12-IN | --- | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 08-Sep-2005 | 12-IN | --- | 2.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 12-IN | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2007 | 12-IN | 1.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2008 | 12-IN | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Sep-2009 | 12-IN | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2010 | 12 IN | 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2011 | 12-IN | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2012 | 12-IN | 4.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2014 | 12-IN | 4.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2015 | 12-IN | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | 12-IN | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 12-IN | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 12-IN | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2019 | 12-IN | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 12-IN | 2.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 12-IN | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2022 | 12-IN | 3.29 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2023 | 12-IN | 2.97 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **13-SH** | 04-Nov-1991 | 13-SH | --- | 1.8 | < 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 13-SH | --- | 2.1 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 13-SH | --- | 1.9 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 13-SH | --- | 1.5 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 13-SH | --- | 1 | 11 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 13-SH | --- | 1.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 13-SH | --- | --- | 7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 13-SH | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Nov-1994 | 13-SH | --- | 2.8 | 5 | --- | --- | --- | --- | --- | --- | 0.6 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 13-SH | --- | --- | 5 | < 0.001 | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 13-SH | --- | 4.5 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 13-SH | --- | --- | 5 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 13-SH | --- | 3.2 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 13-SH | --- | 2.1 | 6 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 13-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 04-Sep-1997 | 13-SH DUP | --- | 2.1 | 9 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 04-Sep-1997 | 13-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 13-SH | --- | 3.2 | 6 | < 0.0008 | 0.002 | < 0.0008 | < 0.002 | < 0.0008 | < 0.0028 | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 13-SH | --- | 4.3 | 6 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 13-SH | --- | 3.7 | 11 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 13-SH | --- | 3.4 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 04-Sep-2002 | 13-SH | --- | 3.7 | 10 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | 0.007 | < 0.1 | --- | --- | < 0.1 | --- |
| | 04-Sep-2003 | 13-SH | --- | 3.3 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 09-Sep-2004 | 13-SH | --- | 3.8 | 14 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2005 | 13-SH | --- | 2.8 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 07-Sep-2006 | 13-SH (Duplicate) | 2.8 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2007 | 13-SH | 2.2 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 03-Sep-2008 | 13-SH | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 10-Sep-2009 | 13-SH | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2010 | 13 SH | 3.1 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 07-Sep-2011 | 13-SH | 3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 13-SH | 2.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 13-SH | 1.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 16-Sep-2014 | 13-SH | 2.9 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 28-Sep-2015 | 13-SH | 2.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 26-Sep-2016 | 13-SH | 2.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 13-SH | 3.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 13-SH | 2.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 16-Sep-2019 | 13-SH | 1.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 13-SH | 1.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 21-Sep-2021 | 13-SH | 2.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 29-Sep-2022 | 13-SH | 2.96 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 28-Sep-2023 | 13-SH | 8.39 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **13-IN** | 17-May-1991 | 13-IN | --- | 2.4 | 29 | < 0.001 | < 0.001 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1991 | 13-IN | --- | 2.2 | < 0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-May-1992 | 13-IN | --- | 2 | 10 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Nov-1992 | 13-IN | --- | 2 | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 13-IN | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 13-IN | --- | 1.2 | 12 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 13-IN | --- | 1.2 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 13-IN | --- | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 13-IN | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 13-IN | --- | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 13-IN | --- | 1.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 13-IN | --- | 1.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 13-IN DUP | --- | 2.4 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 13-IN | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 13-IN | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 13-IN | --- | 1.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2003 | 13-IN | --- | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2004 | 13-IN | --- | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2005 | 13-IN | --- | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 13-IN | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2007 | 13-IN | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2008 | 13-IN | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Sep-2009 | 13-IN | 1.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2010 | 13 IN | 4.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2011 | 13-IN | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2012 | 13-IN | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 13-IN | 1.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2014 | 13-IN | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2015 | 13-IN | 2.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | --- | --- | --- |
| | 26-Sep-2016 | 13-IN | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 13-IN | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 13-IN | 2.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2019 | 13-IN | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 13-IN | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2021 | 13-IN | 3.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 13-IN | 3.16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2023 | 13-IN | 2.50 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **13-SS** | 17-May-1991 | 13-SS | --- | 2 | 54 | < 0.001 | < 0.001 | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 13-May-1992 | 13-SS | --- | 2.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-May-1993 | 13-SS | --- | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Nov-1993 | 13-SS | --- | 3 | 60 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **13(R)SS** | 10-Sep-2004 | 13(R)-SS | --- | 5.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2005 | 13(R)-SS | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 13(R)-SS | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Oct-2007 | 13(R)-SS | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2008 | 13(R)-SS | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2009 | 13(R)-SS | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2010 | 13 (R) SS | 10.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 13(R)SS | <1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2014 | 13(R)SS | 3.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2015 | 13(R)SS | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2016 | 13(R)SS | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 13(R)SS | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 13(R)SS | 1.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2019 | 13(R)SS | 0.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 13(R)SS | <1.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2021 | 13(R)SS | 1.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 13(R)SS | 1.36 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Could not obtain sample** | 28-Sep-2023 | 13(R)SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **14-SH** | 13-Nov-1993 | 14-SH | --- | 1.5 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 14-SH | --- | 2.3 | 6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 14-SH | --- | 2.4 | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 02-Nov-1994 | 14-SH | --- | 1.6 | 5 | --- | --- | --- | --- | --- | --- | 0.2 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 14-SH | --- | 2.1 | 12 | < 0.001 | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 14-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-1995 | 14-SH DUP | --- | 2 | 5 | < 0.001 | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-1995 | 14-SH DUP | --- | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 14-SH | --- | --- | 5 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 14-SH | --- | 3.2 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 14-SH | --- | 2.6 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1997 | 14-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 14-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0029 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 14-SH | --- | 3 | 5 | < 0.0009 | < 0.0009 | < 0.0009 | < 0.002 | < 0.0009 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 14-SH | --- | 3.4 | 11 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 14-SH | --- | 4.1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 05-Sep-2002 | 14-SH | --- | 5.5 | 18 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 04-Sep-2003 | 14-SH | --- | 4.7 | 14 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 09-Sep-2004 | 14-SH | --- | 5.2 | 14 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2005 | 14-SH | --- | 4.5 | 11 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 14-SH | 3.8 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2007 | 14-SH | 4.1 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 03-Sep-2008 | 14-SH | 4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 09-Sep-2009 | 14-SH | 5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 09-Sep-2010 | 14-SH | 4.7 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2011 | 14-SH | 3 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 14-SH | 3.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 25-Sep-2013 | 14-SH | 3.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 16-Sep-2014 | 14-SH | 6.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | 14-SH | 3.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2016 | 14-SH | 4.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |

Table 4.5
VEOLIA, Swan Hills Treatment Centre
Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 26-Sep-2017 | 14-SH | 4.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2018 | 14-SH | 3.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 16-Sep-2019 | 14-SH | 0.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 14-SH | 2.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 14-SH | 3.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2022 | 14-SH | 3.18 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 27-Sep-2023 | 14-SH | 2.84 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **15-SH** | 18-May-1993 | 15-SH | --- | 2.3 | 14 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-Nov-1993 | 15-SH | --- | 12.5 | 55 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 31-May-1994 | 15-SH | --- | 5.4 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-1994 | 15-SH | --- | 5.5 | 15 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 01-Nov-1994 | 15-SH | --- | 5.5 | 13 | --- | --- | --- | --- | --- | --- | 0.5 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 15-SH | --- | --- | 16 | --- | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 15-SH | --- | 5.1 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-1995 | 15-SH DUP | --- | 5.3 | 11 | < 0.001 | < 0.001 | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-1995 | 15-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 15-SH | --- | --- | 17 | < 0.0004 | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 15-SH | --- | 5.8 | --- | --- | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 15-SH | --- | 4.7 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 15-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 15-SH | --- | 4.4 | 7 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 15-SH | --- | 4.9 | 8 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 15-SH | --- | 4.6 | 8 | < 0.0009 | < 0.0009 | < 0.0009 | < 0.002 | < 0.0009 | < 0.0029 | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2001 | 15-SH | --- | 4.3 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 05-Sep-2002 | 15-SH | --- | 5.1 | 17 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 03-Sep-2003 | 15-SH | --- | 5.1 | 11 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2004 | 15-SH | --- | 5.5 | 20 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 07-Sep-2005 | 15-SH | --- | 4.8 | 7 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 15-SH | 4.5 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 06-Sep-2007 | 15-SH | 4.8 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 04-Sep-2008 | 15-SH | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.1 | --- | --- |
| | 10-Sep-2009 | 15-SH | 5.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 09-Sep-2010 | 15 SH | 7.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2011 | 15-SH | 6.1 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 06-Sep-2012 | 15-SH | 6.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 15-SH | 5.9 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| **(Previously labeled 15-I** | 17-Sep-2014 | 15-SH | 6.6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | 15-SH | 5.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2016 | 15-SH | 5.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 15-SH | 5.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 15-SH | 5.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 16-Sep-2019 | 15-SH | 4.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 21-Sep-2020 | 15-SH | 4.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 15-SH | 5.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 29-Sep-2022 | 15-SH | 5.38 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 28-Sep-2023 | 15-SH | 4.56 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **15-IN** | 22-Sep-1994 | 15-IN | --- | 15 | 16 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 15-IN | --- | 6.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 15-IN | --- | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 15-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 15-IN | --- | 4.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 15-IN | --- | 4.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 15-IN | --- | 4.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 15-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2002 | 15-IN | --- | 4.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 15-IN | --- | 5.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 15-IN | --- | 5.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2005 | 15-IN | --- | 5.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 15-IN | 4.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2007 | 15-IN | 4.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2008 | 15-IN | 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Sep-2009 | 15-IN | 6.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2010 | 15 IN | 6.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2011 | 15-IN | 5.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2012 | 15-IN | 6.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 15-IN | 6.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Previously labeled 15-S** | 17-Sep-2014 | 15-IN | 6.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2015 | 15-IN | 4.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | 15-IN | 5.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 15-IN | 5.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 15-IN | 5.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Dry** | 16-Sep-2019 | 15-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2020 | 15-IN | 4.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 15-IN | 5.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 15-IN | 4.98 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2023 | 15-IN | 4.07 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **15-SS** | 12-Nov-1993 | 15-SS | --- | 6.7 | 100 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **15(R)SS** | 10-Sep-2004 | 15(R)-SS | --- | 11.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Nov-2004 | 15(R)-SS | --- | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 08-Sep-2005 | 15(R)-SS | --- | 2.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 15(R)-SS | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2007 | 15(R)-SS | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2008 | 15(R)-SS | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2009 | 15(R)-SS | 15.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2010 | 15 (R) SS | 58.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2011 | 15 (R)-SS | 30.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 15(R)SS | 28.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **15(2R)SS** | 16-Sep-2014 | 15(2R)SS | 8.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2015 | 15(2R)SS | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2016 | 15(2R)SS | 4.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 15(2R)SS | <20 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 15(2R)SS | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2019 | 15(2R)SS | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 15(2R)SS | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 15(2R)SS | 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 15(2R)SS | 2.97 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Could not obtain sample** | 28-Sep-2023 | 15(2R)SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **16-SH** | 28-Sep-1995 | 16-SH | --- | 4.2 | 10 | < 0.001 | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 16-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 16-SH | --- | --- | 5 | < 0.0009 | --- | < 0.0009 | < 0.0009 | < 0.0009 | < 0.0018 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-1996 | 16-SH | --- | 4.4 | --- | --- | < 0.0009 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 16-SH | --- | 3 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 16-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 16-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0029 | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 16-SH | --- | 3.5 | 7 | < 0.0009 | < 0.0009 | < 0.0009 | < 0.002 | < 0.0009 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 16-SH | --- | 3.4 | 9 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 16-SH | --- | 4 | 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| **(Duplicate)** | 05-Sep-2000 | 16-SH DUP | --- | 3.7 | 9 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 16-SH | --- | 3.1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 04-Sep-2002 | 16-SH | --- | 3.6 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 04-Sep-2003 | 16-SH | --- | 4.1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2004 | 16-SH | --- | 3.8 | 23 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2005 | 16-SH | --- | 3.8 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 16-SH | 3.5 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 05-Sep-2007 | 16-SH | 3.4 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 03-Sep-2008 | 16-SH | 4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 10-Sep-2009 | 16-SH | 3.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2010 | 16 SH | 5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 07-Sep-2011 | 16-SH | 4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | 16-SH | 4.4 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 16-SH | 3.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 16-Sep-2014 | 16-SH | 5.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 28-Sep-2015 | 16-SH | 3.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 26-Sep-2016 | 16-SH | 4.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 16-SH | 4.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 16-SH | 4.3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 16-Sep-2019 | 16-SH | 2.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 16-SH | 3 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 21-Sep-2021 | 16-SH | 3.4 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2022 | 16-SH | 3.44 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 28-Sep-2023 | 16-SH | 3.71 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **16-IN** | 05-Sep-1996 | 16-IN | --- | 4.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 16-IN | --- | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 15-Sep-1998 | 16-IN | --- | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 16-IN | --- | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2000 | 16-IN | --- | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 16-IN | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2002 | 16-IN | --- | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2003 | 16-IN | --- | 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 16-IN | --- | 4.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2005 | 16-IN | --- | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 16-IN | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2007 | 16-IN | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2008 | 16-IN | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Sep-2009 | 16-IN | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2010 | 16 IN | 4.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2011 | 16-IN | 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2012 | 16-IN | 4.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 16-IN | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-2014 | 16-IN | 5.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2015 | 16-IN | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2016 | 16-IN | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 16-IN | 3.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 16-IN | 3.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Dry** | 16-Sep-2019 | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 16-IN | 3.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2021 | 16-IN | 4.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2022 | 16-IN | 3.07 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Dry** | 28-Sep-2023 | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **17-SH** | 01-Nov-1994 | 17-SH | --- | 3.5 | 5 | --- | --- | --- | --- | --- | --- | 0.6 | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 17-SH | --- | --- | 5 | --- | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-1995 | 17-SH | --- | 2.2 | --- | < 0.001 | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-1995 | 17-SH DUP | --- | 2 | 5 | < 0.001 | --- | < 0.001 | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- |
| **(Duplicate)** | 28-Sep-1995 | 17-SH DUP | --- | --- | --- | --- | < 0.001 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 17-SH | --- | --- | 5 | < 0.0009 | --- | < 0.0009 | < 0.0009 | < 0.0009 | < 0.0018 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 17-SH | --- | 3.4 | --- | --- | < 0.0009 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 17-SH | --- | 1.6 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 17-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 17-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 17-SH | --- | 2.2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 17-SH | --- | 2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 17-SH | --- | 1.7 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 17-SH | --- | 1.7 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 06-Sep-2001 | 17-SH | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2002 | 17-SH | --- | 2.4 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0012 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 03-Sep-2003 | 17-SH | --- | 2.2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 08-Sep-2004 | 17-SH | --- | 2.9 | 13 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | < 0.0008 | --- | --- | < 0.1 | --- | --- | < 0.1 | --- |
| | 07-Sep-2005 | 17-SH | --- | 2.5 | < 5 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 07-Sep-2006 | 17-SH | 2.1 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 06-Sep-2007 | 17-SH | 1.6 | --- | --- | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00080 | < 0.00040 | < 0.00080 | --- | --- | < 0.10 | --- | --- | < 0.10 | --- |
| | 04-Sep-2008 | 17-SH | 2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.1 | < 0.1 | --- | < 0.1 | --- | --- |
| | 10-Sep-2009 | 17-SH | 2.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 09-Sep-2010 | 17 SH | 2.2 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| | 08-Sep-2011 | 17-SH | 2.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 06-Sep-2012 | 17-SH | 1.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | 17-SH | 1.8 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 17-Sep-2014 | 17-SH | 3.6 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | 17-SH | 2.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2016 | 17-SH | 2.6 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 17-SH | 2.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 17-SH | 2.5 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2019 | 17-SH | 1.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 21-Sep-2020 | 17-SH | 2.9 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 17-SH | 2.7 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 29-Sep-2022 | 17-SH | 2.79 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 28-Sep-2023 | 17-SH | 2.72 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **17-IN** | 28-Sep-1995 | 17-IN | --- | 4.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1996 | 17-IN | --- | 4.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-1997 | 17-IN | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Sep-1998 | 17-IN | --- | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-1999 | 17-IN | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2000 | 17-IN | --- | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2001 | 17-IN | --- | 2.9 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 05-Sep-2002 | 17-IN | --- | 3.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 03-Sep-2003 | 17-IN | --- | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2004 | 17-IN | --- | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2005 | 17-IN | --- | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 07-Sep-2006 | 17-IN | 3.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2007 | 17-IN | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 04-Sep-2008 | 17-IN | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 10-Sep-2009 | 17-IN | 7.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 09-Sep-2010 | 17 IN | 5.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Sep-2011 | 17-IN | 4.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 06-Sep-2012 | 17-IN | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 17-IN | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2014 | 17-IN | 4.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.5**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | | | BTEX | | | | | | SELECT HYDROCARBONS | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Dissolved Organic Carbon (DOC) (mg/L) | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) | Benzene (mg/L) | Toluene (mg/L) | Ethylbenzene (mg/L) | m&p-Xylene (mg/L) | o-Xylene (mg/L) | Xylenes-Total (mg/L) | Oil and Grease (mg/L) | PHC F1 (C6-C10) (mg/L) | PHC F1 (C6-C10) - BTEX (mg/L) | PHC F2 (C10-C16) (mg/L) | TVH (C5-C10) (mg/L) | TPH (C3-C10) (mg/L) | TEH (C11-C60) (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 | --- | --- | --- | --- | --- | --- | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | 0.0050 | 0.024 | 0.0016 | --- | --- | 0.020 | --- | --- | 2.2 | 2.2 | --- | --- | --- |
| **Alberta Tier 2 Aquatic Life Fine Groundwater Guideline (Fine/C** | | | --- | --- | --- | 3.6/0.074 | 12000/0.021 | ---/41 | | | ---/2.9 | | | ---/9.8 | ---/9.8 | --- | --- | --- |
| | 29-Sep-2015 | 17-IN | 3.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | 17-IN | 3.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | 17-IN | 3.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 17-IN | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 17-IN | 2.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2020 | 17-IN | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 17-IN | 3.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 17-IN | 4.38 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2023 | 17-IN | 3.17 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **M-5** | 01-Oct-2001 | M-5 | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0012 | --- | --- | --- | --- | --- | --- | --- |
| | 01-Oct-2001 | M-5 | --- | 1 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 23-Sep-2002 | M-5 | --- | 0.6 | < 5 | < 0.0009 | < 0.0009 | < 0.0009 | < 0.002 | < 0.0009 | < 0.002 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 18-Oct-2003 | M-5 | --- | 11.8 | < 5 | < 0.0004 | 0.0011 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | --- | --- |
| | 02-Dec-2003 | M-5 | --- | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | --- | --- |
| | 26-Oct-2004 | M-5 | --- | 1.2 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | --- | --- |
| | 26-Nov-2004 | M-5 | --- | --- | --- | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0008 | < 0.0004 | --- | --- | --- | --- | --- | --- | < 0.1 | --- |
| **(Duplicate)** | 26-Nov-2004 | M-5 DUP1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 24-Oct-2005 | M-5 | --- | 2.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 12-Sep-2007 | M-5 | 1.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Oct-2008 | M-5 | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 11-Sep-2009 | M-5 | 1.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | --- | --- | < 0.00050 | --- | < 0.10 | < 0.10 | --- | < 0.10 | --- | --- |
| **M-6** | 29-Sep-2010 | M-6 | 1.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 16-Dec-2011 | M6 | 13.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **89-1** | 27-Mar-2006 | 89-1 | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Jun-2006 | 89-1 | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2006 | 89-1 | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-Dec-2006 | 89-1 | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **99-1** | 27-Mar-2006 | 99-1 | 1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Jun-2006 | 99-1 | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2006 | 99-1 | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 19-Dec-2006 | 99-1 | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **86-2** | 27-Jun-2006 | 86-2 | 3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **86-3** | 27-Jun-2006 | 86-3 | 2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **89-3** | 02-Oct-2001 | 89-3 | --- | --- | < 5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 24-Sep-2002 | 89-3 | --- | 0.6 | 22.0 | < 0.0009 | < 0.0009 | < 0.0009 | < 0.002 | < 0.0009 | < 0.002 | --- | --- | --- | --- | --- | < 0.1 | --- |
| | 14-Oct-2003 | 89-3 | --- | 9 | 22.0 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | --- | --- |
| | 26-Oct-2004 | 89-3 | --- | 0.9 | < 5 | < 0.0004 | < 0.0004 | < 0.0004 | --- | --- | < 0.0008 | --- | --- | < 0.1 | --- | --- | --- | --- |
| | 25-Oct-2005 | 89-3 | --- | 1.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 13-Sep-2007 | 89-3 | 1.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 08-Oct-2008 | 89-3 | 4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 28-Sep-2010 | 89-3 | 7.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 14-Dec-2011 | 89-3 | 6.7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 26-Sep-2013 | 89-3 | 1.2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2014 | 89-3 | 2.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2015 | PW | 1.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2016 | PW | 1.6 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 27-Sep-2017 | PW | 2.3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 18-Sep-2018 | 89-3 | 3.5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 17-Sep-2019 | 89-3 | 0.8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2020 | 89-3 | 2.0 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2021 | 89-3 | 4.1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2022 | 89-3 | 2.4 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 29-Sep-2023 | 89-3 | 1.34 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **QA/QC** | | | | | | | | | | | | | | | | | | |
| **Trip Blank** | 05-Sep-2012 | SPINEL 1 | < 1.0 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | SPINEL 18 | < 1.0 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 05-Sep-2012 | SPINEL 28 | < 1.0 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 26-Sep-2013 | TRIP BLANK | < 1.0 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 16-Sep-2014 | TRIP BLANK | <1.0 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | TRIP BLANK | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2016 | TRIP BLANK | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | TRIP BLANK | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 19-Sep-2018 | TRIP BLANK | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 16-Sep-2019 | TRIP BLANK | <0.50 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 23-Sep-2020 | TRIP BLANK | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | TRIP BLANK | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2022 | TRIP BLANK | <0.50 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 29-Sep-2023 | TRIP BLANK | <0.50 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| **Field Blank** | 25-Sep-2013 | 20-SH | < 1.0 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 16-Sep-2014 | 41-SH | 3.5 | --- | --- | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00071 | --- | < 0.10 | < 0.10 | --- | --- | --- | --- |
| | 28-Sep-2015 | FIELD BLANK 1 | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 29-Sep-2015 | FIELD BLANK 2 | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 26-Sep-2016 | 10-SH | 1.1 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2016 | 20-SH | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 10-SH | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 27-Sep-2017 | 20-SH | 1.8 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 10-SH | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 18-Sep-2018 | 20-SH | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 16-Sep-2019 | 10-SH | <0.50 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 17-Sep-2019 | 20-SH | <0.50 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 21-Sep-2020 | 10-SH | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2020 | 20-SH | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 23-Sep-2020 | 30-SH | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 21-Sep-2021 | 10-SH | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 22-Sep-2021 | 20-SH | <1.0 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00071 | --- | <0.10 | <0.10 | --- | --- | --- | --- |
| | 28-Sep-2022 | 10-SH | <0.50 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 29-Sep-2022 | 20-SH | <0.50 | --- | --- | <0.00050 | <0.00050 | <0.00050 | <0.00040 | <0.00030 | <0.00050 | --- | <0.10 | <0.025 | --- | --- | --- | --- |
| | 29-Sep-2023 | FIELD BLANK | <0.50 | --- | --- | <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 (August, 2022), 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 |

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 |
| **Bold** | Guideline exceeded |
| Regular | Concentration is equal to the guideline |

Detection Limit is greater than the guideline

--- Guideline Row: No guideline for that parameter

--- Results: Parameter was not analyzed

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| | | | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **01-SH [Decommissioned]** | 04-Nov-1992 | 01-SH [DECOM] | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.00002 |
| | 10-Nov-1993 | 01-SH [DECOM] | --- | --- | --- | < 0.000118 | < 0.000118 | < 0.000118 | < 0.000118 | < 0.000118 | < 0.000118 | < 0.000708 |
| | 31-May-1994 | 01-SH [DECOM] | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| **01A-SH** | 22-Sep-1994 | 01A-SH | --- | --- | --- | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.00005 |
| | 28-Sep-1995 | 01A-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 01A-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 05-Sep-1997 | 01A-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 01A-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 01A-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2000 | 01A-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Oct-2001 | 01A-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 11-Sep-2003 | 01A-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 01A-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 01A-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 06-Sep-2007 | 01A-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 01A-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 01A-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 01A SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 01A-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 01A-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 01A-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 01A-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 01A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 01A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 01A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 01A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 01A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2020 | 01A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 01A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 01A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 01A-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **01-IN [Decommissioned]** | 10-Nov-1993 | 01-IN [DECOM] | --- | --- | --- | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0006 |
| **01A-IN** | 22-Sep-1994 | 01A-IN | --- | --- | --- | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.00005 |
| | 28-Sep-1995 | 01A-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 01A-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 01A-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 01A-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 07-Sep-2001 | 01A-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2002 | 01A-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 01A-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 01A-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 01A-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 01A-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 06-Sep-2007 | 01A-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 01A-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 01A-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 01A IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 01A-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 01A-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 01A-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 01A-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 01A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 01A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 01A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 01A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 01A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2020 | 01A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 01A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 01A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 01A-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **02-SH [Decommissioned]** | 02-Dec-1991 | 02-SH [DECOM] | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 03-Nov-1992 | 02-SH [DECOM] | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| | 04-Nov-1992 | 02-SH [DECOM] | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.000113 |
| **03-SH** | 02-Dec-1991 | 03-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 03-Nov-1992 | 03-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| | 04-Nov-1992 | 03-SH | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.000113 |
| | 10-Nov-1993 | 03-SH | --- | --- | --- | < 0.000108 | < 0.000108 | < 0.000108 | < 0.000108 | < 0.000108 | < 0.000108 | < 0.000648 |
| | 31-May-1994 | 03-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| **(Duplicate)** | 31-May-1994 | 03-SH DUP | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| | 21-Sep-1994 | 03-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00005 |
| | 22-Sep-1994 | 03-SH | --- | --- | --- | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.000286 |
| **(Duplicate)** | 22-Sep-1994 | 03-SH DUP | --- | --- | --- | < 0.0000478 | < 0.0000478 | < 0.0000478 | < 0.0000478 | < 0.0000478 | < 0.0000478 | < 0.000287 |
| | 28-Sep-1995 | 03-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 03-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-1997 | 03-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 15-Sep-1998 | 03-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| **(Duplicate)** | 15-Sep-1998 | 03-SH DUP | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 03-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2000 | 03-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 03-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 03-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 03-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 09-Sep-2004 | 03-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2005 | 03-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 03-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 03-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 03-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 03-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 03-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 03-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 03-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 03-SH | < 0.000011 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 03-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 03-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 28-Sep-2016 | 03-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 03-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 03-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 03-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 03-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 03-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 03-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 03-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **03-IN** | 07-Sep-2006 | 03-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 03-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 03-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 03-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 03-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 03-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 03-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 03-IN | < 0.000011 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 03-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 03-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 28-Sep-2016 | 03-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 03-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 03-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 03-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 03-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 03-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 03-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 03-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| | | | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **04-SH** | 02-Dec-1991 | 04-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 03-Nov-1992 | 04-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| | 04-Nov-1992 | 04-SH | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.000113 |
| | 10-Nov-1993 | 04-SH | --- | --- | --- | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000618 |
| | 31-May-1994 | 04-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| | 21-Sep-1994 | 04-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00005 |
| | 22-Sep-1994 | 04-SH | --- | --- | --- | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.000284 |
| | 28-Sep-1995 | 04-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 04-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 03-Sep-1997 | 04-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 15-Sep-1998 | 04-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 04-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2000 | 04-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 04-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 06-Sep-2001 | 04-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 04-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00003 | < 0.00002 | < 0.00002 | < 0.00002 | 0.000030-0.00019 |
| **(Duplicate)** | 04-Sep-2002 | 04-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 08-Oct-2002 | 04-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 07-Sep-2003 | 04-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| **(Duplicate)** | 11-Sep-2003 | 04-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 04-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| **(Duplicate)** | 08-Sep-2004 | 04-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 04-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2005 | 04-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 04-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2006 | 04-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 04-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 05-Sep-2007 | 04-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 04-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| **(Duplicate)** | 03-Sep-2008 | 04-SH DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 04-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 09-Sep-2009 | 04-SH DUP | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 04 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 08-Sep-2010 | SYLVITE 24 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 04-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 07-Sep-2011 | ZIRCON 24 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 04-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 05-Sep-2012 | SPINEL 22 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 04-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 26-Sep-2013 | 24-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 04-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 04-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2016 | 04-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 04-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 04-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 04-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 04-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 04-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 04-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 04-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **04-IN** | 08-Sep-2010 | 04 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000013 | 0.00003 | < 0.000010 | < 0.000010 | 0.000043 |
| | 13-Oct-2010 | FLUORITE 3 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 14-Oct-2010 | FLUORITE 14 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 04-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 17-Sep-2014 | 04-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 04-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2016 | 04-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 04-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 04-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 04-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 04-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 04-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 04-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 04-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **04-SS** | 26-Sep-2013 | 04-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 26-Sep-2013 | 24-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 04-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 16-Sep-2014 | 24-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 04-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 04-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2017 | 04-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 04-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 04-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 04-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 04-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 04-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 04-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| | | | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **05-SH** | 02-Dec-1991 | 05-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 03-Nov-1992 | 05-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| | 04-Nov-1992 | 05-SH | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.000113 |
| | 10-Nov-1993 | 05-SH | --- | --- | --- | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0006 |
| | 31-May-1994 | 05-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| | 21-Sep-1994 | 05-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00005 |
| | 22-Sep-1994 | 05-SH | --- | --- | --- | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.000284 |
| | 28-Sep-1995 | 05-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 05-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 03-Sep-1997 | 05-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 05-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 05-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2000 | 05-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 05-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 06-Sep-2001 | 05-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 05-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 04-Sep-2002 | 05-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 05-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| **(Duplicate)** | 07-Sep-2003 | 05-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 05-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| **(Duplicate)** | 08-Sep-2004 | 05-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 05-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2005 | 05-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 05-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 05-Sep-2007 | 05-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2008 | 05-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| **(Duplicate)** | 05-Sep-2008 | 05-SH DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 05-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 09-Sep-2009 | 05-SH DUP | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 05 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 08-Sep-2010 | SYLVITE 25 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 05-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 07-Sep-2011 | ZIRCON 25 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 05-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 05-Sep-2012 | SPINEL 23 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 05-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 05-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 17-Sep-2014 | 25-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 05-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 28-Sep-2015 | 25-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 28-Sep-2016 | 05-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 28-Sep-2016 | 25-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 05-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 27-Sep-2017 | 25-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 05-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 17-Sep-2018 | 25-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 05-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 17-Sep-2019 | 25-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 05-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 22-Sep-2020 | 25-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 05-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 22-Sep-2021 | 25-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 05-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 29-Sep-2022 | 25-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 05-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 25-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **05-IN** | 16-Sep-1998 | 05-IN | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.0009 |
| | 09-Sep-1999 | 05-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 05-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 05-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 05-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 05-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 05-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 30-Sep-2004 | 05-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00003 | 0.00005 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 05-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 05-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 05-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2008 | 05-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 05-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 05 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 05-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 05-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 05-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 26-Sep-2013 | 25-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 05-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 05-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 28-Sep-2016 | 05-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 05-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 05-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 05-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 05-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 05-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 05-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 05-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| | | | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **05-SS** | 10-Sep-2004 | 05-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.0001 | < 0.00002 | < 0.00002 | --- |
| | 30-Oct-2004 | 05-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.0003 | 0.00016 | < 0.00002 | < 0.00002 | --- |
| | 26-Nov-2004 | 05-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00003 | 0.00002 | < 0.00002 | < 0.00002 | 0.00005 |
| **(Duplicate)** | 26-Nov-2004 | 05-SS DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00003 | 0.00002 | < 0.00002 | < 0.00002 | 0.00005 |
| **(Duplicate)** | 26-Nov-2004 | 05-SS DUP2 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| | 18-Jan-2005 | 05-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00002 | 0.00003 | < 0.00002 | < 0.00002 | 0.00005 |
| **(Duplicate)** | 18-Jan-2005 | 05-SS DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00004 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00004 |
| | 03-Apr-2005 | 05-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| **(Duplicate)** | 03-Apr-2005 | 05-SS DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| | 27-May-2005 | 05-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| **(Duplicate)** | 27-May-2005 | 05-SS DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00004 | < 0.00002 | < 0.00002 | 0.00004 |
| **(Duplicate)** | 07-Sep-2005 | 05-SS DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 08-Sep-2005 | 05-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 17-Nov-2005 | 05-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 17-Nov-2005 | 05-SS DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 17-Nov-2005 | 05-SS DUP2 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 12-Apr-2006 | 05-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 12-Apr-2006 | 05-SS DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 05-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2006 | 05-SS DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2007 | 05-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000021 | < 0.000020 | < 0.000020 | 0.00002 |
| **(Duplicate)** | 07-Sep-2007 | 05-SS DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 15-Oct-2007 | 05-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 15-Oct-2007 | 05-SS DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 03-Sep-2008 | 05-SS DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 04-Sep-2008 | 05-SS | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 17-Sep-2009 | 05-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 17-Sep-2009 | 05-SS DUP | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 05 (R) SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 09-Sep-2010 | SYLVITE 22 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 05-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 08-Sep-2011 | ZIRCON 22 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 05-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 16-Sep-2014 | 05-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 16-Sep-2014 | 25-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 05-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 28-Sep-2015 | 25-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 28-Sep-2016 | 05-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 28-Sep-2016 | 25-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 05-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 27-Sep-2017 | 25-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 05-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 17-Sep-2018 | 25-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 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-2019 | 25-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 23-Sep-2020 | 05-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 23-Sep-2020 | 25-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 05-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 22-Sep-2021 | 25-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 05-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 29-Sep-2022 | 25-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 05-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 25-SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **06-SH** | 22-Sep-1994 | 06-SH | --- | --- | --- | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.000283 |
| | 28-Sep-1995 | 06-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 06-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 03-Sep-1997 | 06-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 15-Sep-1998 | 06-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| **(Duplicate)** | 15-Sep-1998 | 06-SH DUP | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 06-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2000 | 06-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 06-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 06-Sep-2001 | 06-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 06-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 04-Sep-2002 | 06-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 06-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| **(Duplicate)** | 03-Sep-2003 | 06-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00003 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 14-Oct-2003 | 06-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| **(Duplicate)** | 14-Oct-2003 | 06-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 06-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| **(Duplicate)** | 08-Sep-2004 | 06-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 30-Oct-2004 | 06-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 06-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2005 | 06-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 06-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2006 | 06-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 06-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 05-Sep-2007 | 06-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 06-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| **(Duplicate)** | 03-Sep-2008 | 06-SH DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 06-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 09-Sep-2009 | 06-SH DUP | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 06 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 08-Sep-2010 | SYLVITE 26 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 06-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 07-Sep-2011 | ZIRCON 26 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 06-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 05-Sep-2012 | SPINEL 25 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 25-Sep-2013 | 06-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 25-Sep-2013 | 26-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 06-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 06-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 28-Sep-2016 | 06-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2017 | 06-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 06-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 06-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 06-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 06-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 06-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 06-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **06-IN** | 15-May-1991 | 06-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 02-Dec-1991 | 06-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 06-IN | --- | --- | --- | < 0.000318 | < 0.000318 | < 0.000318 | < 0.000318 | < 0.000318 | < 0.000318 | < 0.00032 |
| | 03-Nov-1992 | 06-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| | 04-Nov-1992 | 06-IN | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.000113 |
| | 10-Nov-1993 | 06-IN | --- | --- | --- | < 0.000104 | < 0.000104 | < 0.000104 | < 0.000104 | < 0.000104 | < 0.000104 | < 0.000624 |
| | 15-Sep-1998 | 06-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 06-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 06-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 06-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.0001 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00010-0.00026 |
| | 23-May-2002 | 06-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 23-May-2002 | 06-IN DUP | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-2002 | 06-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 06-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 06-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 06-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 06-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 06-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 06-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 06 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 06-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 06-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 25-Sep-2013 | 06-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **06(R)IN** | 17-Sep-2014 | 06(R)IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 06(R)IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 28-Sep-2016 | 06(R)IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2017 | 06(R)IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 06(R)IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 06(R)IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 06(R)IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 06(R)IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 06(R)IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 06(R)IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **07-SH** | 02-Dec-1991 | 07-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 03-Nov-1992 | 07-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| | 04-Nov-1992 | 07-SH | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.000113 |
| | 10-Nov-1993 | 07-SH | --- | --- | --- | < 0.000111 | < 0.000111 | < 0.000111 | < 0.000111 | < 0.000111 | < 0.000111 | < 0.000666 |
| | 31-May-1994 | 07-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| | 22-Sep-1994 | 07-SH | --- | --- | --- | < 0.0000481 | < 0.0000481 | < 0.0000481 | < 0.0000481 | < 0.0000481 | < 0.0000481 | < 0.000289 |
| | 28-Sep-1995 | 07-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 07-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 03-Sep-1997 | 07-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 15-Sep-1998 | 07-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| **(Duplicate)** | 15-Sep-1998 | 07-SH DUP | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 07-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 09-Sep-1999 | 07-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2000 | 07-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 05-Sep-2000 | 07-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 07-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 06-Sep-2001 | 07-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 07-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 04-Sep-2002 | 07-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00004 | < 0.00002 | < 0.00002 | < 0.00002 | (0.00004-0.0002) |
| | 08-Oct-2002 | 07-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 07-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| **(Duplicate)** | 03-Sep-2003 | 07-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 07-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| **(Duplicate)** | 08-Sep-2004 | 07-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 07-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2005 | 07-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 07-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2006 | 07-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 07-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 05-Sep-2007 | 07-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 07-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| **(Duplicate)** | 03-Sep-2008 | 07-SH DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 07-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 09-Sep-2009 | 07-SH DUP | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 07 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 08-Sep-2010 | SYLVITE 27 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 07-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 07-Sep-2011 | ZIRCON 27 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 07-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 05-Sep-2012 | SPINEL 27 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 25-Sep-2013 | 07-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | <0.000050 |
| **(Duplicate)** | 25-Sep-2013 | 27-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 07-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 17-Sep-2014 | 27-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 07-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 29-Sep-2015 | 27-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 07-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 27-Sep-2016 | 27-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2017 | 07-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 26-Sep-2017 | 27-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 07-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 17-Sep-2018 | 27-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 07-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 17-Sep-2019 | 27-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 07-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 22-Sep-2020 | 27-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 07-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 22-Sep-2021 | 27-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 07-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 28-Sep-2022 | 27-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 07-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 29-Sep-2022 | 27-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **07-IN** | 15-May-1991 | 07-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 02-Dec-1991 | 07-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 07-IN | --- | --- | --- | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.00031 |
| | 03-Nov-1992 | 07-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| | 04-Nov-1992 | 07-IN | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.000113 |
| | 10-Nov-1993 | 07-IN | --- | --- | --- | < 0.000105 | < 0.000105 | < 0.000105 | < 0.000105 | < 0.000105 | < 0.000105 | < 0.00063 |
| | 15-Sep-1998 | 07-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 07-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 07-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 07-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00005 | < 0.00002 | < 0.00002 | < 0.00002 | 0.000050-0.00021 |
| | 09-May-2002 | 07-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 07-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 07-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 07-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 07-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 07-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 07-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000033 | < 0.000020 | < 0.000020 | 0.00003 |
| | 15-Oct-2007 | 07-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 15-Oct-2007 | 07-IN DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 07-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 07-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 07 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 07-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 07-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 25-Sep-2013 | 07-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 07-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 07-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 07-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2017 | 07-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 07-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 07-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 07-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 07-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 07-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 07-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **07-SS** | 04-Oct-1998 | 07-SS | < 0.00004 | < 0.00004 | < 0.00004 | < 0.00004 | < 0.00004 | < 0.00004 | < 0.00004 | < 0.00004 | < 0.00004 | < 0.00036 |
| **07(R)SS** | 16-Sep-2014 | 07(R)SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 07(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 07(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2017 | 07(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 07(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 07(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 23-Sep-2020 | 07(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 07(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| | | | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **08-SH** | 02-Dec-1991 | 08-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 08-SH | --- | --- | --- | < 0.000305 | < 0.000305 | < 0.000305 | < 0.000305 | < 0.000305 | < 0.000305 | < 0.00183 |
| | 13-May-1992 | 08-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00031 |
| | 03-Nov-1992 | 08-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| | 04-Nov-1992 | 08-SH | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.000113 |
| | 10-Nov-1993 | 08-SH | --- | --- | --- | < 0.000101 | < 0.000101 | < 0.000101 | < 0.000101 | < 0.000101 | < 0.000101 | < 0.000606 |
| | 31-May-1994 | 08-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| **(Duplicate)** | 31-May-1994 | 08-SH DUP | --- | --- | --- | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.000283 |
| | 22-Sep-1994 | 08-SH DUP | --- | --- | --- | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.000284 |
| | 28-Sep-1995 | 08-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 05-Sep-1996 | 08-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| **(Duplicate)** | 05-Sep-1996 | 08-SH DUP | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 05-Sep-1997 | 08-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 15-Sep-1998 | 08-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 08-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 09-Sep-1999 | 08-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2000 | 08-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 05-Sep-2000 | 08-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 08-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2002 | 08-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2003 | 08-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 09-Sep-2004 | 08-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2005 | 08-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 08-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 08-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 08-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 08-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 8 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 08-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 08-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 25-Sep-2013 | 08-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 29-Sep-2015 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2017 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 27-Sep-2023 | 08-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **08-IN** | 07-Sep-2006 | 08-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 08-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 08-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 08-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 8 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 08-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 08-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 25-Sep-2013 | 08-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 08-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 08-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 08-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2017 | 08-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 08-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 08-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 08-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 08-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 08-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 27-Sep-2023 | 08-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **09-SH [Decommissioned]** | 02-Dec-1991 | 09-SH [DECOM] | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 31-Aug-1992 | 09-SH [DECOM] | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| **09-IN [Decommissioned]** | 31-Aug-1992 | 09-IN [DECOM] | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| **10-SH [Decommissioned]** | 01-Sep-1992 | 10-SH [DECOM] | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| **10-IN [Decommissioned]** | 17-May-1991 | 10-IN [DECOM] | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 02-Dec-1991 | 10-IN [DECOM] | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 10-IN [DECOM] | --- | --- | --- | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.00031 |
| | 01-Sep-1992 | 10-IN [DECOM] | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00002 |
| **11-SH** | 17-May-1991 | 11-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 02-Dec-1991 | 11-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 11-SH | --- | --- | --- | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.00031 |
| | 04-Nov-1992 | 11-SH | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.00002 |
| | 10-Nov-1993 | 11-SH | --- | --- | --- | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0006 |
| | 31-May-1994 | 11-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| | 22-Sep-1994 | 11-SH | --- | --- | --- | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.0000474 | < 0.00005 |
| | 28-Sep-1995 | 11-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 05-Sep-1996 | 11-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 05-Sep-1997 | 11-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 09-Sep-1999 | 11-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2000 | 11-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 11-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00003 | < 0.00002 | < 0.00002 | 0.000030-0.00019 |
| | 09-May-2002 | 11-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2002 | 11-SH | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00045 |
| | 03-Sep-2003 | 11-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 11-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 11-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 11-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 06-Sep-2007 | 11-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000026 | < 0.000020 | < 0.000020 | 0.00003 |
| | 16-Oct-2007 | 11-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 16-Oct-2007 | 11-SH DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 11-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 11-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 11 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 11-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 11-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 11-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 11-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 17-Sep-2014 | 31-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 29-Sep-2015 | 31-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 27-Sep-2016 | 31-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 27-Sep-2017 | 31-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **(Duplicate)** | 18-Sep-2018 | 31-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 17-Sep-2019 | 31-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2020 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 21-Sep-2020 | 31-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 22-Sep-2021 | 31-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 29-Sep-2022 | 31-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 11-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **(Duplicate)** | 28-Sep-2023 | 31-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| | | | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **11-IN** | 17-May-1991 | 11-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 02-Dec-1991 | 11-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 11-IN | --- | --- | --- | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.00031 |
| | 10-Nov-1993 | 11-IN | --- | --- | --- | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000618 |
| | 22-Sep-1994 | 11-IN | --- | --- | --- | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.00005 |
| | 28-Sep-1995 | 11-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 05-Sep-1996 | 11-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 05-Sep-1997 | 11-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 11-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 11-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 11-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 11-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2002 | 11-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 11-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 11-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 11-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 11-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 06-Sep-2007 | 11-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000023 | < 0.000020 | < 0.000020 | < 0.000020 | 0.00002 |
| | 16-Oct-2007 | 11-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 16-Oct-2007 | 11-IN DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 11-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 11-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 11 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 11-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 11-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 11-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 11-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000013 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2020 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 11-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **11-SS** | 17-May-1991 | 11-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 11-SS | --- | --- | --- | < 0.000309 | < 0.000309 | < 0.000309 | < 0.000309 | < 0.000309 | < 0.000309 | < 0.00031 |
| **12-SH** | 17-May-1991 | 12-SH | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 12-SH | --- | --- | --- | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.000313 | < 0.00031 |
| | 04-Nov-1992 | 12-SH | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.00002 |
| | 10-Nov-1993 | 12-SH | --- | --- | --- | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0006 |
| | 31-May-1994 | 12-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| | 22-Sep-1994 | 12-SH | --- | --- | --- | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.00005 |
| | 28-Sep-1995 | 12-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 05-Sep-1996 | 12-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| **(Duplicate)** | 05-Sep-1996 | 12-SH DUP | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 05-Sep-1997 | 12-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 05-Sep-1997 | 12-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 12-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 12-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2000 | 12-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 12-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 12-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2003 | 12-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 09-Sep-2004 | 12-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2005 | 12-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 12-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2007 | 12-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2008 | 12-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 12-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 12 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 12-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 12-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 12-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 12-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 12-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **12-IN** | 17-May-1991 | 12-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 02-Dec-1991 | 12-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 12-IN | --- | --- | --- | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.00031 |
| | 04-Nov-1992 | 12-IN | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.00002 |
| | 10-Nov-1993 | 12-IN | --- | --- | --- | < 0.000111 | < 0.000111 | < 0.000111 | < 0.000111 | < 0.000111 | < 0.000111 | < 0.000666 |
| | 28-Sep-1995 | 12-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 05-Sep-1996 | 12-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 05-Sep-1997 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 12-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2003 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 09-Sep-2004 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00016 | < 0.00002 | < 0.00002 | --- |
| | 30-Sep-2004 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00003 | 0.00006 | < 0.00002 | < 0.00002 | --- |
| | 30-Oct-2004 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 26-Nov-2004 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00003 | < 0.00002 | < 0.00002 | 0.00004 |
| **(Duplicate)** | 26-Nov-2004 | 12-IN DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00004 |
| | 18-Jan-2005 | 12-IN DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| | 03-Apr-2005 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00006 | < 0.00002 | < 0.00002 | 0.00006 |
| **(Duplicate)** | 03-Apr-2005 | 12-IN DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| | 27-May-2005 | 12-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| **(Duplicate)** | 27-May-2005 | 12-IN DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| **(Duplicate)** | 07-Sep-2005 | 12-IN DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 08-Sep-2005 | 12-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 12-Apr-2006 | 12-IN DUP | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 |
| **(Duplicate)** | 12-Apr-2006 | 12-IN DUP2 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 |
| | 07-Sep-2006 | 12-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2006 | 12-IN DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2007 | 12-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 07-Sep-2007 | 12-IN DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 03-Sep-2008 | 12-IN DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 05-Sep-2008 | 12-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 11-Sep-2009 | 12-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 11-Sep-2009 | 12-IN DUP | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 12 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 09-Sep-2010 | SYLVITE 20 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 12-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | ZIRCON 20 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 12-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 06-Sep-2012 | SPINEL 19 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 17-Sep-2014 | 12-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 12-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| | | | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **13-SH** | 12-May-1992 | 13-SH | --- | --- | --- | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.00031 |
| | 04-Nov-1992 | 13-SH | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.00002 |
| | 10-Nov-1993 | 13-SH | --- | --- | --- | < 0.000102 | < 0.000102 | < 0.000102 | < 0.000102 | < 0.000102 | < 0.000102 | < 0.000612 |
| | 31-May-1994 | 13-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| | 22-Sep-1994 | 13-SH | --- | --- | --- | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.00005 |
| | 28-Sep-1995 | 13-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 13-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-1997 | 13-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 04-Sep-1997 | 13-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 13-SH | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.0009 |
| | 09-Sep-1999 | 13-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2000 | 13-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 13-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 13-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2003 | 13-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 09-Sep-2004 | 13-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2005 | 13-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 13-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 13-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 13-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Oct-2008 | 13-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 21-Oct-2008 | 13-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | 0.00002 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| **(Duplicate)** | 21-Oct-2008 | 13-IN DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 13-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 13 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 13-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 13-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 13-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 13-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 13-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2016 | 13-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 13-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 13-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 13-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 13-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2021 | 13-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 13-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 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-May-1991 | 13-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 02-Dec-1991 | 13-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 13-IN | --- | --- | --- | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.000311 | < 0.00031 |
| | 04-Nov-1992 | 13-IN | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.00002 |
| **(Duplicate)** | 04-Nov-1992 | 13-IN DUP | --- | --- | --- | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.0000189 | < 0.000113 |
| | 10-Nov-1993 | 13-IN | --- | --- | --- | < 0.000104 | < 0.000104 | < 0.000104 | < 0.000104 | < 0.000104 | < 0.000104 | < 0.000624 |
| | 22-Sep-1994 | 13-IN | --- | --- | --- | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.00005 |
| | 28-Sep-1995 | 13-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 13-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-1997 | 13-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 13-IN | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.004 | < 0.0009 |
| | 09-Sep-1999 | 13-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 09-Sep-1999 | 13-IN DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 13-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 13-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 13-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2003 | 13-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 09-Sep-2004 | 13-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2005 | 13-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 13-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 13-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 13-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Oct-2008 | 13-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 21-Oct-2008 | 13-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | 0.00002 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| **(Duplicate)** | 21-Oct-2008 | 13-IN DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 13-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 13 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 13-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 13-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 13-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 13-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 13-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2016 | 13-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 13-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 13-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 13-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 13-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2021 | 13-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 13-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 13-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **13-SS** | 17-May-1991 | 13-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.0001 |
| | 12-May-1992 | 13-SS | --- | --- | --- | < 0.000314 | < 0.000314 | < 0.000314 | < 0.000314 | < 0.000314 | < 0.000314 | < 0.00188 |
| | 13-May-1992 | 13-SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00031 |
| | 10-Nov-1993 | 13-SS | --- | --- | --- | < 0.000099 | < 0.000099 | < 0.000099 | < 0.000099 | < 0.000099 | < 0.000099 | < 0.000594 |
| **13(R)SS** | 10-Sep-2004 | 13(R)-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 30-Sep-2004 | 13(R)-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2005 | 13(R)-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 13(R)-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 16-Oct-2007 | 13(R)-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 13(R)-SS | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 17-Sep-2009 | 13(R)-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Oct-2009 | 13(R)-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Duplicate)** | 16-Oct-2009 | 13(R)-SS DUP | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 13 (R) SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 13 (R)-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 13(R)SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 13(R)SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 13(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2016 | 13(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 13(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 13(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 13(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 13(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2021 | 13(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 13(R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **Could not obtain sample** | 28-Sep-2023 | 13(R)SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **14-SH** | 12-May-1992 | 14-SH | --- | --- | --- | < 0.000305 | < 0.000305 | < 0.000305 | < 0.000305 | < 0.000305 | < 0.000305 | < 0.00183 |
| | 10-Nov-1993 | 14-SH | --- | --- | --- | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000103 | < 0.000618 |
| | 31-May-1994 | 14-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| | 22-Sep-1994 | 14-SH | --- | --- | --- | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.0000472 | < 0.00005 |
| | 28-Sep-1995 | 14-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| **(Duplicate)** | 28-Sep-1995 | 14-SH DUP | --- | --- | --- | --- | --- | --- | --- | --- | --- | < 0.00001 |
| | 05-Sep-1996 | 14-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 05-Sep-1997 | 14-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 15-Sep-1998 | 14-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 05-Sep-2000 | 14-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 14-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2002 | 14-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2003 | 14-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 09-Sep-2004 | 14-SH | < 0.00003 | < 0.00003 | < 0.00003 | < 0.00003 | < 0.00003 | < 0.00003 | < 0.00003 | < 0.00003 | < 0.00003 | --- |
| | 08-Sep-2005 | 14-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 14-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 14-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 14-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 09-Sep-2009 | 14-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 14 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 14-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 14-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 25-Sep-2013 | 14-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 14-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2017 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2018 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 27-Sep-2023 | 14-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **15-SH** | 10-Nov-1993 | 15-SH | --- | --- | --- | < 0.000106 | < 0.000106 | < 0.000106 | < 0.000106 | < 0.000106 | < 0.000106 | < 0.000636 |
| | 31-May-1994 | 15-SH | --- | --- | --- | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000016 | < 0.000096 |
| | 22-Sep-1994 | 15-SH | --- | --- | --- | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.00005 |
| | 28-Sep-1995 | 15-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| **(Duplicate)** | 28-Sep-1995 | 15-SH DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 15-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-1997 | 15-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 15-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 15-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2000 | 15-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 07-Sep-2001 | 15-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2002 | 15-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 15-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 15-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 15-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 15-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 06-Sep-2007 | 15-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 15-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 15-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 15 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 15-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 15-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 15-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Previously labeled 15-IN)** | 17-Sep-2014 | 15-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2020 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 15-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **15-IN** | 22-Sep-1994 | 15-IN | --- | --- | --- | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.0000476 | < 0.00005 |
| | 28-Sep-1995 | 15-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 15-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-1997 | 15-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 15-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 15-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 15-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 15-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2002 | 15-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 15-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 15-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 18-Jan-2005 | 15-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| | 07-Sep-2005 | 15-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 15-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 06-Sep-2007 | 15-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 15-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 15-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 15 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 15-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 15-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 15-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **(Previously labeled 15-SH)** | 17-Sep-2014 | 15-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 15-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 15-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 15-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 15-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **Dry** | 16-Sep-2019 | 15-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 21-Sep-2020 | 15-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 22-Sep-2021 | 15-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 15-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 15-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **15-SS** | 10-Nov-1993 | 15-SS | --- | --- | --- | < 0.000115 | < 0.000115 | < 0.000115 | < 0.000115 | < 0.000115 | < 0.000115 | < 0.00069 |
| **15(R)SS** | 10-Sep-2004 | 15(R)-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00012 | < 0.00002 | < 0.00002 | --- |
| | 30-Sep-2004 | 15(R)-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00005 | < 0.00002 | < 0.00002 | --- |
| | 30-Oct-2004 | 15(R)-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00005 | 0.00009 | < 0.00002 | < 0.00002 | --- |
| | 26-Nov-2004 | 15(R)-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| **(Duplicate)** | 26-Nov-2004 | 15(R)-SS DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| | 18-Jan-2005 | 15(R)-SS | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| **(Duplicate)** | 18-Jan-2005 | 15(R)-SS DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| | 08-Sep-2005 | 15(R)-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000028 | < 0.000020 | < 0.000020 | 0.00003 |
| | 06-Oct-2005 | 15(R)-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000042 | < 0.000020 | < 0.000020 | 0.00004 |
| **(Duplicate)** | 06-Oct-2005 | 15(R)-SS DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000039 | < 0.000020 | < 0.000020 | 0.00004 |
| | 17-Nov-2005 | 15(R)-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 17-Nov-2005 | 15(R)-SS DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 17-Nov-2005 | 15(R)-SS DUP2 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 12-Apr-2006 | 15(R)-SS DUP | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 12-Apr-2006 | 15(R)-SS DUP2 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 15(R)-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2007 | 15(R)-SS | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 15(R)-SS | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 17-Sep-2009 | 15(R)-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 15 (R) SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 15 (R)-SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 15(R)SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 15(R)SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **15(2R)SS** | 16-Sep-2014 | 15(2R)SS | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 15(2R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2016 | 15(2R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 15(2R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 15(2R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 15(2R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 15(2R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 15(2R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 15(2R)SS | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **Could not obtain sample** | 28-Sep-2023 | 15(2R)SS | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **16-SH** | 28-Sep-1995 | 16-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 05-Sep-1996 | 16-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-1997 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 15-Sep-1998 | 16-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2000 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| **(Duplicate)** | 05-Sep-2000 | 16-SH DUP | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2003 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2005 | 16-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 16-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 16-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 08-Sep-2009 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 08-Sep-2010 | 16 SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 07-Sep-2011 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2012 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 26-Sep-2013 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-2014 | 16-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 28-Sep-2015 | 16-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00018 |
| | 26-Sep-2016 | 16-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00018 |
| | 27-Sep-2017 | 16-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00018 |
| | 18-Sep-2018 | 16-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00018 |
| | 16-Sep-2019 | 16-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00018 |
| | 22-Sep-2020 | 16-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00018 |
| | 21-Sep-2021 | 16-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00018 |
| | 28-Sep-2022 | 16-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00018 |
| | 28-Sep-2023 | 16-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00018 |
| **16-IN** | 05-Sep-1996 | 16-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-1997 | 16-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 15-Sep-1998 | 16-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 16-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 16-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 16-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2002 | 16-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 04-Sep-2003 | 16-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 16-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2005 | 16-IN | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 | < 0.000021 |
| | 07-Sep-2006 | 16-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 05-Sep-2007 | 16-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 03-Sep-2008 | 16-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 16-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 08-Sep-2010 | 16 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 07-Sep-2011 | 16-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | 16-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 16-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 16-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | 16-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2016 | 16-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 16-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 16-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| **Dry** | 16-Sep-2019 | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | 22-Sep-2020 | 16-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 21-Sep-2021 | 16-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 16-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **Dry** | 28-Sep-2023 | 16-IN | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **17-SH** | 28-Sep-1995 | 17-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| **(Duplicate)** | 28-Sep-1995 | 17-SH DUP | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00009 |
| | 04-Sep-1996 | 17-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-1997 | 17-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 17-SH | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 17-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2000 | 17-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 17-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2002 | 17-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 17-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 17-SH | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 17-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 17-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 06-Sep-2007 | 17-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 17-SH | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 17-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 17 SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 17-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 17-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 17-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 17-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2020 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 17-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| | | | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **17-IN** | 28-Sep-1995 | 17-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | 0.00001-0.00009 |
| | 04-Sep-1996 | 17-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 04-Sep-1997 | 17-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 16-Sep-1998 | 17-IN | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0001 | < 0.0009 |
| | 09-Sep-1999 | 17-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Sep-2000 | 17-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 06-Sep-2001 | 17-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 05-Sep-2002 | 17-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 03-Sep-2003 | 17-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 08-Sep-2004 | 17-IN | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 07-Sep-2005 | 17-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 07-Sep-2006 | 17-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 06-Sep-2007 | 17-IN | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 04-Sep-2008 | 17-IN | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 10-Sep-2009 | 17-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 09-Sep-2010 | 17 IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 08-Sep-2011 | 17-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | 17-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **(Duplicate)** | 06-Sep-2012 | SPINEL 20 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | 17-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | <0.000050 |
| | 17-Sep-2014 | 17-IN | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 17-Sep-2019 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2020 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2023 | 17-IN | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **M-5** | 01-Oct-2001 | M-5 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 23-Sep-2002 | M-5 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00018 |
| | 18-Oct-2003 | M-5 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00004 | < 0.00002 | < 0.00002 | --- |
| | 02-Dec-2003 | M-5 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | --- |
| **(Duplicate)** | 02-Dec-2003 | M-5 DUP1 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | --- |
| **(Duplicate)** | 02-Dec-2003 | M-5 DUP2 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | < 0.00000002 | --- |
| | 26-Oct-2004 | M-5 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00002 | 0.00003 | < 0.00002 | < 0.00002 | --- |
| | 26-Nov-2004 | M-5 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| **(Duplicate)** | 26-Nov-2004 | M-5 DUP1 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| | 24-Oct-2005 | M-5 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 12-Sep-2007 | M-5 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000033 | 0.000072 | < 0.000020 | < 0.000020 | **0.0001** |
| | 16-Oct-2007 | M-5 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| **(Duplicate)** | 16-Oct-2007 | M-5 DUP1 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 08-Oct-2008 | M-5 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 11-Sep-2009 | M-5 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **M-6** | 29-Sep-2010 | M-6 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Dec-2011 | M6 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| **89-3** | 24-Sep-2002 | 89-3 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00005 | < 0.00045 |
| | 14-Oct-2003 | 89-3 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 26-Oct-2004 | 89-3 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | --- |
| | 25-Oct-2005 | 89-3 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 13-Sep-2007 | 89-3 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| | 08-Oct-2008 | 89-3 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00005 |
| | 28-Sep-2010 | 89-3 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 14-Dec-2011 | 89-3 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 26-Sep-2013 | 89-3 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 89-3 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | PW | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2016 | PW | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | PW | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 89-3 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2019 | 89-3 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | <0.000030 |
| | 21-Sep-2020 | 89-3 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | <0.000031 |
| | 22-Sep-2021 | 89-3 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 89-3 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2023 | 89-3 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **QA/QC** | | | | | | | | | | | | |
| **Field Blank** | 05-Sep-2012 | SPINEL 17 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 06-Sep-2012 | SPINEL 24 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 25-Sep-2013 | 20-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | 41-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 17-Sep-2014 | 42-SH | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 28-Sep-2015 | FIELD BLANK 1 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 29-Sep-2015 | FIELD BLANK 2 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 26-Sep-2016 | 10-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 28-Sep-2016 | 20-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 10-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | 20-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 10-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 18-Sep-2018 | 20-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | 10-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 17-Sep-2019 | 20-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2020 | 10-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2020 | 20-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 23-Sep-2020 | 30-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 21-Sep-2021 | 10-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | 20-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | 10-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | 20-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 29-Sep-2022 | Field Blank | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **Trip Blank** | 05-Sep-2012 | SPINEL 1 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | SPINEL 13 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | SPINEL 18 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | SPINEL 21 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | SPINEL 26 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | SPINEL 28 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | SPINEL 5 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 05-Sep-2012 | SPINEL 9 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 26-Sep-2013 | TRIP BLANK | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 16-Sep-2014 | TRIP BLANK | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000050 |
| | 29-Sep-2015 | TRIP BLANK | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 28-Sep-2016 | TRIP BLANK | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 27-Sep-2017 | TRIP BLANK | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 19-Sep-2018 | TRIP BLANK | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000050 |
| | 16-Sep-2019 | TRIP BLANK | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 23-Sep-2020 | TRIP BLANK | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 22-Sep-2021 | TRIP BLANK | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| | 28-Sep-2022 | TRIP BLANK | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000030 |
| **Not available** | 29-Sep-2023 | TRIP BLANK | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |

**Table 4.6**
**VEOLIA, Swan Hills Treatment Centre**
**Historical Groundwater Monitoring Results: PCB Aroclors**

| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | PCB AROCLORS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 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) |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | **0.000094** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PCB 1254 Spike 0.1 ug/L** | 01-Sep-2012 | SPINEL 12 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.00004 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| | 01-Sep-2012 | SPINEL 4 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000023 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| **PCB 1254 Spike 0.2 ug/L** | 01-Sep-2012 | SPINEL 11 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000088 | 0.000026 | < 0.000010 | < 0.000010 | **0.000114** |
| | 01-Sep-2012 | SPINEL 3 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000061 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000061 |
| **PCB 1254 Spike 0.5 ug/L** | 01-Sep-2012 | SPINEL 10 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000206 | 0.000041 | < 0.000010 | < 0.000010 | **0.000247** |
| | 01-Sep-2012 | SPINEL 2 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000079 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000079 |
| **PCB 1260 Spike 0.1 ug/L** | 01-Sep-2012 | SPINEL 16 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.00008 | < 0.000010 | < 0.000010 | 0.00008 |
| | 01-Sep-2012 | SPINEL 8 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000086 | < 0.000010 | < 0.000010 | 0.000086 |
| **PCB 1260 Spike 0.2 ug/L** | 01-Sep-2012 | SPINEL 15 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000143 | < 0.000010 | < 0.000010 | **0.000143** |
| | 01-Sep-2012 | SPINEL 7 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000101 | < 0.000010 | < 0.000010 | **0.000101** |
| **PCB 1260 Spike 0.5 ug/L** | 01-Sep-2012 | SPINEL 14 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000465 | < 0.000010 | < 0.000010 | **0.000465** |
| | 01-Sep-2012 | SPINEL 6 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000286 | < 0.000010 | < 0.000010 | **0.000286** |
| **PCB 1254 Spike 0.1 µg/L** | 18-Sep-2014 | 51-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000287 | < 0.000020 | < 0.000020 | < 0.000020 | **0.00029** |
| **PCB 1260 Spike 0.1 µg/L** | 18-Sep-2014 | 52-SH | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000167 | < 0.000020 | < 0.000020 | **0.00017** |
| **PCB 1254 Spike 0.1 µg/L** | 29-Sep-2015 | 51-SH | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 | 0.000287 | <0.000020 | <0.000020 | <0.000020 | **0.00029** |
| **PCB 1260 Spike 0.1 µg/L** | 29-Sep-2015 | 52-SH | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 | <0.000020 | 0.000167 | <0.000020 | <0.000020 | **0.00017** |
| **PCB 1254 Spike 0.1 µg/L** | 28-Sep-2016 | 51-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000170 | <0.000010 | <0.000010 | <0.000010 | 0.00017 |
| **PCB 1260 Spike 0.1 µg/L** | 28-Sep-2016 | 52-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000500 | <0.000010 | <0.000010 | 0.0005 |
| **PCB 1254 Spike 0.1 µg/L** | 28-Sep-2017 | 51-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.00138 | <0.000010 | <0.000010 | <0.000010 | 0.00138 |
| **PCB 1260 Spike 0.1 µg/L** | 28-Sep-2017 | 52-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.00104 | <0.000010 | <0.000010 | 0.00104 |
| **PCB 1254 Spike 0.1 µg/L** | 19-Sep-2018 | 51-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000827 | <0.000010 | <0.000010 | <0.000010 | 0.000827 |
| **PCB 1260 Spike 0.1 µg/L** | 19-Sep-2018 | 52-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000610 | <0.000010 | <0.000010 | 0.00061 |
| **PCB 1254 Spike 0.1 µg/L** | 17-Sep-2019 | 51-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00007 | <0.000781 | <0.00002 | <0.00002 | **0.000781** |
| **PCB 1260 Spike 0.1 µg/L** | 17-Sep-2019 | 52-SH | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.00002 | <0.000573 | <0.00008 | <0.00002 | <0.00002 | **0.000573** |
| **PCB 1254 Spike 0.1 µg/L** | 23-Sep-2020 | 51-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000052 | <0.000010 | <0.000010 | <0.000010 | 0.000052 |
| **PCB 1260 Spike 0.1 µg/L** | 23-Sep-2020 | 52-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000061 | <0.000010 | <0.000010 | 0.000061 |
| **PCB 1254 Spike 1.0 µg/L** | 22-Sep-2021 | 51-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.00102 | <0.000010 | <0.000010 | <0.000010 | **0.00102** |
| **PCB 1260 Spike 1.0 µg/L** | 22-Sep-2021 | 52-SH | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | 0.000978 | <0.000010 | <0.000010 | **0.000978** |
| **PCB 1254 Spike 1.0 µg/L** | 28-Sep-2022 | 51-SH | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | 0.000761 | <0.000070 | <0.000050 | <0.000050 | **0.000761** |
| **PCB 1260 Spike 1.0 µg/L** | 29-Sep-2022 | 52-SH | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000060 | 0.000724 | <0.000050 | <0.000050 | **0.000724** |
| **PCB 1254 Spike 1.0 µg/L** | 2-Oct-2023 | 51-SH | <0.000050 | <0.000050 | <0.000050 | 0.0011 | <0.000050 | 0.000996 | 0.000997 | <0.000050 | <0.000050 | **0.00309** |
| **PCB 1260 Spike 1.0 µg/L** | 2-Oct-2023 | 52-SH | <0.000050 | <0.000050 | <0.000050 | 0.000962 | <0.000050 | 0.000879 | 0.000945 | <0.000050 | <0.000050 | **0.00279** |

**NOTES:**

3: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August 2022), 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 |

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August 2022), 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 |

Detection Limit is greater than the guideline
--- Guideline Row: No guideline for that parameter
--- Results: Parameter was not analyzed

**Table 5.1**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)**

| | | | GENERAL | | | | INDICATORS | | | CATIONS, ANIONS AND ION BALANCE | | | | | NITROGEN PARAMETERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | pH | EC (µs/cm) | Total Hardness as $CaCO_3$ (mg/L) | Total Alkalinity as $CaCO_3$ (mg/L) | Chloride (mg/L) | Sulphate (mg/L) | TDS (calculated) (mg/L) | Calcium:D (mg/L) | Magnesium:D (mg/L) | Potassium:D (mg/L) | Sodium:D (mg/L) | Bicarbonate (mg/L) | Nitrite as N (mg/L) | Nitrate as N (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **7.0-10.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **---** | **---** |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **1** | **10** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **1** | **10** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **120** | **Variable** | **500** | **---** | **---** | **---** | **200** | **---** | **Variable** | **3** |
| **01-SH [Decommissioned]** | 15-May-1985 | 01-SH [DECOM] | 7.81 | 492 | 268.2 | 273 | 1.6 | 8.4 | 280 | 77 | 18.4 | 1.75 | 8.3 | 332.8 | 0.014 | 0.02 |
| | 15-Jun-1985 | 01-SH [DECOM] | 7.15 | 640 | 333.1 | 340 | 1.5 | 1.8 | 350 | --- | 24.5 | 2.22 | --- | 414.5 | < 0.003 | < 0.003 |
| | 15-Sep-1985 | 01-SH [DECOM] | 7.53 | 539 | 265.3 | 295 | 1.5 | 6.9 | 295 | 76 | 18.3 | 2.05 | 8.4 | 359.6 | < 0.003 | 0.037 |
| | 15-May-1986 | 01-SH [DECOM] | 7.86 | 530 | 287.2 | 291 | 0.6 | 6.7 | 300 | 79 | 21.8 | 1.79 | 7.7 | 354.7 | 0.004 | 0.026 |
| | 15-Aug-1986 | 01-SH [DECOM] | 7.26 | 534 | 277.3 | 279 | 1 | 4.9 | 285 | 77 | 20.6 | 1.78 | 7.6 | 340.1 | < 0.003 | 0.005 |
| | 15-Oct-1986 | 01-SH [DECOM] | 7.92 | 560 | 297.2 | 310 | 0.9 | 5.6 | 315 | 82 | 22.4 | 2.08 | 8.6 | 377.9 | < 0.003 | 0.007 |
| | 15-May-1987 | 01-SH [DECOM] | 7.4 | 538 | 280.3 | 296 | 0.8 | 6 | 290 | 79.7 | 19.7 | 1.85 | 7.75 | 360.8 | < 0.003 | 0.049 |
| | 15-Sep-1987 | 01-SH [DECOM] | 7.56 | 508 | 273.1 | 273 | 1.1 | 6.3 | 280 | 76 | 20.2 | 1.54 | 6.7 | 332.8 | 0.004 | 0.034 |
| | 15-Nov-1987 | 01-SH [DECOM] | 7.78 | 609 | 267.7 | 273 | 0.7 | 5.2 | 285 | 73 | 20.7 | 1.68 | 7 | 332.8 | < 0.003 | 0.05 |
| | | 01-SH +95CI | 7.77 | 580.76 | 297.19 | 306.66 | 1.32 | 6.94 | 312.49 | 79.36 | 22.02 | 2 | 8.22 | 373.8 | 0.0068 | 0.038 |
| | | 01-SH -95CI | 7.41 | 519.24 | 269.34 | 277.79 | 0.83 | 4.57 | 283.07 | 75.56 | 19.45 | 1.72 | 7.29 | 338.6 | 0.0021 | 0.014 |
| | | 01-SH MAX | 7.92 | 640 | 333.1 | 340 | 1.6 | 8.4 | 350 | 82 | 24.5 | 2.22 | 8.6 | 414.5 | 0.014 | 0.05 |
| | | 01-SH MEAN | 7.59 | 550 | 283.27 | 292.22 | 1.078 | 5.76 | 297.78 | 77.46 | 20.73 | 1.86 | 7.76 | 356.2 | 0.0044 | 0.026 |
| | | 01-SH MIN | 7.15 | 492 | 265.3 | 273 | 0.6 | 1.8 | 280 | 73 | 18.3 | 1.54 | 6.7 | 332.8 | 0.003 | 0.003 |
| | | 01-SH N | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 9 | 8 | 9 | 9 | 9 |
| | | 01-SH SD | 0.28 | 47.08 | 21.31 | 22.1 | 0.37 | 1.81 | 22.52 | 2.74 | 1.96 | 0.22 | 0.67 | 26.9 | 0.0036 | 0.018 |
| **01-IN [Decommissioned]** | 15-Feb-1985 | 01-IN [DECOM] | 7.56 | 1080 | 518.7 | 408 | 3.2 | 176 | **680** | 151 | 34.3 | 5.5 | 48 | 497.4 | 0.014 | 0.095 |
| | 15-Jun-1985 | 01-IN [DECOM] | 7.95 | 1000 | 463.2 | 401 | 3.6 | 170 | **630** | 128 | 34.8 | 5.35 | 46.7 | 488.8 | 0.003 | 0.045 |
| | 15-Dec-1985 | 01-IN [DECOM] | 7.61 | 1120 | 401.3 | 349 | 4.75 | 182 | **600** | 109 | 31.3 | 5.7 | 53 | 425.4 | 0.057 | 0.021 |
| | 15-May-1986 | 01-IN [DECOM] | 7.7 | 996 | 496.2 | 435 | 1 | 131 | **640** | 144 | 33.1 | 5.55 | 46.5 | 530.3 | < 0.003 | 0.184 |
| | 15-Aug-1986 | 01-IN [DECOM] | 7.71 | 1035 | 479.4 | 412 | 2.3 | 148 | **625** | 144 | 29 | 5.1 | 40 | 502.2 | < 0.003 | 0.004 |
| | 15-Oct-1986 | 01-IN [DECOM] | 8.1 | 1040 | 488.3 | 446 | 1.7 | 150 | **670** | 141 | 33 | 5.45 | 50 | 543.7 | 0.004 | 0.012 |
| | 15-May-1987 | 01-IN [DECOM] | 8.05 | 942 | 456.5 | 436 | 2.2 | 92 | **580** | 134 | 29.6 | 4.98 | 41 | 532 | < 0.003 | 0.84 |
| | 15-Sep-1987 | 01-IN [DECOM] | 7.75 | 982 | 495.8 | 451 | 2.1 | 131 | **630** | 144 | 33 | 5.26 | 42.4 | 549.8 | < 0.003 | 0.66 |
| | 15-Nov-1987 | 01-IN [DECOM] | 7.85 | 1000 | 507.4 | 449 | 1.7 | 122 | **640** | 146 | 34.6 | 5.25 | 42.5 | 547.3 | < 0.003 | 0.74 |
| | | 01-IN +95CI | 7.93 | 1056.78 | 501.44 | 442.15 | 3.26 | 163.6 | 652.99 | 146.2 | 33.91 | 5.5 | 48.44 | 539.1 | 0.022 | 0.52 |
| | | 01-IN -95CI | 7.68 | 986.56 | 455.62 | 399.4 | 1.75 | 125.73 | 612.57 | 129.54 | 31.14 | 5.2 | 42.7 | 486.9 | 0.0013 | 0.06 |
| | | 01-IN MAX | 8.1 | 1120 | 518.7 | 451 | 4.75 | 182 | 680 | 151 | 34.8 | 5.7 | 53 | 549.8 | 0.057 | 0.84 |
| | | 01-IN MEAN | 7.81 | 1021.67 | 478.53 | 420.78 | 2.51 | 144.67 | 632.78 | 137.89 | 32.52 | 5.35 | 45.57 | 513 | 0.01 | 0.29 |
| | | 01-IN MIN | 7.56 | 942 | 401.3 | 349 | 1 | 92 | 580 | 109 | 29 | 4.98 | 40 | 425.4 | 0.003 | 0.004 |
| | | 01-IN N | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| | | 01-IN SD | 0.19 | 53.74 | 35.07 | 32.72 | 1.15 | 28.98 | 30.93 | 12.78 | 2.12 | 0.23 | 4.39 | 39.9 | 0.018 | 0.35 |
| **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] | 7.49 | 580 | 135.8 | 268 | 1 | 36 | 340 | 43.6 | 6.5 | 7.3 | 78.6 | 326.7 | < 0.003 | 0.006 |
| | 15-Jul-1985 | 01-SS [DECOM] | 7.87 | 434 | 101.2 | 217 | 1.5 | 36.2 | 285 | 33.1 | 4.5 | 6.7 | 67 | 264 | 0.008 | 0.053 |
| | 15-Dec-1985 | 01-SS [DECOM] | 7.62 | 530 | 110.5 | 237 | 1.21 | 42.5 | 320 | 35 | 5.6 | 7.4 | 73 | 288.9 | < 0.003 | 0.008 |
| | 15-May-1986 | 01-SS [DECOM] | 7.65 | 584 | 154.9 | 286 | 0.6 | 35.2 | 350 | 48.8 | 8 | 7.25 | 75 | 348.6 | < 0.003 | 0.003 |
| | 15-Aug-1986 | 01-SS [DECOM] | 7.67 | 588 | 130.8 | 268 | 0.9 | 37.1 | 335 | 42.6 | 5.9 | 7 | 74 | 326.7 | 0.006 | 0.019 |
| | 15-Oct-1986 | 01-SS [DECOM] | 8 | 560 | 148.3 | 276 | 0.9 | 30 | 340 | 46.8 | 7.6 | 7.4 | 68 | 336.4 | 0.004 | 0.003 |
| | 15-Feb-1987 | 01-SS [DECOM] | 7.57 | 601 | --- | --- | 0.7 | 38.8 | --- | 52 | 9.3 | 7.25 | 70 | --- | --- | --- |
| | 15-Sep-1987 | 01-SS [DECOM] | 7.87 | 579 | 172.9 | 290 | 1.3 | 32.3 | 350 | 55 | 8.6 | 7.55 | 70 | 353.5 | < 0.003 | 0.003 |
| | 15-Nov-1987 | 01-SS [DECOM] | 7.95 | 600 | 167.5 | 295 | 0.7 | 27 | 360 | 52 | 9.1 | 7.35 | 71.5 | 359.6 | 0.009 | 0.53 |
| | | 01-SS +95CI | 7.86 | 596.16 | 160.18 | 288.45 | 1.18 | 38.057 | 353.11 | 50.41 | 8.33 | 7.41 | 74.29 | 351.6 | 0.0067 | 0.26 |
| | | 01-SS -95CI | 7.62 | 527.4 | 126.53 | 252.66 | 0.78 | 31.97 | 322.45 | 40.46 | 6.13 | 7.08 | 69.51 | 307.8 | 0.0035 | 0.019 |
| | | 01-SS MAX | 8 | 601 | 172.9 | 298 | 1.5 | 42.5 | 360 | 55 | 9.3 | 7.55 | 78.6 | 363.3 | 0.009 | 0.53 |
| | | 01-SS MEAN | 7.74 | 561.78 | 143.36 | 270.56 | 0.98 | 35.01 | 337.78 | 45.43 | 7.23 | 7.24 | 71.9 | 329.7 | 0.0051 | 0.12 |
| | | 01-SS MIN | 7.49 | 434 | 101.2 | 217 | 0.6 | 27 | 285 | 33.1 | 4.5 | 6.7 | 67 | 264 | 0.003 | 0.003 |
| | | 01-SS N | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| | | 01-SS SD | 0.18 | 52.62 | 25.76 | 27.4 | 0.3 | 4.66 | 23.47 | 7.61 | 1.69 | 0.25 | 3.65 | 33.5 | 0.0024 | 0.22 |

**Table 5.1**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)**

| | | | GENERAL | | | | INDICATORS | | | CATIONS, ANIONS AND ION BALANCE | | | | | NITROGEN PARAMETERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | pH | EC (µs/cm) | Total Hardness as $CaCO_3$ (mg/L) | Total Alkalinity as $CaCO_3$ (mg/L) | Chloride (mg/L) | Sulphate (mg/L) | TDS (calculated) (mg/L) | Calcium:D (mg/L) | Magnesium:D (mg/L) | Potassium:D (mg/L) | Sodium:D (mg/L) | Bicarbonate (mg/L) | Nitrite as N (mg/L) | Nitrate as N (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **7.0-10.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **---** | **---** |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **1** | **10** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **1** | **10** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **120** | **Variable** | **500** | **---** | **---** | **---** | **200** | **---** | **Variable** | **3** |
| **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] | 7.91 | 391 | 203.9 | 209 | 0.4 | 4 | 215 | 59 | 13.7 | 0.97 | 4.3 | 254.8 | < 0.003 | 0.004 |
| | 15-Sep-1985 | 02-SH [DECOM] | 7.87 | 381 | 188.9 | 207 | 0.4 | 3.4 | 205 | 55 | 12.5 | 1.12 | 4.3 | 252.3 | < 0.003 | 0.003 |
| | 15-Dec-1985 | 02-SH [DECOM] | 7.72 | 410 | 202.6 | 202 | 0.6 | 4 | 210 | 57 | 14.6 | 1.05 | 3.9 | 246.2 | 0.006 | 0.006 |
| | 15-Feb-1986 | 02-SH [DECOM] | 7.56 | 400 | --- | --- | 0.2 | 4 | --- | 60.9 | 15.4 | 1.23 | 4.5 | --- | --- | --- |
| | 15-Jun-1986 | 02-SH [DECOM] | 7.29 | 400 | 215.6 | 208 | 1.1 | 3.4 | 215 | 60.4 | 15.7 | 0.93 | 4.6 | 253.6 | < 0.003 | 0.004 |
| | 15-Aug-1986 | 02-SH [DECOM] | 7.11 | 414 | 213.8 | 210 | 0.5 | 5 | 220 | 60 | 15.5 | 1.43 | 5.4 | 256 | < 0.003 | 0.027 |
| | 15-Oct-1986 | 02-SH [DECOM] | 7.76 | 380 | 203.8 | 200 | 0.7 | 3.7 | 215 | 57 | 14.9 | 1 | 3.8 | 243.8 | 0.004 | 0.01 |
| | 15-May-1987 | 02-SH [DECOM] | 7.84 | 381 | 200.1 | 202 | 0.2 | 3.7 | 210 | 55 | 15.2 | 1 | 4.1 | 246.2 | < 0.003 | 0.003 |
| | 15-Sep-1987 | 02-SH [DECOM] | 7.88 | 370 | 191 | 200 | 0.8 | 3.5 | 200 | 55 | 13 | 0.95 | 3.7 | 243.8 | < 0.003 | 0.009 |
| | 15-Nov-1987 | 02-SH [DECOM] | 7.71 | 375 | 202.6 | 202 | 1.2 | 4.3 | 215 | 56 | 15.2 | 0.98 | 4 | 246.2 | < 0.003 | 0.003 |
| | | 02-SH +95CI | 7.83 | 399.59 | 208.38 | 206.77 | 0.82 | 4.2 | 214.3 | 58.99 | 15.26 | 1.16 | 4.57 | 252.06 | 0.0043 | 0.011 |
| | | 02-SH -95CI | 7.5 | 380.81 | 197.26 | 202.5 | 0.4 | 3.6 | 206.97 | 56.07 | 13.88 | 0.97 | 3.95 | 246.83 | 0.0029 | 0.0027 |
| | | 02-SH MAX | 7.91 | 414 | 215.6 | 210 | 1.2 | 5 | 220 | 60.9 | 15.7 | 1.43 | 5.4 | 256 | 0.006 | 0.027 |
| | | 02-SH MEAN | 7.67 | 390.2 | 202.82 | 204.64 | 0.61 | 3.9 | 210.64 | 57.53 | 14.57 | 1.066 | 4.26 | 249.45 | 0.0036 | 0.0069 |
| | | 02-SH MIN | 7.11 | 370 | 188.9 | 200 | 0.2 | 3.4 | 200 | 55 | 12.5 | 0.93 | 3.7 | 243.8 | 0.003 | 0.003 |
| | | 02-SH N | 10 | 10 | 11 | 11 | 10 | 10 | 11 | 10 | 10 | 10 | 10 | 11 | 11 | 11 |
| | | 02-SH SD | 0.27 | 15.14 | 9.41 | 3.61 | 0.34 | 0.49 | 6.2 | 2.36 | 1.12 | 0.16 | 0.5 | 4.42 | 0.0012 | 0.0071 |
| **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] | 8.01 | 585 | 255 | 309 | 2.1 | 24.3 | 340 | 76 | 15.8 | 4.36 | 24.9 | 376.7 | 0.054 | 0.024 |
| | 15-Sep-1985 | 02-IN [DECOM] | 7.63 | 616 | 269.1 | 313 | 1.6 | 27.5 | 350 | 80 | 16.8 | 4.15 | 24.7 | 381.5 | 0.004 | 0.01 |
| | 15-Feb-1986 | 02-IN [DECOM] | 7.55 | 640 | --- | --- | 0.9 | 36 | --- | 86.1 | 21 | 4.02 | 27.5 | --- | --- | --- |
| | 15-Jun-1986 | 02-IN [DECOM] | 7.67 | 660 | 314.3 | 319 | 1.9 | 40 | 385 | 89 | 22.3 | 3.91 | 27.5 | 388.9 | < 0.003 | 0.032 |
| | 15-Aug-1986 | 02-IN [DECOM] | 7.35 | 681 | 305.2 | 314 | 1.3 | 52.5 | 390 | 89 | 20.1 | 3.95 | 26.5 | 382.8 | < 0.003 | 0.013 |
| | 15-Oct-1986 | 02-IN [DECOM] | 7.96 | 660 | 303.5 | 320 | 1 | 48.5 | 400 | 86 | 21.5 | 3.9 | 27 | 390.1 | 0.007 | 0.003 |
| | 15-May-1987 | 02-IN [DECOM] | 7.74 | 665 | 308.1 | 318 | 0.8 | 50.5 | 390 | 87 | 22 | 4 | 30 | 387.6 | < 0.003 | 0.003 |
| | 15-Sep-1987 | 02-IN [DECOM] | 7.88 | 661 | 307.3 | 325 | 1.5 | 48.8 | 390 | 89 | 20.6 | 3.8 | 27.6 | 396.2 | < 0.003 | 0.003 |
| | 15-Nov-1987 | 02-IN [DECOM] | 7.79 | 656 | 302.2 | 322 | 0.2 | 42.4 | 385 | 85 | 21.8 | 3.7 | 27.8 | 392.5 | < 0.003 | 0.51 |
| | | 02-IN +95CI | 7.87 | 666.37 | 307.89 | 320.13 | 1.644 | 47.82 | 390 | 88.15 | 21.74 | 4.1 | 28.1 | 390.24 | 0.021 | 0.16 |
| | | 02-IN -95CI | 7.59 | 627.86 | 284.46 | 314.27 | 0.87 | 34.52 | 366.2 | 82.31 | 18.69 | 3.85 | 26.01 | 383.1 | 0.00029 | 0.037 |
| | | 02-IN MAX | 8.01 | 681 | 314.3 | 325 | 2.1 | 52.5 | 400 | 89 | 22.3 | 4.36 | 30 | 396.2 | 0.054 | 0.51 |
| | | 02-IN MEAN | 7.73 | 647.11 | 296.16 | 317.2 | 1.26 | 41.17 | 378.1 | 85.23 | 20.21 | 3.98 | 27.06 | 386.67 | 0.01 | 0.061 |
| | | 02-IN MIN | 7.35 | 585 | 255 | 309 | 0.2 | 24.3 | 340 | 76 | 15.8 | 3.7 | 24.7 | 376.7 | 0.003 | 0.003 |
| | | 02-IN N | 9 | 9 | 10 | 10 | 9 | 9 | 10 | 9 | 9 | 9 | 9 | 10 | 10 | 10 |
| | | 02-IN SD | 0.21 | 29.47 | 18.93 | 4.73 | 0.59 | 10.18 | 19.19 | 4.47 | 2.34 | 0.19 | 1.6 | 5.77 | 0.016 | 0.16 |
| **03-SH** | 18-Feb-1985 | 03-SH | --- | --- | 298.8 | 284 | --- | --- | 316 | --- | --- | --- | --- | 346.2 | < 0.003 | 0.085 |
| | 15-May-1985 | 03-SH | 7.86 | 516 | 284.4 | 289 | 0.6 | 12 | 300 | 81 | 19.9 | 1.23 | 7.1 | 352.3 | < 0.003 | 0.041 |
| | 15-Sep-1985 | 03-SH | 7.65 | 551 | 280.7 | 291 | 0.8 | 11 | 300 | 80 | 19.6 | 1.26 | 6.6 | 354.7 | < 0.003 | 0.082 |
| | 15-Jun-1986 | 03-SH | 7.32 | 570 | 316.6 | 287 | 2.4 | 16.8 | 315 | 87.3 | 23.9 | 1.08 | 7 | 349.9 | < 0.003 | 0.13 |
| | 15-Aug-1986 | 03-SH | 7.53 | 567 | 296.8 | 278 | 1.4 | 17 | 305 | 82 | 22.3 | 1.25 | 6.2 | 338.9 | < 0.003 | 0.084 |
| | 15-Oct-1986 | 03-SH | 7.91 | 550 | 299.7 | 284 | 1.6 | 18 | 315 | 83 | 22.4 | 1.21 | 6.2 | 346.2 | 0.006 | 0.113 |
| | 15-May-1987 | 03-SH | 7.62 | 554 | 302.2 | 273 | 1.3 | 26.7 | 310 | 83 | 23 | 1.11 | 7 | 332.8 | < 0.003 | 0.107 |
| | 15-Sep-1987 | 03-SH | 7.76 | 560 | 295.6 | 286 | 2.1 | 26.6 | 315 | 82 | 22 | 1.21 | 7 | 348.6 | < 0.003 | 0.044 |
| | 15-Nov-1987 | 03-SH | 7.72 | 567 | 312.2 | 276 | 2.5 | 36.8 | 335 | 87 | 23 | 1.05 | 7.8 | 336.4 | < 0.003 | 0.048 |
| | | 03-SH +95CI | 7.8 | 566.37 | 306.07 | 287.12 | 2.08 | 26.68 | 319.31 | 85 | 23.06 | 1.23 | 7.23 | 345 | 0.004 | 0.1 |
| | | 03-SH -95CI | 7.54 | 542.38 | 291.04 | 279.1 | 1.1 | 14.55 | 305.36 | 81.32 | 20.96 | 1.12 | 6.5 | 340.23 | 0.0027 | 0.061 |
| | | 03-SH MAX | 7.91 | 570 | 316.6 | 291 | 2.5 | 36.8 | 335 | 87.3 | 23.9 | 1.26 | 7.8 | 354.7 | 0.006 | 0.13 |
| | | 03-SH MEAN | 7.67 | 554.38 | 298.56 | 283.11 | 1.59 | 20.61 | 312.33 | 83.16 | 22.01 | 1.18 | 6.86 | 345.11 | 0.0033 | 0.082 |
| | | 03-SH MIN | 7.32 | 516 | 280.7 | 273 | 0.6 | 11 | 300 | 80 | 19.6 | 1.05 | 6.2 | 332.8 | 0.003 | 0.041 |
| | | 03-SH N | 8 | 8 | 9 | 9 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 9 |
| | | 03-SH SD | 0.19 | 17.31 | 11.5 | 6.13 | 0.7 | 8.75 | 10.678 | 2.65 | 1.51 | 0.082 | 0.53 | 7.48 | 0.001 | 0.032 |

**Table 5.1**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)**

| | | | GENERAL | | | | INDICATORS | | | CATIONS, ANIONS AND ION BALANCE | | | | | NITROGEN PARAMETERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | pH | EC (µs/cm) | Total Hardness as $CaCO_3$ (mg/L) | Total Alkalinity as $CaCO_3$ (mg/L) | Chloride (mg/L) | Sulphate (mg/L) | TDS (calculated) (mg/L) | Calcium:D (mg/L) | Magnesium:D (mg/L) | Potassium:D (mg/L) | Sodium:D (mg/L) | Bicarbonate (mg/L) | Nitrite as N (mg/L) | Nitrate as N (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **7.0-10.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **---** | **---** |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **1** | **10** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **1** | **10** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **120** | **Variable** | **500** | **---** | **---** | **---** | **200** | **---** | **Variable** | **3** |
| **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 | 8.09 | 852 | 307.9 | 309 | 4.2 | 163 | **540** | 95 | 17.1 | 4.65 | 62 | 376.7 | 0.13 | 1.81 |
| | 15-Sep-1985 | 03-IN | 7.64 | 788 | 350.1 | 328 | 3.1 | 107 | 475 | 103 | 22.5 | 3.7 | 33.7 | 399.8 | 0.04 | 0.36 |
| | 15-Dec-1985 | 03-IN | 7.82 | 890 | 392.7 | 360 | 3 | 128 | **530** | 110 | 28.6 | 4.08 | 32.1 | 438.8 | 0.008 | 1.02 |
| | 15-Feb-1986 | 03-IN | 7.96 | 820 | --- | --- | 3 | 147 | --- | 106 | 32.1 | 4.25 | 29.7 | --- | --- | --- |
| | 15-Jun-1986 | 03-IN | 7.46 | 910 | 408.6 | 341 | 4.7 | 156 | **550** | 117 | 28.2 | 3.6 | 27.3 | 415.7 | 0.014 | 0.61 |
| | 15-Aug-1986 | 03-IN | 7.73 | 959 | 442.7 | 334 | 2.9 | 176 | **585** | 128 | 29.8 | 3.95 | 29.1 | 407.1 | 0.007 | 0.67 |
| | 15-Oct-1986 | 03-IN | 7.69 | 930 | 474.2 | 345 | 3.6 | 172 | **600** | 135 | 33.2 | 4 | 31 | 420.6 | 0.09 | 0.27 |
| | 15-May-1987 | 03-IN | 7.54 | 888 | 472 | 343 | 2.6 | 149 | **560** | 133 | 33.9 | 3.95 | 27 | 418.1 | < 0.003 | 0.059 |
| | 15-Sep-1987 | 03-IN | 7.7 | 920 | 471.2 | 351 | 4.4 | 180 | **600** | 133 | 33.7 | 3.9 | 27 | 427.9 | < 0.003 | 0.016 |
| | 15-Nov-1987 | 03-IN | 7.9 | 987 | 511.5 | 345 | 1.2 | 210 | **650** | 145 | 36.2 | 4.06 | 29.5 | 420.6 | < 0.003 | 0.36 |
| | | 03-IN +95CI | 7.87 | 932.29 | 472.18 | 349.74 | 3.9 | 176.61 | 605.77 | 130.76 | 33.15 | 4.19 | 39.34 | 426.33 | 0.053 | 0.87 |
| | | 03-IN -95CI | 7.63 | 856.51 | 392.28 | 333.35 | 2.64 | 140.99 | 539.68 | 110.24 | 25.91 | 3.83 | 26.34 | 406.36 | 0.0022 | 0.27 |
| | | 03-IN MAX | 8.09 | 987 | 526.5 | 360 | 4.7 | 210 | 670 | 145 | 36.2 | 4.65 | 62 | 438.8 | 0.13 | 1.81 |
| | | 03-IN MEAN | 7.75 | 894.4 | 432.23 | 341.55 | 3.27 | 158.8 | 572.73 | 120.5 | 29.53 | 4.04 | 32.84 | 416.35 | 0.028 | 0.57 |
| | | 03-IN MIN | 7.46 | 788 | 307.9 | 309 | 1.2 | 107 | 475 | 95 | 17.1 | 3.6 | 27 | 376.7 | 0.003 | 0.016 |
| | | 03-IN N | 10 | 10 | 11 | 11 | 10 | 10 | 11 | 10 | 10 | 10 | 10 | 11 | 11 | 11 |
| | | 03-IN SD | 0.19 | 61.13 | 67.6 | 13.86 | 1.02 | 28.74 | 55.92 | 16.56 | 5.85 | 0.29 | 10.48 | 16.89 | 0.043 | 0.51 |
| **04-SH** | 18-Feb-1985 | 04-SH | --- | --- | 326.6 | 337 | --- | --- | 347 | --- | --- | --- | --- | 410.8 | < 0.003 | 0.053 |
| | 15-May-1985 | 04-SH | 7.92 | 601 | 313.5 | 320 | 3.2 | 34.5 | 370 | 89 | 22.1 | 2.28 | 19.5 | 390.1 | 0.017 | 0.43 |
| | 15-Sep-1985 | 04-SH | 8.11 | 627 | 299.4 | 320 | 1.3 | 19 | 340 | 86 | 20.5 | 2.01 | 12.3 | 390.1 | < 0.003 | 0.169 |
| | 15-Jun-1986 | 04-SH | 7.37 | 640 | 311.9 | 322 | 1.8 | 23.7 | 350 | 86.9 | 23 | 2.2 | 10.4 | 392.5 | < 0.003 | 0.17 |
| | 15-Aug-1986 | 04-SH | 7.3 | 632 | 314.2 | 316 | 1 | 19 | 335 | 85 | 24.7 | 2.09 | 9.2 | 385.2 | < 0.003 | 0.161 |
| | 15-Oct-1986 | 04-SH | 7.99 | 610 | 330 | 328 | 1 | 15.5 | 355 | 91 | 24.9 | 2.2 | 8.8 | 399.8 | 0.004 | 0.26 |
| | 15-May-1987 | 04-SH | 7.79 | 569 | 312.9 | 309 | 0.4 | 14.2 | 330 | 85 | 24.4 | 1.73 | 8 | 376.7 | < 0.003 | 0.115 |
| | 15-Sep-1987 | 04-SH | 7.76 | 606 | 324.8 | 328 | 0.9 | 16.4 | 342 | 90.2 | 24.1 | 2.03 | 8.7 | 400 | < 0.003 | 0.07 |
| | 15-Nov-1987 | 04-SH | 7.63 | 603 | 326.6 | 327 | 1.1 | 11.6 | 345 | 89 | 25.3 | 1.85 | 8.8 | 398.6 | < 0.003 | 0.033 |
| | | 04-SH +95CI | 7.93 | 626.48 | 324.22 | 328.3 | 1.93 | 24.2 | 353.67 | 89.39 | 24.76 | 2.18 | 13.34 | 400.21 | 0.0077 | 0.24 |
| | | 04-SH -95CI | 7.53 | 595.52 | 311.31 | 317.7 | 0.75 | 14.28 | 338.33 | 86.14 | 22.49 | 1.92 | 8.08 | 387.3 | 0.0016 | 0.082 |
| | | 04-SH MAX | 8.11 | 640 | 330 | 337 | 3.2 | 34.5 | 370 | 91 | 25.3 | 2.28 | 19.5 | 410.8 | 0.017 | 0.43 |
| | | 04-SH MEAN | 7.73 | 611 | 317.77 | 323 | 1.34 | 19.24 | 346 | 87.77 | 23.63 | 2.05 | 10.71 | 393.76 | 0.0047 | 0.16 |
| | | 04-SH MIN | 7.3 | 569 | 299.4 | 309 | 0.4 | 11.6 | 330 | 85 | 20.5 | 1.73 | 8 | 376.7 | 0.003 | 0.033 |
| | | 04-SH N | 8 | 8 | 9 | 9 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 9 |
| | | 04-SH SD | 0.29 | 22.34 | 9.88 | 8.11 | 0.85 | 7.16 | 11.75 | 2.35 | 1.64 | 0.19 | 3.8 | 9.89 | 0.0046 | 0.12 |
| **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-Dec-1985 | 04-SS | 7.47 | 490 | 217.5 | 243 | 0.7 | 18.5 | 270 | 61 | 15.8 | 2.45 | 14.8 | 296.2 | 0.005 | 0.017 |
| | 15-Feb-1986 | 04-SS | 7 | 480 | --- | --- | 0.01 | 22 | --- | 64.2 | 16.4 | 3.26 | 19 | --- | --- | --- |
| | 15-Jun-1986 | 04-SS | 7.02 | 490 | 218.3 | 231 | 1.9 | 25 | 275 | 60.5 | 16.3 | 3.5 | 20.7 | 281.6 | < 0.003 | 0.003 |
| | 15-Aug-1986 | 04-SS | 6.97 | 485 | 214 | 222 | 0.4 | 25.6 | 265 | 59.1 | 16.1 | 3.54 | 20.2 | 270.6 | < 0.003 | 0.003 |
| | 15-Oct-1986 | 04-SS | 7.5 | 480 | 215 | 233 | 0.7 | 23.6 | 280 | 60 | 15.8 | 3.47 | 21 | 284 | < 0.003 | 0.033 |
| | 15-May-1987 | 04-SS | 7.2 | 453 | 213.8 | 229 | 0.3 | 24.6 | 270 | 59 | 16.1 | 3.62 | 21.7 | 279.2 | < 0.003 | 0.22 |
| | 15-Sep-1987 | 04-SS | 8.04 | 471 | 208.1 | 248 | 0.6 | 25.6 | 275 | 58.7 | 15 | 3.54 | 20.4 | 302 | < 0.003 | 0.003 |
| | 15-Nov-1987 | 04-SS | 7.35 | 478 | 214.6 | 232 | 0.7 | 23.1 | 275 | 59 | 16.3 | 3.45 | 21.2 | 282.8 | < 0.003 | 0.016 |
| | | 04-SS +95CI | 7.57 | 486.73 | 219.15 | 239.23 | 1.05 | 25.15 | 274.99 | 61.45 | 16.29 | 3.62 | 21.4 | 291.53 | 0.0037 | 0.08 |
| | | 04-SS -95CI | 7.07 | 470.02 | 211.08 | 229.22 | 0.28 | 21.85 | 269.01 | 58.93 | 15.66 | 3.091 | 18.35 | 279.42 | 0.0028 | 0.013 |
| | | 04-SS MAX | 8.04 | 490 | 228 | 248 | 1.9 | 25.6 | 280 | 64.2 | 16.4 | 3.62 | 21.7 | 302 | 0.005 | 0.22 |
| | | 04-SS MEAN | 7.32 | 478.38 | 215.11 | 234.22 | 0.66375 | 23.5 | 272 | 60.19 | 15.98 | 3.35 | 19.88 | 285.48 | 0.0032 | 0.033 |
| | | 04-SS MIN | 6.97 | 453 | 206.7 | 222 | 0.01 | 18.5 | 265 | 58.7 | 15 | 2.45 | 14.8 | 270.6 | 0.003 | 0.003 |
| | | 04-SS N | 8 | 8 | 9 | 9 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 9 |
| | | 04-SS SD | 0.36 | 12.06 | 6.18 | 7.66 | 0.56 | 2.38 | 4.58 | 1.82 | 0.45 | 0.38 | 2.2 | 9.27 | 0.00067 | 0.071 |

**Table 5.1**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)**

| | | | GENERAL | | | | INDICATORS | | | CATIONS, ANIONS AND ION BALANCE | | | | | NITROGEN PARAMETERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | pH | EC (µs/cm) | Total Hardness as $CaCO_3$ (mg/L) | Total Alkalinity as $CaCO_3$ (mg/L) | Chloride (mg/L) | Sulphate (mg/L) | TDS (calculated) (mg/L) | Calcium:D (mg/L) | Magnesium:D (mg/L) | Potassium:D (mg/L) | Sodium:D (mg/L) | Bicarbonate (mg/L) | Nitrite as N (mg/L) | Nitrate as N (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **7.0-10.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **---** | **---** |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **1** | **10** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **1** | **10** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **120** | **Variable** | **500** | **---** | **---** | **---** | **200** | **---** | **Variable** | **3** |
| **05-SH** | 18-Feb-1985 | 05-SH | --- | --- | 254 | 256 | --- | --- | 261 | --- | --- | --- | --- | 312.1 | 0.003 | 0.061 |
| | 15-May-1985 | 05-SH | 7.97 | 504 | 277.8 | 282 | 0.7 | 11.6 | 295 | 80 | 18.9 | 1 | 7.8 | 343.8 | 0.003 | 0.003 |
| | 15-Sep-1985 | 05-SH | 7.68 | 530 | 266.1 | 281 | 0.8 | 9 | 290 | 76 | 18.5 | 1.05 | 6.9 | 342.5 | 0.003 | 0.006 |
| | 15-Dec-1985 | 05-SH | 7.7 | 540 | 274 | 288 | 0.7 | 9.6 | 290 | 76 | 20.4 | 1.02 | 6.2 | 351.1 | 0.003 | 0.005 |
| | 15-Jun-1986 | 05-SH | 8.18 | 500 | 272.2 | 258 | 1.7 | 8.1 | 270 | 74.3 | 21 | 0.91 | 5.8 | 314.5 | 0.003 | 0.009 |
| | 15-Aug-1986 | 05-SH | 7.64 | 518 | 270.2 | 260 | 0.5 | 8.8 | 275 | 74 | 20.7 | 0.95 | 5.6 | 316.9 | 0.012 | 0.021 |
| | 15-Oct-1986 | 05-SH | 7.87 | 500 | 273.6 | 272 | 0.2 | 7.8 | 285 | 76 | 20.3 | 0.95 | 5.5 | 331.6 | 0.005 | 0.043 |
| | 15-May-1987 | 05-SH | 7.71 | 473 | 259 | 255 | 0.3 | 7.6 | 260 | 71 | 19.9 | 0.88 | 5.4 | 311 | 0.003 | 0.055 |
| | 15-Sep-1987 | 05-SH | 8.09 | 484 | 257 | 256 | 0.7 | 9.1 | 263 | 72 | 18.7 | 0.92 | 5.6 | 312 | 0.003 | 0.064 |
| | 15-Nov-1987 | 05-SH | 7.64 | 475 | 256.1 | 252 | 1.1 | 8.2 | 265 | 70 | 19.7 | 0.85 | 5.5 | 307.2 | 0.003 | 0.074 |
| | | 05-SH +95CI | 7.97 | 517.96 | 271.42 | 274.31 | 1.04 | 9.66 | 283.76 | 76.38 | 20.38 | 0.99 | 6.57 | 334.4 | 0.0059 | 0.052 |
| | | 05-SH -95CI | 7.7 | 487.37 | 260.58 | 257.69 | 0.45 | 8.07 | 267.04 | 72.35 | 19.2 | 0.9 | 5.5 | 314.14 | 0.0023 | 0.017 |
| | | 05-SH MAX | 8.18 | 540 | 277.8 | 288 | 1.7 | 11.6 | 295 | 80 | 21 | 1.05 | 7.8 | 351.1 | 0.012 | 0.074 |
| | | 05-SH MEAN | 7.83 | 502.67 | 266 | 266 | 0.74 | 8.87 | 275.4 | 74.37 | 19.79 | 0.95 | 6.03 | 324.27 | 0.0041 | 0.034 |
| | | 05-SH MIN | 7.64 | 473 | 254 | 252 | 0.2 | 7.6 | 260 | 70 | 18.5 | 0.85 | 5.4 | 307.2 | 0.003 | 0.003 |
| | | 05-SH N | 9 | 9 | 10 | 10 | 9 | 9 | 10 | 9 | 9 | 9 | 9 | 10 | 10 | 10 |
| | | 05-SH SD | 0.21 | 23.41 | 8.75 | 13.41 | 0.45 | 1.22 | 13.49 | 3.08 | 0.91 | 0.066 | 0.81 | 16.34 | 0.0028 | 0.028 |
| **05-IN** | 18-Feb-1985 | 05-IN | --- | --- | 341.7 | 290 | --- | --- | 488 | --- | --- | --- | --- | 353.5 | 0.012 | 0.012 |
| | 15-May-1985 | 05-IN | 7.96 | 601 | 286.9 | 294 | 2 | 46 | 365 | 83 | 19.3 | 2.08 | 24.3 | 358.4 | 0.032 | 0.36 |
| | 15-Sep-1985 | 05-IN | 7.78 | 552 | 266.6 | 279 | 1.9 | 24 | 310 | 76 | 18.6 | 1.56 | 11.6 | 340.1 | 0.015 | 0.26 |
| | 15-Jun-1986 | 05-IN | 6.86 | 640 | 321.1 | 275 | 4.5 | 55 | 370 | 89.9 | 23.4 | 2 | 20 | 335.2 | 0.007 | 0.167 |
| | 15-Aug-1986 | 05-IN | 7.64 | 686 | 293.1 | 271 | 3 | 75 | 380 | 82 | 21.4 | 2.08 | 26.3 | 330.3 | 0.009 | 0.24 |
| | 15-Oct-1986 | 05-IN | 7.96 | 700 | 325.9 | 295 | 3.6 | 91.5 | 430 | 92 | 23.3 | 2.31 | 28.9 | 359.6 | 0.015 | 0.088 |
| | 15-May-1987 | 05-IN | 7.66 | 682 | 304.3 | 273 | 2.7 | 110 | 430 | 84 | 22.9 | 2.13 | 38 | 332.8 | 0.004 | 0.023 |
| | 15-Sep-1987 | 05-IN | 8.14 | 707 | 307.2 | 259 | 4.2 | 113 | 425 | 87 | 21.8 | 2.1 | 38.6 | 315.7 | 0.007 | 0.009 |
| | 15-Nov-1987 | 05-IN | 7.71 | 684 | 291 | 279 | 3.9 | 97 | 425 | 80 | 22.1 | 2.02 | 42 | 340.1 | 0.006 | 0.011 |
| | | 05-IN +95CI | 7.98 | 694.45 | 319.14 | 287.16 | 3.91 | 98.74 | 436.31 | 87.87 | 22.84 | 2.18 | 35.91 | 350.05 | 0.017 | 0.22 |
| | | 05-IN -95CI | 7.45 | 618.55 | 289.26 | 271.73 | 2.54 | 54.14 | 368.8 | 80.6 | 20.36 | 1.89 | 21.52 | 331.22 | 0.0063 | 0.044 |
| | | 05-IN MAX | 8.14 | 707 | 341.7 | 295 | 4.5 | 113 | 488 | 92 | 23.4 | 2.31 | 42 | 359.6 | 0.032 | 0.36 |
| | | 05-IN MEAN | 7.71 | 656.5 | 304.2 | 279.44 | 3.23 | 76.44 | 402.56 | 84.24 | 21.6 | 2.04 | 28.71 | 340.63 | 0.012 | 0.13 |
| | | 05-IN MIN | 6.86 | 552 | 266.6 | 259 | 1.9 | 24 | 310 | 76 | 18.6 | 1.56 | 11.6 | 315.7 | 0.004 | 0.009 |
| | | 05-IN N | 8 | 8 | 9 | 9 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 9 |
| | | 05-IN SD | 0.39 | 54.76 | 22.86 | 11.81 | 0.98 | 32.18 | 51.67 | 5.24 | 1.79 | 0.21 | 10.38 | 14.41 | 0.0085 | 0.13 |
| **06-SH** | 18-Feb-1985 | 06-SH | --- | --- | 285.5 | 295 | --- | --- | 295 | --- | --- | --- | --- | 359.6 | 0.003 | 0.009 |
| | 15-May-1985 | 06-SH | 7.82 | 493 | 264.1 | 272 | 1 | 10.5 | 285 | 75 | 18.6 | 1.39 | 7.3 | 331.6 | 0.017 | 0.003 |
| | 15-Sep-1985 | 06-SH | 7.84 | 508 | 257 | 276 | 0.9 | 6.8 | 280 | 74 | 17.5 | 1.45 | 6.2 | 336.4 | 0.007 | 0.007 |
| | 15-Dec-1985 | 06-SH | 7.49 | 530 | 268.6 | 289 | 1.12 | 5.8 | 290 | 74 | 20.3 | 1.35 | 5.9 | 352.3 | 0.005 | 0.005 |
| | 15-Jun-1986 | 06-SH | 8.26 | 520 | 282.7 | 278 | 1.8 | 5.3 | 280 | 77.7 | 21.5 | 1.2 | 6.1 | --- | 0.005 | 0.013 |
| | 15-Aug-1986 | 06-SH | 7.27 | 528 | 282.3 | 276 | 1.1 | 6.7 | 285 | 78 | 21.2 | 1.25 | 5.9 | 336.4 | 0.004 | 0.014 |
| | 15-Oct-1986 | 06-SH | 7.86 | 500 | 266.9 | 277 | 1.2 | 6.1 | 290 | 73 | 20.5 | 1.27 | 5.4 | 337.7 | 0.006 | 0.066 |
| | 15-May-1987 | 06-SH | 8.15 | 505 | 270.2 | 275 | 0.8 | 6.5 | 280 | 73 | 21.3 | 1.2 | 5.8 | 335.2 | 0.003 | 0.057 |
| | 15-Sep-1987 | 06-SH | 8.4 | 526 | 276 | 285 | 2.1 | 6.7 | 290 | 76.8 | 20.6 | 1.36 | 6.1 | 348 | 0.003 | 0.068 |
| | 15-Nov-1987 | 06-SH | 7.55 | 536 | 294.7 | 289 | 2.3 | 6.7 | 305 | 81 | 22.4 | 1.31 | 6 | 352.3 | 0.003 | 0.011 |
| | | 06-SH +95CI | 8.09 | 526.09 | 281.91 | 285.96 | 1.73 | 7.76 | 292.89 | 77.61 | 21.42 | 1.37 | 6.41 | 349.72 | 0.0082 | 0.042 |
| | | 06-SH -95CI | 7.6 | 506.35 | 267.69 | 276.44 | 1.01 | 5.82 | 283.11 | 74.05 | 19.44 | 1.25 | 5.74 | 336.83 | 0.003 | 0.0087 |
| | | 06-SH MAX | 8.4 | 536 | 294.7 | 295 | 2.3 | 10.5 | 305 | 81 | 22.4 | 1.45 | 7.3 | 359.6 | 0.017 | 0.068 |
| | | 06-SH MEAN | 7.85 | 516.22 | 274.8 | 281.2 | 1.37 | 6.79 | 288 | 75.83 | 20.43 | 1.31 | 6.08 | 343.28 | 0.0056 | 0.025 |
| | | 06-SH MIN | 7.27 | 493 | 257 | 272 | 0.8 | 5.3 | 280 | 73 | 17.5 | 1.2 | 5.4 | 331.6 | 0.003 | 0.003 |
| | | 06-SH N | 9 | 9 | 10 | 10 | 9 | 9 | 10 | 9 | 9 | 9 | 9 | 9 | 10 | 10 |
| | | 06-SH SD | 0.37 | 15.11 | 11.47 | 7.69 | 0.55 | 1.48 | 7.89 | 2.72 | 1.51 | 0.086 | 0.51 | 9.87 | 0.0042 | 0.027 |

**Table 5.1**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)**

| | | | GENERAL | | | | INDICATORS | | | CATIONS, ANIONS AND ION BALANCE | | | | | NITROGEN PARAMETERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | pH | EC (µs/cm) | Total Hardness as $CaCO_3$ (mg/L) | Total Alkalinity as $CaCO_3$ (mg/L) | Chloride (mg/L) | Sulphate (mg/L) | TDS (calculated) (mg/L) | Calcium:D (mg/L) | Magnesium:D (mg/L) | Potassium:D (mg/L) | Sodium:D (mg/L) | Bicarbonate (mg/L) | Nitrite as N (mg/L) | Nitrate as N (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **7.0-10.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **---** | **---** |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **1** | **10** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **1** | **10** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **120** | **Variable** | **500** | **---** | **---** | **---** | **200** | **---** | **Variable** | **3** |
| **06-IN** | 17-Feb-1985 | 06-IN | --- | --- | 393.2 | 306 | --- | --- | **571** | --- | --- | --- | --- | 373 | 0.004 | 0.015 |
| | 15-May-1985 | 06-IN | 7.96 | 684 | 312.7 | 308 | 2.2 | 83 | 430 | 91 | 20.7 | 3.11 | 34 | 375.5 | 0.039 | 1.08 |
| | 15-Sep-1985 | 06-IN | 8.06 | 781 | 317.3 | 308 | 2.6 | 106 | 450 | 94 | 20 | 3.2 | 47 | 375.5 | 0.019 | 1.1 |
| | 15-Jun-1986 | 06-IN | 7.18 | 750 | 369.1 | 305 | 5.1 | 89 | 450 | 106 | 25.3 | 3.06 | 25.7 | 371.8 | 0.007 | 0.017 |
| | 15-Aug-1986 | 06-IN | 7.49 | 763 | 348 | 304 | 5 | 110 | 455 | 101 | 23.2 | 3 | 30 | 370.6 | < 0.003 | 0.026 |
| | 15-Oct-1986 | 06-IN | 7.85 | 780 | 347 | 314 | 5.9 | 118 | 490 | 97 | 25.4 | 2.9 | 37.5 | 382.8 | 0.006 | 0.058 |
| | 15-Feb-1987 | 06-IN | 7.16 | 907 | --- | --- | 5.1 | 188 | --- | 112 | 27.5 | 3.18 | 48.4 | --- | --- | --- |
| | 15-May-1987 | 06-IN | 8.09 | 781 | 356.2 | 301 | 5.8 | 145 | 500 | 99 | 26.4 | 3.1 | 36.5 | 366.9 | < 0.003 | 0.003 |
| | 15-Sep-1987 | 06-IN | 8.01 | 813 | 367.9 | 308 | 6.3 | 146 | **505** | 105 | 25.6 | 2.99 | 39.3 | 375.5 | < 0.003 | 0.06 |
| | 15-Nov-1987 | 06-IN | 7.92 | 842 | 384.5 | 308 | 6.2 | 147 | **530** | 109 | 27.2 | 3 | 42.5 | 375.5 | 0.004 | 0.046 |
| | | 06-IN +95CI | 7.99 | 829.5 | 373.02 | 309.23 | 5.89 | 147.67 | 516.37 | 106.13 | 26.36 | 3.12 | 42.75 | 376.99 | 0.018 | 0.57 |
| | | 06-IN -95CI | 7.5 | 748.5 | 337.18 | 304.55 | 3.93 | 103.88 | 457.18 | 96.98 | 22.82 | 2.3 | 33 | 371.25 | 0.0019 | 0.038 |
| | | 06-IN MAX | 8.09 | 907 | 393.2 | 314 | 6.3 | 188 | 571 | 112 | 27.5 | 3.2 | 48.4 | 382.8 | 0.039 | 1.1 |
| | | 06-IN MEAN | 7.75 | 789 | 355.1 | 306.89 | 4.91 | 125.78 | 486.78 | 101.56 | 24.59 | 3.06 | 37.88 | 374.12 | 0.0098 | 0.27 |
| | | 06-IN MIN | 7.16 | 684 | 312.7 | 301 | 2.2 | 83 | 430 | 91 | 20 | 2.9 | 25.7 | 366.9 | 0.003 | 0.003 |
| | | 06-IN N | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| | | 06-IN SD | 0.37 | 61.99 | 27.43 | 3.59 | 1.51 | 33.51 | 45.3 | 7 | 2.71 | 0.097 | 7.46 | 4.39 | 0.012 | 0.47 |
| **07-SH** | 18-Feb-1985 | 07-SH | --- | --- | 308.4 | 299 | --- | --- | 340 | --- | --- | --- | --- | 364.5 | 0.004 | 0.019 |
| | 15-May-1985 | 07-SH | 7.95 | 708 | 289.8 | 292 | 3 | 56 | 375 | 83 | 20 | 2.2 | 27 | 355.9 | 0.01 | 0.71 |
| | 15-Sep-1985 | 07-SH | 8.06 | 552 | 275.7 | 283 | 1.1 | 9.8 | 300 | 80 | 18.4 | 1.85 | 8.1 | 345 | 0.006 | 0.033 |
| | 15-Jun-1986 | 07-SH | 7.17 | 620 | 333.9 | 316 | 1.8 | 18 | 350 | --- | --- | 2.14 | 9.9 | 385.2 | < 0.003 | 0.038 |
| | 15-Aug-1986 | 07-SH | 7.36 | 567 | 296.4 | 280 | 1.3 | 16.4 | 310 | 84 | 21 | 1.96 | 8.2 | 341.3 | < 0.003 | 0.092 |
| | 15-Oct-1986 | 07-SH | 7.62 | 560 | 290.6 | 277 | 1.8 | 19.2 | 310 | 81 | 21.4 | 2.04 | 8 | 337.7 | 0.007 | 0.3 |
| | 15-May-1987 | 07-SH | 8.14 | 562 | 291.8 | 279 | 1.3 | 30 | 320 | 81 | 21.7 | 1.75 | 7.74 | 340.1 | < 0.003 | 0.115 |
| | 15-Sep-1987 | 07-SH | 7.77 | 571 | 303.9 | 287 | 2.3 | 34 | 330 | 87 | 21 | 1.9 | 8.3 | 349.9 | < 0.003 | 0.055 |
| | 15-Nov-1987 | 07-SH | 7.88 | 584 | 317.6 | 295 | 2.1 | 33.2 | 340 | 89 | 23.1 | 1.91 | 8.7 | 359.6 | < 0.003 | 0.03 |
| | | 07-SH +95CI | 7.98 | 626.48 | 312.22 | 297.89 | 2.27 | 37.18 | 345.92 | 86.06 | 22.02 | 2.07 | 15.32 | 363.13 | 0.0063 | 0.3 |
| | | 07-SH -95CI | 7.51 | 554.52 | 289.58 | 281.67 | 1.4 | 16.97 | 315.19 | 81.08 | 19.86 | 1.86 | 6.17 | 343.36 | 0.003 | 0.0072 |
| | | 07-SH MAX | 8.14 | 708 | 333.9 | 316 | 3 | 56 | 375 | 89 | 23.1 | 2.2 | 27 | 385.2 | 0.01 | 0.71 |
| | | 07-SH MEAN | 7.74 | 590.5 | 300.9 | 289.78 | 1.84 | 27.08 | 330.56 | 83.57 | 20.94 | 1.97 | 10.74 | 353.24 | 0.0047 | 0.15 |
| | | 07-SH MIN | 7.17 | 552 | 275.7 | 277 | 1.1 | 9.8 | 300 | 80 | 18.4 | 1.75 | 7.74 | 337.7 | 0.003 | 0.019 |
| | | 07-SH N | 8 | 8 | 9 | 9 | 8 | 8 | 9 | 7 | 7 | 8 | 8 | 9 | 9 | 9 |
| | | 07-SH SD | 0.34 | 51.93 | 17.32 | 12.42 | 0.63 | 14.58 | 23.51 | 3.36 | 1.46 | 0.15 | 6.6 | 15.13 | 0.0025 | 0.23 |
| **07-IN** | 18-Feb-1985 | 07-IN | --- | --- | 330.1 | 368 | --- | --- | 487 | --- | --- | --- | --- | 448.6 | 0.005 | 0.008 |
| | 15-May-1985 | 07-IN | 7.95 | 786 | 346 | 369 | 2.1 | 82 | 495 | 104 | 20.9 | 5.5 | 50 | 449.8 | 0.055 | 0.48 |
| | 15-Sep-1985 | 07-IN | 8.06 | 823 | 333.1 | 358 | 1.6 | 97.5 | 500 | 100 | 20.2 | 5.7 | 53 | 436.4 | 0.048 | 0.33 |
| | 15-Jun-1986 | 07-IN | 7.61 | 870 | 345.4 | 365 | 2.9 | 140 | **560** | 96 | 25.6 | 5.5 | 61 | 444.9 | 0.005 | 0.024 |
| | 15-Aug-1986 | 07-IN | 7.36 | 910 | 346.4 | 360 | 1.6 | 135 | **555** | 104 | 21 | 5.3 | 62 | 438.8 | 0.004 | 0.012 |
| | 15-Oct-1986 | 07-IN | 7.75 | 850 | 344.3 | 375 | 1.7 | 110 | **540** | 100 | 22.9 | 5 | 60 | 457.1 | 0.004 | 0.019 |
| | 15-May-1987 | 07-IN | 7.99 | 828 | 343.8 | 361 | 0.9 | 115 | **530** | 99 | 23.4 | 5.25 | 57.5 | 440.1 | < 0.003 | 0.014 |
| | 15-Sep-1987 | 07-IN | 7.72 | 838 | 356.8 | 370 | 1.9 | 110 | **530** | 106 | 22.3 | 5.06 | 54.2 | 451 | < 0.003 | 0.006 |
| | 15-Nov-1987 | 07-IN | 8.22 | 812 | 351.8 | 374 | 2 | 99 | 475 | 104 | 22.3 | 4.9 | 52.5 | 395 | < 0.003 | 0.01 |
| | | 07-IN +95CI | 8.02 | 865.86 | 349.6 | 370.64 | 2.23 | 124.42 | 539.19 | 103.97 | 23.51 | 5.47 | 59.36 | 452.07 | 0.028 | 0.22 |
| | | 07-IN -95CI | 7.64 | 813.39 | 338.78 | 362.69 | 1.45 | 97.7 | 499.03 | 99.28 | 21.14 | 5.08 | 53.18 | 428.31 | 0.00066 | 0.015 |
| | | 07-IN MAX | 8.22 | 910 | 356.8 | 375 | 2.9 | 140 | 560 | 106 | 25.6 | 5.7 | 62 | 457.1 | 0.055 | 0.48 |
| | | 07-IN MEAN | 7.83 | 839.63 | 344.19 | 366.67 | 1.84 | 111.06 | 519.11 | 101.63 | 22.33 | 5.28 | 56.28 | 440.19 | 0.014 | 0.1 |
| | | 07-IN MIN | 7.36 | 786 | 330.1 | 358 | 0.9 | 82 | 475 | 96 | 20.2 | 4.9 | 50 | 395 | 0.003 | 0.006 |
| | | 07-IN N | 8 | 8 | 9 | 9 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 9 |
| | | 07-IN SD | 0.28 | 37.86 | 8.28 | 6.08 | 0.57 | 19.28 | 30.73 | 3.38 | 1.71 | 0.28 | 4.46 | 18.19 | 0.021 | 0.18 |

**Table 5.1**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)**

| | | | GENERAL | | | | INDICATORS | | | CATIONS, ANIONS AND ION BALANCE | | | | | NITROGEN PARAMETERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | pH | EC (µs/cm) | Total Hardness as $CaCO_3$ (mg/L) | Total Alkalinity as $CaCO_3$ (mg/L) | Chloride (mg/L) | Sulphate (mg/L) | TDS (calculated) (mg/L) | Calcium:D (mg/L) | Magnesium:D (mg/L) | Potassium:D (mg/L) | Sodium:D (mg/L) | Bicarbonate (mg/L) | Nitrite as N (mg/L) | Nitrate as N (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **7.0-10.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **---** | **---** |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **1** | **10** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **1** | **10** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **120** | **Variable** | **500** | **---** | **---** | **---** | **200** | **---** | **Variable** | **3** |
| **07-SS** | 15-Feb-1985 | 07-SS | 7.39 | 745 | 328.9 | 328 | 0.7 | 78 | 450 | 99.6 | 19.4 | 5.85 | 46.5 | 399.8 | < 0.003 | 0.004 |
| | 18-Feb-1985 | 07-SS | --- | --- | 288.2 | 319 | --- | --- | 407 | --- | --- | --- | --- | 388.9 | < 0.003 | 0.076 |
| | 15-May-1985 | 07-SS | 7.39 | 675 | 321 | 342 | --- | 70.5 | 445 | 100 | 17.6 | 5.2 | 39 | 417 | < 0.003 | 0.053 |
| | 15-Sep-1985 | 07-SS | 7.73 | 689 | 285 | 310 | 0.7 | 65 | 400 | 87 | 16.4 | 5.5 | 37 | 377.9 | < 0.003 | 0.003 |
| | 15-Dec-1985 | 07-SS | 7.37 | 760 | 285.7 | 334 | 0.9 | 78 | 440 | 84 | 18.4 | 6 | 47 | 407.1 | 0.005 | 0.007 |
| | 15-Jun-1986 | 07-SS | 7 | 720 | 305.7 | 326 | 1.2 | 75 | 435 | 89.7 | 19.8 | 5.5 | 42.4 | 397.4 | 0.007 | 0.003 |
| | 15-Aug-1986 | 07-SS | 6.66 | 725 | 295.7 | 296 | 0.7 | 78.5 | 415 | 88 | 18.4 | 5 | 39 | 360.8 | 0.2 | 0.04 |
| | 15-Oct-1986 | 07-SS | 7.37 | 690 | 300.3 | 317 | 0.9 | 68.5 | 420 | 88 | 19.5 | 5.05 | 35.9 | 386.4 | 0.2 | 0.04 |
| | 15-May-1987 | 07-SS | 7 | 720 | 305.7 | 326 | 1.2 | 75 | 435 | 89.7 | 19.8 | 5.5 | 42.4 | 397.4 | 0.007 | 0.003 |
| | 15-Sep-1987 | 07-SS | 7.24 | 683 | 299.1 | 317 | 1.1 | 68 | 410 | 89 | 18.6 | 4.6 | 32.4 | 386.4 | < 0.003 | 0.009 |
| | 15-Nov-1987 | 07-SS | 7.43 | 686 | 315.3 | 321 | 1.6 | 63.3 | 420 | 94 | 19.5 | 4.65 | 34.2 | 391.3 | < 0.003 | 0.003 |
| | | 07-SS +95CI | 7.44 | 727.21 | 311.3 | 328.67 | 1.2 | 75.48 | 435.02 | 94.19 | 19.42 | 5.58 | 42.66 | 400.65 | 0.087 | 0.037 |
| | | 07-SS -95CI | 7.07 | 691.39 | 294.26 | 314.24 | 0.8 | 68.48 | 415.34 | 87.61 | 18.06 | 4.99 | 36.51 | 383.06 | 0.0071 | 0.0067 |
| | | 07-SS MAX | 7.73 | 760 | 328.9 | 342 | 1.6 | 78.5 | 450 | 100 | 19.8 | 6 | 47 | 417 | 0.2 | 0.076 |
| | | 07-SS MEAN | 7.26 | 709.3 | 302.78 | 321.45 | 1 | 71.98 | 425.18 | 90.9 | 18.74 | 5.29 | 39.58 | 391.85 | 0.04 | 0.022 |
| | | 07-SS MIN | 6.66 | 675 | 285 | 296 | 0.7 | 63.3 | 400 | 84 | 16.4 | 4.6 | 32.4 | 360.8 | 0.003 | 0.003 |
| | | 07-SS N | 10 | 10 | 11 | 11 | 9 | 10 | 11 | 10 | 10 | 10 | 10 | 11 | 11 | 11 |
| | | 07-SS SD | 0.3 | 28.9 | 14.42 | 12.2 | 0.3 | 5.65 | 16.65 | 5.31 | 1.099 | 0.47 | 4.95 | 14.89 | 0.079 | 0.026 |
| **08-SH** | 18-Feb-1985 | 08-SH | --- | --- | 274.7 | 276 | --- | --- | 317 | --- | --- | --- | --- | 336.4 | 0.007 | 0.054 |
| | 15-May-1985 | 08-SH | 7.93 | 516 | 258.7 | 277 | 1.4 | 16.7 | 300 | 75 | 17.3 | 2.02 | 17.2 | 337.7 | 0.016 | 0.118 |
| | 15-Sep-1985 | 08-SH | 7.77 | 534 | 242.9 | 269 | 1 | 24 | 300 | 71 | 15.9 | 2.18 | 17.9 | 327.9 | 0.005 | 0.102 |
| | 15-Jun-1986 | 08-SH | 7.69 | 530 | 270.3 | 281 | 1.9 | 15.5 | 300 | 73.2 | 21.2 | 2 | 11.7 | 342.5 | 0.004 | 0.029 |
| | 15-Aug-1986 | 08-SH | 7.49 | 545 | 264.4 | 275 | 0.7 | 12.5 | 290 | 73 | 19.9 | 2.05 | 10.5 | 335.2 | < 0.003 | 0.006 |
| | 15-Oct-1986 | 08-SH | 7.91 | 530 | 271.1 | 287 | 1.4 | 11.5 | 305 | 75 | 20.3 | 2.1 | 10.2 | 349.9 | < 0.003 | 0.027 |
| | 15-May-1987 | 08-SH | 8 | 533 | 269.4 | 275 | 1 | 15.5 | 300 | 74 | 20.5 | 2.13 | 11 | 335.2 | < 0.003 | 0.017 |
| | 15-Sep-1987 | 08-SH | 7.87 | 539 | 281.5 | 282 | 2.5 | 24 | 310 | 79 | 20.4 | 2.2 | 12 | 343.8 | < 0.003 | 0.055 |
| | 15-Nov-1987 | 08-SH | 7.68 | 555 | 280.3 | 269 | 1.8 | 27.9 | 315 | 80 | 19.5 | 2.1 | 12.6 | 327.9 | < 0.003 | 0.072 |
| | | 08-SH +95CI | 7.91 | 543.24 | 275.89 | 280.63 | 1.87 | 22.63 | 309.71 | 77.14 | 20.64 | 2.15 | 14.96 | 342.09 | 0.008 | 0.078 |
| | | 08-SH -95CI | 7.68 | 527.26 | 260.4 | 272.93 | 1.057 | 14.27 | 298.52 | 72.91 | 18.11 | 2.05 | 10.82 | 332.68 | 0.0024 | 0.028 |
| | | 08-SH MAX | 8 | 555 | 281.5 | 287 | 2.5 | 27.9 | 317 | 80 | 21.2 | 2.2 | 17.9 | 349.9 | 0.016 | 0.12 |
| | | 08-SH MEAN | 7.79 | 535.25 | 268.14 | 276.78 | 1.46 | 18.45 | 304.11 | 75.03 | 19.38 | 2.1 | 12.89 | 337.39 | 0.0052 | 0.053 |
| | | 08-SH MIN | 7.49 | 516 | 242.9 | 269 | 0.7 | 11.5 | 290 | 71 | 15.9 | 2 | 10.2 | 327.9 | 0.003 | 0.006 |
| | | 08-SH N | 8 | 8 | 9 | 9 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 9 |
| | | 08-SH SD | 0.17 | 11.53 | 11.86 | 5.89 | 0.59 | 6.04 | 8.57 | 3.05 | 1.82 | 0.072 | 2.99 | 7.2 | 0.0043 | 0.038 |
| **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 | 7.76 | 667 | 302.8 | 272 | 5.7 | 104 | 425 | 87 | 20.8 | 6 | 28.5 | 332 | **0.21** | 0.59 |
| | 15-Sep-1985 | 08-IN | 7.72 | 729 | 316.6 | 298 | 2.5 | 81 | 420 | 96 | 18.6 | 4.45 | 31.5 | 363.3 | 0.028 | 0.73 |
| | 15-Dec-1985 | 08-IN | 7.73 | 840 | 363.8 | 316 | 2.38 | 198 | **600** | 105 | 24.6 | 4.5 | 54 | 385.2 | 0.021 | 2.78 |
| | 15-Feb-1986 | 08-IN | 7.46 | 970 | --- | --- | 2.2 | 206 | --- | 127 | 28.6 | 4.44 | 54.5 | --- | --- | --- |
| | 15-Jun-1986 | 08-IN | 7.36 | 980 | 436.4 | 301 | 4.1 | 220 | **635** | 126 | 29.5 | 4.3 | 51.8 | 366.9 | 0.025 | 3.46 |
| | 15-Aug-1986 | 08-IN | 7.74 | 1170 | 454.9 | 305 | 2.8 | 320 | **760** | 137 | 27.3 | 4.85 | 73 | 371.8 | 0.023 | 3.18 |
| | 15-Oct-1986 | 08-IN | 8.07 | 970 | 441 | 331 | 2.6 | 196 | **630** | 127 | 30 | 4.65 | 53.5 | 403.5 | 0.069 | 4.03 |
| | 15-May-1987 | 08-IN | 7.8 | 959 | 444.7 | 308 | 1.9 | 256 | **680** | 129 | 29.7 | 4.85 | 67.5 | 375.5 | < 0.003 | 3.52 |
| | 15-Sep-1987 | 08-IN | 7.78 | 920 | 437.2 | 321 | 3.3 | 191 | **595** | 126 | 29.7 | 4.36 | 43.6 | 391.3 | < 0.003 | 2.4 |
| | 15-Nov-1987 | 08-IN | 7.87 | 986 | 456.8 | 320 | 2.6 | 224 | **655** | 134 | 29.6 | 4.2 | 53.5 | 390.1 | < 0.003 | 1.8 |
| | | 08-IN +95CI | 7.85 | 1007.69 | 441.15 | 317.89 | 3.71 | 241.95 | 661.31 | 129.98 | 29.4 | 4.98 | 59.74 | 387.5 | 0.072 | 3.16 |
| | | 08-IN -95CI | 7.61 | 830.51 | 375.54 | 299.02 | 2.31 | 157.24 | 542.87 | 108.82 | 24.28 | 4.34 | 42.54 | 364.61 | 0.00072 | 1.82 |
| | | 08-IN MAX | 8.07 | 1170 | 456.8 | 331 | 5.7 | 320 | 760 | 137 | 30 | 6 | 73 | 403.5 | 0.21 | 4.03 |
| | | 08-IN MEAN | 7.73 | 919.1 | 408.35 | 308.45 | 3.01 | 199.6 | 602.09 | 119.4 | 26.84 | 4.66 | 51.14 | 376.06 | 0.037 | 2.49 |
| | | 08-IN MIN | 7.36 | 667 | 302.8 | 272 | 1.9 | 81 | 420 | 87 | 18.6 | 4.2 | 28.5 | 332 | 0.003 | 0.59 |
| | | 08-IN N | 10 | 10 | 11 | 11 | 10 | 10 | 11 | 10 | 10 | 10 | 10 | 11 | 11 | 11 |
| | | 08-IN SD | 0.2 | 142.93 | 55.52 | 15.97 | 1.13 | 68.33 | 100.21 | 17.07 | 4.13 | 0.52 | 13.87 | 19.37 | 0.061 | 1.14 |

**Table 5.1**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)**

| | | | GENERAL | | | | INDICATORS | | | CATIONS, ANIONS AND ION BALANCE | | | | | NITROGEN PARAMETERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | pH | EC (µs/cm) | Total Hardness as $CaCO_3$ (mg/L) | Total Alkalinity as $CaCO_3$ (mg/L) | Chloride (mg/L) | Sulphate (mg/L) | TDS (calculated) (mg/L) | Calcium:D (mg/L) | Magnesium:D (mg/L) | Potassium:D (mg/L) | Sodium:D (mg/L) | Bicarbonate (mg/L) | Nitrite as N (mg/L) | Nitrate as N (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **7.0-10.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **---** | **---** |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **1** | **10** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **1** | **10** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **120** | **Variable** | **500** | **---** | **---** | **---** | **200** | **---** | **Variable** | **3** |
| **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 | 7.99 | 728 | 280 | 335 | --- | 105 | **505** | 91 | 12.7 | 4.86 | 78 | 408 | < 0.003 | 0.83 |
| | 15-Sep-1985 | 08-SS | 7.91 | 603 | 238.2 | 331 | 1 | 40 | 400 | 78 | 10.5 | 4.5 | 60 | 403.5 | 0.007 | 0.087 |
| | 15-Dec-1985 | 08-SS | 7.53 | 690 | 246 | 373 | 0.92 | 37.5 | 420 | 77 | 13 | 4.5 | 58 | 454.7 | 0.031 | 0.096 |
| | 15-Feb-1986 | 08-SS | 7.77 | 670 | --- | --- | 0.5 | 39 | --- | 88.3 | 12.9 | 4.3 | 50 | --- | --- | --- |
| | 15-Jun-1986 | 08-SS | 7.67 | 610 | 209.9 | 313 | 1.1 | 32.1 | 360 | 65.2 | 11.4 | 4.1 | 51.4 | 381.5 | < 0.003 | 0.3 |
| | 15-Aug-1986 | 08-SS | 7.37 | 621 | 199.1 | 285 | 0.4 | 32.7 | 345 | 64 | 9.5 | 4.48 | 53 | 347.4 | < 0.003 | 0.34 |
| | 15-Oct-1986 | 08-SS | 7.82 | 620 | 226.9 | 317 | 0.7 | 30 | 380 | 72 | 11.4 | 4.4 | 55 | 386.4 | 0.01 | 0.35 |
| | 15-May-1987 | 08-SS | 7.67 | 610 | 209.9 | 313 | 1.1 | 32.1 | 360 | 65.2 | 11.4 | 4.1 | 51.4 | 381.5 | < 0.003 | 0.3 |
| | 15-Sep-1987 | 08-SS | 7.68 | 612 | 226.1 | 321 | 1.2 | 30 | 370 | 73 | 10.6 | 4.66 | 54.6 | 391.3 | < 0.003 | 0.149 |
| | | 08-SS +95CI | 7.84 | 669.53 | 251.91 | 338.37 | 1.071 | 57.66 | 419.55 | 81.27 | 12.27 | 4.59 | 62.42 | 412.42 | 0.012 | 0.43 |
| | | 08-SS -95CI | 7.59 | 611.36 | 218.79 | 309.83 | 0.66 | 26.42 | 363.25 | 68.44 | 10.71 | 4.27 | 51.22 | 377.64 | 0.0016 | 0.17 |
| | | 08-SS MAX | 7.99 | 728 | 280 | 373 | 1.2 | 105 | 505 | 91 | 13 | 4.86 | 78 | 454.7 | 0.031 | 0.83 |
| | | 08-SS MEAN | 7.71 | 640.44 | 235.35 | 324.1 | 0.87 | 42.04 | 391.4 | 74.86 | 11.49 | 4.43 | 56.82 | 395.03 | 0.007 | 0.3 |
| | | 08-SS MIN | 7.37 | 603 | 199.1 | 285 | 0.4 | 30 | 345 | 64 | 9.5 | 4.1 | 50 | 347.4 | 0.003 | 0.087 |
| | | 08-SS N | 9 | 9 | 10 | 10 | 8 | 9 | 10 | 9 | 9 | 9 | 9 | 10 | 10 | 10 |
| | | 08-SS SD | 0.19 | 44.52 | 26.73 | 23.02 | 0.3 | 23.91 | 45.42 | 9.82 | 1.2 | 0.25 | 8.57 | 28.06 | 0.0088 | 0.21 |
| **09-SH [Decommissioned]** | 15-May-1985 | 09-SH [DECOM] | 7.18 | 781 | 271.4 | 151 | 3.2 | 260 | --- | 86 | 13.7 | 1.58 | 65 | 184.1 | 0.031 | 2.77 |
| | 15-Sep-1985 | 09-SH [DECOM] | 6.66 | 938 | 303.4 | 165 | 2.7 | 305 | --- | 97 | 14.8 | 1.64 | 82 | 201.1 | 0.03 | 1.91 |
| | 15-Jun-1986 | 09-SH [DECOM] | 6.84 | 750 | 273.9 | 178 | 3.3 | 211 | --- | 86 | 14.3 | 1.4 | 61.4 | 217 | 0.006 | 0.004 |
| | 15-Aug-1986 | 09-SH [DECOM] | 6.72 | 708 | 229.8 | 174 | 1.9 | 197 | --- | 71 | 12.7 | 1.42 | 57 | 212.1 | < 0.003 | 0.01 |
| | 15-Oct-1986 | 09-SH [DECOM] | 7.08 | 710 | 265 | 208 | 2.6 | 182 | --- | 83 | 14.1 | 3.9 | 57 | 253 | 0.01 | 0.003 |
| | 15-May-1987 | 09-SH [DECOM] | 6.79 | 715 | 235.2 | 174 | 1.6 | 198 | --- | 72 | 13.4 | 1.55 | 73 | 212.1 | 0.004 | 0.003 |
| | 15-Sep-1987 | 09-SH [DECOM] | 6.7 | 689 | 211.9 | 177 | 3.9 | 195 | --- | 66 | 11.4 | 1.4 | 73.5 | 215.8 | 0.004 | 0.003 |
| | 15-Nov-1987 | 09-SH [DECOM] | 6.79 | 659 | 228.5 | 187 | 5.2 | 125 | --- | 71 | 12.4 | 1.3 | 58.5 | 228 | 0.004 | 0.01 |
| | | 09-SH +95CI | 6.97 | 803.81 | 273.67 | 188.17 | 3.84 | 246.23 | --- | 86.33 | 14.13 | 2.37 | 72.35 | 229.21 | 0.02 | 1.35 |
| | | 09-SH -95CI | 6.72 | 683.69 | 231.11 | 165.33 | 2.26 | 172.02 | --- | 71.67 | 12.57 | 1.17 | 59.5 | 201.59 | 0.0032 | 0.18 |
| | | 09-SH MAX | 7.18 | 938 | 303.4 | 208 | 5.2 | 305 | --- | 97 | 14.8 | 3.9 | 82 | 253 | 0.031 | 2.77 |
| | | 09-SH MEAN | 6.85 | 743.75 | 252.39 | 176.75 | 3.05 | 209.13 | --- | 79 | 13.35 | 1.77 | 65.93 | 215.4 | 0.012 | 0.59 |
| | | 09-SH MIN | 6.66 | 659 | 211.9 | 151 | 1.6 | 125 | --- | 66 | 11.4 | 1.3 | 57 | 184.1 | 0.003 | 0.003 |
| | | 09-SH N | 8 | 8 | 8 | 8 | 8 | 8 | --- | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 09-SH SD | 0.19 | 86.67 | 30.71 | 16.48 | 1.15 | 53.54 | --- | 10.58 | 1.12 | 0.87 | 9.27 | 19.93 | 0.012 | 1.1 |
| **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] | 7.87 | 582 | 293.3 | 311 | 6.4 | 12.5 | 350 | 89 | 17.2 | 4.37 | 16.8 | 379.1 | 0.083 | 0.34 |
| | 15-Sep-1985 | 09-IN [DECOM] | 7.9 | 617 | 300.7 | 322 | 2.8 | 13.9 | 350 | 90 | 18.4 | 3.6 | 14.6 | 392.5 | 0.06 | 0.064 |
| | 15-Dec-1985 | 09-IN [DECOM] | 7.61 | 730 | 355.5 | 369 | 1.8 | 33.1 | 420 | 104 | 23.2 | 3.4 | 18 | 449.8 | 0.036 | 0.279 |
| | 15-Feb-1986 | 09-IN [DECOM] | 7.6 | 760 | --- | --- | 1.3 | 46 | --- | 115 | 25.3 | 3.45 | 21.7 | --- | --- | --- |
| | 15-Jun-1986 | 09-IN [DECOM] | 7.99 | 780 | 396.1 | 355 | 2.8 | 80 | 470 | 114 | 27 | 3.3 | 24.9 | 432.7 | 0.033 | 0.21 |
| | 15-Aug-1986 | 09-IN [DECOM] | 7.79 | 806 | 365 | 358 | 1.2 | 78.5 | 460 | 106 | 24.3 | 3.37 | 23.8 | 436.4 | 0.051 | 0.199 |
| | 15-Oct-1986 | 09-IN [DECOM] | 7.9 | 810 | 407.8 | 381 | 2 | 79 | 500 | 119 | 26.8 | 3.38 | 25.6 | 464.4 | 0.14 | 0.012 |
| | 15-May-1987 | 09-IN [DECOM] | 7.9 | 802 | 412.3 | 370 | 1.2 | 90.5 | 500 | 119 | 27.9 | 3.75 | 26.5 | 451 | 0.048 | 0.067 |
| | 15-Sep-1987 | 09-IN [DECOM] | 7.8 | 814 | 408.2 | 382 | 2.3 | 98.1 | **510** | 117 | 28.1 | 3.1 | 25.4 | 465.7 | < 0.003 | 0.003 |
| | 15-Nov-1987 | 09-IN [DECOM] | 7.8 | 821 | 419 | 383 | 2.9 | 74 | **505** | 122 | 27.7 | 3.2 | 27.1 | 466.9 | 0.004 | 0.006 |
| | | 09-IN +95CI | 7.89 | 805.21 | 403.15 | 376.77 | 3.42 | 80.14 | 490.14 | 116.91 | 27.03 | 3.71 | 25.2 | 458.22 | 0.077 | 0.22 |
| | | 09-IN -95CI | 7.74 | 699.19 | 351.07 | 347.41 | 1.52 | 40.98 | 419.86 | 102.09 | 22.15 | 3.27 | 19.68 | 423.18 | 0.025 | 0.057 |
| | | 09-IN MAX | 7.99 | 821 | 419 | 386 | 6.4 | 98.1 | 510 | 122 | 28.1 | 4.37 | 27.1 | 466.9 | 0.14 | 0.36 |
| | | 09-IN MEAN | 7.82 | 752.2 | 377.11 | 362.09 | 2.47 | 60.56 | 455 | 109.5 | 24.59 | 3.49 | 22.44 | 440.7 | 0.051 | 0.14 |
| | | 09-IN MIN | 7.6 | 582 | 293.3 | 311 | 1.2 | 12.5 | 350 | 89 | 17.2 | 3.1 | 14.6 | 379.1 | 0.003 | 0.003 |
| | | 09-IN N | 10 | 10 | 11 | 11 | 10 | 10 | 11 | 10 | 10 | 10 | 10 | 11 | 11 | 11 |
| | | 09-IN SD | 0.13 | 85.53 | 44.062 | 24.85 | 1.53 | 31.59 | 59.46 | 11.96 | 3.93 | 0.36 | 4.45 | 29.65 | 0.044 | 0.14 |
| **09-PEAT** | 15-Nov-1987 | 09-PEAT | **4** | 51.2 | 5.2 | 0.1 | 2.5 | 1.2 | 6 | 1.6 | 0.3 | 0.18 | 0.5 | 0.5 | 0.006 | 0.008 |
| | | 09-PEAT +95CI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 09-PEAT -95CI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 09-PEAT MAX | 4 | 51.2 | 5.2 | 0.1 | 2.5 | 1.2 | 6 | 1.6 | 0.3 | 0.18 | 0.5 | 0.5 | 0.006 | 0.008 |
| | | 09-PEAT MEAN | 4 | 51.2 | 5.2 | 0.1 | 2.5 | 1.2 | 6 | 1.6 | 0.3 | 0.18 | 0.5 | 0.5 | 0.006 | 0.008 |
| | | 09-PEAT MIN | 4 | 51.2 | 5.2 | 0.1 | 2.5 | 1.2 | 6 | 1.6 | 0.3 | 0.18 | 0.5 | 0.5 | 0.006 | 0.008 |
| | | 09-PEAT N | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | 09-PEAT SD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Table 5.1**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Routine Water Analysis (Major Ions, Indicators, etc.)**

| | | | GENERAL | | | | INDICATORS | | | CATIONS, ANIONS AND ION BALANCE | | | | | NITROGEN PARAMETERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | pH | EC (µs/cm) | Total Hardness as $CaCO_3$ (mg/L) | Total Alkalinity as $CaCO_3$ (mg/L) | Chloride (mg/L) | Sulphate (mg/L) | TDS (calculated) (mg/L) | Calcium:D (mg/L) | Magnesium:D (mg/L) | Potassium:D (mg/L) | Sodium:D (mg/L) | Bicarbonate (mg/L) | Nitrite as N (mg/L) | Nitrate as N (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | **7.0-10.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **---** | **---** |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **---** | **1** | **10** |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **250** | **500** | **500** | **---** | **---** | **---** | **200** | **---** | **1** | **10** |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | **6.5 - 8.5** | **---** | **---** | **---** | **120** | **Variable** | **500** | **---** | **---** | **---** | **200** | **---** | **Variable** | **3** |
| **10-SH [Decommissioned]** | 15-May-1985 | 10-SH [DECOM] | 7.9 | 624 | 302.4 | 328 | 2.2 | 29.4 | 375 | 92 | 17.6 | 2.8 | 26.2 | 399.8 | 0.006 | 0.5 |
| | 15-Sep-1985 | 10-SH [DECOM] | 7.94 | 670 | 303.3 | 334 | 1.3 | 38.4 | 380 | 92 | 17.8 | 2.83 | 28.3 | 407.1 | 0.007 | 0.36 |
| | 15-Jun-1986 | 10-SH [DECOM] | 7.48 | 650 | 325.1 | 320 | 2 | 14.6 | 350 | 94.8 | 21.4 | 2.7 | 17 | 390.1 | 0.004 | 0.006 |
| | 15-Aug-1986 | 10-SH [DECOM] | 7.42 | 621 | 297.8 | 320 | 0.4 | 8.2 | 330 | 87 | 19.5 | 2.67 | 16 | 390.1 | 0.004 | 0.005 |
| | 15-Oct-1986 | 10-SH [DECOM] | 7.81 | 620 | 311.1 | 336 | 0.8 | 6.6 | 350 | 91 | 20.3 | 2.73 | 15.7 | 409.6 | 0.011 | 0.003 |
| | 15-May-1987 | 10-SH [DECOM] | 7.7 | 607 | 301.9 | 331 | 0.4 | 5.9 | 340 | 87 | 20.5 | 2.7 | 16.2 | 403.5 | < 0.003 | 0.003 |
| | 15-Sep-1987 | 10-SH [DECOM] | 7.64 | 603 | 307.7 | 344 | 1.1 | 6.1 | 350 | 90 | 20.1 | 2.8 | 16 | 419.3 | 0.006 | 0.005 |
| | 15-Nov-1987 | 10-SH [DECOM] | 8.11 | 604 | 309.4 | 331 | 1.4 | 5.4 | 350 | 91 | 19.9 | 2.7 | 15.7 | 403.5 | 0.006 | 0.24 |
| **10-SH [Decommissioned; continued]** | | 10-SH +95Cl | 7.91 | 641.32 | 313.17 | 336.07 | 1.67 | 23.1 | 364.68 | 92.42 | 20.55 | 2.78 | 22.5 | 409.65 | 0.0076 | 0.28 |
| | | 10-SH -95Cl | 7.59 | 608.43 | 301.51 | 324.93 | 0.74 | 5.55 | 341.57 | 88.78 | 18.73 | 2.7 | 15.28 | 396.1 | 0.0042 | 0.0017 |
| | | 10-SH MAX | 8.11 | 670 | 325.1 | 344 | 2.2 | 38.4 | 380 | 94.8 | 21.4 | 2.83 | 28.3 | 419.3 | 0.011 | 0.5 |
| | | 10-SH MEAN | 7.75 | 624.88 | 307.34 | 330.5 | 1.2 | 14.33 | 353.13 | 90.6 | 19.64 | 2.74 | 18.89 | 402.88 | 0.0059 | 0.14 |
| | | 10-SH MIN | 7.42 | 603 | 297.8 | 320 | 0.4 | 5.4 | 330 | 87 | 17.6 | 2.67 | 15.7 | 390.1 | 0.003 | 0.003 |
| | | 10-SH N | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| | | 10-SH SD | 0.24 | 23.73 | 8.41 | 8.04 | 0.67 | 12.67 | 16.68 | 2.62 | 1.32 | 0.06 | 5.21 | 9.78 | 0.0025 | 0.2 |
| **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] | 7.62 | 800 | 330.6 | 332 | 4.81 | 102 | 480 | 96 | 22 | 5 | 42 | 404.7 | 0.195 | 0.425 |
| | 15-Feb-1986 | 10-IN [DECOM] | 7.35 | 780 | --- | --- | 3.7 | 90 | --- | 109 | 23.8 | 4.9 | 35 | --- | --- | --- |
| | 15-Jun-1986 | 10-IN [DECOM] | 7.94 | 830 | 381.2 | 320 | 4.1 | 114 | 495 | 111 | 25.2 | 4.6 | 38.4 | 390.1 | 0.007 | 1.06 |
| | 15-Aug-1986 | 10-IN [DECOM] | 7.22 | 823 | 337.6 | 323 | 2.3 | 108 | 475 | 99 | 21.9 | 4.8 | 34.6 | 393.7 | 0.018 | 1.49 |
| | 15-Oct-1986 | 10-IN [DECOM] | 8.07 | 810 | 381.7 | 355 | 2.4 | 107 | **520** | 112 | 24.7 | 3.9 | 38.5 | 432.7 | 0.011 | 1.12 |
| | 15-May-1987 | 10-IN [DECOM] | 7.77 | 819 | 376.2 | 339 | 1.4 | 111 | 500 | 108 | 25.8 | 5 | 35 | 413.2 | 0.005 | 0.88 |
| | 15-Sep-1987 | 10-IN [DECOM] | 7.65 | 815 | 394.5 | 349 | 2.5 | 127 | **520** | 116 | 25.4 | 4.7 | 33.6 | 425.4 | < 0.003 | 0.46 |
| | 15-Nov-1987 | 10-IN [DECOM] | 7.67 | 854 | 409.1 | 353 | 2.5 | 116 | **530** | 121 | 25.9 | 4.8 | 36.8 | 430.3 | < 0.003 | 0.52 |
| | | 10-IN +95Cl | 7.86 | 831.39 | 389.64 | 347.22 | 3.74 | 116.86 | 516.28 | 114.71 | 25.46 | 4.96 | 38.66 | 423.23 | 0.097 | 1.04 |
| | | 10-IN -95Cl | 7.47 | 801.36 | 356.96 | 328.56 | 2.18 | 101.89 | 484.16 | 103.29 | 23.22 | 4.47 | 34.81 | 400.5 | 0.0037 | 0.58 |
| | | 10-IN MAX | 8.07 | 854 | 409.1 | 355 | 4.81 | 127 | 530 | 121 | 25.9 | 5 | 42 | 432.7 | 0.2 | 1.49 |
| | | 10-IN MEAN | 7.66 | 816.38 | 373.3 | 337.89 | 2.96 | 109.38 | 500.22 | 109 | 24.34 | 4.71 | 36.74 | 411.87 | 0.047 | 0.81 |
| | | 10-IN MIN | 7.22 | 780 | 330.6 | 320 | 1.4 | 90 | 460 | 96 | 21.9 | 3.9 | 33.6 | 390.1 | 0.003 | 0.43 |
| | | 10-IN N | 8 | 8 | 9 | 9 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 9 |
| | | 10-IN SD | 0.28 | 21.67 | 25.01 | 14.28 | 1.13 | 10.8 | 24.58 | 8.25 | 1.61 | 0.36 | 2.78 | 17.39 | 0.077 | 0.36 |

**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 (August, 2022), 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 |

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 |
| **Bold** | Guideline exceeded |
| Regular | Concentration is equal to the guideline |

Baseline Statistics
--- Guideline Row: No guideline for that parameter
--- Results: Parameter was not analyzed

**Table 5.2**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Dissolved Metals**

| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | DISSOLVED METALS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Antimony (mg/L) | Arsenic (mg/L) | Barium (mg/L) | Beryllium (mg/L) | Cadmium (mg/L) | Chromium (mg/L) | Copper (mg/L) | Lead (mg/L) | Mercury (mg/L) | Nickel (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | 0.006 | 0.010 | 2.0 | --- | 0.007 | 0.05 | 2 | 0.005 | 0.001 | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | 0.006 | 0.01 | 1 | --- | 0.005 | --- | 1 | 0.01 | 0.001 | --- |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | 0.005 | --- | --- | 0.00037 [6] | 0.0089 [7] | 0.007 | 0.007 [8] | 0.000005 | Variable [9] |
| **01-SH [Decommissioned]** | 15-May-1985 | 01-SH [DECOM] | 0.0002 | 0.0014 | --- | < 0.001 | < 0.001 | < 0.001 | 0.008 | < 0.002 | < 0.0001 | 0.035 |
| | 15-Jun-1985 | 01-SH [DECOM] | 0.0003 | 0.0015 | 0.37 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | 0.008 |
| | 15-Sep-1985 | 01-SH [DECOM] | 0.0008 | 0.0003 | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | 0.018 |
| | 15-May-1986 | 01-SH [DECOM] | 0.0004 | 0.0015 | 0.24 | --- | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | 0.02 |
| | 15-Aug-1986 | 01-SH [DECOM] | 0.0005 | 0.0029 | 0.27 | --- | --- | 0.005 | 0.002 | < 0.002 | < 0.0001 | 0.041 |
| | 15-Oct-1986 | 01-SH [DECOM] | 0.0007 | 0.0019 | 0.25 | --- | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | 0.056 |
| | 15-May-1987 | 01-SH [DECOM] | 0.0006 | 0.0012 | 0.25 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.00005 | 0.009 |
| | 15-Sep-1987 | 01-SH [DECOM] | 0.0002 | 0.002 | 0.24 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.00005 | 0.0118 |
| | 15-Nov-1987 | 01-SH [DECOM] | 0.0002 | 0.0006 | 0.25 | < 0.001 | < 0.001 | < 0.001 | 0.002 | 0.003 | < 0.00005 | --- |
| | | 01-SH +95Cl | 0.00058 | 0.002 | 0.3 | 0.001 | 0.001 | 0.0023 | 0.0042 | 0.0023 | 0.0001 | 0.037 |
| | | 01-SH -95Cl | 0.00028 | 0.00098 | 0.23 | 0.001 | 0.001 | 0.00057 | 0.0014 | 0.0019 | 0.000067 | 0.013 |
| | | 01-SH MAX | 0.0008 | 0.0029 | 0.37 | 0.001 | 0.001 | 0.005 | 0.008 | 0.003 | 0.0001 | 0.056 |
| | | 01-SH MEAN | 0.00043 | 0.0015 | 0.27 | 0.001 | 0.001 | 0.0014 | 0.0028 | 0.0021 | 0.000083 | 0.025 |
| | | 01-SH MIN | 0.0002 | 0.0003 | 0.24 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.00005 | 0.008 |
| | | 01-SH N | 9 | 9 | 7 | 6 | 8 | 9 | 9 | 9 | 9 | 8 |
| | | 01-SH SD | 0.00023 | 0.00077 | 0.046 | 0 | 0 | 0.0013 | 0.0021 | 0.00033 | 0.000025 | 0.017 |
| **01-IN [Decommissioned]** | 15-Feb-1985 | 01-IN [DECOM] | 0.0008 | 0.0006 | --- | < 0.001 | < 0.001 | 0.004 | 0.018 | 0.004 | < 0.0001 | 0.05 |
| | 15-Jun-1985 | 01-IN [DECOM] | 0.0002 | 0.0005 | 0.27 | < 0.001 | < 0.001 | < 0.001 | 0.009 | < 0.002 | < 0.0001 | 0.038 |
| | 15-Dec-1985 | 01-IN [DECOM] | 0.0002 | 0.0005 | --- | < 0.001 | < 0.001 | < 0.001 | 0.002 | 0.003 | < 0.0001 | 0.13 |
| | 15-May-1986 | 01-IN [DECOM] | --- | 0.0005 | 0.1 | --- | < 0.001 | < 0.001 | 0.005 | < 0.002 | < 0.0001 | 0.02 |
| | 15-Aug-1986 | 01-IN [DECOM] | 0.0005 | 0.0006 | 0.12 | --- | --- | < 0.001 | 0.007 | 0.003 | < 0.0001 | 0.015 |
| | 15-Oct-1986 | 01-IN [DECOM] | 0.0005 | 0.0004 | 0.13 | --- | < 0.001 | < 0.001 | 0.005 | < 0.002 | < 0.0001 | 0.012 |
| | 15-May-1987 | 01-IN [DECOM] | 0.0004 | 0.0004 | 0.11 | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.00005 | 0.014 |
| | 15-Sep-1987 | 01-IN [DECOM] | 0.0002 | 0.0007 | 0.11 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.00005 | 0.012 |
| | 15-Nov-1987 | 01-IN [DECOM] | 0.0002 | 0.0004 | 0.12 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.00005 | 0.012 |
| | | 01-IN +95Cl | 0.0005 | 0.0006 | 0.18 | 0.001 | 0.001 | 0.002 | 0.0094 | 0.0029 | 0.0001 | 0.059 |
| | | 01-IN -95Cl | 0.00022 | 0.00044 | 0.093 | 0.001 | 0.001 | 0.00068 | 0.003 | 0.002 | 0.000067 | 0.0085 |
| | | 01-IN MAX | 0.0008 | 0.0007 | 0.27 | 0.001 | 0.001 | 0.004 | 0.018 | 0.004 | 0.0001 | 0.13 |
| | | 01-IN MEAN | 0.00038 | 0.00051 | 0.14 | 0.001 | 0.001 | 0.0013 | 0.0062 | 0.0024 | 0.000083 | 0.033 |
| | | 01-IN MIN | 0.0002 | 0.0004 | 0.1 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.00005 | 0.012 |
| | | 01-IN N | 8 | 9 | 7 | 6 | 8 | 9 | 9 | 9 | 9 | 9 |
| | | 01-IN SD | 0.00022 | 0.00011 | 0.059 | 0 | 0 | 0.001 | 0.0049 | 0.00073 | 0.000025 | 0.039 |
| **01-SS [Decommissioned]** | 15-Jun-1985 | 01-SS [DECOM] | 0.0059 | **0.07** | 0.1 | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | 0.037 |
| | 15-Jul-1985 | 01-SS [DECOM] | **0.0077** | **0.022** | --- | < 0.001 | < 0.001 | 0.003 | 0.019 | 0.003 | < 0.0001 | 0.041 |
| | 15-Dec-1985 | 01-SS [DECOM] | 0.0024 | **0.057** | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | 0.019 |
| | 15-May-1986 | 01-SS [DECOM] | 0.0049 | **0.014** | 0.08 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | 0.028 |
| | 15-Aug-1986 | 01-SS [DECOM] | 0.0022 | **0.056** | 0.08 | --- | --- | < 0.001 | 0.002 | < 0.002 | < 0.0001 | 0.032 |
| | 15-Oct-1986 | 01-SS [DECOM] | 0.0022 | **0.085** | 0.08 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | 0.025 |
| | 15-Feb-1987 | 01-SS [DECOM] | 0.0048 | **0.09** | 0.09 | < 0.001 | < 0.001 | 0.002 | < 0.001 | < 0.002 | < 0.0001 | 0.039 |
| | 15-Sep-1987 | 01-SS [DECOM] | 0.0044 | **0.099** | 0.08 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.00005 | 0.03 |
| | 15-Nov-1987 | 01-SS [DECOM] | 0.0051 | **0.099** | 0.09 | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.00005 | 0.032 |
| | | 01-SS +95Cl | 0.0056 | 0.086 | 0.092 | 0.001 | 0.001 | 0.0018 | 0.0074 | 0.0023 | 0.0001 | 0.036 |
| | | 01-SS -95Cl | 0.0032 | 0.045 | 0.08 | 0.001 | 0.001 | 0.00087 | 0.00026 | 0.0019 | 0.000075 | 0.027 |
| | | 01-SS MAX | 0.0077 | 0.099 | 0.1 | 0.001 | 0.001 | 0.003 | 0.019 | 0.003 | 0.0001 | 0.041 |
| | | 01-SS MEAN | 0.0044 | 0.066 | 0.086 | 0.001 | 0.001 | 0.0013 | 0.0036 | 0.0021 | 0.000089 | 0.031 |
| | | 01-SS MIN | 0.0022 | 0.014 | 0.08 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.00005 | 0.019 |
| | | 01-SS N | 9 | 9 | 7 | 6 | 8 | 9 | 9 | 9 | 9 | 9 |
| | | 01-SS SD | 0.0019 | 0.032 | 0.0079 | 0 | 0 | 0.00071 | 0.0059 | 0.00033 | 0.000022 | 0.007 |
| **02-SH [Decommissioned]** | 15-May-1985 | 02-SH [DECOM] | 0.0019 | 0.0044 | --- | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 02-SH [DECOM] | 0.0002 | 0.0008 | --- | < 0.001 | < 0.001 | 0.002 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Dec-1985 | 02-SH [DECOM] | 0.0002 | 0.0028 | --- | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-Feb-1986 | 02-SH [DECOM] | 0.0005 | 0.0039 | --- | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 02-SH [DECOM] | 0.0002 | 0.0037 | 0.26 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 02-SH [DECOM] | 0.0002 | 0.0028 | 0.23 | --- | --- | < 0.001 | < 0.001 | 0.005 | < 0.0001 | --- |
| | 15-Oct-1986 | 02-SH [DECOM] | 0.0003 | 0.0057 | 0.24 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 02-SH [DECOM] | 0.0002 | 0.006 | 0.23 | --- | < 0.001 | 0.003 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 02-SH [DECOM] | 0.0006 | 0.0055 | 0.22 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 02-SH [DECOM] | 0.0004 | 0.0048 | 0.24 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | | 02-SH +95Cl | 0.00079 | 0.005 | 0.25 | 0.001 | 0.001 | 0.0017 | 0.0019 | 0.0029 | 0.0001 | --- |
| | | 02-SH -95Cl | 0.00015 | 0.003 | 0.23 | 0.001 | 0.001 | 0.00088 | 0.0011 | 0.0017 | 0.0001 | --- |
| | | 02-SH MAX | 0.0019 | 0.006 | 0.26 | 0.001 | 0.001 | 0.003 | 0.003 | 0.005 | 0.0001 | --- |
| | | 02-SH MEAN | 0.00047 | 0.004 | 0.24 | 0.001 | 0.001 | 0.0013 | 0.0015 | 0.0023 | 0.0001 | --- |
| | | 02-SH MIN | 0.0002 | 0.0008 | 0.22 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 02-SH N | 10 | 10 | 6 | 7 | 9 | 10 | 10 | 10 | 10 | --- |
| | | 02-SH SD | 0.00052 | 0.0016 | 0.014 | 0 | 0 | 0.00068 | 0.00071 | 0.00095 | 0 | --- |
| **02-IN [Decommissioned]** | 15-May-1985 | 02-IN [DECOM] | 0.0007 | 0.0009 | --- | < 0.001 | < 0.001 | 0.002 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 02-IN [DECOM] | 0.0005 | 0.0009 | --- | < 0.001 | < 0.001 | < 0.001 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-Feb-1986 | 02-IN [DECOM] | 0.0004 | 0.0038 | --- | < 0.001 | < 0.001 | 0.004 | 0.002 | 0.003 | < 0.0001 | --- |
| | 15-Jun-1986 | 02-IN [DECOM] | 0.0023 | 0.0044 | 0.15 | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 02-IN [DECOM] | 0.0002 | 0.0031 | 0.13 | --- | --- | < 0.001 | 0.002 | 0.004 | < 0.0001 | --- |
| | 15-Oct-1986 | 02-IN [DECOM] | 0.0004 | 0.0041 | 0.12 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 02-IN [DECOM] | 0.0002 | 0.0079 | 0.12 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 02-IN [DECOM] | 0.001 | 0.0072 | 0.11 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 02-IN [DECOM] | 0.0005 | 0.0074 | 0.12 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | | 02-IN +95Cl | 0.0011 | 0.0061 | 0.14 | 0.001 | 0.001 | 0.0021 | 0.0026 | 0.0028 | 0.0001 | --- |
| | | 02-IN -95Cl | 0.00026 | 0.0027 | 0.11 | 0.001 | 0.001 | 0.00078 | 0.00093 | 0.0019 | 0.0001 | --- |
| | | 02-IN MAX | 0.0023 | 0.0079 | 0.15 | 0.001 | 0.001 | 0.004 | 0.005 | 0.004 | 0.0001 | --- |
| | | 02-IN MEAN | 0.00069 | 0.0044 | 0.13 | 0.001 | 0.001 | 0.0014 | 0.0018 | 0.0023 | 0.0001 | --- |
| | | 02-IN MIN | 0.0002 | 0.0009 | 0.11 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 02-IN N | 9 | 9 | 6 | 6 | 8 | 9 | 9 | 9 | 9 | --- |
| | | 02-IN SD | 0.00065 | 0.0026 | 0.014 | 0 | 0 | 0.001 | 0.0013 | 0.00071 | 0 | --- |
| **03-SH** | 15-May-1985 | 03-SH | 0.001 | 0.0002 | --- | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 03-SH | 0.0002 | **0.014** | --- | < 0.001 | < 0.001 | < 0.001 | 0.008 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 03-SH | 0.0002 | 0.0004 | 0.27 | < 0.001 | < 0.001 | < 0.001 | 0.007 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 03-SH | 0.0002 | 0.0002 | 0.26 | --- | --- | < 0.001 | 0.006 | 0.003 | < 0.0001 | --- |
| | 15-Oct-1986 | 03-SH | 0.0003 | 0.0005 | 0.26 | --- | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 03-SH | 0.0002 | 0.0004 | 0.25 | --- | < 0.001 | < 0.001 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 03-SH | 0.0005 | 0.0004 | 0.26 | < 0.001 | < 0.001 | 0.002 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 03-SH | 0.0002 | 0.0003 | 0.28 | < 0.001 | < 0.001 | 0.002 | 0.002 | < 0.002 | < 0.0001 | --- |
| | | 03-SH +95Cl | 0.00055 | 0.0054 | 0.27 | 0.001 | 0.001 | 0.0016 | 0.0063 | 0.0024 | 0.0001 | --- |
| | | 03-SH -95Cl | 0.00015 | 0.0013 | 0.26 | 0.001 | 0.001 | 0.00093 | 0.0035 | 0.0019 | 0.0001 | --- |
| | | 03-SH MAX | 0.001 | 0.014 | 0.28 | 0.001 | 0.001 | 0.002 | 0.008 | 0.003 | 0.0001 | --- |
| | | 03-SH MEAN | 0.00035 | 0.0021 | 0.26 | 0.001 | 0.001 | 0.0013 | 0.0049 | 0.0021 | 0.0001 | --- |
| | | 03-SH MIN | 0.0002 | 0.0002 | 0.25 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.0001 | --- |
| | | 03-SH N | 8 | 8 | 6 | 5 | 7 | 8 | 8 | 8 | 8 | --- |
| | | 03-SH SD | 0.00028 | 0.0048 | 0.01 | 0 | 0 | 0.00047 | 0.002 | 0.00035 | 0 | --- |

**Table 5.2**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Dissolved Metals**

| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | DISSOLVED METALS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Antimony (mg/L) | Arsenic (mg/L) | Barium (mg/L) | Beryllium (mg/L) | Cadmium (mg/L) | Chromium (mg/L) | Copper (mg/L) | Lead (mg/L) | Mercury (mg/L) | Nickel (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | 0.006 | 0.010 | 2.0 | --- | 0.007 | 0.05 | 2 | 0.005 | 0.001 | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | 0.006 | 0.01 | 1 | --- | 0.005 | --- | 1 | 0.01 | 0.001 | --- |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | 0.005 | --- | --- | 0.00037 [6] | 0.0089 [7] | 0.007 | 0.007 [8] | 0.000005 | Variable [9] |
| **03-IN** | 15-May-1985 | 03-IN | 0.0002 | 0.0009 | --- | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 03-IN | 0.0002 | 0.0008 | --- | < 0.001 | < 0.001 | < 0.001 | 0.006 | < 0.002 | < 0.0001 | --- |
| | 15-Dec-1985 | 03-IN | 0.0002 | 0.0005 | --- | < 0.001 | < 0.001 | < 0.001 | 0.009 | < 0.002 | < 0.0001 | --- |
| | 15-Feb-1986 | 03-IN | 0.0007 | 0.0009 | --- | < 0.001 | < 0.001 | 0.003 | 0.009 | 0.004 | < 0.0001 | --- |
| | 15-Jun-1986 | 03-IN | 0.0002 | 0.0006 | --- | < 0.001 | < 0.001 | < 0.001 | 0.007 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 03-IN | 0.0002 | 0.0006 | 0.11 | --- | --- | < 0.001 | 0.002 | 0.004 | < 0.0001 | --- |
| | 15-Oct-1986 | 03-IN | 0.0004 | 0.0007 | 0.1 | --- | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 03-IN | 0.0002 | 0.0005 | 0.1 | --- | < 0.001 | 0.002 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 03-IN | 0.0005 | 0.0002 | 0.09 | < 0.001 | < 0.001 | < 0.001 | 0.021 | **0.016** | < 0.0001 | --- |
| | 15-Nov-1987 | 03-IN | 0.0002 | 0.0006 | 0.09 | < 0.001 | < 0.001 | 0.013 | 0.004 | < 0.002 | < 0.0001 | --- |
| | | 03-IN +95CI | 0.00041 | 0.00076 | 0.11 | 0.001 | 0.001 | 0.0048 | 0.01 | 0.0065 | 0.0001 | --- |
| | | 03-IN -95CI | 0.00019 | 0.0005 | 0.091 | 0.001 | 0.001 | 0.00018 | 0.0035 | 0.0011 | 0.0001 | --- |
| | | 03-IN MAX | 0.0007 | 0.0009 | 0.11 | 0.001 | 0.001 | 0.013 | 0.021 | 0.016 | 0.0001 | --- |
| | | 03-IN MEAN | 0.0003 | 0.00063 | 0.098 | 0.001 | 0.001 | 0.0025 | 0.0069 | 0.0038 | 0.0001 | --- |
| | | 03-IN MIN | 0.0002 | 0.0002 | 0.09 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.0001 | --- |
| | | 03-IN N | 10 | 10 | 5 | 7 | 9 | 10 | 10 | 10 | 10 | --- |
| | | 03-IN SD | 0.00018 | 0.00021 | 0.0084 | 0 | 0 | 0.0037 | 0.0055 | 0.0044 | 0 | --- |
| **04-SH** | 15-May-1985 | 04-SH | 0.0004 | 0.0004 | --- | < 0.001 | < 0.001 | < 0.001 | 0.009 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 04-SH | 0.0003 | 0.0004 | --- | < 0.001 | < 0.001 | < 0.001 | 0.013 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 04-SH | 0.0002 | 0.0008 | 0.18 | < 0.001 | < 0.001 | < 0.001 | 0.006 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 04-SH | 0.0002 | 0.0005 | 0.15 | --- | --- | < 0.001 | 0.004 | 0.003 | < 0.0001 | --- |
| | 15-Oct-1986 | 04-SH | 0.0006 | 0.0008 | 0.16 | --- | < 0.001 | < 0.001 | 0.007 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 04-SH | 0.0005 | 0.0003 | 0.15 | --- | < 0.001 | 0.003 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 04-SH | 0.0002 | 0.0004 | 0.14 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 04-SH | 0.0002 | 0.0003 | 0.15 | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | | 04-SH +95CI | 0.00043 | 0.00063 | 0.16 | 0.001 | 0.001 | 0.0017 | 0.0086 | 0.0024 | 0.0001 | --- |
| | | 04-SH -95CI | 0.00022 | 0.00035 | 0.14 | 0.001 | 0.001 | 0.00076 | 0.0037 | 0.0019 | 0.0001 | --- |
| | | 04-SH MAX | 0.0006 | 0.0008 | 0.18 | 0.001 | 0.001 | 0.003 | 0.013 | 0.003 | 0.0001 | --- |
| | | 04-SH MEAN | 0.00033 | 0.00049 | 0.16 | 0.001 | 0.001 | 0.0013 | 0.0061 | 0.0021 | 0.0001 | --- |
| | | 04-SH MIN | 0.0002 | 0.0003 | 0.14 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.0001 | --- |
| | | 04-SH N | 8 | 8 | 6 | 5 | 7 | 8 | 8 | 8 | 8 | --- |
| | | 04-SH SD | 0.00016 | 0.0002 | 0.014 | 0 | 0 | 0.00071 | 0.0036 | 0.00035 | 0 | --- |
| **04-SS** | 15-May-1985 | 04-SS | 0.0023 | **0.029** | --- | < 0.001 | < 0.001 | 0.003 | 0.014 | < 0.002 | **0.0012** | --- |
| | 15-Sep-1985 | 04-SS | 0.0002 | 0.0004 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Dec-1985 | 04-SS | 0.0002 | 0.0074 | --- | < 0.001 | < 0.001 | 0.006 | 0.005 | 0.003 | < 0.0001 | --- |
| | 15-Feb-1986 | 04-SS | 0.0008 | 0.0018 | --- | < 0.001 | < 0.001 | 0.002 | 0.005 | 0.003 | < 0.0001 | --- |
| | 15-Jun-1986 | 04-SS | 0.0002 | 0.002 | 0.09 | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 04-SS | 0.0002 | **0.011** | 0.08 | --- | --- | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Oct-1986 | 04-SS | 0.0007 | **0.012** | 0.07 | --- | < 0.001 | 0.002 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 04-SS | 0.0005 | 0.0004 | 0.06 | --- | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 04-SS | 0.0002 | 0.0008 | 0.06 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 04-SS | 0.0005 | 0.0006 | 0.07 | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | | 04-SS +95CI | 0.00098 | 0.012 | 0.081 | 0.001 | 0.001 | 0.0029 | 0.006 | 0.0025 | 0.00043 | --- |
| | | 04-SS -95CI | 0.00018 | 0.00091 | 0.062 | 0.001 | 0.001 | 0.00091 | 0.001 | 0.0019 | 0.0000056 | --- |
| | | 04-SS MAX | 0.0023 | 0.029 | 0.09 | 0.001 | 0.001 | 0.006 | 0.014 | 0.003 | 0.0012 | --- |
| | | 04-SS MEAN | 0.00058 | 0.0065 | 0.072 | 0.001 | 0.001 | 0.0019 | 0.0035 | 0.0022 | 0.00021 | --- |
| | | 04-SS MIN | 0.0002 | 0.0004 | 0.06 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 04-SS N | 10 | 10 | 6 | 7 | 9 | 10 | 10 | 10 | 10 | --- |
| | | 04-SS SD | 0.00065 | 0.0091 | 0.012 | 0 | 0 | 0.0016 | 0.004 | 0.00042 | 0.00035 | --- |
| **05-SH** | 15-May-1985 | 05-SH | 0.0005 | 0.0006 | --- | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 05-SH | 0.0002 | 0.0014 | --- | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Dec-1985 | 05-SH | 0.0002 | 0.0004 | --- | < 0.001 | < 0.001 | 0.006 | 0.008 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 05-SH | 0.0002 | 0.0007 | 0.27 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 05-SH | 0.0002 | 0.0005 | 0.26 | --- | --- | < 0.001 | 0.005 | 0.003 | < 0.0001 | --- |
| | 15-Oct-1986 | 05-SH | 0.0006 | 0.0005 | 0.27 | --- | < 0.001 | < 0.001 | 0.009 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 05-SH | 0.0003 | 0.0002 | 0.23 | --- | < 0.001 | < 0.001 | 0.009 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 05-SH | 0.0002 | 0.0005 | 0.14 | < 0.001 | < 0.001 | < 0.001 | 0.006 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 05-SH | 0.0002 | 0.0004 | 0.25 | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| **05-SH (continued)** | | 05-SH +95CI | 0.00039 | 0.0008 | 0.28 | 0.001 | 0.001 | 0.0026 | 0.0073 | 0.0023 | 0.0001 | --- |
| | | 05-SH -95CI | 0.00019 | 0.00036 | 0.2 | 0.001 | 0.001 | 0.00047 | 0.0043 | 0.0019 | 0.0001 | --- |
| | | 05-SH MAX | 0.0006 | 0.0014 | 0.27 | 0.001 | 0.001 | 0.006 | 0.009 | 0.003 | 0.0001 | --- |
| | | 05-SH MEAN | 0.00029 | 0.00058 | 0.24 | 0.001 | 0.001 | 0.0016 | 0.0058 | 0.0021 | 0.0001 | --- |
| | | 05-SH MIN | 0.0002 | 0.0002 | 0.14 | 0.001 | 0.001 | 0.001 | 0.003 | 0.002 | 0.0001 | --- |
| | | 05-SH N | 9 | 9 | 6 | 6.00 [4] | 8 | 9 | 9 | 9 | 9 | --- |
| | | 05-SH SD | 0.00015 | 0.00034 | 0.05 | 0 | 0 | 0.0017 | 0.0023 | 0.00033 | 0 | --- |
| **05-IN** | 15-May-1985 | 05-IN | 0.0002 | 0.0007 | --- | < 0.001 | < 0.001 | < 0.001 | 0.016 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 05-IN | 0.0002 | 0.0002 | --- | < 0.001 | < 0.001 | 0.002 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 05-IN | 0.0002 | 0.0008 | 0.22 | < 0.001 | < 0.001 | 0.006 | 0.013 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 05-IN | 0.0002 | 0.0004 | 0.21 | --- | --- | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Oct-1986 | 05-IN | 0.0006 | 0.0008 | 0.21 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 05-IN | 0.0003 | 0.0005 | 0.17 | --- | < 0.001 | 0.008 | 0.009 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 05-IN | --- | 0.0004 | 0.17 | < 0.001 | < 0.001 | 0.002 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 05-IN | 0.0002 | 0.0007 | 0.17 | < 0.001 | < 0.001 | 0.003 | 0.005 | < 0.002 | < 0.0001 | --- |
| | | 05-IN +95CI | 0.00038 | 0.00071 | 0.21 | 0.001 | 0.001 | 0.0048 | 0.01 | 0.002 | 0.0001 | --- |
| | | 05-IN -95CI | 0.00016 | 0.00041 | 0.17 | 0.001 | 0.001 | 0.0012 | 0.0027 | 0.002 | 0.0001 | --- |
| | | 05-IN MAX | 0.0006 | 0.0008 | 0.22 | 0.001 | 0.001 | 0.008 | 0.016 | 0.002 | 0.0001 | --- |
| | | 05-IN MEAN | 0.00027 | 0.00056 | 0.19 | 0.001 | 0.001 | 0.003 | 0.0065 | 0.002 | 0.0001 | --- |
| | | 05-IN MIN | 0.0002 | 0.0002 | 0.17 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 05-IN N | 7 | 8 | 6 | 5 | 7 | 8 | 8 | 8 | 8 | --- |
| | | 05-IN SD | 0.00015 | 0.00022 | 0.024 | 0 | 0 | 0.0026 | 0.0056 | 0 | 0 | --- |
| **06-SH** | 15-May-1985 | 06-SH | 0.0003 | 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 06-SH | 0.0004 | 0.0011 | --- | < 0.001 | < 0.001 | 0.003 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Dec-1985 | 06-SH | 0.0002 | 0.0003 | --- | < 0.001 | < 0.001 | 0.004 | 0.006 | 0.008 | < 0.0001 | --- |
| | 15-Jun-1986 | 06-SH | 0.0002 | 0.0009 | 0.29 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 06-SH | 0.0002 | 0.0006 | 0.27 | --- | --- | < 0.001 | 0.006 | 0.003 | < 0.0001 | --- |
| | 15-Oct-1986 | 06-SH | 0.0004 | 0.0002 | 0.28 | --- | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 06-SH | 0.0002 | 0.0004 | 0.26 | --- | < 0.001 | < 0.001 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 06-SH | 0.0004 | 0.0004 | 0.29 | < 0.001 | < 0.001 | < 0.001 | 0.004 | 0.003 | < 0.0001 | --- |
| | 15-Nov-1987 | 06-SH | 0.0002 | 0.0004 | 0.31 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | | 06-SH +95CI | 0.00034 | 0.0008 | 0.3 | 0.001 | 0.001 | 0.0023 | 0.0048 | 0.0042 | 0.0001 | --- |
| | | 06-SH -95CI | 0.00021 | 0.00037 | 0.27 | 0.001 | 0.001 | 0.00082 | 0.0025 | 0.0016 | 0.0001 | --- |
| | | 06-SH MAX | 0.0004 | 0.0011 | 0.31 | 0.001 | 0.001 | 0.004 | 0.006 | 0.008 | 0.0001 | --- |
| | | 06-SH MEAN | 0.00028 | 0.00059 | 0.28 | 0.001 | 0.001 | 0.0016 | 0.0037 | 0.0029 | 0.0001 | --- |
| | | 06-SH MIN | 0.0002 | 0.0002 | 0.26 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 06-SH N | 9 | 9 | 6 | 6 | 8 | 9 | 9 | 9 | 9 | --- |
| | | 06-SH SD | 0.000097 | 0.00033 | 0.018 | 0 | 0 | 0.0011 | 0.0017 | 0.002 | 0 | --- |

**Table 5.2**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Dissolved Metals**

| | | | DISSOLVED METALS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Antimony (mg/L) | Arsenic (mg/L) | Barium (mg/L) | Beryllium (mg/L) | Cadmium (mg/L) | Chromium (mg/L) | Copper (mg/L) | Lead (mg/L) | Mercury (mg/L) | Nickel (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | 0.006 | 0.010 | 2.0 | --- | 0.007 | 0.05 | 2 | 0.005 | 0.001 | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | 0.006 | 0.01 | 1 | --- | 0.005 | --- | 1 | 0.01 | 0.001 | --- |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | 0.005 | --- | --- | 0.00037 [6] | 0.0089 [7] | 0.007 | 0.007 [8] | 0.000005 | Variable [9] |
| **06-IN** | 15-May-1985 | 06-IN | 0.001 | 0.0011 | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 06-IN | 0.0002 | 0.0005 | --- | < 0.001 | < 0.001 | 0.003 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 06-IN | 0.0002 | 0.0005 | 0.25 | < 0.001 | < 0.001 | < 0.001 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 06-IN | 0.0002 | 0.0009 | 0.19 | --- | --- | 0.002 | 0.004 | 0.005 | < 0.0001 | --- |
| | 15-Oct-1986 | 06-IN | 0.0002 | 0.0006 | 0.19 | --- | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Feb-1987 | 06-IN | 0.0002 | 0.0007 | 0.17 | < 0.001 | < 0.001 | 0.003 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 06-IN | 0.0002 | 0.0008 | 0.17 | --- | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 06-IN | 0.001 | 0.0014 | 0.16 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 06-IN | 0.0002 | 0.0011 | 0.17 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | | 06-IN +95CI | 0.00061 | 0.001 | 0.21 | 0.001 | 0.001 | 0.0021 | 0.0039 | 0.003 | 0.0001 | --- |
| | | 06-IN -95CI | 0.00015 | 0.00064 | 0.16 | 0.001 | 0.001 | 0.00098 | 0.0023 | 0.0017 | 0.0001 | --- |
| | | 06-IN MAX | 0.001 | 0.0014 | 0.25 | 0.001 | 0.001 | 0.003 | 0.005 | 0.005 | 0.0001 | --- |
| | | 06-IN MEAN | 0.00038 | 0.00084 | 0.19 | 0.001 | 0.001 | 0.0016 | 0.0031 | 0.0023 | 0.0001 | --- |
| | | 06-IN MIN | 0.0002 | 0.0005 | 0.16 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 06-IN N | 9 | 9 | 7 | 6.00 [4] | 8 | 9 | 9 | 9 | 9 | --- |
| | | 06-IN SD | 0.00035 | 0.00031 | 0.03 | 0 | 0 | 0.00088 | 0.0012 | 0.001 | 0 | --- |
| **07-SH** | 15-May-1985 | 07-SH | 0.0011 | 0.0008 | --- | < 0.001 | < 0.001 | < 0.001 | 0.012 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 07-SH | 0.0004 | 0.0007 | --- | < 0.001 | < 0.001 | < 0.001 | 0.007 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 07-SH | 0.0002 | 0.0009 | 0.4 | < 0.001 | < 0.001 | 0.018 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 07-SH | 0.0002 | 0.0005 | 0.36 | --- | --- | 0.003 | 0.006 | 0.004 | < 0.0001 | --- |
| | 15-Oct-1986 | 07-SH | 0.0005 | 0.0008 | 0.37 | --- | < 0.001 | < 0.001 | 0.007 | 0.005 | < 0.0001 | --- |
| | 15-May-1987 | 07-SH | 0.0002 | 0.0003 | 0.33 | --- | < 0.001 | 0.004 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 07-SH | 0.0007 | 0.0009 | 0.36 | < 0.001 | < 0.001 | 0.004 | 0.008 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 07-SH | 0.0002 | 0.0005 | 0.39 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | | 07-SH +95CI | 0.00066 | 0.00083 | 0.39 | 0.001 | 0.001 | 0.0081 | 0.0083 | 0.0034 | 0.0001 | --- |
| | | 07-SH -95CI | 0.00021 | 0.00052 | 0.35 | 0.001 | 0.001 | 0.00013 | 0.004 | 0.0018 | 0.0001 | --- |
| | | 07-SH MAX | 0.0011 | 0.0009 | 0.4 | 0.001 | 0.001 | 0.018 | 0.012 | 0.005 | 0.0001 | --- |
| | | 07-SH MEAN | 0.00044 | 0.00068 | 0.37 | 0.001 | 0.001 | 0.0041 | 0.0061 | 0.0026 | 0.0001 | --- |
| | | 07-SH MIN | 0.0002 | 0.0003 | 0.33 | 0.001 | 0.001 | 0.001 | 0.003 | 0.002 | 0.0001 | --- |
| | | 07-SH N | 8 | 8 | 6 | 5 | 7 | 8 | 8 | 8 | 8 | --- |
| | | 07-SH SD | 0.00032 | 0.00022 | 0.025 | 0 | 0 | 0.0058 | 0.0031 | 0.0012 | 0 | --- |
| **07-IN** | 15-May-1985 | 07-IN | 0.0006 | 0.0011 | --- | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 07-IN | 0.0008 | 0.0008 | --- | < 0.001 | < 0.001 | 0.002 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 07-IN | 0.0002 | 0.0008 | 0.2 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 07-IN | 0.0002 | 0.0007 | 0.17 | --- | --- | 0.002 | 0.003 | 0.003 | < 0.0001 | --- |
| | 15-Oct-1986 | 07-IN | 0.0003 | 0.0006 | 0.17 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 07-IN | 0.0002 | 0.0037 | 0.16 | --- | < 0.001 | 0.004 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 07-IN | 0.0007 | 0.0032 | 0.16 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 07-IN | 0.0002 | **0.016** | 0.17 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | | 07-IN +95CI | 0.00058 | 0.007 | 0.18 | 0.001 | 0.001 | 0.0024 | 0.003 | 0.0024 | 0.0001 | --- |
| | | 07-IN -95CI | 0.00022 | 0.00027 | 0.16 | 0.001 | 0.001 | 0.00089 | 0.0013 | 0.0019 | 0.0001 | --- |
| | | 07-IN MAX | 0.0008 | 0.016 | 0.2 | 0.001 | 0.001 | 0.004 | 0.004 | 0.003 | 0.0001 | --- |
| | | 07-IN MEAN | 0.0004 | 0.0034 | 0.17 | 0.001 | 0.001 | 0.0016 | 0.0021 | 0.0021 | 0.0001 | --- |
| | | 07-IN MIN | 0.0002 | 0.0006 | 0.16 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 07-IN N | 8 | 8 | 6 | 5 | 7 | 8 | 8 | 8 | 8 | --- |
| | | 07-IN SD | 0.00026 | 0.0052 | 0.015 | 0 | 0 | 0.0011 | 0.0012 | 0.00035 | 0 | --- |
| **07-SS** | 15-Feb-1985 | 07-SS | 0.0004 | 0.0029 | --- | < 0.001 | < 0.001 | 0.004 | 0.003 | 0.003 | < 0.0001 | --- |
| | 15-May-1985 | 07-SS | 0.001 | 0.0012 | --- | < 0.001 | < 0.001 | < 0.001 | 0.009 | < 0.002 | 0.0000013 | --- |
| | 15-Sep-1985 | 07-SS | 0.0007 | 0.0008 | --- | < 0.001 | < 0.001 | 0.002 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-Dec-1985 | 07-SS | 0.0002 | 0.0018 | --- | < 0.001 | < 0.001 | < 0.001 | 0.005 | 0.005 | < 0.0001 | --- |
| | 15-Jun-1986 | 07-SS | 0.0002 | 0.0008 | 0.08 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 07-SS | 0.0002 | 0.0022 | 0.06 | --- | --- | < 0.001 | 0.007 | 0.004 | < 0.0001 | --- |
| | 15-Oct-1986 | 07-SS | 0.0005 | 0.0008 | 0.06 | --- | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 07-SS | 0.0002 | 0.0034 | 0.06 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 07-SS | 0.0007 | 0.0031 | 0.05 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 07-SS | 0.0003 | 0.0029 | 0.06 | < 0.001 | < 0.001 | 0.003 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | | 07-SS +95CI | 0.00061 | 0.0026 | 0.07 | 0.001 | 0.001 | 0.0023 | 0.0051 | 0.0033 | 0.00011 | --- |
| | | 07-SS -95CI | 0.00027 | 0.0013 | 0.054 | 0.001 | 0.001 | 0.00093 | 0.0017 | 0.0019 | 0.000071 | --- |
| | | 07-SS MAX | 0.001 | 0.0034 | 0.08 | 0.001 | 0.001 | 0.004 | 0.009 | 0.005 | 0.0001 | --- |
| | | 07-SS MEAN | 0.00044 | 0.002 | 0.062 | 0.001 | 0.001 | 0.0016 | 0.0034 | 0.0026 | 0.00009 | --- |
| | | 07-SS MIN | 0.0002 | 0.0008 | 0.05 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0000013 | --- |
| | | 07-SS N | 10 | 10 | 6 | 7 | 9 | 10 | 10 | 10 | 10 | --- |
| | | 07-SS SD | 0.00028 | 0.001 | 0.0098 | 0 | 0 | 0.0011 | 0.0028 | 0.0011 | 0.000031 | --- |
| **08-SH** | 15-May-1985 | 08-SH | 0.001 | 0.0022 | --- | < 0.001 | < 0.001 | < 0.001 | **0.012** | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 08-SH | 0.0005 | 0.0019 | --- | < 0.001 | < 0.001 | < 0.001 | **0.008** | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 08-SH | 0.0002 | 0.0015 | 0.3 | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 08-SH | 0.0002 | 0.0019 | 0.28 | --- | --- | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Oct-1986 | 08-SH | 0.0004 | 0.0013 | 0.29 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 08-SH | 0.0011 | 0.0012 | 0.27 | --- | < 0.001 | < 0.001 | **0.008** | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 08-SH | 0.0005 | 0.0014 | 0.27 | < 0.001 | < 0.001 | 0.002 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 08-SH | 0.0002 | 0.0011 | 0.29 | < 0.001 | < 0.001 | < 0.001 | 0.007 | 0.005 | < 0.0001 | --- |
| | | 08-SH +95CI | 0.00076 | 0.0018 | 0.29 | 0.001 | 0.001 | 0.0014 | 0.0084 | 0.0031 | 0.0001 | --- |
| | | 08-SH -95CI | 0.00027 | 0.0013 | 0.27 | 0.001 | 0.001 | 0.00088 | 0.0031 | 0.0016 | 0.0001 | --- |
| | | 08-SH MAX | 0.0011 | 0.0022 | 0.3 | 0.001 | 0.001 | 0.002 | 0.012 | 0.005 | 0.0001 | --- |
| | | 08-SH MEAN | 0.00051 | 0.0016 | 0.28 | 0.001 | 0.001 | 0.0011 | 0.0058 | 0.0024 | 0.0001 | --- |
| | | 08-SH MIN | 0.0002 | 0.0011 | 0.27 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 08-SH N | 8 | 8 | 6 | 5 | 7 | 8 | 8 | 8 | 8 | --- |
| | | 08-SH SD | 0.00036 | 0.00039 | 0.012 | 0 | 0 | 0.00035 | 0.0038 | 0.0011 | 0 | --- |
| **08-IN** | 15-May-1985 | 08-IN | 0.0002 | 0.0004 | --- | < 0.001 | < 0.001 | **0.045** | **0.025** | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 08-IN | 0.0002 | 0.0009 | --- | < 0.001 | < 0.001 | < 0.001 | **0.011** | < 0.002 | < 0.0001 | --- |
| | 15-Dec-1985 | 08-IN | 0.0054 | 0.0004 | --- | < 0.001 | < 0.001 | < 0.001 | **0.01** | < 0.002 | < 0.0001 | --- |
| | 15-Feb-1986 | 08-IN | 0.0008 | 0.0011 | --- | < 0.001 | < 0.001 | 0.002 | 0.007 | 0.004 | < 0.0001 | --- |
| | 15-Jun-1986 | 08-IN | 0.0002 | 0.0005 | 0.17 | < 0.001 | < 0.001 | **0.019** | **0.017** | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 08-IN | 0.0002 | < 0.0002 | 0.12 | --- | --- | < 0.001 | < 0.001 | 0.004 | < 0.0001 | --- |
| | 15-Oct-1986 | 08-IN | 0.0006 | < 0.0002 | 0.11 | --- | < 0.001 | < 0.001 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 08-IN | 0.0002 | 0.0003 | 0.1 | --- | < 0.001 | **0.075** | **0.028** | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 08-IN | 0.0006 | 0.0007 | 0.07 | < 0.001 | < 0.001 | < 0.001 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 08-IN | 0.0002 | 0.0003 | 0.08 | < 0.001 | < 0.001 | < 0.001 | 0.004 | 0.007 | < 0.0001 | --- |
| | | 08-IN +95CI | 0.0018 | 0.00069 | 0.14 | 0.001 | 0.001 | 0.031 | 0.017 | 0.0039 | 0.0001 | --- |
| | | 08-IN -95CI | 0.00014 | 0.00031 | 0.08 | 0.001 | 0.001 | 0.0011 | 0.0056 | 0.0019 | 0.0001 | --- |
| | | 08-IN MAX | 0.0054 | 0.0011 | 0.17 | 0.001 | 0.001 | 0.075 | 0.028 | 0.007 | 0.0001 | --- |
| | | 08-IN MEAN | 0.00086 | 0.0005 | 0.11 | 0.001 | 0.001 | 0.015 | 0.011 | 0.0029 | 0.0001 | --- |
| | | 08-IN MIN | 0.0002 | 0.0002 | 0.07 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 08-IN N | 10 | 10 | 6 | 7 | 9 | 10 | 10 | 10 | 10 | --- |
| | | 08-IN SD | 0.0016 | 0.00031 | 0.035 | 0 | 0 | 0.026 | 0.0092 | 0.0017 | 0 | --- |
| **08-SS** | 15-May-1985 | 08-SS | 0.0043 | **0.0086** | --- | < 0.001 | < 0.001 | < 0.001 | **0.014** | 0.003 | **0.0014** | --- |
| | 15-Sep-1985 | 08-SS | 0.0002 | **0.023** | --- | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Dec-1985 | 08-SS | 0.0002 | **0.032** | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | 0.003 | < 0.0001 | --- |
| | 15-Feb-1986 | 08-SS | 0.0016 | **0.025** | --- | < 0.001 | < 0.001 | < 0.001 | 0.003 | 0.004 | < 0.0001 | --- |
| | 15-Jun-1986 | 08-SS | 0.0034 | **0.037** | 0.11 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 08-SS | 0.0014 | **0.032** | 0.09 | --- | --- | < 0.001 | 0.004 | 0.003 | < 0.0001 | --- |
| | 15-Oct-1986 | 08-SS | 0.0026 | **0.034** | 0.09 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 08-SS | 0.0012 | **0.027** | 0.09 | --- | < 0.001 | < 0.001 | **0.01** | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 08-SS | 0.005 | **0.017** | 0.08 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | | 08-SS +95CI | 0.0033 | 0.032 | 0.1 | 0.001 | 0.001 | 0.001 | 0.0077 | 0.003 | 0.00053 | --- |
| | | 08-SS -95CI | 0.0011 | 0.02 | 0.082 | 0.001 | 0.001 | 0.001 | 0.0023 | 0.0021 | 0.000039 | --- |
| | | 08-SS MAX | 0.005 | 0.037 | 0.11 | 0.001 | 0.001 | 0.001 | 0.014 | 0.004 | 0.0014 | --- |
| | | 08-SS MEAN | 0.0022 | 0.026 | 0.092 | 0.001 | 0.001 | 0.001 | 0.005 | 0.0026 | 0.00024 | --- |
| | | 08-SS MIN | 0.0002 | 0.0086 | 0.08 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 08-SS N | 9 | 9 | 5 | 6 | 8 | 9 | 9 | 9 | 9 | --- |
| | | 08-SS SD | 0.0017 | 0.009 | 0.011 | 0 | 0 | 0 | 0.0042 | 0.00073 | 0.00043 | --- |

**Table 5.2**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Dissolved Metals**

| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | DISSOLVED METALS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Antimony (mg/L) | Arsenic (mg/L) | Barium (mg/L) | Beryllium (mg/L) | Cadmium (mg/L) | Chromium (mg/L) | Copper (mg/L) | Lead (mg/L) | Mercury (mg/L) | Nickel (mg/L) |
| **Canadian Drinking Water AO Guidelines 2022[1]** | | | --- | --- | --- | --- | --- | --- | 1.0 | --- | --- | --- |
| **Canadian Drinking Water MAC Guidelines 2022[2]** | | | 0.006 | 0.010 | 2.0 | --- | 0.007 | 0.05 | 2 | 0.005 | 0.001 | --- |
| **Alberta Tier 2 Potable Groundwater Guideline[3]** | | | 0.006 | 0.01 | 1 | --- | 0.005 | --- | 1 | 0.01 | 0.001 | --- |
| **Alberta Tier 2 Aquatic Life Groundwater Guideline[4]** | | | --- | 0.005 | --- | --- | 0.00037 [6] | 0.0089 [7] | 0.007 | 0.007 [8] | 0.000005 | Variable [9] |
| **09-SH [Decommissioned]** | 15-May-1985 | 09-SH [DECOM] | 0.0002 | 0.001 | --- | < 0.001 | < 0.001 | < 0.001 | 0.005 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 09-SH [DECOM] | 0.001 | 0.0059 | --- | < 0.001 | < 0.001 | 0.002 | 0.007 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 09-SH [DECOM] | 0.0002 | 0.0014 | 0.43 | < 0.001 | < 0.001 | 0.003 | 0.016 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 09-SH [DECOM] | 0.0002 | 0.0012 | 0.42 | --- | --- | < 0.001 | 0.009 | 0.006 | < 0.0001 | --- |
| | 15-Oct-1986 | 09-SH [DECOM] | 0.0005 | 0.0016 | 0.42 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 09-SH [DECOM] | 0.0002 | 0.0021 | 0.38 | --- | < 0.001 | 0.002 | 0.006 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 09-SH [DECOM] | 0.0006 | 0.0018 | 0.37 | < 0.001 | < 0.001 | 0.003 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 09-SH [DECOM] | 0.0002 | 0.0017 | 0.4 | < 0.001 | < 0.001 | 0.002 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | | 09-SH +95CI | 0.00059 | 0.0032 | 0.42 | 0.001 | 0.001 | 0.0025 | 0.0094 | 0.0035 | 0.0001 | --- |
| | | 09-SH -95CI | 0.00018 | 0.00099 | 0.38 | 0.001 | 0.001 | 0.0013 | 0.0026 | 0.0015 | 0.0001 | --- |
| | | 09-SH MAX | 0.001 | 0.0059 | 0.43 | 0.001 | 0.001 | 0.003 | 0.016 | 0.006 | 0.0001 | --- |
| | | 09-SH MEAN | 0.00039 | 0.0021 | 0.4 | 0.001 | 0.001 | 0.0019 | 0.006 | 0.0025 | 0.0001 | --- |
| | | 09-SH MIN | 0.0002 | 0.001 | 0.37 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 09-SH N | 8 | 8 | 6 | 5 | 7 | 8 | 8 | 8 | 8 | --- |
| | | 09-SH SD | 0.00029 | 0.0016 | 0.024 | 0 | 0 | 0.00083 | 0.0049 | 0.0014 | 0 | --- |
| **09-IN [Decommissioned]** | 15-May-1985 | 09-IN [DECOM] | 0.0004 | 0.0009 | --- | < 0.001 | < 0.001 | < 0.001 | 0.012 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 09-IN [DECOM] | 0.0007 | 0.0013 | --- | < 0.001 | < 0.001 | 0.002 | 0.006 | < 0.002 | < 0.0001 | --- |
| | 15-Dec-1985 | 09-IN [DECOM] | 0.0002 | 0.0007 | --- | < 0.001 | < 0.001 | < 0.001 | 0.005 | 0.004 | < 0.0001 | --- |
| | 15-Feb-1986 | 09-IN [DECOM] | 0.0007 | 0.002 | --- | < 0.001 | < 0.001 | 0.003 | 0.003 | 0.006 | < 0.0001 | --- |
| | 15-Jun-1986 | 09-IN [DECOM] | 0.0002 | 0.0031 | 0.47 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 09-IN [DECOM] | 0.0005 | 0.0048 | 0.48 | --- | --- | 0.003 | < 0.001 | 0.004 | < 0.0001 | --- |
| | 15-Oct-1986 | 09-IN [DECOM] | 0.0005 | 0.0048 | 0.45 | --- | < 0.001 | 0.021 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 09-IN [DECOM] | 0.0003 | 0.009 | 0.43 | --- | < 0.001 | 0.003 | 0.01 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 09-IN [DECOM] | 0.0006 | 0.0098 | 0.39 | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 09-IN [DECOM] | 0.0012 | 0.0018 | 0.48 | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | | 09-IN +95CI | 0.00071 | 0.0059 | 0.48 | 0.001 | 0.001 | 0.0075 | 0.0071 | 0.0037 | 0.0001 | --- |
| | | 09-IN -95CI | 0.00035 | 0.0018 | 0.42 | 0.001 | 0.001 | 0.00011 | 0.0027 | 0.0019 | 0.0001 | --- |
| | | 09-IN MAX | 0.0012 | 0.0098 | 0.48 | 0.001 | 0.001 | 0.021 | 0.012 | 0.006 | 0.0001 | --- |
| | | 09-IN MEAN | 0.00053 | 0.0038 | 0.45 | 0.001 | 0.001 | 0.0037 | 0.0049 | 0.0028 | 0.0001 | --- |
| | | 09-IN MIN | 0.0002 | 0.0007 | 0.39 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 09-IN N | 10 | 10 | 6 | 7 | 9 | 10 | 10 | 10 | 10 | --- |
| | | 09-IN SD | 0.0003 | 0.0033 | 0.035 | 0 | 0 | 0.0061 | 0.0035 | 0.0014 | 0 | --- |
| **09-PEAT** | 15-Nov-1987 | 09-PEAT | 0.0002 | 0.0007 | 0.03 | < 0.001 | < 0.001 | < 0.001 | 0.005 | 0.005 | < 0.0001 | --- |
| | | 09-PEAT +95CI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | --- |
| | | 09-PEAT -95CI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | --- |
| | | 09-PEAT MAX | 0.0002 | 0.0007 | 0.03 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | 0.0001 | --- |
| | | 09-PEAT MEAN | 0.0002 | 0.0007 | 0.03 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | 0.0001 | --- |
| | | 09-PEAT MIN | 0.0002 | 0.0007 | 0.03 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | 0.0001 | --- |
| | | 09-PEAT N | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | --- |
| | | 09-PEAT SD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | --- |
| **10-SH [Decommissioned]** | 15-May-1985 | 10-SH [DECOM] | 0.0005 | 0.0026 | --- | < 0.001 | < 0.001 | < 0.001 | 0.009 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1985 | 10-SH [DECOM] | 0.0003 | 0.0008 | --- | < 0.001 | < 0.001 | < 0.001 | 0.008 | < 0.002 | < 0.0001 | --- |
| | 15-Jun-1986 | 10-SH [DECOM] | 0.0002 | 0.0019 | 0.41 | < 0.001 | < 0.001 | < 0.001 | 0.003 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 10-SH [DECOM] | 0.0005 | 0.0027 | 0.39 | --- | --- | < 0.001 | 0.003 | 0.004 | < 0.0001 | --- |
| | 15-Oct-1986 | 10-SH [DECOM] | 0.0003 | 0.0072 | 0.4 | --- | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 10-SH [DECOM] | 0.0002 | 0.003 | 0.35 | --- | < 0.001 | 0.002 | 0.002 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 10-SH [DECOM] | 0.0013 | 0.0047 | 0.36 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 10-SH [DECOM] | 0.0002 | 0.0018 | 0.36 | < 0.001 | < 0.001 | < 0.001 | 0.002 | < 0.002 | < 0.0001 | --- |
| | | 10-SH +95CI | 0.00069 | 0.0045 | 0.4 | 0.001 | 0.001 | 0.0014 | 0.0058 | 0.0027 | 0.0001 | --- |
| | | 10-SH -95CI | 0.00018 | 0.0017 | 0.36 | 0.001 | 0.001 | 0.00088 | 0.0015 | 0.0018 | 0.0001 | --- |
| | | 10-SH MAX | 0.0013 | 0.0072 | 0.41 | 0.001 | 0.001 | 0.002 | 0.009 | 0.004 | 0.0001 | --- |
| | | 10-SH MEAN | 0.00044 | 0.0031 | 0.38 | 0.001 | 0.001 | 0.0011 | 0.0036 | 0.0022 | 0.0001 | --- |
| | | 10-SH MIN | 0.0002 | 0.0008 | 0.35 | 0.001 | 0.001 | 0.001 | 0.001 | 0.002 | 0.0001 | --- |
| | | 10-SH N | 8 | 8 | 6 | 5 | 7 | 8 | 8 | 8 | 8 | --- |
| | | 10-SH SD | 0.00037 | 0.002 | 0.025 | 0 | 0 | 0.00035 | 0.0031 | 0.00071 | 0 | --- |
| **10-IN [Decommissioned]** | 15-Dec-1985 | 10-IN [DECOM] | 0.0002 | 0.0004 | --- | < 0.001 | < 0.001 | 0.023 | 0.01 | 0.004 | < 0.0001 | --- |
| | 15-Feb-1986 | 10-IN [DECOM] | 0.0005 | 0.0005 | --- | < 0.001 | < 0.001 | 0.005 | 0.003 | 0.004 | < 0.0001 | --- |
| | 15-Jun-1986 | 10-IN [DECOM] | 0.0002 | 0.0004 | 0.22 | < 0.001 | < 0.001 | < 0.001 | 0.006 | < 0.002 | < 0.0001 | --- |
| | 15-Aug-1986 | 10-IN [DECOM] | 0.0002 | 0.0005 | 0.2 | --- | --- | < 0.001 | 0.007 | 0.004 | < 0.0001 | --- |
| | 15-Oct-1986 | 10-IN [DECOM] | 0.0005 | 0.0007 | 0.22 | --- | < 0.001 | < 0.001 | 0.006 | < 0.002 | < 0.0001 | --- |
| | 15-May-1987 | 10-IN [DECOM] | 0.0002 | 0.0004 | 0.19 | --- | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Sep-1987 | 10-IN [DECOM] | 0.0005 | 0.0006 | 0.17 | < 0.001 | < 0.001 | < 0.001 | 0.004 | < 0.002 | < 0.0001 | --- |
| | 15-Nov-1987 | 10-IN [DECOM] | 0.0002 | 0.0005 | 0.21 | < 0.001 | < 0.001 | 0.008 | 0.005 | < 0.002 | < 0.0001 | --- |
| | | 10-IN +95CI | 0.00042 | 0.00057 | 0.22 | 0.001 | 0.001 | 0.01 | 0.0071 | 0.0035 | 0.0001 | --- |
| | | 10-IN -95CI | 0.0002 | 0.00043 | 0.19 | 0.001 | 0.001 | 0.0002 | 0.0041 | 0.002 | 0.0001 | --- |
| | | 10-IN MAX | 0.0005 | 0.0007 | 0.22 | 0.001 | 0.001 | 0.023 | 0.01 | 0.004 | 0.0001 | --- |
| | | 10-IN MEAN | 0.00031 | 0.0005 | 0.2 | 0.001 | 0.001 | 0.0051 | 0.0056 | 0.0028 | 0.0001 | --- |
| | | 10-IN MIN | 0.0002 | 0.0004 | 0.17 | 0.001 | 0.001 | 0.001 | 0.003 | 0.002 | 0.0001 | --- |
| | | 10-IN N | 8 | 8 | 6 | 5 | 7 | 8 | 8 | 8 | 8 | --- |
| | | 10-IN SD | 0.00016 | 0.00011 | 0.019 | 0 | 0 | 0.0077 | 0.0022 | 0.001 | 0 | --- |

**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 (August, 2022), 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 |

4: Alberta Tier 1 Soil and Groundwater Remediation Guidelines (August, 2022), 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 |

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 (Cronic)

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 (Cronic)

| | |
|---|---|
| | Baseline Statistics |
| | Detection Limit is greater than the guideline |
| --- | Guideline Row: No guideline for that parameter |
| --- | Results: Parameter was not analyzed |

**Table 5.3**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | |
|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) |
| **01-SH [Decommissioned]** | 15-May-1985 | 01-SH [DECOM] | 5.2 | 20 |
| | 15-Jun-1985 | 01-SH [DECOM] | 4 | 5 |
| | 15-Sep-1985 | 01-SH [DECOM] | 3.4 | 5 |
| | 15-May-1986 | 01-SH [DECOM] | 4.3 | 21 |
| | 15-Aug-1986 | 01-SH [DECOM] | 2.8 | 38 |
| | 15-Oct-1986 | 01-SH [DECOM] | 2.8 | 8 |
| | 15-May-1987 | 01-SH [DECOM] | 4.2 | 18 |
| | 15-Sep-1987 | 01-SH [DECOM] | 2.8 | 5 |
| | 15-Nov-1987 | 01-SH [DECOM] | 3.4 | 10 |
| | | 01-SH +95CI | 4.2 | 21 |
| | | 01-SH -95CI | 3.11 | 7.25 |
| | | 01-SH MAX | 5.2 | 38 |
| | | 01-SH MEAN | 3.66 | 14 |
| | | 01-SH MIN | 2.8 | 5 |
| | | 01-SH N | 9 | 9 |
| | | 01-SH SD | 0.83 | 11 |
| **01-IN [Decommissioned]** | 15-Feb-1985 | 01-IN [DECOM] | 3.4 | 20 |
| | 15-Jun-1985 | 01-IN [DECOM] | 4.6 | 5 |
| | 15-Dec-1985 | 01-IN [DECOM] | 7.2 | 30 |
| | 15-May-1986 | 01-IN [DECOM] | 5 | 14 |
| | 15-Aug-1986 | 01-IN [DECOM] | 4.2 | 11 |
| | 15-Oct-1986 | 01-IN [DECOM] | 4.3 | 18 |
| | 15-May-1987 | 01-IN [DECOM] | 4.7 | 11 |
| | 15-Sep-1987 | 01-IN [DECOM] | 3.5 | 15 |
| | 15-Nov-1987 | 01-IN [DECOM] | 4.7 | 10 |
| | | 01-IN +95CI | 5.35 | 19.61 |
| | | 01-IN -95CI | 3.9 | 10.17 |
| | | 01-IN MAX | 7.2 | 30 |
| | | 01-IN MEAN | 4.62 | 14.89 |
| | | 01-IN MIN | 3.4 | 5 |
| | | 01-IN N | 9 | 9 |
| | | 01-IN SD | 1.11 | 7.22 |
| **01-SS [Decommissioned]** | 15-Jun-1985 | 01-SS [DECOM] | 1.6 | 7 |
| | 15-Jul-1985 | 01-SS [DECOM] | 6.5 | 25 |
| | 15-Dec-1985 | 01-SS [DECOM] | 2 | 10 |
| | 15-May-1986 | 01-SS [DECOM] | 6.6 | 25 |
| | 15-Aug-1986 | 01-SS [DECOM] | 1.5 | 37 |
| | 15-Oct-1986 | 01-SS [DECOM] | 1.8 | 18 |
| | 15-Feb-1987 | 01-SS [DECOM] | 2 | < 5 |
| | 15-Sep-1987 | 01-SS [DECOM] | 1.2 | 8 |
| | 15-Nov-1987 | 01-SS [DECOM] | 1.7 | 10 |
| | | 01-SS +95CI | 4.18 | 23.21 |
| | | 01-SS -95CI | 1.36 | 9.01 |
| | | 01-SS MAX | 6.6 | 37 |
| | | 01-SS MEAN | 2.77 | 16 |
| | | 01-SS MIN | 1.2 | 5 |
| | | 01-SS N | 9 | 9 |
| | | 01-SS SD | 2.16 | 11 |
| **02-SH [Decommissioned]** | 15-May-1985 | 02-SH [DECOM] | 3 | 10 |
| | 15-Sep-1985 | 02-SH [DECOM] | 2 | 5 |
| | 15-Dec-1985 | 02-SH [DECOM] | 2.2 | 10 |
| | 15-Feb-1986 | 02-SH [DECOM] | 1.2 | 5 |
| | 15-Jun-1986 | 02-SH [DECOM] | 2.3 | 26 |
| | 15-Aug-1986 | 02-SH [DECOM] | 2 | 9 |
| | 15-Oct-1986 | 02-SH [DECOM] | 1.9 | 10 |
| | 15-May-1987 | 02-SH [DECOM] | 3 | 5 |
| | 15-Sep-1987 | 02-SH [DECOM] | 2 | 8 |
| | 15-Nov-1987 | 02-SH [DECOM] | 2.7 | 10 |
| | | 02-SH +95CI | 2.57 | 13.58 |
| | | 02-SH -95CI | 1.89 | 6.02 |
| | | 02-SH MAX | 3 | 26 |
| | | 02-SH MEAN | 2.23 | 9.8 |
| | | 02-SH MIN | 1.2 | 5 |
| | | 02-SH N | 10 | 10 |
| | | 02-SH SD | 0.55 | 6.11 |
| **02-IN [Decommissioned]** | 15-May-1985 | 02-IN [DECOM] | 3 | 20 |
| | 15-Sep-1985 | 02-IN [DECOM] | 5.4 | 5 |
| | 15-Feb-1986 | 02-IN [DECOM] | 2.6 | 15 |
| | 15-Jun-1986 | 02-IN [DECOM] | 3.5 | 17 |
| | 15-Aug-1986 | 02-IN [DECOM] | 3.2 | 10 |
| | 15-Oct-1986 | 02-IN [DECOM] | 3.7 | 17 |
| | 15-May-1987 | 02-IN [DECOM] | 4.8 | 12 |
| | 15-Sep-1987 | 02-IN [DECOM] | 3.2 | 14 |
| | 15-Nov-1987 | 02-IN [DECOM] | 4.2 | 10 |
| | | 02-IN +95CI | 4.33 | 16.33 |
| | | 02-IN -95CI | 3.14 | 10.34 |
| | | 02-IN MAX | 5.4 | 20 |
| | | 02-IN MEAN | 3.73 | 13.33 |
| | | 02-IN MIN | 2.6 | 5 |
| | | 02-IN N | 9 | 9 |
| | | 02-IN SD | 0.91 | 4.58 |

**Table 5.3**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | |
|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) |
| **03-SH** | 15-May-1985 | 03-SH | 5.6 | 25 |
| | 15-Sep-1985 | 03-SH | 5.2 | 10 |
| | 15-Jun-1986 | 03-SH | 6 | 37 |
| | 15-Aug-1986 | 03-SH | 6.1 | 20 |
| | 15-Oct-1986 | 03-SH | 6.4 | 17 |
| | 15-May-1987 | 03-SH | 6.8 | 14 |
| | 15-Sep-1987 | 03-SH | 6.2 | 17 |
| | 15-Nov-1987 | 03-SH | 6.4 | 20 |
| | | 03-SH +95CI | 6.43 | 25.67 |
| | | 03-SH -95CI | 5.74 | 14.33 |
| | | 03-SH MAX | 6.8 | 37 |
| | | 03-SH MEAN | 6.09 | 20 |
| | | 03-SH MIN | 5.2 | 10 |
| | | 03-SH N | 8 | 8 |
| | | 03-SH SD | 0.5 | 8.18 |
| **03-IN** | 15-May-1985 | 03-IN | 13.8 | 30 |
| | 15-Sep-1985 | 03-IN | 4 | 15 |
| | 15-Dec-1985 | 03-IN | 3.8 | 35 |
| | 15-Feb-1986 | 03-IN | 2.8 | 10 |
| | 15-Jun-1986 | 03-IN | 3.6 | 1 |
| | 15-Aug-1986 | 03-IN | 3 | 1 |
| | 15-Oct-1986 | 03-IN | 3.3 | 5 |
| | 15-May-1987 | 03-IN | 4.2 | 5 |
| | 15-Sep-1987 | 03-IN | 3 | 6 |
| | 15-Nov-1987 | 03-IN | 3.9 | 15 |
| | | 03-IN +95CI | 6.58 | 19.6 |
| | | 03-IN -95CI | 2.5 | 5 |
| | | 03-IN MAX | 13.8 | 35 |
| | | 03-IN MEAN | 4.54 | 12.3 |
| | | 03-IN MIN | 2.8 | 1 |
| | | 03-IN N | 10 | 10 |
| | | 03-IN SD | 3.29 | 11.79 |
| **04-SH** | 15-May-1985 | 04-SH | 5 | 20 |
| | 15-Sep-1985 | 04-SH | 3.4 | 1 |
| | 15-Jun-1986 | 04-SH | 3.3 | 1 |
| | 15-Aug-1986 | 04-SH | 3.2 | 1 |
| | 15-Oct-1986 | 04-SH | 3.8 | 10 |
| | 15-May-1987 | 04-SH | 3.6 | 8 |
| | 15-Sep-1987 | 04-SH | 3 | 15 |
| | 15-Nov-1987 | 04-SH | 3.4 | 15 |
| | | 04-SH +95CI | 4.02 | 14.03 |
| | | 04-SH -95CI | 3.16 | 3.72 |
| | | 04-SH MAX | 5 | 20 |
| | | 04-SH MEAN | 3.59 | 8.88 |
| | | 04-SH MIN | 3 | 1 |
| | | 04-SH N | 8 | 8 |
| | | 04-SH SD | 0.62 | 7.43 |
| **04-SS** | 15-Sep-1985 | 04-SS | 1.2 | 1 |
| | 15-Dec-1985 | 04-SS | 8.6 | 35 |
| | 15-Feb-1986 | 04-SS | 3.2 | 20 |
| | 15-Jun-1986 | 04-SS | 1.5 | 27 |
| | 15-Aug-1986 | 04-SS | 1 | 5 |
| | 15-Oct-1986 | 04-SS | 1.4 | 10 |
| | 15-May-1987 | 04-SS | 1.8 | 5 |
| | 15-Sep-1987 | 04-SS | 1 | 9 |
| | 15-Nov-1987 | 04-SS | 1.2 | 20 |
| | | 04-SS +95CI | 3.92 | 22.15 |
| | | 04-SS -95CI | 0.72 | 7.18 |
| | | 04-SS MAX | 8.6 | 35 |
| | | 04-SS MEAN | 2.32 | 14.67 |
| | | 04-SS MIN | 1 | 1 |
| | | 04-SS N | 9 | 9 |
| | | 04-SS SD | 2.45 | 11.46 |
| **05-SH** | 15-May-1985 | 05-SH | 5 | 15 |
| | 15-Sep-1985 | 05-SH | 4.4 | 15 |
| | 15-Dec-1985 | 05-SH | 4.8 | 15 |
| | 15-Jun-1986 | 05-SH | 4.5 | --- |
| | 15-Aug-1986 | 05-SH | 4.3 | 11 |
| | 15-Oct-1986 | 05-SH | 4.8 | 15 |
| | 15-May-1987 | 05-SH | 5.2 | 10 |
| | 15-Sep-1987 | 05-SH | 4.4 | 10 |
| | 15-Nov-1987 | 05-SH | 5.6 | 10 |
| | | 05-SH +95CI | 5.06 | 14.34 |
| | | 05-SH -95CI | 4.5 | 10.85 |
| | | 05-SH MAX | 5.6 | 15 |
| | | 05-SH MEAN | 4.78 | 12.63 |
| | | 05-SH MIN | 4.3 | 10 |
| | | 05-SH N | 9 | 8 |
| | | 05-SH SD | 0.43 | 2.56 |

**Table 5.3**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | |
|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) |
| **05-IN** | 15-May-1985 | 05-IN | 16 | 54 |
| | 15-Sep-1985 | 05-IN | 0.8 | 1 |
| | 15-Jun-1986 | 05-IN | 4.3 | 13 |
| | 15-Aug-1986 | 05-IN | 4.2 | 18 |
| | 15-Oct-1986 | 05-IN | 4.8 | 9 |
| | 15-May-1987 | 05-IN | 5 | 9 |
| | 15-Sep-1987 | 05-IN | 4.3 | 14 |
| | 15-Nov-1987 | 05-IN | 5.4 | 20 |
| | | 05-IN +95CI | 8.67 | 28.32 |
| | | 05-IN -95CI | 2.53 | 6.18 |
| | | 05-IN MAX | 16 | 54 |
| | | 05-IN MEAN | 5.6 | 17.25 |
| | | 05-IN MIN | 0.8 | 1 |
| | | 05-IN N | 8 | 8 |
| | | 05-IN SD | 4.43 | 15.98 |
| **06-SH** | 15-May-1985 | 06-SH | 5.4 | 25 |
| | 15-Sep-1985 | 06-SH | 3.4 | 5 |
| | 15-Dec-1985 | 06-SH | 4.8 | 10 |
| | 15-Jun-1986 | 06-SH | 3.5 | 19 |
| | 15-Aug-1986 | 06-SH | 2.3 | 23 |
| | 15-Oct-1986 | 06-SH | 3.1 | 8 |
| | 15-May-1987 | 06-SH | 3 | 1 |
| | 15-Sep-1987 | 06-SH | 2.4 | 5 |
| | 15-Nov-1987 | 06-SH | 2.6 | 20 |
| | | 06-SH +95CI | 4.08 | 18.71 |
| | | 06-SH -95CI | 2.69 | 7.07 |
| | | 06-SH MAX | 5.4 | 25 |
| | | 06-SH MEAN | 3.39 | 12.89 |
| | | 06-SH MIN | 2.3 | 1 |
| | | 06-SH N | 9 | 9 |
| | | 06-SH SD | 1.066 | 8.9 |
| **06-IN** | 15-May-1985 | 06-IN | 3 | 5 |
| | 15-Sep-1985 | 06-IN | 2.4 | 1 |
| | 15-Jun-1986 | 06-IN | 3 | 1 |
| | 15-Aug-1986 | 06-IN | 2 | 37 |
| | 15-Oct-1986 | 06-IN | 3.1 | 8 |
| | 15-Feb-1987 | 06-IN | 3 | 20 |
| | 15-May-1987 | 06-IN | 3 | 1 |
| | 15-Sep-1987 | 06-IN | 2.2 | 16 |
| | 15-Nov-1987 | 06-IN | 2.6 | 15 |
| | | 06-IN +95CI | 2.97 | 19.36 |
| | | 06-IN -95CI | 2.43 | 3.76 |
| | | 06-IN MAX | 3.1 | 37 |
| | | 06-IN MEAN | 2.7 | 11.56 |
| | | 06-IN MIN | 2 | 1 |
| | | 06-IN N | 9 | 9 |
| | | 06-IN SD | 0.41 | 11.94 |
| **07-SH** | 15-May-1985 | 07-SH | 3.8 | 15 |
| | 15-Sep-1985 | 07-SH | 2.6 | 5 |
| | 15-Jun-1986 | 07-SH | 3.1 | 5 |
| | 15-Aug-1986 | 07-SH | 2 | 10 |
| | 15-Oct-1986 | 07-SH | 8.3 | 28 |
| | 15-May-1987 | 07-SH | 3 | 1 |
| | 15-Sep-1987 | 07-SH | 2.6 | 12 |
| | 15-Nov-1987 | 07-SH | 2.8 | 18 |
| | | 07-SH +95CI | 4.91 | 17.74 |
| | | 07-SH -95CI | 2.14 | 5.76 |
| | | 07-SH MAX | 8.3 | 28 |
| | | 07-SH MEAN | 3.53 | 11.75 |
| | | 07-SH MIN | 2 | 1 |
| | | 07-SH N | 8 | 8 |
| | | 07-SH SD | 2 | 8.65 |
| **07-IN** | 15-May-1985 | 07-IN | 4.2 | 10 |
| | 15-Sep-1985 | 07-IN | 2.8 | 10 |
| | 15-Jun-1986 | 07-IN | 3.3 | 1 |
| | 15-Aug-1986 | 07-IN | 2.4 | 36 |
| | 15-Oct-1986 | 07-IN | 3.8 | 10 |
| | 15-May-1987 | 07-IN | 3.2 | 6 |
| | 15-Sep-1987 | 07-IN | 2.5 | 16 |
| | 15-Nov-1987 | 07-IN | 3.2 | 15 |
| | | 07-IN +95CI | 3.6 | 20.23 |
| | | 07-IN -95CI | 2.75 | 5.77 |
| | | 07-IN MAX | 4.2 | 36 |
| | | 07-IN MEAN | 3.18 | 13 |
| | | 07-IN MIN | 2.4 | 1 |
| | | 07-IN N | 8 | 8 |
| | | 07-IN SD | 0.62 | 10.43 |

**Table 5.3**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | |
|---|---|---|---|---|
| Monitoring Well | Date (dd-mmm-yyyy) | Sample Name | Total Organic Carbon (TOC) (mg/L) | Chemical Oxygen Demand (COD) (mg/L) |
| **07-SS** | 15-Feb-1985 | 07-SS | 0.6 | 10 |
| | 15-May-1985 | 07-SS | 3.4 | 20 |
| | 15-Sep-1985 | 07-SS | 1.4 | 1 |
| | 15-Dec-1985 | 07-SS | 2 | 1 |
| | 15-Jun-1986 | 07-SS | 2.2 | 1 |
| | 15-Aug-1986 | 07-SS | 1.6 | 48 |
| | 15-Oct-1986 | 07-SS | 2.2 | 10 |
| | 15-May-1987 | 07-SS | 2.2 | 1 |
| | 15-Sep-1987 | 07-SS | 1.8 | 5 |
| | 15-Nov-1987 | 07-SS | 2.4 | 15 |
| | | 07-SS +95CI | 2.43 | 20.21 |
| | | 07-SS -95CI | 1.53 | 2.19 |
| | | 07-SS MAX | 3.4 | 48 |
| | | 07-SS MEAN | 1.98 | 11.2 |
| | | 07-SS MIN | 0.6 | 1 |
| | | 07-SS N | 10 | 10 |
| | | 07-SS SD | 0.73 | 14.54 |
| **08-SH** | 15-May-1985 | 08-SH | 4.3 | 5 |
| | 15-Sep-1985 | 08-SH | 2 | 1 |
| | 15-Jun-1986 | 08-SH | 2.4 | 12 |
| | 15-Aug-1986 | 08-SH | 2 | 1 |
| | 15-Oct-1986 | 08-SH | 2.5 | 6 |
| | 15-May-1987 | 08-SH | 2.6 | 1 |
| | 15-Sep-1987 | 08-SH | 1.8 | 11 |
| | 15-Nov-1987 | 08-SH | 2.3 | 10 |
| | | 08-SH +95CI | 3.03 | 9.11 |
| | | 08-SH -95CI | 1.95 | 2.64 |
| | | 08-SH MAX | 4.3 | 12 |
| | | 08-SH MEAN | 2.49 | 5.88 |
| | | 08-SH MIN | 1.8 | 1 |
| | | 08-SH N | 8 | 8 |
| | | 08-SH SD | 0.78 | 4.67 |
| **08-IN** | 15-May-1985 | 08-IN | 0.2 | 25 |
| | 15-Sep-1985 | 08-IN | 2.4 | 5 |
| | 15-Dec-1985 | 08-IN | 2.8 | 20 |
| | 15-Feb-1986 | 08-IN | 1.5 | 20 |
| | 15-Jun-1986 | 08-IN | 2.6 | 1 |
| | 15-Aug-1986 | 08-IN | 2.3 | 5 |
| | 15-Oct-1986 | 08-IN | 2.6 | 9 |
| | 15-May-1987 | 08-IN | 3 | 1 |
| | 15-Sep-1987 | 08-IN | 1.8 | 8 |
| | 15-Nov-1987 | 08-IN | 2.4 | 10 |
| | | 08-IN +95CI | 2.67 | 15.63 |
| | | 08-IN -95CI | 1.65 | 5.17 |
| | | 08-IN MAX | 3 | 25 |
| | | 08-IN MEAN | 2.16 | 10.4 |
| | | 08-IN MIN | 0.2 | 1 |
| | | 08-IN N | 10 | 10 |
| | | 08-IN SD | 0.82 | 8.44 |
| **08-SS** | 15-May-1985 | 08-SS | 3.4 | 10 |
| | 15-Sep-1985 | 08-SS | 1.7 | 1 |
| | 15-Dec-1985 | 08-SS | 1.6 | 1 |
| | 15-Feb-1986 | 08-SS | 0.6 | 10 |
| | 15-Jun-1986 | 08-SS | 1.6 | 1 |
| | 15-Aug-1986 | 08-SS | 1.4 | 1 |
| | 15-Oct-1986 | 08-SS | 1.6 | 9 |
| | 15-May-1987 | 08-SS | 1.6 | 5 |
| | 15-Sep-1987 | 08-SS | 1.2 | 14 |
| | | 08-SS +95CI | 2.12 | 9.09 |
| | | 08-SS -95CI | 1.15 | 2.47 |
| | | 08-SS MAX | 3.4 | 14 |
| | | 08-SS MEAN | 1.63 | 5.78 |
| | | 08-SS MIN | 0.6 | 1 |
| | | 08-SS N | 9 | 9 |
| | | 08-SS SD | 0.74 | 5.07 |
| **09-SH [Decommissioned]** | 15-May-1985 | 09-SH [DECOM] | 32.5 | 106 |
| | 15-Sep-1985 | 09-SH [DECOM] | 31.3 | 81 |
| | 15-Jun-1986 | 09-SH [DECOM] | 40 | 105 |
| | 15-Aug-1986 | 09-SH [DECOM] | 44 | 82 |
| | 15-Oct-1986 | 09-SH [DECOM] | 38 | 100 |
| | 15-May-1987 | 09-SH [DECOM] | 38 | 110 |
| | 15-Sep-1987 | 09-SH [DECOM] | 43 | 110 |
| | 15-Nov-1987 | 09-SH [DECOM] | 46.5 | 128 |
| | | 09-SH +95CI | 42.88 | 113.45 |
| | | 09-SH -95CI | 35.44 | 92.05 |
| | | 09-SH MAX | 46.5 | 128 |
| | | 09-SH MEAN | 39.16 | 102.75 |
| | | 09-SH MIN | 31.3 | 81 |
| | | 09-SH N | 8 | 8 |
| | | 09-SH SD | 5.37 | 15.44 |

**Table 5.3**
**VEOLIA, Swan Hills Treatment Centre**
**Baseline Groundwater Monitoring Analytical Results: Organics and Petroleum Hydrocarbons**

| | | | ORGANICS | |
|---|---|---|---|---|
| **Monitoring Well** | **Date (dd-mmm-yyyy)** | **Sample Name** | **Total Organic Carbon (TOC) (mg/L)** | **Chemical Oxygen Demand (COD) (mg/L)** |
| **09-IN [Decommissioned]** | 15-May-1985 | 09-IN [DECOM] | 16.2 | 56 |
| | 15-Sep-1985 | 09-IN [DECOM] | 14 | 24 |
| | 15-Dec-1985 | 09-IN [DECOM] | 14.8 | 50 |
| | 15-Feb-1986 | 09-IN [DECOM] | 15 | 50 |
| | 15-Jun-1986 | 09-IN [DECOM] | 17 | 44 |
| | 15-Aug-1986 | 09-IN [DECOM] | 17.6 | 34 |
| | 15-Oct-1986 | 09-IN [DECOM] | 18.2 | 47 |
| | 15-May-1987 | 09-IN [DECOM] | 19.6 | 41 |
| | 15-Sep-1987 | 09-IN [DECOM] | 17.8 | 44 |
| | 15-Nov-1987 | 09-IN [DECOM] | 22 | 59 |
| | | 09-IN +95CI | 18.71 | 51.27 |
| | | 09-IN -95CI | 15.73 | 38.53 |
| | | 09-IN MAX | 22 | 59 |
| | | 09-IN MEAN | 17.22 | 44.9 |
| | | 09-IN MIN | 14 | 24 |
| | | 09-IN N | 10 | 10 |
| | | 09-IN SD | 2.41 | 10.28 |
| **09-PEAT** | 15-Nov-1987 | 09-PEAT | 90 | --- |
| | | 09-PEAT +95CI | 0 | --- |
| | | 09-PEAT -95CI | 0 | --- |
| | | 09-PEAT MAX | 90 | --- |
| | | 09-PEAT MEAN | 90 | --- |
| | | 09-PEAT MIN | 90 | --- |
| | | 09-PEAT N | 1 | --- |
| | | 09-PEAT SD | 0 | --- |
| **10-SH [Decommissioned]** | 15-May-1985 | 10-SH [DECOM] | 5.7 | 15 |
| | 15-Sep-1985 | 10-SH [DECOM] | 4.6 | 1 |
| | 15-Jun-1986 | 10-SH [DECOM] | 5.4 | 23 |
| | 15-Aug-1986 | 10-SH [DECOM] | 5 | 16 |
| | 15-Oct-1986 | 10-SH [DECOM] | 4.9 | 11 |
| | 15-May-1987 | 10-SH [DECOM] | 6 | 12 |
| | 15-Sep-1987 | 10-SH [DECOM] | 4.8 | 16 |
| | 15-Nov-1987 | 10-SH [DECOM] | 6.3 | 20 |
| | | 10-SH +95CI | 5.76 | 18.84 |
| | | 10-SH -95CI | 4.91 | 9.66 |
| | | 10-SH MAX | 6.3 | 23 |
| | | 10-SH MEAN | 5.34 | 14.25 |
| | | 10-SH MIN | 4.6 | 1 |
| | | 10-SH N | 8 | 8 |
| | | 10-SH SD | 0.61 | 6.63 |
| **10-IN [Decommissioned]** | 15-Dec-1985 | 10-IN [DECOM] | 13 | 10 |
| | 15-Feb-1986 | 10-IN [DECOM] | 4.4 | 25 |
| | 15-Jun-1986 | 10-IN [DECOM] | 5.4 | 10 |
| | 15-Aug-1986 | 10-IN [DECOM] | 4.8 | 16 |
| | 15-Oct-1986 | 10-IN [DECOM] | 5.2 | 10 |
| | 15-May-1987 | 10-IN [DECOM] | 6.6 | 10 |
| | 15-Sep-1987 | 10-IN [DECOM] | 5 | 16 |
| | 15-Nov-1987 | 10-IN [DECOM] | 6.1 | 20 |
| | | 10-IN +95CI | 8.25 | 18.56 |
| | | 10-IN -95CI | 4.38 | 10.69 |
| | | 10-IN MAX | 13 | 25 |
| | | 10-IN MEAN | 6.31 | 14.63 |
| | | 10-IN MIN | 4.4 | 10 |
| | | 10-IN N | 8 | 8 |
| | | 10-IN SD | 2.79 | 5.68 |

**NOTES:** --- ResutIts: Parameter was not analyzed

**Table 6.0**
**VEOLIA, Swan Hills Treatment Centre**
**2023 Groundwater Analytical Exceedances**

| Monitoring Well | Parameter Exceeded | 2023 Concentration (mg/L) | 2022 Guideline - AB Tier 2 Potable / Aquatic Life [1] (mg/L) | 2023 Mann Kendall Trend (All Data) |
|---|---|---|---|---|
| 01A-SH | pH | 6.24 | 6.5-8.5 | Decreasing |
| | Iron | 1.58 | 0.3 | Not Significant |
| | Manganese | 0.084 | 0.02 | Decreasing |
| 01A-IN | Iron | 0.5 | 0.3 | Not Significant |
| | Manganese | 0.25 | 0.02 | Decreasing |
| 03-SH | Manganese | 0.026 | 0.02 | Not Significant |
| | TDS | 560 | 500 | Increasing |
| 03-IN | TDS | 540 | 500 | Decreasing |
| 04-IN | Manganese | 0.727 | 0.02 | Increasing |
| 04-SS | Manganese | 0.521 | 0.02 | Not Significant |
| 05-SH | TDS | 640 | 500 | Increasing |
| 05-IN | Manganese | 0.073 | 0.02 | Decreasing |
| | TDS | 705 | 500 | Increasing |
| 05-SS | Manganese | 0.39 | 0.02 | Increasing |
| 06-SH | Manganese | 0.69 | 0.02 | Increasing |
| 06-IN 06(R)IN | Manganese | 0.67 | 0.02 | Not Significant |
| 07-SH | Manganese | 0.648 | 0.02 | Not Significant |
| | TDS | 794 | 500 | Increasing |
| 07-IN | Manganese | 0.80 | 0.02 | Not Significant |
| 07-SS 07(R)SS | Manganese | 0.82 | 0.02 | Not Significant |
| 08-IN | TDS | 526 | 500 | Decreasing |
| 11-SH | Manganese | 0.520 | 0.02 | Not Significant |
| | TDS | 709 | 500 | Increasing |
| 11-IN | Manganese | 0.634 | 0.02 | Not Significant |
| | TDS | 709 | 500 | Increasing |
| 12-SH | Manganese | 0.079 | 0.02 | Not Significant |
| 12-IN | Manganese | 0.687 | 0.02 | Not Significant |
| 13-SH | Manganese | 0.021 | 0.02 | Not Significant |
| | TDS | 626 | 500 | Not Significant |
| 15-SH | Manganese | 0.629 | 0.02 | Not Significant |
| 15-IN | Manganese | 0.3340 | 0.02 | Decreasing |
| 17-IN | Manganese | 0.163 | 0.02 | Decreasing |
| 89-3 | Manganese | 1.08 | 0.02 | Increasing |

Shallow Interval Wells
Intermediate Interval Wells
Sandstone Interval Wells

1 Aquatic Life applicable to MW-08 only; lowest concentration between Potable and Aquatic Life guidelines used

**Table 7.1**
**Veolia, Swan Hills Treatment Centre**
**2023 Outliers using 1989 EPA with 95% Confidence**

AECOM

| Monitoring Well | INDICATORS | | | | | | MAJOR IONS | | | | DISSOLVED METALS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | pH (mm/dd/yy - concentration in mg/L) | TDS (mm/dd/yy - concentration in mg/L) | Chloride (Cl) (mm/dd/yy - concentration in mg/L) | Sulphate ($SO_4$) (mm/dd/yy - concentration in mg/L) | DOC (mm/dd/yy - concentration in mg/L) | TOC (mm/dd/yy - concentration in mg/L) | Bicarbonate ($HCO_3$) (mm/dd/yy - concentration in mg/L) | Calcium (Ca) (mm/dd/yy - concentration in mg/L) | Magnesium (mm/dd/yy - concentration in mg/L) | Sodium (Na) (mm/dd/yy - concentration in mg/L) | Arsenic (As) (mm/dd/yy - concentration in mg/L) | Cadmium (Cd) (mm/dd/yy - concentration in mg/L) | Chromium (Cr) (mm/dd/yy - concentration in mg/L) | Copper (Cu) (mm/dd/yy - concentration in mg/L) | Iron (Fe) (mm/dd/yy - concentration in mg/L) | Lead (Pb) (mm/dd/yy - concentration in mg/L) | Manganese (Mn) (mm/dd/yy - concentration in mg/L) | Mercury (Hg) (mm/dd/yy - concentration in mg/L) | Nickel (Ni) (mm/dd/yy - concentration in mg/L) | Zinc (mm/dd/yy - concentration in mg/L) |
| **Shallow Interval** | | | | | | | | | | | | | | | | | | | | |
| 01-SH_01A-SH | None | **9/8/04 - 724** | **9/28/22 - 9.66** | **9/8/04 - 214** | None | None | None | **9/8/04 - 176** | None | None | **8/15/90 - 0.13** | None | None | **11/13/93 - 0.102** | None | None | **9/22/94 - 0.844** | None | **11/13/93 - 0.16** | **11/2/94 - 0.099** |
| 03-SH | None | None | **11/2/94 - 4.4** | None | None | None | None | None | None | None | **9/15/85 - 0.014** | None | **9/9/99 - 0.018** | **9/15/98 - 0.015** | None | None | **9/8/10 - 0.266** | None | None | **9/3/03 - 0.0259** |
| 04-SH | None | **3/15/90 - 244** | **5/15/85 - 3.2** | **5/15/85 - 34.5** | None | None | None | None | None | **5/15/85 - 19.5** | **9/7/11 - 0.0016** | None | **9/15/98 - 0.04** | **9/15/85 - 0.013** | None | None | **9/22/20 - 0.524** | None | **11/1/94 - 0.018** | **9/8/04 - 0.0235** |
| 05-SH | None | None | None | None | None | None | None | None | None | None | **9/7/11 - 0.0019** | None | None | None | None | None | None | None | **9/21/94 - 0015** | **5/31/94 - 0.078** |
| 06-SH | None | None | **9/21/94 - 5.2** | **5/12/92 - 51.4** | **9/8/10 - 3.4 9/17/14 - 7.5** | None | None | None | None | **5/12/92 - 44.1** | **9/7/11 - 0.00208** | None | None | **9/21/94 - 0.128** | None | None | **9/7/05 - 3.55** | None | **9/21/94 - 0.167** | **9/21/94 - 0.054** |
| 07-SH | None | None | 9/29/23 - 208 | None | None | **10/15/86 - 8.3** | None | None | None | **5/15/85 - 27** | None | None | None | **9/9/99 - 0.035** | **9/9/09 - 2.06** | None | None | None | **9/21/94 - 0.017** | **9/4/96 - 0.026** |
| 08-SH (bg) | None | **8/15/90 - 585** | None | None | **9/26/17 - 23** | **5/15/85 - 4.3** | **9/28/22 - 444** | **9/8/11 - 60** | **9/15/85 - 15.9** | None | None | None | None | **9/9/04 - 0.0123** | None | None | **9/16/14 - 1.29** | None | **9/5/12 - 0.0335** | **9/9/04 - 0.0179** |
| 11-SH | None | None | None | 9/28/23 - 167 | **9/17/14 - 3.3** | **9/9/99 - 17.2** | None | None | None | None | **9/9/99 - 0.013** | None | None | None | None | None | None | None | **9/22/94 - 0.027** | **11/2/94 - 0.097** |
| 12-SH | None | None | None | None | None | None | None | None | None | None | **9/18/18 - 0.00282** | None | None | **5/18/93 - 0.012** | **9/18/18 - 0.62** | None | **9/7/07 - 1.19** | None | **9/7/07 - 0.0153** | 9/28/23 - 0.0307 |
| 13-SH | None | None | **9/5/12 - 5.08** | None | 9/28/23 - 8.39 | None | None | None | None | **9/7/06 - 72.6** | None | None | None | **9/22/94 - 0.103** | None | None | None | None | **9/22/94 - 0.034** | **9/26/13 - 0.245** |
| 14-SH | None | None | **9/5/00 - 17.1** | **9/5/00 - 106** | **9/16/19 - 0.64 9/16/14 - 6.5** | None | None | None | None | **9/15/98 - 64.1** | **9/7/06 - 0.0012** | None | **9/9/04 - 0.016** | None | None | None | **9/5/00 - 1.07** | None | **9/5/00 - 0.057** | **9/25/13 - 0.211** |
| 15-SH | None | **5/18/93 - 231** | **11/12/93 - 3.2** | **9/4/97 - 91.5** | None | **5/18/93 - 2.3 11/12/93 - 12.5** | None | None | None | None | **9/26/13 - 0.00144** | None | **9/9/99 - 0.035** | **11/1/94 - 0.018** | **9/26/13 - 0.461** | None | None | None | **9/28/22 - 0.0626** | **11/1/94 - 0.02** |
| 16-SH | None | **9/21/21 - 500** | None | **9/21/21 - 90.1** | **9/16/14 - 5.5** | None | None | None | None | None | **9/7/11 - 0.00058** | None | **9/9/99 - 0.036** | **9/5/96 - 0.031** | None | None | **9/5/96 - 0.571** | None | **9/5/96 - 0.058** | **9/26/13 - 0.0262** |
| 17-SH | None | None | **9/27/16 - 21.8** | None | None | None | **9/4/96 - 228** | None | None | None | None | **9/6/01 - 0.003** | **9/9/99 - 0.024** | **11/1/94 - 0.045** | None | None | **11/1/94 - 0.441** | None | **11/1/94 - 0.015** | None |
| **ntermediate Interval** | | | | | | | | | | | | | | | | | | | | |
| 01-IN_01A-IN | **9/22/94 - 5.57** | **9/22/94 - 73** | **12/15/85 - 4.75** | None | **9/29/15 - 63.8** | **9/22/94 - 43** | **9/22/94 - 65.6** | **9/22/94 - 20** | **9/22/94 - 3.8** | None | **12/4/06 - 0.095** | None | None | **11/13/93 - 0.109** | None | None | None | None | **12/15/85 - 0.13** | **9/22/94 - 0.021** |
| 03-IN | None | None | None | None | None | **5/15/85 - 13.8** | **5/15/88 - 726** | None | None | None | **9/7/11 - 0.00245** | None | **9/9/99 - 0.088** | **9/15/87 - 0.021** | None | None | **9/16/14 - 0.347** | None | **9/9/99 - 0.036** | **9/5/07 - 0.036** |
| 04-IN | None | None | None | None | **9/8/10 - 14.2** | None | None | None | None | None | **9/5/07 - 0.0001 (<0.0002)** | None | **9/17/18 - 0.0124** | None | None | None | None | None | **9/5/07 - 0.0047** | None |
| 05-IN | None | None | None | None | None | **5/15/85 - 16** | None | None | None | None | **9/7/11 - 0.00341** | None | None | **9/7/05 - 0.0669** | **9/26/13 - 0.778** | None | None | None | None | **9/6/01 - 0.0345** |
| 06-IN_06(R)IN | None | None | None | None | None | **11/15/88 - 1.2** | None | None | None | None | **9/17/19 - 0.0151** | None | None | **9/7/05 - 0.0171** | **9/17/19 - 3.05** | None | None | None | **9/17/14 - 0.108** | **9/9/99 - 0.201** |
| 07-IN | None | **3/15/90 - 352** | **6/15/86 - 2.9** | None | **9/16/14 - 4.6** | None | **11/15/87 - 395** | None | None | None | **11/15/87 - 0.016** | None | None | None | None | None | None | None | **9/5/07 - 0.0191** | **9/22/21 - 0.159** |
| 08-IN (bg) | None | None | **5/15/85 - 5.7** | None | None | **5/15/85 - 0.2** | None | None | **9/15/85 - 18.6** | None | None | None | **5/15/87 - 0.075** | **5/15/87 - 0.028** | None | None | None | None | None | None |
| 11-IN | None | 9/28/23 - 709 | None | 9/28/23 - 181 | None | None | None | 9/28/23 - 154 | **9/26/13 - 0.553** | 9/28/23 - 45 | **9/9/99 - 0.0033** | None | None | **9/21/20 - 0.0082** | **9/5/97 - 2.79** | None | **9/22/94 - 0.969** | None | **9/17/14 - 0.0744** | **9/5/96 - 0.03** |
| 12-IN | None | **5/12/92 - 208** | **1/15/90 - 2.9** | None | None | None | **5/12/92 - 237** | None | None | **5/15/90 - 57.5** | None | **5/12/92 - 0.003** | None | **12/10/06 - 0.0726** | None | **9/9/10 - 0.00539** | **9/5/96 - 1.69** | None | **9/8/05 - 1.52** | None |
| 13-IN | None | None | **9/4/03 - 2** | None | None | None | **9/16/98 - 254** | **9/4/97 - 56.5** | None | None | **9/9/99 - 0.007 (Dup was 0.0008)** | None | None | **9/5/07 - 0.0042** | **9/8/05 - 1.4** | None | **9/5/00 - 2.28** | None | **9/9/99 - 0.02** | **9/4/97 - 0.082** |
| 15-IN | None | None | **9/22/94 - 3.1** | **9/22/94 - 144** | None | **9/22/94 - 15** | **9/22/94 - 339** | None | None | None | **9/6/07 - 0.001** | **9/22/94 - 0.003** | None | **9/4/97 - 0.01** | None | None | None | None | **9/4/97 - 0.092** | **9/9/99 - 0.026** |
| 16-IN[1] | **9/4/97 - 7.12** | **9/9/99 - 560** | None | None | **9/16/14 - 5.7** | None | None | None | **9/9/99 - 32.8** | None | None | **9/15/98 - 0.0012** | None | **9/8/04 - 0.165** | 9/10/09 - 3.31 | None | None | None | **9/5/07 - 0.0268** | **9/4/97 - 0.796** |
| 17-IN | None | None | None | None | **9/10/09 - 7.2** | **9/28/95 - 4.7** | None | None | None | None | **9/26/13 - 0.00106** | None | None | **9/16/98 - 0.01** | None | None | None | None | **9/28/95 - 0.04** | **9/5/02 - 0.015** |
| **Sandstone Interval** | | | | | | | | | | | | | | | | | | | | |
| 04-SS | None | None | **6/15/86 - 1.9** | None | **9/16/14 - 4.0** | **12/15/85 - 8.6** | None | None | None | **9/7/05 - 9.3** | **2/16/85 - 0.029** | None | None | **2/16/85 - 0.014** | None | None | **9/7/05 - 0.124** | None | **9/26/13 - 0.0054** | **9/28/15 - 0.0217** |
| 05-SS | None | None | None | None | **9/9/10 - 10.1** | N/A | None | None | None | None | None | None | None | **9/9/10 - 0.101** | None | **9/9/10 - 0.101** | None | None | **9/8/05 - 0.272** | **9/9/10 - 0.667** |
| 07-SS_07(R)SS | None | **9/16/14 - 550** | **9/16/14 - 9.31** | None | None | None | None | None | None | None | None | None | None | None | None | None | None | None | **10/4/98 - 0.026** | None |
| 13-SS_13(R)SS[1] | **9/16/19 - 7.29** | None | None | **9/17/09 - 81.2** | None | None | **9/10/04 - 528** | **9/10/04 - 117** | **9/10/04 - 26.8** | **9/17/09 - 56.9** | None | None | None | None | None | None | **9/17/09 - 0.0109 9/21/21 - 0.029** | None | None | None |
| 15-SS_15(R)SS_15(2R)SS[1] | None | None | None | None | None | N/A | None | None | None | None | **9/7/06 - 0.0001 (<0.0002)** | None | None | None | None | None | None | None | None | **9/8/5 - 1.85** |
| 89-3 | None | None | **9/13/7 - 58.4 9/28/10 - 38.4** | None | None | None | None | None | None | **9/13/07 - 62.4** | None | None | None | None | None | **9/24/02 - 0.134** | None | None | **9/24/02- 0.0287** | **9/24/02- 4.23** |

**NOTES:**

| | |
|---|---|
| N/A | Not enough data points to run test |
| **Bold** | Outlier |
| **Blue and Bold** | 2023 result is an outlier |
| **Red + Bold (actual concentration / detection limit)** | Outlier is a result is below the detection limit |
| **Red + Bold (actual concentration / detection limit)** | 2023 Outlier is a result is below the detection limit |

[1] - No sample collected in 2023, stats results from 2022

**Table 7.2**
**SUEZ, Swan Hills Treatment Centre**
**2023 Sen's Slope/Mann-Kendall trend Analysis**

| Monitoring Well | Data Set | INDICATORS | | | | | | MAJOR IONS | | | | DISSOLVED METALS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pH | TDS | Chloride | Sulphate | DOC | TOC | Bicarbonate | Calcium | Magnesium | Sodium | Arsenic | Cadmium | Chromium | Copper | Iron | Lead | Manganese | Mercury | Nickel | Zinc |
| **Shallow Interval** | | | | | | | | | | | | | | | | | | | | | |
| 01-SH_01A-SH | All Data | Decreasing | Decreasing | Increasing | Decreasing | Not significant | Increasing | Decreasing | Decreasing | Decreasing | Increasing | Decreasing | N/A | N/A | Decreasing | Not significant | N/A | Decreasing | N/A | Decreasing | Decreasing |
| 03-SH | All Data | Increasing | Increasing | Decreasing | Increasing | Not significant | Decreasing | Increasing | Increasing | Increasing | Increasing | Decreasing | N/A | Not significant | Decreasing | N/A | N/A | Not significant | N/A | Decreasing | Decreasing |
| 04-SH | All Data | Not significant | Increasing | Not significant | Decreasing | Not significant | Decreasing | Increasing | Increasing | Increasing | Increasing | Decreasing | N/A | Increasing | Decreasing | N/A | N/A | Not significant | N/A | Decreasing | Decreasing |
| 05-SH | All Data | Not significant | Increasing | Increasing | Increasing | Increasing | Decreasing | Increasing | Increasing | Increasing | Increasing | Decreasing | N/A | N/A | Decreasing | N/A | N/A | Decreasing | N/A | Decreasing | Decreasing |
| | Outliers Removed | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | Decreasing |
| 06-SH | All Data | Not significant | Increasing | Not significant | Decreasing | Not significant | Increasing | Increasing | Increasing | Increasing | Increasing | Not significant | N/A | N/A | Decreasing | N/A | N/A | **Increasing** | N/A | Decreasing | Decreasing |
| | Outliers Removed | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | **Not significant** | - | - | - |
| 07-SH | All Data | Not significant | Increasing | Increasing | Decreasing | Not significant | Not significant | Increasing | Increasing | Increasing | Increasing | Decreasing | N/A | N/A | Decreasing | Not significant | N/A | Not significant | N/A | Not significant | Decreasing |
| 08-SH (bg) | All Data | Increasing | Increasing | Increasing | Not significant | Not significant | Decreasing | Increasing | Increasing | Increasing | Increasing | Decreasing | N/A | N/A | Decreasing | N/A | N/A | Not significant | N/A | Decreasing | Decreasing |
| | Outliers Removed | - | - | - | - | - | - | - | Increasing | - | - | - | - | - | - | - | - | - | - | - | - |
| 11-SH | All Data | Increasing | Increasing | N/A | Increasing | Decreasing | Increasing | Increasing | Increasing | Increasing | Increasing | Not significant | N/A | N/A | Not significant | Not significant | N/A | Not significant | N/A | Decreasing | Not significant |
| 12-SH | All Data | Increasing | Increasing | N/A | Decreasing | Increasing | Not significant | Increasing | Increasing | Increasing | Increasing | Increasing | N/A | N/A | Decreasing | Not significant | N/A | Not significant | N/A | Decreasing | Decreasing |
| 13-SH | All Data | Increasing | Not significant | Increasing | Increasing | Not significant | Increasing | Not significant | Increasing | Increasing | Not significant | Increasing | Not significant | Not significant | Decreasing | N/A | N/A | Not significant | N/A | Not significant | Not significant |
| 14-SH | All Data | Increasing | Not significant | Decreasing | Increasing | Decreasing | Increasing | Increasing | Increasing | Increasing | Not significant | Not significant | Increasing | Increasing | Decreasing | N/A | N/A | Decreasing | N/A | Decreasing | Not significant |
| 15-SH | All Data | Increasing | Increasing | N/A | Decreasing | Not significant | Not significant | Increasing | Increasing | Increasing | Not significant | Decreasing | N/A | Not significant | Decreasing | N/A | N/A | Not significant | N/A | Decreasing | Decreasing |
| | Outliers Removed | - | Increasing | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 16-SH | All Data | Increasing | Not significant | Not significant | Decreasing | Not significant | Not significant | Increasing | Not significant | Not significant | Increasing | Decreasing | N/A | Not significant | Not significant | N/A | N/A | Decreasing | N/A | Decreasing | Decreasing |
| 17-SH | All Data | Increasing | Increasing | Increasing | Not significant | Increasing | Not significant | Increasing | Increasing | Increasing | Increasing | Not significant | Decreasing | Not significant | Decreasing | N/A | N/A | Decreasing | N/A | Decreasing | Decreasing |
| | Outliers Removed | - | - | - | - | - | - | - | - | - | - | - | - | - | Decreasing | - | - | - | - | - | - |
| **Intermediate Interval** | | | | | | | | | | | | | | | | | | | | | |
| 01-IN_01A-IN | All Data | Decreasing | Decreasing | Not significant | Decreasing | Not significant | Increasing | Not significant | Decreasing | Decreasing | Not significant | Increasing | N/A | N/A | Decreasing | Not significant | N/A | Decreasing | N/A | Decreasing | Decreasing |
| 03-IN | All Data | Increasing | Decreasing | Decreasing | Decreasing | Increasing | Not significant | Increasing | Decreasing | Not significant | Not significant | Decreasing | N/A | Increasing | Decreasing | N/A | N/A | Not significant | N/A | Decreasing | Decreasing |
| 04-IN | All Data | Not significant | Not significant | N/A | Not significant | Not significant | Decreasing | Not significant | Not significant | Not significant | Not significant | Increasing | N/A | Not significant | Not significant | N/A | N/A | Increasing | N/A | Not significant | Not significant |
| 05-IN | All Data | Not significant | Increasing | Decreasing | Increasing | Increasing | Not significant | Increasing | Increasing | Increasing | Increasing | Not significant | N/A | N/A | Not significant | Not significant | N/A | Decreasing | N/A | Decreasing | Decreasing |
| 06-IN_06(R)IN | All Data | Not significant | Not significant | Decreasing | Decreasing | Increasing | Not significant | Increasing | Increasing | Increasing | Decreasing | Increasing | N/A | N/A | Decreasing | Increasing | N/A | Not significant | N/A | Increasing | Decreasing |
| 07-IN | All Data | Not significant | Decreasing | Decreasing | Decreasing | Not significant | Decreasing | Not significant | Not significant | Increasing | Decreasing | Increasing | N/A | N/A | Not significant | Not significant | N/A | Not significant | N/A | Not significant | Not significant |
| 08-IN (bg) | All Data | Increasing | Decreasing | Decreasing | Decreasing | Not significant | Decreasing | Increasing | Decreasing | Decreasing | Decreasing | N/A | N/A | Not significant | Decreasing | N/A | N/A | Not significant | N/A | Decreasing | Not significant |
| 11-IN | All Data | Increasing | Increasing | N/A | Increasing | Increasing | Not significant | Not significant | Not significant | Not significant | Increasing | Not significant | N/A | N/A | Not significant | Not significant | N/A | Not significant | N/A | Not significant | Not significant |
| 12-IN | All Data | Increasing | Increasing | Decreasing | Not significant | Not significant | Not significant | Increasing | Increasing | Increasing | Increasing | Increasing | Not significant | N/A | Increasing | Increasing | Increasing | Not significant | N/A | Not significant | Increasing |
| 13-IN | All Data | Increasing | Increasing | Decreasing | Not Significant | Not significant | Not significant | Not significant | Increasing | Not significant | Increasing | Not significant | N/A | N/A | Not significant | Not significant | N/A | Decreasing | N/A | Decreasing | Not significant |
| 15-IN | All Data | Increasing | Not significant | Decreasing | Not Significant | Not significant | Not significant | Not significant | Not significant | Not significant | Not significant | Not significant | Not significant | N/A | Not significant | N/A | N/A | Decreasing | N/A | Decreasing | Not significant |
| 16-IN[1] | All Data | Increasing | Not significant | Decreasing | Not significant | Not significant | Not significant | Not significant | Increasing | Not significant | Decreasing | Decreasing | Not significant | N/A | Not significant | Not significant | N/A | Not significant | N/A | Not significant | Decreasing |
| 17-IN | All Data | Increasing | Increasing | N/A | Not Significant | Not significant | Not significant | Increasing | Not significant | Not significant | Increasing | Decreasing | Not significant | N/A | Decreasing | N/A | N/A | Decreasing | N/A | Decreasing | Decreasing |
| **Sandstone Interval** | | | | | | | | | | | | | | | | | | | | | |
| 04-SS | All Data | Increasing | Increasing | Not significant | Increasing | Not significant | Not significant | Increasing | Increasing | Increasing | Increasing | Decreasing | N/A | N/A | Not significant | Not significant | N/A | Not significant | N/A | Not significant | Decreasing |
| 05-SS | All Data | Not significant | Increasing | N/A | Increasing | Decreasing | N/A | Increasing | Increasing | Increasing | Not significant | Decreasing | Not significant | N/A | Not significant | Not significant | Not significant | Increasing | N/A | Decreasing | Not significant |
| 07-SS_07(R)SS | All Data | Increasing | Not significant | Not significant | Decreasing | Not significant | Decreasing | Increasing | Not significant | Increasing | Not significant | Decreasing | N/A | N/A | Decreasing | N/A | N/A | Not significant | N/A | Decreasing | Not significant |
| 13-SS_13(R)SS[1] | All Data | Not significant | Not significant | N/A | Decreasing | Decreasing | Not significant | Decreasing | Decreasing | Decreasing | Decreasing | Decreasing | Decreasing | N/A | Not significant | N/A | N/A | Decreasing | N/A | Decreasing | Decreasing |
| | Outliers Removed | - | - | - | - | - | - | Decreasing | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 15-SS_15(R)SS_15(2R)SS[1] | All Data | Not significant | Decreasing | Not significant | Decreasing | Not significant | N/A | Decreasing | Not significant | Decreasing | Decreasing | Decreasing | Decreasing | N/A | Decreasing | Not significant | N/A | Not significant | N/A | Decreasing | Decreasing |
| 89-3 | All Data | Not significant | Increasing | N/A | Not significant | Not significant | Not significant | Increasing | Increasing | Increasing | Not significant | Not significant | N/A | N/A | N/A | Not significant | N/A | Increasing | N/A | Decreasing | Decreasing |

**NOTES:**

| | |
|---|---|
| - | No Outliers removed |
| N/A | Insufficient data (data points do not exist or are below the detection limit) |
| | 2022 Alberta Tier 2 Potable Groundwater Exceedance (Commercial/Industrial Land Use) |
| | 2022 Alberta Tier 2 Aquatic Life Groundwater Exceedance (Commercial/Industrial Land Use) |
| **Bold** | Removal of outliers (identified using the Rosner's or Dixon's Outlier Test) affects the Sen's Slope/Mann-Kendall Trend |

# 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

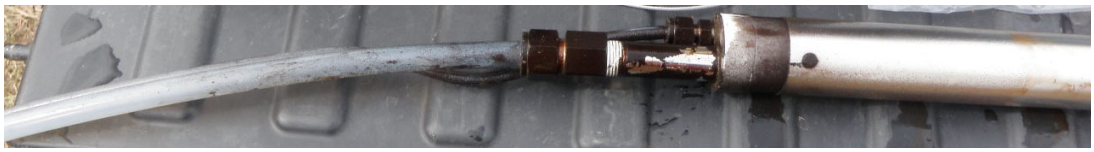
AECOM Imagine it. Delivered.

| 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

# PHOTOGRAPHIC RECORD

AECOM Imagine it. Delivered.

| **Site Name:** | **Site Location:** | **Project No.** |
|---|---|---|
| Swan Hills Treatment Centre | West half of 06-067-08W5 | **60716599** |

| **Photo No.** | **Date:** |
|---|---|
| 1 | **2023-09-13** |

**Well:**
Monitoring Well 13-SH

**Description:**
Monitoring Well 13-SH is significantly frost heaved and no longer represents shallow groundwater conditions. The pneumatic pump was relocated to 13-SH (Pz) piezometer in the interim until a replacement well can be installed.

| **Photo No.** | **Date:** |
|---|---|
| 2 | **2023-09-13** |

**Well:**
Monitoring Well 13-SH

**Description:**
The pneumatic pump has been removed, the Solinst well cap replaced with a lockable J-Plug cap and “Do Not Use” written on the side of well casing.

# PHOTOGRAPHIC RECORD 2

AECOM Imagine it. Delivered.

| Site Name: | Site Location: | Project No. |
|---|---|---|
| Swan Hills Treatment Centre | West half of 06-067-08W5 | 60716599 |

| Photo No. | Date: |
|---|---|
| 3 | 2023-09-13 |

**Well:**
New monitoring well 13-SH_Pz

**Description:**
Photograph of pneumatic pump operation at new monitoring well 13-SH_Pz

| Photo No. | Date: |
|---|---|
| 4 | 2023-09-13 |

**Well:**
New monitoring well 13-SH_Pz

**Description:**
View of pneumatic pump connections

# PHOTOGRAPHIC RECORD 3

AECOM Imagine it. Delivered.

| Site Name: | Site Location: | Project No. |
|---|---|---|
| Swan Hills Treatment Centre | West half of 06-067-08W5 | **60716599** |

| Photo No. | Date: |
|---|---|
| 5 | **2023-09-13** |

**Well:**
Sandstone monitoring well 11-SS

**Description:**
View of the heavily vegetated area around sandstone monitoring well 11-SS

| Photo No. | Date: |
|---|---|
| 6 | **2023-09-13** |

**Well:**
Piezometer 11-SH_Pz

**Description:**
View of the heavily vegetated area around piezometer 11-SH_Pz. Flagging was placed over the piezometer in support of future vegetation clearing, so mulching equipment does not strike the installation.

# PHOTOGRAPHIC RECORD 4

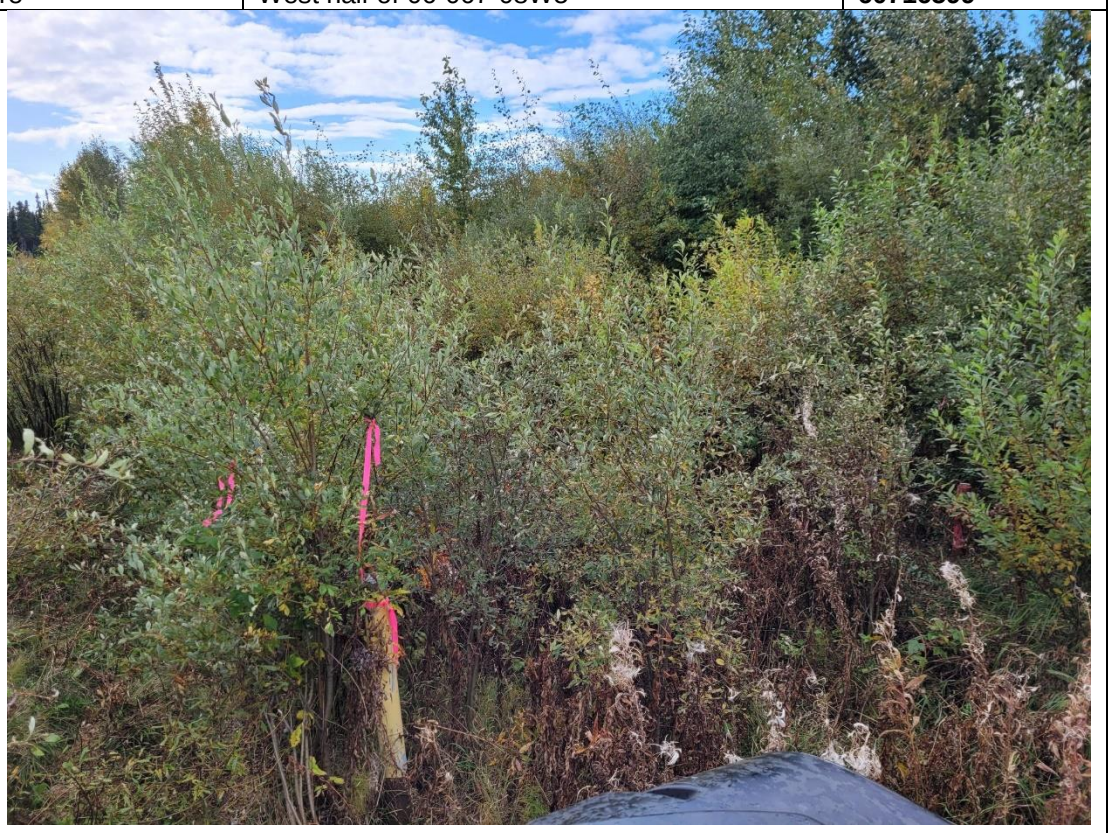
AECOM Imagine it. Delivered.

| **Site Name:** | **Site Location:** | **Project No.** |
|---|---|---|
| Swan Hills Treatment Centre | West half of 06-067-08W5 | **60716599** |

| **Photo No.** | **Date:** |
|---|---|
| 7 | **2023-09-13** |

**Well:**
Piezometer 11-SH_Pz

**Description:**
View of the heavily vegetated area around piezometer 11-SH_Pz. Flagging was placed over the piezometer in support of future vegetation clearing, so mulching equipment does not strike the installation.



# Appendix F

## Laboratory Test Results

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **EO2308922** | Page | : 1 of 26 |
| Client | : **AECOM Canada Ltd.** | Laboratory | : ALS Environmental - Edmonton |
| Contact | : Michael Steed | Account Manager | : Megha Walia |
| Address | : 101 - 18817 Stony Plain Rd. NW<br>Edmonton AB Canada T5S 0C2 | Address | : 9450 - 17 Avenue NW<br>Edmonton AB Canada T6N 1M9 |
| Telephone | : 780 486 7000 | Telephone | : +1 780 413 5227 |
| Project | : Swan Hills - 60716599 | Date Samples Received | : 30-Sep-2023 08:04 |
| PO | : ---- | Date Analysis Commenced | : 02-Oct-2023 |
| C-O-C number | : ---- | Issue Date | : 12-Oct-2023 16:49 |
| Sampler | : ---- | | |
| Site | : | | |
| Quote number | : EO22-AECO100-016 | | |
| No. of samples received | : 39 | | |
| No. of samples analysed | : 39 | | |

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* |
|---|---|---|
| Alex Drake | Lab Analyst | Inorganics, Edmonton, Alberta |
| Amanda Powell | Client Service Manager | Internal Subcontracting, Kelso, Washington DC (District of Columbia) |
| Amaninder Dhillon | Team Lead - Semi-Volatile Instrumentation | Organics, Waterloo, Ontario |
| Christian Murera | Lab Analyst | Organics, Edmonton, Alberta |
| Dan Nguyen | Team Leader - Inorganics | Metals, Edmonton, Alberta |
| Daniel Nguyen | Lab Assistant | Metals, Edmonton, Alberta |
| Elke Tabora | | Inorganics, Calgary, Alberta |
| Ping Yeung | Team Leader - Inorganics | Inorganics, Edmonton, Alberta |
| Ping Yeung | Team Leader - Inorganics | Metals, Edmonton, Alberta |
| Saron Gebremariam | Lab Assistant | Inorganics, Edmonton, Alberta |
| Shruti Mudliar | Lab Analyst | Inorganics, Edmonton, Alberta |
| Shruti Mudliar | Lab Analyst | Metals, 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 |
| µg/L | micrograms per litre |
| µS/cm | microsiemens per centimetre |
| meq/L | milliequivalents per litre |
| mg/L | milligrams per litre |
| pH units | pH units |

<: 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.

## 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.* |
| *RRV* | *Reported result verified by repeat analysis.* |
| *SUR-ND* | *Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.* |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 01A-SH | 01A-IN | 03-SH | 03-IN | 04-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 09:43 | 28-Sep-2023 09:45 | 29-Sep-2023 08:25 | 29-Sep-2023 08:23 | 29-Sep-2023 09:40 |
| | | | | | | EO2308922-001 | EO2308922-002 | EO2308922-003 | EO2308922-004 | EO2308922-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **Physical Tests** | | | | | | | | | | |
| **Hardness (as CaCO3), dissolved** | ---- | EC100/EO | 0.50 | mg/L | | 62.6 | 272 | 497 | 440 | 411 |
| **Conductivity** | ---- | E100/EO | 2.0 | µS/cm | | 167 | 803 | 838 | 815 | 684 |
| **pH** | ---- | E108/EO | 0.10 | pH units | | 6.24 | 8.23 | 8.15 | 8.23 | 8.24 |
| **Alkalinity, bicarbonate (as HCO3)** | 71-52-3 | E290/EO | 1.0 | mg/L | | 79.3 | 571 | 499 | 485 | 489 |
| **Alkalinity, carbonate (as CO3)** | 3812-32-6 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Alkalinity, hydroxide (as OH)** | 14280-30-9 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Alkalinity, total (as CaCO3)** | ---- | E290/EO | 2.0 | mg/L | | 65.0 | 468 | 409 | 397 | 401 |
| **Solids, total dissolved [TDS], calculated** | ---- | EC103/EO | 1.0 | mg/L | | 178 | 483 | 560 | 540 | 433 |
| **Anions and Nutrients** | | | | | | | | | | |
| **Chloride** | 16887-00-6 | E235.Cl/EO | 0.50 | mg/L | | 8.58 | 1.47 | 3.08 | 1.45 | <0.50 |
| **Fluoride** | 16984-48-8 | E235.F/EO | 0.020 | mg/L | | <0.020 | 0.027 | 0.298 | 0.210 | 0.205 |
| **Nitrate (as N)** | 14797-55-8 | E235.NO3/EO | 0.020 | mg/L | | 0.047 | 0.173 | <0.020 | 0.093 | 0.022 |
| **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 | | 0.66 | <0.30 | 84.9 | 88.0 | 9.11 |
| **Nitrate + Nitrite (as N)** | ---- | EC235.N+N/EO | 0.0500 | mg/L | | <0.0500 | 0.173 | <0.0500 | 0.0930 | <0.0500 |
| **Organic / Inorganic Carbon** | | | | | | | | | | |
| **Carbon, dissolved organic [DOC]** | ---- | E358-L/CG | 0.50 | mg/L | | 53.1 | 23.5 | 4.08 | 4.24 | 2.45 |
| **Ion Balance** | | | | | | | | | | |
| **Anion sum** | ---- | EC101/EO | 0.10 | meq/L | | 1.56 | 9.41 | 10.0 | 9.82 | 8.22 |
| **Cation sum** | ---- | EC101/EO | 0.10 | meq/L | | 1.86 | 7.51 | 10.8 | 10.0 | 8.75 |
| **Ion balance (APHA)** | ---- | EC101/EO | 0.01 | % | | 8.77 | -11.2 | 3.85 | 0.91 | 3.12 |
| **Ion balance (cations/anions)** | ---- | EC101/EO | 0.010 | % | | 119 IB:INT | 79.8 IB:INT | 108 | 102 | 106 |
| **Dissolved Metals** | | | | | | | | | | |
| **Calcium, dissolved** | 7440-70-2 | E421/EO | 0.050 | mg/L | | 19.1 | 76.4 | 139 | 121 | 113 |
| **Iron, dissolved** | 7439-89-6 | E421/EO | 0.010 | mg/L | | 1.58 | 0.501 | <0.010 | <0.010 | <0.010 |
| **Magnesium, dissolved** | 7439-95-4 | E421/EO | 0.0050 | mg/L | | 3.62 | 19.8 | 36.5 | 33.4 | 31.2 |
| **Manganese, dissolved** | 7439-96-5 | E421/EO | 0.00010 | mg/L | | 0.0835 | 0.250 | 0.0260 | 0.00131 | 0.0158 |
| **Potassium, dissolved** | 7440-09-7 | E421/EO | 0.050 | mg/L | | 0.642 | 2.86 | 2.11 | 3.16 | 2.82 |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 01A-SH | 01A-IN | 03-SH | 03-IN | 04-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 09:43 | 28-Sep-2023 09:45 | 29-Sep-2023 08:25 | 29-Sep-2023 08:23 | 29-Sep-2023 09:40 |
| | | | | | | EO2308922-001 | EO2308922-002 | EO2308922-003 | EO2308922-004 | EO2308922-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **Dissolved Metals** | | | | | | | | | | |
| **Sodium, dissolved** | 7440-23-5 | E421/EO | 0.050 | mg/L | | 11.7 | 45.1 | 17.9 | 26.0 | 10.9 |
| **Dissolved mercury filtration location** | ---- | EP509/EO | - | - | | Laboratory | 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 | | 0.175 | 0.0416 | 0.0102 | 0.0057 | <0.0010 |
| **Antimony, dissolved** | 7440-36-0 | E421/EO | 0.00010 | mg/L | | <0.00010 | <0.00010 | 0.00015 | <0.00010 | <0.00010 |
| **Arsenic, dissolved** | 7440-38-2 | E421/EO | 0.00010 | mg/L | | 0.00047 | 0.00047 | 0.00028 | 0.00021 | 0.00018 |
| **Barium, dissolved** | 7440-39-3 | E421/EO | 0.00010 | mg/L | | 0.0607 | 0.266 | 0.406 | 0.127 | 0.207 |
| **Boron, dissolved** | 7440-42-8 | E421/EO | 0.010 | mg/L | | <0.010 | 0.088 | 0.027 | 0.049 | 0.088 |
| **Cadmium, dissolved** | 7440-43-9 | E421/EO | 0.0000050 | mg/L | | 0.0000068 | <0.0000050 | 0.0000383 | 0.0000554 | <0.0000050 |
| **Chromium, dissolved** | 7440-47-3 | E421/EO | 0.00050 | mg/L | | 0.00284 | 0.00204 | 0.00205 | 0.00240 | 0.00552 |
| **Copper, dissolved** | 7440-50-8 | E421/EO | 0.00020 | mg/L | | 0.00082 | 0.00050 | 0.00199 | 0.00095 | 0.00058 |
| **Lead, dissolved** | 7439-92-1 | E421/EO | 0.000050 | mg/L | | 0.000106 | <0.000050 | <0.000050 | 0.000058 | <0.000050 |
| **Nickel, dissolved** | 7440-02-0 | E421/EO | 0.00050 | mg/L | | 0.00405 | 0.00180 | 0.00273 | 0.00162 | 0.00335 |
| **Selenium, dissolved** | 7782-49-2 | E421/EO | 0.000050 | mg/L | | 0.000133 | 0.000061 | 0.000118 | 0.000062 | 0.000065 |
| **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 | | 0.000499 | 0.000337 | 0.00603 | 0.00451 | 0.00860 |
| **Zinc, dissolved** | 7440-66-6 | E421/EO | 0.0010 | mg/L | | 0.0063 | 0.0027 | 0.0019 | 0.0031 | <0.0010 |
| **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 | | ---- | ---- | 0.020 | ---- | ---- |
| **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 |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 01A-SH | 01A-IN | 03-SH | 03-IN | 04-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 09:43 | 28-Sep-2023 09:45 | 29-Sep-2023 08:25 | 29-Sep-2023 08:23 | 29-Sep-2023 09:40 |
| | | | | | | EO2308922-001 | EO2308922-002 | EO2308922-003 | EO2308922-004 | EO2308922-005 |
| | | | | | | Result | Result | Result | Result | Result |
| **Hydrocarbons** | | | | | | | | | | |
| **F1-BTEX** | ---- | EC580/EO | 25 | µg/L | | <100 | ---- | <100 | ---- | <100 |
| **Hydrocarbons Surrogates** | | | | | | | | | | |
| **Dichlorotoluene, 3,4-** | 95-75-0 | E581.F1/EO | 1.0 | % | | 96.1 | ---- | 86.9 | ---- | 106 |
| **Volatile Organic Compounds Surrogates** | | | | | | | | | | |
| **Bromofluorobenzene, 4-** | 460-00-4 | E611A/EO | 1.0 | % | | 81.4 | ---- | 86.3 | ---- | 86.4 |
| **Difluorobenzene, 1,4-** | 540-36-3 | E611A/EO | 1.0 | % | | 104 | ---- | 100 | ---- | 104 |
| **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** | ---- | 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 | % | | 73.7 | 90.6 | 80.9 | 97.2 | 82.6 |
| **Tetrachloro-m-xylene** | 877-09-8 | E687-L/WT | 0.010 | % | | 87.9 | 99.1 | 79.4 | 101 | 82.8 |

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 04-IN | 04-SS | 05-SH | 25-SH | 05-IN |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 29-Sep-2023 09:30 | 29-Sep-2023 09:50 | 28-Sep-2023 16:15 | 28-Sep-2023 16:35 | 28-Sep-2023 16:08 |
| | | | | | | EO2308922-006 | EO2308922-007 | EO2308922-008 | EO2308922-009 | EO2308922-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **Physical Tests** | | | | | | | | | | |
| **Hardness (as CaCO3), dissolved** | ---- | EC100/EO | 0.50 | mg/L | | 358 | 293 | 626 | 562 | 543 |
| **Conductivity** | ---- | E100/EO | 2.0 | µS/cm | | 685 | 652 | 934 | 904 | 1040 |
| **pH** | ---- | E108/EO | 0.10 | pH units | | 8.31 | 8.49 | 8.11 | 8.13 | 8.16 |
| **Alkalinity, bicarbonate (as HCO3)** | 71-52-3 | E290/EO | 1.0 | mg/L | | 445 | 371 | 509 | 479 | 591 |
| **Alkalinity, carbonate (as CO3)** | 3812-32-6 | E290/EO | 1.0 | mg/L | | 3.5 | 10.3 | <1.0 | <1.0 | <1.0 |
| **Alkalinity, hydroxide (as OH)** | 14280-30-9 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Alkalinity, total (as CaCO3)** | ---- | E290/EO | 2.0 | mg/L | | 371 | 321 | 418 | 393 | 484 |
| **Solids, total dissolved [TDS], calculated** | ---- | EC103/EO | 1.0 | mg/L | | 442 | 422 | 640 | 603 | 705 |
| **Anions and Nutrients** | | | | | | | | | | |
| **Chloride** | 16887-00-6 | E235.Cl/EO | 0.50 | mg/L | | <0.50 | <0.50 | 2.72 | 2.66 | 1.54 |
| **Fluoride** | 16984-48-8 | E235.F/EO | 0.020 | mg/L | | 0.162 | 0.085 | 0.192 | 0.189 | 0.157 |
| **Nitrate (as N)** | 14797-55-8 | E235.NO3/EO | 0.020 | mg/L | | 0.201 | 0.208 | 0.127 | 0.184 | 0.142 |
| **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 | | 29.3 | 52.4 | 119 | 118 | 132 |
| **Nitrate + Nitrite (as N)** | ---- | EC235.N+N/EO | 0.0500 | mg/L | | 0.201 | 0.208 | 0.137 | 0.184 | 0.142 |
| **Organic / Inorganic Carbon** | | | | | | | | | | |
| **Carbon, dissolved organic [DOC]** | ---- | E358-L/CG | 0.50 | mg/L | | 3.22 | 1.58 | 7.20 | 10.8 | 7.46 |
| **Ion Balance** | | | | | | | | | | |
| **Anion sum** | ---- | EC101/EO | 0.10 | meq/L | | 8.05 | 7.52 | 10.9 | 10.4 | 12.5 |
| **Cation sum** | ---- | EC101/EO | 0.10 | meq/L | | 8.32 | 7.27 | 12.9 | 11.8 | 13.3 |
| **Ion balance (APHA)** | ---- | EC101/EO | 0.01 | % | | 1.65 | -1.69 | 8.40 | 6.31 | 3.10 |
| **Ion balance (cations/anions)** | ---- | EC101/EO | 0.010 | % | | 103 | 96.7 | 118 IB:INT | 113 | 106 |
| **Dissolved Metals** | | | | | | | | | | |
| **Calcium, dissolved** | 7440-70-2 | E421/EO | 0.050 | mg/L | | 106 | 81.5 | 177 | 157 | 155 |
| **Iron, dissolved** | 7439-89-6 | E421/EO | 0.010 | mg/L | | 0.024 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Magnesium, dissolved** | 7439-95-4 | E421/EO | 0.0050 | mg/L | | 22.7 | 21.7 | 44.6 | 41.4 | 37.8 |
| **Manganese, dissolved** | 7439-96-5 | E421/EO | 0.00010 | mg/L | | 0.727 | 0.521 | 0.0187 | 0.0715 | 0.0729 |
| **Potassium, dissolved** | 7440-09-7 | E421/EO | 0.050 | mg/L | | 5.72 | 4.79 | 1.23 | 1.10 | 3.44 |
| **Sodium, dissolved** | 7440-23-5 | E421/EO | 0.050 | mg/L | | 22.8 | 29.4 | 9.21 | 12.0 | 54.2 |

## Analytical Results

Sub-Matrix: Water
(Matrix: Water)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 04-IN | 04-SS | 05-SH | 25-SH | 05-IN |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 29-Sep-2023 09:30 | 29-Sep-2023 09:50 | 28-Sep-2023 16:15 | 28-Sep-2023 16:35 | 28-Sep-2023 16:08 |
| | | | | | | EO2308922-006 | EO2308922-007 | EO2308922-008 | EO2308922-009 | EO2308922-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **Dissolved Metals** | | | | | | | | | | |
| **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 | <0.0010 | 0.0034 | <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 | | 0.00310 | 0.00038 | 0.00021 | 0.00030 | 0.00042 |
| **Barium, dissolved** | 7440-39-3 | E421/EO | 0.00010 | mg/L | | 0.0723 | 0.0989 | 0.118 | 0.101 | 0.0586 |
| **Boron, dissolved** | 7440-42-8 | E421/EO | 0.010 | mg/L | | 0.198 | 0.029 | 0.031 | 0.027 | 0.051 |
| **Cadmium, dissolved** | 7440-43-9 | E421/EO | 0.0000050 | mg/L | | 0.0000076 | 0.0000147 | 0.0000128 | 0.0000237 | 0.0000090 |
| **Chromium, dissolved** | 7440-47-3 | E421/EO | 0.00050 | mg/L | | 0.00257 | 0.00147 | 0.00266 | 0.00503 | 0.00176 |
| **Copper, dissolved** | 7440-50-8 | E421/EO | 0.00020 | mg/L | | 0.00039 | 0.00054 | 0.00090 | 0.00208 | 0.00161 |
| **Lead, dissolved** | 7439-92-1 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| **Nickel, dissolved** | 7440-02-0 | E421/EO | 0.00050 | mg/L | | 0.00280 | 0.00121 | 0.00192 | 0.00202 | 0.00150 |
| **Selenium, dissolved** | 7782-49-2 | E421/EO | 0.000050 | mg/L | | 0.000060 | <0.000050 | 0.000195 | 0.000245 | <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 | | 0.00781 | 0.000438 | 0.00682 | 0.00618 | 0.00902 |
| **Zinc, dissolved** | 7440-66-6 | E421/EO | 0.0010 | mg/L | | <0.0010 | 0.0015 | 0.0014 | 0.0012 | 0.0025 |
| **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 | ---- |
| **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 | % | | ---- | ---- | 87.2 | 85.5 | ---- |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 04-IN | 04-SS | 05-SH | 25-SH | 05-IN |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 29-Sep-2023 09:30 | 29-Sep-2023 09:50 | 28-Sep-2023 16:15 | 28-Sep-2023 16:35 | 28-Sep-2023 16:08 |
| | | | | | | EO2308922-006 | EO2308922-007 | EO2308922-008 | EO2308922-009 | EO2308922-010 |
| | | | | | | Result | Result | Result | Result | Result |
| **Volatile Organic Compounds Surrogates** | | | | | | | | | | |
| **Bromofluorobenzene, 4-** | 460-00-4 | E611A/EO | 1.0 | % | | ---- | ---- | 79.0 | 85.2 | ---- |
| **Difluorobenzene, 1,4-** | 540-36-3 | E611A/EO | 1.0 | % | | ---- | ---- | 105 | 104 | ---- |
| **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** | ---- | 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 | % | | 95.1 | 94.6 | 94.7 | 97.6 | 91.2 |
| **Tetrachloro-m-xylene** | 877-09-8 | E687-L/WT | 0.010 | % | | 96.0 | 89.4 | 88.8 | 97.6 | 86.4 |

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 05-SS | 25-SS | 06-SH | 06-(R)IN | 07-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 09:05 | 29-Sep-2023 09:05 | 29-Sep-2023 10:20 | 29-Sep-2023 10:50 | 29-Sep-2023 11:00 |
| | | | | | | EO2308922-011 | EO2308922-012 | EO2308922-013 | EO2308922-014 | EO2308922-015 |
| | | | | | | Result | Result | Result | Result | Result |
| **Physical Tests** | | | | | | | | | | |
| **Hardness (as CaCO3), dissolved** | ---- | EC100/EO | 0.50 | mg/L | | 165 | 165 | 508 | 517 | 749 |
| **Conductivity** | ---- | E100/EO | 2.0 | µS/cm | | 447 | 443 | 732 | 750 | 1430 |
| **pH** | ---- | E108/EO | 0.10 | pH units | | 8.45 | 8.47 | 8.00 | 8.01 | 8.15 |
| **Alkalinity, bicarbonate (as HCO3)** | 71-52-3 | E290/EO | 1.0 | mg/L | | 265 | 262 | 525 | 526 | 529 |
| **Alkalinity, carbonate (as CO3)** | 3812-32-6 | E290/EO | 1.0 | mg/L | | 5.9 | 6.8 | <1.0 | <1.0 | <1.0 |
| **Alkalinity, hydroxide (as OH)** | 14280-30-9 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Alkalinity, total (as CaCO3)** | ---- | E290/EO | 2.0 | mg/L | | 227 | 226 | 430 | 431 | 434 |
| **Solids, total dissolved [TDS], calculated** | ---- | EC103/EO | 1.0 | mg/L | | 290 | 289 | 481 | 492 | 794 |
| **Anions and Nutrients** | | | | | | | | | | |
| **Chloride** | 16887-00-6 | E235.Cl/EO | 0.50 | mg/L | | <0.50 | <0.50 | 0.81 | 1.08 | 208 |
| **Fluoride** | 16984-48-8 | E235.F/EO | 0.020 | mg/L | | 0.108 | 0.108 | 0.188 | 0.170 | 0.127 |
| **Nitrate (as N)** | 14797-55-8 | E235.NO3/EO | 0.020 | mg/L | | 0.096 | 0.067 | <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 | <0.010 | <0.010 |
| **Sulfate (as SO4)** | 14808-79-8 | E235.SO4/EO | 0.30 | mg/L | | 24.2 | 22.6 | 1.91 | 4.13 | 12.6 |
| **Nitrate + Nitrite (as N)** | ---- | EC235.N+N/EO | 0.0500 | mg/L | | 0.0960 | 0.0670 | <0.0500 | <0.0500 | <0.0500 |
| **Organic / Inorganic Carbon** | | | | | | | | | | |
| **Carbon, dissolved organic [DOC]** | ---- | E358-L/CG | 0.50 | mg/L | | 0.70 | 0.55 | 4.30 | 5.84 | 2.46 |
| **Ion Balance** | | | | | | | | | | |
| **Anion sum** | ---- | EC101/EO | 0.10 | meq/L | | 5.05 | 5.00 | 8.66 | 8.74 | 14.8 |
| **Cation sum** | ---- | EC101/EO | 0.10 | meq/L | | 4.68 | 4.71 | 10.6 | 10.8 | 15.9 |
| **Ion balance (APHA)** | ---- | EC101/EO | 0.01 | % | | -3.80 | -2.99 | 10.1 | 10.5 | 3.58 |
| **Ion balance (cations/anions)** | ---- | EC101/EO | 0.010 | % | | 92.7 | 94.2 | 122 IB:INT | 124 IB:INT | 107 |
| **Dissolved Metals** | | | | | | | | | | |
| **Calcium, dissolved** | 7440-70-2 | E421/EO | 0.050 | mg/L | | 46.9 | 47.1 | 138 | 145 | 210 |
| **Iron, dissolved** | 7439-89-6 | E421/EO | 0.010 | mg/L | | 0.245 | 0.474 | <0.010 | <0.010 | <0.010 |
| **Magnesium, dissolved** | 7439-95-4 | E421/EO | 0.0050 | mg/L | | 11.7 | 11.5 | 39.7 | 37.7 | 54.6 |
| **Manganese, dissolved** | 7439-96-5 | E421/EO | 0.00010 | mg/L | | 0.390 | 0.352 | 0.692 | 0.666 | 0.648 |
| **Potassium, dissolved** | 7440-09-7 | E421/EO | 0.050 | mg/L | | 4.11 | 4.18 | 1.97 | 2.32 | 3.31 |
| **Sodium, dissolved** | 7440-23-5 | E421/EO | 0.050 | mg/L | | 28.5 | 29.3 | 7.44 | 8.52 | 18.1 |

## Analytical Results

Sub-Matrix: Water
(Matrix: Water)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 05-SS | 25-SS | 06-SH | 06-(R)IN | 07-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 09:05 | 29-Sep-2023 09:05 | 29-Sep-2023 10:20 | 29-Sep-2023 10:50 | 29-Sep-2023 11:00 |
| | | | | | | EO2308922-011 | EO2308922-012 | EO2308922-013 | EO2308922-014 | EO2308922-015 |
| | | | | | | Result | Result | Result | Result | Result |
| **Dissolved Metals** | | | | | | | | | | |
| **Dissolved mercury filtration location** | ---- | EP509/EO | - | - | | Field | Field | Laboratory | Laboratory | Laboratory |
| **Dissolved metals filtration location** | ---- | EP421/EO | - | - | | Field | Field | Laboratory | Laboratory | Laboratory |
| **Aluminum, dissolved** | 7429-90-5 | E421/EO | 0.0010 | mg/L | | 0.0807 | <0.0010 | <0.0010 | <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 | | 0.00067 | 0.00119 | 0.00032 | 0.00056 | <0.00010 |
| **Barium, dissolved** | 7440-39-3 | E421/EO | 0.00010 | mg/L | | 0.0994 | 0.0981 | 0.545 | 0.507 | 0.864 |
| **Boron, dissolved** | 7440-42-8 | E421/EO | 0.010 | mg/L | | 0.022 | 0.022 | 0.046 | 0.050 | 0.063 |
| **Cadmium, dissolved** | 7440-43-9 | E421/EO | 0.0000050 | mg/L | | 0.0000221 | 0.0000109 | 0.0000167 | 0.0000280 | 0.0000131 |
| **Chromium, dissolved** | 7440-47-3 | E421/EO | 0.00050 | mg/L | | 0.00153 | 0.00129 | 0.00158 | 0.00183 | 0.00164 |
| **Copper, dissolved** | 7440-50-8 | E421/EO | 0.00020 | mg/L | | 0.00213 | 0.00265 | 0.00050 | 0.00119 | 0.00027 |
| **Lead, dissolved** | 7439-92-1 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| **Nickel, dissolved** | 7440-02-0 | E421/EO | 0.00050 | mg/L | | 0.00218 | 0.00325 | 0.00483 | 0.0123 | 0.00296 |
| **Selenium, dissolved** | 7782-49-2 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | 0.000055 | 0.000093 | <0.000050 |
| **Silver, dissolved** | 7440-22-4 | E421/EO | 0.000010 | mg/L | | <0.000010 | <0.000010 | <0.000010 | 0.000100 | <0.000010 |
| **Uranium, dissolved** | 7440-61-1 | E421/EO | 0.000010 | mg/L | | 0.000059 | 0.000133 | 0.00609 | 0.00669 | 0.00360 |
| **Zinc, dissolved** | 7440-66-6 | E421/EO | 0.0010 | mg/L | | 0.0316 | 0.0414 | 0.0018 | 0.0028 | 0.0013 |
| **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 |
| **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 | % | | ---- | ---- | 91.9 | ---- | 95.7 |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 05-SS | 25-SS | 06-SH | 06-(R)IN | 07-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 09:05 | 29-Sep-2023 09:05 | 29-Sep-2023 10:20 | 29-Sep-2023 10:50 | 29-Sep-2023 11:00 |
| | | | | | | EO2308922-011 | EO2308922-012 | EO2308922-013 | EO2308922-014 | EO2308922-015 |
| | | | | | | Result | Result | Result | Result | Result |
| **Volatile Organic Compounds Surrogates** | | | | | | | | | | |
| **Bromofluorobenzene, 4-** | 460-00-4 | E611A/EO | 1.0 | % | | ---- | ---- | 84.3 | ---- | 87.6 |
| **Difluorobenzene, 1,4-** | 540-36-3 | E611A/EO | 1.0 | % | | ---- | ---- | 103 | ---- | 102 |
| **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** | ---- | 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 | % | | 132 | 128 | 129 | 109 | 132 |
| **Tetrachloro-m-xylene** | 877-09-8 | E687-L/WT | 0.010 | % | | 95.7 | 94.2 | 97.0 | 81.0 | 93.8 |

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 27-SH | 07-IN | 07(R)SS | 08-SH | 08-IN |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 11:00 | 29-Sep-2023 10:50 | 29-Sep-2023 11:10 | 27-Sep-2023 16:35 | 27-Sep-2023 16:31 |
| | | | | | | EO2308922-016 | EO2308922-017 | EO2308922-018 | EO2308922-019 | EO2308922-020 |
| | | | | | | Result | Result | Result | Result | Result |
| **Physical Tests** | | | | | | | | | | |
| **Hardness (as CaCO3), dissolved** | ---- | EC100/EO | 0.50 | mg/L | | 809 | 354 | 304 | 304 | 389 |
| **Conductivity** | ---- | E100/EO | 2.0 | µS/cm | | 1400 | 677 | 693 | 683 | 800 |
| **pH** | ---- | E108/EO | 0.10 | pH units | | 8.10 | 8.23 | 8.46 | 8.25 | 8.35 |
| **Alkalinity, bicarbonate (as HCO3)** | 71-52-3 | E290/EO | 1.0 | mg/L | | 515 | 413 | 399 | 418 | 390 |
| **Alkalinity, carbonate (as CO3)** | 3812-32-6 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | 9.5 | <1.0 | 5.0 |
| **Alkalinity, hydroxide (as OH)** | 14280-30-9 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Alkalinity, total (as CaCO3)** | ---- | E290/EO | 2.0 | mg/L | | 422 | 338 | 343 | 342 | 328 |
| **Solids, total dissolved [TDS], calculated** | ---- | EC103/EO | 1.0 | mg/L | | 808 | 443 | 439 | 421 | 526 |
| **Anions and Nutrients** | | | | | | | | | | |
| **Chloride** | 16887-00-6 | E235.Cl/EO | 0.50 | mg/L | | 206 | 0.84 | <0.50 | 1.25 | 0.59 |
| **Fluoride** | 16984-48-8 | E235.F/EO | 0.020 | mg/L | | 0.111 | 0.156 | 0.073 | 0.230 | 0.163 |
| **Nitrate (as N)** | 14797-55-8 | E235.NO3/EO | 0.020 | mg/L | | 0.020 | 0.052 | 0.218 | 0.021 | 0.121 |
| **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 | | 12.2 | 52.1 | 40.0 | 42.8 | 129 |
| **Nitrate + Nitrite (as N)** | ---- | EC235.N+N/EO | 0.0500 | mg/L | | <0.0500 | 0.0520 | 0.218 | <0.0500 | 0.121 |
| **Organic / Inorganic Carbon** | | | | | | | | | | |
| **Carbon, dissolved organic [DOC]** | ---- | E358-L/CG | 0.50 | mg/L | | 2.47 | 2.55 | 2.06 | 1.64 | 1.80 |
| **Ion Balance** | | | | | | | | | | |
| **Anion sum** | ---- | EC101/EO | 0.10 | meq/L | | 14.5 | 7.87 | 7.71 | 7.77 | 9.27 |
| **Cation sum** | ---- | EC101/EO | 0.10 | meq/L | | 17.0 | 8.47 | 7.93 | 8.00 | 9.56 |
| **Ion balance (APHA)** | ---- | EC101/EO | 0.01 | % | | 7.94 | 3.67 | 1.41 | 1.46 | 1.54 |
| **Ion balance (cations/anions)** | ---- | EC101/EO | 0.010 | % | | 117 IB:INT | 108 | 103 | 103 | 103 |
| **Dissolved Metals** | | | | | | | | | | |
| **Calcium, dissolved** | 7440-70-2 | E421/EO | 0.050 | mg/L | | 234 | 105 | 88.1 | 85.6 | 115 |
| **Iron, dissolved** | 7439-89-6 | E421/EO | 0.010 | mg/L | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Magnesium, dissolved** | 7439-95-4 | E421/EO | 0.0050 | mg/L | | 54.5 | 22.4 | 20.3 | 21.9 | 24.7 |
| **Manganese, dissolved** | 7439-96-5 | E421/EO | 0.00010 | mg/L | | 0.742 | 0.795 | 0.824 | 0.0113 | 0.00200 |
| **Potassium, dissolved** | 7440-09-7 | E421/EO | 0.050 | mg/L | | 3.30 | 5.40 | 5.76 | 2.36 | 4.16 |
| **Sodium, dissolved** | 7440-23-5 | E421/EO | 0.050 | mg/L | | 17.5 | 28.1 | 38.9 | 43.0 | 38.6 |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 27-SH | 07-IN | 07(R)SS | 08-SH | 08-IN |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 11:00 | 29-Sep-2023 10:50 | 29-Sep-2023 11:10 | 27-Sep-2023 16:35 | 27-Sep-2023 16:31 |
| | | | | | | EO2308922-016 | EO2308922-017 | EO2308922-018 | EO2308922-019 | EO2308922-020 |
| | | | | | | Result | Result | Result | Result | Result |
| **Dissolved Metals** | | | | | | | | | | |
| **Dissolved mercury filtration location** | ---- | EP509/EO | - | - | | Laboratory | Laboratory | Laboratory | Field | Field |
| **Dissolved metals filtration location** | ---- | EP421/EO | - | - | | Laboratory | Laboratory | Laboratory | Field | Field |
| **Aluminum, dissolved** | 7429-90-5 | E421/EO | 0.0010 | mg/L | | 0.0019 | <0.0010 | <0.0010 | <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 | 0.00252 | 0.00020 | 0.00059 | <0.00010 |
| **Barium, dissolved** | 7440-39-3 | E421/EO | 0.00010 | mg/L | | 0.861 | 0.150 | 0.0780 | 0.204 | 0.0572 |
| **Boron, dissolved** | 7440-42-8 | E421/EO | 0.010 | mg/L | | 0.069 | 0.184 | 0.038 | 0.062 | 0.172 |
| **Cadmium, dissolved** | 7440-43-9 | E421/EO | 0.0000050 | mg/L | | 0.0000068 | 0.000140 | <0.0000050 | 0.0000567 | 0.0000143 |
| **Chromium, dissolved** | 7440-47-3 | E421/EO | 0.00050 | mg/L | | 0.00174 | 0.00160 | 0.00129 | 0.00171 | 0.00460 |
| **Copper, dissolved** | 7440-50-8 | E421/EO | 0.00020 | mg/L | | 0.00025 | 0.00259 | <0.00020 | 0.00058 | 0.00193 |
| **Lead, dissolved** | 7439-92-1 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| **Nickel, dissolved** | 7440-02-0 | E421/EO | 0.00050 | mg/L | | 0.00319 | 0.00414 | 0.00203 | 0.00247 | 0.00194 |
| **Selenium, dissolved** | 7782-49-2 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | <0.000050 | <0.000050 | 0.000095 |
| **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 | | 0.00426 | 0.00528 | 0.000553 | 0.00528 | 0.00350 |
| **Zinc, dissolved** | 7440-66-6 | E421/EO | 0.0010 | mg/L | | 0.0014 | 0.0092 | <0.0010 | 0.0019 | 0.0041 |
| **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 | | ---- | ---- | ---- | 0.020 | ---- |
| **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 | ---- |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 27-SH | 07-IN | 07(R)SS | 08-SH | 08-IN |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 11:00 | 29-Sep-2023 10:50 | 29-Sep-2023 11:10 | 27-Sep-2023 16:35 | 27-Sep-2023 16:31 |
| | | | | | | EO2308922-016 | EO2308922-017 | EO2308922-018 | EO2308922-019 | EO2308922-020 |
| | | | | | | Result | Result | Result | Result | Result |
| **Hydrocarbons Surrogates** | | | | | | | | | | |
| **Dichlorotoluene, 3,4-** | 95-75-0 | E581.F1/EO | 1.0 | % | | 101 | ---- | ---- | 97.0 | ---- |
| **Volatile Organic Compounds Surrogates** | | | | | | | | | | |
| **Bromofluorobenzene, 4-** | 460-00-4 | E611A/EO | 1.0 | % | | 83.7 | ---- | ---- | 79.4 | ---- |
| **Difluorobenzene, 1,4-** | 540-36-3 | E611A/EO | 1.0 | % | | 103 | ---- | ---- | 99.1 | ---- |
| **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** | ---- | 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 | % | | 142 SUR-ND | 123 | 126 | 134 | 135 |
| **Tetrachloro-m-xylene** | 877-09-8 | E687-L/WT | 0.010 | % | | 97.4 | 92.2 | 83.4 | 89.6 | 97.1 |

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## Analytical Results

Sub-Matrix: Water
(Matrix: Water)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 11-SH | 31-SH | 11-IN | 12-SH | 32-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 10:25 | 28-Sep-2023 14:35 | 28-Sep-2023 10:25 | 28-Sep-2023 13:35 | 29-Sep-2023 00:00 |
| | | | | | | EO2308922-021 | EO2308922-022 | EO2308922-023 | EO2308922-024 | EO2308922-025 |
| | | | | | | Result | Result | Result | Result | Result |
| **Physical Tests** | | | | | | | | | | |
| **Hardness (as CaCO3), dissolved** | ---- | EC100/EO | 0.50 | mg/L | | 543 | 533 | 513 | 339 | ---- |
| **Conductivity** | ---- | E100/EO | 2.0 | µS/cm | | 1030 | 1020 | 1080 | 614 | ---- |
| **pH** | ---- | E108/EO | 0.10 | pH units | | 8.11 | 8.16 | 8.23 | 8.27 | ---- |
| **Alkalinity, bicarbonate (as HCO3)** | 71-52-3 | E290/EO | 1.0 | mg/L | | 549 | 497 | 538 | 466 | ---- |
| **Alkalinity, carbonate (as CO3)** | 3812-32-6 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | ---- |
| **Alkalinity, hydroxide (as OH)** | 14280-30-9 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | ---- |
| **Alkalinity, total (as CaCO3)** | ---- | E290/EO | 2.0 | mg/L | | 450 | 408 | 441 | 382 | ---- |
| **Solids, total dissolved [TDS], calculated** | ---- | EC103/EO | 1.0 | mg/L | | 709 | 677 | 709 | 393 | ---- |
| **Anions and Nutrients** | | | | | | | | | | |
| **Chloride** | 16887-00-6 | E235.Cl/EO | 0.50 | mg/L | | <0.50 | <0.50 | <0.50 | <0.50 | ---- |
| **Fluoride** | 16984-48-8 | E235.F/EO | 0.020 | mg/L | | 0.164 | 0.168 | 0.164 | 0.350 | ---- |
| **Nitrate (as N)** | 14797-55-8 | E235.NO3/EO | 0.020 | mg/L | | 0.151 | 0.169 | 0.082 | 0.099 | ---- |
| **Nitrite (as N)** | 14797-65-0 | E235.NO2/EO | 0.010 | mg/L | | <0.010 | <0.010 | <0.010 | <0.010 | ---- |
| **Sulfate (as SO4)** | 14808-79-8 | E235.SO4/EO | 0.30 | mg/L | | 167 | 165 | 181 | 2.76 | ---- |
| **Nitrate + Nitrite (as N)** | ---- | EC235.N+N/EO | 0.0500 | mg/L | | 0.151 | 0.169 | 0.0820 | 0.0990 | ---- |
| **Organic / Inorganic Carbon** | | | | | | | | | | |
| **Carbon, dissolved organic [DOC]** | ---- | E358-L/CG | 0.50 | mg/L | | 7.53 | 8.13 | 9.80 | 2.85 | ---- |
| **Ion Balance** | | | | | | | | | | |
| **Anion sum** | ---- | EC101/EO | 0.10 | meq/L | | 12.5 | 11.6 | 12.6 | 7.72 | ---- |
| **Cation sum** | ---- | EC101/EO | 0.10 | meq/L | | 13.0 | 12.6 | 12.3 | 7.34 | ---- |
| **Ion balance (APHA)** | ---- | EC101/EO | 0.01 | % | | 1.96 | 4.13 | -1.20 | -2.52 | ---- |
| **Ion balance (cations/anions)** | ---- | EC101/EO | 0.010 | % | | 104 | 109 | 97.6 | 95.1 | ---- |
| **Dissolved Metals** | | | | | | | | | | |
| **Calcium, dissolved** | 7440-70-2 | E421/EO | 0.050 | mg/L | | 165 | 163 | 154 | 93.9 | ---- |
| **Iron, dissolved** | 7439-89-6 | E421/EO | 0.010 | mg/L | | 0.066 | 0.062 | 0.090 | <0.010 | ---- |
| **Magnesium, dissolved** | 7439-95-4 | E421/EO | 0.0050 | mg/L | | 31.8 | 30.6 | 31.1 | 25.4 | ---- |
| **Manganese, dissolved** | 7439-96-5 | E421/EO | 0.00010 | mg/L | | 0.522 | 0.511 | 0.634 | 0.0788 | ---- |
| **Potassium, dissolved** | 7440-09-7 | E421/EO | 0.050 | mg/L | | 2.68 | 2.60 | 2.54 | 2.10 | ---- |
| **Sodium, dissolved** | 7440-23-5 | E421/EO | 0.050 | mg/L | | 46.4 | 43.7 | 45.0 | 11.6 | ---- |

## Analytical Results

Sub-Matrix: Water
(Matrix: Water)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 11-SH | 31-SH | 11-IN | 12-SH | 32-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 10:25 | 28-Sep-2023 14:35 | 28-Sep-2023 10:25 | 28-Sep-2023 13:35 | 29-Sep-2023 00:00 |
| | | | | | | EO2308922-021 | EO2308922-022 | EO2308922-023 | EO2308922-024 | EO2308922-025 |
| | | | | | | Result | Result | Result | Result | Result |
| **Dissolved Metals** | | | | | | | | | | |
| **Dissolved mercury filtration location** | ---- | EP509/EO | - | - | | Field | Field | Field | Field | ---- |
| **Dissolved metals filtration location** | ---- | EP421/EO | - | - | | Field | Field | Field | Field | ---- |
| **Aluminum, dissolved** | 7429-90-5 | E421/EO | 0.0010 | mg/L | | 0.0013 | <0.0010 | <0.0010 | <0.0010 | ---- |
| **Antimony, dissolved** | 7440-36-0 | E421/EO | 0.00010 | mg/L | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | ---- |
| **Arsenic, dissolved** | 7440-38-2 | E421/EO | 0.00010 | mg/L | | 0.00018 | 0.00017 | 0.00016 | 0.00082 | ---- |
| **Barium, dissolved** | 7440-39-3 | E421/EO | 0.00010 | mg/L | | 0.244 | 0.230 | 0.288 | 0.390 | ---- |
| **Boron, dissolved** | 7440-42-8 | E421/EO | 0.010 | mg/L | | 0.133 | 0.132 | 0.129 | 0.040 | ---- |
| **Cadmium, dissolved** | 7440-43-9 | E421/EO | 0.0000050 | mg/L | | 0.0000268 | 0.0000259 | 0.0000217 | 0.0000279 | ---- |
| **Chromium, dissolved** | 7440-47-3 | E421/EO | 0.00050 | mg/L | | 0.00145 | 0.00131 | 0.00135 | 0.00182 | ---- |
| **Copper, dissolved** | 7440-50-8 | E421/EO | 0.00020 | mg/L | | 0.00114 | 0.00100 | 0.00113 | 0.00107 | ---- |
| **Lead, dissolved** | 7439-92-1 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | <0.000050 | 0.000053 | ---- |
| **Nickel, dissolved** | 7440-02-0 | E421/EO | 0.00050 | mg/L | | 0.00233 | 0.00248 | 0.00255 | 0.00150 | ---- |
| **Selenium, dissolved** | 7782-49-2 | E421/EO | 0.000050 | mg/L | | 0.000099 | 0.000118 | <0.000050 | <0.000050 | ---- |
| **Silver, dissolved** | 7440-22-4 | E421/EO | 0.000010 | mg/L | | <0.000010 | <0.000010 | <0.000010 | <0.000010 | ---- |
| **Uranium, dissolved** | 7440-61-1 | E421/EO | 0.000010 | mg/L | | 0.00389 | 0.00382 | 0.00312 | 0.00606 | ---- |
| **Zinc, dissolved** | 7440-66-6 | E421/EO | 0.0010 | mg/L | | 0.0030 | 0.0025 | 0.0031 | 0.0307 | ---- |
| **Mercury, dissolved** | 7439-97-6 | E509/EO | 0.0000050 | mg/L | | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | ---- |
| **Aggregate Organics** | | | | | | | | | | |
| **Adsorbable organic halogens, [AOX], (as Cl)** | ---- | AOX/1D | 10 | mg/L | | ---- | ---- | ---- | 0.020 | 0.020 |
| **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 | ---- |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 11-SH | 31-SH | 11-IN | 12-SH | 32-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 10:25 | 28-Sep-2023 14:35 | 28-Sep-2023 10:25 | 28-Sep-2023 13:35 | 29-Sep-2023 00:00 |
| | | | | | | EO2308922-021 | EO2308922-022 | EO2308922-023 | EO2308922-024 | EO2308922-025 |
| | | | | | | Result | Result | Result | Result | Result |
| **Hydrocarbons Surrogates** | | | | | | | | | | |
| **Dichlorotoluene, 3,4-** | 95-75-0 | E581.F1/EO | 1.0 | % | | 75.8 | 84.8 | ---- | 97.4 | ---- |
| **Volatile Organic Compounds Surrogates** | | | | | | | | | | |
| **Bromofluorobenzene, 4-** | 460-00-4 | E611A/EO | 1.0 | % | | 87.5 | 85.1 | ---- | 89.0 | ---- |
| **Difluorobenzene, 1,4-** | 540-36-3 | E611A/EO | 1.0 | % | | 105 | 103 | ---- | 105 | ---- |
| **Polychlorinated Biphenyls** | | | | | | | | | | |
| **Aroclor 1016** | 12674-11-2 | E687-L/WT | 0.0100 | µg/L | | <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 | ---- |
| **Aroclor 1232** | 11141-16-5 | E687-L/WT | 0.0100 | µg/L | | <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 | ---- |
| **Aroclor 1248** | 12672-29-6 | E687-L/WT | 0.0100 | µg/L | | <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 | ---- |
| **Aroclor 1260** | 11096-82-5 | E687-L/WT | 0.0100 | µg/L | | <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 | ---- |
| **Aroclor 1268** | 11100-14-4 | E687-L/WT | 0.0100 | µg/L | | <0.0100 | <0.0100 | <0.0100 | <0.0100 | ---- |
| **Polychlorinated biphenyls [PCBs], total** | ---- | E687-L/WT | 0.0300 | µg/L | | <0.0300 | <0.0300 | <0.0300 | <0.0300 | ---- |
| **Polychlorinated Biphenyls Surrogates** | | | | | | | | | | |
| **Decachlorobiphenyl** | 2051-24-3 | E687-L/WT | 0.010 | % | | 126 | 129 | 121 | 147 SUR-ND | ---- |
| **Tetrachloro-m-xylene** | 877-09-8 | E687-L/WT | 0.010 | % | | 91.3 | 94.7 | 83.2 | 98.3 | ---- |

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 12-IN | 13-SH | 13-IN | 14-SH | 15-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 13:30 | 28-Sep-2023 17:34 | 28-Sep-2023 17:27 | 27-Sep-2023 05:40 | 28-Sep-2023 11:32 |
| | | | | | | EO2308922-026 | EO2308922-027 | EO2308922-028 | EO2308922-029 | EO2308922-030 |
| | | | | | | Result | Result | Result | Result | Result |
| **Physical Tests** | | | | | | | | | | |
| **Hardness (as CaCO3), dissolved** | ---- | EC100/EO | 0.50 | mg/L | | 283 | 537 | 318 | 308 | 346 |
| **Conductivity** | ---- | E100/EO | 2.0 | µS/cm | | 680 | 950 | 705 | 856 RRV | 750 |
| **pH** | ---- | E108/EO | 0.10 | pH units | | 8.11 | 7.89 | 8.17 | 8.12 RRV | 8.33 |
| **Alkalinity, bicarbonate (as HCO3)** | 71-52-3 | E290/EO | 1.0 | mg/L | | 430 | 621 | 396 | 560 RRV | 503 |
| **Alkalinity, carbonate (as CO3)** | 3812-32-6 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 RRV | 5.3 |
| **Alkalinity, hydroxide (as OH)** | 14280-30-9 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 RRV | <1.0 |
| **Alkalinity, total (as CaCO3)** | ---- | E290/EO | 2.0 | mg/L | | 353 | 509 | 324 | 459 RRV | 421 |
| **Solids, total dissolved [TDS], calculated** | ---- | EC103/EO | 1.0 | mg/L | | 446 | 626 | 449 | 444 | 440 |
| **Anions and Nutrients** | | | | | | | | | | |
| **Chloride** | 16887-00-6 | E235.Cl/EO | 0.50 | mg/L | | <0.50 | <0.50 | <0.50 | 2.49 RRV | <0.50 |
| **Fluoride** | 16984-48-8 | E235.F/EO | 0.020 | mg/L | | 0.226 | 0.136 | 0.167 | 0.176 | 0.206 |
| **Nitrate (as N)** | 14797-55-8 | E235.NO3/EO | 0.020 | mg/L | | 0.099 | <0.020 | <0.020 | 0.104 | 0.163 |
| **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 | | 63.0 | 81.4 | 86.2 | 26.3 RRV | 10.1 |
| **Nitrate + Nitrite (as N)** | ---- | EC235.N+N/EO | 0.0500 | mg/L | | 0.0990 | <0.0500 | <0.0500 | 0.104 | 0.163 |
| **Organic / Inorganic Carbon** | | | | | | | | | | |
| **Carbon, dissolved organic [DOC]** | ---- | E358-L/CG | 0.50 | mg/L | | 2.97 | 8.39 | 2.50 | 2.84 | 4.56 |
| **Ion Balance** | | | | | | | | | | |
| **Anion sum** | ---- | EC101/EO | 0.10 | meq/L | | 8.38 | 11.9 | 8.28 | 9.81 | 8.65 |
| **Cation sum** | ---- | EC101/EO | 0.10 | meq/L | | 7.56 | 11.4 | 7.93 | 6.77 | 8.14 |
| **Ion balance (APHA)** | ---- | EC101/EO | 0.01 | % | | -5.14 | -2.14 | -2.16 | -18.3 | -3.04 |
| **Ion balance (cations/anions)** | ---- | EC101/EO | 0.010 | % | | 90.2 | 95.8 | 95.8 | 69.0 IB:INT | 94.1 |
| **Dissolved Metals** | | | | | | | | | | |
| **Calcium, dissolved** | 7440-70-2 | E421/EO | 0.050 | mg/L | | 82.1 | 153 | 94.9 | 81.6 RRV | 102 |
| **Iron, dissolved** | 7439-89-6 | E421/EO | 0.010 | mg/L | | <0.010 | <0.010 | 0.016 | <0.010 RRV | 0.049 |
| **Magnesium, dissolved** | 7439-95-4 | E421/EO | 0.0050 | mg/L | | 19.0 | 37.6 | 19.8 | 25.3 RRV | 22.2 |
| **Manganese, dissolved** | 7439-96-5 | E421/EO | 0.00010 | mg/L | | 0.687 | 0.238 | 0.0103 | 0.00668 RRV | 0.629 |
| **Potassium, dissolved** | 7440-09-7 | E421/EO | 0.050 | mg/L | | 3.85 | 2.00 | 3.86 | 1.90 RRV | 3.25 |
| **Sodium, dissolved** | 7440-23-5 | E421/EO | 0.050 | mg/L | | 40.7 | 13.7 | 33.8 | 13.1 RRV | 25.8 |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 12-IN | 13-SH | 13-IN | 14-SH | 15-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 13:30 | 28-Sep-2023 17:34 | 28-Sep-2023 17:27 | 27-Sep-2023 05:40 | 28-Sep-2023 11:32 |
| | | | | | | EO2308922-026 | EO2308922-027 | EO2308922-028 | EO2308922-029 | EO2308922-030 |
| | | | | | | Result | Result | Result | Result | Result |
| **Dissolved Metals** | | | | | | | | | | |
| **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 | | 0.0078 | <0.0010 | 0.0020 | 0.0049 RRV | <0.0010 |
| **Antimony, dissolved** | 7440-36-0 | E421/EO | 0.00010 | mg/L | | <0.00010 | 0.00034 | <0.00010 | 0.00023 RRV | <0.00010 |
| **Arsenic, dissolved** | 7440-38-2 | E421/EO | 0.00010 | mg/L | | 0.00558 | 0.00088 | 0.00025 | 0.00024 RRV | 0.00022 |
| **Barium, dissolved** | 7440-39-3 | E421/EO | 0.00010 | mg/L | | 0.143 | 0.277 | 0.136 | 0.266 RRV | 0.442 |
| **Boron, dissolved** | 7440-42-8 | E421/EO | 0.010 | mg/L | | 0.128 | 0.059 | 0.109 | 0.064 RRV | 0.186 |
| **Cadmium, dissolved** | 7440-43-9 | E421/EO | 0.0000050 | mg/L | | 0.0000754 | 0.000179 | 0.0000079 | 0.00310 RRV | 0.0000116 |
| **Chromium, dissolved** | 7440-47-3 | E421/EO | 0.00050 | mg/L | | <0.00050 | 0.00189 | 0.00222 | 0.00434 RRV | 0.00190 |
| **Copper, dissolved** | 7440-50-8 | E421/EO | 0.00020 | mg/L | | 0.0175 | 0.00116 | 0.00087 | 0.00193 RRV | 0.00070 |
| **Lead, dissolved** | 7439-92-1 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | <0.000050 | <0.000050 RRV | <0.000050 |
| **Nickel, dissolved** | 7440-02-0 | E421/EO | 0.00050 | mg/L | | 0.00656 | 0.00788 | 0.00243 | 0.00660 RRV | 0.0162 |
| **Selenium, dissolved** | 7782-49-2 | E421/EO | 0.000050 | mg/L | | <0.000050 | 0.000171 | <0.000050 | 0.000052 RRV | 0.000051 |
| **Silver, dissolved** | 7440-22-4 | E421/EO | 0.000010 | mg/L | | <0.000010 | <0.000010 | <0.000010 | <0.000010 RRV | <0.000010 |
| **Uranium, dissolved** | 7440-61-1 | E421/EO | 0.000010 | mg/L | | 0.00228 | 0.00464 | 0.00287 | 0.00530 RRV | 0.00195 |
| **Zinc, dissolved** | 7440-66-6 | E421/EO | 0.0010 | mg/L | | 0.165 | 0.0040 | 0.0011 | 0.0222 RRV | 0.0020 |
| **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 | | ---- | 0.062 | ---- | ---- | 0.020 |
| **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 |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 12-IN | 13-SH | 13-IN | 14-SH | 15-SH |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 13:30 | 28-Sep-2023 17:34 | 28-Sep-2023 17:27 | 27-Sep-2023 05:40 | 28-Sep-2023 11:32 |
| | | | | | | EO2308922-026 | EO2308922-027 | EO2308922-028 | EO2308922-029 | EO2308922-030 |
| | | | | | | Result | Result | Result | Result | Result |
| **Hydrocarbons Surrogates** | | | | | | | | | | |
| **Dichlorotoluene, 3,4-** | 95-75-0 | E581.F1/EO | 1.0 | % | | ---- | 75.1 | ---- | 70.6 | 80.1 |
| **Volatile Organic Compounds Surrogates** | | | | | | | | | | |
| **Bromofluorobenzene, 4-** | 460-00-4 | E611A/EO | 1.0 | % | | ---- | 83.9 | ---- | 84.9 | 84.9 |
| **Difluorobenzene, 1,4-** | 540-36-3 | E611A/EO | 1.0 | % | | ---- | 105 | ---- | 100 | 106 |
| **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** | ---- | 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 | % | | 125 | 147 SUR-ND | 132 | 133 | 140 |
| **Tetrachloro-m-xylene** | 877-09-8 | E687-L/WT | 0.010 | % | | 82.9 | 102 | 91.4 | 88.2 | 94.0 |

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 15-IN | 16-SH | 17-SH | 17-IN | 89-3 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 11:40 | 28-Sep-2023 17:00 | 28-Sep-2023 10:45 | 28-Sep-2023 10:30 | 29-Sep-2023 12:10 |
| | | | | | | EO2308922-031 | EO2308922-032 | EO2308922-033 | EO2308922-034 | EO2308922-035 |
| | | | | | | Result | Result | Result | Result | Result |
| **Physical Tests** | | | | | | | | | | |
| **Hardness (as CaCO3), dissolved** | ---- | EC100/EO | 0.50 | mg/L | | 349 | 381 | 320 | 351 | 171 |
| **Conductivity** | ---- | E100/EO | 2.0 | µS/cm | | 756 | 734 | 634 | 753 | 372 |
| **pH** | ---- | E108/EO | 0.10 | pH units | | 8.25 | 8.21 | 8.27 | 8.14 | 8.25 |
| **Alkalinity, bicarbonate (as HCO3)** | 71-52-3 | E290/EO | 1.0 | mg/L | | 443 | 475 | 400 | 475 | 242 |
| **Alkalinity, carbonate (as CO3)** | 3812-32-6 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Alkalinity, hydroxide (as OH)** | 14280-30-9 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| **Alkalinity, total (as CaCO3)** | ---- | E290/EO | 2.0 | mg/L | | 363 | 390 | 328 | 389 | 198 |
| **Solids, total dissolved [TDS], calculated** | ---- | EC103/EO | 1.0 | mg/L | | 468 | 454 | 395 | 462 | 247 |
| **Anions and Nutrients** | | | | | | | | | | |
| **Chloride** | 16887-00-6 | E235.Cl/EO | 0.50 | mg/L | | <0.50 | 0.78 | 9.42 | <0.50 | <0.50 |
| **Fluoride** | 16984-48-8 | E235.F/EO | 0.020 | mg/L | | 0.155 | 0.217 | 0.255 | 0.168 | 0.163 |
| **Nitrate (as N)** | 14797-55-8 | E235.NO3/EO | 0.020 | mg/L | | 0.123 | 0.186 | <0.020 | 0.257 | <0.020 |
| **Nitrite (as N)** | 14797-65-0 | E235.NO2/EO | 0.010 | mg/L | | 0.021 | <0.010 | <0.010 | <0.010 | <0.010 |
| **Sulfate (as SO4)** | 14808-79-8 | E235.SO4/EO | 0.30 | mg/L | | 67.7 | 35.8 | 26.8 | 49.7 | 17.0 |
| **Nitrate + Nitrite (as N)** | ---- | EC235.N+N/EO | 0.0500 | mg/L | | 0.144 | 0.186 | <0.0500 | 0.257 | <0.0500 |
| **Organic / Inorganic Carbon** | | | | | | | | | | |
| **Carbon, dissolved organic [DOC]** | ---- | E358-L/CG | 0.50 | mg/L | | 4.07 | 3.71 | 2.72 | 3.17 | 1.34 |
| **Ion Balance** | | | | | | | | | | |
| **Anion sum** | ---- | EC101/EO | 0.10 | meq/L | | 8.68 | 8.58 | 7.39 | 8.84 | 4.32 |
| **Cation sum** | ---- | EC101/EO | 0.10 | meq/L | | 8.52 | 8.64 | 7.30 | 8.31 | 4.07 |
| **Ion balance (APHA)** | ---- | EC101/EO | 0.01 | % | | -0.93 | 0.35 | -0.61 | -3.09 | -2.98 |
| **Ion balance (cations/anions)** | ---- | EC101/EO | 0.010 | % | | 98.2 | 101 | 98.8 | 94.0 | 94.2 |
| **Dissolved Metals** | | | | | | | | | | |
| **Calcium, dissolved** | 7440-70-2 | E421/EO | 0.050 | mg/L | | 104 | 106 | 91.0 | 103 | 45.8 |
| **Iron, dissolved** | 7439-89-6 | E421/EO | 0.010 | mg/L | | <0.010 | 0.010 | <0.010 | 0.012 | <0.010 |
| **Magnesium, dissolved** | 7439-95-4 | E421/EO | 0.0050 | mg/L | | 21.6 | 28.3 | 22.5 | 22.8 | 13.7 |
| **Manganese, dissolved** | 7439-96-5 | E421/EO | 0.00010 | mg/L | | 0.334 | 0.00123 | 0.00052 | 0.163 | 1.08 |
| **Potassium, dissolved** | 7440-09-7 | E421/EO | 0.050 | mg/L | | 4.12 | 3.60 | 1.90 | 3.72 | 2.85 |
| **Sodium, dissolved** | 7440-23-5 | E421/EO | 0.050 | mg/L | | 33.1 | 21.4 | 19.7 | 27.4 | 12.5 |

## Analytical Results

| Sub-Matrix: Water (Matrix: Water) | | | | | Client sample ID | 15-IN | 16-SH | 17-SH | 17-IN | 89-3 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 11:40 | 28-Sep-2023 17:00 | 28-Sep-2023 10:45 | 28-Sep-2023 10:30 | 29-Sep-2023 12:10 |
| Analyte | CAS Number | Method/Lab | LOR | Unit | | EO2308922-031 | EO2308922-032 | EO2308922-033 | EO2308922-034 | EO2308922-035 |
| | | | | | | Result | Result | Result | Result | Result |
| **Dissolved Metals** | | | | | | | | | | |
| Dissolved mercury filtration location | ---- | EP509/EO | - | - | | Field | Field | Field | Field | Laboratory |
| 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 | <0.0010 | <0.0010 | <0.0010 |
| Antimony, dissolved | 7440-36-0 | E421/EO | 0.00010 | mg/L | | <0.00010 | <0.00010 | 0.00011 | <0.00010 | <0.00010 |
| Arsenic, dissolved | 7440-38-2 | E421/EO | 0.00010 | mg/L | | 0.00015 | 0.00013 | 0.00016 | 0.00018 | 0.00056 |
| Barium, dissolved | 7440-39-3 | E421/EO | 0.00010 | mg/L | | 0.157 | 0.150 | 0.254 | 0.122 | 0.101 |
| Boron, dissolved | 7440-42-8 | E421/EO | 0.010 | mg/L | | 0.252 | 0.100 | 0.064 | 0.210 | 0.023 |
| Cadmium, dissolved | 7440-43-9 | E421/EO | 0.0000050 | mg/L | | 0.0000304 | 0.0000082 | 0.0000139 | 0.0000088 | <0.0000050 |
| Chromium, dissolved | 7440-47-3 | E421/EO | 0.00050 | mg/L | | 0.00190 | 0.00436 | 0.00259 | 0.00494 | 0.00226 |
| Copper, dissolved | 7440-50-8 | E421/EO | 0.00020 | mg/L | | 0.00226 | 0.00092 | 0.00119 | 0.00113 | <0.00020 |
| Lead, dissolved | 7439-92-1 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| Nickel, dissolved | 7440-02-0 | E421/EO | 0.00050 | mg/L | | 0.00549 | 0.00280 | 0.00218 | 0.00249 | 0.00110 |
| Selenium, dissolved | 7782-49-2 | E421/EO | 0.000050 | mg/L | | 0.000122 | 0.000502 | 0.000112 | 0.000116 | <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 | | 0.00426 | 0.00884 | 0.00443 | 0.00452 | 0.00159 |
| Zinc, dissolved | 7440-66-6 | E421/EO | 0.0010 | mg/L | | 0.0020 | 0.0023 | 0.0015 | 0.0015 | 0.0079 |
| 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 | | ---- | 0.020 | 0.020 | ---- | ---- |
| **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 | ---- | ---- |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | 15-IN | 16-SH | 17-SH | 17-IN | 89-3 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 28-Sep-2023 11:40 | 28-Sep-2023 17:00 | 28-Sep-2023 10:45 | 28-Sep-2023 10:30 | 29-Sep-2023 12:10 |
| | | | | | | EO2308922-031 | EO2308922-032 | EO2308922-033 | EO2308922-034 | EO2308922-035 |
| | | | | | | Result | Result | Result | Result | Result |
| **Hydrocarbons Surrogates** | | | | | | | | | | |
| **Dichlorotoluene, 3,4-** | 95-75-0 | E581.F1/EO | 1.0 | % | | ---- | 82.0 | 95.5 | ---- | ---- |
| **Volatile Organic Compounds Surrogates** | | | | | | | | | | |
| **Bromofluorobenzene, 4-** | 460-00-4 | E611A/EO | 1.0 | % | | ---- | 82.4 | 82.4 | ---- | ---- |
| **Difluorobenzene, 1,4-** | 540-36-3 | E611A/EO | 1.0 | % | | ---- | 102 | 104 | ---- | ---- |
| **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** | ---- | 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 | % | | 114 | 102 | 85.2 | 109 | 90.6 |
| **Tetrachloro-m-xylene** | 877-09-8 | E687-L/WT | 0.010 | % | | 72.7 | 81.8 | 70.0 | 93.9 | 74.3 |

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | TRIP BLANK | FIELD BLANK | 51-SH | 52-SH | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 29-Sep-2023 00:00 | 29-Sep-2023 14:30 | 02-Oct-2023 13:28 | 02-Oct-2023 13:28 | ---- |
| | | | | | | EO2308922-036 | EO2308922-037 | EO2308922-038 | EO2308922-039 | -------- |
| | | | | | | Result | Result | Result | Result | ---- |
| **Physical Tests** | | | | | | | | | | |
| **Hardness (as CaCO3), dissolved** | ---- | EC100/EO | 0.50 | mg/L | | <0.50 | <0.50 | ---- | ---- | ---- |
| **Conductivity** | ---- | E100/EO | 2.0 | µS/cm | | <2.0 | <2.0 | ---- | ---- | ---- |
| **pH** | ---- | E108/EO | 0.10 | pH units | | 5.39 | 5.31 | ---- | ---- | ---- |
| **Alkalinity, bicarbonate (as HCO3)** | 71-52-3 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | ---- | ---- | ---- |
| **Alkalinity, carbonate (as CO3)** | 3812-32-6 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | ---- | ---- | ---- |
| **Alkalinity, hydroxide (as OH)** | 14280-30-9 | E290/EO | 1.0 | mg/L | | <1.0 | <1.0 | ---- | ---- | ---- |
| **Alkalinity, total (as CaCO3)** | ---- | E290/EO | 2.0 | mg/L | | <2.0 | <2.0 | ---- | ---- | ---- |
| **Solids, total dissolved [TDS], calculated** | ---- | EC103/EO | 1.0 | mg/L | | <1.0 | <1.0 | ---- | ---- | ---- |
| **Anions and Nutrients** | | | | | | | | | | |
| **Chloride** | 16887-00-6 | E235.Cl/EO | 0.50 | mg/L | | <0.50 | <0.50 | ---- | ---- | ---- |
| **Fluoride** | 16984-48-8 | E235.F/EO | 0.020 | mg/L | | <0.020 | <0.020 | ---- | ---- | ---- |
| **Nitrate (as N)** | 14797-55-8 | E235.NO3/EO | 0.020 | mg/L | | <0.020 | <0.020 | ---- | ---- | ---- |
| **Nitrite (as N)** | 14797-65-0 | E235.NO2/EO | 0.010 | mg/L | | <0.010 | <0.010 | ---- | ---- | ---- |
| **Sulfate (as SO4)** | 14808-79-8 | E235.SO4/EO | 0.30 | mg/L | | <0.30 | <0.30 | ---- | ---- | ---- |
| **Nitrate + Nitrite (as N)** | ---- | EC235.N+N/EO | 0.0500 | mg/L | | <0.0500 | <0.0500 | ---- | ---- | ---- |
| **Organic / Inorganic Carbon** | | | | | | | | | | |
| **Carbon, dissolved organic [DOC]** | ---- | E358-L/CG | 0.50 | mg/L | | <0.50 | <0.50 | ---- | ---- | ---- |
| **Ion Balance** | | | | | | | | | | |
| **Anion sum** | ---- | EC101/EO | 0.10 | meq/L | | <0.10 | <0.10 | ---- | ---- | ---- |
| **Cation sum** | ---- | EC101/EO | 0.10 | meq/L | | <0.10 | <0.10 | ---- | ---- | ---- |
| **Ion balance (APHA)** | ---- | EC101/EO | 0.01 | % | | <0.01 | <0.01 | ---- | ---- | ---- |
| **Ion balance (cations/anions)** | ---- | EC101/EO | 0.010 | % | | 100 | 100 | ---- | ---- | ---- |
| **Dissolved Metals** | | | | | | | | | | |
| **Calcium, dissolved** | 7440-70-2 | E421/EO | 0.050 | mg/L | | <0.050 | <0.050 | ---- | ---- | ---- |
| **Iron, dissolved** | 7439-89-6 | E421/EO | 0.010 | mg/L | | <0.010 | <0.010 | ---- | ---- | ---- |
| **Magnesium, dissolved** | 7439-95-4 | E421/EO | 0.0050 | mg/L | | <0.0050 | <0.0050 | ---- | ---- | ---- |
| **Manganese, dissolved** | 7439-96-5 | E421/EO | 0.00010 | mg/L | | <0.00010 | <0.00010 | ---- | ---- | ---- |
| **Potassium, dissolved** | 7440-09-7 | E421/EO | 0.050 | mg/L | | <0.050 | <0.050 | ---- | ---- | ---- |
| **Sodium, dissolved** | 7440-23-5 | E421/EO | 0.050 | mg/L | | <0.050 | <0.050 | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: Water (Matrix: Water) | | | | | Client sample ID | TRIP BLANK | FIELD BLANK | 51-SH | 52-SH | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 29-Sep-2023 00:00 | 29-Sep-2023 14:30 | 02-Oct-2023 13:28 | 02-Oct-2023 13:28 | ---- |
| Analyte | CAS Number | Method/Lab | LOR | Unit | | EO2308922-036 | EO2308922-037 | EO2308922-038 | EO2308922-039 | -------- |
| | | | | | | Result | Result | Result | Result | ---- |
| **Dissolved Metals** | | | | | | | | | | |
| Dissolved mercury filtration location | ---- | EP509/EO | - | - | | Field | Laboratory | ---- | ---- | ---- |
| Dissolved metals filtration location | ---- | EP421/EO | - | - | | Field | Field | ---- | ---- | ---- |
| Aluminum, dissolved | 7429-90-5 | E421/EO | 0.0010 | mg/L | | <0.0010 | <0.0010 | ---- | ---- | ---- |
| Antimony, dissolved | 7440-36-0 | E421/EO | 0.00010 | mg/L | | <0.00010 | <0.00010 | ---- | ---- | ---- |
| Arsenic, dissolved | 7440-38-2 | E421/EO | 0.00010 | mg/L | | <0.00010 | <0.00010 | ---- | ---- | ---- |
| Barium, dissolved | 7440-39-3 | E421/EO | 0.00010 | mg/L | | <0.00010 | <0.00010 | ---- | ---- | ---- |
| Boron, dissolved | 7440-42-8 | E421/EO | 0.010 | mg/L | | <0.010 | <0.010 | ---- | ---- | ---- |
| Cadmium, dissolved | 7440-43-9 | E421/EO | 0.0000050 | mg/L | | <0.0000050 | <0.0000050 | ---- | ---- | ---- |
| Chromium, dissolved | 7440-47-3 | E421/EO | 0.00050 | mg/L | | <0.00050 | <0.00050 | ---- | ---- | ---- |
| Copper, dissolved | 7440-50-8 | E421/EO | 0.00020 | mg/L | | <0.00020 | <0.00020 | ---- | ---- | ---- |
| Lead, dissolved | 7439-92-1 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | ---- | ---- | ---- |
| Nickel, dissolved | 7440-02-0 | E421/EO | 0.00050 | mg/L | | <0.00050 | <0.00050 | ---- | ---- | ---- |
| Selenium, dissolved | 7782-49-2 | E421/EO | 0.000050 | mg/L | | <0.000050 | <0.000050 | ---- | ---- | ---- |
| Silver, dissolved | 7440-22-4 | E421/EO | 0.000010 | mg/L | | <0.000010 | <0.000010 | ---- | ---- | ---- |
| Uranium, dissolved | 7440-61-1 | E421/EO | 0.000010 | mg/L | | <0.000010 | <0.000010 | ---- | ---- | ---- |
| Zinc, dissolved | 7440-66-6 | E421/EO | 0.0010 | mg/L | | <0.0010 | <0.0010 | ---- | ---- | ---- |
| Mercury, dissolved | 7439-97-6 | E509/EO | 0.0000050 | mg/L | | <0.0000050 | <0.0000050 | ---- | ---- | ---- |
| **Aggregate Organics** | | | | | | | | | | |
| Adsorbable organic halogens, [AOX], (as Cl) | ---- | AOX/1D | 10 | mg/L | | ---- | 0.020 | ---- | ---- | ---- |
| **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 | ---- | ---- | ---- |

## Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

| Analyte | CAS Number | Method/Lab | LOR | Unit | Client sample ID | TRIP BLANK | FIELD BLANK | 51-SH | 52-SH | ---- |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Client sampling date / time | 29-Sep-2023 00:00 | 29-Sep-2023 14:30 | 02-Oct-2023 13:28 | 02-Oct-2023 13:28 | ---- |
| | | | | | | EO2308922-036 | EO2308922-037 | EO2308922-038 | EO2308922-039 | -------- |
| | | | | | | Result | Result | Result | Result | ---- |
| **Hydrocarbons Surrogates** | | | | | | | | | | |
| **Dichlorotoluene, 3,4-** | 95-75-0 | E581.F1/EO | 1.0 | % | | 84.8 | 93.0 | ---- | ---- | ---- |
| **Volatile Organic Compounds Surrogates** | | | | | | | | | | |
| **Bromofluorobenzene, 4-** | 460-00-4 | E611A/EO | 1.0 | % | | 80.8 | 84.0 | ---- | ---- | ---- |
| **Difluorobenzene, 1,4-** | 540-36-3 | E611A/EO | 1.0 | % | | 104 | 99.5 | ---- | ---- | ---- |
| **Polychlorinated Biphenyls** | | | | | | | | | | |
| **Aroclor 1016** | 12674-11-2 | E687-L/WT | 0.0100 | µg/L | | ---- | <0.0100 | <0.0500 DLM | <0.0500 DLM | ---- |
| **Aroclor 1221** | 11104-28-2 | E687-L/WT | 0.0100 | µg/L | | ---- | <0.0100 | <0.0500 DLM | <0.0500 DLM | ---- |
| **Aroclor 1232** | 11141-16-5 | E687-L/WT | 0.0100 | µg/L | | ---- | <0.0100 | <0.0500 DLM | <0.0500 DLM | ---- |
| **Aroclor 1242** | 53469-21-9 | E687-L/WT | 0.0100 | µg/L | | ---- | <0.0100 | 1.10 | 0.962 | ---- |
| **Aroclor 1248** | 12672-29-6 | E687-L/WT | 0.0100 | µg/L | | ---- | <0.0100 | <0.0500 DLM | <0.0500 DLM | ---- |
| **Aroclor 1254** | 11097-69-1 | E687-L/WT | 0.0100 | µg/L | | ---- | <0.0100 | 0.996 | 0.879 | ---- |
| **Aroclor 1260** | 11096-82-5 | E687-L/WT | 0.0100 | µg/L | | ---- | <0.0100 | 0.997 | 0.945 | ---- |
| **Aroclor 1262** | 37324-23-5 | E687-L/WT | 0.0100 | µg/L | | ---- | <0.0100 | <0.0500 DLM | <0.0500 DLM | ---- |
| **Aroclor 1268** | 11100-14-4 | E687-L/WT | 0.0100 | µg/L | | ---- | <0.0100 | <0.0500 DLM | <0.0500 DLM | ---- |
| **Polychlorinated biphenyls [PCBs], total** | ---- | E687-L/WT | 0.0300 | µg/L | | ---- | <0.0300 | 3.09 | 2.79 | ---- |
| **Polychlorinated Biphenyls Surrogates** | | | | | | | | | | |
| **Decachlorobiphenyl** | 2051-24-3 | E687-L/WT | 0.010 | % | | ---- | 85.7 | 104 | 93.8 | ---- |
| **Tetrachloro-m-xylene** | 877-09-8 | E687-L/WT | 0.010 | % | | ---- | 80.5 | 89.1 | 81.7 | ---- |

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

ALS Canada Ltd.

right solutions.
right partner.

# QUALITY CONTROL INTERPRETIVE REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **EO2308922** | Page | : 1 of 63 |
| Client | : **AECOM Canada Ltd.** | Laboratory | : ALS Environmental - Edmonton |
| Contact | : Michael Steed | Account Manager | : Megha Walia |
| Address | : 101 - 18817 Stony Plain Rd. NW<br>Edmonton AB Canada T5S 0C2 | Address | : 9450 - 17 Avenue NW<br>Edmonton, Alberta Canada T6N 1M9 |
| Telephone | : 780 486 7000 | Telephone | : +1 780 413 5227 |
| Project | : Swan Hills - 60716599 | Date Samples Received | : 30-Sep-2023 08:04 |
| PO | : ---- | Issue Date | : 12-Oct-2023 16:54 |
| C-O-C number | : ---- | | |
| Sampler | : ---- | | |
| Site | : | | |
| Quote number | : EO22-AECO100-016 | | |
| No. of samples received | : 39 | | |
| No. of samples analysed | : 39 | | |

**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
- Matrix Spike outliers occur - please see following pages for full details.
- Test sample Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.

### *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.

## Outliers : Quality Control Samples

*Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes*

Matrix: **Water**

| Analyte Group | Laboratory sample ID | Client/Ref Sample ID | Analyte | CAS Number | Method | Result | Limits | Comment |
|---|---|---|---|---|---|---|---|---|
| **Matrix Spike (MS) Recoveries** | | | | | | | | |
| Dissolved Metals | EO2308922-002 | 01A-IN | Silver, dissolved | 7440-22-4 | E421 | 66.0 % MES | 70.0-130% | Recovery less than lower data quality objective |
| Dissolved Metals | EO2308922-022 | 31-SH | Silver, dissolved | 7440-22-4 | E421 | 52.6 % MS-Ag | 70.0-130% | Recovery less than lower data quality objective |

## Result Qualifiers

| Qualifier | Description |
|---|---|
| *MES* | *Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).* |
| *MS-Ag* | *MS-Ag: Matrix Spike recovery for silver was marginally below DQO (40 to <60%) due to its instability in the sample matrix. Silver was not detected. Reported result (< LOR) is reliable* |

### Regular Sample Surrogates

Sub-Matrix: **Water**

| Analyte Group | Laboratory sample ID | Client/Ref Sample ID | Analyte | CAS Number | Result | Limits | Comment |
|---|---|---|---|---|---|---|---|
| **Samples Submitted** | | | | | | | |
| Polychlorinated Biphenyls Surrogates | EO2308922-016 | 27-SH | Decachlorobiphenyl | 2051-24-3 | 142 % | 50.0-140 % | Recovery greater than upper data quality objective |
| Polychlorinated Biphenyls Surrogates | EO2308922-024 | 12-SH | Decachlorobiphenyl | 2051-24-3 | 147 % | 50.0-140 % | Recovery greater than upper data quality objective |
| Polychlorinated Biphenyls Surrogates | EO2308922-027 | 13-SH | Decachlorobiphenyl | 2051-24-3 | 147 % | 50.0-140 % | Recovery greater than upper data quality objective |

## 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 / 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 Adsortption and Coulometric** | | | | | | | | | | |
| **Amber glass (nitric acid)** 03-SH | AOX | 29-Sep-2023 | ---- | ---- | ---- | | 09-Oct-2023 | 180 days | 10 days | ✓ |
| **Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsortption and Coulometric** | | | | | | | | | | |
| **Amber glass (nitric acid)** 32-SH | AOX | 29-Sep-2023 | ---- | ---- | ---- | | 10-Oct-2023 | 180 days | 11 days | ✓ |
| **Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsortption and Coulometric** | | | | | | | | | | |
| **Amber glass (nitric acid)** FIELD BLANK | AOX | 29-Sep-2023 | ---- | ---- | ---- | | 10-Oct-2023 | 180 days | 11 days | ✓ |
| **Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsortption and Coulometric** | | | | | | | | | | |
| **Amber glass (nitric acid)** 08-SH | AOX | 27-Sep-2023 | ---- | ---- | ---- | | 09-Oct-2023 | 180 days | 12 days | ✓ |
| **Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsortption and Coulometric** | | | | | | | | | | |
| **Amber glass (nitric acid)** 12-SH | AOX | 28-Sep-2023 | ---- | ---- | ---- | | 10-Oct-2023 | 180 days | 12 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 Adsortption and Coulometric** | | | | | | | | | | |
| **Amber glass (nitric acid)** 13-SH | AOX | 28-Sep-2023 | ---- | ---- | ---- | | 10-Oct-2023 | 180 days | 12 days | ✓ |
| **Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsortption and Coulometric** | | | | | | | | | | |
| **Amber glass (nitric acid)** 15-SH | AOX | 28-Sep-2023 | ---- | ---- | ---- | | 10-Oct-2023 | 180 days | 12 days | ✓ |
| **Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsortption and Coulometric** | | | | | | | | | | |
| **Amber glass (nitric acid)** 16-SH | AOX | 28-Sep-2023 | ---- | ---- | ---- | | 10-Oct-2023 | 180 days | 12 days | ✓ |
| **Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsortption and Coulometric** | | | | | | | | | | |
| **Amber glass (nitric acid)** 17-SH | AOX | 28-Sep-2023 | ---- | ---- | ---- | | 10-Oct-2023 | 180 days | 12 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** 03-IN | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** 03-SH | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** 04-IN | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** 04-SH | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| 04-SS | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-(R)IN | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-SH | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07(R)SS | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-IN | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-SH | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SS | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 89-3 | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| FIELD BLANK | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| TRIP BLANK | E235.Cl | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 01A-IN | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 01A-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-IN | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-SS | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 11-IN | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 11-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-IN | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| 12-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-IN | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-IN | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 16-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 17-IN | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 17-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| 27-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 31-SH | E235.Cl | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 08-IN | E235.Cl | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 02-Oct-2023 | 28 days | 5 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 08-SH | E235.Cl | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 02-Oct-2023 | 28 days | 5 days | ✓ |
| **Anions and Nutrients : Chloride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 14-SH | E235.Cl | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 02-Oct-2023 | 28 days | 6 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 03-IN | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 03-SH | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 04-IN | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 04-SH | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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-SS | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-(R)IN | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-SH | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07(R)SS | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-IN | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-SH | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SS | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 89-3 | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| FIELD BLANK | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| TRIP BLANK | E235.F | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 01A-IN | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 01A-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-IN | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-SS | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 11-IN | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 11-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-IN | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| 12-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-IN | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-IN | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 16-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 17-IN | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 17-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| 27-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 31-SH | E235.F | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 08-IN | E235.F | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 02-Oct-2023 | 28 days | 5 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 08-SH | E235.F | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 02-Oct-2023 | 28 days | 5 days | ✓ |
| **Anions and Nutrients : Fluoride in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 14-SH | E235.F | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 02-Oct-2023 | 28 days | 6 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 03-IN | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 03-SH | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 04-IN | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 04-SH | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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-SS | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-(R)IN | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-SH | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07(R)SS | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-IN | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-SH | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SS | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 89-3 | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| FIELD BLANK | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| TRIP BLANK | E235.NO3 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-IN | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-IN | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-IN | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 16-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 31-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** 01A-IN | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** 01A-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** 05-SS | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** 11-IN | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** 11-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** 15-IN | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** 15-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** 17-IN | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | ✗ EHT | 02-Oct-2023 | 3 days | 4 days | ✗ EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 27-SH | E235.NO3 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | ✗ EHT | 02-Oct-2023 | 3 days | 4 days | ✗ EHT |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 08-IN | E235.NO3 | 27-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | ✗ EHTL | 02-Oct-2023 | 3 days | 5 days | ✗ EHTL |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 08-SH | E235.NO3 | 27-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | ✗ EHTL | 02-Oct-2023 | 3 days | 5 days | ✗ EHTL |
| **Anions and Nutrients : Nitrate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 14-SH | E235.NO3 | 27-Sep-2023 | 02-Oct-2023 | 3 days | 5 days | ✗ EHTL | 02-Oct-2023 | 3 days | 5 days | ✗ EHTL |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 03-IN | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 03-SH | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 04-IN | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 04-SH | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 04-SS | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-(R)IN | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-SH | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07(R)SS | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-IN | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-SH | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SS | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 89-3 | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| FIELD BLANK | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| TRIP BLANK | E235.NO2 | 29-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 3 days | ✓ |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-IN | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-IN | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-IN | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 16-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 31-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 3 days | ✓ | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 01A-IN | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 01A-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-SS | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 11-IN | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 11-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-IN | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 17-IN | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | × EHT | 02-Oct-2023 | 3 days | 4 days | × EHT |

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 17-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | ✗ EHT | 02-Oct-2023 | 3 days | 4 days | ✗ EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** 27-SH | E235.NO2 | 28-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | ✗ EHT | 02-Oct-2023 | 3 days | 4 days | ✗ EHT |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** 08-IN | E235.NO2 | 27-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | ✗ EHTL | 02-Oct-2023 | 3 days | 5 days | ✗ EHTL |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** 08-SH | E235.NO2 | 27-Sep-2023 | 02-Oct-2023 | 3 days | 4 days | ✗ EHTL | 02-Oct-2023 | 3 days | 5 days | ✗ EHTL |
| **Anions and Nutrients : Nitrite in Water by IC** | | | | | | | | | | |
| **HDPE** 14-SH | E235.NO2 | 27-Sep-2023 | 02-Oct-2023 | 3 days | 5 days | ✗ EHTL | 02-Oct-2023 | 3 days | 5 days | ✗ EHTL |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** 03-IN | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** 03-SH | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** 04-IN | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** 04-SH | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 04-SS | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-(R)IN | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-SH | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07(R)SS | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-IN | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-SH | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SS | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 89-3 | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| FIELD BLANK | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| TRIP BLANK | E235.SO4 | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 02-Oct-2023 | 28 days | 3 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 01A-IN | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 01A-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-IN | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 05-SS | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 11-IN | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 11-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-IN | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-IN | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-IN | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 16-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 17-IN | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 17-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 31-SH | E235.SO4 | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 02-Oct-2023 | 28 days | 4 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 08-IN | E235.SO4 | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 02-Oct-2023 | 28 days | 5 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 08-SH | E235.SO4 | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 02-Oct-2023 | 28 days | 5 days | ✓ |
| **Anions and Nutrients : Sulfate in Water by IC** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 14-SH | E235.SO4 | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 02-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 89-3 | E509 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 117 hrs | × UCP | 04-Oct-2023 | 0 hrs | 117 hrs | × UCP |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-(R)IN | E509 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 118 hrs | × UCP | 04-Oct-2023 | 0 hrs | 118 hrs | × UCP |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07(R)SS | E509 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 118 hrs | × UCP | 04-Oct-2023 | 0 hrs | 118 hrs | × UCP |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 07-IN | E509 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 118 hrs | × UCP | 04-Oct-2023 | 0 hrs | 118 hrs | × UCP |

Matrix: **Water**

Evaluation: ✗ = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| **HDPE** 07-SH | E509 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 118 hrs | ✗ UCP | 04-Oct-2023 | 0 hrs | 118 hrs | ✗ UCP |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **HDPE** 06-SH | E509 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 119 hrs | ✗ UCP | 04-Oct-2023 | 0 hrs | 119 hrs | ✗ UCP |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **HDPE** 27-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 0 hrs | 142 hrs | ✗ UCP | 04-Oct-2023 | 0 hrs | 142 hrs | ✗ UCP |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 03-IN | E509 | 29-Sep-2023 | 04-Oct-2023 | 28 days | 5 days | ✓ | 04-Oct-2023 | 28 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 03-SH | E509 | 29-Sep-2023 | 04-Oct-2023 | 28 days | 5 days | ✓ | 04-Oct-2023 | 28 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 04-IN | E509 | 29-Sep-2023 | 04-Oct-2023 | 28 days | 5 days | ✓ | 04-Oct-2023 | 28 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 04-SH | E509 | 29-Sep-2023 | 04-Oct-2023 | 28 days | 5 days | ✓ | 04-Oct-2023 | 28 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 04-SS | E509 | 29-Sep-2023 | 04-Oct-2023 | 28 days | 5 days | ✓ | 04-Oct-2023 | 28 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 25-SS | E509 | 29-Sep-2023 | 04-Oct-2023 | 28 days | 5 days | ✓ | 04-Oct-2023 | 28 days | 5 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| FIELD BLANK | E509 | 29-Sep-2023 | 04-Oct-2023 | 28 days | 5 days | ✓ | 04-Oct-2023 | 28 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| TRIP BLANK | E509 | 29-Sep-2023 | 04-Oct-2023 | 28 days | 5 days | ✓ | 04-Oct-2023 | 28 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 01A-IN | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 01A-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 05-IN | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 05-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 05-SS | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 11-IN | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 11-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 12-IN | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 12-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 13-IN | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 13-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 15-IN | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 15-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 16-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 17-IN | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** | | | | | | | | | | |
| 17-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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)** 25-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 31-SH | E509 | 28-Sep-2023 | 04-Oct-2023 | 28 days | 6 days | ✓ | 04-Oct-2023 | 28 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 08-IN | E509 | 27-Sep-2023 | 04-Oct-2023 | 28 days | 7 days | ✓ | 04-Oct-2023 | 28 days | 7 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 08-SH | E509 | 27-Sep-2023 | 04-Oct-2023 | 28 days | 7 days | ✓ | 04-Oct-2023 | 28 days | 7 days | ✓ |
| **Dissolved Metals : Dissolved Mercury in Water by CVAAS** | | | | | | | | | | |
| **Glass vial dissolved (hydrochloric acid)** 14-SH | E509 | 27-Sep-2023 | 04-Oct-2023 | 28 days | 7 days | ✓ | 04-Oct-2023 | 28 days | 7 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE** 89-3 | E421 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 121 hrs | × UCP | 04-Oct-2023 | 0 hrs | 121 hrs | × UCP |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE** 07(R)SS | E421 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 122 hrs | × UCP | 04-Oct-2023 | 0 hrs | 122 hrs | × UCP |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE** 07-SH | E421 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 122 hrs | × UCP | 04-Oct-2023 | 0 hrs | 122 hrs | × UCP |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE** 06-(R)IN | E421 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 122 hrs | × UCP | 04-Oct-2023 | 0 hrs | 123 hrs | × UCP |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| 07-IN | E421 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 122 hrs | × UCP | 04-Oct-2023 | 0 hrs | 123 hrs | × UCP |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-SH | E421 | 29-Sep-2023 | 04-Oct-2023 | 0 hrs | 123 hrs | × UCP | 04-Oct-2023 | 0 hrs | 123 hrs | × UCP |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 27-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 0 hrs | 146 hrs | × UCP | 04-Oct-2023 | 0 hrs | 146 hrs | × UCP |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 03-IN | E421 | 29-Sep-2023 | 04-Oct-2023 | 180 days | 5 days | ✓ | 04-Oct-2023 | 180 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 03-SH | E421 | 29-Sep-2023 | 04-Oct-2023 | 180 days | 5 days | ✓ | 04-Oct-2023 | 180 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 04-IN | E421 | 29-Sep-2023 | 04-Oct-2023 | 180 days | 5 days | ✓ | 04-Oct-2023 | 180 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 04-SH | E421 | 29-Sep-2023 | 04-Oct-2023 | 180 days | 5 days | ✓ | 04-Oct-2023 | 180 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 04-SS | E421 | 29-Sep-2023 | 04-Oct-2023 | 180 days | 5 days | ✓ | 04-Oct-2023 | 180 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 25-SS | E421 | 29-Sep-2023 | 04-Oct-2023 | 180 days | 5 days | ✓ | 04-Oct-2023 | 180 days | 5 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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)** | | | | | | | | | | |
| FIELD BLANK | E421 | 29-Sep-2023 | 04-Oct-2023 | 180 days | 5 days | ✓ | 04-Oct-2023 | 180 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| TRIP BLANK | E421 | 29-Sep-2023 | 04-Oct-2023 | 180 days | 5 days | ✓ | 04-Oct-2023 | 180 days | 5 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 01A-IN | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 01A-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 05-IN | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 05-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 05-SS | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 11-IN | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 11-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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-IN | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 12-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 13-IN | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 13-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 15-IN | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 15-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 16-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 17-IN | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** | | | | | | | | | | |
| 17-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** 31-SH | E421 | 28-Sep-2023 | 04-Oct-2023 | 180 days | 6 days | ✓ | 04-Oct-2023 | 180 days | 6 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** 08-IN | E421 | 27-Sep-2023 | 04-Oct-2023 | 180 days | 7 days | ✓ | 04-Oct-2023 | 180 days | 7 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** 08-SH | E421 | 27-Sep-2023 | 04-Oct-2023 | 180 days | 7 days | ✓ | 04-Oct-2023 | 180 days | 7 days | ✓ |
| **Dissolved Metals : Dissolved Metals in Water by CRC ICPMS** | | | | | | | | | | |
| **HDPE dissolved (nitric acid)** 14-SH | E421 | 27-Sep-2023 | 04-Oct-2023 | 180 days | 7 days | ✓ | 04-Oct-2023 | 180 days | 7 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 03-SH | E581.F1 | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 04-SH | E581.F1 | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 06-SH | E581.F1 | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 07-SH | E581.F1 | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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)** | | | | | | | | | | |
| FIELD BLANK | E581.F1 | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| TRIP BLANK | E581.F1 | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 01A-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 05-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 11-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 12-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 13-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 15-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 16-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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)** 17-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 25-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 27-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 31-SH | E581.F1 | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 08-SH | E581.F1 | 27-Sep-2023 | 03-Oct-2023 | 14 days | 6 days | ✓ | 03-Oct-2023 | 14 days | 6 days | ✓ |
| **Hydrocarbons : CCME PHC - F1 by Headspace GC-FID** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 14-SH | E581.F1 | 27-Sep-2023 | 03-Oct-2023 | 14 days | 6 days | ✓ | 03-Oct-2023 | 14 days | 6 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** FIELD BLANK | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 3 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** TRIP BLANK | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 3 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** 03-IN | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 (sulfuric acid)** 03-SH | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** 04-IN | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** 04-SH | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** 04-SS | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** 06-(R)IN | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** 07(R)SS | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** 07-IN | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** 07-SH | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** 25-SS | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 (sulfuric acid)** | | | | | | | | | | |
| 89-3 | E358-L | 29-Sep-2023 | 02-Oct-2023 | 28 days | 3 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 05-IN | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 05-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 12-IN | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 12-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 13-IN | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 13-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 16-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 25-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 (sulfuric acid)** | | | | | | | | | | |
| 31-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 4 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 01A-IN | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 01A-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 05-SS | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 11-IN | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 11-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 15-IN | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 15-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 17-IN | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 (sulfuric acid)** | | | | | | | | | | |
| 17-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 27-SH | E358-L | 28-Sep-2023 | 02-Oct-2023 | 28 days | 4 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 08-IN | E358-L | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 08-SH | E358-L | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 03-Oct-2023 | 28 days | 5 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **Amber glass dissolved (sulfuric acid)** | | | | | | | | | | |
| 14-SH | E358-L | 27-Sep-2023 | 02-Oct-2023 | 28 days | 5 days | ✓ | 03-Oct-2023 | 28 days | 6 days | ✓ |
| **Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 06-SH | E358-L | 29-Sep-2023 | 03-Oct-2023 | 3 days | 4 days | × EHT | 03-Oct-2023 | 28 days | 0 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 03-IN | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 03-SH | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 04-IN | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 04-SH | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 04-SS | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 06-(R)IN | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 06-SH | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 07(R)SS | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 07-IN | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 07-SH | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 25-SS | E290 | 29-Sep-2023 | 05-Oct-2023 | 14 days | 6 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 89-3 | E290 | 29-Sep-2023 | 06-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** FIELD BLANK | E290 | 29-Sep-2023 | 06-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** TRIP BLANK | E290 | 29-Sep-2023 | 06-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 7 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 01A-IN | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 01A-SH | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 05-IN | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 05-SH | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 05-SS | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 11-IN | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 11-SH | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 25-SH | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 27-SH | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 31-SH | E290 | 28-Sep-2023 | 05-Oct-2023 | 14 days | 7 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-IN | E290 | 28-Sep-2023 | 06-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 12-SH | E290 | 28-Sep-2023 | 06-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-IN | E290 | 28-Sep-2023 | 06-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 13-SH | E290 | 28-Sep-2023 | 06-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-IN | E290 | 28-Sep-2023 | 06-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** | | | | | | | | | | |
| 15-SH | E290 | 28-Sep-2023 | 06-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 16-SH | E290 | 28-Sep-2023 | 06-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 17-IN | E290 | 28-Sep-2023 | 06-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 17-SH | E290 | 28-Sep-2023 | 06-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 8 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 08-IN | E290 | 27-Sep-2023 | 05-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 9 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 08-SH | E290 | 27-Sep-2023 | 05-Oct-2023 | 14 days | 8 days | ✓ | 06-Oct-2023 | 14 days | 9 days | ✓ |
| **Physical Tests : Alkalinity Species by Titration** | | | | | | | | | | |
| **HDPE** 14-SH | E290 | 27-Sep-2023 | 06-Oct-2023 | 14 days | 9 days | ✓ | 06-Oct-2023 | 14 days | 9 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 03-IN | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 03-SH | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 04-IN | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 04-SH | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 04-SS | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 06-(R)IN | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 06-SH | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 07(R)SS | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 07-IN | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 07-SH | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 25-SS | E100 | 29-Sep-2023 | 05-Oct-2023 | 28 days | 6 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 89-3 | E100 | 29-Sep-2023 | 06-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** FIELD BLANK | E100 | 29-Sep-2023 | 06-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** TRIP BLANK | E100 | 29-Sep-2023 | 06-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 7 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 01A-IN | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 01A-SH | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 05-IN | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 05-SH | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 05-SS | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 11-IN | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 11-SH | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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-SH | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 27-SH | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 31-SH | E100 | 28-Sep-2023 | 05-Oct-2023 | 28 days | 7 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 12-IN | E100 | 28-Sep-2023 | 06-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 12-SH | E100 | 28-Sep-2023 | 06-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 13-IN | E100 | 28-Sep-2023 | 06-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 13-SH | E100 | 28-Sep-2023 | 06-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 15-IN | E100 | 28-Sep-2023 | 06-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 15-SH | E100 | 28-Sep-2023 | 06-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 16-SH | E100 | 28-Sep-2023 | 06-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 17-IN | E100 | 28-Sep-2023 | 06-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 17-SH | E100 | 28-Sep-2023 | 06-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 8 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 08-IN | E100 | 27-Sep-2023 | 05-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 9 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 08-SH | E100 | 27-Sep-2023 | 05-Oct-2023 | 28 days | 8 days | ✓ | 06-Oct-2023 | 28 days | 9 days | ✓ |
| **Physical Tests : Conductivity in Water** | | | | | | | | | | |
| **HDPE** 14-SH | E100 | 27-Sep-2023 | 06-Oct-2023 | 28 days | 9 days | ✓ | 06-Oct-2023 | 28 days | 9 days | ✓ |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 07(R)SS | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 149 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 165 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 07-SH | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 149 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 165 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 06-(R)IN | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 149 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 166 hrs | × EHTR-FM |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 07-IN | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 149 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 166 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 06-SH | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 150 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 166 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 04-IN | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 150 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 167 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 04-SH | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 150 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 167 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 04-SS | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 150 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 167 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 25-SS | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 151 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 167 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 03-SH | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 151 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 168 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 03-IN | E108 | 29-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 152 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 168 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** TRIP BLANK | E108 | 29-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 164 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 167 hrs | × EHTR-FM |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** FIELD BLANK | E108 | 29-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 164 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 168 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 89-3 | E108 | 29-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 167 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 170 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 25-SH | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 167 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 184 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 05-IN | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 168 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 184 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 05-SH | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 168 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 184 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 31-SH | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 169 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 186 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 27-SH | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 173 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 189 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 11-IN | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 174 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 190 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 11-SH | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 174 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 190 hrs | × EHTR-FM |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 01A-IN | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 174 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 191 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 01A-SH | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 174 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 191 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 05-SS | E108 | 28-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 175 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 191 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 13-SH | E108 | 28-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 185 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 189 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 13-IN | E108 | 28-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 186 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 189 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 16-SH | E108 | 28-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 186 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 189 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 12-IN | E108 | 28-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 189 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 193 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 12-SH | E108 | 28-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 189 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 193 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 15-IN | E108 | 28-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 191 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 194 hrs | × EHTR-FM |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 15-SH | E108 | 28-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 191 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 195 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 08-IN | E108 | 27-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 191 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 208 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 08-SH | E108 | 27-Sep-2023 | 05-Oct-2023 | 0.25 hrs | 191 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 208 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 17-SH | E108 | 28-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 192 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 195 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 17-IN | E108 | 28-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 192 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 196 hrs | × EHTR-FM |
| **Physical Tests : pH by Meter** | | | | | | | | | | |
| **HDPE** 14-SH | E108 | 27-Sep-2023 | 06-Oct-2023 | 0.25 hrs | 221 hrs | × EHTR-FM | 06-Oct-2023 | 0.25 hrs | 224 hrs | × EHTR-FM |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 06-(R)IN | E687-L | 29-Sep-2023 | 09-Oct-2023 | 365 days | 10 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 06-SH | E687-L | 29-Sep-2023 | 09-Oct-2023 | 365 days | 10 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 07(R)SS | E687-L | 29-Sep-2023 | 09-Oct-2023 | 365 days | 10 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** 07-IN | E687-L | 29-Sep-2023 | 09-Oct-2023 | 365 days | 10 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 07-SH | E687-L | 29-Sep-2023 | 09-Oct-2023 | 365 days | 10 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 89-3 | E687-L | 29-Sep-2023 | 09-Oct-2023 | 365 days | 10 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** FIELD BLANK | E687-L | 29-Sep-2023 | 09-Oct-2023 | 365 days | 10 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 11-IN | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 11-SH | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 12-IN | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 12-SH | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** 13-IN | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| 13-SH | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 15-IN | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 15-SH | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 16-SH | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 17-IN | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 17-SH | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 25-SS | E687-L | 29-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 27-SH | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 31-SH | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 11 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| 05-SS | E687-L | 28-Sep-2023 | 09-Oct-2023 | 365 days | 12 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 08-IN | E687-L | 27-Sep-2023 | 09-Oct-2023 | 365 days | 12 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 08-SH | E687-L | 27-Sep-2023 | 09-Oct-2023 | 365 days | 12 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 14-SH | E687-L | 27-Sep-2023 | 09-Oct-2023 | 365 days | 13 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 03-IN | E687-L | 29-Sep-2023 | 05-Oct-2023 | 365 days | 6 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 03-SH | E687-L | 29-Sep-2023 | 05-Oct-2023 | 365 days | 6 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 04-IN | E687-L | 29-Sep-2023 | 05-Oct-2023 | 365 days | 6 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 04-SH | E687-L | 29-Sep-2023 | 05-Oct-2023 | 365 days | 6 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 04-SS | E687-L | 29-Sep-2023 | 05-Oct-2023 | 365 days | 6 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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** | | | | | | | | | | |
| 01A-IN | E687-L | 28-Sep-2023 | 05-Oct-2023 | 365 days | 7 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 01A-SH | E687-L | 28-Sep-2023 | 05-Oct-2023 | 365 days | 7 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 05-IN | E687-L | 28-Sep-2023 | 05-Oct-2023 | 365 days | 7 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 05-SH | E687-L | 28-Sep-2023 | 05-Oct-2023 | 365 days | 7 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 25-SH | E687-L | 28-Sep-2023 | 05-Oct-2023 | 365 days | 7 days | ✓ | 06-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 51-SH | E687-L | 02-Oct-2023 | 09-Oct-2023 | 367 days | 10 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Polychlorinated Biphenyls : PCB Aroclors by GC-MS (low level)** | | | | | | | | | | |
| **Amber glass/Teflon lined cap** | | | | | | | | | | |
| 52-SH | E687-L | 02-Oct-2023 | 09-Oct-2023 | 367 days | 10 days | ✓ | 10-Oct-2023 | 40 days | 1 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 03-SH | E611A | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 04-SH | E611A | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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)** | | | | | | | | | | |
| 06-SH | E611A | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 07-SH | E611A | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| FIELD BLANK | E611A | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| TRIP BLANK | E611A | 29-Sep-2023 | 03-Oct-2023 | 14 days | 4 days | ✓ | 03-Oct-2023 | 14 days | 4 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 01A-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 05-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 11-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 12-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** | | | | | | | | | | |
| 13-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

| Analyte Group / 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 |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 15-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 16-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 17-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 25-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 27-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 31-SH | E611A | 28-Sep-2023 | 03-Oct-2023 | 14 days | 5 days | ✓ | 03-Oct-2023 | 14 days | 5 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 08-SH | E611A | 27-Sep-2023 | 03-Oct-2023 | 14 days | 6 days | ✓ | 03-Oct-2023 | 14 days | 6 days | ✓ |
| **Volatile Organic Compounds : BTEX by Headspace GC-MS** | | | | | | | | | | |
| **Glass vial (sodium bisulfate)** 14-SH | E611A | 27-Sep-2023 | 03-Oct-2023 | 14 days | 6 days | ✓ | 03-Oct-2023 | 14 days | 6 days | ✓ |

**Legend & Qualifier Definitions**

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

UCP: Unsuitable Container and/or Preservative used (invalidates standard hold time). Maximum hold time of zero applied. Test results may be biased low / unreliable, and may not meet regulatory requirements.

# 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)** | | | | | | | |
| Alkalinity Species by Titration | E290 | 1170327 | 3 | 57 | 5.2 | 5.0 | ✓ |
| BTEX by Headspace GC-MS | E611A | 1165193 | 2 | 40 | 5.0 | 5.0 | ✓ |
| CCME PHC - F1 by Headspace GC-FID | E581.F1 | 1165194 | 2 | 40 | 5.0 | 5.0 | ✓ |
| Chloride in Water by IC | E235.Cl | 1164328 | 4 | 71 | 5.6 | 5.0 | ✓ |
| Conductivity in Water | E100 | 1170328 | 3 | 57 | 5.2 | 5.0 | ✓ |
| Dissolved Mercury in Water by CVAAS | E509 | 1164373 | 2 | 36 | 5.5 | 5.0 | ✓ |
| Dissolved Metals in Water by CRC ICPMS | E421 | 1168217 | 2 | 40 | 5.0 | 5.0 | ✓ |
| Dissolved Organic Carbon by Combustion (Low Level) | E358-L | 1164880 | 3 | 46 | 6.5 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 1164325 | 4 | 65 | 6.1 | 5.0 | ✓ |
| Nitrate in Water by IC | E235.NO3 | 1164326 | 4 | 70 | 5.7 | 5.0 | ✓ |
| Nitrite in Water by IC | E235.NO2 | 1164329 | 4 | 70 | 5.7 | 5.0 | ✓ |
| pH by Meter | E108 | 1170329 | 3 | 58 | 5.1 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 1164327 | 4 | 69 | 5.8 | 5.0 | ✓ |
| **Laboratory Control Samples (LCS)** | | | | | | | |
| Alkalinity Species by Titration | E290 | 1170327 | 3 | 57 | 5.2 | 5.0 | ✓ |
| BTEX by Headspace GC-MS | E611A | 1165193 | 2 | 40 | 5.0 | 5.0 | ✓ |
| CCME PHC - F1 by Headspace GC-FID | E581.F1 | 1165194 | 2 | 40 | 5.0 | 5.0 | ✓ |
| Chloride in Water by IC | E235.Cl | 1164328 | 4 | 71 | 5.6 | 5.0 | ✓ |
| Conductivity in Water | E100 | 1170328 | 3 | 57 | 5.2 | 5.0 | ✓ |
| Dissolved Mercury in Water by CVAAS | E509 | 1164373 | 2 | 36 | 5.5 | 5.0 | ✓ |
| Dissolved Metals in Water by CRC ICPMS | E421 | 1168217 | 2 | 40 | 5.0 | 5.0 | ✓ |
| Dissolved Organic Carbon by Combustion (Low Level) | E358-L | 1164880 | 3 | 46 | 6.5 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 1164325 | 4 | 65 | 6.1 | 5.0 | ✓ |
| Nitrate in Water by IC | E235.NO3 | 1164326 | 4 | 70 | 5.7 | 5.0 | ✓ |
| Nitrite in Water by IC | E235.NO2 | 1164329 | 4 | 70 | 5.7 | 5.0 | ✓ |
| PCB Aroclors by GC-MS (low level) | E687-L | 1170704 | 3 | 41 | 7.3 | 5.0 | ✓ |
| pH by Meter | E108 | 1170329 | 3 | 58 | 5.1 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 1164327 | 4 | 69 | 5.8 | 5.0 | ✓ |
| **Method Blanks (MB)** | | | | | | | |
| Alkalinity Species by Titration | E290 | 1170327 | 3 | 57 | 5.2 | 5.0 | ✓ |
| BTEX by Headspace GC-MS | E611A | 1165193 | 2 | 40 | 5.0 | 5.0 | ✓ |
| CCME PHC - F1 by Headspace GC-FID | E581.F1 | 1165194 | 2 | 40 | 5.0 | 5.0 | ✓ |
| Chloride in Water by IC | E235.Cl | 1164328 | 4 | 71 | 5.6 | 5.0 | ✓ |
| Conductivity in Water | E100 | 1170328 | 3 | 57 | 5.2 | 5.0 | ✓ |
| Dissolved Mercury in Water by CVAAS | E509 | 1164373 | 2 | 36 | 5.5 | 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 | | | | | | | |
| Dissolved Metals in Water by CRC ICPMS | E421 | 1168217 | 2 | 40 | 5.0 | 5.0 | ✓ |
| Dissolved Organic Carbon by Combustion (Low Level) | E358-L | 1164880 | 3 | 46 | 6.5 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 1164325 | 4 | 65 | 6.1 | 5.0 | ✓ |
| Nitrate in Water by IC | E235.NO3 | 1164326 | 4 | 70 | 5.7 | 5.0 | ✓ |
| Nitrite in Water by IC | E235.NO2 | 1164329 | 4 | 70 | 5.7 | 5.0 | ✓ |
| PCB Aroclors by GC-MS (low level) | E687-L | 1170704 | 3 | 41 | 7.3 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 1164327 | 4 | 69 | 5.8 | 5.0 | ✓ |
| Matrix Spikes (MS) | | | | | | | |
| BTEX by Headspace GC-MS | E611A | 1165193 | 2 | 40 | 5.0 | 5.0 | ✓ |
| Chloride in Water by IC | E235.Cl | 1164328 | 4 | 71 | 5.6 | 5.0 | ✓ |
| Dissolved Mercury in Water by CVAAS | E509 | 1164373 | 2 | 36 | 5.5 | 5.0 | ✓ |
| Dissolved Metals in Water by CRC ICPMS | E421 | 1168217 | 2 | 40 | 5.0 | 5.0 | ✓ |
| Dissolved Organic Carbon by Combustion (Low Level) | E358-L | 1164880 | 3 | 46 | 6.5 | 5.0 | ✓ |
| Fluoride in Water by IC | E235.F | 1164325 | 4 | 65 | 6.1 | 5.0 | ✓ |
| Nitrate in Water by IC | E235.NO3 | 1164326 | 4 | 70 | 5.7 | 5.0 | ✓ |
| Nitrite in Water by IC | E235.NO2 | 1164329 | 4 | 70 | 5.7 | 5.0 | ✓ |
| Sulfate in Water by IC | E235.SO4 | 1164327 | 4 | 69 | 5.8 | 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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>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<br><br>ALS Environmental - Calgary | 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<br><br>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.<br><br>Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method. |
| Dissolved Mercury in Water by CVAAS | E509<br><br>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<br><br>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.<br><br>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<br><br>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<br><br>ALS Environmental - Waterloo | Water | EPA 8270E (mod) | PCB Aroclors are analyzed by GC-MS |
| Dissolved Hardness (Calculated) | EC100<br><br>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<br><br>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.<br>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<br>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<br>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<br>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<br>ALS Environmental - Calgary | Water | APHA 5310 B (mod) | Preparation for Dissolved Organic Carbon |
| Dissolved Metals Water Filtration | EP421<br>ALS Environmental - Edmonton | Water | APHA 3030B | Water samples are filtered (0.45 um), and preserved with HNO3. |
| Dissolved Mercury Water Filtration | EP509<br>ALS Environmental - Edmonton | Water | APHA 3030B | Water samples are filtered (0.45 um), and preserved with HCl. |
| VOCs Preparation for Headspace Analysis | EP581<br>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 the GC/MS-FID system. |
| Pesticides, PCB, and Neutral Extractable Chlorinated Hydrocarbons Extraction (Low Level) | EP660-L<br>ALS Environmental - Waterloo | Water | EPA 3511 (mod) | Samples are extracted from aqueous sample using an organic solvent liquid-liquid extraction. |

# QUALITY CONTROL REPORT

| | | | |
|---|---|---|---|
| **Work Order** | : **EO2308922** | Page | : 1 of 20 |
| Client | : AECOM Canada Ltd. | Laboratory | : ALS Environmental - Edmonton |
| Contact | : Michael Steed | Account Manager | : Megha Walia |
| Address | : 101 - 18817 Stony Plain Rd. NW<br>Edmonton AB Canada T5S 0C2 | Address | : 9450 - 17 Avenue NW<br>Edmonton, Alberta Canada T6N 1M9 |
| Telephone | : | Telephone | : +1 780 413 5227 |
| Project | : Swan Hills - 60716599 | Date Samples Received | : 30-Sep-2023 08:04 |
| PO | : ---- | Date Analysis Commenced | : 02-Oct-2023 |
| C-O-C number | : ---- | Issue Date | : 12-Oct-2023 16:53 |
| Sampler | : ---- 780 486 7000 | | |
| Site | : | | |
| Quote number | : EO22-AECO100-016 | | |
| No. of samples received | : 39 | | |
| No. of samples analysed | : 39 | | |

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* |
|---|---|---|
| Alex Drake | Lab Analyst | Edmonton Inorganics, Edmonton, Alberta |
| Amanda Powell | Client Service Manager | USA - Kelso Internal Subcontracting, Kelso, Washington DC (District of Columbia) |
| Amaninder Dhillon | Team Lead - Semi-Volatile Instrumentation | Waterloo Organics, Waterloo, Ontario |
| Christian Murera | Lab Analyst | Edmonton Organics, Edmonton, Alberta |
| Dan Nguyen | Team Leader - Inorganics | Edmonton Metals, Edmonton, Alberta |
| Daniel Nguyen | Lab Assistant | Edmonton Metals, Edmonton, Alberta |
| Elke Tabora | | Calgary Inorganics, Calgary, Alberta |
| Ping Yeung | Team Leader - Inorganics | Edmonton Inorganics, Edmonton, Alberta |
| Ping Yeung | Team Leader - Inorganics | Edmonton Metals, Edmonton, Alberta |
| Saron Gebremariam | Lab Assistant | Edmonton Inorganics, Edmonton, Alberta |
| Shruti Mudliar | Lab Analyst | Edmonton Inorganics, Edmonton, Alberta |
| Shruti Mudliar | Lab Analyst | Edmonton Metals, 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: 1170327)** | | | | | | | | | | | |
| EO2308922-001 | 01A-SH | Alkalinity, total (as CaCO3) | ---- | E290 | 2.0 | mg/L | 65.0 | 65.4 | 0.613% | 20% | ---- |
| **Physical Tests (QC Lot: 1170328)** | | | | | | | | | | | |
| EO2308922-001 | 01A-SH | Conductivity | ---- | E100 | 2.0 | µS/cm | 167 | 165 | 1.57% | 10% | ---- |
| **Physical Tests (QC Lot: 1170329)** | | | | | | | | | | | |
| EO2308922-001 | 01A-SH | pH | ---- | E108 | 0.10 | pH units | 6.24 | 6.28 | 0.04 | Diff <2x LOR | ---- |
| **Physical Tests (QC Lot: 1170354)** | | | | | | | | | | | |
| EO2308922-013 | 06-SH | pH | ---- | E108 | 0.10 | pH units | 8.00 | 8.04 | 0.499% | 3% | ---- |
| **Physical Tests (QC Lot: 1170356)** | | | | | | | | | | | |
| EO2308922-013 | 06-SH | Conductivity | ---- | E100 | 2.0 | µS/cm | 732 | 731 | 0.137% | 10% | ---- |
| **Physical Tests (QC Lot: 1170357)** | | | | | | | | | | | |
| EO2308922-013 | 06-SH | Alkalinity, total (as CaCO3) | ---- | E290 | 2.0 | mg/L | 430 | 422 | 2.04% | 20% | ---- |
| **Physical Tests (QC Lot: 1172532)** | | | | | | | | | | | |
| EO2308908-004 | Anonymous | Conductivity | ---- | E100 | 2.0 | µS/cm | <2.0 | <2.0 | 0 | Diff <2x LOR | ---- |
| **Physical Tests (QC Lot: 1172533)** | | | | | | | | | | | |
| EO2308908-004 | Anonymous | Alkalinity, total (as CaCO3) | ---- | E290 | 2.0 | mg/L | <2.0 | <2.0 | 0 | Diff <2x LOR | ---- |
| **Physical Tests (QC Lot: 1172534)** | | | | | | | | | | | |
| EO2308908-004 | Anonymous | pH | ---- | E108 | 0.10 | pH units | 5.36 | 5.35 | 0.01 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164325)** | | | | | | | | | | | |
| EO2308924-005 | Anonymous | Fluoride | 16984-48-8 | E235.F | 0.020 | mg/L | 0.109 | 0.109 | 0 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164326)** | | | | | | | | | | | |
| EO2308924-005 | Anonymous | Nitrate (as N) | 14797-55-8 | E235.NO3 | 0.020 | mg/L | 0.346 | 0.349 | 0.834% | 20% | ---- |
| **Anions and Nutrients (QC Lot: 1164327)** | | | | | | | | | | | |
| EO2308924-005 | Anonymous | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.30 | mg/L | 51.2 | 51.4 | 0.542% | 20% | ---- |
| **Anions and Nutrients (QC Lot: 1164328)** | | | | | | | | | | | |
| EO2308924-005 | Anonymous | Chloride | 16887-00-6 | E235.Cl | 0.50 | mg/L | 3.99 | 4.02 | 0.02 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164329)** | | | | | | | | | | | |
| EO2308924-005 | Anonymous | Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.010 | mg/L | 0.013 | 0.013 | 0.0002 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164335)** | | | | | | | | | | | |
| EO2308922-028 | 13-IN | 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: 1164336)** | | | | | | | | | | | |

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: 1164336) - continued** | | | | | | | | | | | |
| EO2308922-028 | 13-IN | 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: 1164337)** | | | | | | | | | | | |
| EO2308922-028 | 13-IN | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.30 | mg/L | 86.2 | 84.6 | 1.94% | 20% | ---- |
| **Anions and Nutrients (QC Lot: 1164338)** | | | | | | | | | | | |
| EO2308922-028 | 13-IN | Fluoride | 16984-48-8 | E235.F | 0.020 | mg/L | 0.167 | 0.169 | 0.002 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164339)** | | | | | | | | | | | |
| EO2308922-028 | 13-IN | Chloride | 16887-00-6 | E235.Cl | 0.50 | mg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164805)** | | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | 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: 1164806)** | | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | 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: 1164807)** | | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.30 | mg/L | <0.30 | <0.30 | 0 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164808)** | | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | Fluoride | 16984-48-8 | E235.F | 0.020 | mg/L | <0.020 | <0.020 | 0 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164809)** | | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | Chloride | 16887-00-6 | E235.Cl | 0.50 | mg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164924)** | | | | | | | | | | | |
| EO2308922-037 | FIELD BLANK | 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: 1164925)** | | | | | | | | | | | |
| EO2308922-037 | FIELD BLANK | 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: 1164926)** | | | | | | | | | | | |
| EO2308922-037 | FIELD BLANK | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.30 | mg/L | <0.30 | <0.30 | 0 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164927)** | | | | | | | | | | | |
| EO2308922-037 | FIELD BLANK | Fluoride | 16984-48-8 | E235.F | 0.020 | mg/L | <0.020 | <0.020 | 0 | Diff <2x LOR | ---- |
| **Anions and Nutrients (QC Lot: 1164928)** | | | | | | | | | | | |
| EO2308922-037 | FIELD BLANK | Chloride | 16887-00-6 | E235.Cl | 0.50 | mg/L | <0.50 | <0.50 | 0 | Diff <2x LOR | ---- |
| **Organic / Inorganic Carbon (QC Lot: 1164880)** | | | | | | | | | | | |
| EO2308922-001 | 01A-SH | Carbon, dissolved organic [DOC] | ---- | E358-L | 0.50 | mg/L | 53.1 | 49.3 | 7.40% | 20% | ---- |
| **Organic / Inorganic Carbon (QC Lot: 1164881)** | | | | | | | | | | | |
| EO2308922-022 | 31-SH | Carbon, dissolved organic [DOC] | ---- | E358-L | 0.50 | mg/L | 8.13 | 7.40 | 9.46% | 20% | ---- |
| **Organic / Inorganic Carbon (QC Lot: 1166133)** | | | | | | | | | | | |
| CG2313845-001 | Anonymous | Carbon, dissolved organic [DOC] | ---- | E358-L | 0.50 | mg/L | <0.50 | <0.50 | 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* |
| **Dissolved Metals (QC Lot: 1164373)** | | | | | | | | | | | |
| EO2308922-001 | 01A-SH | Mercury, dissolved | 7439-97-6 | E509 | 0.0000050 | mg/L | <0.0000050 | <0.0000050 | 0 | Diff <2x LOR | ---- |
| **Dissolved Metals (QC Lot: 1164374)** | | | | | | | | | | | |
| EO2308922-021 | 11-SH | Mercury, dissolved | 7439-97-6 | E509 | 0.0000050 | mg/L | <0.0000050 | <0.0000050 | 0 | Diff <2x LOR | ---- |
| **Dissolved Metals (QC Lot: 1168217)** | | | | | | | | | | | |
| EO2308922-001 | 01A-SH | Aluminum, dissolved | 7429-90-5 | E421 | 0.0010 | mg/L | 0.175 | 0.162 | 7.77% | 20% | ---- |
| | | 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 | 0.00047 | 0.00046 | 0.000009 | Diff <2x LOR | ---- |
| | | Barium, dissolved | 7440-39-3 | E421 | 0.00010 | mg/L | 0.0607 | 0.0606 | 0.212% | 20% | ---- |
| | | 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 | 0.0000068 | 0.0000068 | 0 | Diff <2x LOR | ---- |
| | | Calcium, dissolved | 7440-70-2 | E421 | 0.050 | mg/L | 19.1 | 19.3 | 1.15% | 20% | ---- |
| | | Chromium, dissolved | 7440-47-3 | E421 | 0.00050 | mg/L | 0.00284 | 0.00278 | 0.00005 | Diff <2x LOR | ---- |
| | | Copper, dissolved | 7440-50-8 | E421 | 0.00020 | mg/L | 0.00082 | 0.00080 | 0.00002 | Diff <2x LOR | ---- |
| | | Iron, dissolved | 7439-89-6 | E421 | 0.010 | mg/L | 1.58 | 1.60 | 1.15% | 20% | ---- |
| | | Lead, dissolved | 7439-92-1 | E421 | 0.000050 | mg/L | 0.000106 | 0.000105 | 0.000002 | Diff <2x LOR | ---- |
| | | Magnesium, dissolved | 7439-95-4 | E421 | 0.0050 | mg/L | 3.62 | 3.70 | 2.02% | 20% | ---- |
| | | Manganese, dissolved | 7439-96-5 | E421 | 0.00010 | mg/L | 0.0835 | 0.0835 | 0.0600% | 20% | ---- |
| | | Nickel, dissolved | 7440-02-0 | E421 | 0.00050 | mg/L | 0.00405 | 0.00405 | 0.000002 | Diff <2x LOR | ---- |
| | | Potassium, dissolved | 7440-09-7 | E421 | 0.050 | mg/L | 0.642 | 0.657 | 2.33% | 20% | ---- |
| | | Selenium, dissolved | 7782-49-2 | E421 | 0.000050 | mg/L | 0.000133 | 0.000121 | 0.000012 | 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 | 11.7 | 11.9 | 2.03% | 20% | ---- |
| | | Uranium, dissolved | 7440-61-1 | E421 | 0.000010 | mg/L | 0.000499 | 0.000495 | 0.710% | 20% | ---- |
| | | Zinc, dissolved | 7440-66-6 | E421 | 0.0010 | mg/L | 0.0063 | 0.0060 | 0.0003 | Diff <2x LOR | ---- |
| **Dissolved Metals (QC Lot: 1168218)** | | | | | | | | | | | |
| EO2308922-021 | 11-SH | Aluminum, dissolved | 7429-90-5 | E421 | 0.0010 | mg/L | 0.0013 | <0.0010 | 0.0003 | 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 | 0.00018 | 0.00017 | 0.00001 | Diff <2x LOR | ---- |
| | | Barium, dissolved | 7440-39-3 | E421 | 0.00010 | mg/L | 0.244 | 0.250 | 2.60% | 20% | ---- |
| | | Boron, dissolved | 7440-42-8 | E421 | 0.010 | mg/L | 0.133 | 0.133 | 0.208% | 20% | ---- |
| | | Cadmium, dissolved | 7440-43-9 | E421 | 0.0000050 | mg/L | 0.0000268 | 0.0000290 | 0.0000022 | Diff <2x LOR | ---- |
| | | Calcium, dissolved | 7440-70-2 | E421 | 0.050 | mg/L | 165 | 166 | 0.209% | 20% | ---- |
| | | Chromium, dissolved | 7440-47-3 | E421 | 0.00050 | mg/L | 0.00145 | 0.00210 | 0.00065 | Diff <2x LOR | ---- |
| | | Copper, dissolved | 7440-50-8 | E421 | 0.00020 | mg/L | 0.00114 | 0.00115 | 0.000009 | 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: 1168218) - continued** | | | | | | | | | | | |
| EO2308922-021 | 11-SH | Iron, dissolved | 7439-89-6 | E421 | 0.010 | mg/L | 0.066 | 0.072 | 0.006 | 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 | 31.8 | 31.8 | 0.129% | 20% | ---- |
| | | Manganese, dissolved | 7439-96-5 | E421 | 0.00010 | mg/L | 0.522 | 0.533 | 2.04% | 20% | ---- |
| | | Nickel, dissolved | 7440-02-0 | E421 | 0.00050 | mg/L | 0.00233 | 0.00278 | 0.00045 | Diff <2x LOR | ---- |
| | | Potassium, dissolved | 7440-09-7 | E421 | 0.050 | mg/L | 2.68 | 2.78 | 3.77% | 20% | ---- |
| | | Selenium, dissolved | 7782-49-2 | E421 | 0.000050 | mg/L | 0.000099 | 0.000082 | 0.000017 | 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 | 46.4 | 46.6 | 0.388% | 20% | ---- |
| | | Uranium, dissolved | 7440-61-1 | E421 | 0.000010 | mg/L | 0.00389 | 0.00393 | 0.933% | 20% | ---- |
| | | Zinc, dissolved | 7440-66-6 | E421 | 0.0010 | mg/L | 0.0030 | 0.0031 | 0.0001 | Diff <2x LOR | ---- |
| **Volatile Organic Compounds (QC Lot: 1165193)** | | | | | | | | | | | |
| EO2308906-015 | Anonymous | Benzene | 71-43-2 | E611A | 0.50 | µg/L | 0.00143 mg/L | 1.45 | 0.02 | Diff <2x LOR | ---- |
| | | Ethylbenzene | 100-41-4 | E611A | 0.50 | µg/L | 0.00133 mg/L | 1.40 | 0.07 | Diff <2x LOR | ---- |
| | | Toluene | 108-88-3 | E611A | 0.50 | µg/L | <0.00050 mg/L | <0.50 | 0 | Diff <2x LOR | ---- |
| | | Xylene, m+p- | 179601-23-1 | E611A | 0.40 | µg/L | 0.00246 mg/L | 2.19 | 0.27 | Diff <2x LOR | ---- |
| | | Xylene, o- | 95-47-6 | E611A | 0.30 | µg/L | <0.00030 mg/L | 0.31 | 0.008 | Diff <2x LOR | ---- |
| **Volatile Organic Compounds (QC Lot: 1165454)** | | | | | | | | | | | |
| EO2308922-003 | 03-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: 1165194)** | | | | | | | | | | | |
| EO2308906-015 | Anonymous | F1 (C6-C10) | ---- | E581.F1 | 100 | µg/L | <0.10 mg/L | <100 | 0 | Diff <2x LOR | ---- |
| **Hydrocarbons (QC Lot: 1165453)** | | | | | | | | | | | |
| EO2308922-003 | 03-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: 1170327)** | | | | | | |
| Alkalinity, total (as CaCO3) | ---- | E290 | 1 | mg/L | <1.0 | ---- |
| **Physical Tests (QCLot: 1170328)** | | | | | | |
| Conductivity | ---- | E100 | 1 | µS/cm | <1.0 | ---- |
| **Physical Tests (QCLot: 1170356)** | | | | | | |
| Conductivity | ---- | E100 | 1 | µS/cm | <1.0 | ---- |
| **Physical Tests (QCLot: 1170357)** | | | | | | |
| Alkalinity, total (as CaCO3) | ---- | E290 | 1 | mg/L | <1.0 | ---- |
| **Physical Tests (QCLot: 1172532)** | | | | | | |
| Conductivity | ---- | E100 | 1 | µS/cm | <1.0 | ---- |
| **Physical Tests (QCLot: 1172533)** | | | | | | |
| Alkalinity, total (as CaCO3) | ---- | E290 | 1 | mg/L | <1.0 | ---- |
| **Anions and Nutrients (QCLot: 1164325)** | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | <0.020 | ---- |
| **Anions and Nutrients (QCLot: 1164326)** | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3 | 0.02 | mg/L | <0.020 | ---- |
| **Anions and Nutrients (QCLot: 1164327)** | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | <0.30 | ---- |
| **Anions and Nutrients (QCLot: 1164328)** | | | | | | |
| Chloride | 16887-00-6 | E235.Cl | 0.5 | mg/L | <0.50 | ---- |
| **Anions and Nutrients (QCLot: 1164329)** | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.01 | mg/L | <0.010 | ---- |
| **Anions and Nutrients (QCLot: 1164335)** | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3 | 0.02 | mg/L | <0.020 | ---- |
| **Anions and Nutrients (QCLot: 1164336)** | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.01 | mg/L | <0.010 | ---- |
| **Anions and Nutrients (QCLot: 1164337)** | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | <0.30 | ---- |
| **Anions and Nutrients (QCLot: 1164338)** | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | <0.020 | ---- |
| **Anions and Nutrients (QCLot: 1164339)** | | | | | | |
| Chloride | 16887-00-6 | E235.Cl | 0.5 | mg/L | <0.50 | ---- |
| **Anions and Nutrients (QCLot: 1164805)** | | | | | | |

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **Anions and Nutrients (QCLot: 1164805) - continued** | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3 | 0.02 | mg/L | <0.020 | ---- |
| **Anions and Nutrients (QCLot: 1164806)** | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.01 | mg/L | <0.010 | ---- |
| **Anions and Nutrients (QCLot: 1164807)** | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | <0.30 | ---- |
| **Anions and Nutrients (QCLot: 1164808)** | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | <0.020 | ---- |
| **Anions and Nutrients (QCLot: 1164809)** | | | | | | |
| Chloride | 16887-00-6 | E235.Cl | 0.5 | mg/L | <0.50 | ---- |
| **Anions and Nutrients (QCLot: 1164924)** | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3 | 0.02 | mg/L | <0.020 | ---- |
| **Anions and Nutrients (QCLot: 1164925)** | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.01 | mg/L | <0.010 | ---- |
| **Anions and Nutrients (QCLot: 1164926)** | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | <0.30 | ---- |
| **Anions and Nutrients (QCLot: 1164927)** | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | <0.020 | ---- |
| **Anions and Nutrients (QCLot: 1164928)** | | | | | | |
| Chloride | 16887-00-6 | E235.Cl | 0.5 | mg/L | <0.50 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1164880)** | | | | | | |
| Carbon, dissolved organic [DOC] | ---- | E358-L | 0.5 | mg/L | <0.50 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1164881)** | | | | | | |
| Carbon, dissolved organic [DOC] | ---- | E358-L | 0.5 | mg/L | <0.50 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1166133)** | | | | | | |
| Carbon, dissolved organic [DOC] | ---- | E358-L | 0.5 | mg/L | <0.50 | ---- |
| **Dissolved Metals (QCLot: 1164373)** | | | | | | |
| Mercury, dissolved | 7439-97-6 | E509 | 0.000005 | mg/L | <0.0000050 | ---- |
| **Dissolved Metals (QCLot: 1164374)** | | | | | | |
| Mercury, dissolved | 7439-97-6 | E509 | 0.000005 | mg/L | <0.0000050 | ---- |
| **Dissolved Metals (QCLot: 1168217)** | | | | | | |
| 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 | ---- |

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **Dissolved Metals (QCLot: 1168217) - continued** | | | | | | |
| 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: 1168218)** | | | | | | |
| 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 | ---- |

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **Dissolved Metals (QCLot: 1168218) - continued** | | | | | | |
| Zinc, dissolved | 7440-66-6 | E421 | 0.001 | mg/L | <0.0010 | ---- |
| **Volatile Organic Compounds (QCLot: 1165193)** | | | | | | |
| 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: 1165454)** | | | | | | |
| 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 | ---- |
| **Hydrocarbons (QCLot: 1165194)** | | | | | | |
| F1 (C6-C10) | ---- | E581.F1 | 100 | µg/L | <100 | ---- |
| **Hydrocarbons (QCLot: 1165453)** | | | | | | |
| F1 (C6-C10) | ---- | E581.F1 | 100 | µg/L | <100 | ---- |
| **Polychlorinated Biphenyls (QCLot: 1170704)** | | | | | | |
| 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: 1175899)** | | | | | | |
| 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 | ---- |

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Result | Qualifier |
|---|---|---|---|---|---|---|
| **Polychlorinated Biphenyls (QCLot: 1175899) - continued** | | | | | | |
| 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: 1175900)** | | | | | | |
| 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 | ---- |

## 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 | Concentration | LCS | Low | High | Qualifier |
| **Physical Tests (QCLot: 1170327)** | | | | | | | | | |
| Alkalinity, total (as CaCO3) | ---- | E290 | 1 | mg/L | 500 mg/L | 108 | 85.0 | 115 | ---- |
| **Physical Tests (QCLot: 1170328)** | | | | | | | | | |
| Conductivity | ---- | E100 | 1 | µS/cm | 1412 µS/cm | 106 | 90.0 | 110 | ---- |
| **Physical Tests (QCLot: 1170329)** | | | | | | | | | |
| pH | ---- | E108 | ---- | pH units | 6 pH units | 102 | 97.0 | 103 | ---- |
| **Physical Tests (QCLot: 1170354)** | | | | | | | | | |
| pH | ---- | E108 | ---- | pH units | 6 pH units | 102 | 97.0 | 103 | ---- |
| **Physical Tests (QCLot: 1170356)** | | | | | | | | | |
| Conductivity | ---- | E100 | 1 | µS/cm | 1412 µS/cm | 105 | 90.0 | 110 | ---- |
| **Physical Tests (QCLot: 1170357)** | | | | | | | | | |
| Alkalinity, total (as CaCO3) | ---- | E290 | 1 | mg/L | 500 mg/L | 110 | 85.0 | 115 | ---- |
| **Physical Tests (QCLot: 1172532)** | | | | | | | | | |
| Conductivity | ---- | E100 | 1 | µS/cm | 1412 µS/cm | 106 | 90.0 | 110 | ---- |
| **Physical Tests (QCLot: 1172533)** | | | | | | | | | |
| Alkalinity, total (as CaCO3) | ---- | E290 | 1 | mg/L | 500 mg/L | 111 | 85.0 | 115 | ---- |
| **Physical Tests (QCLot: 1172534)** | | | | | | | | | |
| pH | ---- | E108 | ---- | pH units | 6 pH units | 101 | 97.0 | 103 | ---- |
| **Anions and Nutrients (QCLot: 1164325)** | | | | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | 1 mg/L | 100 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164326)** | | | | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3 | 0.02 | mg/L | 2.5 mg/L | 102 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164327)** | | | | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | 100 mg/L | 102 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164328)** | | | | | | | | | |
| Chloride | 16887-00-6 | E235.Cl | 0.5 | mg/L | 100 mg/L | 101 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164329)** | | | | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.01 | mg/L | 0.5 mg/L | 100 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164335)** | | | | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3 | 0.02 | mg/L | 2.5 mg/L | 103 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164336)** | | | | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.01 | mg/L | 0.5 mg/L | 102 | 90.0 | 110 | ---- |

Sub-Matrix: **Water**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Concentration | LCS | Low | High | Qualifier |
| **Anions and Nutrients (QCLot: 1164337)** | | | | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | 100 mg/L | 102 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164338)** | | | | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | 1 mg/L | 99.9 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164339)** | | | | | | | | | |
| Chloride | 16887-00-6 | E235.Cl | 0.5 | mg/L | 100 mg/L | 101 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164805)** | | | | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3 | 0.02 | mg/L | 2.5 mg/L | 104 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164806)** | | | | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.01 | mg/L | 0.5 mg/L | 102 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164807)** | | | | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | 100 mg/L | 102 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164808)** | | | | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | 1 mg/L | 101 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164809)** | | | | | | | | | |
| Chloride | 16887-00-6 | E235.Cl | 0.5 | mg/L | 100 mg/L | 101 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164924)** | | | | | | | | | |
| Nitrate (as N) | 14797-55-8 | E235.NO3 | 0.02 | mg/L | 2.5 mg/L | 103 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164925)** | | | | | | | | | |
| Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.01 | mg/L | 0.5 mg/L | 98.8 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164926)** | | | | | | | | | |
| Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 0.3 | mg/L | 100 mg/L | 101 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164927)** | | | | | | | | | |
| Fluoride | 16984-48-8 | E235.F | 0.02 | mg/L | 1 mg/L | 100 | 90.0 | 110 | ---- |
| **Anions and Nutrients (QCLot: 1164928)** | | | | | | | | | |
| Chloride | 16887-00-6 | E235.Cl | 0.5 | mg/L | 100 mg/L | 100 | 90.0 | 110 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1164880)** | | | | | | | | | |
| Carbon, dissolved organic [DOC] | ---- | E358-L | 0.5 | mg/L | 8.57 mg/L | 87.4 | 80.0 | 120 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1164881)** | | | | | | | | | |
| Carbon, dissolved organic [DOC] | ---- | E358-L | 0.5 | mg/L | 8.57 mg/L | 87.0 | 80.0 | 120 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1166133)** | | | | | | | | | |
| Carbon, dissolved organic [DOC] | ---- | E358-L | 0.5 | mg/L | 8.57 mg/L | 87.7 | 80.0 | 120 | ---- |
| Mercury, dissolved | 7439-97-6 | E509 | 0.000005 | mg/L | 0.0001 mg/L | 83.6 | 80.0 | 120 | ---- |
| Mercury, dissolved | 7439-97-6 | E509 | 0.000005 | mg/L | 0.0001 mg/L | 98.7 | 80.0 | 120 | ---- |

Sub-Matrix: **Water**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Concentration | LCS | Low | High | Qualifier |
| **Dissolved Metals (QCLot: 1168217)** | | | | | | | | | |
| Aluminum, dissolved | 7429-90-5 | E421 | 0.001 | mg/L | 2 mg/L | 102 | 80.0 | 120 | ---- |
| Antimony, dissolved | 7440-36-0 | E421 | 0.0001 | mg/L | 1 mg/L | 96.3 | 80.0 | 120 | ---- |
| Arsenic, dissolved | 7440-38-2 | E421 | 0.0001 | mg/L | 1 mg/L | 103 | 80.0 | 120 | ---- |
| Barium, dissolved | 7440-39-3 | E421 | 0.0001 | mg/L | 0.25 mg/L | 98.4 | 80.0 | 120 | ---- |
| Boron, dissolved | 7440-42-8 | E421 | 0.01 | mg/L | 1 mg/L | 93.2 | 80.0 | 120 | ---- |
| Cadmium, dissolved | 7440-43-9 | E421 | 0.000005 | mg/L | 0.1 mg/L | 98.3 | 80.0 | 120 | ---- |
| Calcium, dissolved | 7440-70-2 | E421 | 0.05 | mg/L | 50 mg/L | 97.4 | 80.0 | 120 | ---- |
| Chromium, dissolved | 7440-47-3 | E421 | 0.0005 | mg/L | 0.25 mg/L | 98.4 | 80.0 | 120 | ---- |
| Copper, dissolved | 7440-50-8 | E421 | 0.0002 | mg/L | 0.25 mg/L | 97.7 | 80.0 | 120 | ---- |
| Iron, dissolved | 7439-89-6 | E421 | 0.01 | mg/L | 1 mg/L | 96.5 | 80.0 | 120 | ---- |
| Lead, dissolved | 7439-92-1 | E421 | 0.00005 | mg/L | 0.5 mg/L | 97.2 | 80.0 | 120 | ---- |
| Magnesium, dissolved | 7439-95-4 | E421 | 0.005 | mg/L | 50 mg/L | 105 | 80.0 | 120 | ---- |
| Manganese, dissolved | 7439-96-5 | E421 | 0.0001 | mg/L | 0.25 mg/L | 99.9 | 80.0 | 120 | ---- |
| Nickel, dissolved | 7440-02-0 | E421 | 0.0005 | mg/L | 0.5 mg/L | 106 | 80.0 | 120 | ---- |
| Potassium, dissolved | 7440-09-7 | E421 | 0.05 | mg/L | 50 mg/L | 100 | 80.0 | 120 | ---- |
| Selenium, dissolved | 7782-49-2 | E421 | 0.00005 | mg/L | 1 mg/L | 98.6 | 80.0 | 120 | ---- |
| Silver, dissolved | 7440-22-4 | E421 | 0.00001 | mg/L | 0.1 mg/L | 92.0 | 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 | ---- |
| **Dissolved Metals (QCLot: 1168218)** | | | | | | | | | |
| 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 | 97.6 | 80.0 | 120 | ---- |
| Arsenic, dissolved | 7440-38-2 | E421 | 0.0001 | mg/L | 1 mg/L | 101 | 80.0 | 120 | ---- |
| Barium, dissolved | 7440-39-3 | E421 | 0.0001 | mg/L | 0.25 mg/L | 102 | 80.0 | 120 | ---- |
| Boron, dissolved | 7440-42-8 | E421 | 0.01 | mg/L | 1 mg/L | 96.4 | 80.0 | 120 | ---- |
| Cadmium, dissolved | 7440-43-9 | E421 | 0.000005 | mg/L | 0.1 mg/L | 99.4 | 80.0 | 120 | ---- |
| Calcium, dissolved | 7440-70-2 | E421 | 0.05 | mg/L | 50 mg/L | 98.6 | 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 | 97.4 | 80.0 | 120 | ---- |
| Iron, dissolved | 7439-89-6 | E421 | 0.01 | mg/L | 1 mg/L | 97.4 | 80.0 | 120 | ---- |
| Lead, dissolved | 7439-92-1 | E421 | 0.00005 | mg/L | 0.5 mg/L | 98.5 | 80.0 | 120 | ---- |
| Magnesium, dissolved | 7439-95-4 | E421 | 0.005 | mg/L | 50 mg/L | 105 | 80.0 | 120 | ---- |
| Manganese, dissolved | 7439-96-5 | E421 | 0.0001 | mg/L | 0.25 mg/L | 98.4 | 80.0 | 120 | ---- |
| Nickel, dissolved | 7440-02-0 | E421 | 0.0005 | mg/L | 0.5 mg/L | 107 | 80.0 | 120 | ---- |
| Potassium, dissolved | 7440-09-7 | E421 | 0.05 | mg/L | 50 mg/L | 100 | 80.0 | 120 | ---- |

Sub-Matrix: **Water**

| Analyte | CAS Number | Method | LOR | Unit | Laboratory Control Sample (LCS) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| | | | | | Concentration | LCS | Low | High | Qualifier |
| **Dissolved Metals (QCLot: 1168218) - continued** | | | | | | | | | |
| Selenium, dissolved | 7782-49-2 | E421 | 0.00005 | mg/L | 1 mg/L | 99.1 | 80.0 | 120 | ---- |
| Silver, dissolved | 7440-22-4 | E421 | 0.00001 | mg/L | 0.1 mg/L | 93.0 | 80.0 | 120 | ---- |
| Sodium, dissolved | 7440-23-5 | E421 | 0.05 | mg/L | 50 mg/L | 106 | 80.0 | 120 | ---- |
| Uranium, dissolved | 7440-61-1 | E421 | 0.00001 | mg/L | 0.005 mg/L | 102 | 80.0 | 120 | ---- |
| Zinc, dissolved | 7440-66-6 | E421 | 0.001 | mg/L | 0.5 mg/L | 104 | 80.0 | 120 | ---- |
| **Volatile Organic Compounds (QCLot: 1165193)** | | | | | | | | | |
| Benzene | 71-43-2 | E611A | 0.5 | µg/L | 100 µg/L | 90.1 | 70.0 | 130 | ---- |
| Ethylbenzene | 100-41-4 | E611A | 0.5 | µg/L | 100 µg/L | 92.9 | 70.0 | 130 | ---- |
| Toluene | 108-88-3 | E611A | 0.5 | µg/L | 100 µg/L | 81.7 | 70.0 | 130 | ---- |
| Xylene, m+p- | 179601-23-1 | E611A | 0.4 | µg/L | 200 µg/L | 94.2 | 70.0 | 130 | ---- |
| Xylene, o- | 95-47-6 | E611A | 0.3 | µg/L | 100 µg/L | 103 | 70.0 | 130 | ---- |
| **Volatile Organic Compounds (QCLot: 1165454)** | | | | | | | | | |
| Benzene | 71-43-2 | E611A | 0.5 | µg/L | 100 µg/L | 88.8 | 70.0 | 130 | ---- |
| Ethylbenzene | 100-41-4 | E611A | 0.5 | µg/L | 100 µg/L | 88.3 | 70.0 | 130 | ---- |
| Toluene | 108-88-3 | E611A | 0.5 | µg/L | 100 µg/L | 88.0 | 70.0 | 130 | ---- |
| Xylene, m+p- | 179601-23-1 | E611A | 0.4 | µg/L | 200 µg/L | 101 | 70.0 | 130 | ---- |
| Xylene, o- | 95-47-6 | E611A | 0.3 | µg/L | 100 µg/L | 103 | 70.0 | 130 | ---- |
| **Hydrocarbons (QCLot: 1165194)** | | | | | | | | | |
| F1 (C6-C10) | ---- | E581.F1 | 100 | µg/L | 2750 µg/L | 110 | 70.0 | 130 | ---- |
| **Hydrocarbons (QCLot: 1165453)** | | | | | | | | | |
| F1 (C6-C10) | ---- | E581.F1 | 100 | µg/L | 2750 µg/L | 118 | 70.0 | 130 | ---- |
| **Polychlorinated Biphenyls (QCLot: 1170704)** | | | | | | | | | |
| Aroclor 1016 | 12674-11-2 | E687-L | 0.01 | µg/L | 0.1 µg/L | 120 | 60.0 | 140 | ---- |
| Aroclor 1221 | 11104-28-2 | E687-L | 0.01 | µg/L | 0.1 µg/L | 120 | 60.0 | 140 | ---- |
| Aroclor 1232 | 11141-16-5 | E687-L | 0.01 | µg/L | 0.1 µg/L | 120 | 60.0 | 140 | ---- |
| Aroclor 1242 | 53469-21-9 | E687-L | 0.01 | µg/L | 0.1 µg/L | 120 | 60.0 | 140 | ---- |
| Aroclor 1248 | 12672-29-6 | E687-L | 0.01 | µg/L | 0.1 µg/L | 92.6 | 60.0 | 140 | ---- |
| Aroclor 1254 | 11097-69-1 | E687-L | 0.01 | µg/L | 0.1 µg/L | 106 | 60.0 | 140 | ---- |
| Aroclor 1260 | 11096-82-5 | E687-L | 0.01 | µg/L | 0.1 µg/L | 116 | 60.0 | 140 | ---- |
| Aroclor 1262 | 37324-23-5 | E687-L | 0.01 | µg/L | 0.1 µg/L | 116 | 60.0 | 140 | ---- |
| Aroclor 1268 | 11100-14-4 | E687-L | 0.01 | µg/L | 0.1 µg/L | 116 | 60.0 | 140 | ---- |
| **Polychlorinated Biphenyls (QCLot: 1175899)** | | | | | | | | | |
| Aroclor 1016 | 12674-11-2 | E687-L | 0.01 | µg/L | 0.1 µg/L | 113 | 60.0 | 140 | ---- |

Sub-Matrix: **Water**

| | | | | | Laboratory Control Sample (LCS) Report | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Spike | Recovery (%) | Recovery Limits (%) | | |
| Analyte | CAS Number | Method | LOR | Unit | Concentration | LCS | Low | High | Qualifier |
| **Polychlorinated Biphenyls (QCLot: 1175899) - continued** | | | | | | | | | |
| Aroclor 1221 | 11104-28-2 | E687-L | 0.01 | µg/L | 0.1 µg/L | 113 | 60.0 | 140 | ---- |
| Aroclor 1232 | 11141-16-5 | E687-L | 0.01 | µg/L | 0.1 µg/L | 113 | 60.0 | 140 | ---- |
| Aroclor 1242 | 53469-21-9 | E687-L | 0.01 | µg/L | 0.1 µg/L | 113 | 60.0 | 140 | ---- |
| Aroclor 1248 | 12672-29-6 | E687-L | 0.01 | µg/L | 0.1 µg/L | 89.2 | 60.0 | 140 | ---- |
| Aroclor 1254 | 11097-69-1 | E687-L | 0.01 | µg/L | 0.1 µg/L | 104 | 60.0 | 140 | ---- |
| Aroclor 1260 | 11096-82-5 | E687-L | 0.01 | µg/L | 0.1 µg/L | 122 | 60.0 | 140 | ---- |
| Aroclor 1262 | 37324-23-5 | E687-L | 0.01 | µg/L | 0.1 µg/L | 122 | 60.0 | 140 | ---- |
| Aroclor 1268 | 11100-14-4 | E687-L | 0.01 | µg/L | 0.1 µg/L | 122 | 60.0 | 140 | ---- |
| **Polychlorinated Biphenyls (QCLot: 1175900)** | | | | | | | | | |
| Aroclor 1016 | 12674-11-2 | E687-L | 0.01 | µg/L | 0.1 µg/L | 104 | 60.0 | 140 | ---- |
| Aroclor 1221 | 11104-28-2 | E687-L | 0.01 | µg/L | 0.1 µg/L | 104 | 60.0 | 140 | ---- |
| Aroclor 1232 | 11141-16-5 | E687-L | 0.01 | µg/L | 0.1 µg/L | 104 | 60.0 | 140 | ---- |
| Aroclor 1242 | 53469-21-9 | E687-L | 0.01 | µg/L | 0.1 µg/L | 104 | 60.0 | 140 | ---- |
| Aroclor 1248 | 12672-29-6 | E687-L | 0.01 | µg/L | 0.1 µg/L | 84.9 | 60.0 | 140 | ---- |
| Aroclor 1254 | 11097-69-1 | E687-L | 0.01 | µg/L | 0.1 µg/L | 97.5 | 60.0 | 140 | ---- |
| Aroclor 1260 | 11096-82-5 | E687-L | 0.01 | µg/L | 0.1 µg/L | 123 | 60.0 | 140 | ---- |
| Aroclor 1262 | 37324-23-5 | E687-L | 0.01 | µg/L | 0.1 µg/L | 123 | 60.0 | 140 | ---- |
| Aroclor 1268 | 11100-14-4 | E687-L | 0.01 | µg/L | 0.1 µg/L | 123 | 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: 1164325)** | | | | | | | | | | |
| EO2308924-005 | Anonymous | Fluoride | 16984-48-8 | E235.F | 1.02 mg/L | 1 mg/L | 102 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164326)** | | | | | | | | | | |
| EO2308924-005 | Anonymous | Nitrate (as N) | 14797-55-8 | E235.NO3 | 2.58 mg/L | 2.5 mg/L | 103 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164327)** | | | | | | | | | | |
| EO2308924-005 | Anonymous | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 99.0 mg/L | 100 mg/L | 99.0 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164328)** | | | | | | | | | | |
| EO2308924-005 | Anonymous | Chloride | 16887-00-6 | E235.Cl | 104 mg/L | 100 mg/L | 104 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164329)** | | | | | | | | | | |
| EO2308924-005 | Anonymous | Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.521 mg/L | 0.5 mg/L | 104 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164335)** | | | | | | | | | | |
| EO2308922-028 | 13-IN | Nitrate (as N) | 14797-55-8 | E235.NO3 | 2.57 mg/L | 2.5 mg/L | 103 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164336)** | | | | | | | | | | |
| EO2308922-028 | 13-IN | Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.509 mg/L | 0.5 mg/L | 102 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164337)** | | | | | | | | | | |
| EO2308922-028 | 13-IN | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 90.5 mg/L | 100 mg/L | 90.5 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164338)** | | | | | | | | | | |
| EO2308922-028 | 13-IN | Fluoride | 16984-48-8 | E235.F | 1.01 mg/L | 1 mg/L | 101 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164339)** | | | | | | | | | | |
| EO2308922-028 | 13-IN | Chloride | 16887-00-6 | E235.Cl | 99.8 mg/L | 100 mg/L | 99.8 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164805)** | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | Nitrate (as N) | 14797-55-8 | E235.NO3 | 2.66 mg/L | 2.5 mg/L | 106 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164806)** | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.536 mg/L | 0.5 mg/L | 107 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164807)** | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | 103 mg/L | 100 mg/L | 103 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164808)** | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | Fluoride | 16984-48-8 | E235.F | 1.02 mg/L | 1 mg/L | 102 | 75.0 | 125 | ---- |

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: 1164809)** | | | | | | | | | | |
| EO2308922-036 | TRIP BLANK | Chloride | 16887-00-6 | E235.Cl | 102 mg/L | 100 mg/L | 102 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164924)** | | | | | | | | | | |
| EO2308941-003 | Anonymous | Nitrate (as N) | 14797-55-8 | E235.NO3 | 2.54 mg/L | 2.5 mg/L | 101 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164925)** | | | | | | | | | | |
| EO2308941-003 | Anonymous | Nitrite (as N) | 14797-65-0 | E235.NO2 | 0.477 mg/L | 0.5 mg/L | 95.4 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164926)** | | | | | | | | | | |
| EO2308941-003 | Anonymous | Sulfate (as SO4) | 14808-79-8 | E235.SO4 | ND mg/L | 100 mg/L | ND | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164927)** | | | | | | | | | | |
| EO2308922-037 | FIELD BLANK | Fluoride | 16984-48-8 | E235.F | 0.978 mg/L | 1 mg/L | 97.8 | 75.0 | 125 | ---- |
| **Anions and Nutrients (QCLot: 1164928)** | | | | | | | | | | |
| EO2308941-003 | Anonymous | Chloride | 16887-00-6 | E235.Cl | 94.0 mg/L | 100 mg/L | 94.0 | 75.0 | 125 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1164880)** | | | | | | | | | | |
| EO2308922-001 | 01A-SH | Carbon, dissolved organic [DOC] | ---- | E358-L | ND mg/L | 5 mg/L | ND | 70.0 | 130 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1164881)** | | | | | | | | | | |
| EO2308922-022 | 31-SH | Carbon, dissolved organic [DOC] | ---- | E358-L | ND mg/L | 5 mg/L | ND | 70.0 | 130 | ---- |
| **Organic / Inorganic Carbon (QCLot: 1166133)** | | | | | | | | | | |
| CG2313845-001 | Anonymous | Carbon, dissolved organic [DOC] | ---- | E358-L | 4.88 mg/L | 5 mg/L | 97.7 | 70.0 | 130 | ---- |
| **Dissolved Metals (QCLot: 1164373)** | | | | | | | | | | |
| EO2308922-002 | 01A-IN | Mercury, dissolved | 7439-97-6 | E509 | 0.000103 mg/L | 0.0001 mg/L | 103 | 70.0 | 130 | ---- |
| **Dissolved Metals (QCLot: 1164374)** | | | | | | | | | | |
| EO2308922-022 | 31-SH | Mercury, dissolved | 7439-97-6 | E509 | 0.0000703 mg/L | 0.0001 mg/L | 70.3 | 70.0 | 130 | ---- |
| **Dissolved Metals (QCLot: 1168217)** | | | | | | | | | | |
| EO2308922-002 | 01A-IN | Aluminum, dissolved | 7429-90-5 | E421 | 0.191 mg/L | 0.2 mg/L | 95.6 | 70.0 | 130 | ---- |
| | | Antimony, dissolved | 7440-36-0 | E421 | 0.0201 mg/L | 0.02 mg/L | 100 | 70.0 | 130 | ---- |
| | | Arsenic, dissolved | 7440-38-2 | E421 | 0.0203 mg/L | 0.02 mg/L | 101 | 70.0 | 130 | ---- |
| | | Barium, dissolved | 7440-39-3 | E421 | ND mg/L | 0.02 mg/L | ND | 70.0 | 130 | ---- |
| | | Boron, dissolved | 7440-42-8 | E421 | 0.105 mg/L | 0.1 mg/L | 105 | 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 | 4 mg/L | ND | 70.0 | 130 | ---- |
| | | Chromium, dissolved | 7440-47-3 | E421 | 0.0384 mg/L | 0.04 mg/L | 96.0 | 70.0 | 130 | ---- |
| | | Copper, dissolved | 7440-50-8 | E421 | 0.0193 mg/L | 0.02 mg/L | 96.5 | 70.0 | 130 | ---- |
| | | Iron, dissolved | 7439-89-6 | E421 | 1.93 mg/L | 2 mg/L | 96.5 | 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: 1168217) - continued** | | | | | | | | | | |
| EO2308922-002 | 01A-IN | Lead, dissolved | 7439-92-1 | E421 | 0.0191 mg/L | 0.02 mg/L | 95.4 | 70.0 | 130 | ---- |
| | | Magnesium, dissolved | 7439-95-4 | E421 | ND mg/L | 1 mg/L | ND | 70.0 | 130 | ---- |
| | | Manganese, dissolved | 7439-96-5 | E421 | ND mg/L | 0.02 mg/L | ND | 70.0 | 130 | ---- |
| | | Nickel, dissolved | 7440-02-0 | E421 | 0.0387 mg/L | 0.04 mg/L | 96.6 | 70.0 | 130 | ---- |
| | | Potassium, dissolved | 7440-09-7 | E421 | 3.81 mg/L | 4 mg/L | 95.3 | 70.0 | 130 | ---- |
| | | Selenium, dissolved | 7782-49-2 | E421 | 0.0414 mg/L | 0.04 mg/L | 104 | 70.0 | 130 | ---- |
| | | Silver, dissolved | 7440-22-4 | E421 | 0.00264 mg/L | 0.004 mg/L | 66.0 | 70.0 | 130 | MES |
| | | Sodium, dissolved | 7440-23-5 | E421 | ND mg/L | 2 mg/L | ND | 70.0 | 130 | ---- |
| | | Uranium, dissolved | 7440-61-1 | E421 | 0.00379 mg/L | 0.004 mg/L | 94.7 | 70.0 | 130 | ---- |
| | | Zinc, dissolved | 7440-66-6 | E421 | 0.376 mg/L | 0.4 mg/L | 94.1 | 70.0 | 130 | ---- |
| **Dissolved Metals (QCLot: 1168218)** | | | | | | | | | | |
| EO2308922-022 | 31-SH | Aluminum, dissolved | 7429-90-5 | E421 | 0.187 mg/L | 0.2 mg/L | 93.4 | 70.0 | 130 | ---- |
| | | Antimony, dissolved | 7440-36-0 | E421 | 0.0200 mg/L | 0.02 mg/L | 100.0 | 70.0 | 130 | ---- |
| | | Arsenic, dissolved | 7440-38-2 | E421 | 0.0206 mg/L | 0.02 mg/L | 103 | 70.0 | 130 | ---- |
| | | Barium, dissolved | 7440-39-3 | E421 | ND mg/L | 0.02 mg/L | ND | 70.0 | 130 | ---- |
| | | Boron, dissolved | 7440-42-8 | E421 | ND mg/L | 0.1 mg/L | ND | 70.0 | 130 | ---- |
| | | Cadmium, dissolved | 7440-43-9 | E421 | 0.00395 mg/L | 0.004 mg/L | 98.7 | 70.0 | 130 | ---- |
| | | Calcium, dissolved | 7440-70-2 | E421 | ND mg/L | 4 mg/L | ND | 70.0 | 130 | ---- |
| | | Chromium, dissolved | 7440-47-3 | E421 | 0.0383 mg/L | 0.04 mg/L | 95.8 | 70.0 | 130 | ---- |
| | | Copper, dissolved | 7440-50-8 | E421 | 0.0185 mg/L | 0.02 mg/L | 92.6 | 70.0 | 130 | ---- |
| | | Iron, dissolved | 7439-89-6 | E421 | 1.99 mg/L | 2 mg/L | 99.4 | 70.0 | 130 | ---- |
| | | Lead, dissolved | 7439-92-1 | E421 | 0.0187 mg/L | 0.02 mg/L | 93.7 | 70.0 | 130 | ---- |
| | | Magnesium, dissolved | 7439-95-4 | E421 | ND mg/L | 1 mg/L | ND | 70.0 | 130 | ---- |
| | | Manganese, dissolved | 7439-96-5 | E421 | ND mg/L | 0.02 mg/L | ND | 70.0 | 130 | ---- |
| | | Nickel, dissolved | 7440-02-0 | E421 | 0.0373 mg/L | 0.04 mg/L | 93.2 | 70.0 | 130 | ---- |
| | | Potassium, dissolved | 7440-09-7 | E421 | 3.87 mg/L | 4 mg/L | 96.8 | 70.0 | 130 | ---- |
| | | Selenium, dissolved | 7782-49-2 | E421 | 0.0428 mg/L | 0.04 mg/L | 107 | 70.0 | 130 | ---- |
| | | Silver, dissolved | 7440-22-4 | E421 | 0.00210 mg/L | 0.004 mg/L | 52.6 | 70.0 | 130 | MS-Ag |
| | | Sodium, dissolved | 7440-23-5 | E421 | ND mg/L | 2 mg/L | ND | 70.0 | 130 | ---- |
| | | Uranium, dissolved | 7440-61-1 | E421 | 0.00390 mg/L | 0.004 mg/L | 97.4 | 70.0 | 130 | ---- |
| | | Zinc, dissolved | 7440-66-6 | E421 | 0.359 mg/L | 0.4 mg/L | 89.7 | 70.0 | 130 | ---- |
| **Volatile Organic Compounds (QCLot: 1165193)** | | | | | | | | | | |
| EO2308906-016 | Anonymous | Benzene | 71-43-2 | E611A | ND µg/L | 100 µg/L | ND | 50.0 | 140 | MS-B |
| | | Ethylbenzene | 100-41-4 | E611A | 89.6 µg/L | 100 µg/L | 89.6 | 50.0 | 140 | ---- |
| | | Toluene | 108-88-3 | E611A | 84.0 µg/L | 100 µg/L | 84.0 | 50.0 | 140 | ---- |

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 |
| **Volatile Organic Compounds (QCLot: 1165193) - continued** | | | | | | | | | | |
| EO2308906-016 | Anonymous | Xylene, m+p- | 179601-23-1 | E611A | 178 µg/L | 200 µg/L | 89.1 | 50.0 | 140 | ---- |
| | | Xylene, o- | 95-47-6 | E611A | 56.0 µg/L | 100 µg/L | 56.0 | 50.0 | 140 | ---- |
| **Volatile Organic Compounds (QCLot: 1165454)** | | | | | | | | | | |
| EO2308922-005 | 04-SH | Benzene | 71-43-2 | E611A | 89.1 µg/L | 100 µg/L | 89.1 | 50.0 | 140 | ---- |
| | | Ethylbenzene | 100-41-4 | E611A | 88.5 µg/L | 100 µg/L | 88.5 | 50.0 | 140 | ---- |
| | | Toluene | 108-88-3 | E611A | 85.2 µg/L | 100 µg/L | 85.2 | 50.0 | 140 | ---- |
| | | Xylene, m+p- | 179601-23-1 | E611A | 190 µg/L | 200 µg/L | 95.2 | 50.0 | 140 | ---- |
| | | Xylene, o- | 95-47-6 | E611A | 101 µg/L | 100 µg/L | 101 | 50.0 | 140 | ---- |

## Qualifiers

| Qualifier | Description |
|---|---|
| *MES* | *Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).* |
| *MS-Ag* | *MS-Ag: Matrix Spike recovery for silver was marginally below DQO (40 to <60%) due to its instability in the sample matrix. Silver was not detected. Reported result (< LOR) is reliable* |
| *MS-B* | *Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.* |

October 11, 2023 Service Request No:K2311231

Megha Walia
ALS Environmental - Canada
9450 17 Ave NW
Edmonton, AB T6N 1M9

**Laboratory Results for: EO2308922**

Dear Megha,

Enclosed are the results of the sample(s) submitted to our laboratory October 04, 2023
For your reference, these analyses have been assigned our service request number **K2311231.**

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 3260. You may also contact me via email at Luke.Rahn@alsglobal.com.

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Luke Rahn
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:** EO2308922
**Sample Matrix:** Water

**Service Request:** K2311231
**Date Received:** 10/04/2023

## 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:**

Nine water samples were received for analysis at ALS Environmental on 10/04/2023. 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 _____ Date 10/11/2023

## SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

| CLIENT ID: EO2308922-027 | | | Lab ID: K2311231-005 | | | |
|---|---|---|---|---|---|---|
| **Analyte** | **Results** | **Flag** | **MDL** | **MRL** | **Units** | **Method** |
| Halides, Adsorbable Organic (AOX) | 0.062 | | | 0.020 | mg/L | 1650C |

# 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:**K2311231
**Project:** EO2308922

## SAMPLE CROSS-REFERENCE

| SAMPLE # | CLIENT SAMPLE ID | DATE | TIME |
|---|---|---|---|
| K2311231-001 | EO2308922-003 | 9/29/2023 | 0725 |
| K2311231-002 | EO2308922-019 | 9/27/2023 | 1535 |
| K2311231-003 | EO2308922-024 | 9/28/2023 | 1235 |
| K2311231-004 | EO2308922-025 | 9/29/2023 | 1400 |
| K2311231-005 | EO2308922-027 | 9/28/2023 | 1634 |
| K2311231-006 | EO2308922-030 | 9/28/2023 | 1032 |
| K2311231-007 | EO2308922-032 | 9/28/2023 | 1600 |
| K2311231-008 | EO2308922-033 | 9/28/2023 | 0945 |
| K2311231-009 | EO2308922-037 | 9/29/2023 | 1330 |

# Chain of Custody

ALS Environmental - Edmonton
9450 - 17 Avenue NW
Edmonton AB Canada T6N 1M9

144656 V2311231

| | |
|---|---|
| Destination Lab: | **USA - Kelso** |
| Address: | 1317 South 13th Avenue Kelso DC United States 98626 |
| Client: | AECOM Canada Ltd. |
| Work Order Number: | **EO2308922** |
| Original Receipt Date/Time | Instructions Received |
| 30/09/2023 07:04 | |

Relinquished By

Date/Time

Received By MC MS

Date/Time 10/4/23 1010

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 |
|---|---|---|---|---|---|---|---|---|
| EO2308922-003 | 03-SH | Water | Amber glass (nitric acid) | AOX | Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration | 24-10-2023 | 29/09/2023 07:25 | |
| EO2308922-019 | 08-SH | Water | Amber glass (nitric acid) | AOX | Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration | 24-10-2023 | 27/09/2023 15:35 | |
| EO2308922-024 | 12-SH | Water | Amber glass (nitric acid) | AOX | Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration | 24-10-2023 | 28/09/2023 12:35 | |
| EO2308922-025 | 32-SH | Water | Amber glass (nitric acid) | AOX | Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration | 24-10-2023 | 29/09/2023 14:00 | |
| EO2308922-027 | 13-SH | Water | Amber glass (nitric acid) | AOX | Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration | 24-10-2023 | 28/09/2023 16:34 | |
| EO2308922-030 | 15-SH | Water | Amber glass (nitric acid) | AOX | Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration | 24-10-2023 | 28/09/2023 10:32 | |
| EO2308922-032 | 16-SH | Water | Amber glass (nitric acid) | AOX | Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration | 24-10-2023 | 28/09/2023 16:00 | |
| EO2308922-033 | 17-SH | Water | Amber glass (nitric acid) | AOX | Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration | 24-10-2023 | 28/09/2023 09:45 | |

| ALS Sample ID | Client ID | Matrix | Container Type | Test Codes | Method Description | Due Date | Sampling Date and Time | Remarks |
|---|---|---|---|---|---|---|---|---|
| EO2308922-037 | FIELD BLANK | Water | Amber glass (nitric acid) | AOX | Adsorbable Organic Halides (AOX) by Adsortption and Coulometric Titration | 24-10-2023 | 29/09/2023 13:30 | |

VN2311231

PM LB

# Cooler Receipt and Preservation Form

Client ALS Canada Service Request K23 11231

Received: 10/4/23 Opened: 10/4/23 By: VM Unloaded: 10/4/23 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 |
|---|---|---|---|---|---|---|---|
| | 4.2 | IR01 | | | | 773609533162 | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

4. Was a Temperature Blank present in cooler? NA Y (N) If yes, notate the temperature in the appropriate column above:
   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 # above 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* Ryoc
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 the 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 |
|---|---|---|---|---|---|---|---|---|---|
| E008922-003 | 250mL | | | X | HNO3 | 5mL | BEI-166-G | VM | 1340 |
| E008922-037 | ↓ | | | X | ↓ | ↓ | ↓ | VM | 1340 |
| | | | | | | | | | |
| | | | | | | | | | |

Notes, Discrepancies, Resolutions: _____

# 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. |
| J | The result is an estimated value. |
| 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:** K2311231
**Project:** EO2308922/

**Sample Name:** EO2308922-003 **Date Collected:** 09/29/23
**Lab Code:** K2311231-001 **Date Received:** 10/4/23
**Sample Matrix:** Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 1650C | | KABROWN |

**Sample Name:** EO2308922-019 **Date Collected:** 09/27/23
**Lab Code:** K2311231-002 **Date Received:** 10/4/23
**Sample Matrix:** Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 1650C | | KABROWN |

**Sample Name:** EO2308922-024 **Date Collected:** 09/28/23
**Lab Code:** K2311231-003 **Date Received:** 10/4/23
**Sample Matrix:** Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 1650C | | KABROWN |

**Sample Name:** EO2308922-025 **Date Collected:** 09/29/23
**Lab Code:** K2311231-004 **Date Received:** 10/4/23
**Sample Matrix:** Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 1650C | | KABROWN |

**Sample Name:** EO2308922-027 **Date Collected:** 09/28/23
**Lab Code:** K2311231-005 **Date Received:** 10/4/23
**Sample Matrix:** Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 1650C | | KABROWN |

**Client:** ALS Environmental - Canada **Service Request:** K2311231
**Project:** EO2308922/

**Sample Name:** EO2308922-030 **Date Collected:** 09/28/23
**Lab Code:** K2311231-006 **Date Received:** 10/4/23
**Sample Matrix:** Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 1650C | | KABROWN |

**Sample Name:** EO2308922-032 **Date Collected:** 09/28/23
**Lab Code:** K2311231-007 **Date Received:** 10/4/23
**Sample Matrix:** Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 1650C | | KABROWN |

**Sample Name:** EO2308922-033 **Date Collected:** 09/28/23
**Lab Code:** K2311231-008 **Date Received:** 10/4/23
**Sample Matrix:** Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 1650C | | KABROWN |

**Sample Name:** EO2308922-037 **Date Collected:** 09/29/23
**Lab Code:** K2311231-009 **Date Received:** 10/4/23
**Sample Matrix:** Water

| Analysis Method | Extracted/Digested By | Analyzed By |
|---|---|---|
| 1650C | | KABROWN |

# 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:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | 09/29/23 07:25 |
| **Sample Matrix:** | Water | **Date Received:** | 10/04/23 10:10 |
| **Sample Name:** | EO2308922-003 | **Basis:** | NA |
| **Lab Code:** | K2311231-001 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/09/23 13:52 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | 09/27/23 15:35 |
| **Sample Matrix:** | Water | **Date Received:** | 10/04/23 10:10 |
| **Sample Name:** | EO2308922-019 | **Basis:** | NA |
| **Lab Code:** | K2311231-002 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/09/23 13:52 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | 09/28/23 12:35 |
| **Sample Matrix:** | Water | **Date Received:** | 10/04/23 10:10 |
| **Sample Name:** | EO2308922-024 | **Basis:** | NA |
| **Lab Code:** | K2311231-003 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/10/23 11:22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | 09/29/23 14:00 |
| **Sample Matrix:** | Water | **Date Received:** | 10/04/23 10:10 |
| **Sample Name:** | EO2308922-025 | **Basis:** | NA |
| **Lab Code:** | K2311231-004 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/10/23 11:22 | |

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | 09/28/23 16:34 |
| **Sample Matrix:** | Water | **Date Received:** | 10/04/23 10:10 |
| **Sample Name:** | EO2308922-027 | **Basis:** | NA |
| **Lab Code:** | K2311231-005 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | **0.062** | mg/L | 0.020 | 1 | 10/10/23 11:22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | 09/28/23 10:32 |
| **Sample Matrix:** | Water | **Date Received:** | 10/04/23 10:10 |
| **Sample Name:** | EO2308922-030 | **Basis:** | NA |
| **Lab Code:** | K2311231-006 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/10/23 11:22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | 09/28/23 16:00 |
| **Sample Matrix:** | Water | **Date Received:** | 10/04/23 10:10 |
| **Sample Name:** | EO2308922-032 | **Basis:** | NA |
| **Lab Code:** | K2311231-007 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/10/23 11:22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | 09/28/23 09:45 |
| **Sample Matrix:** | Water | **Date Received:** | 10/04/23 10:10 |
| **Sample Name:** | EO2308922-033 | **Basis:** | NA |
| **Lab Code:** | K2311231-008 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/10/23 11:22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | 09/29/23 13:30 |
| **Sample Matrix:** | Water | **Date Received:** | 10/04/23 10:10 |
| **Sample Name:** | EO2308922-037 | **Basis:** | NA |
| **Lab Code:** | K2311231-009 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/10/23 11:22 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Batch QC | **Basis:** | NA |
| **Lab Code:** | KQ2317763-09 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | **2.7** | mg/L | 2.0 | 100 | 10/09/23 13:52 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Batch QC | **Basis:** | NA |
| **Lab Code:** | KQ2317871-09 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | **4.3** | mg/L | 2.0 | 100 | 10/10/23 11:22 | |

# QC Summary Forms

**ALS Environmental—Kelso Laboratory**
1317 South 13th Avenue, Kelso, WA 98626
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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:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2311231-MB1 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/09/23 13:52 | |

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| **Sample Name:** | Method Blank | **Basis:** | NA |
| **Lab Code:** | K2311231-MB2 | | |

## General Chemistry Parameters

| Analyte Name | Analysis Method | Result | Units | MRL | Dil. | Date Analyzed | Q |
|---|---|---|---|---|---|---|---|
| Halides, Adsorbable Organic (AOX) | 1650C | ND U | mg/L | 0.020 | 1 | 10/10/23 11:22 | |

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922/ | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| | | **Date Analyzed:** | 10/09/2023 |
| | | **Analysis Lot:** | 819792 |

## 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 | 0.100 |
| Run A | 3.73 | 9.36 | 0.097 |
| Percent Recovery A | 102 | 94 | 97 |
| Run B | 3.60 | 9.35 | |
| Percent Recovery B | 99 | 94 | |

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922/ | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| | | **Date Analyzed:** | 10/10/2023 |
| | | **Analysis Lot:** | 819977 |

## 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 | 0.100 |
| Run A | 3.58 | 10.2 | 0.092 |
| Percent Recovery A | 98 | 102 | 92 |
| Run B | 3.61 | 10.8 | |
| Percent Recovery B | 99 | 108 | |

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | N/A |
| **Sample Matrix:** | Water | **Date Received:** | N/A |
| | | **Date Analyzed:** | 10/9/23 |
| | | **Date Extracted:** | NA |

**Duplicate Matrix Spike Summary**
**Halides, Adsorbable Organic (AOX)**

| | | | |
|---|---|---|---|
| **Sample Name:** | Batch QC | **Units:** | mg/L |
| **Lab Code:** | KQ2317763-09 | **Basis:** | NA |
| **Analysis Method:** | 1650C | | |
| **Prep Method:** | None | | |

| | | Matrix Spike KQ2317763-09MS | | | Duplicate Matrix Spike KQ2317763-09DMS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Sample Result** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Halides, Adsorbable Organic (AOX) | 2.7 | 22.4 | 20.0 | 98 | 21.5 | 20.0 | 94 | 90-110 | 4 | 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.**

**ALS Group USA, Corp.**
**dba ALS Environmental**

QA/QC Report

| | | | |
|---|---|---|---|
| **Client:** | ALS Environmental - Canada | **Service Request:** | K2311231 |
| **Project:** | EO2308922 | **Date Collected:** | N/A |
| **Sample Matrix:** | Water | **Date Received:** | N/A |
| | | **Date Analyzed:** | 10/10/23 |
| | | **Date Extracted:** | NA |

**Duplicate Matrix Spike Summary**
**Halides, Adsorbable Organic (AOX)**

| | | | |
|---|---|---|---|
| **Sample Name:** | Batch QC | **Units:** | mg/L |
| **Lab Code:** | KQ2317871-09 | **Basis:** | NA |
| **Analysis Method:** | 1650C | | |
| **Prep Method:** | None | | |

| | | Matrix Spike KQ2317871-09MS | | | Duplicate Matrix Spike KQ2317871-09DMS | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte Name** | **Sample Result** | **Result** | **Spike Amount** | **% Rec** | **Result** | **Spike Amount** | **% Rec** | **% Rec Limits** | **RPD** | **RPD Limit** |
| Halides, Adsorbable Organic (AOX) | 4.3 | 23.1 | 20.0 | 94 | 23.1 | 20.0 | 94 | 90-110 | <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

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page 1 of 4

| 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: | |

| Project Information | |
|---|---|
| ALS Account # / Quote #: | |
| Job #: | Swan Hills - 60716599 |
| PO / AFE: | |
| LSD: | |

**ALS Lab Work Order # (ALS use only):** EO2308922

| 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 | michael.steed@aecom.com |

| Oil and Gas Required Fields (client use) | |
|---|---|
| AFE/Cost Center: | PO# |
| Major/Minor Code: | Routing Code: |
| Requisitioner: | |
| Location: | |

**ALS Contact:** Pamela Toledo **Sampler:**

| 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:** |
| For all tests with rush TATs requested, please contact your AM to confirm availability. |

AFFIX ALS BARCODE LABEL HERE (ALS use only)

**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 | Routine | Dissolved Metals | Dissolved Mercury | BTEX, F1 | PCB | AOX | Dioxin and Furan | D:Solved Multiples | SAMPLES ON HOLD | EXTENDED STORAGE REQUIRED | SUSPECTED HAZARD (see notes) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 01A-SH | 04/28/23 | 9:43 | Water | | X | X | X | X | x | X | | | X | | | |
| | 01A-IN | 04/28/23 | 9:45 | Water | | X | X | X | X | | X | | | X | | | |
| | 03-SH | 04/24/23 | 8:25 | Water | | X | X | X | X | x | X | x | x | X | | | |
| | 03-IN | 04/28/23 | 8:23 | Water | | X | X | X | X | | X | | | X | | | |
| | 04-SH | 04/24/23 | 9:40 | Water | | X | X | X | X | x | X | | | X | | | |
| | 04-IN | 04/28/23 | 9:30 | Water | | X | X | X | X | | X | | | X | | | |
| | 04-SS | 04/28/23 | 9:50 | Water | | X | X | X | X | | X | | | X | | | |
| | 05-SH | 04/28/23 | 16:15 | Water | | X | X | X | X | x | X | | | X | | | |
| | 25-SH | 04/28/23 | 16:35 | Water | | X | X | X | X | x | X | | | X | | | |
| | 05-IN | 04/28/23 | 16:08 | Water | | X | X | X | X | | X | | | X | | | |
| | 05-SS | 04/28/23 | 9:05 | Water | | X | X | X | X | | X | | | X | | | |
| | 25-SS | 04/28/23 | 9:05 | Water | | X | X | X | X | | X | | | X | | | |

Environmental Division
Edmonton
Work Order Reference
EO2308922

Telephone : +1 780 413 5227

| Drinking Water (DW) Samples[1] (client use) | Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only) |
|---|---|
| Are samples taken from a Regulated DW System? ☐ YES ☑ NO | Dioxin and Furan - Quote Q89925 |
| Are samples for human consumption/ use? ☐ YES ☑ NO | |

**SHIPMENT RELEASE (client use)**

| Released by: | Date: | Time: |
|---|---|---|
| Carter Mackie | 04/24/23 | 18:00 |

**INITIAL SHIPMENT RECEPTION (ALS use only)**

| Received by: | Date: | Time: |
|---|---|---|
| | 30-Sep-23 | 8:04 |

**FINAL SHIPMENT RECEPTION (ALS use only)**

| Received by: | Date: | Time: |
|---|---|---|
| | | |

**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 | | | |
|---|---|---|---|---|---|---|---|
| 5.7 | | | | | | | |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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.

If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

FEB 2022 FRONT

# Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page 2 of 4

| 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.

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:**

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 - 60716599

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 | Routine | Dissolved Metals | Dissolved Mercury | BTEX, F1 | PCB | AOX | Dioxin and Furan | Total Metals | Total Mercury | Total Nutrients | Dissolved Nutrients | SAMPLES ON HOLD | EXTENDED STORAGE REQUIRED | SUSPECTED HAZARD (see notes) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 06-SH | 09/29/23 | 10:20 | Water | | X | X | X | X | x | X | | | X | X | X | | | | |
| | 06(R)IN | 09/29/23 | 10:50 | Water | | X | X | X | X | | X | | | X | X | X | | | | |
| | 07-SH | 09/29/23 | 11:00 | Water | | X | X | X | X | x | X | | | X | X | X | | | | |
| | 27-SH | 09/27/23 | 11:00 | Water | | X | X | X | X | x | X | | | | | | X | | | |
| | 07-IN | 09/29/23 | 10:50 | Water | | X | X | X | X | | X | | | X | X | X | | | | |
| | 07(R)SS | 09/29/23 | 11:10 | Water | | X | X | X | X | | X | | | X | X | X | | | | |
| | 08-SH | 09/27/23 | 16:35 | Water | | X | X | X | X | x | X | x | X | | | | X | | | |
| | 08-IN | 09/27/23 | 16:31 | Water | | X | X | X | X | | X | | | | | | X | | | |
| | 11-SH | 09/28/23 | 10:25 | Water | | X | X | X | X | x | X | | | | | | X | | | |
| | 31-SH | 09/28/23 | 14:35 | Water | | X | X | X | X | x | X | | | | | | X | | | |
| | 11-IN | 09/28/23 | 10:25 | Water | | X | X | X | X | | X | | | | | | X | | | |
| | 12-SH | 09/28/23 | 13:35 | Water | | X | X | X | X | 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)**

Dioxin and Furan - Quote Q89925

**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: |
|---|---|---|
| Carter Mackie | 09/29/23 | 18:00 |

**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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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.**

FEB 2022 FRONT

# Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page 3 of 4

| 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: | |

**Project Information**

| | |
|---|---|
| ALS Account # / Quote #: | |
| Job #: | Swan Hills - 60716599 |
| PO / AFE: | |
| LSD: | |

**ALS Lab Work Order # (ALS use only):**

**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 | |

**Oil and Gas Required Fields (client use)**

| | |
|---|---|
| AFE/Cost Center: | PO# |
| Major/Minor Code: | Routing Code: |
| Requisitioner: | |
| Location: | |

**ALS Contact:** Pamela Toledo **Sampler:**

**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:**

For all tests with rush TATs requested, please contact your AM to confirm availability.

**AFFIX ALS BARCODE LABEL HERE (ALS use only)**

**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 | Routine | Dissolved Metals | Dissolved Mercury | BTEX, F1 | PCB | AOX | Dioxin and Furan | Dissolved nutrients | SAMPLES ON HOLD | EXTENDED STORAGE REQUIRED | SUSPECTED HAZARD (see notes) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 32-SH | | | Water | | | | | | | | x | x | x | | | |
| | 12-IN | 09/28/23 | 13:30 | Water | | x | x | x | x | | x | | | x | | | |
| | 13-SH | 09/28/23 | 17:34 | Water | | x | x | x | x | x | x | x | x | x | | | |
| | 13-IN | 09/28/23 | 17:27 | Water | | x | x | x | x | | x | | | x | | | |
| | ~~18(R)SS~~ | | | ~~Water~~ | | x | x | x | x | | x | | | | | | |
| | 14-SH | 09/27/23 | 5:40 | Water | | x | x | x | x | x | x | | | x | | | |
| | 15-SH | 09/28/23 | 11:32 | Water | | x | x | x | x | x | x | x | x | x | | | |
| | 15-IN | 09/28/23 | 11:40 | Water | | x | x | x | x | | x | | | x | | | |
| | ~~15(2R)SS~~ | | | ~~Water~~ | | x | x | x | x | | x | | | | | | |
| | 16-SH | 09/28/23 | 17:00 | Water | | x | x | x | x | x | x | x | x | x | | | |
| | ~~16-IN~~ | | | ~~Water~~ | | x | x | x | x | | x | | | | | | |
| | 17-SH | 09/28/23 | 10:45 | Water | | x | x | x | x | 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)**

Dioxin and Furan - Quote Q89925

**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: |
|---|---|---|
| Carter Mackie | 09/27/23 | 18:00 |

**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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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

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page 4 of 4

| 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. |
| 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:** |
| 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 - 60716599 |
| PO / AFE: | |
| LSD: | |
| **ALS Lab Work Order # (ALS use only):** | |

| Oil and Gas Required Fields (client use) | | |
|---|---|---|
| AFE/Cost Center: | | PO# |
| Major/Minor Code: | | Routing Code: |
| Requisitioner: | | |
| Location: | | |
| **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 | Routine | Dissolved Metals | Dissolved Mercury | BTEX, F1 | PCB | AOX | Dioxin and Furan | Total Metals | Total Mercury | Total Nutrients | Dissolved Nutrients | | | SAMPLES ON HOLD | EXTENDED STORAGE REQUIRED | SUSPECTED HAZARD (see notes) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 17-IN | 04/28/23 | 10:30 | Water | | X | X | X | X | | X | | | | | | X | | | | | |
| | 89-3 | 04/29/23 | 12:10 | Water | | X | X | ~~X~~ | ~~X~~ | | X | | | X | X | X | | | | | | |
| | Trip Blank | 04/29/23 | N/A | Water | | X | X | X | X | X | X | | | | | | X | | | | | |
| | ~~10-SH~~ 3 | | | Water | | X | X | X | X | X | X | X | X | | | | X | | | | | |
| | ~~20-SH~~ | | | Water | | X | X | X | X | X | X | | | | | | X | | | | | |
| | ~~30-SH~~ 5-SH | | | Water | | X | X | X | X | X | X | | | | | | X | | | | | |
| | ~~51-SH~~ | | | Water | | | | | | | X | | | | | | X | | | | | |
| | ~~52-SH~~ | | | Water | | | | | | | X | | | | | | | | | | | |
| | Feild Blank | 04/29/23 | 14:30 | Water | | X | X | X | X | X | X | X | X | | | | X | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |

| Drinking Water (DW) Samples[1] (client use) | Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only) |
|---|---|
| Are samples taken from a Regulated DW System? ☐ YES ☐ NO | Dioxin and Furan - Quote Q89925 |
| Are samples for human consumption/ use? ☐ YES ☑ NO | |

**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: |
| Carter Mackie | 04/29/23 | 18:00 |

| 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.**

FEB 2022 FRONT

# Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 22 -

Page 1 of 1

**Environmental Division Edmonton**

Work Order Reference

**EO2308922**

Telephone : +1 780 413 5227

| 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 n

☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge r

☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge r

☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge r

☐ Same day [E2] if received by 10am M-S - 200% rush surc

Additional fees may apply to rush requests on wee

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, ple

**Project Information**

ALS Account # / Quote #:

Job #: Swan Hills - 60716599

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**

Indicate Filtered (F), Preserved (P) or Filter

| 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 | Routine | Dissolved Metals | Dissolved Mercury | BTEX, F1 | PCB | AOX | Dioxin and Furan | SAMPLES ON HOLD | EXTENDED STORAGE REQUI | SUSPECTED HAZARD (see notes) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ~~17-IN~~ | | | ~~Water~~ | | x | x | x | x | | x | | | | | |
| | ~~89-3~~ | | | ~~Water~~ | | x | x | x | x | | x | | | | | |
| | ~~Trip Blank~~ | | | ~~Water~~ | | x | x | x | x | x | x | | | | | |
| | ~~18-SH~~ | | | ~~Water~~ | | x | x | x | x | x | x | x | x | | | |
| | ~~20-SH~~ | | | ~~Water~~ | | x | x | x | x | x | x | | | | | |
| | ~~30-SH~~ | | | ~~Water~~ | | x | x | x | x | x | x | | | | | |
| | 51-SH | 02-OCT-23 | 13:28 | Water | 1 | | | | | | x | | | | | |
| | 52-SH | 02-OCT-23 | 13:28 | Water | 1 | | | | | | 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)**

Dioxin and Furan - Quote Q89925

**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 | | | |
|---|---|---|---|---|---|---|---|
| 20.7 | | | | | | | |

**SHIPMENT RELEASE (client use)**

| Released by: | Date: | Time: |
|---|---|---|
| | 02-OCT-23 | 1328 |

**INITIAL SHIPMENT RECEPTION (ALS use only)**

| Received by: | Date: | Time: |
|---|---|---|
| VA | 2-Oct-2023 | 3:18 pm |

**FINAL SHIPMENT RECEPTION (ALS use only)**

| Received by: | Date: | Time: |
|---|---|---|
| | | |

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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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.**

# 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

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | Outlier Tests for Selected Uncensored Variables | | | | | |
| 2 | | | | User Selected Options | | | | | | |
| 3 | | | Date/Time of Computation | ProUCL 5.2 2023-12-13 8:26:23 AM | | | | | | |
| 4 | | | | From File | 2023-ShallowProUCL_b.xls | | | | | |
| 5 | | | | Full Precision | OFF | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | 01A-SH | | | | | |
| 8 | | | | | Rosner's Outlier Test for pH () | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | Mean | 6.818 | | | | | |
| 12 | | | | Standard Deviation | 0.858 | | | | | |
| 13 | | | | Number of data | 51 | | | | | |
| 14 | | | | Number of suspected outliers | 1 | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | Potential | Obs. | Test | Critical | Critical | | |
| 17 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | |
| 18 | 1 | 6.818 | 0.849 | 5.15 | 25 | 1.964 | 3.137 | 3.488 | | |
| 19 | | | | | | | | | | |
| 20 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | Rosner's Outlier Test for TDS (mg/L) | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | Mean | 205.2 | | | | | |
| 29 | | | | Standard Deviation | 136.2 | | | | | |
| 30 | | | | Number of data | 51 | | | | | |
| 31 | | | | Number of suspected outliers | 1 | | | | | |
| 32 | | | | | | | | | | |
| 33 | | | | Potential | Obs. | Test | Critical | Critical | | |
| 34 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | |
| 35 | 1 | 205.2 | 134.9 | 724 | 32 | 3.847 | 3.137 | 3.488 | | |
| 36 | | | | | | | | | | |
| 37 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | |
| 38 | Potential outliers is: 724 | | | | | | | | | |
| 39 | | | | | | | | | | |
| 40 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | |
| 41 | Potential outliers is: 724 | | | | | | | | | |
| 42 | | | | | | | | | | |
| 43 | | | | | | | | | | |
| 44 | | | | | Rosner's Outlier Test for Chloride (mg/L) | | | | | |
| 45 | | | | | | | | | | |
| 46 | | | | | | | | | | |
| 47 | | | | Mean | 2.175 | | | | | |
| 48 | | | | Standard Deviation | 2.024 | | | | | |
| 49 | | | | Number of data | 50 | | | | | |
| 50 | | | | Number of suspected outliers | 1 | | | | | |
| 51 | | | | | | | | | | |
| 52 | | | | Potential | Obs. | Test | Critical | Critical | | |
| 53 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | 1 | 2.175 | 2.003 | 9.66 | 49 | 3.736 | 3.13 | 3.48 | | | |
| 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 1 Potential Outlier | | | | | | | | | | |
| 60 | Potential outliers is: 9.66 | | | | | | | | | | |
| 61 | | | | | | | | | | | |
| 62 | | | | | | | | | | | |
| 63 | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | | | | |
| 64 | | | | | | | | | | | |
| 65 | | | | | | | | | | | |
| 66 | | | | Mean | 13.26 | | | | | | |
| 67 | | | | Standard Deviation | 32.51 | | | | | | |
| 68 | | | | Number of data | 50 | | | | | | |
| 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 | 13.26 | 32.18 | 214 | 31 | 6.238 | 3.13 | 3.48 | | | |
| 74 | | | | | | | | | | | |
| 75 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 76 | Potential outliers is: 214 | | | | | | | | | | |
| 77 | | | | | | | | | | | |
| 78 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 79 | Potential outliers is: 214 | | | | | | | | | | |
| 80 | | | | | | | | | | | |
| 81 | | | | | | | | | | | |
| 82 | Dixon's Outlier Test for DOC (mg/L) | | | | | | | | | | |
| 83 | | | | | | | | | | | |
| 84 | Number of Observations = 21 | | | | | | | | | | |
| 85 | 10% critical value: 0.391 | | | | | | | | | | |
| 86 | 5% critical value: 0.44 | | | | | | | | | | |
| 87 | 1% critical value: 0.524 | | | | | | | | | | |
| 88 | | | | | | | | | | | |
| 89 | 1. Observation Value 61 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 90 | | | | | | | | | | | |
| 91 | Test Statistic: 0.201 | | | | | | | | | | |
| 92 | | | | | | | | | | | |
| 93 | For 10% significance level, 61 is not an outlier. | | | | | | | | | | |
| 94 | For 5% significance level, 61 is not an outlier. | | | | | | | | | | |
| 95 | For 1% significance level, 61 is not an outlier. | | | | | | | | | | |
| 96 | | | | | | | | | | | |
| 97 | 2. Observation Value 10 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 98 | | | | | | | | | | | |
| 99 | Test Statistic: 0.366 | | | | | | | | | | |
| 100 | | | | | | | | | | | |
| 101 | For 10% significance level, 10 is not an outlier. | | | | | | | | | | |
| 102 | For 5% significance level, 10 is not an outlier. | | | | | | | | | | |
| 103 | For 1% significance level, 10 is not an outlier. | | | | | | | | | | |
| 104 | | | | | | | | | | | |
| 105 | | | | | | | | | | | |
| 106 | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | | | | | | |
| 108 | | | | | | | | | | |
| 109 | | | | Mean | 216.1 | | | | | |
| 110 | | | | Standard Deviation | 154.9 | | | | | |
| 111 | | | | Number of data | 50 | | | | | |
| 112 | | | | Number of suspected outliers | 1 | | | | | |
| 113 | | | | | | | | | | |
| 114 | | | | Potential | Obs. | Test | Critical | Critical | | |
| 115 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | |
| 116 | 1 | 216.1 | 153.3 | 558 | 31 | 2.23 | 3.13 | 3.48 | | |
| 117 | | | | | | | | | | |
| 118 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | |
| 119 | | | | | | | | | | |
| 120 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | |
| 121 | | | | | | | | | | |
| 122 | | | | | | | | | | |
| 123 | | | | | Rosner's Outlier Test for Calcium (mg/L) | | | | | |
| 124 | | | | | | | | | | |
| 125 | | | | | | | | | | |
| 126 | | | | Mean | 49.63 | | | | | |
| 127 | | | | Standard Deviation | 35.29 | | | | | |
| 128 | | | | Number of data | 51 | | | | | |
| 129 | | | | Number of suspected outliers | 1 | | | | | |
| 130 | | | | | | | | | | |
| 131 | | | | Potential | Obs. | Test | Critical | Critical | | |
| 132 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | |
| 133 | 1 | 49.63 | 34.94 | 176 | 32 | 3.616 | 3.137 | 3.488 | | |
| 134 | | | | | | | | | | |
| 135 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | |
| 136 | Potential outliers is: 176 | | | | | | | | | |
| 137 | | | | | | | | | | |
| 138 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | |
| 139 | Potential outliers is: 176 | | | | | | | | | |
| 140 | | | | | | | | | | |
| 141 | | | | | | | | | | |
| 142 | | | | | Rosner's Outlier Test for Magnesium (mg/L) | | | | | |
| 143 | | | | | | | | | | |
| 144 | | | | | | | | | | |
| 145 | | | | Mean | 11.72 | | | | | |
| 146 | | | | Standard Deviation | 9.091 | | | | | |
| 147 | | | | Number of data | 52 | | | | | |
| 148 | | | | Number of suspected outliers | 1 | | | | | |
| 149 | | | | | | | | | | |
| 150 | | | | Potential | Obs. | Test | Critical | Critical | | |
| 151 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | |
| 152 | 1 | 11.72 | 9.003 | 35 | 33 | 2.586 | 3.144 | 3.496 | | |
| 153 | | | | | | | | | | |
| 154 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | |
| 155 | | | | | | | | | | |
| 156 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | |
| 157 | | | | | | | | | | |
| 158 | | | | | | | | | | |
| 159 | | | | | Rosner's Outlier Test for Sodium (mg/L) | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | | | | | | |
| 161 | | | | | | | | | | |
| 162 | | | | Mean | 8.64 | | | | | |
| 163 | | | | Standard Deviation | 4.353 | | | | | |
| 164 | | | | Number of data | 51 | | | | | |
| 165 | | | | Number of suspected outliers | 1 | | | | | |
| 166 | | | | | | | | | | |
| 167 | | | | Potential | Obs. | Test | Critical | Critical | | |
| 168 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | |
| 169 | 1 | 8.64 | 4.311 | 20.8 | 47 | 2.821 | 3.137 | 3.488 | | |
| 170 | | | | | | | | | | |
| 171 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | |
| 172 | | | | | | | | | | |
| 173 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | |
| 174 | | | | | | | | | | |
| 175 | | | | | | | | | | |
| 176 | | | | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | |
| 177 | | | | | | | | | | |
| 178 | | | | | | | | | | |
| 179 | | | | Mean | 0.00329 | | | | | |
| 180 | | | | Standard Deviation | 0.0183 | | | | | |
| 181 | | | | Number of data | 50 | | | | | |
| 182 | | | | Number of suspected outliers | 1 | | | | | |
| 183 | | | | | | | | | | |
| 184 | | | | Potential | Obs. | Test | Critical | Critical | | |
| 185 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | |
| 186 | 1 | 0.00329 | 0.0181 | 0.13 | 14 | 6.996 | 3.13 | 3.48 | | |
| 187 | | | | | | | | | | |
| 188 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | |
| 189 | Potential outliers is: 0.13 | | | | | | | | | |
| 190 | | | | | | | | | | |
| 191 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | |
| 192 | Potential outliers is: 0.13 | | | | | | | | | |
| 193 | | | | | | | | | | |
| 194 | | | | | | | | | | |
| 195 | | | | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | |
| 196 | | | | | | | | | | |
| 197 | Number of Observations = 8 | | | | | | | | | |
| 198 | 10% critical value: 0.479 | | | | | | | | | |
| 199 | 5% critical value: 0.554 | | | | | | | | | |
| 200 | 1% critical value: 0.683 | | | | | | | | | |
| 201 | | | | | | | | | | |
| 202 | 1. Observation Value 0.003 is a Potential Outlier (Upper Tail)? | | | | | | | | | |
| 203 | | | | | | | | | | |
| 204 | Test Statistic: 0.947 | | | | | | | | | |
| 205 | | | | | | | | | | |
| 206 | For 10% significance level, 0.003 is an outlier. | | | | | | | | | |
| 207 | For 5% significance level, 0.003 is an outlier. | | | | | | | | | |
| 208 | For 1% significance level, 0.003 is an outlier. | | | | | | | | | |
| 209 | | | | | | | | | | |
| 210 | 2. Observation Value 6.8E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | |
| 211 | | | | | | | | | | |
| 212 | Test Statistic: 0.001 | | | | | | | | | |

For 10% significance level, 6.8E-06 is not an outlier.

For 5% significance level, 6.8E-06 is not an outlier.

For 1% significance level, 6.8E-06 is not an outlier.

## Dixon's Outlier Test for Chromium (mg/L)

Number of Observations = 23

10% critical value: 0.374

5% critical value: 0.421

1% critical value: 0.505

**1. Observation Value 0.017 is a Potential Outlier (Upper Tail)?**

Test Statistic: 0.247

For 10% significance level, 0.017 is not an outlier.

For 5% significance level, 0.017 is not an outlier.

For 1% significance level, 0.017 is not an outlier.

**2. Observation Value 0.00061 is a Potential Outlier (Lower Tail)?**

Test Statistic: 0.015

For 10% significance level, 0.00061 is not an outlier.

For 5% significance level, 0.00061 is not an outlier.

For 1% significance level, 0.00061 is not an outlier.

## Rosner's Outlier Test for Copper (mg/L)

| | |
|---|---|
| Mean | 0.00382 |
| Standard Deviation | 0.0143 |
| Number of data | 50 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00382 | 0.0141 | 0.102 | 18 | 6.951 | 3.13 | 3.48 |

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

## Rosner's Outlier Test for Iron (mg/L)

| | |
|---|---|
| Mean | 2.778 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | Standard Deviation | 1.427 | | | | | | | |
| 267 | | | Number of data | 32 | | | | | | | |
| 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 | 2.778 | 1.405 | 6.79 | 5 | 2.856 | 2.94 | 3.27 | | | |
| 273 | | | | | | | | | | | |
| 274 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 275 | | | | | | | | | | | |
| 276 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 277 | | | | | | | | | | | |
| 278 | | | | | | | | | | | |
| 279 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | |
| 280 | | | | | | | | | | | |
| 281 | Number of Observations = 22 | | | | | | | | | | |
| 282 | 10% critical value: 0.382 | | | | | | | | | | |
| 283 | 5% critical value: 0.43 | | | | | | | | | | |
| 284 | 1% critical value: 0.514 | | | | | | | | | | |
| 285 | | | | | | | | | | | |
| 286 | 1. Observation Value 0.003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 287 | | | | | | | | | | | |
| 288 | Test Statistic: 0.411 | | | | | | | | | | |
| 289 | | | | | | | | | | | |
| 290 | For 10% significance level, 0.003 is an outlier. | | | | | | | | | | |
| 291 | For 5% significance level, 0.003 is not an outlier. | | | | | | | | | | |
| 292 | For 1% significance level, 0.003 is not an outlier. | | | | | | | | | | |
| 293 | | | | | | | | | | | |
| 294 | 2. Observation Value 5.2E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 295 | | | | | | | | | | | |
| 296 | Test Statistic: 0.014 | | | | | | | | | | |
| 297 | | | | | | | | | | | |
| 298 | For 10% significance level, 5.2E-05 is not an outlier. | | | | | | | | | | |
| 299 | For 5% significance level, 5.2E-05 is not an outlier. | | | | | | | | | | |
| 300 | For 1% significance level, 5.2E-05 is not an outlier. | | | | | | | | | | |
| 301 | | | | | | | | | | | |
| 302 | | | | | | | | | | | |
| 303 | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | | | |
| 304 | | | | | | | | | | | |
| 305 | | | | | | | | | | | |
| 306 | | | Mean | 0.161 | | | | | | | |
| 307 | | | Standard Deviation | 0.205 | | | | | | | |
| 308 | | | Number of data | 32 | | | | | | | |
| 309 | | | Number of suspected outliers | 1 | | | | | | | |
| 310 | | | | | | | | | | | |
| 311 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 312 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 313 | 1 | 0.161 | 0.201 | 0.844 | 2 | 3.394 | 2.94 | 3.27 | | | |
| 314 | | | | | | | | | | | |
| 315 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 316 | Potential outliers is: 0.844 | | | | | | | | | | |
| 317 | | | | | | | | | | | |
| 318 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | Potential outliers is: 0.844 | | | | | | | | | | |
| 320 | | | | | | | | | | | |
| 321 | | | | | | | | | | | |
| 322 | | | Available only for sample sizes 3 to 500 | | | | | | | | |
| 323 | | | | | | | | | | | |
| 324 | | | | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | |
| 325 | | | | | | | | | | | |
| 326 | | | | | | | | | | | |
| 327 | | | | Mean | 0.0141 | | | | | | |
| 328 | | | | Standard Deviation | 0.0261 | | | | | | |
| 329 | | | | Number of data | 49 | | | | | | |
| 330 | | | | Number of suspected outliers | 1 | | | | | | |
| 331 | | | | | | | | | | | |
| 332 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 333 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 334 | 1 | 0.0141 | 0.0258 | 0.16 | 17 | 5.657 | 3.12 | 3.47 | | | |
| 335 | | | | | | | | | | | |
| 336 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 337 | Potential outliers is: 0.16 | | | | | | | | | | |
| 338 | | | | | | | | | | | |
| 339 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 340 | Potential outliers is: 0.16 | | | | | | | | | | |
| 341 | | | | | | | | | | | |
| 342 | | | | | | | | | | | |
| 343 | | | | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | |
| 344 | | | | | | | | | | | |
| 345 | | | | | | | | | | | |
| 346 | | | | Mean | 0.0135 | | | | | | |
| 347 | | | | Standard Deviation | 0.0203 | | | | | | |
| 348 | | | | Number of data | 32 | | | | | | |
| 349 | | | | Number of suspected outliers | 1 | | | | | | |
| 350 | | | | | | | | | | | |
| 351 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 352 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 353 | 1 | 0.0135 | 0.02 | 0.099 | 3 | 4.273 | 2.94 | 3.27 | | | |
| 354 | | | | | | | | | | | |
| 355 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 356 | Potential outliers is: 0.099 | | | | | | | | | | |
| 357 | | | | | | | | | | | |
| 358 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 359 | Potential outliers is: 0.099 | | | | | | | | | | |
| 360 | | | | | | | | | | | |
| 361 | | | | | | | | | | | |
| 362 | | | | Rosner's Outlier Test for TOC (mg/L) | | | | | | | |
| 363 | | | | | | | | | | | |
| 364 | | | | | | | | | | | |
| 365 | | | | Mean | 19.37 | | | | | | |
| 366 | | | | Standard Deviation | 22.55 | | | | | | |
| 367 | | | | Number of data | 34 | | | | | | |
| 368 | | | | Number of suspected outliers | 1 | | | | | | |
| 369 | | | | | | | | | | | |
| 370 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 371 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | 1 | 19.37 | 22.21 | 80.1 | 19 | 2.734 | 2.97 | 3.3 | | | |
| 373 | | | | | | | | | | | |
| 374 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 375 | | | | | | | | | | | |
| 376 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 377 | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 8:32:02 AM | | | | | | | | |
| | | | From File | 2023-ShallowProUCL_c.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 03-SH | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.832 | | | | | | | |
| | | | Standard Deviation | 0.267 | | | | | | | |
| | | | Number of data | 58 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 7.832 | 0.265 | 7.26 | 9 | 2.162 | 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 TDS (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 377.4 | | | | | | | |
| | | | Standard Deviation | 83.29 | | | | | | | |
| | | | Number of data | 58 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 377.4 | 82.57 | 561 | 47 | 2.224 | 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 | 1.219 | | | | | | | |
| | | | Standard Deviation | 0.759 | | | | | | | |
| | | | Number of data | 56 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 1.219 | 0.752 | 4.4 | 27 | 4.23 | 3.172 | 3.528 | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 55 | Potential outliers is: 4.4 | | | | | | | | | | | |
| 56 | | | | | | | | | | | | |
| 57 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 58 | Potential outliers is: 4.4 | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 61 | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | |
| 64 | | | | Mean | 47.78 | | | | | | | |
| 65 | | | | Standard Deviation | 25.51 | | | | | | | |
| 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 | 47.78 | 25.28 | 99.1 | 44 | 2.03 | 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 = 18 | | | | | | | | | | | |
| 81 | 10% critical value: 0.424 | | | | | | | | | | | |
| 82 | 5% critical value: 0.475 | | | | | | | | | | | |
| 83 | 1% critical value: 0.561 | | | | | | | | | | | |
| 84 | | | | | | | | | | | | |
| 85 | 1. Observation Value 5.7 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | Test Statistic: 0.123 | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | For 10% significance level, 5.7 is not an outlier. | | | | | | | | | | | |
| 90 | For 5% significance level, 5.7 is not an outlier. | | | | | | | | | | | |
| 91 | For 1% significance level, 5.7 is not an outlier. | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | 2. Observation Value 3.9 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | Test Statistic: 0.113 | | | | | | | | | | | |
| 96 | | | | | | | | | | | | |
| 97 | For 10% significance level, 3.9 is not an outlier. | | | | | | | | | | | |
| 98 | For 5% significance level, 3.9 is not an outlier. | | | | | | | | | | | |
| 99 | For 1% significance level, 3.9 is not an outlier. | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | | | | | | | | | |
| 102 | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Mean | 387.9 | | | | | | | |
| 106 | | | | Standard Deviation | 74.83 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | Number of data | 55 | | | | | | | | |
| 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 | 387.9 | 74.15 | 575 | 45 | 2.523 | 3.165 | 3.52 | | | | |
| 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 | 89.96 | | | | | | | | |
| 123 | | | Standard Deviation | 17.74 | | | | | | | | |
| 124 | | | Number of data | 56 | | | | | | | | |
| 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 | 89.96 | 17.58 | 139 | 56 | 2.79 | 3.172 | 3.528 | | | | |
| 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 | 24.51 | | | | | | | | |
| 140 | | | Standard Deviation | 4.979 | | | | | | | | |
| 141 | | | Number of data | 56 | | | | | | | | |
| 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 | 24.51 | 4.935 | 36.5 | 56 | 2.43 | 3.172 | 3.528 | | | | |
| 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 | 18.99 | | | | | | | | |
| 157 | | | Standard Deviation | 11.11 | | | | | | | | |
| 158 | | | Number of data | 56 | | | | | | | | |
| 159 | | | Number of suspected outliers | 1 | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | | | | | | | | |
| 161 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 162 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 163 | 1 | 18.99 | 11.01 | 46.4 | 40 | 2.49 | 3.172 | 3.528 | | | | |
| 164 | | | | | | | | | | | | |
| 165 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 166 | | | | | | | | | | | | |
| 167 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 168 | | | | | | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | | | | | | | | |
| 173 | Mean | 5.6143E-4 | | | | | | | | | | |
| 174 | Standard Deviation | 0.00185 | | | | | | | | | | |
| 175 | Number of data | 56 | | | | | | | | | | |
| 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 | 5.6143E-4 | 0.00183 | 0.014 | 2 | 7.332 | 3.172 | 3.528 | | | | |
| 181 | | | | | | | | | | | | |
| 182 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 183 | Potential outliers is: 0.014 | | | | | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 186 | Potential outliers is: 0.014 | | | | | | | | | | | |
| 187 | | | | | | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | Number of Observations = 15 | | | | | | | | | | | |
| 192 | 10% critical value: 0.472 | | | | | | | | | | | |
| 193 | 5% critical value: 0.525 | | | | | | | | | | | |
| 194 | 1% critical value: 0.616 | | | | | | | | | | | |
| 195 | | | | | | | | | | | | |
| 196 | 1. Observation Value 0.000136 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 197 | | | | | | | | | | | | |
| 198 | Test Statistic: 0.495 | | | | | | | | | | | |
| 199 | | | | | | | | | | | | |
| 200 | For 10% significance level, 0.000136 is an outlier. | | | | | | | | | | | |
| 201 | For 5% significance level, 0.000136 is not an outlier. | | | | | | | | | | | |
| 202 | For 1% significance level, 0.000136 is not an outlier. | | | | | | | | | | | |
| 203 | | | | | | | | | | | | |
| 204 | 2. Observation Value 2.38E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 205 | | | | | | | | | | | | |
| 206 | Test Statistic: 0.120 | | | | | | | | | | | |
| 207 | | | | | | | | | | | | |
| 208 | For 10% significance level, 2.38E-05 is not an outlier. | | | | | | | | | | | |
| 209 | For 5% significance level, 2.38E-05 is not an outlier. | | | | | | | | | | | |
| 210 | For 1% significance level, 2.38E-05 is not an outlier. | | | | | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Rosner's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | | | | | | | | | | | | |
| 216 | | | | Mean | 0.00309 | | | | | | | |
| 217 | | | | Standard Deviation | 0.00393 | | | | | | | |
| 218 | | | | Number of data | 56 | | | | | | | |
| 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 | 0.00309 | 0.0039 | 0.018 | 30 | 3.827 | 3.172 | 3.528 | | | | |
| 224 | | | | | | | | | | | | |
| 225 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 226 | Potential outliers is: 0.018 | | | | | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 229 | Potential outliers is: 0.018 | | | | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 233 | | | | | | | | | | | | |
| 234 | | | | | | | | | | | | |
| 235 | | | | Mean | 0.00331 | | | | | | | |
| 236 | | | | Standard Deviation | 0.00245 | | | | | | | |
| 237 | | | | Number of data | 54 | | | | | | | |
| 238 | | | | Number of suspected outliers | 1 | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 241 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 242 | 1 | 0.00331 | 0.00243 | 0.015 | 29 | 4.816 | 3.158 | 3.512 | | | | |
| 243 | | | | | | | | | | | | |
| 244 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 245 | Potential outliers is: 0.015 | | | | | | | | | | | |
| 246 | | | | | | | | | | | | |
| 247 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 248 | Potential outliers is: 0.015 | | | | | | | | | | | |
| 249 | | | | | | | | | | | | |
| 250 | | | | | | | | | | | | |
| 251 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 252 | | | | | | | | | | | | |
| 253 | Number of Observations = 7 | | | | | | | | | | | |
| 254 | 10% critical value: 0.434 | | | | | | | | | | | |
| 255 | 5% critical value: 0.507 | | | | | | | | | | | |
| 256 | 1% critical value: 0.637 | | | | | | | | | | | |
| 257 | | | | | | | | | | | | |
| 258 | 1. Observation Value 0.07 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 259 | | | | | | | | | | | | |
| 260 | Test Statistic: 0.633 | | | | | | | | | | | |
| 261 | | | | | | | | | | | | |
| 262 | For 10% significance level, 0.07 is an outlier. | | | | | | | | | | | |
| 263 | For 5% significance level, 0.07 is an outlier. | | | | | | | | | | | |
| 264 | For 1% significance level, 0.07 is not an outlier. | | | | | | | | | | | |
| 265 | | | | | | | | | | | | |

2. Observation Value 0.01 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.033

For 10% significance level, 0.01 is not an outlier.
For 5% significance level, 0.01 is not an outlier.
For 1% significance level, 0.01 is not an outlier.

Dixon's Outlier Test for Lead (mg/L)

Number of Observations = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889

1. Observation Value 0.008 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.630

For 10% significance level, 0.008 is not an outlier.
For 5% significance level, 0.008 is not an outlier.
For 1% significance level, 0.008 is not an outlier.

2. Observation Value 6.5E-05 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.007

For 10% significance level, 6.5E-05 is not an outlier.
For 5% significance level, 6.5E-05 is not an outlier.
For 1% significance level, 6.5E-05 is not an outlier.

Rosner's Outlier Test for Manganese (mg/L)

| | |
|---|---|
| Mean | 0.0591 |
| Standard Deviation | 0.0701 |
| Number of data | 31 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.0591 | 0.069 | 0.266 | 18 | 3 | 2.92 | 3.25 |

For 5% Significance Level, there is 1 Potential Outlier
Potential outliers is: 0.266

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for Mercury (mg/L)

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | Number of Observations = 3 | | | | | | | | | | | |
| 320 | 10% critical value: 0.886 | | | | | | | | | | | |
| 321 | 5% critical value: 0.941 | | | | | | | | | | | |
| 322 | 1% critical value: 0.988 | | | | | | | | | | | |
| 323 | | | | | | | | | | | | |
| 324 | 1. Observation Value 0.00018 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 325 | | | | | | | | | | | | |
| 326 | Test Statistic: 0.752 | | | | | | | | | | | |
| 327 | | | | | | | | | | | | |
| 328 | For 10% significance level, 0.00018 is not an outlier. | | | | | | | | | | | |
| 329 | For 5% significance level, 0.00018 is not an outlier. | | | | | | | | | | | |
| 330 | For 1% significance level, 0.00018 is not an outlier. | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | 2. Observation Value 7.1E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 333 | | | | | | | | | | | | |
| 334 | Test Statistic: 0.248 | | | | | | | | | | | |
| 335 | | | | | | | | | | | | |
| 336 | For 10% significance level, 7.1E-06 is not an outlier. | | | | | | | | | | | |
| 337 | For 5% significance level, 7.1E-06 is not an outlier. | | | | | | | | | | | |
| 338 | For 1% significance level, 7.1E-06 is not an outlier. | | | | | | | | | | | |
| 339 | | | | | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | | | | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | | | | Mean | 0.00539 | | | | | | | |
| 345 | | | | Standard Deviation | 0.00351 | | | | | | | |
| 346 | | | | Number of data | 33 | | | | | | | |
| 347 | | | | Number of suspected outliers | 1 | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 350 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 351 | 1 | 0.00539 | 0.00346 | 0.015 | 2 | 2.78 | 2.95 | 3.29 | | | | |
| 352 | | | | | | | | | | | | |
| 353 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 356 | | | | | | | | | | | | |
| 357 | | | | | | | | | | | | |
| 358 | | | | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | |
| 359 | | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | | | | Mean | 0.00662 | | | | | | | |
| 362 | | | | Standard Deviation | 0.00588 | | | | | | | |
| 363 | | | | Number of data | 33 | | | | | | | |
| 364 | | | | Number of suspected outliers | 1 | | | | | | | |
| 365 | | | | | | | | | | | | |
| 366 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 367 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 368 | 1 | 0.00662 | 0.00579 | 0.0259 | 13 | 3.329 | 2.95 | 3.29 | | | | |
| 369 | | | | | | | | | | | | |
| 370 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 371 | Potential outliers is: 0.0259 | | | | | | | | | | | |

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0259

Rosner's Outlier Test for TOC (mg/L)

| | |
|---|---|
| Mean | 5.365 |
| Standard Deviation | 1.109 |
| Number of data | 40 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 5.365 | 1.095 | 2.8 | 29 | 2.343 | 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 5.2 2023-12-13 8:34:35 AM | | | | | | | |
| | | | From File | 2023-ShallowProUCL_d.xls | | | | | | |
| | | | Full Precision | OFF | | | | | | |
| | | | | | | | | | | |
| | | | | 04-SH | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | |
| | | | | | | | | | | |
| | | | Mean | 7.748 | | | | | | |
| | | | Standard Deviation | 0.303 | | | | | | |
| | | | Number of data | 58 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | | | | | | | | |
| | | | Potential | | Obs. | Test | Critical | Critical | | |
| # | Mean | sd | outlier | | Number | value | value (5%) | value (1%) | | |
| 1 | 7.748 | 0.3 | 7.06 | | 27 | 2.295 | 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 TDS (mg/L) | | | | | | |
| | | | | | | | | | | |
| | | | Mean | 381.9 | | | | | | |
| | | | Standard Deviation | 35.51 | | | | | | |
| | | | Number of data | 58 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | | | | | | | | |
| | | | Potential | | Obs. | Test | Critical | Critical | | |
| # | Mean | sd | outlier | | Number | value | value (5%) | value (1%) | | |
| 1 | 381.9 | 35.2 | 244 | | 17 | 3.917 | 3.186 | 3.544 | | |
| | | | | | | | | | | |
| 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 | 0.775 | | | | | | |
| | | | Standard Deviation | 0.651 | | | | | | |
| | | | Number of data | 30 | | | | | | |
| | | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | 1 | 0.775 | 0.64 | 3.2 | 1 | 3.786 | 2.91 | 3.24 | | | |
| 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 | 13.46 | | | | | | | | | |
| 67 | Standard Deviation | 5.627 | | | | | | | | | |
| 68 | Number of data | 55 | | | | | | | | | |
| 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 | 13.46 | 5.576 | 34.5 | 1 | 3.773 | 3.165 | 3.52 | | | |
| 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 = 18 | | | | | | | | | | |
| 85 | 10% critical value: 0.424 | | | | | | | | | | |
| 86 | 5% critical value: 0.475 | | | | | | | | | | |
| 87 | 1% critical value: 0.561 | | | | | | | | | | |
| 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 | 457.2 | | | | | | |
| | | | Standard Deviation | 43.91 | | | | | | |
| | | | Number of data | 55 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 457.2 | 43.51 | 539 | 51 | 1.881 | 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 | 101.2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standard Deviation | 10.53 | | | | | | |
| | | | Number of data | 55 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 101.2 | 10.43 | 123 | 50 | 2.094 | 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 Magnesium (mg/L)

| | | | Mean | 27.42 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standard Deviation | 2.963 | | | | | | |
| | | | Number of data | 55 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 27.42 | 2.936 | 20.5 | 2 | 2.356 | 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 Sodium (mg/L)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | Mean | 10 | | | | | | |
| 161 | | | | Standard Deviation | 1.592 | | | | | | |
| 162 | | | | Number of data | 55 | | | | | | |
| 163 | | | | Number of suspected outliers | 1 | | | | | | |
| 164 | | | | | | | | | | | |
| 165 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 166 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 167 | 1 | 10 | 1.577 | 19.5 | 1 | 6.024 | 3.165 | 3.52 | | | |
| 168 | | | | | | | | | | | |
| 169 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 170 | Potential outliers is: 19.5 | | | | | | | | | | |
| 171 | | | | | | | | | | | |
| 172 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 173 | Potential outliers is: 19.5 | | | | | | | | | | |
| 174 | | | | | | | | | | | |
| 175 | | | | | | | | | | | |
| 176 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | |
| 177 | | | | | | | | | | | |
| 178 | | | | | | | | | | | |
| 179 | | | | Mean | 2.8036E-4 | | | | | | |
| 180 | | | | Standard Deviation | 2.3140E-4 | | | | | | |
| 181 | | | | Number of data | 55 | | | | | | |
| 182 | | | | Number of suspected outliers | 1 | | | | | | |
| 183 | | | | | | | | | | | |
| 184 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 185 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 186 | 1 | 2.8036E-4 | 2.2929E-4 | 0.0016 | 43 | 5.755 | 3.165 | 3.52 | | | |
| 187 | | | | | | | | | | | |
| 188 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 189 | Potential outliers is: 0.0016 | | | | | | | | | | |
| 190 | | | | | | | | | | | |
| 191 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 192 | Potential outliers is: 0.0016 | | | | | | | | | | |
| 193 | | | | | | | | | | | |
| 194 | | | | | | | | | | | |
| 195 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | |
| 196 | | | | | | | | | | | |
| 197 | Number of Observations = 13 | | | | | | | | | | |
| 198 | 10% critical value: 0.467 | | | | | | | | | | |
| 199 | 5% critical value: 0.521 | | | | | | | | | | |
| 200 | 1% critical value: 0.615 | | | | | | | | | | |
| 201 | | | | | | | | | | | |
| 202 | 1. Observation Value 2.3E-05 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 203 | | | | | | | | | | | |
| 204 | Test Statistic: 0.196 | | | | | | | | | | |
| 205 | | | | | | | | | | | |
| 206 | For 10% significance level, 2.3E-05 is not an outlier. | | | | | | | | | | |
| 207 | For 5% significance level, 2.3E-05 is not an outlier. | | | | | | | | | | |
| 208 | For 1% significance level, 2.3E-05 is not an outlier. | | | | | | | | | | |
| 209 | | | | | | | | | | | |
| 210 | 2. Observation Value 7.3E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 211 | | | | | | | | | | | |
| 212 | Test Statistic: 0.053 | | | | | | | | | | |

For 10% significance level, 7.3E-06 is not an outlier.

For 5% significance level, 7.3E-06 is not an outlier.

For 1% significance level, 7.3E-06 is not an outlier.

## Rosner's Outlier Test for Chromium (mg/L)

| | |
|---|---|
| Mean | 0.00616 |
| Standard Deviation | 0.00808 |
| Number of data | 55 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00616 | 0.00801 | 0.04 | 29 | 4.226 | 3.165 | 3.52 |

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 | 0.00269 |
| Standard Deviation | 0.00248 |
| Number of data | 55 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00269 | 0.00246 | 0.013 | 2 | 4.194 | 3.165 | 3.52 |

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

## Dixon's Outlier Test for Iron (mg/L)

Number of Observations = 5

10% critical value: 0.557

5% critical value: 0.642

1% critical value: 0.78

1. Observation Value 0.03 is a Potential Outlier (Upper Tail)?

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | Test Statistic: 0.000 | | | | | | | | | | |
| 267 | | | | | | | | | | | |
| 268 | For 10% significance level, 0.03 is not an outlier. | | | | | | | | | | |
| 269 | For 5% significance level, 0.03 is not an outlier. | | | | | | | | | | |
| 270 | For 1% significance level, 0.03 is not an outlier. | | | | | | | | | | |
| 271 | | | | | | | | | | | |
| 272 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 273 | | | | | | | | | | | |
| 274 | Test Statistic: 0.000 | | | | | | | | | | |
| 275 | | | | | | | | | | | |
| 276 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | |
| 277 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | |
| 278 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | |
| 279 | | | | | | | | | | | |
| 280 | | | | | | | | | | | |
| 281 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | |
| 282 | | | | | | | | | | | |
| 283 | Number of Observations = 4 | | | | | | | | | | |
| 284 | 10% critical value: 0.679 | | | | | | | | | | |
| 285 | 5% critical value: 0.765 | | | | | | | | | | |
| 286 | 1% critical value: 0.889 | | | | | | | | | | |
| 287 | | | | | | | | | | | |
| 288 | 1. Observation Value 0.003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 289 | | | | | | | | | | | |
| 290 | Test Statistic: 0.761 | | | | | | | | | | |
| 291 | | | | | | | | | | | |
| 292 | For 10% significance level, 0.003 is an outlier. | | | | | | | | | | |
| 293 | For 5% significance level, 0.003 is not an outlier. | | | | | | | | | | |
| 294 | For 1% significance level, 0.003 is not an outlier. | | | | | | | | | | |
| 295 | | | | | | | | | | | |
| 296 | 2. Observation Value 0.00011 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 297 | | | | | | | | | | | |
| 298 | Test Statistic: 0.001 | | | | | | | | | | |
| 299 | | | | | | | | | | | |
| 300 | For 10% significance level, 0.00011 is not an outlier. | | | | | | | | | | |
| 301 | For 5% significance level, 0.00011 is not an outlier. | | | | | | | | | | |
| 302 | For 1% significance level, 0.00011 is not an outlier. | | | | | | | | | | |
| 303 | | | | | | | | | | | |
| 304 | | | | | | | | | | | |
| 305 | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | | | |
| 306 | | | | | | | | | | | |
| 307 | | | | | | | | | | | |
| 308 | | | Mean | 0.13 | | | | | | | |
| 309 | | | Standard Deviation | 0.131 | | | | | | | |
| 310 | | | Number of data | 31 | | | | | | | |
| 311 | | | Number of suspected outliers | 1 | | | | | | | |
| 312 | | | | | | | | | | | |
| 313 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 314 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 315 | 1 | 0.13 | 0.129 | 0.524 | 28 | 3.045 | 2.92 | 3.25 | | | |
| 316 | | | | | | | | | | | |
| 317 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 318 | Potential outliers is: 0.524 | | | | | | | | | | |

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for Mercury (mg/L)

Number of Observations = 4

10% critical value: 0.679

5% critical value: 0.765

1% critical value: 0.889

1. Observation Value 0.0001 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.550

For 10% significance level, 0.0001 is not an outlier.

For 5% significance level, 0.0001 is not an outlier.

For 1% significance level, 0.0001 is not an outlier.

2. Observation Value 9.1E-06 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.450

For 10% significance level, 9.1E-06 is not an outlier.

For 5% significance level, 9.1E-06 is not an outlier.

For 1% significance level, 9.1E-06 is not an outlier.

Rosner's Outlier Test for Nickel (mg/L)

| | |
|---|---|
| Mean | 0.00427 |
| Standard Deviation | 0.0035 |
| Number of data | 33 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00427 | 0.00344 | 0.018 | 3 | 3.989 | 2.95 | 3.29 |

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 | 0.00388 |
| Standard Deviation | 0.00413 |
| Number of data | 33 |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | Number of suspected outliers | | | 1 | | | | | | | |
| 373 | | | | | | | | | | | |
| 374 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 375 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 376 | 1 | 0.00388 | 0.00407 | 0.0235 | 14 | 4.826 | 2.95 | 3.29 | | | |
| 377 | | | | | | | | | | | |
| 378 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 379 | Potential outliers is: 0.0235 | | | | | | | | | | |
| 380 | | | | | | | | | | | |
| 381 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 382 | Potential outliers is: 0.0235 | | | | | | | | | | |
| 383 | | | | | | | | | | | |
| 384 | | | | | | | | | | | |
| 385 | Rosner's Outlier Test for TOC (mg/L) | | | | | | | | | | |
| 386 | | | | | | | | | | | |
| 387 | | | | | | | | | | | |
| 388 | Mean | 3.198 | | | | | | | | | |
| 389 | Standard Deviation | 0.677 | | | | | | | | | |
| 390 | Number of data | 40 | | | | | | | | | |
| 391 | Number of suspected outliers | 1 | | | | | | | | | |
| 392 | | | | | | | | | | | |
| 393 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 394 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 395 | 1 | 3.198 | 0.668 | 5 | 1 | 2.698 | 3.04 | 3.38 | | | |
| 396 | | | | | | | | | | | |
| 397 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 398 | | | | | | | | | | | |
| 399 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 400 | | | | | | | | | | | |

## Outlier Tests for Selected Uncensored Variables

| | |
|---|---|
| User Selected Options | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 8:40:30 AM |
| From File | 2023-ShallowProUCL_e.xls |
| Full Precision | OFF |

### 05-SH

### Rosner's Outlier Test for pH ()

| | |
|---|---|
| Mean | 7.743 |
| Standard Deviation | 0.259 |
| Number of data | 55 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 7.743 | 0.256 | 7.23 | 26 | 2.003 | 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 | 488 |
| Standard Deviation | 189.6 |
| Number of data | 55 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 488 | 187.9 | 246 | 15 | 1.288 | 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 | 1.375 |
| Standard Deviation | 0.752 |
| Number of data | 54 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 1.375 | 0.745 | 2.72 | 54 | 1.805 | 3.158 | 3.512 |

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 | 79.27 |
| Standard Deviation | 58.09 |
| Number of data | 54 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 79.27 | 57.55 | 169 | 48 | 1.559 | 3.158 | 3.512 |

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 = 17

10% critical value: 0.438

5% critical value: 0.49

1% critical value: 0.577

1. Observation Value 7.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.082

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 4.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.198

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 | 481.5 |
| Standard Deviation | 152.4 |
| Number of data | 53 |
| Number of suspected outliers | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Potential | Obs. | Test | Critical | Critical | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | |
| 1 | 481.5 | 150.9 | 727 | 37 | 1.627 | 3.151 | 3.504 | |

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 | 130.5 |
| Standard Deviation | 48.26 |
| Number of data | 57 |
| Number of suspected outliers | 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Potential | Obs. | Test | Critical | Critical |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) |
| 1 | 130.5 | 47.83 | 66.5 | 18 | 1.339 | 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 | 34.87 |
| Standard Deviation | 13.17 |
| Number of data | 57 |
| Number of suspected outliers | 1 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | Potential | Obs. | Test | Critical | Critical |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) |
| 1 | 34.87 | 13.05 | 53.9 | 31 | 1.458 | 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 | 7.32 |
| Standard Deviation | 1.45 |
| Number of data | 57 |
| 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 | 7.32 | 1.438 | 11.8 | 41 | 3.116 | 3.179 | 3.536 | | | | |
| 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 | 3.3776E-4 | | | | | | | | | | |
| 172 | Standard Deviation | 3.0815E-4 | | | | | | | | | | |
| 173 | Number of data | 49 | | | | | | | | | | |
| 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 | 3.3776E-4 | 3.0499E-4 | 0.0019 | 39 | 5.122 | 3.12 | 3.47 | | | | |
| 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 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | Number of Observations = 15 | | | | | | | | | | | |
| 190 | 10% critical value: 0.472 | | | | | | | | | | | |
| 191 | 5% critical value: 0.525 | | | | | | | | | | | |
| 192 | 1% critical value: 0.616 | | | | | | | | | | | |
| 193 | | | | | | | | | | | | |
| 194 | 1. Observation Value 0.01 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 195 | | | | | | | | | | | | |
| 196 | Test Statistic: 0.932 | | | | | | | | | | | |
| 197 | | | | | | | | | | | | |
| 198 | For 10% significance level, 0.01 is an outlier. | | | | | | | | | | | |
| 199 | For 5% significance level, 0.01 is an outlier. | | | | | | | | | | | |
| 200 | For 1% significance level, 0.01 is an outlier. | | | | | | | | | | | |
| 201 | | | | | | | | | | | | |
| 202 | 2. Observation Value 1.28E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 203 | | | | | | | | | | | | |
| 204 | Test Statistic: 0.007 | | | | | | | | | | | |
| 205 | | | | | | | | | | | | |
| 206 | For 10% significance level, 1.28E-05 is not an outlier. | | | | | | | | | | | |
| 207 | For 5% significance level, 1.28E-05 is not an outlier. | | | | | | | | | | | |
| 208 | For 1% significance level, 1.28E-05 is not an outlier. | | | | | | | | | | | |
| 209 | | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | Rosner's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 212 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | 0.00658 | | | | | | | | | |
| | Standard Deviation | 0.0108 | | | | | | | | | |
| | Number of data | 26 | | | | | | | | | |
| | Number of suspected outliers | 1 | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 0.00658 | 0.0106 | 0.045 | 6 | 3.641 | 2.84 | 3.16 | | | | |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.045

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.045

## Rosner's Outlier Test for Copper (mg/L)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | 0.00279 | | | | | | | | | |
| | Standard Deviation | 0.00206 | | | | | | | | | |
| | Number of data | 56 | | | | | | | | | |
| | Number of suspected outliers | 1 | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 0.00279 | 0.00204 | 0.009 | 6 | 3.049 | 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 Iron (mg/L)

Number of Observations = 14

10% critical value: 0.492

5% critical value: 0.546

1% critical value: 0.641

1. Observation Value 0.899 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.802

For 10% significance level, 0.899 is an outlier.

For 5% significance level, 0.899 is an outlier.

For 1% significance level, 0.899 is an outlier.

2. Observation Value 0.01 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.104

For 10% significance level, 0.01 is not an outlier.

For 5% significance level, 0.01 is not an outlier.

For 1% significance level, 0.01 is not an outlier.

**Dixon's Outlier Test for Lead (mg/L)**

Number of Observations = 3

10% critical value: 0.886

5% critical value: 0.941

1% critical value: 0.988

**1. Observation Value 0.003 is a Potential Outlier (Upper Tail)?**

Test Statistic: 0.997

For 10% significance level, 0.003 is an outlier.

For 5% significance level, 0.003 is an outlier.

For 1% significance level, 0.003 is an outlier.

**2. Observation Value 0.000102 is a Potential Outlier (Lower Tail)?**

Test Statistic: 0.003

For 10% significance level, 0.000102 is not an outlier.

For 5% significance level, 0.000102 is not an outlier.

For 1% significance level, 0.000102 is not an outlier.

**Rosner's Outlier Test for Manganese (mg/L)**

| | |
|---|---|
| Mean | 0.208 |
| Standard Deviation | 0.178 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.208 | 0.175 | 0.625 | 21 | 2.374 | 2.94 | 3.27 |

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

**Available only for sample sizes 3 to 500**

**Rosner's Outlier Test for Nickel (mg/L)**

| | |
|---|---|
| Mean | 0.00427 |
| Standard Deviation | 0.00325 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | Number of data | 33 | | | | | | | | |
| 320 | | | Number of suspected outliers | 1 | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 323 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 324 | 1 | 0.00427 | 0.0032 | 0.015 | 2 | 3.349 | 2.95 | 3.29 | | | | |
| 325 | | | | | | | | | | | | |
| 326 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 327 | Potential outliers is: 0.015 | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 330 | Potential outliers is: 0.015 | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | | | | | | | | | | | | |
| 333 | | | | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | | | | | | | | | | | | |
| 336 | | | Mean | 0.0067 | | | | | | | | |
| 337 | | | Standard Deviation | 0.014 | | | | | | | | |
| 338 | | | Number of data | 33 | | | | | | | | |
| 339 | | | Number of suspected outliers | 1 | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 342 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 343 | 1 | 0.0067 | 0.0138 | 0.078 | 1 | 5.184 | 2.95 | 3.29 | | | | |
| 344 | | | | | | | | | | | | |
| 345 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 346 | Potential outliers is: 0.078 | | | | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 349 | Potential outliers is: 0.078 | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | | | | | | | | | | | | |
| 352 | | | | Rosner's Outlier Test for TOC (mg/L) | | | | | | | | |
| 353 | | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | | | Mean | 4.387 | | | | | | | | |
| 356 | | | Standard Deviation | 0.579 | | | | | | | | |
| 357 | | | Number of data | 38 | | | | | | | | |
| 358 | | | Number of suspected outliers | 1 | | | | | | | | |
| 359 | | | | | | | | | | | | |
| 360 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 361 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 362 | 1 | 4.387 | 0.571 | 2.8 | 24 | 2.78 | 3.01 | 3.36 | | | | |
| 363 | | | | | | | | | | | | |
| 364 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 365 | | | | | | | | | | | | |
| 366 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 8:42:03 AM | | | | | | | | |
| | | | From File | 2023-ShallowProUCL_f.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 06-SH | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.667 | | | | | | | |
| | | | Standard Deviation | 0.338 | | | | | | | |
| | | | Number of data | 53 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 7.667 | 0.335 | | 6.9 | 28 | 2.291 | 3.151 | 3.504 | | | |
| | | | | | | | | | | | |
| 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 | 481.1 | | | | | | | |
| | | | Standard Deviation | 149.1 | | | | | | | |
| | | | Number of data | 53 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 481.1 | 147.7 | | 748 | 29 | 1.807 | 3.151 | 3.504 | | | |
| | | | | | | | | | | | |
| 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 | 1.942 | | | | | | | |
| | | | Standard Deviation | 0.892 | | | | | | | |
| | | | Number of data | 49 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 1.942 | 0.883 | | 5.2 | 19 | 3.69 | 3.12 | 3.47 | | | |

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 | 6.59 |
| Standard Deviation | 7.079 |
| Number of data | 49 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 6.59 | 7.007 | 51.4 | 18 | 6.395 | 3.12 | 3.47 |

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 = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Observation Value 7.5 is a Potential Outlier (Upper Tail)?

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 Tail)?

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 | 607.9 | | | | | | | |
| 108 | | | | Standard Deviation | 196.1 | | | | | | | |
| 109 | | | | Number of data | 48 | | | | | | | |
| 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 | 607.9 | 194.1 | 927 | 24 | 1.644 | 3.11 | 3.46 | | | | |
| 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 | 134.3 | | | | | | | |
| 125 | | | | Standard Deviation | 43.25 | | | | | | | |
| 126 | | | | Number of data | 50 | | | | | | | |
| 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 | 134.3 | 42.82 | 216 | 29 | 1.908 | 3.13 | 3.48 | | | | |
| 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 | 37.1 | | | | | | | |
| 142 | | | | Standard Deviation | 12.29 | | | | | | | |
| 143 | | | | Number of data | 50 | | | | | | | |
| 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 | 37.1 | 12.16 | 60.9 | 25 | 1.957 | 3.13 | 3.48 | | | | |
| 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 | 9.332 | | | | | | | |
| 159 | | | | Standard Deviation | 6.126 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | Number of data | 50 | | | | | | | |
| 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 | 9.332 | 6.064 | 44.1 | 18 | 5.734 | 3.13 | 3.48 | | | | |
| 166 | | | | | | | | | | | | |
| 167 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 168 | Potential outliers is: 44.1 | | | | | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 171 | Potential outliers is: 44.1 | | | | | | | | | | | |
| 172 | | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | | | | Mean | 5.3020E-4 | | | | | | | |
| 178 | | | | Standard Deviation | 3.7317E-4 | | | | | | | |
| 179 | | | | Number of data | 50 | | | | | | | |
| 180 | | | | Number of suspected outliers | 1 | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 183 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 184 | 1 | 5.3020E-4 | 3.6942E-4 | 0.00208 | 38 | 4.195 | 3.13 | 3.48 | | | | |
| 185 | | | | | | | | | | | | |
| 186 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 187 | Potential outliers is: 0.00208 | | | | | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 190 | Potential outliers is: 0.00208 | | | | | | | | | | | |
| 191 | | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | Number of Observations = 16 | | | | | | | | | | | |
| 196 | 10% critical value: 0.454 | | | | | | | | | | | |
| 197 | 5% critical value: 0.507 | | | | | | | | | | | |
| 198 | 1% critical value: 0.595 | | | | | | | | | | | |
| 199 | | | | | | | | | | | | |
| 200 | 1. Observation Value 9E-05 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 201 | | | | | | | | | | | | |
| 202 | Test Statistic: 0.335 | | | | | | | | | | | |
| 203 | | | | | | | | | | | | |
| 204 | For 10% significance level, 9E-05 is not an outlier. | | | | | | | | | | | |
| 205 | For 5% significance level, 9E-05 is not an outlier. | | | | | | | | | | | |
| 206 | For 1% significance level, 9E-05 is not an outlier. | | | | | | | | | | | |
| 207 | | | | | | | | | | | | |
| 208 | 2. Observation Value 9.1E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 209 | | | | | | | | | | | | |
| 210 | Test Statistic: 0.058 | | | | | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | For 10% significance level, 9.1E-06 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | For 5% significance level, 9.1E-06 is not an outlier. | | | | | | | | | | | |
| 214 | For 1% significance level, 9.1E-06 is not an outlier. | | | | | | | | | | | |
| 215 | | | | | | | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | Dixon's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | Number of Observations = 19 | | | | | | | | | | | |
| 220 | 10% critical value: 0.412 | | | | | | | | | | | |
| 221 | 5% critical value: 0.462 | | | | | | | | | | | |
| 222 | 1% critical value: 0.547 | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | 1. Observation Value 0.061 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 225 | | | | | | | | | | | | |
| 226 | Test Statistic: 0.822 | | | | | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | For 10% significance level, 0.061 is an outlier. | | | | | | | | | | | |
| 229 | For 5% significance level, 0.061 is an outlier. | | | | | | | | | | | |
| 230 | For 1% significance level, 0.061 is an outlier. | | | | | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | 2. Observation Value 0.00014 is a Potential Outlier (Lower Tail) | | | | | | | | | | | |
| 233 | | | | | | | | | | | | |
| 234 | Test Statistic: 0.006 | | | | | | | | | | | |
| 235 | | | | | | | | | | | | |
| 236 | For 10% significance level, 0.00014 is not an outlier. | | | | | | | | | | | |
| 237 | For 5% significance level, 0.00014 is not an outlier. | | | | | | | | | | | |
| 238 | For 1% significance level, 0.00014 is not an outlier. | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | | | | | | | | | |
| 241 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 242 | | | | | | | | | | | | |
| 243 | | | | | | | | | | | | |
| 244 | | | | Mean | 0.00537 | | | | | | | |
| 245 | | | | Standard Deviation | 0.0184 | | | | | | | |
| 246 | | | | Number of data | 50 | | | | | | | |
| 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 | 0.00537 | 0.0182 | 0.128 | 19 | 6.721 | 3.13 | 3.48 | | | | |
| 252 | | | | | | | | | | | | |
| 253 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 254 | Potential outliers is: 0.128 | | | | | | | | | | | |
| 255 | | | | | | | | | | | | |
| 256 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 257 | Potential outliers is: 0.128 | | | | | | | | | | | |
| 258 | | | | | | | | | | | | |
| 259 | | | | | | | | | | | | |
| 260 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 261 | | | | | | | | | | | | |
| 262 | Number of Observations = 13 | | | | | | | | | | | |
| 263 | 10% critical value: 0.467 | | | | | | | | | | | |
| 264 | 5% critical value: 0.521 | | | | | | | | | | | |
| 265 | 1% critical value: 0.615 | | | | | | | | | | | |

1. Observation Value 0.36 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.848

For 10% significance level, 0.36 is an outlier.
For 5% significance level, 0.36 is an outlier.
For 1% significance level, 0.36 is an outlier.

2. Observation Value 0.022 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.116

For 10% significance level, 0.022 is not an outlier.
For 5% significance level, 0.022 is not an outlier.
For 1% significance level, 0.022 is not an outlier.

## Dixon's Outlier Test for Lead (mg/L)

Number of Observations = 9
10% critical value: 0.441
5% critical value: 0.512
1% critical value: 0.635

1. Observation Value 0.008 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.508

For 10% significance level, 0.008 is an outlier.
For 5% significance level, 0.008 is not an outlier.
For 1% significance level, 0.008 is not an outlier.

2. Observation Value 5.6E-05 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.019

For 10% significance level, 5.6E-05 is not an outlier.
For 5% significance level, 5.6E-05 is not an outlier.
For 1% significance level, 5.6E-05 is not an outlier.

## Rosner's Outlier Test for Manganese (mg/L)

| | |
|---|---|
| Mean | 0.828 |
| Standard Deviation | 0.612 |
| Number of data | 30 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.828 | 0.601 | 3.55 | 12 | 4.527 | 2.91 | 3.24 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 3.55

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 3.55

**Dixon's Outlier Test for Mercury (mg/L)**

Number of Observations = 5

10% critical value: 0.557

5% critical value: 0.642

1% critical value: 0.78

**1. Observation Value 9E-05 is a Potential Outlier (Upper Tail)?**

Test Statistic: 0.472

For 10% significance level, 9E-05 is not an outlier.

For 5% significance level, 9E-05 is not an outlier.

For 1% significance level, 9E-05 is not an outlier.

**2. Observation Value 5.2E-06 is a Potential Outlier (Lower Tail)?**

Test Statistic: 0.034

For 10% significance level, 5.2E-06 is not an outlier.

For 5% significance level, 5.2E-06 is not an outlier.

For 1% significance level, 5.2E-06 is not an outlier.

**Rosner's Outlier Test for Nickel (mg/L)**

| | |
|---|---|
| Mean | 0.0149 |
| Standard Deviation | 0.0294 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.0149 | 0.0289 | 0.167 | 1 | 5.259 | 2.94 | 3.27 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.167

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.167

**Rosner's Outlier Test for Zinc (mg/L)**

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | | | | | | | | |
| 373 | | | | Mean | 0.00562 | | | | | | | |
| 374 | | | | Standard Deviation | 0.00948 | | | | | | | |
| 375 | | | | Number of data | 32 | | | | | | | |
| 376 | | | | Number of suspected outliers | 1 | | | | | | | |
| 377 | | | | | | | | | | | | |
| 378 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 379 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 380 | 1 | 0.00562 | 0.00933 | 0.054 | 1 | 5.185 | 2.94 | 3.27 | | | | |
| 381 | | | | | | | | | | | | |
| 382 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 383 | Potential outliers is: 0.054 | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 386 | Potential outliers is: 0.054 | | | | | | | | | | | |
| 387 | | | | | | | | | | | | |
| 388 | | | | | | | | | | | | |
| 389 | | | | Rosner's Outlier Test for TOC (mg/L) | | | | | | | | |
| 390 | | | | | | | | | | | | |
| 391 | | | | | | | | | | | | |
| 392 | | | | Mean | 3.897 | | | | | | | |
| 393 | | | | Standard Deviation | 1.413 | | | | | | | |
| 394 | | | | Number of data | 35 | | | | | | | |
| 395 | | | | Number of suspected outliers | 1 | | | | | | | |
| 396 | | | | | | | | | | | | |
| 397 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 398 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 399 | 1 | 3.897 | 1.393 | 7.8 | 23 | 2.802 | 2.98 | 3.32 | | | | |
| 400 | | | | | | | | | | | | |
| 401 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 402 | | | | | | | | | | | | |
| 403 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 404 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 8:43:35 AM | | | | | | | | |
| | | | From File | 2023-ShallowProUCL_g.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 07-SH | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.678 | | | | | | | |
| | | | Standard Deviation | 0.299 | | | | | | | |
| | | | Number of data | 57 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 7.678 | 0.296 | 7.06 | 30 | 2.084 | 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 | 502.9 | | | | | | | |
| | | | Standard Deviation | 131.8 | | | | | | | |
| | | | Number of data | 57 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 502.9 | 130.6 | 820 | 56 | 2.428 | 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 | 34.04 | | | | | | | |
| | | | Standard Deviation | 51 | | | | | | | |
| | | | Number of data | 55 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 34.04 | 50.54 | 208 | 55 | 3.442 | 3.165 | 3.52 | | | | |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 208

For 1% Significance Level, there is no Potential Outlier

## Rosner's Outlier Test for Sulphate (mg/L)

| | |
|---|---|
| Mean | 27.62 |
| Standard Deviation | 11.49 |
| Number of data | 55 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 27.62 | 11.38 | 56 | 1 | 2.494 | 3.165 | 3.52 |

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 = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Observation Value 3.4 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.286

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.

2. Observation Value 1.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.167

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 | 520.1 |
| Standard Deviation | 110.2 |
| Number of data | 54 |

| | 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 | 520.1 | 109.2 | 337.7 | 6 | 1.67 | 3.158 | 3.512 | | | | |
| 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 | 133 | | | | | | | | | | |
| 122 | Standard Deviation | 38.34 | | | | | | | | | | |
| 123 | Number of data | 54 | | | | | | | | | | |
| 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 | 133 | 37.98 | 221 | 52 | 2.316 | 3.158 | 3.512 | | | | |
| 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 | 35.07 | | | | | | | | | | |
| 139 | Standard Deviation | 10.17 | | | | | | | | | | |
| 140 | Number of data | 54 | | | | | | | | | | |
| 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 | 35.07 | 10.08 | 58.9 | 52 | 2.365 | 3.158 | 3.512 | | | | |
| 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 | | | | | | | | | | |
| 156 | Standard Deviation | 3.224 | | | | | | | | | | |
| 157 | Number of data | 55 | | | | | | | | | | |
| 158 | Number of suspected outliers | 1 | | | | | | | | | | |
| 159 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 161 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 162 | 1 | 13 | 3.194 | 27 | 1 | 4.381 | 3.165 | 3.52 | | | | |
| 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 | 4.0127E-4 | | | | | | | | | | |
| 175 | Standard Deviation | 2.5641E-4 | | | | | | | | | | |
| 176 | Number of data | 55 | | | | | | | | | | |
| 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 | 4.0127E-4 | 2.5407E-4 | 0.0012 | 34 | 3.144 | 3.165 | 3.52 | | | | |
| 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 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 189 | | | | | | | | | | | | |
| 190 | Number of Observations = 10 | | | | | | | | | | | |
| 191 | 10% critical value: 0.409 | | | | | | | | | | | |
| 192 | 5% critical value: 0.477 | | | | | | | | | | | |
| 193 | 1% critical value: 0.597 | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | 1. Observation Value 0.0003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 196 | | | | | | | | | | | | |
| 197 | Test Statistic: 0.893 | | | | | | | | | | | |
| 198 | | | | | | | | | | | | |
| 199 | For 10% significance level, 0.0003 is an outlier. | | | | | | | | | | | |
| 200 | For 5% significance level, 0.0003 is an outlier. | | | | | | | | | | | |
| 201 | For 1% significance level, 0.0003 is an outlier. | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | 2. Observation Value 5.9E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | Test Statistic: 0.083 | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | For 10% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 208 | For 5% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 209 | For 1% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | Dixon's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |

Number of Observations = 17

10% critical value: 0.438

5% critical value: 0.49

1% critical value: 0.577

1. Observation Value 0.022 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.229

For 10% significance level, 0.022 is not an outlier.

For 5% significance level, 0.022 is not an outlier.

For 1% significance level, 0.022 is not an outlier.

2. Observation Value 0.00012 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.004

For 10% significance level, 0.00012 is not an outlier.

For 5% significance level, 0.00012 is not an outlier.

For 1% significance level, 0.00012 is not an outlier.

Rosner's Outlier Test for Copper (mg/L)

| | |
|---|---|
| Mean | 0.00309 |
| Standard Deviation | 0.00494 |
| Number of data | 55 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00309 | 0.00489 | 0.035 | 31 | 6.525 | 3.165 | 3.52 |

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 Iron (mg/L)

| | |
|---|---|
| Mean | 0.335 |
| Standard Deviation | 0.533 |
| Number of data | 30 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.335 | 0.524 | 2.06 | 16 | 3.294 | 2.91 | 3.24 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | | | | | | | | |
| 267 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 268 | Potential outliers is: 2.06 | | | | | | | | | | | |
| 269 | | | | | | | | | | | | |
| 270 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 271 | Potential outliers is: 2.06 | | | | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | | |
| 275 | | | | | | | | | | | | |
| 276 | Number of Observations = 6 | | | | | | | | | | | |
| 277 | 10% critical value: 0.482 | | | | | | | | | | | |
| 278 | 5% critical value: 0.56 | | | | | | | | | | | |
| 279 | 1% critical value: 0.698 | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | 1. Observation Value 0.005 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | Test Statistic: 0.202 | | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | For 10% significance level, 0.005 is not an outlier. | | | | | | | | | | | |
| 286 | For 5% significance level, 0.005 is not an outlier. | | | | | | | | | | | |
| 287 | For 1% significance level, 0.005 is not an outlier. | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | 2. Observation Value 5.5E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | Test Statistic: 0.090 | | | | | | | | | | | |
| 292 | | | | | | | | | | | | |
| 293 | For 10% significance level, 5.5E-05 is not an outlier. | | | | | | | | | | | |
| 294 | For 5% significance level, 5.5E-05 is not an outlier. | | | | | | | | | | | |
| 295 | For 1% significance level, 5.5E-05 is not an outlier. | | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | | | | | | | | | | | | |
| 298 | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 299 | | | | | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | Mean | 0.381 | | | | | | | | | | |
| 302 | Standard Deviation | 0.262 | | | | | | | | | | |
| 303 | Number of data | 30 | | | | | | | | | | |
| 304 | Number of suspected outliers | 1 | | | | | | | | | | |
| 305 | | | | | | | | | | | | |
| 306 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 307 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 308 | 1 | 0.381 | 0.258 | 0.995 | 2 | 2.381 | 2.91 | 3.24 | | | | |
| 309 | | | | | | | | | | | | |
| 310 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 311 | | | | | | | | | | | | |
| 312 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 313 | | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | Dixon's Outlier Test for Mercury (mg/L) | | | | | | | | | | | |
| 316 | | | | | | | | | | | | |
| 317 | Number of Observations = 5 | | | | | | | | | | | |
| 318 | 10% critical value: 0.557 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | 5% critical value: 0.642 | | | | | | | | | | | |
| 320 | 1% critical value: 0.78 | | | | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | 1. Observation Value 0.00026 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 323 | | | | | | | | | | | | |
| 324 | Test Statistic: 0.206 | | | | | | | | | | | |
| 325 | | | | | | | | | | | | |
| 326 | For 10% significance level, 0.00026 is not an outlier. | | | | | | | | | | | |
| 327 | For 5% significance level, 0.00026 is not an outlier. | | | | | | | | | | | |
| 328 | For 1% significance level, 0.00026 is not an outlier. | | | | | | | | | | | |
| 329 | | | | | | | | | | | | |
| 330 | 2. Observation Value 1.78E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | Test Statistic: 0.133 | | | | | | | | | | | |
| 333 | | | | | | | | | | | | |
| 334 | For 10% significance level, 1.78E-05 is not an outlier. | | | | | | | | | | | |
| 335 | For 5% significance level, 1.78E-05 is not an outlier. | | | | | | | | | | | |
| 336 | For 1% significance level, 1.78E-05 is not an outlier. | | | | | | | | | | | |
| 337 | | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | | | | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | | | | | | | | | | | | |
| 342 | | | | Mean | 0.00393 | | | | | | | |
| 343 | | | | Standard Deviation | 0.00338 | | | | | | | |
| 344 | | | | Number of data | 32 | | | | | | | |
| 345 | | | | Number of suspected outliers | 1 | | | | | | | |
| 346 | | | | | | | | | | | | |
| 347 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 348 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 349 | 1 | 0.00393 | 0.00333 | 0.017 | 2 | 3.929 | 2.94 | 3.27 | | | | |
| 350 | | | | | | | | | | | | |
| 351 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 352 | Potential outliers is: 0.017 | | | | | | | | | | | |
| 353 | | | | | | | | | | | | |
| 354 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 355 | Potential outliers is: 0.017 | | | | | | | | | | | |
| 356 | | | | | | | | | | | | |
| 357 | | | | | | | | | | | | |
| 358 | | | | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | |
| 359 | | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | | | | Mean | 0.00478 | | | | | | | |
| 362 | | | | Standard Deviation | 0.00485 | | | | | | | |
| 363 | | | | Number of data | 32 | | | | | | | |
| 364 | | | | Number of suspected outliers | 1 | | | | | | | |
| 365 | | | | | | | | | | | | |
| 366 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 367 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 368 | 1 | 0.00478 | 0.00477 | 0.026 | 5 | 4.446 | 2.94 | 3.27 | | | | |
| 369 | | | | | | | | | | | | |
| 370 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 371 | Potential outliers is: 0.026 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | | | | | | | | |
| 373 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 374 | Potential outliers is: 0.026 | | | | | | | | | | | |
| 375 | | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | | | | Rosner's Outlier Test for TOC (mg/L) | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | | | | | | | | | | | | |
| 380 | | | | Mean | 3.341 | | | | | | | |
| 381 | | | | Standard Deviation | 1.08 | | | | | | | |
| 382 | | | | Number of data | 39 | | | | | | | |
| 383 | | | | Number of suspected outliers | 1 | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 386 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 387 | 1 | 3.341 | 1.066 | 8.3 | 5 | 4.651 | 3.03 | 3.37 | | | | |
| 388 | | | | | | | | | | | | |
| 389 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 390 | Potential outliers is: 8.3 | | | | | | | | | | | |
| 391 | | | | | | | | | | | | |
| 392 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 393 | Potential outliers is: 8.3 | | | | | | | | | | | |
| 394 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| 2 | | | | User Selected Options | | | | | | | | |
| 3 | | | Date/Time of Computation | ProUCL 5.2 2023-12-13 8:57:39 AM | | | | | | | | |
| 4 | | | | From File | 2023-ShallowProUCL_h.xls | | | | | | | |
| 5 | | | | Full Precision | OFF | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | 08-SH | | | | | | | |
| 8 | | | | | Rosner's Outlier Test for pH () | | | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | Mean | 7.883 | | | | | | | |
| 12 | | | | Standard Deviation | 0.241 | | | | | | | |
| 13 | | | | Number of data | 57 | | | | | | | |
| 14 | | | | Number of suspected outliers | 1 | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 17 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 18 | 1 | 7.883 | 0.239 | 7.37 | 17 | 2.147 | 3.179 | 3.536 | | | | |
| 19 | | | | | | | | | | | | |
| 20 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 23 | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | | | | | Rosner's Outlier Test for TDS (mg/L) | | | | | | | |
| 26 | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | |
| 28 | | | | Mean | 338.9 | | | | | | | |
| 29 | | | | Standard Deviation | 44.26 | | | | | | | |
| 30 | | | | Number of data | 57 | | | | | | | |
| 31 | | | | Number of suspected outliers | 1 | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 34 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 35 | 1 | 338.9 | 43.87 | 585 | 19 | 5.61 | 3.179 | 3.536 | | | | |
| 36 | | | | | | | | | | | | |
| 37 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 38 | Potential outliers is: 585 | | | | | | | | | | | |
| 39 | | | | | | | | | | | | |
| 40 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 41 | Potential outliers is: 585 | | | | | | | | | | | |
| 42 | | | | | | | | | | | | |
| 43 | | | | | | | | | | | | |
| 44 | | | | | Rosner's Outlier Test for Chloride (mg/L) | | | | | | | |
| 45 | | | | | | | | | | | | |
| 46 | | | | | | | | | | | | |
| 47 | | | | Mean | 1.351 | | | | | | | |
| 48 | | | | Standard Deviation | 0.578 | | | | | | | |
| 49 | | | | Number of data | 54 | | | | | | | |
| 50 | | | | Number of suspected outliers | 1 | | | | | | | |
| 51 | | | | | | | | | | | | |
| 52 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 53 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | 1 | 1.351 | 0.572 | 0.01 | 17 | 2.343 | 3.158 | 3.512 | | | | |
| 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 | 35.32 | | | | | | | |
| 65 | | | | Standard Deviation | 9.53 | | | | | | | |
| 66 | | | | Number of data | 54 | | | | | | | |
| 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 | 35.32 | 9.441 | 11.5 | 5 | 2.523 | 3.158 | 3.512 | | | | |
| 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 = 18 | | | | | | | | | | | |
| 81 | 10% critical value: 0.424 | | | | | | | | | | | |
| 82 | 5% critical value: 0.475 | | | | | | | | | | | |
| 83 | 1% critical value: 0.561 | | | | | | | | | | | |
| 84 | | | | | | | | | | | | |
| 85 | 1. Observation Value 23 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | Test Statistic: 0.903 | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | Test Statistic: 0.063 | | | | | | | | | | | |
| 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 | 351.5 | | | | | | | |
| 106 | | | | Standard Deviation | 25.54 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | Number of data | 54 | | | | | | | | |
| 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 | 351.5 | 25.3 | 444 | 53 | 3.654 | 3.158 | 3.512 | | | | |
| 113 | | | | | | | | | | | | |
| 114 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 115 | Potential outliers is: 444 | | | | | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 118 | Potential outliers is: 444 | | | | | | | | | | | |
| 119 | | | | | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | Rosner's Outlier Test for Calcium (mg/L) | | | | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | | | | | | | | | | | | |
| 124 | | | Mean | 79.1 | | | | | | | | |
| 125 | | | Standard Deviation | 5.919 | | | | | | | | |
| 126 | | | Number of data | 54 | | | | | | | | |
| 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 | 79.1 | 5.864 | 60 | 42 | 3.256 | 3.158 | 3.512 | | | | |
| 132 | | | | | | | | | | | | |
| 133 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 134 | Potential outliers is: 60 | | | | | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | | | | | | | | |
| 139 | Rosner's Outlier Test for Magnesium (mg/L) | | | | | | | | | | | |
| 140 | | | | | | | | | | | | |
| 141 | | | | | | | | | | | | |
| 142 | | | Mean | 20.7 | | | | | | | | |
| 143 | | | Standard Deviation | 1.456 | | | | | | | | |
| 144 | | | Number of data | 54 | | | | | | | | |
| 145 | | | Number of suspected outliers | 1 | | | | | | | | |
| 146 | | | | | | | | | | | | |
| 147 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 148 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 149 | 1 | 20.7 | 1.442 | 15.9 | 2 | 3.326 | 3.158 | 3.512 | | | | |
| 150 | | | | | | | | | | | | |
| 151 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 152 | Potential outliers is: 15.9 | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 155 | | | | | | | | | | | | |
| 156 | | | | | | | | | | | | |
| 157 | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | Mean | 19.51 | | | | | | | |
| 161 | | | | Standard Deviation | 9.508 | | | | | | | |
| 162 | | | | Number of data | 54 | | | | | | | |
| 163 | | | | Number of suspected outliers | 1 | | | | | | | |
| 164 | | | | | | | | | | | | |
| 165 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 166 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 167 | 1 | 19.51 | 9.419 | 46.1 | 53 | 2.823 | 3.158 | 3.512 | | | | |
| 168 | | | | | | | | | | | | |
| 169 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 170 | | | | | | | | | | | | |
| 171 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 172 | | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | | | | Mean | 6.9833E-4 | | | | | | | |
| 178 | | | | Standard Deviation | 4.8218E-4 | | | | | | | |
| 179 | | | | Number of data | 54 | | | | | | | |
| 180 | | | | Number of suspected outliers | 1 | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 183 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 184 | 1 | 6.9833E-4 | 4.7769E-4 | 0.0022 | 1 | 3.144 | 3.158 | 3.512 | | | | |
| 185 | | | | | | | | | | | | |
| 186 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 187 | | | | | | | | | | | | |
| 188 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 189 | | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Number of Observations = 18 | | | | | | | | | | | |
| 194 | 10% critical value: 0.424 | | | | | | | | | | | |
| 195 | 5% critical value: 0.475 | | | | | | | | | | | |
| 196 | 1% critical value: 0.561 | | | | | | | | | | | |
| 197 | | | | | | | | | | | | |
| 198 | 1. Observation Value 0.003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 199 | | | | | | | | | | | | |
| 200 | Test Statistic: 0.536 | | | | | | | | | | | |
| 201 | | | | | | | | | | | | |
| 202 | For 10% significance level, 0.003 is an outlier. | | | | | | | | | | | |
| 203 | For 5% significance level, 0.003 is an outlier. | | | | | | | | | | | |
| 204 | For 1% significance level, 0.003 is not an outlier. | | | | | | | | | | | |
| 205 | | | | | | | | | | | | |
| 206 | 2. Observation Value 7.4E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 207 | | | | | | | | | | | | |
| 208 | Test Statistic: 0.005 | | | | | | | | | | | |
| 209 | | | | | | | | | | | | |
| 210 | For 10% significance level, 7.4E-06 is not an outlier. | | | | | | | | | | | |
| 211 | For 5% significance level, 7.4E-06 is not an outlier. | | | | | | | | | | | |
| 212 | For 1% significance level, 7.4E-06 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | Rosner's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | | | | | | | | |
| 218 | | | | Mean | 0.00571 | | | | | | | |
| 219 | | | | Standard Deviation | 0.00694 | | | | | | | |
| 220 | | | | Number of data | 54 | | | | | | | |
| 221 | | | | Number of suspected outliers | 1 | | | | | | | |
| 222 | | | | | | | | | | | | |
| 223 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 224 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 225 | 1 | 0.00571 | 0.00687 | 0.027 | 29 | 3.098 | 3.158 | 3.512 | | | | |
| 226 | | | | | | | | | | | | |
| 227 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 233 | | | | | | | | | | | | |
| 234 | | | | | | | | | | | | |
| 235 | | | | Mean | 0.00304 | | | | | | | |
| 236 | | | | Standard Deviation | 0.00287 | | | | | | | |
| 237 | | | | Number of data | 54 | | | | | | | |
| 238 | | | | Number of suspected outliers | 1 | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 241 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 242 | 1 | 0.00304 | 0.00284 | 0.0123 | 35 | 3.258 | 3.158 | 3.512 | | | | |
| 243 | | | | | | | | | | | | |
| 244 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 245 | Potential outliers is: 0.0123 | | | | | | | | | | | |
| 246 | | | | | | | | | | | | |
| 247 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 248 | | | | | | | | | | | | |
| 249 | | | | | | | | | | | | |
| 250 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 251 | | | | | | | | | | | | |
| 252 | Number of Observations = 5 | | | | | | | | | | | |
| 253 | 10% critical value: 0.557 | | | | | | | | | | | |
| 254 | 5% critical value: 0.642 | | | | | | | | | | | |
| 255 | 1% critical value: 0.78 | | | | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | 1. Observation Value 0.024 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 258 | | | | | | | | | | | | |
| 259 | Test Statistic: 0.286 | | | | | | | | | | | |
| 260 | | | | | | | | | | | | |
| 261 | For 10% significance level, 0.024 is not an outlier. | | | | | | | | | | | |
| 262 | For 5% significance level, 0.024 is not an outlier. | | | | | | | | | | | |
| 263 | For 1% significance level, 0.024 is not an outlier. | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |

Test Statistic: 0.000

For 10% significance level, 0.01 is not an outlier.

For 5% significance level, 0.01 is not an outlier.

For 1% significance level, 0.01 is not an outlier.

Dixon's Outlier Test for Lead (mg/L)

Number of Observations = 5

10% critical value: 0.557

5% critical value: 0.642

1% critical value: 0.78

1. Observation Value 0.005 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.000

For 10% significance level, 0.005 is not an outlier.

For 5% significance level, 0.005 is not an outlier.

For 1% significance level, 0.005 is not an outlier.

2. Observation Value 6.7E-05 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.189

For 10% significance level, 6.7E-05 is not an outlier.

For 5% significance level, 6.7E-05 is not an outlier.

For 1% significance level, 6.7E-05 is not an outlier.

Rosner's Outlier Test for Manganese (mg/L)

| | |
|---|---|
| Mean | 0.195 |
| Standard Deviation | 0.31 |
| Number of data | 30 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.195 | 0.305 | 1.29 | 21 | 3.593 | 2.91 | 3.24 |

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

Dixon's Outlier Test for Mercury (mg/L)

Number of Observations = 4

10% critical value: 0.679

5% critical value: 0.765

1% critical value: 0.889

1. Observation Value 0.00026 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.078

For 10% significance level, 0.00026 is not an outlier.

For 5% significance level, 0.00026 is not an outlier.

For 1% significance level, 0.00026 is not an outlier.

2. Observation Value 5.2E-06 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.176

For 10% significance level, 5.2E-06 is not an outlier.

For 5% significance level, 5.2E-06 is not an outlier.

For 1% significance level, 5.2E-06 is not an outlier.

Rosner's Outlier Test for Nickel (mg/L)

| | |
|---|---|
| Mean | 0.00571 |
| Standard Deviation | 0.00659 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00571 | 0.00649 | 0.0335 | 21 | 4.284 | 2.94 | 3.27 |

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 | 0.00469 |
| Standard Deviation | 0.00436 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00469 | 0.00429 | 0.0179 | 13 | 3.079 | 2.94 | 3.27 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 373 | Potential outliers is: 0.0179 | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | | | | | | | | | | | | |
| 378 | | | | Rosner's Outlier Test for TOC (mg/L) | | | | | | | | |
| 379 | | | | | | | | | | | | |
| 380 | | | | | | | | | | | | |
| 381 | | | | Mean | 1.887 | | | | | | | |
| 382 | | | | Standard Deviation | 0.663 | | | | | | | |
| 383 | | | | Number of data | 39 | | | | | | | |
| 384 | | | | Number of suspected outliers | 1 | | | | | | | |
| 385 | | | | | | | | | | | | |
| 386 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 387 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 388 | 1 | 1.887 | 0.654 | 4.3 | 1 | 3.689 | 3.03 | 3.37 | | | | |
| 389 | | | | | | | | | | | | |
| 390 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 391 | Potential outliers is: 4.3 | | | | | | | | | | | |
| 392 | | | | | | | | | | | | |
| 393 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 394 | Potential outliers is: 4.3 | | | | | | | | | | | |
| 395 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Outlier Tests for Selected Uncensored Variables | | | | | | | | | | |
| | User Selected Options | | | | | | | | | | |
| | Date/Time of Computation | ProUCL 5.2 2023-12-13 8:58:58 AM | | | | | | | | | |
| | From File | 2023-ShallowProUCL_i.xls | | | | | | | | | |
| | Full Precision | OFF | | | | | | | | | |
| | | | | | | | | | | | |
| | 11-SH | | | | | | | | | | |
| | Rosner's Outlier Test for pH () | | | | | | | | | | |
| | | | | | | | | | | | |
| | Mean | 7.607 | | | | | | | | | |
| | Standard Deviation | 0.339 | | | | | | | | | |
| | Number of data | 37 | | | | | | | | | |
| | Number of suspected outliers | 1 | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| | 1 | 7.607 | 0.334 | 6.9 | 7 | 2.114 | 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 TDS (mg/L) | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | Mean | 473.9 | | | | | | | | | |
| | Standard Deviation | 80.04 | | | | | | | | | |
| | Number of data | 37 | | | | | | | | | |
| | Number of suspected outliers | 1 | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| | 1 | 473.9 | 78.95 | 709 | 37 | 2.977 | 3 | 3.34 | | | |
| | | | | | | | | | | | |
| | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| | | | | | | | | | | | |
| | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | Dixon's Outlier Test for Chloride (mg/L) | | | | | | | | | | |
| | | | | | | | | | | | |
| | Number of Observations = 15 | | | | | | | | | | |
| | 10% critical value: 0.472 | | | | | | | | | | |
| | 5% critical value: 0.525 | | | | | | | | | | |
| | 1% critical value: 0.616 | | | | | | | | | | |
| | | | | | | | | | | | |
| | 1. Observation Value 2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| | | | | | | | | | | | |
| | Test Statistic: 0.600 | | | | | | | | | | |
| | | | | | | | | | | | |
| | For 10% significance level, 2 is an outlier. | | | | | | | | | | |

For 5% significance level, 2 is an outlier.

For 1% significance level, 2 is not an outlier.

2. Observation Value 0.2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.333

For 10% significance level, 0.2 is not an outlier.

For 5% significance level, 0.2 is not an outlier.

For 1% significance level, 0.2 is not an outlier.

## Rosner's Outlier Test for Sulphate (mg/L)

| | |
|---|---|
| Mean | 31.82 |
| Standard Deviation | 41.25 |
| Number of data | 31 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 31.82 | 40.58 | 167 | 31 | 3.331 | 2.92 | 3.25 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 167

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 167

## 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 14.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.164

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 Tail)?

Test Statistic: 0.485

For 10% significance level, 3.3 is an outlier.

For 5% significance level, 3.3 is an outlier.

For 1% significance level, 3.3 is not an outlier.

## Rosner's Outlier Test for Bicarbonate (mg/L)

| | |
|---|---|
| Mean | 535.1 |
| Standard Deviation | 37.95 |
| Number of data | 36 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 535.1 | 37.42 | 607 | 32 | 1.922 | 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 | 122.1 |
| Standard Deviation | 17.48 |
| Number of data | 37 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 122.1 | 17.24 | 165 | 37 | 2.491 | 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 Magnesium (mg/L)

| | |
|---|---|
| Mean | 26.86 |
| Standard Deviation | 3.001 |
| Number of data | 37 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 26.86 | 2.96 | 33.5 | 36 | 2.245 | 3 | 3.34 |

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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | | | | |
| 161 | | | | | | | | | | | | |
| 162 | | | | | | | | | | | | |
| 163 | | | | Mean | 25.04 | | | | | | | |
| 164 | | | | Standard Deviation | 9.372 | | | | | | | |
| 165 | | | | Number of data | 37 | | | | | | | |
| 166 | | | | Number of suspected outliers | 1 | | | | | | | |
| 167 | | | | | | | | | | | | |
| 168 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 169 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 170 | 1 | 25.04 | 9.245 | 46.4 | 37 | 2.311 | 3 | 3.34 | | | | |
| 171 | | | | | | | | | | | | |
| 172 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 178 | | | | | | | | | | | | |
| 179 | | | | | | | | | | | | |
| 180 | | | | Mean | 0.00183 | | | | | | | |
| 181 | | | | Standard Deviation | 0.00301 | | | | | | | |
| 182 | | | | Number of data | 37 | | | | | | | |
| 183 | | | | Number of suspected outliers | 1 | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 186 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 187 | 1 | 0.00183 | 0.00297 | 0.013 | 13 | 3.76 | 3 | 3.34 | | | | |
| 188 | | | | | | | | | | | | |
| 189 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 190 | Potential outliers is: 0.013 | | | | | | | | | | | |
| 191 | | | | | | | | | | | | |
| 192 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 193 | Potential outliers is: 0.013 | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | | | | | | | | | |
| 196 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 197 | | | | | | | | | | | | |
| 198 | Number of Observations = 17 | | | | | | | | | | | |
| 199 | 10% critical value: 0.438 | | | | | | | | | | | |
| 200 | 5% critical value: 0.49 | | | | | | | | | | | |
| 201 | 1% critical value: 0.577 | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | 1. Observation Value 0.003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | Test Statistic: 0.978 | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | For 10% significance level, 0.003 is an outlier. | | | | | | | | | | | |
| 208 | For 5% significance level, 0.003 is an outlier. | | | | | | | | | | | |
| 209 | For 1% significance level, 0.003 is an outlier. | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | 2. Observation Value 1E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 212 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Test Statistic: 0.044 | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | For 10% significance level, 1E-05 is not an outlier. | | | | | | | | | | | |
| 216 | For 5% significance level, 1E-05 is not an outlier. | | | | | | | | | | | |
| 217 | For 1% significance level, 1E-05 is not an outlier. | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | | | | | | | | | |
| 220 | Dixon's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 221 | | | | | | | | | | | | |
| 222 | Number of Observations = 12 | | | | | | | | | | | |
| 223 | 10% critical value: 0.49 | | | | | | | | | | | |
| 224 | 5% critical value: 0.546 | | | | | | | | | | | |
| 225 | 1% critical value: 0.642 | | | | | | | | | | | |
| 226 | | | | | | | | | | | | |
| 227 | 1. Observation Value 0.019 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | Test Statistic: 0.285 | | | | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | For 10% significance level, 0.019 is not an outlier. | | | | | | | | | | | |
| 232 | For 5% significance level, 0.019 is not an outlier. | | | | | | | | | | | |
| 233 | For 1% significance level, 0.019 is not an outlier. | | | | | | | | | | | |
| 234 | | | | | | | | | | | | |
| 235 | 2. Observation Value 0.00013 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 236 | | | | | | | | | | | | |
| 237 | Test Statistic: 0.126 | | | | | | | | | | | |
| 238 | | | | | | | | | | | | |
| 239 | For 10% significance level, 0.00013 is not an outlier. | | | | | | | | | | | |
| 240 | For 5% significance level, 0.00013 is not an outlier. | | | | | | | | | | | |
| 241 | For 1% significance level, 0.00013 is not an outlier. | | | | | | | | | | | |
| 242 | | | | | | | | | | | | |
| 243 | | | | | | | | | | | | |
| 244 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 245 | | | | | | | | | | | | |
| 246 | | | | | | | | | | | | |
| 247 | | | | Mean | 0.00249 | | | | | | | |
| 248 | | | | Standard Deviation | 0.00173 | | | | | | | |
| 249 | | | | Number of data | 37 | | | | | | | |
| 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 | 0.00249 | 0.00171 | 0.007 | 5 | 2.639 | 3 | 3.34 | | | | |
| 255 | | | | | | | | | | | | |
| 256 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 257 | | | | | | | | | | | | |
| 258 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 259 | | | | | | | | | | | | |
| 260 | | | | | | | | | | | | |
| 261 | Rosner's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 262 | | | | | | | | | | | | |
| 263 | | | | | | | | | | | | |
| 264 | | | | Mean | 2.707 | | | | | | | |
| 265 | | | | Standard Deviation | 4.002 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | Number of data | 30 | | | | | | | | |
| 267 | | | Number of suspected outliers | 1 | | | | | | | | |
| 268 | | | | | | | | | | | | |
| 269 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 270 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 271 | 1 | 2.707 | 3.935 | 12.9 | 9 | 2.59 | 2.91 | 3.24 | | | | |
| 272 | | | | | | | | | | | | |
| 273 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 276 | | | | | | | | | | | | |
| 277 | | | | | | | | | | | | |
| 278 | | | Available only for sample sizes 3 to 500 | | | | | | | | | |
| 279 | | | | | | | | | | | | |
| 280 | | | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | | |
| 281 | | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | | | Mean | 0.519 | | | | | | | | |
| 284 | | | Standard Deviation | 0.117 | | | | | | | | |
| 285 | | | Number of data | 30 | | | | | | | | |
| 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 | 0.519 | 0.115 | 0.226 | 20 | 2.542 | 2.91 | 3.24 | | | | |
| 291 | | | | | | | | | | | | |
| 292 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 293 | | | | | | | | | | | | |
| 294 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 295 | | | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | | | Dixon's Outlier Test for Mercury (mg/L) | | | | | | | | | |
| 298 | | | | | | | | | | | | |
| 299 | Number of Observations = 3 | | | | | | | | | | | |
| 300 | 10% critical value: 0.886 | | | | | | | | | | | |
| 301 | 5% critical value: 0.941 | | | | | | | | | | | |
| 302 | 1% critical value: 0.988 | | | | | | | | | | | |
| 303 | | | | | | | | | | | | |
| 304 | 1. Observation Value 0.00011 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 305 | | | | | | | | | | | | |
| 306 | Test Statistic: 0.616 | | | | | | | | | | | |
| 307 | | | | | | | | | | | | |
| 308 | For 10% significance level, 0.00011 is not an outlier. | | | | | | | | | | | |
| 309 | For 5% significance level, 0.00011 is not an outlier. | | | | | | | | | | | |
| 310 | For 1% significance level, 0.00011 is not an outlier. | | | | | | | | | | | |
| 311 | | | | | | | | | | | | |
| 312 | 2. Observation Value 1.26E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 313 | | | | | | | | | | | | |
| 314 | Test Statistic: 0.384 | | | | | | | | | | | |
| 315 | | | | | | | | | | | | |
| 316 | For 10% significance level, 1.26E-05 is not an outlier. | | | | | | | | | | | |
| 317 | For 5% significance level, 1.26E-05 is not an outlier. | | | | | | | | | | | |
| 318 | For 1% significance level, 1.26E-05 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | | | | | | | | |
| 320 | | | | | | | | | | | | |
| 321 | | | | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | | |
| 322 | | | | | | | | | | | | |
| 323 | | | | | | | | | | | | |
| 324 | | | | Mean | 0.0061 | | | | | | | |
| 325 | | | | Standard Deviation | 0.00584 | | | | | | | |
| 326 | | | | Number of data | 31 | | | | | | | |
| 327 | | | | Number of suspected outliers | 1 | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 330 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 331 | 1 | 0.0061 | 0.00575 | 0.027 | 2 | 3.639 | 2.92 | 3.25 | | | | |
| 332 | | | | | | | | | | | | |
| 333 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 334 | Potential outliers is: 0.027 | | | | | | | | | | | |
| 335 | | | | | | | | | | | | |
| 336 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 337 | Potential outliers is: 0.027 | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | | | | | | | | | | | | |
| 340 | | | | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | |
| 341 | | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | | | | Mean | 0.00895 | | | | | | | |
| 344 | | | | Standard Deviation | 0.0166 | | | | | | | |
| 345 | | | | Number of data | 31 | | | | | | | |
| 346 | | | | Number of suspected outliers | 1 | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 349 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 350 | 1 | 0.00895 | 0.0164 | 0.097 | 3 | 5.379 | 2.92 | 3.25 | | | | |
| 351 | | | | | | | | | | | | |
| 352 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 353 | Potential outliers is: 0.097 | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 356 | Potential outliers is: 0.097 | | | | | | | | | | | |
| 357 | | | | | | | | | | | | |
| 358 | | | | | | | | | | | | |
| 359 | | | | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | Number of Observations = 19 | | | | | | | | | | | |
| 362 | 10% critical value: 0.412 | | | | | | | | | | | |
| 363 | 5% critical value: 0.462 | | | | | | | | | | | |
| 364 | 1% critical value: 0.547 | | | | | | | | | | | |
| 365 | | | | | | | | | | | | |
| 366 | 1. Observation Value 17.2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |
| 368 | Test Statistic: 0.519 | | | | | | | | | | | |
| 369 | | | | | | | | | | | | |
| 370 | For 10% significance level, 17.2 is an outlier. | | | | | | | | | | | |
| 371 | For 5% significance level, 17.2 is an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | For 1% significance level, 17.2 is not an outlier. | | | | | | | | | | | |
| 373 | | | | | | | | | | | | |
| 374 | 2. Observation Value 10.6 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 375 | | | | | | | | | | | | |
| 376 | Test Statistic: 0.316 | | | | | | | | | | | |
| 377 | | | | | | | | | | | | |
| 378 | For 10% significance level, 10.6 is not an outlier. | | | | | | | | | | | |
| 379 | For 5% significance level, 10.6 is not an outlier. | | | | | | | | | | | |
| 380 | For 1% significance level, 10.6 is not an outlier. | | | | | | | | | | | |
| 381 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:00:14 AM | | | | | | | | |
| | | | From File | 2023-ShallowProUCL_j.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 12-SH | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.936 | | | | | | | |
| | | | Standard Deviation | 0.258 | | | | | | | |
| | | | Number of data | 37 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 7.936 | 0.254 | | 7.37 | 9 | 2.223 | 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 TDS (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 281.5 | | | | | | | |
| | | | Standard Deviation | 58.55 | | | | | | | |
| | | | Number of data | 37 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 281.5 | 57.76 | | 146 | 10 | 2.345 | 3 | 3.34 | | | |
| | | | | | | | | | | | |
| For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| | | | | | | | | | | | |
| For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | Dixon's Outlier Test for Chloride (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| Number of Observations = 9 | | | | | | | | | | | |
| 10% critical value: 0.441 | | | | | | | | | | | |
| 5% critical value: 0.512 | | | | | | | | | | | |
| 1% critical value: 0.635 | | | | | | | | | | | |
| | | | | | | | | | | | |
| 1. Observation Value 1.2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| | | | | | | | | | | | |
| Test Statistic: 0.714 | | | | | | | | | | | |
| | | | | | | | | | | | |
| For 10% significance level, 1.2 is an outlier. | | | | | | | | | | | |

For 5% significance level, 1.2 is an outlier.

For 1% significance level, 1.2 is an outlier.

2. Observation Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.5 is not an outlier.

For 5% significance level, 0.5 is not an outlier.

For 1% significance level, 0.5 is not an outlier.

## Rosner's Outlier Test for Sulphate (mg/L)

| | |
|---|---|
| Mean | 3.411 |
| Standard Deviation | 1.451 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 3.411 | 1.428 | 6.4 | 2 | 2.092 | 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 = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Observation Value 3.3 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.219

For 10% significance level, 3.3 is not an outlier.

For 5% significance level, 3.3 is not an outlier.

For 1% significance level, 3.3 is not an outlier.

2. Observation Value 1.24 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.269

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.

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 108 | | | | | | | | | | | | |
| 109 | | | | | | | | | | | | |
| 110 | | | | Mean | 352.6 | | | | | | | |
| 111 | | | | Standard Deviation | 73.96 | | | | | | | |
| 112 | | | | Number of data | 36 | | | | | | | |
| 113 | | | | Number of suspected outliers | 1 | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 116 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 117 | 1 | 352.6 | 72.93 | 173 | 9 | 2.463 | 2.99 | 3.33 | | | | |
| 118 | | | | | | | | | | | | |
| 119 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | | | | | | | | | | | | |
| 124 | Rosner's Outlier Test for Calcium (mg/L) | | | | | | | | | | | |
| 125 | | | | | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | Mean | 69.47 | | | | | | | |
| 128 | | | | Standard Deviation | 21.26 | | | | | | | |
| 129 | | | | Number of data | 37 | | | | | | | |
| 130 | | | | Number of suspected outliers | 1 | | | | | | | |
| 131 | | | | | | | | | | | | |
| 132 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 133 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 134 | 1 | 69.47 | 20.97 | 17.2 | 24 | 2.493 | 3 | 3.34 | | | | |
| 135 | | | | | | | | | | | | |
| 136 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | | | | | | | | |
| 141 | Rosner's Outlier Test for Magnesium (mg/L) | | | | | | | | | | | |
| 142 | | | | | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | | | | Mean | 21.05 | | | | | | | |
| 145 | | | | Standard Deviation | 4.524 | | | | | | | |
| 146 | | | | Number of data | 37 | | | | | | | |
| 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 | 21.05 | 4.462 | 10.4 | 10 | 2.387 | 3 | 3.34 | | | | |
| 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 | 8.843 | | | | | | | | | |
| | Standard Deviation | 2.43 | | | | | | | | | |
| | Number of data | 37 | | | | | | | | | |
| | Number of suspected outliers | 1 | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 8.843 | 2.396 | 13.8 | 33 | 2.068 | 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 Arsenic (mg/L)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | 9.0541E-4 | | | | | | | | | |
| | Standard Deviation | 6.2635E-4 | | | | | | | | | |
| | Number of data | 37 | | | | | | | | | |
| | Number of suspected outliers | 1 | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 9.0541E-4 | 6.1783E-4 | 0.00282 | 32 | 3.099 | 3 | 3.34 | | | | |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.00282

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for Cadmium (mg/L)

Number of Observations = 16

10% critical value: 0.454

5% critical value: 0.507

1% critical value: 0.595

1. Observation Value 0.003 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.989

For 10% significance level, 0.003 is an outlier.

For 5% significance level, 0.003 is an outlier.

For 1% significance level, 0.003 is an outlier.

2. Observation Value 8.2E-06 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.051

For 10% significance level, 8.2E-06 is not an outlier.

For 5% significance level, 8.2E-06 is not an outlier.

For 1% significance level, 8.2E-06 is not an outlier.

Dixon's Outlier Test for Chromium (mg/L)

Number of Observations = 8

10% critical value: 0.479

5% critical value: 0.554

1% critical value: 0.683

1. Observation Value 0.023 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.044

For 10% significance level, 0.023 is not an outlier.

For 5% significance level, 0.023 is not an outlier.

For 1% significance level, 0.023 is not an outlier.

2. Observation Value 0.00015 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.006

For 10% significance level, 0.00015 is not an outlier.

For 5% significance level, 0.00015 is not an outlier.

For 1% significance level, 0.00015 is not an outlier.

Rosner's Outlier Test for Copper (mg/L)

| | |
|---|---|
| Mean | 0.00231 |
| Standard Deviation | 0.00272 |
| Number of data | 37 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00231 | 0.00268 | 0.012 | 4 | 3.611 | 3 | 3.34 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.012

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.012

Rosner's Outlier Test for Iron (mg/L)

| | |
|---|---|
| Mean | 0.093 |
| Standard Deviation | 0.137 |
| Number of data | 30 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | Number of suspected outliers | | | 1 | | | | | | | | |
| 267 | | | | | | | | | | | | |
| 268 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 269 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 270 | 1 | 0.093 | 0.135 | 0.62 | 25 | 3.915 | 2.91 | 3.24 | | | | |
| 271 | | | | | | | | | | | | |
| 272 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 273 | Potential outliers is: 0.62 | | | | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 276 | Potential outliers is: 0.62 | | | | | | | | | | | |
| 277 | | | | | | | | | | | | |
| 278 | | | | | | | | | | | | |
| 279 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | Number of Observations = 3 | | | | | | | | | | | |
| 282 | 10% critical value: 0.886 | | | | | | | | | | | |
| 283 | 5% critical value: 0.941 | | | | | | | | | | | |
| 284 | 1% critical value: 0.988 | | | | | | | | | | | |
| 285 | | | | | | | | | | | | |
| 286 | 1. Observation Value 0.0007 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 287 | | | | | | | | | | | | |
| 288 | Test Statistic: 0.155 | | | | | | | | | | | |
| 289 | | | | | | | | | | | | |
| 290 | For 10% significance level, 0.0007 is not an outlier. | | | | | | | | | | | |
| 291 | For 5% significance level, 0.0007 is not an outlier. | | | | | | | | | | | |
| 292 | For 1% significance level, 0.0007 is not an outlier. | | | | | | | | | | | |
| 293 | | | | | | | | | | | | |
| 294 | 2. Observation Value 5.3E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 295 | | | | | | | | | | | | |
| 296 | Test Statistic: 0.845 | | | | | | | | | | | |
| 297 | | | | | | | | | | | | |
| 298 | For 10% significance level, 5.3E-05 is not an outlier. | | | | | | | | | | | |
| 299 | For 5% significance level, 5.3E-05 is not an outlier. | | | | | | | | | | | |
| 300 | For 1% significance level, 5.3E-05 is not an outlier. | | | | | | | | | | | |
| 301 | | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | | | | | | | | | | | | |
| 306 | Mean | 0.276 | | | | | | | | | | |
| 307 | Standard Deviation | 0.232 | | | | | | | | | | |
| 308 | Number of data | 30 | | | | | | | | | | |
| 309 | Number of suspected outliers | 1 | | | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 312 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 313 | 1 | 0.276 | 0.229 | 1.19 | 14 | 4.001 | 2.91 | 3.24 | | | | |
| 314 | | | | | | | | | | | | |
| 315 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 316 | Potential outliers is: 1.19 | | | | | | | | | | | |
| 317 | | | | | | | | | | | | |
| 318 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |

Potential outliers is: 1.19

Dixon's Outlier Test for Mercury (mg/L)

Number of Observations = 3

10% critical value: 0.886

5% critical value: 0.941

1% critical value: 0.988

1. Observation Value 0.00043 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.921

For 10% significance level, 0.00043 is an outlier.

For 5% significance level, 0.00043 is not an outlier.

For 1% significance level, 0.00043 is not an outlier.

2. Observation Value 5E-05 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.079

For 10% significance level, 5E-05 is not an outlier.

For 5% significance level, 5E-05 is not an outlier.

For 1% significance level, 5E-05 is not an outlier.

Rosner's Outlier Test for Nickel (mg/L)

| | |
|---|---|
| Mean | 0.00355 |
| Standard Deviation | 0.004 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00355 | 0.00394 | 0.0153 | 16 | 2.982 | 2.94 | 3.27 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0153

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Zinc (mg/L)

| | |
|---|---|
| Mean | 0.00709 |
| Standard Deviation | 0.00718 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 373 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 374 | 1 | 0.00709 | 0.00706 | 0.0307 | 32 | 3.342 | 2.94 | 3.27 | | | | |
| 375 | | | | | | | | | | | | |
| 376 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 377 | Potential outliers is: 0.0307 | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 380 | Potential outliers is: 0.0307 | | | | | | | | | | | |
| 381 | | | | | | | | | | | | |
| 382 | | | | | | | | | | | | |
| 383 | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | Number of Observations = 19 | | | | | | | | | | | |
| 386 | 10% critical value: 0.412 | | | | | | | | | | | |
| 387 | 5% critical value: 0.462 | | | | | | | | | | | |
| 388 | 1% critical value: 0.547 | | | | | | | | | | | |
| 389 | | | | | | | | | | | | |
| 390 | 1. Observation Value 2.5 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 391 | | | | | | | | | | | | |
| 392 | Test Statistic: 0.091 | | | | | | | | | | | |
| 393 | | | | | | | | | | | | |
| 394 | For 10% significance level, 2.5 is not an outlier. | | | | | | | | | | | |
| 395 | For 5% significance level, 2.5 is not an outlier. | | | | | | | | | | | |
| 396 | For 1% significance level, 2.5 is not an outlier. | | | | | | | | | | | |
| 397 | | | | | | | | | | | | |
| 398 | 2. Observation Value 1 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 399 | | | | | | | | | | | | |
| 400 | Test Statistic: 0.286 | | | | | | | | | | | |
| 401 | | | | | | | | | | | | |
| 402 | For 10% significance level, 1 is not an outlier. | | | | | | | | | | | |
| 403 | For 5% significance level, 1 is not an outlier. | | | | | | | | | | | |
| 404 | For 1% significance level, 1 is not an outlier. | | | | | | | | | | | |
| 405 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:01:33 AM | | | | | | | | |
| | | | From File | 2023-ShallowProUCL_k.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 13-SH | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.785 | | | | | | | |
| | | | Standard Deviation | 0.217 | | | | | | | |
| | | | Number of data | 37 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 7.785 | 0.214 | | 8.23 | 25 | 2.084 | 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 TDS (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 482.2 | | | | | | | |
| | | | Standard Deviation | 168.7 | | | | | | | |
| | | | Number of data | 37 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 482.2 | 166.4 | | 811 | 13 | 1.976 | 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 Chloride (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 1.851 | | | | | | | |
| | | | Standard Deviation | 0.868 | | | | | | | |
| | | | Number of data | 37 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 1.851 | 0.856 | | 5.08 | 26 | 3.77 | 3 | 3.34 | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 55 | Potential outliers is: 5.08 | | | | | | | | | | | |
| 56 | | | | | | | | | | | | |
| 57 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 58 | Potential outliers is: 5.08 | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 61 | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | |
| 64 | | | | Mean | 41.01 | | | | | | | |
| 65 | | | | Standard Deviation | 15.62 | | | | | | | |
| 66 | | | | Number of data | 32 | | | | | | | |
| 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 | 41.01 | 15.38 | 81.4 | 32 | 2.627 | 2.94 | 3.27 | | | | |
| 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 = 18 | | | | | | | | | | | |
| 81 | 10% critical value: 0.424 | | | | | | | | | | | |
| 82 | 5% critical value: 0.475 | | | | | | | | | | | |
| 83 | 1% critical value: 0.561 | | | | | | | | | | | |
| 84 | | | | | | | | | | | | |
| 85 | 1. Observation Value 8.39 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | Test Statistic: 0.818 | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | For 10% significance level, 8.39 is an outlier. | | | | | | | | | | | |
| 90 | For 5% significance level, 8.39 is an outlier. | | | | | | | | | | | |
| 91 | For 1% significance level, 8.39 is an outlier. | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | 2. Observation Value 1.14 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | Test Statistic: 0.355 | | | | | | | | | | | |
| 96 | | | | | | | | | | | | |
| 97 | For 10% significance level, 1.14 is not an outlier. | | | | | | | | | | | |
| 98 | For 5% significance level, 1.14 is not an outlier. | | | | | | | | | | | |
| 99 | For 1% significance level, 1.14 is not an outlier. | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | | | | | | | | | |
| 102 | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Mean | 541.2 | | | | | | | |
| 106 | | | | Standard Deviation | 209 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | Number of data | 37 | | | | | | | | |
| 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 | 541.2 | 206.1 | 973 | 14 | 2.095 | 3 | 3.34 | | | | |
| 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 | 113.6 | | | | | | | | |
| 123 | | | Standard Deviation | 38.99 | | | | | | | | |
| 124 | | | Number of data | 37 | | | | | | | | |
| 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 | 113.6 | 38.46 | 202 | 13 | 2.298 | 3 | 3.34 | | | | |
| 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 | 31.11 | | | | | | | | |
| 140 | | | Standard Deviation | 12.05 | | | | | | | | |
| 141 | | | Number of data | 37 | | | | | | | | |
| 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 | 31.11 | 11.88 | 57.2 | 13 | 2.196 | 3 | 3.34 | | | | |
| 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 | 26.69 | | | | | | | | |
| 157 | | | Standard Deviation | 14.51 | | | | | | | | |
| 158 | | | Number of data | 37 | | | | | | | | |
| 159 | | | Number of suspected outliers | 1 | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Potential | Obs. | Test | Critical | Critical | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | |
| 1 | 26.69 | 14.32 | 72.6 | 20 | 3.206 | 3 | 3.34 | |

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 | 0.00135 |
| Standard Deviation | 9.2621E-4 |
| Number of data | 37 |
| Number of suspected outliers | 1 |

| | | | Potential | Obs. | Test | Critical | Critical | |
|---|---|---|---|---|---|---|---|---|
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | |
| 1 | 0.00135 | 9.1361E-4 | 0.00355 | 32 | 2.41 | 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 Cadmium (mg/L)

| | |
|---|---|
| Mean | 7.4753E-4 |
| Standard Deviation | 0.00116 |
| Number of data | 37 |
| Number of suspected outliers | 1 |

| | | | Potential | Obs. | Test | Critical | Critical | |
|---|---|---|---|---|---|---|---|---|
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | |
| 1 | 7.4753E-4 | 0.00114 | 0.003 | 2 | 1.975 | 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 Chromium (mg/L)

| | |
|---|---|
| Mean | 0.00531 |
| Standard Deviation | 0.00645 |
| Number of data | 37 |
| Number of suspected outliers | 1 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 214 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 215 | 1 | 0.00531 | 0.00636 | 0.022 | 20 | 2.625 | 3 | 3.34 | | | | |
| 216 | | | | | | | | | | | | |
| 217 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 220 | | | | | | | | | | | | |
| 221 | | | | | | | | | | | | |
| 222 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | | | | | | | | | | | | |
| 225 | Mean | 0.00699 | | | | | | | | | | |
| 226 | Standard Deviation | 0.0177 | | | | | | | | | | |
| 227 | Number of data | 37 | | | | | | | | | | |
| 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 | 0.00699 | 0.0174 | 0.103 | 7 | 5.511 | 3 | 3.34 | | | | |
| 233 | | | | | | | | | | | | |
| 234 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 235 | Potential outliers is: 0.103 | | | | | | | | | | | |
| 236 | | | | | | | | | | | | |
| 237 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 238 | Potential outliers is: 0.103 | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | | | | | | | | | |
| 241 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 242 | | | | | | | | | | | | |
| 243 | Number of Observations = 7 | | | | | | | | | | | |
| 244 | 10% critical value: 0.434 | | | | | | | | | | | |
| 245 | 5% critical value: 0.507 | | | | | | | | | | | |
| 246 | 1% critical value: 0.637 | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | 1. Observation Value 0.062 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 249 | | | | | | | | | | | | |
| 250 | Test Statistic: 0.231 | | | | | | | | | | | |
| 251 | | | | | | | | | | | | |
| 252 | For 10% significance level, 0.062 is not an outlier. | | | | | | | | | | | |
| 253 | For 5% significance level, 0.062 is not an outlier. | | | | | | | | | | | |
| 254 | For 1% significance level, 0.062 is not an outlier. | | | | | | | | | | | |
| 255 | | | | | | | | | | | | |
| 256 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 257 | | | | | | | | | | | | |
| 258 | Test Statistic: 0.038 | | | | | | | | | | | |
| 259 | | | | | | | | | | | | |
| 260 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 261 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 262 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 263 | | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | | | | | | | | |
| 267 | Number of Observations = 6 | | | | | | | | | | | |
| 268 | 10% critical value: 0.482 | | | | | | | | | | | |
| 269 | 5% critical value: 0.56 | | | | | | | | | | | |
| 270 | 1% critical value: 0.698 | | | | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | 1. Observation Value 0.0013 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | Test Statistic: 0.723 | | | | | | | | | | | |
| 275 | | | | | | | | | | | | |
| 276 | For 10% significance level, 0.0013 is an outlier. | | | | | | | | | | | |
| 277 | For 5% significance level, 0.0013 is an outlier. | | | | | | | | | | | |
| 278 | For 1% significance level, 0.0013 is an outlier. | | | | | | | | | | | |
| 279 | | | | | | | | | | | | |
| 280 | 2. Observation Value 5.6E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 281 | | | | | | | | | | | | |
| 282 | Test Statistic: 0.027 | | | | | | | | | | | |
| 283 | | | | | | | | | | | | |
| 284 | For 10% significance level, 5.6E-05 is not an outlier. | | | | | | | | | | | |
| 285 | For 5% significance level, 5.6E-05 is not an outlier. | | | | | | | | | | | |
| 286 | For 1% significance level, 5.6E-05 is not an outlier. | | | | | | | | | | | |
| 287 | | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | | | | | | | | | | | | |
| 292 | Mean | 0.116 | | | | | | | | | | |
| 293 | Standard Deviation | 0.118 | | | | | | | | | | |
| 294 | Number of data | 30 | | | | | | | | | | |
| 295 | Number of suspected outliers | 1 | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 298 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 299 | 1 | 0.116 | 0.116 | 0.442 | 6 | 2.825 | 2.91 | 3.24 | | | | |
| 300 | | | | | | | | | | | | |
| 301 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | | | | | | | | | | | | |
| 306 | Dixon's Outlier Test for Mercury (mg/L) | | | | | | | | | | | |
| 307 | | | | | | | | | | | | |
| 308 | Number of Observations = 4 | | | | | | | | | | | |
| 309 | 10% critical value: 0.679 | | | | | | | | | | | |
| 310 | 5% critical value: 0.765 | | | | | | | | | | | |
| 311 | 1% critical value: 0.889 | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | 1. Observation Value 0.00022 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | Test Statistic: 0.799 | | | | | | | | | | | |
| 316 | | | | | | | | | | | | |
| 317 | For 10% significance level, 0.00022 is an outlier. | | | | | | | | | | | |
| 318 | For 5% significance level, 0.00022 is an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | For 1% significance level, 0.00022 is not an outlier. | | | | | | | | | | | |
| 320 | | | | | | | | | | | | |
| 321 | 2. Observation Value 7.2E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 322 | | | | | | | | | | | | |
| 323 | Test Statistic: 0.201 | | | | | | | | | | | |
| 324 | | | | | | | | | | | | |
| 325 | For 10% significance level, 7.2E-06 is not an outlier. | | | | | | | | | | | |
| 326 | For 5% significance level, 7.2E-06 is not an outlier. | | | | | | | | | | | |
| 327 | For 1% significance level, 7.2E-06 is not an outlier. | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | | | | | | | | | | | | |
| 330 | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | | | | | | | | | | | | |
| 333 | | | | Mean | 0.00746 | | | | | | | |
| 334 | | | | Standard Deviation | 0.00799 | | | | | | | |
| 335 | | | | Number of data | 32 | | | | | | | |
| 336 | | | | Number of suspected outliers | 1 | | | | | | | |
| 337 | | | | | | | | | | | | |
| 338 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 339 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 340 | 1 | 0.00746 | 0.00786 | 0.034 | 2 | 3.375 | 2.94 | 3.27 | | | | |
| 341 | | | | | | | | | | | | |
| 342 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 343 | Potential outliers is: 0.034 | | | | | | | | | | | |
| 344 | | | | | | | | | | | | |
| 345 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 346 | Potential outliers is: 0.034 | | | | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | | | | | | | | | | | | |
| 352 | | | | Mean | 0.0227 | | | | | | | |
| 353 | | | | Standard Deviation | 0.0483 | | | | | | | |
| 354 | | | | Number of data | 32 | | | | | | | |
| 355 | | | | Number of suspected outliers | 1 | | | | | | | |
| 356 | | | | | | | | | | | | |
| 357 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 358 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 359 | 1 | 0.0227 | 0.0475 | 0.245 | 22 | 4.68 | 2.94 | 3.27 | | | | |
| 360 | | | | | | | | | | | | |
| 361 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 362 | Potential outliers is: 0.245 | | | | | | | | | | | |
| 363 | | | | | | | | | | | | |
| 364 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 365 | Potential outliers is: 0.245 | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |
| 368 | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | | | | |
| 369 | | | | | | | | | | | | |
| 370 | Number of Observations = 19 | | | | | | | | | | | |
| 371 | 10% critical value: 0.412 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | 5% critical value: 0.462 | | | | | | | | | | | |
| 373 | 1% critical value: 0.547 | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | 1. Observation Value 4.5 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | Test Statistic: 0.233 | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | For 10% significance level, 4.5 is not an outlier. | | | | | | | | | | | |
| 380 | For 5% significance level, 4.5 is not an outlier. | | | | | | | | | | | |
| 381 | For 1% significance level, 4.5 is not an outlier. | | | | | | | | | | | |
| 382 | | | | | | | | | | | | |
| 383 | 2. Observation Value 1 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | Test Statistic: 0.179 | | | | | | | | | | | |
| 386 | | | | | | | | | | | | |
| 387 | For 10% significance level, 1 is not an outlier. | | | | | | | | | | | |
| 388 | For 5% significance level, 1 is not an outlier. | | | | | | | | | | | |
| 389 | For 1% significance level, 1 is not an outlier. | | | | | | | | | | | |
| 390 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:02:50 AM | | | | | | | | |
| | | | From File | 2023-ShallowProUCL_I.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 14-SH | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.715 | | | | | | | |
| | | | Standard Deviation | 0.323 | | | | | | | |
| | | | Number of data | 31 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 7.715 | 0.318 | 6.86 | 8 | 2.69 | 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 | 510.2 | | | | | | | |
| | | | Standard Deviation | 168.2 | | | | | | | |
| | | | Number of data | 32 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 510.2 | 165.6 | 237 | 28 | 1.65 | 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 | 4.208 | | | | | | | |
| | | | Standard Deviation | 3.502 | | | | | | | |
| | | | Number of data | 32 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 4.208 | 3.447 | 17.1 | 9 | 3.74 | 2.94 | 3.27 | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 55 | Potential outliers is: 17.1 | | | | | | | | | | | |
| 56 | | | | | | | | | | | | |
| 57 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 58 | Potential outliers is: 17.1 | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 61 | | | | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | |
| 64 | | | | Mean | 27.83 | | | | | | | |
| 65 | | | | Standard Deviation | 22.11 | | | | | | | |
| 66 | | | | Number of data | 31 | | | | | | | |
| 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 | 27.83 | 21.75 | 106 | 8 | 3.594 | 2.92 | 3.25 | | | | |
| 72 | | | | | | | | | | | | |
| 73 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 74 | Potential outliers is: 106 | | | | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 77 | Potential outliers is: 106 | | | | | | | | | | | |
| 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 6.5 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | Test Statistic: 0.492 | | | | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | For 10% significance level, 6.5 is an outlier. | | | | | | | | | | | |
| 92 | For 5% significance level, 6.5 is an outlier. | | | | | | | | | | | |
| 93 | For 1% significance level, 6.5 is not an outlier. | | | | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | 2. Observation Value 0.64 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 96 | | | | | | | | | | | | |
| 97 | Test Statistic: 0.542 | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | For 10% significance level, 0.64 is an outlier. | | | | | | | | | | | |
| 100 | For 5% significance level, 0.64 is an outlier. | | | | | | | | | | | |
| 101 | For 1% significance level, 0.64 is not an outlier. | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | | | | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | |
| 105 | | | | | | | | | | | | |
| 106 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | Mean | 596.4 | | | | | | | |
| 108 | | | | Standard Deviation | 226.2 | | | | | | | |
| 109 | | | | Number of data | 32 | | | | | | | |
| 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 | 596.4 | 222.7 | 916 | 16 | 1.435 | 2.94 | 3.27 | | | | |
| 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 | 122.7 | | | | | | | |
| 125 | | | | Standard Deviation | 47.35 | | | | | | | |
| 126 | | | | Number of data | 32 | | | | | | | |
| 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 | 122.7 | 46.6 | 22.8 | 28 | 2.144 | 2.94 | 3.27 | | | | |
| 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 | 34.22 | | | | | | | |
| 142 | | | | Standard Deviation | 13.25 | | | | | | | |
| 143 | | | | Number of data | 32 | | | | | | | |
| 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 | 34.22 | 13.05 | 6.16 | 28 | 2.151 | 2.94 | 3.27 | | | | |
| 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 | 22.77 | | | | | | | |
| 159 | | | | Standard Deviation | 11.13 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | Number of data | 32 | | | | | | | | |
| 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 | 22.77 | 10.95 | 64.1 | 8 | 3.774 | 2.94 | 3.27 | | | | |
| 166 | | | | | | | | | | | | |
| 167 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 168 | Potential outliers is: 64.1 | | | | | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 171 | Potential outliers is: 64.1 | | | | | | | | | | | |
| 172 | | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | | | Mean | 3.5313E-4 | | | | | | | | |
| 178 | | | Standard Deviation | 2.0675E-4 | | | | | | | | |
| 179 | | | Number of data | 32 | | | | | | | | |
| 180 | | | Number of suspected outliers | 1 | | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 183 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 184 | 1 | 3.5313E-4 | 2.0349E-4 | 0.0012 | 15 | 4.162 | 2.94 | 3.27 | | | | |
| 185 | | | | | | | | | | | | |
| 186 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 187 | Potential outliers is: 0.0012 | | | | | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 190 | Potential outliers is: 0.0012 | | | | | | | | | | | |
| 191 | | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | | | | Rosner's Outlier Test for Cadmium (mg/L) | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | | | | | | | | | |
| 196 | | | Mean | 6.3503E-4 | | | | | | | | |
| 197 | | | Standard Deviation | 0.00105 | | | | | | | | |
| 198 | | | Number of data | 32 | | | | | | | | |
| 199 | | | Number of suspected outliers | 1 | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 202 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 203 | 1 | 6.3503E-4 | 0.00104 | 0.0031 | 32 | 2.374 | 2.94 | 3.27 | | | | |
| 204 | | | | | | | | | | | | |
| 205 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | | | | | | | | | | | | |
| 210 | | | | Rosner's Outlier Test for Chromium (mg/L) | | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | Mean | 0.00387 | | | | | | | | |
| 214 | | | Standard Deviation | 0.00351 | | | | | | | | |
| 215 | | | Number of data | 32 | | | | | | | | |
| 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 | 0.00387 | 0.00345 | 0.016 | 13 | 3.513 | 2.94 | 3.27 | | | | |
| 221 | | | | | | | | | | | | |
| 222 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 223 | Potential outliers is: 0.016 | | | | | | | | | | | |
| 224 | | | | | | | | | | | | |
| 225 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 226 | Potential outliers is: 0.016 | | | | | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | | | Mean | 0.00334 | | | | | | | | |
| 233 | | | Standard Deviation | 0.00287 | | | | | | | | |
| 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 | 0.00334 | 0.00282 | 0.01 | 6 | 2.362 | 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 | | | | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | Number of Observations = 9 | | | | | | | | | | | |
| 249 | 10% critical value: 0.441 | | | | | | | | | | | |
| 250 | 5% critical value: 0.512 | | | | | | | | | | | |
| 251 | 1% critical value: 0.635 | | | | | | | | | | | |
| 252 | | | | | | | | | | | | |
| 253 | 1. Observation Value 0.095 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 254 | | | | | | | | | | | | |
| 255 | Test Statistic: 0.077 | | | | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | For 10% significance level, 0.095 is not an outlier. | | | | | | | | | | | |
| 258 | For 5% significance level, 0.095 is not an outlier. | | | | | | | | | | | |
| 259 | For 1% significance level, 0.095 is not an outlier. | | | | | | | | | | | |
| 260 | | | | | | | | | | | | |
| 261 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 262 | | | | | | | | | | | | |
| 263 | Test Statistic: 0.250 | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 267 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 268 | | | | | | | | | | | | |
| 269 | | | | | | | | | | | | |
| 270 | | | | Available only for sample sizes 3 to 500 | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | | | | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | | | | Mean | 0.269 | | | | | | | |
| 276 | | | | Standard Deviation | 0.278 | | | | | | | |
| 277 | | | | Number of data | 30 | | | | | | | |
| 278 | | | | Number of suspected outliers | 1 | | | | | | | |
| 279 | | | | | | | | | | | | |
| 280 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 281 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 282 | 1 | 0.269 | 0.273 | 1.07 | 7 | 2.933 | 2.91 | 3.24 | | | | |
| 283 | | | | | | | | | | | | |
| 284 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 285 | Potential outliers is: 1.07 | | | | | | | | | | | |
| 286 | | | | | | | | | | | | |
| 287 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | | | | | | | | | | | | |
| 290 | | | | Dixon's Outlier Test for Mercury (mg/L) | | | | | | | | |
| 291 | | | | | | | | | | | | |
| 292 | Number of Observations = 3 | | | | | | | | | | | |
| 293 | 10% critical value: 0.886 | | | | | | | | | | | |
| 294 | 5% critical value: 0.941 | | | | | | | | | | | |
| 295 | 1% critical value: 0.988 | | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | 1. Observation Value 0.00014 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 298 | | | | | | | | | | | | |
| 299 | Test Statistic: 0.722 | | | | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | For 10% significance level, 0.00014 is not an outlier. | | | | | | | | | | | |
| 302 | For 5% significance level, 0.00014 is not an outlier. | | | | | | | | | | | |
| 303 | For 1% significance level, 0.00014 is not an outlier. | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | 2. Observation Value 1.53E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 306 | | | | | | | | | | | | |
| 307 | Test Statistic: 0.278 | | | | | | | | | | | |
| 308 | | | | | | | | | | | | |
| 309 | For 10% significance level, 1.53E-05 is not an outlier. | | | | | | | | | | | |
| 310 | For 5% significance level, 1.53E-05 is not an outlier. | | | | | | | | | | | |
| 311 | For 1% significance level, 1.53E-05 is not an outlier. | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | | | | | | | | | | | | |
| 314 | | | | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | | |
| 315 | | | | | | | | | | | | |
| 316 | | | | | | | | | | | | |
| 317 | | | | Mean | 0.00968 | | | | | | | |
| 318 | | | | Standard Deviation | 0.0131 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | Number of data | 31 | | | | | | | | |
| 320 | | | Number of suspected outliers | 1 | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 323 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 324 | 1 | 0.00968 | 0.0128 | 0.057 | 2 | 3.685 | 2.92 | 3.25 | | | | |
| 325 | | | | | | | | | | | | |
| 326 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 327 | Potential outliers is: 0.057 | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 330 | Potential outliers is: 0.057 | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | | | | | | | | | | | | |
| 333 | | | | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | | | | | | | | | | | | |
| 336 | | | Mean | 0.0264 | | | | | | | | |
| 337 | | | Standard Deviation | 0.0438 | | | | | | | | |
| 338 | | | Number of data | 31 | | | | | | | | |
| 339 | | | Number of suspected outliers | 1 | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 342 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 343 | 1 | 0.0264 | 0.0431 | 0.211 | 21 | 4.287 | 2.92 | 3.25 | | | | |
| 344 | | | | | | | | | | | | |
| 345 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 346 | Potential outliers is: 0.211 | | | | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 349 | Potential outliers is: 0.211 | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | | | | | | | | | | | | |
| 352 | | | | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | |
| 353 | | | | | | | | | | | | |
| 354 | Number of Observations = 14 | | | | | | | | | | | |
| 355 | 10% critical value: 0.492 | | | | | | | | | | | |
| 356 | 5% critical value: 0.546 | | | | | | | | | | | |
| 357 | 1% critical value: 0.641 | | | | | | | | | | | |
| 358 | | | | | | | | | | | | |
| 359 | 1. Observation Value 5.5 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | Test Statistic: 0.235 | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | For 10% significance level, 5.5 is not an outlier. | | | | | | | | | | | |
| 364 | For 5% significance level, 5.5 is not an outlier. | | | | | | | | | | | |
| 365 | For 1% significance level, 5.5 is not an outlier. | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | 2. Observation Value 1.5 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |
| 369 | Test Statistic: 0.188 | | | | | | | | | | | |
| 370 | | | | | | | | | | | | |
| 371 | For 10% significance level, 1.5 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | For 5% significance level, 1.5 is not an outlier. | | | | | | | | | | | |
| 373 | For 1% significance level, 1.5 is not an outlier. | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |

Outlier Tests for Selected Uncensored Variables

User Selected Options

| | |
|---|---|
| Date/Time of Computation | ProUCL 5.2 2023-12-13 9:04:22 AM |
| From File | 2023-ShallowProUCL_m.xls |
| Full Precision | OFF |

15-SH

Rosner's Outlier Test for pH ()

| | |
|---|---|
| Mean | 7.766 |
| Standard Deviation | 0.372 |
| Number of data | 34 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 7.766 | 0.366 | 7.01 | 6 | 2.063 | 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 TDS (mg/L)

| | |
|---|---|
| Mean | 372.4 |
| Standard Deviation | 45.4 |
| Number of data | 34 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 372.4 | 44.73 | 231 | 1 | 3.162 | 2.97 | 3.3 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 231

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for Chloride (mg/L)

Number of Observations = 17

10% critical value: 0.438

5% critical value: 0.49

1% critical value: 0.577

1. Observation Value 3.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.651

For 10% significance level, 3.2 is an outlier.

For 5% significance level, 3.2 is an outlier.

For 1% significance level, 3.2 is an outlier.

2. Observation Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.090

For 10% significance level, 0.5 is not an outlier.

For 5% significance level, 0.5 is not an outlier.

For 1% significance level, 0.5 is not an outlier.

## Rosner's Outlier Test for Sulphate (mg/L)

| | |
|---|---|
| Mean | 30.49 |
| Standard Deviation | 20.14 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 30.49 | 19.82 | 91.5 | 6 | 3.078 | 2.94 | 3.27 |

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 = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Observation Value 7.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.227

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 Tail)?

Test Statistic: 0.113

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)

| | |
|---|---|
| Mean | 407 |
| Standard Deviation | 59.47 |
| Number of data | 34 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 407 | 58.59 | 275 | 1 | 2.252 | 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 | 89.51 |
| Standard Deviation | 11.1 |
| Number of data | 34 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 89.51 | 10.94 | 58.2 | 1 | 2.862 | 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 | 20.22 |
| Standard Deviation | 2.475 |
| Number of data | 34 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 20.22 | 2.438 | 14 | 2 | 2.553 | 2.97 | 3.3 |

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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | | | | |
| 161 | | | | | | | | | | | | |
| 162 | | | | | | | | | | | | |
| 163 | | | | Mean | 26.16 | | | | | | | |
| 164 | | | | Standard Deviation | 7.504 | | | | | | | |
| 165 | | | | Number of data | 34 | | | | | | | |
| 166 | | | | Number of suspected outliers | 1 | | | | | | | |
| 167 | | | | | | | | | | | | |
| 168 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 169 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 170 | 1 | 26.16 | 7.392 | 5.71 | 1 | 2.766 | 2.97 | 3.3 | | | | |
| 171 | | | | | | | | | | | | |
| 172 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 178 | | | | | | | | | | | | |
| 179 | | | | | | | | | | | | |
| 180 | | | | Mean | 3.5735E-4 | | | | | | | |
| 181 | | | | Standard Deviation | 3.1238E-4 | | | | | | | |
| 182 | | | | Number of data | 34 | | | | | | | |
| 183 | | | | Number of suspected outliers | 1 | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 186 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 187 | 1 | 3.5735E-4 | 3.0776E-4 | 0.00144 | 24 | 3.518 | 2.97 | 3.3 | | | | |
| 188 | | | | | | | | | | | | |
| 189 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 190 | Potential outliers is: 0.00144 | | | | | | | | | | | |
| 191 | | | | | | | | | | | | |
| 192 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 193 | Potential outliers is: 0.00144 | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | | | | | | | | | |
| 196 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 197 | | | | | | | | | | | | |
| 198 | Number of Observations = 15 | | | | | | | | | | | |
| 199 | 10% critical value: 0.472 | | | | | | | | | | | |
| 200 | 5% critical value: 0.525 | | | | | | | | | | | |
| 201 | 1% critical value: 0.616 | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | 1. Observation Value 0.0005 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | Test Statistic: 0.956 | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | For 10% significance level, 0.0005 is an outlier. | | | | | | | | | | | |
| 208 | For 5% significance level, 0.0005 is an outlier. | | | | | | | | | | | |
| 209 | For 1% significance level, 0.0005 is an outlier. | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | 2. Observation Value 7.4E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 212 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Test Statistic: 0.044 | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | For 10% significance level, 7.4E-06 is not an outlier. | | | | | | | | | | | |
| 216 | For 5% significance level, 7.4E-06 is not an outlier. | | | | | | | | | | | |
| 217 | For 1% significance level, 7.4E-06 is not an outlier. | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | | | | | | | | | |
| 220 | Rosner's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 221 | | | | | | | | | | | | |
| 222 | | | | | | | | | | | | |
| 223 | | | | Mean | 0.00351 | | | | | | | |
| 224 | | | | Standard Deviation | 0.00648 | | | | | | | |
| 225 | | | | Number of data | 34 | | | | | | | |
| 226 | | | | Number of suspected outliers | 1 | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 229 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 230 | 1 | 0.00351 | 0.00638 | 0.035 | 10 | 4.935 | 2.97 | 3.3 | | | | |
| 231 | | | | | | | | | | | | |
| 232 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 233 | Potential outliers is: 0.035 | | | | | | | | | | | |
| 234 | | | | | | | | | | | | |
| 235 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 236 | Potential outliers is: 0.035 | | | | | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | | | | | | | | | | | | |
| 239 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 240 | | | | | | | | | | | | |
| 241 | | | | | | | | | | | | |
| 242 | | | | Mean | 0.00407 | | | | | | | |
| 243 | | | | Standard Deviation | 0.0038 | | | | | | | |
| 244 | | | | Number of data | 34 | | | | | | | |
| 245 | | | | Number of suspected outliers | 1 | | | | | | | |
| 246 | | | | | | | | | | | | |
| 247 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 248 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 249 | 1 | 0.00407 | 0.00374 | 0.018 | 5 | 3.723 | 2.97 | 3.3 | | | | |
| 250 | | | | | | | | | | | | |
| 251 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 252 | Potential outliers is: 0.018 | | | | | | | | | | | |
| 253 | | | | | | | | | | | | |
| 254 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 255 | Potential outliers is: 0.018 | | | | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | | | | | | | | | | | | |
| 258 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 259 | | | | | | | | | | | | |
| 260 | Number of Observations = 14 | | | | | | | | | | | |
| 261 | 10% critical value: 0.492 | | | | | | | | | | | |
| 262 | 5% critical value: 0.546 | | | | | | | | | | | |
| 263 | 1% critical value: 0.641 | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | 1. Observation Value 0.461 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |

Test Statistic: 0.845

For 10% significance level, 0.461 is an outlier.

For 5% significance level, 0.461 is an outlier.

For 1% significance level, 0.461 is an outlier.

2. Observation Value 0.01 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.01 is not an outlier.

For 5% significance level, 0.01 is not an outlier.

For 1% significance level, 0.01 is not an outlier.

Dixon's Outlier Test for Lead (mg/L)

Number of Observations = 4

10% critical value: 0.679

5% critical value: 0.765

1% critical value: 0.889

1. Observation Value 0.0007 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.929

For 10% significance level, 0.0007 is an outlier.

For 5% significance level, 0.0007 is an outlier.

For 1% significance level, 0.0007 is an outlier.

2. Observation Value 6.5E-05 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.002

For 10% significance level, 6.5E-05 is not an outlier.

For 5% significance level, 6.5E-05 is not an outlier.

For 1% significance level, 6.5E-05 is not an outlier.

Rosner's Outlier Test for Manganese (mg/L)

| | |
|---|---|
| Mean | 0.313 |
| Standard Deviation | 0.221 |
| Number of data | 30 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.313 | 0.217 | 0.678 | 20 | 1.681 | 2.91 | 3.24 |

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Available only for sample sizes 3 to 500

Rosner's Outlier Test for Nickel (mg/L)

| | |
|---|---|
| Mean | 0.00976 |
| Standard Deviation | 0.0122 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00976 | 0.012 | 0.0626 | 31 | 4.388 | 2.94 | 3.27 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0626

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0626

Rosner's Outlier Test for Zinc (mg/L)

| | |
|---|---|
| Mean | 0.00518 |
| Standard Deviation | 0.005 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00518 | 0.00492 | 0.02 | 3 | 3.013 | 2.94 | 3.27 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.02

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for TOC (mg/L)

Number of Observations = 16

10% critical value: 0.454

5% critical value: 0.507

1% critical value: 0.595

1. Observation Value 12.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.864

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | | | | | | | | |
| 373 | For 10% significance level, 12.5 is an outlier. | | | | | | | | | | | |
| 374 | For 5% significance level, 12.5 is an outlier. | | | | | | | | | | | |
| 375 | For 1% significance level, 12.5 is an outlier. | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | 2. Observation Value 2.3 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | Test Statistic: 0.656 | | | | | | | | | | | |
| 380 | | | | | | | | | | | | |
| 381 | For 10% significance level, 2.3 is an outlier. | | | | | | | | | | | |
| 382 | For 5% significance level, 2.3 is an outlier. | | | | | | | | | | | |
| 383 | For 1% significance level, 2.3 is an outlier. | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | |
| | | | User Selected Options | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:05:22 AM | | | | | | | |
| | | | From File | 2023-ShallowProUCL_n.xls | | | | | | |
| | | | Full Precision | OFF | | | | | | |
| | | | | | | | | | | |
| | | | | 16-SH | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | Mean | 7.901 | | | | | | |
| | | | Standard Deviation | 0.257 | | | | | | |
| | | | Number of data | 29 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | |
| 1 | 7.901 | 0.253 | | 7.28 | 4 | 2.458 | 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 TDS (mg/L) | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | Mean | 445.7 | | | | | | |
| | | | Standard Deviation | 18.2 | | | | | | |
| | | | Number of data | 29 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | |
| 1 | 445.7 | 17.89 | | 500 | 27 | 3.036 | 2.89 | 3.22 | | |
| | | | | | | | | | | |
| For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| Potential outliers is: 500 | | | | | | | | | | |
| | | | | | | | | | | |
| For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | Rosner's Outlier Test for Chloride (mg/L) | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | Mean | 0.934 | | | | | | |
| | | | Standard Deviation | 0.402 | | | | | | |
| | | | Number of data | 29 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | |
| 1 | 0.934 | 0.395 | | 1.9 | 1 | 2.447 | 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 Sulphate (mg/L)

| | |
|---|---|
| Mean | 42.94 |
| Standard Deviation | 13.89 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 42.94 | 13.65 | 90.1 | 27 | 3.455 | 2.89 | 3.22 |

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 = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Observation Value 5.5 is a Potential Outlier (Upper Tail)?

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 Tail)?

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 | 479.9 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | Standard Deviation | 17.2 | | | | | | | |
| 108 | | | Number of data | 29 | | | | | | | |
| 109 | | | Number of suspected outliers | 1 | | | | | | | |
| 110 | | | | | | | | | | | |
| 111 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 112 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 113 | 1 | 479.9 | 16.9 | 522 | 25 | 2.491 | 2.89 | 3.22 | | | |
| 114 | | | | | | | | | | | |
| 115 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 116 | | | | | | | | | | | |
| 117 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 118 | | | | | | | | | | | |
| 119 | | | | | | | | | | | |
| 120 | | | | Rosner's Outlier Test for Calcium (mg/L) | | | | | | | |
| 121 | | | | | | | | | | | |
| 122 | | | | | | | | | | | |
| 123 | | | Mean | 104.1 | | | | | | | |
| 124 | | | Standard Deviation | 7.15 | | | | | | | |
| 125 | | | Number of data | 29 | | | | | | | |
| 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 | 104.1 | 7.025 | 119 | 27 | 2.123 | 2.89 | 3.22 | | | |
| 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 | 29.9 | | | | | | | |
| 141 | | | Standard Deviation | 1.874 | | | | | | | |
| 142 | | | Number of data | 29 | | | | | | | |
| 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 | 29.9 | 1.842 | 33.5 | 3 | 1.955 | 2.89 | 3.22 | | | |
| 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 | 25.56 | | | | | | | |
| 158 | | | Standard Deviation | 5.536 | | | | | | | |
| 159 | | | Number of data | 29 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 25.56 | 5.44 | 38.3 | 20 | 2.342 | 2.89 | 3.22 | | | |
| 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 | 2.3931E-4 | | | | | | | | | |
| 175 | Standard Deviation | 1.1035E-4 | | | | | | | | | |
| 176 | Number of data | 29 | | | | | | | | | |
| 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 | 2.3931E-4 | 1.0843E-4 | 5.8000E-4 | 17 | 3.142 | 2.89 | 3.22 | | | |
| 182 | | | | | | | | | | | |
| 183 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 184 | Potential outliers is: 5.8000E-4 | | | | | | | | | | |
| 185 | | | | | | | | | | | |
| 186 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 187 | | | | | | | | | | | |
| 188 | | | | | | | | | | | |
| 189 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | |
| 190 | | | | | | | | | | | |
| 191 | Number of Observations = 7 | | | | | | | | | | |
| 192 | 10% critical value: 0.434 | | | | | | | | | | |
| 193 | 5% critical value: 0.507 | | | | | | | | | | |
| 194 | 1% critical value: 0.637 | | | | | | | | | | |
| 195 | | | | | | | | | | | |
| 196 | 1. Observation Value 7E-05 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 197 | | | | | | | | | | | |
| 198 | Test Statistic: 0.719 | | | | | | | | | | |
| 199 | | | | | | | | | | | |
| 200 | For 10% significance level, 7E-05 is an outlier. | | | | | | | | | | |
| 201 | For 5% significance level, 7E-05 is an outlier. | | | | | | | | | | |
| 202 | For 1% significance level, 7E-05 is an outlier. | | | | | | | | | | |
| 203 | | | | | | | | | | | |
| 204 | 2. Observation Value 6.4E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 205 | | | | | | | | | | | |
| 206 | Test Statistic: 0.028 | | | | | | | | | | |
| 207 | | | | | | | | | | | |
| 208 | For 10% significance level, 6.4E-06 is not an outlier. | | | | | | | | | | |
| 209 | For 5% significance level, 6.4E-06 is not an outlier. | | | | | | | | | | |
| 210 | For 1% significance level, 6.4E-06 is not an outlier. | | | | | | | | | | |
| 211 | | | | | | | | | | | |
| 212 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Rosner's Outlier Test for Chromium (mg/L) | | | | | | | | | | |
| 214 | | | | | | | | | | | |
| 215 | | | | | | | | | | | |
| 216 | | | | Mean | 0.00694 | | | | | | |
| 217 | | | | Standard Deviation | 0.00767 | | | | | | |
| 218 | | | | Number of data | 29 | | | | | | |
| 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 | 0.00694 | 0.00753 | 0.036 | 5 | 3.857 | 2.89 | 3.22 | | | |
| 224 | | | | | | | | | | | |
| 225 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 226 | Potential outliers is: 0.036 | | | | | | | | | | |
| 227 | | | | | | | | | | | |
| 228 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 229 | Potential outliers is: 0.036 | | | | | | | | | | |
| 230 | | | | | | | | | | | |
| 231 | | | | | | | | | | | |
| 232 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | |
| 233 | | | | | | | | | | | |
| 234 | | | | | | | | | | | |
| 235 | | | | Mean | 0.00384 | | | | | | |
| 236 | | | | Standard Deviation | 0.00574 | | | | | | |
| 237 | | | | Number of data | 29 | | | | | | |
| 238 | | | | Number of suspected outliers | 1 | | | | | | |
| 239 | | | | | | | | | | | |
| 240 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 241 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 242 | 1 | 0.00384 | 0.00564 | 0.031 | 2 | 4.812 | 2.89 | 3.22 | | | |
| 243 | | | | | | | | | | | |
| 244 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 245 | Potential outliers is: 0.031 | | | | | | | | | | |
| 246 | | | | | | | | | | | |
| 247 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 248 | Potential outliers is: 0.031 | | | | | | | | | | |
| 249 | | | | | | | | | | | |
| 250 | | | | | | | | | | | |
| 251 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | |
| 252 | | | | | | | | | | | |
| 253 | Number of Observations = 7 | | | | | | | | | | |
| 254 | 10% critical value: 0.434 | | | | | | | | | | |
| 255 | 5% critical value: 0.507 | | | | | | | | | | |
| 256 | 1% critical value: 0.637 | | | | | | | | | | |
| 257 | | | | | | | | | | | |
| 258 | 1. Observation Value 0.69 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 259 | | | | | | | | | | | |
| 260 | Test Statistic: 0.971 | | | | | | | | | | |
| 261 | | | | | | | | | | | |
| 262 | For 10% significance level, 0.69 is an outlier. | | | | | | | | | | |
| 263 | For 5% significance level, 0.69 is an outlier. | | | | | | | | | | |
| 264 | For 1% significance level, 0.69 is an outlier. | | | | | | | | | | |
| 265 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 267 | | | | | | | | | | | |
| 268 | Test Statistic: 0.015 | | | | | | | | | | |
| 269 | | | | | | | | | | | |
| 270 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | |
| 271 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | |
| 272 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | |
| 273 | | | | | | | | | | | |
| 274 | | | | | | | | | | | |
| 275 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | |
| 276 | | | | | | | | | | | |
| 277 | Number of Observations = 3 | | | | | | | | | | |
| 278 | 10% critical value: 0.886 | | | | | | | | | | |
| 279 | 5% critical value: 0.941 | | | | | | | | | | |
| 280 | 1% critical value: 0.988 | | | | | | | | | | |
| 281 | | | | | | | | | | | |
| 282 | 1. Observation Value 0.0005 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 283 | | | | | | | | | | | |
| 284 | Test Statistic: 0.878 | | | | | | | | | | |
| 285 | | | | | | | | | | | |
| 286 | For 10% significance level, 0.0005 is not an outlier. | | | | | | | | | | |
| 287 | For 5% significance level, 0.0005 is not an outlier. | | | | | | | | | | |
| 288 | For 1% significance level, 0.0005 is not an outlier. | | | | | | | | | | |
| 289 | | | | | | | | | | | |
| 290 | 2. Observation Value 5.6E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 291 | | | | | | | | | | | |
| 292 | Test Statistic: 0.122 | | | | | | | | | | |
| 293 | | | | | | | | | | | |
| 294 | For 10% significance level, 5.6E-05 is not an outlier. | | | | | | | | | | |
| 295 | For 5% significance level, 5.6E-05 is not an outlier. | | | | | | | | | | |
| 296 | For 1% significance level, 5.6E-05 is not an outlier. | | | | | | | | | | |
| 297 | | | | | | | | | | | |
| 298 | | | | | | | | | | | |
| 299 | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | | | |
| 300 | | | | | | | | | | | |
| 301 | | | | | | | | | | | |
| 302 | | | | Mean | 0.0531 | | | | | | |
| 303 | | | | Standard Deviation | 0.124 | | | | | | |
| 304 | | | | Number of data | 27 | | | | | | |
| 305 | | | | Number of suspected outliers | 1 | | | | | | |
| 306 | | | | | | | | | | | |
| 307 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 308 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 309 | 1 | 0.0531 | 0.122 | 0.571 | 2 | 4.258 | 2.86 | 3.18 | | | |
| 310 | | | | | | | | | | | |
| 311 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 312 | Potential outliers is: 0.571 | | | | | | | | | | |
| 313 | | | | | | | | | | | |
| 314 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 315 | Potential outliers is: 0.571 | | | | | | | | | | |
| 316 | | | | | | | | | | | |
| 317 | | | | | | | | | | | |
| 318 | Dixon's Outlier Test for Mercury (mg/L) | | | | | | | | | | |

Number of Observations = 3

10% critical value: 0.886

5% critical value: 0.941

1% critical value: 0.988

1. Observation Value 0.0003 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.863

For 10% significance level, 0.0003 is not an outlier.

For 5% significance level, 0.0003 is not an outlier.

For 1% significance level, 0.0003 is not an outlier.

2. Observation Value 3.35E-05 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.137

For 10% significance level, 3.35E-05 is not an outlier.

For 5% significance level, 3.35E-05 is not an outlier.

For 1% significance level, 3.35E-05 is not an outlier.

Rosner's Outlier Test for Nickel (mg/L)

| | |
|---|---|
| Mean | 0.00568 |
| Standard Deviation | 0.0109 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00568 | 0.0107 | 0.058 | 2 | 4.899 | 2.89 | 3.22 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.058

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.058

Rosner's Outlier Test for Zinc (mg/L)

| | |
|---|---|
| Mean | 0.00583 |
| Standard Deviation | 0.00615 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00583 | 0.00604 | 0.0262 | 19 | 3.37 | 2.89 | 3.22 |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | | | | | | | |
| 373 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 374 | Potential outliers is: 0.0262 | | | | | | | | | | |
| 375 | | | | | | | | | | | |
| 376 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 377 | Potential outliers is: 0.0262 | | | | | | | | | | |
| 378 | | | | | | | | | | | |
| 379 | | | | | | | | | | | |
| 380 | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | | | |
| 381 | | | | | | | | | | | |
| 382 | Number of Observations = 11 | | | | | | | | | | |
| 383 | 10% critical value: 0.517 | | | | | | | | | | |
| 384 | 5% critical value: 0.576 | | | | | | | | | | |
| 385 | 1% critical value: 0.679 | | | | | | | | | | |
| 386 | | | | | | | | | | | |
| 387 | 1. Observation Value 4.4 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 388 | | | | | | | | | | | |
| 389 | Test Statistic: 0.231 | | | | | | | | | | |
| 390 | | | | | | | | | | | |
| 391 | For 10% significance level, 4.4 is not an outlier. | | | | | | | | | | |
| 392 | For 5% significance level, 4.4 is not an outlier. | | | | | | | | | | |
| 393 | For 1% significance level, 4.4 is not an outlier. | | | | | | | | | | |
| 394 | | | | | | | | | | | |
| 395 | 2. Observation Value 3 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 396 | | | | | | | | | | | |
| 397 | Test Statistic: 0.333 | | | | | | | | | | |
| 398 | | | | | | | | | | | |
| 399 | For 10% significance level, 3 is not an outlier. | | | | | | | | | | |
| 400 | For 5% significance level, 3 is not an outlier. | | | | | | | | | | |
| 401 | For 1% significance level, 3 is not an outlier. | | | | | | | | | | |
| 402 | | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | |
| | | | User Selected Options | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:06:29 AM | | | | | | | |
| | | | From File | 2023-ShallowProUCL_o.xls | | | | | | |
| | | | Full Precision | OFF | | | | | | |
| | | | | | | | | | | |
| | | | | 17-SH | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | |
| | | | | | | | | | | |
| | | | Mean | 7.975 | | | | | | |
| | | | Standard Deviation | 0.271 | | | | | | |
| | | | Number of data | 30 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 7.975 | 0.266 | 7.25 | 2 | 2.727 | 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 TDS (mg/L) | | | | | | |
| | | | | | | | | | | |
| | | | Mean | 333.8 | | | | | | |
| | | | Standard Deviation | 47.25 | | | | | | |
| | | | Number of data | 30 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 333.8 | 46.46 | 208 | 3 | 2.707 | 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 Chloride (mg/L) | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | Mean | 4.122 | | | | | | |
| | | | Standard Deviation | 5.874 | | | | | | |
| | | | Number of data | 30 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 4.122 | 5.775 | 21.8 | 23 | 3.061 | 2.91 | 3.24 | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 55 | Potential outliers is: 21.8 | | | | | | | | | | |
| 56 | | | | | | | | | | | |
| 57 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 58 | | | | | | | | | | | |
| 59 | | | | | | | | | | | |
| 60 | | | | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | |
| 61 | | | | | | | | | | | |
| 62 | | | | | | | | | | | |
| 63 | | | | Mean | 24.04 | | | | | | |
| 64 | | | | Standard Deviation | 8.923 | | | | | | |
| 65 | | | | Number of data | 30 | | | | | | |
| 66 | | | | Number of suspected outliers | 1 | | | | | | |
| 67 | | | | | | | | | | | |
| 68 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 69 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 70 | 1 | 24.04 | 8.773 | 45.1 | 24 | 2.401 | 2.91 | 3.24 | | | |
| 71 | | | | | | | | | | | |
| 72 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 73 | | | | | | | | | | | |
| 74 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 75 | | | | | | | | | | | |
| 76 | | | | | | | | | | | |
| 77 | | | | Dixon's Outlier Test for DOC (mg/L) | | | | | | | |
| 78 | | | | | | | | | | | |
| 79 | Number of Observations = 18 | | | | | | | | | | |
| 80 | 10% critical value: 0.424 | | | | | | | | | | |
| 81 | 5% critical value: 0.475 | | | | | | | | | | |
| 82 | 1% critical value: 0.561 | | | | | | | | | | |
| 83 | | | | | | | | | | | |
| 84 | 1. Observation Value 3.6 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 85 | | | | | | | | | | | |
| 86 | Test Statistic: 0.444 | | | | | | | | | | |
| 87 | | | | | | | | | | | |
| 88 | For 10% significance level, 3.6 is an outlier. | | | | | | | | | | |
| 89 | For 5% significance level, 3.6 is not an outlier. | | | | | | | | | | |
| 90 | For 1% significance level, 3.6 is not an outlier. | | | | | | | | | | |
| 91 | | | | | | | | | | | |
| 92 | 2. Observation Value 1.6 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 93 | | | | | | | | | | | |
| 94 | Test Statistic: 0.167 | | | | | | | | | | |
| 95 | | | | | | | | | | | |
| 96 | For 10% significance level, 1.6 is not an outlier. | | | | | | | | | | |
| 97 | For 5% significance level, 1.6 is not an outlier. | | | | | | | | | | |
| 98 | For 1% significance level, 1.6 is not an outlier. | | | | | | | | | | |
| 99 | | | | | | | | | | | |
| 100 | | | | | | | | | | | |
| 101 | | | | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | |
| 102 | | | | | | | | | | | |
| 103 | | | | | | | | | | | |
| 104 | | | | Mean | 367.4 | | | | | | |
| 105 | | | | Standard Deviation | 39.49 | | | | | | |
| 106 | | | | Number of data | 30 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 367.4 | 38.83 | 228 | 3 | 3.59 | 2.91 | 3.24 | | | |
| 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 | 81.95 | | | | | | | |
| 124 | | | Standard Deviation | 11.33 | | | | | | | |
| 125 | | | Number of data | 30 | | | | | | | |
| 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 | 81.95 | 11.14 | 55.7 | 3 | 2.357 | 2.91 | 3.24 | | | |
| 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 | 21.45 | | | | | | | |
| 141 | | | Standard Deviation | 3.189 | | | | | | | |
| 142 | | | Number of data | 30 | | | | | | | |
| 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 | 21.45 | 3.135 | 29.5 | 24 | 2.568 | 2.91 | 3.24 | | | |
| 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 | 17.22 | | | | | | | |
| 158 | | | Standard Deviation | 5.28 | | | | | | | |
| 159 | | | Number of data | 30 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 17.22 | 5.191 | 26.5 | 24 | 1.789 | 2.91 | 3.24 | | | |
| 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 | 2.4400E-4 | | | | | | | | | |
| 175 | Standard Deviation | 1.1091E-4 | | | | | | | | | |
| 176 | Number of data | 30 | | | | | | | | | |
| 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 | 2.4400E-4 | 1.0904E-4 | 4.0000E-4 | 1 | 1.431 | 2.91 | 3.24 | | | |
| 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 | 2.0001E-4 | | | | | | | | | |
| 192 | Standard Deviation | 5.3705E-4 | | | | | | | | | |
| 193 | Number of data | 30 | | | | | | | | | |
| 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 | 2.0001E-4 | 5.2802E-4 | 0.003 | 1 | 5.303 | 2.91 | 3.24 | | | |
| 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 | 0.00243 | | | | | | | | | |
| 211 | Standard Deviation | 0.00429 | | | | | | | | | |
| 212 | Number of data | 30 | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 0.00243 | 0.00422 | 0.024 | 6 | 5.109 | 2.91 | 3.24 | | | |
| 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 | 0.00409 | | | | | | | | | |
| 230 | Standard Deviation | 0.0079 | | | | | | | | | |
| 231 | Number of data | 30 | | | | | | | | | |
| 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 | 0.00409 | 0.00777 | 0.045 | 1 | 5.268 | 2.91 | 3.24 | | | |
| 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 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | |
| 246 | | | | | | | | | | | |
| 247 | Number of Observations = 8 | | | | | | | | | | |
| 248 | 10% critical value: 0.479 | | | | | | | | | | |
| 249 | 5% critical value: 0.554 | | | | | | | | | | |
| 250 | 1% critical value: 0.683 | | | | | | | | | | |
| 251 | | | | | | | | | | | |
| 252 | 1. Observation Value 0.096 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 253 | | | | | | | | | | | |
| 254 | Test Statistic: 0.384 | | | | | | | | | | |
| 255 | | | | | | | | | | | |
| 256 | For 10% significance level, 0.096 is not an outlier. | | | | | | | | | | |
| 257 | For 5% significance level, 0.096 is not an outlier. | | | | | | | | | | |
| 258 | For 1% significance level, 0.096 is not an outlier. | | | | | | | | | | |
| 259 | | | | | | | | | | | |
| 260 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 261 | | | | | | | | | | | |
| 262 | Test Statistic: 0.000 | | | | | | | | | | |
| 263 | | | | | | | | | | | |
| 264 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | |
| 265 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | |

For 1% significance level, 0.01 is not an outlier.

Dixon's Outlier Test for Lead (mg/L)

Number of Observations = 3

10% critical value: 0.886

5% critical value: 0.941

1% critical value: 0.988

1. Observation Value 0.0006 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.000

For 10% significance level, 0.0006 is not an outlier.

For 5% significance level, 0.0006 is not an outlier.

For 1% significance level, 0.0006 is not an outlier.

2. Observation Value 0.00011 is a Potential Outlier (Lower Tail)?

Test Statistic: 1.000

For 10% significance level, 0.00011 is an outlier.

For 5% significance level, 0.00011 is an outlier.

For 1% significance level, 0.00011 is an outlier.

Rosner's Outlier Test for Manganese (mg/L)

| | |
|---|---|
| Mean | 0.0426 |
| Standard Deviation | 0.0994 |
| Number of data | 28 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.0426 | 0.0976 | 0.441 | 1 | 4.081 | 2.88 | 3.2 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.441

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.441

Available only for sample sizes 3 to 500

Rosner's Outlier Test for Nickel (mg/L)

| | |
|---|---|
| Mean | 0.00303 |
| Standard Deviation | 0.00337 |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | Number of data | 30 | | | | | | | |
| 320 | | | Number of suspected outliers | 1 | | | | | | | |
| 321 | | | | | | | | | | | |
| 322 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 323 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 324 | 1 | 0.00303 | 0.00331 | 0.015 | 1 | 3.613 | 2.91 | 3.24 | | | |
| 325 | | | | | | | | | | | |
| 326 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 327 | Potential outliers is: 0.015 | | | | | | | | | | |
| 328 | | | | | | | | | | | |
| 329 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 330 | Potential outliers is: 0.015 | | | | | | | | | | |
| 331 | | | | | | | | | | | |
| 332 | | | | | | | | | | | |
| 333 | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | | | |
| 334 | | | | | | | | | | | |
| 335 | | | | | | | | | | | |
| 336 | | | Mean | 0.00535 | | | | | | | |
| 337 | | | Standard Deviation | 0.00454 | | | | | | | |
| 338 | | | Number of data | 30 | | | | | | | |
| 339 | | | Number of suspected outliers | 1 | | | | | | | |
| 340 | | | | | | | | | | | |
| 341 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 342 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 343 | 1 | 0.00535 | 0.00447 | 0.016 | 1 | 2.384 | 2.91 | 3.24 | | | |
| 344 | | | | | | | | | | | |
| 345 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 346 | | | | | | | | | | | |
| 347 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 348 | | | | | | | | | | | |
| 349 | | | | | | | | | | | |
| 350 | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | | | |
| 351 | | | | | | | | | | | |
| 352 | Number of Observations = 12 | | | | | | | | | | |
| 353 | 10% critical value: 0.49 | | | | | | | | | | |
| 354 | 5% critical value: 0.546 | | | | | | | | | | |
| 355 | 1% critical value: 0.642 | | | | | | | | | | |
| 356 | | | | | | | | | | | |
| 357 | 1. Observation Value 3.5 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 358 | | | | | | | | | | | |
| 359 | Test Statistic: 0.333 | | | | | | | | | | |
| 360 | | | | | | | | | | | |
| 361 | For 10% significance level, 3.5 is not an outlier. | | | | | | | | | | |
| 362 | For 5% significance level, 3.5 is not an outlier. | | | | | | | | | | |
| 363 | For 1% significance level, 3.5 is not an outlier. | | | | | | | | | | |
| 364 | | | | | | | | | | | |
| 365 | 2. Observation Value 1.6 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 366 | | | | | | | | | | | |
| 367 | Test Statistic: 0.056 | | | | | | | | | | |
| 368 | | | | | | | | | | | |
| 369 | For 10% significance level, 1.6 is not an outlier. | | | | | | | | | | |
| 370 | For 5% significance level, 1.6 is not an outlier. | | | | | | | | | | |
| 371 | For 1% significance level, 1.6 is not an outlier. | | | | | | | | | | |

# App G2 Outlier Test Output – Intermediate

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| 2 | | | | User Selected Options | | | | | | | | |
| 3 | | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:09:26 AM | | | | | | | | |
| 4 | | | | From File | 2023-IntermediateProUCL-1_b.xls | | | | | | | |
| 5 | | | | Full Precision | OFF | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | 01A-IN | | | | | | | |
| 8 | | | | | Rosner's Outlier Test for pH () | | | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | Mean | 7.548 | | | | | | | |
| 12 | | | | Standard Deviation | 0.459 | | | | | | | |
| 13 | | | | Number of data | 52 | | | | | | | |
| 14 | | | | Number of suspected outliers | 1 | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 17 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 18 | 1 | 7.548 | 0.454 | 5.57 | 25 | 4.354 | 3.144 | 3.496 | | | | |
| 19 | | | | | | | | | | | | |
| 20 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 21 | Potential outliers is: 5.57 | | | | | | | | | | | |
| 22 | | | | | | | | | | | | |
| 23 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 24 | Potential outliers is: 5.57 | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | |
| 27 | | | | | Rosner's Outlier Test for Chloride (mg/L) | | | | | | | |
| 28 | | | | | | | | | | | | |
| 29 | | | | | | | | | | | | |
| 30 | | | | Mean | 1.581 | | | | | | | |
| 31 | | | | Standard Deviation | 0.913 | | | | | | | |
| 32 | | | | Number of data | 48 | | | | | | | |
| 33 | | | | Number of suspected outliers | 1 | | | | | | | |
| 34 | | | | | | | | | | | | |
| 35 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 36 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 37 | 1 | 1.581 | 0.903 | 4.75 | 3 | 3.51 | 3.11 | 3.46 | | | | |
| 38 | | | | | | | | | | | | |
| 39 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 40 | Potential outliers is: 4.75 | | | | | | | | | | | |
| 41 | | | | | | | | | | | | |
| 42 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 43 | Potential outliers is: 4.75 | | | | | | | | | | | |
| 44 | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | |
| 46 | | | | | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | |
| 47 | | | | | | | | | | | | |
| 48 | | | | | | | | | | | | |
| 49 | | | | Mean | 70.33 | | | | | | | |
| 50 | | | | Standard Deviation | 49.15 | | | | | | | |
| 51 | | | | Number of data | 45 | | | | | | | |
| 52 | | | | Number of suspected outliers | 1 | | | | | | | |
| 53 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | | | | Potential | | Obs. | Test | Critical | Critical | | | |
| 55 | # | Mean | sd | outlier | | Number | value | value (5%) | value (1%) | | | |
| 56 | 1 | 70.33 | 48.6 | 182 | | 3 | 2.298 | 3.09 | 3.44 | | | |
| 57 | | | | | | | | | | | | |
| 58 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 61 | | | | | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | Rosner's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 64 | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | |
| 66 | | | Mean | 13.1 | | | | | | | | |
| 67 | | | Standard Deviation | 11.61 | | | | | | | | |
| 68 | | | Number of data | 27 | | | | | | | | |
| 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 | 13.1 | 11.39 | 33.8 | | 17 | 1.817 | 2.86 | 3.18 | | | |
| 74 | | | | | | | | | | | | |
| 75 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 76 | | | | | | | | | | | | |
| 77 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 78 | | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | |
| 83 | | | Mean | 0.445 | | | | | | | | |
| 84 | | | Standard Deviation | 0.103 | | | | | | | | |
| 85 | | | Number of data | 28 | | | | | | | | |
| 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 | 0.445 | 0.101 | 0.244 | | 8 | 1.989 | 2.88 | 3.2 | | | |
| 91 | | | | | | | | | | | | |
| 92 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 93 | | | | | | | | | | | | |
| 94 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 95 | | | | | | | | | | | | |
| 96 | | | | | | | | | | | | |
| 97 | Rosner's Outlier Test for Total Dissolved Solids (mg/L) | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | |
| 100 | | | Mean | 510.9 | | | | | | | | |
| 101 | | | Standard Deviation | 105.3 | | | | | | | | |
| 102 | | | Number of data | 52 | | | | | | | | |
| 103 | | | Number of suspected outliers | 1 | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Potential | | Obs. | Test | Critical | Critical | | | |
| 106 | # | Mean | sd | outlier | | Number | value | value (5%) | value (1%) | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | 1 | 510.9 | 104.2 | 73 | 25 | 4.201 | 3.144 | 3.496 | | | | |
| 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 | 113 | | | | | | | |
| 120 | | | | Standard Deviation | 22.52 | | | | | | | |
| 121 | | | | Number of data | 46 | | | | | | | |
| 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 | 113 | 22.27 | 20 | 18 | 4.175 | 3.09 | 3.45 | | | | |
| 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 | 27 | | | | | | | |
| 139 | | | | Standard Deviation | 5.172 | | | | | | | |
| 140 | | | | Number of data | 46 | | | | | | | |
| 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 | 27 | 5.116 | 3.8 | 18 | 4.535 | 3.09 | 3.45 | | | | |
| 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 | 36.81 | | | | | | | |
| 158 | | | | Standard Deviation | 12.42 | | | | | | | |
| 159 | | | | Number of data | 46 | | | | | | | |

| | 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 | 36.81 | 12.28 | 2.6 | 18 | 2.786 | 3.09 | 3.45 | | | | |
| 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 | 488.2 | | | | | | | | | | |
| 175 | Standard Deviation | 81.33 | | | | | | | | | | |
| 176 | Number of data | 45 | | | | | | | | | | |
| 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 | 488.2 | 80.42 | 65.6 | 18 | 5.255 | 3.09 | 3.44 | | | | |
| 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 | 0.0116 | | | | | | | | | | |
| 194 | Standard Deviation | 0.019 | | | | | | | | | | |
| 195 | Number of data | 46 | | | | | | | | | | |
| 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 | 0.0116 | 0.0188 | 0.095 | 29 | 4.449 | 3.09 | 3.45 | | | | |
| 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 | 0.00546 | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard Deviation | | | 0.0165 | | | | | | | | |
| Number of data | | | 43 | | | | | | | | |
| Number of suspected outliers | | | 1 | | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 0.00546 | 0.0163 | 0.109 | 17 | 6.35 | 3.07 | 3.41 | | | | |
| | | | | | | | | | | | |
| 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 | | | 0.012 | | | | | | | | |
| Standard Deviation | | | 0.0208 | | | | | | | | |
| Number of data | | | 45 | | | | | | | | |
| Number of suspected outliers | | | 1 | | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 0.012 | 0.0206 | 0.13 | 3 | 5.727 | 3.09 | 3.44 | | | | |
| | | | | | | | | | | | |
| 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 | | | 0.0056 | | | | | | | | |
| Standard Deviation | | | 0.00466 | | | | | | | | |
| Number of data | | | 29 | | | | | | | | |
| Number of suspected outliers | | | 1 | | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 0.0056 | 0.00458 | 0.021 | 1 | 3.36 | 2.89 | 3.22 | | | | |
| | | | | | | | | | | | |
| 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 | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | Rosner's Outlier Test for Total Organic Carbon (mg/L) | | | | | | | | | | | |
| 267 | | | | | | | | | | | | |
| 268 | | | | | | | | | | | | |
| 269 | | | Mean | 11.35 | | | | | | | | |
| 270 | | | Standard Deviation | 10.73 | | | | | | | | |
| 271 | | | Number of data | 35 | | | | | | | | |
| 272 | | | Number of suspected outliers | 1 | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 275 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 276 | 1 | 11.35 | 10.57 | 43 | 25 | 2.994 | 2.98 | 3.32 | | | | |
| 277 | | | | | | | | | | | | |
| 278 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 279 | Potential outliers is: 43 | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | | | | | | | | | | | | |
| 284 | Dixon's Outlier Test for Dissolved Organic Carbon (mg/L) | | | | | | | | | | | |
| 285 | | | | | | | | | | | | |
| 286 | Number of Observations = 21 | | | | | | | | | | | |
| 287 | 10% critical value: 0.391 | | | | | | | | | | | |
| 288 | 5% critical value: 0.44 | | | | | | | | | | | |
| 289 | 1% critical value: 0.524 | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | 1. Observation Value 63.8 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 292 | | | | | | | | | | | | |
| 293 | Test Statistic: 0.741 | | | | | | | | | | | |
| 294 | | | | | | | | | | | | |
| 295 | For 10% significance level, 63.8 is an outlier. | | | | | | | | | | | |
| 296 | For 5% significance level, 63.8 is an outlier. | | | | | | | | | | | |
| 297 | For 1% significance level, 63.8 is an outlier. | | | | | | | | | | | |
| 298 | | | | | | | | | | | | |
| 299 | 2. Observation Value 18.8 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | Test Statistic: 0.138 | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | For 10% significance level, 18.8 is not an outlier. | | | | | | | | | | | |
| 304 | For 5% significance level, 18.8 is not an outlier. | | | | | | | | | | | |
| 305 | For 1% significance level, 18.8 is not an outlier. | | | | | | | | | | | |
| 306 | | | | | | | | | | | | |
| 307 | | | | | | | | | | | | |
| 308 | Dixon's Outlier Test for Dissolved Cadmium (mg/L) | | | | | | | | | | | |
| 309 | | | | | | | | | | | | |
| 310 | Number of Observations = 7 | | | | | | | | | | | |
| 311 | 10% critical value: 0.434 | | | | | | | | | | | |
| 312 | 5% critical value: 0.507 | | | | | | | | | | | |
| 313 | 1% critical value: 0.637 | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | 1. Observation Value 0.0044 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 316 | | | | | | | | | | | | |
| 317 | Test Statistic: 0.988 | | | | | | | | | | | |
| 318 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | For 10% significance level, 0.0044 is an outlier. | | | | | | | | | | | |
| 320 | For 5% significance level, 0.0044 is an outlier. | | | | | | | | | | | |
| 321 | For 1% significance level, 0.0044 is an outlier. | | | | | | | | | | | |
| 322 | | | | | | | | | | | | |
| 323 | 2. Observation Value 6.4E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 324 | | | | | | | | | | | | |
| 325 | Test Statistic: 0.001 | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | For 10% significance level, 6.4E-06 is not an outlier. | | | | | | | | | | | |
| 328 | For 5% significance level, 6.4E-06 is not an outlier. | | | | | | | | | | | |
| 329 | For 1% significance level, 6.4E-06 is not an outlier. | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | Dixon's Outlier Test for Dissolved Lead (mg/L) | | | | | | | | | | | |
| 333 | | | | | | | | | | | | |
| 334 | Number of Observations = 7 | | | | | | | | | | | |
| 335 | 10% critical value: 0.434 | | | | | | | | | | | |
| 336 | 5% critical value: 0.507 | | | | | | | | | | | |
| 337 | 1% critical value: 0.637 | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | 1. Observation Value 0.004 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | Test Statistic: 0.258 | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | For 10% significance level, 0.004 is not an outlier. | | | | | | | | | | | |
| 344 | For 5% significance level, 0.004 is not an outlier. | | | | | | | | | | | |
| 345 | For 1% significance level, 0.004 is not an outlier. | | | | | | | | | | | |
| 346 | | | | | | | | | | | | |
| 347 | 2. Observation Value 0.00013 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | Test Statistic: 0.044 | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | For 10% significance level, 0.00013 is not an outlier. | | | | | | | | | | | |
| 352 | For 5% significance level, 0.00013 is not an outlier. | | | | | | | | | | | |
| 353 | For 1% significance level, 0.00013 is not an outlier. | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | | | | | | | | | | | | |
| 356 | Dixon's Outlier Test for Dissolved Mercury (mg/L) | | | | | | | | | | | |
| 357 | | | | | | | | | | | | |
| 358 | Number of Observations = 4 | | | | | | | | | | | |
| 359 | 10% critical value: 0.679 | | | | | | | | | | | |
| 360 | 5% critical value: 0.765 | | | | | | | | | | | |
| 361 | 1% critical value: 0.889 | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | 1. Observation Value 0.00092 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 364 | | | | | | | | | | | | |
| 365 | Test Statistic: 0.951 | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | For 10% significance level, 0.00092 is an outlier. | | | | | | | | | | | |
| 368 | For 5% significance level, 0.00092 is an outlier. | | | | | | | | | | | |
| 369 | For 1% significance level, 0.00092 is an outlier. | | | | | | | | | | | |
| 370 | | | | | | | | | | | | |
| 371 | 2. Observation Value 5.6E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | | | | | | | | |
| 373 | Test Statistic: 0.007 | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | For 10% significance level, 5.6E-06 is not an outlier. | | | | | | | | | | | |
| 376 | For 5% significance level, 5.6E-06 is not an outlier. | | | | | | | | | | | |
| 377 | For 1% significance level, 5.6E-06 is not an outlier. | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | | | | | | | | | | | | |
| 380 | Dixon's Outlier Test for Dissolved Chromium (mg/L) | | | | | | | | | | | |
| 381 | | | | | | | | | | | | |
| 382 | Number of Observations = 18 | | | | | | | | | | | |
| 383 | 10% critical value: 0.424 | | | | | | | | | | | |
| 384 | 5% critical value: 0.475 | | | | | | | | | | | |
| 385 | 1% critical value: 0.561 | | | | | | | | | | | |
| 386 | | | | | | | | | | | | |
| 387 | 1. Observation Value 0.047 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 388 | | | | | | | | | | | | |
| 389 | Test Statistic: 0.836 | | | | | | | | | | | |
| 390 | | | | | | | | | | | | |
| 391 | For 10% significance level, 0.047 is an outlier. | | | | | | | | | | | |
| 392 | For 5% significance level, 0.047 is an outlier. | | | | | | | | | | | |
| 393 | For 1% significance level, 0.047 is an outlier. | | | | | | | | | | | |
| 394 | | | | | | | | | | | | |
| 395 | 2. Observation Value 0.00031 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 396 | | | | | | | | | | | | |
| 397 | Test Statistic: 0.004 | | | | | | | | | | | |
| 398 | | | | | | | | | | | | |
| 399 | For 10% significance level, 0.00031 is not an outlier. | | | | | | | | | | | |
| 400 | For 5% significance level, 0.00031 is not an outlier. | | | | | | | | | | | |
| 401 | For 1% significance level, 0.00031 is not an outlier. | | | | | | | | | | | |
| 402 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:11:09 AM | | | | | | | | |
| | | | From File | 2023-IntermediateProUCL-1_c.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 03-IN | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.779 | | | | | | | |
| | | | Standard Deviation | 0.316 | | | | | | | |
| | | | Number of data | 57 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 7.779 | 0.313 | | 7.04 | 30 | 2.363 | 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 | 1.967 | | | | | | | |
| | | | Standard Deviation | 1.232 | | | | | | | |
| | | | Number of data | 45 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 1.967 | 1.218 | | 4.7 | 5 | 2.244 | 3.09 | 3.44 | | | |
| | | | | | | | | | | | |
| 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 | 157.2 | | | | | | | |
| | | | Standard Deviation | 64.44 | | | | | | | |
| | | | Number of data | 41 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 157.2 | 63.64 | | 295 | 17 | 2.165 | 3.05 | 3.39 | | | |

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 = 21

10% critical value: 0.391

5% critical value: 0.44

1% critical value: 0.524

**1. Observation Value 0.347 is a Potential Outlier (Upper Tail)?**

Test Statistic: 0.660

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 (Lower Tail)?**

Test Statistic: 0.035

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 | 591.6 |
| Standard Deviation | 85.75 |
| Number of data | 57 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 591.6 | 85 | 767 | 18 | 2.063 | 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 | 122 |
| Standard Deviation | 19.44 |
| Number of data | 41 |
| Number of suspected outliers | 1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | | | | | | | | |
| 108 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 109 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 110 | 1 | 122 | 19.21 | 168 | 12 | 2.397 | 3.05 | 3.39 | | | | |
| 111 | | | | | | | | | | | | |
| 112 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 113 | | | | | | | | | | | | |
| 114 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 115 | | | | | | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | Rosner's Outlier Test for Magnesium (mg/L) | | | | | | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | | | | | | | | |
| 120 | | | | Mean | 30.46 | | | | | | | |
| 121 | | | | Standard Deviation | 4.986 | | | | | | | |
| 122 | | | | Number of data | 41 | | | | | | | |
| 123 | | | | Number of suspected outliers | 1 | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 126 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 127 | 1 | 30.46 | 4.925 | 17.1 | 1 | 2.714 | 3.05 | 3.39 | | | | |
| 128 | | | | | | | | | | | | |
| 129 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 132 | | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | | | | | | | | |
| 137 | | | | Mean | 39.22 | | | | | | | |
| 138 | | | | Standard Deviation | 11.81 | | | | | | | |
| 139 | | | | Number of data | 41 | | | | | | | |
| 140 | | | | Number of suspected outliers | 1 | | | | | | | |
| 141 | | | | | | | | | | | | |
| 142 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 143 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 144 | 1 | 39.22 | 11.67 | 63.6 | 24 | 2.09 | 3.05 | 3.39 | | | | |
| 145 | | | | | | | | | | | | |
| 146 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | | | | | | | | | | | | |
| 151 | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 152 | | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | | | | Mean | 441.9 | | | | | | | |
| 155 | | | | Standard Deviation | 50.85 | | | | | | | |
| 156 | | | | Number of data | 41 | | | | | | | |
| 157 | | | | Number of suspected outliers | 1 | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | | | | 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 | 441.9 | 50.23 | 726 | 12 | 5.655 | 3.05 | 3.39 | | | | |
| 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 | 4.9395E-4 | | | | | | | |
| 174 | | | | Standard Deviation | 4.2405E-4 | | | | | | | |
| 175 | | | | Number of data | 38 | | | | | | | |
| 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 | 4.9395E-4 | 4.1843E-4 | 0.00245 | 26 | 4.675 | 3.01 | 3.36 | | | | |
| 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 | 0.00656 | | | | | | | |
| 193 | | | | Standard Deviation | 0.0145 | | | | | | | |
| 194 | | | | Number of data | 38 | | | | | | | |
| 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 | 0.00656 | 0.0144 | 0.088 | 20 | 5.674 | 3.01 | 3.36 | | | | |
| 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 | 0.0035 | | | | | | | |
| 212 | | | | Standard Deviation | 0.00372 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | Number of data | 38 | | | | | | | | |
| 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 | 0.0035 | 0.00367 | 0.021 | 9 | 4.772 | 3.01 | 3.36 | | | | |
| 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 = 19 | | | | | | | | | | | |
| 230 | 10% critical value: 0.412 | | | | | | | | | | | |
| 231 | 5% critical value: 0.462 | | | | | | | | | | | |
| 232 | 1% critical value: 0.547 | | | | | | | | | | | |
| 233 | | | | | | | | | | | | |
| 234 | 1. Observation Value 0.036 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 = 19 | | | | | | | | | | | |
| 254 | 10% critical value: 0.412 | | | | | | | | | | | |
| 255 | 5% critical value: 0.462 | | | | | | | | | | | |
| 256 | 1% critical value: 0.547 | | | | | | | | | | | |
| 257 | | | | | | | | | | | | |
| 258 | 1. Observation Value 0.036 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 Tail)?

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 = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

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 Tail)?

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.

Dixon's Outlier Test for Dissolved Lead (mg/L)

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | | | | | | | | |
| 320 | Number of Observations = 8 | | | | | | | | | | | |
| 321 | 10% critical value: 0.479 | | | | | | | | | | | |
| 322 | 5% critical value: 0.554 | | | | | | | | | | | |
| 323 | 1% critical value: 0.683 | | | | | | | | | | | |
| 324 | | | | | | | | | | | | |
| 325 | 1. Observation Value 0.016 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | Test Statistic: 0.757 | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | For 10% significance level, 0.016 is an outlier. | | | | | | | | | | | |
| 330 | For 5% significance level, 0.016 is an outlier. | | | | | | | | | | | |
| 331 | For 1% significance level, 0.016 is an outlier. | | | | | | | | | | | |
| 332 | | | | | | | | | | | | |
| 333 | 2. Observation Value 5.8E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | Test Statistic: 0.025 | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | For 10% significance level, 5.8E-05 is not an outlier. | | | | | | | | | | | |
| 338 | For 5% significance level, 5.8E-05 is not an outlier. | | | | | | | | | | | |
| 339 | For 1% significance level, 5.8E-05 is not an outlier. | | | | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | | | | | | | | | | | | |
| 342 | | | | Available only for sample sizes 3 to 500 | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | | | | Available only for sample sizes 3 to 500 | | | | | | | | |
| 345 | | | | | | | | | | | | |
| 346 | | | | Dixon's Outlier Test for Dissolved Cadmium (mg/L) | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | Number of Observations = 10 | | | | | | | | | | | |
| 349 | 10% critical value: 0.409 | | | | | | | | | | | |
| 350 | 5% critical value: 0.477 | | | | | | | | | | | |
| 351 | 1% critical value: 0.597 | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | 1. Observation Value 5.54E-05 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | Test Statistic: 0.659 | | | | | | | | | | | |
| 356 | | | | | | | | | | | | |
| 357 | For 10% significance level, 5.54E-05 is an outlier. | | | | | | | | | | | |
| 358 | For 5% significance level, 5.54E-05 is an outlier. | | | | | | | | | | | |
| 359 | For 1% significance level, 5.54E-05 is an outlier. | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | 2. Observation Value 7.9E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | Test Statistic: 0.119 | | | | | | | | | | | |
| 364 | | | | | | | | | | | | |
| 365 | For 10% significance level, 7.9E-06 is not an outlier. | | | | | | | | | | | |
| 366 | For 5% significance level, 7.9E-06 is not an outlier. | | | | | | | | | | | |
| 367 | For 1% significance level, 7.9E-06 is not an outlier. | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | |
| | | | User Selected Options | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:12:16 AM | | | | | | | |
| | | | From File | 2023-IntermediateProUCL-1_d.xls | | | | | | |
| | | | Full Precision | OFF | | | | | | |
| | | | | | | | | | | |
| | | | | 04-IN | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | Mean | 7.831 | | | | | | |
| | | | Standard Deviation | 0.315 | | | | | | |
| | | | Number of data | 34 | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | |
| | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | |
| 1 | 7.831 | 0.31 | | 8.44 | 6 | 1.964 | 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 Sulphate (mg/L) | | | | | | |
| | | | | | | | | | | |
| Number of Observations = 23 | | | | | | | | | | |
| 10% critical value: 0.374 | | | | | | | | | | |
| 5% critical value: 0.421 | | | | | | | | | | |
| 1% critical value: 0.505 | | | | | | | | | | |
| | | | | | | | | | | |
| 1. Observation Value 31 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| | | | | | | | | | | |
| Test Statistic: 0.037 | | | | | | | | | | |
| | | | | | | | | | | |
| For 10% significance level, 31 is not an outlier. | | | | | | | | | | |
| For 5% significance level, 31 is not an outlier. | | | | | | | | | | |
| For 1% significance level, 31 is not an outlier. | | | | | | | | | | |
| | | | | | | | | | | |
| 2. Observation Value 22.2 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| | | | | | | | | | | |
| Test Statistic: 0.082 | | | | | | | | | | |
| | | | | | | | | | | |
| For 10% significance level, 22.2 is not an outlier. | | | | | | | | | | |
| For 5% significance level, 22.2 is not an outlier. | | | | | | | | | | |
| For 1% significance level, 22.2 is not an outlier. | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | Dixon's Outlier Test for Manganese (mg/L) | | | | | | |
| | | | | | | | | | | |
| Number of Observations = 17 | | | | | | | | | | |
| 10% critical value: 0.438 | | | | | | | | | | |
| 5% critical value: 0.49 | | | | | | | | | | |

1% critical value: 0.577

1. Observation Value 0.727 is a Potential Outlier (Upper Tail)?

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 Tail)?

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 | 430.4 |
| Standard Deviation | 31.1 |
| Number of data | 34 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 430.4 | 30.64 | 500 | 7 | 2.273 | 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 Calcium (mg/L)

Number of Observations = 24

10% critical value: 0.367

5% critical value: 0.413

1% critical value: 0.497

1. Observation Value 120 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.210

For 10% significance level, 120 is not an outlier.

For 5% significance level, 120 is not an outlier.

For 1% significance level, 120 is not an outlier.

2. Observation Value 80.4 is a Potential Outlier (Lower Tail)?

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | Test Statistic: 0.047 | | | | | | | | | | |
| 108 | | | | | | | | | | | |
| 109 | For 10% significance level, 80.4 is not an outlier. | | | | | | | | | | |
| 110 | For 5% significance level, 80.4 is not an outlier. | | | | | | | | | | |
| 111 | For 1% significance level, 80.4 is not an outlier. | | | | | | | | | | |
| 112 | | | | | | | | | | | |
| 113 | | | | | | | | | | | |
| 114 | Dixon's Outlier Test for Magnesium (mg/L) | | | | | | | | | | |
| 115 | | | | | | | | | | | |
| 116 | Number of Observations = 24 | | | | | | | | | | |
| 117 | 10% critical value: 0.367 | | | | | | | | | | |
| 118 | 5% critical value: 0.413 | | | | | | | | | | |
| 119 | 1% critical value: 0.497 | | | | | | | | | | |
| 120 | | | | | | | | | | | |
| 121 | 1. Observation Value 27.4 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 122 | | | | | | | | | | | |
| 123 | Test Statistic: 0.222 | | | | | | | | | | |
| 124 | | | | | | | | | | | |
| 125 | For 10% significance level, 27.4 is not an outlier. | | | | | | | | | | |
| 126 | For 5% significance level, 27.4 is not an outlier. | | | | | | | | | | |
| 127 | For 1% significance level, 27.4 is not an outlier. | | | | | | | | | | |
| 128 | | | | | | | | | | | |
| 129 | 2. Observation Value 19.5 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 130 | | | | | | | | | | | |
| 131 | Test Statistic: 0.111 | | | | | | | | | | |
| 132 | | | | | | | | | | | |
| 133 | For 10% significance level, 19.5 is not an outlier. | | | | | | | | | | |
| 134 | For 5% significance level, 19.5 is not an outlier. | | | | | | | | | | |
| 135 | For 1% significance level, 19.5 is not an outlier. | | | | | | | | | | |
| 136 | | | | | | | | | | | |
| 137 | | | | | | | | | | | |
| 138 | Dixon's Outlier Test for Sodium (mg/L) | | | | | | | | | | |
| 139 | | | | | | | | | | | |
| 140 | Number of Observations = 24 | | | | | | | | | | |
| 141 | 10% critical value: 0.367 | | | | | | | | | | |
| 142 | 5% critical value: 0.413 | | | | | | | | | | |
| 143 | 1% critical value: 0.497 | | | | | | | | | | |
| 144 | | | | | | | | | | | |
| 145 | 1. Observation Value 29.3 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 146 | | | | | | | | | | | |
| 147 | Test Statistic: 0.284 | | | | | | | | | | |
| 148 | | | | | | | | | | | |
| 149 | For 10% significance level, 29.3 is not an outlier. | | | | | | | | | | |
| 150 | For 5% significance level, 29.3 is not an outlier. | | | | | | | | | | |
| 151 | For 1% significance level, 29.3 is not an outlier. | | | | | | | | | | |
| 152 | | | | | | | | | | | |
| 153 | 2. Observation Value 20.4 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 154 | | | | | | | | | | | |
| 155 | Test Statistic: 0.121 | | | | | | | | | | |
| 156 | | | | | | | | | | | |
| 157 | For 10% significance level, 20.4 is not an outlier. | | | | | | | | | | |
| 158 | For 5% significance level, 20.4 is not an outlier. | | | | | | | | | | |
| 159 | For 1% significance level, 20.4 is not an outlier. | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | | | | | | | |
| 161 | | | | | | | | | | | |
| 162 | Dixon's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | |
| 163 | | | | | | | | | | | |
| 164 | Number of Observations = 23 | | | | | | | | | | |
| 165 | 10% critical value: 0.374 | | | | | | | | | | |
| 166 | 5% critical value: 0.421 | | | | | | | | | | |
| 167 | 1% critical value: 0.505 | | | | | | | | | | |
| 168 | | | | | | | | | | | |
| 169 | 1. Observation Value 488 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 170 | | | | | | | | | | | |
| 171 | Test Statistic: 0.280 | | | | | | | | | | |
| 172 | | | | | | | | | | | |
| 173 | For 10% significance level, 488 is not an outlier. | | | | | | | | | | |
| 174 | For 5% significance level, 488 is not an outlier. | | | | | | | | | | |
| 175 | For 1% significance level, 488 is not an outlier. | | | | | | | | | | |
| 176 | | | | | | | | | | | |
| 177 | 2. Observation Value 431 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 178 | | | | | | | | | | | |
| 179 | Test Statistic: 0.239 | | | | | | | | | | |
| 180 | | | | | | | | | | | |
| 181 | For 10% significance level, 431 is not an outlier. | | | | | | | | | | |
| 182 | For 5% significance level, 431 is not an outlier. | | | | | | | | | | |
| 183 | For 1% significance level, 431 is not an outlier. | | | | | | | | | | |
| 184 | | | | | | | | | | | |
| 185 | | | | | | | | | | | |
| 186 | Dixon's Outlier Test for Arsenic (mg/L) | | | | | | | | | | |
| 187 | | | | | | | | | | | |
| 188 | Number of Observations = 21 | | | | | | | | | | |
| 189 | 10% critical value: 0.391 | | | | | | | | | | |
| 190 | 5% critical value: 0.44 | | | | | | | | | | |
| 191 | 1% critical value: 0.524 | | | | | | | | | | |
| 192 | | | | | | | | | | | |
| 193 | 1. Observation Value 0.0052 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 194 | | | | | | | | | | | |
| 195 | Test Statistic: 0.406 | | | | | | | | | | |
| 196 | | | | | | | | | | | |
| 197 | For 10% significance level, 0.0052 is an outlier. | | | | | | | | | | |
| 198 | For 5% significance level, 0.0052 is not an outlier. | | | | | | | | | | |
| 199 | For 1% significance level, 0.0052 is not an outlier. | | | | | | | | | | |
| 200 | | | | | | | | | | | |
| 201 | 2. Observation Value 0.0002 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 202 | | | | | | | | | | | |
| 203 | Test Statistic: 0.486 | | | | | | | | | | |
| 204 | | | | | | | | | | | |
| 205 | For 10% significance level, 0.0002 is an outlier. | | | | | | | | | | |
| 206 | For 5% significance level, 0.0002 is an outlier. | | | | | | | | | | |
| 207 | For 1% significance level, 0.0002 is not an outlier. | | | | | | | | | | |
| 208 | | | | | | | | | | | |
| 209 | | | | | | | | | | | |
| 210 | Dixon's Outlier Test for Chromium (mg/L) | | | | | | | | | | |
| 211 | | | | | | | | | | | |
| 212 | Number of Observations = 21 | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | 10% critical value: 0.391 | | | | | | | | | | |
| 214 | 5% critical value: 0.44 | | | | | | | | | | |
| 215 | 1% critical value: 0.524 | | | | | | | | | | |
| 216 | | | | | | | | | | | |
| 217 | 1. Observation Value 0.0124 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 218 | | | | | | | | | | | |
| 219 | Test Statistic: 0.618 | | | | | | | | | | |
| 220 | | | | | | | | | | | |
| 221 | For 10% significance level, 0.0124 is an outlier. | | | | | | | | | | |
| 222 | For 5% significance level, 0.0124 is an outlier. | | | | | | | | | | |
| 223 | For 1% significance level, 0.0124 is an outlier. | | | | | | | | | | |
| 224 | | | | | | | | | | | |
| 225 | 2. Observation Value 0.0002 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 226 | | | | | | | | | | | |
| 227 | Test Statistic: 0.048 | | | | | | | | | | |
| 228 | | | | | | | | | | | |
| 229 | For 10% significance level, 0.0002 is not an outlier. | | | | | | | | | | |
| 230 | For 5% significance level, 0.0002 is not an outlier. | | | | | | | | | | |
| 231 | For 1% significance level, 0.0002 is not an outlier. | | | | | | | | | | |
| 232 | | | | | | | | | | | |
| 233 | | | | | | | | | | | |
| 234 | Dixon's Outlier Test for Copper (mg/L) | | | | | | | | | | |
| 235 | | | | | | | | | | | |
| 236 | Number of Observations = 21 | | | | | | | | | | |
| 237 | 10% critical value: 0.391 | | | | | | | | | | |
| 238 | 5% critical value: 0.44 | | | | | | | | | | |
| 239 | 1% critical value: 0.524 | | | | | | | | | | |
| 240 | | | | | | | | | | | |
| 241 | 1. Observation Value 0.006 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 242 | | | | | | | | | | | |
| 243 | Test Statistic: 0.178 | | | | | | | | | | |
| 244 | | | | | | | | | | | |
| 245 | For 10% significance level, 0.006 is not an outlier. | | | | | | | | | | |
| 246 | For 5% significance level, 0.006 is not an outlier. | | | | | | | | | | |
| 247 | For 1% significance level, 0.006 is not an outlier. | | | | | | | | | | |
| 248 | | | | | | | | | | | |
| 249 | 2. Observation Value 0.00026 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 250 | | | | | | | | | | | |
| 251 | Test Statistic: 0.027 | | | | | | | | | | |
| 252 | | | | | | | | | | | |
| 253 | For 10% significance level, 0.00026 is not an outlier. | | | | | | | | | | |
| 254 | For 5% significance level, 0.00026 is not an outlier. | | | | | | | | | | |
| 255 | For 1% significance level, 0.00026 is not an outlier. | | | | | | | | | | |
| 256 | | | | | | | | | | | |
| 257 | | | | | | | | | | | |
| 258 | Dixon's Outlier Test for Nickel (mg/L) | | | | | | | | | | |
| 259 | | | | | | | | | | | |
| 260 | Number of Observations = 14 | | | | | | | | | | |
| 261 | 10% critical value: 0.492 | | | | | | | | | | |
| 262 | 5% critical value: 0.546 | | | | | | | | | | |
| 263 | 1% critical value: 0.641 | | | | | | | | | | |
| 264 | | | | | | | | | | | |
| 265 | 1. Observation Value 0.0047 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | | | | | | | |
| 267 | Test Statistic: 0.588 | | | | | | | | | | |
| 268 | | | | | | | | | | | |
| 269 | For 10% significance level, 0.0047 is an outlier. | | | | | | | | | | |
| 270 | For 5% significance level, 0.0047 is an outlier. | | | | | | | | | | |
| 271 | For 1% significance level, 0.0047 is not an outlier. | | | | | | | | | | |
| 272 | | | | | | | | | | | |
| 273 | 2. Observation Value 0.00074 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 274 | | | | | | | | | | | |
| 275 | Test Statistic: 0.354 | | | | | | | | | | |
| 276 | | | | | | | | | | | |
| 277 | For 10% significance level, 0.00074 is not an outlier. | | | | | | | | | | |
| 278 | For 5% significance level, 0.00074 is not an outlier. | | | | | | | | | | |
| 279 | For 1% significance level, 0.00074 is not an outlier. | | | | | | | | | | |
| 280 | | | | | | | | | | | |
| 281 | | | | | | | | | | | |
| 282 | Dixon's Outlier Test for Zinc (mg/L) | | | | | | | | | | |
| 283 | | | | | | | | | | | |
| 284 | Number of Observations = 14 | | | | | | | | | | |
| 285 | 10% critical value: 0.492 | | | | | | | | | | |
| 286 | 5% critical value: 0.546 | | | | | | | | | | |
| 287 | 1% critical value: 0.641 | | | | | | | | | | |
| 288 | | | | | | | | | | | |
| 289 | 1. Observation Value 0.0048 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 290 | | | | | | | | | | | |
| 291 | Test Statistic: 0.474 | | | | | | | | | | |
| 292 | | | | | | | | | | | |
| 293 | For 10% significance level, 0.0048 is not an outlier. | | | | | | | | | | |
| 294 | For 5% significance level, 0.0048 is not an outlier. | | | | | | | | | | |
| 295 | For 1% significance level, 0.0048 is not an outlier. | | | | | | | | | | |
| 296 | | | | | | | | | | | |
| 297 | 2. Observation Value 0.001 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 298 | | | | | | | | | | | |
| 299 | Test Statistic: 0.000 | | | | | | | | | | |
| 300 | | | | | | | | | | | |
| 301 | For 10% significance level, 0.001 is not an outlier. | | | | | | | | | | |
| 302 | For 5% significance level, 0.001 is not an outlier. | | | | | | | | | | |
| 303 | For 1% significance level, 0.001 is not an outlier. | | | | | | | | | | |
| 304 | | | | | | | | | | | |
| 305 | | | | | | | | | | | |
| 306 | Dixon's Outlier Test for Total Organic Carbon (mg/L) | | | | | | | | | | |
| 307 | | | | | | | | | | | |
| 308 | Number of Observations = 21 | | | | | | | | | | |
| 309 | 10% critical value: 0.391 | | | | | | | | | | |
| 310 | 5% critical value: 0.44 | | | | | | | | | | |
| 311 | 1% critical value: 0.524 | | | | | | | | | | |
| 312 | | | | | | | | | | | |
| 313 | 1. Observation Value 4.8 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 314 | | | | | | | | | | | |
| 315 | Test Statistic: 0.316 | | | | | | | | | | |
| 316 | | | | | | | | | | | |
| 317 | For 10% significance level, 4.8 is not an outlier. | | | | | | | | | | |
| 318 | For 5% significance level, 4.8 is not an outlier. | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | For 1% significance level, 4.8 is not an outlier. | | | | | | | | | | |
| 320 | | | | | | | | | | | |
| 321 | 2. Observation Value 2.6 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 322 | | | | | | | | | | | |
| 323 | Test Statistic: 0.188 | | | | | | | | | | |
| 324 | | | | | | | | | | | |
| 325 | For 10% significance level, 2.6 is not an outlier. | | | | | | | | | | |
| 326 | For 5% significance level, 2.6 is not an outlier. | | | | | | | | | | |
| 327 | For 1% significance level, 2.6 is not an outlier. | | | | | | | | | | |
| 328 | | | | | | | | | | | |
| 329 | | | | | | | | | | | |
| 330 | Dixon's Outlier Test for Dissolved Organic Carbon (mg/L) | | | | | | | | | | |
| 331 | | | | | | | | | | | |
| 332 | Number of Observations = 13 | | | | | | | | | | |
| 333 | 10% critical value: 0.467 | | | | | | | | | | |
| 334 | 5% critical value: 0.521 | | | | | | | | | | |
| 335 | 1% critical value: 0.615 | | | | | | | | | | |
| 336 | | | | | | | | | | | |
| 337 | 1. Observation Value 14.2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 338 | | | | | | | | | | | |
| 339 | Test Statistic: 0.909 | | | | | | | | | | |
| 340 | | | | | | | | | | | |
| 341 | For 10% significance level, 14.2 is an outlier. | | | | | | | | | | |
| 342 | For 5% significance level, 14.2 is an outlier. | | | | | | | | | | |
| 343 | For 1% significance level, 14.2 is an outlier. | | | | | | | | | | |
| 344 | | | | | | | | | | | |
| 345 | 2. Observation Value 3.1 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 346 | | | | | | | | | | | |
| 347 | Test Statistic: 0.109 | | | | | | | | | | |
| 348 | | | | | | | | | | | |
| 349 | For 10% significance level, 3.1 is not an outlier. | | | | | | | | | | |
| 350 | For 5% significance level, 3.1 is not an outlier. | | | | | | | | | | |
| 351 | For 1% significance level, 3.1 is not an outlier. | | | | | | | | | | |
| 352 | | | | | | | | | | | |
| 353 | | | | | | | | | | | |
| 354 | Dixon's Outlier Test for Chloride (mg/L) | | | | | | | | | | |
| 355 | | | | | | | | | | | |
| 356 | Number of Observations = 9 | | | | | | | | | | |
| 357 | 10% critical value: 0.441 | | | | | | | | | | |
| 358 | 5% critical value: 0.512 | | | | | | | | | | |
| 359 | 1% critical value: 0.635 | | | | | | | | | | |
| 360 | | | | | | | | | | | |
| 361 | 1. Observation Value 0.9 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 362 | | | | | | | | | | | |
| 363 | Test Statistic: 0.562 | | | | | | | | | | |
| 364 | | | | | | | | | | | |
| 365 | For 10% significance level, 0.9 is an outlier. | | | | | | | | | | |
| 366 | For 5% significance level, 0.9 is an outlier. | | | | | | | | | | |
| 367 | For 1% significance level, 0.9 is not an outlier. | | | | | | | | | | |
| 368 | | | | | | | | | | | |
| 369 | 2. Observation Value 1E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 370 | | | | | | | | | | | |
| 371 | Test Statistic: 0.025 | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | | | | | | | |
| 373 | For 10% significance level, 1E-05 is not an outlier. | | | | | | | | | | |
| 374 | For 5% significance level, 1E-05 is not an outlier. | | | | | | | | | | |
| 375 | For 1% significance level, 1E-05 is not an outlier. | | | | | | | | | | |
| 376 | | | | | | | | | | | |
| 377 | | | | | | | | | | | |
| 378 | | | | Available only for sample sizes 3 to 500 | | | | | | | |
| 379 | | | | | | | | | | | |
| 380 | | | | Available only for sample sizes 3 to 500 | | | | | | | |
| 381 | | | | | | | | | | | |
| 382 | | | | Dixon's Outlier Test for Iron (mg/L) | | | | | | | |
| 383 | | | | | | | | | | | |
| 384 | Number of Observations = 5 | | | | | | | | | | |
| 385 | 10% critical value: 0.557 | | | | | | | | | | |
| 386 | 5% critical value: 0.642 | | | | | | | | | | |
| 387 | 1% critical value: 0.78 | | | | | | | | | | |
| 388 | | | | | | | | | | | |
| 389 | 1. Observation Value 0.16 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 390 | | | | | | | | | | | |
| 391 | Test Statistic: 0.732 | | | | | | | | | | |
| 392 | | | | | | | | | | | |
| 393 | For 10% significance level, 0.16 is an outlier. | | | | | | | | | | |
| 394 | For 5% significance level, 0.16 is an outlier. | | | | | | | | | | |
| 395 | For 1% significance level, 0.16 is not an outlier. | | | | | | | | | | |
| 396 | | | | | | | | | | | |
| 397 | 2. Observation Value 0.011 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 398 | | | | | | | | | | | |
| 399 | Test Statistic: 0.034 | | | | | | | | | | |
| 400 | | | | | | | | | | | |
| 401 | For 10% significance level, 0.011 is not an outlier. | | | | | | | | | | |
| 402 | For 5% significance level, 0.011 is not an outlier. | | | | | | | | | | |
| 403 | For 1% significance level, 0.011 is not an outlier. | | | | | | | | | | |
| 404 | | | | | | | | | | | |
| 405 | | | | | | | | | | | |
| 406 | | | | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | |
| 407 | | | | | | | | | | | |
| 408 | Number of Observations = 9 | | | | | | | | | | |
| 409 | 10% critical value: 0.441 | | | | | | | | | | |
| 410 | 5% critical value: 0.512 | | | | | | | | | | |
| 411 | 1% critical value: 0.635 | | | | | | | | | | |
| 412 | | | | | | | | | | | |
| 413 | 1. Observation Value 7.53E-05 is a Potential Outlier (Upper Tail)? | | | | | | | | | | |
| 414 | | | | | | | | | | | |
| 415 | Test Statistic: 0.479 | | | | | | | | | | |
| 416 | | | | | | | | | | | |
| 417 | For 10% significance level, 7.53E-05 is an outlier. | | | | | | | | | | |
| 418 | For 5% significance level, 7.53E-05 is not an outlier. | | | | | | | | | | |
| 419 | For 1% significance level, 7.53E-05 is not an outlier. | | | | | | | | | | |
| 420 | | | | | | | | | | | |
| 421 | 2. Observation Value 6.5E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | |
| 422 | | | | | | | | | | | |
| 423 | Test Statistic: 0.025 | | | | | | | | | | |
| 424 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 425 | For 10% significance level, 6.5E-06 is not an outlier. | | | | | | | | | | |
| 426 | For 5% significance level, 6.5E-06 is not an outlier. | | | | | | | | | | |
| 427 | For 1% significance level, 6.5E-06 is not an outlier. | | | | | | | | | | |
| 428 | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:13:36 AM | | | | | | | | |
| | | | From File | 2023-IntermediateProUCL-1_e.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 05-IN | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.714 | | | | | | | |
| | | | Standard Deviation | 0.317 | | | | | | | |
| | | | Number of data | 54 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 7.714 | 0.314 | | 6.86 | 3 | 2.717 | 3.158 | 3.512 | | | |
| | | | | | | | | | | | |
| 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 | 2.174 | | | | | | | |
| | | | Standard Deviation | 0.784 | | | | | | | |
| | | | Number of data | 48 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 2.174 | 0.776 | | 4.5 | 3 | 2.997 | 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 Sulphate (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 150.5 | | | | | | | |
| | | | Standard Deviation | 51.74 | | | | | | | |
| | | | Number of data | 45 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 150.5 | 51.16 | | 24 | 2 | 2.473 | 3.09 | 3.44 | | | |

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 | 0.131 |
| Standard Deviation | 0.201 |
| Number of data | 26 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.131 | 0.197 | 0.778 | 16 | 3.287 | 2.84 | 3.16 |

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 | 0.778 |
| Standard Deviation | 0.386 |
| Number of data | 26 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.778 | 0.378 | 0.0729 | 26 | 1.864 | 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 | 614.4 |
| Standard Deviation | 152.6 |
| Number of data | 54 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 614.4 | 151.2 | 310 | 3 | 2.013 | 3.158 | 3.512 |

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 | 123.1 |
| Standard Deviation | 36 |
| Number of data | 45 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 123.1 | 35.6 | 179 | 40 | 1.57 | 3.09 | 3.44 |

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 | 32.31 |
| Standard Deviation | 9.002 |
| Number of data | 45 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 32.31 | 8.902 | 47.2 | 44 | 1.673 | 3.09 | 3.44 |

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 | 57.52 |
| Standard Deviation | 17.65 |
| Number of data | 45 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 57.52 | 17.45 | 11.6 | 2 | 2.632 | 3.09 | 3.44 |

For 5% Significance Level, there is no Potential Outlier

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 161 | | | | | | | | | | | | |
| 162 | | | | | | | | | | | | |
| 163 | | | | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | |
| 164 | | | | | | | | | | | | |
| 165 | | | | | | | | | | | | |
| 166 | | | | Mean | 510.3 | | | | | | | |
| 167 | | | | Standard Deviation | 137 | | | | | | | |
| 168 | | | | Number of data | 45 | | | | | | | |
| 169 | | | | Number of suspected outliers | 1 | | | | | | | |
| 170 | | | | | | | | | | | | |
| 171 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 172 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 173 | 1 | 510.3 | 135.5 | 315.7 | 8 | 1.436 | 3.09 | 3.44 | | | | |
| 174 | | | | | | | | | | | | |
| 175 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 178 | | | | | | | | | | | | |
| 179 | | | | | | | | | | | | |
| 180 | | | | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | | | | Mean | 8.2881E-4 | | | | | | | |
| 184 | | | | Standard Deviation | 6.7854E-4 | | | | | | | |
| 185 | | | | Number of data | 42 | | | | | | | |
| 186 | | | | Number of suspected outliers | 1 | | | | | | | |
| 187 | | | | | | | | | | | | |
| 188 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 189 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 190 | 1 | 8.2881E-4 | 6.7042E-4 | 0.00341 | 30 | 3.85 | 3.06 | 3.4 | | | | |
| 191 | | | | | | | | | | | | |
| 192 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 193 | Potential outliers is: 0.00341 | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 196 | Potential outliers is: 0.00341 | | | | | | | | | | | |
| 197 | | | | | | | | | | | | |
| 198 | | | | | | | | | | | | |
| 199 | | | | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | | | | | | | | | | | | |
| 202 | | | | Mean | 0.00569 | | | | | | | |
| 203 | | | | Standard Deviation | 0.0113 | | | | | | | |
| 204 | | | | Number of data | 43 | | | | | | | |
| 205 | | | | Number of suspected outliers | 1 | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 208 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 209 | 1 | 0.00569 | 0.0111 | 0.0669 | 25 | 5.502 | 3.07 | 3.41 | | | | |
| 210 | | | | | | | | | | | | |
| 211 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 212 | 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 | 0.00408 |
| Standard Deviation | 0.00241 |
| Number of data | 25 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00408 | 0.00236 | 0.0082 | 8 | 1.748 | 2.82 | 3.14 |

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 | 0.00787 |
| Standard Deviation | 0.00884 |
| Number of data | 26 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00787 | 0.00866 | 0.0345 | 4 | 3.074 | 2.84 | 3.16 |

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 = 18 | | | | | | | | | | | |
| 275 | 10% critical value: 0.424 | | | | | | | | | | | |
| 276 | 5% critical value: 0.475 | | | | | | | | | | | |
| 277 | 1% critical value: 0.561 | | | | | | | | | | | |
| 278 | | | | | | | | | | | | |
| 279 | 1. Observation Value 8.59 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | Test Statistic: 0.310 | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | Test Statistic: 0.185 | | | | | | | | | | | |
| 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 | | | | | | | | | | | | |
| 295 | | | | | | | | | | | | |
| 296 | Dixon's Outlier Test for Dissolved Cadmium (mg/L) | | | | | | | | | | | |
| 297 | | | | | | | | | | | | |
| 298 | Number of Observations = 14 | | | | | | | | | | | |
| 299 | 10% critical value: 0.492 | | | | | | | | | | | |
| 300 | 5% critical value: 0.546 | | | | | | | | | | | |
| 301 | 1% critical value: 0.641 | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | 1. Observation Value 0.0009 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | Test Statistic: 0.983 | | | | | | | | | | | |
| 306 | | | | | | | | | | | | |
| 307 | For 10% significance level, 0.0009 is an outlier. | | | | | | | | | | | |
| 308 | For 5% significance level, 0.0009 is an outlier. | | | | | | | | | | | |
| 309 | For 1% significance level, 0.0009 is an outlier. | | | | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | 2. Observation Value 5.9E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | Test Statistic: 0.228 | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | For 10% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 316 | For 5% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 317 | For 1% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 318 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | | | | | | | | |
| 320 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 323 | | | | | | | | | | | | |
| 324 | Dixon's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 325 | | | | | | | | | | | | |
| 326 | Number of Observations = 17 | | | | | | | | | | | |
| 327 | 10% critical value: 0.438 | | | | | | | | | | | |
| 328 | 5% critical value: 0.49 | | | | | | | | | | | |
| 329 | 1% critical value: 0.577 | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | 1. Observation Value 0.033 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 332 | | | | | | | | | | | | |
| 333 | Test Statistic: 0.792 | | | | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | For 10% significance level, 0.033 is an outlier. | | | | | | | | | | | |
| 336 | For 5% significance level, 0.033 is an outlier. | | | | | | | | | | | |
| 337 | For 1% significance level, 0.033 is an outlier. | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | 2. Observation Value 0.00015 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | Test Statistic: 0.001 | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | For 10% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 344 | For 5% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 345 | For 1% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 346 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:14:45 AM | | | | | | | | |
| | | | From File | 2023-IntermediateProUCL-1_f.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 06R-IN | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.731 | | | | | | | |
| | | | Standard Deviation | 0.298 | | | | | | | |
| | | | Number of data | 55 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 7.731 | 0.296 | | 7.1 | 18 | 2.135 | 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 | 2.515 | | | | | | | |
| | | | Standard Deviation | 1.62 | | | | | | | |
| | | | Number of data | 49 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 2.515 | 1.604 | | 6.3 | 8 | 2.36 | 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 Sulphate (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 109.6 | | | | | | | |
| | | | Standard Deviation | 69.67 | | | | | | | |
| | | | Number of data | 48 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 109.6 | 68.94 | | 2.55 | 41 | 1.553 | 3.11 | 3.46 | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 56 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | | | | | | | | | | | | |
| 59 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 61 | Number of Observations = 24 | | | | | | | | | | | |
| 62 | 10% critical value: 0.367 | | | | | | | | | | | |
| 63 | 5% critical value: 0.413 | | | | | | | | | | | |
| 64 | 1% critical value: 0.497 | | | | | | | | | | | |
| 65 | | | | | | | | | | | | |
| 66 | 1. Observation Value 3.05 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 67 | | | | | | | | | | | | |
| 68 | Test Statistic: 0.457 | | | | | | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | For 10% significance level, 3.05 is an outlier. | | | | | | | | | | | |
| 71 | For 5% significance level, 3.05 is an outlier. | | | | | | | | | | | |
| 72 | For 1% significance level, 3.05 is not an outlier. | | | | | | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | Test Statistic: 0.000 | | | | | | | | | | | |
| 77 | | | | | | | | | | | | |
| 78 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 79 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 80 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | | | | | | | | |
| 83 | Dixon's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 84 | | | | | | | | | | | | |
| 85 | Number of Observations = 24 | | | | | | | | | | | |
| 86 | 10% critical value: 0.367 | | | | | | | | | | | |
| 87 | 5% critical value: 0.413 | | | | | | | | | | | |
| 88 | 1% critical value: 0.497 | | | | | | | | | | | |
| 89 | | | | | | | | | | | | |
| 90 | 1. Observation Value 3.34 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 91 | | | | | | | | | | | | |
| 92 | Test Statistic: 0.354 | | | | | | | | | | | |
| 93 | | | | | | | | | | | | |
| 94 | For 10% significance level, 3.34 is not an outlier. | | | | | | | | | | | |
| 95 | For 5% significance level, 3.34 is not an outlier. | | | | | | | | | | | |
| 96 | For 1% significance level, 3.34 is not an outlier. | | | | | | | | | | | |
| 97 | | | | | | | | | | | | |
| 98 | 2. Observation Value 0.001 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 99 | | | | | | | | | | | | |
| 100 | Test Statistic: 0.018 | | | | | | | | | | | |
| 101 | | | | | | | | | | | | |
| 102 | For 10% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 103 | For 5% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 104 | For 1% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 105 | | | | | | | | | | | | |
| 106 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | Rosner's Outlier Test for Total Dissolved Solids (mg/L) | | | | | | | | | | | |
| 108 | | | | | | | | | | | | |
| 109 | | | | | | | | | | | | |
| 110 | | | Mean | 553.6 | | | | | | | | |
| 111 | | | Standard Deviation | 59.3 | | | | | | | | |
| 112 | | | Number of data | 55 | | | | | | | | |
| 113 | | | Number of suspected outliers | 1 | | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 116 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 117 | 1 | 553.6 | 58.76 | 417 | 23 | 2.325 | 3.165 | 3.52 | | | | |
| 118 | | | | | | | | | | | | |
| 119 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | | | | | | | | | | | | |
| 124 | Rosner's Outlier Test for Calcium (mg/L) | | | | | | | | | | | |
| 125 | | | | | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | Mean | 120.5 | | | | | | | | |
| 128 | | | Standard Deviation | 20.99 | | | | | | | | |
| 129 | | | Number of data | 48 | | | | | | | | |
| 130 | | | Number of suspected outliers | 1 | | | | | | | | |
| 131 | | | | | | | | | | | | |
| 132 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 133 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 134 | 1 | 120.5 | 20.77 | 172 | 43 | 2.48 | 3.11 | 3.46 | | | | |
| 135 | | | | | | | | | | | | |
| 136 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | | | | | | | | |
| 141 | Rosner's Outlier Test for Magnesium (mg/L) | | | | | | | | | | | |
| 142 | | | | | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | | | Mean | 29.97 | | | | | | | | |
| 145 | | | Standard Deviation | 6.341 | | | | | | | | |
| 146 | | | Number of data | 48 | | | | | | | | |
| 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 | 29.97 | 6.274 | 44.8 | 42 | 2.364 | 3.11 | 3.46 | | | | |
| 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 | 43.35 | | | | | | | |
| | | | Standard Deviation | 20.52 | | | | | | | |
| | | | Number of data | 48 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 43.35 | 20.31 | 8.2 | 46 | 1.731 | 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 Bicarbonate (mg/L) | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 481.4 | | | | | | | |
| | | | Standard Deviation | 108.7 | | | | | | | |
| | | | Number of data | 47 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 481.4 | 107.6 | 707 | 43 | 2.098 | 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 | 0.00175 | | | | | | | |
| | | | Standard Deviation | 0.00294 | | | | | | | |
| | | | Number of data | 47 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 0.00175 | 0.0029 | 0.0151 | 43 | 4.598 | 3.1 | 3.46 | | | | |
| | | | | | | | | | | | |
| 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) | | | | | | | | | | | |
| | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | | | | | | | | |
| 214 | | | | Mean | 0.00295 | | | | | | | |
| 215 | | | | Standard Deviation | 0.0035 | | | | | | | |
| 216 | | | | Number of data | 47 | | | | | | | |
| 217 | | | | Number of suspected outliers | 1 | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 220 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 221 | 1 | 0.00295 | 0.00346 | 0.0171 | 30 | 4.092 | 3.1 | 3.46 | | | | |
| 222 | | | | | | | | | | | | |
| 223 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 224 | Potential outliers is: 0.0171 | | | | | | | | | | | |
| 225 | | | | | | | | | | | | |
| 226 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 227 | Potential outliers is: 0.0171 | | | | | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | | | | | | | | | |
| 230 | | | | | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | | | | | | | | | | | | |
| 233 | | | | Mean | 0.0188 | | | | | | | |
| 234 | | | | Standard Deviation | 0.0214 | | | | | | | |
| 235 | | | | Number of data | 25 | | | | | | | |
| 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 | 0.0188 | 0.021 | 0.108 | 16 | 4.25 | 2.82 | 3.14 | | | | |
| 241 | | | | | | | | | | | | |
| 242 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 243 | Potential outliers is: 0.108 | | | | | | | | | | | |
| 244 | | | | | | | | | | | | |
| 245 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 246 | Potential outliers is: 0.108 | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | | | | | | | | | | | | |
| 249 | | | | | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | |
| 250 | | | | | | | | | | | | |
| 251 | | | | | | | | | | | | |
| 252 | | | | Mean | 0.0311 | | | | | | | |
| 253 | | | | Standard Deviation | 0.0529 | | | | | | | |
| 254 | | | | Number of data | 25 | | | | | | | |
| 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 | 0.0311 | 0.0518 | 0.201 | 2 | 3.28 | 2.82 | 3.14 | | | | |
| 260 | | | | | | | | | | | | |
| 261 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 262 | Potential outliers is: 0.201 | | | | | | | | | | | |
| 263 | | | | | | | | | | | | |
| 264 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 265 | 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%) |
|---|---|---|---|---|---|---|---|
| 1 | 2.655 | 0.464 | 1.2 | 12 | 3.134 | 3.01 | 3.36 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 1.2

For 1% Significance Level, there is no Potential Outlier

## Dixon's Outlier Test for Dissolved Organic Carbon (mg/L)

Number of Observations = 17

10% critical value: 0.438

5% critical value: 0.49

1% critical value: 0.577

1. Observation Value 7.22 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.220

For 10% significance level, 7.22 is not an outlier.

For 5% significance level, 7.22 is not an outlier.

For 1% significance level, 7.22 is not an outlier.

2. Observation Value 3.2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.094

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 Cadmium (mg/L)

Number of Observations = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Observation Value 0.0004 is a Potential Outlier (Upper Tail)?

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | Test Statistic: 0.887 | | | | | | | | | | | |
| 320 | | | | | | | | | | | | |
| 321 | For 10% significance level, 0.0004 is an outlier. | | | | | | | | | | | |
| 322 | For 5% significance level, 0.0004 is an outlier. | | | | | | | | | | | |
| 323 | For 1% significance level, 0.0004 is an outlier. | | | | | | | | | | | |
| 324 | | | | | | | | | | | | |
| 325 | 2. Observation Value 8.4E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | Test Statistic: 0.019 | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | For 10% significance level, 8.4E-06 is not an outlier. | | | | | | | | | | | |
| 330 | For 5% significance level, 8.4E-06 is not an outlier. | | | | | | | | | | | |
| 331 | For 1% significance level, 8.4E-06 is not an outlier. | | | | | | | | | | | |
| 332 | | | | | | | | | | | | |
| 333 | | | | | | | | | | | | |
| 334 | Dixon's Outlier Test for Dissolved Lead (mg/L) | | | | | | | | | | | |
| 335 | | | | | | | | | | | | |
| 336 | Number of Observations = 5 | | | | | | | | | | | |
| 337 | 10% critical value: 0.557 | | | | | | | | | | | |
| 338 | 5% critical value: 0.642 | | | | | | | | | | | |
| 339 | 1% critical value: 0.78 | | | | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | 1. Observation Value 0.005 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | Test Statistic: 0.836 | | | | | | | | | | | |
| 344 | | | | | | | | | | | | |
| 345 | For 10% significance level, 0.005 is an outlier. | | | | | | | | | | | |
| 346 | For 5% significance level, 0.005 is an outlier. | | | | | | | | | | | |
| 347 | For 1% significance level, 0.005 is an outlier. | | | | | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | 2. Observation Value 9.8E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | Test Statistic: 0.002 | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | For 10% significance level, 9.8E-05 is not an outlier. | | | | | | | | | | | |
| 354 | For 5% significance level, 9.8E-05 is not an outlier. | | | | | | | | | | | |
| 355 | For 1% significance level, 9.8E-05 is not an outlier. | | | | | | | | | | | |
| 356 | | | | | | | | | | | | |
| 357 | | | | | | | | | | | | |
| 358 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 359 | | | | | | | | | | | | |
| 360 | Dixon's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 361 | | | | | | | | | | | | |
| 362 | Number of Observations = 20 | | | | | | | | | | | |
| 363 | 10% critical value: 0.401 | | | | | | | | | | | |
| 364 | 5% critical value: 0.45 | | | | | | | | | | | |
| 365 | 1% critical value: 0.535 | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | 1. Observation Value 0.044 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |
| 369 | Test Statistic: 0.412 | | | | | | | | | | | |
| 370 | | | | | | | | | | | | |
| 371 | For 10% significance level, 0.044 is an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | For 5% significance level, 0.044 is not an outlier. | | | | | | | | | | | |
| 373 | For 1% significance level, 0.044 is not an outlier. | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | 2. Observation Value 0.00015 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | Test Statistic: 0.006 | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | For 10% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 380 | For 5% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 381 | For 1% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 382 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| 2 | | | | User Selected Options | | | | | | | | |
| 3 | | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:15:57 AM | | | | | | | | |
| 4 | | | | From File | 2023-IntermediateProUCL-1_g.xls | | | | | | | |
| 5 | | | | Full Precision | OFF | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | 07-IN | | | | | | | |
| 8 | | | | | Rosner's Outlier Test for pH () | | | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | Mean | 7.767 | | | | | | | |
| 12 | | | | Standard Deviation | 0.299 | | | | | | | |
| 13 | | | | Number of data | 56 | | | | | | | |
| 14 | | | | Number of suspected outliers | 1 | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 17 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 18 | 1 | 7.767 | 0.297 | 7 | 29 | 2.584 | 3.172 | 3.528 | | | | |
| 19 | | | | | | | | | | | | |
| 20 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 23 | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | | | | | Rosner's Outlier Test for Chloride (mg/L) | | | | | | | |
| 26 | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | |
| 28 | | | | Mean | 0.837 | | | | | | | |
| 29 | | | | Standard Deviation | 0.602 | | | | | | | |
| 30 | | | | Number of data | 50 | | | | | | | |
| 31 | | | | Number of suspected outliers | 1 | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 34 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 35 | 1 | 0.837 | 0.596 | 2.9 | 3 | 3.465 | 3.13 | 3.48 | | | | |
| 36 | | | | | | | | | | | | |
| 37 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 38 | Potential outliers is: 2.9 | | | | | | | | | | | |
| 39 | | | | | | | | | | | | |
| 40 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 41 | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | |
| 43 | | | | | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | |
| 44 | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | |
| 46 | | | | Mean | 83.26 | | | | | | | |
| 47 | | | | Standard Deviation | 20.22 | | | | | | | |
| 48 | | | | Number of data | 49 | | | | | | | |
| 49 | | | | Number of suspected outliers | 1 | | | | | | | |
| 50 | | | | | | | | | | | | |
| 51 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 52 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 53 | 1 | 83.26 | 20.01 | 140 | 3 | 2.836 | 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 Iron (mg/L)

| | |
|---|---|
| Mean | 0.224 |
| Standard Deviation | 0.229 |
| Number of data | 25 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.224 | 0.225 | 0.737 | 21 | 2.28 | 2.82 | 3.14 |

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 | 0.803 |
| Standard Deviation | 0.27 |
| Number of data | 25 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.803 | 0.264 | 0.278 | 13 | 1.989 | 2.82 | 3.14 |

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 | 477.1 |
| Standard Deviation | 39.74 |
| Number of data | 56 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 477.1 | 39.38 | 352 | 17 | 3.178 | 3.172 | 3.528 |

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 | 101.3 |
| Standard Deviation | 7.616 |
| Number of data | 49 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 101.3 | 7.538 | 121 | 23 | 2.611 | 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 Magnesium (mg/L)

| | |
|---|---|
| Mean | 22.69 |
| Standard Deviation | 1.653 |
| Number of data | 49 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 22.69 | 1.636 | 27.2 | 25 | 2.756 | 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 Sodium (mg/L)

| | |
|---|---|
| Mean | 43.19 |
| Standard Deviation | 9.157 |
| Number of data | 49 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 43.19 | 9.063 | 62 | 4 | 2.075 | 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 Bicarbonate (mg/L)

| | |
|---|---|
| Mean | 442.6 |
| Standard Deviation | 14.95 |
| Number of data | 48 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 442.6 | 14.79 | 395 | 9 | 3.218 | 3.11 | 3.46 |

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 | 0.00355 |
| Standard Deviation | 0.0028 |
| Number of data | 48 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00355 | 0.00277 | 0.016 | 8 | 4.493 | 3.11 | 3.46 |

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 | 0.00214 |
| Standard Deviation | 0.00151 |
| Number of data | 48 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00214 | 0.00149 | 0.0061 | 32 | 2.648 | 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 Nickel (mg/L)

| | |
|---|---|
| Mean | 0.00506 |
| Standard Deviation | 0.00356 |
| Number of data | 26 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00506 | 0.00349 | 0.0191 | 10 | 4.026 | 2.84 | 3.16 |

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 | 0.0143 |
| Standard Deviation | 0.0302 |
| Number of data | 26 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.0143 | 0.0296 | 0.159 | 24 | 4.891 | 2.84 | 3.16 |

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%) |
|---|---|---|---|---|---|---|---|
| 1 | 2.897 | 0.611 | 4.2 | 1 | 2.132 | 3.01 | 3.36 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | | | | | | | | |
| 267 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 268 | | | | | | | | | | | | |
| 269 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 270 | | | | | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | Dixon's Outlier Test for Dissolved Organic Carbon (mg/L) | | | | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | Number of Observations = 18 | | | | | | | | | | | |
| 275 | 10% critical value: 0.424 | | | | | | | | | | | |
| 276 | 5% critical value: 0.475 | | | | | | | | | | | |
| 277 | 1% critical value: 0.561 | | | | | | | | | | | |
| 278 | | | | | | | | | | | | |
| 279 | 1. Observation Value 4.6 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | Test Statistic: 0.522 | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | For 10% significance level, 4.6 is an outlier. | | | | | | | | | | | |
| 284 | For 5% significance level, 4.6 is an outlier. | | | | | | | | | | | |
| 285 | For 1% significance level, 4.6 is not an outlier. | | | | | | | | | | | |
| 286 | | | | | | | | | | | | |
| 287 | 2. Observation Value 2 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | Test Statistic: 0.214 | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | For 10% significance level, 2 is not an outlier. | | | | | | | | | | | |
| 292 | For 5% significance level, 2 is not an outlier. | | | | | | | | | | | |
| 293 | For 1% significance level, 2 is not an outlier. | | | | | | | | | | | |
| 294 | | | | | | | | | | | | |
| 295 | | | | | | | | | | | | |
| 296 | Dixon's Outlier Test for Dissolved Cadmium (mg/L) | | | | | | | | | | | |
| 297 | | | | | | | | | | | | |
| 298 | Number of Observations = 16 | | | | | | | | | | | |
| 299 | 10% critical value: 0.454 | | | | | | | | | | | |
| 300 | 5% critical value: 0.507 | | | | | | | | | | | |
| 301 | 1% critical value: 0.595 | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | 1. Observation Value 0.0003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | Test Statistic: 0.704 | | | | | | | | | | | |
| 306 | | | | | | | | | | | | |
| 307 | For 10% significance level, 0.0003 is an outlier. | | | | | | | | | | | |
| 308 | For 5% significance level, 0.0003 is an outlier. | | | | | | | | | | | |
| 309 | For 1% significance level, 0.0003 is an outlier. | | | | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | 2. Observation Value 5.9E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | Test Statistic: 0.056 | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | For 10% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 316 | For 5% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 317 | For 1% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 318 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | | | | | | | | |
| 320 | Dixon's Outlier Test for Dissolved Chromium (mg/L) | | | | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | Number of Observations = 17 | | | | | | | | | | | |
| 323 | 10% critical value: 0.438 | | | | | | | | | | | |
| 324 | 5% critical value: 0.49 | | | | | | | | | | | |
| 325 | 1% critical value: 0.577 | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | 1. Observation Value 0.032 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | Test Statistic: 0.791 | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | For 10% significance level, 0.032 is an outlier. | | | | | | | | | | | |
| 332 | For 5% significance level, 0.032 is an outlier. | | | | | | | | | | | |
| 333 | For 1% significance level, 0.032 is an outlier. | | | | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | 2. Observation Value 0.00016 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | Test Statistic: 0.035 | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | For 10% significance level, 0.00016 is not an outlier. | | | | | | | | | | | |
| 340 | For 5% significance level, 0.00016 is not an outlier. | | | | | | | | | | | |
| 341 | For 1% significance level, 0.00016 is not an outlier. | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 345 | | | | | | | | | | | | |
| 346 | Dixon's Outlier Test for Dissolved Mercury (mg/L) | | | | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | Number of Observations = 3 | | | | | | | | | | | |
| 349 | 10% critical value: 0.886 | | | | | | | | | | | |
| 350 | 5% critical value: 0.941 | | | | | | | | | | | |
| 351 | 1% critical value: 0.988 | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | 1. Observation Value 0.00021 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | Test Statistic: 1.000 | | | | | | | | | | | |
| 356 | | | | | | | | | | | | |
| 357 | For 10% significance level, 0.00021 is an outlier. | | | | | | | | | | | |
| 358 | For 5% significance level, 0.00021 is an outlier. | | | | | | | | | | | |
| 359 | For 1% significance level, 0.00021 is an outlier. | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | 2. Observation Value 9.4E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | Test Statistic: 0.000 | | | | | | | | | | | |
| 364 | | | | | | | | | | | | |
| 365 | For 10% significance level, 9.4E-06 is not an outlier. | | | | | | | | | | | |
| 366 | For 5% significance level, 9.4E-06 is not an outlier. | | | | | | | | | | | |
| 367 | For 1% significance level, 9.4E-06 is not an outlier. | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| 2 | | | | User Selected Options | | | | | | | | |
| 3 | | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:17:07 AM | | | | | | | | |
| 4 | | | | From File | 2023-IntermediateProUCL-1_h.xls | | | | | | | |
| 5 | | | | Full Precision | OFF | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | 08-IN | | | | | | | |
| 8 | | | | | Rosner's Outlier Test for pH () | | | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | Mean | 7.774 | | | | | | | |
| 12 | | | | Standard Deviation | 0.328 | | | | | | | |
| 13 | | | | Number of data | 57 | | | | | | | |
| 14 | | | | Number of suspected outliers | 1 | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 17 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 18 | 1 | 7.774 | 0.325 | 7.06 | 30 | 2.2 | 3.179 | 3.536 | | | | |
| 19 | | | | | | | | | | | | |
| 20 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 23 | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | | | | | Rosner's Outlier Test for Chloride (mg/L) | | | | | | | |
| 26 | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | |
| 28 | | | | Mean | 1.535 | | | | | | | |
| 29 | | | | Standard Deviation | 1.079 | | | | | | | |
| 30 | | | | Number of data | 43 | | | | | | | |
| 31 | | | | Number of suspected outliers | 1 | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 34 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 35 | 1 | 1.535 | 1.066 | 5.7 | 1 | 3.906 | 3.07 | 3.41 | | | | |
| 36 | | | | | | | | | | | | |
| 37 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 38 | Potential outliers is: 5.7 | | | | | | | | | | | |
| 39 | | | | | | | | | | | | |
| 40 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 41 | Potential outliers is: 5.7 | | | | | | | | | | | |
| 42 | | | | | | | | | | | | |
| 43 | | | | | | | | | | | | |
| 44 | | | | | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | |
| 45 | | | | | | | | | | | | |
| 46 | | | | | | | | | | | | |
| 47 | | | | Mean | 182.5 | | | | | | | |
| 48 | | | | Standard Deviation | 49.29 | | | | | | | |
| 49 | | | | Number of data | 39 | | | | | | | |
| 50 | | | | Number of suspected outliers | 1 | | | | | | | |
| 51 | | | | | | | | | | | | |
| 52 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 53 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | 1 | 182.5 | 48.65 | 320 | 6 | 2.825 | 3.03 | 3.37 | | | | |
| 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 = 20 | | | | | | | | | | | |
| 64 | 10% critical value: 0.401 | | | | | | | | | | | |
| 65 | 5% critical value: 0.45 | | | | | | | | | | | |
| 66 | 1% critical value: 0.535 | | | | | | | | | | | |
| 67 | | | | | | | | | | | | |
| 68 | 1. Observation Value 1.09 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 | 595.2 | | | | | | | | |
| 89 | | | Standard Deviation | 73.78 | | | | | | | | |
| 90 | | | Number of data | 57 | | | | | | | | |
| 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 | 595.2 | 73.13 | 420 | 4 | 2.396 | 3.179 | 3.536 | | | | |
| 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 | 116.7 | | | | | | | | |
| 106 | | | Standard Deviation | 10.5 | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | Number of data | 39 | | | | | | | | |
| 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 | 116.7 | 10.37 | 87 | 1 | 2.866 | 3.03 | 3.37 | | | | |
| 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 Magnesium (mg/L) | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | | | | | | | | |
| 122 | | | | Mean | 26.42 | | | | | | | |
| 123 | | | | Standard Deviation | 2.437 | | | | | | | |
| 124 | | | | Number of data | 39 | | | | | | | |
| 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 | 26.42 | 2.405 | 18.6 | 2 | 3.25 | 3.03 | 3.37 | | | | |
| 130 | | | | | | | | | | | | |
| 131 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 132 | Potential outliers is: 18.6 | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | | | | | | | | |
| 137 | | | | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | |
| 138 | | | | | | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | Mean | 47.72 | | | | | | | |
| 141 | | | | Standard Deviation | 12.44 | | | | | | | |
| 142 | | | | Number of data | 39 | | | | | | | |
| 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 | 47.72 | 12.28 | 81 | 17 | 2.711 | 3.03 | 3.37 | | | | |
| 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 Bicarbonate (mg/L) | | | | | | | | |
| 155 | | | | | | | | | | | | |
| 156 | | | | | | | | | | | | |
| 157 | | | | Mean | 387.1 | | | | | | | |
| 158 | | | | Standard Deviation | 20.17 | | | | | | | |
| 159 | | | | Number of data | 39 | | | | | | | |

| | 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 | 387.1 | 19.91 | 332 | 3 | 2.766 | 3.03 | 3.37 | | | | |
| 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 | 0.00609 | | | | | | | | | | |
| 175 | Standard Deviation | 0.0141 | | | | | | | | | | |
| 176 | Number of data | 37 | | | | | | | | | | |
| 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 | 0.00609 | 0.0139 | 0.075 | 8 | 4.966 | 3 | 3.34 | | | | |
| 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 | 0.00485 | | | | | | | | | | |
| 194 | Standard Deviation | 0.00623 | | | | | | | | | | |
| 195 | Number of data | 37 | | | | | | | | | | |
| 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 | 0.00485 | 0.00615 | 0.028 | 8 | 3.764 | 3 | 3.34 | | | | |
| 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 = 18 | | | | | | | | | | | |
| 212 | 10% critical value: 0.424 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | 5% critical value: 0.475 | | | | | | | | | | | |
| 214 | 1% critical value: 0.561 | | | | | | | | | | | |
| 215 | | | | | | | | | | | | |
| 216 | 1. Observation Value 0.0341 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 (Lower Tail)? | | | | | | | | | | | |
| 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 = 18 | | | | | | | | | | | |
| 236 | 10% critical value: 0.424 | | | | | | | | | | | |
| 237 | 5% critical value: 0.475 | | | | | | | | | | | |
| 238 | 1% critical value: 0.561 | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | 1. Observation Value 0.0198 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 = 18 | | | | | | | | | | | |
| 278 | 10% critical value: 0.424 | | | | | | | | | | | |
| 279 | 5% critical value: 0.475 | | | | | | | | | | | |
| 280 | 1% critical value: 0.561 | | | | | | | | | | | |
| 281 | | | | | | | | | | | | |
| 282 | 1. Observation Value 4.6 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 283 | | | | | | | | | | | | |
| 284 | Test Statistic: 0.321 | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 291 | | | | | | | | | | | | |
| 292 | Test Statistic: 0.050 | | | | | | | | | | | |
| 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 | | | | | | | | | | | | |
| 298 | | | | | | | | | | | | |
| 299 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | Dixon's Outlier Test for Dissolved Cadmium (mg/L) | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | Number of Observations = 14 | | | | | | | | | | | |
| 304 | 10% critical value: 0.492 | | | | | | | | | | | |
| 305 | 5% critical value: 0.546 | | | | | | | | | | | |
| 306 | 1% critical value: 0.641 | | | | | | | | | | | |
| 307 | | | | | | | | | | | | |
| 308 | 1. Observation Value 0.000126 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 309 | | | | | | | | | | | | |
| 310 | Test Statistic: 0.451 | | | | | | | | | | | |
| 311 | | | | | | | | | | | | |
| 312 | For 10% significance level, 0.000126 is not an outlier. | | | | | | | | | | | |
| 313 | For 5% significance level, 0.000126 is not an outlier. | | | | | | | | | | | |
| 314 | For 1% significance level, 0.000126 is not an outlier. | | | | | | | | | | | |
| 315 | | | | | | | | | | | | |
| 316 | 2. Observation Value 8.4E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 317 | | | | | | | | | | | | |
| 318 | Test Statistic: 0.034 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | | | | | | | | |
| 320 | For 10% significance level, 8.4E-06 is not an outlier. | | | | | | | | | | | |
| 321 | For 5% significance level, 8.4E-06 is not an outlier. | | | | | | | | | | | |
| 322 | For 1% significance level, 8.4E-06 is not an outlier. | | | | | | | | | | | |
| 323 | | | | | | | | | | | | |
| 324 | | | | | | | | | | | | |
| 325 | Dixon's Outlier Test for Dissolved Lead (mg/L) | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | Number of Observations = 5 | | | | | | | | | | | |
| 328 | 10% critical value: 0.557 | | | | | | | | | | | |
| 329 | 5% critical value: 0.642 | | | | | | | | | | | |
| 330 | 1% critical value: 0.78 | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | 1. Observation Value 0.007 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 333 | | | | | | | | | | | | |
| 334 | Test Statistic: 0.290 | | | | | | | | | | | |
| 335 | | | | | | | | | | | | |
| 336 | For 10% significance level, 0.007 is not an outlier. | | | | | | | | | | | |
| 337 | For 5% significance level, 0.007 is not an outlier. | | | | | | | | | | | |
| 338 | For 1% significance level, 0.007 is not an outlier. | | | | | | | | | | | |
| 339 | | | | | | | | | | | | |
| 340 | 2. Observation Value 0.0001 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 341 | | | | | | | | | | | | |
| 342 | Test Statistic: 0.565 | | | | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | For 10% significance level, 0.0001 is an outlier. | | | | | | | | | | | |
| 345 | For 5% significance level, 0.0001 is not an outlier. | | | | | | | | | | | |
| 346 | For 1% significance level, 0.0001 is not an outlier. | | | | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | Dixon's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | Number of Observations = 17 | | | | | | | | | | | |
| 354 | 10% critical value: 0.438 | | | | | | | | | | | |
| 355 | 5% critical value: 0.49 | | | | | | | | | | | |
| 356 | 1% critical value: 0.577 | | | | | | | | | | | |
| 357 | | | | | | | | | | | | |
| 358 | 1. Observation Value 0.00126 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 359 | | | | | | | | | | | | |
| 360 | Test Statistic: 0.316 | | | | | | | | | | | |
| 361 | | | | | | | | | | | | |
| 362 | For 10% significance level, 0.00126 is not an outlier. | | | | | | | | | | | |
| 363 | For 5% significance level, 0.00126 is not an outlier. | | | | | | | | | | | |
| 364 | For 1% significance level, 0.00126 is not an outlier. | | | | | | | | | | | |
| 365 | | | | | | | | | | | | |
| 366 | 2. Observation Value 0.0001 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |
| 368 | Test Statistic: 0.025 | | | | | | | | | | | |
| 369 | | | | | | | | | | | | |
| 370 | For 10% significance level, 0.0001 is not an outlier. | | | | | | | | | | | |
| 371 | For 5% significance level, 0.0001 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | For 1% significance level, 0.0001 is not an outlier. | | | | | | | | | | | |
| 373 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | User Selected Options | | | | | | | | | |
| | Date/Time of Computation | | ProUCL 5.2 2023-12-13 9:18:10 AM | | | | | | | | |
| | | From File | 2023-IntermediateProUCL-1_i.xls | | | | | | | | |
| | | Full Precision | OFF | | | | | | | | |
| | | | | | | | | | | | |
| | | | 11-IN | | | | | | | | |
| | | | Rosner's Outlier Test for pH () | | | | | | | | |
| | | | | | | | | | | | |
| | | Mean | 7.806 | | | | | | | | |
| | | Standard Deviation | 0.286 | | | | | | | | |
| | | Number of data | 35 | | | | | | | | |
| | | Number of suspected outliers | 1 | | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 7.806 | 0.282 | 7.24 | 6 | 2.007 | 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 Sulphate (mg/L) | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | Mean | 16.1 | | | | | | | | |
| | | Standard Deviation | 31.71 | | | | | | | | |
| | | Number of data | 30 | | | | | | | | |
| | | Number of suspected outliers | 1 | | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 16.1 | 31.18 | 181 | 30 | 5.289 | 2.91 | 3.24 | | | | |
| | | | | | | | | | | | |
| 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 | 0.384 | | | | | | | | |
| | | Standard Deviation | 0.592 | | | | | | | | |
| | | Number of data | 28 | | | | | | | | |
| | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | 1 | 0.384 | 0.582 | 2.79 | 4 | 4.137 | 2.88 | 3.2 | | | | |
| 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 | 0.493 | | | | | | | |
| 67 | | | | Standard Deviation | 0.161 | | | | | | | |
| 68 | | | | Number of data | 28 | | | | | | | |
| 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 | 0.493 | 0.158 | 0.969 | 1 | 3.007 | 2.88 | 3.2 | | | | |
| 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 | 423.1 | | | | | | | |
| 85 | | | | Standard Deviation | 55.77 | | | | | | | |
| 86 | | | | Number of data | 35 | | | | | | | |
| 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 | 423.1 | 54.97 | 709 | 35 | 5.202 | 2.98 | 3.32 | | | | |
| 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 | 101.7 | | | | | | | |
| 104 | | | | Standard Deviation | 13.21 | | | | | | | |
| 105 | | | | Number of data | 34 | | | | | | | |
| 106 | | | | Number of suspected outliers | 1 | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | | | | | | | | |
| 108 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 109 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 110 | 1 | 101.7 | 13.01 | 154 | 34 | 4.02 | 2.97 | 3.3 | | | | |
| 111 | | | | | | | | | | | | |
| 112 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 113 | Potential outliers is: 154 | | | | | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 116 | Potential outliers is: 154 | | | | | | | | | | | |
| 117 | | | | | | | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | Rosner's Outlier Test for Magnesium (mg/L) | | | | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | | | | | | | | |
| 122 | | | | Mean | 24.78 | | | | | | | |
| 123 | | | | Standard Deviation | 4.751 | | | | | | | |
| 124 | | | | Number of data | 34 | | | | | | | |
| 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 | 24.78 | 4.681 | 0.553 | 24 | 5.175 | 2.97 | 3.3 | | | | |
| 130 | | | | | | | | | | | | |
| 131 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 132 | Potential outliers is: 0.553 | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 135 | Potential outliers is: 0.553 | | | | | | | | | | | |
| 136 | | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | | | | | | | | |
| 141 | | | | Mean | 28.48 | | | | | | | |
| 142 | | | | Standard Deviation | 4.217 | | | | | | | |
| 143 | | | | Number of data | 34 | | | | | | | |
| 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 | 28.48 | 4.154 | 45 | 34 | 3.977 | 2.97 | 3.3 | | | | |
| 149 | | | | | | | | | | | | |
| 150 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 151 | Potential outliers is: 45 | | | | | | | | | | | |
| 152 | | | | | | | | | | | | |
| 153 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 154 | Potential outliers is: 45 | | | | | | | | | | | |
| 155 | | | | | | | | | | | | |
| 156 | | | | | | | | | | | | |
| 157 | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | Mean | 494.4 | | | | | | | |
| 161 | | | | Standard Deviation | 24.83 | | | | | | | |
| 162 | | | | Number of data | 34 | | | | | | | |
| 163 | | | | Number of suspected outliers | 1 | | | | | | | |
| 164 | | | | | | | | | | | | |
| 165 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 166 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 167 | 1 | 494.4 | 24.46 | 558 | 8 | 2.599 | 2.97 | 3.3 | | | | |
| 168 | | | | | | | | | | | | |
| 169 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 170 | | | | | | | | | | | | |
| 171 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 172 | | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | | | | Mean | 0.001 | | | | | | | |
| 178 | | | | Standard Deviation | 7.2074E-4 | | | | | | | |
| 179 | | | | Number of data | 34 | | | | | | | |
| 180 | | | | Number of suspected outliers | 1 | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 183 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 184 | 1 | 0.001 | 7.1007E-4 | 0.0033 | 10 | 3.235 | 2.97 | 3.3 | | | | |
| 185 | | | | | | | | | | | | |
| 186 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 187 | Potential outliers is: 0.0033 | | | | | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | | | | | | | | | | | | |
| 192 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 193 | | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | Mean | 0.00212 | | | | | | | |
| 196 | | | | Standard Deviation | 0.00194 | | | | | | | |
| 197 | | | | Number of data | 34 | | | | | | | |
| 198 | | | | Number of suspected outliers | 1 | | | | | | | |
| 199 | | | | | | | | | | | | |
| 200 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 201 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 202 | 1 | 0.00212 | 0.00191 | 0.0082 | 31 | 3.174 | 2.97 | 3.3 | | | | |
| 203 | | | | | | | | | | | | |
| 204 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 205 | Potential outliers is: 0.0082 | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | | | | | | | | | | | | |
| 210 | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | Mean | 0.0137 | | | | | | | | |
| 214 | | | Standard Deviation | 0.0173 | | | | | | | | |
| 215 | | | Number of data | 30 | | | | | | | | |
| 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 | 0.0137 | 0.017 | 0.0744 | 21 | 3.572 | 2.91 | 3.24 | | | | |
| 221 | | | | | | | | | | | | |
| 222 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 223 | Potential outliers is: 0.0744 | | | | | | | | | | | |
| 224 | | | | | | | | | | | | |
| 225 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 226 | Potential outliers is: 0.0744 | | | | | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | | | Mean | 0.00496 | | | | | | | | |
| 233 | | | Standard Deviation | 0.00573 | | | | | | | | |
| 234 | | | Number of data | 30 | | | | | | | | |
| 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 | 0.00496 | 0.00563 | 0.03 | 3 | 4.448 | 2.91 | 3.24 | | | | |
| 240 | | | | | | | | | | | | |
| 241 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 242 | Potential outliers is: 0.03 | | | | | | | | | | | |
| 243 | | | | | | | | | | | | |
| 244 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 245 | Potential outliers is: 0.03 | | | | | | | | | | | |
| 246 | | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | Dixon's Outlier Test for Total Organic Carbon (mg/L) | | | | | | | | | | | |
| 249 | | | | | | | | | | | | |
| 250 | Number of Observations = 18 | | | | | | | | | | | |
| 251 | 10% critical value: 0.424 | | | | | | | | | | | |
| 252 | 5% critical value: 0.475 | | | | | | | | | | | |
| 253 | 1% critical value: 0.561 | | | | | | | | | | | |
| 254 | | | | | | | | | | | | |
| 255 | 1. Observation Value 11.3 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | Test Statistic: 0.158 | | | | | | | | | | | |
| 258 | | | | | | | | | | | | |
| 259 | For 10% significance level, 11.3 is not an outlier. | | | | | | | | | | | |
| 260 | For 5% significance level, 11.3 is not an outlier. | | | | | | | | | | | |
| 261 | For 1% significance level, 11.3 is not an outlier. | | | | | | | | | | | |
| 262 | | | | | | | | | | | | |
| 263 | 2. Observation Value 9.2 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | 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 | 10.74 |
| Standard Deviation | 1.011 |
| Number of data | 34 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 10.74 | 0.996 | 13.1 | 13 | 2.375 | 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 Chloride (mg/L)

Number of Observations = 10

10% critical value: 0.409

5% critical value: 0.477

1% critical value: 0.597

**1. Observation Value 1.4 is a Potential Outlier (Upper Tail)?**

Test Statistic: 0.455

For 10% significance level, 1.4 is an outlier.

For 5% significance level, 1.4 is not an outlier.

For 1% significance level, 1.4 is not an outlier.

**2. Observation Value 0.1 is a Potential Outlier (Lower Tail)?**

Test Statistic: 0.250

For 10% significance level, 0.1 is not an outlier.

For 5% significance level, 0.1 is not an outlier.

For 1% significance level, 0.1 is not an outlier.

## Dixon's Outlier Test for Dissolved Cadmium (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 | | | | | | | | | | | | |
| 320 | 1. Observation Value 0.005 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | Test Statistic: 0.988 | | | | | | | | | | | |
| 323 | | | | | | | | | | | | |
| 324 | For 10% significance level, 0.005 is an outlier. | | | | | | | | | | | |
| 325 | For 5% significance level, 0.005 is an outlier. | | | | | | | | | | | |
| 326 | For 1% significance level, 0.005 is an outlier. | | | | | | | | | | | |
| 327 | | | | | | | | | | | | |
| 328 | 2. Observation Value 5.8E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 329 | | | | | | | | | | | | |
| 330 | Test Statistic: 0.080 | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | For 10% significance level, 5.8E-06 is not an outlier. | | | | | | | | | | | |
| 333 | For 5% significance level, 5.8E-06 is not an outlier. | | | | | | | | | | | |
| 334 | For 1% significance level, 5.8E-06 is not an outlier. | | | | | | | | | | | |
| 335 | | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | Dixon's Outlier Test for Dissolved Chromium (mg/L) | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | Number of Observations = 10 | | | | | | | | | | | |
| 340 | 10% critical value: 0.409 | | | | | | | | | | | |
| 341 | 5% critical value: 0.477 | | | | | | | | | | | |
| 342 | 1% critical value: 0.597 | | | | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | 1. Observation Value 0.035 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 345 | | | | | | | | | | | | |
| 346 | Test Statistic: 0.459 | | | | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | For 10% significance level, 0.035 is an outlier. | | | | | | | | | | | |
| 349 | For 5% significance level, 0.035 is not an outlier. | | | | | | | | | | | |
| 350 | For 1% significance level, 0.035 is not an outlier. | | | | | | | | | | | |
| 351 | | | | | | | | | | | | |
| 352 | 2. Observation Value 0.00015 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 353 | | | | | | | | | | | | |
| 354 | Test Statistic: 0.001 | | | | | | | | | | | |
| 355 | | | | | | | | | | | | |
| 356 | For 10% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 357 | For 5% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 358 | For 1% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 359 | | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | Dixon's Outlier Test for Dissolved Mercury (mg/L) | | | | | | | | | | | |
| 364 | | | | | | | | | | | | |
| 365 | Number of Observations = 6 | | | | | | | | | | | |
| 366 | 10% critical value: 0.482 | | | | | | | | | | | |
| 367 | 5% critical value: 0.56 | | | | | | | | | | | |
| 368 | 1% critical value: 0.698 | | | | | | | | | | | |
| 369 | | | | | | | | | | | | |
| 370 | 1. Observation Value 0.00022 is a Potential Outlier (Upper Tail) | | | | | | | | | | | |
| 371 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | Test Statistic: 0.093 | | | | | | | | | | | |
| 373 | | | | | | | | | | | | |
| 374 | For 10% significance level, 0.00022 is not an outlier. | | | | | | | | | | | |
| 375 | For 5% significance level, 0.00022 is not an outlier. | | | | | | | | | | | |
| 376 | For 1% significance level, 0.00022 is not an outlier. | | | | | | | | | | | |
| 377 | | | | | | | | | | | | |
| 378 | 2. Observation Value 5.9E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 379 | | | | | | | | | | | | |
| 380 | Test Statistic: 0.027 | | | | | | | | | | | |
| 381 | | | | | | | | | | | | |
| 382 | For 10% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 383 | For 5% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 384 | For 1% significance level, 5.9E-06 is not an outlier. | | | | | | | | | | | |
| 385 | | | | | | | | | | | | |

Outlier Tests for Selected Uncensored Variables

User Selected Options

| | |
|---|---|
| Date/Time of Computation | ProUCL 5.2 2023-12-13 9:19:06 AM |
| From File | 2023-IntermediateProUCL-1_j.xls |
| Full Precision | OFF |

12-IN

Rosner's Outlier Test for pH ()

| | |
|---|---|
| Mean | 7.865 |
| Standard Deviation | 0.293 |
| Number of data | 40 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 7.865 | 0.29 | 8.41 | 31 | 1.883 | 3.04 | 3.38 |

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 | 0.544 |
| Number of data | 40 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.934 | 0.537 | 2.9 | 1 | 3.661 | 3.04 | 3.38 |

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 | 74.69 |
| Standard Deviation | 8.296 |
| Number of data | 28 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | 1 | 74.69 | 8.146 | 56.8 | 17 | 2.196 | 2.88 | 3.2 | | | | |
| 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 | 0.545 | | | | | | | | |
| 65 | | | Standard Deviation | 0.588 | | | | | | | | |
| 66 | | | Number of data | 27 | | | | | | | | |
| 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 | 0.545 | 0.577 | 1.91 | 23 | 2.365 | 2.86 | 3.18 | | | | |
| 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 | Rosner's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 81 | | | Mean | 0.711 | | | | | | | | |
| 82 | | | Standard Deviation | 0.333 | | | | | | | | |
| 83 | | | Number of data | 27 | | | | | | | | |
| 84 | | | Number of suspected outliers | 1 | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 87 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 88 | 1 | 0.711 | 0.327 | 1.69 | 2 | 2.997 | 2.86 | 3.18 | | | | |
| 89 | | | | | | | | | | | | |
| 90 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 91 | Potential outliers is: 1.69 | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | |
| 96 | Rosner's Outlier Test for Total Dissolved Solids (mg/L) | | | | | | | | | | | |
| 97 | | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | | | Mean | 385.6 | | | | | | | | |
| 100 | | | Standard Deviation | 51.77 | | | | | | | | |
| 101 | | | Number of data | 40 | | | | | | | | |
| 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 | 385.6 | 51.12 | 208 | 8 | 3.473 | 3.04 | 3.38 | | | | |

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 | 86.48 |
| Standard Deviation | 13.13 |
| Number of data | 40 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 86.48 | 12.96 | 56.2 | 3 | 2.336 | 3.04 | 3.38 |

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 | 3.001 |
| Number of data | 40 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 19.82 | 2.964 | 13.1 | 1 | 2.268 | 3.04 | 3.38 |

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 | 29.66 |
| Standard Deviation | 9.074 |
| Number of data | 40 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 29.66 | 8.96 | 57.5 | 3 | 3.107 | 3.04 | 3.38 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 57.5

For 1% Significance Level, there is no Potential Outlier

## Rosner's Outlier Test for Bicarbonate (mg/L)

| | |
|---|---|
| Mean | 361.6 |
| Standard Deviation | 39.86 |
| Number of data | 39 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 361.6 | 39.35 | 236.5 | 8 | 3.178 | 3.03 | 3.37 |

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 | 0.0027 |
| Standard Deviation | 0.00308 |
| Number of data | 39 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.0027 | 0.00304 | 0.0106 | 35 | 2.593 | 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 | 5.3470E-4 |
| Standard Deviation | 7.9712E-4 |
| Number of data | 39 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 5.3470E-4 | 7.8683E-4 | 0.003 | 8 | 3.133 | 3.03 | 3.37 |

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 | 0.00998 |
| Standard Deviation | 0.0156 |
| Number of data | 39 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00998 | 0.0154 | 0.0726 | 23 | 4.067 | 3.03 | 3.37 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0726

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.0726

## Rosner's Outlier Test for Lead (mg/L)

| | |
|---|---|
| Mean | 0.00127 |
| Standard Deviation | 0.00108 |
| Number of data | 38 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00127 | 0.00107 | 0.00539 | 27 | 3.868 | 3.01 | 3.36 |

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 | 0.137 |
| Standard Deviation | 0.309 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 267 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 268 | 1 | 0.137 | 0.303 | 1.52 | 11 | 4.56 | 2.89 | 3.22 | | | | |
| 269 | | | | | | | | | | | | |
| 270 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 271 | Potential outliers is: 1.52 | | | | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 274 | Potential outliers is: 1.52 | | | | | | | | | | | |
| 275 | | | | | | | | | | | | |
| 276 | | | | | | | | | | | | |
| 277 | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 278 | | | | | | | | | | | | |
| 279 | | | | | | | | | | | | |
| 280 | Mean | 0.322 | | | | | | | | | | |
| 281 | Standard Deviation | 0.385 | | | | | | | | | | |
| 282 | Number of data | 29 | | | | | | | | | | |
| 283 | Number of suspected outliers | 1 | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 286 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 287 | 1 | 0.322 | 0.378 | 1.19 | 16 | 2.296 | 2.89 | 3.22 | | | | |
| 288 | | | | | | | | | | | | |
| 289 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 292 | | | | | | | | | | | | |
| 293 | | | | | | | | | | | | |
| 294 | Dixon's Outlier Test for Total Organic Carbon (mg/L) | | | | | | | | | | | |
| 295 | | | | | | | | | | | | |
| 296 | Number of Observations = 22 | | | | | | | | | | | |
| 297 | 10% critical value: 0.382 | | | | | | | | | | | |
| 298 | 5% critical value: 0.43 | | | | | | | | | | | |
| 299 | 1% critical value: 0.514 | | | | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | 1. Observation Value 4 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | Test Statistic: 0.053 | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | For 10% significance level, 4 is not an outlier. | | | | | | | | | | | |
| 306 | For 5% significance level, 4 is not an outlier. | | | | | | | | | | | |
| 307 | For 1% significance level, 4 is not an outlier. | | | | | | | | | | | |
| 308 | | | | | | | | | | | | |
| 309 | 2. Observation Value 1.4 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | Test Statistic: 0.280 | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | For 10% significance level, 1.4 is not an outlier. | | | | | | | | | | | |
| 314 | For 5% significance level, 1.4 is not an outlier. | | | | | | | | | | | |
| 315 | For 1% significance level, 1.4 is not an outlier. | | | | | | | | | | | |
| 316 | | | | | | | | | | | | |
| 317 | | | | | | | | | | | | |
| 318 | Dixon's Outlier Test for Dissolved Organic Carbon (mg/L) | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | | | | | | | | |
| 320 | Number of Observations = 17 | | | | | | | | | | | |
| 321 | 10% critical value: 0.438 | | | | | | | | | | | |
| 322 | 5% critical value: 0.49 | | | | | | | | | | | |
| 323 | 1% critical value: 0.577 | | | | | | | | | | | |
| 324 | | | | | | | | | | | | |
| 325 | 1. Observation Value 4.8 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | Test Statistic: 0.107 | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | For 10% significance level, 4.8 is not an outlier. | | | | | | | | | | | |
| 330 | For 5% significance level, 4.8 is not an outlier. | | | | | | | | | | | |
| 331 | For 1% significance level, 4.8 is not an outlier. | | | | | | | | | | | |
| 332 | | | | | | | | | | | | |
| 333 | 2. Observation Value 1.9 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | Test Statistic: 0.038 | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | For 10% significance level, 1.9 is not an outlier. | | | | | | | | | | | |
| 338 | For 5% significance level, 1.9 is not an outlier. | | | | | | | | | | | |
| 339 | For 1% significance level, 1.9 is not an outlier. | | | | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | | | | | | | | | | | | |
| 342 | Dixon's Outlier Test for Dissolved Chromium (mg/L) | | | | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | Number of Observations = 15 | | | | | | | | | | | |
| 345 | 10% critical value: 0.472 | | | | | | | | | | | |
| 346 | 5% critical value: 0.525 | | | | | | | | | | | |
| 347 | 1% critical value: 0.616 | | | | | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | 1. Observation Value 0.028 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | Test Statistic: 0.778 | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | For 10% significance level, 0.028 is an outlier. | | | | | | | | | | | |
| 354 | For 5% significance level, 0.028 is an outlier. | | | | | | | | | | | |
| 355 | For 1% significance level, 0.028 is an outlier. | | | | | | | | | | | |
| 356 | | | | | | | | | | | | |
| 357 | 2. Observation Value 0.00012 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 358 | | | | | | | | | | | | |
| 359 | Test Statistic: 0.128 | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | For 10% significance level, 0.00012 is not an outlier. | | | | | | | | | | | |
| 362 | For 5% significance level, 0.00012 is not an outlier. | | | | | | | | | | | |
| 363 | For 1% significance level, 0.00012 is not an outlier. | | | | | | | | | | | |
| 364 | | | | | | | | | | | | |
| 365 | | | | | | | | | | | | |
| 366 | Dixon's Outlier Test for Dissolved Mercury (mg/L) | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |
| 368 | Number of Observations = 3 | | | | | | | | | | | |
| 369 | 10% critical value: 0.886 | | | | | | | | | | | |
| 370 | 5% critical value: 0.941 | | | | | | | | | | | |
| 371 | 1% critical value: 0.988 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | | | | | | | | |
| 373 | 1. Observation Value 0.00012 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | Test Statistic: 0.306 | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | For 10% significance level, 0.00012 is not an outlier. | | | | | | | | | | | |
| 378 | For 5% significance level, 0.00012 is not an outlier. | | | | | | | | | | | |
| 379 | For 1% significance level, 0.00012 is not an outlier. | | | | | | | | | | | |
| 380 | | | | | | | | | | | | |
| 381 | 2. Observation Value 2.21E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 382 | | | | | | | | | | | | |
| 383 | Test Statistic: 0.694 | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | For 10% significance level, 2.21E-05 is not an outlier. | | | | | | | | | | | |
| 386 | For 5% significance level, 2.21E-05 is not an outlier. | | | | | | | | | | | |
| 387 | For 1% significance level, 2.21E-05 is not an outlier. | | | | | | | | | | | |
| 388 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| 2 | | | User Selected Options | | | | | | | | |
| 3 | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:20:25 AM | | | | | | | | |
| 4 | | | From File | 2023-IntermediateProUCL-1_k.xls | | | | | | | |
| 5 | | | Full Precision | OFF | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | 13-IN | | | | | | | |
| 8 | | | | Rosner's Outlier Test for pH () | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | Mean | 7.86 | | | | | | | |
| 12 | | | Standard Deviation | 0.276 | | | | | | | |
| 13 | | | Number of data | 36 | | | | | | | |
| 14 | | | Number of suspected outliers | 1 | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 17 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 18 | 1 | 7.86 | 0.273 | 7.33 | 7 | 1.943 | 2.99 | 3.33 | | | |
| 19 | | | | | | | | | | | |
| 20 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 21 | | | | | | | | | | | |
| 22 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 23 | | | | | | | | | | | |
| 24 | | | | | | | | | | | |
| 25 | | | | Rosner's Outlier Test for Chloride (mg/L) | | | | | | | |
| 26 | | | | | | | | | | | |
| 27 | | | | | | | | | | | |
| 28 | | | Mean | 0.791 | | | | | | | |
| 29 | | | Standard Deviation | 0.369 | | | | | | | |
| 30 | | | Number of data | 36 | | | | | | | |
| 31 | | | Number of suspected outliers | 1 | | | | | | | |
| 32 | | | | | | | | | | | |
| 33 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 34 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 35 | 1 | 0.791 | 0.364 | 2 | 16 | 3.321 | 2.99 | 3.33 | | | |
| 36 | | | | | | | | | | | |
| 37 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | |
| 38 | Potential outliers is: 2 | | | | | | | | | | |
| 39 | | | | | | | | | | | |
| 40 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | |
| 41 | | | | | | | | | | | |
| 42 | | | | | | | | | | | |
| 43 | | | | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | |
| 44 | | | | | | | | | | | |
| 45 | | | | | | | | | | | |
| 46 | | | Mean | 88.45 | | | | | | | |
| 47 | | | Standard Deviation | 18.53 | | | | | | | |
| 48 | | | Number of data | 30 | | | | | | | |
| 49 | | | Number of suspected outliers | 1 | | | | | | | |
| 50 | | | | | | | | | | | |
| 51 | | | | Potential | Obs. | Test | Critical | Critical | | | |
| 52 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | |
| 53 | 1 | 88.45 | 18.22 | 42.8 | 4 | 2.506 | 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 | 0.199 |
| Standard Deviation | 0.3 |
| Number of data | 28 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.199 | 0.294 | 1.4 | 10 | 4.079 | 2.88 | 3.2 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 1.4

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 1.4

## Rosner's Outlier Test for Manganese (mg/L)

| | |
|---|---|
| Mean | 0.827 |
| Standard Deviation | 0.45 |
| Number of data | 28 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.827 | 0.442 | 2.28 | 5 | 3.29 | 2.88 | 3.2 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 2.28

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 2.28

## Rosner's Outlier Test for Total Dissolved Solids (mg/L)

| | |
|---|---|
| Mean | 396.4 |
| Standard Deviation | 44.28 |
| Number of data | 36 |
| Number of suspected outliers | 1 |

| | | | Potential | Obs. | Test | Critical | Critical |
|---|---|---|---|---|---|---|---|

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 108 | 1 | 396.4 | 43.66 | 285 | 1 | 2.551 | 2.99 | 3.33 | | | | |
| 109 | | | | | | | | | | | | |
| 110 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 111 | | | | | | | | | | | | |
| 112 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 113 | | | | | | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | Rosner's Outlier Test for Calcium (mg/L) | | | | | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | | | | | | | | | | | | |
| 118 | | | Mean | 93.84 | | | | | | | | |
| 119 | | | Standard Deviation | 10.36 | | | | | | | | |
| 120 | | | Number of data | 35 | | | | | | | | |
| 121 | | | Number of suspected outliers | 1 | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 124 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 125 | 1 | 93.84 | 10.21 | 56.5 | 9 | 3.655 | 2.98 | 3.32 | | | | |
| 126 | | | | | | | | | | | | |
| 127 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 128 | Potential outliers is: 56.5 | | | | | | | | | | | |
| 129 | | | | | | | | | | | | |
| 130 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 131 | Potential outliers is: 56.5 | | | | | | | | | | | |
| 132 | | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | Rosner's Outlier Test for Magnesium (mg/L) | | | | | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | | | | | | | | |
| 137 | | | Mean | 20.95 | | | | | | | | |
| 138 | | | Standard Deviation | 2.088 | | | | | | | | |
| 139 | | | Number of data | 35 | | | | | | | | |
| 140 | | | Number of suspected outliers | 1 | | | | | | | | |
| 141 | | | | | | | | | | | | |
| 142 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 143 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 144 | 1 | 20.95 | 2.058 | 16 | 1 | 2.406 | 2.98 | 3.32 | | | | |
| 145 | | | | | | | | | | | | |
| 146 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | | | | | | | | | | | | |
| 151 | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | | | | |
| 152 | | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | | | Mean | 23.52 | | | | | | | | |
| 155 | | | Standard Deviation | 5.528 | | | | | | | | |
| 156 | | | Number of data | 35 | | | | | | | | |
| 157 | | | Number of suspected outliers | 1 | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | | | | 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 | 23.52 | 5.449 | 34.9 | 31 | 2.089 | 2.98 | 3.32 | | | | |
| 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 Bicarbonate (mg/L) | | | | | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | | | | | | | | | | | | |
| 171 | | | Mean | 346.7 | | | | | | | | |
| 172 | | | Standard Deviation | 28.4 | | | | | | | | |
| 173 | | | Number of data | 35 | | | | | | | | |
| 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 | 346.7 | 27.99 | 254 | 10 | 3.312 | 2.98 | 3.32 | | | | |
| 179 | | | | | | | | | | | | |
| 180 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 181 | Potential outliers is: 254 | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | | | | | | | | | | | | |
| 186 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 187 | | | | | | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | | | Mean | 8.2000E-4 | | | | | | | | |
| 190 | | | Standard Deviation | 0.00121 | | | | | | | | |
| 191 | | | Number of data | 35 | | | | | | | | |
| 192 | | | Number of suspected outliers | 1 | | | | | | | | |
| 193 | | | | | | | | | | | | |
| 194 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 195 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 196 | 1 | 8.2000E-4 | 0.0012 | 0.007 | 11 | 5.166 | 2.98 | 3.32 | | | | |
| 197 | | | | | | | | | | | | |
| 198 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 199 | Potential outliers is: 0.007 | | | | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 202 | Potential outliers is: 0.007 | | | | | | | | | | | |
| 203 | | | | | | | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | | | | | | | | | | | | |
| 208 | | | Mean | 0.00125 | | | | | | | | |
| 209 | | | Standard Deviation | 8.9245E-4 | | | | | | | | |
| 210 | | | Number of data | 35 | | | | | | | | |
| 211 | | | Number of suspected outliers | 1 | | | | | | | | |
| 212 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 214 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 215 | 1 | 0.00125 | 8.7961E-4 | 0.0042 | 19 | 3.349 | 2.98 | 3.32 | | | | |
| 216 | | | | | | | | | | | | |
| 217 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 218 | Potential outliers is: 0.0042 | | | | | | | | | | | |
| 219 | | | | | | | | | | | | |
| 220 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 221 | Potential outliers is: 0.0042 | | | | | | | | | | | |
| 222 | | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | | | | | |
| 225 | | | | | | | | | | | | |
| 226 | | | | | | | | | | | | |
| 227 | | | | Mean | 0.00446 | | | | | | | |
| 228 | | | | Standard Deviation | 0.00458 | | | | | | | |
| 229 | | | | Number of data | 30 | | | | | | | |
| 230 | | | | Number of suspected outliers | 1 | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 233 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 234 | 1 | 0.00446 | 0.00451 | 0.02 | 6 | 3.448 | 2.91 | 3.24 | | | | |
| 235 | | | | | | | | | | | | |
| 236 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 237 | Potential outliers is: 0.02 | | | | | | | | | | | |
| 238 | | | | | | | | | | | | |
| 239 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 240 | Potential outliers is: 0.02 | | | | | | | | | | | |
| 241 | | | | | | | | | | | | |
| 242 | | | | | | | | | | | | |
| 243 | Rosner's Outlier Test for D-Nickel (mg/L) | | | | | | | | | | | |
| 244 | | | | | | | | | | | | |
| 245 | | | | | | | | | | | | |
| 246 | | | | Mean | 0.8 | | | | | | | |
| 247 | | | | Standard Deviation | 0.407 | | | | | | | |
| 248 | | | | Number of data | 30 | | | | | | | |
| 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 | 0.8 | 0.4 | 0 | 2 | 2 | 2.91 | 3.24 | | | | |
| 254 | | | | | | | | | | | | |
| 255 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 258 | | | | | | | | | | | | |
| 259 | | | | | | | | | | | | |
| 260 | Rosner's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 261 | | | | | | | | | | | | |
| 262 | | | | | | | | | | | | |
| 263 | | | | Mean | 0.00668 | | | | | | | |
| 264 | | | | Standard Deviation | 0.0146 | | | | | | | |
| 265 | | | | Number of data | 30 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | Number of suspected outliers | | | 1 | | | | | | | | |
| 267 | | | | | | | | | | | | |
| 268 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 269 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 270 | 1 | 0.00668 | 0.0144 | 0.082 | 4 | 5.242 | 2.91 | 3.24 | | | | |
| 271 | | | | | | | | | | | | |
| 272 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 273 | Potential outliers is: 0.082 | | | | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 276 | Potential outliers is: 0.082 | | | | | | | | | | | |
| 277 | | | | | | | | | | | | |
| 278 | | | | | | | | | | | | |
| 279 | Dixon's Outlier Test for Total Organic Carbon (mg/L) | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | Number of Observations = 18 | | | | | | | | | | | |
| 282 | 10% critical value: 0.424 | | | | | | | | | | | |
| 283 | 5% critical value: 0.475 | | | | | | | | | | | |
| 284 | 1% critical value: 0.561 | | | | | | | | | | | |
| 285 | | | | | | | | | | | | |
| 286 | 1. Observation Value 3.2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 287 | | | | | | | | | | | | |
| 288 | Test Statistic: 0.400 | | | | | | | | | | | |
| 289 | | | | | | | | | | | | |
| 290 | For 10% significance level, 3.2 is not an outlier. | | | | | | | | | | | |
| 291 | For 5% significance level, 3.2 is not an outlier. | | | | | | | | | | | |
| 292 | For 1% significance level, 3.2 is not an outlier. | | | | | | | | | | | |
| 293 | | | | | | | | | | | | |
| 294 | 2. Observation Value 1 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 295 | | | | | | | | | | | | |
| 296 | Test Statistic: 0.143 | | | | | | | | | | | |
| 297 | | | | | | | | | | | | |
| 298 | For 10% significance level, 1 is not an outlier. | | | | | | | | | | | |
| 299 | For 5% significance level, 1 is not an outlier. | | | | | | | | | | | |
| 300 | For 1% significance level, 1 is not an outlier. | | | | | | | | | | | |
| 301 | | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | Dixon's Outlier Test for Dissolved Organic Carbon (mg/L) | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | Number of Observations = 18 | | | | | | | | | | | |
| 306 | 10% critical value: 0.424 | | | | | | | | | | | |
| 307 | 5% critical value: 0.475 | | | | | | | | | | | |
| 308 | 1% critical value: 0.561 | | | | | | | | | | | |
| 309 | | | | | | | | | | | | |
| 310 | 1. Observation Value 4.2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 311 | | | | | | | | | | | | |
| 312 | Test Statistic: 0.115 | | | | | | | | | | | |
| 313 | | | | | | | | | | | | |
| 314 | For 10% significance level, 4.2 is not an outlier. | | | | | | | | | | | |
| 315 | For 5% significance level, 4.2 is not an outlier. | | | | | | | | | | | |
| 316 | For 1% significance level, 4.2 is not an outlier. | | | | | | | | | | | |
| 317 | | | | | | | | | | | | |
| 318 | 2. Observation Value 1.3 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | | | | | | | | |
| 320 | Test Statistic: 0.115 | | | | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | For 10% significance level, 1.3 is not an outlier. | | | | | | | | | | | |
| 323 | For 5% significance level, 1.3 is not an outlier. | | | | | | | | | | | |
| 324 | For 1% significance level, 1.3 is not an outlier. | | | | | | | | | | | |
| 325 | | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | Dixon's Outlier Test for Dissolved Cadmium (mg/L) | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | Number of Observations = 15 | | | | | | | | | | | |
| 330 | 10% critical value: 0.472 | | | | | | | | | | | |
| 331 | 5% critical value: 0.525 | | | | | | | | | | | |
| 332 | 1% critical value: 0.616 | | | | | | | | | | | |
| 333 | | | | | | | | | | | | |
| 334 | 1. Observation Value 0.0003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 335 | | | | | | | | | | | | |
| 336 | Test Statistic: 0.959 | | | | | | | | | | | |
| 337 | | | | | | | | | | | | |
| 338 | For 10% significance level, 0.0003 is an outlier. | | | | | | | | | | | |
| 339 | For 5% significance level, 0.0003 is an outlier. | | | | | | | | | | | |
| 340 | For 1% significance level, 0.0003 is an outlier. | | | | | | | | | | | |
| 341 | | | | | | | | | | | | |
| 342 | 2. Observation Value 6.3E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | Test Statistic: 0.117 | | | | | | | | | | | |
| 345 | | | | | | | | | | | | |
| 346 | For 10% significance level, 6.3E-06 is not an outlier. | | | | | | | | | | | |
| 347 | For 5% significance level, 6.3E-06 is not an outlier. | | | | | | | | | | | |
| 348 | For 1% significance level, 6.3E-06 is not an outlier. | | | | | | | | | | | |
| 349 | | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | Dixon's Outlier Test for Dissolved Chromium (mg/L) | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | Number of Observations = 10 | | | | | | | | | | | |
| 354 | 10% critical value: 0.409 | | | | | | | | | | | |
| 355 | 5% critical value: 0.477 | | | | | | | | | | | |
| 356 | 1% critical value: 0.597 | | | | | | | | | | | |
| 357 | | | | | | | | | | | | |
| 358 | 1. Observation Value 0.036 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 359 | | | | | | | | | | | | |
| 360 | Test Statistic: 0.418 | | | | | | | | | | | |
| 361 | | | | | | | | | | | | |
| 362 | For 10% significance level, 0.036 is an outlier. | | | | | | | | | | | |
| 363 | For 5% significance level, 0.036 is not an outlier. | | | | | | | | | | | |
| 364 | For 1% significance level, 0.036 is not an outlier. | | | | | | | | | | | |
| 365 | | | | | | | | | | | | |
| 366 | 2. Observation Value 0.00011 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |
| 368 | Test Statistic: 0.000 | | | | | | | | | | | |
| 369 | | | | | | | | | | | | |
| 370 | For 10% significance level, 0.00011 is not an outlier. | | | | | | | | | | | |
| 371 | For 5% significance level, 0.00011 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | For 1% significance level, 0.00011 is not an outlier. | | | | | | | | | | | |
| 373 | | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | Dixon's Outlier Test for Dissolved Lead (mg/L) | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | Number of Observations = 3 | | | | | | | | | | | |
| 378 | 10% critical value: 0.886 | | | | | | | | | | | |
| 379 | 5% critical value: 0.941 | | | | | | | | | | | |
| 380 | 1% critical value: 0.988 | | | | | | | | | | | |
| 381 | | | | | | | | | | | | |
| 382 | 1. Observation Value 0.0006 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 383 | | | | | | | | | | | | |
| 384 | Test Statistic: 0.979 | | | | | | | | | | | |
| 385 | | | | | | | | | | | | |
| 386 | For 10% significance level, 0.0006 is an outlier. | | | | | | | | | | | |
| 387 | For 5% significance level, 0.0006 is an outlier. | | | | | | | | | | | |
| 388 | For 1% significance level, 0.0006 is not an outlier. | | | | | | | | | | | |
| 389 | | | | | | | | | | | | |
| 390 | 2. Observation Value 0.000161 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 391 | | | | | | | | | | | | |
| 392 | Test Statistic: 0.021 | | | | | | | | | | | |
| 393 | | | | | | | | | | | | |
| 394 | For 10% significance level, 0.000161 is not an outlier. | | | | | | | | | | | |
| 395 | For 5% significance level, 0.000161 is not an outlier. | | | | | | | | | | | |
| 396 | For 1% significance level, 0.000161 is not an outlier. | | | | | | | | | | | |
| 397 | | | | | | | | | | | | |
| 398 | | | | | | | | | | | | |
| 399 | Dixon's Outlier Test for Dissolved Mercury (mg/L) | | | | | | | | | | | |
| 400 | | | | | | | | | | | | |
| 401 | Number of Observations = 3 | | | | | | | | | | | |
| 402 | 10% critical value: 0.886 | | | | | | | | | | | |
| 403 | 5% critical value: 0.941 | | | | | | | | | | | |
| 404 | 1% critical value: 0.988 | | | | | | | | | | | |
| 405 | | | | | | | | | | | | |
| 406 | 1. Observation Value 5E-05 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 407 | | | | | | | | | | | | |
| 408 | Test Statistic: 0.082 | | | | | | | | | | | |
| 409 | | | | | | | | | | | | |
| 410 | For 10% significance level, 5E-05 is not an outlier. | | | | | | | | | | | |
| 411 | For 5% significance level, 5E-05 is not an outlier. | | | | | | | | | | | |
| 412 | For 1% significance level, 5E-05 is not an outlier. | | | | | | | | | | | |
| 413 | | | | | | | | | | | | |
| 414 | 2. Observation Value 5E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 415 | | | | | | | | | | | | |
| 416 | Test Statistic: 0.918 | | | | | | | | | | | |
| 417 | | | | | | | | | | | | |
| 418 | For 10% significance level, 5E-06 is an outlier. | | | | | | | | | | | |
| 419 | For 5% significance level, 5E-06 is not an outlier. | | | | | | | | | | | |
| 420 | For 1% significance level, 5E-06 is not an outlier. | | | | | | | | | | | |
| 421 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:23:32 AM | | | | | | | | |
| | | | From File | 2023-IntermediateProUCL-1_I.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 15-IN | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.859 | | | | | | | |
| | | | Standard Deviation | 0.319 | | | | | | | |
| | | | Number of data | 29 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 7.859 | 0.314 | | 7.04 | 4 | 2.609 | 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 Chloride (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 0.803 | | | | | | | |
| | | | Standard Deviation | 0.548 | | | | | | | |
| | | | Number of data | 29 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |
| 1 | 0.803 | 0.539 | | 3.1 | 1 | 4.261 | 2.89 | 3.22 | | | |
| | | | | | | | | | | | |
| 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 | 54.35 | | | | | | | |
| | | | Standard Deviation | 30.26 | | | | | | | |
| | | | Number of data | 29 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | value (1%) | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | 1 | 54.35 | 29.74 | 144 | 1 | 3.015 | 2.89 | 3.22 | | | | |
| 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 | 0.632 | | | | | | | | | | |
| 66 | Standard Deviation | 0.281 | | | | | | | | | | |
| 67 | Number of data | 27 | | | | | | | | | | |
| 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 | 0.632 | 0.276 | 1.28 | 17 | 2.354 | 2.86 | 3.18 | | | | |
| 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 | 412.8 | | | | | | | | | | |
| 83 | Standard Deviation | 51.19 | | | | | | | | | | |
| 84 | Number of data | 29 | | | | | | | | | | |
| 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 | 412.8 | 50.3 | 317 | 17 | 1.905 | 2.89 | 3.22 | | | | |
| 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 | 94.69 | | | | | | | | | | |
| 100 | Standard Deviation | 11.68 | | | | | | | | | | |
| 101 | Number of data | 29 | | | | | | | | | | |
| 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 | 94.69 | 11.47 | 121 | 2 | 2.293 | 2.89 | 3.22 | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | | | | | | | | |
| 108 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 109 | | | | | | | | | | | | |
| 110 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 111 | | | | | | | | | | | | |
| 112 | | | | | | | | | | | | |
| 113 | | | | Rosner's Outlier Test for Magnesium (mg/L) | | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | | | | | | | | | |
| 116 | | | | Mean | 21.54 | | | | | | | |
| 117 | | | | Standard Deviation | 2.514 | | | | | | | |
| 118 | | | | Number of data | 29 | | | | | | | |
| 119 | | | | Number of suspected outliers | 1 | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 122 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 123 | 1 | 21.54 | 2.47 | 15.6 | 15 | 2.404 | 2.89 | 3.22 | | | | |
| 124 | | | | | | | | | | | | |
| 125 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | | | | | | | | |
| 130 | | | | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | |
| 131 | | | | | | | | | | | | |
| 132 | | | | | | | | | | | | |
| 133 | | | | Mean | 31.1 | | | | | | | |
| 134 | | | | Standard Deviation | 5.881 | | | | | | | |
| 135 | | | | Number of data | 29 | | | | | | | |
| 136 | | | | Number of suspected outliers | 1 | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 139 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 140 | 1 | 31.1 | 5.779 | 17.5 | 17 | 2.353 | 2.89 | 3.22 | | | | |
| 141 | | | | | | | | | | | | |
| 142 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 145 | | | | | | | | | | | | |
| 146 | | | | | | | | | | | | |
| 147 | | | | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | |
| 148 | | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | | | | Mean | 413.9 | | | | | | | |
| 151 | | | | Standard Deviation | 22.58 | | | | | | | |
| 152 | | | | Number of data | 29 | | | | | | | |
| 153 | | | | Number of suspected outliers | 1 | | | | | | | |
| 154 | | | | | | | | | | | | |
| 155 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 156 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 157 | 1 | 413.9 | 22.18 | 339 | 1 | 3.378 | 2.89 | 3.22 | | | | |
| 158 | | | | | | | | | | | | |
| 159 | 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 | 3.4793E-4 |
| Standard Deviation | 2.1551E-4 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 3.4793E-4 | 2.1176E-4 | 0.001 | 14 | 3.079 | 2.89 | 3.22 |

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 | 2.3270E-4 |
| Standard Deviation | 5.6358E-4 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 2.3270E-4 | 5.5378E-4 | 0.003 | 1 | 4.997 | 2.89 | 3.22 |

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 | 0.00279 |
| Standard Deviation | 0.00206 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | 1 | 0.00279 | 0.00202 | 0.01 | 6 | 3.566 | 2.89 | 3.22 | | | | |
| 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 | 0.013 | | | | | | | | | | |
| 226 | Standard Deviation | 0.0166 | | | | | | | | | | |
| 227 | Number of data | 29 | | | | | | | | | | |
| 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 | 0.013 | 0.0163 | 0.092 | 4 | 4.83 | 2.89 | 3.22 | | | | |
| 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 | 0.00508 | | | | | | | | | | |
| 245 | Standard Deviation | 0.00544 | | | | | | | | | | |
| 246 | Number of data | 29 | | | | | | | | | | |
| 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 | 0.00508 | 0.00534 | 0.026 | 6 | 3.917 | 2.89 | 3.22 | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 = 17 | | | | | | | | | | | |
| 287 | 10% critical value: 0.438 | | | | | | | | | | | |
| 288 | 5% critical value: 0.49 | | | | | | | | | | | |
| 289 | 1% critical value: 0.577 | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | 1. Observation Value 6.8 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 292 | | | | | | | | | | | | |
| 293 | Test Statistic: 0.150 | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | Test Statistic: 0.300 | | | | | | | | | | | |
| 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 | | | | | | | | | | | | |
| 307 | | | | | | | | | | | | |
| 308 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 309 | | | | | | | | | | | | |
| 310 | Number of Observations = 11 | | | | | | | | | | | |
| 311 | 10% critical value: 0.517 | | | | | | | | | | | |
| 312 | 5% critical value: 0.576 | | | | | | | | | | | |
| 313 | 1% critical value: 0.679 | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | 1. Observation Value 0.42 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 316 | | | | | | | | | | | | |
| 317 | Test Statistic: 0.366 | | | | | | | | | | | |
| 318 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | For 10% significance level, 0.42 is not an outlier. | | | | | | | | | | | |
| 320 | For 5% significance level, 0.42 is not an outlier. | | | | | | | | | | | |
| 321 | For 1% significance level, 0.42 is not an outlier. | | | | | | | | | | | |
| 322 | | | | | | | | | | | | |
| 323 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 324 | | | | | | | | | | | | |
| 325 | Test Statistic: 0.000 | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 328 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 329 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | Dixon's Outlier Test for Dissolved Chromium (mg/L) | | | | | | | | | | | |
| 333 | | | | | | | | | | | | |
| 334 | Number of Observations = 14 | | | | | | | | | | | |
| 335 | 10% critical value: 0.492 | | | | | | | | | | | |
| 336 | 5% critical value: 0.546 | | | | | | | | | | | |
| 337 | 1% critical value: 0.641 | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | 1. Observation Value 0.032 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | Test Statistic: 0.691 | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | For 10% significance level, 0.032 is an outlier. | | | | | | | | | | | |
| 344 | For 5% significance level, 0.032 is an outlier. | | | | | | | | | | | |
| 345 | For 1% significance level, 0.032 is an outlier. | | | | | | | | | | | |
| 346 | | | | | | | | | | | | |
| 347 | 2. Observation Value 0.00011 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | Test Statistic: 0.007 | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | For 10% significance level, 0.00011 is not an outlier. | | | | | | | | | | | |
| 352 | For 5% significance level, 0.00011 is not an outlier. | | | | | | | | | | | |
| 353 | For 1% significance level, 0.00011 is not an outlier. | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | | | | | | | | | | | | |
| 356 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 357 | | | | | | | | | | | | |
| 358 | Dixon's Outlier Test for Dissolved Mercury (mg/L) | | | | | | | | | | | |
| 359 | | | | | | | | | | | | |
| 360 | Number of Observations = 3 | | | | | | | | | | | |
| 361 | 10% critical value: 0.886 | | | | | | | | | | | |
| 362 | 5% critical value: 0.941 | | | | | | | | | | | |
| 363 | 1% critical value: 0.988 | | | | | | | | | | | |
| 364 | | | | | | | | | | | | |
| 365 | 1. Observation Value 5E-05 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | Test Statistic: 0.000 | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |
| 369 | For 10% significance level, 5E-05 is not an outlier. | | | | | | | | | | | |
| 370 | For 5% significance level, 5E-05 is not an outlier. | | | | | | | | | | | |
| 371 | For 1% significance level, 5E-05 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | | | | | | | | |
| 373 | 2. Observation Value 3.48E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | Test Statistic: 1.000 | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | For 10% significance level, 3.48E-05 is an outlier. | | | | | | | | | | | |
| 378 | For 5% significance level, 3.48E-05 is an outlier. | | | | | | | | | | | |
| 379 | For 1% significance level, 3.48E-05 is an outlier. | | | | | | | | | | | |
| 380 | | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:30:04 AM | | | | | | | | |
| | | | From File | 2023-IntermediateProUCL-1_m.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 16-IN | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.935 | | | | | | | |
| | | | Standard Deviation | 0.264 | | | | | | | |
| | | | Number of data | 26 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | 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 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | 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 | | | | | | | |
| | | | | | | | | | | | |
| | | | | Potential | Obs. | Test | Critical | Critical | | | |
| # | Mean | sd | | outlier | Number | value | value (5%) | 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 Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 | | | | | | | | | | | | |

## Rosner's Outlier Test for Total Dissolved Solids (mg/L)

| | |
|---|---|
| Mean | 487.3 |
| Standard Deviation | 25.48 |
| Number of data | 26 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 487.3 | 24.98 | 560 | 4 | 2.911 | 2.84 | 3.16 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 560

For 1% Significance Level, there is no Potential Outlier

## Rosner's Outlier Test for Calcium (mg/L)

| | |
|---|---|
| Mean | 110.1 |
| Standard Deviation | 9.794 |
| Number of data | 26 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 110.1 | 9.604 | 88.2 | 10 | 2.277 | 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 | 27.14 |
| Standard Deviation | 2.016 |
| Number of data | 26 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 27.14 | 1.977 | 32.8 | 4 | 2.861 | 2.84 | 3.16 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 32.8

For 1% Significance Level, there is no Potential Outlier

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | | | | | | | | |
| 161 | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | | | | |
| 162 | | | | | | | | | | | | |
| 163 | | | | | | | | | | | | |
| 164 | | | | Mean | 35.12 | | | | | | | |
| 165 | | | | Standard Deviation | 7.522 | | | | | | | |
| 166 | | | | Number of data | 26 | | | | | | | |
| 167 | | | | Number of suspected outliers | 1 | | | | | | | |
| 168 | | | | | | | | | | | | |
| 169 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 170 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 171 | 1 | 35.12 | 7.376 | 50 | 5 | 2.018 | 2.84 | 3.16 | | | | |
| 172 | | | | | | | | | | | | |
| 173 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 174 | | | | | | | | | | | | |
| 175 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 179 | | | | | | | | | | | | |
| 180 | | | | | | | | | | | | |
| 181 | | | | Mean | 463.5 | | | | | | | |
| 182 | | | | Standard Deviation | 20.7 | | | | | | | |
| 183 | | | | Number of data | 26 | | | | | | | |
| 184 | | | | Number of suspected outliers | 1 | | | | | | | |
| 185 | | | | | | | | | | | | |
| 186 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 187 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 188 | 1 | 463.5 | 20.29 | 512 | 25 | 2.39 | 2.84 | 3.16 | | | | |
| 189 | | | | | | | | | | | | |
| 190 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 191 | | | | | | | | | | | | |
| 192 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 193 | | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 196 | | | | | | | | | | | | |
| 197 | | | | | | | | | | | | |
| 198 | | | | Mean | 4.4538E-4 | | | | | | | |
| 199 | | | | Standard Deviation | 3.9163E-4 | | | | | | | |
| 200 | | | | Number of data | 26 | | | | | | | |
| 201 | | | | Number of suspected outliers | 1 | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 204 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 205 | 1 | 4.4538E-4 | 3.8403E-4 | 0.00152 | 16 | 2.798 | 2.84 | 3.16 | | | | |
| 206 | | | | | | | | | | | | |
| 207 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | Rosner's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | 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 Tail)?

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 Tail)?

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 Tail)? | | | | | | | | | | | |
| 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 | | | | | | | | | | | | |
| 335 | | | | | | | | | | | | |
| 336 | Dixon's Outlier Test for Dissolved Chromium (mg/L) | | | | | | | | | | | |
| 337 | | | | | | | | | | | | |
| 338 | Number of Observations = 12 | | | | | | | | | | | |
| 339 | 10% critical value: 0.49 | | | | | | | | | | | |
| 340 | 5% critical value: 0.546 | | | | | | | | | | | |
| 341 | 1% critical value: 0.642 | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | 1. Observation Value 0.041 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 344 | | | | | | | | | | | | |
| 345 | Test Statistic: 0.910 | | | | | | | | | | | |
| 346 | | | | | | | | | | | | |
| 347 | For 10% significance level, 0.041 is an outlier. | | | | | | | | | | | |
| 348 | For 5% significance level, 0.041 is an outlier. | | | | | | | | | | | |
| 349 | For 1% significance level, 0.041 is an outlier. | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | 2. Observation Value 0.00016 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | Test Statistic: 0.062 | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | For 10% significance level, 0.00016 is not an outlier. | | | | | | | | | | | |
| 356 | For 5% significance level, 0.00016 is not an outlier. | | | | | | | | | | | |
| 357 | For 1% significance level, 0.00016 is not an outlier. | | | | | | | | | | | |
| 358 | | | | | | | | | | | | |
| 359 | | | | | | | | | | | | |
| 360 | Dixon's Outlier Test for Dissolved Lead (mg/L) | | | | | | | | | | | |
| 361 | | | | | | | | | | | | |
| 362 | Number of Observations = 4 | | | | | | | | | | | |
| 363 | 10% critical value: 0.679 | | | | | | | | | | | |
| 364 | 5% critical value: 0.765 | | | | | | | | | | | |
| 365 | 1% critical value: 0.889 | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | 1. Observation Value 0.0005 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |
| 369 | Test Statistic: 0.248 | | | | | | | | | | | |
| 370 | | | | | | | | | | | | |
| 371 | For 10% significance level, 0.0005 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | For 5% significance level, 0.0005 is not an outlier. | | | | | | | | | | | |
| 373 | For 1% significance level, 0.0005 is not an outlier. | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | 2. Observation Value 9.6E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | Test Statistic: 0.752 | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | For 10% significance level, 9.6E-05 is an outlier. | | | | | | | | | | | |
| 380 | For 5% significance level, 9.6E-05 is not an outlier. | | | | | | | | | | | |
| 381 | For 1% significance level, 9.6E-05 is not an outlier. | | | | | | | | | | | |
| 382 | | | | | | | | | | | | |
| 383 | | | | | | | | | | | | |
| 384 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | User Selected Options | | | | | | | | | |
| | Date/Time of Computation | | ProUCL 5.2 2023-12-13 9:31:40 AM | | | | | | | | |
| | | From File | 2023-IntermediateProUCL-1_n.xls | | | | | | | | |
| | | Full Precision | OFF | | | | | | | | |
| | | | | | | | | | | | |
| | | | 17-IN | | | | | | | | |
| | | | Rosner's Outlier Test for pH () | | | | | | | | |
| | | | | | | | | | | | |
| | | Mean | 7.81 | | | | | | | | |
| | | Standard Deviation | 0.342 | | | | | | | | |
| | | Number of data | 29 | | | | | | | | |
| | | Number of suspected outliers | 1 | | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 7.81 | 0.337 | 7.05 | 3 | 2.258 | 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 Sulphate (mg/L) | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | Mean | 54.93 | | | | | | | | |
| | | Standard Deviation | 9.845 | | | | | | | | |
| | | Number of data | 29 | | | | | | | | |
| | | Number of suspected outliers | 1 | | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 54.93 | 9.674 | 77.5 | 21 | 2.333 | 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 | 0.561 | | | | | | | | |
| | | Standard Deviation | 0.241 | | | | | | | | |
| | | Number of data | 27 | | | | | | | | |
| | | Number of suspected outliers | 1 | | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 0.561 | 0.236 | 1.08 | 3 | 2.197 | 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 | 457.9 |
| Standard Deviation | 19.31 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 457.9 | 18.98 | 501 | 21 | 2.271 | 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 Calcium (mg/L)**

| | |
|---|---|
| Mean | 108.2 |
| Standard Deviation | 7.761 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 108.2 | 7.626 | 93 | 1 | 1.987 | 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 Magnesium (mg/L)**

| | |
|---|---|
| Mean | 24.17 |
| Standard Deviation | 1.687 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 24.17 | 1.658 | 28.8 | 21 | 2.792 | 2.89 | 3.22 |

For 5% Significance Level, there is no Potential Outlier

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 108 | | | | | | | | | | | | |
| 109 | | | | | | | | | | | | |
| 110 | Rosner's Outlier Test for Sodium (mg/L) | | | | | | | | | | | |
| 111 | | | | | | | | | | | | |
| 112 | | | | | | | | | | | | |
| 113 | | | Mean | 30.23 | | | | | | | | |
| 114 | | | Standard Deviation | 3.417 | | | | | | | | |
| 115 | | | Number of data | 29 | | | | | | | | |
| 116 | | | Number of suspected outliers | 1 | | | | | | | | |
| 117 | | | | | | | | | | | | |
| 118 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 119 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 120 | 1 | 30.23 | 3.358 | 37.6 | 23 | 2.194 | 2.89 | 3.22 | | | | |
| 121 | | | | | | | | | | | | |
| 122 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 123 | | | | | | | | | | | | |
| 124 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 125 | | | | | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | | | | | | | | |
| 130 | | | Mean | 473.1 | | | | | | | | |
| 131 | | | Standard Deviation | 20.39 | | | | | | | | |
| 132 | | | Number of data | 29 | | | | | | | | |
| 133 | | | Number of suspected outliers | 1 | | | | | | | | |
| 134 | | | | | | | | | | | | |
| 135 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 136 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 137 | 1 | 473.1 | 20.04 | 423 | 20 | 2.501 | 2.89 | 3.22 | | | | |
| 138 | | | | | | | | | | | | |
| 139 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 140 | | | | | | | | | | | | |
| 141 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 142 | | | | | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | Rosner's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 145 | | | | | | | | | | | | |
| 146 | | | | | | | | | | | | |
| 147 | | | Mean | 3.6931E-4 | | | | | | | | |
| 148 | | | Standard Deviation | 2.2058E-4 | | | | | | | | |
| 149 | | | Number of data | 29 | | | | | | | | |
| 150 | | | Number of suspected outliers | 1 | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 153 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 154 | 1 | 3.6931E-4 | 2.1675E-4 | 0.00106 | 19 | 3.187 | 2.89 | 3.22 | | | | |
| 155 | | | | | | | | | | | | |
| 156 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 157 | Potential outliers is: 0.00106 | | | | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | | | | | | | | |
| 161 | | | | | | | | | | | | |
| 162 | | | | Rosner's Outlier Test for Cadmium (mg/L) | | | | | | | | |
| 163 | | | | | | | | | | | | |
| 164 | | | | | | | | | | | | |
| 165 | | | | Mean | 1.0544E-4 | | | | | | | |
| 166 | | | | Standard Deviation | 9.1606E-5 | | | | | | | |
| 167 | | | | Number of data | 29 | | | | | | | |
| 168 | | | | Number of suspected outliers | 1 | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 171 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 172 | 1 | 1.0544E-4 | 9.0013E-5 | 3.0000E-4 | 4 | 2.161 | 2.89 | 3.22 | | | | |
| 173 | | | | | | | | | | | | |
| 174 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | | | | | | | | | | | | |
| 179 | | | | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | |
| 180 | | | | | | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | Mean | 0.00295 | | | | | | | |
| 183 | | | | Standard Deviation | 0.00218 | | | | | | | |
| 184 | | | | Number of data | 29 | | | | | | | |
| 185 | | | | Number of suspected outliers | 1 | | | | | | | |
| 186 | | | | | | | | | | | | |
| 187 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 188 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 189 | 1 | 0.00295 | 0.00214 | 0.01 | 4 | 3.286 | 2.89 | 3.22 | | | | |
| 190 | | | | | | | | | | | | |
| 191 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 192 | Potential outliers is: 0.01 | | | | | | | | | | | |
| 193 | | | | | | | | | | | | |
| 194 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 195 | Potential outliers is: 0.01 | | | | | | | | | | | |
| 196 | | | | | | | | | | | | |
| 197 | | | | | | | | | | | | |
| 198 | | | | Rosner's Outlier Test for Nickel (mg/L) | | | | | | | | |
| 199 | | | | | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | | | | Mean | 0.0059 | | | | | | | |
| 202 | | | | Standard Deviation | 0.00693 | | | | | | | |
| 203 | | | | Number of data | 29 | | | | | | | |
| 204 | | | | Number of suspected outliers | 1 | | | | | | | |
| 205 | | | | | | | | | | | | |
| 206 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 207 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 208 | 1 | 0.0059 | 0.00681 | 0.04 | 1 | 5.006 | 2.89 | 3.22 | | | | |
| 209 | | | | | | | | | | | | |
| 210 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 211 | Potential outliers is: 0.04 | | | | | | | | | | | |
| 212 | | | | | | | | | | | | |

For 1% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.04

## Rosner's Outlier Test for Zinc (mg/L)

| | |
|---|---|
| Mean | 0.00423 |
| Standard Deviation | 0.00346 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00423 | 0.0034 | 0.015 | 8 | 3.166 | 2.89 | 3.22 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.015

For 1% Significance Level, there is no Potential Outlier

## 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 Tail)?

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 Tail)?

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 = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | 1. Observation Value 7.2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 267 | | | | | | | | | | | | |
| 268 | Test Statistic: 0.667 | | | | | | | | | | | |
| 269 | | | | | | | | | | | | |
| 270 | For 10% significance level, 7.2 is an outlier. | | | | | | | | | | | |
| 271 | For 5% significance level, 7.2 is an outlier. | | | | | | | | | | | |
| 272 | For 1% significance level, 7.2 is an outlier. | | | | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | 2. Observation Value 2.53 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 275 | | | | | | | | | | | | |
| 276 | Test Statistic: 0.251 | | | | | | | | | | | |
| 277 | | | | | | | | | | | | |
| 278 | For 10% significance level, 2.53 is not an outlier. | | | | | | | | | | | |
| 279 | For 5% significance level, 2.53 is not an outlier. | | | | | | | | | | | |
| 280 | For 1% significance level, 2.53 is not an outlier. | | | | | | | | | | | |
| 281 | | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | Dixon's Outlier Test for Chloride (mg/L) | | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | Number of Observations = 12 | | | | | | | | | | | |
| 286 | 10% critical value: 0.49 | | | | | | | | | | | |
| 287 | 5% critical value: 0.546 | | | | | | | | | | | |
| 288 | 1% critical value: 0.642 | | | | | | | | | | | |
| 289 | | | | | | | | | | | | |
| 290 | 1. Observation Value 2.2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 291 | | | | | | | | | | | | |
| 292 | Test Statistic: 0.500 | | | | | | | | | | | |
| 293 | | | | | | | | | | | | |
| 294 | For 10% significance level, 2.2 is an outlier. | | | | | | | | | | | |
| 295 | For 5% significance level, 2.2 is not an outlier. | | | | | | | | | | | |
| 296 | For 1% significance level, 2.2 is not an outlier. | | | | | | | | | | | |
| 297 | | | | | | | | | | | | |
| 298 | 2. Observation Value 0.58 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 299 | | | | | | | | | | | | |
| 300 | Test Statistic: 0.020 | | | | | | | | | | | |
| 301 | | | | | | | | | | | | |
| 302 | For 10% significance level, 0.58 is not an outlier. | | | | | | | | | | | |
| 303 | For 5% significance level, 0.58 is not an outlier. | | | | | | | | | | | |
| 304 | For 1% significance level, 0.58 is not an outlier. | | | | | | | | | | | |
| 305 | | | | | | | | | | | | |
| 306 | | | | | | | | | | | | |
| 307 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 308 | | | | | | | | | | | | |
| 309 | Number of Observations = 10 | | | | | | | | | | | |
| 310 | 10% critical value: 0.409 | | | | | | | | | | | |
| 311 | 5% critical value: 0.477 | | | | | | | | | | | |
| 312 | 1% critical value: 0.597 | | | | | | | | | | | |
| 313 | | | | | | | | | | | | |
| 314 | 1. Observation Value 0.48 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 315 | | | | | | | | | | | | |
| 316 | Test Statistic: 0.778 | | | | | | | | | | | |
| 317 | | | | | | | | | | | | |
| 318 | For 10% significance level, 0.48 is an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | For 5% significance level, 0.48 is an outlier. | | | | | | | | | | | |
| 320 | For 1% significance level, 0.48 is an outlier. | | | | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | 2. Observation Value 0.012 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 323 | | | | | | | | | | | | |
| 324 | Test Statistic: 0.153 | | | | | | | | | | | |
| 325 | | | | | | | | | | | | |
| 326 | For 10% significance level, 0.012 is not an outlier. | | | | | | | | | | | |
| 327 | For 5% significance level, 0.012 is not an outlier. | | | | | | | | | | | |
| 328 | For 1% significance level, 0.012 is not an outlier. | | | | | | | | | | | |
| 329 | | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | Dixon's Outlier Test for Dissolved Chromium (mg/L) | | | | | | | | | | | |
| 332 | | | | | | | | | | | | |
| 333 | Number of Observations = 13 | | | | | | | | | | | |
| 334 | 10% critical value: 0.467 | | | | | | | | | | | |
| 335 | 5% critical value: 0.521 | | | | | | | | | | | |
| 336 | 1% critical value: 0.615 | | | | | | | | | | | |
| 337 | | | | | | | | | | | | |
| 338 | 1. Observation Value 0.039 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 339 | | | | | | | | | | | | |
| 340 | Test Statistic: 0.877 | | | | | | | | | | | |
| 341 | | | | | | | | | | | | |
| 342 | For 10% significance level, 0.039 is an outlier. | | | | | | | | | | | |
| 343 | For 5% significance level, 0.039 is an outlier. | | | | | | | | | | | |
| 344 | For 1% significance level, 0.039 is an outlier. | | | | | | | | | | | |
| 345 | | | | | | | | | | | | |
| 346 | 2. Observation Value 0.00019 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | Test Statistic: 0.005 | | | | | | | | | | | |
| 349 | | | | | | | | | | | | |
| 350 | For 10% significance level, 0.00019 is not an outlier. | | | | | | | | | | | |
| 351 | For 5% significance level, 0.00019 is not an outlier. | | | | | | | | | | | |
| 352 | For 1% significance level, 0.00019 is not an outlier. | | | | | | | | | | | |
| 353 | | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 356 | | | | | | | | | | | | |
| 357 | Dixon's Outlier Test for Dissolved Mercury (mg/L) | | | | | | | | | | | |
| 358 | | | | | | | | | | | | |
| 359 | Number of Observations = 5 | | | | | | | | | | | |
| 360 | 10% critical value: 0.557 | | | | | | | | | | | |
| 361 | 5% critical value: 0.642 | | | | | | | | | | | |
| 362 | 1% critical value: 0.78 | | | | | | | | | | | |
| 363 | | | | | | | | | | | | |
| 364 | 1. Observation Value 0.00015 is a Potential Outlier (Upper Tail)' | | | | | | | | | | | |
| 365 | | | | | | | | | | | | |
| 366 | Test Statistic: 0.690 | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |
| 368 | For 10% significance level, 0.00015 is an outlier. | | | | | | | | | | | |
| 369 | For 5% significance level, 0.00015 is an outlier. | | | | | | | | | | | |
| 370 | For 1% significance level, 0.00015 is not an outlier. | | | | | | | | | | | |
| 371 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | 2. Observation Value 5E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 373 | | | | | | | | | | | | |
| 374 | Test Statistic: 0.012 | | | | | | | | | | | |
| 375 | | | | | | | | | | | | |
| 376 | For 10% significance level, 5E-06 is not an outlier. | | | | | | | | | | | |
| 377 | For 5% significance level, 5E-06 is not an outlier. | | | | | | | | | | | |
| 378 | For 1% significance level, 5E-06 is not an outlier. | | | | | | | | | | | |
| 379 | | | | | | | | | | | | |

# App G3 Outlier Test Output - Sandstone

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| | | | User Selected Options | | | | | | | | |
| | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:34:43 AM | | | | | | | | |
| | | | From File | 2023-SandstoneProUCL_b.xls | | | | | | | |
| | | | Full Precision | OFF | | | | | | | |
| | | | | | | | | | | | |
| | | | | 04-SS | | | | | | | |
| | | | | Rosner's Outlier Test for pH () | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 7.636 | | | | | | | |
| | | | Standard Deviation | 0.441 | | | | | | | |
| | | | Number of data | 34 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 7.636 | 0.434 | 8.49 | 34 | 1.967 | 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 TDS (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 315.4 | | | | | | | |
| | | | Standard Deviation | 62.61 | | | | | | | |
| | | | Number of data | 34 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 315.4 | 61.69 | 432 | 33 | 1.891 | 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 Chloride (mg/L) | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | Mean | 0.483 | | | | | | | |
| | | | Standard Deviation | 0.349 | | | | | | | |
| | | | Number of data | 28 | | | | | | | |
| | | | Number of suspected outliers | 1 | | | | | | | |
| | | | | | | | | | | | |
| | | | Potential | Obs. | Test | Critical | Critical | | | | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 1 | 0.483 | 0.342 | 1.9 | 3 | 4.139 | 2.88 | 3.2 | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 55 | Potential outliers is: 1.9 | | | | | | | | | | | |
| 56 | | | | | | | | | | | | |
| 57 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 58 | Potential outliers is: 1.9 | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 61 | Rosner's Outlier Test for Sulphate (mg/L) | | | | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | | | | | | | | | | | | |
| 64 | | | | Mean | 34.42 | | | | | | | |
| 65 | | | | Standard Deviation | 15.5 | | | | | | | |
| 66 | | | | Number of data | 29 | | | | | | | |
| 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 | 34.42 | 15.23 | 10.5 | 18 | 1.571 | 2.89 | 3.22 | | | | |
| 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 = 11 | | | | | | | | | | | |
| 81 | 10% critical value: 0.517 | | | | | | | | | | | |
| 82 | 5% critical value: 0.576 | | | | | | | | | | | |
| 83 | 1% critical value: 0.679 | | | | | | | | | | | |
| 84 | | | | | | | | | | | | |
| 85 | 1. Observation Value 4 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | Test Statistic: 0.628 | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | For 10% significance level, 4 is an outlier. | | | | | | | | | | | |
| 90 | For 5% significance level, 4 is an outlier. | | | | | | | | | | | |
| 91 | For 1% significance level, 4 is not an outlier. | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | 2. Observation Value 1.4 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | Test Statistic: 0.091 | | | | | | | | | | | |
| 96 | | | | | | | | | | | | |
| 97 | For 10% significance level, 1.4 is not an outlier. | | | | | | | | | | | |
| 98 | For 5% significance level, 1.4 is not an outlier. | | | | | | | | | | | |
| 99 | For 1% significance level, 1.4 is not an outlier. | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | | | | | | | | | |
| 102 | Rosner's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Mean | 329.7 | | | | | | | |
| 106 | | | | Standard Deviation | 58.08 | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | Number of data | 29 | | | | | | | | |
| 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 | 329.7 | 57.07 | 480 | 18 | 2.633 | 2.89 | 3.22 | | | | |
| 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 | 69.66 | | | | | | | | |
| 123 | | | Standard Deviation | 14.54 | | | | | | | | |
| 124 | | | Number of data | 29 | | | | | | | | |
| 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 | 69.66 | 14.29 | 101 | 18 | 2.193 | 2.89 | 3.22 | | | | |
| 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 | 18.51 | | | | | | | | |
| 140 | | | Standard Deviation | 3.82 | | | | | | | | |
| 141 | | | Number of data | 29 | | | | | | | | |
| 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 | 18.51 | 3.754 | 26 | 18 | 1.996 | 2.89 | 3.22 | | | | |
| 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 | 24.06 | | | | | | | | |
| 157 | | | Standard Deviation | 5.648 | | | | | | | | |
| 158 | | | Number of data | 29 | | | | | | | | |
| 159 | | | Number of suspected outliers | 1 | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Potential | Obs. | Test | Critical | Critical | |
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | |
| 1 | 24.06 | 5.55 | 9.3 | 18 | 2.659 | 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 Arsenic (mg/L)**

| | |
|---|---|
| Mean | 0.00282 |
| Standard Deviation | 0.00586 |
| Number of data | 29 |
| Number of suspected outliers | 1 |

| | | | Potential | Obs. | Test | Critical | Critical | |
|---|---|---|---|---|---|---|---|---|
| # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | |
| 1 | 0.00282 | 0.00576 | 0.029 | 1 | 4.543 | 2.89 | 3.22 | |

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

**Dixon's Outlier Test for Cadmium (mg/L)**

Number of Observations = 9

10% critical value: 0.441

5% critical value: 0.512

1% critical value: 0.635

**1. Observation Value 6.98E-05 is a Potential Outlier (Upper Tail)?**

Test Statistic: 0.108

For 10% significance level, 6.98E-05 is not an outlier.

For 5% significance level, 6.98E-05 is not an outlier.

For 1% significance level, 6.98E-05 is not an outlier.

**2. Observation Value 8.3E-06 is a Potential Outlier (Lower Tail)?**

Test Statistic: 0.056

For 10% significance level, 8.3E-06 is not an outlier.

For 5% significance level, 8.3E-06 is not an outlier.

For 1% significance level, 8.3E-06 is not an outlier.

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Dixon's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | Number of Observations = 9 | | | | | | | | | | | |
| 216 | 10% critical value: 0.441 | | | | | | | | | | | |
| 217 | 5% critical value: 0.512 | | | | | | | | | | | |
| 218 | 1% critical value: 0.635 | | | | | | | | | | | |
| 219 | | | | | | | | | | | | |
| 220 | 1. Observation Value 0.006 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 221 | | | | | | | | | | | | |
| 222 | Test Statistic: 0.221 | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | For 10% significance level, 0.006 is not an outlier. | | | | | | | | | | | |
| 225 | For 5% significance level, 0.006 is not an outlier. | | | | | | | | | | | |
| 226 | For 1% significance level, 0.006 is not an outlier. | | | | | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | 2. Observation Value 0.00047 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 229 | | | | | | | | | | | | |
| 230 | Test Statistic: 0.221 | | | | | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | For 10% significance level, 0.00047 is not an outlier. | | | | | | | | | | | |
| 233 | For 5% significance level, 0.00047 is not an outlier. | | | | | | | | | | | |
| 234 | For 1% significance level, 0.00047 is not an outlier. | | | | | | | | | | | |
| 235 | | | | | | | | | | | | |
| 236 | | | | | | | | | | | | |
| 237 | Rosner's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 238 | | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | Mean | 0.00198 | | | | | | | | | | |
| 241 | Standard Deviation | 0.00268 | | | | | | | | | | |
| 242 | Number of data | 29 | | | | | | | | | | |
| 243 | Number of suspected outliers | 1 | | | | | | | | | | |
| 244 | | | | | | | | | | | | |
| 245 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 246 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 247 | 1 | 0.00198 | 0.00263 | 0.014 | 1 | 4.572 | 2.89 | 3.22 | | | | |
| 248 | | | | | | | | | | | | |
| 249 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 250 | Potential outliers is: 0.014 | | | | | | | | | | | |
| 251 | | | | | | | | | | | | |
| 252 | For 1% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 253 | Potential outliers is: 0.014 | | | | | | | | | | | |
| 254 | | | | | | | | | | | | |
| 255 | | | | | | | | | | | | |
| 256 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 257 | | | | | | | | | | | | |
| 258 | Number of Observations = 12 | | | | | | | | | | | |
| 259 | 10% critical value: 0.49 | | | | | | | | | | | |
| 260 | 5% critical value: 0.546 | | | | | | | | | | | |
| 261 | 1% critical value: 0.642 | | | | | | | | | | | |
| 262 | | | | | | | | | | | | |
| 263 | 1. Observation Value 3.17 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | Test Statistic: 0.250 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | | | | | | | | |
| 267 | For 10% significance level, 3.17 is not an outlier. | | | | | | | | | | | |
| 268 | For 5% significance level, 3.17 is not an outlier. | | | | | | | | | | | |
| 269 | For 1% significance level, 3.17 is not an outlier. | | | | | | | | | | | |
| 270 | | | | | | | | | | | | |
| 271 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | Test Statistic: 0.000 | | | | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 276 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 277 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 278 | | | | | | | | | | | | |
| 279 | | | | | | | | | | | | |
| 280 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | | |
| 281 | | | | | | | | | | | | |
| 282 | Number of Observations = 3 | | | | | | | | | | | |
| 283 | 10% critical value: 0.886 | | | | | | | | | | | |
| 284 | 5% critical value: 0.941 | | | | | | | | | | | |
| 285 | 1% critical value: 0.988 | | | | | | | | | | | |
| 286 | | | | | | | | | | | | |
| 287 | 1. Observation Value 0.003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | Test Statistic: 0.000 | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | For 10% significance level, 0.003 is not an outlier. | | | | | | | | | | | |
| 292 | For 5% significance level, 0.003 is not an outlier. | | | | | | | | | | | |
| 293 | For 1% significance level, 0.003 is not an outlier. | | | | | | | | | | | |
| 294 | | | | | | | | | | | | |
| 295 | 2. Observation Value 5.5E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | Test Statistic: 1.000 | | | | | | | | | | | |
| 298 | | | | | | | | | | | | |
| 299 | For 10% significance level, 5.5E-05 is an outlier. | | | | | | | | | | | |
| 300 | For 5% significance level, 5.5E-05 is an outlier. | | | | | | | | | | | |
| 301 | For 1% significance level, 5.5E-05 is an outlier. | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | | | | | | | | | | | | |
| 304 | Dixon's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 305 | | | | | | | | | | | | |
| 306 | Number of Observations = 12 | | | | | | | | | | | |
| 307 | 10% critical value: 0.49 | | | | | | | | | | | |
| 308 | 5% critical value: 0.546 | | | | | | | | | | | |
| 309 | 1% critical value: 0.642 | | | | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | 1. Observation Value 0.601 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | Test Statistic: 0.126 | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | For 10% significance level, 0.601 is not an outlier. | | | | | | | | | | | |
| 316 | For 5% significance level, 0.601 is not an outlier. | | | | | | | | | | | |
| 317 | For 1% significance level, 0.601 is not an outlier. | | | | | | | | | | | |
| 318 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | 2. Observation Value 0.124 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 320 | | | | | | | | | | | | |
| 321 | Test Statistic: 0.819 | | | | | | | | | | | |
| 322 | | | | | | | | | | | | |
| 323 | For 10% significance level, 0.124 is an outlier. | | | | | | | | | | | |
| 324 | For 5% significance level, 0.124 is an outlier. | | | | | | | | | | | |
| 325 | For 1% significance level, 0.124 is an outlier. | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | | | | | | | | | | | | |
| 328 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 329 | | | | | | | | | | | | |
| 330 | Dixon's Outlier Test for Nickel (mg/L) | | | | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | Number of Observations = 11 | | | | | | | | | | | |
| 333 | 10% critical value: 0.517 | | | | | | | | | | | |
| 334 | 5% critical value: 0.576 | | | | | | | | | | | |
| 335 | 1% critical value: 0.679 | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | 1. Observation Value 0.0054 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | Test Statistic: 0.604 | | | | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | For 10% significance level, 0.0054 is an outlier. | | | | | | | | | | | |
| 342 | For 5% significance level, 0.0054 is an outlier. | | | | | | | | | | | |
| 343 | For 1% significance level, 0.0054 is not an outlier. | | | | | | | | | | | |
| 344 | | | | | | | | | | | | |
| 345 | 2. Observation Value 0.00028 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 346 | | | | | | | | | | | | |
| 347 | Test Statistic: 0.101 | | | | | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | For 10% significance level, 0.00028 is not an outlier. | | | | | | | | | | | |
| 350 | For 5% significance level, 0.00028 is not an outlier. | | | | | | | | | | | |
| 351 | For 1% significance level, 0.00028 is not an outlier. | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | | | | | | | | | | | | |
| 354 | Dixon's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 355 | | | | | | | | | | | | |
| 356 | Number of Observations = 11 | | | | | | | | | | | |
| 357 | 10% critical value: 0.517 | | | | | | | | | | | |
| 358 | 5% critical value: 0.576 | | | | | | | | | | | |
| 359 | 1% critical value: 0.679 | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | 1. Observation Value 0.0217 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | Test Statistic: 0.784 | | | | | | | | | | | |
| 364 | | | | | | | | | | | | |
| 365 | For 10% significance level, 0.0217 is an outlier. | | | | | | | | | | | |
| 366 | For 5% significance level, 0.0217 is an outlier. | | | | | | | | | | | |
| 367 | For 1% significance level, 0.0217 is an outlier. | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |
| 369 | 2. Observation Value 0.0015 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 370 | | | | | | | | | | | | |
| 371 | Test Statistic: 0.054 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | | | | | | | | |
| 373 | For 10% significance level, 0.0015 is not an outlier. | | | | | | | | | | | |
| 374 | For 5% significance level, 0.0015 is not an outlier. | | | | | | | | | | | |
| 375 | For 1% significance level, 0.0015 is not an outlier. | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | | | | | | | | | | | | |
| 378 | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | | | | |
| 379 | | | | | | | | | | | | |
| 380 | Number of Observations = 24 | | | | | | | | | | | |
| 381 | 10% critical value: 0.367 | | | | | | | | | | | |
| 382 | 5% critical value: 0.413 | | | | | | | | | | | |
| 383 | 1% critical value: 0.497 | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | 1. Observation Value 8.6 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 386 | | | | | | | | | | | | |
| 387 | Test Statistic: 0.803 | | | | | | | | | | | |
| 388 | | | | | | | | | | | | |
| 389 | For 10% significance level, 8.6 is an outlier. | | | | | | | | | | | |
| 390 | For 5% significance level, 8.6 is an outlier. | | | | | | | | | | | |
| 391 | For 1% significance level, 8.6 is an outlier. | | | | | | | | | | | |
| 392 | | | | | | | | | | | | |
| 393 | 2. Observation Value 0.8 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 394 | | | | | | | | | | | | |
| 395 | Test Statistic: 0.118 | | | | | | | | | | | |
| 396 | | | | | | | | | | | | |
| 397 | For 10% significance level, 0.8 is not an outlier. | | | | | | | | | | | |
| 398 | For 5% significance level, 0.8 is not an outlier. | | | | | | | | | | | |
| 399 | For 1% significance level, 0.8 is not an outlier. | | | | | | | | | | | |
| 400 | | | | | | | | | | | | |

| | | |
|---|---|---|
| | Outlier Tests for Selected Uncensored Variables | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 9:35:52 AM | |
| From File | 2023-SandstoneProUCL_c.xls | |
| Full Precision | OFF | |

05-SS

Dixon's Outlier Test for pH ()

Number of Observations = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Observation Value 8.48 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.239

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 Tail)?

Test Statistic: 0.221

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 = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Observation Value 290 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.456

For 10% significance level, 290 is 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 Tail)?

Test Statistic: 0.088

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 Chloride (mg/L) | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Number of Observations = 3 | | | | | | | | | | | |
| 59 | 10% critical value: 0.886 | | | | | | | | | | | |
| 60 | 5% critical value: 0.941 | | | | | | | | | | | |
| 61 | 1% critical value: 0.988 | | | | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | 1. Observation Value 1.2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 64 | | | | | | | | | | | | |
| 65 | Test Statistic: 0.000 | | | | | | | | | | | |
| 66 | | | | | | | | | | | | |
| 67 | For 10% significance level, 1.2 is not an outlier. | | | | | | | | | | | |
| 68 | For 5% significance level, 1.2 is not an outlier. | | | | | | | | | | | |
| 69 | For 1% significance level, 1.2 is not an outlier. | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |
| 71 | 2. Observation Value 0.7 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 72 | | | | | | | | | | | | |
| 73 | Test Statistic: 1.000 | | | | | | | | | | | |
| 74 | | | | | | | | | | | | |
| 75 | For 10% significance level, 0.7 is an outlier. | | | | | | | | | | | |
| 76 | For 5% significance level, 0.7 is an outlier. | | | | | | | | | | | |
| 77 | For 1% significance level, 0.7 is an outlier. | | | | | | | | | | | |
| 78 | | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | Dixon's Outlier Test for Sulphate (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 26.3 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | Test Statistic: 0.071 | | | | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | For 10% significance level, 26.3 is not an outlier. | | | | | | | | | | | |
| 92 | For 5% significance level, 26.3 is not an outlier. | | | | | | | | | | | |
| 93 | For 1% significance level, 26.3 is not an outlier. | | | | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | 2. Observation Value 20 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 96 | | | | | | | | | | | | |
| 97 | Test Statistic: 0.350 | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | For 10% significance level, 20 is not an outlier. | | | | | | | | | | | |
| 100 | For 5% significance level, 20 is not an outlier. | | | | | | | | | | | |
| 101 | For 1% significance level, 20 is not an outlier. | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | Dixon's Outlier Test for DOC (mg/L) | | | | | | | | | | | |
| 105 | | | | | | | | | | | | |
| 106 | Number of Observations = 16 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 107 | 10% critical value: 0.454 | | | | | | | | | | | |
| 108 | 5% critical value: 0.507 | | | | | | | | | | | |
| 109 | 1% critical value: 0.595 | | | | | | | | | | | |
| 110 | | | | | | | | | | | | |
| 111 | 1. Observation Value 10.1 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 112 | | | | | | | | | | | | |
| 113 | Test Statistic: 0.609 | | | | | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | For 10% significance level, 10.1 is an outlier. | | | | | | | | | | | |
| 116 | For 5% significance level, 10.1 is an outlier. | | | | | | | | | | | |
| 117 | For 1% significance level, 10.1 is an outlier. | | | | | | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | 2. Observation Value 0.7 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | Test Statistic: 0.053 | | | | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | For 10% significance level, 0.7 is not an outlier. | | | | | | | | | | | |
| 124 | For 5% significance level, 0.7 is not an outlier. | | | | | | | | | | | |
| 125 | For 1% significance level, 0.7 is not an outlier. | | | | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | | | | | | | | | |
| 128 | Dixon's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 129 | | | | | | | | | | | | |
| 130 | Number of Observations = 18 | | | | | | | | | | | |
| 131 | 10% critical value: 0.424 | | | | | | | | | | | |
| 132 | 5% critical value: 0.475 | | | | | | | | | | | |
| 133 | 1% critical value: 0.561 | | | | | | | | | | | |
| 134 | | | | | | | | | | | | |
| 135 | 1. Observation Value 282 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 136 | | | | | | | | | | | | |
| 137 | Test Statistic: 0.290 | | | | | | | | | | | |
| 138 | | | | | | | | | | | | |
| 139 | For 10% significance level, 282 is not an outlier. | | | | | | | | | | | |
| 140 | For 5% significance level, 282 is not an outlier. | | | | | | | | | | | |
| 141 | For 1% significance level, 282 is not an outlier. | | | | | | | | | | | |
| 142 | | | | | | | | | | | | |
| 143 | 2. Observation Value 246 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 144 | | | | | | | | | | | | |
| 145 | Test Statistic: 0.185 | | | | | | | | | | | |
| 146 | | | | | | | | | | | | |
| 147 | For 10% significance level, 246 is not an outlier. | | | | | | | | | | | |
| 148 | For 5% significance level, 246 is not an outlier. | | | | | | | | | | | |
| 149 | For 1% significance level, 246 is not an outlier. | | | | | | | | | | | |
| 150 | | | | | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | Dixon's Outlier Test for Calcium (mg/L) | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | Number of Observations = 18 | | | | | | | | | | | |
| 155 | 10% critical value: 0.424 | | | | | | | | | | | |
| 156 | 5% critical value: 0.475 | | | | | | | | | | | |
| 157 | 1% critical value: 0.561 | | | | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | 1. Observation Value 52.4 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 160 | | | | | | | | | | | | |
| 161 | Test Statistic: 0.149 | | | | | | | | | | | |
| 162 | | | | | | | | | | | | |
| 163 | For 10% significance level, 52.4 is not an outlier. | | | | | | | | | | | |
| 164 | For 5% significance level, 52.4 is not an outlier. | | | | | | | | | | | |
| 165 | For 1% significance level, 52.4 is not an outlier. | | | | | | | | | | | |
| 166 | | | | | | | | | | | | |
| 167 | 2. Observation Value 41.7 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 168 | | | | | | | | | | | | |
| 169 | Test Statistic: 0.213 | | | | | | | | | | | |
| 170 | | | | | | | | | | | | |
| 171 | For 10% significance level, 41.7 is not an outlier. | | | | | | | | | | | |
| 172 | For 5% significance level, 41.7 is not an outlier. | | | | | | | | | | | |
| 173 | For 1% significance level, 41.7 is not an outlier. | | | | | | | | | | | |
| 174 | | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | Dixon's Outlier Test for Magnesium (mg/L) | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | Number of Observations = 18 | | | | | | | | | | | |
| 179 | 10% critical value: 0.424 | | | | | | | | | | | |
| 180 | 5% critical value: 0.475 | | | | | | | | | | | |
| 181 | 1% critical value: 0.561 | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | 1. Observation Value 13.1 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | Test Statistic: 0.111 | | | | | | | | | | | |
| 186 | | | | | | | | | | | | |
| 187 | For 10% significance level, 13.1 is not an outlier. | | | | | | | | | | | |
| 188 | For 5% significance level, 13.1 is not an outlier. | | | | | | | | | | | |
| 189 | For 1% significance level, 13.1 is not an outlier. | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | 2. Observation Value 9.7 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Test Statistic: 0.226 | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | For 10% significance level, 9.7 is not an outlier. | | | | | | | | | | | |
| 196 | For 5% significance level, 9.7 is not an outlier. | | | | | | | | | | | |
| 197 | For 1% significance level, 9.7 is not an outlier. | | | | | | | | | | | |
| 198 | | | | | | | | | | | | |
| 199 | | | | | | | | | | | | |
| 200 | Dixon's Outlier Test for Sodium (mg/L) | | | | | | | | | | | |
| 201 | | | | | | | | | | | | |
| 202 | Number of Observations = 18 | | | | | | | | | | | |
| 203 | 10% critical value: 0.424 | | | | | | | | | | | |
| 204 | 5% critical value: 0.475 | | | | | | | | | | | |
| 205 | 1% critical value: 0.561 | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | 1. Observation Value 32.8 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | Test Statistic: 0.167 | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | For 10% significance level, 32.8 is not an outlier. | | | | | | | | | | | |
| 212 | For 5% significance level, 32.8 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 213 | For 1% significance level, 32.8 is not an outlier. | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | 2. Observation Value 25.9 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | Test Statistic: 0.250 | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | For 10% significance level, 25.9 is not an outlier. | | | | | | | | | | | |
| 220 | For 5% significance level, 25.9 is not an outlier. | | | | | | | | | | | |
| 221 | For 1% significance level, 25.9 is not an outlier. | | | | | | | | | | | |
| 222 | | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | Dixon's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 225 | | | | | | | | | | | | |
| 226 | Number of Observations = 18 | | | | | | | | | | | |
| 227 | 10% critical value: 0.424 | | | | | | | | | | | |
| 228 | 5% critical value: 0.475 | | | | | | | | | | | |
| 229 | 1% critical value: 0.561 | | | | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | 1. Observation Value 0.0097 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 232 | | | | | | | | | | | | |
| 233 | Test Statistic: 0.330 | | | | | | | | | | | |
| 234 | | | | | | | | | | | | |
| 235 | For 10% significance level, 0.0097 is not an outlier. | | | | | | | | | | | |
| 236 | For 5% significance level, 0.0097 is not an outlier. | | | | | | | | | | | |
| 237 | For 1% significance level, 0.0097 is not an outlier. | | | | | | | | | | | |
| 238 | | | | | | | | | | | | |
| 239 | 2. Observation Value 0.00019 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 240 | | | | | | | | | | | | |
| 241 | Test Statistic: 0.019 | | | | | | | | | | | |
| 242 | | | | | | | | | | | | |
| 243 | For 10% significance level, 0.00019 is not an outlier. | | | | | | | | | | | |
| 244 | For 5% significance level, 0.00019 is not an outlier. | | | | | | | | | | | |
| 245 | For 1% significance level, 0.00019 is not an outlier. | | | | | | | | | | | |
| 246 | | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 249 | | | | | | | | | | | | |
| 250 | Number of Observations = 10 | | | | | | | | | | | |
| 251 | 10% critical value: 0.409 | | | | | | | | | | | |
| 252 | 5% critical value: 0.477 | | | | | | | | | | | |
| 253 | 1% critical value: 0.597 | | | | | | | | | | | |
| 254 | | | | | | | | | | | | |
| 255 | 1. Observation Value 0.000113 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | Test Statistic: 0.261 | | | | | | | | | | | |
| 258 | | | | | | | | | | | | |
| 259 | For 10% significance level, 0.000113 is not an outlier. | | | | | | | | | | | |
| 260 | For 5% significance level, 0.000113 is not an outlier. | | | | | | | | | | | |
| 261 | For 1% significance level, 0.000113 is not an outlier. | | | | | | | | | | | |
| 262 | | | | | | | | | | | | |
| 263 | 2. Observation Value 7.2E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | Test Statistic: 0.029 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 266 | | | | | | | | | | | | |
| 267 | For 10% significance level, 7.2E-06 is not an outlier. | | | | | | | | | | | |
| 268 | For 5% significance level, 7.2E-06 is not an outlier. | | | | | | | | | | | |
| 269 | For 1% significance level, 7.2E-06 is not an outlier. | | | | | | | | | | | |
| 270 | | | | | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | Dixon's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 275 | | | | | | | | | | | | |
| 276 | Number of Observations = 18 | | | | | | | | | | | |
| 277 | 10% critical value: 0.424 | | | | | | | | | | | |
| 278 | 5% critical value: 0.475 | | | | | | | | | | | |
| 279 | 1% critical value: 0.561 | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | 1. Observation Value 0.101 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | Test Statistic: 0.886 | | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | For 10% significance level, 0.101 is an outlier. | | | | | | | | | | | |
| 286 | For 5% significance level, 0.101 is an outlier. | | | | | | | | | | | |
| 287 | For 1% significance level, 0.101 is an outlier. | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | 2. Observation Value 0.0004 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | Test Statistic: 0.050 | | | | | | | | | | | |
| 292 | | | | | | | | | | | | |
| 293 | For 10% significance level, 0.0004 is not an outlier. | | | | | | | | | | | |
| 294 | For 5% significance level, 0.0004 is not an outlier. | | | | | | | | | | | |
| 295 | For 1% significance level, 0.0004 is not an outlier. | | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | | | | | | | | | | | | |
| 298 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 299 | | | | | | | | | | | | |
| 300 | Number of Observations = 18 | | | | | | | | | | | |
| 301 | 10% critical value: 0.424 | | | | | | | | | | | |
| 302 | 5% critical value: 0.475 | | | | | | | | | | | |
| 303 | 1% critical value: 0.561 | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | 1. Observation Value 2.19 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 306 | | | | | | | | | | | | |
| 307 | Test Statistic: 0.148 | | | | | | | | | | | |
| 308 | | | | | | | | | | | | |
| 309 | For 10% significance level, 2.19 is not an outlier. | | | | | | | | | | | |
| 310 | For 5% significance level, 2.19 is not an outlier. | | | | | | | | | | | |
| 311 | For 1% significance level, 2.19 is not an outlier. | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | Test Statistic: 0.011 | | | | | | | | | | | |
| 316 | | | | | | | | | | | | |
| 317 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 318 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 319 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 320 | | | | | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | | |
| 323 | | | | | | | | | | | | |
| 324 | Number of Observations = 18 | | | | | | | | | | | |
| 325 | 10% critical value: 0.424 | | | | | | | | | | | |
| 326 | 5% critical value: 0.475 | | | | | | | | | | | |
| 327 | 1% critical value: 0.561 | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | 1. Observation Value 0.101 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | Test Statistic: 0.898 | | | | | | | | | | | |
| 332 | | | | | | | | | | | | |
| 333 | For 10% significance level, 0.101 is an outlier. | | | | | | | | | | | |
| 334 | For 5% significance level, 0.101 is an outlier. | | | | | | | | | | | |
| 335 | For 1% significance level, 0.101 is an outlier. | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | 2. Observation Value 5E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | Test Statistic: 0.000 | | | | | | | | | | | |
| 340 | | | | | | | | | | | | |
| 341 | For 10% significance level, 5E-05 is not an outlier. | | | | | | | | | | | |
| 342 | For 5% significance level, 5E-05 is not an outlier. | | | | | | | | | | | |
| 343 | For 1% significance level, 5E-05 is not an outlier. | | | | | | | | | | | |
| 344 | | | | | | | | | | | | |
| 345 | | | | | | | | | | | | |
| 346 | Dixon's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 347 | | | | | | | | | | | | |
| 348 | Number of Observations = 18 | | | | | | | | | | | |
| 349 | 10% critical value: 0.424 | | | | | | | | | | | |
| 350 | 5% critical value: 0.475 | | | | | | | | | | | |
| 351 | 1% critical value: 0.561 | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | 1. Observation Value 0.436 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | Test Statistic: 0.353 | | | | | | | | | | | |
| 356 | | | | | | | | | | | | |
| 357 | For 10% significance level, 0.436 is not an outlier. | | | | | | | | | | | |
| 358 | For 5% significance level, 0.436 is not an outlier. | | | | | | | | | | | |
| 359 | For 1% significance level, 0.436 is not an outlier. | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | 2. Observation Value 0.336 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | Test Statistic: 0.214 | | | | | | | | | | | |
| 364 | | | | | | | | | | | | |
| 365 | For 10% significance level, 0.336 is not an outlier. | | | | | | | | | | | |
| 366 | For 5% significance level, 0.336 is not an outlier. | | | | | | | | | | | |
| 367 | For 1% significance level, 0.336 is not an outlier. | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |
| 369 | | | | | | | | | | | | |
| 370 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 371 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 372 | Dixon's Outlier Test for Nickel (mg/L) | | | | | | | | | | | |
| 373 | | | | | | | | | | | | |
| 374 | Number of Observations = 18 | | | | | | | | | | | |
| 375 | 10% critical value: 0.424 | | | | | | | | | | | |
| 376 | 5% critical value: 0.475 | | | | | | | | | | | |
| 377 | 1% critical value: 0.561 | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | 1. Observation Value 0.272 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 380 | | | | | | | | | | | | |
| 381 | Test Statistic: 0.965 | | | | | | | | | | | |
| 382 | | | | | | | | | | | | |
| 383 | For 10% significance level, 0.272 is an outlier. | | | | | | | | | | | |
| 384 | For 5% significance level, 0.272 is an outlier. | | | | | | | | | | | |
| 385 | For 1% significance level, 0.272 is an outlier. | | | | | | | | | | | |
| 386 | | | | | | | | | | | | |
| 387 | 2. Observation Value 0.00046 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 388 | | | | | | | | | | | | |
| 389 | Test Statistic: 0.030 | | | | | | | | | | | |
| 390 | | | | | | | | | | | | |
| 391 | For 10% significance level, 0.00046 is not an outlier. | | | | | | | | | | | |
| 392 | For 5% significance level, 0.00046 is not an outlier. | | | | | | | | | | | |
| 393 | For 1% significance level, 0.00046 is not an outlier. | | | | | | | | | | | |
| 394 | | | | | | | | | | | | |
| 395 | | | | | | | | | | | | |
| 396 | Dixon's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 397 | | | | | | | | | | | | |
| 398 | Number of Observations = 18 | | | | | | | | | | | |
| 399 | 10% critical value: 0.424 | | | | | | | | | | | |
| 400 | 5% critical value: 0.475 | | | | | | | | | | | |
| 401 | 1% critical value: 0.561 | | | | | | | | | | | |
| 402 | | | | | | | | | | | | |
| 403 | 1. Observation Value 0.667 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 404 | | | | | | | | | | | | |
| 405 | Test Statistic: 0.886 | | | | | | | | | | | |
| 406 | | | | | | | | | | | | |
| 407 | For 10% significance level, 0.667 is an outlier. | | | | | | | | | | | |
| 408 | For 5% significance level, 0.667 is an outlier. | | | | | | | | | | | |
| 409 | For 1% significance level, 0.667 is an outlier. | | | | | | | | | | | |
| 410 | | | | | | | | | | | | |
| 411 | 2. Observation Value 0.0032 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 412 | | | | | | | | | | | | |
| 413 | Test Statistic: 0.068 | | | | | | | | | | | |
| 414 | | | | | | | | | | | | |
| 415 | For 10% significance level, 0.0032 is not an outlier. | | | | | | | | | | | |
| 416 | For 5% significance level, 0.0032 is not an outlier. | | | | | | | | | | | |
| 417 | For 1% significance level, 0.0032 is not an outlier. | | | | | | | | | | | |
| 418 | | | | | | | | | | | | |
| 419 | | | | | | | | | | | | |
| 420 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | Outlier Tests for Selected Uncensored Variables | | | | | | | |
| 2 | | | | User Selected Options | | | | | | | | |
| 3 | | | Date/Time of Computation | ProUCL 5.2 2023-12-13 9:37:09 AM | | | | | | | | |
| 4 | | | | From File | 2023-SandstoneProUCL_d.xls | | | | | | | |
| 5 | | | | Full Precision | OFF | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | | 07(R)SS | | | | | | | |
| 8 | | | | | Rosner's Outlier Test for pH () | | | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | Mean | 7.703 | | | | | | | |
| 12 | | | | Standard Deviation | 0.437 | | | | | | | |
| 13 | | | | Number of data | 46 | | | | | | | |
| 14 | | | | Number of suspected outliers | 1 | | | | | | | |
| 15 | | | | | | | | | | | | |
| 16 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 17 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 18 | 1 | 7.703 | 0.432 | 6.66 | 6 | 2.414 | 3.09 | 3.45 | | | | |
| 19 | | | | | | | | | | | | |
| 20 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 21 | | | | | | | | | | | | |
| 22 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 23 | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | |
| 25 | | | | | Rosner's Outlier Test for TDS (mg/L) | | | | | | | |
| 26 | | | | | | | | | | | | |
| 27 | | | | | | | | | | | | |
| 28 | | | | Mean | 431.7 | | | | | | | |
| 29 | | | | Standard Deviation | 37.67 | | | | | | | |
| 30 | | | | Number of data | 46 | | | | | | | |
| 31 | | | | Number of suspected outliers | 1 | | | | | | | |
| 32 | | | | | | | | | | | | |
| 33 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 34 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 35 | 1 | 431.7 | 37.26 | 550 | 37 | 3.175 | 3.09 | 3.45 | | | | |
| 36 | | | | | | | | | | | | |
| 37 | For 5% Significance Level, there is 1 Potential Outlier | | | | | | | | | | | |
| 38 | Potential outliers is: 550 | | | | | | | | | | | |
| 39 | | | | | | | | | | | | |
| 40 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 41 | | | | | | | | | | | | |
| 42 | | | | | | | | | | | | |
| 43 | | | | | Rosner's Outlier Test for Chloride (mg/L) | | | | | | | |
| 44 | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | |
| 46 | | | | Mean | 1.132 | | | | | | | |
| 47 | | | | Standard Deviation | 1.768 | | | | | | | |
| 48 | | | | Number of data | 34 | | | | | | | |
| 49 | | | | Number of suspected outliers | 1 | | | | | | | |
| 50 | | | | | | | | | | | | |
| 51 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 52 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 53 | 1 | 1.132 | 1.742 | 9.31 | 25 | 4.694 | 2.97 | 3.3 | | | | |

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 | 63.15 |
| Standard Deviation | 17.77 |
| Number of data | 32 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 63.15 | 17.49 | 114 | 23 | 2.907 | 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 = 10

10% critical value: 0.409

5% critical value: 0.477

1% critical value: 0.597

1. Observation Value 6.1 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.198

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 Tail)?

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 | 415.5 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | Standard Deviation | 51.22 | | | | | | | | |
| 108 | | | Number of data | 32 | | | | | | | | |
| 109 | Number of suspected outliers | | | 1 | | | | | | | | |
| 110 | | | | | | | | | | | | |
| 111 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 112 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 113 | 1 | 415.5 | 50.42 | 544 | 25 | 2.549 | 2.94 | 3.27 | | | | |
| 114 | | | | | | | | | | | | |
| 115 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | | | | | | | | |
| 120 | Rosner's Outlier Test for Calcium (mg/L) | | | | | | | | | | | |
| 121 | | | | | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | | | Mean | 92.88 | | | | | | | | |
| 124 | | | Standard Deviation | 9.694 | | | | | | | | |
| 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 | 92.88 | 9.542 | 118 | 24 | 2.633 | 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 | 19.87 | | | | | | | | |
| 141 | | | Standard Deviation | 1.712 | | | | | | | | |
| 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 | 19.87 | 1.685 | 23.8 | 30 | 2.335 | 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 | 38.58 | | | | | | | | |
| 158 | | | Standard Deviation | 4.507 | | | | | | | | |
| 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 | 38.58 | 4.436 | 50.1 | 23 | 2.597 | 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 | 0.00132 | | | | | | | | | | |
| 175 | Standard Deviation | 0.00108 | | | | | | | | | | |
| 176 | Number of data | 30 | | | | | | | | | | |
| 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 | 0.00132 | 0.00106 | 0.0038 | 27 | 2.342 | 2.91 | 3.24 | | | | |
| 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 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 189 | | | | | | | | | | | | |
| 190 | Number of Observations = 8 | | | | | | | | | | | |
| 191 | 10% critical value: 0.479 | | | | | | | | | | | |
| 192 | 5% critical value: 0.554 | | | | | | | | | | | |
| 193 | 1% critical value: 0.683 | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | 1. Observation Value 0.000364 is a Potential Outlier (Upper Tail | | | | | | | | | | | |
| 196 | | | | | | | | | | | | |
| 197 | Test Statistic: 0.826 | | | | | | | | | | | |
| 198 | | | | | | | | | | | | |
| 199 | For 10% significance level, 0.000364 is an outlier. | | | | | | | | | | | |
| 200 | For 5% significance level, 0.000364 is an outlier. | | | | | | | | | | | |
| 201 | For 1% significance level, 0.000364 is an outlier. | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | 2. Observation Value 5.5E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | Test Statistic: 0.020 | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | For 10% significance level, 5.5E-06 is not an outlier. | | | | | | | | | | | |
| 208 | For 5% significance level, 5.5E-06 is not an outlier. | | | | | | | | | | | |
| 209 | For 1% significance level, 5.5E-06 is not an outlier. | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | Dixon's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |

Number of Observations = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Observation Value 0.021 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.767

For 10% significance level, 0.021 is an outlier.

For 5% significance level, 0.021 is an outlier.

For 1% significance level, 0.021 is an outlier.

2. Observation Value 0.00014 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.003

For 10% significance level, 0.00014 is not an outlier.

For 5% significance level, 0.00014 is not an outlier.

For 1% significance level, 0.00014 is not an outlier.

Rosner's Outlier Test for Copper (mg/L)

| | |
|---|---|
| Mean | 0.00202 |
| Standard Deviation | 0.0022 |
| Number of data | 30 |
| Number of suspected outliers | 1 |

| # | Mean | sd | Potential outlier | Obs. Number | Test value | Critical value (5%) | Critical value (1%) |
|---|---|---|---|---|---|---|---|
| 1 | 0.00202 | 0.00217 | 0.009 | 2 | 3.22 | 2.91 | 3.24 |

For 5% Significance Level, there is 1 Potential Outlier

Potential outliers is: 0.009

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for Iron (mg/L)

Number of Observations = 5

10% critical value: 0.557

5% critical value: 0.642

1% critical value: 0.78

1. Observation Value 2.01 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.819

For 10% significance level, 2.01 is an outlier.

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | For 5% significance level, 2.01 is an outlier. | | | | | | | | | | | |
| 267 | For 1% significance level, 2.01 is an outlier. | | | | | | | | | | | |
| 268 | | | | | | | | | | | | |
| 269 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 270 | | | | | | | | | | | | |
| 271 | Test Statistic: 0.004 | | | | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 274 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 275 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 276 | | | | | | | | | | | | |
| 277 | | | | | | | | | | | | |
| 278 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | | |
| 279 | | | | | | | | | | | | |
| 280 | Number of Observations = 4 | | | | | | | | | | | |
| 281 | 10% critical value: 0.679 | | | | | | | | | | | |
| 282 | 5% critical value: 0.765 | | | | | | | | | | | |
| 283 | 1% critical value: 0.889 | | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | 1. Observation Value 0.005 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 286 | | | | | | | | | | | | |
| 287 | Test Statistic: 0.203 | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | For 10% significance level, 0.005 is not an outlier. | | | | | | | | | | | |
| 290 | For 5% significance level, 0.005 is not an outlier. | | | | | | | | | | | |
| 291 | For 1% significance level, 0.005 is not an outlier. | | | | | | | | | | | |
| 292 | | | | | | | | | | | | |
| 293 | 2. Observation Value 6.3E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 294 | | | | | | | | | | | | |
| 295 | Test Statistic: 0.595 | | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | For 10% significance level, 6.3E-05 is not an outlier. | | | | | | | | | | | |
| 298 | For 5% significance level, 6.3E-05 is not an outlier. | | | | | | | | | | | |
| 299 | For 1% significance level, 6.3E-05 is not an outlier. | | | | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | | | | | | | | | | | | |
| 302 | Dixon's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 303 | | | | | | | | | | | | |
| 304 | Number of Observations = 12 | | | | | | | | | | | |
| 305 | 10% critical value: 0.49 | | | | | | | | | | | |
| 306 | 5% critical value: 0.546 | | | | | | | | | | | |
| 307 | 1% critical value: 0.642 | | | | | | | | | | | |
| 308 | | | | | | | | | | | | |
| 309 | 1. Observation Value 2.13 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | Test Statistic: 0.089 | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | For 10% significance level, 2.13 is not an outlier. | | | | | | | | | | | |
| 314 | For 5% significance level, 2.13 is not an outlier. | | | | | | | | | | | |
| 315 | For 1% significance level, 2.13 is not an outlier. | | | | | | | | | | | |
| 316 | | | | | | | | | | | | |
| 317 | 2. Observation Value 0.004 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 318 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | Test Statistic: 0.413 | | | | | | | | | | | |
| 320 | | | | | | | | | | | | |
| 321 | For 10% significance level, 0.004 is not an outlier. | | | | | | | | | | | |
| 322 | For 5% significance level, 0.004 is not an outlier. | | | | | | | | | | | |
| 323 | For 1% significance level, 0.004 is not an outlier. | | | | | | | | | | | |
| 324 | | | | | | | | | | | | |
| 325 | | | | | | | | | | | | |
| 326 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 327 | | | | | | | | | | | | |
| 328 | Dixon's Outlier Test for Nickel (mg/L) | | | | | | | | | | | |
| 329 | | | | | | | | | | | | |
| 330 | Number of Observations = 11 | | | | | | | | | | | |
| 331 | 10% critical value: 0.517 | | | | | | | | | | | |
| 332 | 5% critical value: 0.576 | | | | | | | | | | | |
| 333 | 1% critical value: 0.679 | | | | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | 1. Observation Value 0.026 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | Test Statistic: 0.647 | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | For 10% significance level, 0.026 is an outlier. | | | | | | | | | | | |
| 340 | For 5% significance level, 0.026 is an outlier. | | | | | | | | | | | |
| 341 | For 1% significance level, 0.026 is not an outlier. | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | 2. Observation Value 0.00171 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 344 | | | | | | | | | | | | |
| 345 | Test Statistic: 0.011 | | | | | | | | | | | |
| 346 | | | | | | | | | | | | |
| 347 | For 10% significance level, 0.00171 is not an outlier. | | | | | | | | | | | |
| 348 | For 5% significance level, 0.00171 is not an outlier. | | | | | | | | | | | |
| 349 | For 1% significance level, 0.00171 is not an outlier. | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | | | | | | | | | | | | |
| 352 | Dixon's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 353 | | | | | | | | | | | | |
| 354 | Number of Observations = 11 | | | | | | | | | | | |
| 355 | 10% critical value: 0.517 | | | | | | | | | | | |
| 356 | 5% critical value: 0.576 | | | | | | | | | | | |
| 357 | 1% critical value: 0.679 | | | | | | | | | | | |
| 358 | | | | | | | | | | | | |
| 359 | 1. Observation Value 0.0043 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | Test Statistic: 0.303 | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | For 10% significance level, 0.0043 is not an outlier. | | | | | | | | | | | |
| 364 | For 5% significance level, 0.0043 is not an outlier. | | | | | | | | | | | |
| 365 | For 1% significance level, 0.0043 is not an outlier. | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | 2. Observation Value 0.001 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 368 | | | | | | | | | | | | |
| 369 | Test Statistic: 0.000 | | | | | | | | | | | |
| 370 | | | | | | | | | | | | |
| 371 | For 10% significance level, 0.001 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | For 5% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 373 | For 1% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | | | | | | | | | | | | |
| 376 | Rosner's Outlier Test for TOC (mg/L) | | | | | | | | | | | |
| 377 | | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | | | | Mean | 1.881 | | | | | | | |
| 380 | | | | Standard Deviation | 0.525 | | | | | | | |
| 381 | | | | Number of data | 36 | | | | | | | |
| 382 | | | | Number of suspected outliers | 1 | | | | | | | |
| 383 | | | | | | | | | | | | |
| 384 | | | | Potential | Obs. | Test | Critical | Critical | | | | |
| 385 | # | Mean | sd | outlier | Number | value | value (5%) | value (1%) | | | | |
| 386 | 1 | 1.881 | 0.518 | 3.4 | 2 | 2.934 | 2.99 | 3.33 | | | | |
| 387 | | | | | | | | | | | | |
| 388 | For 5% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 389 | | | | | | | | | | | | |
| 390 | For 1% Significance Level, there is no Potential Outlier | | | | | | | | | | | |
| 391 | | | | | | | | | | | | |

| | | |
|---|---|---|
| | Outlier Tests for Selected Uncensored Variables | |
| | User Selected Options | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 9:38:32 AM | |
| From File | 2023-SandstoneProUCL_e.xls | |
| Full Precision | OFF | |

13(R)SS

Dixon's Outlier Test for pH ()

Number of Observations = 22

10% critical value: 0.382

5% critical value: 0.43

1% critical value: 0.514

1. Observation Value 8.49 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.333

For 10% significance level, 8.49 is not an outlier.

For 5% significance level, 8.49 is not an outlier.

For 1% significance level, 8.49 is not an outlier.

2. Observation Value 7.29 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.303

For 10% significance level, 7.29 is not an outlier.

For 5% significance level, 7.29 is not an outlier.

For 1% significance level, 7.29 is not an outlier.

Dixon's Outlier Test for TDS (mg/L)

Number of Observations = 22

10% critical value: 0.382

5% critical value: 0.43

1% critical value: 0.514

1. Observation Value 445 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.398

For 10% significance level, 445 is an outlier.

For 5% significance level, 445 is not an outlier.

For 1% significance level, 445 is not an outlier.

2. Observation Value 236 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.062

For 10% significance level, 236 is not an outlier.

For 5% significance level, 236 is not an outlier.

For 1% significance level, 236 is not an outlier.

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 54 | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 56 | Dixon's Outlier Test for Chloride (mg/L) | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Number of Observations = 9 | | | | | | | | | | | |
| 59 | 10% critical value: 0.441 | | | | | | | | | | | |
| 60 | 5% critical value: 0.512 | | | | | | | | | | | |
| 61 | 1% critical value: 0.635 | | | | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | 1. Observation Value 2.5 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 64 | | | | | | | | | | | | |
| 65 | Test Statistic: 0.095 | | | | | | | | | | | |
| 66 | | | | | | | | | | | | |
| 67 | For 10% significance level, 2.5 is not an outlier. | | | | | | | | | | | |
| 68 | For 5% significance level, 2.5 is not an outlier. | | | | | | | | | | | |
| 69 | For 1% significance level, 2.5 is not an outlier. | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |
| 71 | 2. Observation Value 0.3 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 72 | | | | | | | | | | | | |
| 73 | Test Statistic: 0.050 | | | | | | | | | | | |
| 74 | | | | | | | | | | | | |
| 75 | For 10% significance level, 0.3 is not an outlier. | | | | | | | | | | | |
| 76 | For 5% significance level, 0.3 is not an outlier. | | | | | | | | | | | |
| 77 | For 1% significance level, 0.3 is not an outlier. | | | | | | | | | | | |
| 78 | | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | Dixon's Outlier Test for Sulphate (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 81.2 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | Test Statistic: 0.856 | | | | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | For 10% significance level, 81.2 is an outlier. | | | | | | | | | | | |
| 92 | For 5% significance level, 81.2 is an outlier. | | | | | | | | | | | |
| 93 | For 1% significance level, 81.2 is an outlier. | | | | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | 2. Observation Value 18.9 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 96 | | | | | | | | | | | | |
| 97 | Test Statistic: 0.111 | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | For 10% significance level, 18.9 is not an outlier. | | | | | | | | | | | |
| 100 | For 5% significance level, 18.9 is not an outlier. | | | | | | | | | | | |
| 101 | For 1% significance level, 18.9 is not an outlier. | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | Dixon's Outlier Test for DOC (mg/L) | | | | | | | | | | | |
| 105 | | | | | | | | | | | | |
| 106 | Number of Observations = 15 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | 10% critical value: 0.472 | | | | | | | | | | | |
| 108 | 5% critical value: 0.525 | | | | | | | | | | | |
| 109 | 1% critical value: 0.616 | | | | | | | | | | | |
| 110 | | | | | | | | | | | | |
| 111 | 1. Observation Value 10.1 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 112 | | | | | | | | | | | | |
| 113 | Test Statistic: 0.703 | | | | | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | For 10% significance level, 10.1 is an outlier. | | | | | | | | | | | |
| 116 | For 5% significance level, 10.1 is an outlier. | | | | | | | | | | | |
| 117 | For 1% significance level, 10.1 is an outlier. | | | | | | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | 2. Observation Value 0.73 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | Test Statistic: 0.091 | | | | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | For 10% significance level, 0.73 is not an outlier. | | | | | | | | | | | |
| 124 | For 5% significance level, 0.73 is not an outlier. | | | | | | | | | | | |
| 125 | For 1% significance level, 0.73 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 528 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 136 | | | | | | | | | | | | |
| 137 | Test Statistic: 0.510 | | | | | | | | | | | |
| 138 | | | | | | | | | | | | |
| 139 | For 10% significance level, 528 is an outlier. | | | | | | | | | | | |
| 140 | For 5% significance level, 528 is an outlier. | | | | | | | | | | | |
| 141 | For 1% significance level, 528 is not an outlier. | | | | | | | | | | | |
| 142 | | | | | | | | | | | | |
| 143 | 2. Observation Value 256 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 144 | | | | | | | | | | | | |
| 145 | Test Statistic: 0.079 | | | | | | | | | | | |
| 146 | | | | | | | | | | | | |
| 147 | For 10% significance level, 256 is not an outlier. | | | | | | | | | | | |
| 148 | For 5% significance level, 256 is not an outlier. | | | | | | | | | | | |
| 149 | For 1% significance level, 256 is not an outlier. | | | | | | | | | | | |
| 150 | | | | | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | Dixon's Outlier Test for Calcium (mg/L) | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | Number of Observations = 21 | | | | | | | | | | | |
| 155 | 10% critical value: 0.391 | | | | | | | | | | | |
| 156 | 5% critical value: 0.44 | | | | | | | | | | | |
| 157 | 1% critical value: 0.524 | | | | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | 1. Observation Value 117 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 160 | | | | | | | | | | | | |
| 161 | Test Statistic: 0.433 | | | | | | | | | | | |
| 162 | | | | | | | | | | | | |
| 163 | For 10% significance level, 117 is an outlier. | | | | | | | | | | | |
| 164 | For 5% significance level, 117 is not an outlier. | | | | | | | | | | | |
| 165 | For 1% significance level, 117 is not an outlier. | | | | | | | | | | | |
| 166 | | | | | | | | | | | | |
| 167 | 2. Observation Value 52 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 168 | | | | | | | | | | | | |
| 169 | Test Statistic: 0.126 | | | | | | | | | | | |
| 170 | | | | | | | | | | | | |
| 171 | For 10% significance level, 52 is not an outlier. | | | | | | | | | | | |
| 172 | For 5% significance level, 52 is not an outlier. | | | | | | | | | | | |
| 173 | For 1% significance level, 52 is not an outlier. | | | | | | | | | | | |
| 174 | | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | Dixon's Outlier Test for Magnesium (mg/L) | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | Number of Observations = 21 | | | | | | | | | | | |
| 179 | 10% critical value: 0.391 | | | | | | | | | | | |
| 180 | 5% critical value: 0.44 | | | | | | | | | | | |
| 181 | 1% critical value: 0.524 | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | 1. Observation Value 26.8 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | Test Statistic: 0.652 | | | | | | | | | | | |
| 186 | | | | | | | | | | | | |
| 187 | For 10% significance level, 26.8 is an outlier. | | | | | | | | | | | |
| 188 | For 5% significance level, 26.8 is an outlier. | | | | | | | | | | | |
| 189 | For 1% significance level, 26.8 is an outlier. | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | 2. Observation Value 10.7 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Test Statistic: 0.100 | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | For 10% significance level, 10.7 is not an outlier. | | | | | | | | | | | |
| 196 | For 5% significance level, 10.7 is not an outlier. | | | | | | | | | | | |
| 197 | For 1% significance level, 10.7 is not an outlier. | | | | | | | | | | | |
| 198 | | | | | | | | | | | | |
| 199 | | | | | | | | | | | | |
| 200 | Dixon's Outlier Test for Sodium (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 56.9 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | Test Statistic: 0.704 | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | For 10% significance level, 56.9 is an outlier. | | | | | | | | | | | |
| 212 | For 5% significance level, 56.9 is an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | For 1% significance level, 56.9 is an outlier. | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | 2. Observation Value 13.2 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | Test Statistic: 0.038 | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | For 10% significance level, 13.2 is not an outlier. | | | | | | | | | | | |
| 220 | For 5% significance level, 13.2 is not an outlier. | | | | | | | | | | | |
| 221 | For 1% significance level, 13.2 is not an outlier. | | | | | | | | | | | |
| 222 | | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | Dixon's Outlier Test for Arsenic (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 0.056 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 232 | | | | | | | | | | | | |
| 233 | Test Statistic: 0.748 | | | | | | | | | | | |
| 234 | | | | | | | | | | | | |
| 235 | For 10% significance level, 0.056 is an outlier. | | | | | | | | | | | |
| 236 | For 5% significance level, 0.056 is an outlier. | | | | | | | | | | | |
| 237 | For 1% significance level, 0.056 is an outlier. | | | | | | | | | | | |
| 238 | | | | | | | | | | | | |
| 239 | 2. Observation Value 0.00042 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 240 | | | | | | | | | | | | |
| 241 | Test Statistic: 0.005 | | | | | | | | | | | |
| 242 | | | | | | | | | | | | |
| 243 | For 10% significance level, 0.00042 is not an outlier. | | | | | | | | | | | |
| 244 | For 5% significance level, 0.00042 is not an outlier. | | | | | | | | | | | |
| 245 | For 1% significance level, 0.00042 is not an outlier. | | | | | | | | | | | |
| 246 | | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | Dixon's Outlier Test for Cadmium (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 0.003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | Test Statistic: 0.672 | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | Test Statistic: 0.017 | | | | | | | | | | | |

For 10% significance level, 5E-06 is not an outlier.

For 5% significance level, 5E-06 is not an outlier.

For 1% significance level, 5E-06 is not an outlier.

## Dixon's Outlier Test for Chromium (mg/L)

Number of Observations = 9

10% critical value: 0.441

5% critical value: 0.512

1% critical value: 0.635

1. Observation Value 0.007 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.860

For 10% significance level, 0.007 is an outlier.

For 5% significance level, 0.007 is an outlier.

For 1% significance level, 0.007 is an outlier.

2. Observation Value 0.00013 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.010

For 10% significance level, 0.00013 is not an outlier.

For 5% significance level, 0.00013 is not an outlier.

For 1% significance level, 0.00013 is not an outlier.

## Dixon's Outlier Test for Copper (mg/L)

Number of Observations = 19

10% critical value: 0.412

5% critical value: 0.462

1% critical value: 0.547

1. Observation Value 0.083 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.522

For 10% significance level, 0.083 is an outlier.

For 5% significance level, 0.083 is an outlier.

For 1% significance level, 0.083 is not an outlier.

2. Observation Value 0.001 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.018

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.

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 319 | | | | | | | | | | | | |
| 320 | Dixon's Outlier Test for Iron (mg/L) | | | | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | Number of Observations = 3 | | | | | | | | | | | |
| 323 | 10% critical value: 0.886 | | | | | | | | | | | |
| 324 | 5% critical value: 0.941 | | | | | | | | | | | |
| 325 | 1% critical value: 0.988 | | | | | | | | | | | |
| 326 | | | | | | | | | | | | |
| 327 | 1. Observation Value 0.04 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | Test Statistic: 1.000 | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | For 10% significance level, 0.04 is an outlier. | | | | | | | | | | | |
| 332 | For 5% significance level, 0.04 is an outlier. | | | | | | | | | | | |
| 333 | For 1% significance level, 0.04 is an outlier. | | | | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | Test Statistic: 0.000 | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 340 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 341 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | Dixon's Outlier Test for Lead (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 0.00315 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | Test Statistic: 0.857 | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | For 10% significance level, 0.00315 is an outlier. | | | | | | | | | | | |
| 356 | For 5% significance level, 0.00315 is an outlier. | | | | | | | | | | | |
| 357 | For 1% significance level, 0.00315 is an outlier. | | | | | | | | | | | |
| 358 | | | | | | | | | | | | |
| 359 | 2. Observation Value 5.7E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | Test Statistic: 0.006 | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | For 10% significance level, 5.7E-05 is not an outlier. | | | | | | | | | | | |
| 364 | For 5% significance level, 5.7E-05 is not an outlier. | | | | | | | | | | | |
| 365 | For 1% significance level, 5.7E-05 is not an outlier. | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |
| 368 | Dixon's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 369 | | | | | | | | | | | | |
| 370 | Number of Observations = 18 | | | | | | | | | | | |
| 371 | 10% critical value: 0.424 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 372 | 5% critical value: 0.475 | | | | | | | | | | | |
| 373 | 1% critical value: 0.561 | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | 1. Observation Value 0.92 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | Test Statistic: 0.346 | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | For 10% significance level, 0.92 is not an outlier. | | | | | | | | | | | |
| 380 | For 5% significance level, 0.92 is not an outlier. | | | | | | | | | | | |
| 381 | For 1% significance level, 0.92 is not an outlier. | | | | | | | | | | | |
| 382 | | | | | | | | | | | | |
| 383 | 2. Observation Value 0.005 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | Test Statistic: 0.039 | | | | | | | | | | | |
| 386 | | | | | | | | | | | | |
| 387 | For 10% significance level, 0.005 is not an outlier. | | | | | | | | | | | |
| 388 | For 5% significance level, 0.005 is not an outlier. | | | | | | | | | | | |
| 389 | For 1% significance level, 0.005 is not an outlier. | | | | | | | | | | | |
| 390 | | | | | | | | | | | | |
| 391 | | | | | | | | | | | | |
| 392 | Dixon's Outlier Test for Mercury (mg/L) | | | | | | | | | | | |
| 393 | | | | | | | | | | | | |
| 394 | Number of Observations = 4 | | | | | | | | | | | |
| 395 | 10% critical value: 0.679 | | | | | | | | | | | |
| 396 | 5% critical value: 0.765 | | | | | | | | | | | |
| 397 | 1% critical value: 0.889 | | | | | | | | | | | |
| 398 | | | | | | | | | | | | |
| 399 | 1. Observation Value 9E-05 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 400 | | | | | | | | | | | | |
| 401 | Test Statistic: 0.343 | | | | | | | | | | | |
| 402 | | | | | | | | | | | | |
| 403 | For 10% significance level, 9E-05 is not an outlier. | | | | | | | | | | | |
| 404 | For 5% significance level, 9E-05 is not an outlier. | | | | | | | | | | | |
| 405 | For 1% significance level, 9E-05 is not an outlier. | | | | | | | | | | | |
| 406 | | | | | | | | | | | | |
| 407 | 2. Observation Value 8.6E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 408 | | | | | | | | | | | | |
| 409 | Test Statistic: 0.509 | | | | | | | | | | | |
| 410 | | | | | | | | | | | | |
| 411 | For 10% significance level, 8.6E-06 is not an outlier. | | | | | | | | | | | |
| 412 | For 5% significance level, 8.6E-06 is not an outlier. | | | | | | | | | | | |
| 413 | For 1% significance level, 8.6E-06 is not an outlier. | | | | | | | | | | | |
| 414 | | | | | | | | | | | | |
| 415 | | | | | | | | | | | | |
| 416 | Dixon's Outlier Test for Nickel (mg/L) | | | | | | | | | | | |
| 417 | | | | | | | | | | | | |
| 418 | Number of Observations = 17 | | | | | | | | | | | |
| 419 | 10% critical value: 0.438 | | | | | | | | | | | |
| 420 | 5% critical value: 0.49 | | | | | | | | | | | |
| 421 | 1% critical value: 0.577 | | | | | | | | | | | |
| 422 | | | | | | | | | | | | |
| 423 | 1. Observation Value 0.0227 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 424 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 425 | Test Statistic: 0.288 | | | | | | | | | | | |
| 426 | | | | | | | | | | | | |
| 427 | For 10% significance level, 0.0227 is not an outlier. | | | | | | | | | | | |
| 428 | For 5% significance level, 0.0227 is not an outlier. | | | | | | | | | | | |
| 429 | For 1% significance level, 0.0227 is not an outlier. | | | | | | | | | | | |
| 430 | | | | | | | | | | | | |
| 431 | 2. Observation Value 0.0005 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 432 | | | | | | | | | | | | |
| 433 | Test Statistic: 0.147 | | | | | | | | | | | |
| 434 | | | | | | | | | | | | |
| 435 | For 10% significance level, 0.0005 is not an outlier. | | | | | | | | | | | |
| 436 | For 5% significance level, 0.0005 is not an outlier. | | | | | | | | | | | |
| 437 | For 1% significance level, 0.0005 is not an outlier. | | | | | | | | | | | |
| 438 | | | | | | | | | | | | |
| 439 | | | | | | | | | | | | |
| 440 | Dixon's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 441 | | | | | | | | | | | | |
| 442 | Number of Observations = 17 | | | | | | | | | | | |
| 443 | 10% critical value: 0.438 | | | | | | | | | | | |
| 444 | 5% critical value: 0.49 | | | | | | | | | | | |
| 445 | 1% critical value: 0.577 | | | | | | | | | | | |
| 446 | | | | | | | | | | | | |
| 447 | 1. Observation Value 1.61 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 448 | | | | | | | | | | | | |
| 449 | Test Statistic: 0.703 | | | | | | | | | | | |
| 450 | | | | | | | | | | | | |
| 451 | For 10% significance level, 1.61 is an outlier. | | | | | | | | | | | |
| 452 | For 5% significance level, 1.61 is an outlier. | | | | | | | | | | | |
| 453 | For 1% significance level, 1.61 is an outlier. | | | | | | | | | | | |
| 454 | | | | | | | | | | | | |
| 455 | 2. Observation Value 0.0044 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 456 | | | | | | | | | | | | |
| 457 | Test Statistic: 0.018 | | | | | | | | | | | |
| 458 | | | | | | | | | | | | |
| 459 | For 10% significance level, 0.0044 is not an outlier. | | | | | | | | | | | |
| 460 | For 5% significance level, 0.0044 is not an outlier. | | | | | | | | | | | |
| 461 | For 1% significance level, 0.0044 is not an outlier. | | | | | | | | | | | |
| 462 | | | | | | | | | | | | |
| 463 | | | | | | | | | | | | |
| 464 | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | | | | |
| 465 | | | | | | | | | | | | |
| 466 | Number of Observations = 6 | | | | | | | | | | | |
| 467 | 10% critical value: 0.482 | | | | | | | | | | | |
| 468 | 5% critical value: 0.56 | | | | | | | | | | | |
| 469 | 1% critical value: 0.698 | | | | | | | | | | | |
| 470 | | | | | | | | | | | | |
| 471 | 1. Observation Value 5.9 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 472 | | | | | | | | | | | | |
| 473 | Test Statistic: 0.354 | | | | | | | | | | | |
| 474 | | | | | | | | | | | | |
| 475 | For 10% significance level, 5.9 is not an outlier. | | | | | | | | | | | |
| 476 | For 5% significance level, 5.9 is not an outlier. | | | | | | | | | | | |
| 477 | For 1% significance level, 5.9 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 478 | | | | | | | | | | | | |
| 479 | 2. Observation Value 1.1 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 480 | | | | | | | | | | | | |
| 481 | Test Statistic: 0.188 | | | | | | | | | | | |
| 482 | | | | | | | | | | | | |
| 483 | For 10% significance level, 1.1 is not an outlier. | | | | | | | | | | | |
| 484 | For 5% significance level, 1.1 is not an outlier. | | | | | | | | | | | |
| 485 | For 1% significance level, 1.1 is not an outlier. | | | | | | | | | | | |
| 486 | | | | | | | | | | | | |

| | | |
|---|---|---|
| | Outlier Tests for Selected Uncensored Variables | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 9:41:39 AM | |
| From File | 2023-SandstoneProUCL_g.xls | |
| Full Precision | OFF | |

89-3

Dixon's Outlier Test for pH ()

Number of Observations = 22

10% critical value: 0.382

5% critical value: 0.43

1% critical value: 0.514

1. Observation Value 8.4 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.153

For 10% significance level, 8.4 is not an outlier.

For 5% significance level, 8.4 is not an outlier.

For 1% significance level, 8.4 is not an outlier.

2. Observation Value 7.3 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.126

For 10% significance level, 7.3 is not an outlier.

For 5% significance level, 7.3 is not an outlier.

For 1% significance level, 7.3 is not an outlier.

Dixon's Outlier Test for TDS (mg/L)

Number of Observations = 21

10% critical value: 0.391

5% critical value: 0.44

1% critical value: 0.524

1. Observation Value 293 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.324

For 10% significance level, 293 is not an outlier.

For 5% significance level, 293 is not an outlier.

For 1% significance level, 293 is not an outlier.

2. Observation Value 176 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.074

For 10% significance level, 176 is not an outlier.

For 5% significance level, 176 is not an outlier.

For 1% significance level, 176 is not an outlier.

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 54 | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 56 | Dixon's Outlier Test for Chloride (mg/L) | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Number of Observations = 7 | | | | | | | | | | | |
| 59 | 10% critical value: 0.434 | | | | | | | | | | | |
| 60 | 5% critical value: 0.507 | | | | | | | | | | | |
| 61 | 1% critical value: 0.637 | | | | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | 1. Observation Value 58.4 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 64 | | | | | | | | | | | | |
| 65 | Test Statistic: 0.344 | | | | | | | | | | | |
| 66 | | | | | | | | | | | | |
| 67 | For 10% significance level, 58.4 is not an outlier. | | | | | | | | | | | |
| 68 | For 5% significance level, 58.4 is not an outlier. | | | | | | | | | | | |
| 69 | For 1% significance level, 58.4 is not an outlier. | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |
| 71 | 2. Observation Value 0.2 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 72 | | | | | | | | | | | | |
| 73 | Test Statistic: 0.012 | | | | | | | | | | | |
| 74 | | | | | | | | | | | | |
| 75 | For 10% significance level, 0.2 is not an outlier. | | | | | | | | | | | |
| 76 | For 5% significance level, 0.2 is not an outlier. | | | | | | | | | | | |
| 77 | For 1% significance level, 0.2 is not an outlier. | | | | | | | | | | | |
| 78 | | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | Dixon's Outlier Test for Sulphate (mg/L) | | | | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | Number of Observations = 22 | | | | | | | | | | | |
| 83 | 10% critical value: 0.382 | | | | | | | | | | | |
| 84 | 5% critical value: 0.43 | | | | | | | | | | | |
| 85 | 1% critical value: 0.514 | | | | | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | 1. Observation Value 30.1 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | Test Statistic: 0.405 | | | | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | For 10% significance level, 30.1 is an outlier. | | | | | | | | | | | |
| 92 | For 5% significance level, 30.1 is not an outlier. | | | | | | | | | | | |
| 93 | For 1% significance level, 30.1 is not an outlier. | | | | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | 2. Observation Value 13.6 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 96 | | | | | | | | | | | | |
| 97 | Test Statistic: 0.162 | | | | | | | | | | | |
| 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 = 15 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | 10% critical value: 0.472 | | | | | | | | | | | |
| 108 | 5% critical value: 0.525 | | | | | | | | | | | |
| 109 | 1% critical value: 0.616 | | | | | | | | | | | |
| 110 | | | | | | | | | | | | |
| 111 | 1. Observation Value 7.1 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 112 | | | | | | | | | | | | |
| 113 | Test Statistic: 0.508 | | | | | | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | For 10% significance level, 7.1 is an outlier. | | | | | | | | | | | |
| 116 | For 5% significance level, 7.1 is not an outlier. | | | | | | | | | | | |
| 117 | For 1% significance level, 7.1 is not an outlier. | | | | | | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | 2. Observation Value 0.83 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | Test Statistic: 0.113 | | | | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | For 10% significance level, 0.83 is not an outlier. | | | | | | | | | | | |
| 124 | For 5% significance level, 0.83 is not an outlier. | | | | | | | | | | | |
| 125 | For 1% significance level, 0.83 is not an outlier. | | | | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | | | | | | | | | |
| 128 | Dixon's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 129 | | | | | | | | | | | | |
| 130 | Number of Observations = 22 | | | | | | | | | | | |
| 131 | 10% critical value: 0.382 | | | | | | | | | | | |
| 132 | 5% critical value: 0.43 | | | | | | | | | | | |
| 133 | 1% critical value: 0.514 | | | | | | | | | | | |
| 134 | | | | | | | | | | | | |
| 135 | 1. Observation Value 245 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 136 | | | | | | | | | | | | |
| 137 | Test Statistic: 0.055 | | | | | | | | | | | |
| 138 | | | | | | | | | | | | |
| 139 | For 10% significance level, 245 is not an outlier. | | | | | | | | | | | |
| 140 | For 5% significance level, 245 is not an outlier. | | | | | | | | | | | |
| 141 | For 1% significance level, 245 is not an outlier. | | | | | | | | | | | |
| 142 | | | | | | | | | | | | |
| 143 | 2. Observation Value 186 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 144 | | | | | | | | | | | | |
| 145 | Test Statistic: 0.071 | | | | | | | | | | | |
| 146 | | | | | | | | | | | | |
| 147 | For 10% significance level, 186 is not an outlier. | | | | | | | | | | | |
| 148 | For 5% significance level, 186 is not an outlier. | | | | | | | | | | | |
| 149 | For 1% significance level, 186 is not an outlier. | | | | | | | | | | | |
| 150 | | | | | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | Dixon's Outlier Test for Calcium (mg/L) | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | Number of Observations = 22 | | | | | | | | | | | |
| 155 | 10% critical value: 0.382 | | | | | | | | | | | |
| 156 | 5% critical value: 0.43 | | | | | | | | | | | |
| 157 | 1% critical value: 0.514 | | | | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | 1. Observation Value 48.4 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | | | | | | | | |
| 161 | Test Statistic: 0.053 | | | | | | | | | | | |
| 162 | | | | | | | | | | | | |
| 163 | For 10% significance level, 48.4 is not an outlier. | | | | | | | | | | | |
| 164 | For 5% significance level, 48.4 is not an outlier. | | | | | | | | | | | |
| 165 | For 1% significance level, 48.4 is not an outlier. | | | | | | | | | | | |
| 166 | | | | | | | | | | | | |
| 167 | 2. Observation Value 35.4 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 168 | | | | | | | | | | | | |
| 169 | Test Statistic: 0.137 | | | | | | | | | | | |
| 170 | | | | | | | | | | | | |
| 171 | For 10% significance level, 35.4 is not an outlier. | | | | | | | | | | | |
| 172 | For 5% significance level, 35.4 is not an outlier. | | | | | | | | | | | |
| 173 | For 1% significance level, 35.4 is not an outlier. | | | | | | | | | | | |
| 174 | | | | | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | Dixon's Outlier Test for Magnesium (mg/L) | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | Number of Observations = 22 | | | | | | | | | | | |
| 179 | 10% critical value: 0.382 | | | | | | | | | | | |
| 180 | 5% critical value: 0.43 | | | | | | | | | | | |
| 181 | 1% critical value: 0.514 | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | 1. Observation Value 16.9 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | Test Statistic: 0.286 | | | | | | | | | | | |
| 186 | | | | | | | | | | | | |
| 187 | For 10% significance level, 16.9 is not an outlier. | | | | | | | | | | | |
| 188 | For 5% significance level, 16.9 is not an outlier. | | | | | | | | | | | |
| 189 | For 1% significance level, 16.9 is not an outlier. | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | 2. Observation Value 10.9 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Test Statistic: 0.091 | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | For 10% significance level, 10.9 is not an outlier. | | | | | | | | | | | |
| 196 | For 5% significance level, 10.9 is not an outlier. | | | | | | | | | | | |
| 197 | For 1% significance level, 10.9 is not an outlier. | | | | | | | | | | | |
| 198 | | | | | | | | | | | | |
| 199 | | | | | | | | | | | | |
| 200 | Dixon's Outlier Test for Sodium (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 62.4 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | Test Statistic: 0.938 | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | For 10% significance level, 62.4 is an outlier. | | | | | | | | | | | |
| 212 | For 5% significance level, 62.4 is an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | For 1% significance level, 62.4 is an outlier. | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | 2. Observation Value 11.8 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | Test Statistic: 0.184 | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | For 10% significance level, 11.8 is not an outlier. | | | | | | | | | | | |
| 220 | For 5% significance level, 11.8 is not an outlier. | | | | | | | | | | | |
| 221 | For 1% significance level, 11.8 is not an outlier. | | | | | | | | | | | |
| 222 | | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | Dixon's Outlier Test for Arsenic (mg/L) | | | | | | | | | | | |
| 225 | | | | | | | | | | | | |
| 226 | Number of Observations = 19 | | | | | | | | | | | |
| 227 | 10% critical value: 0.412 | | | | | | | | | | | |
| 228 | 5% critical value: 0.462 | | | | | | | | | | | |
| 229 | 1% critical value: 0.547 | | | | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | 1. Observation Value 0.0036 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 232 | | | | | | | | | | | | |
| 233 | Test Statistic: 0.197 | | | | | | | | | | | |
| 234 | | | | | | | | | | | | |
| 235 | For 10% significance level, 0.0036 is not an outlier. | | | | | | | | | | | |
| 236 | For 5% significance level, 0.0036 is not an outlier. | | | | | | | | | | | |
| 237 | For 1% significance level, 0.0036 is not an outlier. | | | | | | | | | | | |
| 238 | | | | | | | | | | | | |
| 239 | 2. Observation Value 0.0001 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 240 | | | | | | | | | | | | |
| 241 | Test Statistic: 0.035 | | | | | | | | | | | |
| 242 | | | | | | | | | | | | |
| 243 | For 10% significance level, 0.0001 is not an outlier. | | | | | | | | | | | |
| 244 | For 5% significance level, 0.0001 is not an outlier. | | | | | | | | | | | |
| 245 | For 1% significance level, 0.0001 is not an outlier. | | | | | | | | | | | |
| 246 | | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | Dixon's Outlier Test for Cadmium (mg/L) | | | | | | | | | | | |
| 249 | | | | | | | | | | | | |
| 250 | Number of Observations = 5 | | | | | | | | | | | |
| 251 | 10% critical value: 0.557 | | | | | | | | | | | |
| 252 | 5% critical value: 0.642 | | | | | | | | | | | |
| 253 | 1% critical value: 0.78 | | | | | | | | | | | |
| 254 | | | | | | | | | | | | |
| 255 | 1. Observation Value 0.0169 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | Test Statistic: 0.956 | | | | | | | | | | | |
| 258 | | | | | | | | | | | | |
| 259 | For 10% significance level, 0.0169 is an outlier. | | | | | | | | | | | |
| 260 | For 5% significance level, 0.0169 is an outlier. | | | | | | | | | | | |
| 261 | For 1% significance level, 0.0169 is an outlier. | | | | | | | | | | | |
| 262 | | | | | | | | | | | | |
| 263 | 2. Observation Value 6.5E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | Test Statistic: 0.020 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | | | | | | | | |
| 267 | For 10% significance level, 6.5E-06 is not an outlier. | | | | | | | | | | | |
| 268 | For 5% significance level, 6.5E-06 is not an outlier. | | | | | | | | | | | |
| 269 | For 1% significance level, 6.5E-06 is not an outlier. | | | | | | | | | | | |
| 270 | | | | | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | Dixon's Outlier Test for Chromium (mg/L) | | | | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | Number of Observations = 4 | | | | | | | | | | | |
| 275 | 10% critical value: 0.679 | | | | | | | | | | | |
| 276 | 5% critical value: 0.765 | | | | | | | | | | | |
| 277 | 1% critical value: 0.889 | | | | | | | | | | | |
| 278 | | | | | | | | | | | | |
| 279 | 1. Observation Value 0.009 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | Test Statistic: 0.843 | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | For 10% significance level, 0.009 is an outlier. | | | | | | | | | | | |
| 284 | For 5% significance level, 0.009 is an outlier. | | | | | | | | | | | |
| 285 | For 1% significance level, 0.009 is not an outlier. | | | | | | | | | | | |
| 286 | | | | | | | | | | | | |
| 287 | 2. Observation Value 0.001 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | Test Statistic: 0.025 | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | For 10% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 292 | For 5% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 293 | For 1% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 294 | | | | | | | | | | | | |
| 295 | | | | | | | | | | | | |
| 296 | Dixon's Outlier Test for Copper (mg/L) | | | | | | | | | | | |
| 297 | | | | | | | | | | | | |
| 298 | Number of Observations = 7 | | | | | | | | | | | |
| 299 | 10% critical value: 0.434 | | | | | | | | | | | |
| 300 | 5% critical value: 0.507 | | | | | | | | | | | |
| 301 | 1% critical value: 0.637 | | | | | | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | 1. Observation Value 0.00564 is a Potential Outlier (Upper Tail | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | Test Statistic: 0.067 | | | | | | | | | | | |
| 306 | | | | | | | | | | | | |
| 307 | For 10% significance level, 0.00564 is not an outlier. | | | | | | | | | | | |
| 308 | For 5% significance level, 0.00564 is not an outlier. | | | | | | | | | | | |
| 309 | For 1% significance level, 0.00564 is not an outlier. | | | | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | 2. Observation Value 0.00054 is a Potential Outlier (Lower Tail) | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | Test Statistic: 0.110 | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | For 10% significance level, 0.00054 is not an outlier. | | | | | | | | | | | |
| 316 | For 5% significance level, 0.00054 is not an outlier. | | | | | | | | | | | |
| 317 | For 1% significance level, 0.00054 is not an outlier. | | | | | | | | | | | |
| 318 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | | | | | | | | |
| 320 | Dixon's Outlier Test for Iron (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 8.95 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | Test Statistic: 0.094 | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | For 10% significance level, 8.95 is not an outlier. | | | | | | | | | | | |
| 332 | For 5% significance level, 8.95 is not an outlier. | | | | | | | | | | | |
| 333 | For 1% significance level, 8.95 is not an outlier. | | | | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | Test Statistic: 0.006 | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 340 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 341 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | | |
| 345 | | | | | | | | | | | | |
| 346 | Number of Observations = 3 | | | | | | | | | | | |
| 347 | 10% critical value: 0.886 | | | | | | | | | | | |
| 348 | 5% critical value: 0.941 | | | | | | | | | | | |
| 349 | 1% critical value: 0.988 | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | 1. Observation Value 0.134 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | Test Statistic: 1.000 | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | For 10% significance level, 0.134 is an outlier. | | | | | | | | | | | |
| 356 | For 5% significance level, 0.134 is an outlier. | | | | | | | | | | | |
| 357 | For 1% significance level, 0.134 is an outlier. | | | | | | | | | | | |
| 358 | | | | | | | | | | | | |
| 359 | 2. Observation Value 0.0002 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | Test Statistic: 0.000 | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | For 10% significance level, 0.0002 is not an outlier. | | | | | | | | | | | |
| 364 | For 5% significance level, 0.0002 is not an outlier. | | | | | | | | | | | |
| 365 | For 1% significance level, 0.0002 is not an outlier. | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |
| 368 | Dixon's Outlier Test for Manganese (mg/L) | | | | | | | | | | | |
| 369 | | | | | | | | | | | | |
| 370 | Number of Observations = 22 | | | | | | | | | | | |
| 371 | 10% critical value: 0.382 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | 5% critical value: 0.43 | | | | | | | | | | | |
| 373 | 1% critical value: 0.514 | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | 1. Observation Value 1.27 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | Test Statistic: 0.138 | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | For 10% significance level, 1.27 is not an outlier. | | | | | | | | | | | |
| 380 | For 5% significance level, 1.27 is not an outlier. | | | | | | | | | | | |
| 381 | For 1% significance level, 1.27 is not an outlier. | | | | | | | | | | | |
| 382 | | | | | | | | | | | | |
| 383 | 2. Observation Value 0.232 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | Test Statistic: 0.405 | | | | | | | | | | | |
| 386 | | | | | | | | | | | | |
| 387 | For 10% significance level, 0.232 is an outlier. | | | | | | | | | | | |
| 388 | For 5% significance level, 0.232 is not an outlier. | | | | | | | | | | | |
| 389 | For 1% significance level, 0.232 is not an outlier. | | | | | | | | | | | |
| 390 | | | | | | | | | | | | |
| 391 | | | | | | | | | | | | |
| 392 | Available only for sample sizes 3 to 500 | | | | | | | | | | | |
| 393 | | | | | | | | | | | | |
| 394 | Dixon's Outlier Test for Nickel (mg/L) | | | | | | | | | | | |
| 395 | | | | | | | | | | | | |
| 396 | Number of Observations = 19 | | | | | | | | | | | |
| 397 | 10% critical value: 0.412 | | | | | | | | | | | |
| 398 | 5% critical value: 0.462 | | | | | | | | | | | |
| 399 | 1% critical value: 0.547 | | | | | | | | | | | |
| 400 | | | | | | | | | | | | |
| 401 | 1. Observation Value 0.0287 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 402 | | | | | | | | | | | | |
| 403 | Test Statistic: 0.791 | | | | | | | | | | | |
| 404 | | | | | | | | | | | | |
| 405 | For 10% significance level, 0.0287 is an outlier. | | | | | | | | | | | |
| 406 | For 5% significance level, 0.0287 is an outlier. | | | | | | | | | | | |
| 407 | For 1% significance level, 0.0287 is an outlier. | | | | | | | | | | | |
| 408 | | | | | | | | | | | | |
| 409 | 2. Observation Value 0.00048 is a Potential Outlier (Lower Tail) | | | | | | | | | | | |
| 410 | | | | | | | | | | | | |
| 411 | Test Statistic: 0.003 | | | | | | | | | | | |
| 412 | | | | | | | | | | | | |
| 413 | For 10% significance level, 0.00048 is not an outlier. | | | | | | | | | | | |
| 414 | For 5% significance level, 0.00048 is not an outlier. | | | | | | | | | | | |
| 415 | For 1% significance level, 0.00048 is not an outlier. | | | | | | | | | | | |
| 416 | | | | | | | | | | | | |
| 417 | | | | | | | | | | | | |
| 418 | Dixon's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 419 | | | | | | | | | | | | |
| 420 | Number of Observations = 19 | | | | | | | | | | | |
| 421 | 10% critical value: 0.412 | | | | | | | | | | | |
| 422 | 5% critical value: 0.462 | | | | | | | | | | | |
| 423 | 1% critical value: 0.547 | | | | | | | | | | | |
| 424 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 425 | 1. Observation Value 4.23 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 426 | | | | | | | | | | | | |
| 427 | Test Statistic: 0.845 | | | | | | | | | | | |
| 428 | | | | | | | | | | | | |
| 429 | For 10% significance level, 4.23 is an outlier. | | | | | | | | | | | |
| 430 | For 5% significance level, 4.23 is an outlier. | | | | | | | | | | | |
| 431 | For 1% significance level, 4.23 is an outlier. | | | | | | | | | | | |
| 432 | | | | | | | | | | | | |
| 433 | 2. Observation Value 0.0011 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 434 | | | | | | | | | | | | |
| 435 | Test Statistic: 0.003 | | | | | | | | | | | |
| 436 | | | | | | | | | | | | |
| 437 | For 10% significance level, 0.0011 is not an outlier. | | | | | | | | | | | |
| 438 | For 5% significance level, 0.0011 is not an outlier. | | | | | | | | | | | |
| 439 | For 1% significance level, 0.0011 is not an outlier. | | | | | | | | | | | |
| 440 | | | | | | | | | | | | |
| 441 | | | | | | | | | | | | |
| 442 | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | | | | |
| 443 | | | | | | | | | | | | |
| 444 | Number of Observations = 4 | | | | | | | | | | | |
| 445 | 10% critical value: 0.679 | | | | | | | | | | | |
| 446 | 5% critical value: 0.765 | | | | | | | | | | | |
| 447 | 1% critical value: 0.889 | | | | | | | | | | | |
| 448 | | | | | | | | | | | | |
| 449 | 1. Observation Value 9 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 450 | | | | | | | | | | | | |
| 451 | Test Statistic: 0.929 | | | | | | | | | | | |
| 452 | | | | | | | | | | | | |
| 453 | For 10% significance level, 9 is an outlier. | | | | | | | | | | | |
| 454 | For 5% significance level, 9 is an outlier. | | | | | | | | | | | |
| 455 | For 1% significance level, 9 is an outlier. | | | | | | | | | | | |
| 456 | | | | | | | | | | | | |
| 457 | 2. Observation Value 0.6 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 458 | | | | | | | | | | | | |
| 459 | Test Statistic: 0.036 | | | | | | | | | | | |
| 460 | | | | | | | | | | | | |
| 461 | For 10% significance level, 0.6 is not an outlier. | | | | | | | | | | | |
| 462 | For 5% significance level, 0.6 is not an outlier. | | | | | | | | | | | |
| 463 | For 1% significance level, 0.6 is not an outlier. | | | | | | | | | | | |
| 464 | | | | | | | | | | | | |

| | | |
|---|---|---|
| | Outlier Tests for Selected Uncensored Variables | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 9:40:06 AM | |
| From File | 2023-SandstoneProUCL_f.xls | |
| Full Precision | OFF | |

MW-15-2R-SS

Dixon's Outlier Test for pH ()

Number of Observations = 19

10% critical value: 0.412

5% critical value: 0.462

1% critical value: 0.547

1. Observation Value 8.51 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.175

For 10% significance level, 8.51 is not an outlier.

For 5% significance level, 8.51 is not an outlier.

For 1% significance level, 8.51 is not an outlier.

2. Observation Value 7.83 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.088

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.

Dixon's Outlier Test for TDS (mg/L)

Number of Observations = 19

10% critical value: 0.412

5% critical value: 0.462

1% critical value: 0.547

1. Observation Value 931 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.075

For 10% significance level, 931 is not an outlier.

For 5% significance level, 931 is not an outlier.

For 1% significance level, 931 is not an outlier.

2. Observation Value 227 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.058

For 10% significance level, 227 is not an outlier.

For 5% significance level, 227 is not an outlier.

For 1% significance level, 227 is not an outlier.

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 54 | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 56 | Dixon's Outlier Test for Chloride (mg/L) | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Number of Observations = 19 | | | | | | | | | | | |
| 59 | 10% critical value: 0.412 | | | | | | | | | | | |
| 60 | 5% critical value: 0.462 | | | | | | | | | | | |
| 61 | 1% critical value: 0.547 | | | | | | | | | | | |
| 62 | | | | | | | | | | | | |
| 63 | 1. Observation Value 30.1 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 = 18 | | | | | | | | | | | |
| 83 | 10% critical value: 0.424 | | | | | | | | | | | |
| 84 | 5% critical value: 0.475 | | | | | | | | | | | |
| 85 | 1% critical value: 0.561 | | | | | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | 1. Observation Value 148 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | Test Statistic: 0.410 | | | | | | | | | | | |
| 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 15.4 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 96 | | | | | | | | | | | | |
| 97 | Test Statistic: 0.055 | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | For 10% significance level, 15.4 is not an outlier. | | | | | | | | | | | |
| 100 | For 5% significance level, 15.4 is not an outlier. | | | | | | | | | | | |
| 101 | For 1% significance level, 15.4 is not an outlier. | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | Dixon's Outlier Test for DOC (mg/L) | | | | | | | | | | | |
| 105 | | | | | | | | | | | | |
| 106 | Number of Observations = 16 | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | 10% critical value: 0.454 | | | | | | | | | | | |
| 108 | 5% critical value: 0.507 | | | | | | | | | | | |
| 109 | 1% critical value: 0.595 | | | | | | | | | | | |
| 110 | | | | | | | | | | | | |
| 111 | 1. Observation Value 58.3 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 112 | | | | | | | | | | | | |
| 113 | Test Statistic: 0.537 | | | | | | | | | | | |
| 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 2 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | Test Statistic: 0.015 | | | | | | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | For 10% significance level, 2 is not an outlier. | | | | | | | | | | | |
| 124 | For 5% significance level, 2 is not an outlier. | | | | | | | | | | | |
| 125 | For 1% significance level, 2 is not an outlier. | | | | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | | | | | | | | | |
| 128 | Dixon's Outlier Test for Bicarbonate (mg/L) | | | | | | | | | | | |
| 129 | | | | | | | | | | | | |
| 130 | Number of Observations = 19 | | | | | | | | | | | |
| 131 | 10% critical value: 0.412 | | | | | | | | | | | |
| 132 | 5% critical value: 0.462 | | | | | | | | | | | |
| 133 | 1% critical value: 0.547 | | | | | | | | | | | |
| 134 | | | | | | | | | | | | |
| 135 | 1. Observation Value 1060 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 = 21 | | | | | | | | | | | |
| 155 | 10% critical value: 0.391 | | | | | | | | | | | |
| 156 | 5% critical value: 0.44 | | | | | | | | | | | |
| 157 | 1% critical value: 0.524 | | | | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | 1. Observation Value 246 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
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| 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 Tail)? | | | | | | | | | | | |
| 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 = 21 | | | | | | | | | | | |
| 179 | 10% critical value: 0.391 | | | | | | | | | | | |
| 180 | 5% critical value: 0.44 | | | | | | | | | | | |
| 181 | 1% critical value: 0.524 | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | 1. Observation Value 51.6 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 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 = 21 | | | | | | | | | | | |
| 203 | 10% critical value: 0.391 | | | | | | | | | | | |
| 204 | 5% critical value: 0.44 | | | | | | | | | | | |
| 205 | 1% critical value: 0.524 | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | 1. Observation Value 118 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 |
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| 213 | For 1% significance level, 118 is an outlier. | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | 2. Observation Value 33.6 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 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 = 21 | | | | | | | | | | | |
| 227 | 10% critical value: 0.391 | | | | | | | | | | | |
| 228 | 5% critical value: 0.44 | | | | | | | | | | | |
| 229 | 1% critical value: 0.524 | | | | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | 1. Observation Value 0.0765 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 232 | | | | | | | | | | | | |
| 233 | Test Statistic: 0.371 | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 240 | | | | | | | | | | | | |
| 241 | Test Statistic: 0.060 | | | | | | | | | | | |
| 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 = 21 | | | | | | | | | | | |
| 251 | 10% critical value: 0.391 | | | | | | | | | | | |
| 252 | 5% critical value: 0.44 | | | | | | | | | | | |
| 253 | 1% critical value: 0.524 | | | | | | | | | | | |
| 254 | | | | | | | | | | | | |
| 255 | 1. Observation Value 0.003 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 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 Tail)? | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | Test Statistic: 0.001 | | | | | | | | | | | |

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| 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 Chromium (mg/L) | | | | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | Number of Observations = 9 | | | | | | | | | | | |
| 275 | 10% critical value: 0.441 | | | | | | | | | | | |
| 276 | 5% critical value: 0.512 | | | | | | | | | | | |
| 277 | 1% critical value: 0.635 | | | | | | | | | | | |
| 278 | | | | | | | | | | | | |
| 279 | 1. Observation Value 0.013 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | Test Statistic: 0.624 | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | For 10% significance level, 0.013 is an outlier. | | | | | | | | | | | |
| 284 | For 5% significance level, 0.013 is an outlier. | | | | | | | | | | | |
| 285 | For 1% significance level, 0.013 is not an outlier. | | | | | | | | | | | |
| 286 | | | | | | | | | | | | |
| 287 | 2. Observation Value 0.00018 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | Test Statistic: 0.000 | | | | | | | | | | | |
| 290 | | | | | | | | | | | | |
| 291 | For 10% significance level, 0.00018 is not an outlier. | | | | | | | | | | | |
| 292 | For 5% significance level, 0.00018 is not an outlier. | | | | | | | | | | | |
| 293 | For 1% significance level, 0.00018 is not an outlier. | | | | | | | | | | | |
| 294 | | | | | | | | | | | | |
| 295 | | | | | | | | | | | | |
| 296 | Dixon's Outlier Test for Copper (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 0.454 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | Test Statistic: 0.714 | | | | | | | | | | | |
| 306 | | | | | | | | | | | | |
| 307 | For 10% significance level, 0.454 is an outlier. | | | | | | | | | | | |
| 308 | For 5% significance level, 0.454 is an outlier. | | | | | | | | | | | |
| 309 | For 1% significance level, 0.454 is an outlier. | | | | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | 2. Observation Value 0.00013 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | Test Statistic: 0.001 | | | | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | For 10% significance level, 0.00013 is not an outlier. | | | | | | | | | | | |
| 316 | For 5% significance level, 0.00013 is not an outlier. | | | | | | | | | | | |
| 317 | For 1% significance level, 0.00013 is not an outlier. | | | | | | | | | | | |
| 318 | | | | | | | | | | | | |

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| 319 | | | | | | | | | | | | |
| 320 | Dixon's Outlier Test for Iron (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 19.5 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 328 | | | | | | | | | | | | |
| 329 | Test Statistic: 0.911 | | | | | | | | | | | |
| 330 | | | | | | | | | | | | |
| 331 | For 10% significance level, 19.5 is an outlier. | | | | | | | | | | | |
| 332 | For 5% significance level, 19.5 is an outlier. | | | | | | | | | | | |
| 333 | For 1% significance level, 19.5 is an outlier. | | | | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | 2. Observation Value 0.01 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | Test Statistic: 0.000 | | | | | | | | | | | |
| 338 | | | | | | | | | | | | |
| 339 | For 10% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 340 | For 5% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 341 | For 1% significance level, 0.01 is not an outlier. | | | | | | | | | | | |
| 342 | | | | | | | | | | | | |
| 343 | | | | | | | | | | | | |
| 344 | Dixon's Outlier Test for Lead (mg/L) | | | | | | | | | | | |
| 345 | | | | | | | | | | | | |
| 346 | Number of Observations = 4 | | | | | | | | | | | |
| 347 | 10% critical value: 0.679 | | | | | | | | | | | |
| 348 | 5% critical value: 0.765 | | | | | | | | | | | |
| 349 | 1% critical value: 0.889 | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | 1. Observation Value 0.001 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 352 | | | | | | | | | | | | |
| 353 | Test Statistic: 0.426 | | | | | | | | | | | |
| 354 | | | | | | | | | | | | |
| 355 | For 10% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 356 | For 5% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 357 | For 1% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 358 | | | | | | | | | | | | |
| 359 | 2. Observation Value 6E-05 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 360 | | | | | | | | | | | | |
| 361 | Test Statistic: 0.074 | | | | | | | | | | | |
| 362 | | | | | | | | | | | | |
| 363 | For 10% significance level, 6E-05 is not an outlier. | | | | | | | | | | | |
| 364 | For 5% significance level, 6E-05 is not an outlier. | | | | | | | | | | | |
| 365 | For 1% significance level, 6E-05 is not an outlier. | | | | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | | | | | | | | | | | | |
| 368 | Dixon's Outlier Test for Manganese (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 |
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| 372 | 5% critical value: 0.45 | | | | | | | | | | | |
| 373 | 1% critical value: 0.535 | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | 1. Observation Value 3.9 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | Test Statistic: 0.243 | | | | | | | | | | | |
| 378 | | | | | | | | | | | | |
| 379 | For 10% significance level, 3.9 is not an outlier. | | | | | | | | | | | |
| 380 | For 5% significance level, 3.9 is not an outlier. | | | | | | | | | | | |
| 381 | For 1% significance level, 3.9 is not an outlier. | | | | | | | | | | | |
| 382 | | | | | | | | | | | | |
| 383 | 2. Observation Value 0.251 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 384 | | | | | | | | | | | | |
| 385 | Test Statistic: 0.041 | | | | | | | | | | | |
| 386 | | | | | | | | | | | | |
| 387 | For 10% significance level, 0.251 is not an outlier. | | | | | | | | | | | |
| 388 | For 5% significance level, 0.251 is not an outlier. | | | | | | | | | | | |
| 389 | For 1% significance level, 0.251 is not an outlier. | | | | | | | | | | | |
| 390 | | | | | | | | | | | | |
| 391 | | | | | | | | | | | | |
| 392 | Dixon's Outlier Test for Mercury (mg/L) | | | | | | | | | | | |
| 393 | | | | | | | | | | | | |
| 394 | Number of Observations = 6 | | | | | | | | | | | |
| 395 | 10% critical value: 0.482 | | | | | | | | | | | |
| 396 | 5% critical value: 0.56 | | | | | | | | | | | |
| 397 | 1% critical value: 0.698 | | | | | | | | | | | |
| 398 | | | | | | | | | | | | |
| 399 | 1. Observation Value 0.00021 is a Potential Outlier (Upper Tail) | | | | | | | | | | | |
| 400 | | | | | | | | | | | | |
| 401 | Test Statistic: 0.636 | | | | | | | | | | | |
| 402 | | | | | | | | | | | | |
| 403 | For 10% significance level, 0.00021 is an outlier. | | | | | | | | | | | |
| 404 | For 5% significance level, 0.00021 is an outlier. | | | | | | | | | | | |
| 405 | For 1% significance level, 0.00021 is not an outlier. | | | | | | | | | | | |
| 406 | | | | | | | | | | | | |
| 407 | 2. Observation Value 5.5E-06 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 408 | | | | | | | | | | | | |
| 409 | Test Statistic: 0.005 | | | | | | | | | | | |
| 410 | | | | | | | | | | | | |
| 411 | For 10% significance level, 5.5E-06 is not an outlier. | | | | | | | | | | | |
| 412 | For 5% significance level, 5.5E-06 is not an outlier. | | | | | | | | | | | |
| 413 | For 1% significance level, 5.5E-06 is not an outlier. | | | | | | | | | | | |
| 414 | | | | | | | | | | | | |
| 415 | | | | | | | | | | | | |
| 416 | Dixon's Outlier Test for Nickel (mg/L) | | | | | | | | | | | |
| 417 | | | | | | | | | | | | |
| 418 | Number of Observations = 20 | | | | | | | | | | | |
| 419 | 10% critical value: 0.401 | | | | | | | | | | | |
| 420 | 5% critical value: 0.45 | | | | | | | | | | | |
| 421 | 1% critical value: 0.535 | | | | | | | | | | | |
| 422 | | | | | | | | | | | | |
| 423 | 1. Observation Value 0.723 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 424 | | | | | | | | | | | | |

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| 425 | Test Statistic: 0.899 | | | | | | | | | | | |
| 426 | | | | | | | | | | | | |
| 427 | For 10% significance level, 0.723 is an outlier. | | | | | | | | | | | |
| 428 | For 5% significance level, 0.723 is an outlier. | | | | | | | | | | | |
| 429 | For 1% significance level, 0.723 is an outlier. | | | | | | | | | | | |
| 430 | | | | | | | | | | | | |
| 431 | 2. Observation Value 0.00082 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 432 | | | | | | | | | | | | |
| 433 | Test Statistic: 0.003 | | | | | | | | | | | |
| 434 | | | | | | | | | | | | |
| 435 | For 10% significance level, 0.00082 is not an outlier. | | | | | | | | | | | |
| 436 | For 5% significance level, 0.00082 is not an outlier. | | | | | | | | | | | |
| 437 | For 1% significance level, 0.00082 is not an outlier. | | | | | | | | | | | |
| 438 | | | | | | | | | | | | |
| 439 | | | | | | | | | | | | |
| 440 | Dixon's Outlier Test for Zinc (mg/L) | | | | | | | | | | | |
| 441 | | | | | | | | | | | | |
| 442 | Number of Observations = 20 | | | | | | | | | | | |
| 443 | 10% critical value: 0.401 | | | | | | | | | | | |
| 444 | 5% critical value: 0.45 | | | | | | | | | | | |
| 445 | 1% critical value: 0.535 | | | | | | | | | | | |
| 446 | | | | | | | | | | | | |
| 447 | 1. Observation Value 1.85 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 448 | | | | | | | | | | | | |
| 449 | Test Statistic: 0.947 | | | | | | | | | | | |
| 450 | | | | | | | | | | | | |
| 451 | For 10% significance level, 1.85 is an outlier. | | | | | | | | | | | |
| 452 | For 5% significance level, 1.85 is an outlier. | | | | | | | | | | | |
| 453 | For 1% significance level, 1.85 is an outlier. | | | | | | | | | | | |
| 454 | | | | | | | | | | | | |
| 455 | 2. Observation Value 0.001 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 456 | | | | | | | | | | | | |
| 457 | Test Statistic: 0.000 | | | | | | | | | | | |
| 458 | | | | | | | | | | | | |
| 459 | For 10% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 460 | For 5% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 461 | For 1% significance level, 0.001 is not an outlier. | | | | | | | | | | | |
| 462 | | | | | | | | | | | | |
| 463 | | | | | | | | | | | | |
| 464 | Dixon's Outlier Test for TOC (mg/L) | | | | | | | | | | | |
| 465 | | | | | | | | | | | | |
| 466 | Number of Observations = 3 | | | | | | | | | | | |
| 467 | 10% critical value: 0.886 | | | | | | | | | | | |
| 468 | 5% critical value: 0.941 | | | | | | | | | | | |
| 469 | 1% critical value: 0.988 | | | | | | | | | | | |
| 470 | | | | | | | | | | | | |
| 471 | 1. Observation Value 11.1 is a Potential Outlier (Upper Tail)? | | | | | | | | | | | |
| 472 | | | | | | | | | | | | |
| 473 | Test Statistic: 0.524 | | | | | | | | | | | |
| 474 | | | | | | | | | | | | |
| 475 | For 10% significance level, 11.1 is not an outlier. | | | | | | | | | | | |
| 476 | For 5% significance level, 11.1 is not an outlier. | | | | | | | | | | | |
| 477 | For 1% significance level, 11.1 is not an outlier. | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 478 | | | | | | | | | | | | |
| 479 | 2. Observation Value 2.7 is a Potential Outlier (Lower Tail)? | | | | | | | | | | | |
| 480 | | | | | | | | | | | | |
| 481 | Test Statistic: 0.476 | | | | | | | | | | | |
| 482 | | | | | | | | | | | | |
| 483 | For 10% significance level, 2.7 is not an outlier. | | | | | | | | | | | |
| 484 | For 5% significance level, 2.7 is not an outlier. | | | | | | | | | | | |
| 485 | For 1% significance level, 2.7 is not an outlier. | | | | | | | | | | | |
| 486 | | | | | | | | | | | | |

# App G4 Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Shallow

| | | |
|---|---|---|
| | Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 10:05:14 AM | |
| From File | 2023-ShallowProUCL_b.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

01A-SH

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 50 |
| Number of Distinct Observations | 36 |
| Minimum | 0.3 |
| Maximum | 9.66 |
| Mean of Raw Data | 2.175 |
| Standard Deviation of Raw Data | 2.024 |
| Khat | 1.727 |
| Theta hat | 1.26 |
| Kstar | 1.636 |
| Theta star | 1.329 |
| Mean of Log Transformed Data | 0.46 |
| Standard Deviation of Log Transformed Data | 0.785 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.858 |
| Shapiro Wilk Test Statistic | 0.743 |
| Shapiro Wilk Critical (0.05) Value | 0.947 |
| Approximate Shapiro Wilk P Value | 5.786E-11 |
| Lilliefors Test Statistic | 0.215 |
| Lilliefors Critical (0.05) Value | 0.125 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.969 |
| A-D Test Statistic | 0.961 |
| A-D Critical (0.05) Value | 0.765 |
| K-S Test Statistic | 0.133 |
| K-S Critical(0.05) Value | 0.127 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.994 |
| Shapiro Wilk Test Statistic | 0.979 |
| Shapiro Wilk Critical (0.05) Value | 0.947 |
| Approximate Shapiro Wilk P Value | 0.686 |
| Lilliefors Test Statistic | 0.0755 |
| Lilliefors Critical (0.05) Value | 0.125 |

Data appear 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 | | 50 | | | | | | |
| 58 | | | | Number of Distinct Observations | | 22 | | | | | | |
| 59 | | | | Minimum | | 1.0000E-4 | | | | | | |
| 60 | | | | Maximum | | 0.13 | | | | | | |
| 61 | | | | Mean of Raw Data | | 0.00329 | | | | | | |
| 62 | | | | Standard Deviation of Raw Data | | 0.0183 | | | | | | |
| 63 | | | | Khat | | 0.379 | | | | | | |
| 64 | | | | Theta hat | | 0.00868 | | | | | | |
| 65 | | | | Kstar | | 0.37 | | | | | | |
| 66 | | | | Theta star | | 0.0089 | | | | | | |
| 67 | | | | Mean of Log Transformed Data | | -7.466 | | | | | | |
| 68 | | | | Standard Deviation of Log Transformed Data | | 1.103 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | Correlation Coefficient R | | 0.358 | | | | | | |
| 73 | | | | Shapiro Wilk Test Statistic | | 0.165 | | | | | | |
| 74 | | | | Shapiro Wilk Critical (0.05) Value | | 0.947 | | | | | | |
| 75 | | | | Approximate Shapiro Wilk P Value | | 0 | | | | | | |
| 76 | | | | Lilliefors Test Statistic | | 0.489 | | | | | | |
| 77 | | | | Lilliefors Critical (0.05) Value | | 0.125 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | Correlation Coefficient R | | 0.663 | | | | | | |
| 83 | | | | A-D Test Statistic | | 10.36 | | | | | | |
| 84 | | | | A-D Critical (0.05) Value | | 0.843 | | | | | | |
| 85 | | | | K-S Test Statistic | | 0.348 | | | | | | |
| 86 | | | | K-S Critical(0.05) Value | | 0.135 | | | | | | |
| 87 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | Correlation Coefficient R | | 0.881 | | | | | | |
| 92 | | | | Shapiro Wilk Test Statistic | | 0.811 | | | | | | |
| 93 | | | | Shapiro Wilk Critical (0.05) Value | | 0.947 | | | | | | |
| 94 | | | | Approximate Shapiro Wilk P Value | | 3.0805E-8 | | | | | | |
| 95 | | | | Lilliefors Test Statistic | | 0.183 | | | | | | |
| 96 | | | | Lilliefors Critical (0.05) Value | | 0.125 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Copper (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | Number of Valid Observations | | 50 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 108 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 109 | | | | | Maximum | 0.102 | | | | | | |
| 110 | | | | | Mean of Raw Data | 0.00382 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.0143 | | | | | | |
| 112 | | | | | Khat | 0.63 | | | | | | |
| 113 | | | | | Theta hat | 0.00607 | | | | | | |
| 114 | | | | | Kstar | 0.605 | | | | | | |
| 115 | | | | | Theta star | 0.00631 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -6.542 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 0.995 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.419 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.216 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.947 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 0 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.403 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.125 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.673 | | | | | | |
| 132 | | | | | A-D Test Statistic | 6.6 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.803 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.283 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.131 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.923 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.881 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.947 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 3.4003E-5 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.183 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.125 | | | | | | |
| 146 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | Nickel (mg/L) | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | | | | | Raw Statistics | | | | | | | |
| 155 | | | | | Number of Valid Observations | 49 | | | | | | |
| 156 | | | | | Number of Distinct Observations | 38 | | | | | | |
| 157 | | | | | Minimum | 0.0011 | | | | | | |
| 158 | | | | | Maximum | 0.16 | | | | | | |
| 159 | | | | | Mean of Raw Data | 0.0141 | | | | | | |

| | | |
|---|---|---|
| 160 | Standard Deviation of Raw Data | 0.0261 |
| 161 | Khat | 0.776 |
| 162 | Theta hat | 0.0182 |
| 163 | Kstar | 0.742 |
| 164 | Theta star | 0.019 |
| 165 | Mean of Log Transformed Data | -5.031 |
| 166 | Standard Deviation of Log Transformed Data | 1.108 |
| 167 | | |
| 168 | **Normal GOF Test Results** | |
| 169 | | |
| 170 | Correlation Coefficient R | 0.684 |
| 171 | Shapiro Wilk Test Statistic | 0.503 |
| 172 | Shapiro Wilk Critical (0.05) Value | 0.947 |
| 173 | Approximate Shapiro Wilk P Value | 0 |
| 174 | Lilliefors Test Statistic | 0.309 |
| 175 | Lilliefors Critical (0.05) Value | 0.126 |
| 176 | Data not Normal at (0.05) Significance Level | |
| 177 | | |
| 178 | **Gamma GOF Test Results** | |
| 179 | | |
| 180 | Correlation Coefficient R | 0.912 |
| 181 | A-D Test Statistic | 3.317 |
| 182 | A-D Critical (0.05) Value | 0.791 |
| 183 | K-S Test Statistic | 0.218 |
| 184 | K-S Critical(0.05) Value | 0.132 |
| 185 | Data not Gamma Distributed at (0.05) Significance Level | |
| 186 | | |
| 187 | **Lognormal GOF Test Results** | |
| 188 | | |
| 189 | Correlation Coefficient R | 0.961 |
| 190 | Shapiro Wilk Test Statistic | 0.92 |
| 191 | Shapiro Wilk Critical (0.05) Value | 0.947 |
| 192 | Approximate Shapiro Wilk P Value | 0.00259 |
| 193 | Lilliefors Test Statistic | 0.167 |
| 194 | Lilliefors Critical (0.05) Value | 0.126 |
| 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 Significance** | |
| 200 | | |
| 201 | **Zinc (mg/L)** | |
| 202 | | |
| 203 | **Raw Statistics** | |
| 204 | Number of Valid Observations | 32 |
| 205 | Number of Distinct Observations | 26 |
| 206 | Minimum | 0.002 |
| 207 | Maximum | 0.099 |
| 208 | Mean of Raw Data | 0.0135 |
| 209 | Standard Deviation of Raw Data | 0.0203 |
| 210 | Khat | 1.133 |
| 211 | Theta hat | 0.0119 |
| 212 | Kstar | 1.048 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Theta star | 0.0129 | | | | | | |
| 214 | | | | | Mean of Log Transformed Data | -4.805 | | | | | | |
| 215 | | | | | Standard Deviation of Log Transformed Data | 0.875 | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | Normal GOF Test Results | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | | Correlation Coefficient R | 0.705 | | | | | | |
| 220 | | | | | Shapiro Wilk Test Statistic | 0.52 | | | | | | |
| 221 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 222 | | | | | Approximate Shapiro Wilk P Value | 5.255E-11 | | | | | | |
| 223 | | | | | Lilliefors Test Statistic | 0.334 | | | | | | |
| 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 | 0.897 | | | | | | |
| 230 | | | | | A-D Test Statistic | 2.443 | | | | | | |
| 231 | | | | | A-D Critical (0.05) Value | 0.773 | | | | | | |
| 232 | | | | | K-S Test Statistic | 0.206 | | | | | | |
| 233 | | | | | K-S Critical(0.05) Value | 0.16 | | | | | | |
| 234 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 235 | | | | | | | | | | | | |
| 236 | | | | | Lognormal GOF Test Results | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | | | | | Correlation Coefficient R | 0.951 | | | | | | |
| 239 | | | | | Shapiro Wilk Test Statistic | 0.908 | | | | | | |
| 240 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 241 | | | | | Approximate Shapiro Wilk P Value | 0.0106 | | | | | | |
| 242 | | | | | Lilliefors Test Statistic | 0.142 | | | | | | |
| 243 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 244 | 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 5.2 2023-12-13 10:08:01 AM | |
| From File | 2023-ShallowProUCL_c.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

03-SH

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 56 |
| Number of Distinct Observations | 21 |
| Minimum | 0.01 |
| Maximum | 4.4 |
| Mean of Raw Data | 1.219 |
| Standard Deviation of Raw Data | 0.759 |
| Khat | 2.53 |
| Theta hat | 0.482 |
| Kstar | 2.407 |
| Theta star | 0.506 |
| Mean of Log Transformed Data | -0.0124 |
| Standard Deviation of Log Transformed Data | 0.817 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.912 |
| Approximate Shapiro Wilk Test Statistic | 0.851 |
| Approximate Shapiro Wilk P Value | 2.1852E-7 |
| Lilliefors Test Statistic | 0.209 |
| Lilliefors Critical (0.05) Value | 0.118 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.978 |
| A-D Test Statistic | 1.206 |
| A-D Critical (0.05) Value | 0.76 |
| K-S Test Statistic | 0.138 |
| K-S Critical(0.05) Value | 0.12 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.842 |
| Approximate Shapiro Wilk Test Statistic | 0.756 |
| Approximate Shapiro Wilk P Value | 6.350E-12 |
| Lilliefors Test Statistic | 0.185 |
| Lilliefors Critical (0.05) Value | 0.118 |

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

| | 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 Significance | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 56 | Arsenic (mg/L) | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | | | | | Raw Statistics | | | | | | | |
| 59 | | | | | Number of Valid Observations | 56 | | | | | | |
| 60 | | | | | Number of Distinct Observations | 16 | | | | | | |
| 61 | | | | | Minimum | 1.2000E-4 | | | | | | |
| 62 | | | | | Maximum | 0.014 | | | | | | |
| 63 | | | | | Mean of Raw Data | 5.6143E-4 | | | | | | |
| 64 | | | | | Standard Deviation of Raw Data | 0.00185 | | | | | | |
| 65 | | | | | Khat | 0.848 | | | | | | |
| 66 | | | | | Theta hat | 6.6226E-4 | | | | | | |
| 67 | | | | | Kstar | 0.814 | | | | | | |
| 68 | | | | | Theta star | 6.8951E-4 | | | | | | |
| 69 | | | | | Mean of Log Transformed Data | -8.18 | | | | | | |
| 70 | | | | | Standard Deviation of Log Transformed Data | 0.762 | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Normal GOF Test Results | | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | | Correlation Coefficient R | 0.414 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk Test Statistic | 0.213 | | | | | | |
| 76 | | | | | Approximate Shapiro Wilk P Value | 0 | | | | | | |
| 77 | | | | | Lilliefors Test Statistic | 0.428 | | | | | | |
| 78 | | | | | Lilliefors Critical (0.05) Value | 0.118 | | | | | | |
| 79 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 81 | | | | | Gamma GOF Test Results | | | | | | | |
| 82 | | | | | | | | | | | | |
| 83 | | | | | Correlation Coefficient R | 0.644 | | | | | | |
| 84 | | | | | A-D Test Statistic | 9.837 | | | | | | |
| 85 | | | | | A-D Critical (0.05) Value | 0.787 | | | | | | |
| 86 | | | | | K-S Test Statistic | 0.361 | | | | | | |
| 87 | | | | | K-S Critical(0.05) Value | 0.123 | | | | | | |
| 88 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 89 | | | | | | | | | | | | |
| 90 | | | | | Lognormal GOF Test Results | | | | | | | |
| 91 | | | | | | | | | | | | |
| 92 | | | | | Correlation Coefficient R | 0.831 | | | | | | |
| 93 | | | | | Approximate Shapiro Wilk Test Statistic | 0.721 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 1.724E-13 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.242 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.118 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Chromium (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | | Raw Statistics | | | | | | | |
| 106 | | | | | Number of Valid Observations | 56 | | | | | | |

| | | |
|---|---|---|
| 107 | Number of Distinct Observations | 20 |
| 108 | Minimum | 2.9000E-4 |
| 109 | Maximum | 0.018 |
| 110 | Mean of Raw Data | 0.00309 |
| 111 | Standard Deviation of Raw Data | 0.00393 |
| 112 | Khat | 1.092 |
| 113 | Theta hat | 0.00283 |
| 114 | Kstar | 1.046 |
| 115 | Theta star | 0.00295 |
| 116 | Mean of Log Transformed Data | -6.303 |
| 117 | Standard Deviation of Log Transformed Data | 0.982 |
| 118 | | |
| 119 | **Normal GOF Test Results** | |
| 120 | | |
| 121 | Correlation Coefficient R | 0.794 |
| 122 | Approximate Shapiro Wilk Test Statistic | 0.638 |
| 123 | Approximate Shapiro Wilk P Value | 0 |
| 124 | Lilliefors Test Statistic | 0.319 |
| 125 | Lilliefors Critical (0.05) Value | 0.118 |
| 126 | Data not Normal at (0.05) Significance Level | |
| 127 | | |
| 128 | **Gamma GOF Test Results** | |
| 129 | | |
| 130 | Correlation Coefficient R | 0.954 |
| 131 | A-D Test Statistic | 3.021 |
| 132 | A-D Critical (0.05) Value | 0.777 |
| 133 | K-S Test Statistic | 0.242 |
| 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 | 0.966 |
| 140 | Approximate Shapiro Wilk Test Statistic | 0.922 |
| 141 | Approximate Shapiro Wilk P Value | 0.00137 |
| 142 | Lilliefors Test Statistic | 0.177 |
| 143 | Lilliefors Critical (0.05) Value | 0.118 |
| 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 Significance | |
| 149 | | |
| 150 | **Manganese (mg/L)** | |
| 151 | | |
| 152 | **Raw Statistics** | |
| 153 | Number of Valid Observations | 31 |
| 154 | Number of Distinct Observations | 28 |
| 155 | Minimum | 0.001 |
| 156 | Maximum | 0.266 |
| 157 | Mean of Raw Data | 0.0591 |
| 158 | Standard Deviation of Raw Data | 0.0701 |
| 159 | Khat | 0.614 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Theta hat | 0.0962 | | | | | | |
| 161 | | | | | Kstar | 0.576 | | | | | | |
| 162 | | | | | Theta star | 0.103 | | | | | | |
| 163 | | | | | Mean of Log Transformed Data | -3.831 | | | | | | |
| 164 | | | | | Standard Deviation of Log Transformed Data | 1.676 | | | | | | |
| 165 | | | | | | | | | | | | |
| 166 | | | | | Normal GOF Test Results | | | | | | | |
| 167 | | | | | | | | | | | | |
| 168 | | | | | Correlation Coefficient R | 0.898 | | | | | | |
| 169 | | | | | Shapiro Wilk Test Statistic | 0.804 | | | | | | |
| 170 | | | | | Shapiro Wilk Critical (0.05) Value | 0.929 | | | | | | |
| 171 | | | | | Approximate Shapiro Wilk P Value | 2.6290E-5 | | | | | | |
| 172 | | | | | Lilliefors Test Statistic | 0.231 | | | | | | |
| 173 | | | | | Lilliefors Critical (0.05) Value | 0.156 | | | | | | |
| 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 | 0.594 | | | | | | |
| 180 | | | | | A-D Critical (0.05) Value | 0.8 | | | | | | |
| 181 | | | | | K-S Test Statistic | 0.115 | | | | | | |
| 182 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 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 | 0.938 | | | | | | |
| 189 | | | | | Shapiro Wilk Critical (0.05) Value | 0.929 | | | | | | |
| 190 | | | | | Approximate Shapiro Wilk P Value | 0.09 | | | | | | |
| 191 | | | | | Lilliefors Test Statistic | 0.116 | | | | | | |
| 192 | | | | | Lilliefors Critical (0.05) Value | 0.156 | | | | | | |
| 193 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | Nickel (mg/L) | | | | | | | | | | | |
| 196 | | | | | | | | | | | | |
| 197 | | | | | Raw Statistics | | | | | | | |
| 198 | | | | | Number of Valid Observations | 33 | | | | | | |
| 199 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 200 | | | | | Minimum | 0.00149 | | | | | | |
| 201 | | | | | Maximum | 0.015 | | | | | | |
| 202 | | | | | Mean of Raw Data | 0.00539 | | | | | | |
| 203 | | | | | Standard Deviation of Raw Data | 0.00351 | | | | | | |
| 204 | | | | | Khat | 3.065 | | | | | | |
| 205 | | | | | Theta hat | 0.00176 | | | | | | |
| 206 | | | | | Kstar | 2.806 | | | | | | |
| 207 | | | | | Theta star | 0.00192 | | | | | | |
| 208 | | | | | Mean of Log Transformed Data | -5.395 | | | | | | |
| 209 | | | | | Standard Deviation of Log Transformed Data | 0.583 | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | | | | | Normal GOF Test Results | | | | | | | |
| 212 | | | | | | | | | | | | |

| | | |
|---|---|---|
| 213 | Correlation Coefficient R | 0.907 |
| 214 | Shapiro Wilk Test Statistic | 0.819 |
| 215 | Shapiro Wilk Critical (0.05) Value | 0.931 |
| 216 | Approximate Shapiro Wilk P Value | 3.1206E-5 |
| 217 | Lilliefors Test Statistic | 0.241 |
| 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 | 0.97 |
| 224 | A-D Test Statistic | 0.642 |
| 225 | A-D Critical (0.05) Value | 0.753 |
| 226 | K-S Test Statistic | 0.172 |
| 227 | K-S Critical(0.05) Value | 0.154 |
| 228 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | |
| 229 | | |
| 230 | **Lognormal GOF Test Results** | |
| 231 | | |
| 232 | Correlation Coefficient R | 0.99 |
| 233 | Shapiro Wilk Test Statistic | 0.97 |
| 234 | Shapiro Wilk Critical (0.05) Value | 0.931 |
| 235 | Approximate Shapiro Wilk P Value | 0.555 |
| 236 | Lilliefors Test Statistic | 0.131 |
| 237 | Lilliefors Critical (0.05) Value | 0.152 |
| 238 | Data appear Lognormal at (0.05) Significance Level | |
| 239 | | |
| 240 | Zinc (mg/L) | |
| 241 | | |
| 242 | **Raw Statistics** | |
| 243 | Number of Valid Observations | 33 |
| 244 | Number of Distinct Observations | 28 |
| 245 | Minimum | 0.001 |
| 246 | Maximum | 0.0259 |
| 247 | Mean of Raw Data | 0.00662 |
| 248 | Standard Deviation of Raw Data | 0.00588 |
| 249 | Khat | 1.633 |
| 250 | Theta hat | 0.00405 |
| 251 | Kstar | 1.505 |
| 252 | Theta star | 0.0044 |
| 253 | Mean of Log Transformed Data | -5.354 |
| 254 | Standard Deviation of Log Transformed Data | 0.848 |
| 255 | | |
| 256 | **Normal GOF Test Results** | |
| 257 | | |
| 258 | Correlation Coefficient R | 0.892 |
| 259 | Shapiro Wilk Test Statistic | 0.799 |
| 260 | Shapiro Wilk Critical (0.05) Value | 0.931 |
| 261 | Approximate Shapiro Wilk P Value | 1.0407E-5 |
| 262 | Lilliefors Test Statistic | 0.191 |
| 263 | Lilliefors Critical (0.05) Value | 0.152 |
| 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 | 0.984 | | | | | | |
| 269 | | | | | A-D Test Statistic | 0.378 | | | | | | |
| 270 | | | | | A-D Critical (0.05) Value | 0.764 | | | | | | |
| 271 | | | | | K-S Test Statistic | 0.0996 | | | | | | |
| 272 | | | | | K-S Critical(0.05) Value | 0.156 | | | | | | |
| 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 | 0.975 | | | | | | |
| 279 | | | | | Shapiro Wilk Critical (0.05) Value | 0.931 | | | | | | |
| 280 | | | | | Approximate Shapiro Wilk P Value | 0.678 | | | | | | |
| 281 | | | | | Lilliefors Test Statistic | 0.0722 | | | | | | |
| 282 | | | | | Lilliefors Critical (0.05) Value | 0.152 | | | | | | |
| 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 5.2 2023-12-13 10:20:30 AM | |
| From File | 2023-ShallowProUCL_d.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

04-SH

Arsenic (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 55 |
| Number of Distinct Observations | 10 |
| Minimum | 1.0000E-4 |
| Maximum | 0.0016 |
| Mean of Raw Data | 2.8036E-4 |
| Standard Deviation of Raw Data | 2.3140E-4 |
| Khat | 3.001 |
| Theta hat | 9.3423E-5 |
| Kstar | 2.849 |
| Theta star | 9.8393E-5 |
| Mean of Log Transformed Data | -8.355 |
| Standard Deviation of Log Transformed Data | 0.539 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.742 |
| Approximate Shapiro Wilk Test Statistic | 0.587 |
| Approximate Shapiro Wilk P Value | 0 |
| Lilliefors Test Statistic | 0.309 |
| Lilliefors Critical (0.05) Value | 0.119 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.857 |
| A-D Test Statistic | 3.946 |
| A-D Critical (0.05) Value | 0.757 |
| K-S Test Statistic | 0.312 |
| K-S Critical(0.05) Value | 0.121 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.929 |
| Approximate Shapiro Wilk Test Statistic | 0.87 |
| Approximate Shapiro Wilk P Value | 2.9653E-6 |
| Lilliefors Test Statistic | 0.291 |
| Lilliefors Critical (0.05) Value | 0.119 |

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

| | 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 Significance | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 56 | Chromium (mg/L) | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | | | | | Raw Statistics | | | | | | | |
| 59 | | | | | Number of Valid Observations | 55 | | | | | | |
| 60 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 61 | | | | | Minimum | 1.0000E-4 | | | | | | |
| 62 | | | | | Maximum | 0.04 | | | | | | |
| 63 | | | | | Mean of Raw Data | 0.00616 | | | | | | |
| 64 | | | | | Standard Deviation of Raw Data | 0.00808 | | | | | | |
| 65 | | | | | Khat | 0.807 | | | | | | |
| 66 | | | | | Theta hat | 0.00763 | | | | | | |
| 67 | | | | | Kstar | 0.776 | | | | | | |
| 68 | | | | | Theta star | 0.00795 | | | | | | |
| 69 | | | | | Mean of Log Transformed Data | -5.823 | | | | | | |
| 70 | | | | | Standard Deviation of Log Transformed Data | 1.269 | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Normal GOF Test Results | | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | | Correlation Coefficient R | 0.833 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk Test Statistic | 0.704 | | | | | | |
| 76 | | | | | Approximate Shapiro Wilk P Value | 6.550E-14 | | | | | | |
| 77 | | | | | Lilliefors Test Statistic | 0.227 | | | | | | |
| 78 | | | | | Lilliefors Critical (0.05) Value | 0.119 | | | | | | |
| 79 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 81 | | | | | Gamma GOF Test Results | | | | | | | |
| 82 | | | | | | | | | | | | |
| 83 | | | | | Correlation Coefficient R | 0.988 | | | | | | |
| 84 | | | | | A-D Test Statistic | 1.926 | | | | | | |
| 85 | | | | | A-D Critical (0.05) Value | 0.79 | | | | | | |
| 86 | | | | | K-S Test Statistic | 0.186 | | | | | | |
| 87 | | | | | K-S Critical(0.05) Value | 0.125 | | | | | | |
| 88 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 89 | | | | | | | | | | | | |
| 90 | | | | | Lognormal GOF Test Results | | | | | | | |
| 91 | | | | | | | | | | | | |
| 92 | | | | | Correlation Coefficient R | 0.971 | | | | | | |
| 93 | | | | | Approximate Shapiro Wilk Test Statistic | 0.939 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 0.0124 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.185 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.119 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Copper (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | | Raw Statistics | | | | | | | |
| 106 | | | | | Number of Valid Observations | 55 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 108 | | | | | Minimum | 5.8000E-4 | | | | | | |
| 109 | | | | | Maximum | 0.013 | | | | | | |
| 110 | | | | | Mean of Raw Data | 0.00269 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.00248 | | | | | | |
| 112 | | | | | Khat | 1.696 | | | | | | |
| 113 | | | | | Theta hat | 0.00159 | | | | | | |
| 114 | | | | | Kstar | 1.616 | | | | | | |
| 115 | | | | | Theta star | 0.00166 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -6.241 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 0.784 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.869 | | | | | | |
| 122 | | | | | Approximate Shapiro Wilk Test Statistic | 0.766 | | | | | | |
| 123 | | | | | Approximate Shapiro Wilk P Value | 2.957E-11 | | | | | | |
| 124 | | | | | Lilliefors Test Statistic | 0.246 | | | | | | |
| 125 | | | | | Lilliefors Critical (0.05) Value | 0.119 | | | | | | |
| 126 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 127 | | | | | | | | | | | | |
| 128 | | | | | Gamma GOF Test Results | | | | | | | |
| 129 | | | | | | | | | | | | |
| 130 | | | | | Correlation Coefficient R | 0.98 | | | | | | |
| 131 | | | | | A-D Test Statistic | 1.557 | | | | | | |
| 132 | | | | | A-D Critical (0.05) Value | 0.766 | | | | | | |
| 133 | | | | | K-S Test Statistic | 0.178 | | | | | | |
| 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 | 0.98 | | | | | | |
| 140 | | | | | Approximate Shapiro Wilk Test Statistic | 0.944 | | | | | | |
| 141 | | | | | Approximate Shapiro Wilk P Value | 0.0201 | | | | | | |
| 142 | | | | | Lilliefors Test Statistic | 0.13 | | | | | | |
| 143 | | | | | Lilliefors Critical (0.05) Value | 0.119 | | | | | | |
| 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 Significance | | | | | | | | | | | |

| | | |
|---|---|---|
| | Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 10:22:04 AM | |
| From File | 2023-ShallowProUCL_e.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

05-SH

Chloride (mg/L)

**Raw Statistics**

| | |
|---|---|
| Number of Valid Observations | 54 |
| Number of Distinct Observations | 35 |
| Minimum | 0.1 |
| Maximum | 2.72 |
| Mean of Raw Data | 1.375 |
| Standard Deviation of Raw Data | 0.752 |
| Khat | 2.436 |
| Theta hat | 0.564 |
| Kstar | 2.313 |
| Theta star | 0.594 |
| Mean of Log Transformed Data | 0.0992 |
| Standard Deviation of Log Transformed Data | 0.764 |

**Normal GOF Test Results**

| | |
|---|---|
| Correlation Coefficient R | 0.982 |
| Approximate Shapiro Wilk Test Statistic | 0.94 |
| Approximate Shapiro Wilk P Value | 0.0141 |
| Lilliefors Test Statistic | 0.111 |
| Lilliefors Critical (0.05) Value | 0.12 |

Data appear Approximate Normal at (0.05) Significance Level

**Gamma GOF Test Results**

| | |
|---|---|
| Correlation Coefficient R | 0.941 |
| A-D Test Statistic | 1.045 |
| A-D Critical (0.05) Value | 0.76 |
| K-S Test Statistic | 0.12 |
| K-S Critical(0.05) Value | 0.122 |

Data follow Appr. Gamma Distribution at (0.05) Significance Level

**Lognormal GOF Test Results**

| | |
|---|---|
| Correlation Coefficient R | 0.946 |
| Approximate Shapiro Wilk Test Statistic | 0.888 |
| Approximate Shapiro Wilk P Value | 3.2257E-5 |
| Lilliefors Test Statistic | 0.14 |
| Lilliefors Critical (0.05) Value | 0.12 |

Data not 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 | | | | | 49 | | | | | | |
| 56 | Number of Missing Observations | | | | | 7 | | | | | | |
| 57 | Number of Distinct Observations | | | | | 16 | | | | | | |
| 58 | Minimum | | | | | 1.5000E-4 | | | | | | |
| 59 | Maximum | | | | | 0.0019 | | | | | | |
| 60 | Mean of Raw Data | | | | | 3.3776E-4 | | | | | | |
| 61 | Standard Deviation of Raw Data | | | | | 3.0815E-4 | | | | | | |
| 62 | Khat | | | | | 2.709 | | | | | | |
| 63 | Theta hat | | | | | 1.2468E-4 | | | | | | |
| 64 | Kstar | | | | | 2.557 | | | | | | |
| 65 | Theta star | | | | | 1.3210E-4 | | | | | | |
| 66 | Mean of Log Transformed Data | | | | | -8.189 | | | | | | |
| 67 | Standard Deviation of Log Transformed Data | | | | | 0.544 | | | | | | |
| 68 | | | | | | | | | | | | |
| 69 | Normal GOF Test Results | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |
| 71 | Correlation Coefficient R | | | | | 0.713 | | | | | | |
| 72 | Shapiro Wilk Test Statistic | | | | | 0.538 | | | | | | |
| 73 | Shapiro Wilk Critical (0.05) Value | | | | | 0.947 | | | | | | |
| 74 | Approximate Shapiro Wilk P Value | | | | | 0 | | | | | | |
| 75 | Lilliefors Test Statistic | | | | | 0.271 | | | | | | |
| 76 | Lilliefors Critical (0.05) Value | | | | | 0.126 | | | | | | |
| 77 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 78 | | | | | | | | | | | | |
| 79 | Gamma GOF Test Results | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 81 | Correlation Coefficient R | | | | | 0.85 | | | | | | |
| 82 | A-D Test Statistic | | | | | 5.173 | | | | | | |
| 83 | A-D Critical (0.05) Value | | | | | 0.758 | | | | | | |
| 84 | K-S Test Statistic | | | | | 0.282 | | | | | | |
| 85 | K-S Critical(0.05) Value | | | | | 0.128 | | | | | | |
| 86 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 87 | | | | | | | | | | | | |
| 88 | Lognormal GOF Test Results | | | | | | | | | | | |
| 89 | | | | | | | | | | | | |
| 90 | Correlation Coefficient R | | | | | 0.875 | | | | | | |
| 91 | Shapiro Wilk Test Statistic | | | | | 0.771 | | | | | | |
| 92 | Shapiro Wilk Critical (0.05) Value | | | | | 0.947 | | | | | | |
| 93 | Approximate Shapiro Wilk P Value | | | | | 1.2608E-9 | | | | | | |
| 94 | Lilliefors Test Statistic | | | | | 0.268 | | | | | | |
| 95 | Lilliefors Critical (0.05) Value | | | | | 0.126 | | | | | | |
| 96 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 97 | | | | | | | | | | | | |
| 98 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 99 | | | | | | | | | | | | |
| 100 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 101 | | | | | | | | | | | | |
| 102 | Copper (mg/L) | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | Raw Statistics | | | | | | | | | | | |
| 105 | Number of Valid Observations | | | | | 56 | | | | | | |
| 106 | Number of Distinct Observations | | | | | 24 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Minimum | 7.2000E-4 | | | | | | |
| 108 | | | | | Maximum | 0.009 | | | | | | |
| 109 | | | | | Mean of Raw Data | 0.00279 | | | | | | |
| 110 | | | | | Standard Deviation of Raw Data | 0.00206 | | | | | | |
| 111 | | | | | Khat | 2.184 | | | | | | |
| 112 | | | | | Theta hat | 0.00128 | | | | | | |
| 113 | | | | | Kstar | 2.079 | | | | | | |
| 114 | | | | | Theta star | 0.00134 | | | | | | |
| 115 | | | | | Mean of Log Transformed Data | -6.129 | | | | | | |
| 116 | | | | | Standard Deviation of Log Transformed Data | 0.704 | | | | | | |
| 117 | | | | | | | | | | | | |
| 118 | | | | | Normal GOF Test Results | | | | | | | |
| 119 | | | | | | | | | | | | |
| 120 | | | | | Correlation Coefficient R | 0.913 | | | | | | |
| 121 | | | | | Approximate Shapiro Wilk Test Statistic | 0.825 | | | | | | |
| 122 | | | | | Approximate Shapiro Wilk P Value | 1.1181E-8 | | | | | | |
| 123 | | | | | Lilliefors Test Statistic | 0.167 | | | | | | |
| 124 | | | | | Lilliefors Critical (0.05) Value | 0.118 | | | | | | |
| 125 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | | Gamma GOF Test Results | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Correlation Coefficient R | 0.98 | | | | | | |
| 130 | | | | | A-D Test Statistic | 1.901 | | | | | | |
| 131 | | | | | A-D Critical (0.05) Value | 0.762 | | | | | | |
| 132 | | | | | K-S Test Statistic | 0.161 | | | | | | |
| 133 | | | | | K-S Critical(0.05) Value | 0.12 | | | | | | |
| 134 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | Lognormal GOF Test Results | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Correlation Coefficient R | 0.961 | | | | | | |
| 139 | | | | | Approximate Shapiro Wilk Test Statistic | 0.903 | | | | | | |
| 140 | | | | | Approximate Shapiro Wilk P Value | 1.2184E-4 | | | | | | |
| 141 | | | | | Lilliefors Test Statistic | 0.156 | | | | | | |
| 142 | | | | | Lilliefors Critical (0.05) Value | 0.118 | | | | | | |
| 143 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 144 | | | | | | | | | | | | |
| 145 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 146 | | | | | | | | | | | | |
| 147 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 148 | | | | | | | | | | | | |
| 149 | Manganese (mg/L) | | | | | | | | | | | |
| 150 | | | | | | | | | | | | |
| 151 | | | | | Raw Statistics | | | | | | | |
| 152 | | | | | Number of Valid Observations | 32 | | | | | | |
| 153 | | | | | Number of Distinct Observations | 31 | | | | | | |
| 154 | | | | | Minimum | 9.7000E-4 | | | | | | |
| 155 | | | | | Maximum | 0.625 | | | | | | |
| 156 | | | | | Mean of Raw Data | 0.208 | | | | | | |
| 157 | | | | | Standard Deviation of Raw Data | 0.178 | | | | | | |
| 158 | | | | | Khat | 0.771 | | | | | | |
| 159 | | | | | Theta hat | 0.27 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Kstar | 0.719 | | | | | | |
| 161 | | | | | Theta star | 0.29 | | | | | | |
| 162 | | | | | Mean of Log Transformed Data | -2.342 | | | | | | |
| 163 | | | | | Standard Deviation of Log Transformed Data | 1.779 | | | | | | |
| 164 | | | | | | | | | | | | |
| 165 | | | | | Normal GOF Test Results | | | | | | | |
| 166 | | | | | | | | | | | | |
| 167 | | | | | Correlation Coefficient R | 0.953 | | | | | | |
| 168 | | | | | Shapiro Wilk Test Statistic | 0.894 | | | | | | |
| 169 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 170 | | | | | Approximate Shapiro Wilk P Value | 0.00442 | | | | | | |
| 171 | | | | | Lilliefors Test Statistic | 0.174 | | | | | | |
| 172 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 173 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 174 | | | | | | | | | | | | |
| 175 | | | | | Gamma GOF Test Results | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | | | | | Correlation Coefficient R | 0.926 | | | | | | |
| 178 | | | | | A-D Test Statistic | 0.83 | | | | | | |
| 179 | | | | | A-D Critical (0.05) Value | 0.787 | | | | | | |
| 180 | | | | | K-S Test Statistic | 0.132 | | | | | | |
| 181 | | | | | K-S Critical(0.05) Value | 0.161 | | | | | | |
| 182 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 183 | | | | | | | | | | | | |
| 184 | | | | | Lognormal GOF Test Results | | | | | | | |
| 185 | | | | | | | | | | | | |
| 186 | | | | | Correlation Coefficient R | 0.905 | | | | | | |
| 187 | | | | | Shapiro Wilk Test Statistic | 0.812 | | | | | | |
| 188 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 189 | | | | | Approximate Shapiro Wilk P Value | 3.0572E-5 | | | | | | |
| 190 | | | | | Lilliefors Test Statistic | 0.204 | | | | | | |
| 191 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 192 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 193 | | | | | | | | | | | | |
| 194 | Nickel (mg/L) | | | | | | | | | | | |
| 195 | | | | | | | | | | | | |
| 196 | | | | | Raw Statistics | | | | | | | |
| 197 | | | | | Number of Valid Observations | 33 | | | | | | |
| 198 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 199 | | | | | Minimum | 7.4000E-4 | | | | | | |
| 200 | | | | | Maximum | 0.015 | | | | | | |
| 201 | | | | | Mean of Raw Data | 0.00427 | | | | | | |
| 202 | | | | | Standard Deviation of Raw Data | 0.00325 | | | | | | |
| 203 | | | | | Khat | 2.136 | | | | | | |
| 204 | | | | | Theta hat | 0.002 | | | | | | |
| 205 | | | | | Kstar | 1.962 | | | | | | |
| 206 | | | | | Theta star | 0.00218 | | | | | | |
| 207 | | | | | Mean of Log Transformed Data | -5.707 | | | | | | |
| 208 | | | | | Standard Deviation of Log Transformed Data | 0.738 | | | | | | |
| 209 | | | | | | | | | | | | |
| 210 | | | | | Normal GOF Test Results | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | | | | | Correlation Coefficient R | 0.896 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Shapiro Wilk Test Statistic | 0.809 | | | | | | |
| 214 | | | | | Shapiro Wilk Critical (0.05) Value | 0.931 | | | | | | |
| 215 | | | | | Approximate Shapiro Wilk P Value | 1.8218E-5 | | | | | | |
| 216 | | | | | Lilliefors Test Statistic | 0.169 | | | | | | |
| 217 | | | | | Lilliefors Critical (0.05) Value | 0.152 | | | | | | |
| 218 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 219 | | | | | | | | | | | | |
| 220 | | | | Gamma GOF Test Results | | | | | | | | |
| 221 | | | | | | | | | | | | |
| 222 | | | | | Correlation Coefficient R | 0.965 | | | | | | |
| 223 | | | | | A-D Test Statistic | 0.423 | | | | | | |
| 224 | | | | | A-D Critical (0.05) Value | 0.758 | | | | | | |
| 225 | | | | | K-S Test Statistic | 0.09 | | | | | | |
| 226 | | | | | K-S Critical(0.05) Value | 0.155 | | | | | | |
| 227 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | Lognormal GOF Test Results | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | | | | | Correlation Coefficient R | 0.986 | | | | | | |
| 232 | | | | | Shapiro Wilk Test Statistic | 0.965 | | | | | | |
| 233 | | | | | Shapiro Wilk Critical (0.05) Value | 0.931 | | | | | | |
| 234 | | | | | Approximate Shapiro Wilk P Value | 0.419 | | | | | | |
| 235 | | | | | Lilliefors Test Statistic | 0.115 | | | | | | |
| 236 | | | | | Lilliefors Critical (0.05) Value | 0.152 | | | | | | |
| 237 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 238 | | | | | | | | | | | | |
| 239 | Zinc (mg/L) | | | | | | | | | | | |
| 240 | | | | | | | | | | | | |
| 241 | | | | Raw Statistics | | | | | | | | |
| 242 | | | | | Number of Valid Observations | 33 | | | | | | |
| 243 | | | | | Number of Distinct Observations | 21 | | | | | | |
| 244 | | | | | Minimum | 0.001 | | | | | | |
| 245 | | | | | Maximum | 0.078 | | | | | | |
| 246 | | | | | Mean of Raw Data | 0.0067 | | | | | | |
| 247 | | | | | Standard Deviation of Raw Data | 0.014 | | | | | | |
| 248 | | | | | Khat | 0.779 | | | | | | |
| 249 | | | | | Theta hat | 0.0086 | | | | | | |
| 250 | | | | | Kstar | 0.729 | | | | | | |
| 251 | | | | | Theta star | 0.00919 | | | | | | |
| 252 | | | | | Mean of Log Transformed Data | -5.77 | | | | | | |
| 253 | | | | | Standard Deviation of Log Transformed Data | 1.05 | | | | | | |
| 254 | | | | | | | | | | | | |
| 255 | | | | Normal GOF Test Results | | | | | | | | |
| 256 | | | | | | | | | | | | |
| 257 | | | | | Correlation Coefficient R | 0.624 | | | | | | |
| 258 | | | | | Shapiro Wilk Test Statistic | 0.423 | | | | | | |
| 259 | | | | | Shapiro Wilk Critical (0.05) Value | 0.931 | | | | | | |
| 260 | | | | | Approximate Shapiro Wilk P Value | 6.664E-13 | | | | | | |
| 261 | | | | | Lilliefors Test Statistic | 0.365 | | | | | | |
| 262 | | | | | Lilliefors Critical (0.05) Value | 0.152 | | | | | | |
| 263 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 264 | | | | | | | | | | | | |
| 265 | | | | Gamma GOF Test Results | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | | | | | | | | |
| 267 | | | | | Correlation Coefficient R | 0.862 | | | | | | |
| 268 | | | | | A-D Test Statistic | 2.811 | | | | | | |
| 269 | | | | | A-D Critical (0.05) Value | 0.786 | | | | | | |
| 270 | | | | | K-S Test Statistic | 0.298 | | | | | | |
| 271 | | | | | K-S Critical(0.05) Value | 0.159 | | | | | | |
| 272 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | | | | Lognormal GOF Test Results | | | | | | | | |
| 275 | | | | | | | | | | | | |
| 276 | | | | | Correlation Coefficient R | 0.941 | | | | | | |
| 277 | | | | | Shapiro Wilk Test Statistic | 0.883 | | | | | | |
| 278 | | | | | Shapiro Wilk Critical (0.05) Value | 0.931 | | | | | | |
| 279 | | | | | Approximate Shapiro Wilk P Value | 0.00176 | | | | | | |
| 280 | | | | | Lilliefors Test Statistic | 0.194 | | | | | | |
| 281 | | | | | Lilliefors Critical (0.05) Value | 0.152 | | | | | | |
| 282 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 283 | | | | | | | | | | | | |
| 284 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 285 | | | | | | | | | | | | |
| 286 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |

| | | |
|---|---|---|
| | Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 10:24:19 AM | |
| From File | 2023-ShallowProUCL_f.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

06-SH

Arsenic (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 50 |
| Number of Distinct Observations | 23 |
| Minimum | 2.0000E-4 |
| Maximum | 0.00208 |
| Mean of Raw Data | 5.3020E-4 |
| Standard Deviation of Raw Data | 3.7317E-4 |
| Khat | 2.625 |
| Theta hat | 2.0198E-4 |
| Kstar | 2.481 |
| Theta star | 2.1372E-4 |
| Mean of Log Transformed Data | -7.745 |
| Standard Deviation of Log Transformed Data | 0.63 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.898 |
| Shapiro Wilk Test Statistic | 0.817 |
| Shapiro Wilk Critical (0.05) Value | 0.947 |
| Approximate Shapiro Wilk P Value | 5.3426E-8 |
| Lilliefors Test Statistic | 0.192 |
| Lilliefors Critical (0.05) Value | 0.125 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.977 |
| A-D Test Statistic | 1.245 |
| A-D Critical (0.05) Value | 0.759 |
| K-S Test Statistic | 0.133 |
| K-S Critical(0.05) Value | 0.126 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.966 |
| Shapiro Wilk Test Statistic | 0.915 |
| Shapiro Wilk Critical (0.05) Value | 0.947 |
| Approximate Shapiro Wilk P Value | 0.0014 |
| Lilliefors Test Statistic | 0.15 |
| Lilliefors Critical (0.05) Value | 0.125 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Copper (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | Raw Statistics | | | | | | | |
| 61 | | | | | Number of Valid Observations | 50 | | | | | | |
| 62 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 63 | | | | | Minimum | 2.4000E-4 | | | | | | |
| 64 | | | | | Maximum | 0.128 | | | | | | |
| 65 | | | | | Mean of Raw Data | 0.00537 | | | | | | |
| 66 | | | | | Standard Deviation of Raw Data | 0.0184 | | | | | | |
| 67 | | | | | Khat | 0.609 | | | | | | |
| 68 | | | | | Theta hat | 0.00882 | | | | | | |
| 69 | | | | | Kstar | 0.586 | | | | | | |
| 70 | | | | | Theta star | 0.00917 | | | | | | |
| 71 | | | | | Mean of Log Transformed Data | -6.238 | | | | | | |
| 72 | | | | | Standard Deviation of Log Transformed Data | 1.039 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | | Normal GOF Test Results | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | | Correlation Coefficient R | 0.458 | | | | | | |
| 77 | | | | | Shapiro Wilk Test Statistic | 0.251 | | | | | | |
| 78 | | | | | Shapiro Wilk Critical (0.05) Value | 0.947 | | | | | | |
| 79 | | | | | Approximate Shapiro Wilk P Value | 0 | | | | | | |
| 80 | | | | | Lilliefors Test Statistic | 0.446 | | | | | | |
| 81 | | | | | Lilliefors Critical (0.05) Value | 0.125 | | | | | | |
| 82 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 83 | | | | | | | | | | | | |
| 84 | | | | | Gamma GOF Test Results | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | | | | | Correlation Coefficient R | 0.728 | | | | | | |
| 87 | | | | | A-D Test Statistic | 6.355 | | | | | | |
| 88 | | | | | A-D Critical (0.05) Value | 0.805 | | | | | | |
| 89 | | | | | K-S Test Statistic | 0.288 | | | | | | |
| 90 | | | | | K-S Critical(0.05) Value | 0.132 | | | | | | |
| 91 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | | Lognormal GOF Test Results | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | | Correlation Coefficient R | 0.933 | | | | | | |
| 96 | | | | | Shapiro Wilk Test Statistic | 0.895 | | | | | | |
| 97 | | | | | Shapiro Wilk Critical (0.05) Value | 0.947 | | | | | | |
| 98 | | | | | Approximate Shapiro Wilk P Value | 1.5486E-4 | | | | | | |
| 99 | | | | | Lilliefors Test Statistic | 0.14 | | | | | | |
| 100 | | | | | Lilliefors Critical (0.05) Value | 0.125 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 106 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | Nickel (mg/L) | | | | | | | | | | | |
| 108 | | | | | | | | | | | | |
| 109 | | | | Raw Statistics | | | | | | | | |
| 110 | | | | Number of Valid Observations | | 32 | | | | | | |
| 111 | | | | Number of Distinct Observations | | 27 | | | | | | |
| 112 | | | | Minimum | | 0.0041 | | | | | | |
| 113 | | | | Maximum | | 0.167 | | | | | | |
| 114 | | | | Mean of Raw Data | | 0.0149 | | | | | | |
| 115 | | | | Standard Deviation of Raw Data | | 0.0294 | | | | | | |
| 116 | | | | Khat | | 1.033 | | | | | | |
| 117 | | | | Theta hat | | 0.0144 | | | | | | |
| 118 | | | | Kstar | | 0.957 | | | | | | |
| 119 | | | | Theta star | | 0.0156 | | | | | | |
| 120 | | | | Mean of Log Transformed Data | | -4.764 | | | | | | |
| 121 | | | | Standard Deviation of Log Transformed Data | | 0.822 | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | | | | Normal GOF Test Results | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | Correlation Coefficient R | | 0.583 | | | | | | |
| 126 | | | | Shapiro Wilk Test Statistic | | 0.375 | | | | | | |
| 127 | | | | Shapiro Wilk Critical (0.05) Value | | 0.93 | | | | | | |
| 128 | | | | Approximate Shapiro Wilk P Value | | 3.156E-13 | | | | | | |
| 129 | | | | Lilliefors Test Statistic | | 0.388 | | | | | | |
| 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 | | 0.805 | | | | | | |
| 136 | | | | A-D Test Statistic | | 4.386 | | | | | | |
| 137 | | | | A-D Critical (0.05) Value | | 0.775 | | | | | | |
| 138 | | | | K-S Test Statistic | | 0.321 | | | | | | |
| 139 | | | | K-S Critical(0.05) Value | | 0.16 | | | | | | |
| 140 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 141 | | | | | | | | | | | | |
| 142 | | | | Lognormal GOF Test Results | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | | | | Correlation Coefficient R | | 0.864 | | | | | | |
| 145 | | | | Shapiro Wilk Test Statistic | | 0.757 | | | | | | |
| 146 | | | | Shapiro Wilk Critical (0.05) Value | | 0.93 | | | | | | |
| 147 | | | | Approximate Shapiro Wilk P Value | | 1.5990E-6 | | | | | | |
| 148 | | | | Lilliefors Test Statistic | | 0.227 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 155 | | | | | | | | | | | | |
| 156 | Zinc (mg/L) | | | | | | | | | | | |
| 157 | | | | | | | | | | | | |
| 158 | | | | Raw Statistics | | | | | | | | |
| 159 | | | | Number of Valid Observations | | 32 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 161 | | | | | Minimum | 0.001 | | | | | | |
| 162 | | | | | Maximum | 0.054 | | | | | | |
| 163 | | | | | Mean of Raw Data | 0.00562 | | | | | | |
| 164 | | | | | Standard Deviation of Raw Data | 0.00948 | | | | | | |
| 165 | | | | | Khat | 1.139 | | | | | | |
| 166 | | | | | Theta hat | 0.00494 | | | | | | |
| 167 | | | | | Kstar | 1.053 | | | | | | |
| 168 | | | | | Theta star | 0.00534 | | | | | | |
| 169 | | | | | Mean of Log Transformed Data | -5.681 | | | | | | |
| 170 | | | | | Standard Deviation of Log Transformed Data | 0.862 | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | Normal GOF Test Results | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Correlation Coefficient R | 0.639 | | | | | | |
| 175 | | | | | Shapiro Wilk Test Statistic | 0.443 | | | | | | |
| 176 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 177 | | | | | Approximate Shapiro Wilk P Value | 3.203E-12 | | | | | | |
| 178 | | | | | Lilliefors Test Statistic | 0.321 | | | | | | |
| 179 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 180 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | | Gamma GOF Test Results | | | | | | | |
| 183 | | | | | | | | | | | | |
| 184 | | | | | Correlation Coefficient R | 0.834 | | | | | | |
| 185 | | | | | A-D Test Statistic | 1.982 | | | | | | |
| 186 | | | | | A-D Critical (0.05) Value | 0.772 | | | | | | |
| 187 | | | | | K-S Test Statistic | 0.204 | | | | | | |
| 188 | | | | | K-S Critical(0.05) Value | 0.16 | | | | | | |
| 189 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | | | | | Lognormal GOF Test Results | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | | | | | Correlation Coefficient R | 0.96 | | | | | | |
| 194 | | | | | Shapiro Wilk Test Statistic | 0.928 | | | | | | |
| 195 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 196 | | | | | Approximate Shapiro Wilk P Value | 0.0411 | | | | | | |
| 197 | | | | | Lilliefors Test Statistic | 0.113 | | | | | | |
| 198 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 199 | 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 5.2 2023-12-13 10:27:32 AM | |
| From File | 2023-ShallowProUCL_g.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

07-SH

Arsenic (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 55 |
| Number of Distinct Observations | 15 |
| Minimum | 1.0000E-4 |
| Maximum | 0.0012 |
| Mean of Raw Data | 4.0127E-4 |
| Standard Deviation of Raw Data | 2.5641E-4 |
| Khat | 2.531 |
| Theta hat | 1.5851E-4 |
| Kstar | 2.406 |
| Theta star | 1.6681E-4 |
| Mean of Log Transformed Data | -8.031 |
| Standard Deviation of Log Transformed Data | 0.677 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.951 |
| Approximate Shapiro Wilk Test Statistic | 0.897 |
| Approximate Shapiro Wilk P Value | 7.0620E-5 |
| Lilliefors Test Statistic | 0.157 |
| Lilliefors Critical (0.05) Value | 0.119 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.987 |
| A-D Test Statistic | 0.836 |
| A-D Critical (0.05) Value | 0.76 |
| K-S Test Statistic | 0.144 |
| K-S Critical(0.05) Value | 0.121 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.978 |
| Approximate Shapiro Wilk Test Statistic | 0.936 |
| Approximate Shapiro Wilk P Value | 0.00838 |
| Lilliefors Test Statistic | 0.129 |
| Lilliefors Critical (0.05) Value | 0.119 |

Data not Lognormal at (0.05) Significance Level

Non-parametric GOF Test Results

| | 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 Significance | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 56 | Copper (mg/L) | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | | | | | Raw Statistics | | | | | | | |
| 59 | | | | | Number of Valid Observations | 55 | | | | | | |
| 60 | | | | | Number of Distinct Observations | 26 | | | | | | |
| 61 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 62 | | | | | Maximum | 0.035 | | | | | | |
| 63 | | | | | Mean of Raw Data | 0.00309 | | | | | | |
| 64 | | | | | Standard Deviation of Raw Data | 0.00494 | | | | | | |
| 65 | | | | | Khat | 0.96 | | | | | | |
| 66 | | | | | Theta hat | 0.00322 | | | | | | |
| 67 | | | | | Kstar | 0.919 | | | | | | |
| 68 | | | | | Theta star | 0.00336 | | | | | | |
| 69 | | | | | Mean of Log Transformed Data | -6.383 | | | | | | |
| 70 | | | | | Standard Deviation of Log Transformed Data | 1.122 | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Normal GOF Test Results | | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | | Correlation Coefficient R | 0.67 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk Test Statistic | 0.493 | | | | | | |
| 76 | | | | | Approximate Shapiro Wilk P Value | 0 | | | | | | |
| 77 | | | | | Lilliefors Test Statistic | 0.3 | | | | | | |
| 78 | | | | | Lilliefors Critical (0.05) Value | 0.119 | | | | | | |
| 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 | 1.054 | | | | | | |
| 85 | | | | | A-D Critical (0.05) Value | 0.782 | | | | | | |
| 86 | | | | | K-S Test Statistic | 0.147 | | | | | | |
| 87 | | | | | K-S Critical(0.05) Value | 0.124 | | | | | | |
| 88 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 89 | | | | | | | | | | | | |
| 90 | | | | | Lognormal GOF Test Results | | | | | | | |
| 91 | | | | | | | | | | | | |
| 92 | | | | | Correlation Coefficient R | 0.979 | | | | | | |
| 93 | | | | | Approximate Shapiro Wilk Test Statistic | 0.953 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 0.0574 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.132 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.119 | | | | | | |
| 97 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | Iron (mg/L) | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | | Raw Statistics | | | | | | | |
| 102 | | | | | Number of Valid Observations | 30 | | | | | | |
| 103 | | | | | Number of Distinct Observations | 21 | | | | | | |
| 104 | | | | | Minimum | 0.01 | | | | | | |
| 105 | | | | | Maximum | 2.06 | | | | | | |
| 106 | | | | | Mean of Raw Data | 0.335 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Standard Deviation of Raw Data | 0.533 | | | | | | |
| 108 | | | | | Khat | 0.456 | | | | | | |
| 109 | | | | | Theta hat | 0.735 | | | | | | |
| 110 | | | | | Kstar | 0.433 | | | | | | |
| 111 | | | | | Theta star | 0.775 | | | | | | |
| 112 | | | | | Mean of Log Transformed Data | -2.505 | | | | | | |
| 113 | | | | | Standard Deviation of Log Transformed Data | 1.854 | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | | Normal GOF Test Results | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | | | | | Correlation Coefficient R | 0.816 | | | | | | |
| 118 | | | | | Shapiro Wilk Test Statistic | 0.669 | | | | | | |
| 119 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 120 | | | | | Approximate Shapiro Wilk P Value | 6.8896E-8 | | | | | | |
| 121 | | | | | Lilliefors Test Statistic | 0.283 | | | | | | |
| 122 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 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 | 1.447 | | | | | | |
| 129 | | | | | A-D Critical (0.05) Value | 0.819 | | | | | | |
| 130 | | | | | K-S Test Statistic | 0.209 | | | | | | |
| 131 | | | | | K-S Critical(0.05) Value | 0.17 | | | | | | |
| 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 | 0.881 | | | | | | |
| 138 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 139 | | | | | Approximate Shapiro Wilk P Value | 0.00269 | | | | | | |
| 140 | | | | | Lilliefors Test Statistic | 0.171 | | | | | | |
| 141 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Manganese (mg/L) | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | | | | | Raw Statistics | | | | | | | |
| 151 | | | | | Number of Valid Observations | 30 | | | | | | |
| 152 | | | | | Number of Distinct Observations | 30 | | | | | | |
| 153 | | | | | Minimum | 0.001 | | | | | | |
| 154 | | | | | Maximum | 0.995 | | | | | | |
| 155 | | | | | Mean of Raw Data | 0.381 | | | | | | |
| 156 | | | | | Standard Deviation of Raw Data | 0.262 | | | | | | |
| 157 | | | | | Khat | 1.156 | | | | | | |
| 158 | | | | | Theta hat | 0.329 | | | | | | |
| 159 | | | | | Kstar | 1.063 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Theta star | 0.358 | | | | | | |
| 161 | | | | | Mean of Log Transformed Data | -1.457 | | | | | | |
| 162 | | | | | Standard Deviation of Log Transformed Data | 1.445 | | | | | | |
| 163 | | | | | | | | | | | | |
| 164 | | | | | Normal GOF Test Results | | | | | | | |
| 165 | | | | | | | | | | | | |
| 166 | | | | | Correlation Coefficient R | 0.984 | | | | | | |
| 167 | | | | | Shapiro Wilk Test Statistic | 0.957 | | | | | | |
| 168 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 169 | | | | | Approximate Shapiro Wilk P Value | 0.304 | | | | | | |
| 170 | | | | | Lilliefors Test Statistic | 0.0901 | | | | | | |
| 171 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 172 | Data appear Normal at (0.05) Significance Level | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Gamma GOF Test Results | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | Correlation Coefficient R | 0.962 | | | | | | |
| 177 | | | | | A-D Test Statistic | 0.898 | | | | | | |
| 178 | | | | | A-D Critical (0.05) Value | 0.772 | | | | | | |
| 179 | | | | | K-S Test Statistic | 0.162 | | | | | | |
| 180 | | | | | K-S Critical(0.05) Value | 0.164 | | | | | | |
| 181 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | | | | | Lognormal GOF Test Results | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | | | | | Correlation Coefficient R | 0.864 | | | | | | |
| 186 | | | | | Shapiro Wilk Test Statistic | 0.764 | | | | | | |
| 187 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 188 | | | | | Approximate Shapiro Wilk P Value | 4.8319E-6 | | | | | | |
| 189 | | | | | Lilliefors Test Statistic | 0.223 | | | | | | |
| 190 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 191 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Nickel (mg/L) | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | | Raw Statistics | | | | | | | |
| 196 | | | | | Number of Valid Observations | 32 | | | | | | |
| 197 | | | | | Number of Distinct Observations | 22 | | | | | | |
| 198 | | | | | Minimum | 9.0000E-4 | | | | | | |
| 199 | | | | | Maximum | 0.017 | | | | | | |
| 200 | | | | | Mean of Raw Data | 0.00393 | | | | | | |
| 201 | | | | | Standard Deviation of Raw Data | 0.00338 | | | | | | |
| 202 | | | | | Khat | 2.074 | | | | | | |
| 203 | | | | | Theta hat | 0.00189 | | | | | | |
| 204 | | | | | Kstar | 1.9 | | | | | | |
| 205 | | | | | Theta star | 0.00207 | | | | | | |
| 206 | | | | | Mean of Log Transformed Data | -5.8 | | | | | | |
| 207 | | | | | Standard Deviation of Log Transformed Data | 0.71 | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | | | | | Normal GOF Test Results | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | | | | | Correlation Coefficient R | 0.833 | | | | | | |
| 212 | | | | | Shapiro Wilk Test Statistic | 0.711 | | | | | | |

| | 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 | 1.6528E-7 | | | | | | |
| 215 | | | | | Lilliefors Test Statistic | 0.217 | | | | | | |
| 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 | 0.931 | | | | | | |
| 222 | | | | | A-D Test Statistic | 1.103 | | | | | | |
| 223 | | | | | A-D Critical (0.05) Value | 0.759 | | | | | | |
| 224 | | | | | K-S Test Statistic | 0.167 | | | | | | |
| 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 | 0.971 | | | | | | |
| 231 | | | | | Shapiro Wilk Test Statistic | 0.939 | | | | | | |
| 232 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 233 | | | | | Approximate Shapiro Wilk P Value | 0.0873 | | | | | | |
| 234 | | | | | Lilliefors Test Statistic | 0.166 | | | | | | |
| 235 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 236 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | Zinc (mg/L) | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | Raw Statistics | | | | | | | | |
| 241 | | | | | Number of Valid Observations | 32 | | | | | | |
| 242 | | | | | Number of Distinct Observations | 22 | | | | | | |
| 243 | | | | | Minimum | 0.001 | | | | | | |
| 244 | | | | | Maximum | 0.026 | | | | | | |
| 245 | | | | | Mean of Raw Data | 0.00478 | | | | | | |
| 246 | | | | | Standard Deviation of Raw Data | 0.00485 | | | | | | |
| 247 | | | | | Khat | 1.631 | | | | | | |
| 248 | | | | | Theta hat | 0.00293 | | | | | | |
| 249 | | | | | Kstar | 1.499 | | | | | | |
| 250 | | | | | Theta star | 0.00319 | | | | | | |
| 251 | | | | | Mean of Log Transformed Data | -5.68 | | | | | | |
| 252 | | | | | Standard Deviation of Log Transformed Data | 0.806 | | | | | | |
| 253 | | | | | | | | | | | | |
| 254 | | | | Normal GOF Test Results | | | | | | | | |
| 255 | | | | | | | | | | | | |
| 256 | | | | | Correlation Coefficient R | 0.817 | | | | | | |
| 257 | | | | | Shapiro Wilk Test Statistic | 0.692 | | | | | | |
| 258 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 259 | | | | | Approximate Shapiro Wilk P Value | 6.7860E-8 | | | | | | |
| 260 | | | | | Lilliefors Test Statistic | 0.23 | | | | | | |
| 261 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 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 | 0.941 | | | | | | |
| 267 | | | | | A-D Test Statistic | 0.64 | | | | | | |
| 268 | | | | | A-D Critical (0.05) Value | 0.763 | | | | | | |
| 269 | | | | | K-S Test Statistic | 0.138 | | | | | | |
| 270 | | | | | K-S Critical(0.05) Value | 0.158 | | | | | | |
| 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 | 0.965 | | | | | | |
| 277 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 278 | | | | | Approximate Shapiro Wilk P Value | 0.428 | | | | | | |
| 279 | | | | | Lilliefors Test Statistic | 0.079 | | | | | | |
| 280 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 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 5.2 2023-12-13 10:29:13 AM | |
| From File | 2023-ShallowProUCL_h.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

08-SH

Arsenic (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 54 |
| Number of Distinct Observations | 24 |
| Minimum | 2.0000E-4 |
| Maximum | 0.0022 |
| Mean of Raw Data | 6.9833E-4 |
| Standard Deviation of Raw Data | 4.8218E-4 |
| Khat | 2.504 |
| Theta hat | 2.7888E-4 |
| Kstar | 2.377 |
| Theta star | 2.9375E-4 |
| Mean of Log Transformed Data | -7.48 |
| Standard Deviation of Log Transformed Data | 0.656 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.928 |
| Approximate Shapiro Wilk Test Statistic | 0.853 |
| Approximate Shapiro Wilk P Value | 5.3296E-7 |
| Lilliefors Test Statistic | 0.165 |
| Lilliefors Critical (0.05) Value | 0.12 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.989 |
| A-D Test Statistic | 0.815 |
| A-D Critical (0.05) Value | 0.76 |
| K-S Test Statistic | 0.129 |
| K-S Critical(0.05) Value | 0.122 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.987 |
| Approximate Shapiro Wilk Test Statistic | 0.951 |
| Approximate Shapiro Wilk P Value | 0.0524 |
| Lilliefors Test Statistic | 0.108 |
| Lilliefors Critical (0.05) Value | 0.12 |

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 | | | | | 54 | | | | | | |
| 56 | Number of Distinct Observations | | | | | 30 | | | | | | |
| 57 | Minimum | | | | | 1.0000E-4 | | | | | | |
| 58 | Maximum | | | | | 0.027 | | | | | | |
| 59 | Mean of Raw Data | | | | | 0.00571 | | | | | | |
| 60 | Standard Deviation of Raw Data | | | | | 0.00694 | | | | | | |
| 61 | Khat | | | | | 0.732 | | | | | | |
| 62 | Theta hat | | | | | 0.0078 | | | | | | |
| 63 | Kstar | | | | | 0.704 | | | | | | |
| 64 | Theta star | | | | | 0.00811 | | | | | | |
| 65 | Mean of Log Transformed Data | | | | | -5.986 | | | | | | |
| 66 | Standard Deviation of Log Transformed Data | | | | | 1.399 | | | | | | |
| 67 | | | | | | | | | | | | |
| 68 | Normal GOF Test Results | | | | | | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | Correlation Coefficient R | | | | | 0.876 | | | | | | |
| 71 | Approximate Shapiro Wilk Test Statistic | | | | | 0.76 | | | | | | |
| 72 | Approximate Shapiro Wilk P Value | | | | | 2.787E-11 | | | | | | |
| 73 | Lilliefors Test Statistic | | | | | 0.246 | | | | | | |
| 74 | Lilliefors Critical (0.05) Value | | | | | 0.12 | | | | | | |
| 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 | | | | | 1.638 | | | | | | |
| 81 | A-D Critical (0.05) Value | | | | | 0.794 | | | | | | |
| 82 | K-S Test Statistic | | | | | 0.177 | | | | | | |
| 83 | K-S Critical(0.05) Value | | | | | 0.126 | | | | | | |
| 84 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | Lognormal GOF Test Results | | | | | | | | | | | |
| 87 | | | | | | | | | | | | |
| 88 | Correlation Coefficient R | | | | | 0.98 | | | | | | |
| 89 | Approximate Shapiro Wilk Test Statistic | | | | | 0.944 | | | | | | |
| 90 | Approximate Shapiro Wilk P Value | | | | | 0.0234 | | | | | | |
| 91 | Lilliefors Test Statistic | | | | | 0.153 | | | | | | |
| 92 | Lilliefors Critical (0.05) Value | | | | | 0.12 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | Copper (mg/L) | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | Raw Statistics | | | | | | | | | | | |
| 102 | Number of Valid Observations | | | | | 54 | | | | | | |
| 103 | Number of Distinct Observations | | | | | 27 | | | | | | |
| 104 | Minimum | | | | | 4.4000E-4 | | | | | | |
| 105 | Maximum | | | | | 0.0123 | | | | | | |
| 106 | Mean of Raw Data | | | | | 0.00304 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Standard Deviation of Raw Data | 0.00287 | | | | | | |
| 108 | | | | | Khat | 1.448 | | | | | | |
| 109 | | | | | Theta hat | 0.0021 | | | | | | |
| 110 | | | | | Kstar | 1.38 | | | | | | |
| 111 | | | | | Theta star | 0.0022 | | | | | | |
| 112 | | | | | Mean of Log Transformed Data | -6.181 | | | | | | |
| 113 | | | | | Standard Deviation of Log Transformed Data | 0.882 | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | | Normal GOF Test Results | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | | | | | Correlation Coefficient R | 0.887 | | | | | | |
| 118 | | | | | Approximate Shapiro Wilk Test Statistic | 0.781 | | | | | | |
| 119 | | | | | Approximate Shapiro Wilk P Value | 2.548E-10 | | | | | | |
| 120 | | | | | Lilliefors Test Statistic | 0.19 | | | | | | |
| 121 | | | | | Lilliefors Critical (0.05) Value | 0.12 | | | | | | |
| 122 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 123 | | | | | | | | | | | | |
| 124 | | | | | Gamma GOF Test Results | | | | | | | |
| 125 | | | | | | | | | | | | |
| 126 | | | | | Correlation Coefficient R | 0.983 | | | | | | |
| 127 | | | | | A-D Test Statistic | 1.275 | | | | | | |
| 128 | | | | | A-D Critical (0.05) Value | 0.769 | | | | | | |
| 129 | | | | | K-S Test Statistic | 0.131 | | | | | | |
| 130 | | | | | K-S Critical(0.05) Value | 0.123 | | | | | | |
| 131 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 132 | | | | | | | | | | | | |
| 133 | | | | | Lognormal GOF Test Results | | | | | | | |
| 134 | | | | | | | | | | | | |
| 135 | | | | | Correlation Coefficient R | 0.983 | | | | | | |
| 136 | | | | | Approximate Shapiro Wilk Test Statistic | 0.947 | | | | | | |
| 137 | | | | | Approximate Shapiro Wilk P Value | 0.0324 | | | | | | |
| 138 | | | | | Lilliefors Test Statistic | 0.128 | | | | | | |
| 139 | | | | | Lilliefors Critical (0.05) Value | 0.12 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 145 | | | | | | | | | | | | |
| 146 | Manganese (mg/L) | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | | | | | Raw Statistics | | | | | | | |
| 149 | | | | | Number of Valid Observations | 30 | | | | | | |
| 150 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 151 | | | | | Minimum | 0.004 | | | | | | |
| 152 | | | | | Maximum | 1.29 | | | | | | |
| 153 | | | | | Mean of Raw Data | 0.195 | | | | | | |
| 154 | | | | | Standard Deviation of Raw Data | 0.31 | | | | | | |
| 155 | | | | | Khat | 0.474 | | | | | | |
| 156 | | | | | Theta hat | 0.411 | | | | | | |
| 157 | | | | | Kstar | 0.449 | | | | | | |
| 158 | | | | | Theta star | 0.434 | | | | | | |
| 159 | | | | | Mean of Log Transformed Data | -2.988 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Standard Deviation of Log Transformed Data | 1.794 | | | | | | |
| 161 | | | | | | | | | | | | |
| 162 | | | | | Normal GOF Test Results | | | | | | | |
| 163 | | | | | | | | | | | | |
| 164 | | | | | Correlation Coefficient R | 0.816 | | | | | | |
| 165 | | | | | Shapiro Wilk Test Statistic | 0.674 | | | | | | |
| 166 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 167 | | | | | Approximate Shapiro Wilk P Value | 8.4563E-8 | | | | | | |
| 168 | | | | | Lilliefors Test Statistic | 0.298 | | | | | | |
| 169 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 170 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | Gamma GOF Test Results | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Correlation Coefficient R | 0.994 | | | | | | |
| 175 | | | | | A-D Test Statistic | 1.244 | | | | | | |
| 176 | | | | | A-D Critical (0.05) Value | 0.815 | | | | | | |
| 177 | | | | | K-S Test Statistic | 0.196 | | | | | | |
| 178 | | | | | K-S Critical(0.05) Value | 0.17 | | | | | | |
| 179 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 180 | | | | | | | | | | | | |
| 181 | | | | | Lognormal GOF Test Results | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | | | | | Correlation Coefficient R | 0.975 | | | | | | |
| 184 | | | | | Shapiro Wilk Test Statistic | 0.93 | | | | | | |
| 185 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 186 | | | | | Approximate Shapiro Wilk P Value | 0.0583 | | | | | | |
| 187 | | | | | Lilliefors Test Statistic | 0.136 | | | | | | |
| 188 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 189 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | Nickel (mg/L) | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | | | | | Raw Statistics | | | | | | | |
| 194 | | | | | Number of Valid Observations | 32 | | | | | | |
| 195 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 196 | | | | | Minimum | 5.0000E-4 | | | | | | |
| 197 | | | | | Maximum | 0.0335 | | | | | | |
| 198 | | | | | Mean of Raw Data | 0.00571 | | | | | | |
| 199 | | | | | Standard Deviation of Raw Data | 0.00659 | | | | | | |
| 200 | | | | | Khat | 1.433 | | | | | | |
| 201 | | | | | Theta hat | 0.00399 | | | | | | |
| 202 | | | | | Kstar | 1.319 | | | | | | |
| 203 | | | | | Theta star | 0.00433 | | | | | | |
| 204 | | | | | Mean of Log Transformed Data | -5.553 | | | | | | |
| 205 | | | | | Standard Deviation of Log Transformed Data | 0.837 | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | | | | | Normal GOF Test Results | | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | | | | | Correlation Coefficient R | 0.782 | | | | | | |
| 210 | | | | | Shapiro Wilk Test Statistic | 0.635 | | | | | | |
| 211 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 212 | | | | | Approximate Shapiro Wilk P Value | 5.2789E-9 | | | | | | |

| | | |
|---|---|---|
| | Lilliefors Test Statistic | 0.355 |
| | Lilliefors Critical (0.05) Value | 0.154 |
| Data not Normal at (0.05) Significance Level | | |
| | | |
| Gamma GOF Test Results | | |
| | | |
| | Correlation Coefficient R | 0.936 |
| | A-D Test Statistic | 1.788 |
| | A-D Critical (0.05) Value | 0.766 |
| | K-S Test Statistic | 0.261 |
| | K-S Critical(0.05) Value | 0.159 |
| Data not Gamma Distributed at (0.05) Significance Level | | |
| | | |
| Lognormal GOF Test Results | | |
| | | |
| | Correlation Coefficient R | 0.961 |
| | Shapiro Wilk Test Statistic | 0.938 |
| | Shapiro Wilk Critical (0.05) Value | 0.93 |
| | Approximate Shapiro Wilk P Value | 0.0779 |
| | Lilliefors Test Statistic | 0.193 |
| | Lilliefors Critical (0.05) Value | 0.154 |
| Data appear Approximate_Lognormal at (0.05) Significance Level | | |
| | | |
| Zinc (mg/L) | | |
| | | |
| Raw Statistics | | |
| | Number of Valid Observations | 32 |
| | Number of Distinct Observations | 21 |
| | Minimum | 6.0000E-4 |
| | Maximum | 0.0179 |
| | Mean of Raw Data | 0.00469 |
| | Standard Deviation of Raw Data | 0.00436 |
| | Khat | 1.443 |
| | Theta hat | 0.00325 |
| | Kstar | 1.329 |
| | Theta star | 0.00353 |
| | Mean of Log Transformed Data | -5.747 |
| | Standard Deviation of Log Transformed Data | 0.903 |
| | | |
| Normal GOF Test Results | | |
| | | |
| | Correlation Coefficient R | 0.893 |
| | Shapiro Wilk Test Statistic | 0.797 |
| | Shapiro Wilk Critical (0.05) Value | 0.93 |
| | Approximate Shapiro Wilk P Value | 1.2846E-5 |
| | Lilliefors Test Statistic | 0.227 |
| | Lilliefors Critical (0.05) Value | 0.154 |
| Data not Normal at (0.05) Significance Level | | |
| | | |
| Gamma GOF Test Results | | |
| | | |
| | Correlation Coefficient R | 0.981 |
| | A-D Test Statistic | 0.814 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | A-D Critical (0.05) Value | 0.766 | | | | | | |
| 267 | | | | | K-S Test Statistic | 0.133 | | | | | | |
| 268 | | | | | K-S Critical(0.05) Value | 0.159 | | | | | | |
| 269 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 270 | | | | | | | | | | | | |
| 271 | | | | Lognormal GOF Test Results | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | | | | | Correlation Coefficient R | 0.982 | | | | | | |
| 274 | | | | | Shapiro Wilk Test Statistic | 0.951 | | | | | | |
| 275 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 276 | | | | | Approximate Shapiro Wilk P Value | 0.194 | | | | | | |
| 277 | | | | | Lilliefors Test Statistic | 0.161 | | | | | | |
| 278 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 279 | 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 5.2 2023-12-13 10:31:04 AM | |
| From File | 2023-ShallowProUCL_i.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

11-SH

Arsenic (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 37 |
| Number of Distinct Observations | 31 |
| Minimum | 1.3000E-4 |
| Maximum | 0.013 |
| Mean of Raw Data | 0.00183 |
| Standard Deviation of Raw Data | 0.00301 |
| Khat | 0.67 |
| Theta hat | 0.00273 |
| Kstar | 0.634 |
| Theta star | 0.00289 |
| Mean of Log Transformed Data | -7.211 |
| Standard Deviation of Log Transformed Data | 1.279 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.766 |
| Shapiro Wilk Test Statistic | 0.598 |
| Shapiro Wilk Critical (0.05) Value | 0.936 |
| Approximate Shapiro Wilk P Value | 3.356E-11 |
| Lilliefors Test Statistic | 0.314 |
| Lilliefors Critical (0.05) Value | 0.144 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.967 |
| A-D Test Statistic | 2.461 |
| A-D Critical (0.05) Value | 0.796 |
| K-S Test Statistic | 0.226 |
| K-S Critical(0.05) Value | 0.152 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.964 |
| Shapiro Wilk Test Statistic | 0.913 |
| Shapiro Wilk Critical (0.05) Value | 0.936 |
| Approximate Shapiro Wilk P Value | 0.00746 |
| Lilliefors Test Statistic | 0.149 |
| Lilliefors Critical (0.05) Value | 0.144 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Copper (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | Raw Statistics | | | | | | | |
| 61 | | | | | Number of Valid Observations | 37 | | | | | | |
| 62 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 63 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 64 | | | | | Maximum | 0.007 | | | | | | |
| 65 | | | | | Mean of Raw Data | 0.00249 | | | | | | |
| 66 | | | | | Standard Deviation of Raw Data | 0.00173 | | | | | | |
| 67 | | | | | Khat | 2.233 | | | | | | |
| 68 | | | | | Theta hat | 0.00112 | | | | | | |
| 69 | | | | | Kstar | 2.07 | | | | | | |
| 70 | | | | | Theta star | 0.0012 | | | | | | |
| 71 | | | | | Mean of Log Transformed Data | -6.235 | | | | | | |
| 72 | | | | | Standard Deviation of Log Transformed Data | 0.742 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | | Normal GOF Test Results | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | | Correlation Coefficient R | 0.933 | | | | | | |
| 77 | | | | | Shapiro Wilk Test Statistic | 0.865 | | | | | | |
| 78 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 79 | | | | | Approximate Shapiro Wilk P Value | 2.0122E-4 | | | | | | |
| 80 | | | | | Lilliefors Test Statistic | 0.168 | | | | | | |
| 81 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 82 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 83 | | | | | | | | | | | | |
| 84 | | | | | Gamma GOF Test Results | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | | | | | Correlation Coefficient R | 0.984 | | | | | | |
| 87 | | | | | A-D Test Statistic | 0.744 | | | | | | |
| 88 | | | | | A-D Critical (0.05) Value | 0.758 | | | | | | |
| 89 | | | | | K-S Test Statistic | 0.166 | | | | | | |
| 90 | | | | | K-S Critical(0.05) Value | 0.147 | | | | | | |
| 91 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | | Lognormal GOF Test Results | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | | Correlation Coefficient R | 0.965 | | | | | | |
| 96 | | | | | Shapiro Wilk Test Statistic | 0.938 | | | | | | |
| 97 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 98 | | | | | Approximate Shapiro Wilk P Value | 0.0536 | | | | | | |
| 99 | | | | | Lilliefors Test Statistic | 0.146 | | | | | | |
| 100 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 101 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Iron (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | | Raw Statistics | | | | | | | |
| 106 | | | | | Number of Valid Observations | 30 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 108 | | | | | Minimum | 0.01 | | | | | | |
| 109 | | | | | Maximum | 12.9 | | | | | | |
| 110 | | | | | Mean of Raw Data | 2.707 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 4.002 | | | | | | |
| 112 | | | | | Khat | 0.378 | | | | | | |
| 113 | | | | | Theta hat | 7.161 | | | | | | |
| 114 | | | | | Kstar | 0.362 | | | | | | |
| 115 | | | | | Theta star | 7.468 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -0.761 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 2.384 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.842 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.702 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 2.7526E-7 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.278 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.945 | | | | | | |
| 132 | | | | | A-D Test Statistic | 0.624 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.836 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.131 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.172 | | | | | | |
| 136 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.973 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.922 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 0.0351 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.115 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 146 | Data appear Approximate_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 | 24 | | | | | | |
| 153 | | | | | Minimum | 0.00168 | | | | | | |
| 154 | | | | | Maximum | 0.027 | | | | | | |
| 155 | | | | | Mean of Raw Data | 0.0061 | | | | | | |
| 156 | | | | | Standard Deviation of Raw Data | 0.00584 | | | | | | |
| 157 | | | | | Khat | 1.941 | | | | | | |
| 158 | | | | | Theta hat | 0.00314 | | | | | | |
| 159 | | | | | Kstar | 1.774 | | | | | | |

| | | |
|---|---|---|
| Theta star | 0.00344 | |
| Mean of Log Transformed Data | -5.38 | |
| Standard Deviation of Log Transformed Data | 0.695 | |
| | | |
| **Normal GOF Test Results** | | |
| | | |
| Correlation Coefficient R | 0.81 | |
| Shapiro Wilk Test Statistic | 0.669 | |
| Shapiro Wilk Critical (0.05) Value | 0.929 | |
| Approximate Shapiro Wilk P Value | 3.9364E-8 | |
| Lilliefors Test Statistic | 0.313 | |
| Lilliefors Critical (0.05) Value | 0.156 | |
| Data not Normal at (0.05) Significance Level | | |
| | | |
| **Gamma GOF Test Results** | | |
| | | |
| Correlation Coefficient R | 0.937 | |
| A-D Test Statistic | 1.614 | |
| A-D Critical (0.05) Value | 0.759 | |
| K-S Test Statistic | 0.219 | |
| K-S Critical(0.05) Value | 0.16 | |
| Data not Gamma Distributed at (0.05) Significance Level | | |
| | | |
| **Lognormal GOF Test Results** | | |
| | | |
| Correlation Coefficient R | 0.962 | |
| Shapiro Wilk Test Statistic | 0.92 | |
| Shapiro Wilk Critical (0.05) Value | 0.929 | |
| Approximate Shapiro Wilk P Value | 0.027 | |
| Lilliefors Test Statistic | 0.159 | |
| 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 Significance** | | |
| | | |
| **Zinc (mg/L)** | | |
| | | |
| **Raw Statistics** | | |
| Number of Valid Observations | 31 | |
| Number of Distinct Observations | 29 | |
| Minimum | 0.001 | |
| Maximum | 0.097 | |
| Mean of Raw Data | 0.00895 | |
| Standard Deviation of Raw Data | 0.0166 | |
| Khat | 1.254 | |
| Theta hat | 0.00714 | |
| Kstar | 1.154 | |
| Theta star | 0.00776 | |
| Mean of Log Transformed Data | -5.165 | |
| Standard Deviation of Log Transformed Data | 0.778 | |
| | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Normal GOF Test Results | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | | | | | Correlation Coefficient R | 0.55 | | | | | | |
| 216 | | | | | Shapiro Wilk Test Statistic | 0.339 | | | | | | |
| 217 | | | | | Shapiro Wilk Critical (0.05) Value | 0.929 | | | | | | |
| 218 | | | | | Approximate Shapiro Wilk P Value | 2.565E-13 | | | | | | |
| 219 | | | | | Lilliefors Test Statistic | 0.358 | | | | | | |
| 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 | 0.732 | | | | | | |
| 226 | | | | | A-D Test Statistic | 2.627 | | | | | | |
| 227 | | | | | A-D Critical (0.05) Value | 0.77 | | | | | | |
| 228 | | | | | K-S Test Statistic | 0.235 | | | | | | |
| 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 | 0.93 | | | | | | |
| 235 | | | | | Shapiro Wilk Test Statistic | 0.897 | | | | | | |
| 236 | | | | | Shapiro Wilk Critical (0.05) Value | 0.929 | | | | | | |
| 237 | | | | | Approximate Shapiro Wilk P Value | 0.006 | | | | | | |
| 238 | | | | | Lilliefors Test Statistic | 0.139 | | | | | | |
| 239 | | | | | Lilliefors Critical (0.05) Value | 0.156 | | | | | | |
| 240 | 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 5.2 2023-12-13 10:32:43 AM | |
| From File | 2023-ShallowProUCL_j.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |
| 12-SH | | |
| Sulphate (mg/L) | | |
| Raw Statistics | | |
| Number of Valid Observations | 32 | |
| Number of Distinct Observations | 29 | |
| Minimum | 0.5 | |
| Maximum | 6.4 | |
| Mean of Raw Data | 3.411 | |
| Standard Deviation of Raw Data | 1.451 | |
| Khat | 4.36 | |
| Theta hat | 0.782 | |
| Kstar | 3.972 | |
| Theta star | 0.859 | |
| Mean of Log Transformed Data | 1.108 | |
| Standard Deviation of Log Transformed Data | 0.558 | |
| Normal GOF Test Results | | |
| Correlation Coefficient R | 0.986 | |
| Shapiro Wilk Test Statistic | 0.966 | |
| Shapiro Wilk Critical (0.05) Value | 0.93 | |
| Approximate Shapiro Wilk P Value | 0.455 | |
| Lilliefors Test Statistic | 0.0931 | |
| Lilliefors Critical (0.05) Value | 0.154 | |
| Data appear Normal at (0.05) Significance Level | | |
| Gamma GOF Test Results | | |
| Correlation Coefficient R | 0.974 | |
| A-D Test Statistic | 0.719 | |
| A-D Critical (0.05) Value | 0.75 | |
| K-S Test Statistic | 0.117 | |
| K-S Critical(0.05) Value | 0.156 | |
| Data appear Gamma Distributed at (0.05) Significance Level | | |
| Lognormal GOF Test Results | | |
| Correlation Coefficient R | 0.926 | |
| Shapiro Wilk Test Statistic | 0.865 | |
| Shapiro Wilk Critical (0.05) Value | 0.93 | |
| Approximate Shapiro Wilk P Value | 6.7779E-4 | |
| Lilliefors Test Statistic | 0.153 | |
| Lilliefors Critical (0.05) Value | 0.154 | |
| 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 | | 37 | | | | | | |
| 58 | | | | Number of Distinct Observations | | 24 | | | | | | |
| 59 | | | | Minimum | | 2.0000E-4 | | | | | | |
| 60 | | | | Maximum | | 0.00282 | | | | | | |
| 61 | | | | Mean of Raw Data | | 9.0541E-4 | | | | | | |
| 62 | | | | Standard Deviation of Raw Data | | 6.2635E-4 | | | | | | |
| 63 | | | | Khat | | 2.488 | | | | | | |
| 64 | | | | Theta hat | | 3.6394E-4 | | | | | | |
| 65 | | | | Kstar | | 2.304 | | | | | | |
| 66 | | | | Theta star | | 3.9295E-4 | | | | | | |
| 67 | | | | Mean of Log Transformed Data | | -7.221 | | | | | | |
| 68 | | | | Standard Deviation of Log Transformed Data | | 0.671 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | Correlation Coefficient R | | 0.925 | | | | | | |
| 73 | | | | Shapiro Wilk Test Statistic | | 0.855 | | | | | | |
| 74 | | | | Shapiro Wilk Critical (0.05) Value | | 0.936 | | | | | | |
| 75 | | | | Approximate Shapiro Wilk P Value | | 9.6586E-5 | | | | | | |
| 76 | | | | Lilliefors Test Statistic | | 0.203 | | | | | | |
| 77 | | | | Lilliefors Critical (0.05) Value | | 0.144 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | Correlation Coefficient R | | 0.987 | | | | | | |
| 83 | | | | A-D Test Statistic | | 0.564 | | | | | | |
| 84 | | | | A-D Critical (0.05) Value | | 0.757 | | | | | | |
| 85 | | | | K-S Test Statistic | | 0.124 | | | | | | |
| 86 | | | | K-S Critical(0.05) Value | | 0.146 | | | | | | |
| 87 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | Correlation Coefficient R | | 0.989 | | | | | | |
| 92 | | | | Shapiro Wilk Test Statistic | | 0.966 | | | | | | |
| 93 | | | | Shapiro Wilk Critical (0.05) Value | | 0.936 | | | | | | |
| 94 | | | | Approximate Shapiro Wilk P Value | | 0.389 | | | | | | |
| 95 | | | | Lilliefors Test Statistic | | 0.0871 | | | | | | |
| 96 | | | | Lilliefors Critical (0.05) Value | | 0.144 | | | | | | |
| 97 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | Copper (mg/L) | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | Raw Statistics | | | | | | | | |
| 102 | | | | Number of Valid Observations | | 37 | | | | | | |
| 103 | | | | Number of Distinct Observations | | 26 | | | | | | |
| 104 | | | | Minimum | | 2.0000E-4 | | | | | | |
| 105 | | | | Maximum | | 0.012 | | | | | | |
| 106 | | | | Mean of Raw Data | | 0.00231 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Standard Deviation of Raw Data | 0.00272 | | | | | | |
| 108 | | | | | Khat | 1.265 | | | | | | |
| 109 | | | | | Theta hat | 0.00183 | | | | | | |
| 110 | | | | | Kstar | 1.18 | | | | | | |
| 111 | | | | | Theta star | 0.00196 | | | | | | |
| 112 | | | | | Mean of Log Transformed Data | -6.513 | | | | | | |
| 113 | | | | | Standard Deviation of Log Transformed Data | 0.901 | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | | Normal GOF Test Results | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | | | | | Correlation Coefficient R | 0.806 | | | | | | |
| 118 | | | | | Shapiro Wilk Test Statistic | 0.66 | | | | | | |
| 119 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 120 | | | | | Approximate Shapiro Wilk P Value | 7.510E-10 | | | | | | |
| 121 | | | | | Lilliefors Test Statistic | 0.279 | | | | | | |
| 122 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 123 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | | Gamma GOF Test Results | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | | Correlation Coefficient R | 0.955 | | | | | | |
| 128 | | | | | A-D Test Statistic | 2.025 | | | | | | |
| 129 | | | | | A-D Critical (0.05) Value | 0.771 | | | | | | |
| 130 | | | | | K-S Test Statistic | 0.209 | | | | | | |
| 131 | | | | | K-S Critical(0.05) Value | 0.148 | | | | | | |
| 132 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | | | | | Lognormal GOF Test Results | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | Correlation Coefficient R | 0.969 | | | | | | |
| 137 | | | | | Shapiro Wilk Test Statistic | 0.941 | | | | | | |
| 138 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 139 | | | | | Approximate Shapiro Wilk P Value | 0.0668 | | | | | | |
| 140 | | | | | Lilliefors Test Statistic | 0.161 | | | | | | |
| 141 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 142 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | Iron (mg/L) | | | | | | | | | | | |
| 145 | | | | | | | | | | | | |
| 146 | | | | | Raw Statistics | | | | | | | |
| 147 | | | | | Number of Valid Observations | 30 | | | | | | |
| 148 | | | | | Number of Distinct Observations | 18 | | | | | | |
| 149 | | | | | Minimum | 0.01 | | | | | | |
| 150 | | | | | Maximum | 0.62 | | | | | | |
| 151 | | | | | Mean of Raw Data | 0.093 | | | | | | |
| 152 | | | | | Standard Deviation of Raw Data | 0.137 | | | | | | |
| 153 | | | | | Khat | 0.762 | | | | | | |
| 154 | | | | | Theta hat | 0.122 | | | | | | |
| 155 | | | | | Kstar | 0.708 | | | | | | |
| 156 | | | | | Theta star | 0.131 | | | | | | |
| 157 | | | | | Mean of Log Transformed Data | -3.16 | | | | | | |
| 158 | | | | | Standard Deviation of Log Transformed Data | 1.26 | | | | | | |
| 159 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | Normal GOF Test Results | | | | | | | | | | | |
| 161 | | | | | | | | | | | | |
| 162 | | | | | Correlation Coefficient R | 0.792 | | | | | | |
| 163 | | | | | Shapiro Wilk Test Statistic | 0.643 | | | | | | |
| 164 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 165 | | | | | Approximate Shapiro Wilk P Value | 2.3428E-8 | | | | | | |
| 166 | | | | | Lilliefors Test Statistic | 0.272 | | | | | | |
| 167 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 168 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | Gamma GOF Test Results | | | | | | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | Correlation Coefficient R | 0.975 | | | | | | |
| 173 | | | | | A-D Test Statistic | 1.203 | | | | | | |
| 174 | | | | | A-D Critical (0.05) Value | 0.787 | | | | | | |
| 175 | | | | | K-S Test Statistic | 0.162 | | | | | | |
| 176 | | | | | K-S Critical(0.05) Value | 0.166 | | | | | | |
| 177 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 178 | | | | | | | | | | | | |
| 179 | Lognormal GOF Test Results | | | | | | | | | | | |
| 180 | | | | | | | | | | | | |
| 181 | | | | | Correlation Coefficient R | 0.962 | | | | | | |
| 182 | | | | | Shapiro Wilk Test Statistic | 0.908 | | | | | | |
| 183 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 184 | | | | | Approximate Shapiro Wilk P Value | 0.0141 | | | | | | |
| 185 | | | | | Lilliefors Test Statistic | 0.174 | | | | | | |
| 186 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 187 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | Nickel (mg/L) | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | | | | | Raw Statistics | | | | | | | |
| 192 | | | | | Number of Valid Observations | 32 | | | | | | |
| 193 | | | | | Number of Distinct Observations | 20 | | | | | | |
| 194 | | | | | Minimum | 5.0000E-4 | | | | | | |
| 195 | | | | | Maximum | 0.0153 | | | | | | |
| 196 | | | | | Mean of Raw Data | 0.00355 | | | | | | |
| 197 | | | | | Standard Deviation of Raw Data | 0.004 | | | | | | |
| 198 | | | | | Khat | 1.214 | | | | | | |
| 199 | | | | | Theta hat | 0.00293 | | | | | | |
| 200 | | | | | Kstar | 1.121 | | | | | | |
| 201 | | | | | Theta star | 0.00317 | | | | | | |
| 202 | | | | | Mean of Log Transformed Data | -6.106 | | | | | | |
| 203 | | | | | Standard Deviation of Log Transformed Data | 0.931 | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | Normal GOF Test Results | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | | | | | Correlation Coefficient R | 0.836 | | | | | | |
| 208 | | | | | Shapiro Wilk Test Statistic | 0.698 | | | | | | |
| 209 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 210 | | | | | Approximate Shapiro Wilk P Value | 8.7330E-8 | | | | | | |
| 211 | | | | | Lilliefors Test Statistic | 0.307 | | | | | | |
| 212 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | | | | Gamma GOF Test Results | | | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | Correlation Coefficient R | 0.961 | | | | | | |
| 218 | | | | | A-D Test Statistic | 1.696 | | | | | | |
| 219 | | | | | A-D Critical (0.05) Value | 0.771 | | | | | | |
| 220 | | | | | K-S Test Statistic | 0.259 | | | | | | |
| 221 | | | | | K-S Critical(0.05) Value | 0.159 | | | | | | |
| 222 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | | | | Lognormal GOF Test Results | | | | | | | | |
| 225 | | | | | | | | | | | | |
| 226 | | | | | Correlation Coefficient R | 0.969 | | | | | | |
| 227 | | | | | Shapiro Wilk Test Statistic | 0.926 | | | | | | |
| 228 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 229 | | | | | Approximate Shapiro Wilk P Value | 0.037 | | | | | | |
| 230 | | | | | Lilliefors Test Statistic | 0.203 | | | | | | |
| 231 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 232 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 233 | | | | | | | | | | | | |
| 234 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 235 | | | | | | | | | | | | |
| 236 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | Zinc (mg/L) | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | Raw Statistics | | | | | | | | |
| 241 | | | | | Number of Valid Observations | 32 | | | | | | |
| 242 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 243 | | | | | Minimum | 8.0000E-4 | | | | | | |
| 244 | | | | | Maximum | 0.0307 | | | | | | |
| 245 | | | | | Mean of Raw Data | 0.00709 | | | | | | |
| 246 | | | | | Standard Deviation of Raw Data | 0.00718 | | | | | | |
| 247 | | | | | Khat | 1.296 | | | | | | |
| 248 | | | | | Theta hat | 0.00547 | | | | | | |
| 249 | | | | | Kstar | 1.196 | | | | | | |
| 250 | | | | | Theta star | 0.00593 | | | | | | |
| 251 | | | | | Mean of Log Transformed Data | -5.382 | | | | | | |
| 252 | | | | | Standard Deviation of Log Transformed Data | 0.956 | | | | | | |
| 253 | | | | | | | | | | | | |
| 254 | | | | Normal GOF Test Results | | | | | | | | |
| 255 | | | | | | | | | | | | |
| 256 | | | | | Correlation Coefficient R | 0.877 | | | | | | |
| 257 | | | | | Shapiro Wilk Test Statistic | 0.774 | | | | | | |
| 258 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 259 | | | | | Approximate Shapiro Wilk P Value | 3.8157E-6 | | | | | | |
| 260 | | | | | Lilliefors Test Statistic | 0.231 | | | | | | |
| 261 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 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 | 0.985 | | | | | | |
| 267 | | | | | A-D Test Statistic | 0.72 | | | | | | |
| 268 | | | | | A-D Critical (0.05) Value | 0.769 | | | | | | |
| 269 | | | | | K-S Test Statistic | 0.144 | | | | | | |
| 270 | | | | | K-S Critical(0.05) Value | 0.159 | | | | | | |
| 271 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | | | | Lognormal GOF Test Results | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | | | | | Correlation Coefficient R | 0.989 | | | | | | |
| 276 | | | | | Shapiro Wilk Test Statistic | 0.967 | | | | | | |
| 277 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 278 | | | | | Approximate Shapiro Wilk P Value | 0.491 | | | | | | |
| 279 | | | | | Lilliefors Test Statistic | 0.0891 | | | | | | |
| 280 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 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 5.2 2023-12-13 10:34:03 AM | |
| From File | 2023-ShallowProUCL_k.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

13-SH

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 37 |
| Number of Distinct Observations | 30 |
| Minimum | 0.5 |
| Maximum | 5.08 |
| Mean of Raw Data | 1.851 |
| Standard Deviation of Raw Data | 0.868 |
| Khat | 4.446 |
| Theta hat | 0.416 |
| Kstar | 4.103 |
| Theta star | 0.451 |
| Mean of Log Transformed Data | 0.499 |
| Standard Deviation of Log Transformed Data | 0.518 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.94 |
| Shapiro Wilk Test Statistic | 0.9 |
| Shapiro Wilk Critical (0.05) Value | 0.936 |
| Approximate Shapiro Wilk P Value | 0.00283 |
| Lilliefors Test Statistic | 0.117 |
| Lilliefors Critical (0.05) Value | 0.144 |

Data appear Approximate Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.956 |
| A-D Test Statistic | 1.152 |
| A-D Critical (0.05) Value | 0.752 |
| K-S Test Statistic | 0.174 |
| K-S Critical(0.05) Value | 0.146 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.954 |
| Shapiro Wilk Test Statistic | 0.912 |
| Shapiro Wilk Critical (0.05) Value | 0.936 |
| Approximate Shapiro Wilk P Value | 0.00706 |
| Lilliefors Test Statistic | 0.204 |
| Lilliefors Critical (0.05) Value | 0.144 |

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 | 37 | | | | | | |
| 58 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 59 | | | | | Minimum | 1.6000E-5 | | | | | | |
| 60 | | | | | Maximum | 0.003 | | | | | | |
| 61 | | | | | Mean of Raw Data | 7.4753E-4 | | | | | | |
| 62 | | | | | Standard Deviation of Raw Data | 0.00116 | | | | | | |
| 63 | | | | | Khat | 0.476 | | | | | | |
| 64 | | | | | Theta hat | 0.00157 | | | | | | |
| 65 | | | | | Kstar | 0.456 | | | | | | |
| 66 | | | | | Theta star | 0.00164 | | | | | | |
| 67 | | | | | Mean of Log Transformed Data | -8.542 | | | | | | |
| 68 | | | | | Standard Deviation of Log Transformed Data | 1.729 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | | Normal GOF Test Results | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Correlation Coefficient R | 0.784 | | | | | | |
| 73 | | | | | Shapiro Wilk Test Statistic | 0.599 | | | | | | |
| 74 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk P Value | 3.517E-11 | | | | | | |
| 76 | | | | | Lilliefors Test Statistic | 0.38 | | | | | | |
| 77 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | | Gamma GOF Test Results | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | Correlation Coefficient R | 0.863 | | | | | | |
| 83 | | | | | A-D Test Statistic | 2.779 | | | | | | |
| 84 | | | | | A-D Critical (0.05) Value | 0.818 | | | | | | |
| 85 | | | | | K-S Test Statistic | 0.269 | | | | | | |
| 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 | 0.954 | | | | | | |
| 92 | | | | | Shapiro Wilk Test Statistic | 0.885 | | | | | | |
| 93 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 8.9976E-4 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.17 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Chromium (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | | Raw Statistics | | | | | | | |
| 106 | | | | | Number of Valid Observations | 37 | | | | | | |

| | | |
|---|---|---|
| Number of Distinct Observations | 25 | |
| Minimum | 1.0000E-4 | |
| Maximum | 0.022 | |
| Mean of Raw Data | 0.00531 | |
| Standard Deviation of Raw Data | 0.00645 | |
| Khat | 0.715 | |
| Theta hat | 0.00742 | |
| Kstar | 0.675 | |
| Theta star | 0.00786 | |
| Mean of Log Transformed Data | -6.081 | |
| Standard Deviation of Log Transformed Data | 1.432 | |

**Normal GOF Test Results**

| | |
|---|---|
| Correlation Coefficient R | 0.874 |
| Shapiro Wilk Test Statistic | 0.754 |
| Shapiro Wilk Critical (0.05) Value | 0.936 |
| Approximate Shapiro Wilk P Value | 1.4317E-7 |
| Lilliefors Test Statistic | 0.318 |
| Lilliefors Critical (0.05) Value | 0.144 |

Data not Normal at (0.05) Significance Level

**Gamma GOF Test Results**

| | |
|---|---|
| Correlation Coefficient R | 0.963 |
| A-D Test Statistic | 1.16 |
| A-D Critical (0.05) Value | 0.792 |
| K-S Test Statistic | 0.237 |
| K-S Critical(0.05) Value | 0.151 |

Data not Gamma Distributed at (0.05) Significance Level

**Lognormal GOF Test Results**

| | |
|---|---|
| Correlation Coefficient R | 0.981 |
| Shapiro Wilk Test Statistic | 0.949 |
| Shapiro Wilk Critical (0.05) Value | 0.936 |
| Approximate Shapiro Wilk P Value | 0.116 |
| Lilliefors Test Statistic | 0.159 |
| Lilliefors Critical (0.05) Value | 0.144 |

Data appear Approximate_Lognormal at (0.05) Significance Level

**Copper (mg/L)**

**Raw Statistics**

| | |
|---|---|
| Number of Valid Observations | 37 |
| Number of Distinct Observations | 32 |
| Minimum | 2.0000E-4 |
| Maximum | 0.103 |
| Mean of Raw Data | 0.00699 |
| Standard Deviation of Raw Data | 0.0177 |
| Khat | 0.612 |
| Theta hat | 0.0114 |
| Kstar | 0.581 |

| | | |
|---|---|---|
| Theta star | 0.012 | |
| Mean of Log Transformed Data | -5.969 | |
| Standard Deviation of Log Transformed Data | 1.248 | |
| | | |
| **Normal GOF Test Results** | | |
| | | |
| Correlation Coefficient R | 0.575 | |
| Shapiro Wilk Test Statistic | 0.366 | |
| Shapiro Wilk Critical (0.05) Value | 0.936 | |
| Approximate Shapiro Wilk P Value | 1.443E-15 | |
| Lilliefors Test Statistic | 0.374 | |
| Lilliefors Critical (0.05) Value | 0.144 | |
| Data not Normal at (0.05) Significance Level | | |
| | | |
| **Gamma GOF Test Results** | | |
| | | |
| Correlation Coefficient R | 0.837 | |
| A-D Test Statistic | 2.531 | |
| A-D Critical (0.05) Value | 0.802 | |
| K-S Test Statistic | 0.198 | |
| K-S Critical(0.05) Value | 0.152 | |
| Data not Gamma Distributed at (0.05) Significance Level | | |
| | | |
| **Lognormal GOF Test Results** | | |
| | | |
| Correlation Coefficient R | 0.977 | |
| Shapiro Wilk Test Statistic | 0.964 | |
| Shapiro Wilk Critical (0.05) Value | 0.936 | |
| Approximate Shapiro Wilk P Value | 0.336 | |
| Lilliefors Test Statistic | 0.0877 | |
| Lilliefors Critical (0.05) Value | 0.144 | |
| Data appear Lognormal at (0.05) Significance Level | | |
| | | |
| **Manganese (mg/L)** | | |
| | | |
| **Raw Statistics** | | |
| Number of Valid Observations | 30 | |
| Number of Distinct Observations | 29 | |
| Minimum | 0.004 | |
| Maximum | 0.442 | |
| Mean of Raw Data | 0.116 | |
| Standard Deviation of Raw Data | 0.118 | |
| Khat | 0.929 | |
| Theta hat | 0.124 | |
| Kstar | 0.858 | |
| Theta star | 0.135 | |
| Mean of Log Transformed Data | -2.785 | |
| Standard Deviation of Log Transformed Data | 1.299 | |
| | | |
| **Normal GOF Test Results** | | |
| | | |
| Correlation Coefficient R | 0.915 | |
| Shapiro Wilk Test Statistic | 0.833 | |

| | | |
|---|---|---|
| | Shapiro Wilk Critical (0.05) Value | 0.927 |
| | Approximate Shapiro Wilk P Value | 1.7121E-4 |
| | Lilliefors Test Statistic | 0.222 |
| | Lilliefors Critical (0.05) Value | 0.159 |
| Data not Normal at (0.05) Significance Level | | |
| | | |
| Gamma GOF Test Results | | |
| | | |
| | Correlation Coefficient R | 0.983 |
| | A-D Test Statistic | 0.256 |
| | A-D Critical (0.05) Value | 0.779 |
| | K-S Test Statistic | 0.0939 |
| | K-S Critical(0.05) Value | 0.165 |
| Data appear Gamma Distributed at (0.05) Significance Level | | |
| | | |
| Lognormal GOF Test Results | | |
| | | |
| | Correlation Coefficient R | 0.979 |
| | Shapiro Wilk Test Statistic | 0.946 |
| | Shapiro Wilk Critical (0.05) Value | 0.927 |
| | Approximate Shapiro Wilk P Value | 0.155 |
| | Lilliefors Test Statistic | 0.0952 |
| | Lilliefors Critical (0.05) Value | 0.159 |
| Data appear Lognormal at (0.05) Significance Level | | |
| | | |
| Nickel (mg/L) | | |
| | | |
| Raw Statistics | | |
| | Number of Valid Observations | 32 |
| | Number of Distinct Observations | 29 |
| | Minimum | 0.0015 |
| | Maximum | 0.034 |
| | Mean of Raw Data | 0.00746 |
| | Standard Deviation of Raw Data | 0.00799 |
| | Khat | 1.558 |
| | Theta hat | 0.00479 |
| | Kstar | 1.432 |
| | Theta star | 0.00521 |
| | Mean of Log Transformed Data | -5.253 |
| | Standard Deviation of Log Transformed Data | 0.79 |
| | | |
| Normal GOF Test Results | | |
| | | |
| | Correlation Coefficient R | 0.8 |
| | Shapiro Wilk Test Statistic | 0.647 |
| | Shapiro Wilk Critical (0.05) Value | 0.93 |
| | Approximate Shapiro Wilk P Value | 9.0049E-9 |
| | Lilliefors Test Statistic | 0.317 |
| | Lilliefors Critical (0.05) Value | 0.154 |
| Data not Normal at (0.05) Significance Level | | |
| | | |
| Gamma GOF Test Results | | |
| | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | Correlation Coefficient R | 0.931 | | | | | | |
| 267 | | | | | A-D Test Statistic | 1.727 | | | | | | |
| 268 | | | | | A-D Critical (0.05) Value | 0.764 | | | | | | |
| 269 | | | | | K-S Test Statistic | 0.204 | | | | | | |
| 270 | | | | | K-S Critical(0.05) Value | 0.158 | | | | | | |
| 271 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | | | | Lognormal GOF Test Results | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | | | | | Correlation Coefficient R | 0.967 | | | | | | |
| 276 | | | | | Shapiro Wilk Test Statistic | 0.929 | | | | | | |
| 277 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 278 | | | | | Approximate Shapiro Wilk P Value | 0.0434 | | | | | | |
| 279 | | | | | Lilliefors Test Statistic | 0.139 | | | | | | |
| 280 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 281 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | Zinc (mg/L) | | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | | | | Raw Statistics | | | | | | | | |
| 286 | | | | | Number of Valid Observations | 32 | | | | | | |
| 287 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 288 | | | | | Minimum | 6.0000E-4 | | | | | | |
| 289 | | | | | Maximum | 0.245 | | | | | | |
| 290 | | | | | Mean of Raw Data | 0.0227 | | | | | | |
| 291 | | | | | Standard Deviation of Raw Data | 0.0483 | | | | | | |
| 292 | | | | | Khat | 0.534 | | | | | | |
| 293 | | | | | Theta hat | 0.0426 | | | | | | |
| 294 | | | | | Kstar | 0.504 | | | | | | |
| 295 | | | | | Theta star | 0.0451 | | | | | | |
| 296 | | | | | Mean of Log Transformed Data | -4.963 | | | | | | |
| 297 | | | | | Standard Deviation of Log Transformed Data | 1.47 | | | | | | |
| 298 | | | | | | | | | | | | |
| 299 | | | | Normal GOF Test Results | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | | | | | Correlation Coefficient R | 0.678 | | | | | | |
| 302 | | | | | Shapiro Wilk Test Statistic | 0.487 | | | | | | |
| 303 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 304 | | | | | Approximate Shapiro Wilk P Value | 1.554E-11 | | | | | | |
| 305 | | | | | Lilliefors Test Statistic | 0.323 | | | | | | |
| 306 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 307 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 308 | | | | | | | | | | | | |
| 309 | | | | Gamma GOF Test Results | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | | | | | Correlation Coefficient R | 0.937 | | | | | | |
| 312 | | | | | A-D Test Statistic | 1.98 | | | | | | |
| 313 | | | | | A-D Critical (0.05) Value | 0.807 | | | | | | |
| 314 | | | | | K-S Test Statistic | 0.223 | | | | | | |
| 315 | | | | | K-S Critical(0.05) Value | 0.164 | | | | | | |
| 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 | 0.982 | | | | | | |
| 321 | | | | | Shapiro Wilk Test Statistic | 0.959 | | | | | | |
| 322 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 323 | | | | | Approximate Shapiro Wilk P Value | 0.302 | | | | | | |
| 324 | | | | | Lilliefors Test Statistic | 0.142 | | | | | | |
| 325 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 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 5.2 2023-12-13 10:35:14 AM | |
| From File | 2023-ShallowProUCL_I.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

14-SH

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 32 |
| Number of Distinct Observations | 31 |
| Minimum | 0.9 |
| Maximum | 17.1 |
| Mean of Raw Data | 4.208 |
| Standard Deviation of Raw Data | 3.502 |
| Khat | 2.018 |
| Theta hat | 2.086 |
| Kstar | 1.85 |
| Theta star | 2.275 |
| Mean of Log Transformed Data | 1.169 |
| Standard Deviation of Log Transformed Data | 0.735 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.874 |
| Shapiro Wilk Test Statistic | 0.777 |
| Shapiro Wilk Critical (0.05) Value | 0.93 |
| Approximate Shapiro Wilk P Value | 4.3815E-6 |
| Lilliefors Test Statistic | 0.175 |
| Lilliefors Critical (0.05) Value | 0.154 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.968 |
| A-D Test Statistic | 0.563 |
| A-D Critical (0.05) Value | 0.759 |
| K-S Test Statistic | 0.12 |
| K-S Critical(0.05) Value | 0.158 |

Data appear Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.983 |
| Shapiro Wilk Test Statistic | 0.96 |
| Shapiro Wilk Critical (0.05) Value | 0.93 |
| Approximate Shapiro Wilk P Value | 0.325 |
| Lilliefors Test Statistic | 0.12 |
| Lilliefors Critical (0.05) Value | 0.154 |

Data appear 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 | | 32 | | | | | | |
| 58 | | | | Number of Distinct Observations | | 18 | | | | | | |
| 59 | | | | Minimum | | 1.7000E-4 | | | | | | |
| 60 | | | | Maximum | | 0.0012 | | | | | | |
| 61 | | | | Mean of Raw Data | | 3.5313E-4 | | | | | | |
| 62 | | | | Standard Deviation of Raw Data | | 2.0675E-4 | | | | | | |
| 63 | | | | Khat | | 4.202 | | | | | | |
| 64 | | | | Theta hat | | 8.4039E-5 | | | | | | |
| 65 | | | | Kstar | | 3.829 | | | | | | |
| 66 | | | | Theta star | | 9.2228E-5 | | | | | | |
| 67 | | | | Mean of Log Transformed Data | | -8.072 | | | | | | |
| 68 | | | | Standard Deviation of Log Transformed Data | | 0.48 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | Correlation Coefficient R | | 0.851 | | | | | | |
| 73 | | | | Shapiro Wilk Test Statistic | | 0.744 | | | | | | |
| 74 | | | | Shapiro Wilk Critical (0.05) Value | | 0.93 | | | | | | |
| 75 | | | | Approximate Shapiro Wilk P Value | | 8.3766E-7 | | | | | | |
| 76 | | | | Lilliefors Test Statistic | | 0.188 | | | | | | |
| 77 | | | | Lilliefors Critical (0.05) Value | | 0.154 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | Correlation Coefficient R | | 0.924 | | | | | | |
| 83 | | | | A-D Test Statistic | | 1.637 | | | | | | |
| 84 | | | | A-D Critical (0.05) Value | | 0.75 | | | | | | |
| 85 | | | | K-S Test Statistic | | 0.186 | | | | | | |
| 86 | | | | K-S Critical(0.05) Value | | 0.156 | | | | | | |
| 87 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | Correlation Coefficient R | | 0.936 | | | | | | |
| 92 | | | | Shapiro Wilk Test Statistic | | 0.874 | | | | | | |
| 93 | | | | Shapiro Wilk Critical (0.05) Value | | 0.93 | | | | | | |
| 94 | | | | Approximate Shapiro Wilk P Value | | 0.00118 | | | | | | |
| 95 | | | | Lilliefors Test Statistic | | 0.176 | | | | | | |
| 96 | | | | Lilliefors Critical (0.05) Value | | 0.154 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Cadmium (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | Number of Valid Observations | | 32 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 21 | | | | | | |
| 108 | | | | | Minimum | 1.4000E-5 | | | | | | |
| 109 | | | | | Maximum | 0.0031 | | | | | | |
| 110 | | | | | Mean of Raw Data | 6.3503E-4 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.00105 | | | | | | |
| 112 | | | | | Khat | 0.552 | | | | | | |
| 113 | | | | | Theta hat | 0.00115 | | | | | | |
| 114 | | | | | Kstar | 0.521 | | | | | | |
| 115 | | | | | Theta star | 0.00122 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -8.495 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 1.532 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.751 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.557 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 2.182E-10 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.357 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.889 | | | | | | |
| 132 | | | | | A-D Test Statistic | 2.305 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.806 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.26 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.164 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.969 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.924 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 0.0318 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.162 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 146 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | Chromium (mg/L) | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | | | | | Raw Statistics | | | | | | | |
| 155 | | | | | Number of Valid Observations | 32 | | | | | | |
| 156 | | | | | Number of Distinct Observations | 22 | | | | | | |
| 157 | | | | | Minimum | 5.3000E-4 | | | | | | |
| 158 | | | | | Maximum | 0.016 | | | | | | |
| 159 | | | | | Mean of Raw Data | 0.00387 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Standard Deviation of Raw Data | 0.00351 | | | | | | |
| 161 | | | | | Khat | 1.622 | | | | | | |
| 162 | | | | | Theta hat | 0.00238 | | | | | | |
| 163 | | | | | Kstar | 1.491 | | | | | | |
| 164 | | | | | Theta star | 0.00259 | | | | | | |
| 165 | | | | | Mean of Log Transformed Data | -5.894 | | | | | | |
| 166 | | | | | Standard Deviation of Log Transformed Data | 0.84 | | | | | | |
| 167 | | | | | | | | | | | | |
| 168 | | | | | Normal GOF Test Results | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | | | | | Correlation Coefficient R | 0.881 | | | | | | |
| 171 | | | | | Shapiro Wilk Test Statistic | 0.784 | | | | | | |
| 172 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 173 | | | | | Approximate Shapiro Wilk P Value | 6.3702E-6 | | | | | | |
| 174 | | | | | Lilliefors Test Statistic | 0.214 | | | | | | |
| 175 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 176 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | | | | | Gamma GOF Test Results | | | | | | | |
| 179 | | | | | | | | | | | | |
| 180 | | | | | Correlation Coefficient R | 0.979 | | | | | | |
| 181 | | | | | A-D Test Statistic | 0.834 | | | | | | |
| 182 | | | | | A-D Critical (0.05) Value | 0.763 | | | | | | |
| 183 | | | | | K-S Test Statistic | 0.185 | | | | | | |
| 184 | | | | | K-S Critical(0.05) Value | 0.158 | | | | | | |
| 185 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 186 | | | | | | | | | | | | |
| 187 | | | | | Lognormal GOF Test Results | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | | | | | Correlation Coefficient R | 0.984 | | | | | | |
| 190 | | | | | Shapiro Wilk Test Statistic | 0.962 | | | | | | |
| 191 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 192 | | | | | Approximate Shapiro Wilk P Value | 0.365 | | | | | | |
| 193 | | | | | Lilliefors Test Statistic | 0.149 | | | | | | |
| 194 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 195 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 196 | | | | | | | | | | | | |
| 197 | Nickel (mg/L) | | | | | | | | | | | |
| 198 | | | | | | | | | | | | |
| 199 | | | | | Raw Statistics | | | | | | | |
| 200 | | | | | Number of Valid Observations | 31 | | | | | | |
| 201 | | | | | Number of Distinct Observations | 29 | | | | | | |
| 202 | | | | | Minimum | 5.0000E-4 | | | | | | |
| 203 | | | | | Maximum | 0.057 | | | | | | |
| 204 | | | | | Mean of Raw Data | 0.00968 | | | | | | |
| 205 | | | | | Standard Deviation of Raw Data | 0.0131 | | | | | | |
| 206 | | | | | Khat | 0.899 | | | | | | |
| 207 | | | | | Theta hat | 0.0108 | | | | | | |
| 208 | | | | | Kstar | 0.834 | | | | | | |
| 209 | | | | | Theta star | 0.0116 | | | | | | |
| 210 | | | | | Mean of Log Transformed Data | -5.288 | | | | | | |
| 211 | | | | | Standard Deviation of Log Transformed Data | 1.101 | | | | | | |
| 212 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Normal GOF Test Results | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | | | | | Correlation Coefficient R | 0.805 | | | | | | |
| 216 | | | | | Shapiro Wilk Test Statistic | 0.661 | | | | | | |
| 217 | | | | | Shapiro Wilk Critical (0.05) Value | 0.929 | | | | | | |
| 218 | | | | | Approximate Shapiro Wilk P Value | 2.8395E-8 | | | | | | |
| 219 | | | | | Lilliefors Test Statistic | 0.347 | | | | | | |
| 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 | 0.968 | | | | | | |
| 226 | | | | | A-D Test Statistic | 2.257 | | | | | | |
| 227 | | | | | A-D Critical (0.05) Value | 0.78 | | | | | | |
| 228 | | | | | K-S Test Statistic | 0.281 | | | | | | |
| 229 | | | | | K-S Critical(0.05) Value | 0.163 | | | | | | |
| 230 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | Lognormal GOF Test Results | | | | | | | | | | | |
| 233 | | | | | | | | | | | | |
| 234 | | | | | Correlation Coefficient R | 0.957 | | | | | | |
| 235 | | | | | Shapiro Wilk Test Statistic | 0.917 | | | | | | |
| 236 | | | | | Shapiro Wilk Critical (0.05) Value | 0.929 | | | | | | |
| 237 | | | | | Approximate Shapiro Wilk P Value | 0.023 | | | | | | |
| 238 | | | | | Lilliefors Test Statistic | 0.206 | | | | | | |
| 239 | | | | | Lilliefors Critical (0.05) Value | 0.156 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 245 | | | | | | | | | | | | |
| 246 | Zinc (mg/L) | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | Raw Statistics | | | | | | | | | | | |
| 249 | | | | | Number of Valid Observations | 31 | | | | | | |
| 250 | | | | | Number of Distinct Observations | 28 | | | | | | |
| 251 | | | | | Minimum | 0.0011 | | | | | | |
| 252 | | | | | Maximum | 0.211 | | | | | | |
| 253 | | | | | Mean of Raw Data | 0.0264 | | | | | | |
| 254 | | | | | Standard Deviation of Raw Data | 0.0438 | | | | | | |
| 255 | | | | | Khat | 0.703 | | | | | | |
| 256 | | | | | Theta hat | 0.0376 | | | | | | |
| 257 | | | | | Kstar | 0.656 | | | | | | |
| 258 | | | | | Theta star | 0.0403 | | | | | | |
| 259 | | | | | Mean of Log Transformed Data | -4.492 | | | | | | |
| 260 | | | | | Standard Deviation of Log Transformed Data | 1.278 | | | | | | |
| 261 | | | | | | | | | | | | |
| 262 | Normal GOF Test Results | | | | | | | | | | | |
| 263 | | | | | | | | | | | | |
| 264 | | | | | Correlation Coefficient R | 0.749 | | | | | | |
| 265 | | | | | Shapiro Wilk Test Statistic | 0.583 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | Shapiro Wilk Critical (0.05) Value | 0.929 | | | | | | |
| 267 | | | | | Approximate Shapiro Wilk P Value | 1.1954E-9 | | | | | | |
| 268 | | | | | Lilliefors Test Statistic | 0.318 | | | | | | |
| 269 | | | | | Lilliefors Critical (0.05) Value | 0.156 | | | | | | |
| 270 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | | | | Gamma GOF Test Results | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | | | | | Correlation Coefficient R | 0.953 | | | | | | |
| 275 | | | | | A-D Test Statistic | 1.579 | | | | | | |
| 276 | | | | | A-D Critical (0.05) Value | 0.792 | | | | | | |
| 277 | | | | | K-S Test Statistic | 0.199 | | | | | | |
| 278 | | | | | K-S Critical(0.05) Value | 0.164 | | | | | | |
| 279 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | | | | Lognormal GOF Test Results | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | | | | | Correlation Coefficient R | 0.985 | | | | | | |
| 284 | | | | | Shapiro Wilk Test Statistic | 0.965 | | | | | | |
| 285 | | | | | Shapiro Wilk Critical (0.05) Value | 0.929 | | | | | | |
| 286 | | | | | Approximate Shapiro Wilk P Value | 0.436 | | | | | | |
| 287 | | | | | Lilliefors Test Statistic | 0.0969 | | | | | | |
| 288 | | | | | Lilliefors Critical (0.05) Value | 0.156 | | | | | | |
| 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 5.2 2023-12-13 10:36:31 AM | |
| From File | 2023-ShallowProUCL_m.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

15-SH

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 17 |
| Number of Missing Observations | 17 |
| Number of Distinct Observations | 13 |
| Minimum | 0.5 |
| Maximum | 3.2 |
| Mean of Raw Data | 1.073 |
| Standard Deviation of Raw Data | 0.643 |
| Khat | 4.372 |
| Theta hat | 0.245 |
| Kstar | 3.64 |
| Theta star | 0.295 |
| Mean of Log Transformed Data | -0.0483 |
| Standard Deviation of Log Transformed Data | 0.47 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.846 |
| Shapiro Wilk Test Statistic | 0.737 |
| Shapiro Wilk Critical (0.05) Value | 0.892 |
| Approximate Shapiro Wilk P Value | 1.5392E-4 |
| Lilliefors Test Statistic | 0.253 |
| Lilliefors Critical (0.05) Value | 0.207 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.924 |
| A-D Test Statistic | 0.628 |
| A-D Critical (0.05) Value | 0.742 |
| K-S Test Statistic | 0.224 |
| K-S Critical(0.05) Value | 0.21 |

Data follow Appr. Gamma Distribution at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.962 |
| Shapiro Wilk Test Statistic | 0.931 |
| Shapiro Wilk Critical (0.05) Value | 0.892 |
| Approximate Shapiro Wilk P Value | 0.224 |
| Lilliefors Test Statistic | 0.195 |
| Lilliefors Critical (0.05) Value | 0.207 |

Data appear Lognormal at (0.05) Significance Level

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | | | | | | | | | | | | |
| 55 | Arsenic (mg/L) | | | | | | | | | | | |
| 56 | | | | | | | | | | | | |
| 57 | | | | Raw Statistics | | | | | | | | |
| 58 | | | | Number of Valid Observations | | 34 | | | | | | |
| 59 | | | | Number of Distinct Observations | | 16 | | | | | | |
| 60 | | | | Minimum | | 1.6000E-4 | | | | | | |
| 61 | | | | Maximum | | 0.00144 | | | | | | |
| 62 | | | | Mean of Raw Data | | 3.5735E-4 | | | | | | |
| 63 | | | | Standard Deviation of Raw Data | | 3.1238E-4 | | | | | | |
| 64 | | | | Khat | | 2.305 | | | | | | |
| 65 | | | | Theta hat | | 1.5503E-4 | | | | | | |
| 66 | | | | Kstar | | 2.121 | | | | | | |
| 67 | | | | Theta star | | 1.6847E-4 | | | | | | |
| 68 | | | | Mean of Log Transformed Data | | -8.169 | | | | | | |
| 69 | | | | Standard Deviation of Log Transformed Data | | 0.614 | | | | | | |
| 70 | | | | | | | | | | | | |
| 71 | | | | Normal GOF Test Results | | | | | | | | |
| 72 | | | | | | | | | | | | |
| 73 | | | | Correlation Coefficient R | | 0.787 | | | | | | |
| 74 | | | | Shapiro Wilk Test Statistic | | 0.628 | | | | | | |
| 75 | | | | Shapiro Wilk Critical (0.05) Value | | 0.933 | | | | | | |
| 76 | | | | Approximate Shapiro Wilk P Value | | 1.0902E-9 | | | | | | |
| 77 | | | | Lilliefors Test Statistic | | 0.338 | | | | | | |
| 78 | | | | Lilliefors Critical (0.05) Value | | 0.15 | | | | | | |
| 79 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 81 | | | | Gamma GOF Test Results | | | | | | | | |
| 82 | | | | | | | | | | | | |
| 83 | | | | Correlation Coefficient R | | 0.917 | | | | | | |
| 84 | | | | A-D Test Statistic | | 4.532 | | | | | | |
| 85 | | | | A-D Critical (0.05) Value | | 0.758 | | | | | | |
| 86 | | | | K-S Test Statistic | | 0.305 | | | | | | |
| 87 | | | | K-S Critical(0.05) Value | | 0.153 | | | | | | |
| 88 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 89 | | | | | | | | | | | | |
| 90 | | | | Lognormal GOF Test Results | | | | | | | | |
| 91 | | | | | | | | | | | | |
| 92 | | | | Correlation Coefficient R | | 0.864 | | | | | | |
| 93 | | | | Shapiro Wilk Test Statistic | | 0.74 | | | | | | |
| 94 | | | | Shapiro Wilk Critical (0.05) Value | | 0.933 | | | | | | |
| 95 | | | | Approximate Shapiro Wilk P Value | | 2.7265E-7 | | | | | | |
| 96 | | | | Lilliefors Test Statistic | | 0.303 | | | | | | |
| 97 | | | | Lilliefors Critical (0.05) Value | | 0.15 | | | | | | |
| 98 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 99 | | | | | | | | | | | | |
| 100 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 101 | | | | | | | | | | | | |
| 102 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | Chromium (mg/L) | | | | | | | | | | | |
| 105 | | | | | | | | | | | | |
| 106 | | | | Raw Statistics | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Valid Observations | 34 | | | | | | |
| 108 | | | | | Number of Distinct Observations | 16 | | | | | | |
| 109 | | | | | Minimum | 1.1000E-4 | | | | | | |
| 110 | | | | | Maximum | 0.035 | | | | | | |
| 111 | | | | | Mean of Raw Data | 0.00351 | | | | | | |
| 112 | | | | | Standard Deviation of Raw Data | 0.00648 | | | | | | |
| 113 | | | | | Khat | 0.668 | | | | | | |
| 114 | | | | | Theta hat | 0.00526 | | | | | | |
| 115 | | | | | Kstar | 0.629 | | | | | | |
| 116 | | | | | Theta star | 0.00558 | | | | | | |
| 117 | | | | | Mean of Log Transformed Data | -6.561 | | | | | | |
| 118 | | | | | Standard Deviation of Log Transformed Data | 1.359 | | | | | | |
| 119 | | | | | | | | | | | | |
| 120 | | | | | Normal GOF Test Results | | | | | | | |
| 121 | | | | | | | | | | | | |
| 122 | | | | | Correlation Coefficient R | 0.696 | | | | | | |
| 123 | | | | | Shapiro Wilk Test Statistic | 0.515 | | | | | | |
| 124 | | | | | Shapiro Wilk Critical (0.05) Value | 0.933 | | | | | | |
| 125 | | | | | Approximate Shapiro Wilk P Value | 8.867E-12 | | | | | | |
| 126 | | | | | Lilliefors Test Statistic | 0.357 | | | | | | |
| 127 | | | | | Lilliefors Critical (0.05) Value | 0.15 | | | | | | |
| 128 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 129 | | | | | | | | | | | | |
| 130 | | | | | Gamma GOF Test Results | | | | | | | |
| 131 | | | | | | | | | | | | |
| 132 | | | | | Correlation Coefficient R | 0.924 | | | | | | |
| 133 | | | | | A-D Test Statistic | 1.342 | | | | | | |
| 134 | | | | | A-D Critical (0.05) Value | 0.796 | | | | | | |
| 135 | | | | | K-S Test Statistic | 0.263 | | | | | | |
| 136 | | | | | K-S Critical(0.05) Value | 0.158 | | | | | | |
| 137 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 138 | | | | | | | | | | | | |
| 139 | | | | | Lognormal GOF Test Results | | | | | | | |
| 140 | | | | | | | | | | | | |
| 141 | | | | | Correlation Coefficient R | 0.984 | | | | | | |
| 142 | | | | | Shapiro Wilk Test Statistic | 0.965 | | | | | | |
| 143 | | | | | Shapiro Wilk Critical (0.05) Value | 0.933 | | | | | | |
| 144 | | | | | Approximate Shapiro Wilk P Value | 0.401 | | | | | | |
| 145 | | | | | Lilliefors Test Statistic | 0.164 | | | | | | |
| 146 | | | | | Lilliefors Critical (0.05) Value | 0.15 | | | | | | |
| 147 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 148 | | | | | | | | | | | | |
| 149 | Copper (mg/L) | | | | | | | | | | | |
| 150 | | | | | | | | | | | | |
| 151 | | | | | Raw Statistics | | | | | | | |
| 152 | | | | | Number of Valid Observations | 34 | | | | | | |
| 153 | | | | | Number of Distinct Observations | 26 | | | | | | |
| 154 | | | | | Minimum | 5.1000E-4 | | | | | | |
| 155 | | | | | Maximum | 0.018 | | | | | | |
| 156 | | | | | Mean of Raw Data | 0.00407 | | | | | | |
| 157 | | | | | Standard Deviation of Raw Data | 0.0038 | | | | | | |
| 158 | | | | | Khat | 1.605 | | | | | | |
| 159 | | | | | Theta hat | 0.00254 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Kstar | 1.483 | | | | | | |
| 161 | | | | | Theta star | 0.00275 | | | | | | |
| 162 | | | | | Mean of Log Transformed Data | -5.847 | | | | | | |
| 163 | | | | | Standard Deviation of Log Transformed Data | 0.859 | | | | | | |
| 164 | | | | | | | | | | | | |
| 165 | | | | | Normal GOF Test Results | | | | | | | |
| 166 | | | | | | | | | | | | |
| 167 | | | | | Correlation Coefficient R | 0.855 | | | | | | |
| 168 | | | | | Shapiro Wilk Test Statistic | 0.744 | | | | | | |
| 169 | | | | | Shapiro Wilk Critical (0.05) Value | 0.933 | | | | | | |
| 170 | | | | | Approximate Shapiro Wilk P Value | 3.3192E-7 | | | | | | |
| 171 | | | | | Lilliefors Test Statistic | 0.221 | | | | | | |
| 172 | | | | | Lilliefors Critical (0.05) Value | 0.15 | | | | | | |
| 173 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 174 | | | | | | | | | | | | |
| 175 | | | | | Gamma GOF Test Results | | | | | | | |
| 176 | | | | | | | | | | | | |
| 177 | | | | | Correlation Coefficient R | 0.96 | | | | | | |
| 178 | | | | | A-D Test Statistic | 0.63 | | | | | | |
| 179 | | | | | A-D Critical (0.05) Value | 0.765 | | | | | | |
| 180 | | | | | K-S Test Statistic | 0.113 | | | | | | |
| 181 | | | | | K-S Critical(0.05) Value | 0.154 | | | | | | |
| 182 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 183 | | | | | | | | | | | | |
| 184 | | | | | Lognormal GOF Test Results | | | | | | | |
| 185 | | | | | | | | | | | | |
| 186 | | | | | Correlation Coefficient R | 0.983 | | | | | | |
| 187 | | | | | Shapiro Wilk Test Statistic | 0.961 | | | | | | |
| 188 | | | | | Shapiro Wilk Critical (0.05) Value | 0.933 | | | | | | |
| 189 | | | | | Approximate Shapiro Wilk P Value | 0.323 | | | | | | |
| 190 | | | | | Lilliefors Test Statistic | 0.111 | | | | | | |
| 191 | | | | | Lilliefors Critical (0.05) Value | 0.15 | | | | | | |
| 192 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 193 | | | | | | | | | | | | |
| 194 | Nickel (mg/L) | | | | | | | | | | | |
| 195 | | | | | | | | | | | | |
| 196 | | | | | Raw Statistics | | | | | | | |
| 197 | | | | | Number of Valid Observations | 32 | | | | | | |
| 198 | | | | | Number of Distinct Observations | 30 | | | | | | |
| 199 | | | | | Minimum | 0.002 | | | | | | |
| 200 | | | | | Maximum | 0.0626 | | | | | | |
| 201 | | | | | Mean of Raw Data | 0.00976 | | | | | | |
| 202 | | | | | Standard Deviation of Raw Data | 0.0122 | | | | | | |
| 203 | | | | | Khat | 1.311 | | | | | | |
| 204 | | | | | Theta hat | 0.00745 | | | | | | |
| 205 | | | | | Kstar | 1.209 | | | | | | |
| 206 | | | | | Theta star | 0.00808 | | | | | | |
| 207 | | | | | Mean of Log Transformed Data | -5.057 | | | | | | |
| 208 | | | | | Standard Deviation of Log Transformed Data | 0.84 | | | | | | |
| 209 | | | | | | | | | | | | |
| 210 | | | | | Normal GOF Test Results | | | | | | | |
| 211 | | | | | | | | | | | | |
| 212 | | | | | Correlation Coefficient R | 0.765 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Shapiro Wilk Test Statistic | 0.608 | | | | | | |
| 214 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 215 | | | | | Approximate Shapiro Wilk P Value | 1.6929E-9 | | | | | | |
| 216 | | | | | Lilliefors Test Statistic | 0.317 | | | | | | |
| 217 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 218 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 219 | | | | | | | | | | | | |
| 220 | | | | Gamma GOF Test Results | | | | | | | | |
| 221 | | | | | | | | | | | | |
| 222 | | | | | Correlation Coefficient R | 0.932 | | | | | | |
| 223 | | | | | A-D Test Statistic | 2.38 | | | | | | |
| 224 | | | | | A-D Critical (0.05) Value | 0.769 | | | | | | |
| 225 | | | | | K-S Test Statistic | 0.272 | | | | | | |
| 226 | | | | | K-S Critical(0.05) Value | 0.159 | | | | | | |
| 227 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | Lognormal GOF Test Results | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | | | | | Correlation Coefficient R | 0.946 | | | | | | |
| 232 | | | | | Shapiro Wilk Test Statistic | 0.893 | | | | | | |
| 233 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 234 | | | | | Approximate Shapiro Wilk P Value | 0.00404 | | | | | | |
| 235 | | | | | Lilliefors Test Statistic | 0.225 | | | | | | |
| 236 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 237 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 238 | | | | | | | | | | | | |
| 239 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 240 | | | | | | | | | | | | |
| 241 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 242 | | | | | | | | | | | | |
| 243 | Zinc (mg/L) | | | | | | | | | | | |
| 244 | | | | | | | | | | | | |
| 245 | | | | Raw Statistics | | | | | | | | |
| 246 | | | | | Number of Valid Observations | 32 | | | | | | |
| 247 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 248 | | | | | Minimum | 6.0000E-4 | | | | | | |
| 249 | | | | | Maximum | 0.02 | | | | | | |
| 250 | | | | | Mean of Raw Data | 0.00518 | | | | | | |
| 251 | | | | | Standard Deviation of Raw Data | 0.005 | | | | | | |
| 252 | | | | | Khat | 1.555 | | | | | | |
| 253 | | | | | Theta hat | 0.00333 | | | | | | |
| 254 | | | | | Kstar | 1.43 | | | | | | |
| 255 | | | | | Theta star | 0.00363 | | | | | | |
| 256 | | | | | Mean of Log Transformed Data | -5.617 | | | | | | |
| 257 | | | | | Standard Deviation of Log Transformed Data | 0.847 | | | | | | |
| 258 | | | | | | | | | | | | |
| 259 | | | | Normal GOF Test Results | | | | | | | | |
| 260 | | | | | | | | | | | | |
| 261 | | | | | Correlation Coefficient R | 0.856 | | | | | | |
| 262 | | | | | Shapiro Wilk Test Statistic | 0.734 | | | | | | |
| 263 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 264 | | | | | Approximate Shapiro Wilk P Value | 4.9393E-7 | | | | | | |
| 265 | | | | | Lilliefors Test Statistic | 0.233 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 267 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 268 | | | | | | | | | | | | |
| 269 | | | | | Gamma GOF Test Results | | | | | | | |
| 270 | | | | | | | | | | | | |
| 271 | | | | | Correlation Coefficient R | 0.959 | | | | | | |
| 272 | | | | | A-D Test Statistic | 0.766 | | | | | | |
| 273 | | | | | A-D Critical (0.05) Value | 0.764 | | | | | | |
| 274 | | | | | K-S Test Statistic | 0.13 | | | | | | |
| 275 | | | | | K-S Critical(0.05) Value | 0.158 | | | | | | |
| 276 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 277 | | | | | | | | | | | | |
| 278 | | | | | Lognormal GOF Test Results | | | | | | | |
| 279 | | | | | | | | | | | | |
| 280 | | | | | Correlation Coefficient R | 0.989 | | | | | | |
| 281 | | | | | Shapiro Wilk Test Statistic | 0.973 | | | | | | |
| 282 | | | | | Shapiro Wilk Critical (0.05) Value | 0.93 | | | | | | |
| 283 | | | | | Approximate Shapiro Wilk P Value | 0.637 | | | | | | |
| 284 | | | | | Lilliefors Test Statistic | 0.107 | | | | | | |
| 285 | | | | | Lilliefors Critical (0.05) Value | 0.154 | | | | | | |
| 286 | 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 5.2 2023-12-13 10:37:46 AM | |
| From File | 2023-ShallowProUCL_n.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

16-SH

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 29 |
| Number of Distinct Observations | 16 |
| Minimum | 0.5 |
| Maximum | 1.9 |
| Mean of Raw Data | 0.934 |
| Standard Deviation of Raw Data | 0.402 |
| Khat | 5.823 |
| Theta hat | 0.16 |
| Kstar | 5.244 |
| Theta star | 0.178 |
| Mean of Log Transformed Data | -0.157 |
| Standard Deviation of Log Transformed Data | 0.429 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.957 |
| Shapiro Wilk Test Statistic | 0.903 |
| Shapiro Wilk Critical (0.05) Value | 0.926 |
| Approximate Shapiro Wilk P Value | 0.0124 |
| Lilliefors Test Statistic | 0.148 |
| Lilliefors Critical (0.05) Value | 0.161 |

Data appear Approximate Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.983 |
| A-D Test Statistic | 0.767 |
| A-D Critical (0.05) Value | 0.747 |
| K-S Test Statistic | 0.165 |
| K-S Critical(0.05) Value | 0.163 |

Data appear Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.964 |
| Shapiro Wilk Test Statistic | 0.909 |
| Shapiro Wilk Critical (0.05) Value | 0.926 |
| Approximate Shapiro Wilk P Value | 0.018 |
| Lilliefors Test Statistic | 0.17 |
| Lilliefors Critical (0.05) Value | 0.161 |

Data not 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 | 29 | | | | | | |
| 58 | | | | | Number of Distinct Observations | 9 | | | | | | |
| 59 | | | | | Minimum | 1.3000E-4 | | | | | | |
| 60 | | | | | Maximum | 5.8000E-4 | | | | | | |
| 61 | | | | | Mean of Raw Data | 2.3931E-4 | | | | | | |
| 62 | | | | | Standard Deviation of Raw Data | 1.1035E-4 | | | | | | |
| 63 | | | | | Khat | 6.228 | | | | | | |
| 64 | | | | | Theta hat | 3.8423E-5 | | | | | | |
| 65 | | | | | Kstar | 5.607 | | | | | | |
| 66 | | | | | Theta star | 4.2681E-5 | | | | | | |
| 67 | | | | | Mean of Log Transformed Data | -8.42 | | | | | | |
| 68 | | | | | Standard Deviation of Log Transformed Data | 0.393 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Correlation Coefficient R | 0.873 | | | | | | |
| 73 | | | | | Shapiro Wilk Test Statistic | 0.766 | | | | | | |
| 74 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk P Value | 7.9988E-6 | | | | | | |
| 76 | | | | | Lilliefors Test Statistic | 0.363 | | | | | | |
| 77 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | Correlation Coefficient R | 0.928 | | | | | | |
| 83 | | | | | A-D Test Statistic | 2.319 | | | | | | |
| 84 | | | | | A-D Critical (0.05) Value | 0.747 | | | | | | |
| 85 | | | | | K-S Test Statistic | 0.342 | | | | | | |
| 86 | | | | | K-S Critical(0.05) Value | 0.163 | | | | | | |
| 87 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | | Correlation Coefficient R | 0.926 | | | | | | |
| 92 | | | | | Shapiro Wilk Test Statistic | 0.853 | | | | | | |
| 93 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 6.6150E-4 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.322 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Chromium (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | | Number of Valid Observations | 29 | | | | | | |

| | | |
|---|---|---|
| Number of Distinct Observations | 23 | |
| Minimum | 6.2000E-4 | |
| Maximum | 0.036 | |
| Mean of Raw Data | 0.00694 | |
| Standard Deviation of Raw Data | 0.00767 | |
| Khat | 1.104 | |
| Theta hat | 0.00629 | |
| Kstar | 1.012 | |
| Theta star | 0.00686 | |
| Mean of Log Transformed Data | -5.487 | |
| Standard Deviation of Log Transformed Data | 1.061 | |

**Normal GOF Test Results**

| | |
|---|---|
| Correlation Coefficient R | 0.857 |
| Shapiro Wilk Test Statistic | 0.75 |
| Shapiro Wilk Critical (0.05) Value | 0.926 |
| Approximate Shapiro Wilk P Value | 3.7057E-6 |
| Lilliefors Test Statistic | 0.221 |
| Lilliefors Critical (0.05) Value | 0.161 |

Data not Normal at (0.05) Significance Level

**Gamma GOF Test Results**

| | |
|---|---|
| Correlation Coefficient R | 0.975 |
| A-D Test Statistic | 0.588 |
| A-D Critical (0.05) Value | 0.772 |
| K-S Test Statistic | 0.142 |
| K-S Critical(0.05) Value | 0.167 |

Data appear Gamma Distributed at (0.05) Significance Level

**Lognormal GOF Test Results**

| | |
|---|---|
| Correlation Coefficient R | 0.987 |
| Shapiro Wilk Test Statistic | 0.966 |
| Shapiro Wilk Critical (0.05) Value | 0.926 |
| Approximate Shapiro Wilk P Value | 0.493 |
| Lilliefors Test Statistic | 0.121 |
| Lilliefors Critical (0.05) Value | 0.161 |

Data appear Lognormal at (0.05) Significance Level

Copper (mg/L)

**Raw Statistics**

| | |
|---|---|
| Number of Valid Observations | 29 |
| Number of Distinct Observations | 26 |
| Minimum | 6.0000E-4 |
| Maximum | 0.031 |
| Mean of Raw Data | 0.00384 |
| Standard Deviation of Raw Data | 0.00574 |
| Khat | 1.295 |
| Theta hat | 0.00297 |
| Kstar | 1.184 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Theta star | 0.00325 | | | | | | |
| 161 | | | | | Mean of Log Transformed Data | -5.994 | | | | | | |
| 162 | | | | | Standard Deviation of Log Transformed Data | 0.814 | | | | | | |
| 163 | | | | | | | | | | | | |
| 164 | | | | | Normal GOF Test Results | | | | | | | |
| 165 | | | | | | | | | | | | |
| 166 | | | | | Correlation Coefficient R | 0.667 | | | | | | |
| 167 | | | | | Shapiro Wilk Test Statistic | 0.477 | | | | | | |
| 168 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 169 | | | | | Approximate Shapiro Wilk P Value | 1.041E-10 | | | | | | |
| 170 | | | | | Lilliefors Test Statistic | 0.324 | | | | | | |
| 171 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 172 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Gamma GOF Test Results | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | Correlation Coefficient R | 0.849 | | | | | | |
| 177 | | | | | A-D Test Statistic | 1.802 | | | | | | |
| 178 | | | | | A-D Critical (0.05) Value | 0.767 | | | | | | |
| 179 | | | | | K-S Test Statistic | 0.204 | | | | | | |
| 180 | | | | | K-S Critical(0.05) Value | 0.166 | | | | | | |
| 181 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | | | | | Lognormal GOF Test Results | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | | | | | Correlation Coefficient R | 0.959 | | | | | | |
| 186 | | | | | Shapiro Wilk Test Statistic | 0.933 | | | | | | |
| 187 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 188 | | | | | Approximate Shapiro Wilk P Value | 0.0729 | | | | | | |
| 189 | | | | | Lilliefors Test Statistic | 0.126 | | | | | | |
| 190 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 191 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Manganese (mg/L) | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | | Raw Statistics | | | | | | | |
| 196 | | | | | Number of Valid Observations | 27 | | | | | | |
| 197 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 198 | | | | | Minimum | 9.4000E-4 | | | | | | |
| 199 | | | | | Maximum | 0.571 | | | | | | |
| 200 | | | | | Mean of Raw Data | 0.0531 | | | | | | |
| 201 | | | | | Standard Deviation of Raw Data | 0.124 | | | | | | |
| 202 | | | | | Khat | 0.42 | | | | | | |
| 203 | | | | | Theta hat | 0.127 | | | | | | |
| 204 | | | | | Kstar | 0.398 | | | | | | |
| 205 | | | | | Theta star | 0.134 | | | | | | |
| 206 | | | | | Mean of Log Transformed Data | -4.491 | | | | | | |
| 207 | | | | | Standard Deviation of Log Transformed Data | 1.759 | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | | | | | Normal GOF Test Results | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | | | | | Correlation Coefficient R | 0.662 | | | | | | |
| 212 | | | | | Shapiro Wilk Test Statistic | 0.461 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Shapiro Wilk Critical (0.05) Value | 0.923 | | | | | | |
| 214 | | | | | Approximate Shapiro Wilk P Value | 2.402E-10 | | | | | | |
| 215 | | | | | Lilliefors Test Statistic | 0.376 | | | | | | |
| 216 | | | | | Lilliefors Critical (0.05) Value | 0.167 | | | | | | |
| 217 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | Gamma GOF Test Results | | | | | | | | |
| 220 | | | | | | | | | | | | |
| 221 | | | | | Correlation Coefficient R | 0.942 | | | | | | |
| 222 | | | | | A-D Test Statistic | 1.59 | | | | | | |
| 223 | | | | | A-D Critical (0.05) Value | 0.826 | | | | | | |
| 224 | | | | | K-S Test Statistic | 0.213 | | | | | | |
| 225 | | | | | K-S Critical(0.05) Value | 0.18 | | | | | | |
| 226 | Data not 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 | 0.952 | | | | | | |
| 232 | | | | | Shapiro Wilk Critical (0.05) Value | 0.923 | | | | | | |
| 233 | | | | | Approximate Shapiro Wilk P Value | 0.254 | | | | | | |
| 234 | | | | | Lilliefors Test Statistic | 0.121 | | | | | | |
| 235 | | | | | Lilliefors Critical (0.05) Value | 0.167 | | | | | | |
| 236 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | Nickel (mg/L) | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | Raw Statistics | | | | | | | | |
| 241 | | | | | Number of Valid Observations | 29 | | | | | | |
| 242 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 243 | | | | | Minimum | 3.1000E-4 | | | | | | |
| 244 | | | | | Maximum | 0.058 | | | | | | |
| 245 | | | | | Mean of Raw Data | 0.00568 | | | | | | |
| 246 | | | | | Standard Deviation of Raw Data | 0.0109 | | | | | | |
| 247 | | | | | Khat | 0.872 | | | | | | |
| 248 | | | | | Theta hat | 0.00652 | | | | | | |
| 249 | | | | | Kstar | 0.805 | | | | | | |
| 250 | | | | | Theta star | 0.00706 | | | | | | |
| 251 | | | | | Mean of Log Transformed Data | -5.844 | | | | | | |
| 252 | | | | | Standard Deviation of Log Transformed Data | 1.033 | | | | | | |
| 253 | | | | | | | | | | | | |
| 254 | | | | Normal GOF Test Results | | | | | | | | |
| 255 | | | | | | | | | | | | |
| 256 | | | | | Correlation Coefficient R | 0.635 | | | | | | |
| 257 | | | | | Shapiro Wilk Test Statistic | 0.436 | | | | | | |
| 258 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 259 | | | | | Approximate Shapiro Wilk P Value | 2.765E-11 | | | | | | |
| 260 | | | | | Lilliefors Test Statistic | 0.37 | | | | | | |
| 261 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 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 | 0.856 | | | | | | |
| 267 | | | | | A-D Test Statistic | 1.953 | | | | | | |
| 268 | | | | | A-D Critical (0.05) Value | 0.779 | | | | | | |
| 269 | | | | | K-S Test Statistic | 0.23 | | | | | | |
| 270 | | | | | K-S Critical(0.05) Value | 0.168 | | | | | | |
| 271 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | | | | Lognormal GOF Test Results | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | | | | | Correlation Coefficient R | 0.968 | | | | | | |
| 276 | | | | | Shapiro Wilk Test Statistic | 0.953 | | | | | | |
| 277 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 278 | | | | | Approximate Shapiro Wilk P Value | 0.245 | | | | | | |
| 279 | | | | | Lilliefors Test Statistic | 0.126 | | | | | | |
| 280 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 281 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | Zinc (mg/L) | | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | | | | Raw Statistics | | | | | | | | |
| 286 | | | | | Number of Valid Observations | 29 | | | | | | |
| 287 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 288 | | | | | Minimum | 0.001 | | | | | | |
| 289 | | | | | Maximum | 0.0262 | | | | | | |
| 290 | | | | | Mean of Raw Data | 0.00583 | | | | | | |
| 291 | | | | | Standard Deviation of Raw Data | 0.00615 | | | | | | |
| 292 | | | | | Khat | 1.274 | | | | | | |
| 293 | | | | | Theta hat | 0.00458 | | | | | | |
| 294 | | | | | Kstar | 1.165 | | | | | | |
| 295 | | | | | Theta star | 0.00501 | | | | | | |
| 296 | | | | | Mean of Log Transformed Data | -5.586 | | | | | | |
| 297 | | | | | Standard Deviation of Log Transformed Data | 0.937 | | | | | | |
| 298 | | | | | | | | | | | | |
| 299 | | | | Normal GOF Test Results | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | | | | | Correlation Coefficient R | 0.865 | | | | | | |
| 302 | | | | | Shapiro Wilk Test Statistic | 0.754 | | | | | | |
| 303 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 304 | | | | | Approximate Shapiro Wilk P Value | 4.4768E-6 | | | | | | |
| 305 | | | | | Lilliefors Test Statistic | 0.216 | | | | | | |
| 306 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 307 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 308 | | | | | | | | | | | | |
| 309 | | | | Gamma GOF Test Results | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | | | | | Correlation Coefficient R | 0.985 | | | | | | |
| 312 | | | | | A-D Test Statistic | 0.944 | | | | | | |
| 313 | | | | | A-D Critical (0.05) Value | 0.768 | | | | | | |
| 314 | | | | | K-S Test Statistic | 0.172 | | | | | | |
| 315 | | | | | K-S Critical(0.05) Value | 0.166 | | | | | | |
| 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 | 0.977 | | | | | | |
| 321 | | | | | Shapiro Wilk Test Statistic | 0.94 | | | | | | |
| 322 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 323 | | | | | Approximate Shapiro Wilk P Value | 0.117 | | | | | | |
| 324 | | | | | Lilliefors Test Statistic | 0.147 | | | | | | |
| 325 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 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 5.2 2023-12-13 10:39:31 AM | |
| From File | 2023-ShallowProUCL_o.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

17-SH

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 30 |
| Number of Distinct Observations | 16 |
| Minimum | 0.5 |
| Maximum | 21.8 |
| Mean of Raw Data | 4.122 |
| Standard Deviation of Raw Data | 5.874 |
| Khat | 0.654 |
| Theta hat | 6.304 |
| Kstar | 0.611 |
| Theta star | 6.75 |
| Mean of Log Transformed Data | 0.483 |
| Standard Deviation of Log Transformed Data | 1.361 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.827 |
| Shapiro Wilk Test Statistic | 0.683 |
| Shapiro Wilk Critical (0.05) Value | 0.927 |
| Approximate Shapiro Wilk P Value | 1.2382E-7 |
| Lilliefors Test Statistic | 0.314 |
| Lilliefors Critical (0.05) Value | 0.159 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.979 |
| A-D Test Statistic | 2.75 |
| A-D Critical (0.05) Value | 0.796 |
| K-S Test Statistic | 0.261 |
| K-S Critical(0.05) Value | 0.167 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.904 |
| Shapiro Wilk Test Statistic | 0.795 |
| Shapiro Wilk Critical (0.05) Value | 0.927 |
| Approximate Shapiro Wilk P Value | 2.3466E-5 |
| Lilliefors Test Statistic | 0.273 |
| Lilliefors Critical (0.05) Value | 0.159 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Arsenic (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | Raw Statistics | | | | | | | |
| 61 | | | | | Number of Valid Observations | 30 | | | | | | |
| 62 | | | | | Number of Distinct Observations | 9 | | | | | | |
| 63 | | | | | Minimum | 1.0000E-4 | | | | | | |
| 64 | | | | | Maximum | 4.0000E-4 | | | | | | |
| 65 | | | | | Mean of Raw Data | 2.4400E-4 | | | | | | |
| 66 | | | | | Standard Deviation of Raw Data | 1.1091E-4 | | | | | | |
| 67 | | | | | Khat | 5.15 | | | | | | |
| 68 | | | | | Theta hat | 4.7382E-5 | | | | | | |
| 69 | | | | | Kstar | 4.657 | | | | | | |
| 70 | | | | | Theta star | 5.2396E-5 | | | | | | |
| 71 | | | | | Mean of Log Transformed Data | -8.419 | | | | | | |
| 72 | | | | | Standard Deviation of Log Transformed Data | 0.457 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | | Normal GOF Test Results | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | | Correlation Coefficient R | 0.902 | | | | | | |
| 77 | | | | | Shapiro Wilk Test Statistic | 0.791 | | | | | | |
| 78 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 79 | | | | | Approximate Shapiro Wilk P Value | 1.9160E-5 | | | | | | |
| 80 | | | | | Lilliefors Test Statistic | 0.321 | | | | | | |
| 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 | 0.899 | | | | | | |
| 87 | | | | | A-D Test Statistic | 2.071 | | | | | | |
| 88 | | | | | A-D Critical (0.05) Value | 0.746 | | | | | | |
| 89 | | | | | K-S Test Statistic | 0.28 | | | | | | |
| 90 | | | | | K-S Critical(0.05) Value | 0.16 | | | | | | |
| 91 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | | Lognormal GOF Test Results | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | | Correlation Coefficient R | 0.936 | | | | | | |
| 96 | | | | | Shapiro Wilk Test Statistic | 0.857 | | | | | | |
| 97 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 98 | | | | | Approximate Shapiro Wilk P Value | 6.5595E-4 | | | | | | |
| 99 | | | | | Lilliefors Test Statistic | 0.252 | | | | | | |
| 100 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 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 | | 30 | | | | | | |
| 111 | | | | Number of Distinct Observations | | 18 | | | | | | |
| 112 | | | | Minimum | | 8.0000E-6 | | | | | | |
| 113 | | | | Maximum | | 0.003 | | | | | | |
| 114 | | | | Mean of Raw Data | | 2.0001E-4 | | | | | | |
| 115 | | | | Standard Deviation of Raw Data | | 5.3705E-4 | | | | | | |
| 116 | | | | Khat | | 0.544 | | | | | | |
| 117 | | | | Theta hat | | 3.6775E-4 | | | | | | |
| 118 | | | | Kstar | | 0.512 | | | | | | |
| 119 | | | | Theta star | | 3.9087E-4 | | | | | | |
| 120 | | | | Mean of Log Transformed Data | | -9.67 | | | | | | |
| 121 | | | | Standard Deviation of Log Transformed Data | | 1.422 | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | | | | Normal GOF Test Results | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | Correlation Coefficient R | | 0.529 | | | | | | |
| 126 | | | | Shapiro Wilk Test Statistic | | 0.315 | | | | | | |
| 127 | | | | Shapiro Wilk Critical (0.05) Value | | 0.927 | | | | | | |
| 128 | | | | Approximate Shapiro Wilk P Value | | 3.095E-13 | | | | | | |
| 129 | | | | Lilliefors Test Statistic | | 0.433 | | | | | | |
| 130 | | | | Lilliefors Critical (0.05) Value | | 0.159 | | | | | | |
| 131 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 132 | | | | | | | | | | | | |
| 133 | | | | Gamma GOF Test Results | | | | | | | | |
| 134 | | | | | | | | | | | | |
| 135 | | | | Correlation Coefficient R | | 0.774 | | | | | | |
| 136 | | | | A-D Test Statistic | | 2.543 | | | | | | |
| 137 | | | | A-D Critical (0.05) Value | | 0.805 | | | | | | |
| 138 | | | | K-S Test Statistic | | 0.257 | | | | | | |
| 139 | | | | K-S Critical(0.05) Value | | 0.169 | | | | | | |
| 140 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 141 | | | | | | | | | | | | |
| 142 | | | | Lognormal GOF Test Results | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | | | | Correlation Coefficient R | | 0.928 | | | | | | |
| 145 | | | | Shapiro Wilk Test Statistic | | 0.863 | | | | | | |
| 146 | | | | Shapiro Wilk Critical (0.05) Value | | 0.927 | | | | | | |
| 147 | | | | Approximate Shapiro Wilk P Value | | 9.4787E-4 | | | | | | |
| 148 | | | | Lilliefors Test Statistic | | 0.225 | | | | | | |
| 149 | | | | Lilliefors Critical (0.05) Value | | 0.159 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 155 | | | | | | | | | | | | |
| 156 | Chromium (mg/L) | | | | | | | | | | | |
| 157 | | | | | | | | | | | | |
| 158 | | | | Raw Statistics | | | | | | | | |
| 159 | | | | Number of Valid Observations | | 30 | | | | | | |

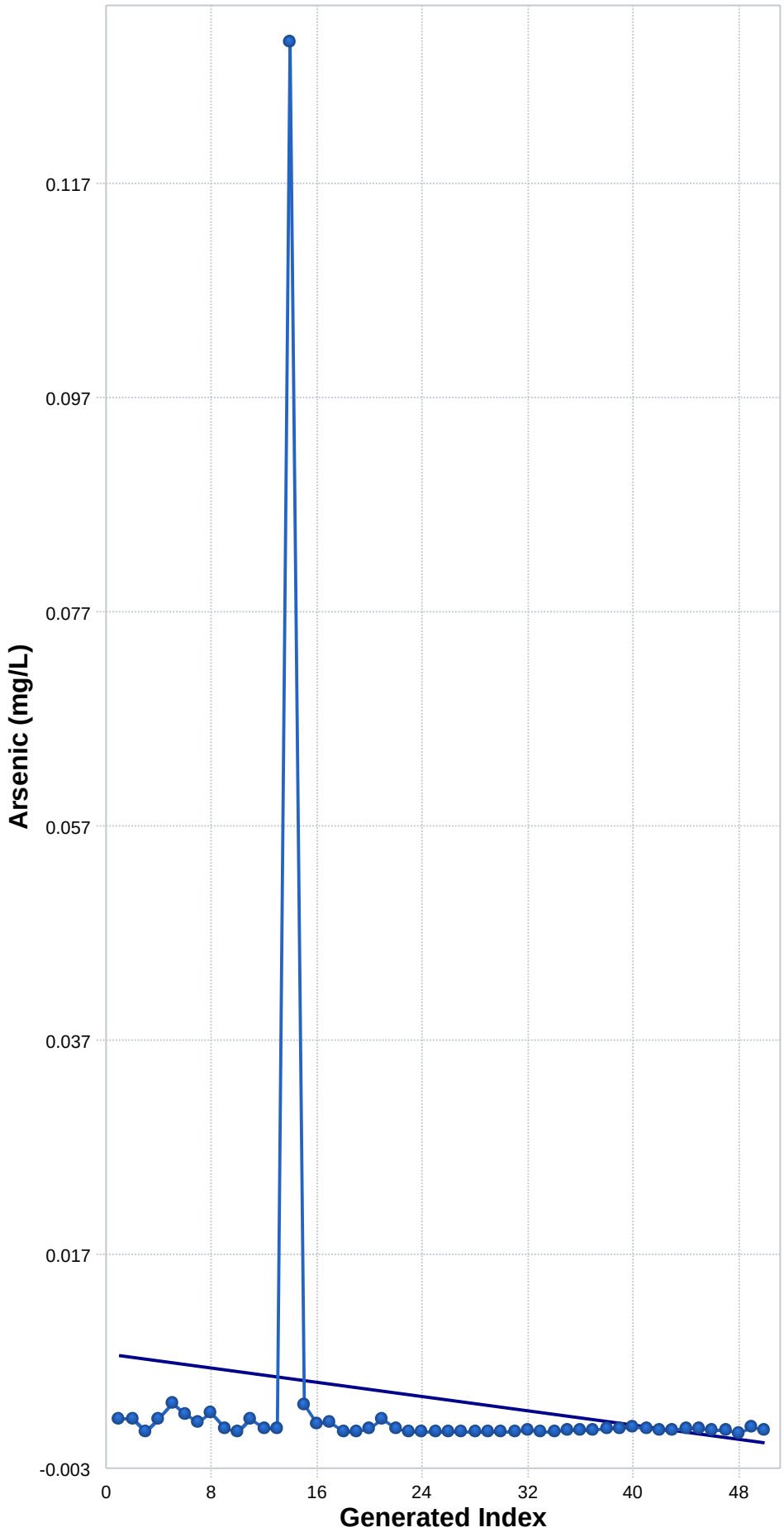
| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Number of Distinct Observations | 16 | | | | | | |
| 161 | | | | | Minimum | 2.3000E-4 | | | | | | |
| 162 | | | | | Maximum | 0.024 | | | | | | |
| 163 | | | | | Mean of Raw Data | 0.00243 | | | | | | |
| 164 | | | | | Standard Deviation of Raw Data | 0.00429 | | | | | | |
| 165 | | | | | Khat | 0.989 | | | | | | |
| 166 | | | | | Theta hat | 0.00245 | | | | | | |
| 167 | | | | | Kstar | 0.912 | | | | | | |
| 168 | | | | | Theta star | 0.00266 | | | | | | |
| 169 | | | | | Mean of Log Transformed Data | -6.605 | | | | | | |
| 170 | | | | | Standard Deviation of Log Transformed Data | 0.987 | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | Normal GOF Test Results | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Correlation Coefficient R | 0.633 | | | | | | |
| 175 | | | | | Shapiro Wilk Test Statistic | 0.436 | | | | | | |
| 176 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 177 | | | | | Approximate Shapiro Wilk P Value | 1.283E-11 | | | | | | |
| 178 | | | | | Lilliefors Test Statistic | 0.34 | | | | | | |
| 179 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 180 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | | Gamma GOF Test Results | | | | | | | |
| 183 | | | | | | | | | | | | |
| 184 | | | | | Correlation Coefficient R | 0.827 | | | | | | |
| 185 | | | | | A-D Test Statistic | 1.452 | | | | | | |
| 186 | | | | | A-D Critical (0.05) Value | 0.776 | | | | | | |
| 187 | | | | | K-S Test Statistic | 0.238 | | | | | | |
| 188 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 189 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | | | | | Lognormal GOF Test Results | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | | | | | Correlation Coefficient R | 0.973 | | | | | | |
| 194 | | | | | Shapiro Wilk Test Statistic | 0.956 | | | | | | |
| 195 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 196 | | | | | Approximate Shapiro Wilk P Value | 0.276 | | | | | | |
| 197 | | | | | Lilliefors Test Statistic | 0.146 | | | | | | |
| 198 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 199 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | Manganese (mg/L) | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | | | | | Raw Statistics | | | | | | | |
| 204 | | | | | Number of Valid Observations | 28 | | | | | | |
| 205 | | | | | Number of Distinct Observations | 19 | | | | | | |
| 206 | | | | | Minimum | 1.1000E-4 | | | | | | |
| 207 | | | | | Maximum | 0.441 | | | | | | |
| 208 | | | | | Mean of Raw Data | 0.0426 | | | | | | |
| 209 | | | | | Standard Deviation of Raw Data | 0.0994 | | | | | | |
| 210 | | | | | Khat | 0.367 | | | | | | |
| 211 | | | | | Theta hat | 0.116 | | | | | | |
| 212 | | | | | Kstar | 0.351 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Theta star | 0.121 | | | | | | |
| 214 | | | | | Mean of Log Transformed Data | -4.975 | | | | | | |
| 215 | | | | | Standard Deviation of Log Transformed Data | 1.848 | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | Normal GOF Test Results | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | | Correlation Coefficient R | 0.679 | | | | | | |
| 220 | | | | | Shapiro Wilk Test Statistic | 0.481 | | | | | | |
| 221 | | | | | Shapiro Wilk Critical (0.05) Value | 0.924 | | | | | | |
| 222 | | | | | Approximate Shapiro Wilk P Value | 2.331E-10 | | | | | | |
| 223 | | | | | Lilliefors Test Statistic | 0.395 | | | | | | |
| 224 | | | | | Lilliefors Critical (0.05) Value | 0.164 | | | | | | |
| 225 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 226 | | | | | | | | | | | | |
| 227 | | | | | Gamma GOF Test Results | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | | Correlation Coefficient R | 0.964 | | | | | | |
| 230 | | | | | A-D Test Statistic | 3.206 | | | | | | |
| 231 | | | | | A-D Critical (0.05) Value | 0.84 | | | | | | |
| 232 | | | | | K-S Test Statistic | 0.355 | | | | | | |
| 233 | | | | | K-S Critical(0.05) Value | 0.178 | | | | | | |
| 234 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 235 | | | | | | | | | | | | |
| 236 | | | | | Lognormal GOF Test Results | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | | | | | Correlation Coefficient R | 0.946 | | | | | | |
| 239 | | | | | Shapiro Wilk Test Statistic | 0.903 | | | | | | |
| 240 | | | | | Shapiro Wilk Critical (0.05) Value | 0.924 | | | | | | |
| 241 | | | | | Approximate Shapiro Wilk P Value | 0.0135 | | | | | | |
| 242 | | | | | Lilliefors Test Statistic | 0.248 | | | | | | |
| 243 | | | | | Lilliefors Critical (0.05) Value | 0.164 | | | | | | |
| 244 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 245 | | | | | | | | | | | | |
| 246 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 249 | | | | | | | | | | | | |
| 250 | Nickel (mg/L) | | | | | | | | | | | |
| 251 | | | | | | | | | | | | |
| 252 | | | | | Raw Statistics | | | | | | | |
| 253 | | | | | Number of Valid Observations | 30 | | | | | | |
| 254 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 255 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 256 | | | | | Maximum | 0.015 | | | | | | |
| 257 | | | | | Mean of Raw Data | 0.00303 | | | | | | |
| 258 | | | | | Standard Deviation of Raw Data | 0.00337 | | | | | | |
| 259 | | | | | Khat | 1.295 | | | | | | |
| 260 | | | | | Theta hat | 0.00234 | | | | | | |
| 261 | | | | | Kstar | 1.187 | | | | | | |
| 262 | | | | | Theta star | 0.00255 | | | | | | |
| 263 | | | | | Mean of Log Transformed Data | -6.232 | | | | | | |
| 264 | | | | | Standard Deviation of Log Transformed Data | 0.95 | | | | | | |
| 265 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | Normal GOF Test Results | | | | | | | | | | | |
| 267 | | | | | | | | | | | | |
| 268 | | | | | Correlation Coefficient R | 0.814 | | | | | | |
| 269 | | | | | Shapiro Wilk Test Statistic | 0.677 | | | | | | |
| 270 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 271 | | | | | Approximate Shapiro Wilk P Value | 9.2966E-8 | | | | | | |
| 272 | | | | | Lilliefors Test Statistic | 0.228 | | | | | | |
| 273 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 274 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 275 | | | | | | | | | | | | |
| 276 | Gamma GOF Test Results | | | | | | | | | | | |
| 277 | | | | | | | | | | | | |
| 278 | | | | | Correlation Coefficient R | 0.942 | | | | | | |
| 279 | | | | | A-D Test Statistic | 0.692 | | | | | | |
| 280 | | | | | A-D Critical (0.05) Value | 0.768 | | | | | | |
| 281 | | | | | K-S Test Statistic | 0.121 | | | | | | |
| 282 | | | | | K-S Critical(0.05) Value | 0.164 | | | | | | |
| 283 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | Lognormal GOF Test Results | | | | | | | | | | | |
| 286 | | | | | | | | | | | | |
| 287 | | | | | Correlation Coefficient R | 0.987 | | | | | | |
| 288 | | | | | Shapiro Wilk Test Statistic | 0.978 | | | | | | |
| 289 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 290 | | | | | Approximate Shapiro Wilk P Value | 0.788 | | | | | | |
| 291 | | | | | Lilliefors Test Statistic | 0.107 | | | | | | |
| 292 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 293 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 294 | | | | | | | | | | | | |
| 295 | Zinc (mg/L) | | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | Raw Statistics | | | | | | | | | | | |
| 298 | | | | | Number of Valid Observations | 30 | | | | | | |
| 299 | | | | | Number of Distinct Observations | 21 | | | | | | |
| 300 | | | | | Minimum | 0.001 | | | | | | |
| 301 | | | | | Maximum | 0.016 | | | | | | |
| 302 | | | | | Mean of Raw Data | 0.00535 | | | | | | |
| 303 | | | | | Standard Deviation of Raw Data | 0.00454 | | | | | | |
| 304 | | | | | Khat | 1.642 | | | | | | |
| 305 | | | | | Theta hat | 0.00326 | | | | | | |
| 306 | | | | | Kstar | 1.5 | | | | | | |
| 307 | | | | | Theta star | 0.00357 | | | | | | |
| 308 | | | | | Mean of Log Transformed Data | -5.565 | | | | | | |
| 309 | | | | | Standard Deviation of Log Transformed Data | 0.844 | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | Normal GOF Test Results | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | | | | | Correlation Coefficient R | 0.909 | | | | | | |
| 314 | | | | | Shapiro Wilk Test Statistic | 0.815 | | | | | | |
| 315 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 316 | | | | | Approximate Shapiro Wilk P Value | 6.4013E-5 | | | | | | |
| 317 | | | | | Lilliefors Test Statistic | 0.238 | | | | | | |
| 318 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |

| | 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 | 0.972 | | | | | | |
| 324 | | | | | A-D Test Statistic | 0.643 | | | | | | |
| 325 | | | | | A-D Critical (0.05) Value | 0.762 | | | | | | |
| 326 | | | | | K-S Test Statistic | 0.135 | | | | | | |
| 327 | | | | | K-S Critical(0.05) Value | 0.163 | | | | | | |
| 328 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 329 | | | | | | | | | | | | |
| 330 | | | | Lognormal GOF Test Results | | | | | | | | |
| 331 | | | | | | | | | | | | |
| 332 | | | | | Correlation Coefficient R | 0.983 | | | | | | |
| 333 | | | | | Shapiro Wilk Test Statistic | 0.947 | | | | | | |
| 334 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 335 | | | | | Approximate Shapiro Wilk P Value | 0.161 | | | | | | |
| 336 | | | | | Lilliefors Test Statistic | 0.113 | | | | | | |
| 337 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 338 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |

# Mann-Kendall - 01A-SH - ARSENIC




**Mann-Kendall Trend Analysis**

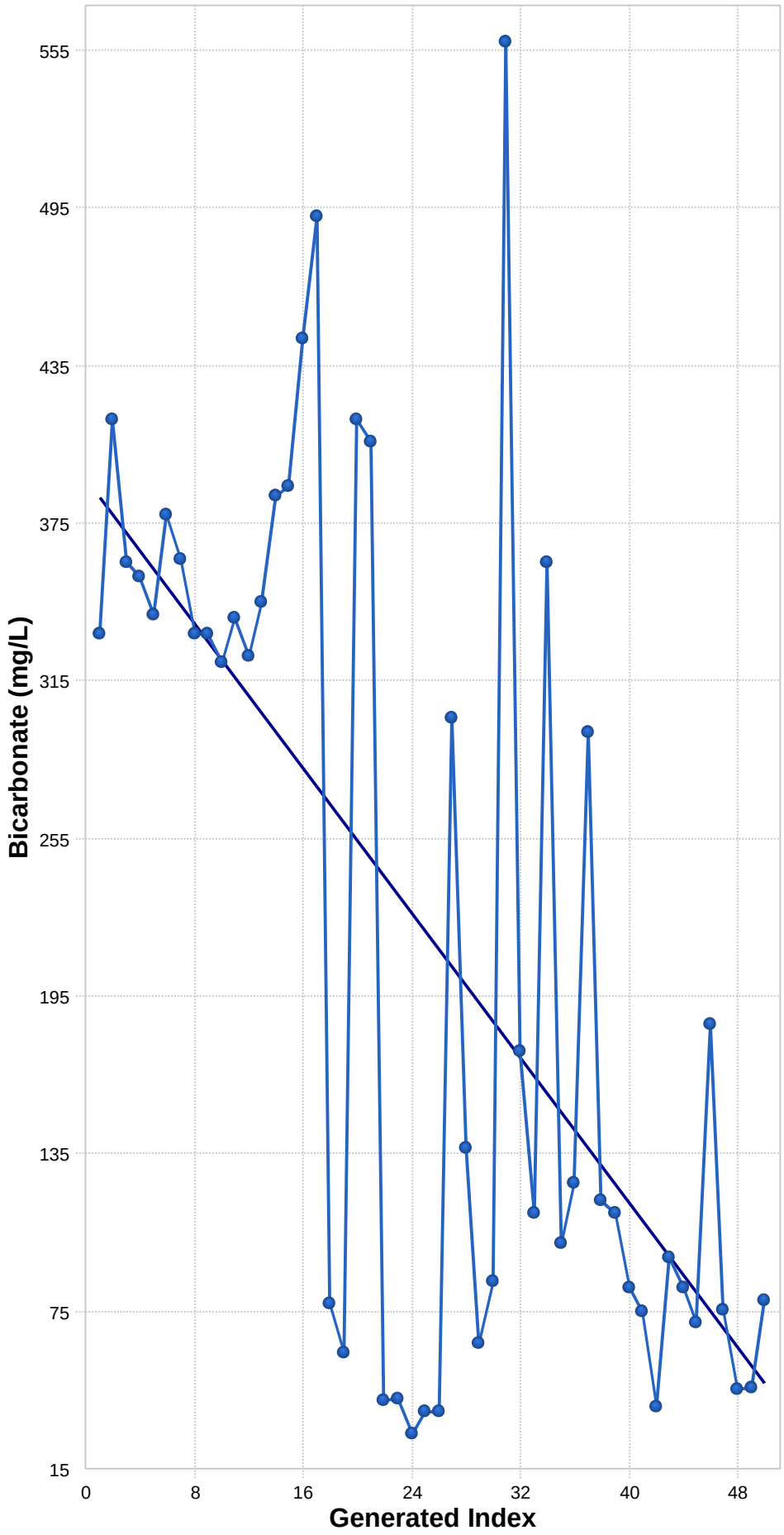
| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 118.9117 |
| Standardized Value of S | -2.4472 |
| M-K Test Value (S) | -292 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0072 |

**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.

# Mann-Kendall - 01A-SH - BICARBONATE



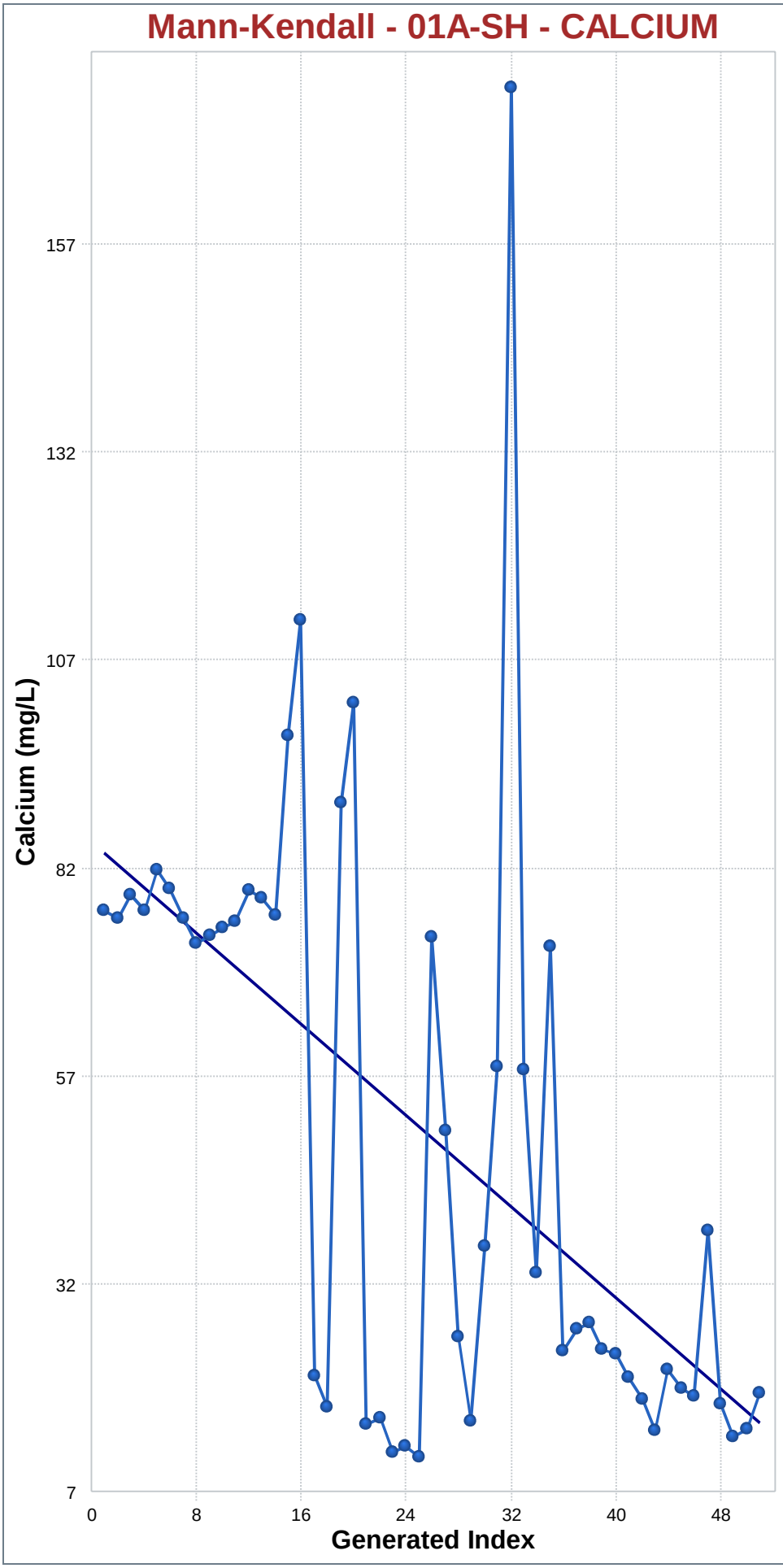

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 119.5282 |
| Standardized Value of S | -3.8819 |
| M-K Test Value (S) | -465 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -6.8792 |
| OLS Regression Intercept | 391.5288 |

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




**Mann-Kendall Trend Analysis**

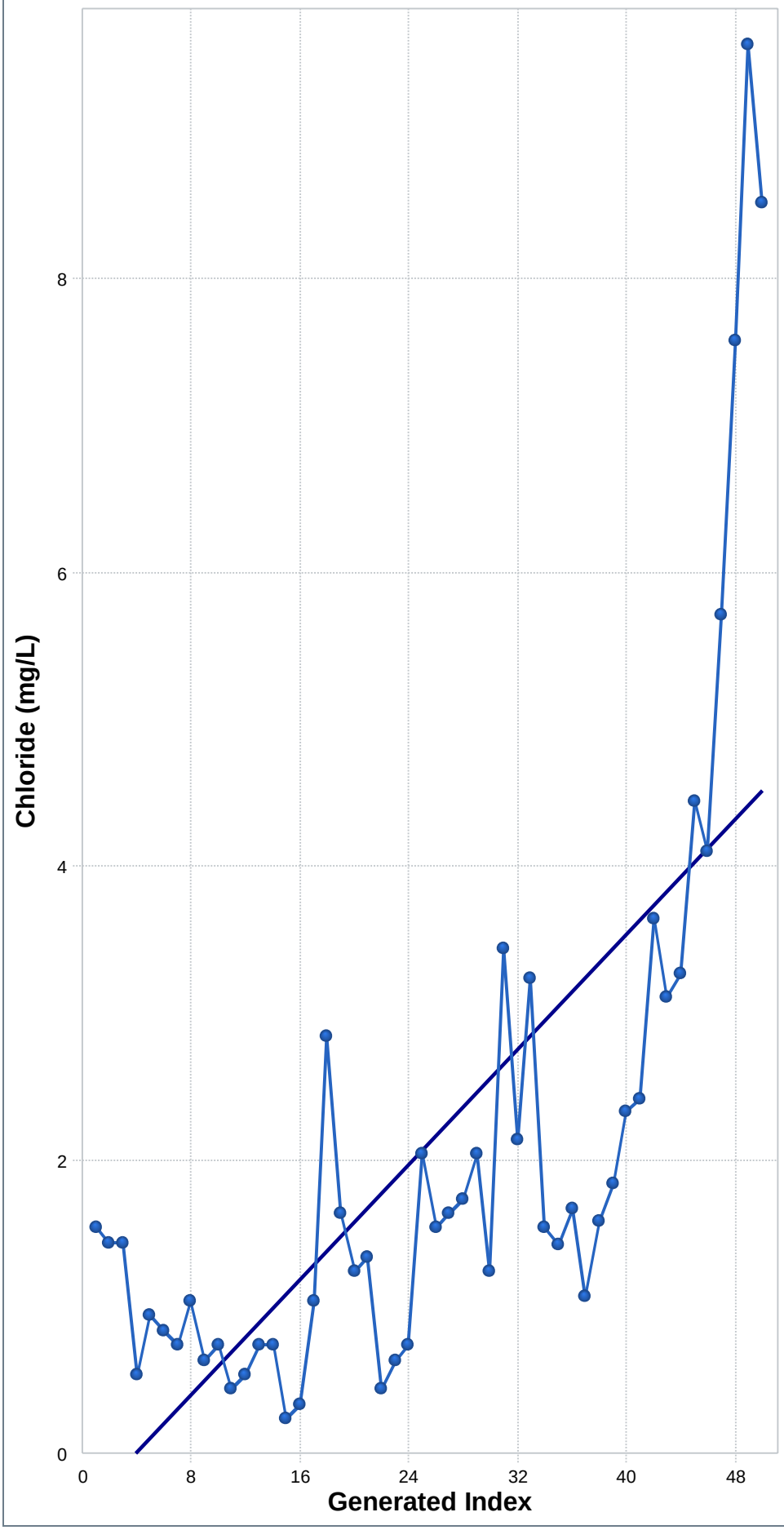
| | |
|---|---|
| n | 51 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 123.1111 |
| Standardized Value of S | -4.5000 |
| M-K Test Value (S) | -555 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -1.3705 |
| OLS Regression Intercept | 85.2614 |

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

# Mann-Kendall - 01A-SH - CHLORIDE




**Mann-Kendall Trend Analysis**

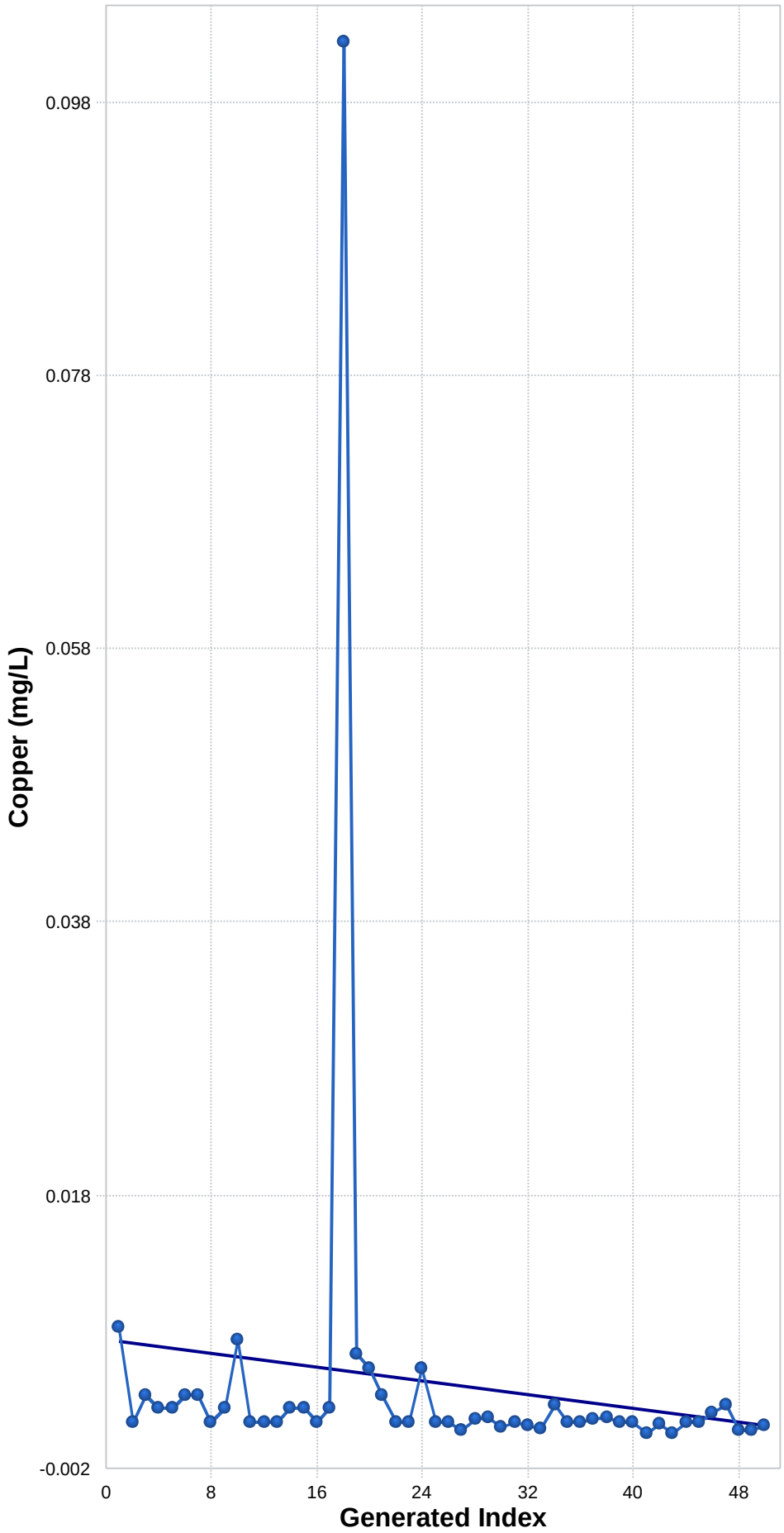
| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 119.4292 |
| Standardized Value of S | 5.8696 |
| M-K Test Value (S) | 702 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0981 |
| OLS Regression Intercept | -0.3270 |

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

# Mann-Kendall - 01A-SH - COPPER



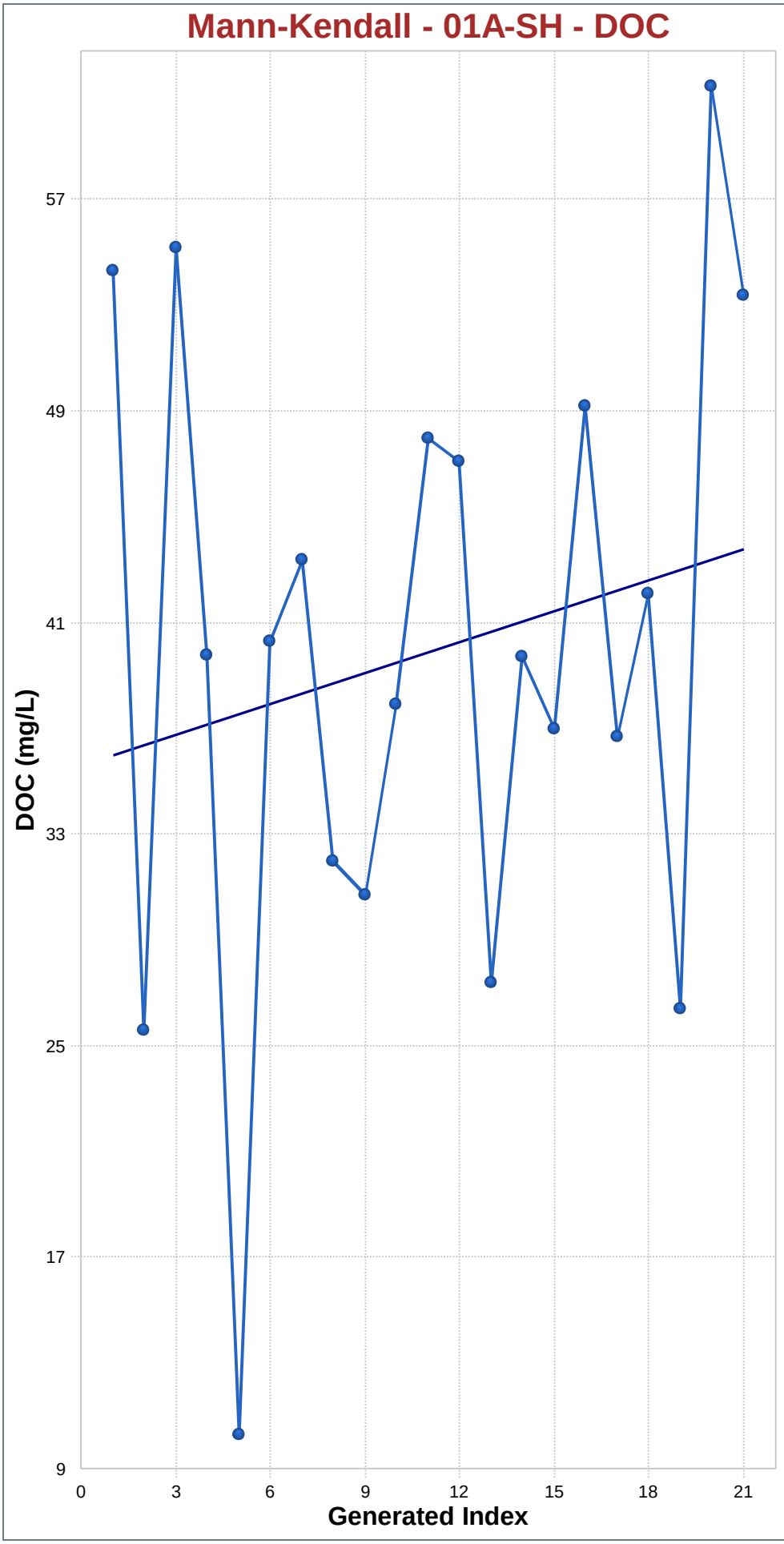

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 116.8903 |
| Standardized Value of S | -3.7899 |
| M-K Test Value (S) | -444 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0070 |

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




**Mann-Kendall Trend Analysis**

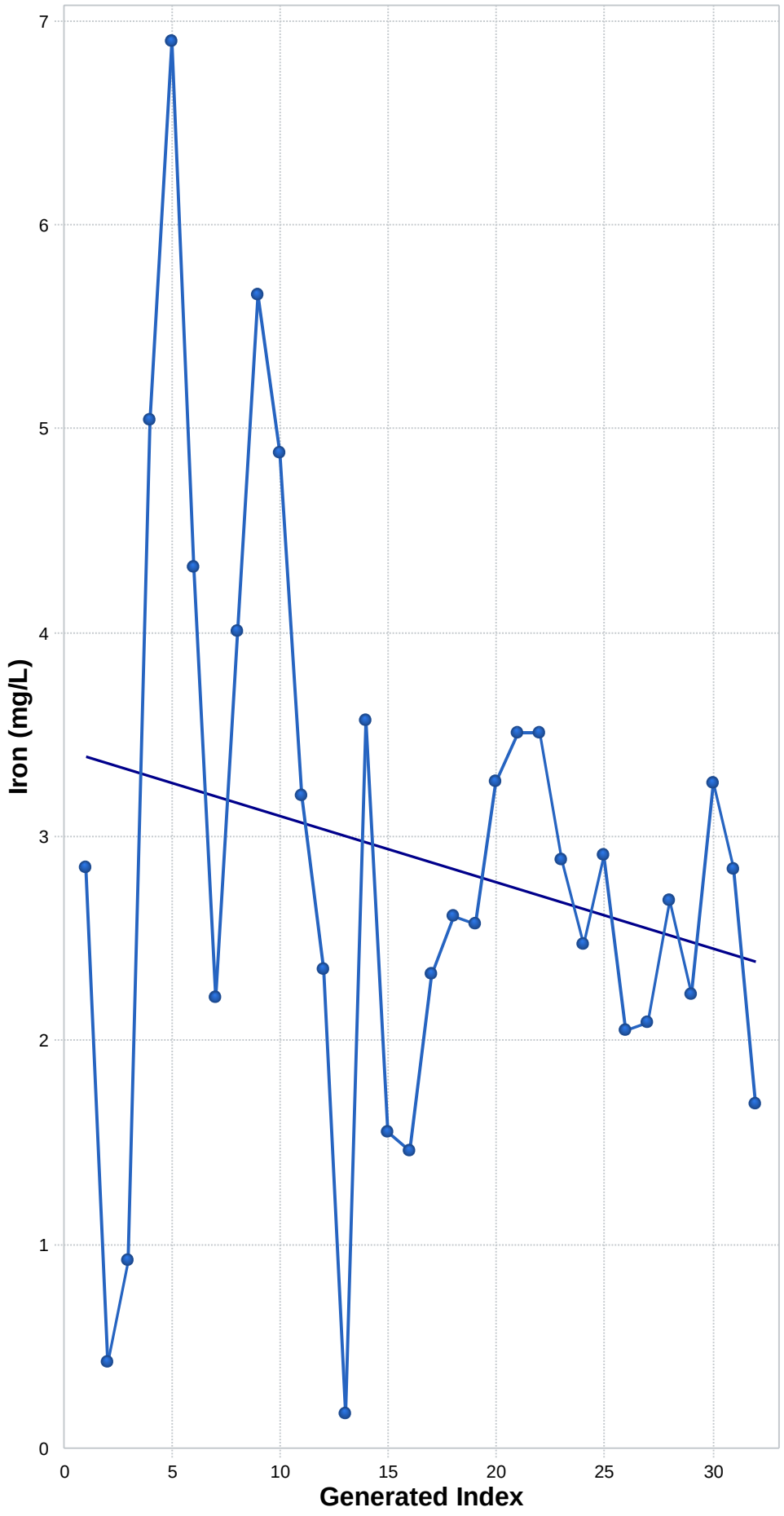
| | |
|---|---|
| n | 21 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 33.1160 |
| Standardized Value of S | 0.5133 |
| M-K Test Value (S) | 18 |
| Tabulated p-value | 0.3060 |
| Approximate p-value | 0.3039 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3909 |
| OLS Regression Intercept | 35.2952 |

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

# Mann-Kendall - 01A-SH - IRON




**Mann-Kendall Trend Analysis**

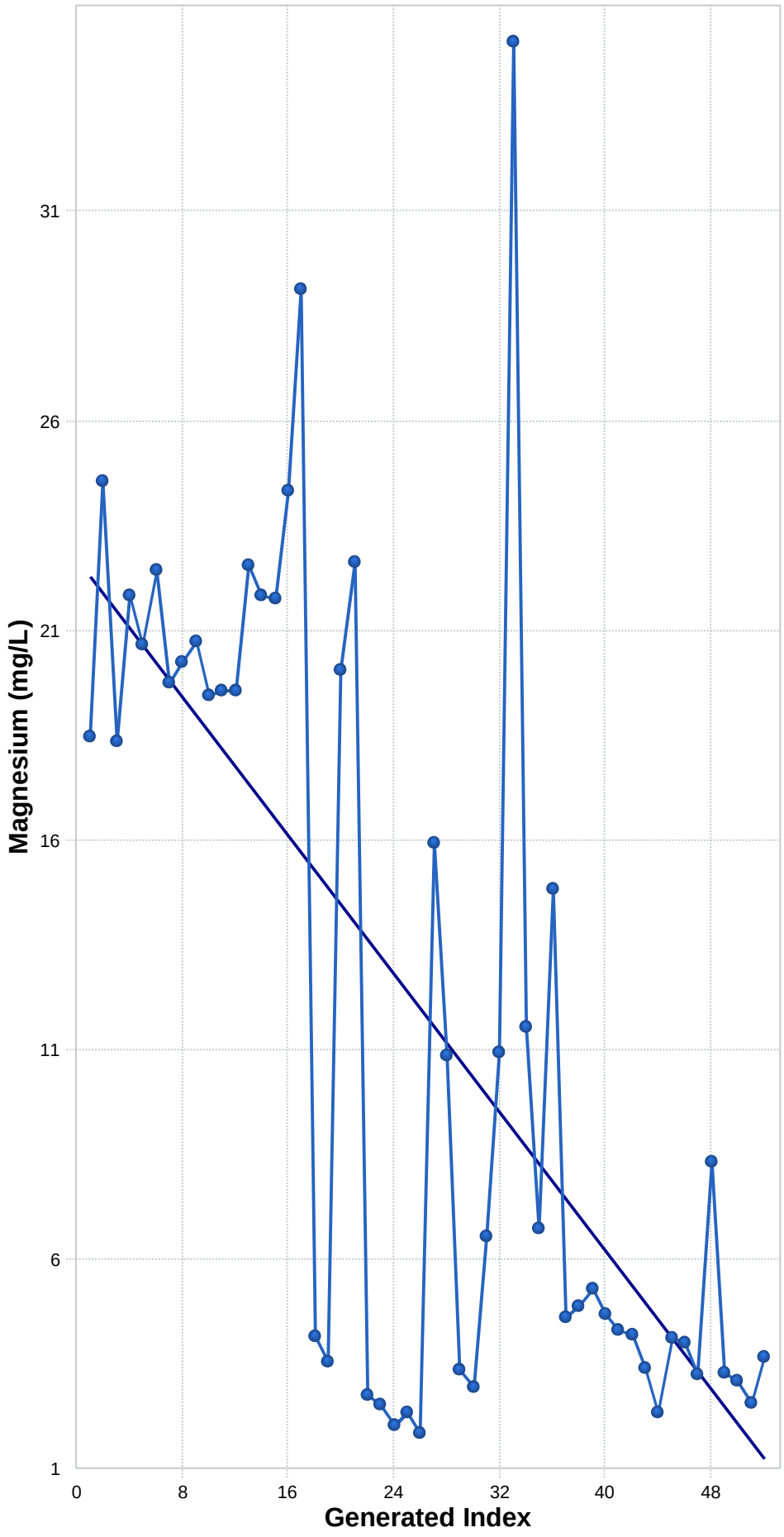
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6577 |
| Standardized Value of S | -1.1029 |
| M-K Test Value (S) | -69 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1350 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0325 |
| OLS Regression Intercept | 3.3148 |

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

# Mann-Kendall - 01A-SH - MAGNESIUM



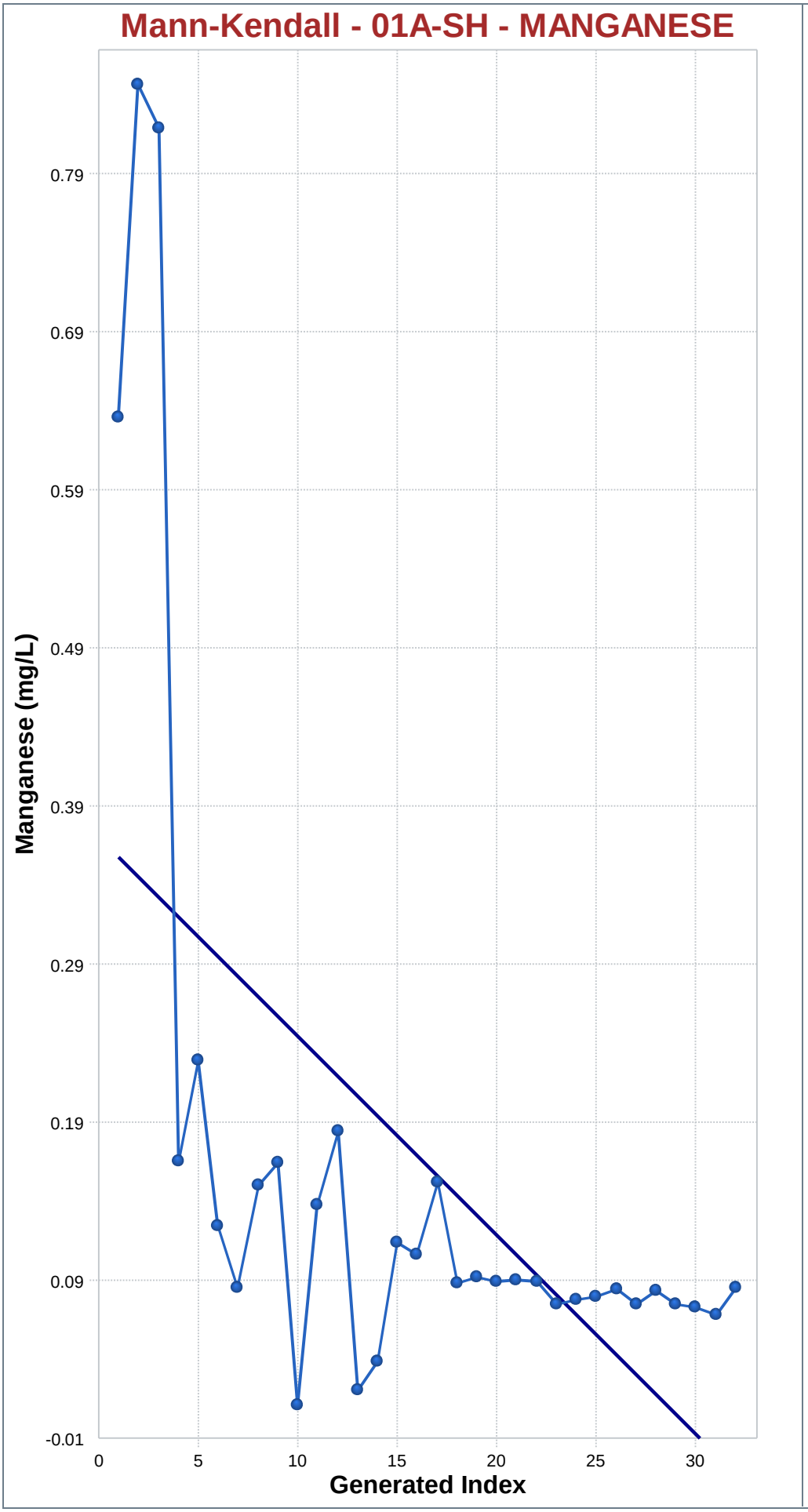

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 52 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 126.7175 |
| Standardized Value of S | -4.5377 |
| M-K Test Value (S) | -576 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.4123 |
| OLS Regression Intercept | 22.6452 |

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




**Mann-Kendall Trend Analysis**

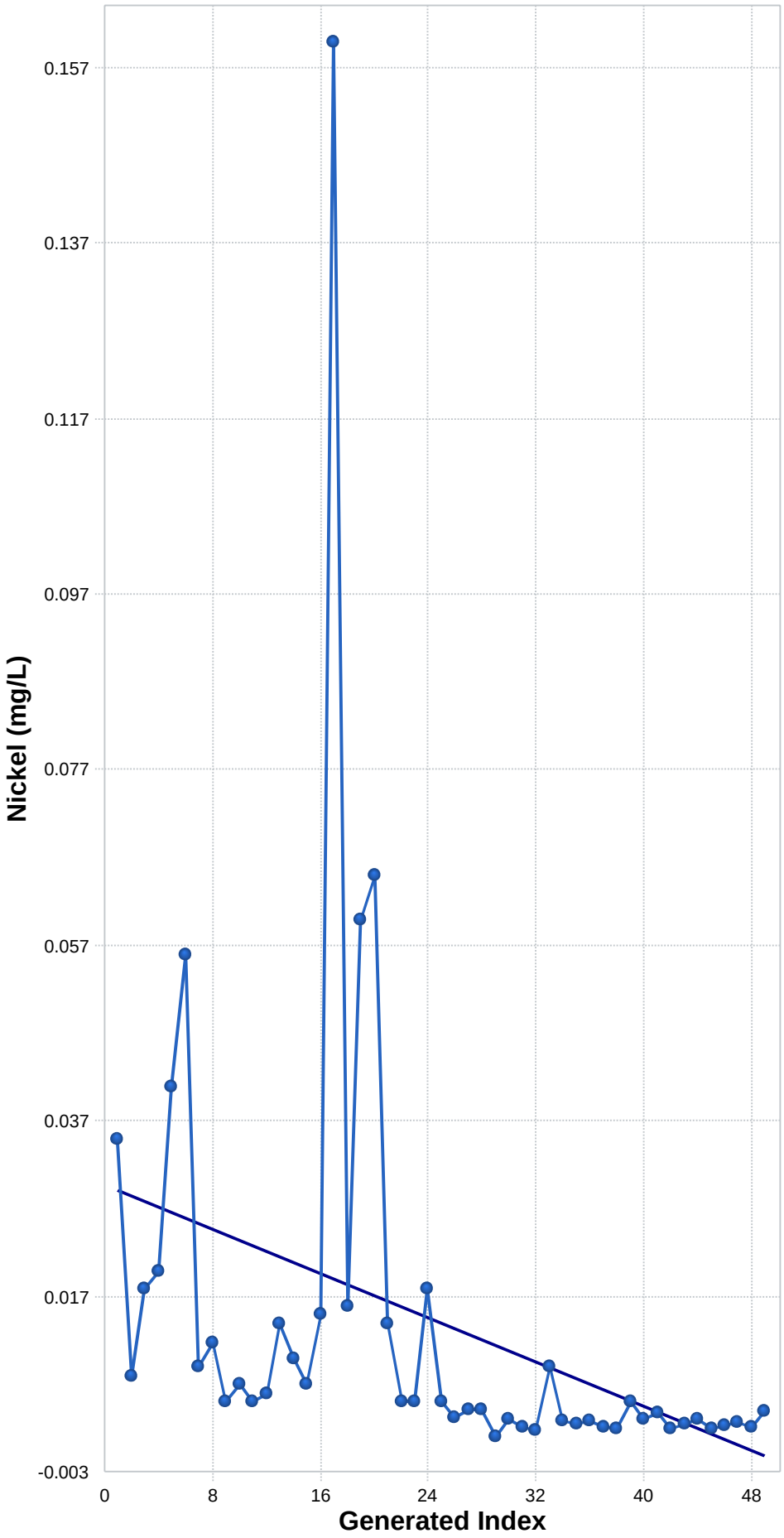
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6658 |
| Standardized Value of S | -4.2974 |
| M-K Test Value (S) | -266 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0126 |
| OLS Regression Intercept | 0.3686 |

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

# Mann-Kendall - 01A-SH - NICKEL



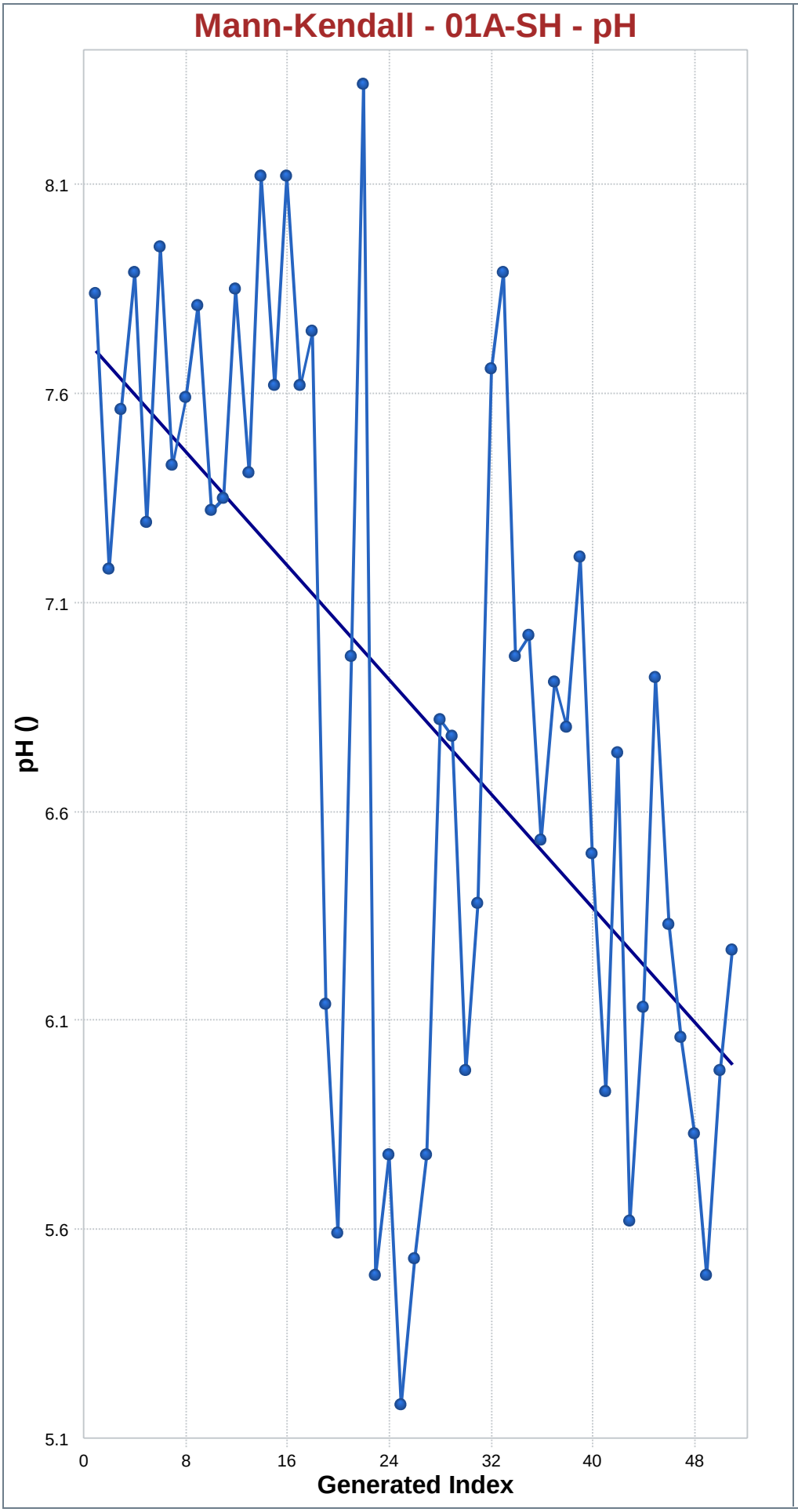

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 49 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 115.8634 |
| Standardized Value of S | -5.3857 |
| M-K Test Value (S) | -625 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0006 |
| OLS Regression Intercept | 0.0299 |

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



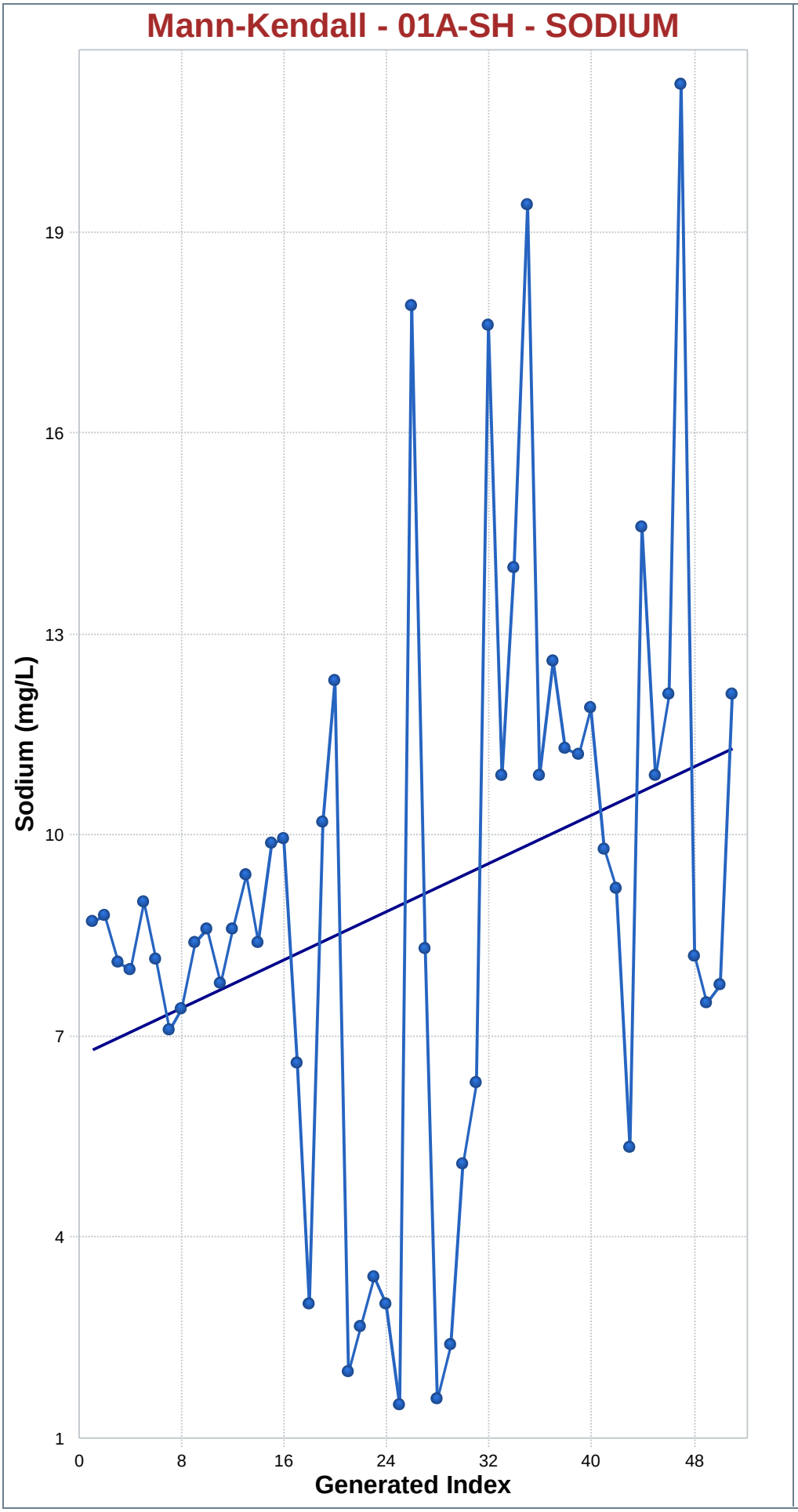

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 51 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 123.0908 |
| Standardized Value of S | -4.0214 |
| 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 | -0.0341 |
| OLS Regression Intercept | 7.7047 |

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



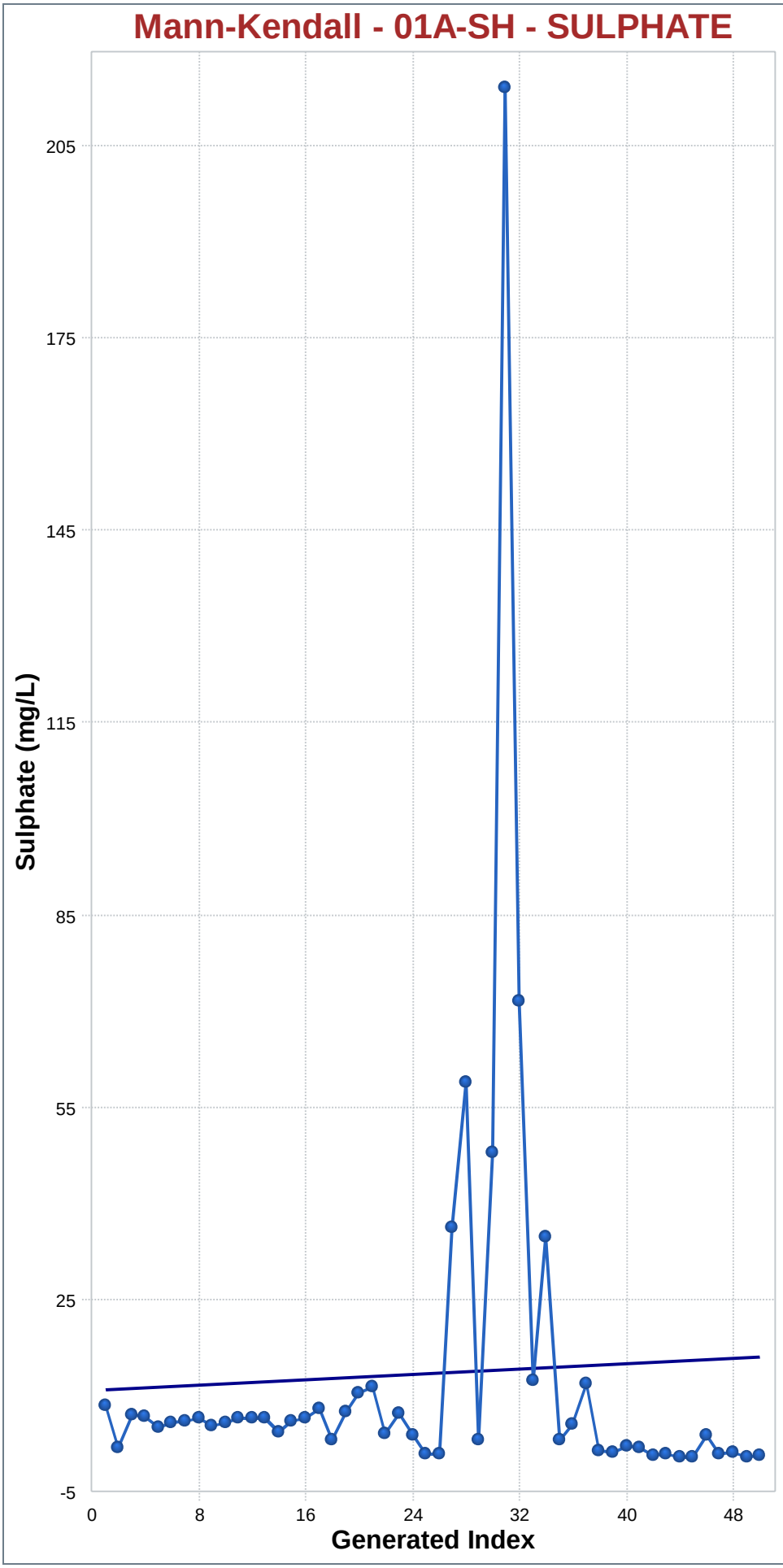

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 51 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 123.0880 |
| Standardized Value of S | 2.0554 |
| M-K Test Value (S) | 254 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0199 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0897 |
| OLS Regression Intercept | 6.3070 |

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



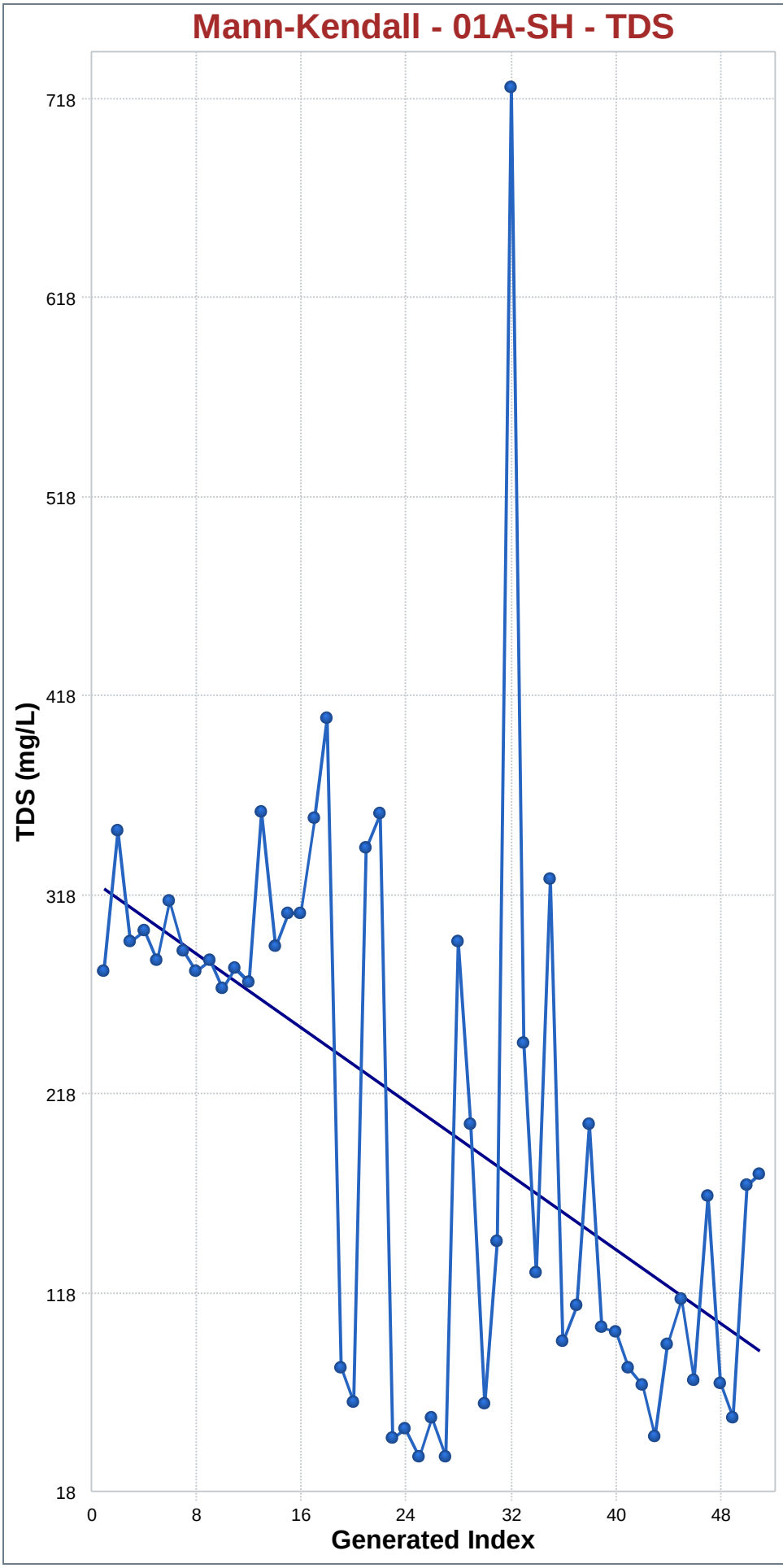

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 119.5157 |
| Standardized Value of S | -2.8197 |
| M-K Test Value (S) | -338 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0024 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1040 |
| OLS Regression Intercept | 10.6093 |

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




**Mann-Kendall Trend Analysis**

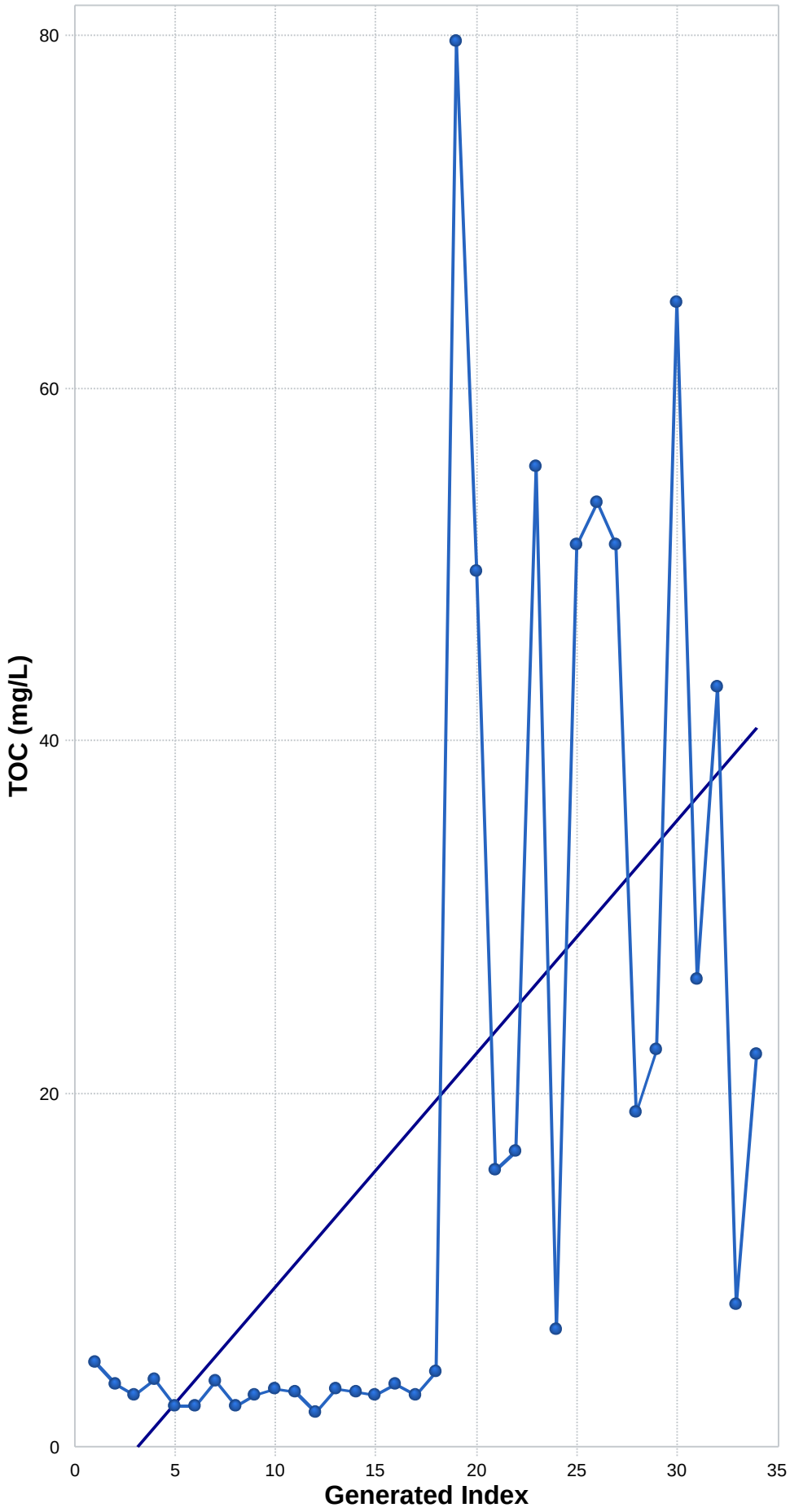
| | |
|---|---|
| n | 51 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 123.0989 |
| Standardized Value of S | -3.4038 |
| M-K Test Value (S) | -420 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0003 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -4.6542 |
| OLS Regression Intercept | 326.1940 |

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

# Mann-Kendall - 01A-SH - TOC



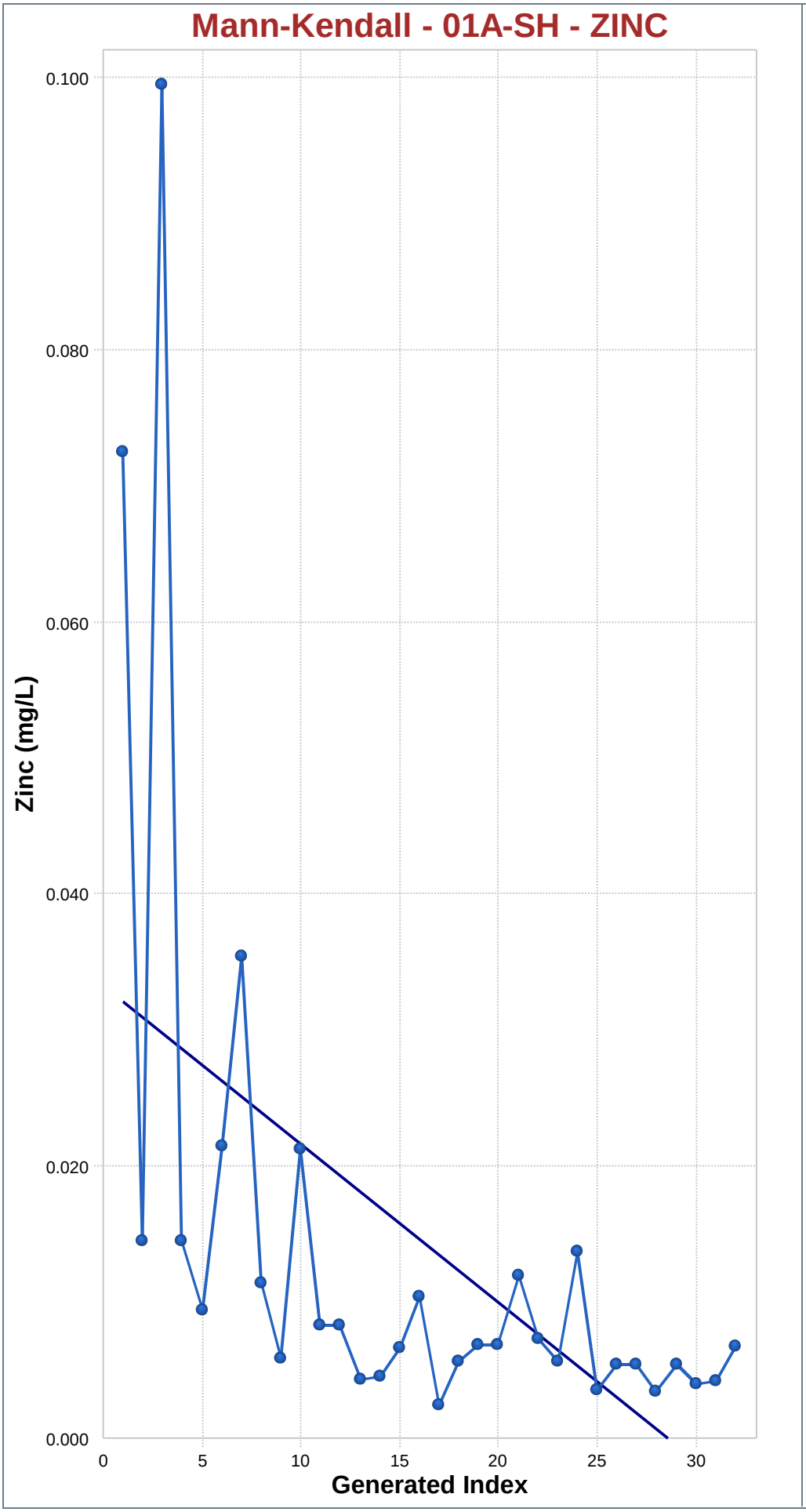

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

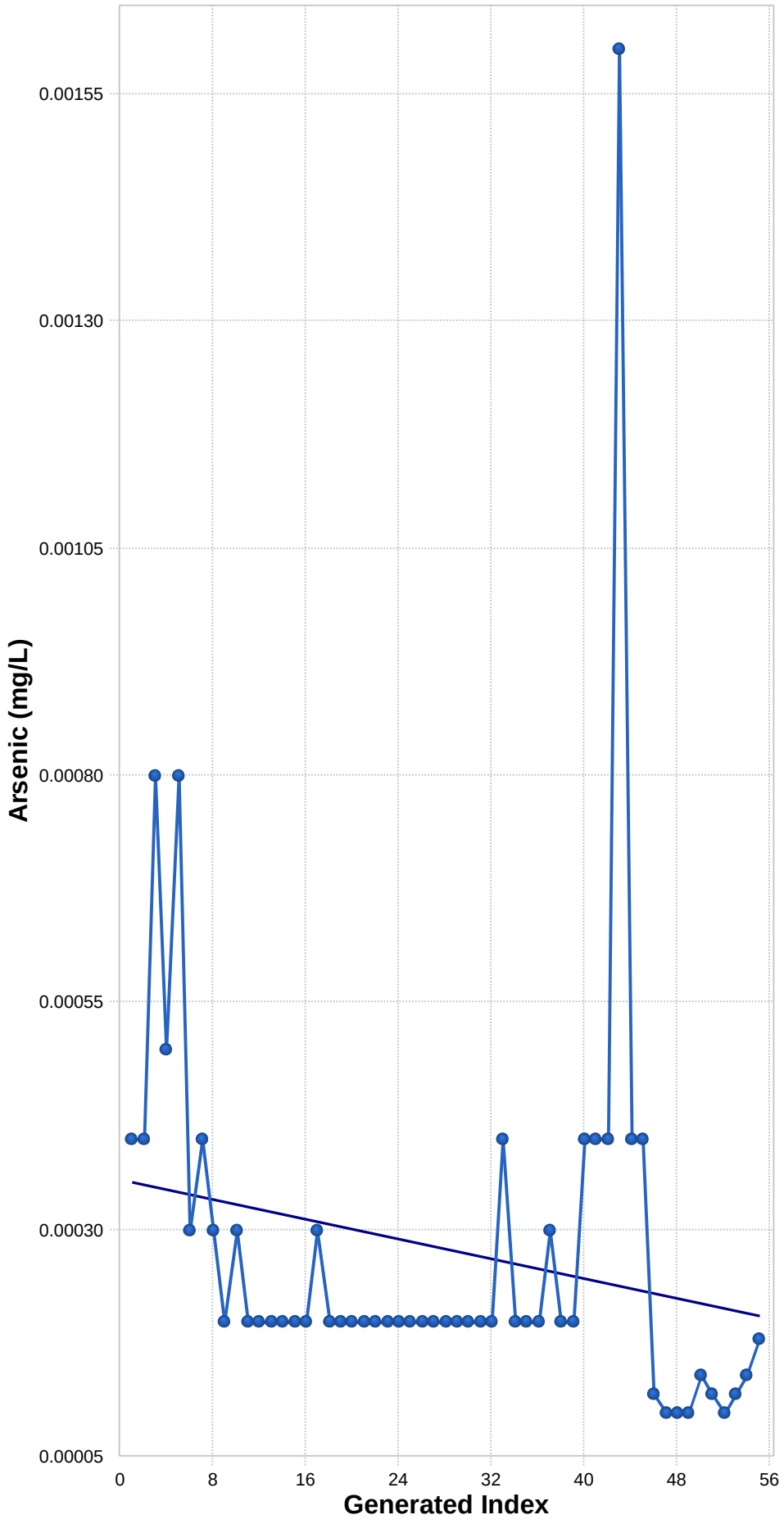
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6036 |
| Standardized Value of S | -4.0582 |
| M-K Test Value (S) | -251 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0012 |
| OLS Regression Intercept | 0.0328 |

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

# Mann-Kendall - 04-SH - ARSENIC



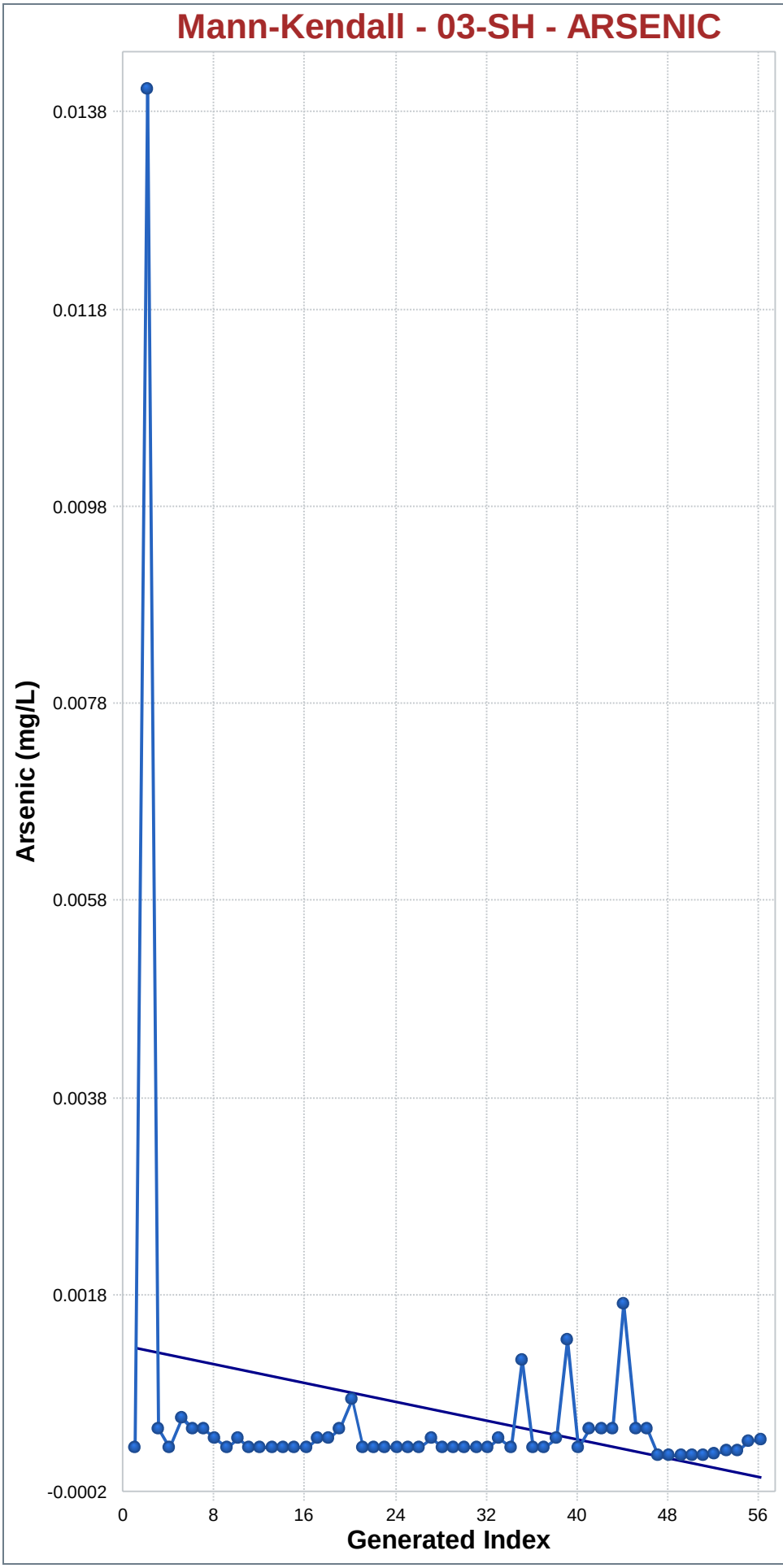

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 128.6507 |
| Standardized Value of S | -3.7621 |
| 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 | 0.0000 |
| OLS Regression Intercept | 0.0004 |

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




**Mann-Kendall Trend Analysis**

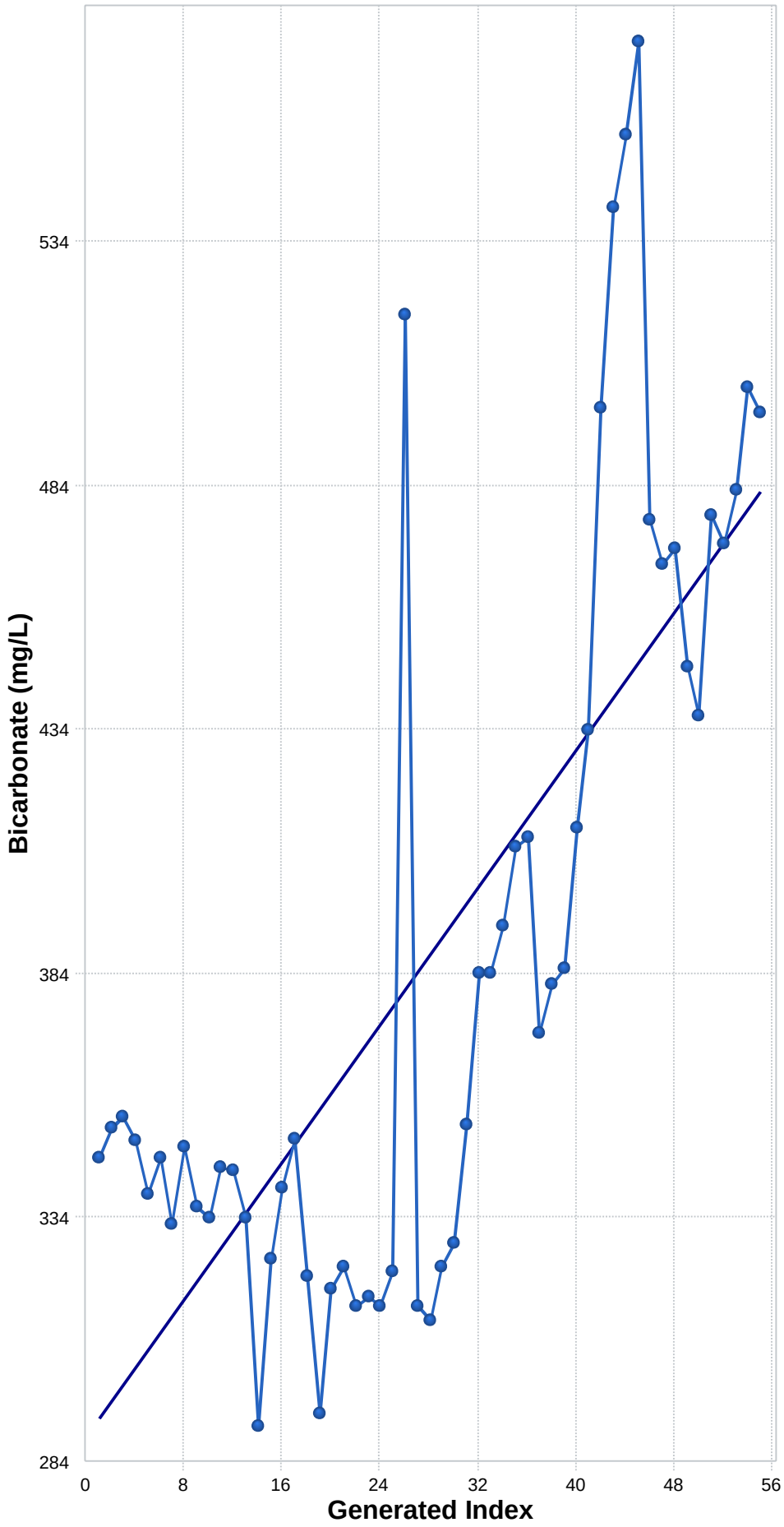
| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 135.1061 |
| Standardized Value of S | -1.8504 |
| M-K Test Value (S) | -251 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0321 |

**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.

# Mann-Kendall - 03-SH - BICARBONATE




**Mann-Kendall Trend Analysis**

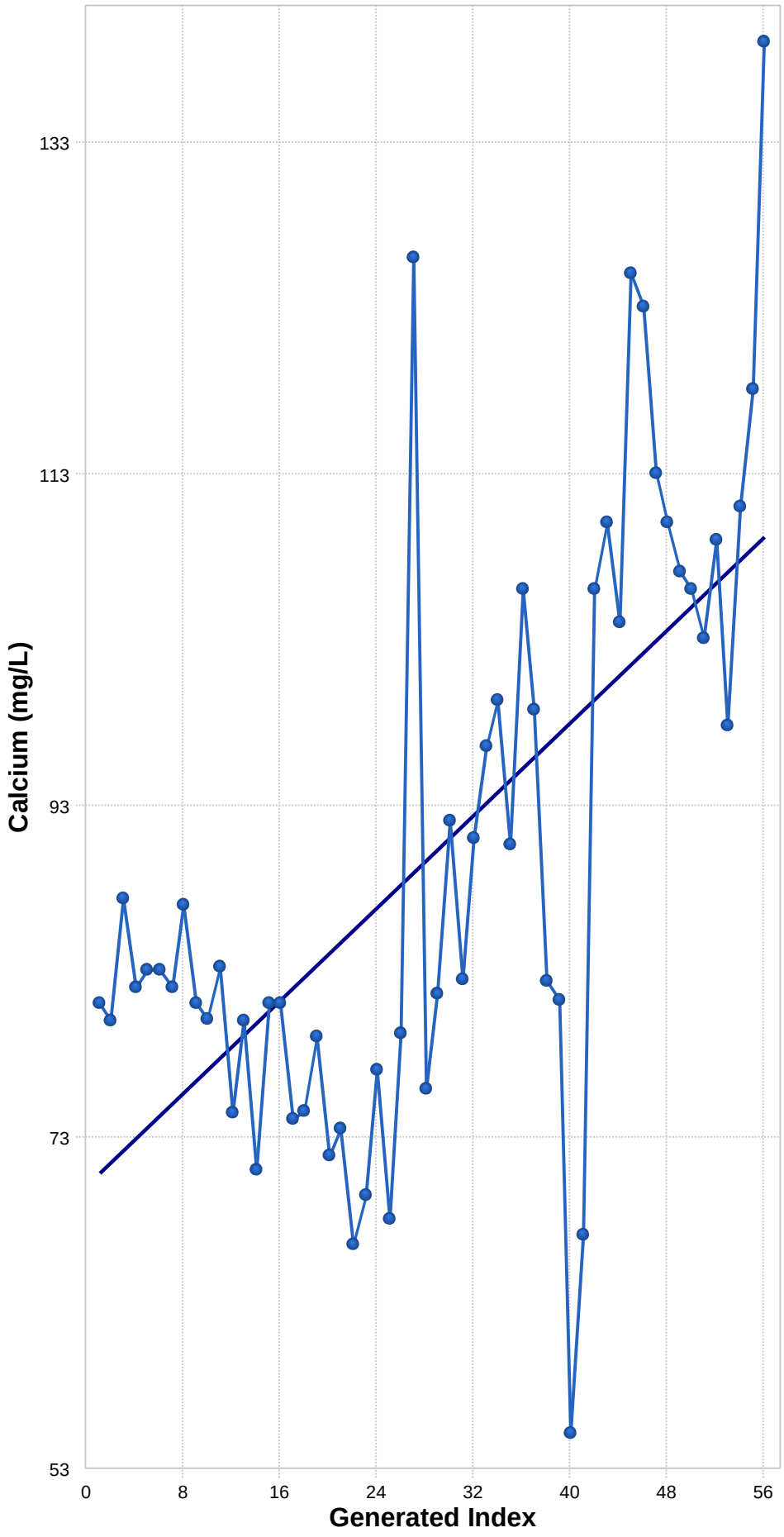
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.7219 |
| Standardized Value of S | 4.9157 |
| M-K Test Value (S) | 678 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 3.5197 |
| OLS Regression Intercept | 289.3463 |

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

# Mann-Kendall - 03-SH - CALCIUM



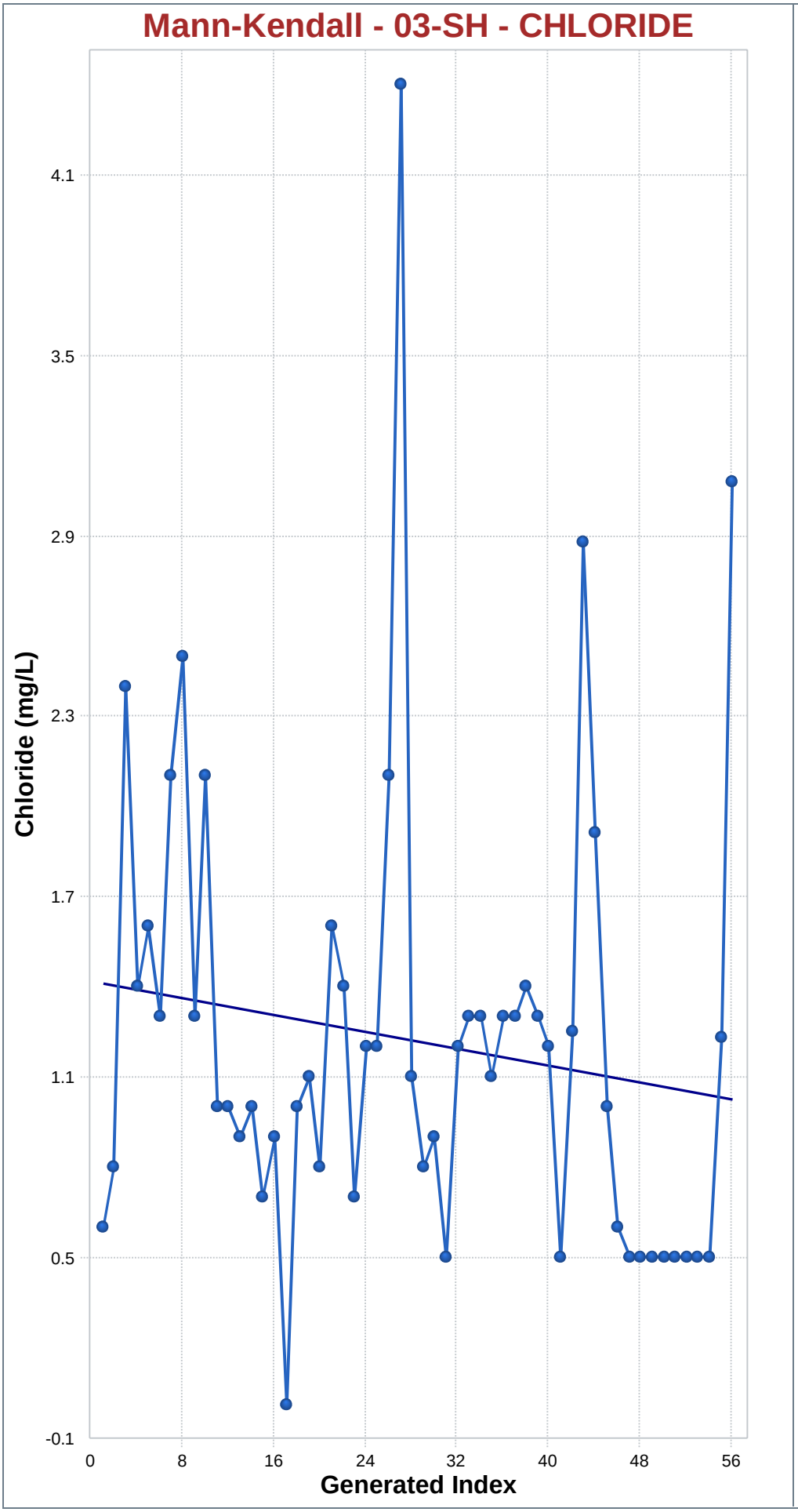

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 141.4343 |
| Standardized Value of S | 4.1574 |
| 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 | 0.6968 |
| OLS Regression Intercept | 70.1008 |

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




**Mann-Kendall Trend Analysis**

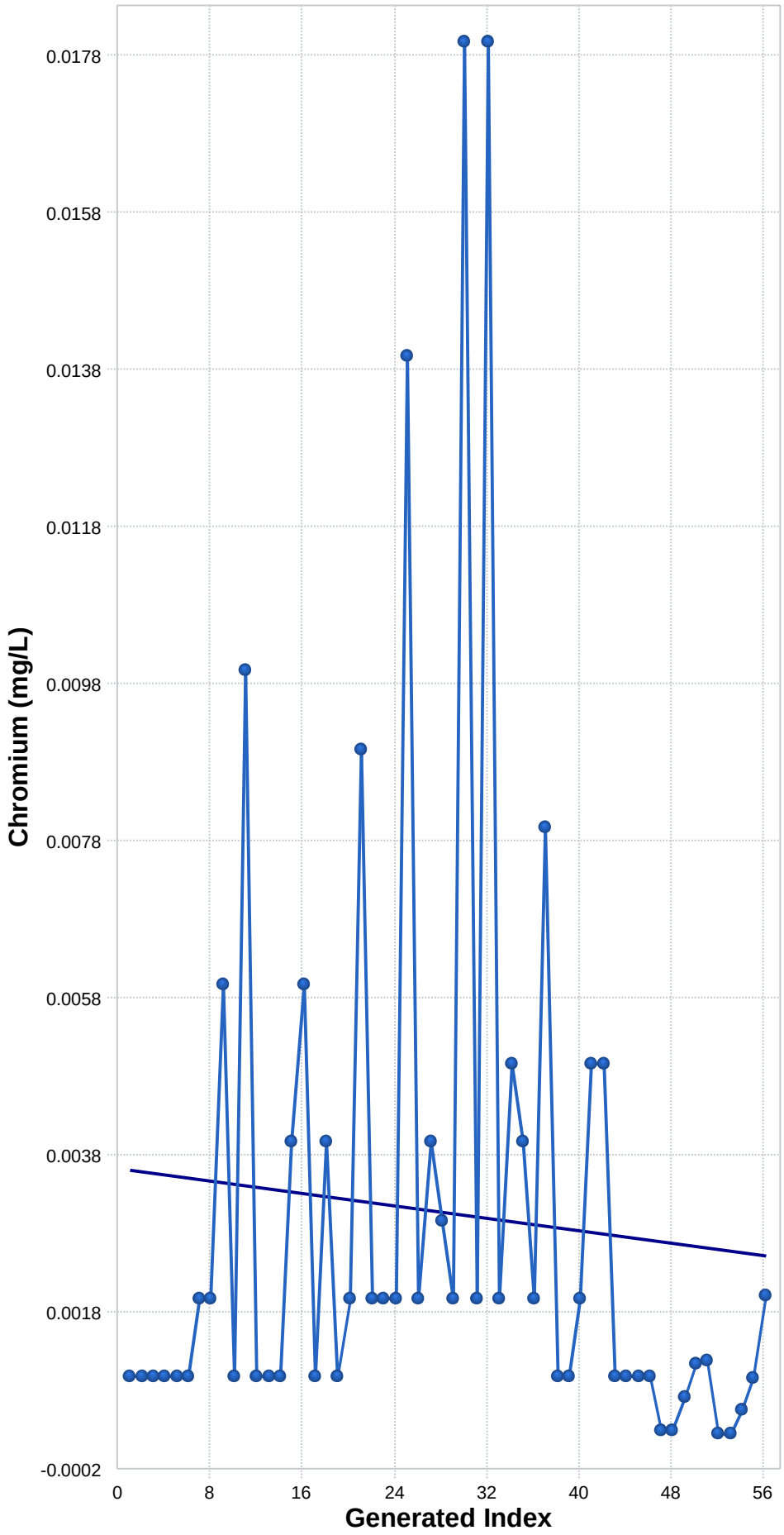
| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 140.7267 |
| Standardized Value of S | -1.9684 |
| M-K Test Value (S) | -278 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0245 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0070 |
| OLS Regression Intercept | 1.4194 |

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

# Mann-Kendall - 03-SH - CHROMIUM




**Mann-Kendall Trend Analysis**

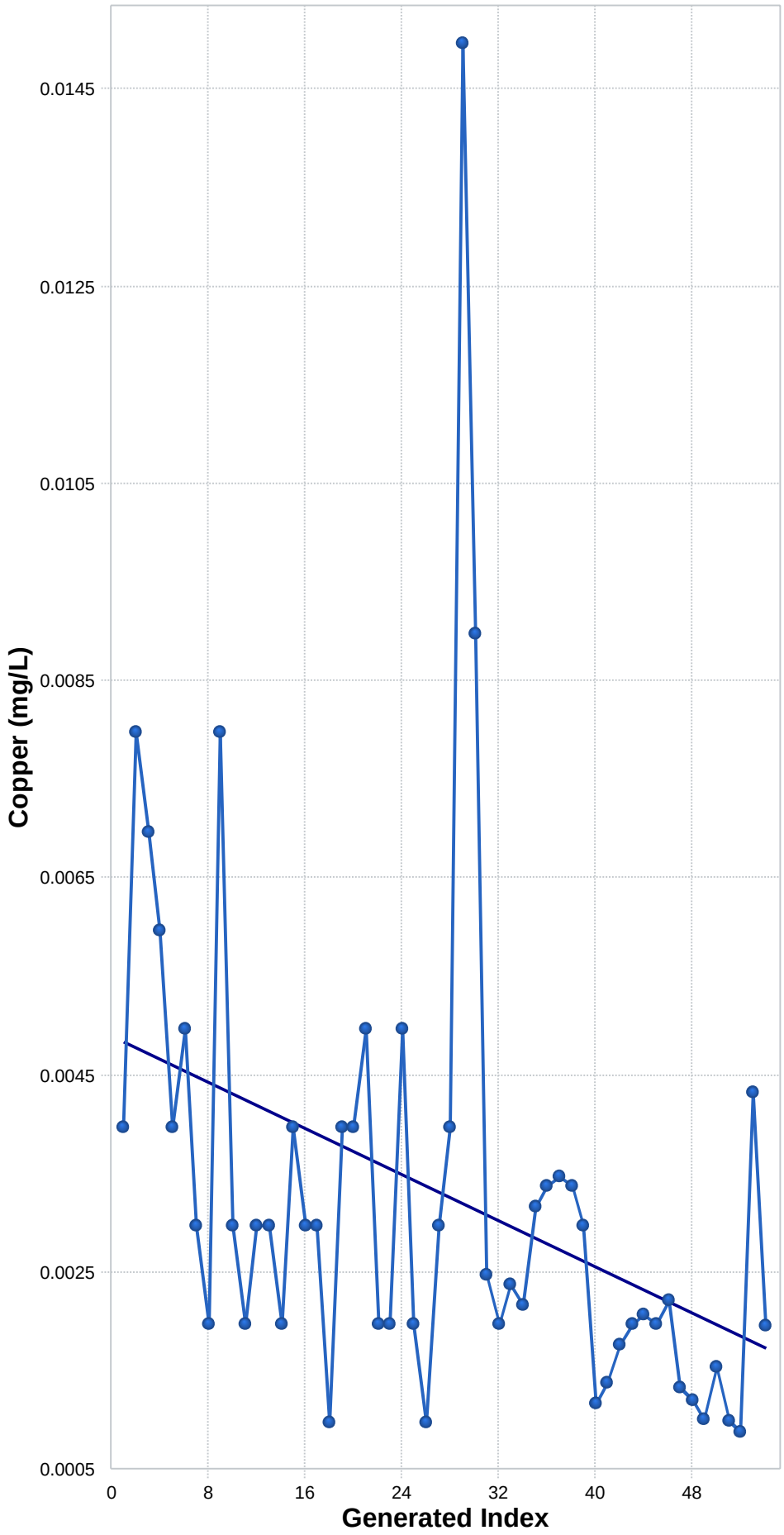
| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 138.1847 |
| Standardized Value of S | -1.2737 |
| M-K Test Value (S) | -177 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1014 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0037 |

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

# Mann-Kendall - 03-SH - COPPER



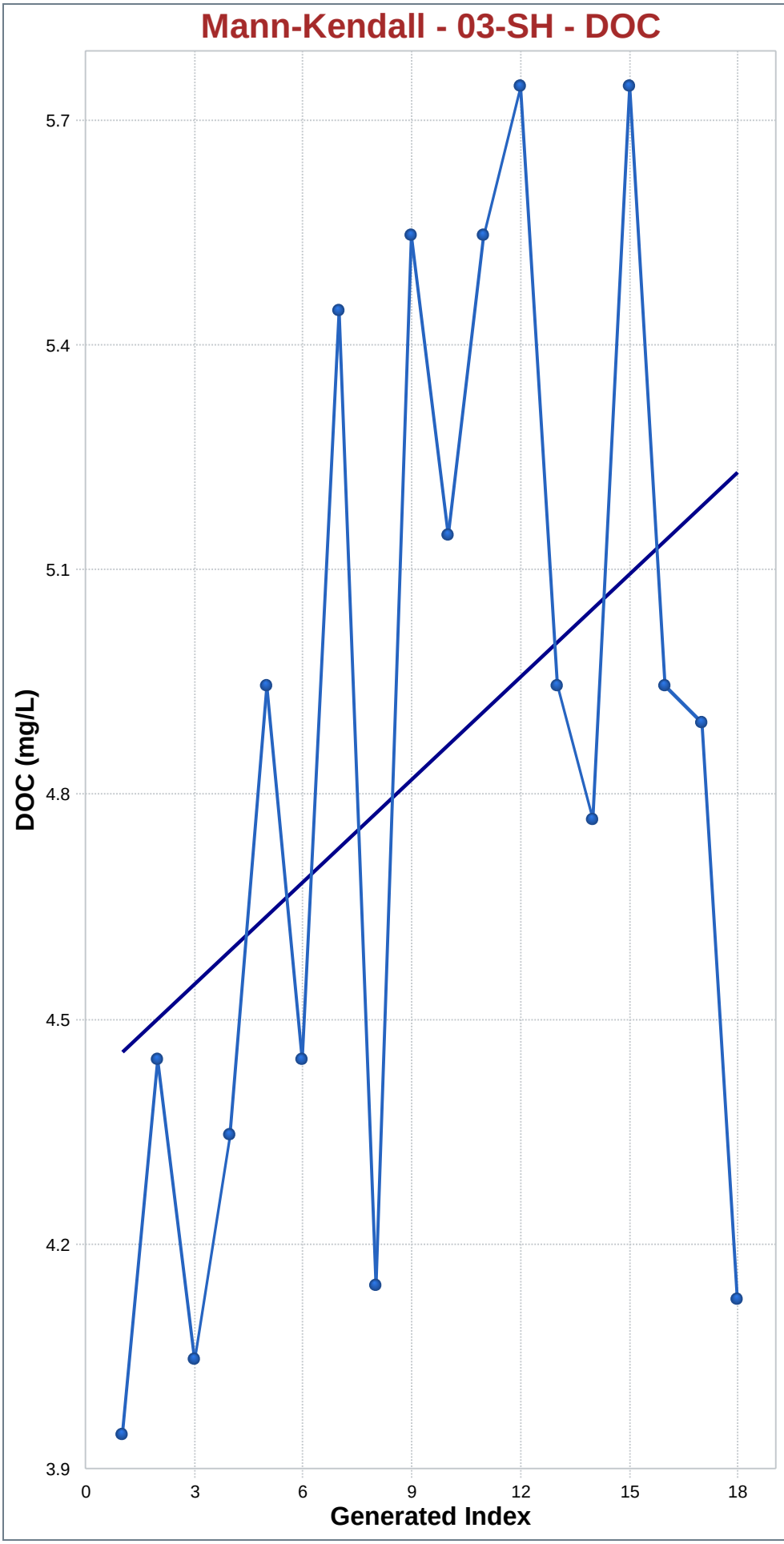

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.3217 |
| Standardized Value of S | -4.0429 |
| M-K Test Value (S) | -540 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0049 |

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




**Mann-Kendall Trend Analysis**

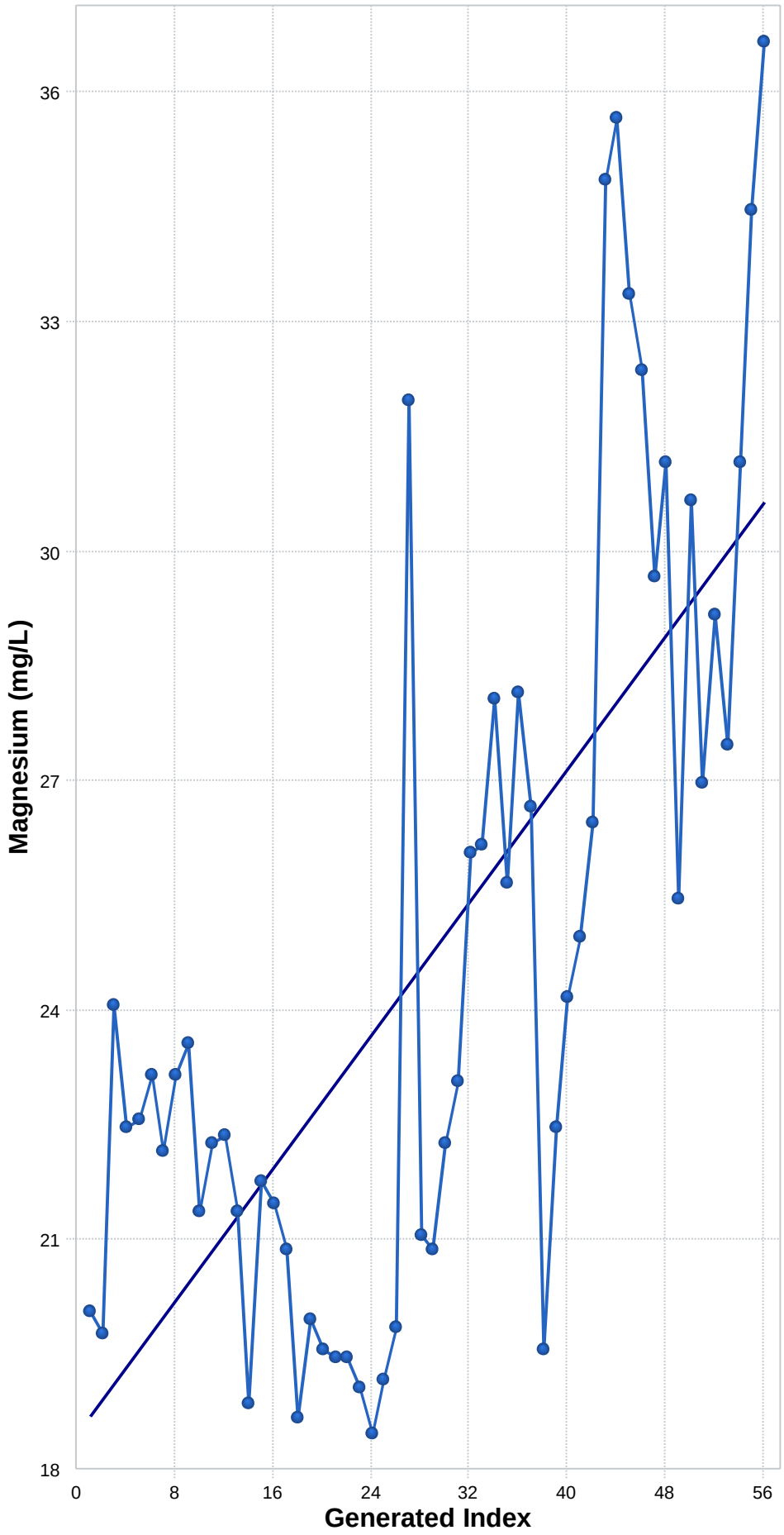
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.2742 |
| Standardized Value of S | 1.5985 |
| M-K Test Value (S) | 43 |
| Tabulated p-value | 0.0560 |
| Approximate p-value | 0.0550 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0455 |
| OLS Regression Intercept | 4.3650 |

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

# Mann-Kendall - 03-SH - MAGNESIUM




**Mann-Kendall Trend Analysis**

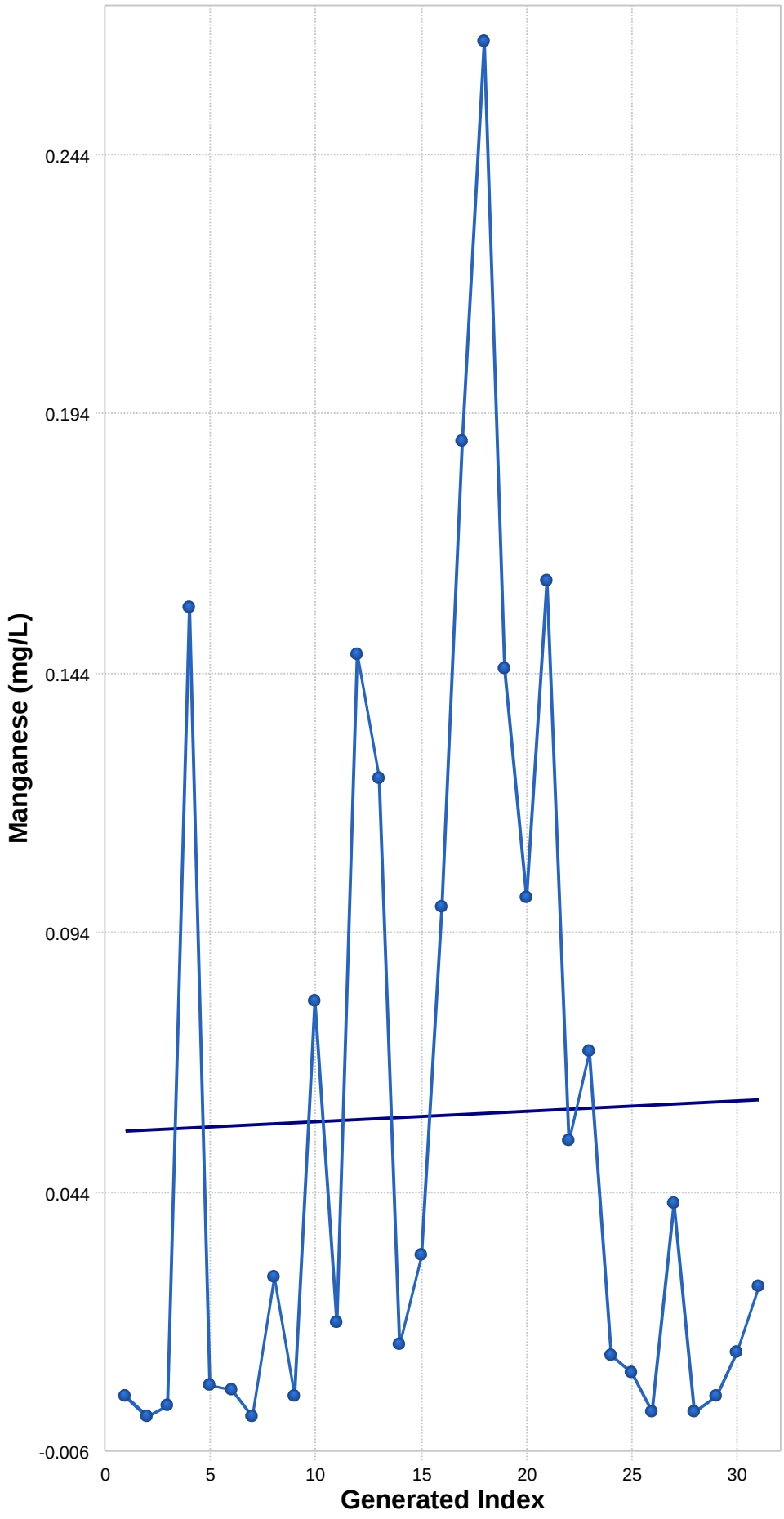
| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 141.4638 |
| Standardized Value of S | 4.7291 |
| M-K Test Value (S) | 670 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.2175 |
| OLS Regression Intercept | 18.3092 |

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

# Mann-Kendall - 03-SH - MANGANESE



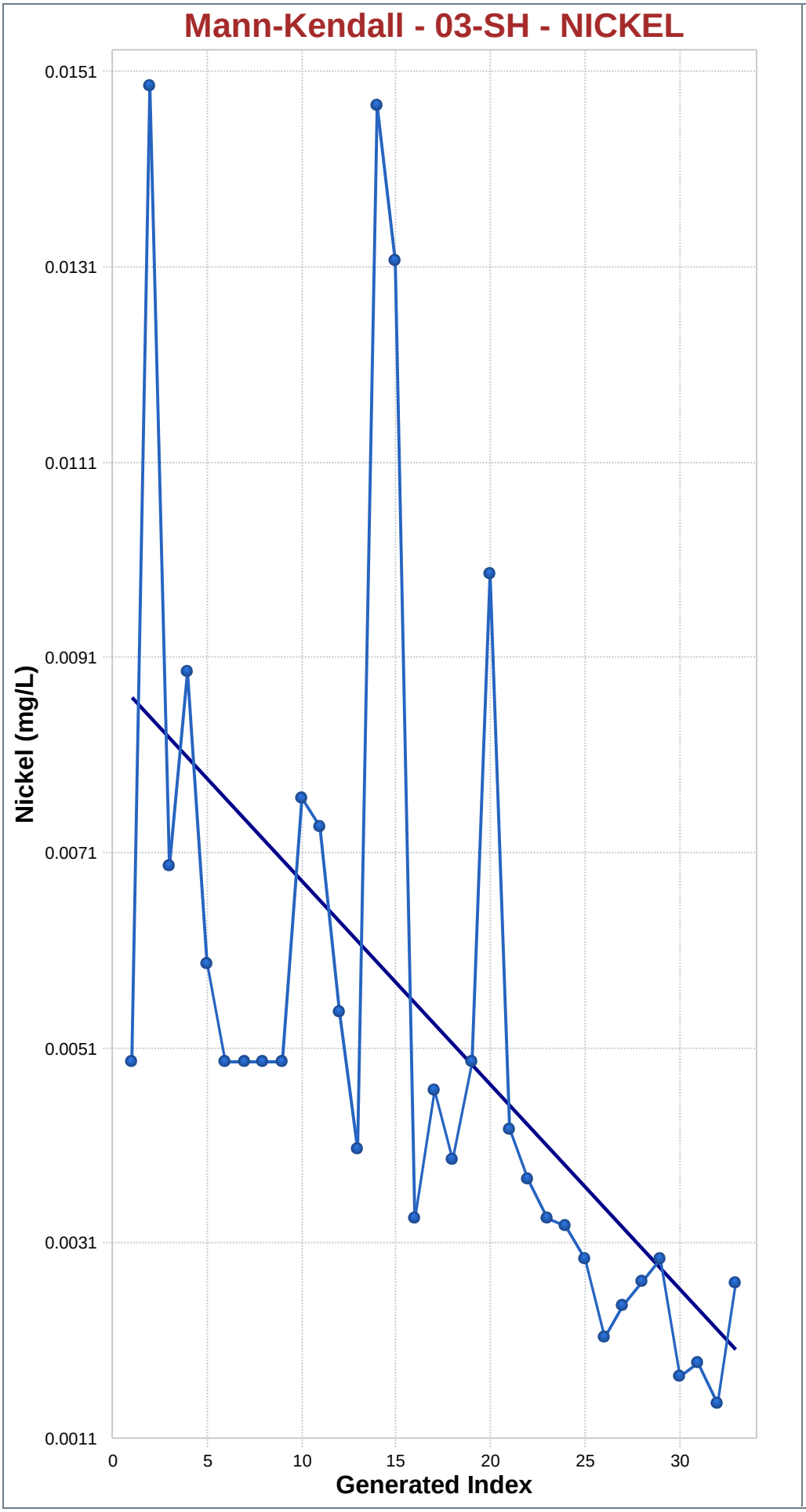

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 31 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 58.7963 |
| Standardized Value of S | 0.5783 |
| M-K Test Value (S) | 35 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.2815 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0002 |
| OLS Regression Intercept | 0.0558 |

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



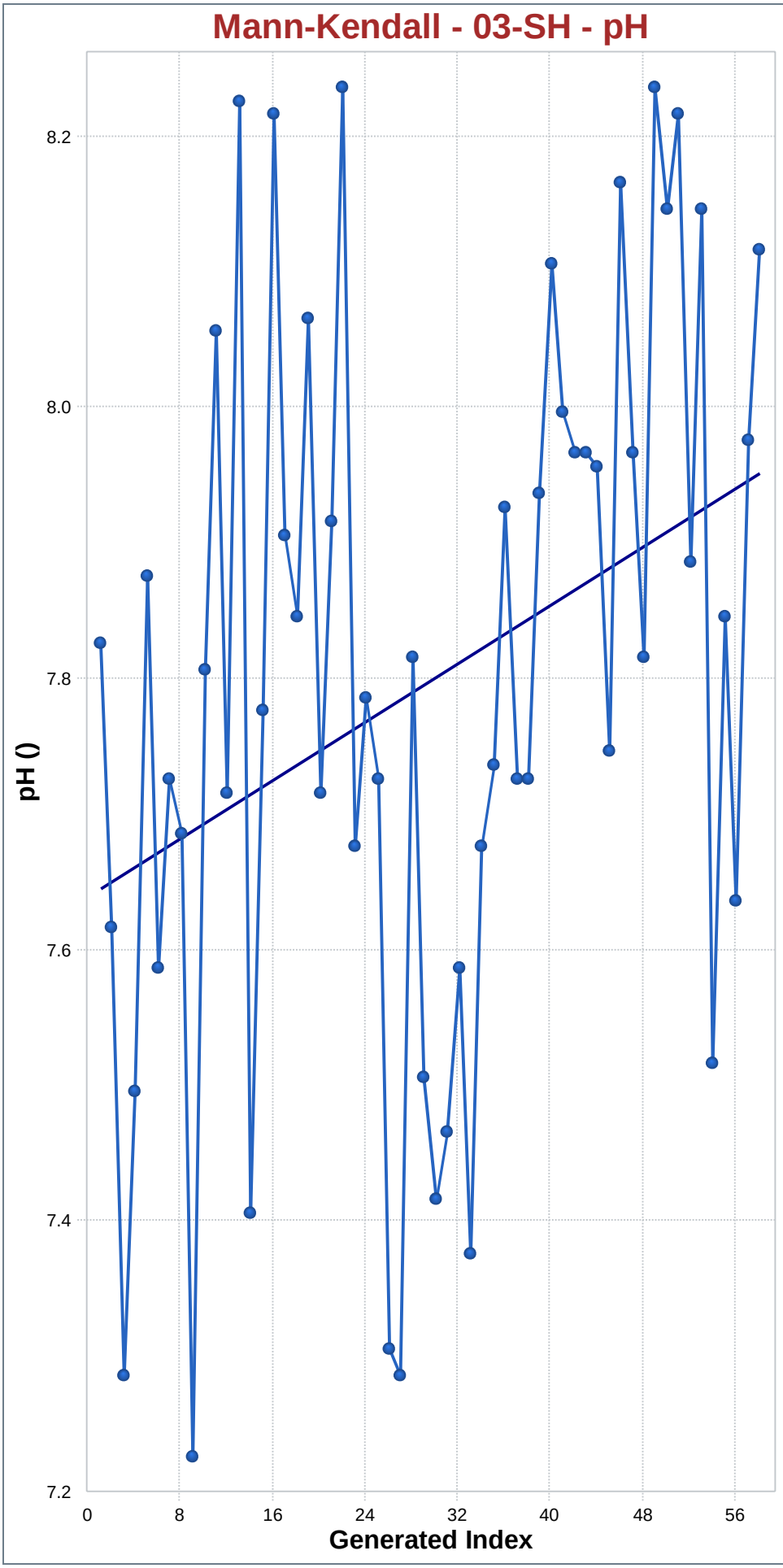

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 33 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 64.3117 |
| Standardized Value of S | -5.2090 |
| M-K Test Value (S) | -336 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0089 |

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



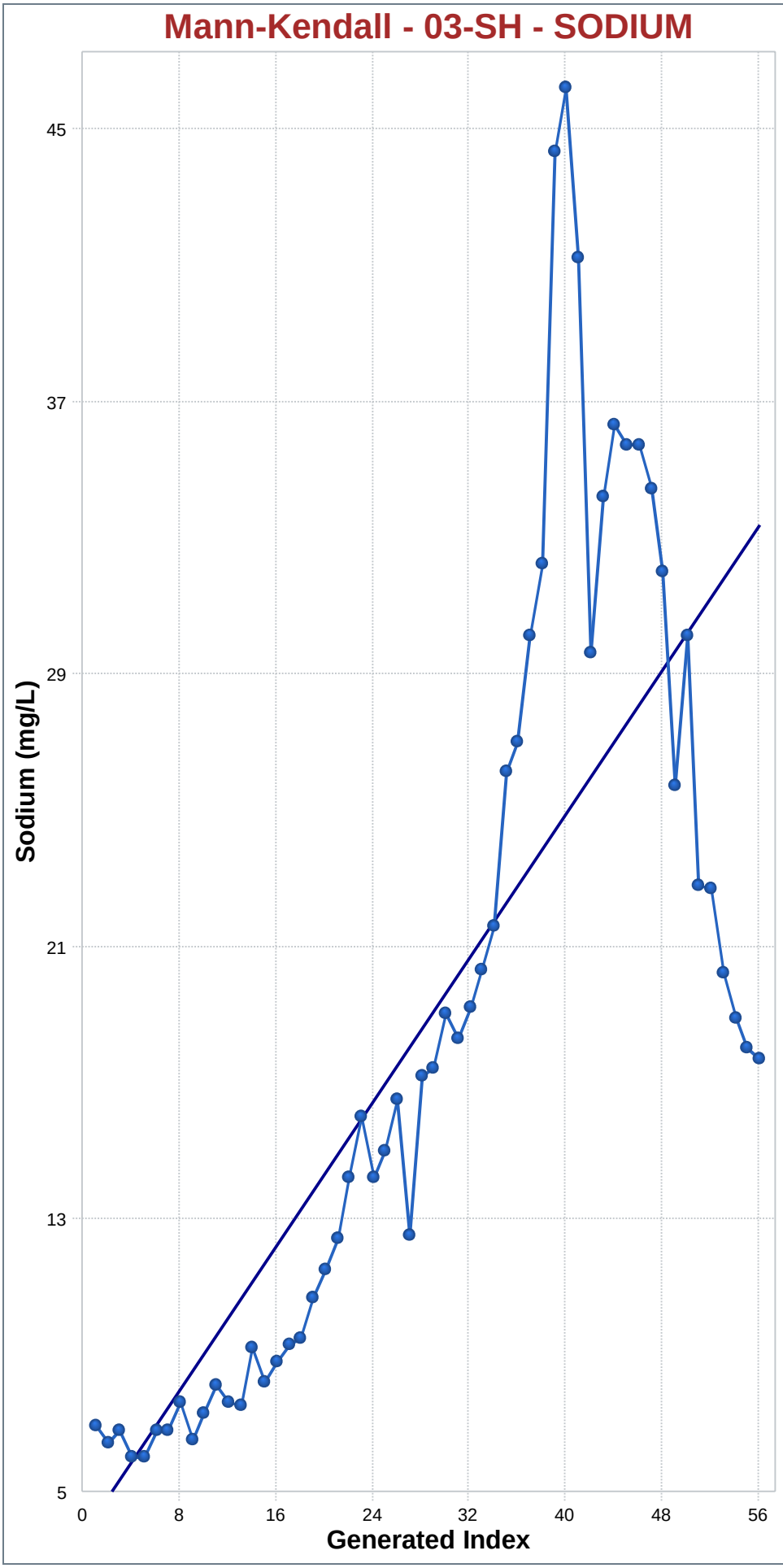

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 58 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 149.0045 |
| Standardized Value of S | 2.8724 |
| M-K Test Value (S) | 429 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0020 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0054 |
| OLS Regression Intercept | 7.6733 |

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




**Mann-Kendall Trend Analysis**

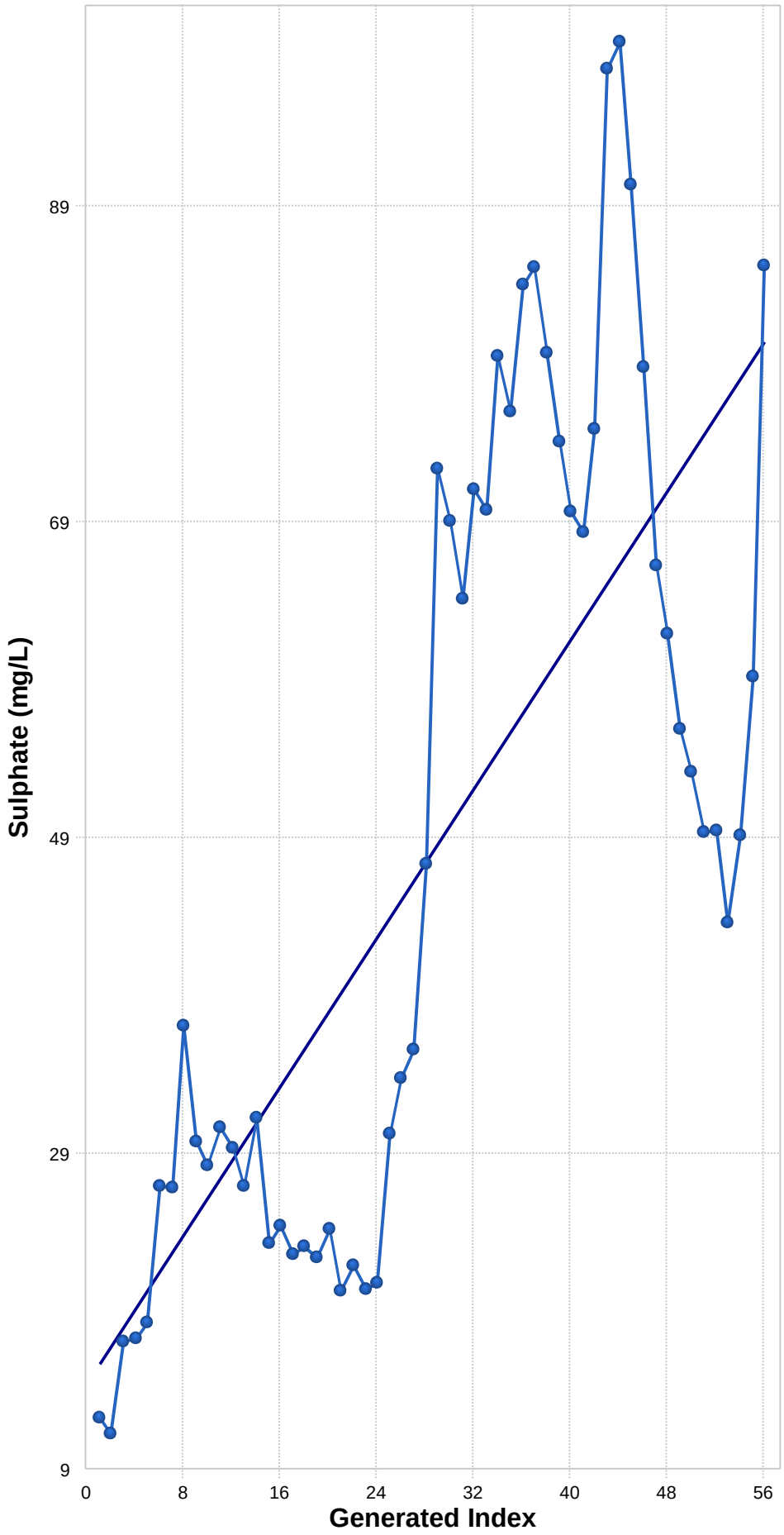
| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 141.4614 |
| Standardized Value of S | 7.7548 |
| M-K Test Value (S) | 1,098 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.5304 |
| OLS Regression Intercept | 3.8768 |

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

# Mann-Kendall - 03-SH - SULPHATE




**Mann-Kendall Trend Analysis**

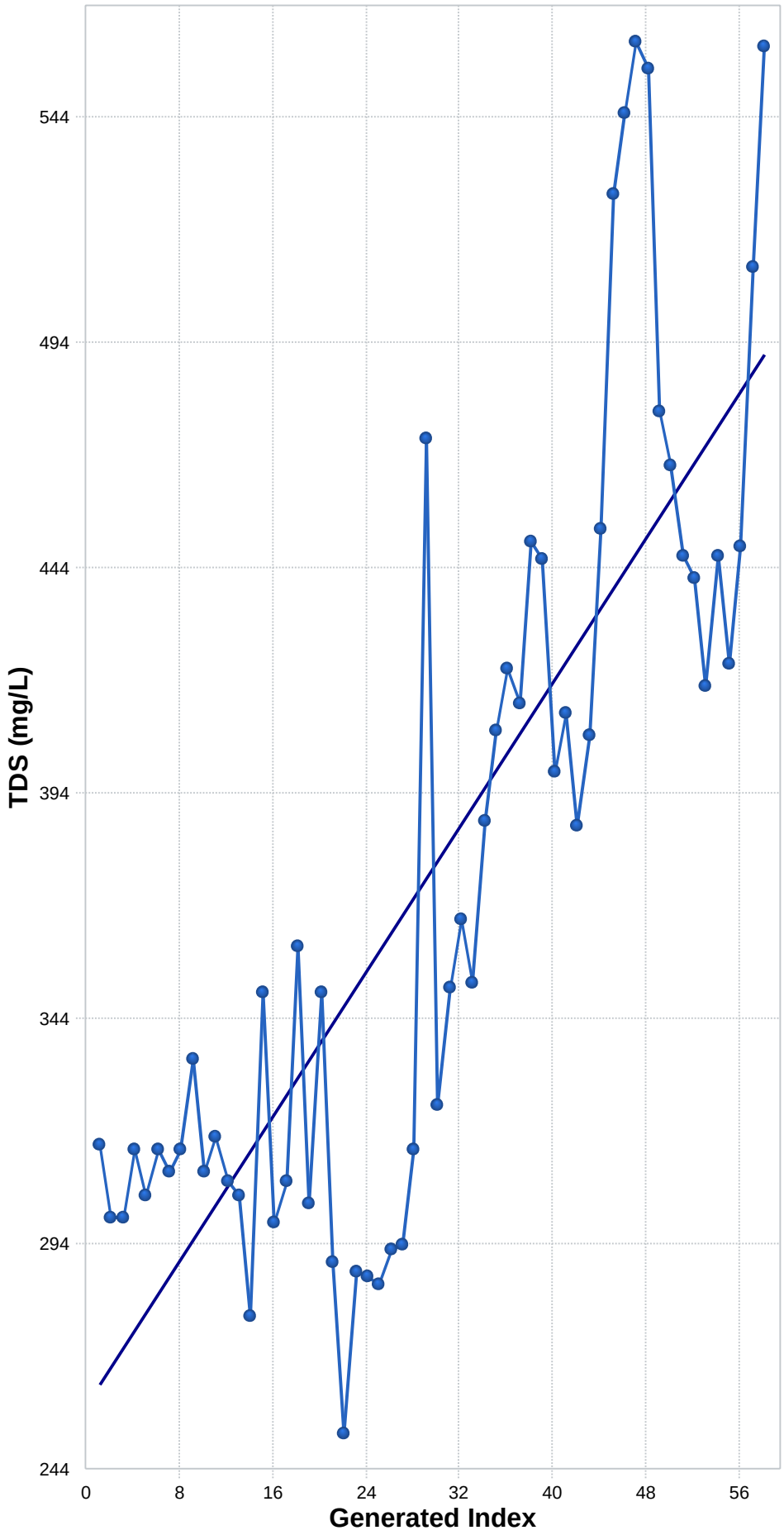
| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 141.4885 |
| Standardized Value of S | 5.4139 |
| M-K Test Value (S) | 767 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.1770 |
| OLS Regression Intercept | 14.2346 |

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

# Mann-Kendall - 03-SH - TDS




**Mann-Kendall Trend Analysis**

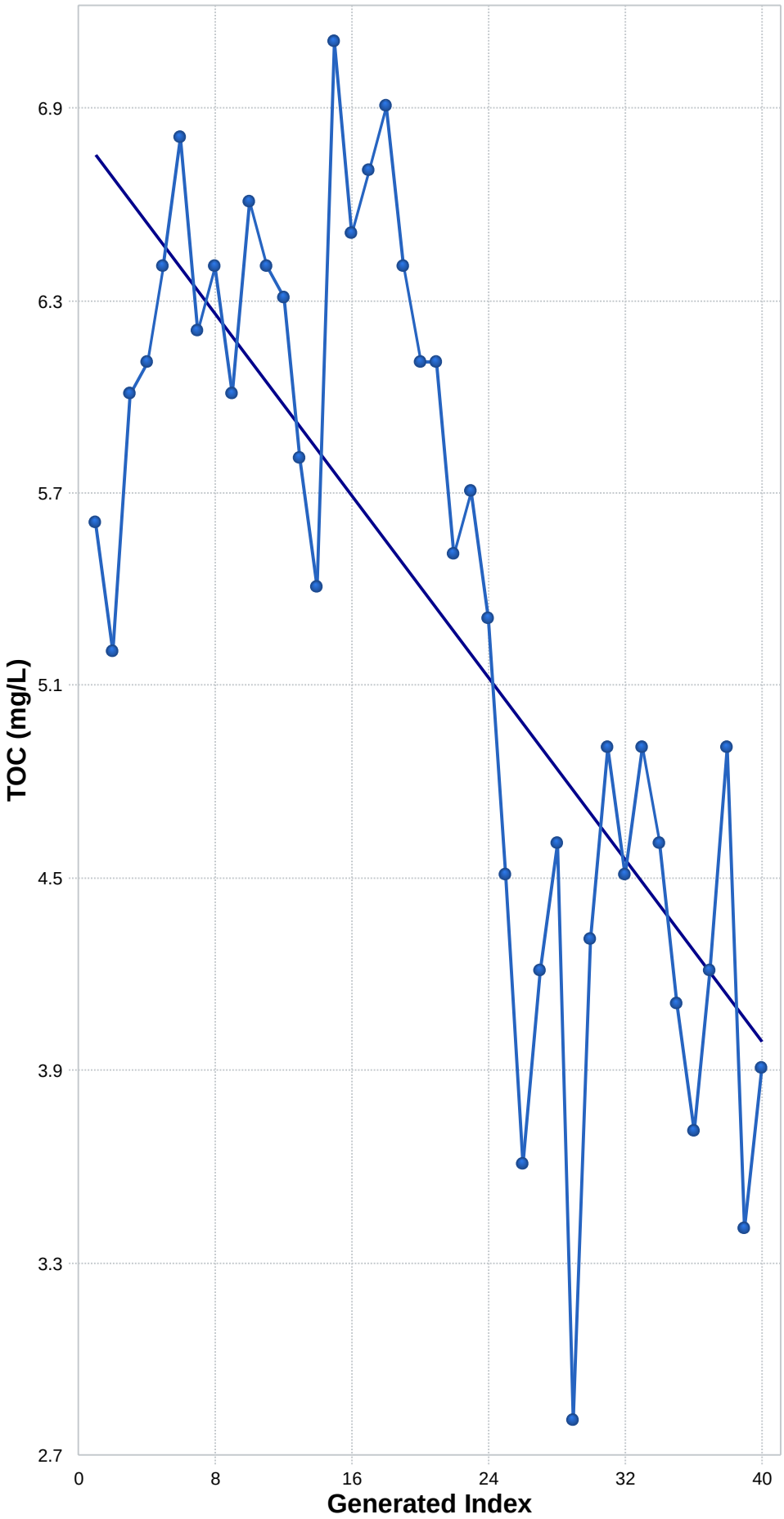
| | |
|---|---|
| n | 58 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 149.0268 |
| Standardized Value of S | 6.2002 |
| M-K Test Value (S) | 925 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 4.0111 |
| OLS Regression Intercept | 259.0526 |

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

# Mann-Kendall - 03-SH - TOC



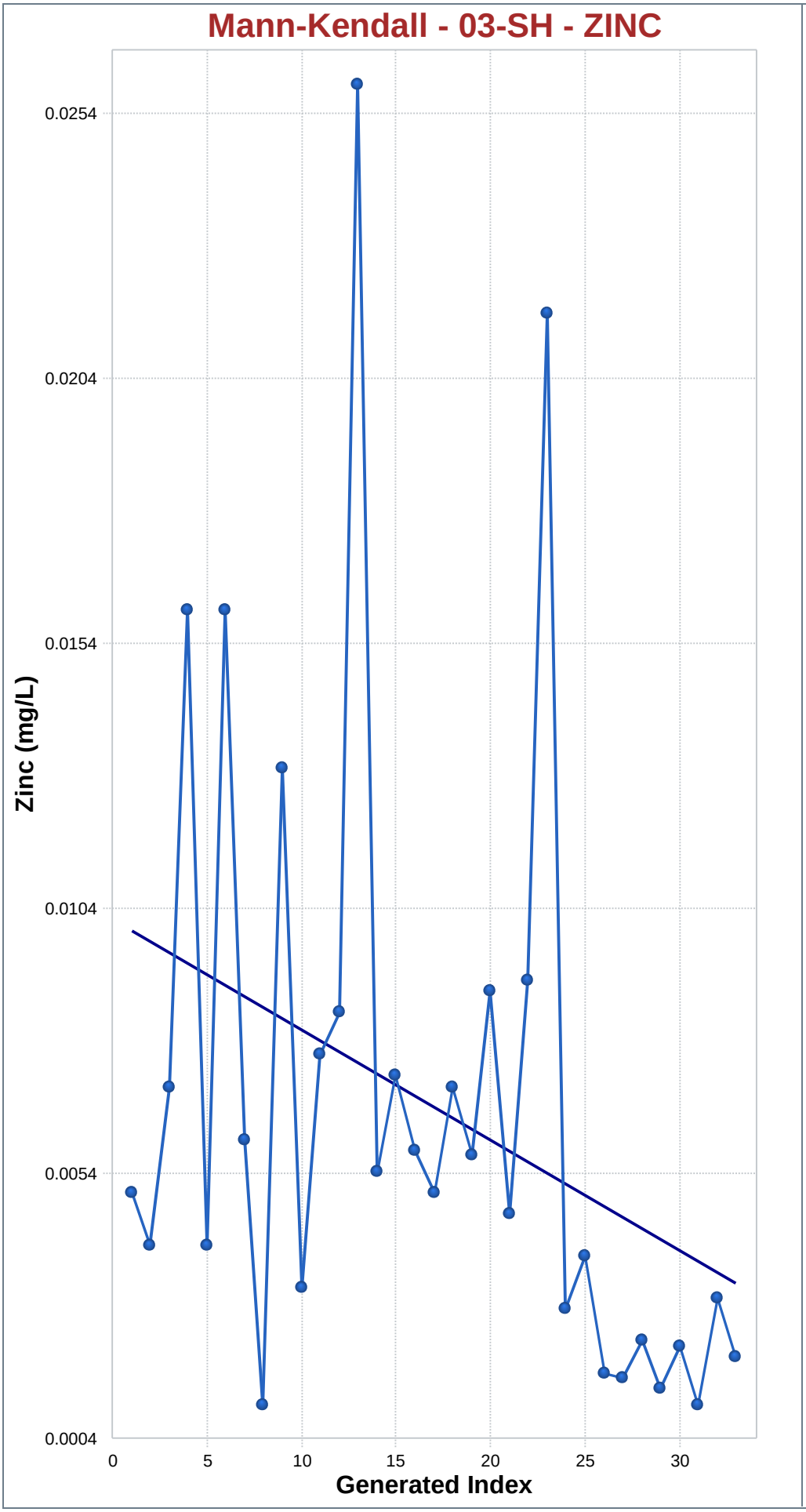

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

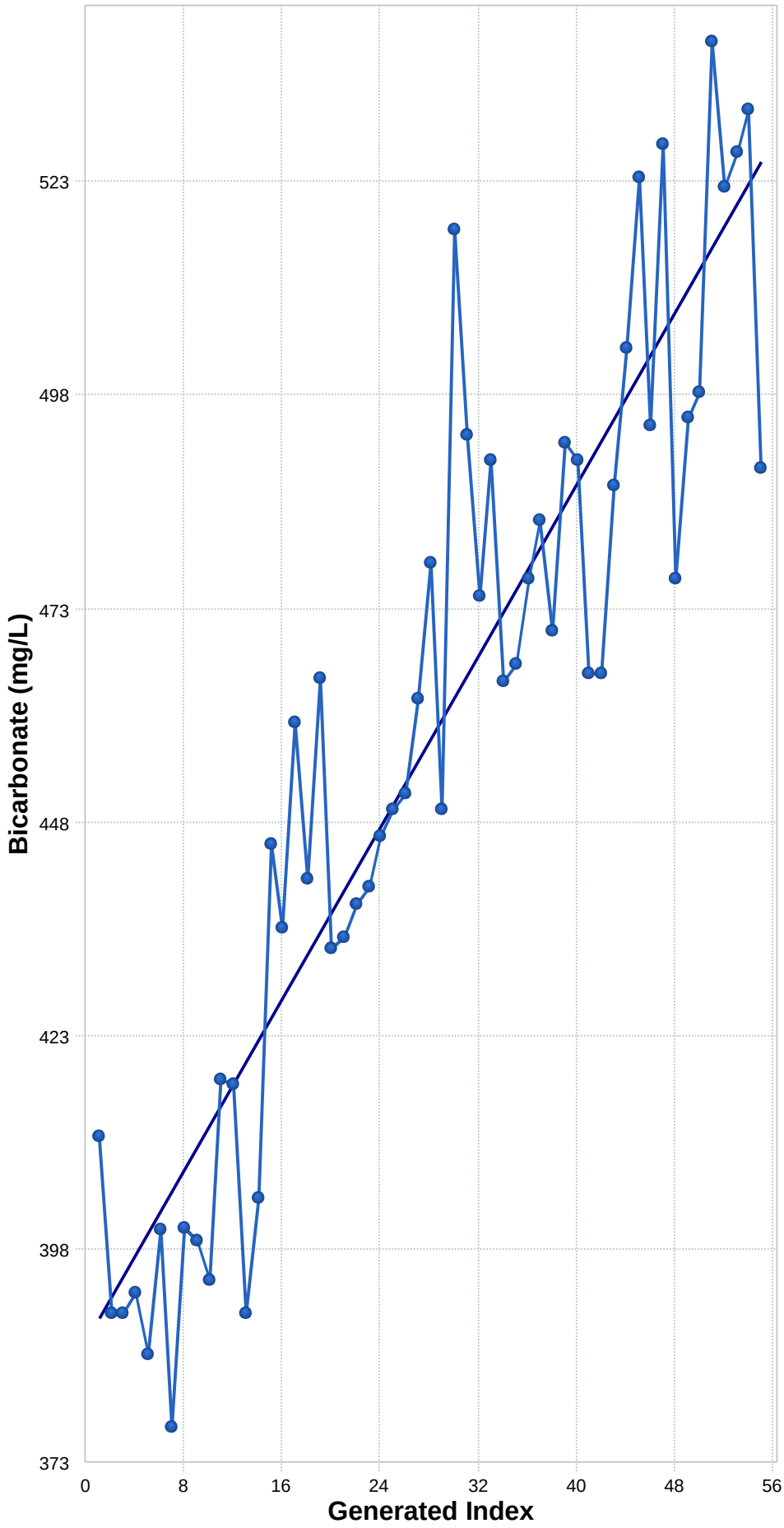
| | |
|---|---|
| n | 33 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 64.5006 |
| Standardized Value of S | -2.8527 |
| M-K Test Value (S) | -185 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0022 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0101 |

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

# Mann-Kendall - 04-SH - BICARBONATE




**Mann-Kendall Trend Analysis**

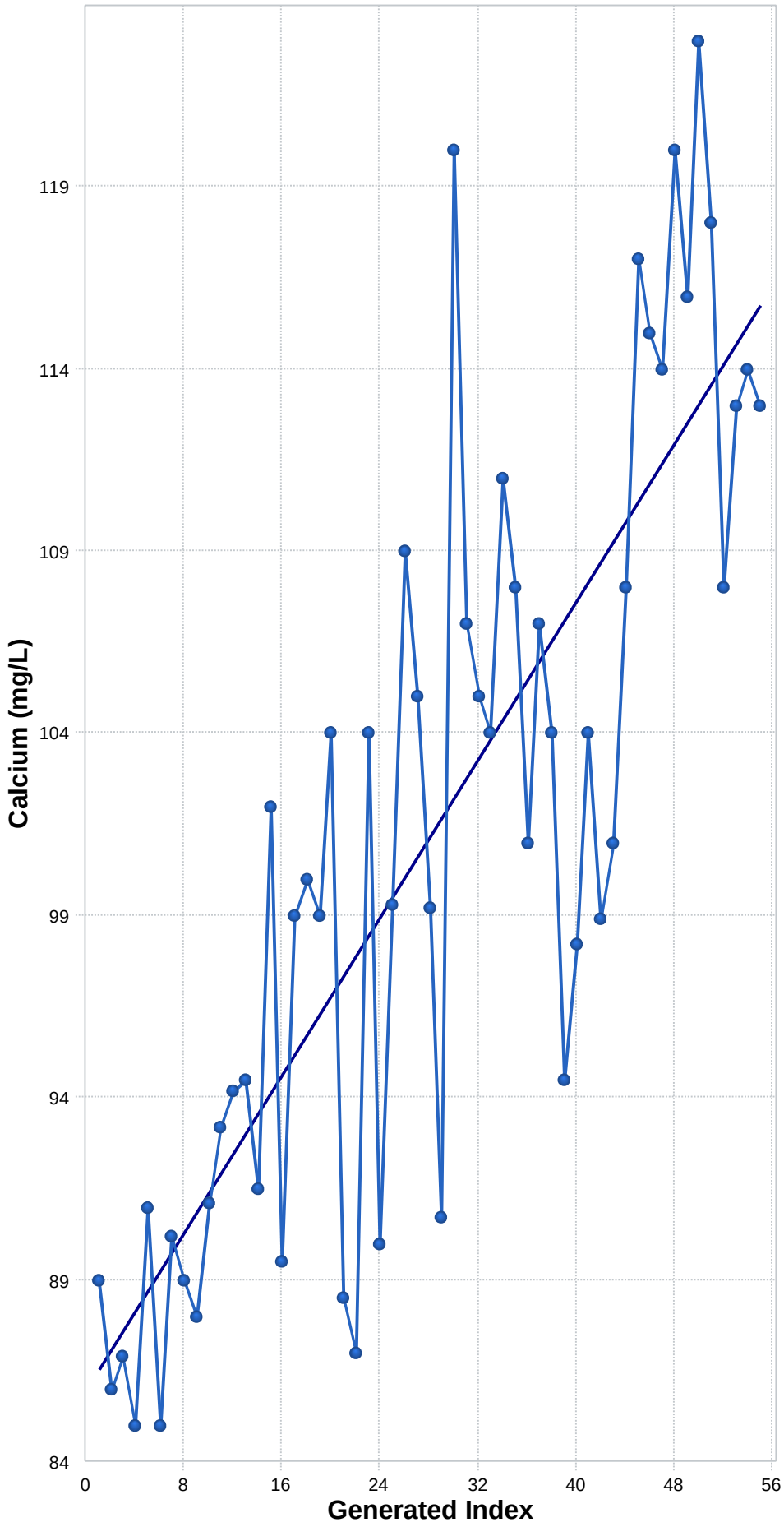
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.7219 |
| Standardized Value of S | 8.1832 |
| M-K Test Value (S) | 1,128 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 2.5096 |
| OLS Regression Intercept | 386.9186 |

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

# Mann-Kendall - 04-SH - CALCIUM




**Mann-Kendall Trend Analysis**

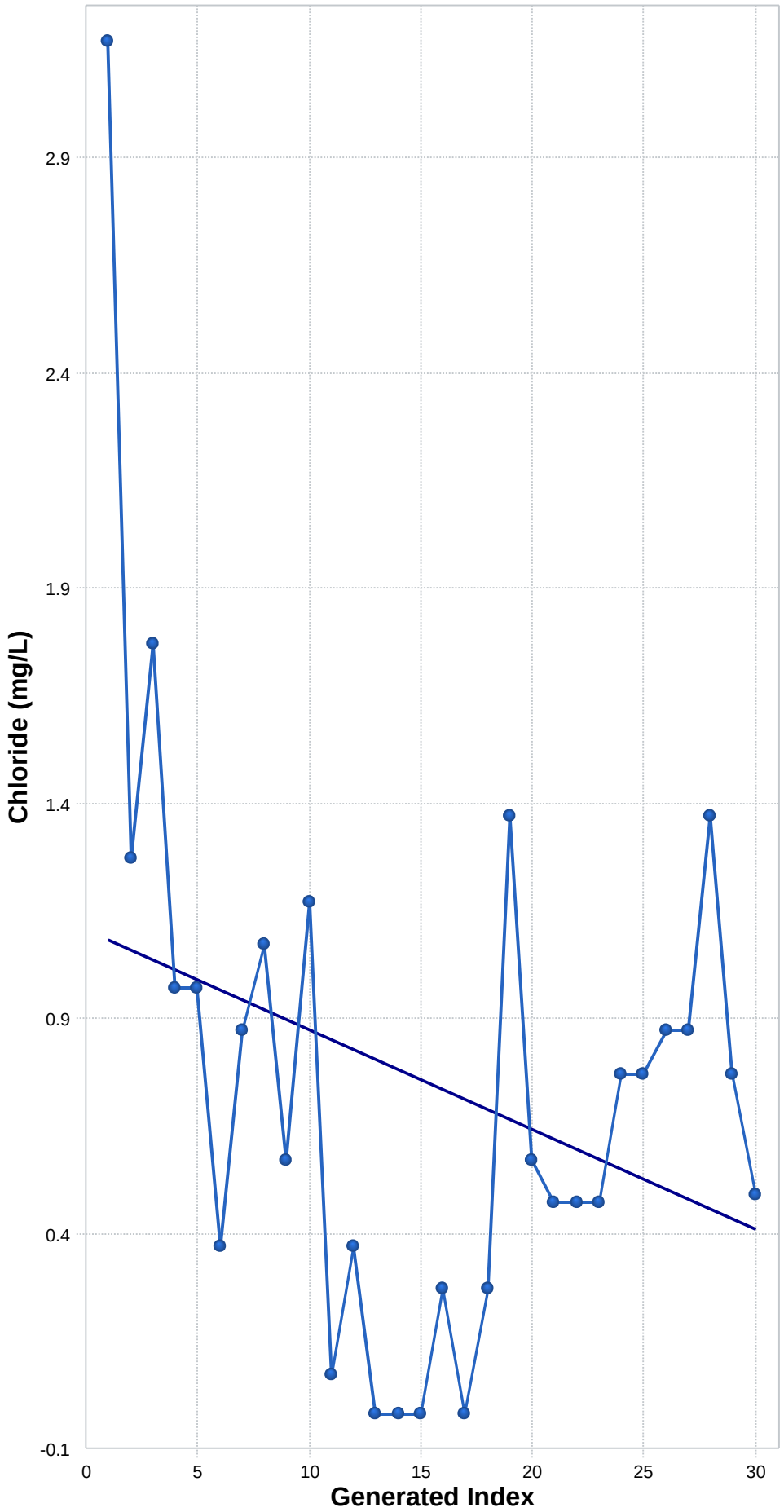
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.6396 |
| Standardized Value of S | 6.6914 |
| M-K Test Value (S) | 922 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.5404 |
| OLS Regression Intercept | 86.0210 |

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

# Mann-Kendall - 04-SH - CHLORIDE




**Mann-Kendall Trend Analysis**

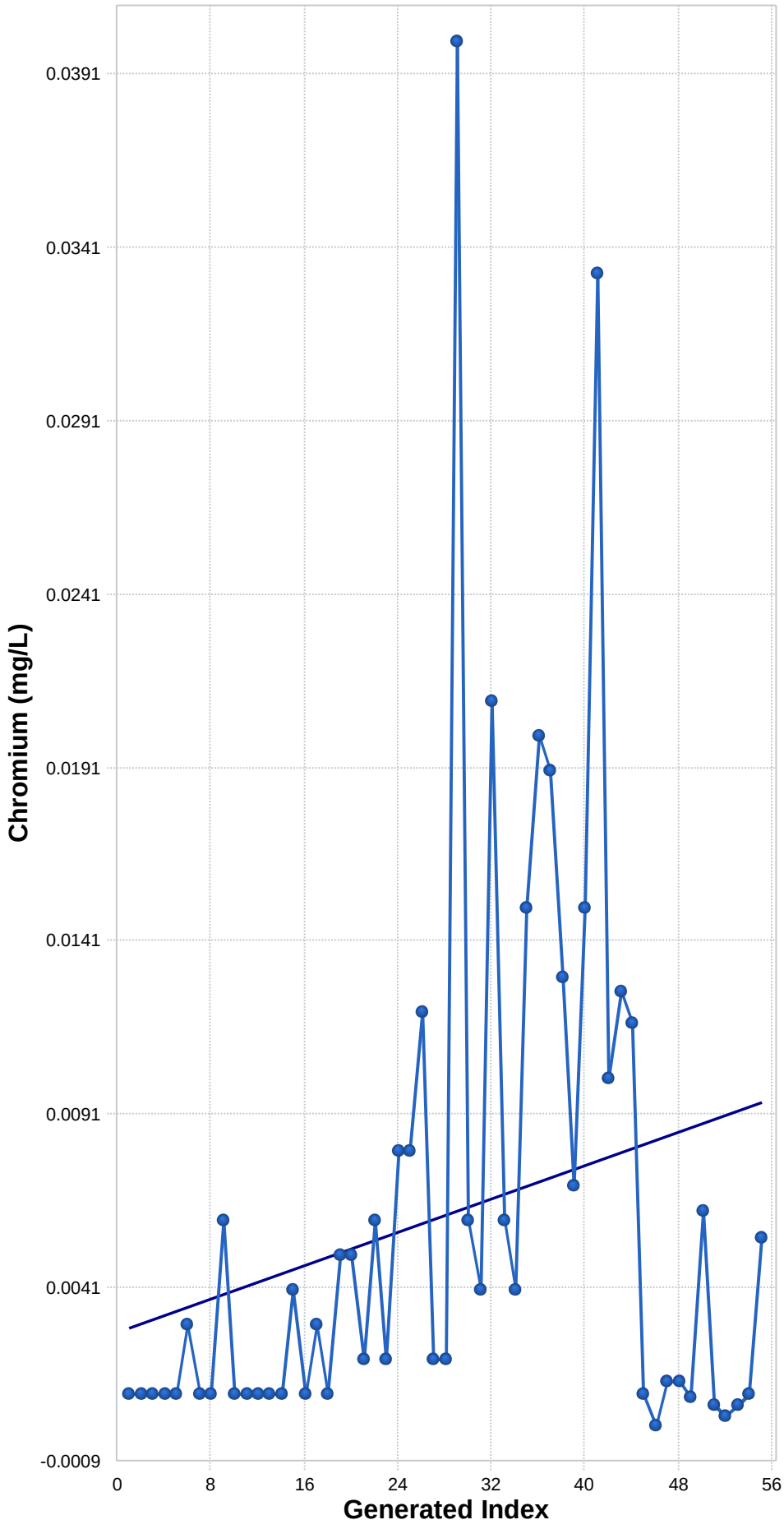
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 55.8301 |
| Standardized Value of S | -0.7881 |
| M-K Test Value (S) | -45 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.2153 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0232 |
| OLS Regression Intercept | 1.1356 |

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

# Mann-Kendall - 04-SH - CHROMIUM



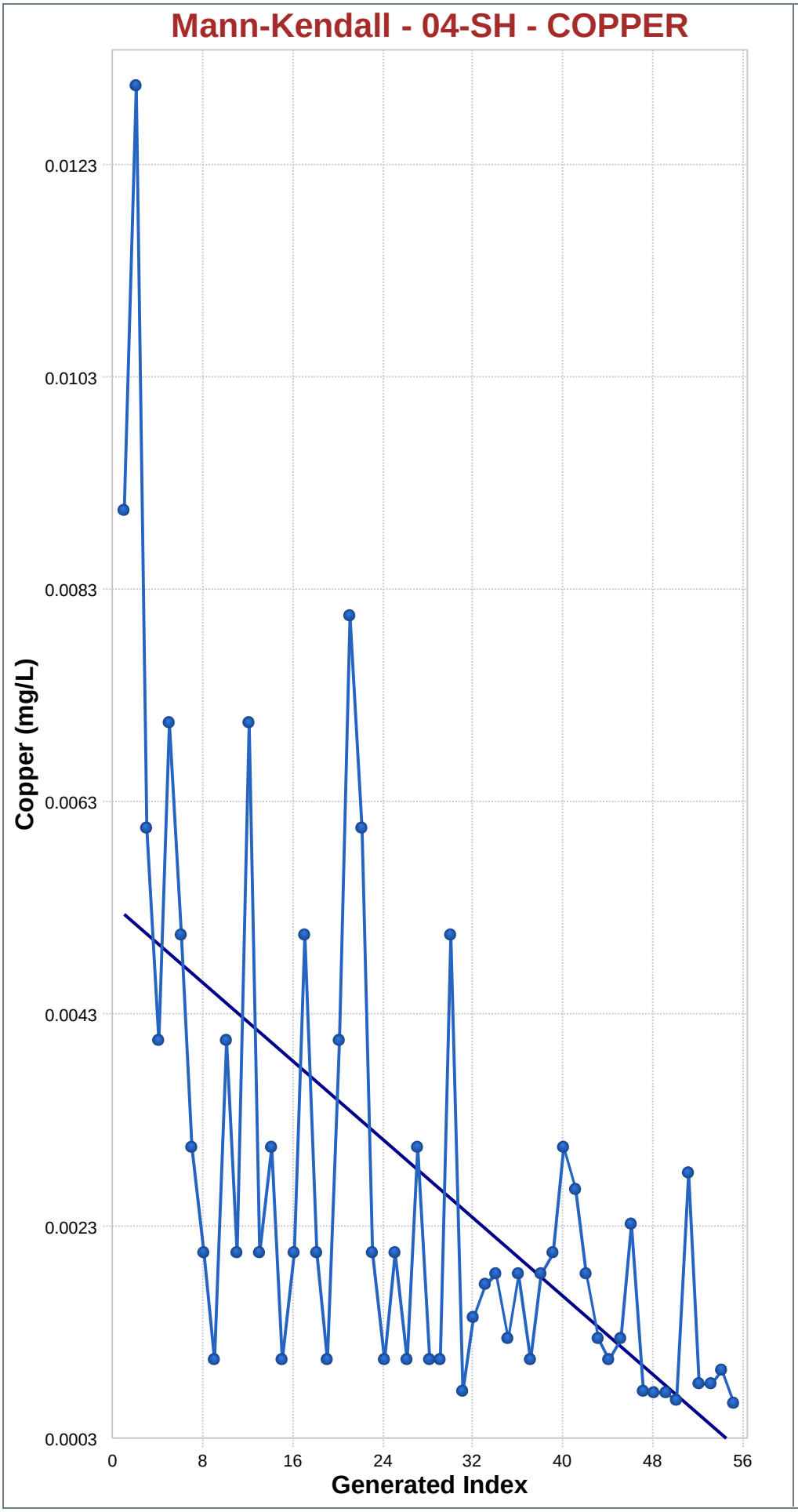

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 135.8516 |
| Standardized Value of S | 1.9727 |
| M-K Test Value (S) | 269 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0243 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0001 |
| OLS Regression Intercept | 0.0028 |

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



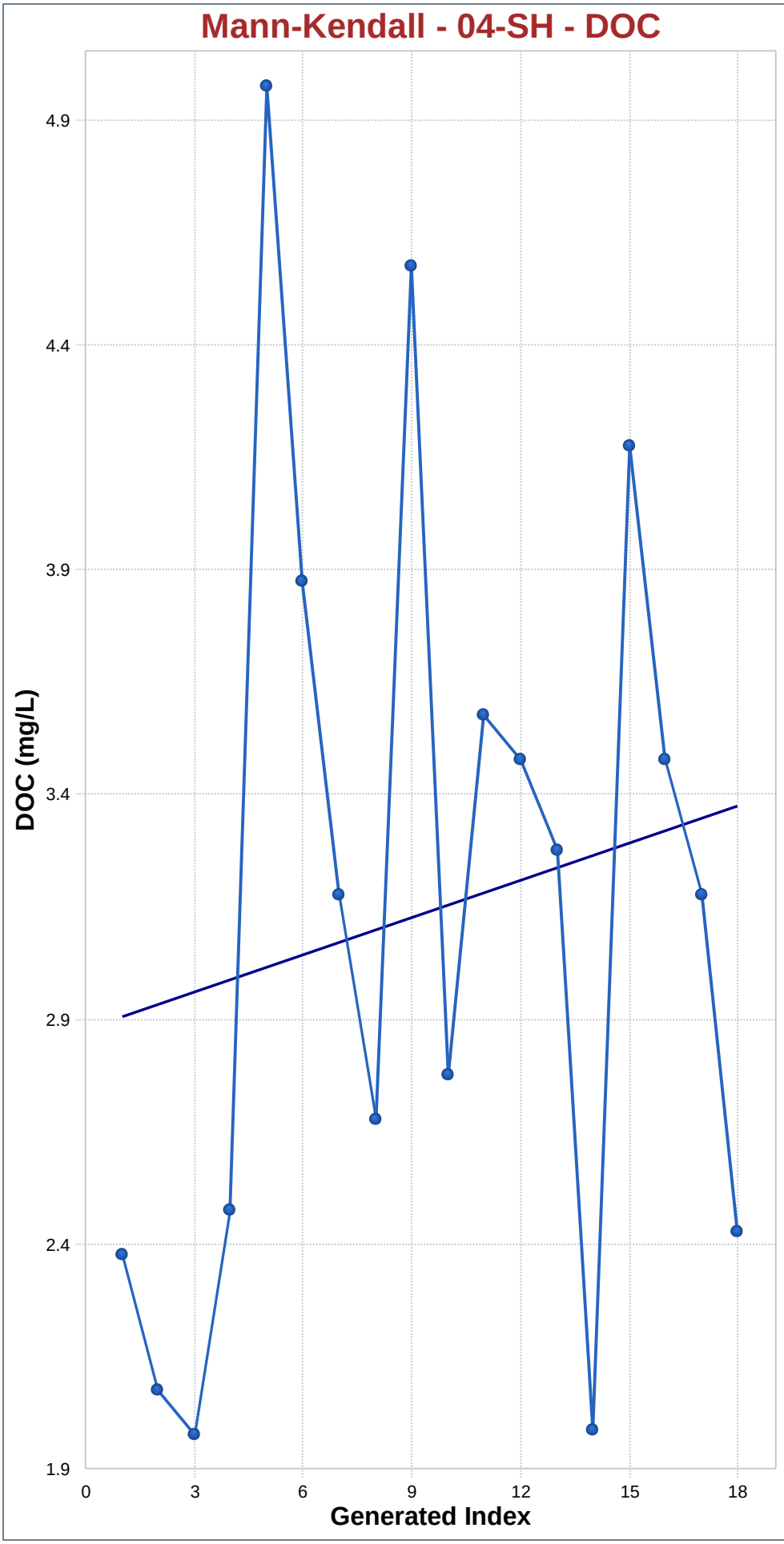

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.0596 |
| Standardized Value of S | -5.1292 |
| M-K Test Value (S) | -704 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0053 |

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




**Mann-Kendall Trend Analysis**

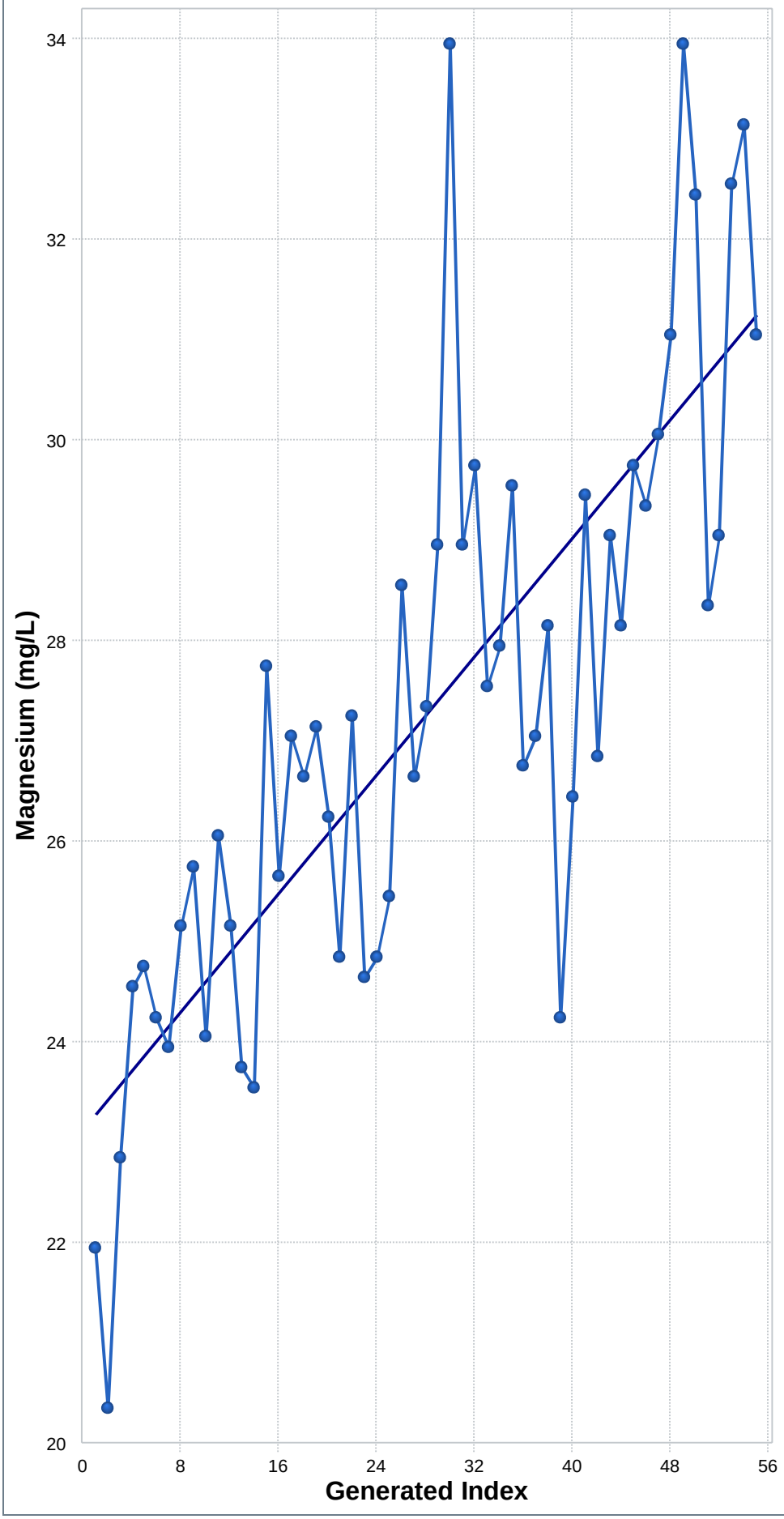
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3629 |
| Standardized Value of S | 0.6828 |
| M-K Test Value (S) | 19 |
| Tabulated p-value | 0.2500 |
| Approximate p-value | 0.2474 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0277 |
| OLS Regression Intercept | 2.9013 |

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

# Mann-Kendall - 04-SH - MAGNESIUM




**Mann-Kendall Trend Analysis**

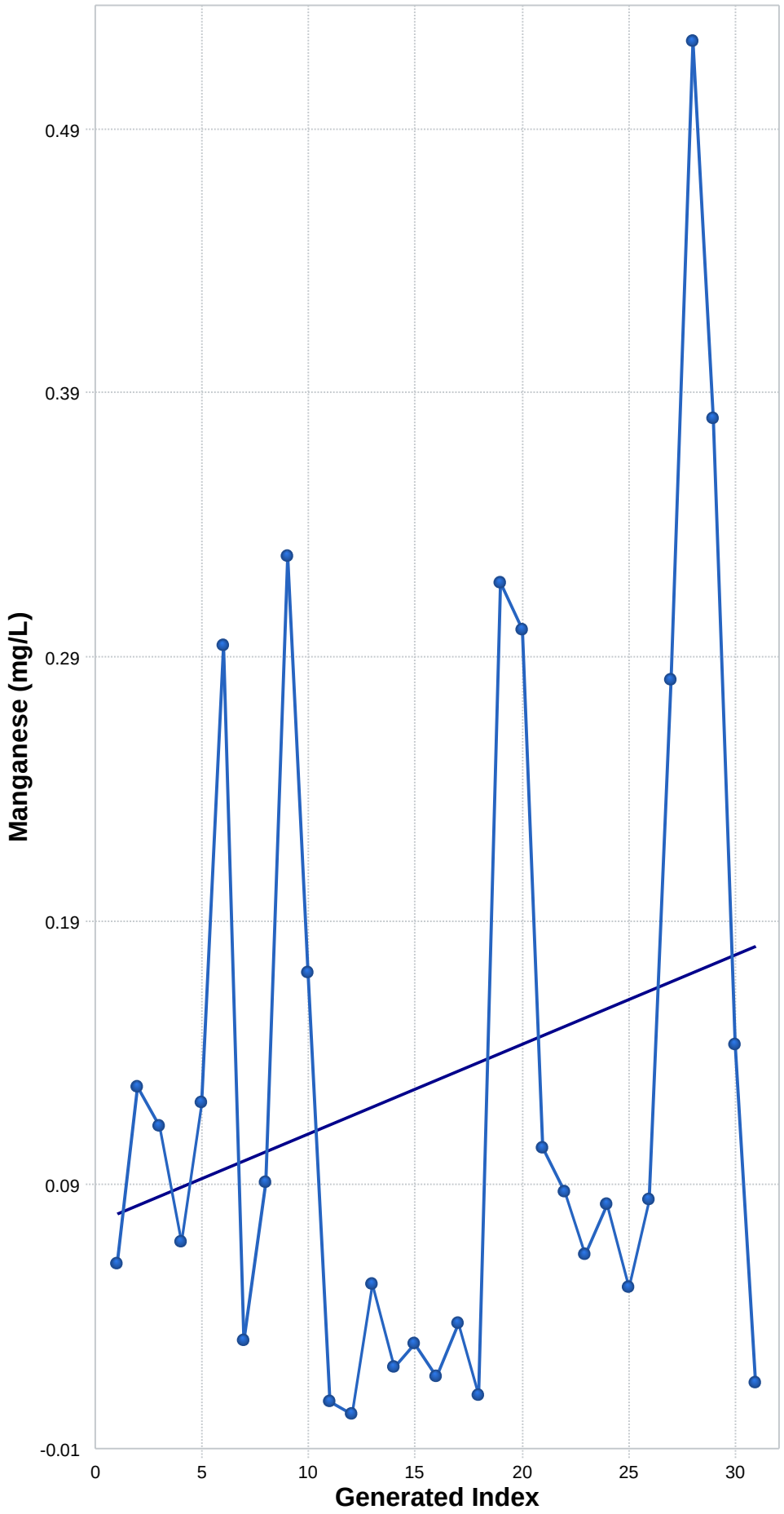
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.7098 |
| Standardized Value of S | 6.8913 |
| M-K Test Value (S) | 950 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1477 |
| OLS Regression Intercept | 23.2814 |

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

# Mann-Kendall - 04-SH - MANGANESE



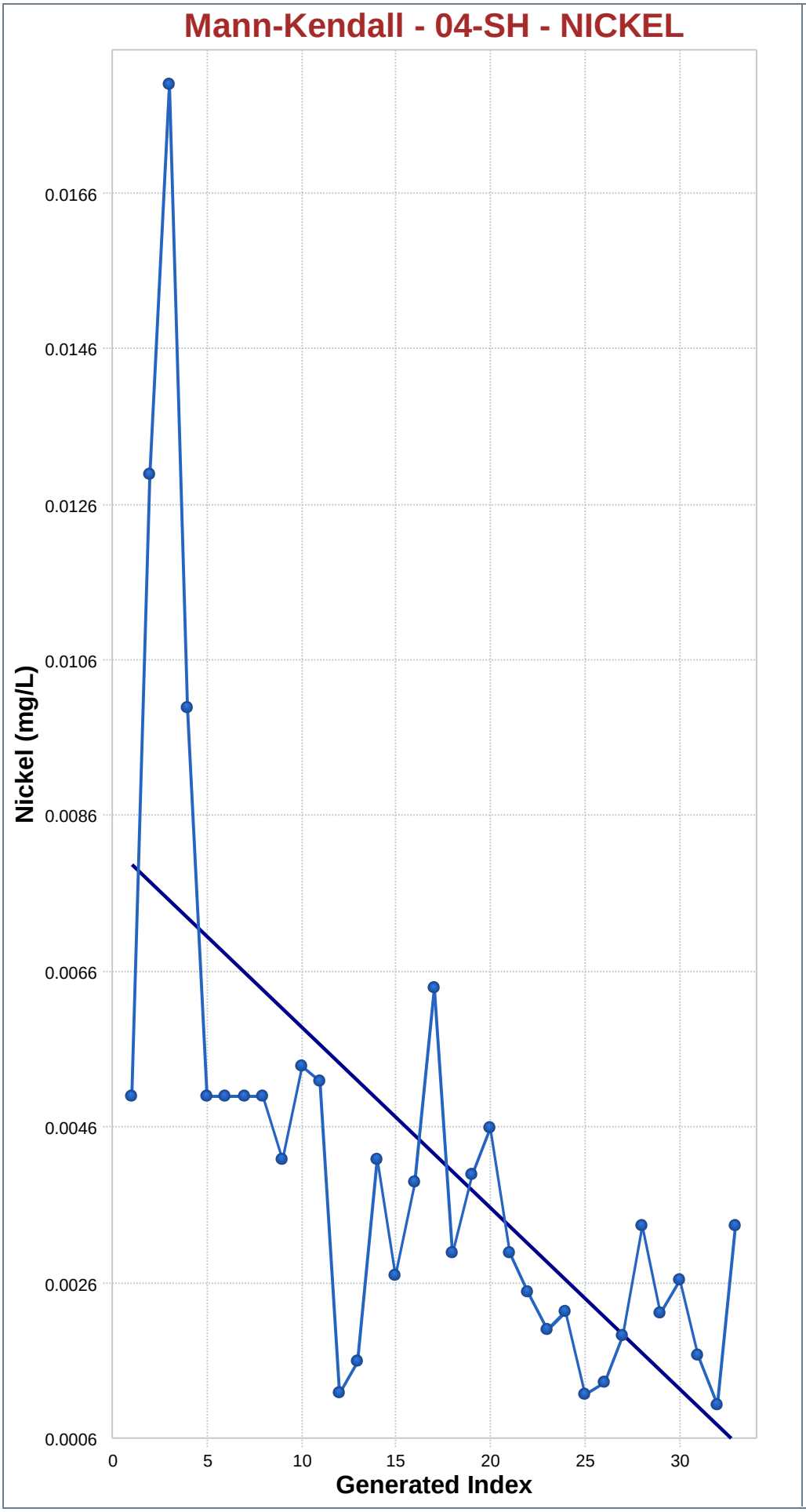

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 31 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 58.8359 |
| Standardized Value of S | 0.5099 |
| M-K Test Value (S) | 31 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3051 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0034 |
| OLS Regression Intercept | 0.0765 |

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



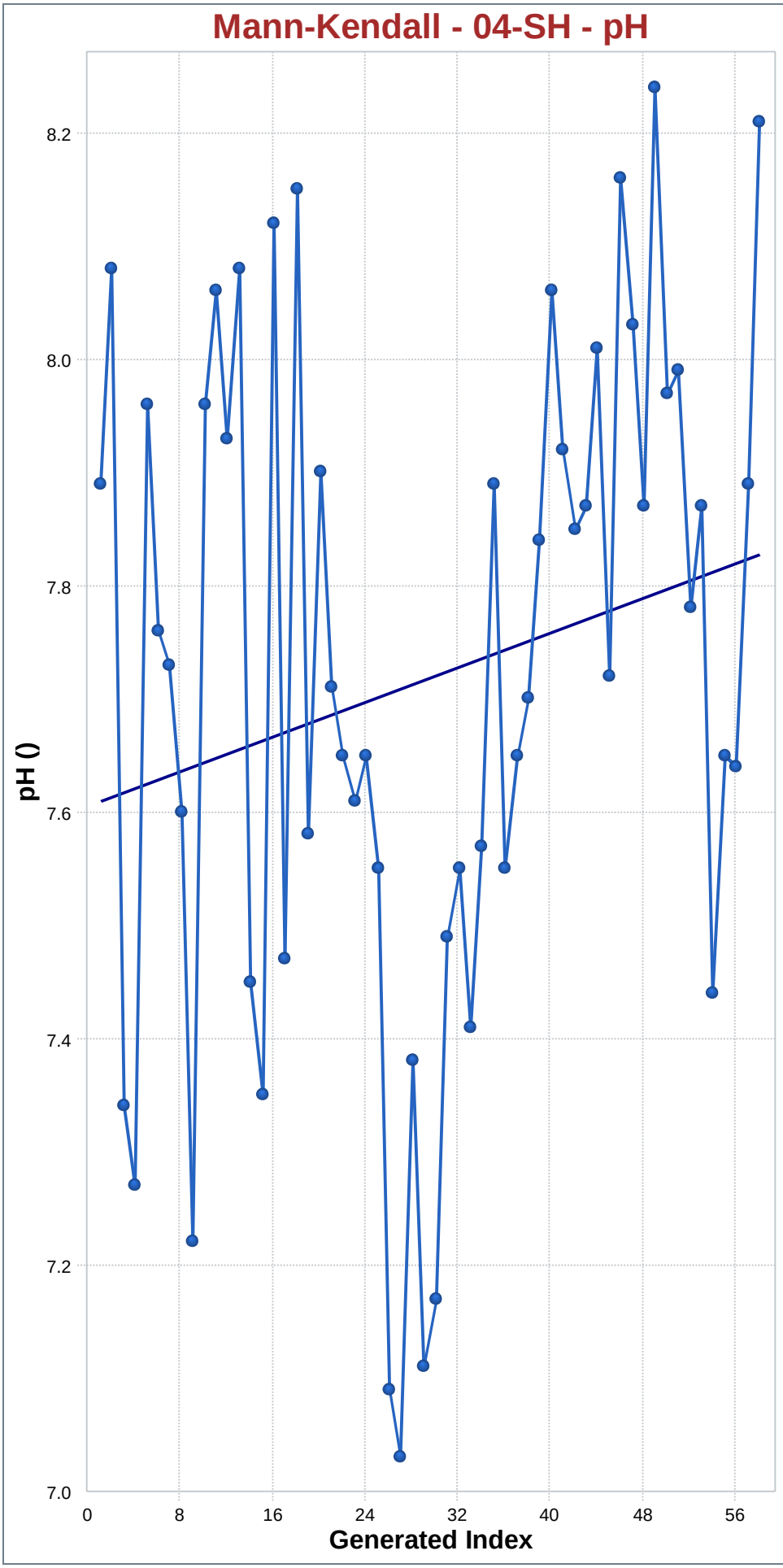

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 33 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 64.3946 |
| Standardized Value of S | -4.4258 |
| M-K Test Value (S) | -286 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0082 |

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




**Mann-Kendall Trend Analysis**

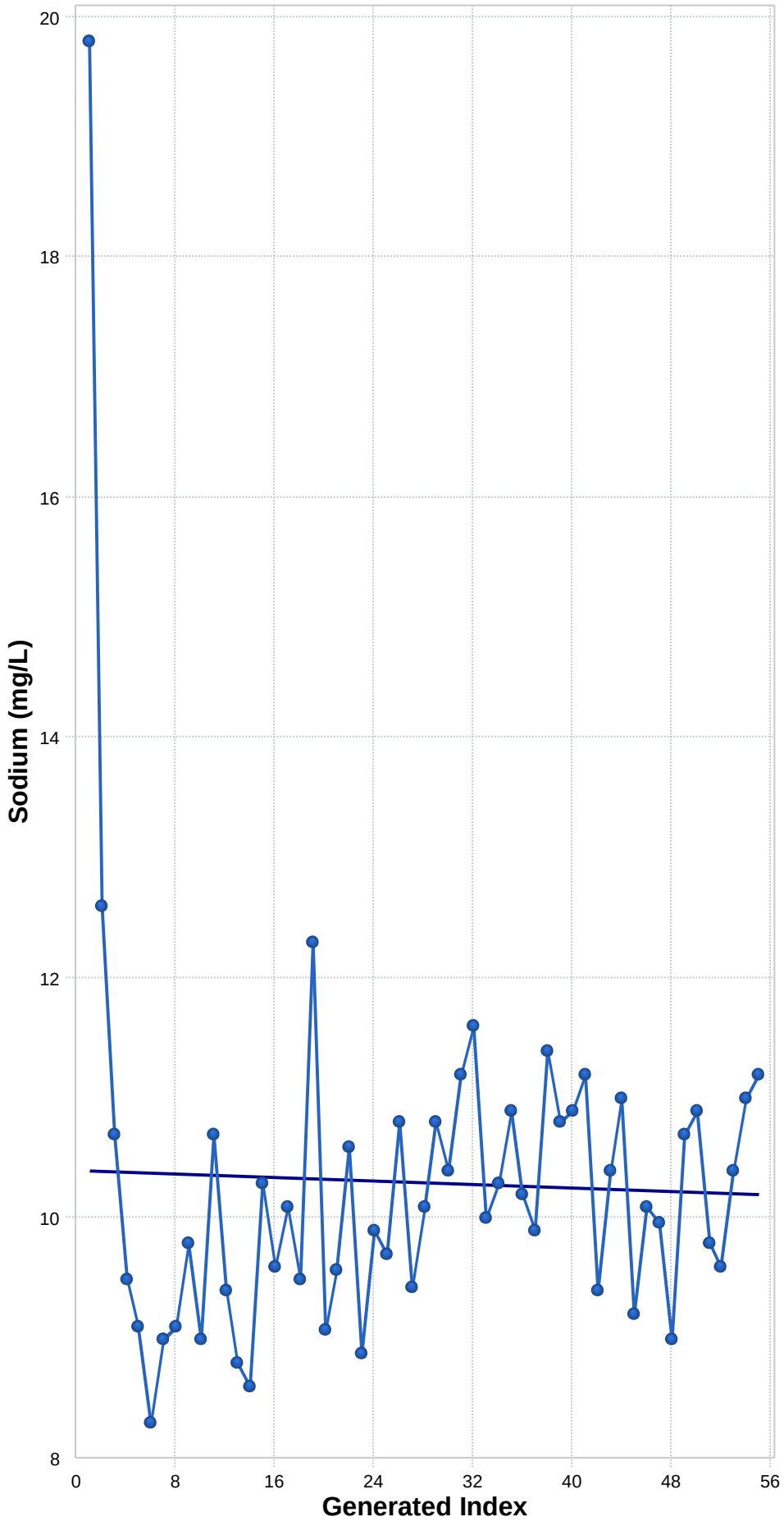
| | |
|---|---|
| n | 58 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 149.0000 |
| Standardized Value of S | 1.5973 |
| M-K Test Value (S) | 239 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0551 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0038 |
| OLS Regression Intercept | 7.6363 |

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

# Mann-Kendall - 04-SH - SODIUM




**Mann-Kendall Trend Analysis**

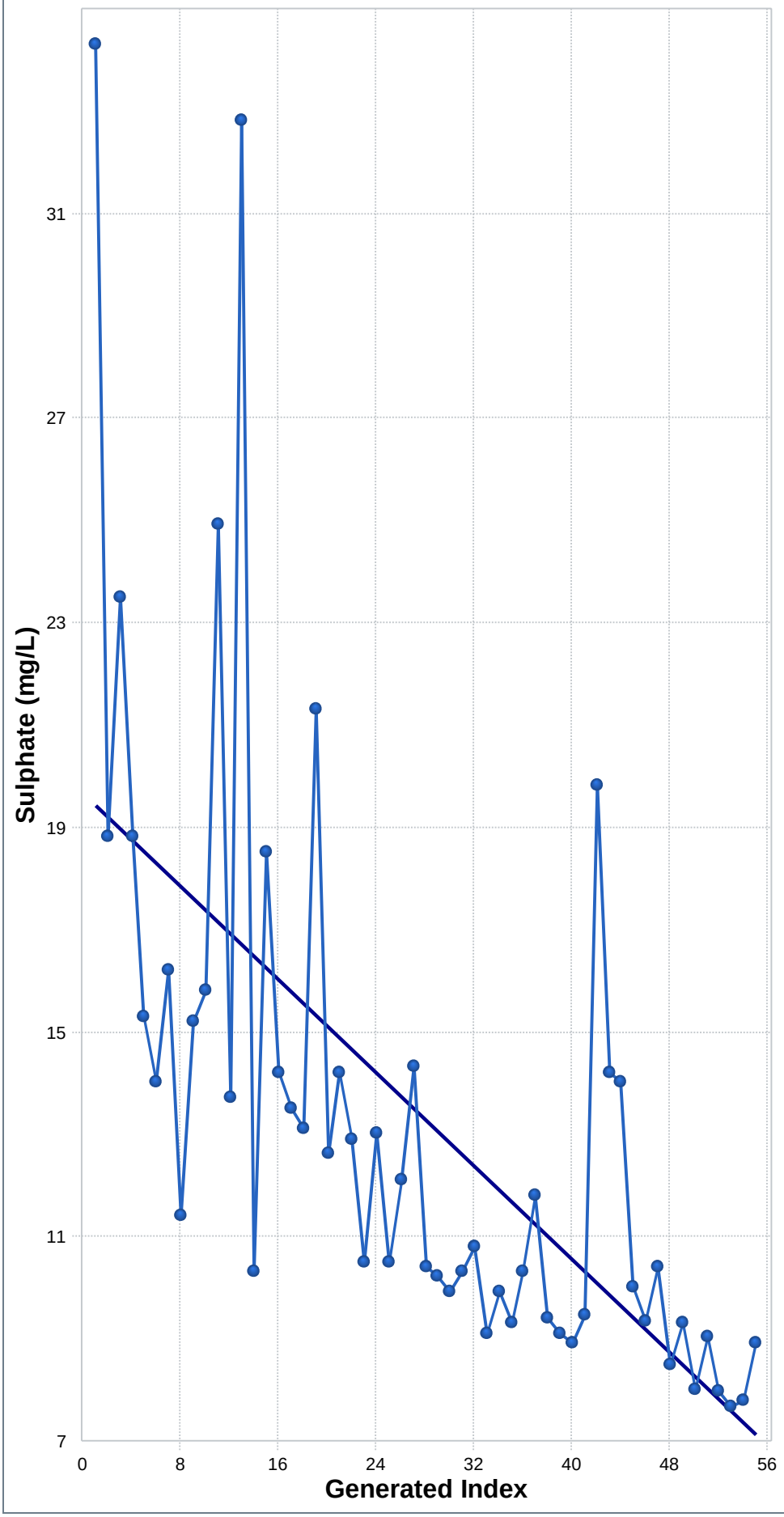
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.6275 |
| Standardized Value of S | 2.2597 |
| M-K Test Value (S) | 312 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0119 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0034 |
| OLS Regression Intercept | 10.0958 |

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

# Mann-Kendall - 04-SH - SULPHATE



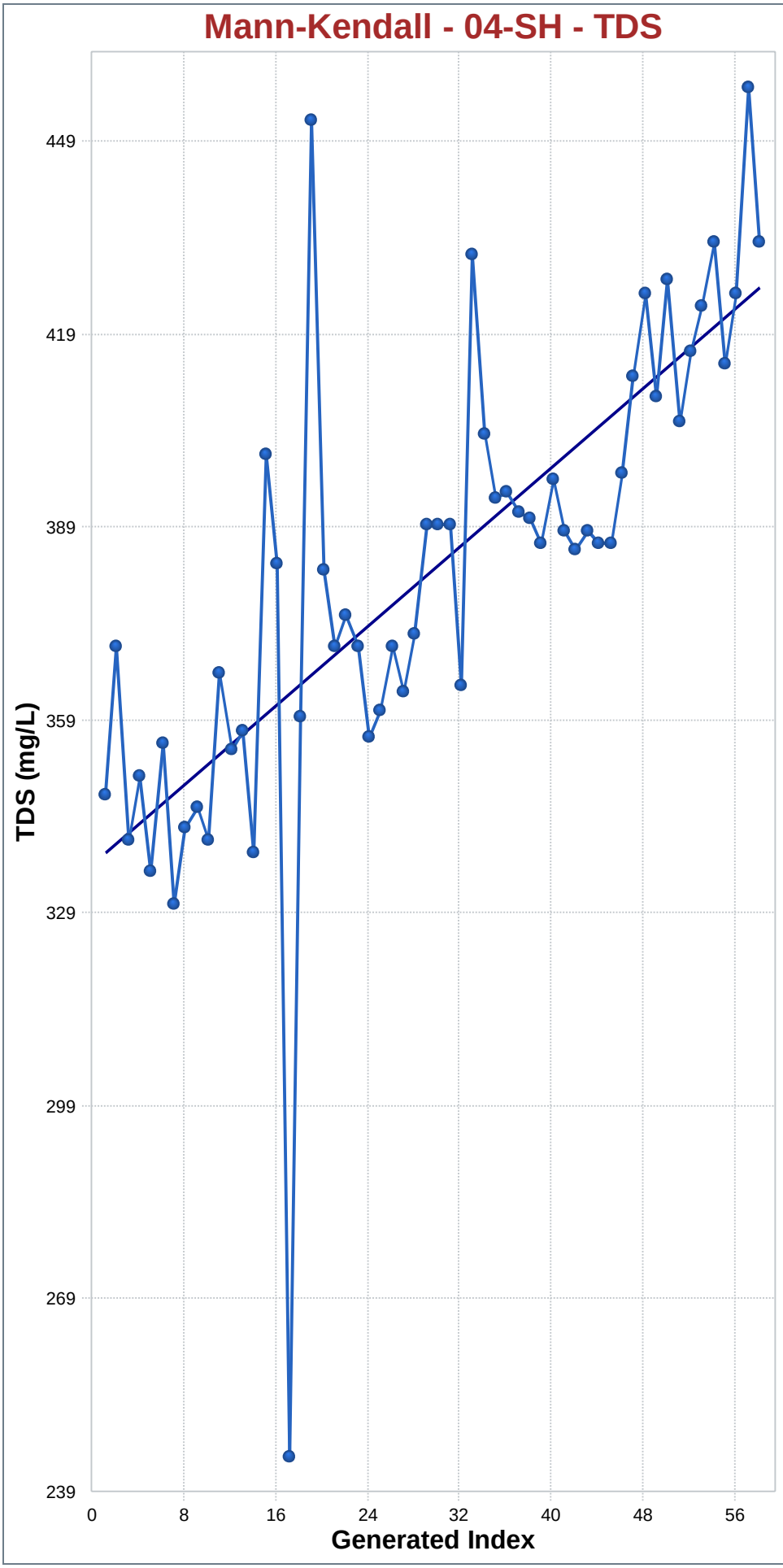

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.6977 |
| Standardized Value of S | -6.8919 |
| M-K Test Value (S) | -950 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.2278 |
| OLS Regression Intercept | 19.8411 |

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



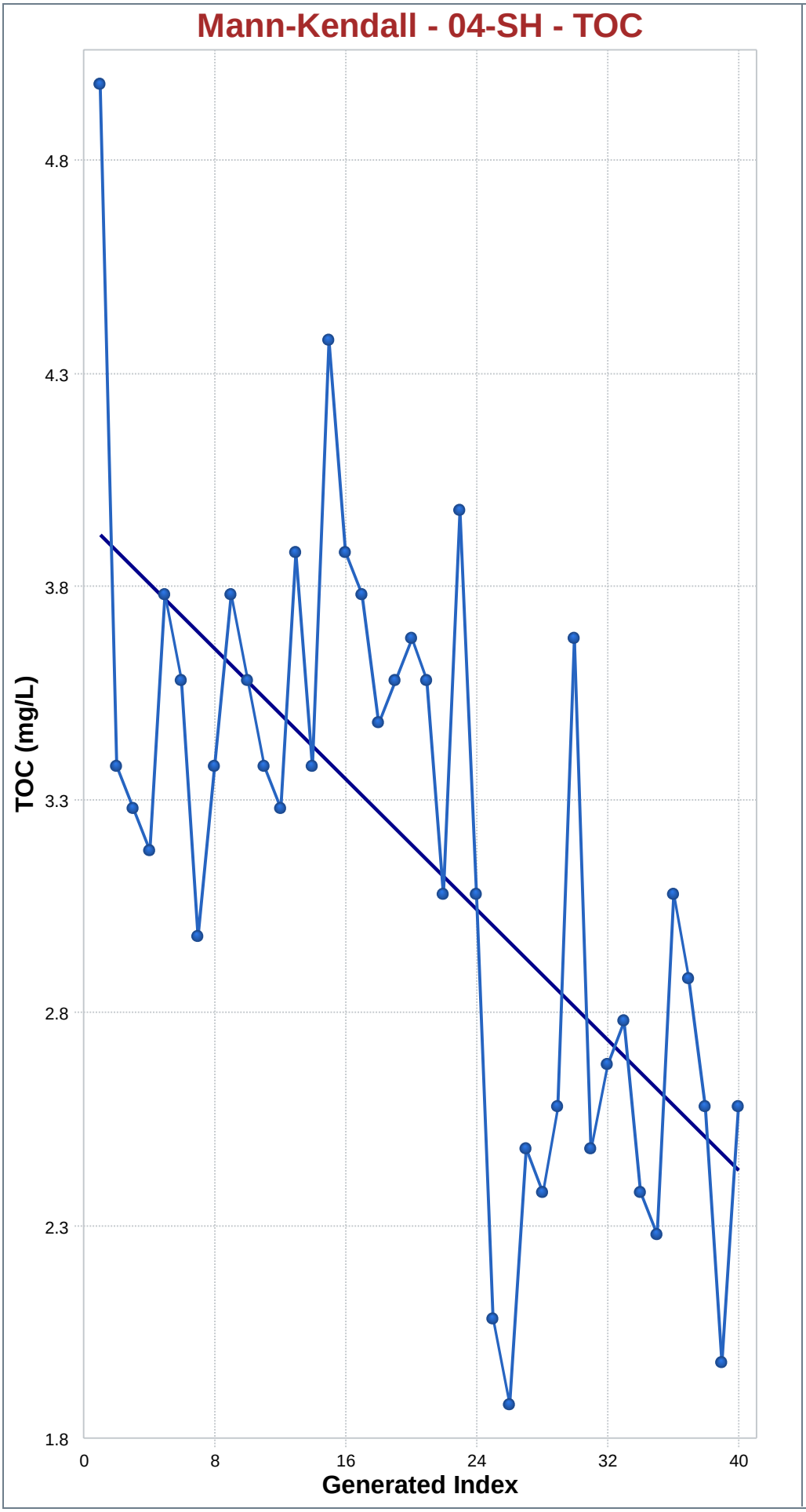

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 58 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 149.0089 |
| Standardized Value of S | 7.1002 |
| M-K Test Value (S) | 1,059 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.5410 |
| OLS Regression Intercept | 336.4192 |

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



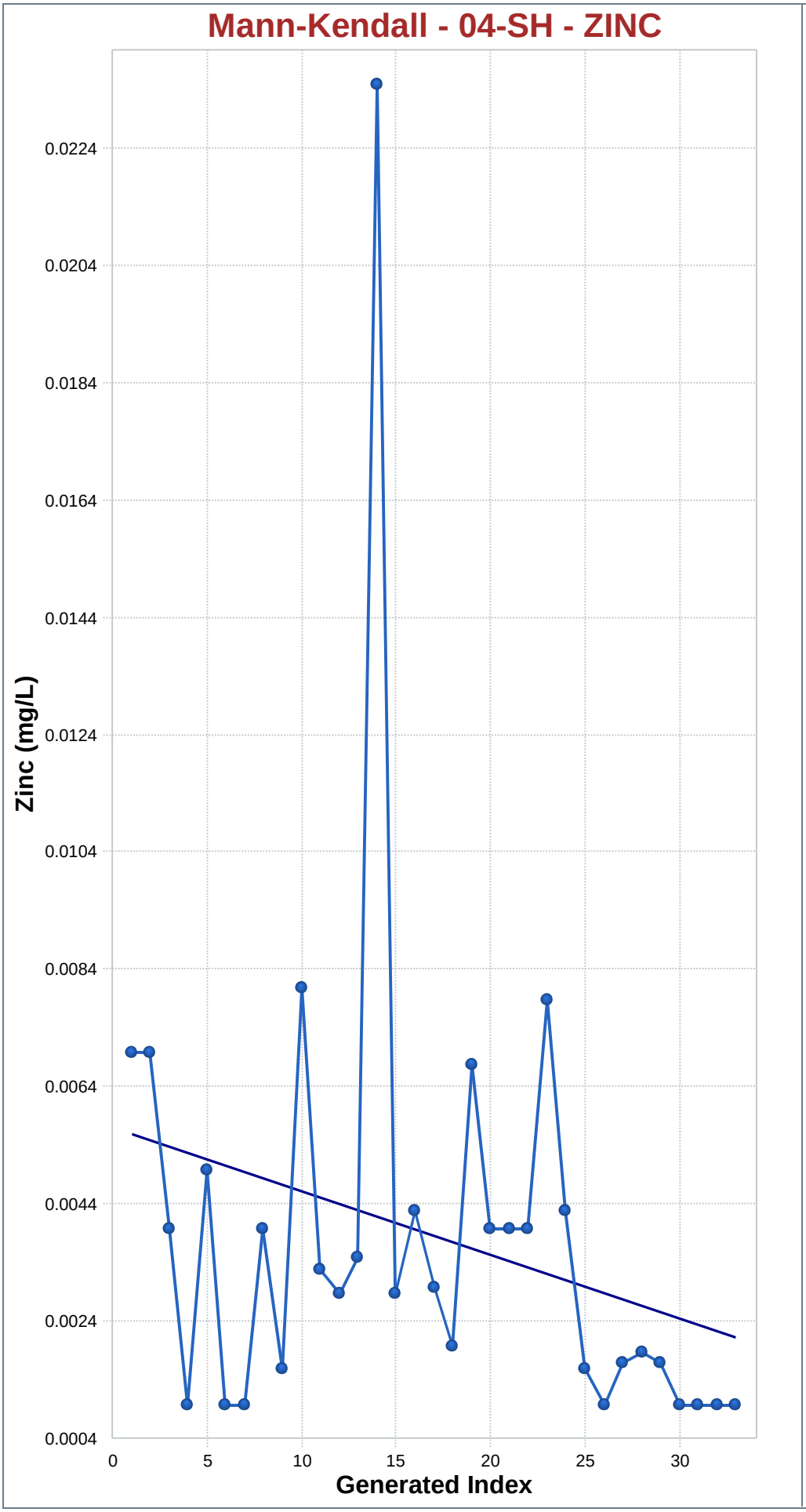

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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.



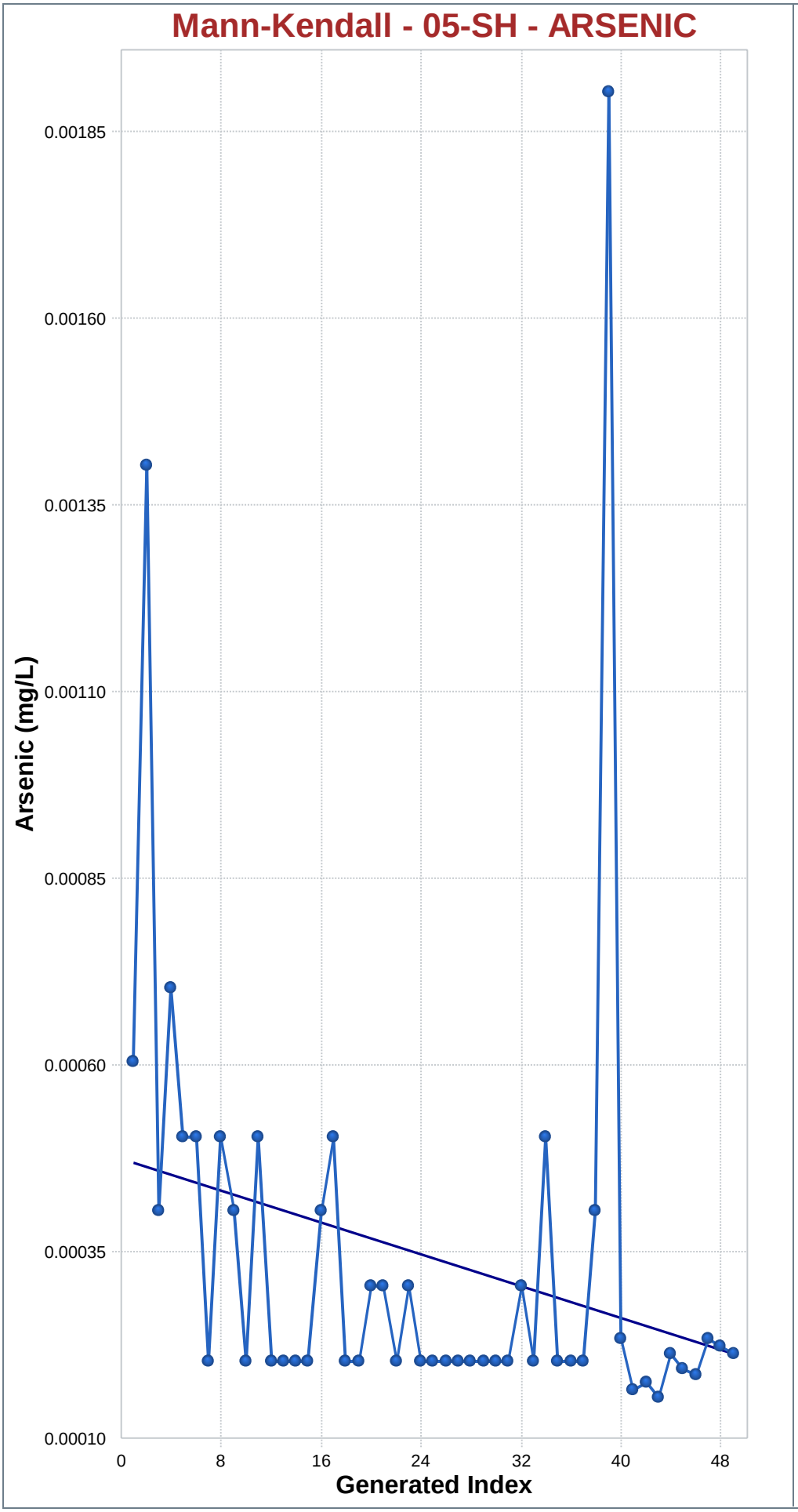

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 33 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 63.8618 |
| Standardized Value of S | -2.2862 |
| M-K Test Value (S) | -147 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0111 |

**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**

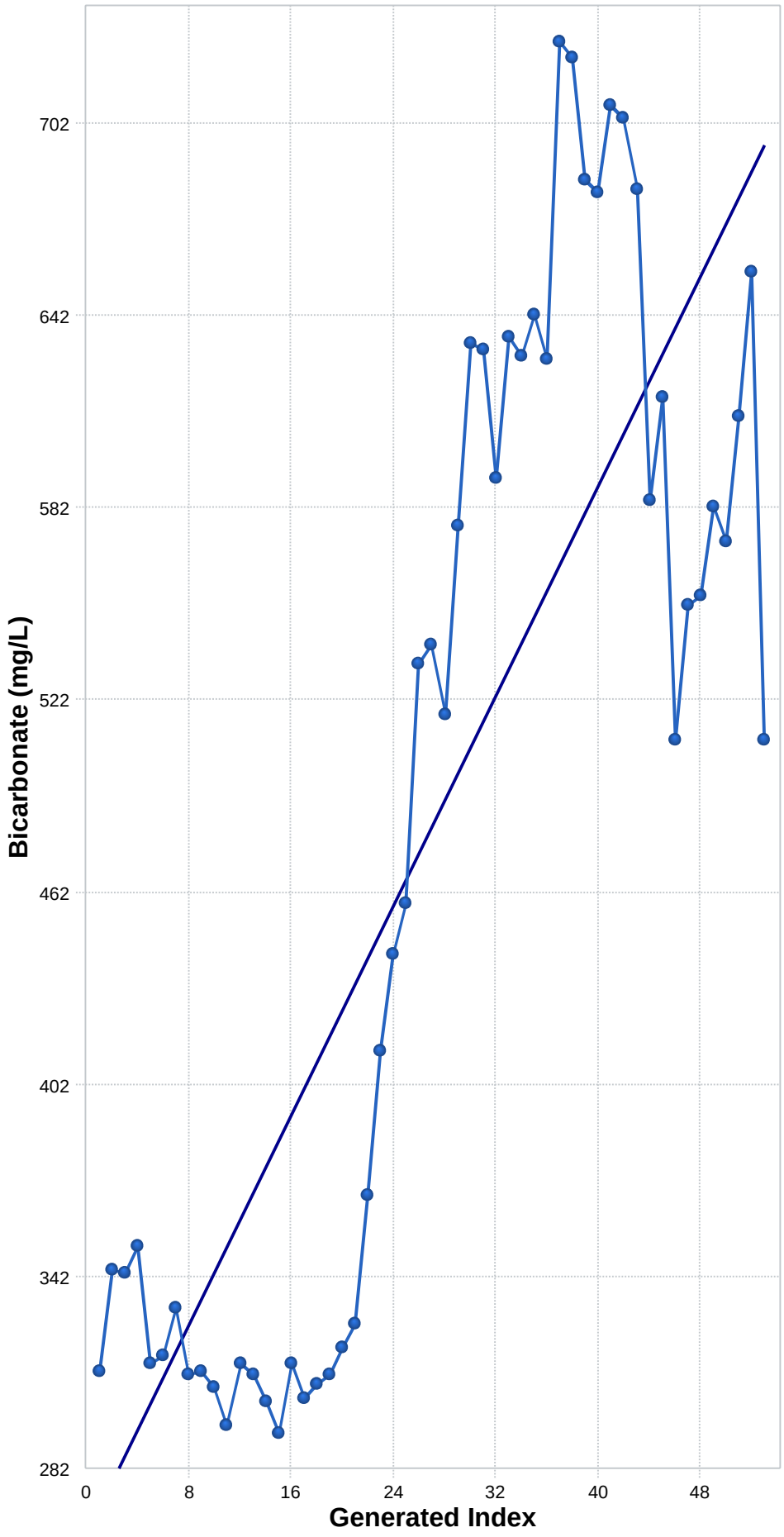
| | |
|---|---|
| n | 49 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 110.9700 |
| Standardized Value of S | -3.2261 |
| M-K Test Value (S) | -359 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0006 |

**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 - 05-SH - BICARBONATE




**Mann-Kendall Trend Analysis**

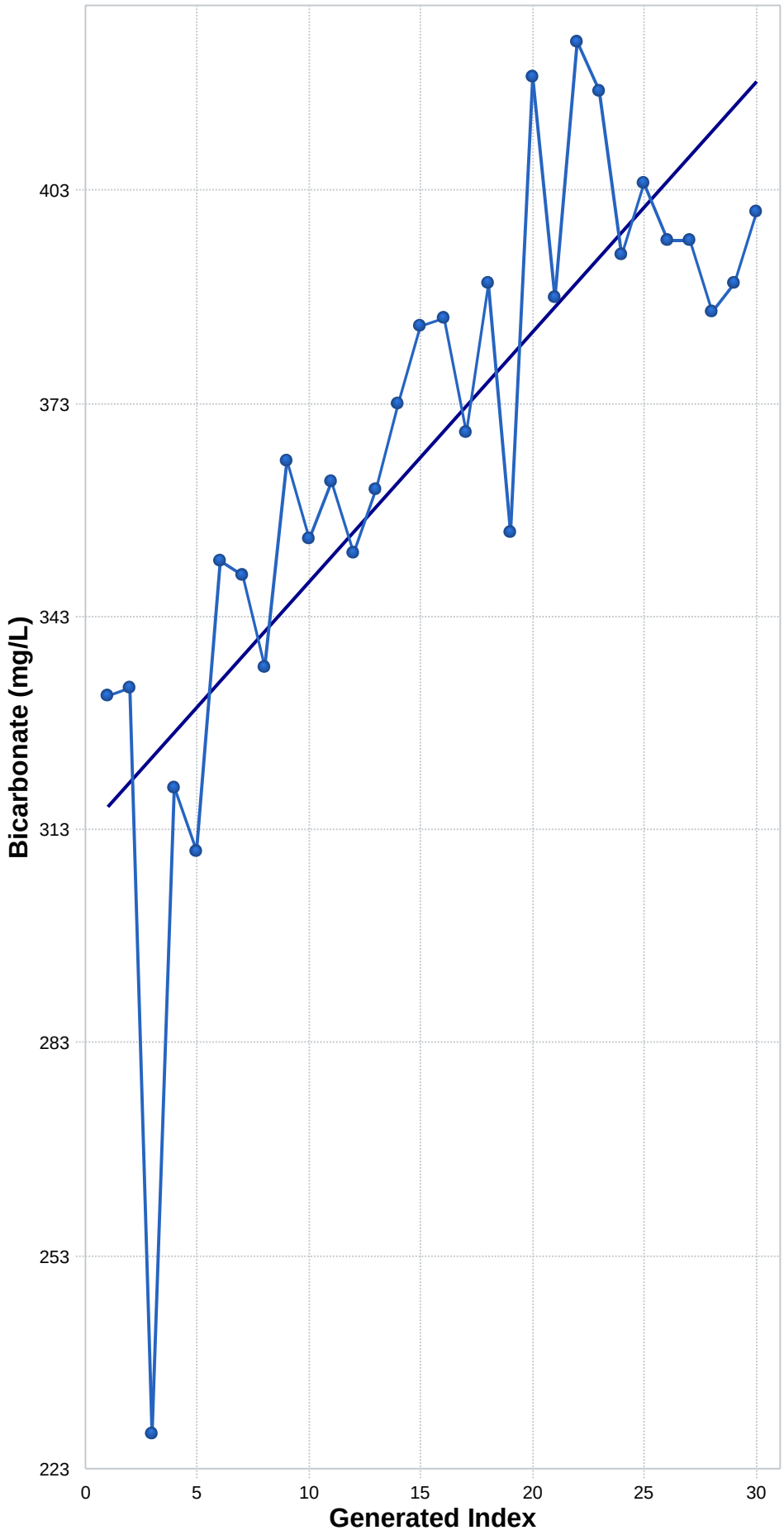
| | |
|---|---|
| n | 53 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 130.3546 |
| Standardized Value of S | 5.5694 |
| M-K Test Value (S) | 727 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 8.2065 |
| OLS Regression Intercept | 259.9165 |

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

# Mann-Kendall - 17-SH - BICARBONATE




**Mann-Kendall Trend Analysis**

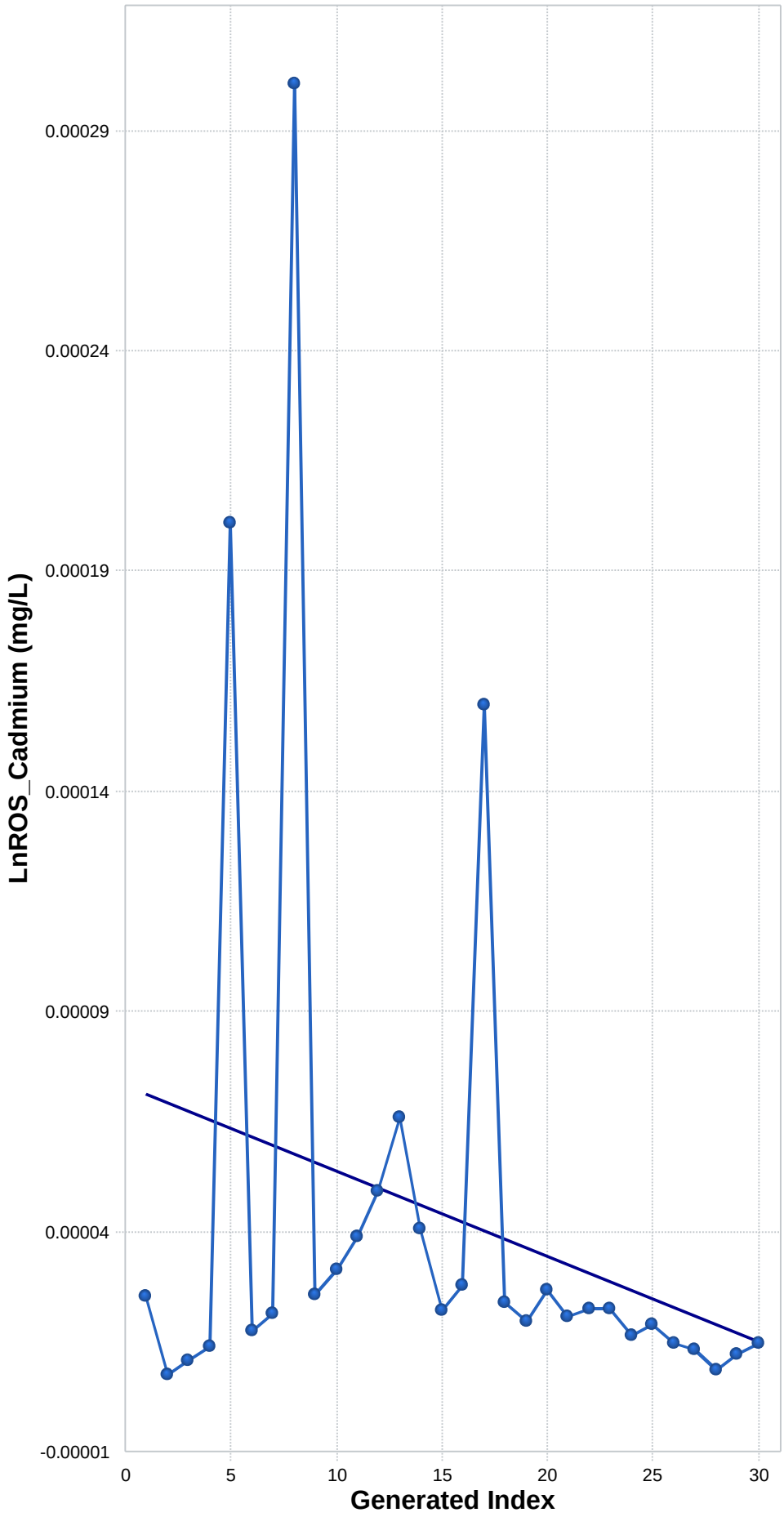
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0327 |
| Standardized Value of S | 5.3540 |
| M-K Test Value (S) | 301 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 3.5226 |
| OLS Regression Intercept | 312.8000 |

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

# Mann-Kendall - 17-SH - CADMIUM




**Mann-Kendall Trend Analysis**

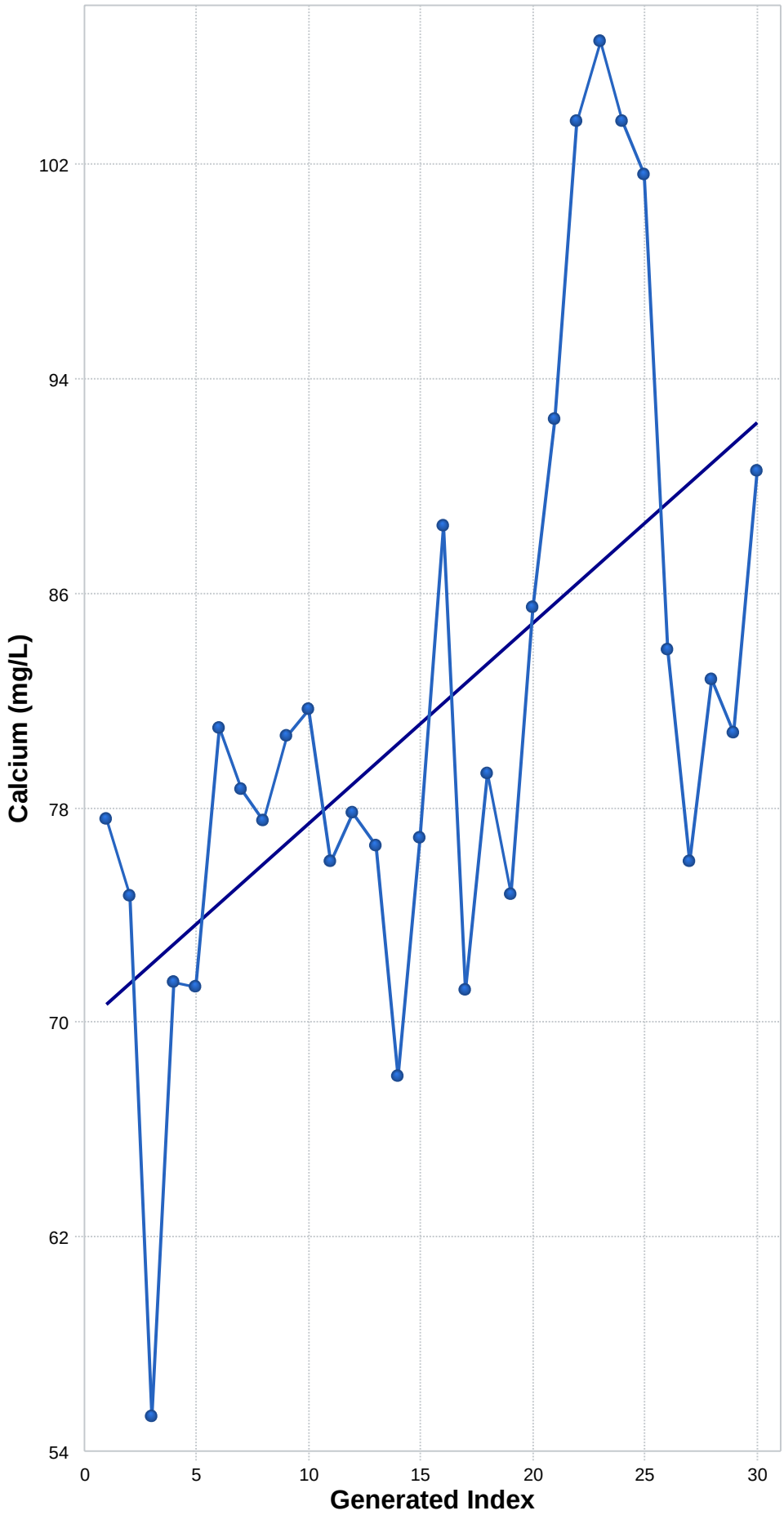
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0327 |
| Standardized Value of S | -1.9631 |
| M-K Test Value (S) | -111 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0248 |

**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 - 17-SH - CALCIUM



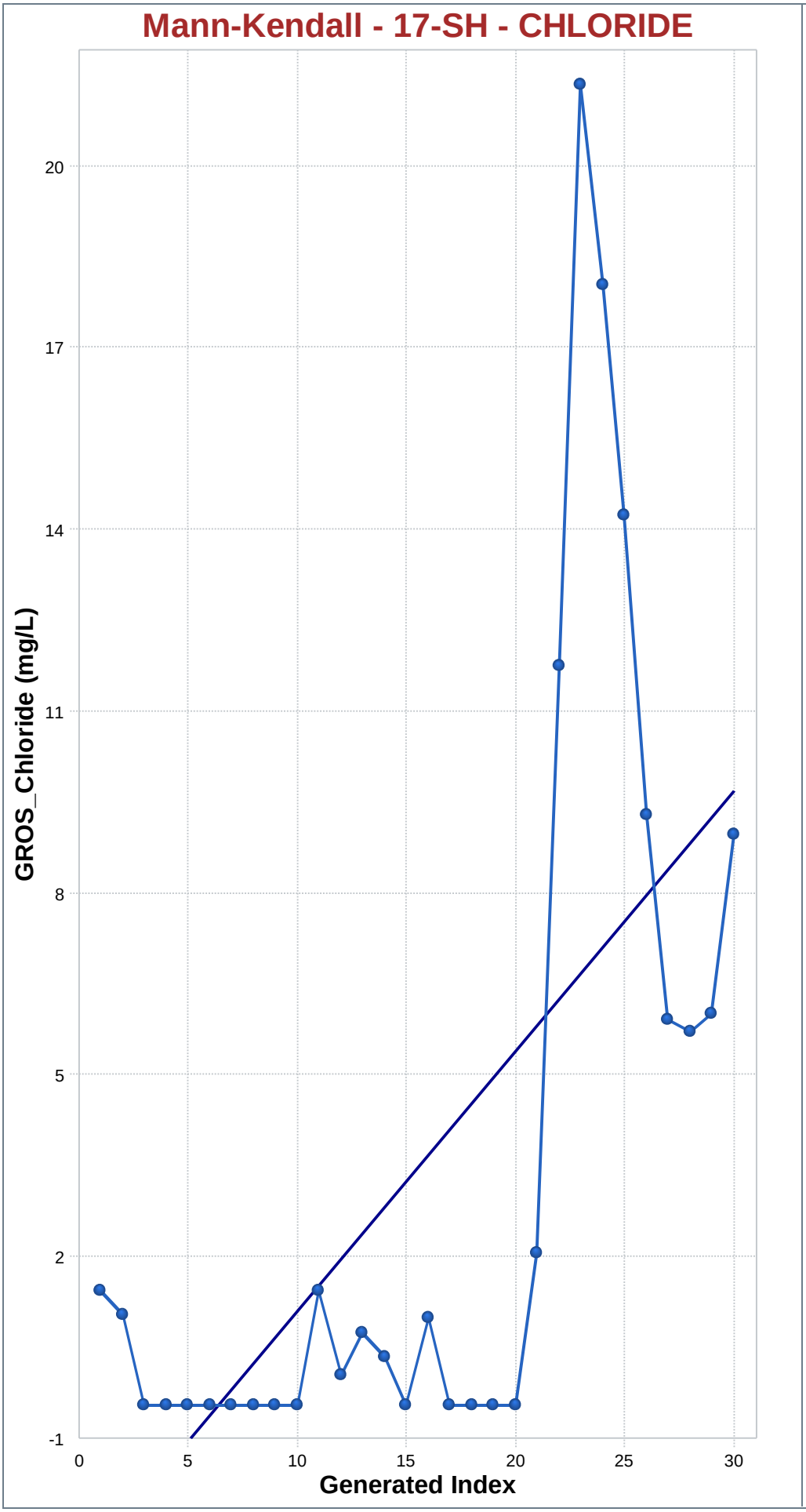

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0327 |
| Standardized Value of S | 2.9626 |
| M-K Test Value (S) | 167 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0015 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.7484 |
| OLS Regression Intercept | 70.3526 |

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




**Mann-Kendall Trend Analysis**

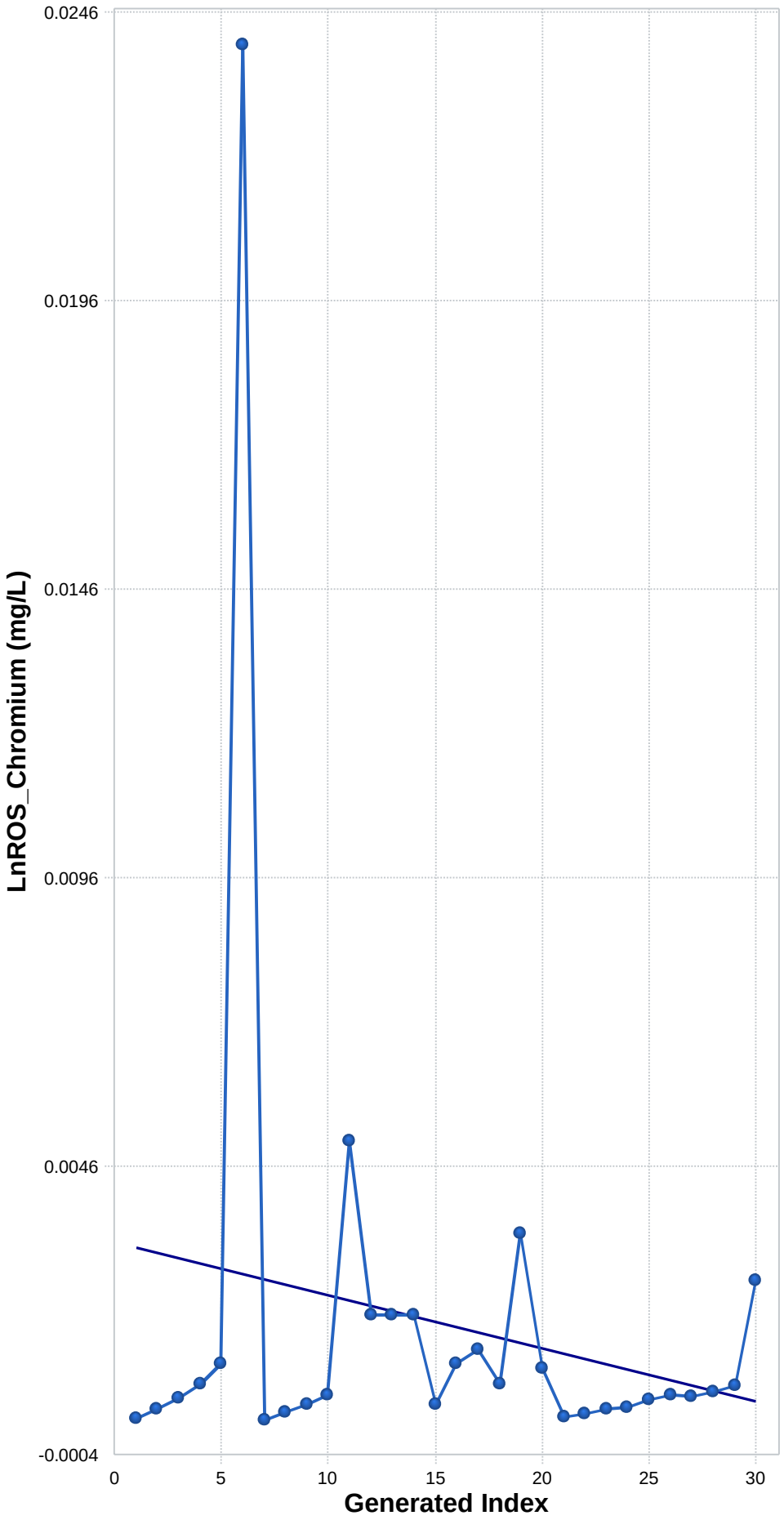
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.5910 |
| Standardized Value of S | 3.1908 |
| M-K Test Value (S) | 172 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0007 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.4307 |
| OLS Regression Intercept | -2.7669 |

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

# Mann-Kendall - 17-SH - CHROMIUM



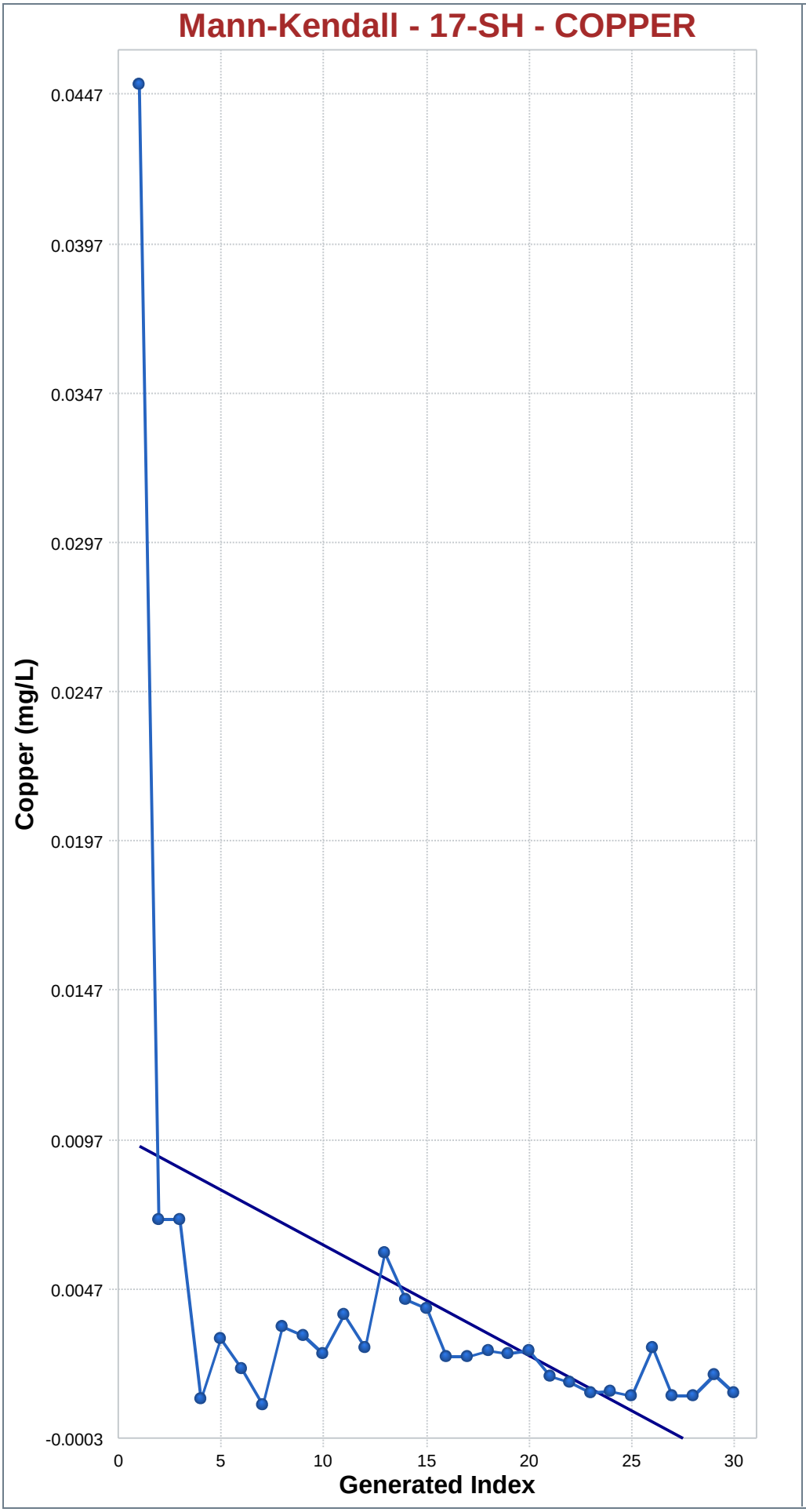

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0179 |
| Standardized Value of S | 0.5891 |
| M-K Test Value (S) | 34 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.2779 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0033 |

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



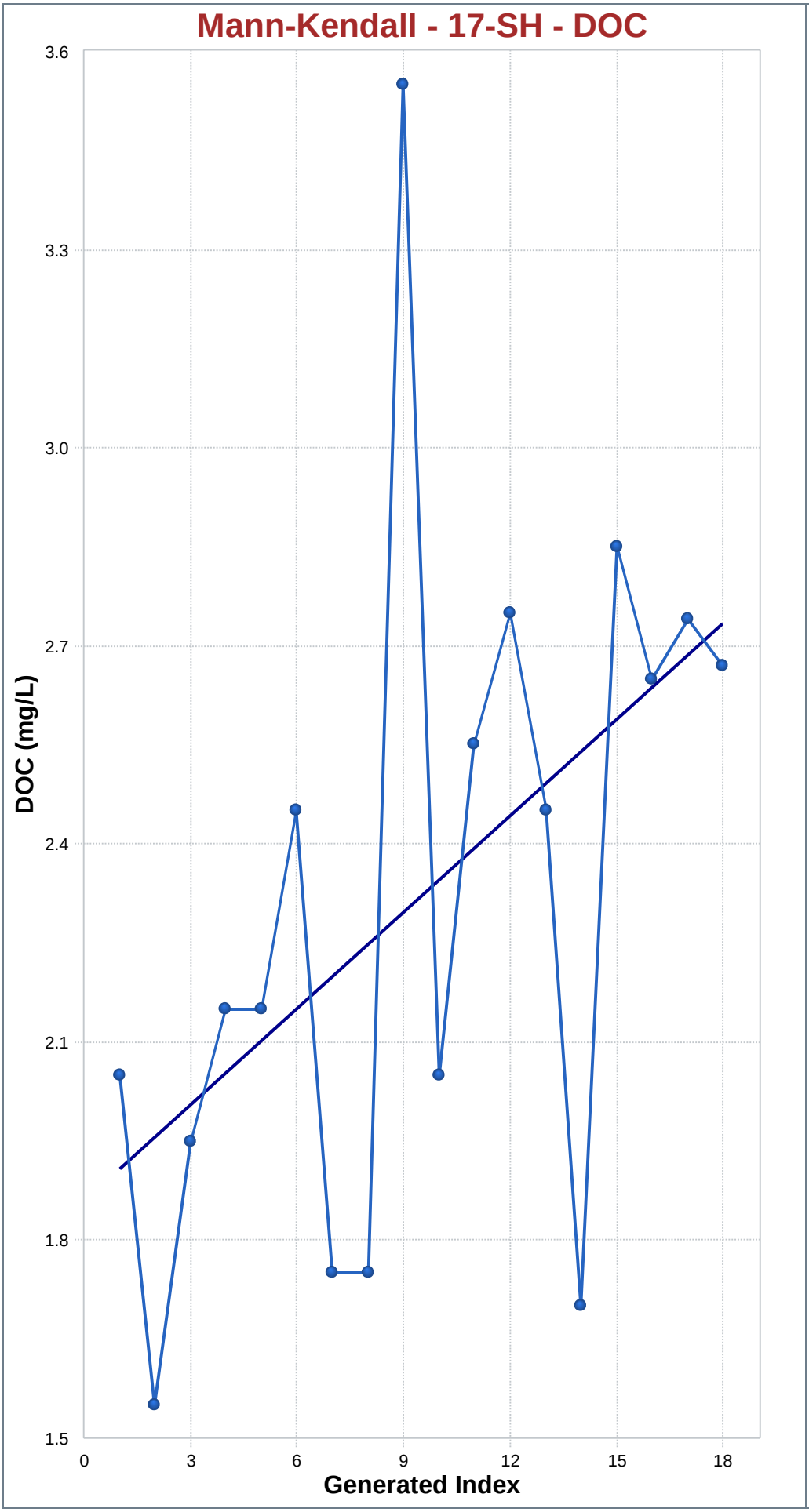

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0060 |
| Standardized Value of S | -3.3389 |
| M-K Test Value (S) | -188 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0004 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0004 |
| OLS Regression Intercept | 0.0098 |

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




**Mann-Kendall Trend Analysis**

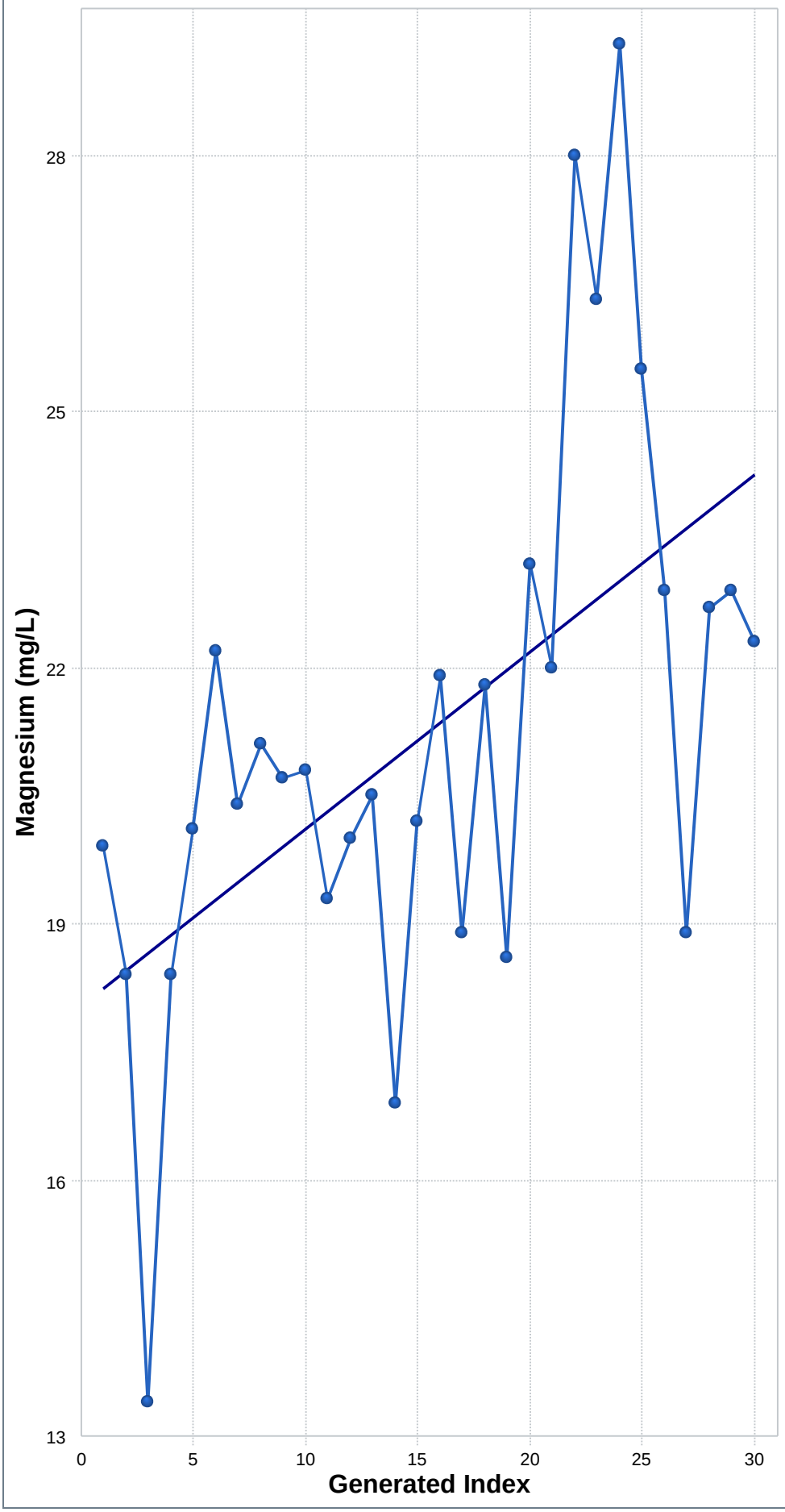
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3249 |
| Standardized Value of S | 2.2792 |
| M-K Test Value (S) | 61 |
| Tabulated p-value | 0.0110 |
| Approximate p-value | 0.0113 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0485 |
| OLS Regression Intercept | 1.9088 |

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

# Mann-Kendall - 17-SH - MAGNESIUM



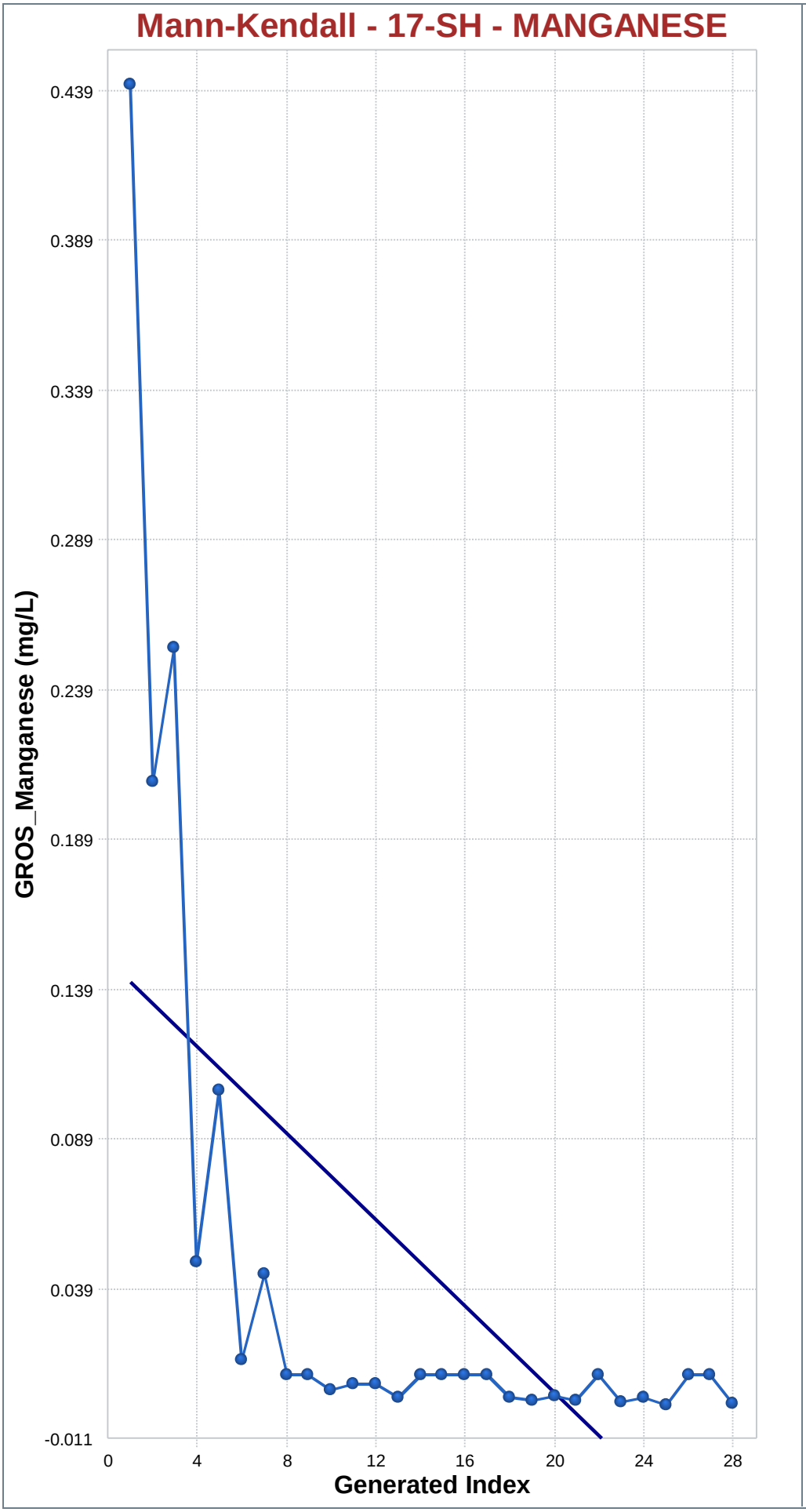

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0238 |
| Standardized Value of S | 3.2665 |
| M-K Test Value (S) | 184 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0005 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.2077 |
| OLS Regression Intercept | 18.2310 |

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




**Mann-Kendall Trend Analysis**

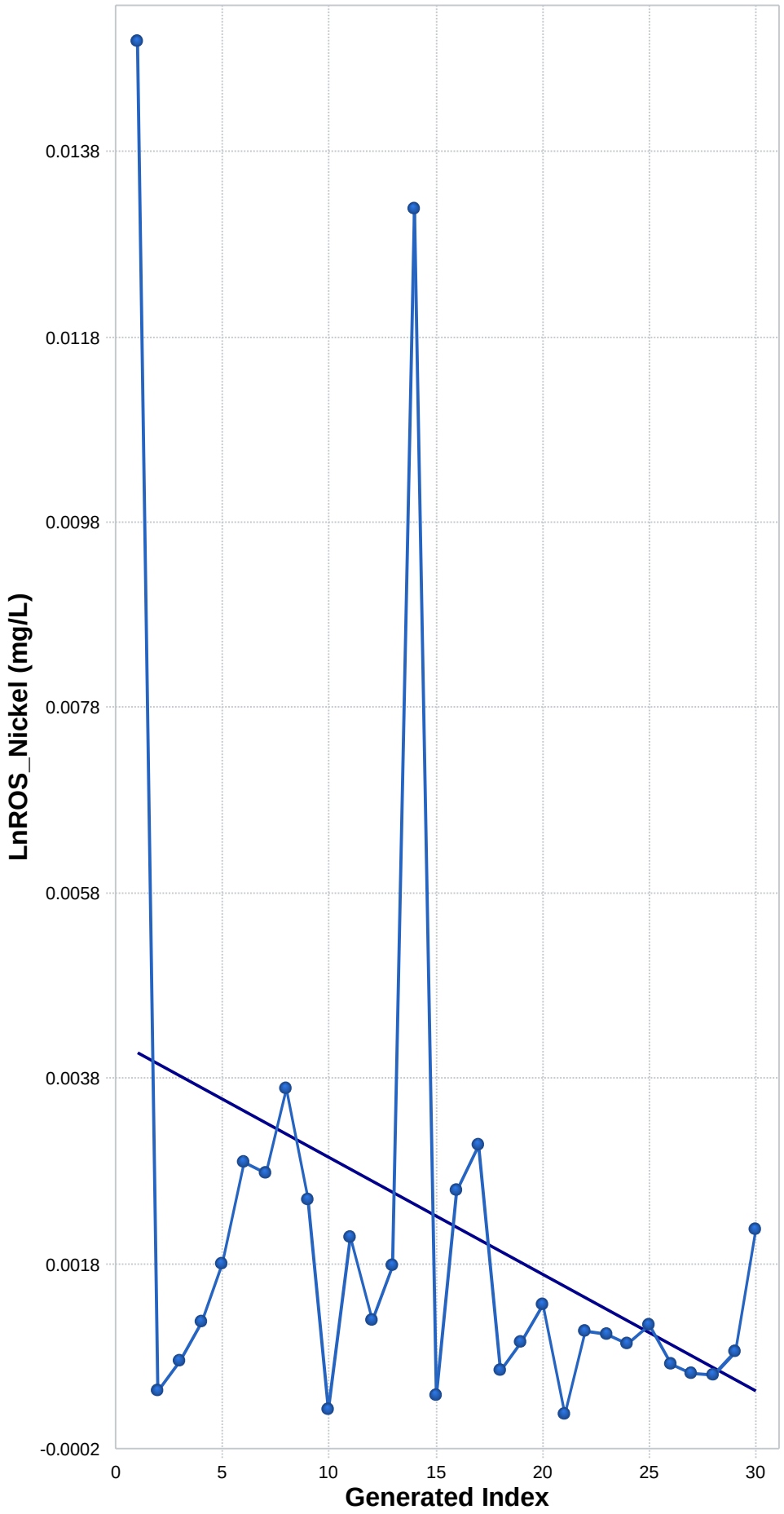
| | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 49.6890 |
| Standardized Value of S | -4.4678 |
| M-K Test Value (S) | -223 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0072 |
| OLS Regression Intercept | 0.1488 |

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

# Mann-Kendall - 17-SH - NICKEL



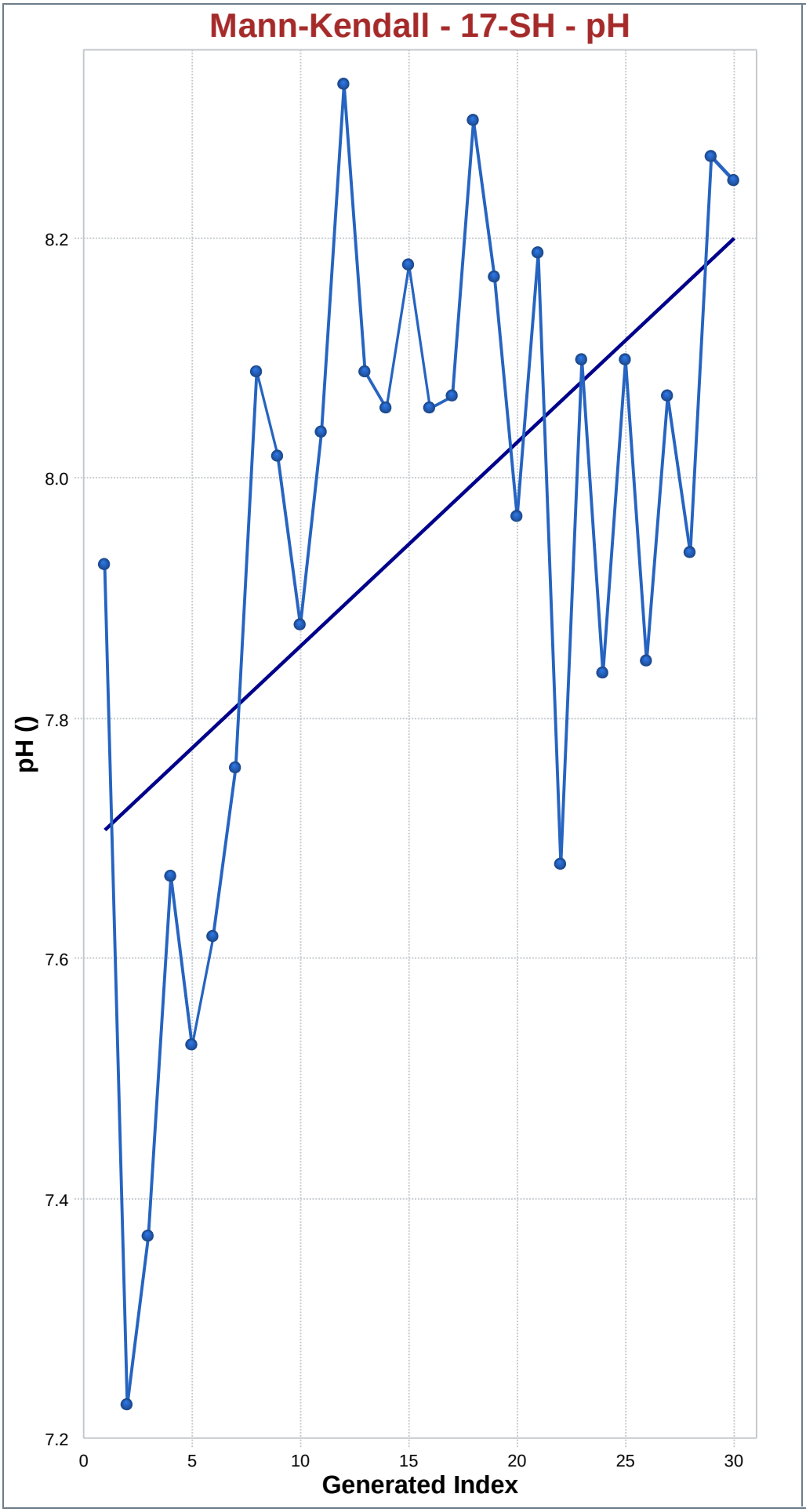

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0506 |
| Standardized Value of S | -1.9268 |
| M-K Test Value (S) | -109 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0270 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0042 |

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




**Mann-Kendall Trend Analysis**

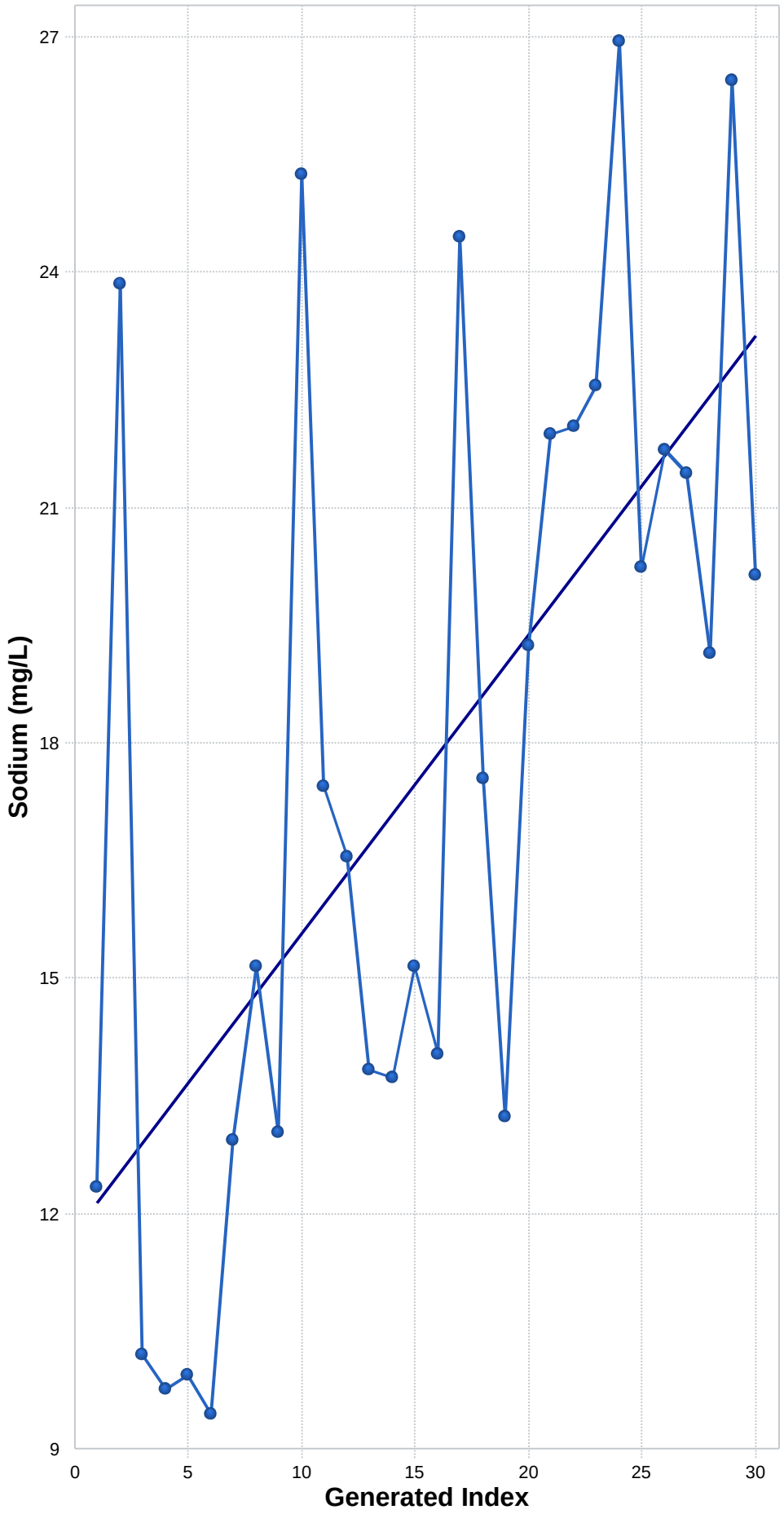
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0149 |
| Standardized Value of S | 2.9635 |
| M-K Test Value (S) | 167 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0015 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0170 |
| OLS Regression Intercept | 7.7120 |

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

# Mann-Kendall - 17-SH - SODIUM



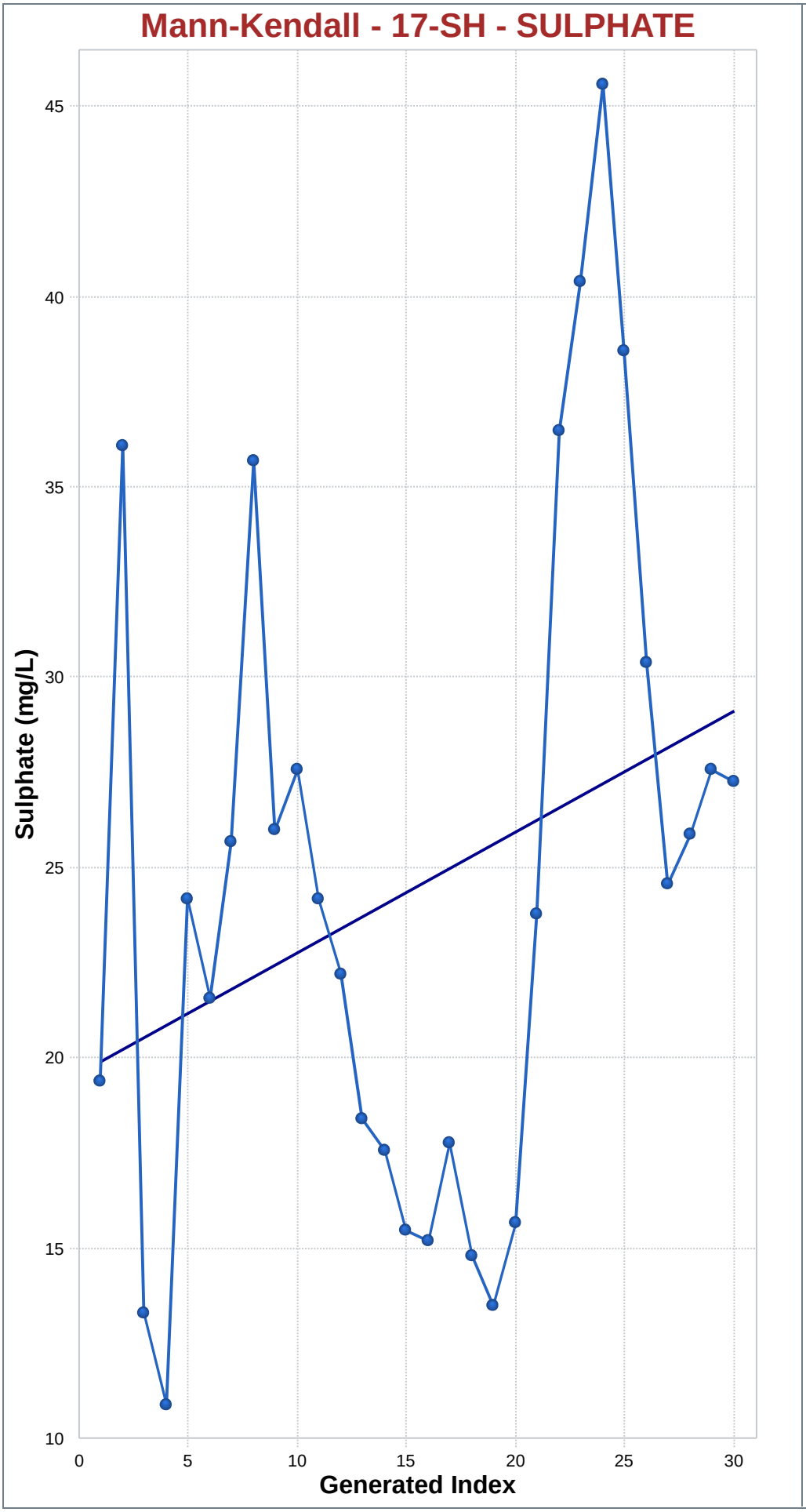

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0417 |
| Standardized Value of S | 3.6223 |
| M-K Test Value (S) | 204 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3813 |
| OLS Regression Intercept | 11.3062 |

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



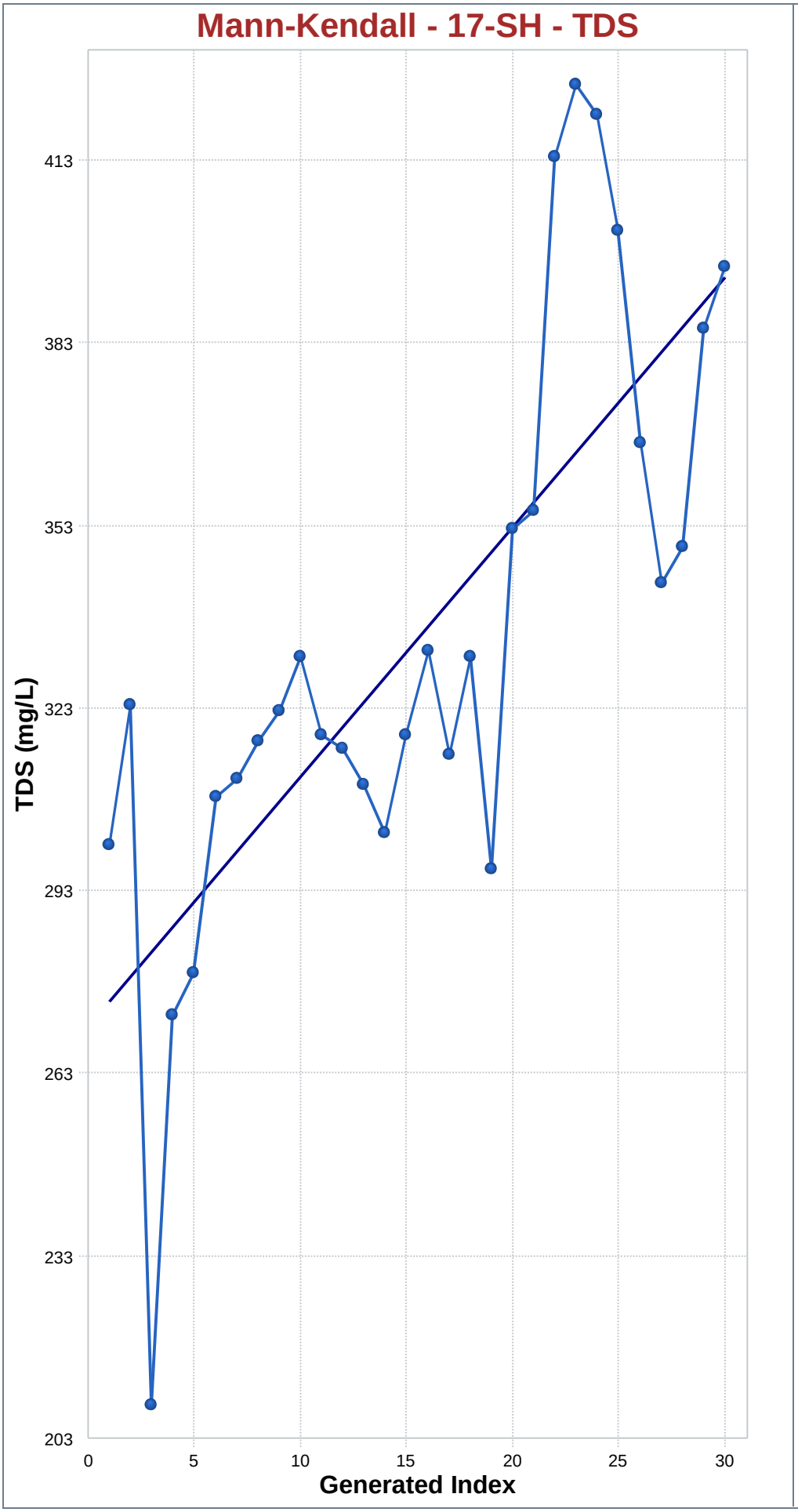

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0327 |
| Standardized Value of S | 1.3920 |
| M-K Test Value (S) | 79 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0820 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3184 |
| OLS Regression Intercept | 19.1011 |

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



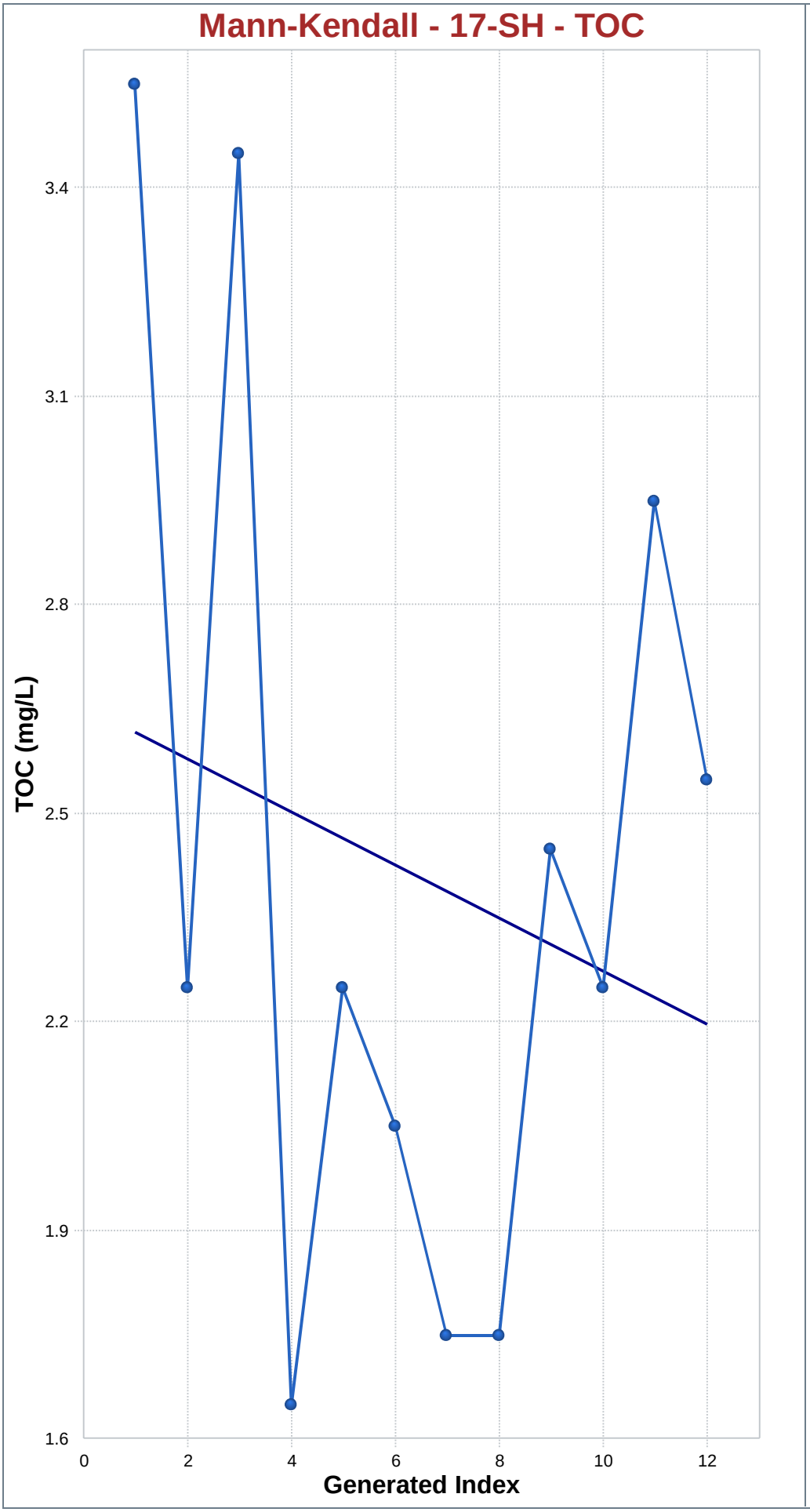

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0327 |
| Standardized Value of S | 4.4617 |
| M-K Test Value (S) | 251 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 4.0990 |
| OLS Regression Intercept | 270.2322 |

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



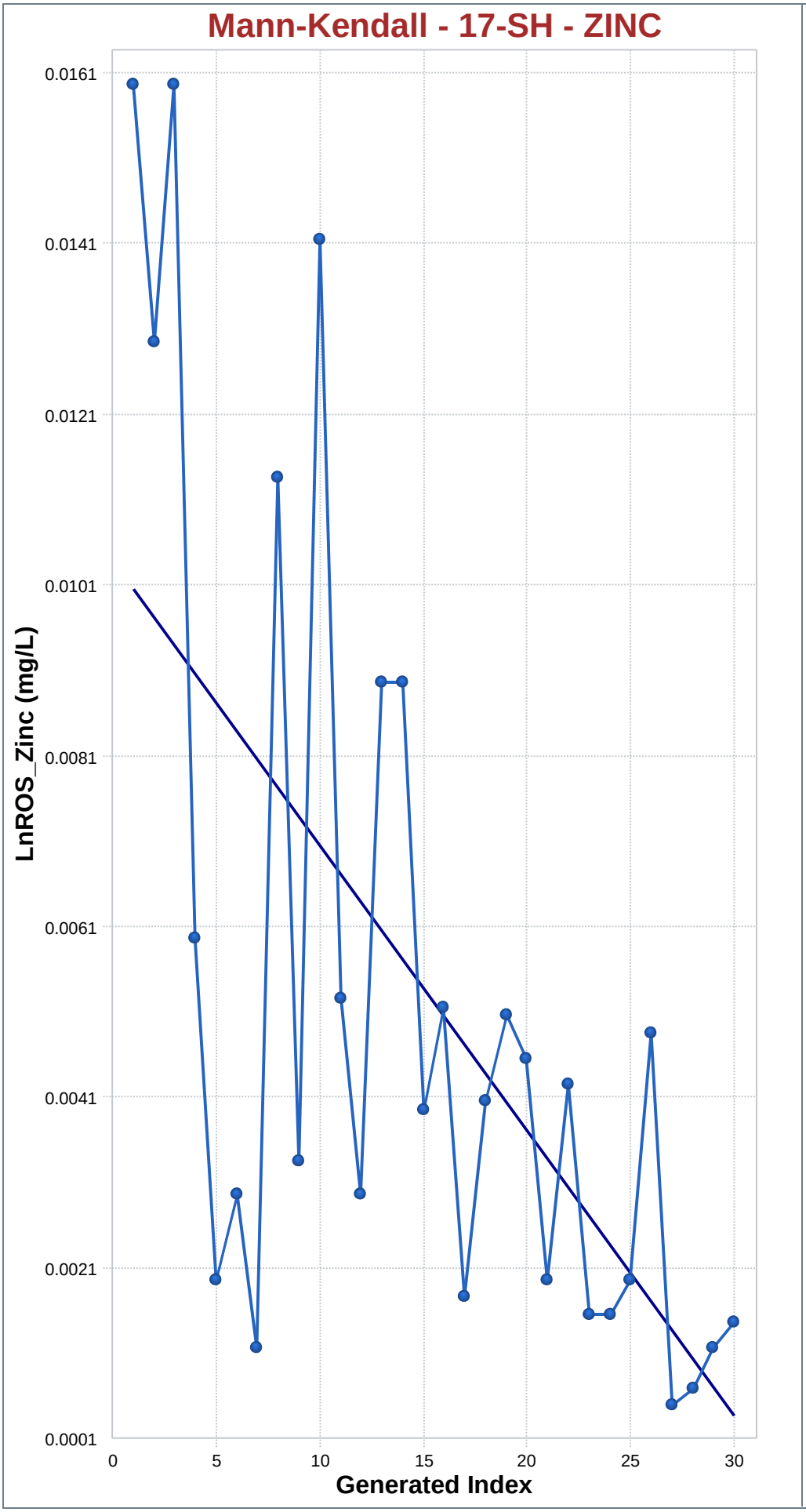

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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.



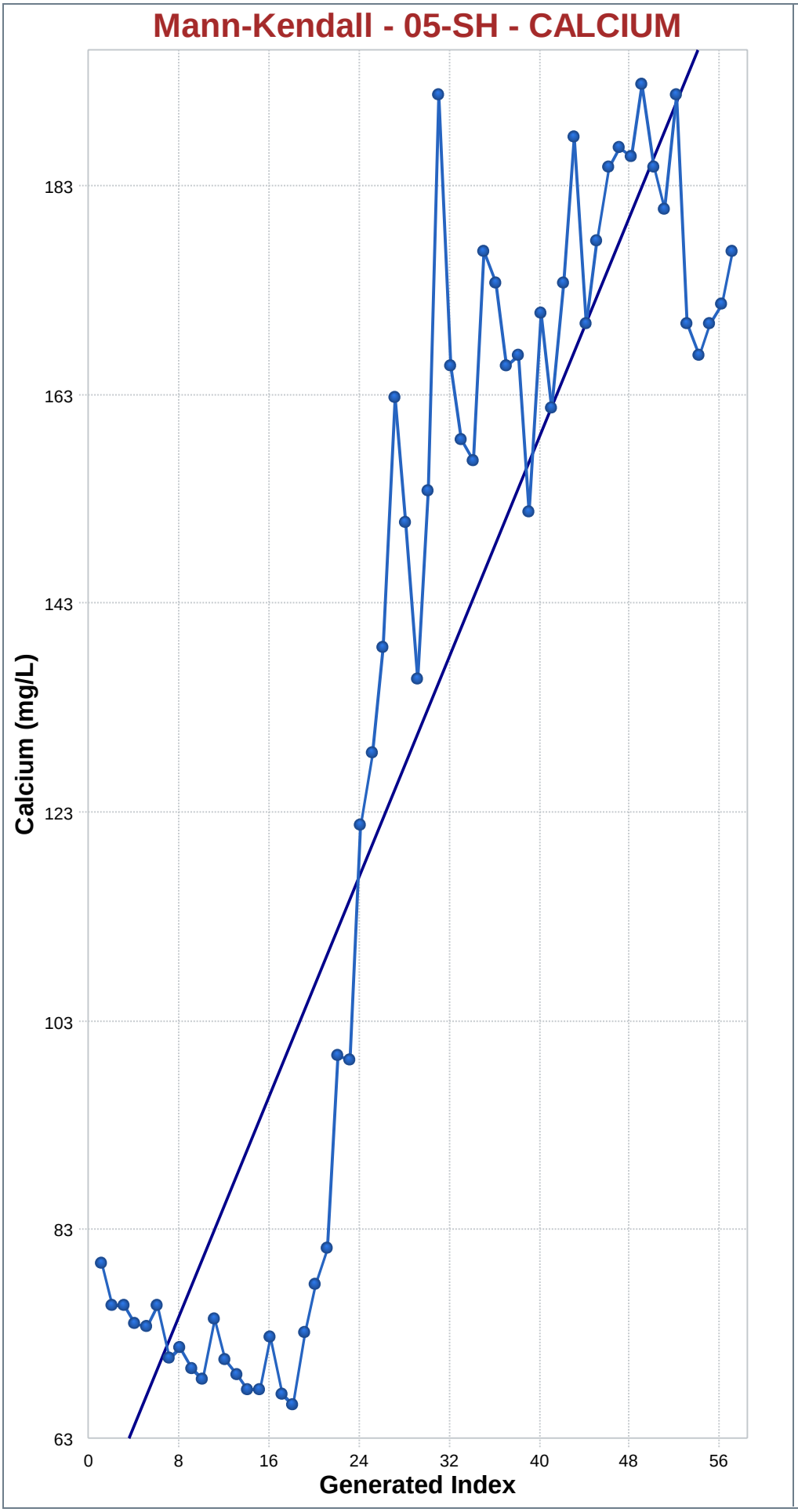

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 55.9732 |
| Standardized Value of S | -3.7161 |
| M-K Test Value (S) | -209 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0003 |
| OLS Regression Intercept | 0.0104 |

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



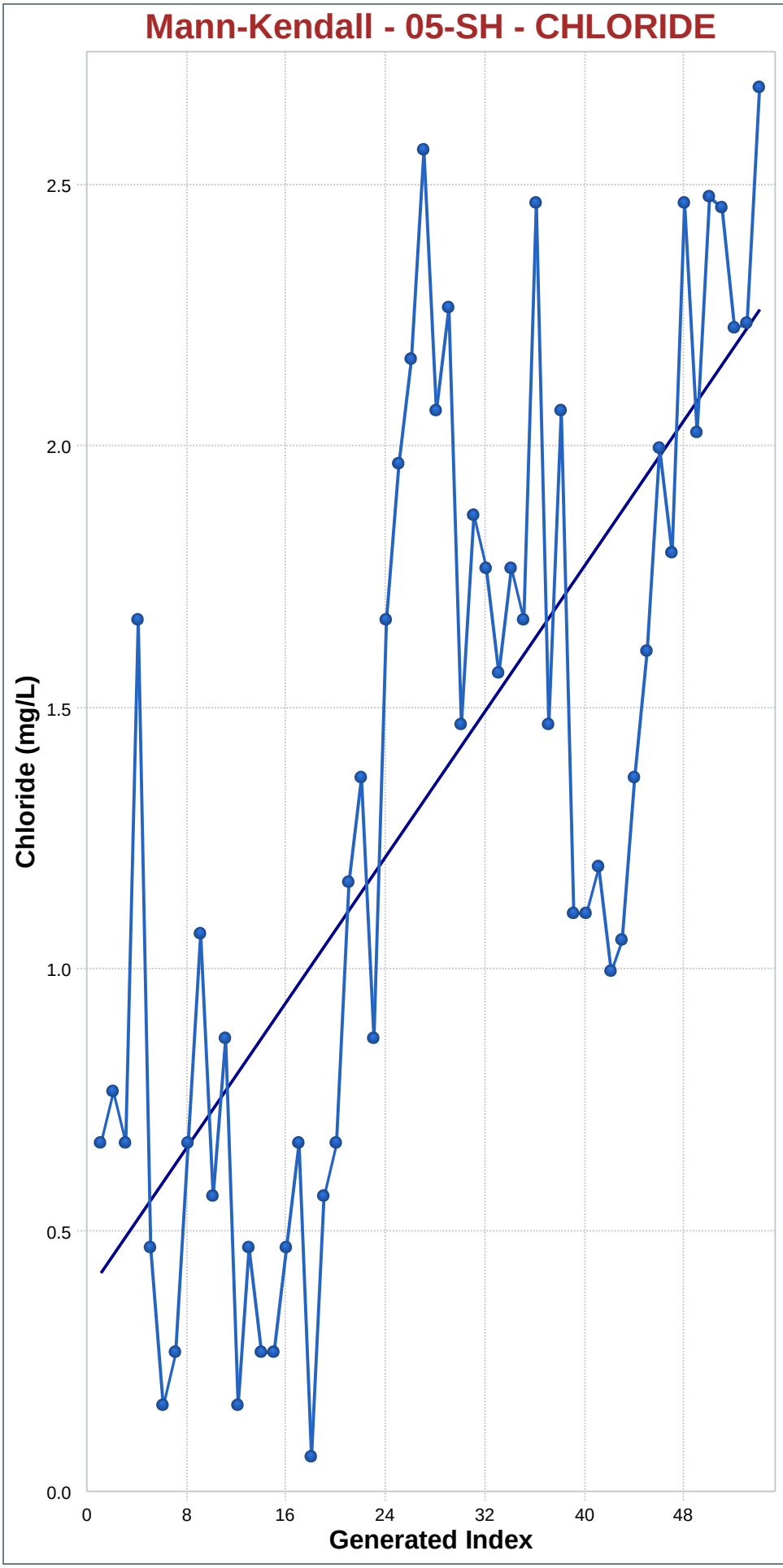

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.2182 |
| Standardized Value of S | 7.0515 |
| 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 | 2.6385 |
| OLS Regression Intercept | 54.0228 |

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




**Mann-Kendall Trend Analysis**

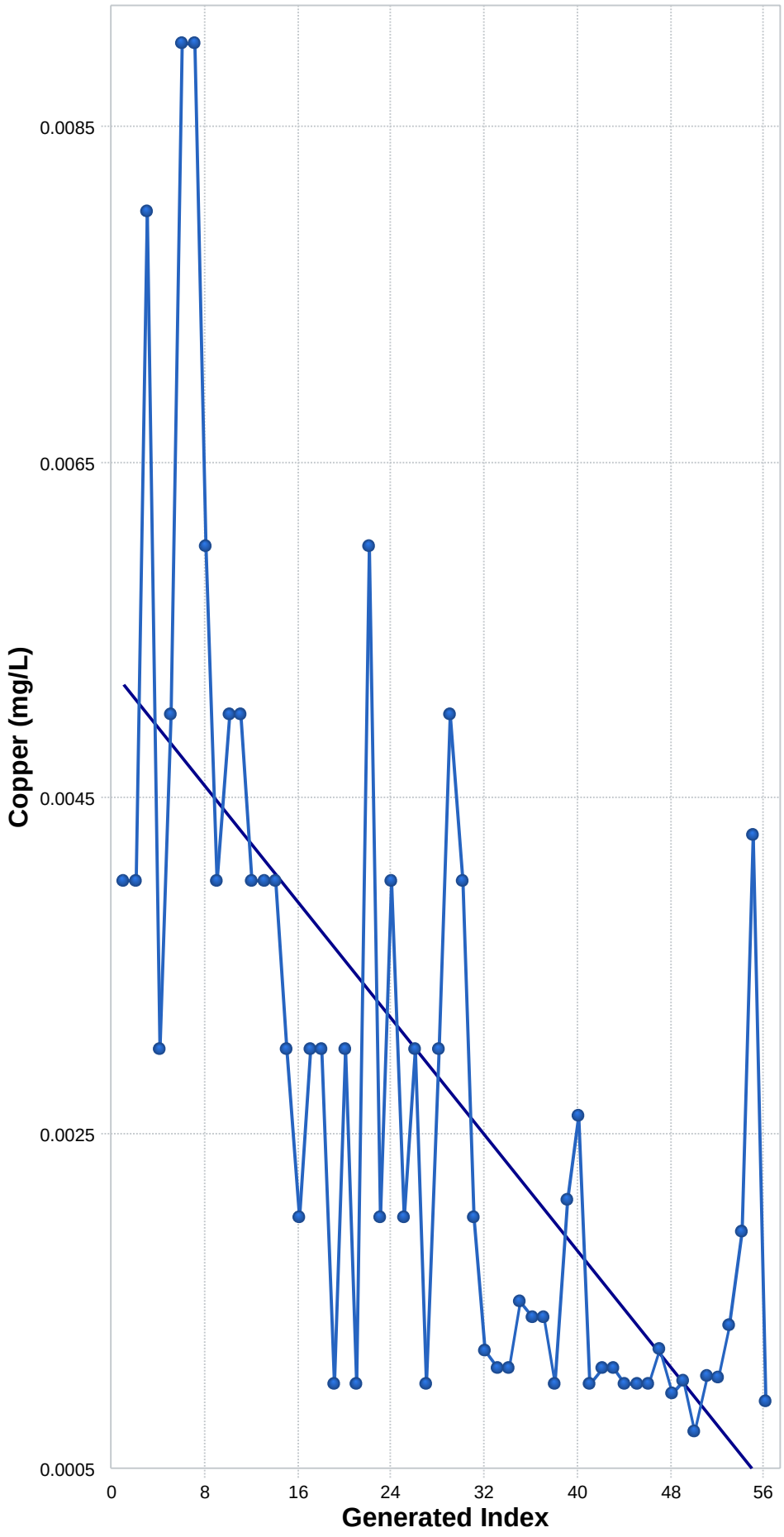
| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.9042 |
| Standardized Value of S | 5.4069 |
| M-K Test Value (S) | 725 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0347 |
| OLS Regression Intercept | 0.4194 |

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

# Mann-Kendall - 05-SH - COPPER



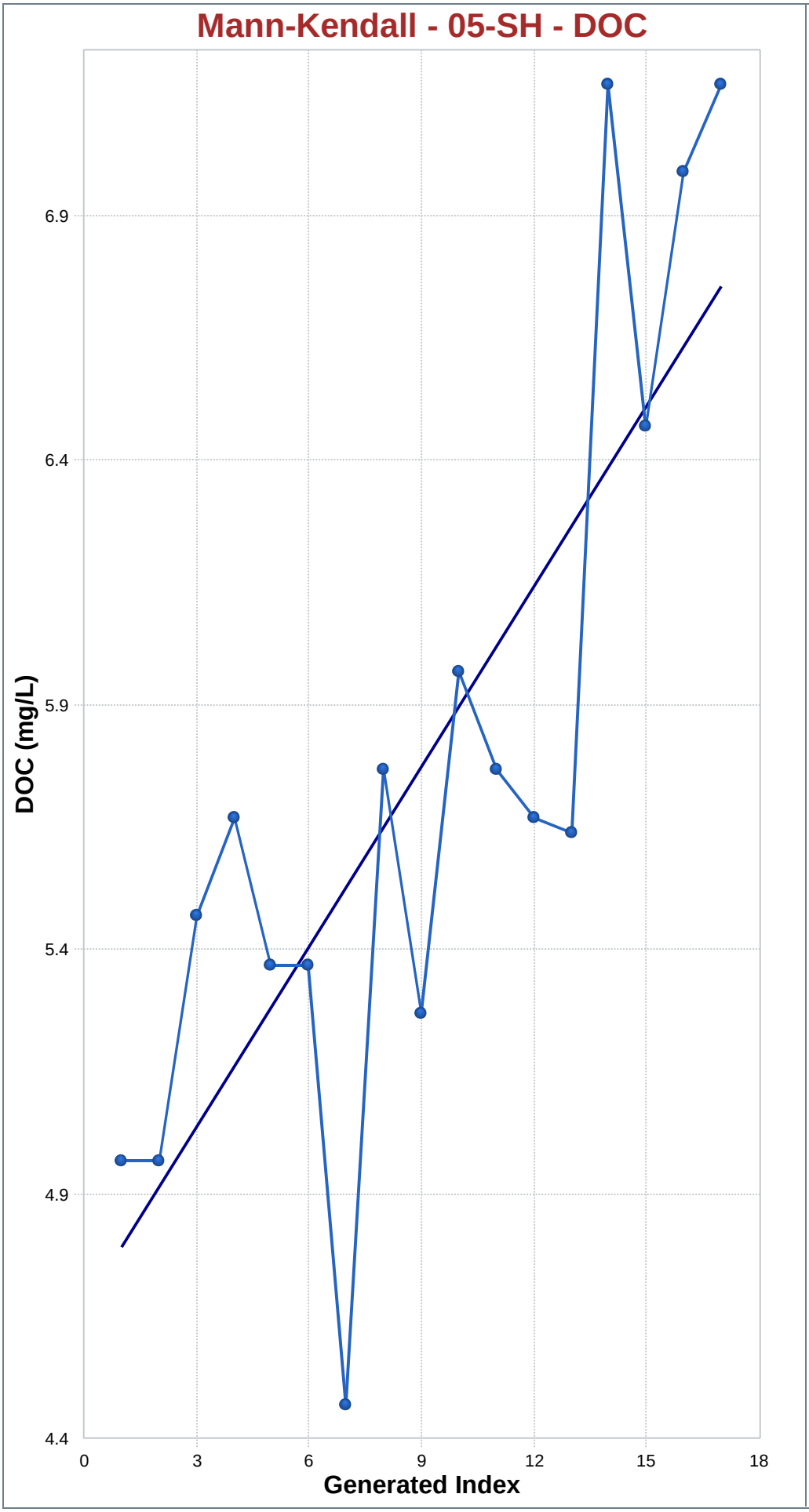

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 140.7693 |
| Standardized Value of S | -5.8322 |
| M-K Test Value (S) | -822 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0053 |

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



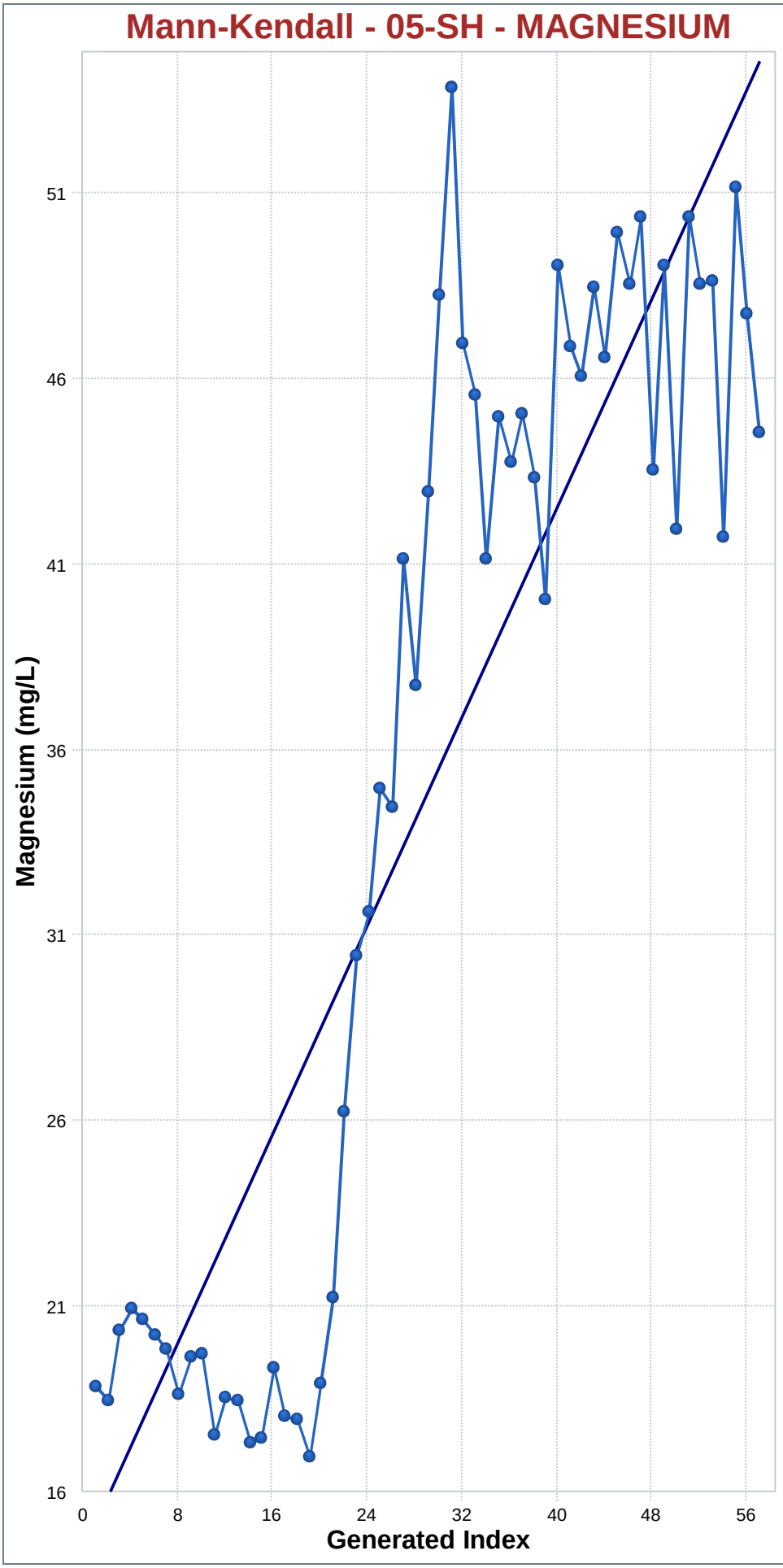

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 17 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 24.1730 |
| Standardized Value of S | 3.2267 |
| M-K Test Value (S) | 79 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0006 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1226 |
| OLS Regression Intercept | 4.7019 |

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




**Mann-Kendall Trend Analysis**

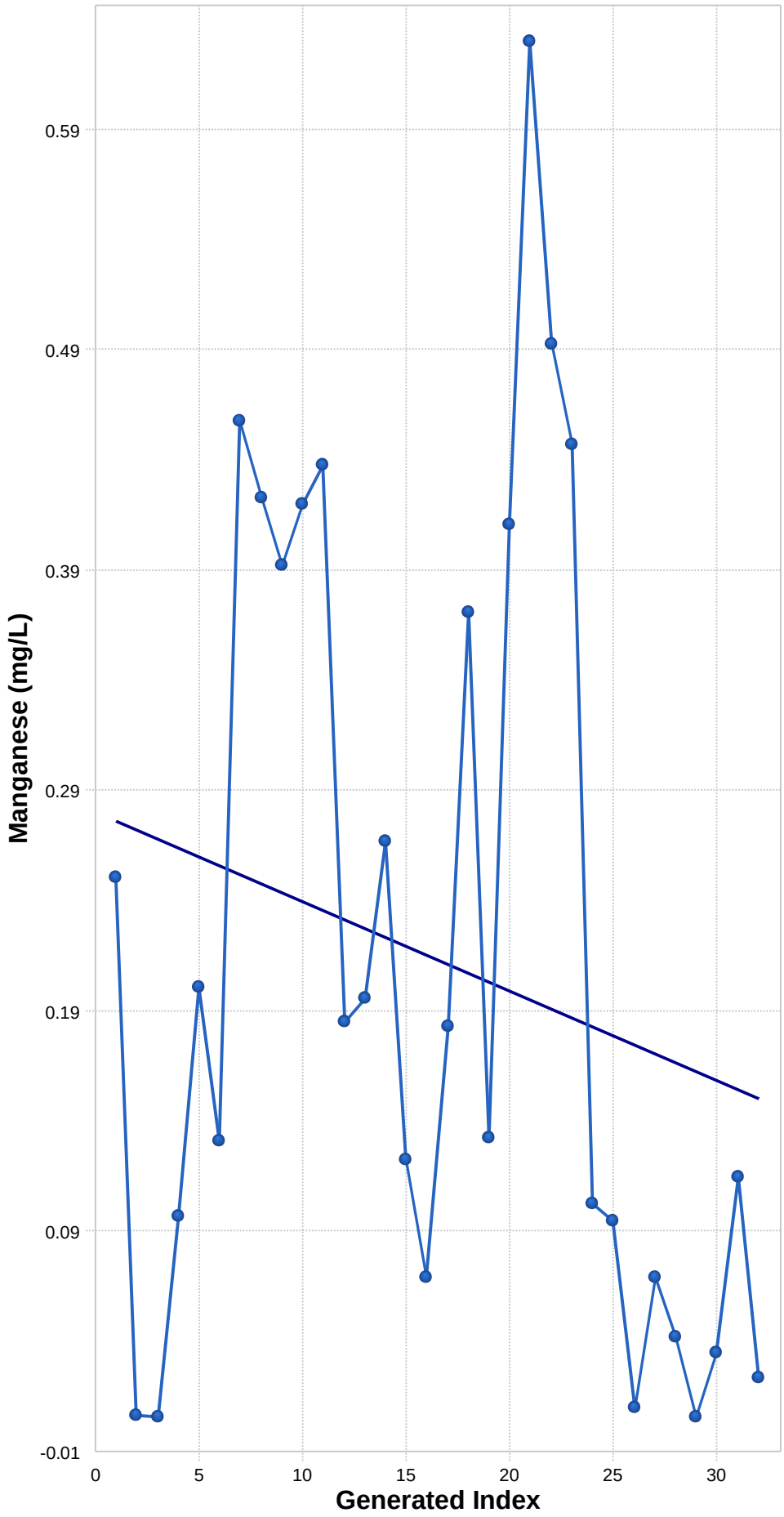
| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.2504 |
| Standardized Value of S | 6.6506 |
| M-K Test Value (S) | 967 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.7052 |
| OLS Regression Intercept | 14.4210 |

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

# Mann-Kendall - 05-SH - MANGANESE



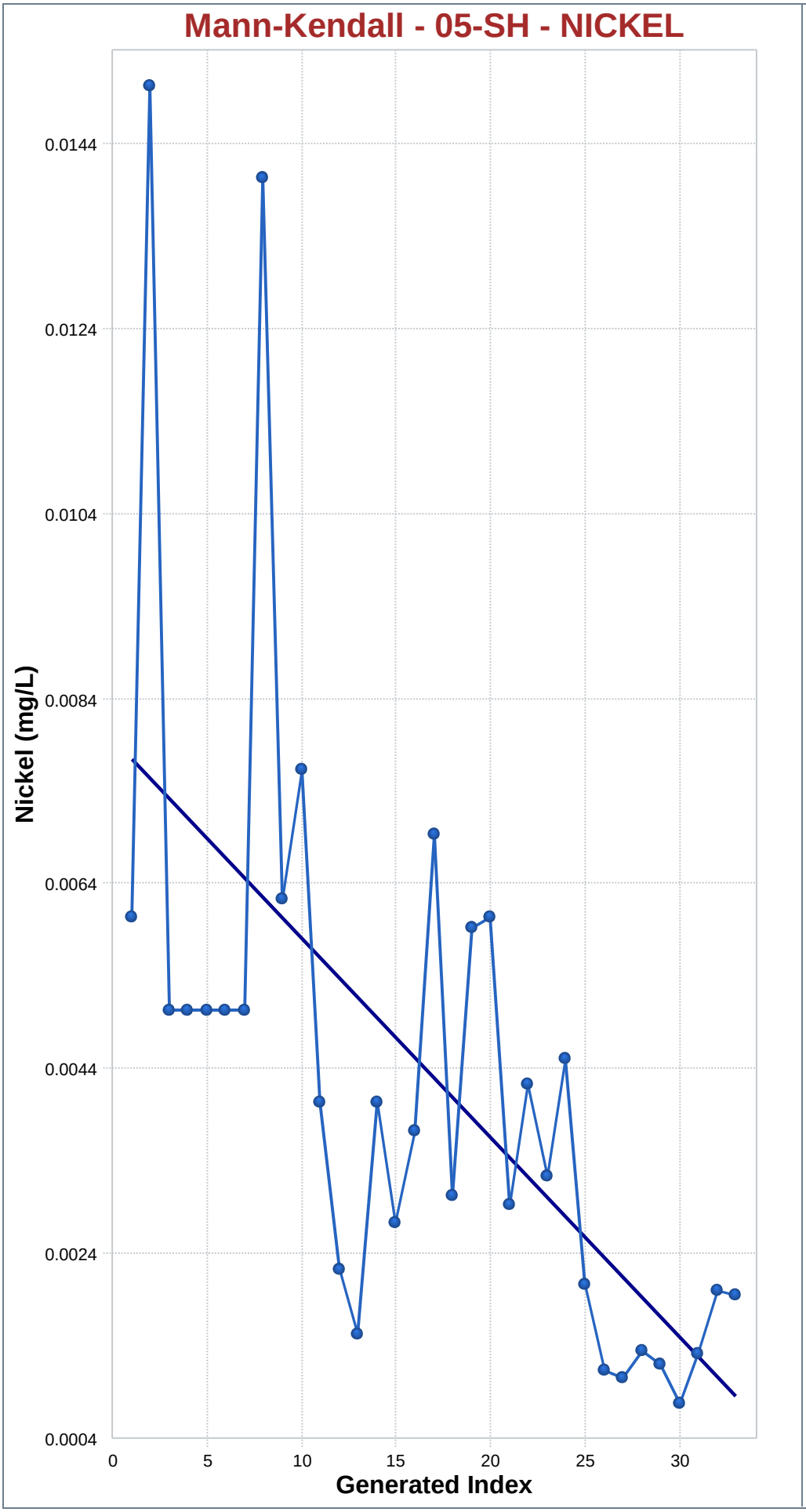

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6577 |
| Standardized Value of S | -1.6543 |
| M-K Test Value (S) | -103 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0490 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0041 |
| OLS Regression Intercept | 0.2754 |

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



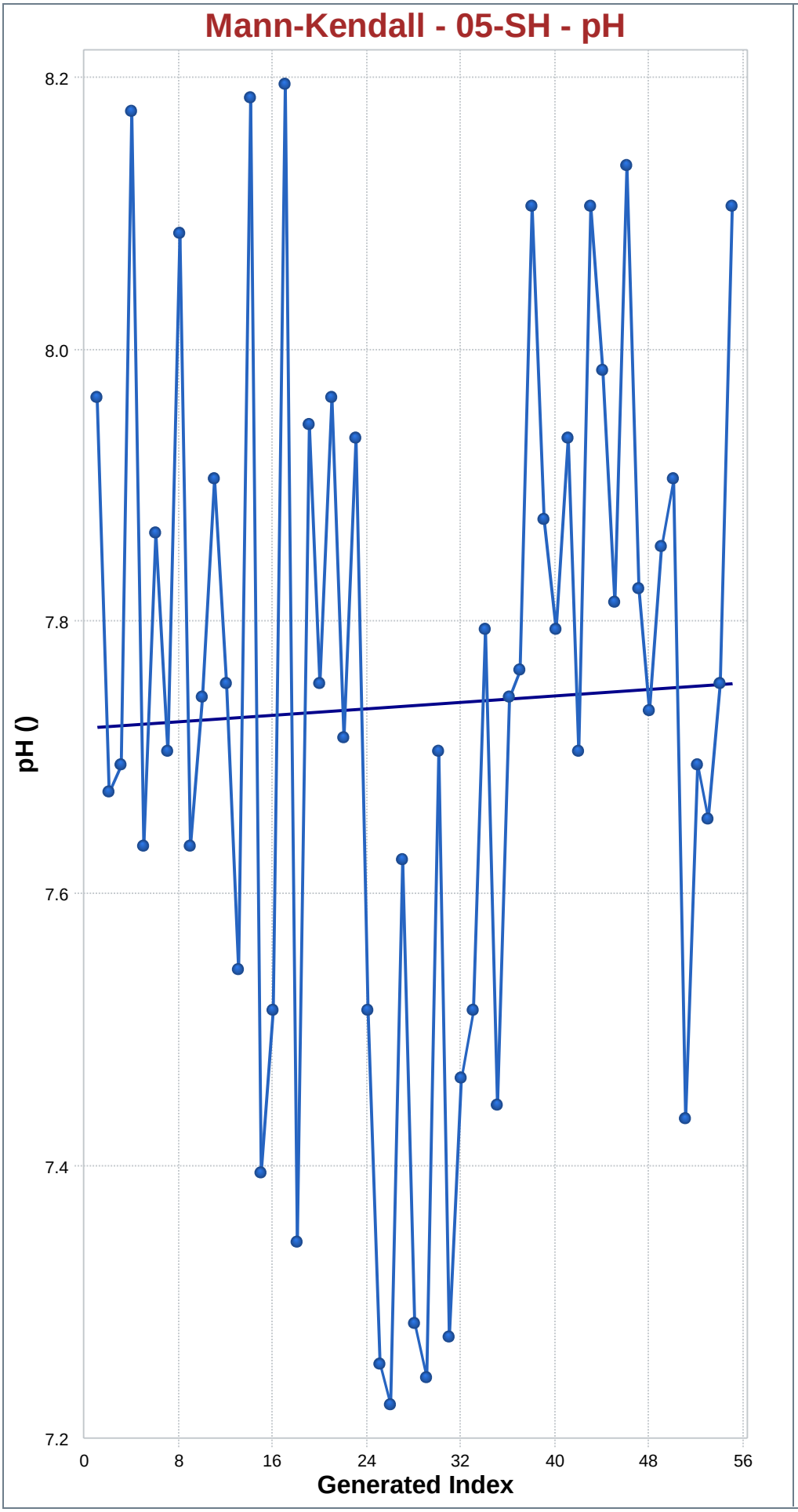

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 33 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 64.3946 |
| Standardized Value of S | -4.3637 |
| M-K Test Value (S) | -282 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0079 |

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




**Mann-Kendall Trend Analysis**

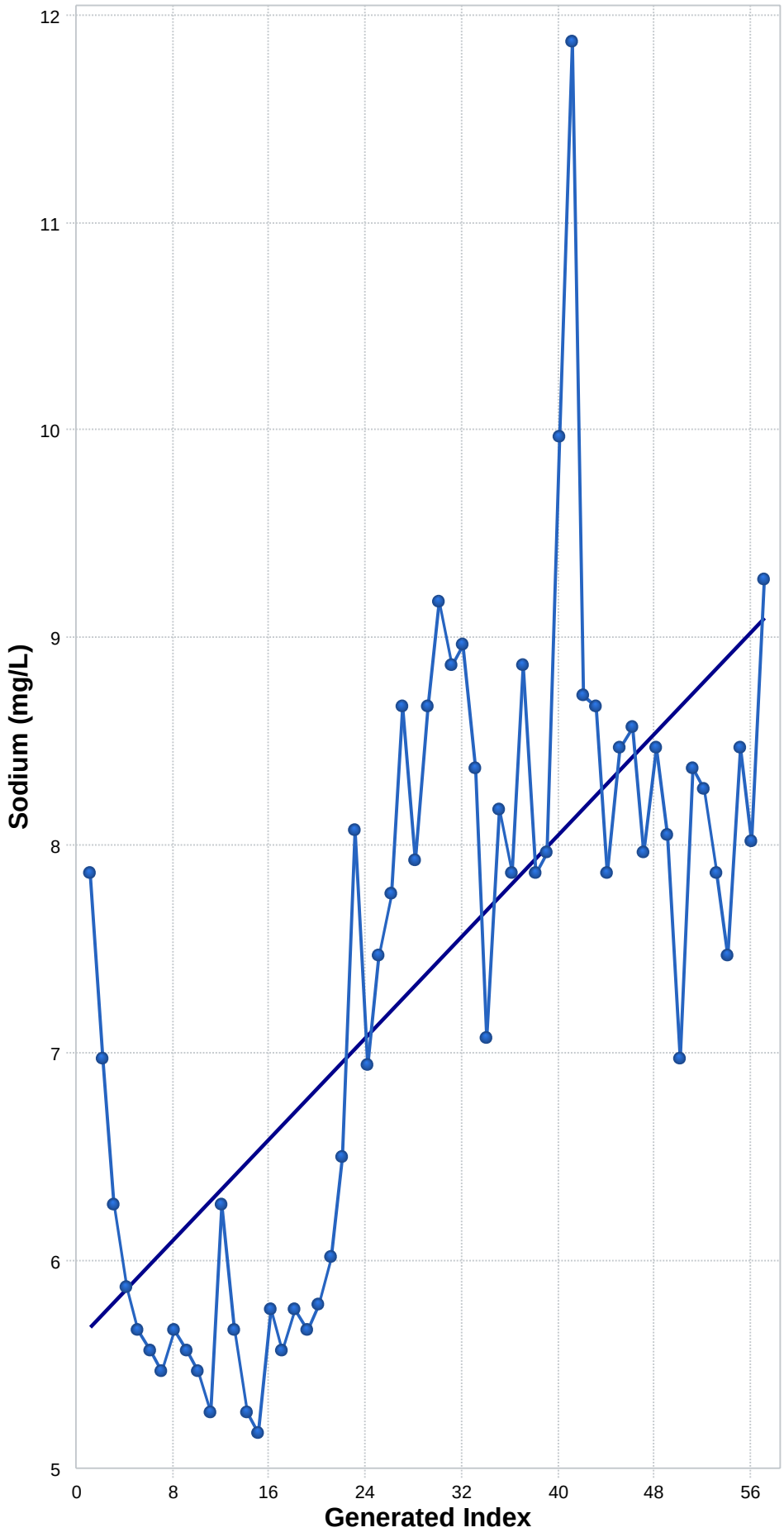
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.6711 |
| Standardized Value of S | 0.4721 |
| M-K Test Value (S) | 66 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3184 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0006 |
| OLS Regression Intercept | 7.7269 |

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

# Mann-Kendall - 05-SH - SODIUM



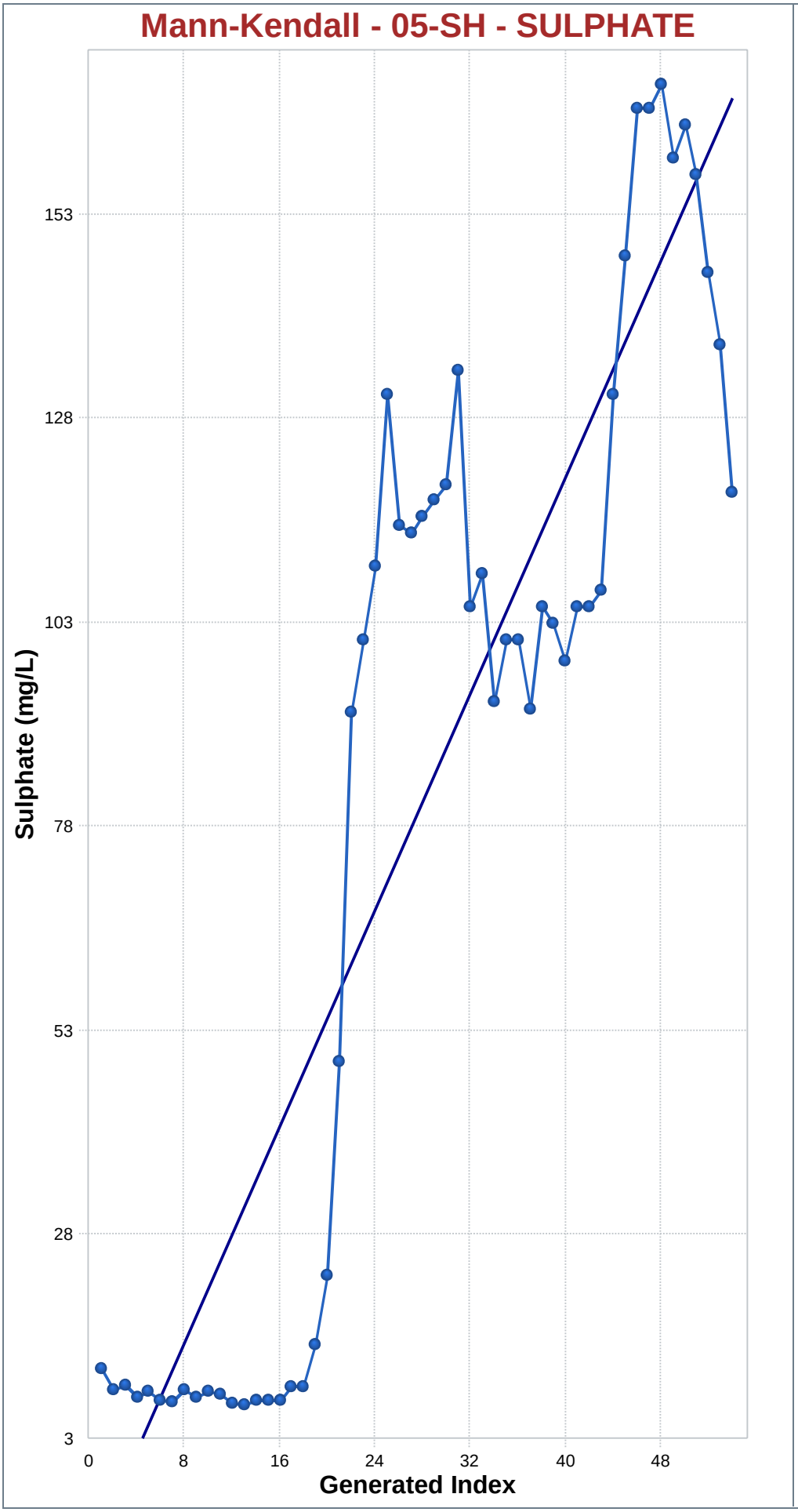

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.1115 |
| Standardized Value of S | 5.1064 |
| M-K Test Value (S) | 742 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0611 |
| OLS Regression Intercept | 5.5481 |

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



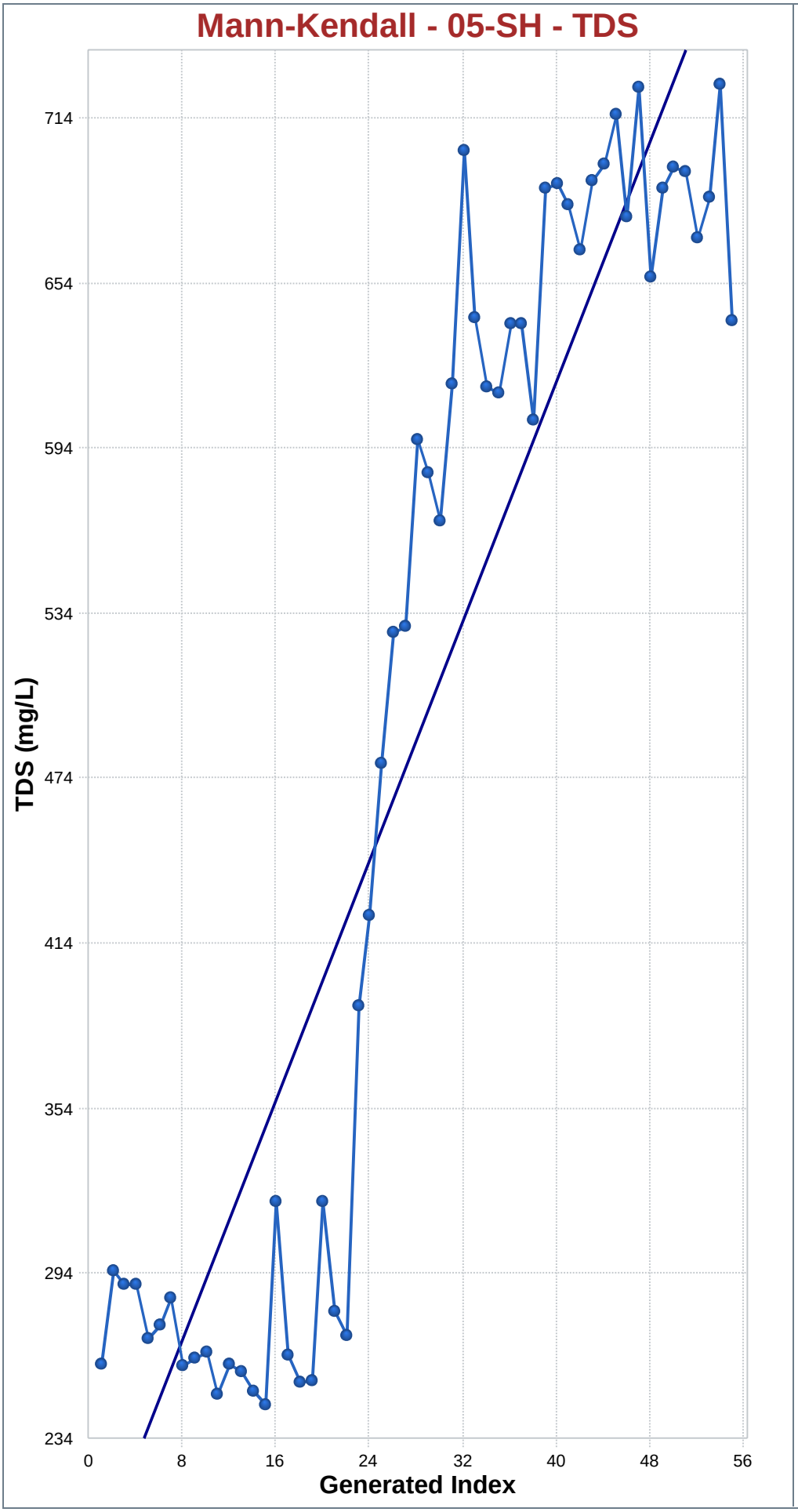

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.9764 |
| Standardized Value of S | 6.6430 |
| M-K Test Value (S) | 891 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 3.3205 |
| OLS Regression Intercept | -12.0402 |

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



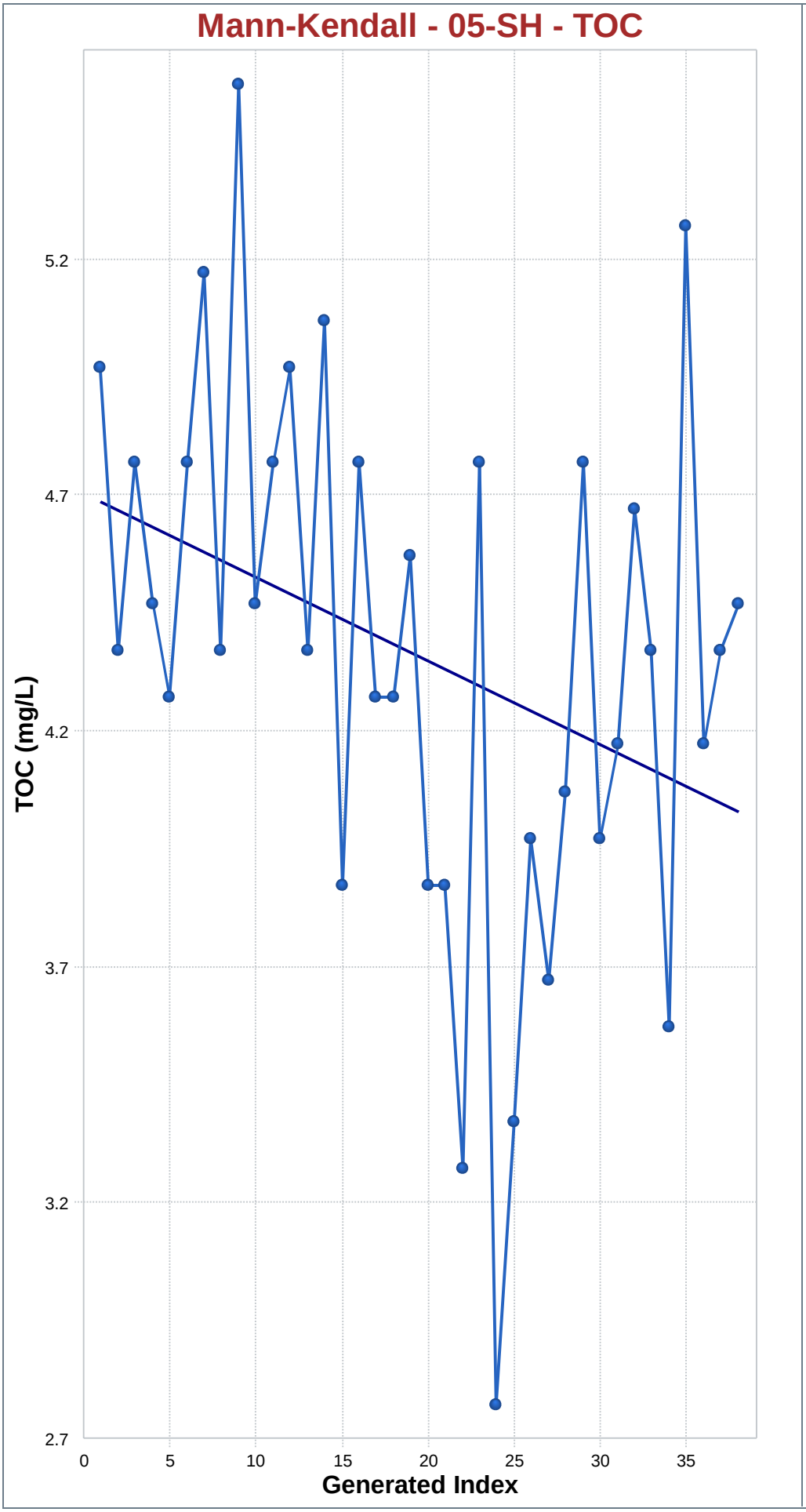

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.7316 |
| Standardized Value of S | 7.2532 |
| M-K Test Value (S) | 1,000 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 10.8823 |
| OLS Regression Intercept | 183.3313 |

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



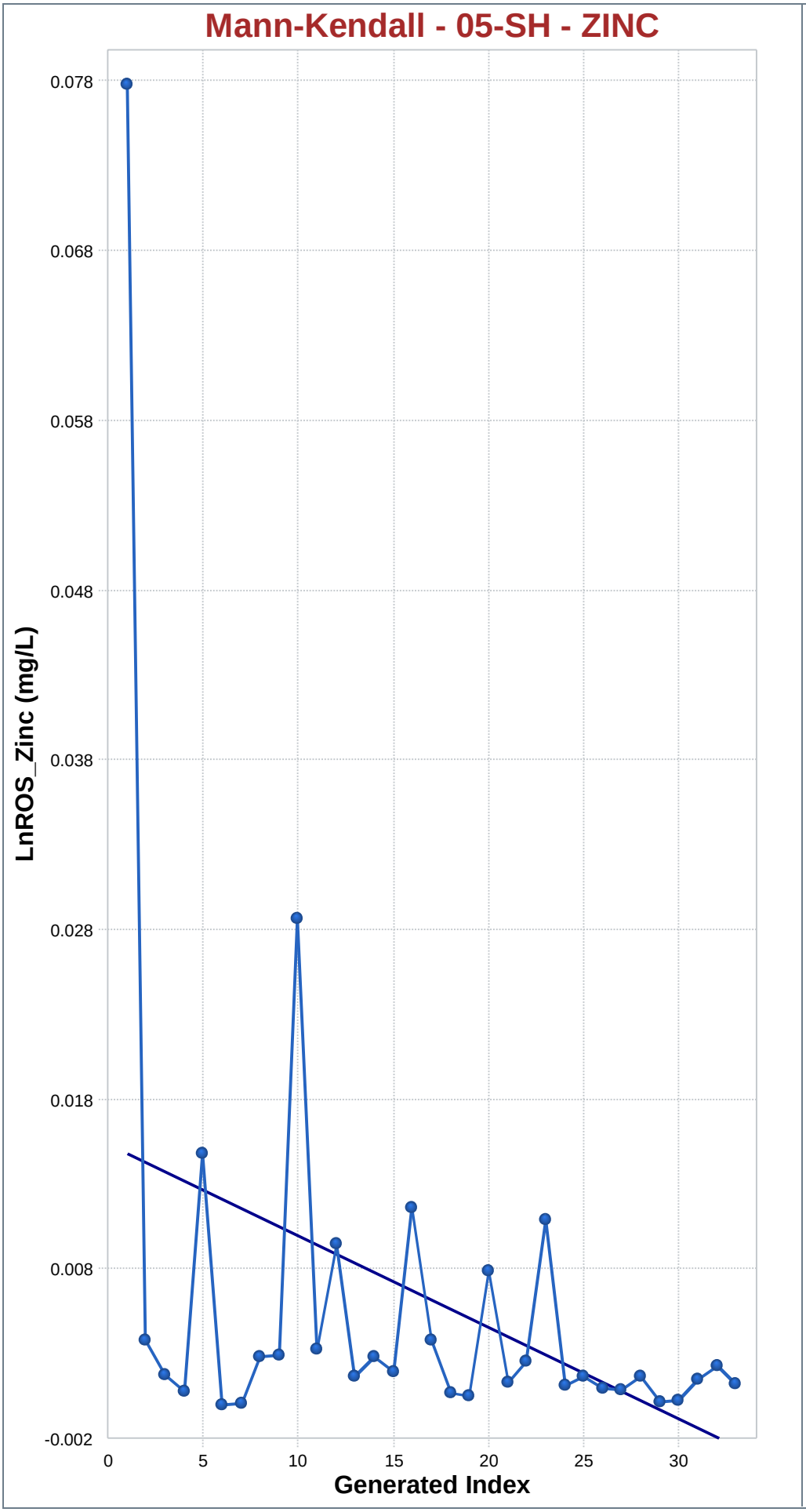

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

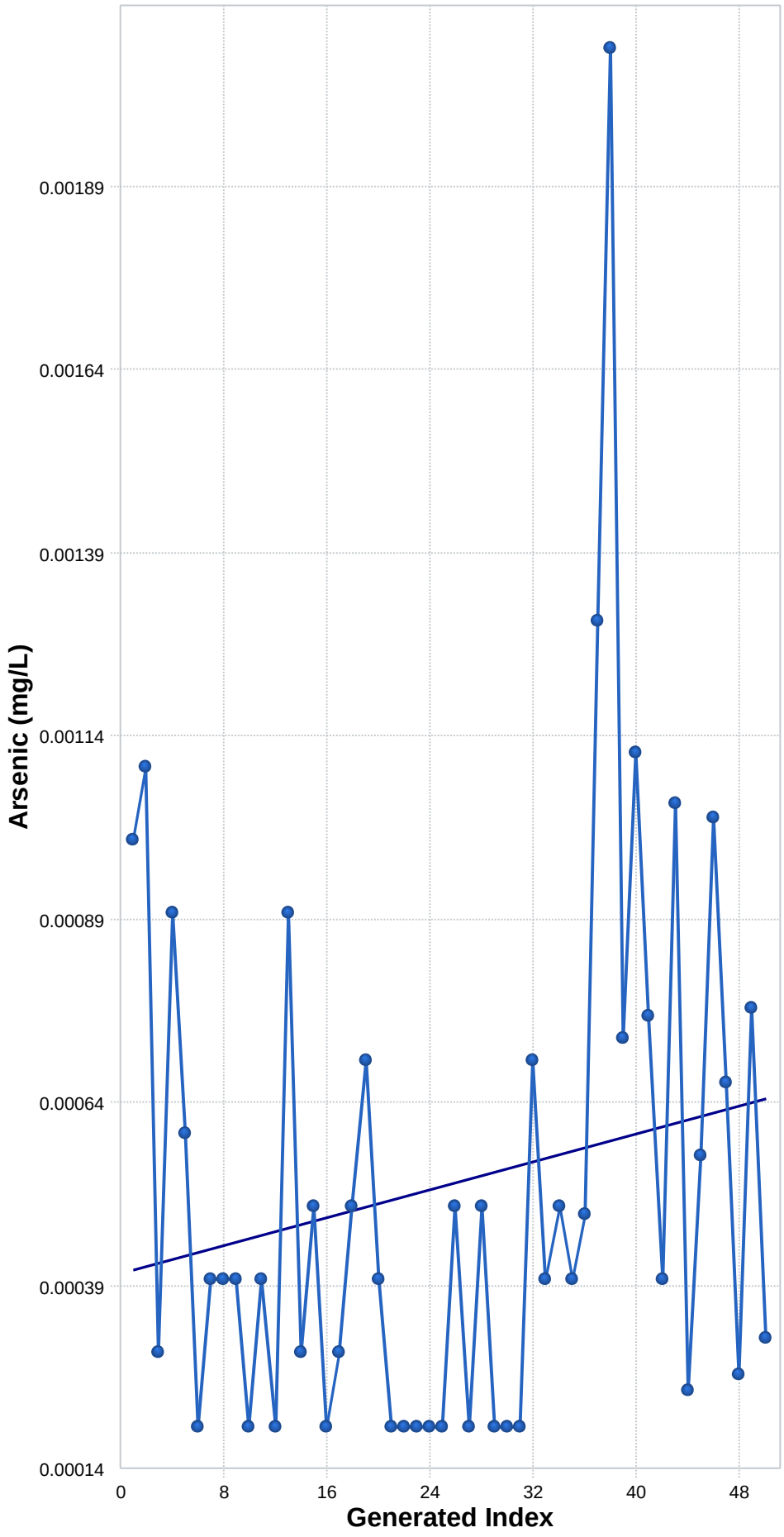
| | |
|---|---|
| n | 33 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 64.4955 |
| Standardized Value of S | -2.0777 |
| M-K Test Value (S) | -135 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0189 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0005 |
| OLS Regression Intercept | 0.0155 |

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

# Mann-Kendall - 06-SH - ARSENIC




**Mann-Kendall Trend Analysis**

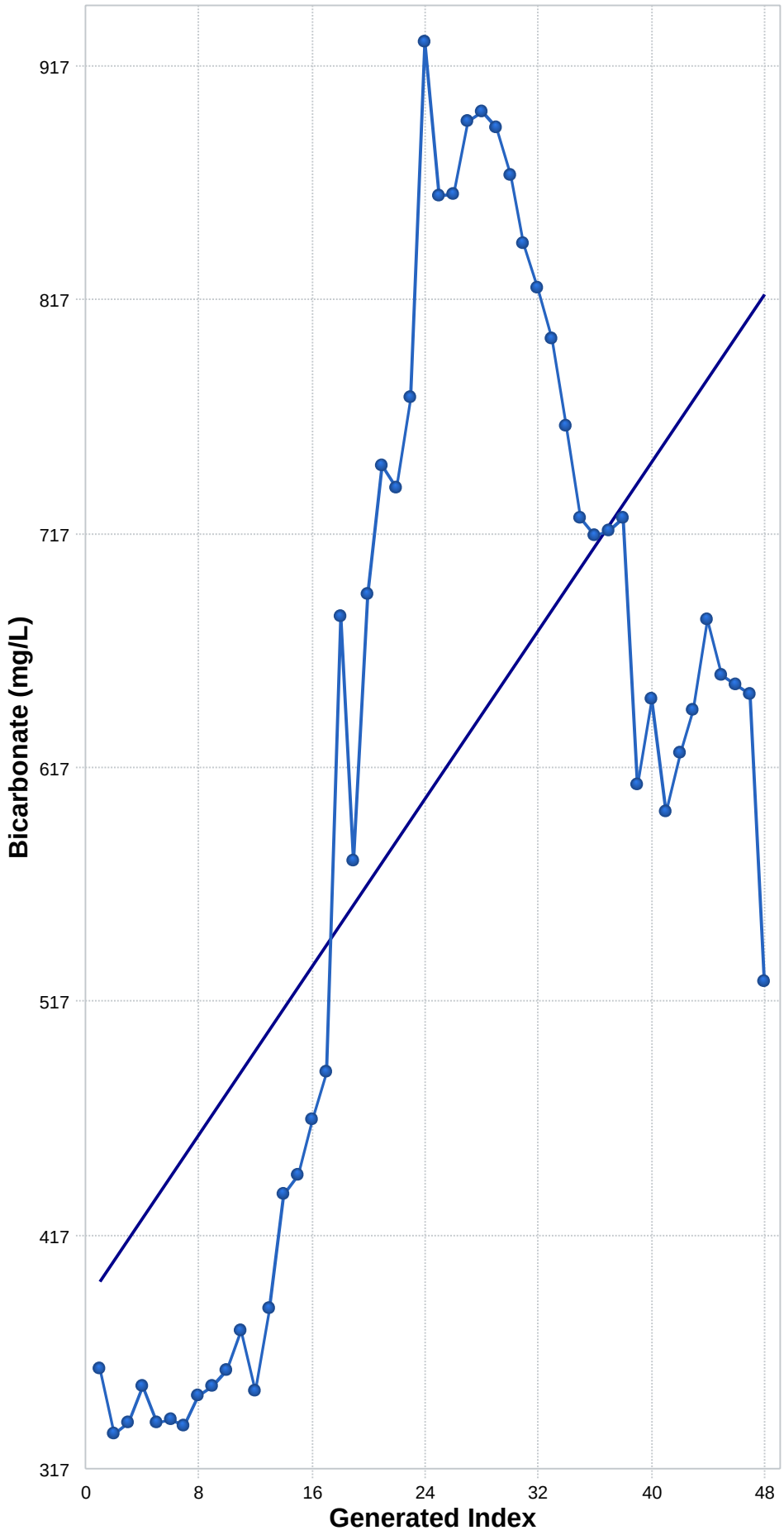
| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 118.0480 |
| Standardized Value of S | 1.2114 |
| M-K Test Value (S) | 144 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1129 |

**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 - 06-SH - BICARBONATE




**Mann-Kendall Trend Analysis**

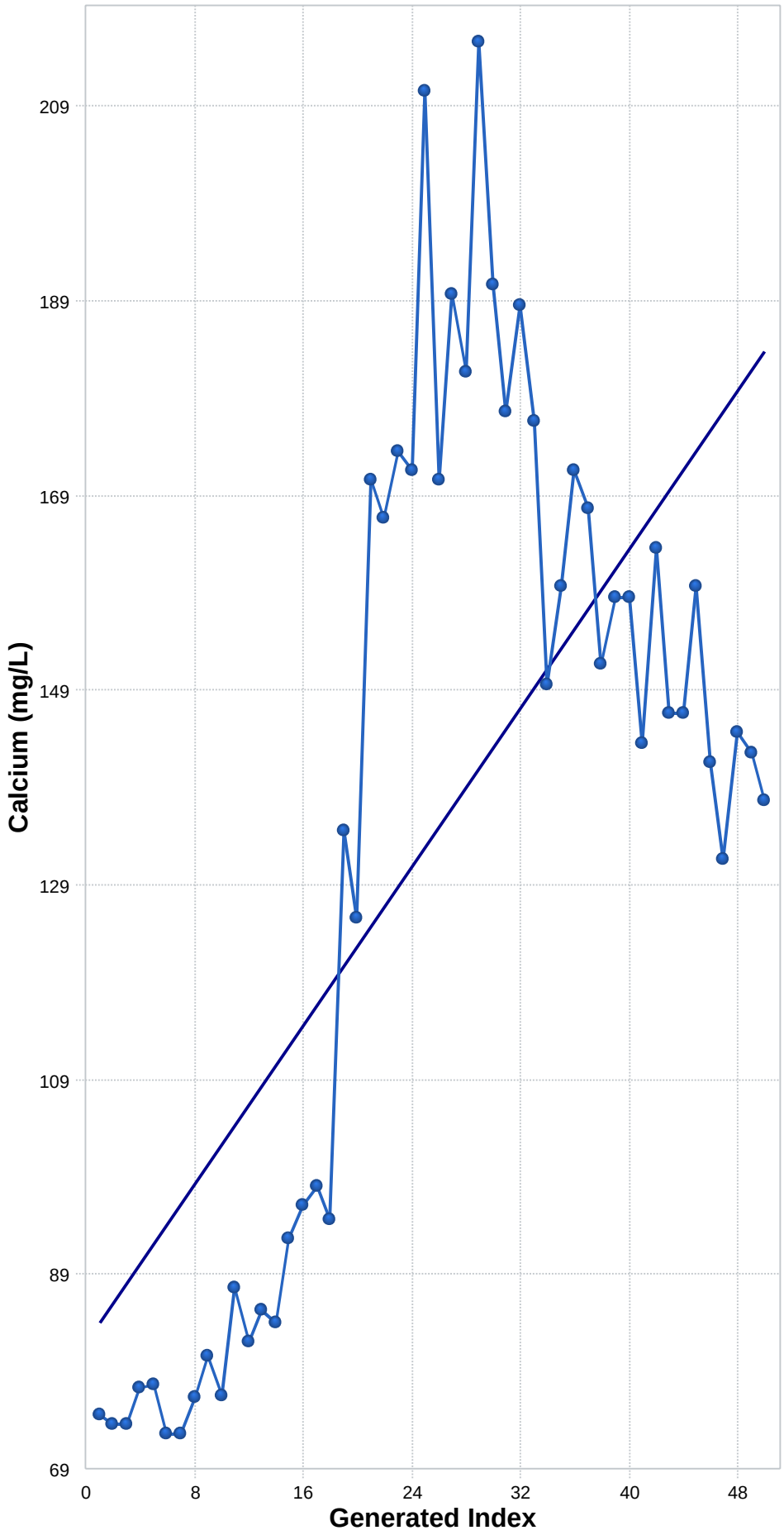
| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.4974 |
| Standardized Value of S | 3.8223 |
| M-K Test Value (S) | 431 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 8.9844 |
| OLS Regression Intercept | 387.7605 |

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

# Mann-Kendall - 06-SH - CALCIUM



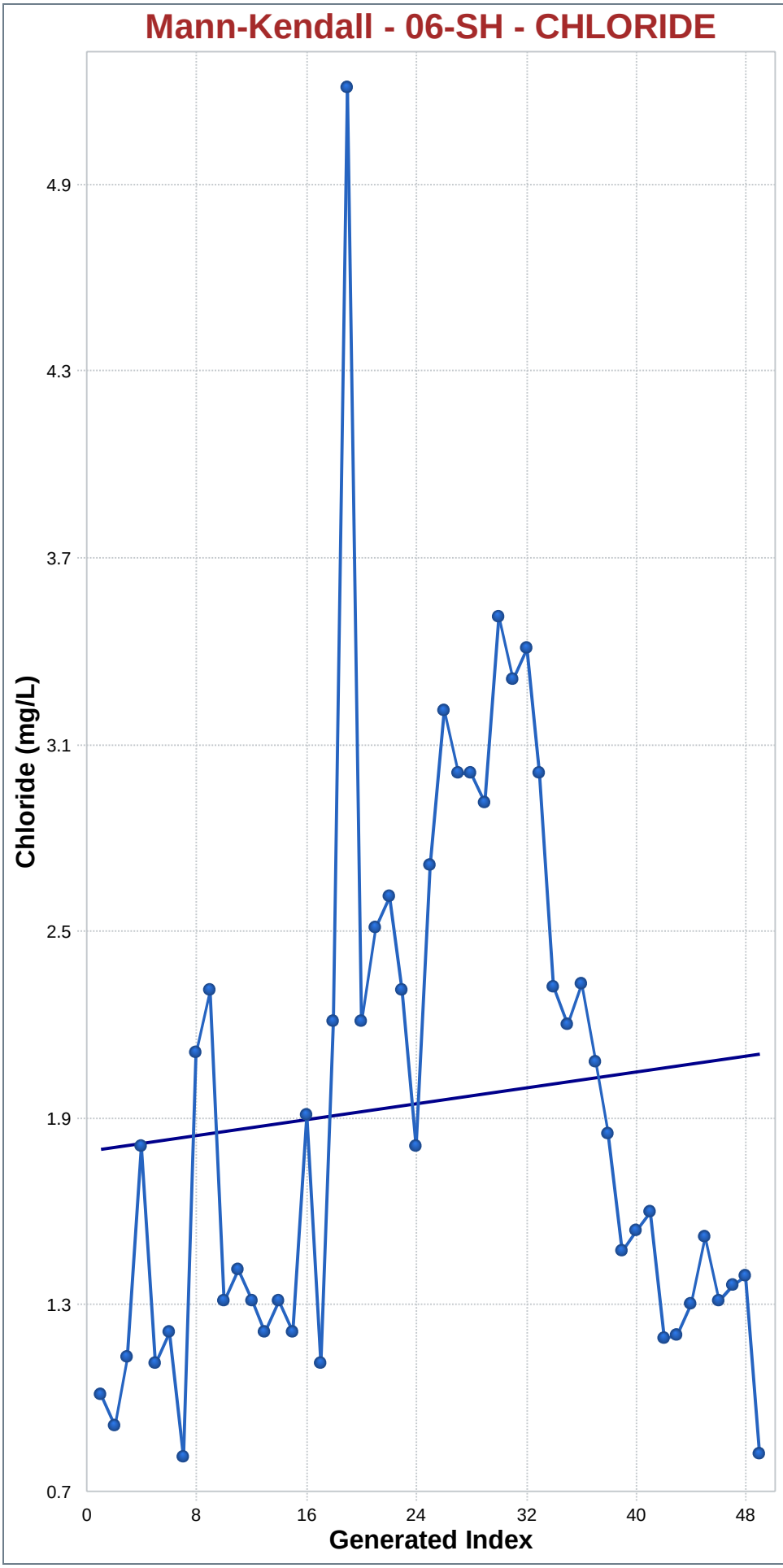

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 119.5185 |
| Standardized Value of S | 4.0077 |
| M-K Test Value (S) | 480 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 2.0366 |
| OLS Regression Intercept | 82.3702 |

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



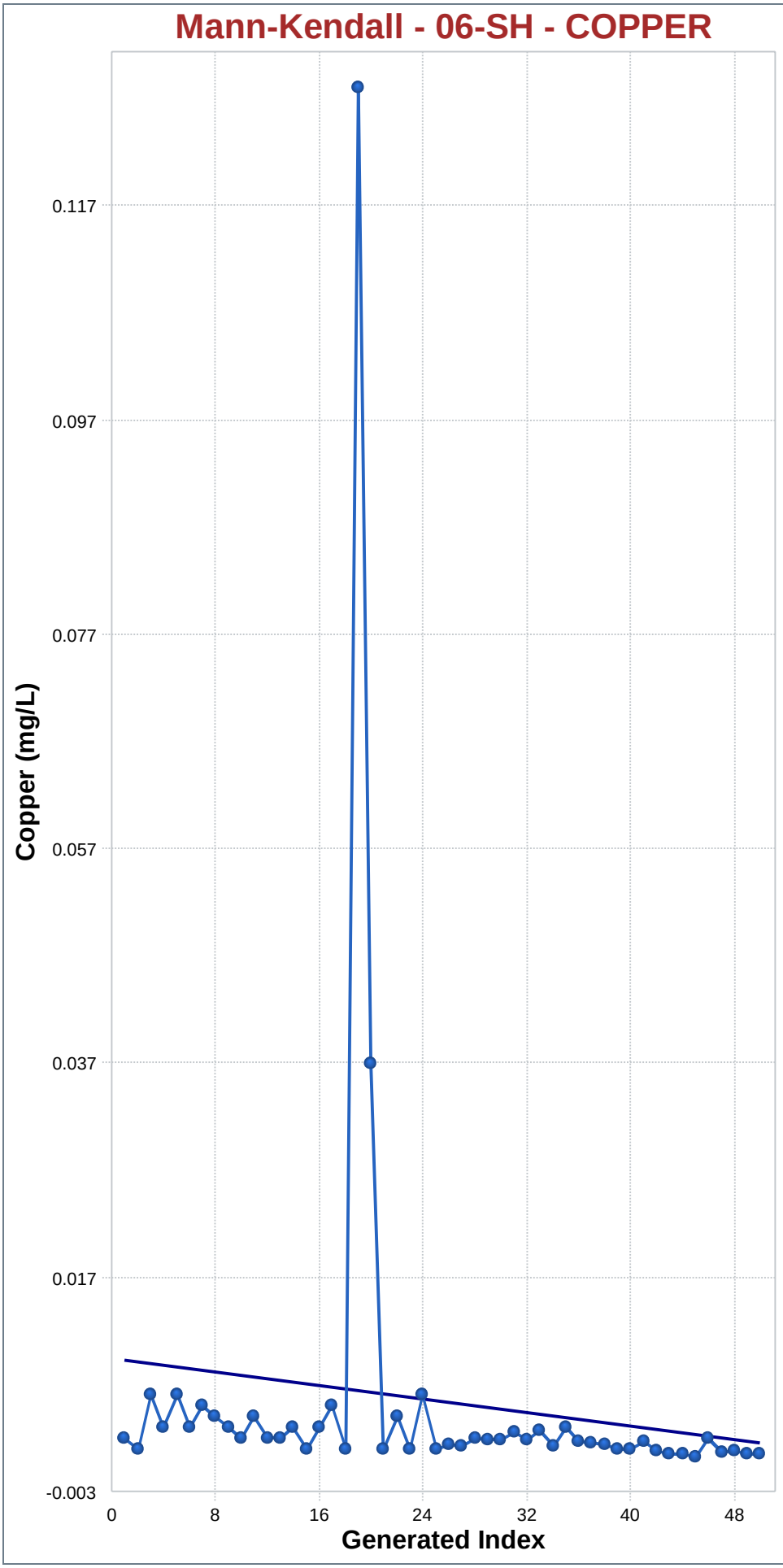

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 49 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 115.9253 |
| Standardized Value of S | 1.1645 |
| M-K Test Value (S) | 136 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1221 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0063 |
| OLS Regression Intercept | 1.7839 |

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



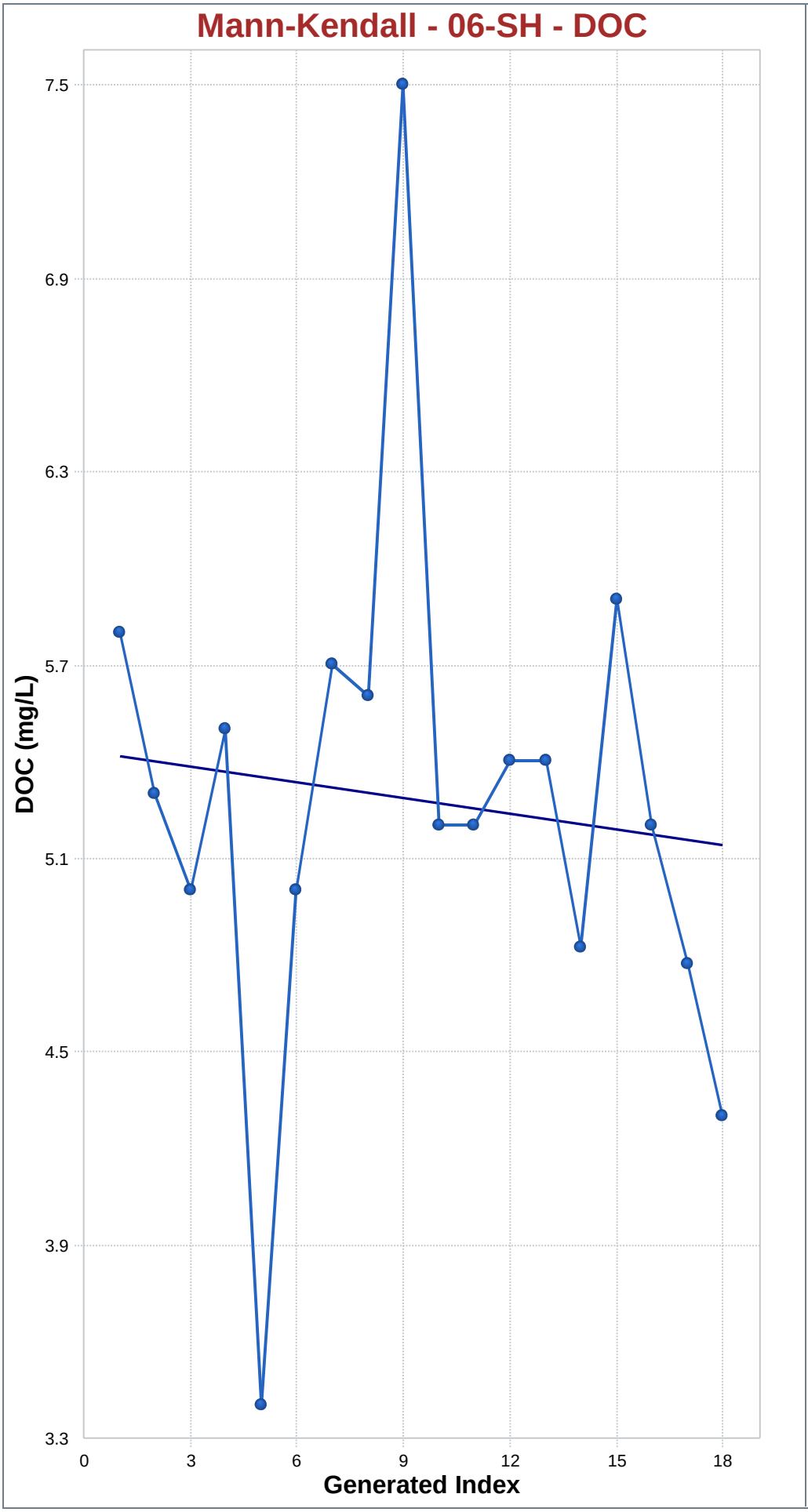

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 119.0420 |
| Standardized Value of S | -4.7378 |
| M-K Test Value (S) | -565 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0094 |

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




**Mann-Kendall Trend Analysis**

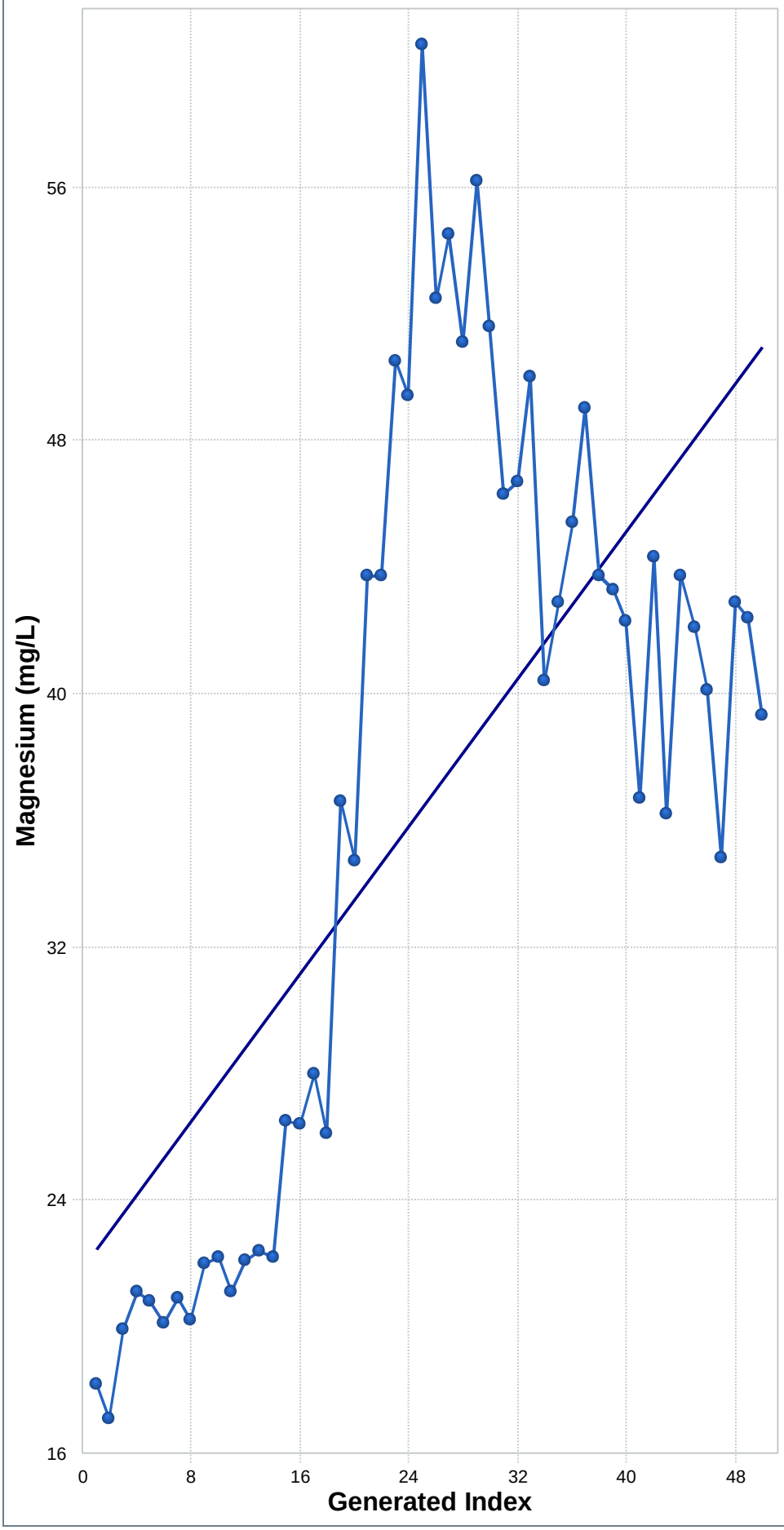
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.2932 |
| Standardized Value of S | -1.1029 |
| M-K Test Value (S) | -30 |
| Tabulated p-value | 0.1300 |
| Approximate p-value | 0.1350 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0164 |
| OLS Regression Intercept | 5.4328 |

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

# Mann-Kendall - 06-SH - MAGNESIUM




**Mann-Kendall Trend Analysis**

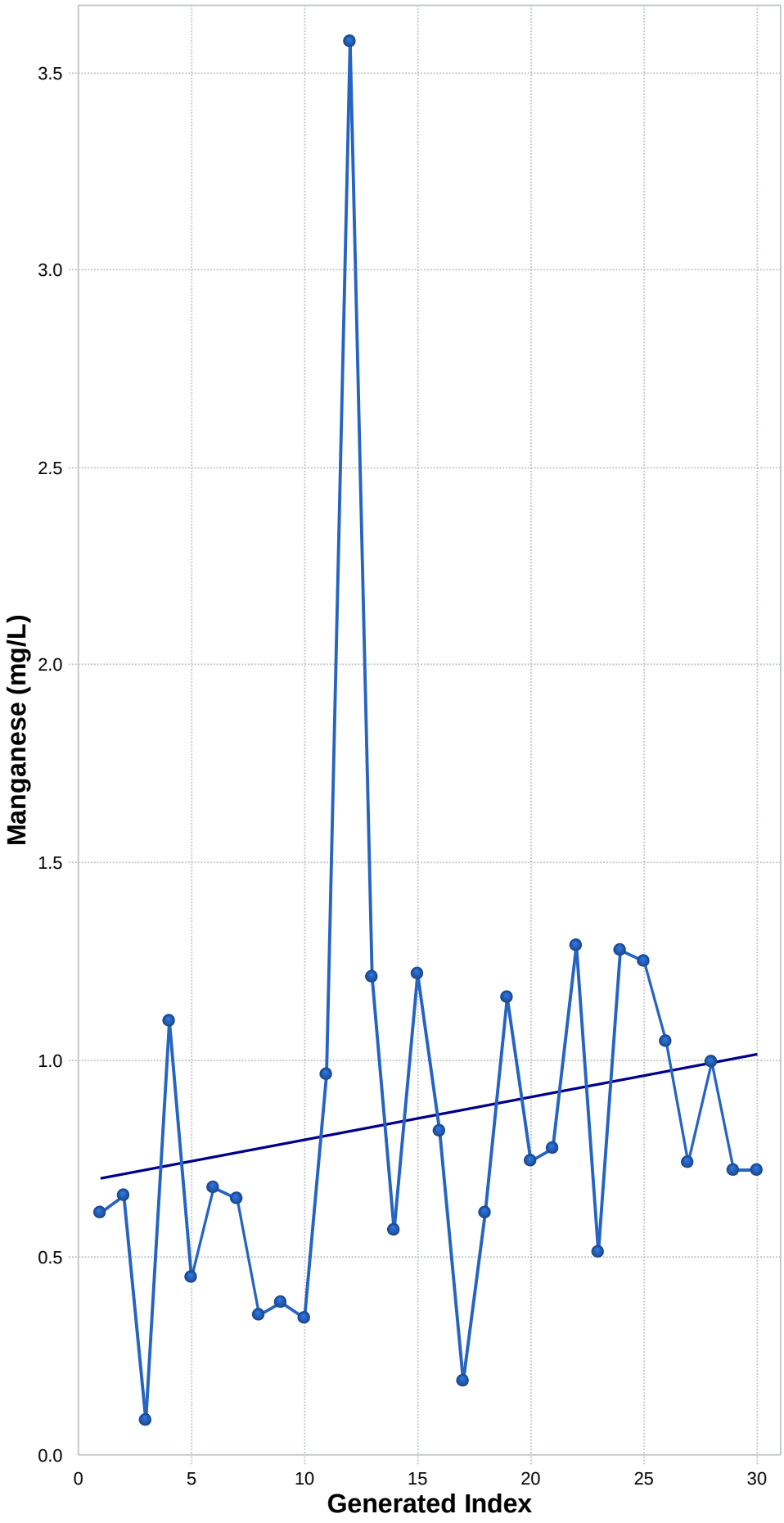
| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 119.4990 |
| Standardized Value of S | 4.2929 |
| M-K Test Value (S) | 514 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.5824 |
| OLS Regression Intercept | 22.2442 |

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

# Mann-Kendall - 06-SH - MANGANESE



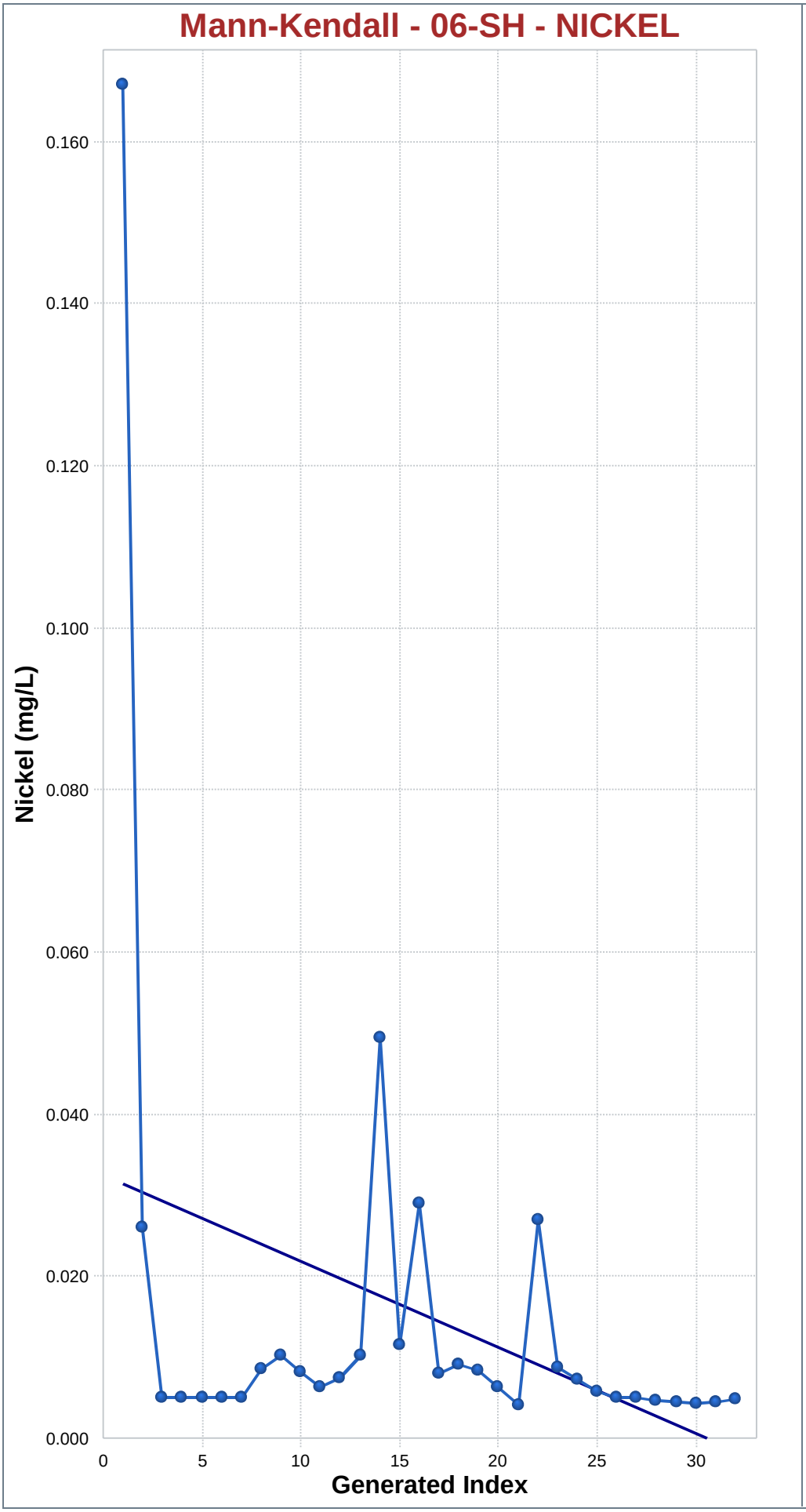

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0417 |
| Standardized Value of S | 1.6952 |
| M-K Test Value (S) | 96 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0450 |

**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.



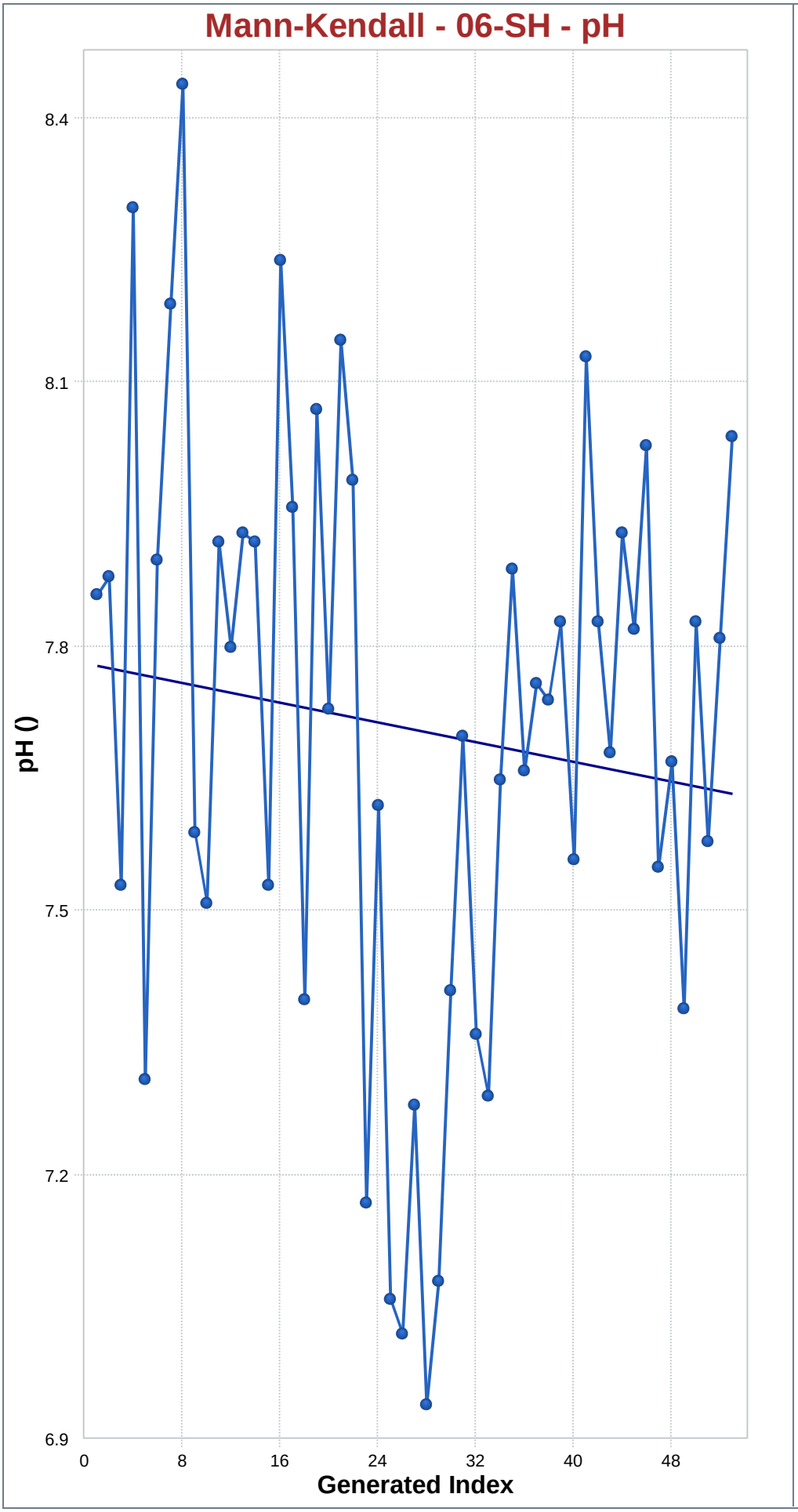

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.5224 |
| Standardized Value of S | -2.2756 |
| M-K Test Value (S) | -141 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0114 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0011 |
| OLS Regression Intercept | 0.0325 |

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




**Mann-Kendall Trend Analysis**

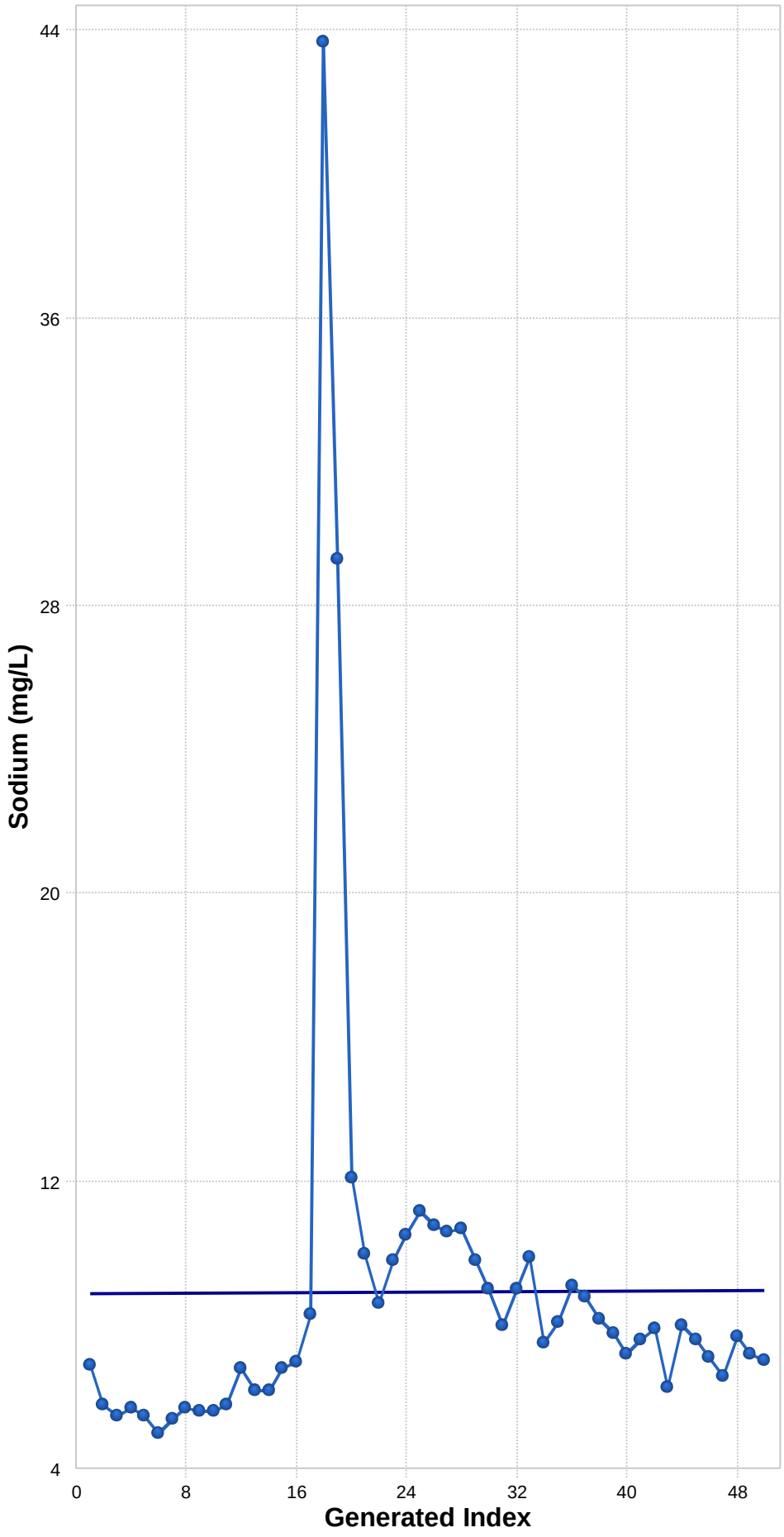
| | |
|---|---|
| n | 53 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 130.3406 |
| Standardized Value of S | -0.5908 |
| M-K Test Value (S) | -78 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.2773 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0028 |
| OLS Regression Intercept | 7.7424 |

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

# Mann-Kendall - 06-SH - SODIUM




**Mann-Kendall Trend Analysis**

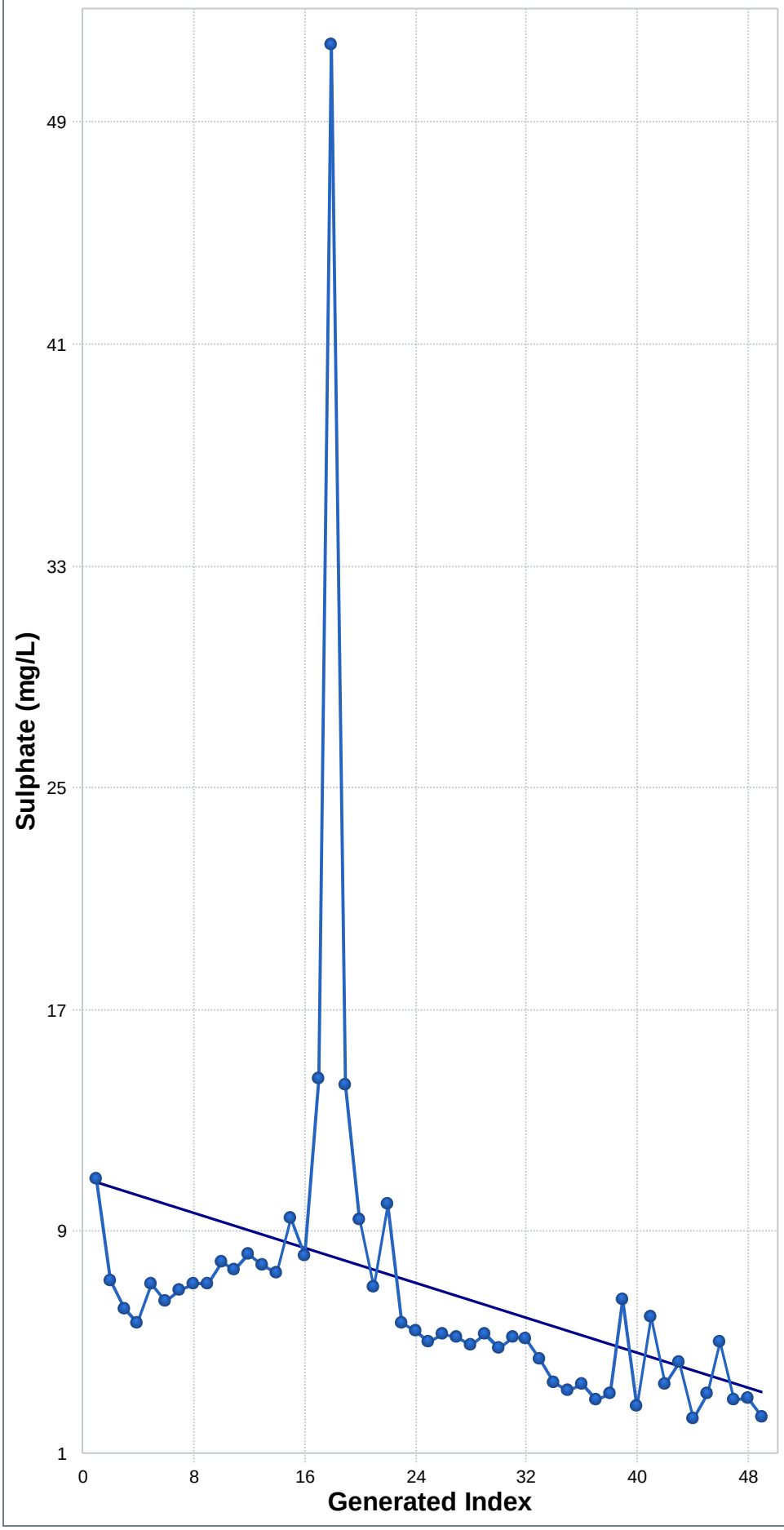
| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 119.5059 |
| Standardized Value of S | 1.6903 |
| M-K Test Value (S) | 203 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0455 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0026 |
| OLS Regression Intercept | 9.2662 |

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

# Mann-Kendall - 06-SH - SULPHATE




**Mann-Kendall Trend Analysis**

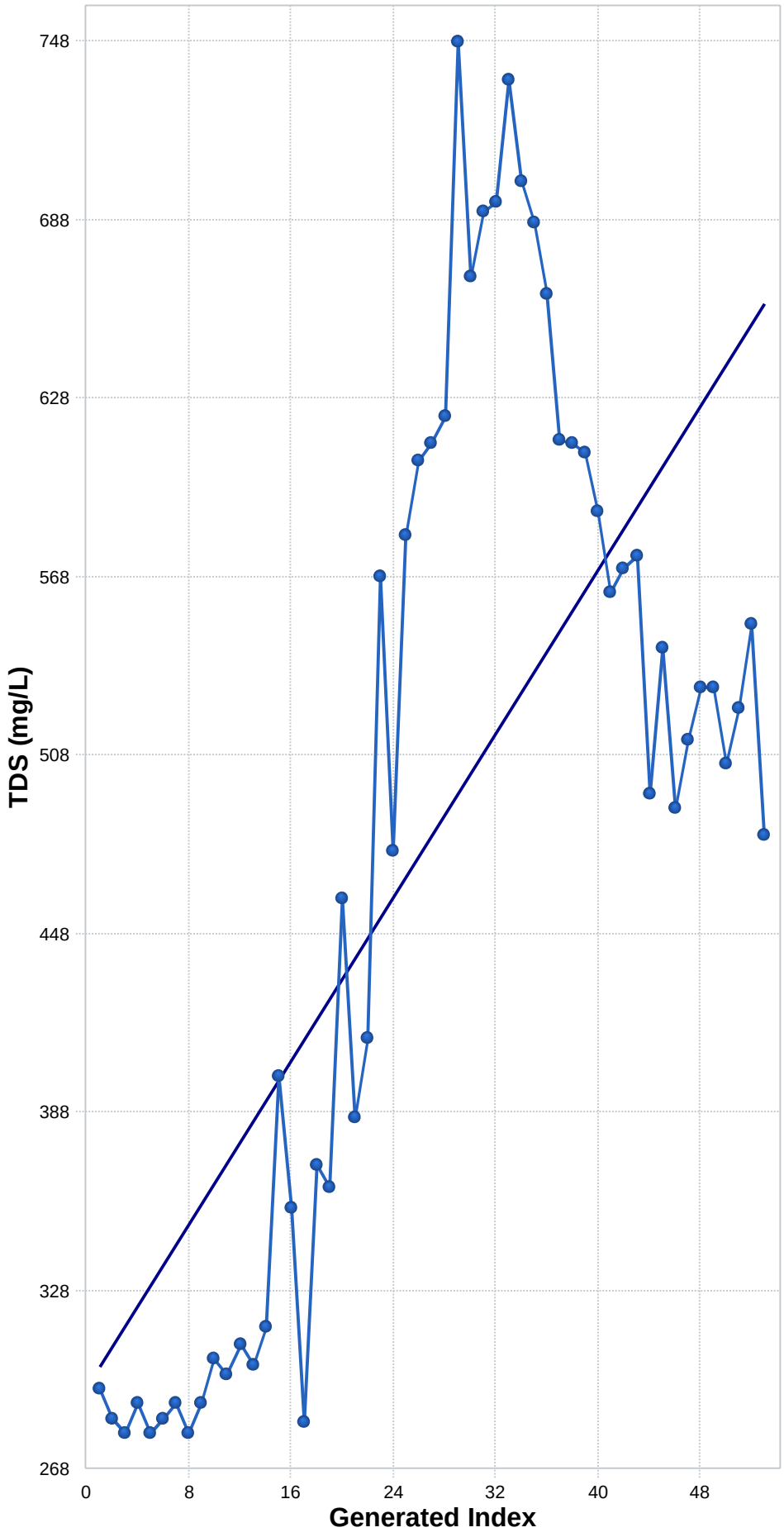
| | |
|---|---|
| n | 49 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 115.9784 |
| Standardized Value of S | -5.7252 |
| M-K Test Value (S) | -665 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.1581 |
| OLS Regression Intercept | 10.5439 |

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

# Mann-Kendall - 06-SH - TDS



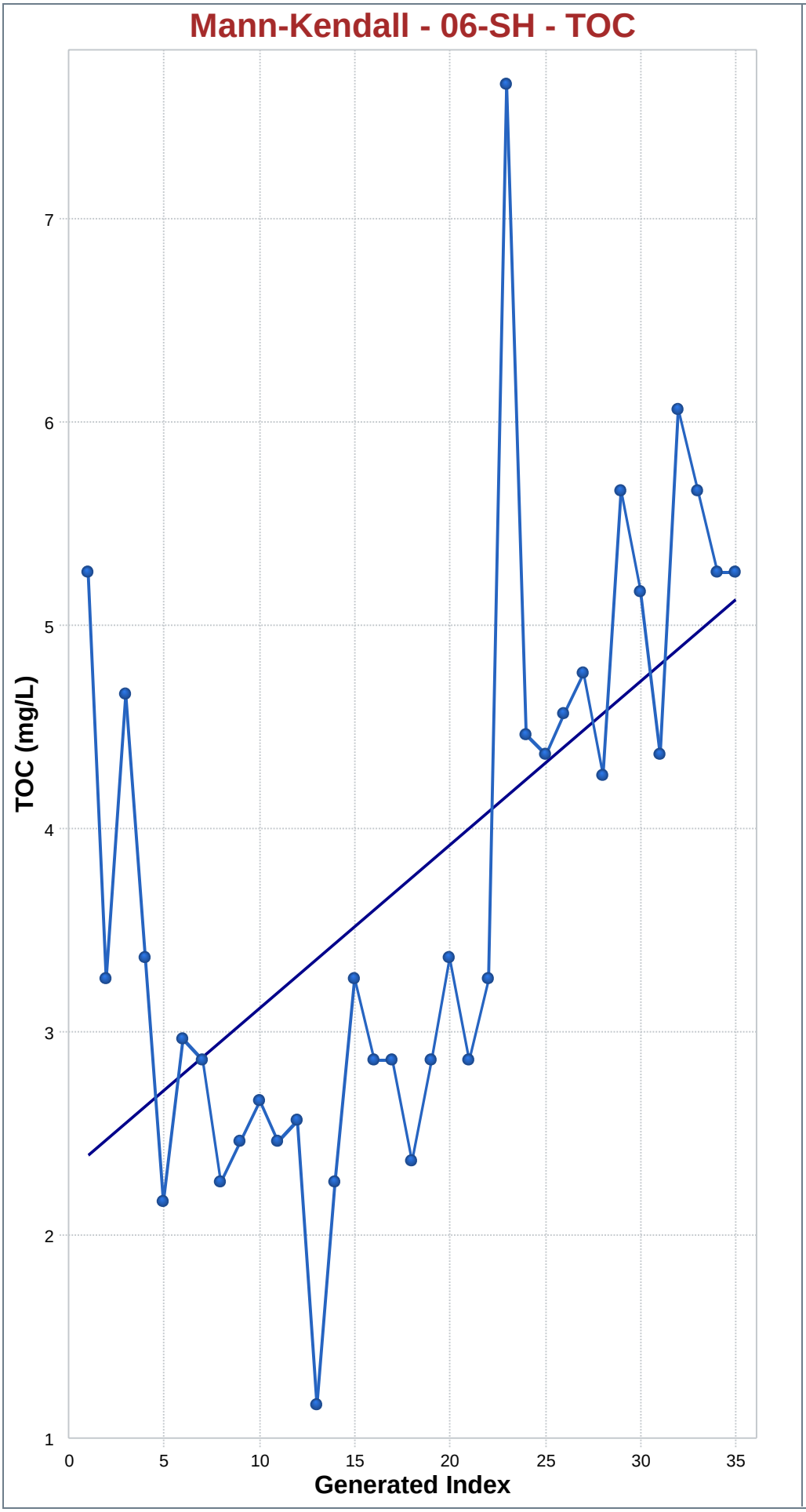

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 53 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 130.3265 |
| Standardized Value of S | 4.7726 |
| M-K Test Value (S) | 623 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 6.8738 |
| OLS Regression Intercept | 295.5203 |

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



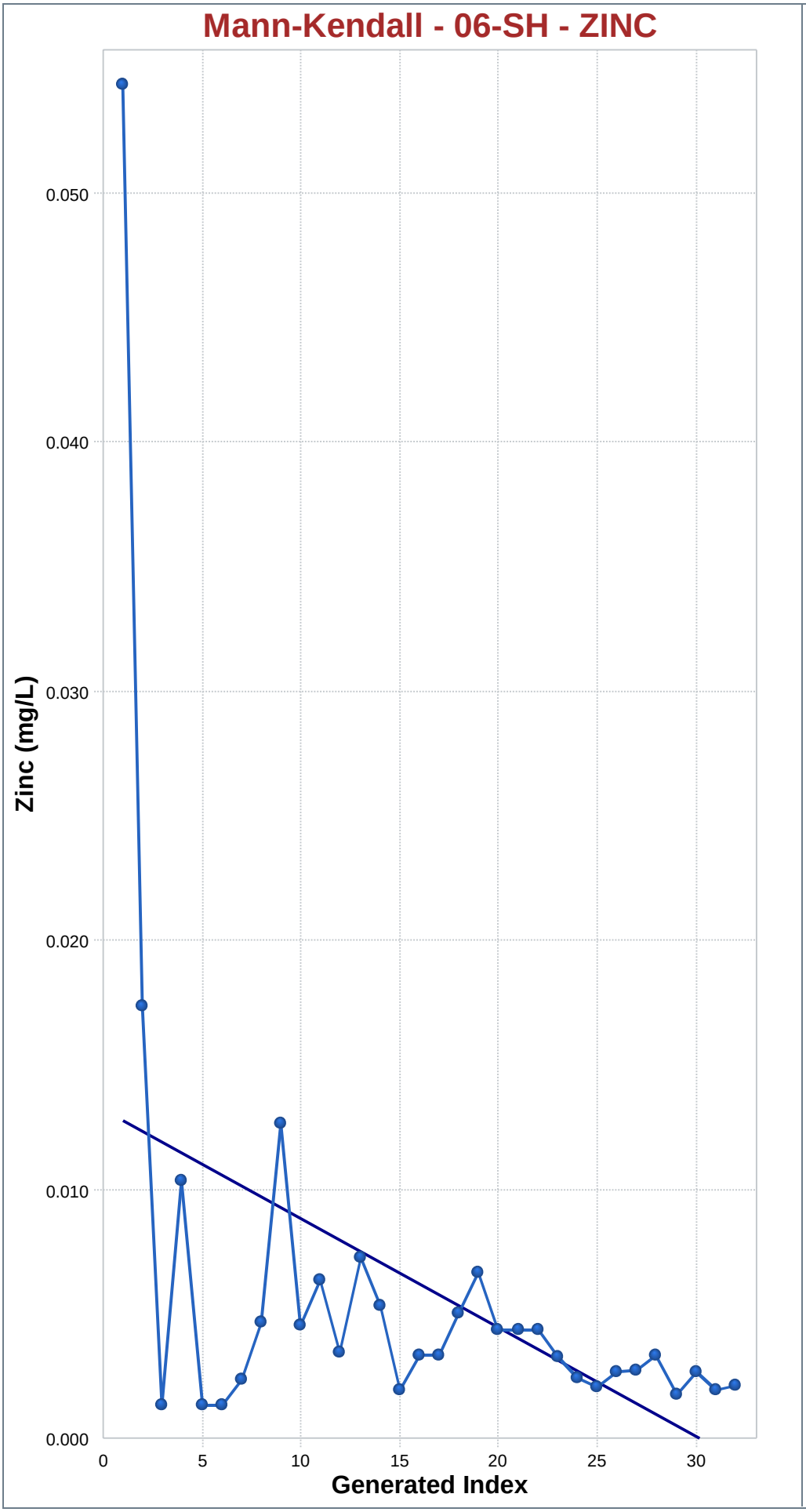

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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.



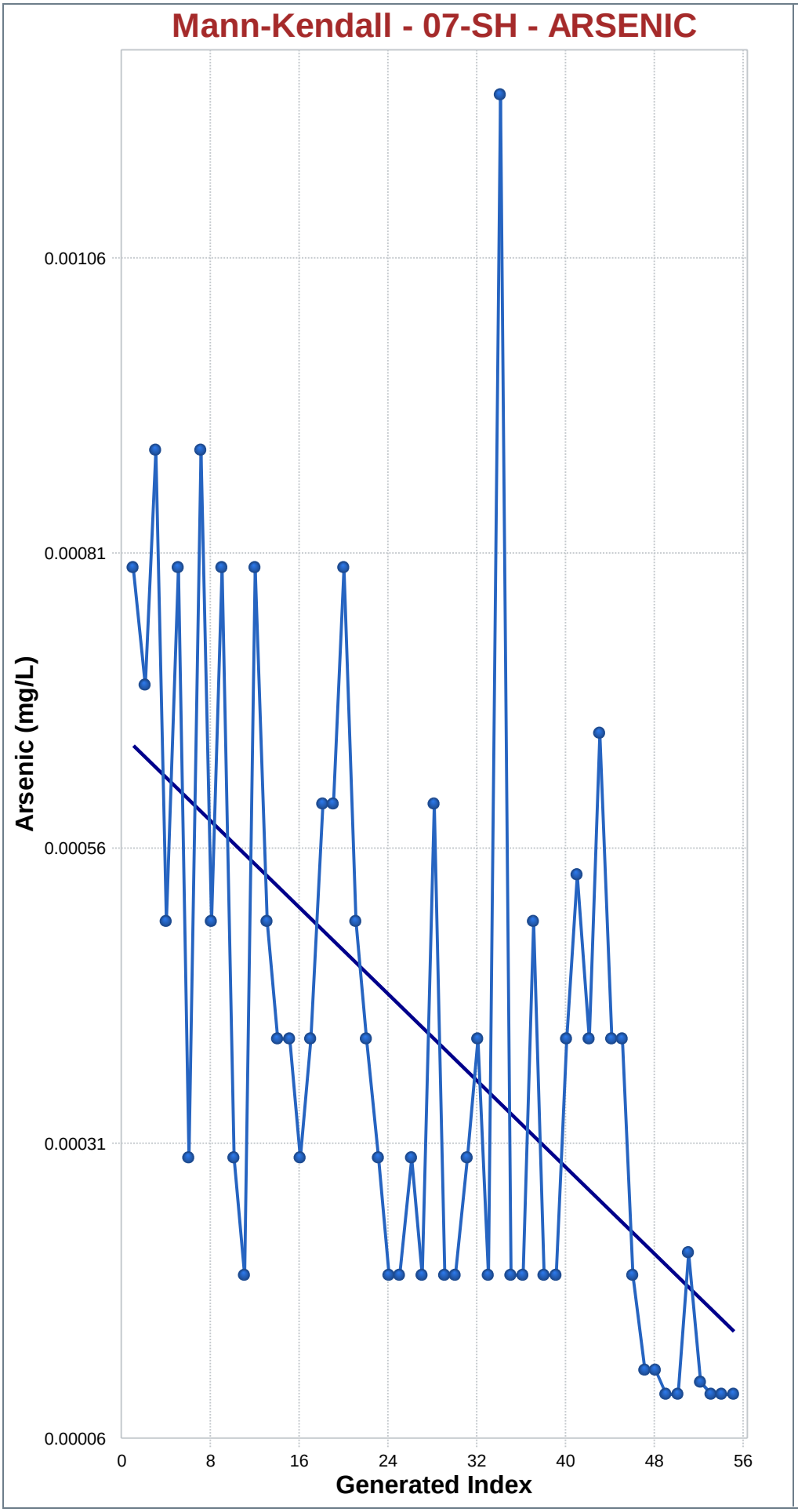

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.5603 |
| Standardized Value of S | -2.5341 |
| M-K Test Value (S) | -157 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0056 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0004 |
| OLS Regression Intercept | 0.0129 |

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




**Mann-Kendall Trend Analysis**

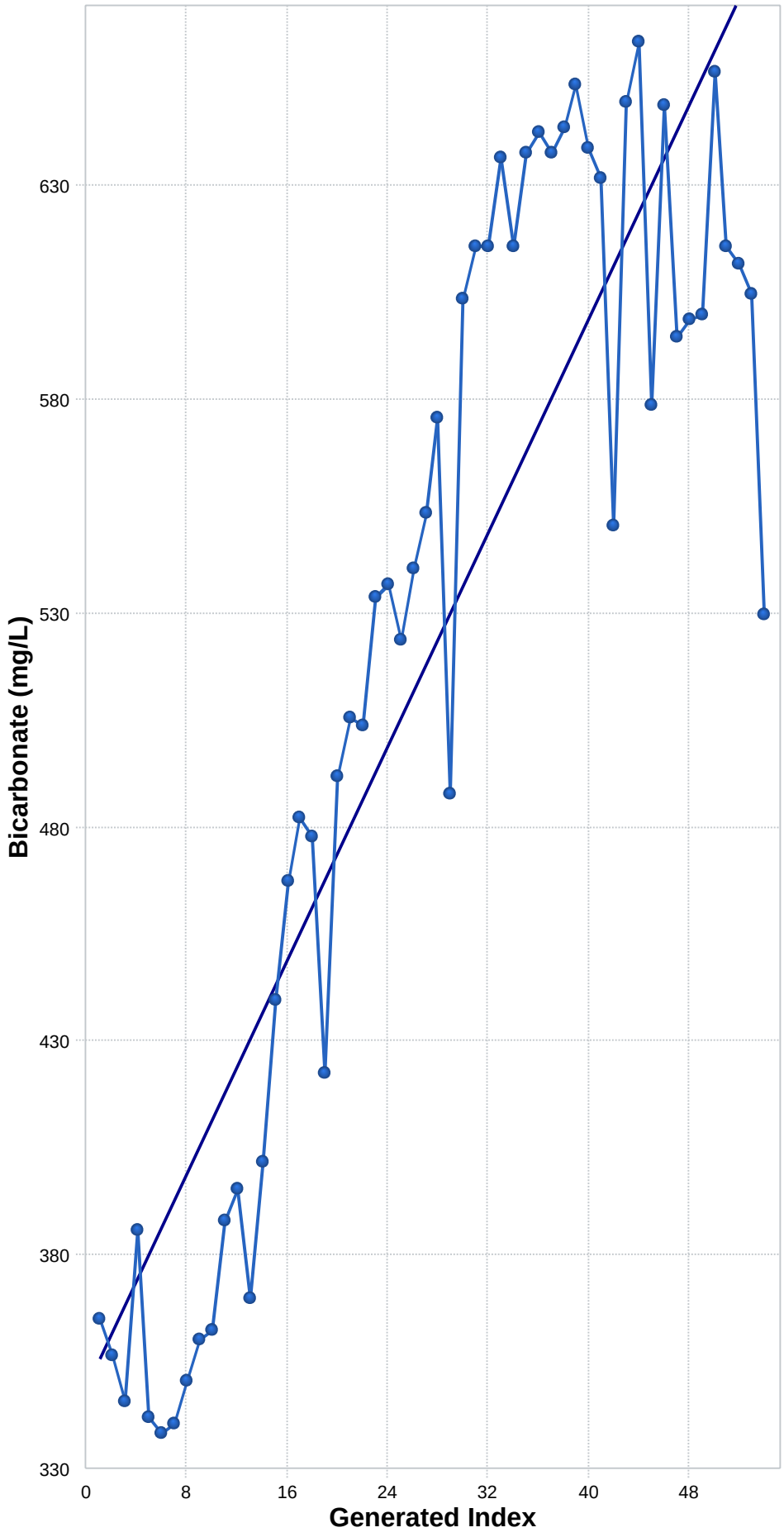
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 136.3317 |
| Standardized Value of S | -5.1199 |
| M-K Test Value (S) | -699 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**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 - 07-SH - BICARBONATE




**Mann-Kendall Trend Analysis**

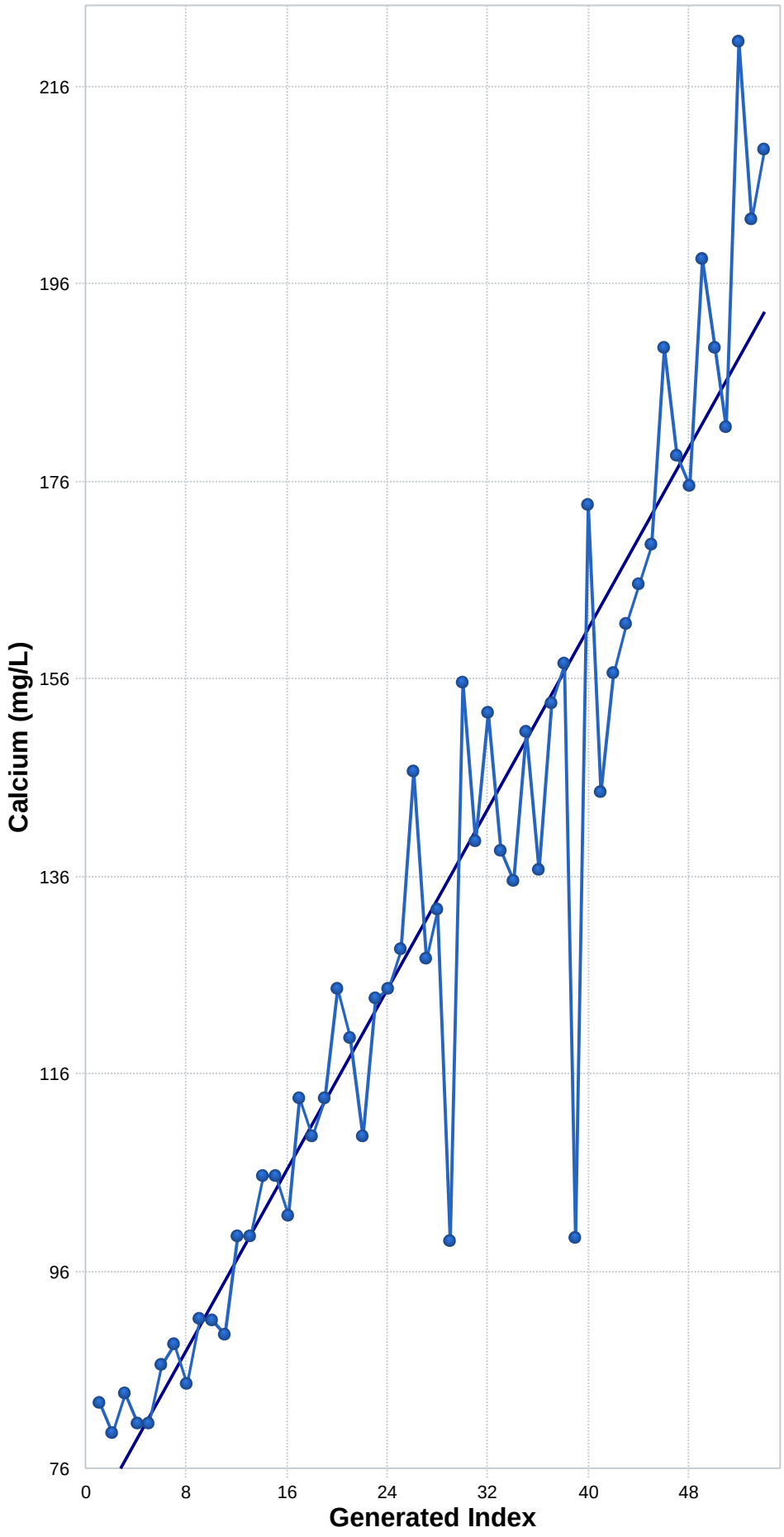
| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 134.0050 |
| Standardized Value of S | 7.5146 |
| M-K Test Value (S) | 1,008 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 6.2284 |
| OLS Regression Intercept | 348.8247 |

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

# Mann-Kendall - 07-SH - CALCIUM



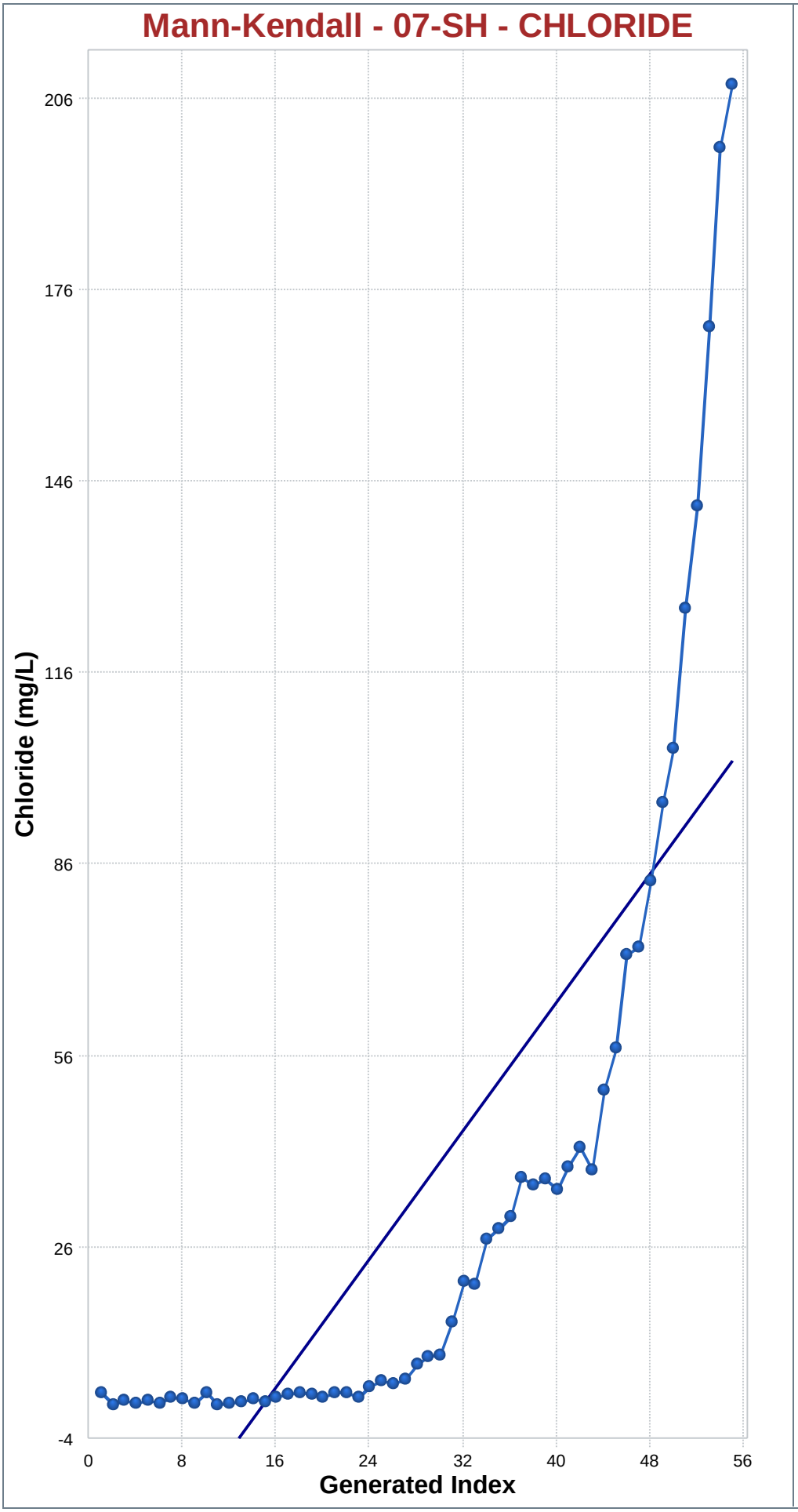

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 134.0149 |
| Standardized Value of S | 9.0214 |
| M-K Test Value (S) | 1,210 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 2.2879 |
| OLS Regression Intercept | 70.1070 |

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



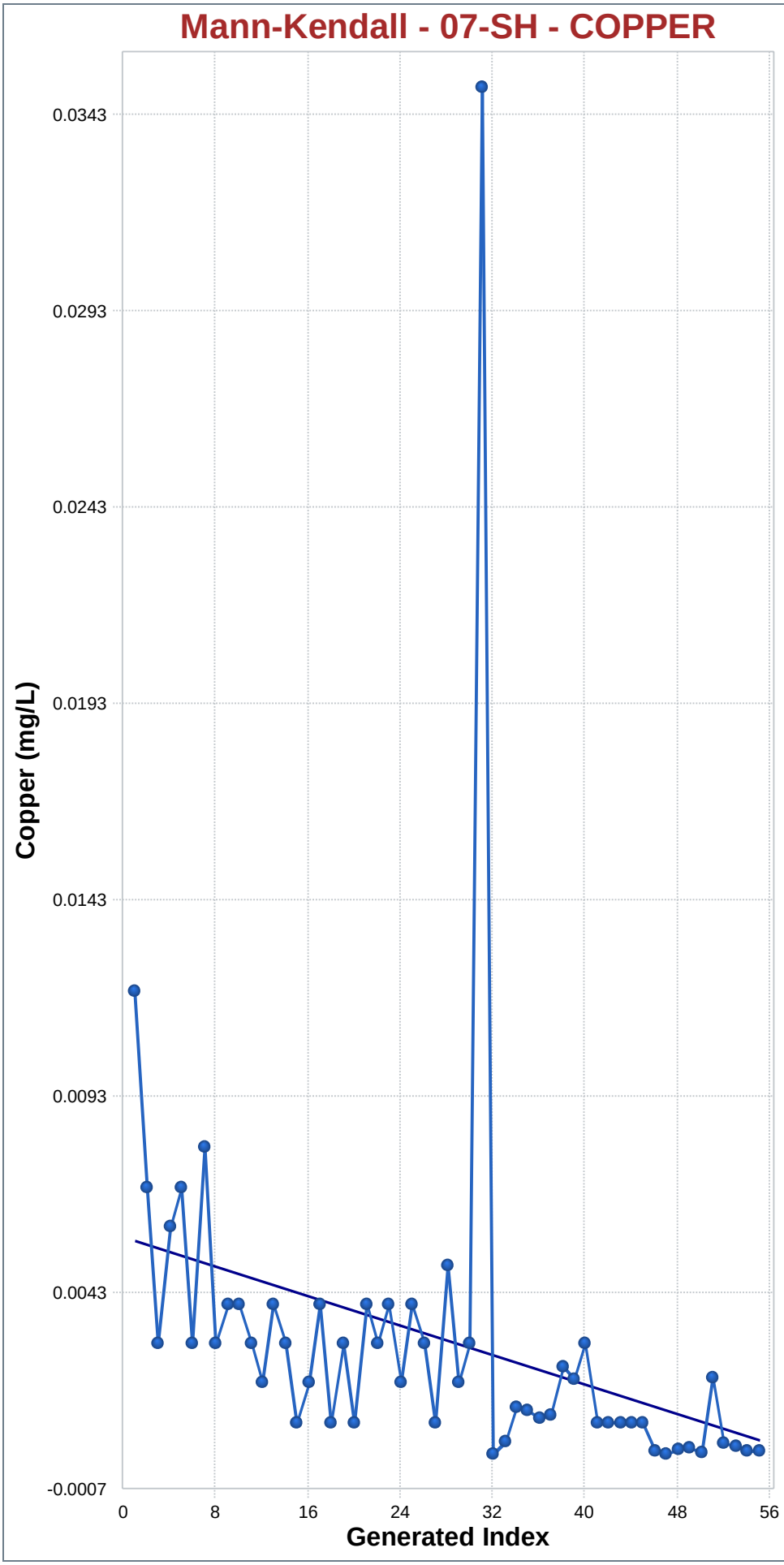

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.7014 |
| Standardized Value of S | 9.5133 |
| 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 | 2.5233 |
| OLS Regression Intercept | -36.6156 |

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



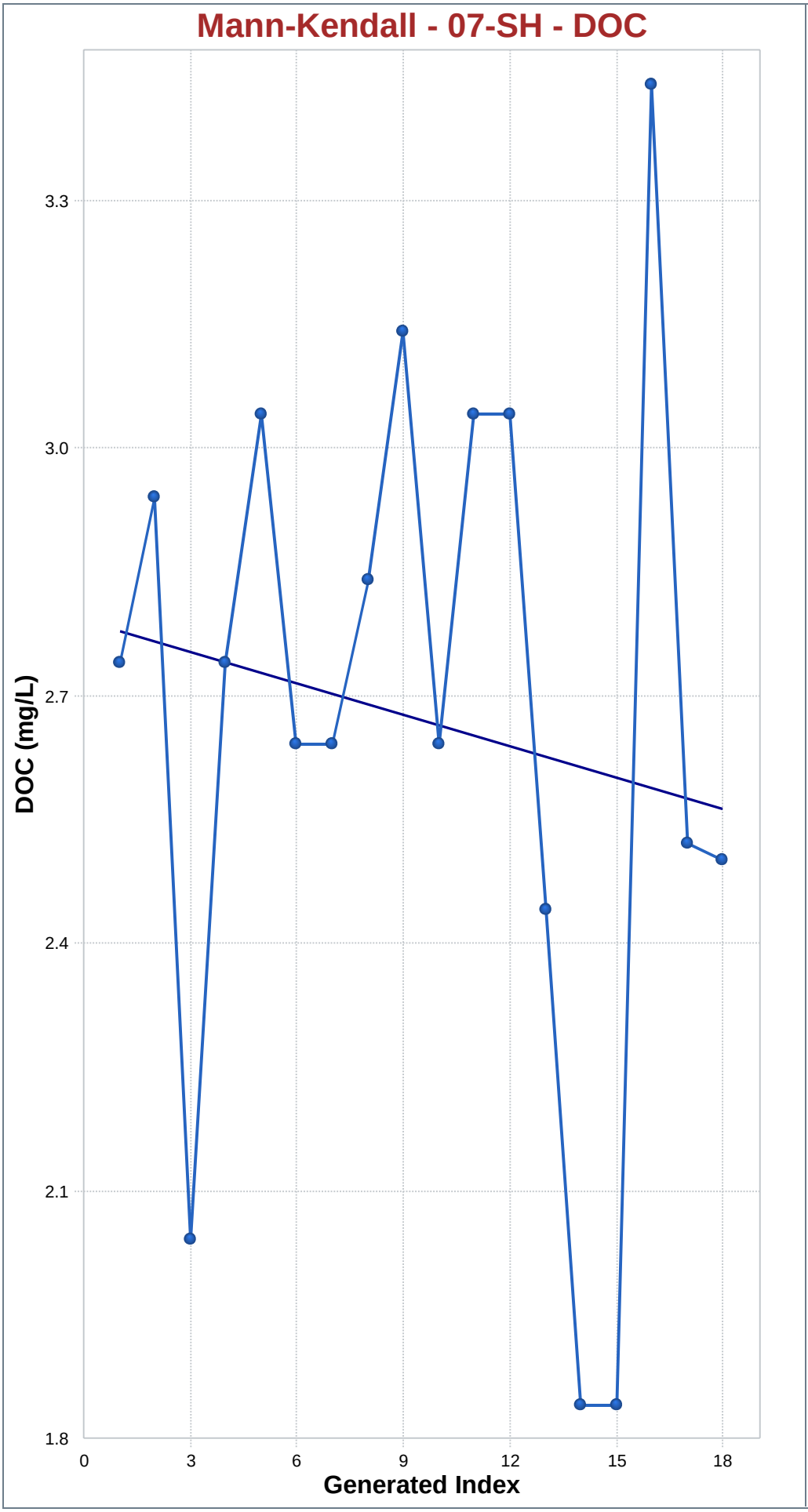

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 136.7553 |
| Standardized Value of S | -5.9157 |
| M-K Test Value (S) | -810 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0057 |

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



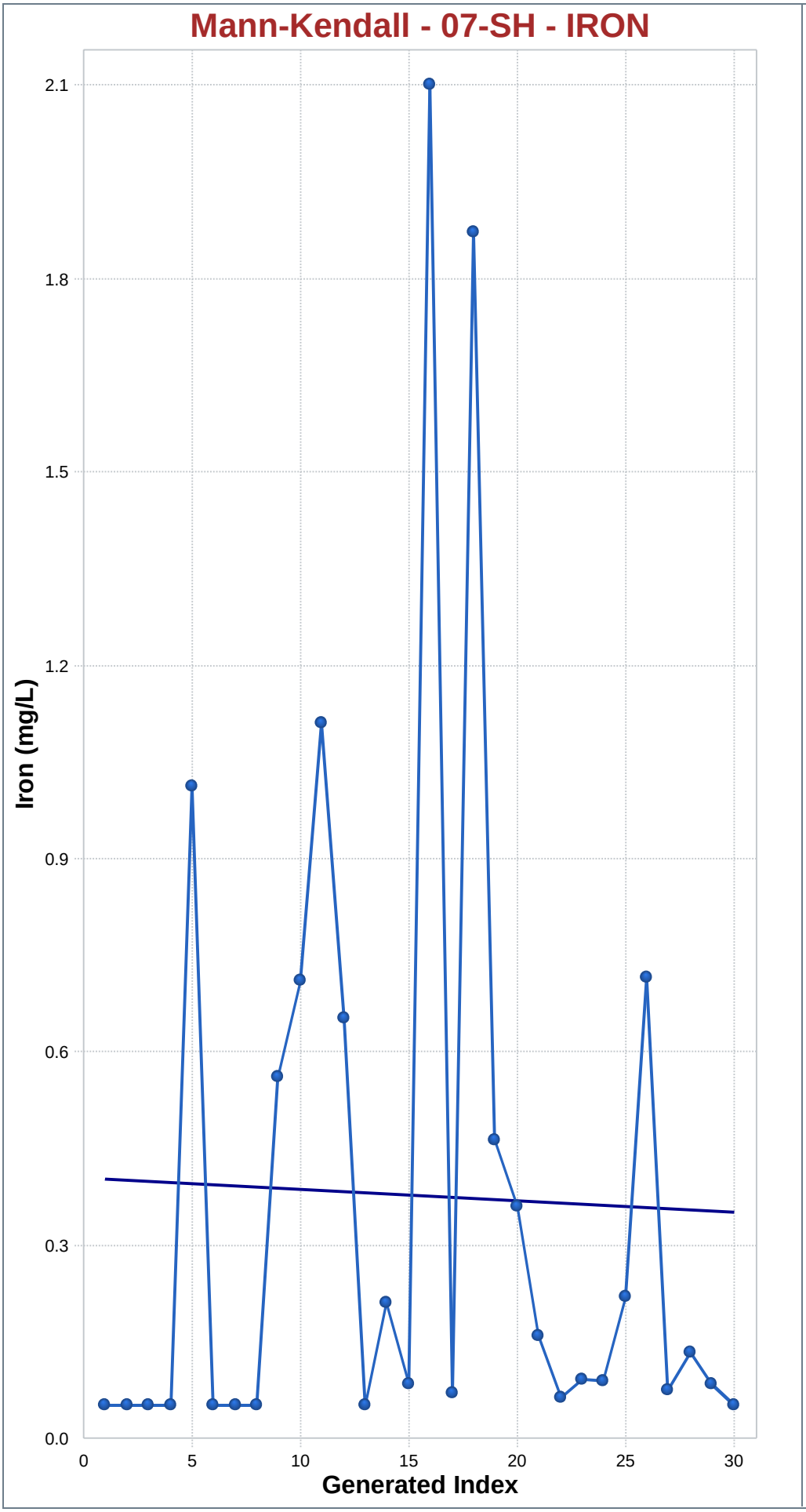

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.2234 |
| Standardized Value of S | -0.7627 |
| M-K Test Value (S) | -21 |
| Tabulated p-value | 0.2270 |
| Approximate p-value | 0.2228 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0126 |
| OLS Regression Intercept | 2.7494 |

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




**Mann-Kendall Trend Analysis**

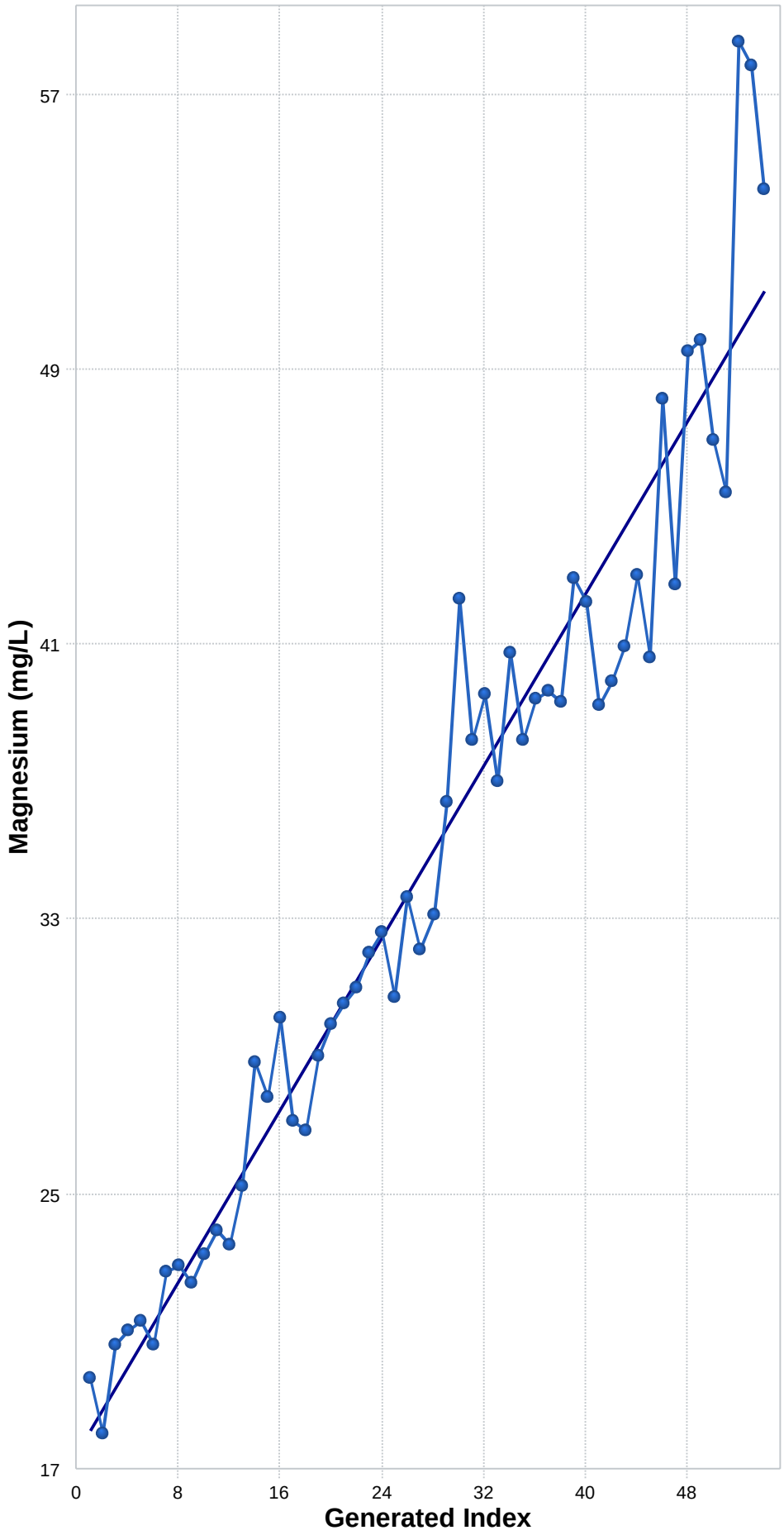
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 55.2147 |
| Standardized Value of S | 0.9237 |
| M-K Test Value (S) | 52 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1778 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0018 |
| OLS Regression Intercept | 0.3637 |

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

# Mann-Kendall - 07-SH - MAGNESIUM




**Mann-Kendall Trend Analysis**

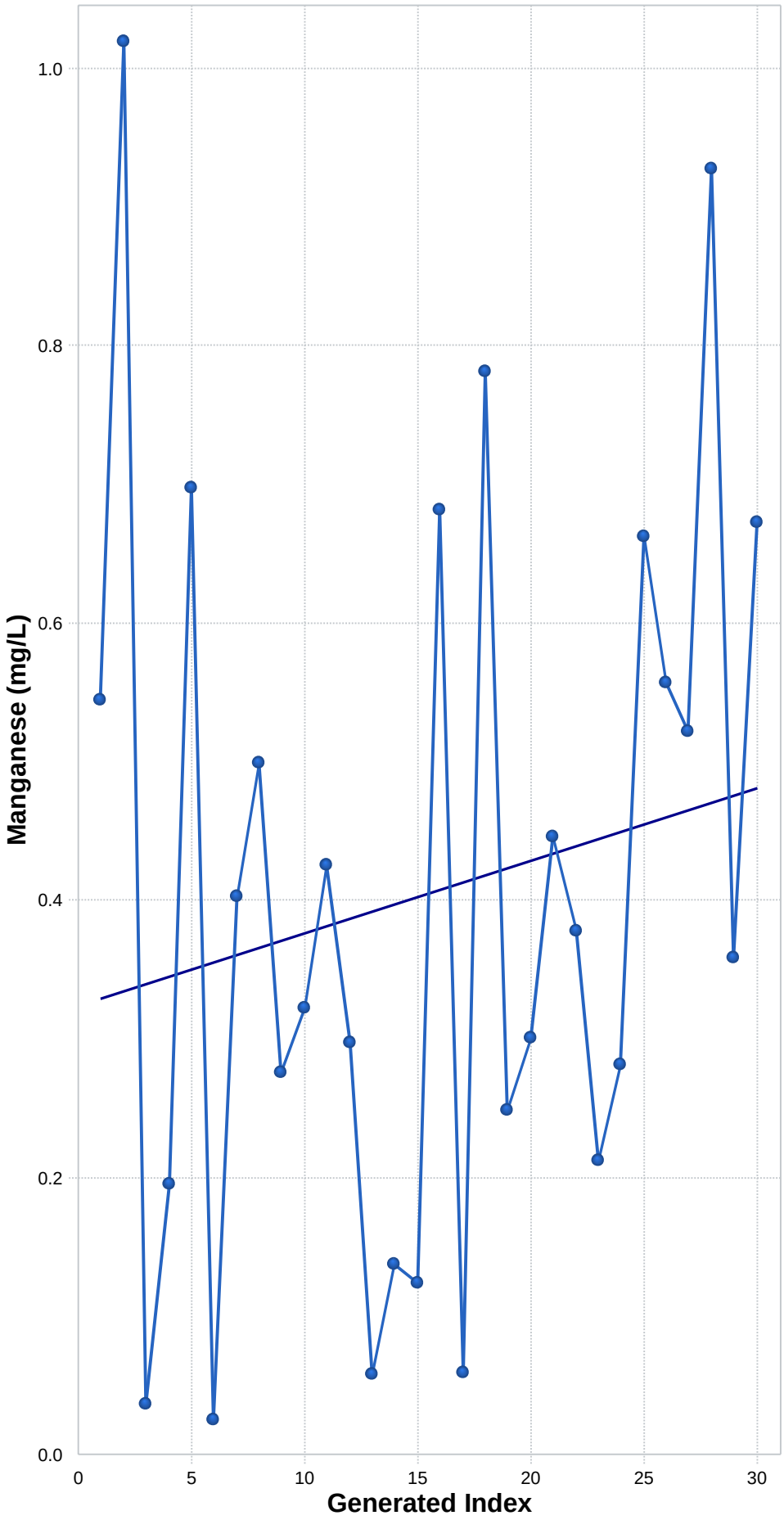
| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 134.0336 |
| Standardized Value of S | 9.5051 |
| M-K Test Value (S) | 1,275 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.6255 |
| OLS Regression Intercept | 17.8685 |

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

# Mann-Kendall - 07-SH - MANGANESE



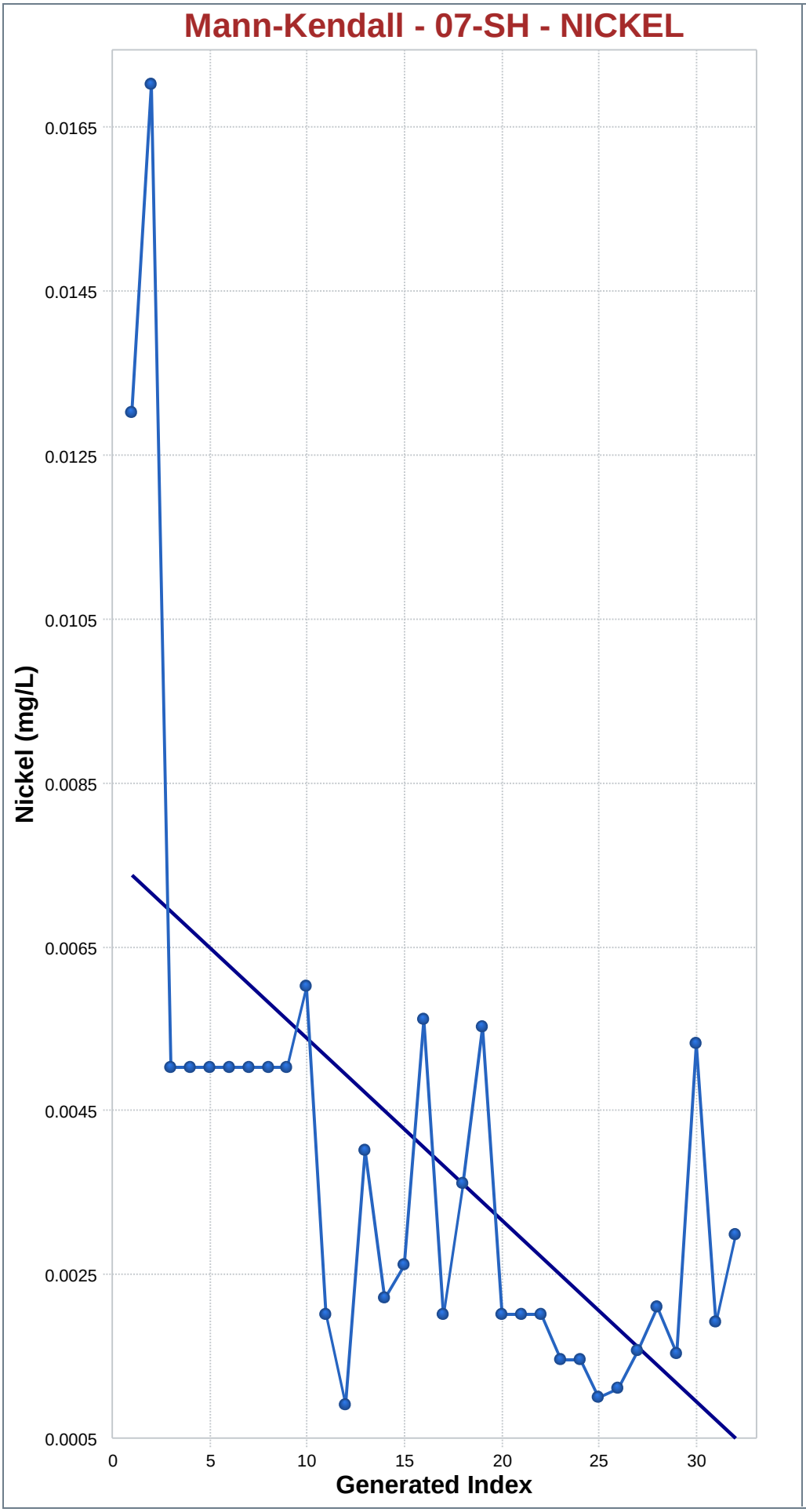

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0506 |
| Standardized Value of S | 1.2132 |
| M-K Test Value (S) | 69 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1125 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0052 |
| OLS Regression Intercept | 0.2992 |

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



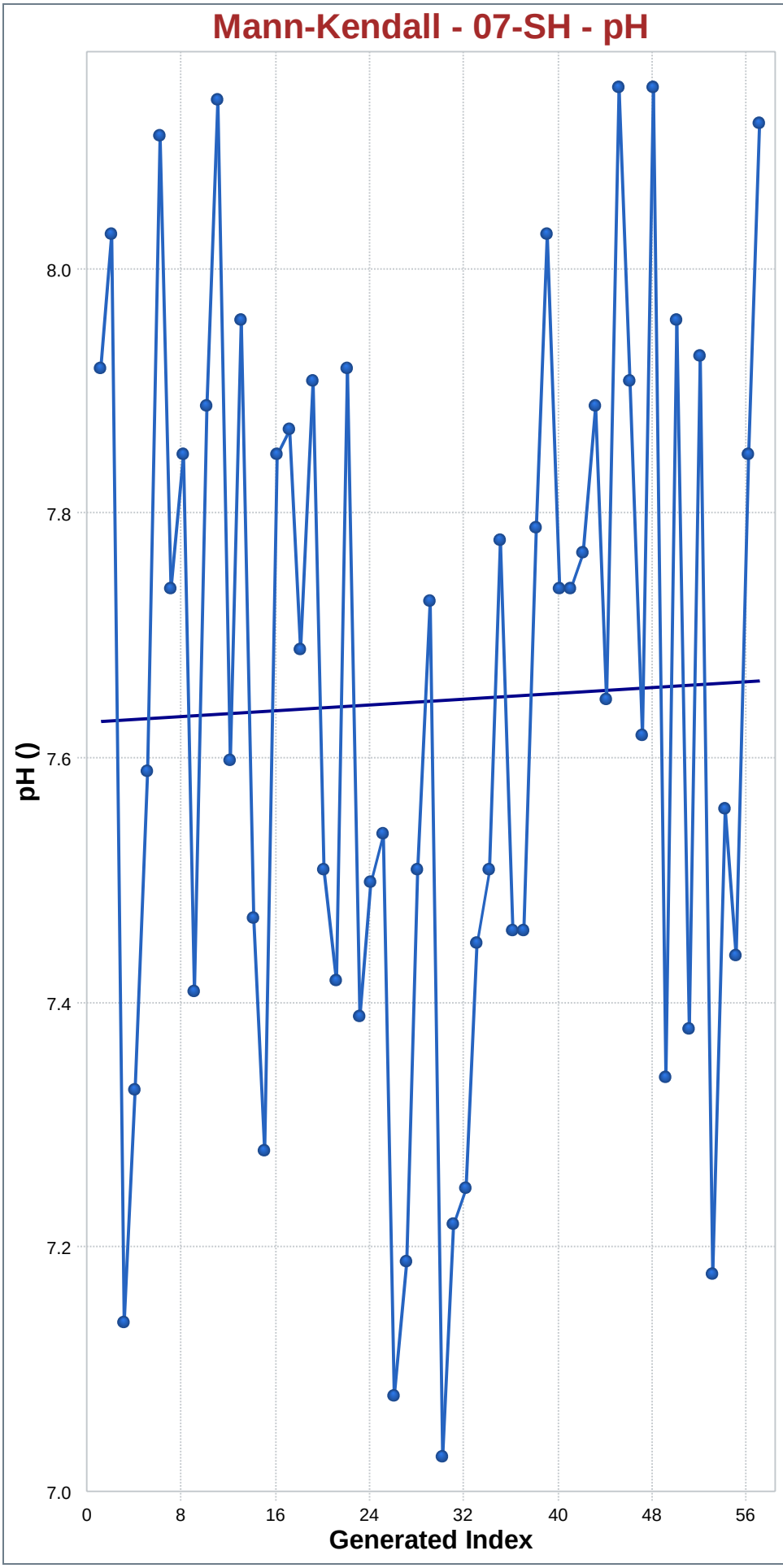

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.1692 |
| Standardized Value of S | -3.5312 |
| M-K Test Value (S) | -217 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0002 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0076 |

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



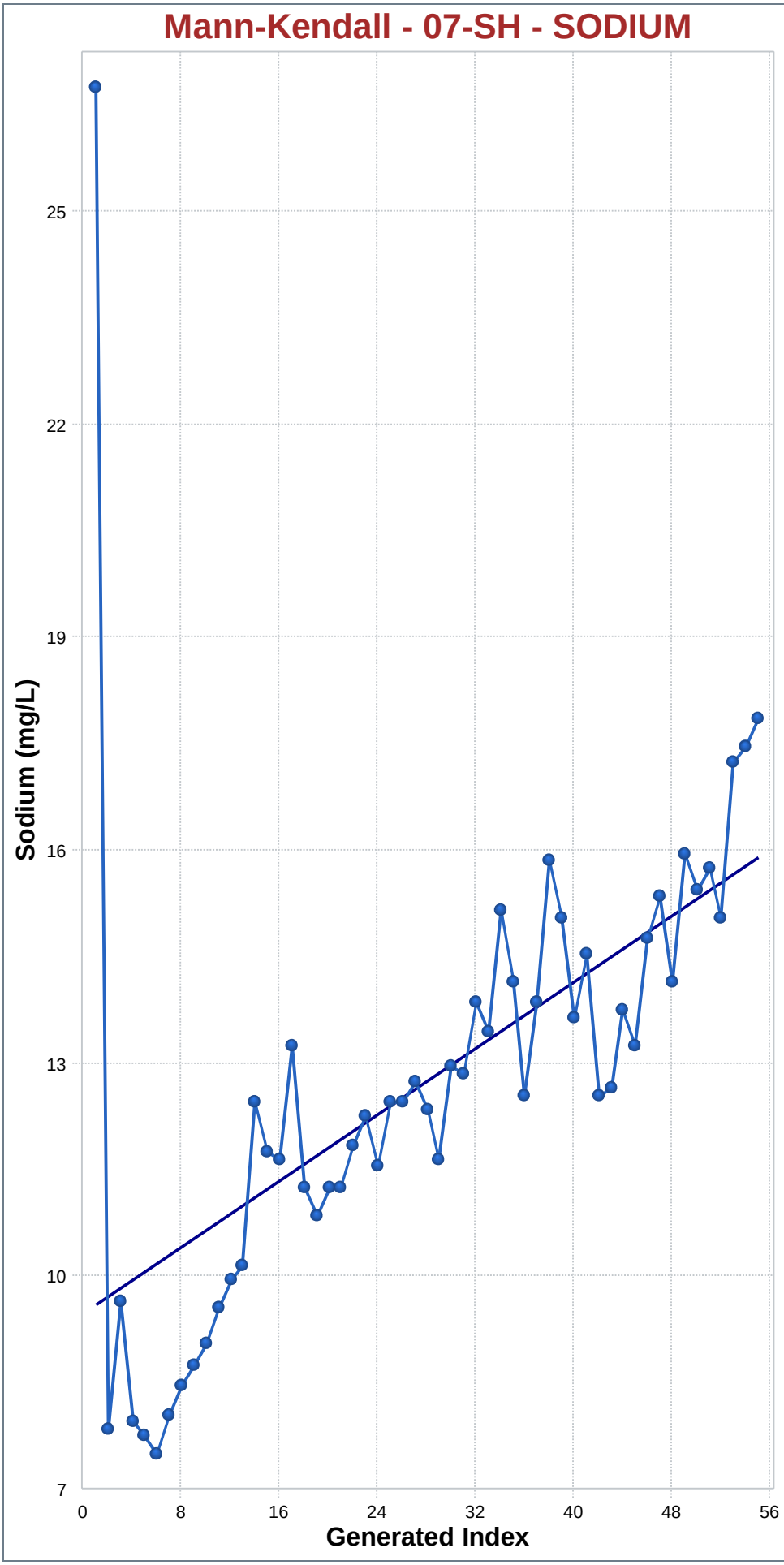

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.2056 |
| Standardized Value of S | 0.3099 |
| M-K Test Value (S) | 46 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3783 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0006 |
| OLS Regression Intercept | 7.6604 |

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




**Mann-Kendall Trend Analysis**

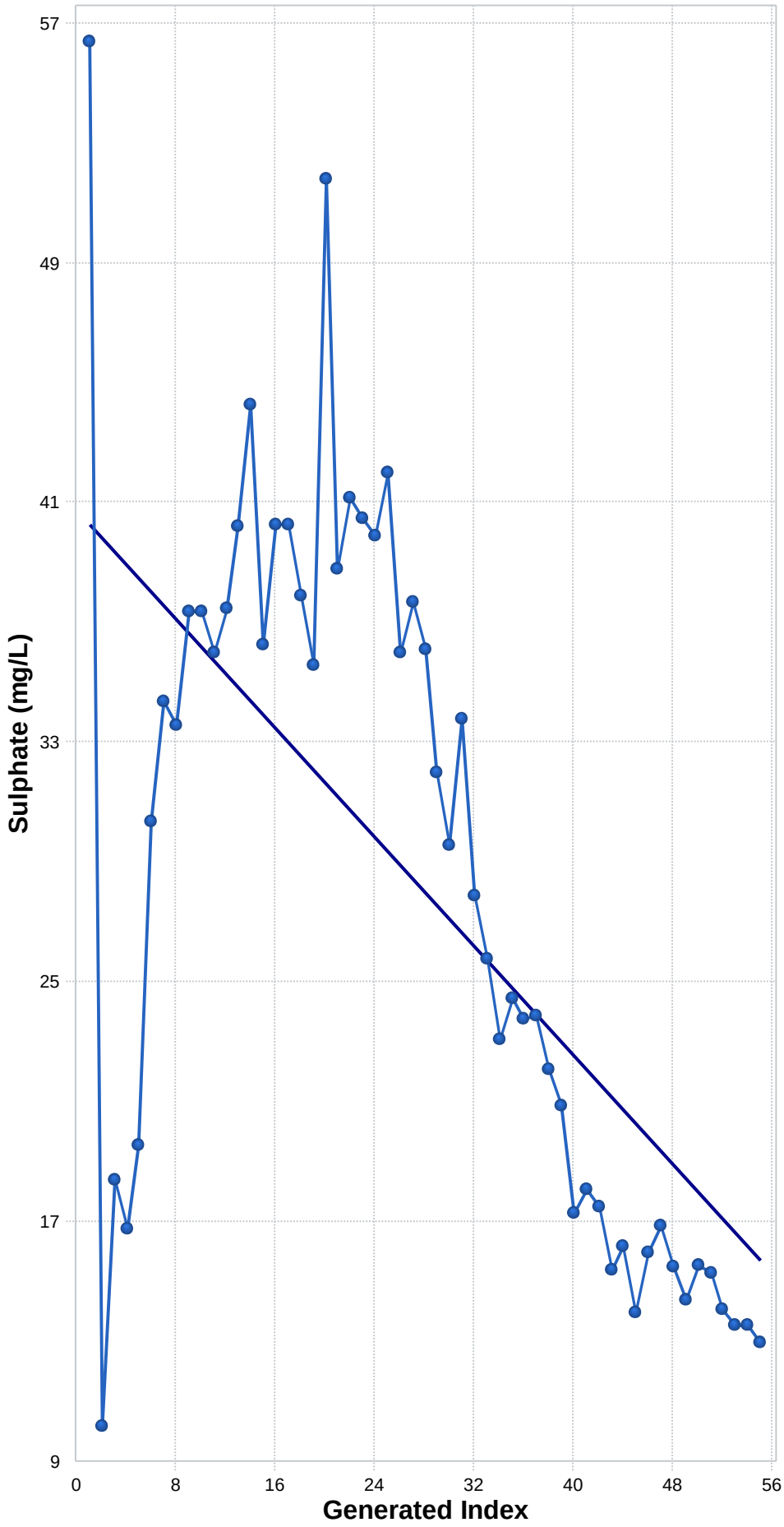
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.7014 |
| Standardized Value of S | 7.7414 |
| M-K Test Value (S) | 1,067 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1168 |
| OLS Regression Intercept | 9.7330 |

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

# Mann-Kendall - 07-SH - SULPHATE



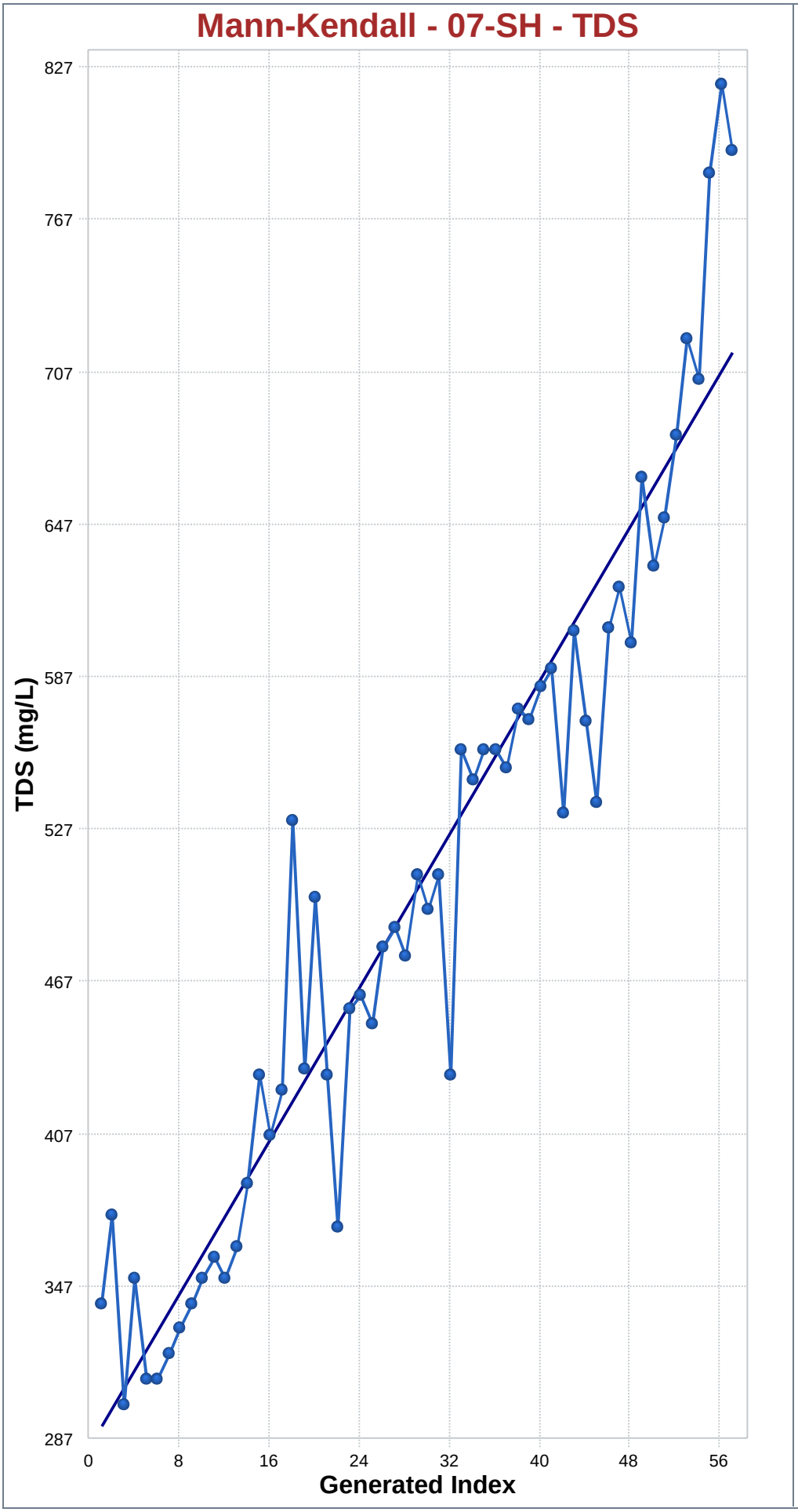

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.7353 |
| Standardized Value of S | -5.6050 |
| M-K Test Value (S) | -773 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.4544 |
| OLS Regression Intercept | 40.3396 |

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



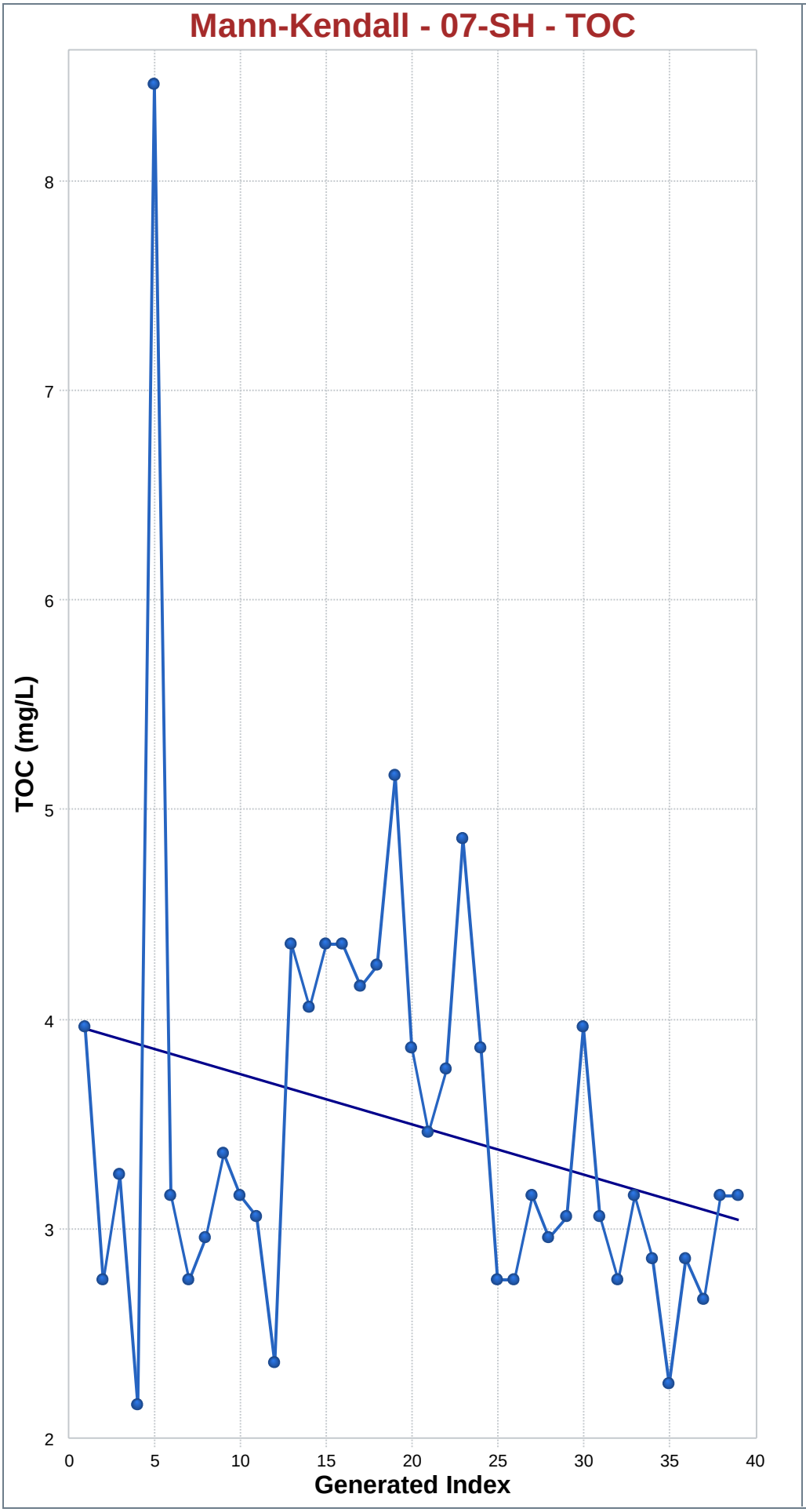

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.2194 |
| Standardized Value of S | 9.4133 |
| M-K Test Value (S) | 1,368 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 7.5441 |
| OLS Regression Intercept | 284.1692 |

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



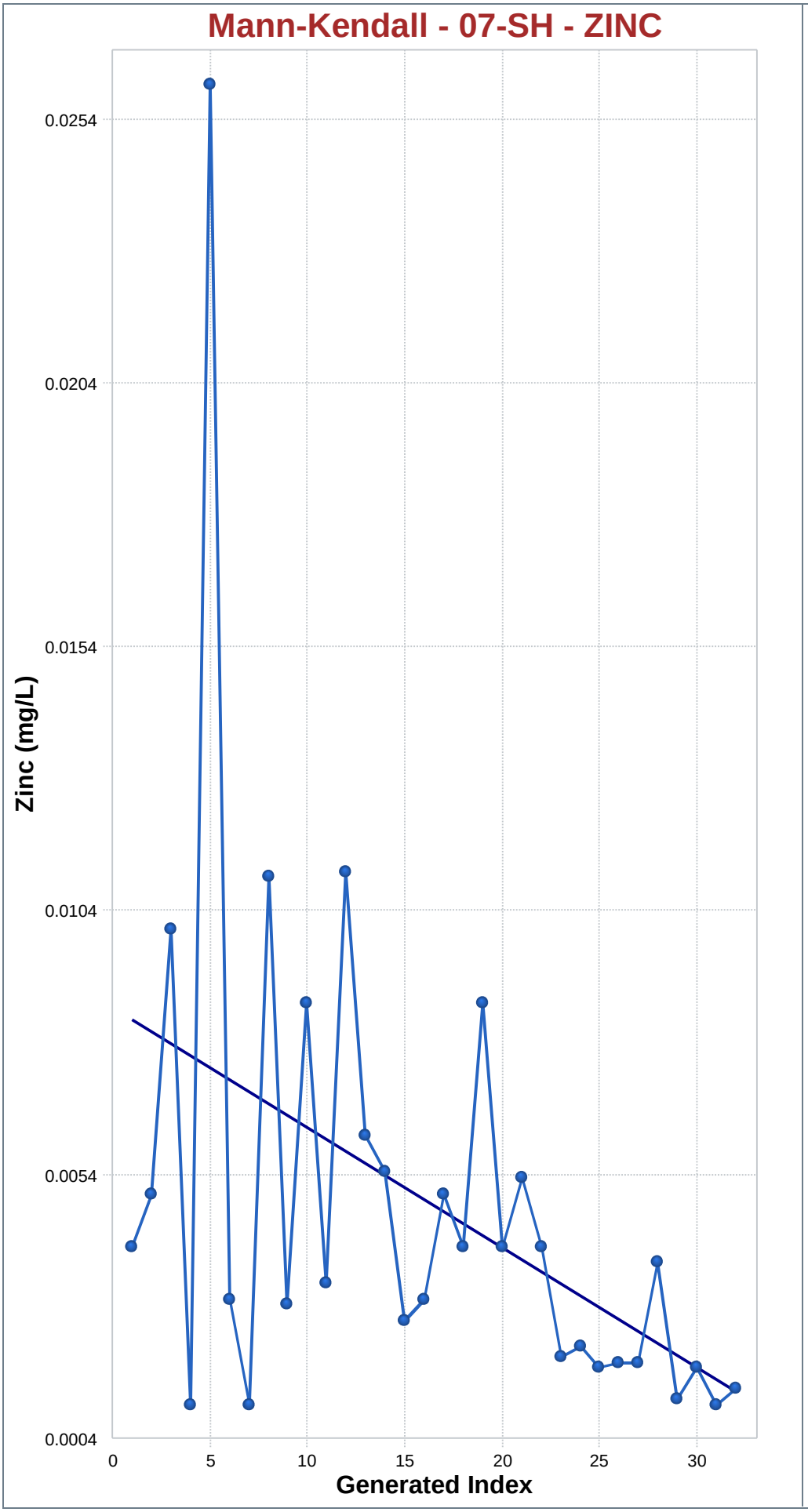

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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.



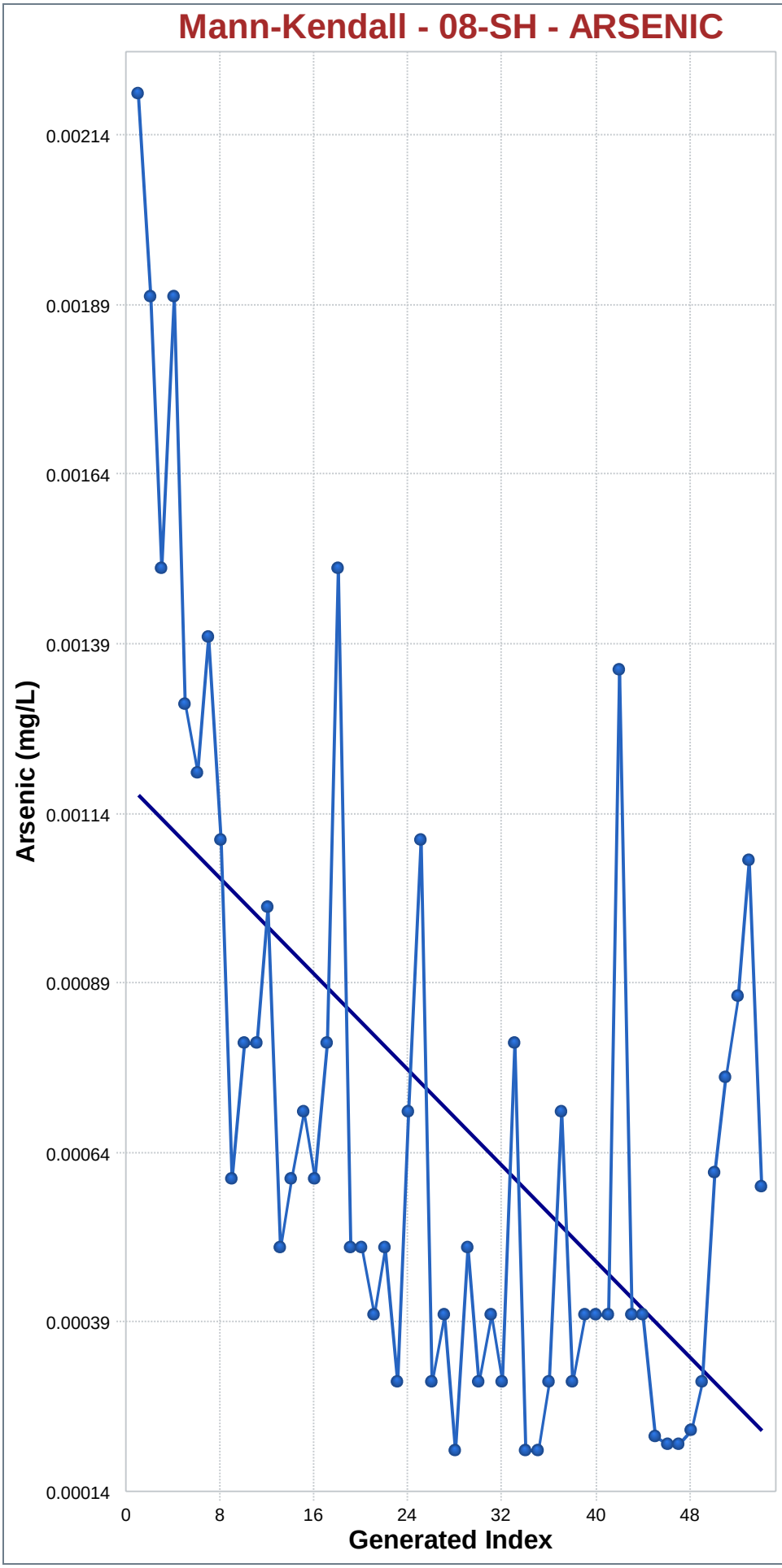

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.5251 |
| Standardized Value of S | -3.1369 |
| M-K Test Value (S) | -194 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0009 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0085 |

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



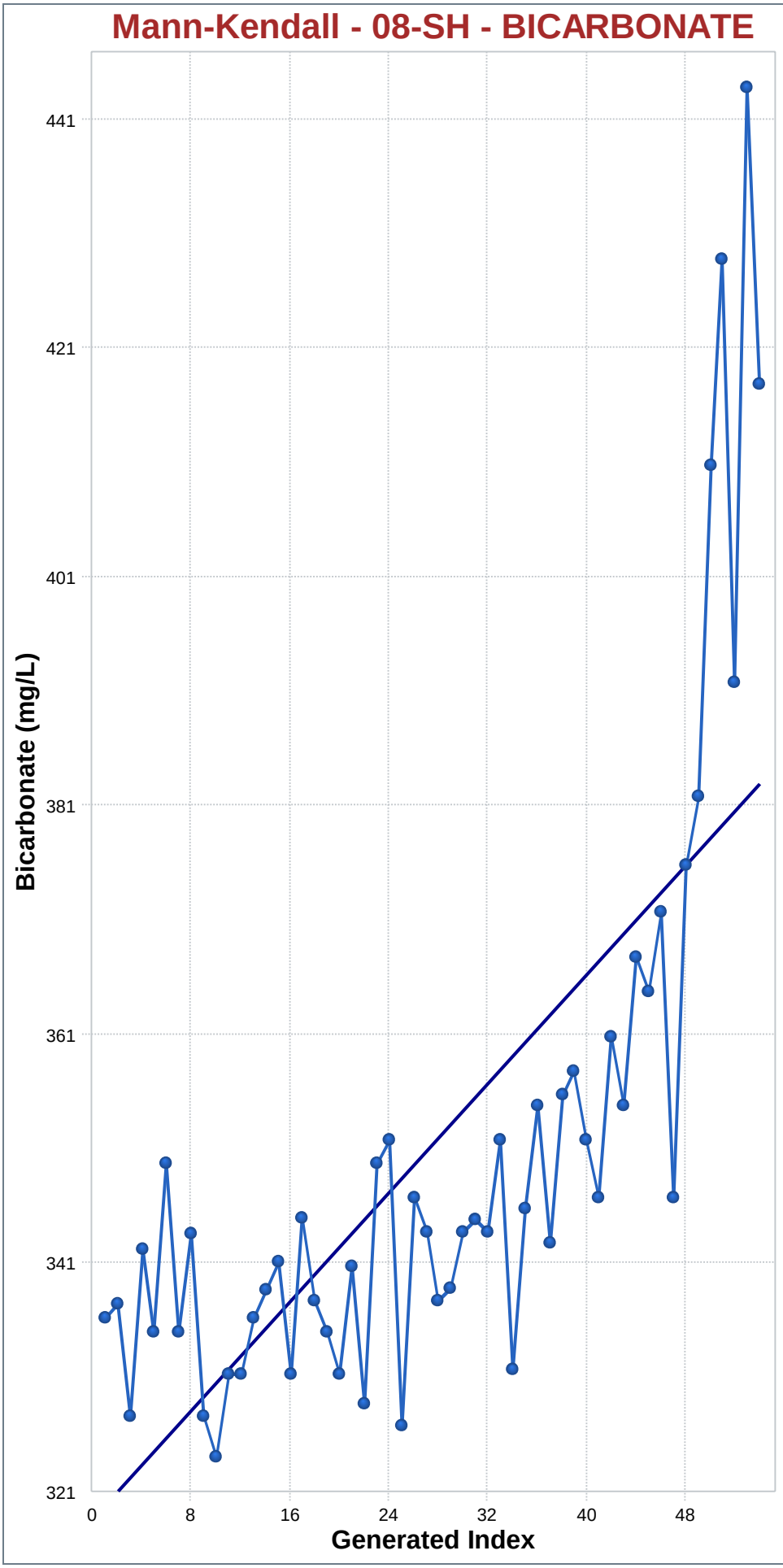

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.4803 |
| Standardized Value of S | -4.3602 |
| M-K Test Value (S) | -583 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0012 |

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



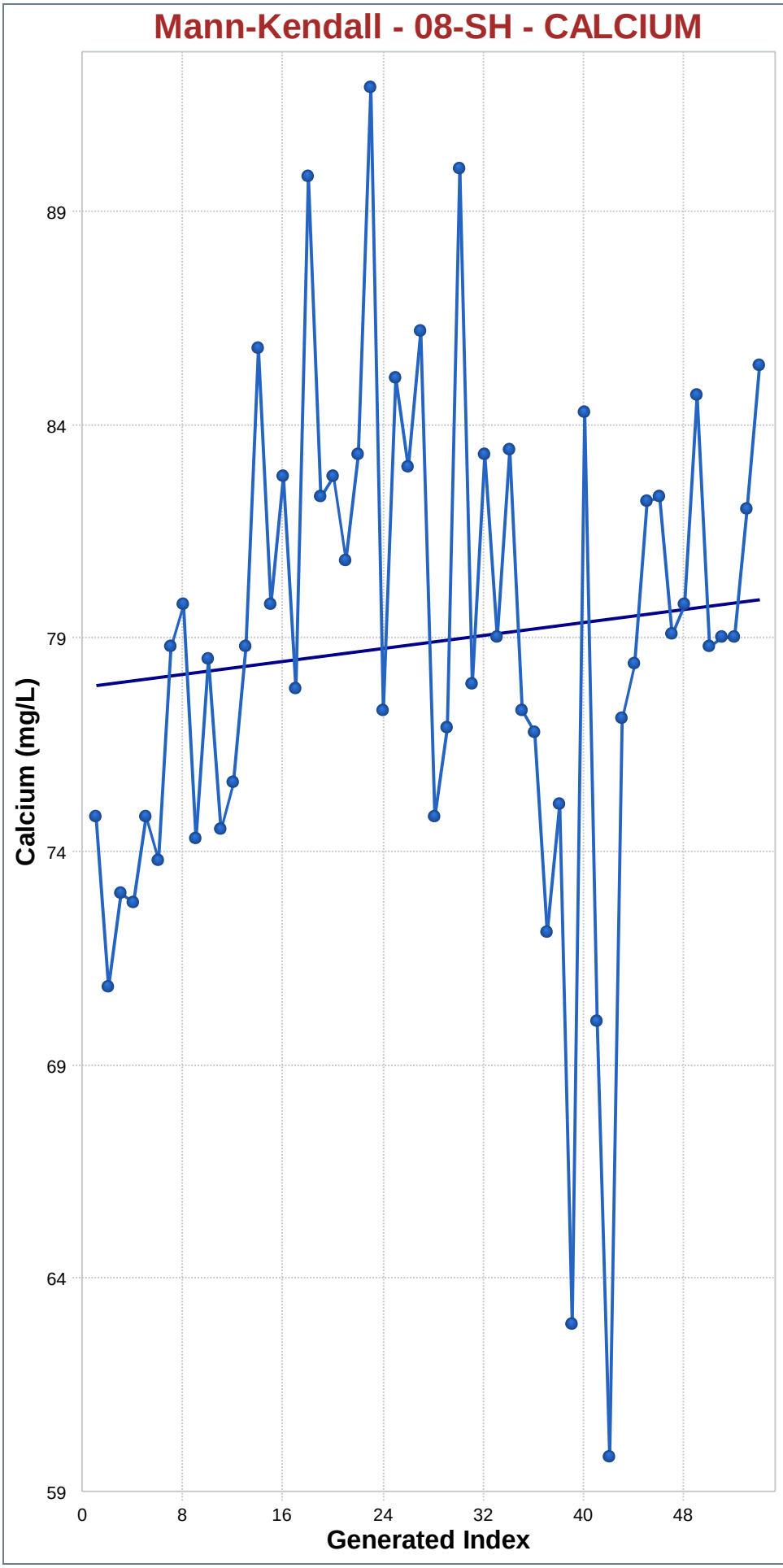

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.9390 |
| Standardized Value of S | 6.7045 |
| M-K Test Value (S) | 899 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.1928 |
| OLS Regression Intercept | 318.7384 |

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



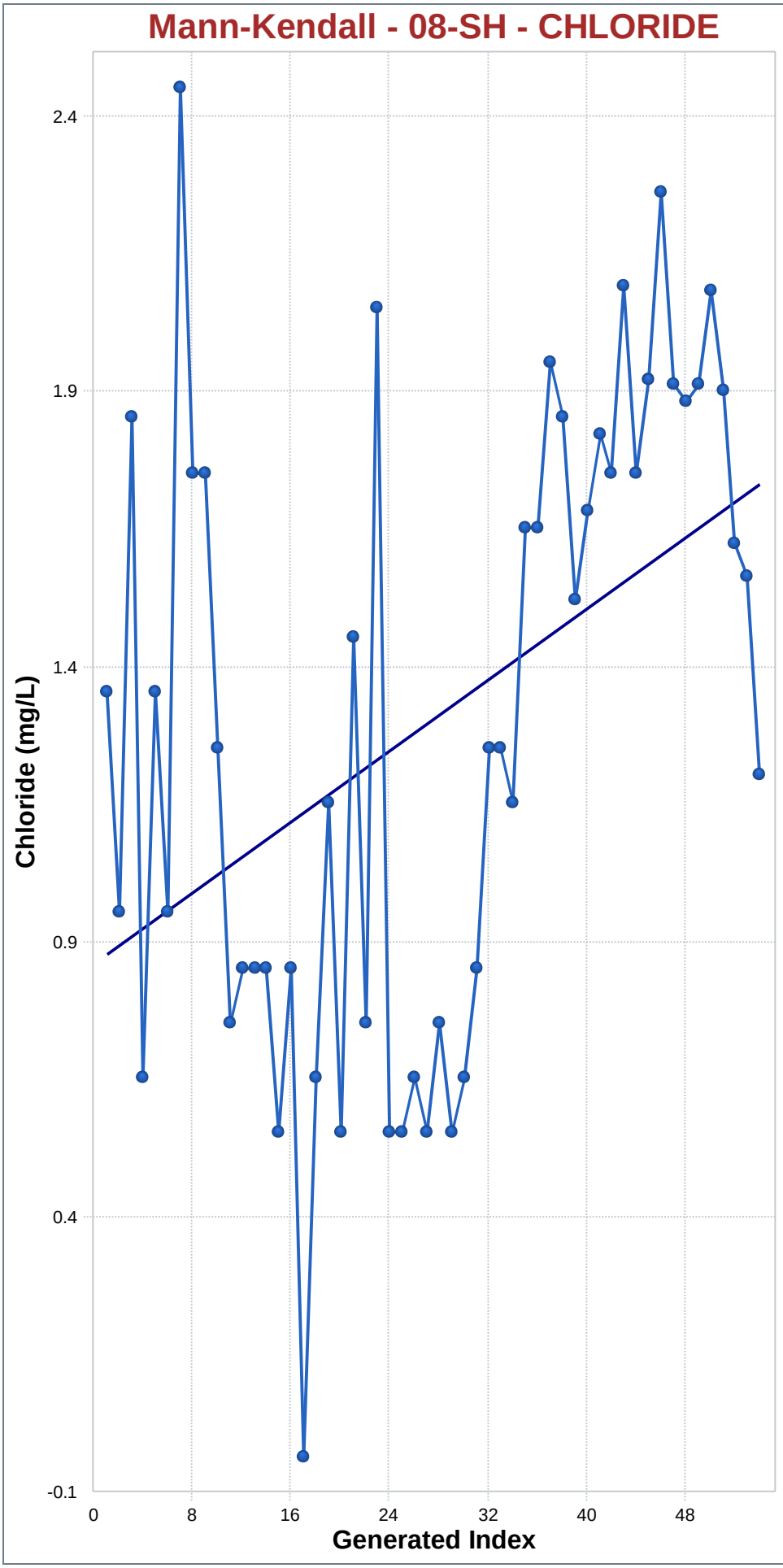

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.9714 |
| Standardized Value of S | 1.8213 |
| M-K Test Value (S) | 245 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0343 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0380 |
| OLS Regression Intercept | 78.0504 |

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



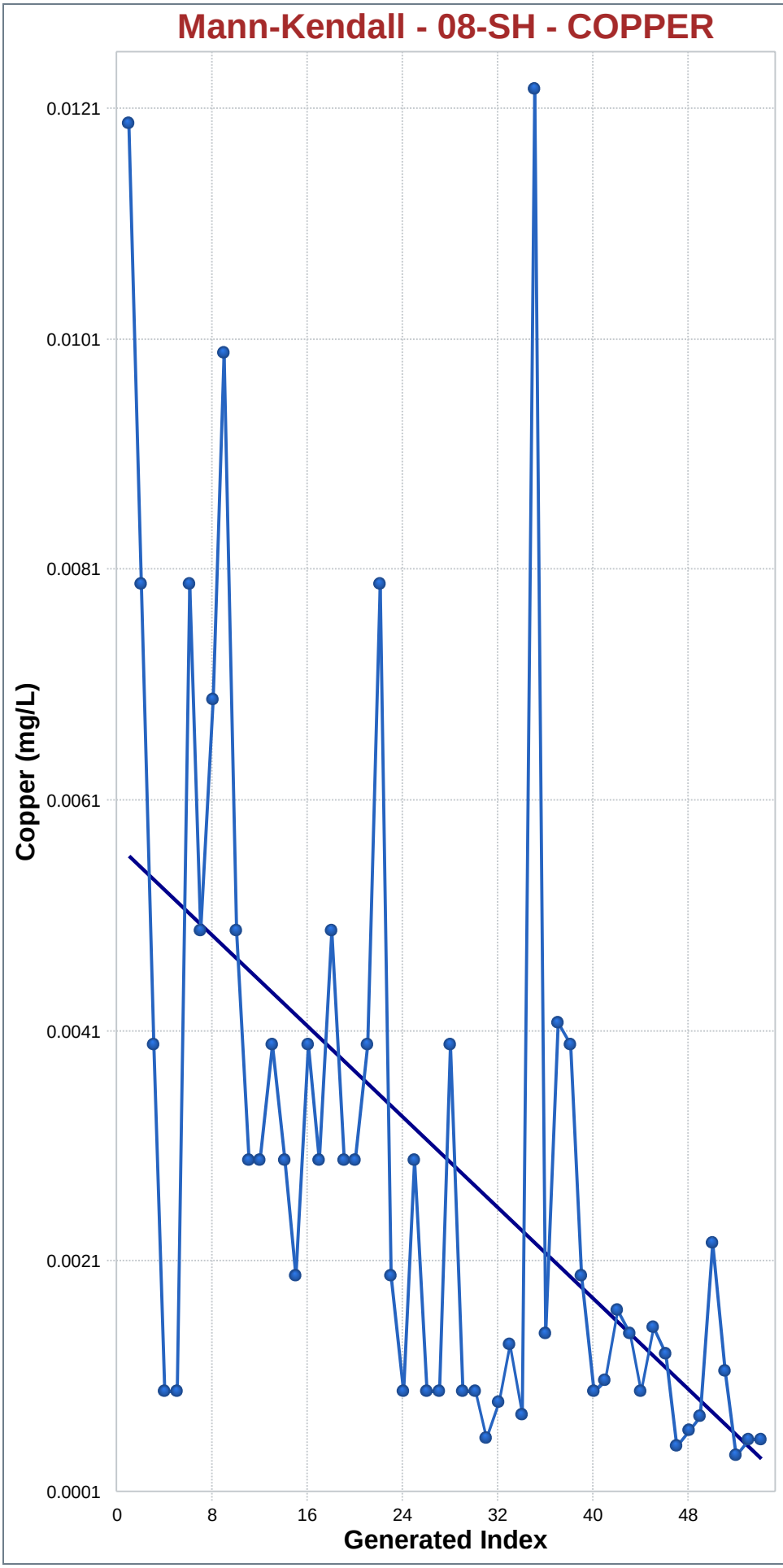

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.7585 |
| Standardized Value of S | 3.0727 |
| M-K Test Value (S) | 412 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0011 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0161 |
| OLS Regression Intercept | 0.9070 |

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



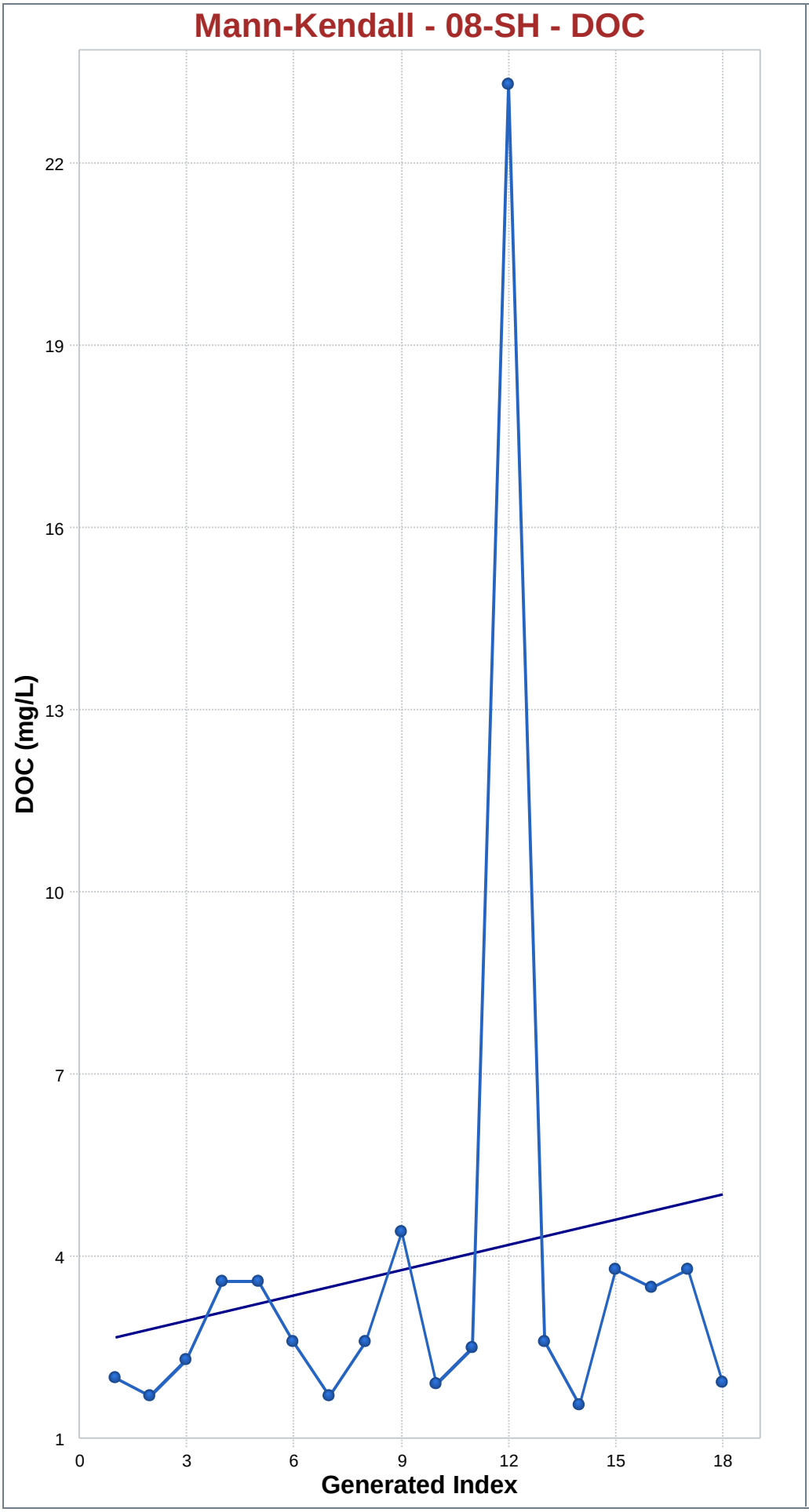

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.3767 |
| Standardized Value of S | -4.9709 |
| M-K Test Value (S) | -664 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0058 |

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



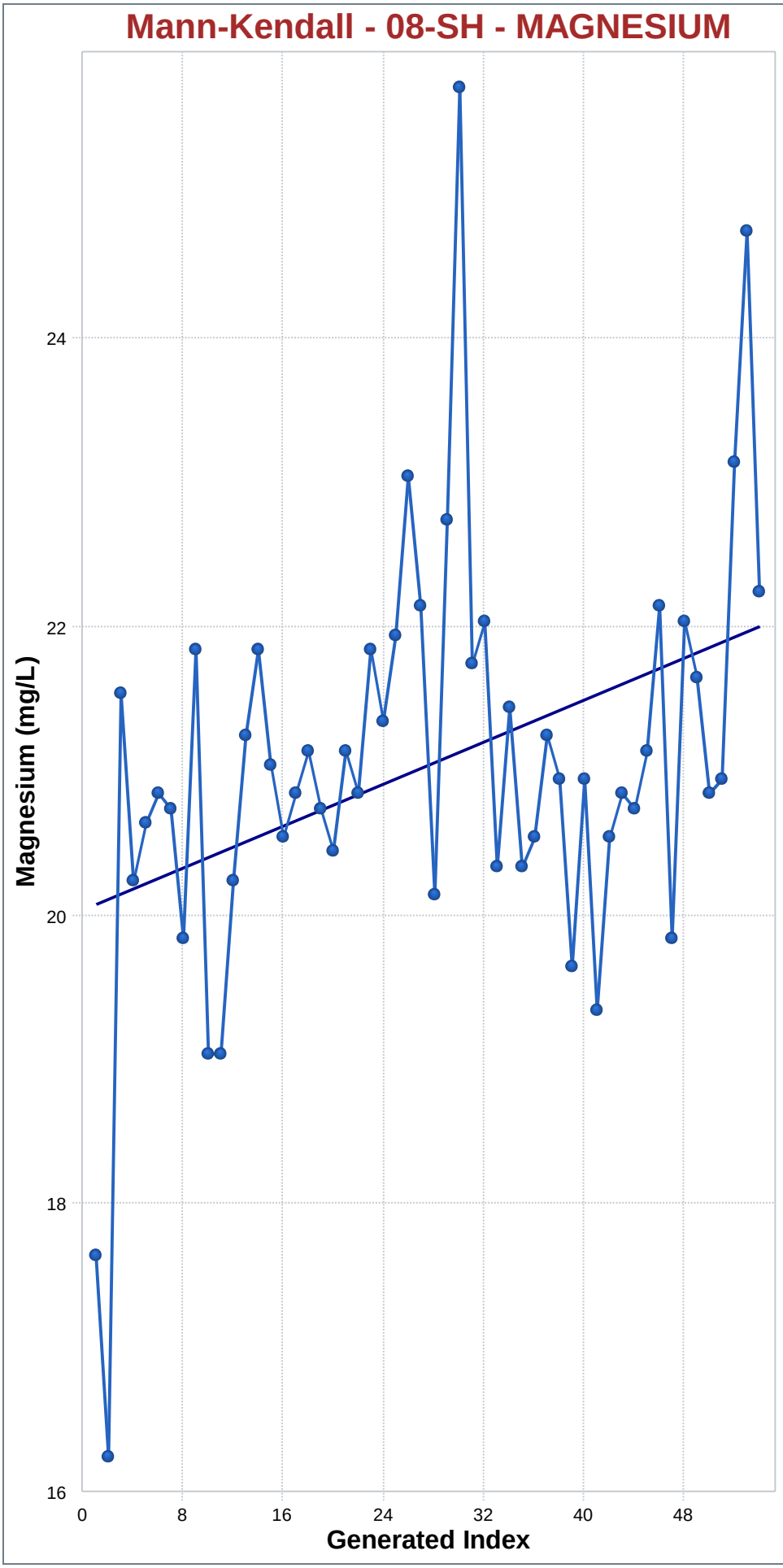

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.2742 |
| Standardized Value of S | 0.9134 |
| M-K Test Value (S) | 25 |
| Tabulated p-value | 0.1840 |
| Approximate p-value | 0.1805 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1394 |
| OLS Regression Intercept | 2.2308 |

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



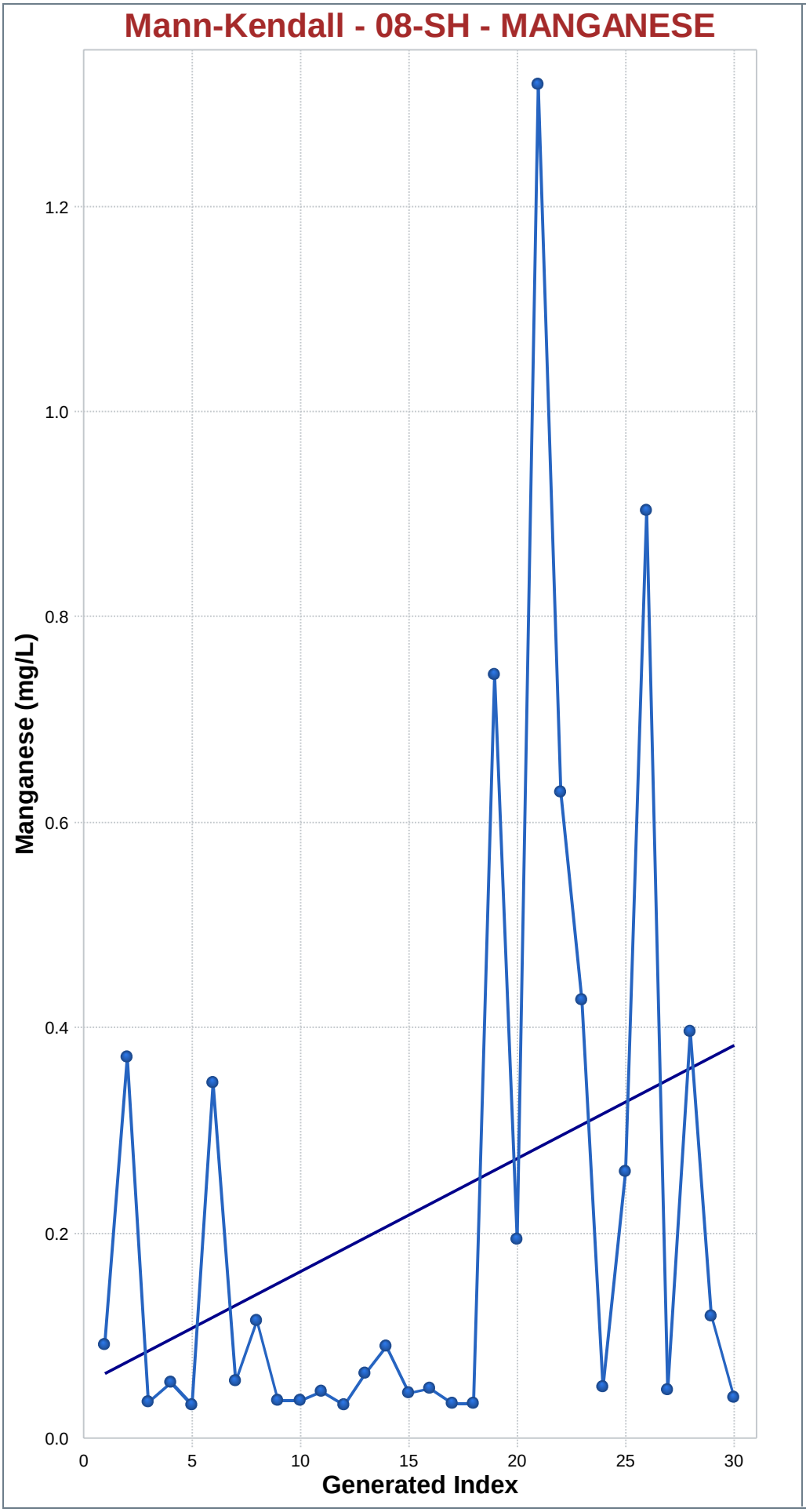

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.8843 |
| Standardized Value of S | 2.6291 |
| M-K Test Value (S) | 353 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0043 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0363 |
| OLS Regression Intercept | 19.6986 |

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




**Mann-Kendall Trend Analysis**

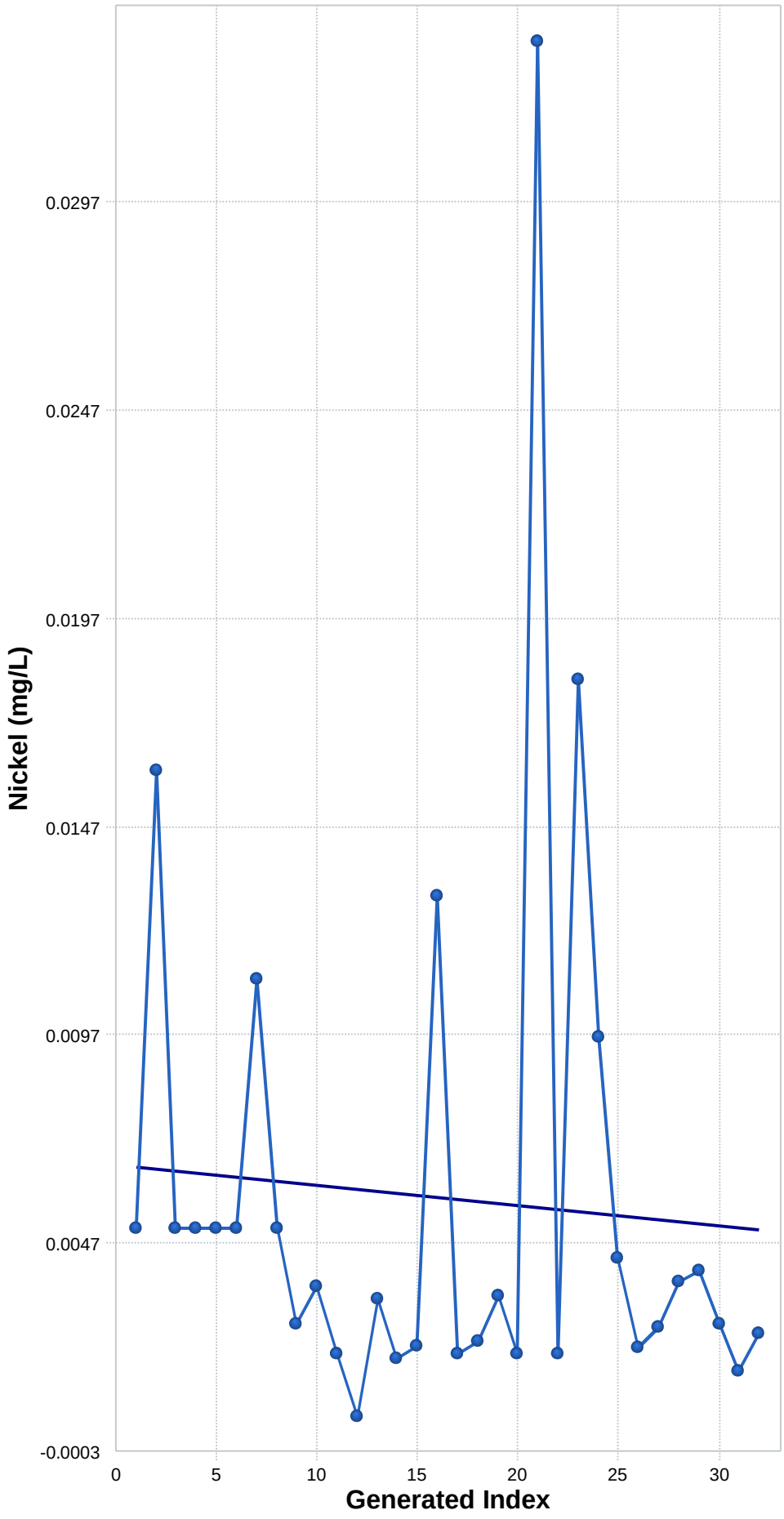
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0238 |
| Standardized Value of S | 1.3744 |
| M-K Test Value (S) | 78 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0847 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0110 |
| OLS Regression Intercept | 0.0237 |

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

# Mann-Kendall - 08-SH - NICKEL



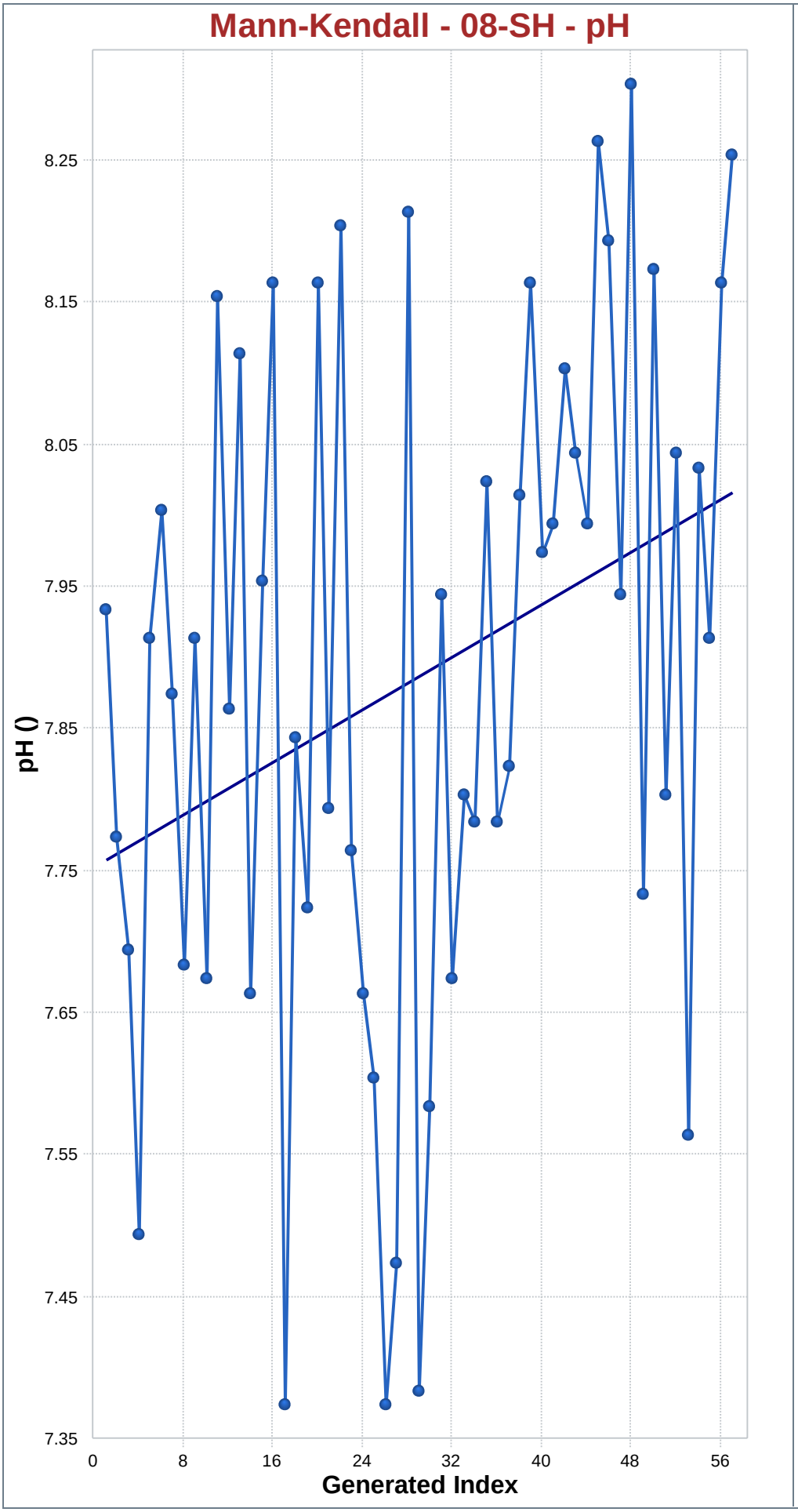

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.3569 |
| Standardized Value of S | -1.7439 |
| M-K Test Value (S) | -108 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0406 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0065 |

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




**Mann-Kendall Trend Analysis**

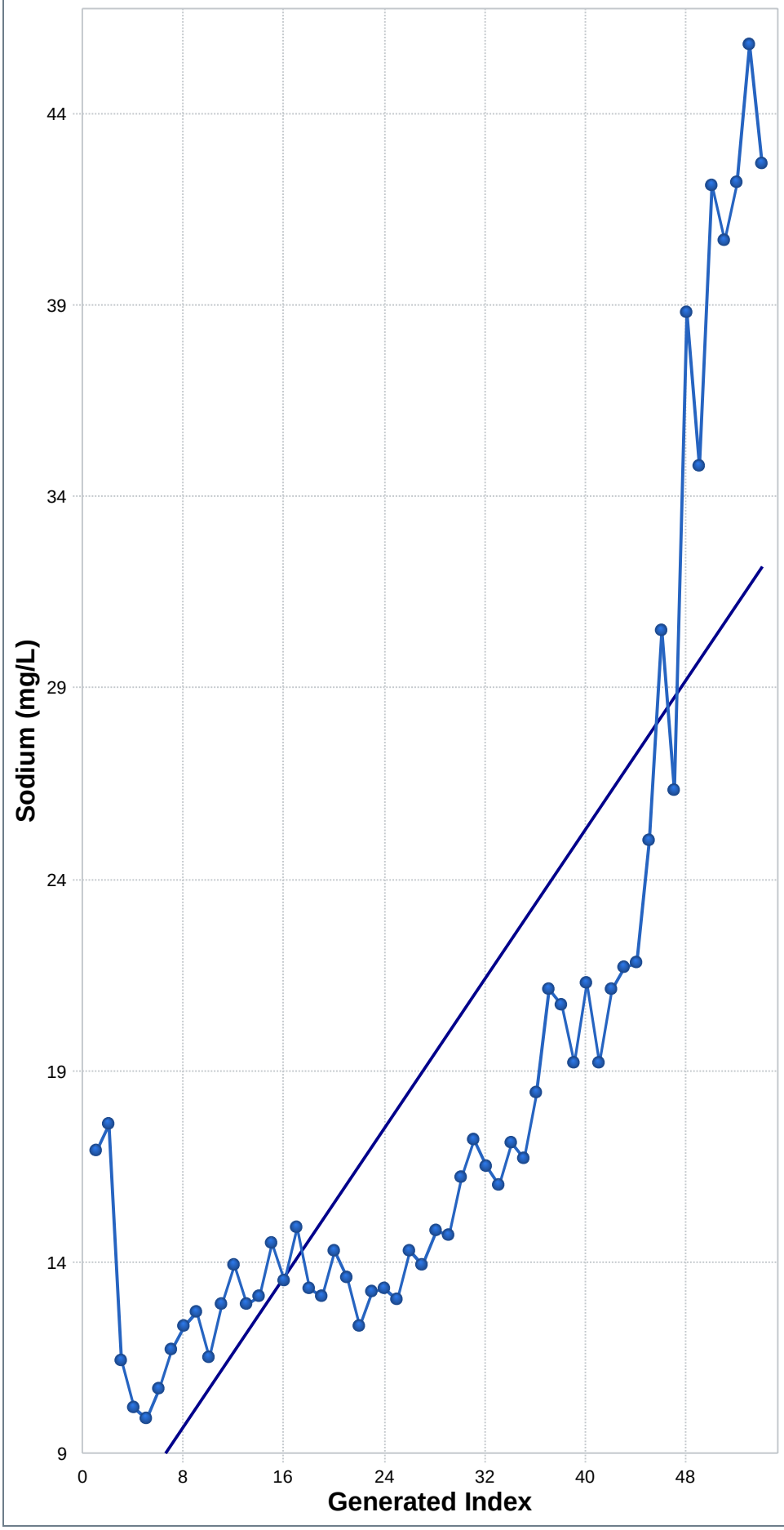
| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.1976 |
| Standardized Value of S | 2.5345 |
| M-K Test Value (S) | 369 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0056 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0046 |
| OLS Regression Intercept | 7.7488 |

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

# Mann-Kendall - 08-SH - SODIUM



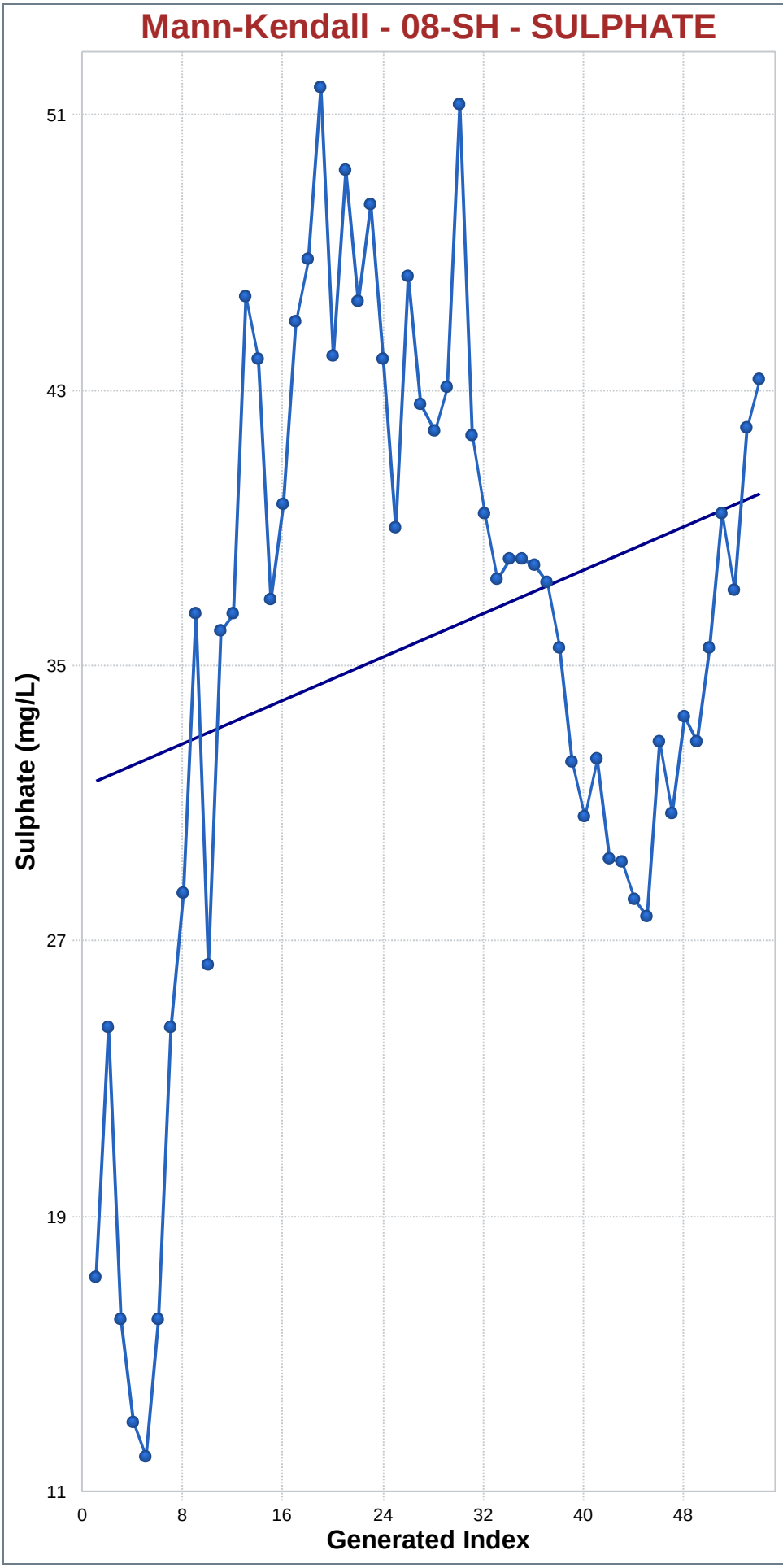

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 134.0112 |
| Standardized Value of S | 8.3277 |
| M-K Test Value (S) | 1,117 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.4886 |
| OLS Regression Intercept | 6.0766 |

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




**Mann-Kendall Trend Analysis**

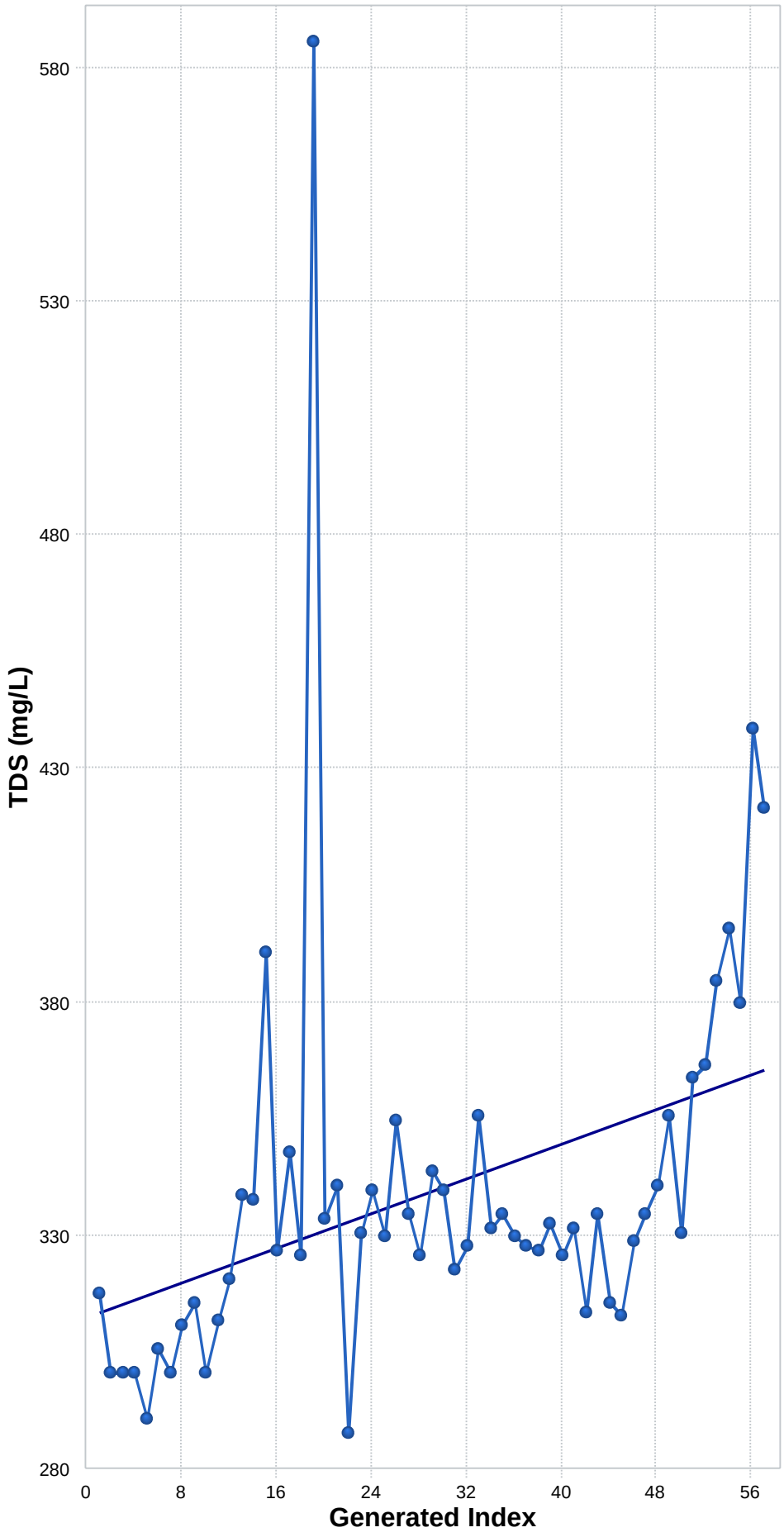
| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 134.0112 |
| Standardized Value of S | 0.3134 |
| M-K Test Value (S) | 43 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3770 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1571 |
| OLS Regression Intercept | 31.0051 |

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

# Mann-Kendall - 08-SH - TDS




**Mann-Kendall Trend Analysis**

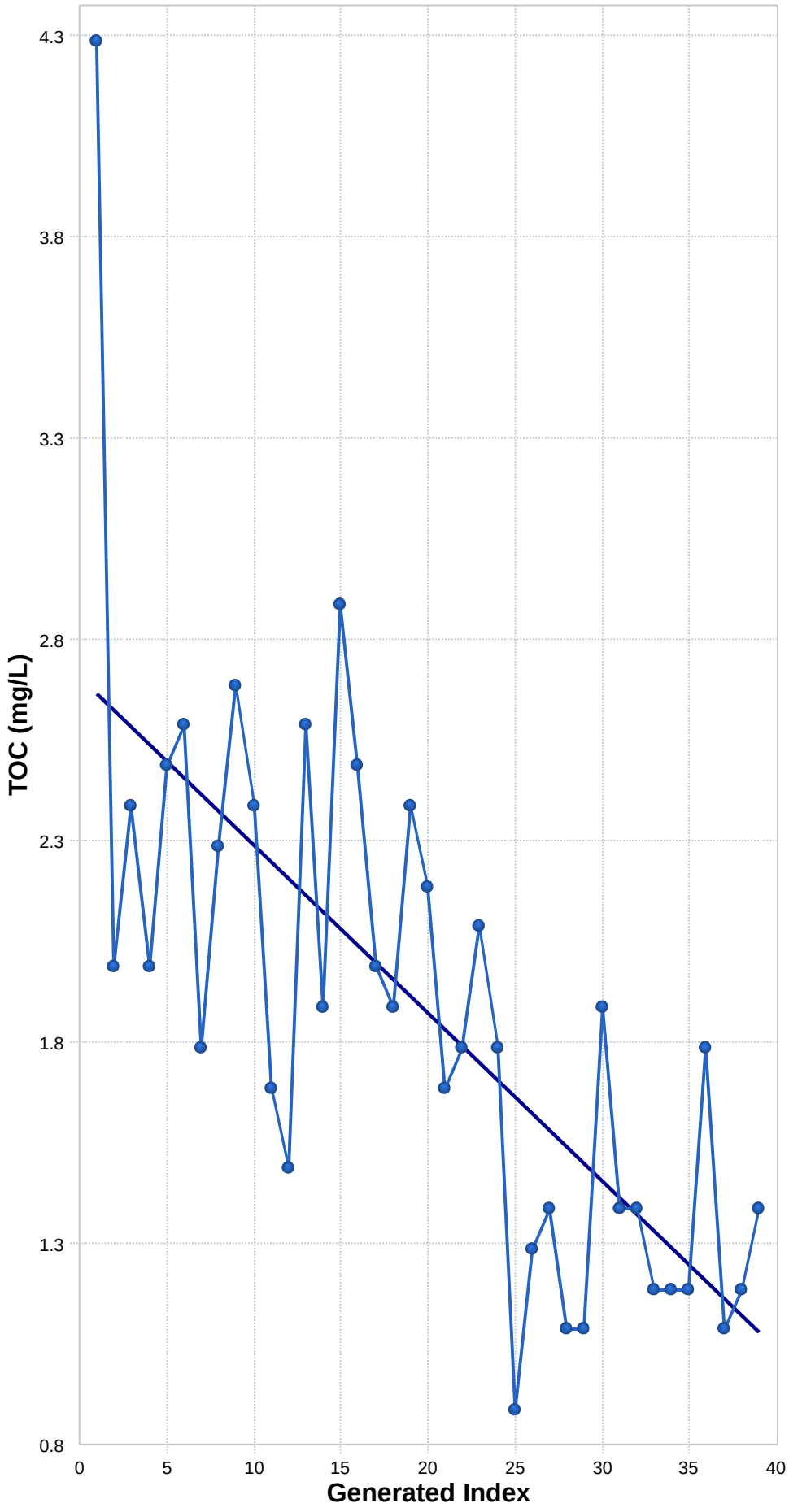
| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.1367 |
| Standardized Value of S | 4.5268 |
| M-K Test Value (S) | 658 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.9298 |
| OLS Regression Intercept | 311.8954 |

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

# Mann-Kendall - 08-SH - TOC



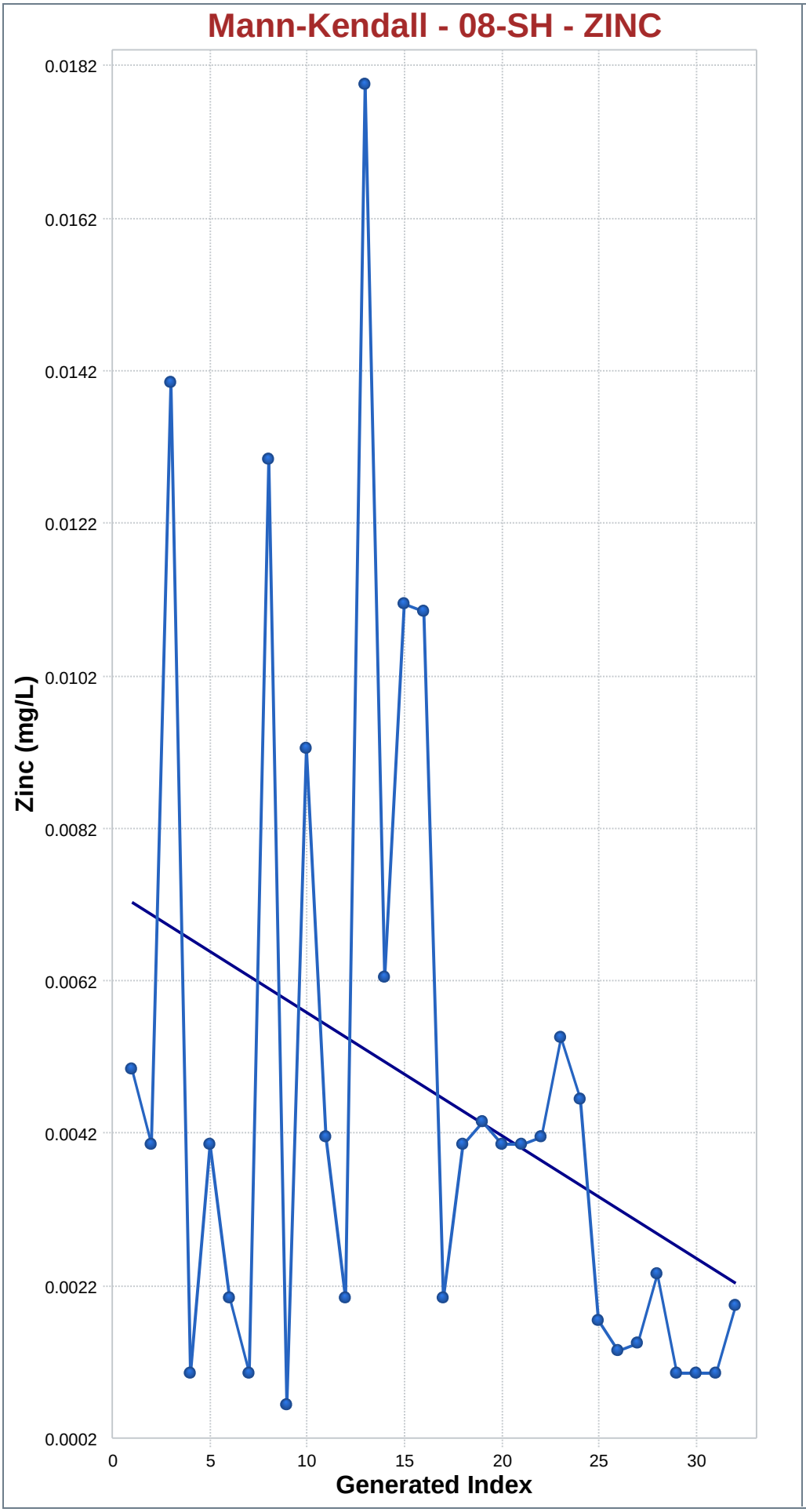

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

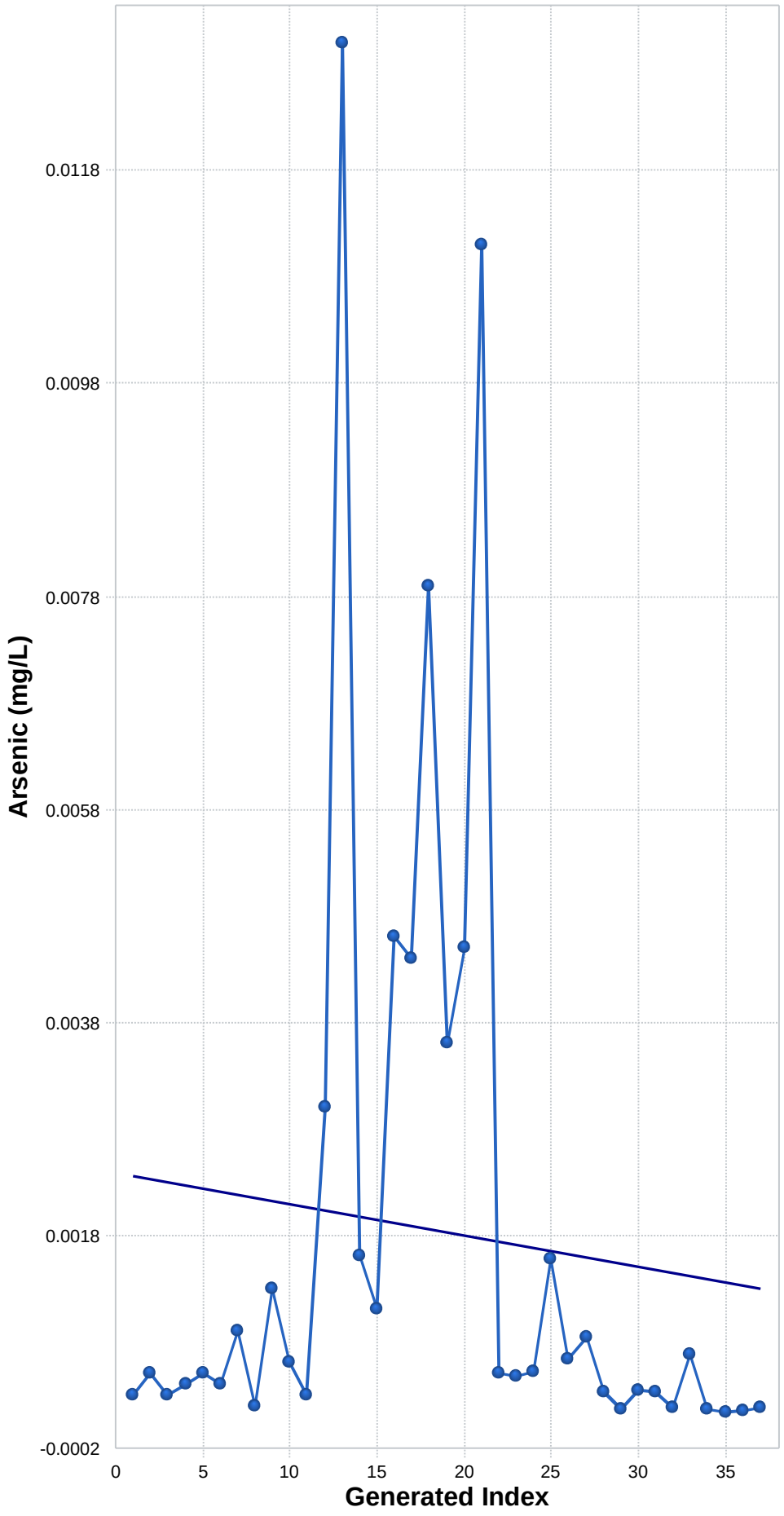
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.3569 |
| Standardized Value of S | -2.1025 |
| M-K Test Value (S) | -130 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0178 |

**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 - 11-SH - ARSENIC




**Mann-Kendall Trend Analysis**

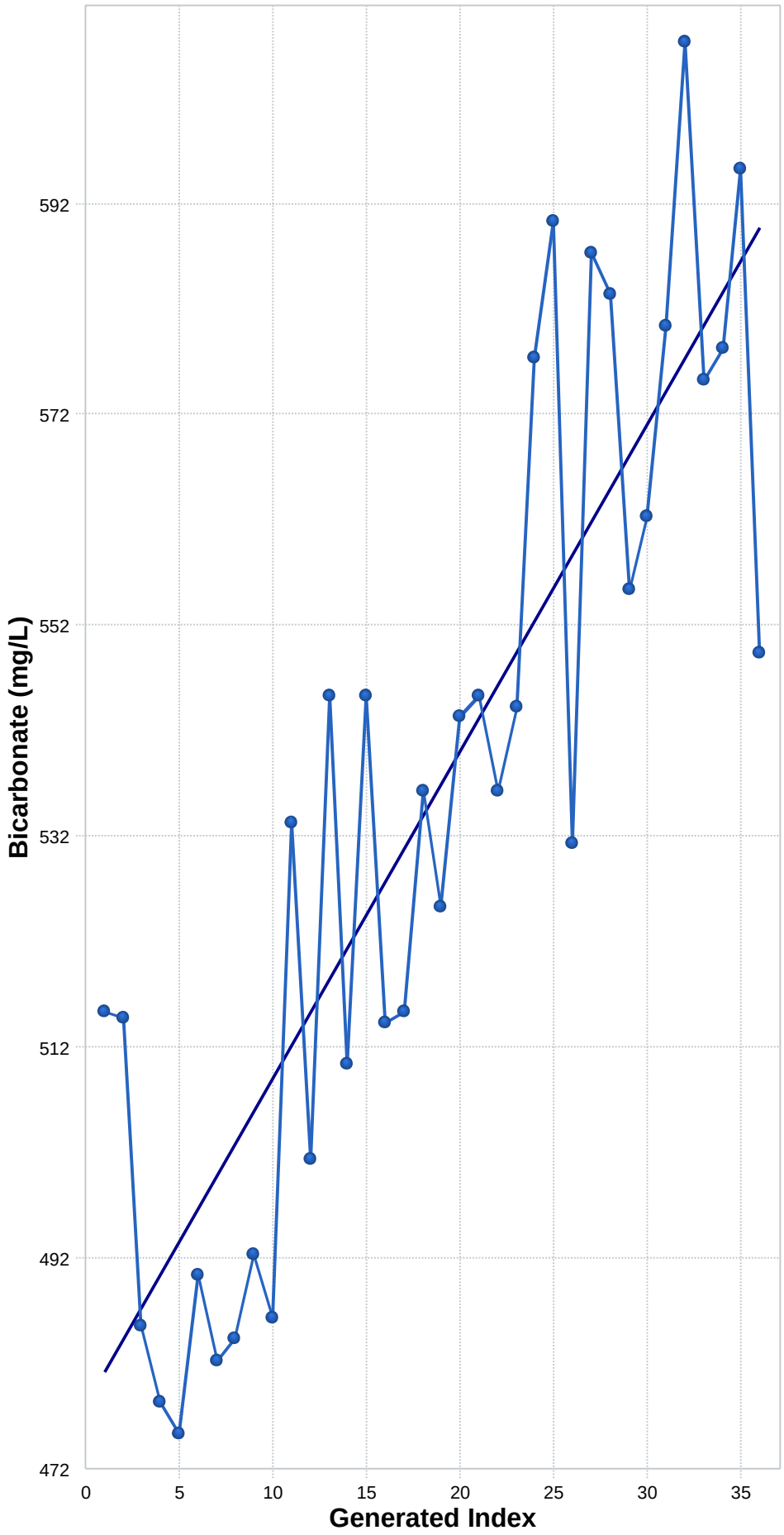
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.3981 |
| Standardized Value of S | -1.5576 |
| M-K Test Value (S) | -120 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0597 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0024 |

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

# Mann-Kendall - 11-SH - BICARBONATE



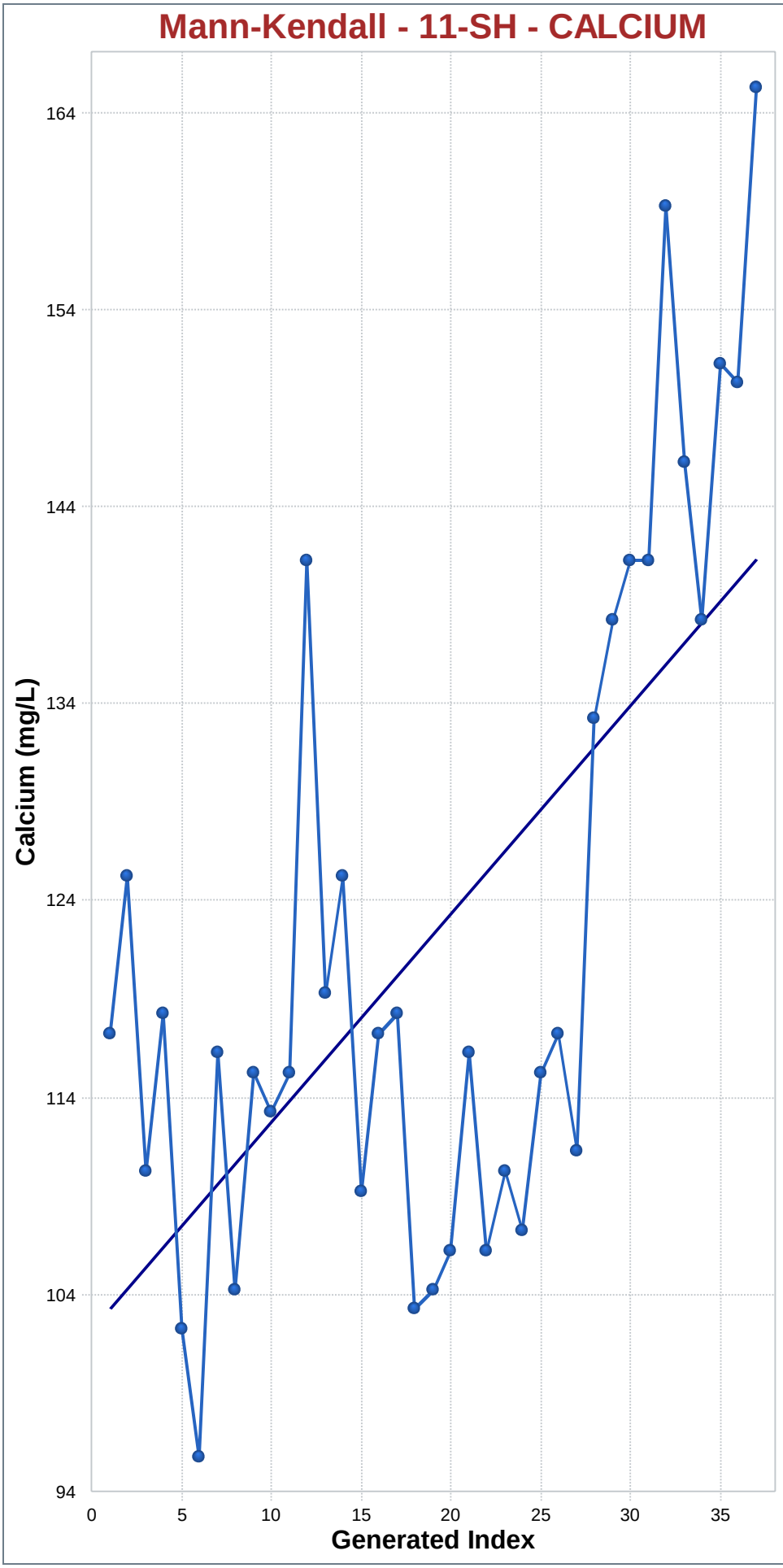

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 36 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 73.3780 |
| Standardized Value of S | 5.6965 |
| M-K Test Value (S) | 419 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 3.0992 |
| OLS Regression Intercept | 477.7375 |

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




**Mann-Kendall Trend Analysis**

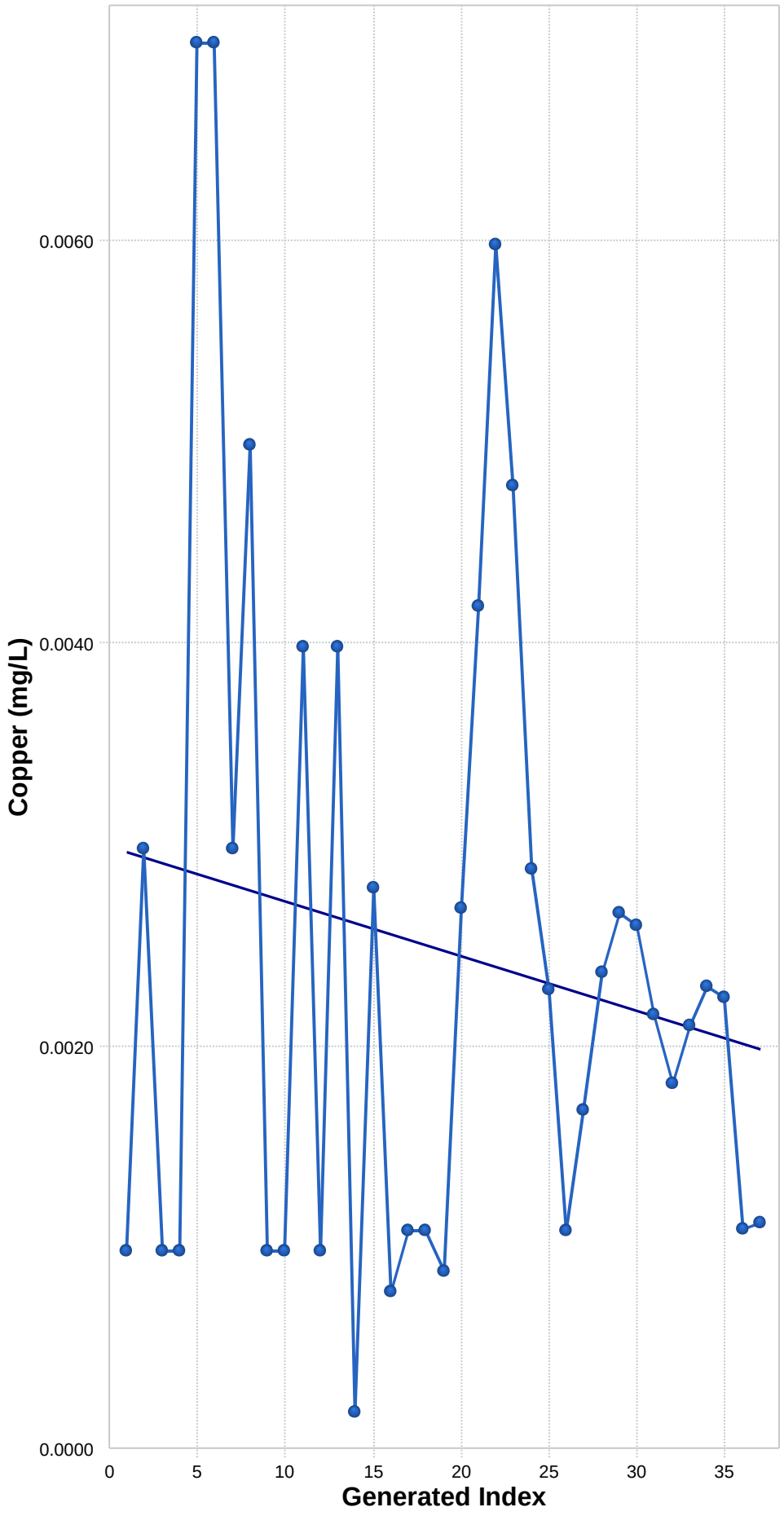
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.3413 |
| Standardized Value of S | 3.4451 |
| M-K Test Value (S) | 264 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0003 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.0573 |
| OLS Regression Intercept | 101.9797 |

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

# Mann-Kendall - 11-SH - COPPER



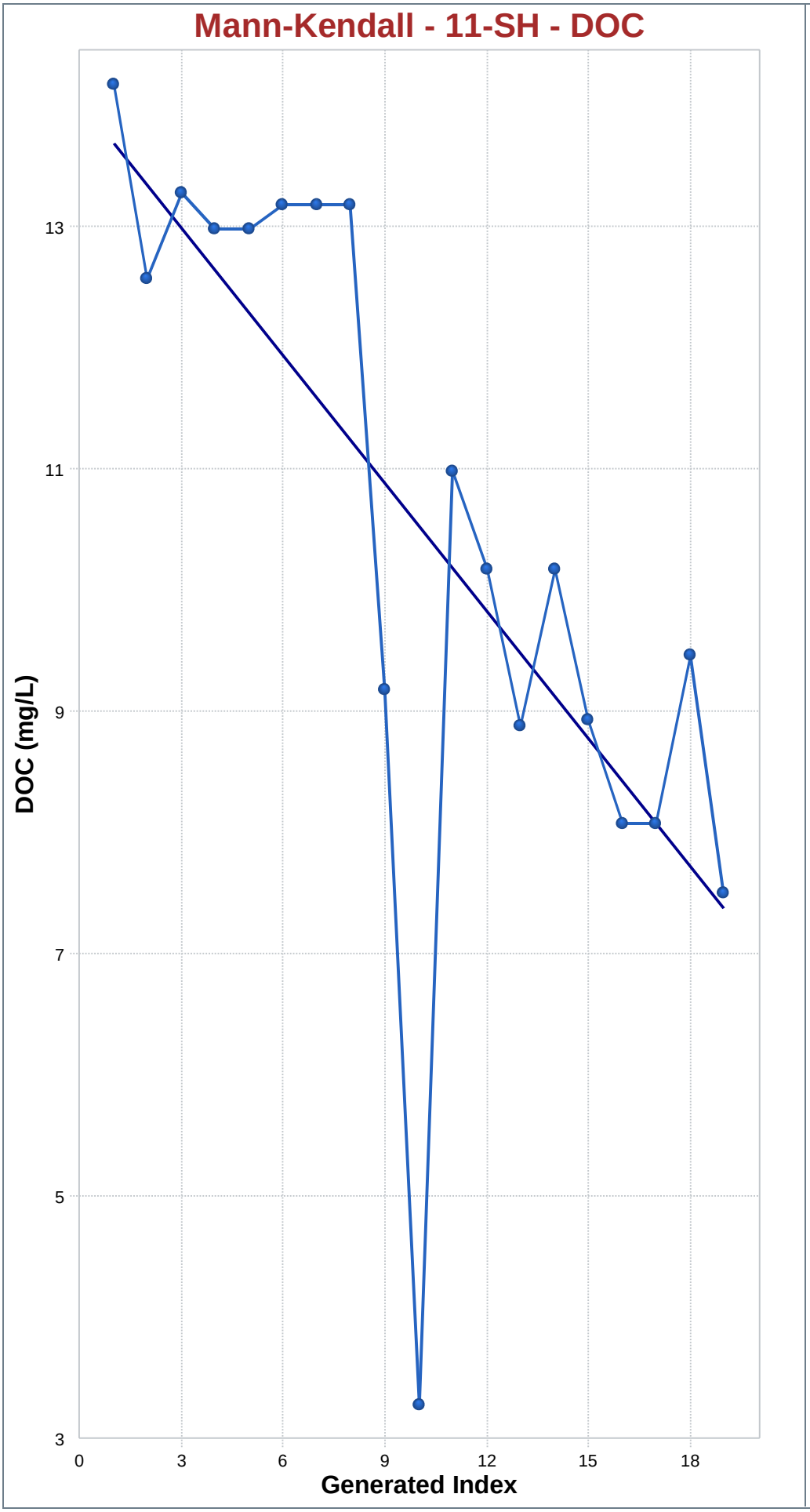

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.2299 |
| Standardized Value of S | -0.3148 |
| M-K Test Value (S) | -25 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3764 |

**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.



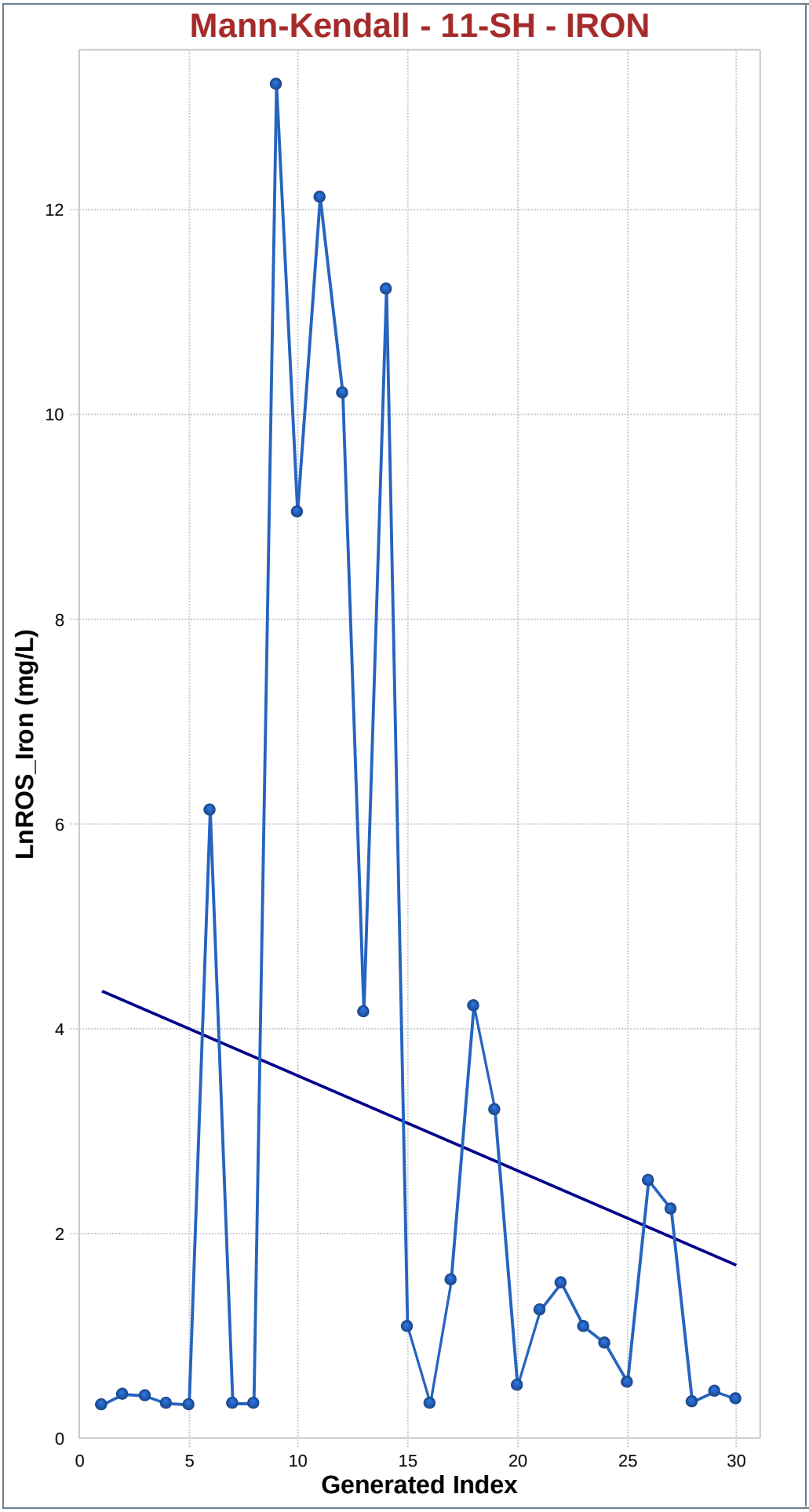

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 19 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 28.4664 |
| Standardized Value of S | -3.5832 |
| M-K Test Value (S) | -103 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0002 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.3509 |
| OLS Regression Intercept | 14.0711 |

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




**Mann-Kendall Trend Analysis**

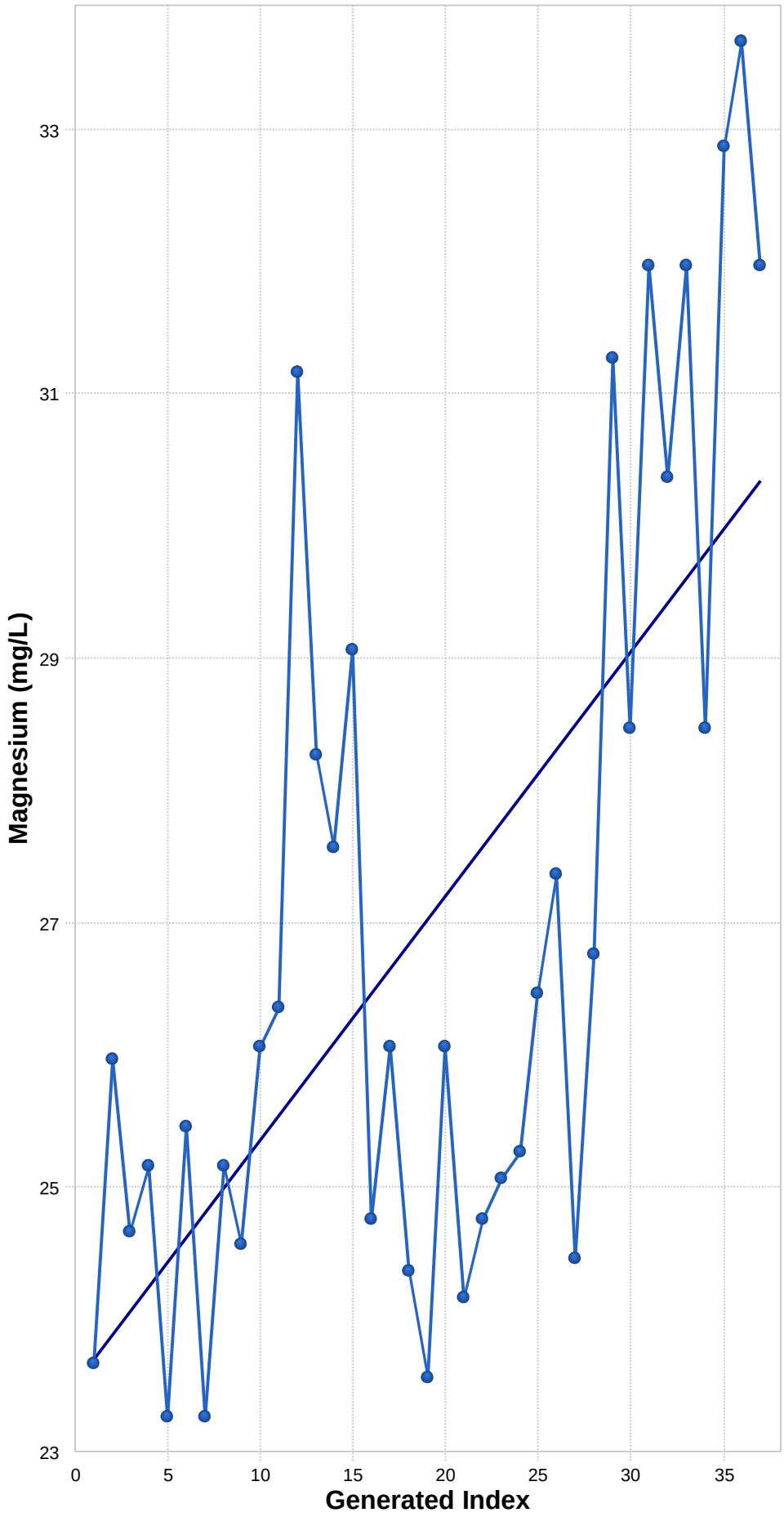
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0417 |
| Standardized Value of S | |
| M-K Test Value (S) | 0 |
| Appx. Critical Value (0.05) | |
| Approximate p-value | |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0922 |
| OLS Regression Intercept | 4.1348 |

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

# Mann-Kendall - 11-SH - MAGNESIUM



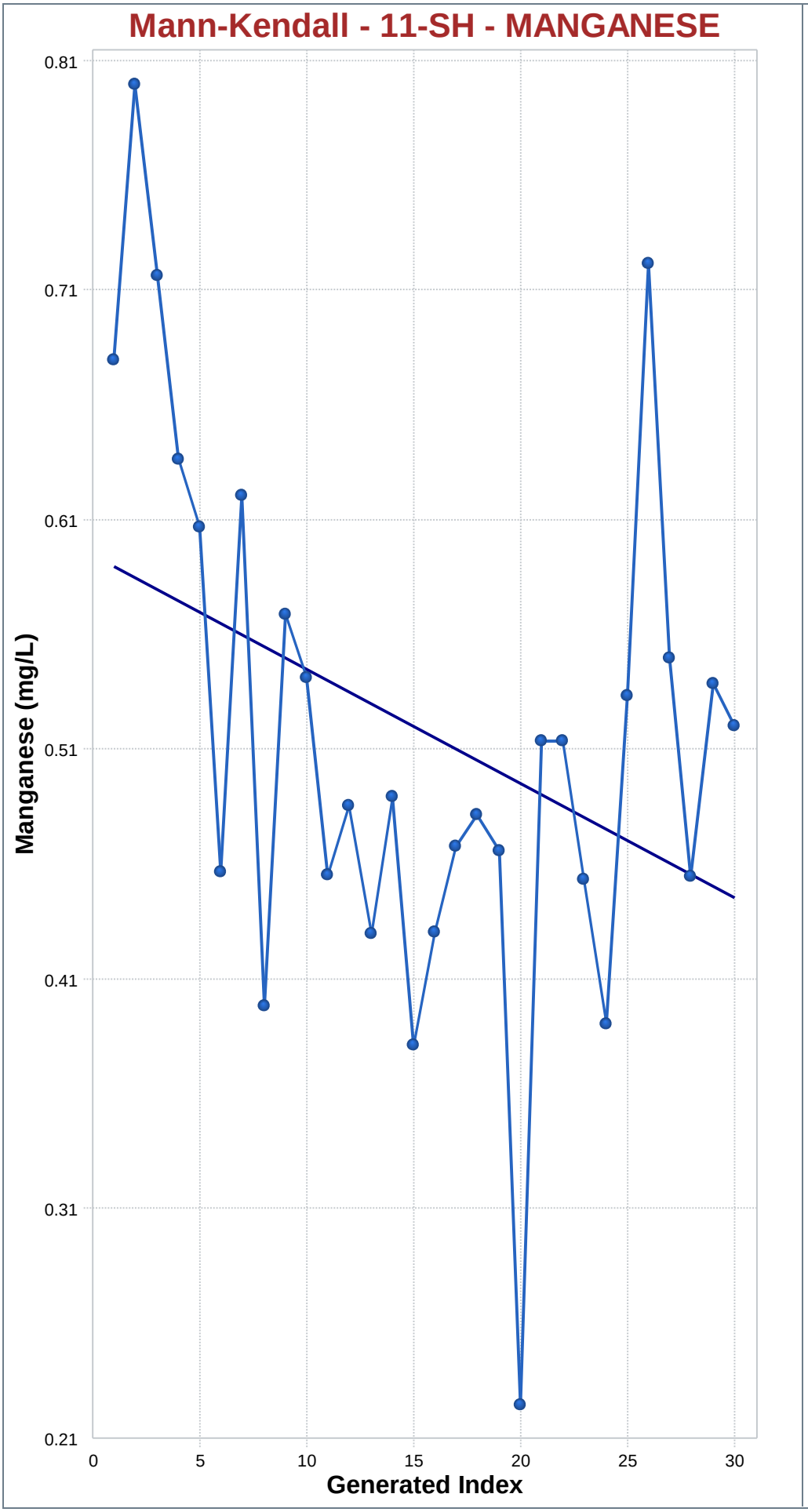

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.3850 |
| Standardized Value of S | 4.1238 |
| M-K Test Value (S) | 316 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1845 |
| OLS Regression Intercept | 23.3509 |

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



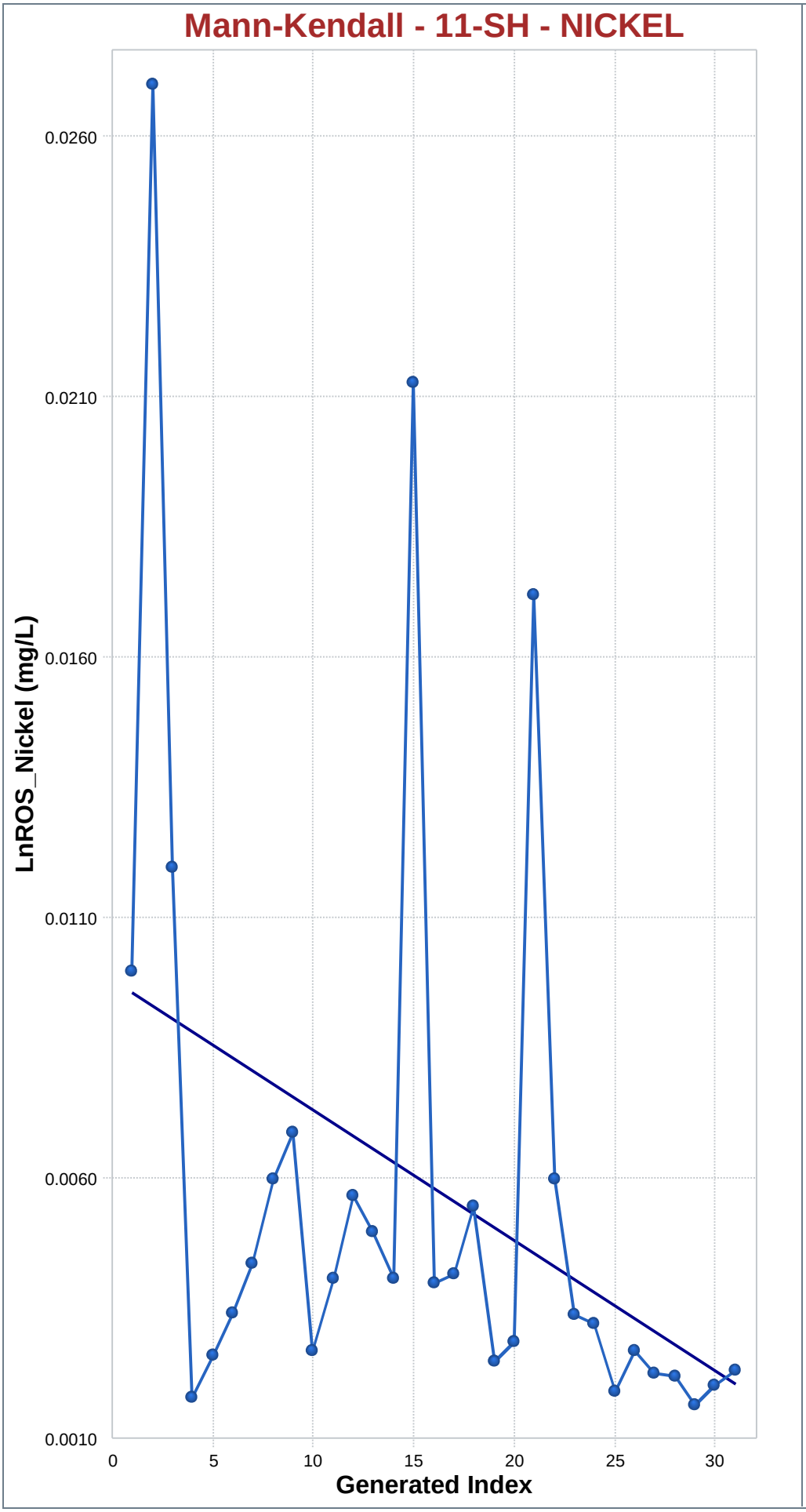

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0417 |
| Standardized Value of S | -1.6238 |
| M-K Test Value (S) | -92 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0522 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0050 |
| OLS Regression Intercept | 0.5963 |

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



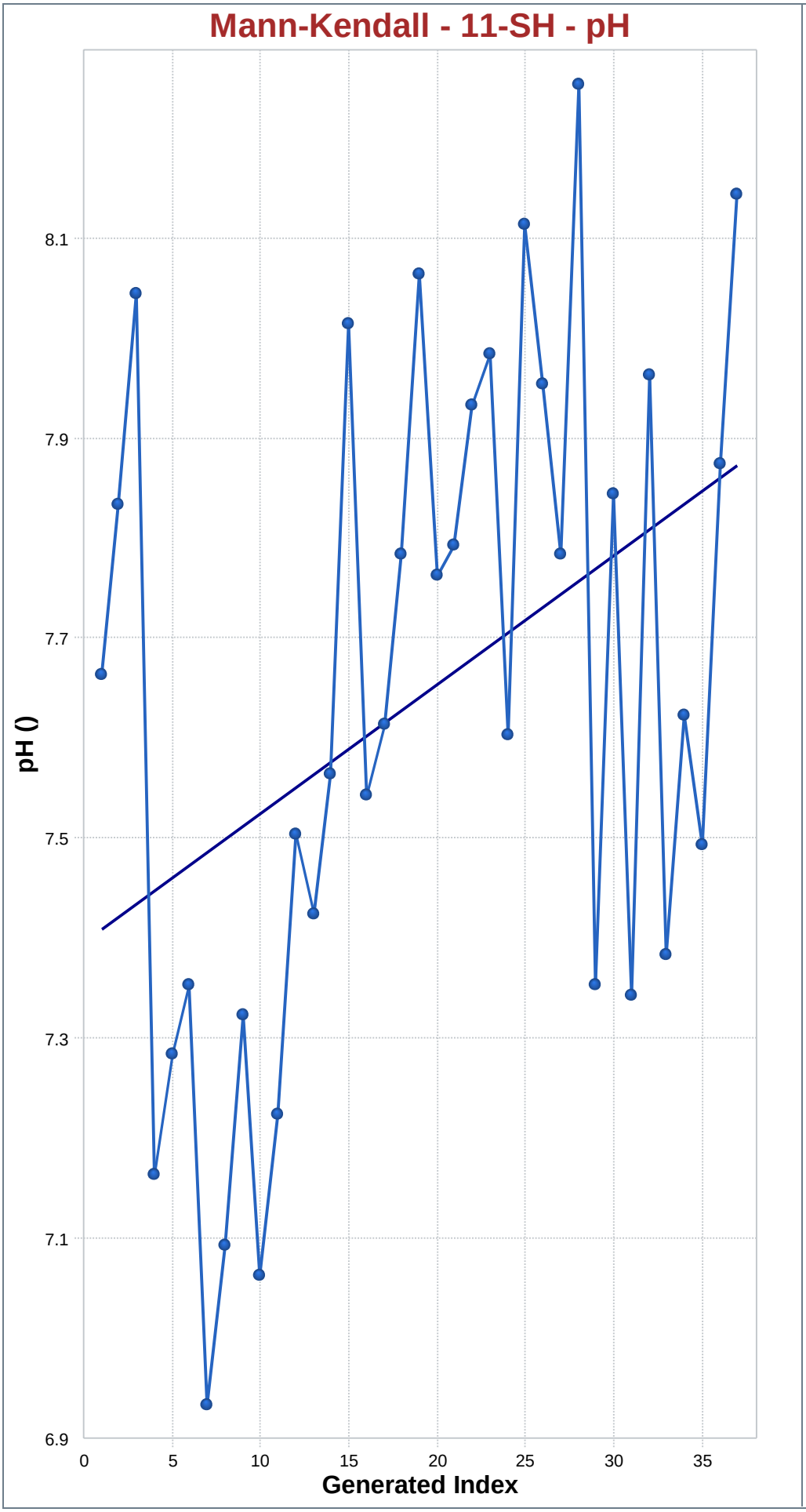

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 31 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 58.8104 |
| Standardized Value of S | -3.1457 |
| M-K Test Value (S) | -186 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0008 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0003 |
| OLS Regression Intercept | 0.0099 |

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



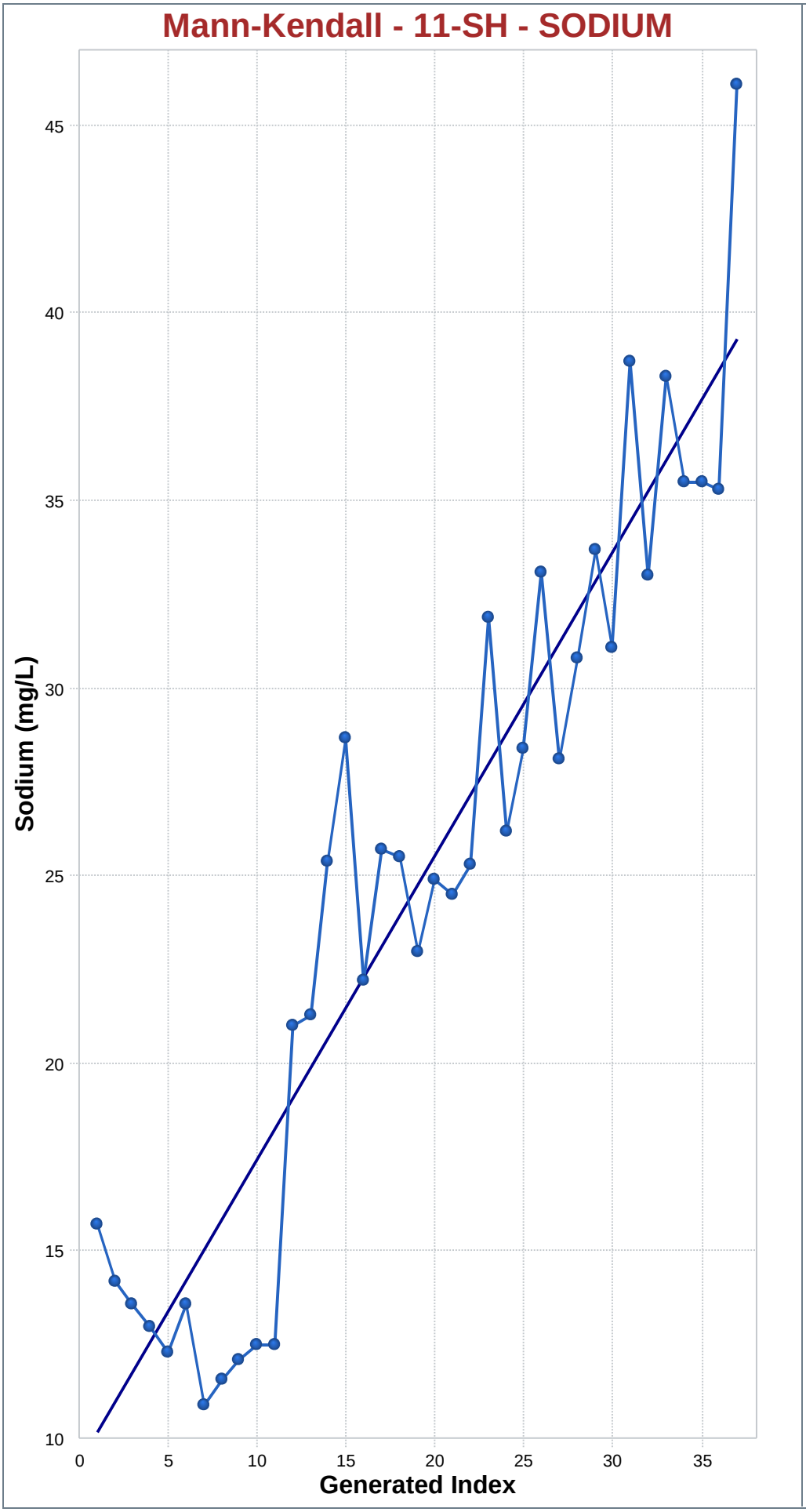

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4461 |
| Standardized Value of S | 2.6816 |
| M-K Test Value (S) | 206 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0037 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0129 |
| OLS Regression Intercept | 7.3622 |

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



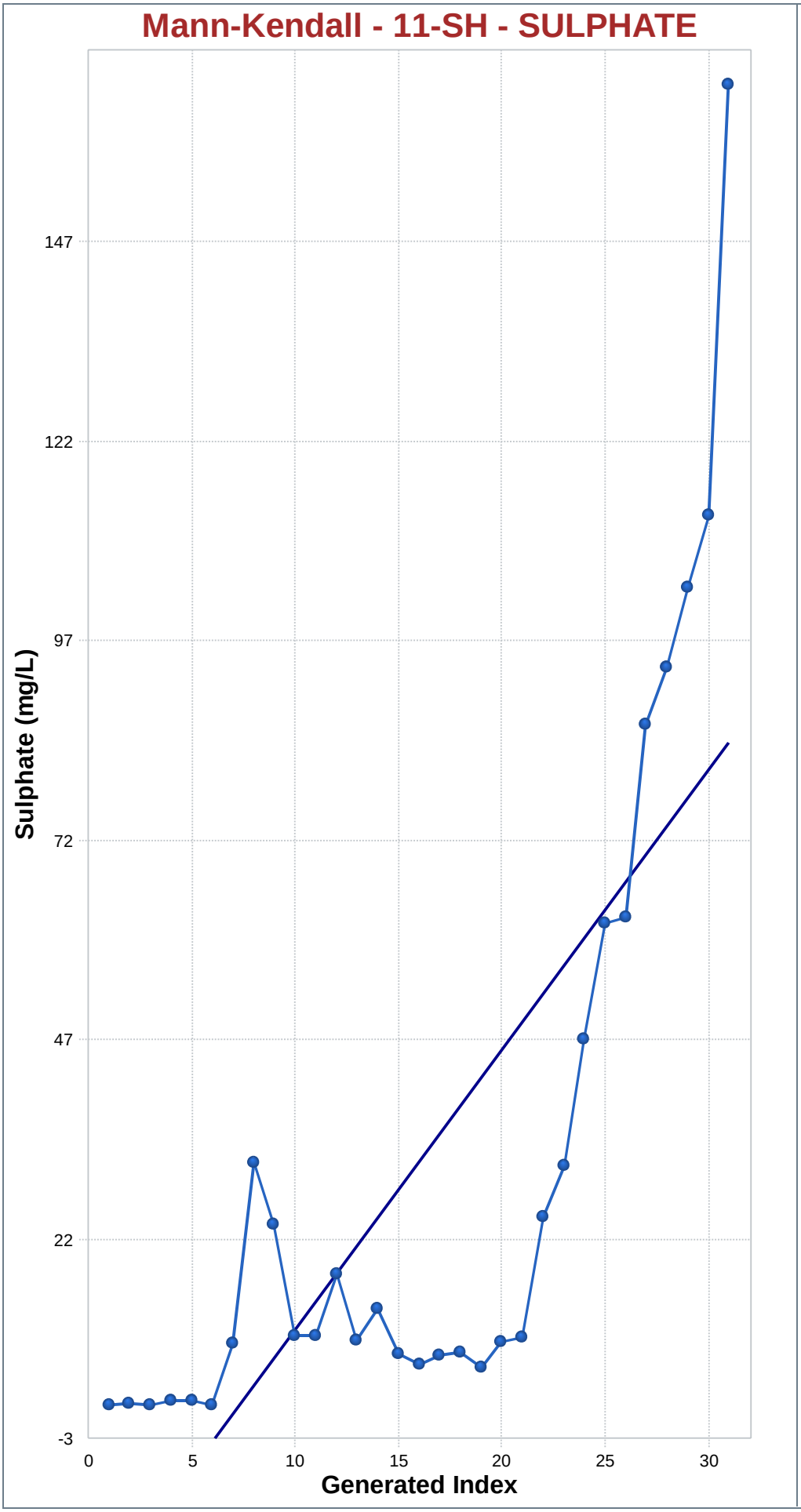

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4395 |
| Standardized Value of S | 6.3841 |
| M-K Test Value (S) | 489 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.8094 |
| OLS Regression Intercept | 9.6568 |

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



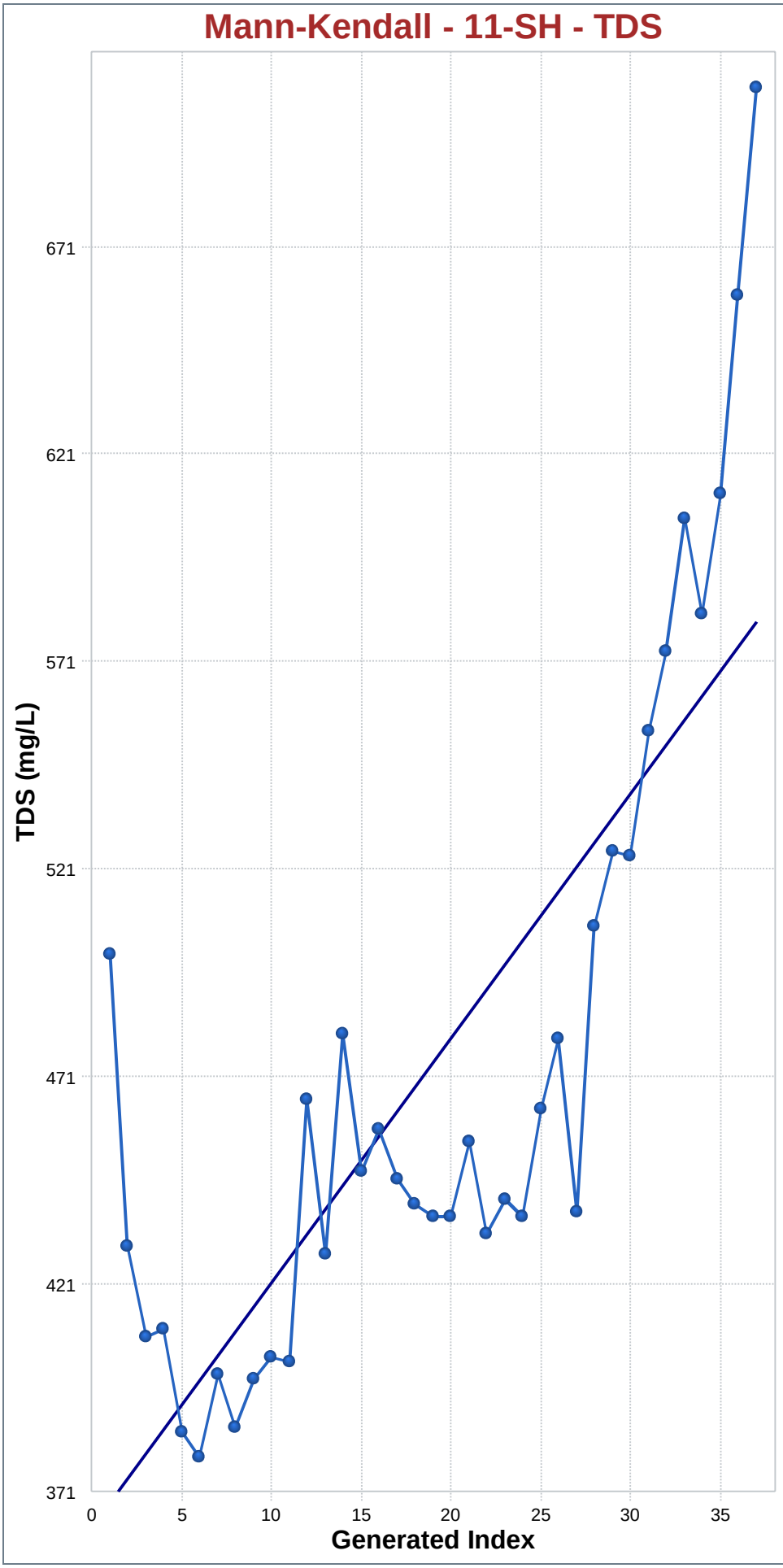

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 31 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 58.8104 |
| Standardized Value of S | 5.0841 |
| M-K Test Value (S) | 300 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 3.5091 |
| OLS Regression Intercept | -24.3215 |

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



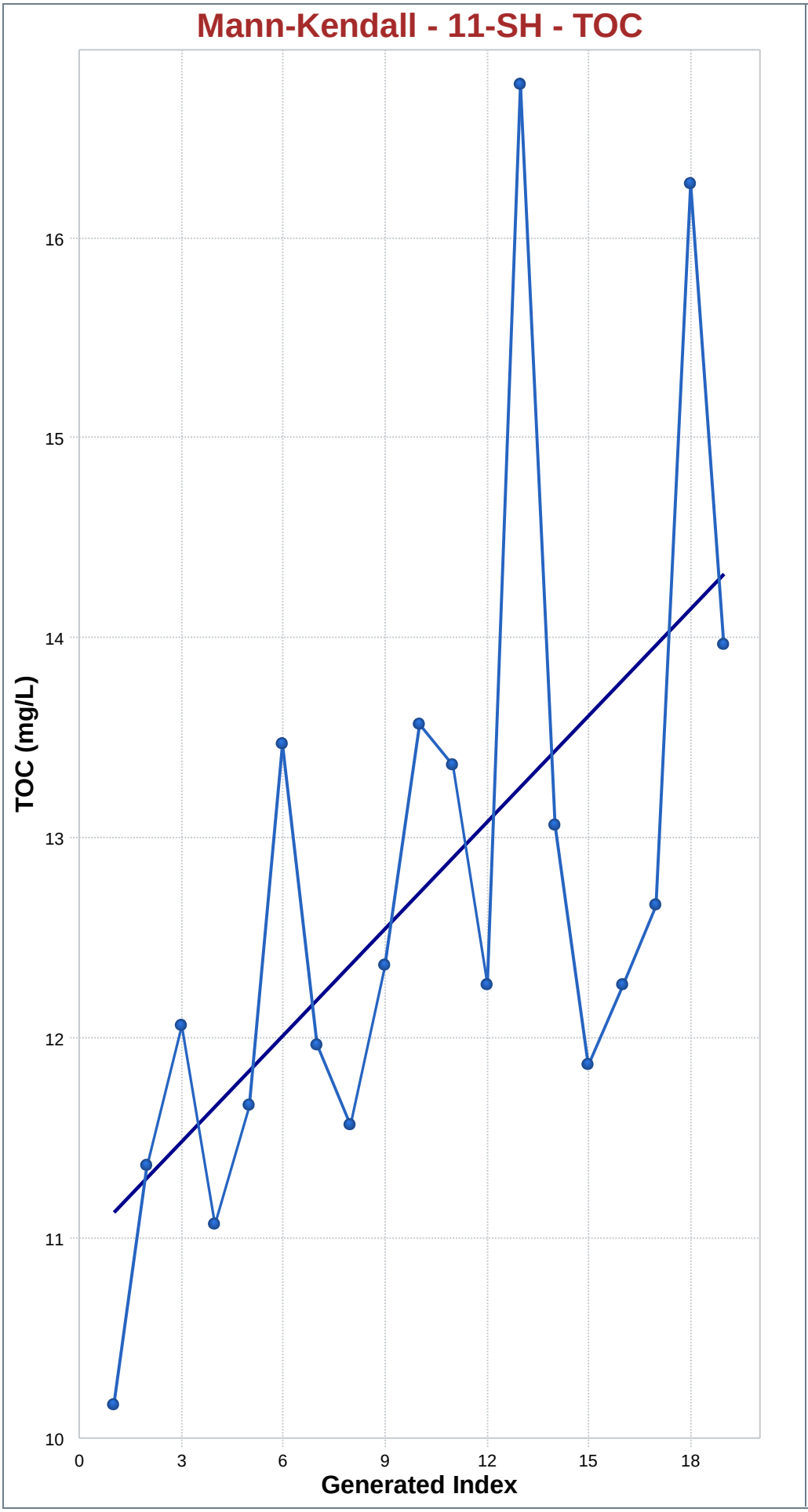

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4352 |
| Standardized Value of S | 5.4949 |
| M-K Test Value (S) | 421 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 5.9184 |
| OLS Regression Intercept | 361.4955 |

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



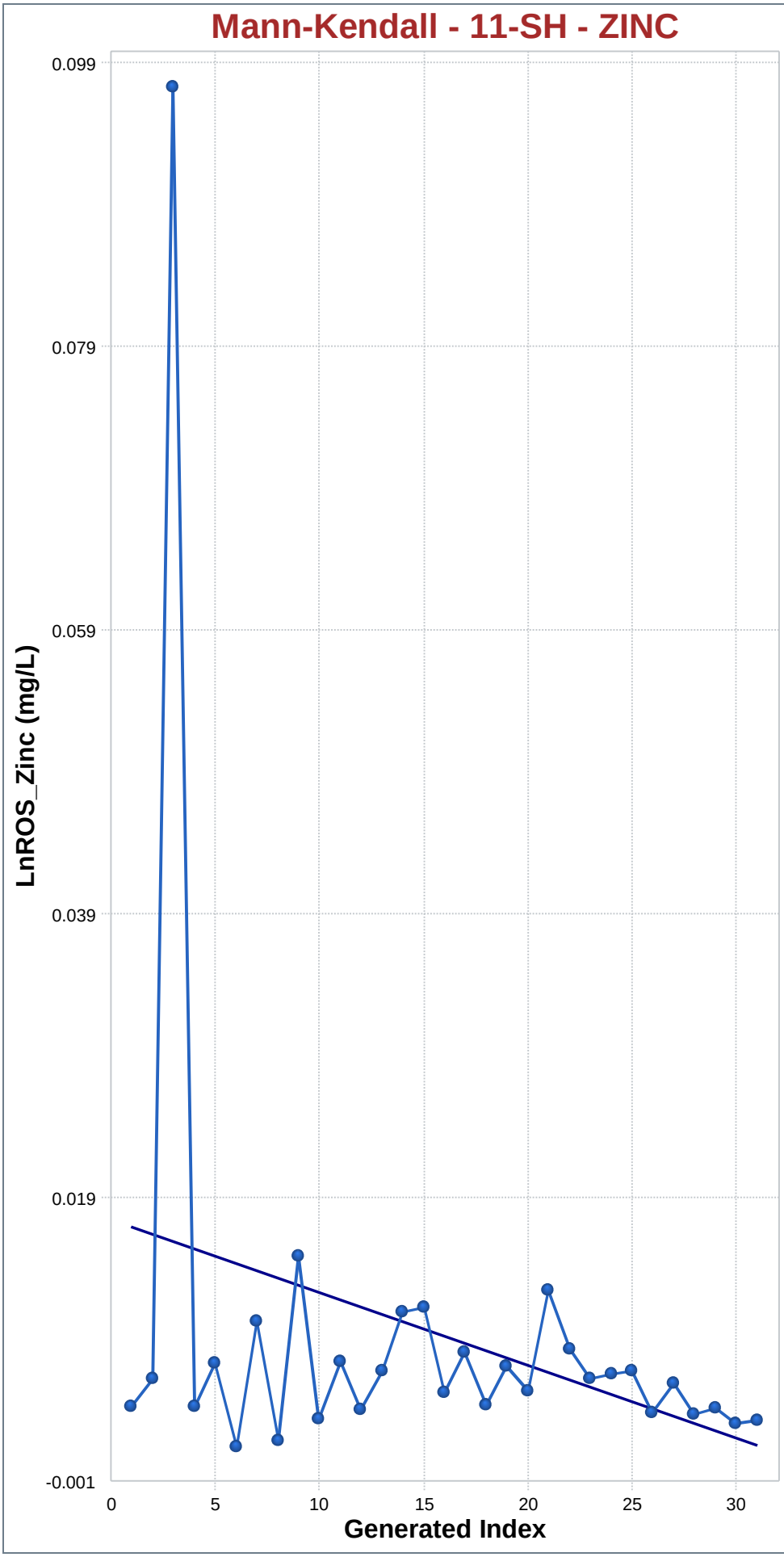

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

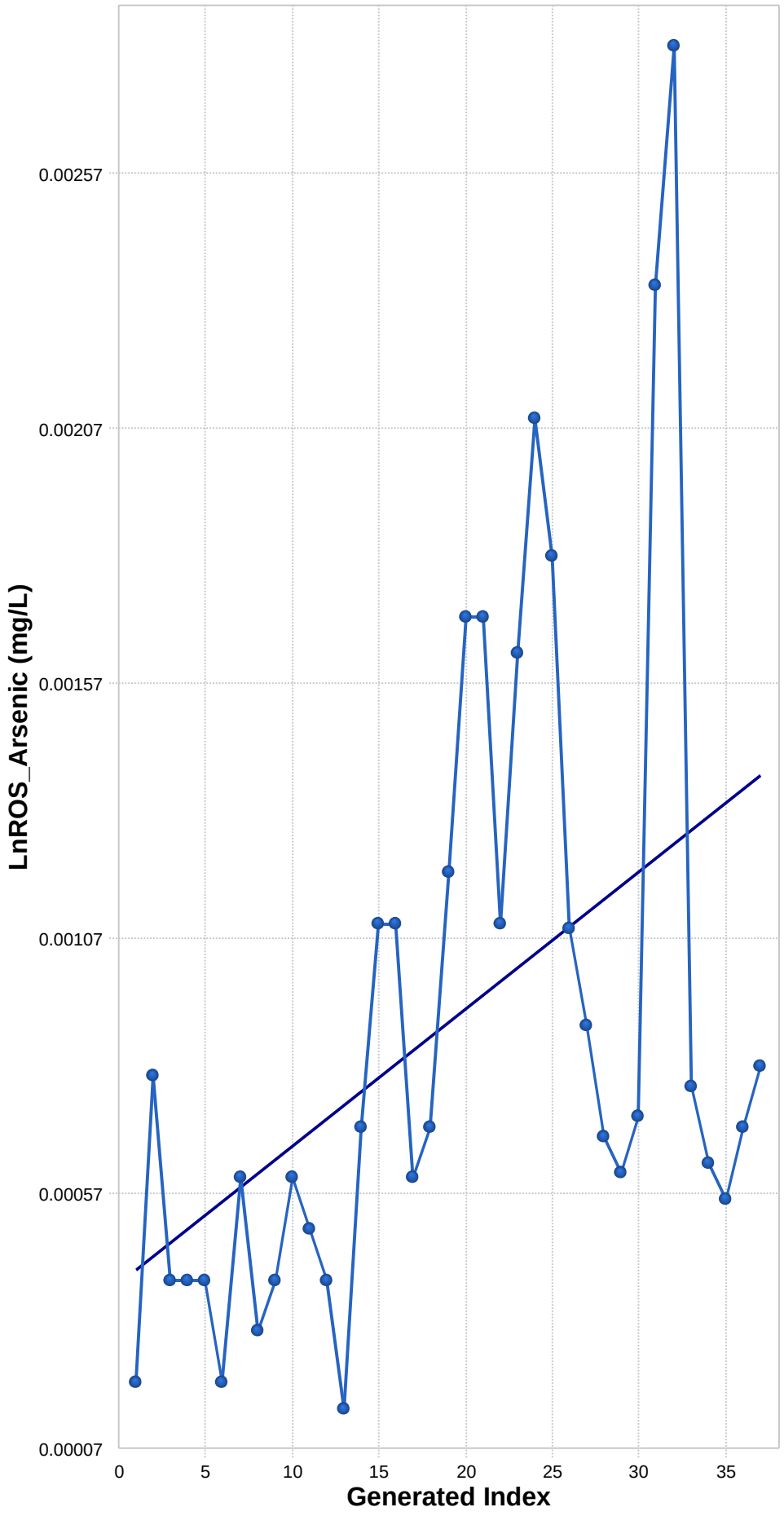
| | |
|---|---|
| n | 31 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 58.8189 |
| Standardized Value of S | -1.2581 |
| M-K Test Value (S) | -75 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1042 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0005 |
| OLS Regression Intercept | 0.0172 |

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

# Mann-Kendall - 12-SH - ARSENIC




**Mann-Kendall Trend Analysis**

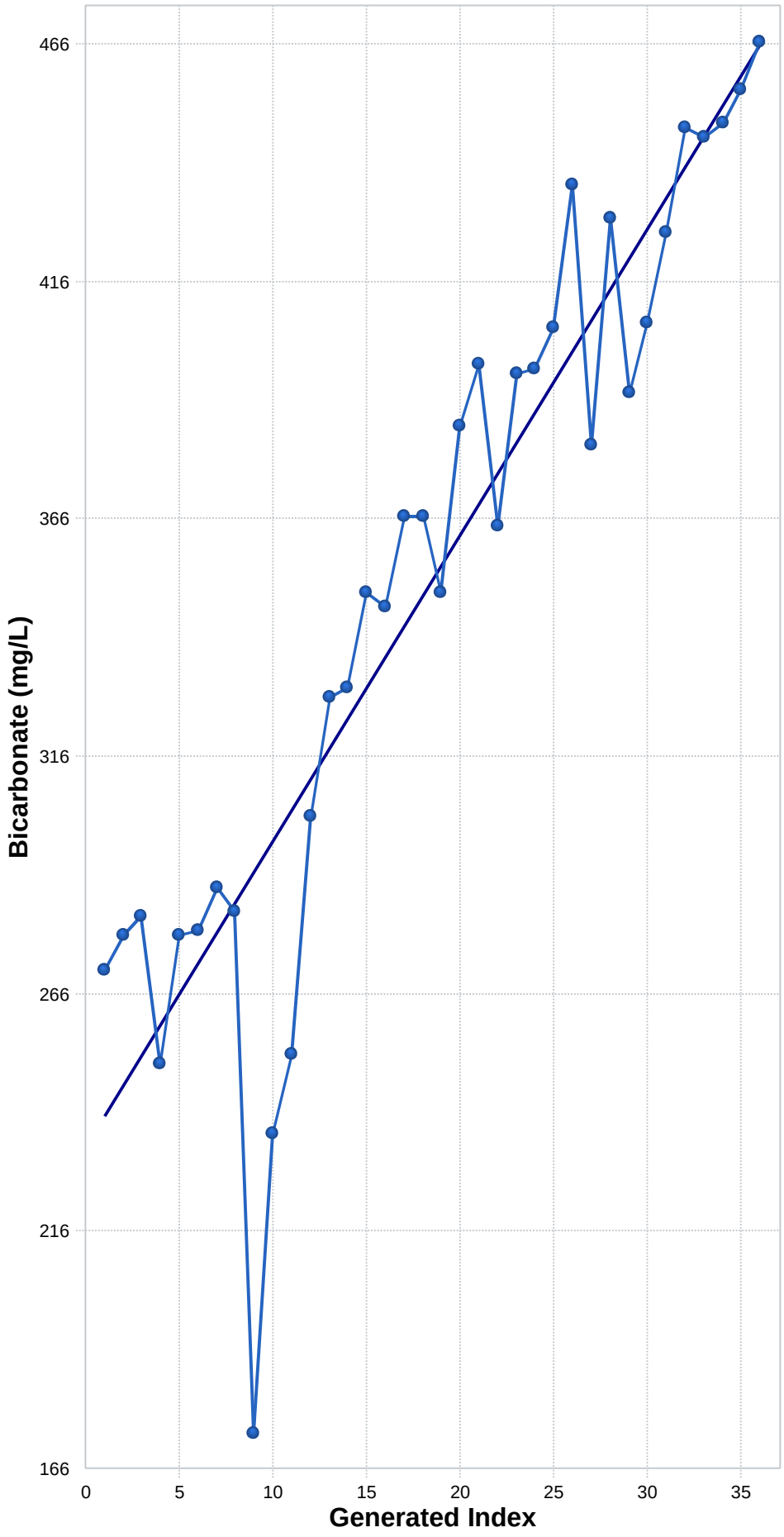
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.2649 |
| Standardized Value of S | 3.3305 |
| M-K Test Value (S) | 255 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0004 |

**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 - 12-SH - BICARBONATE



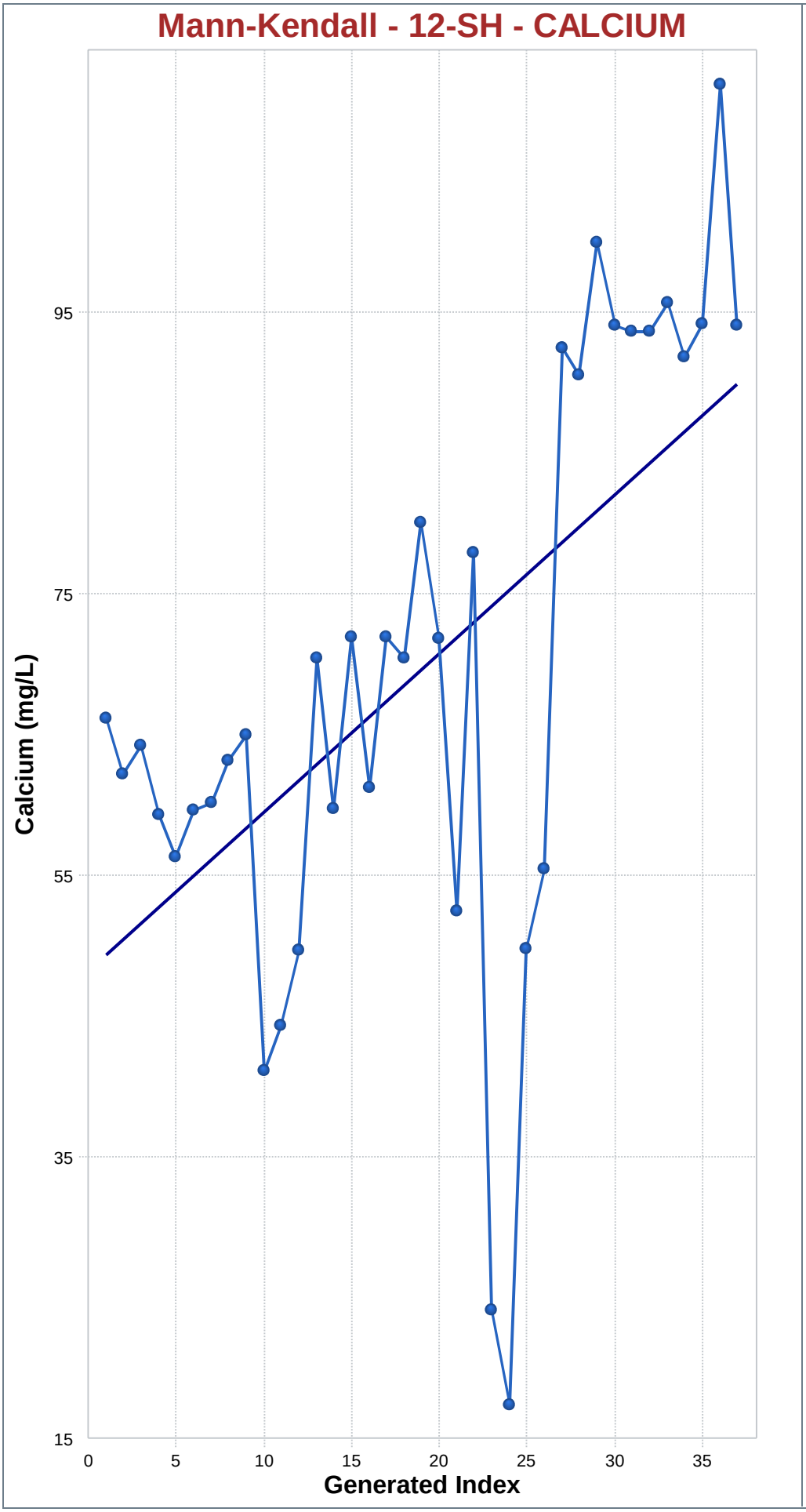

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 36 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 73.4030 |
| Standardized Value of S | 7.0161 |
| M-K Test Value (S) | 516 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 6.4349 |
| OLS Regression Intercept | 233.5513 |

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



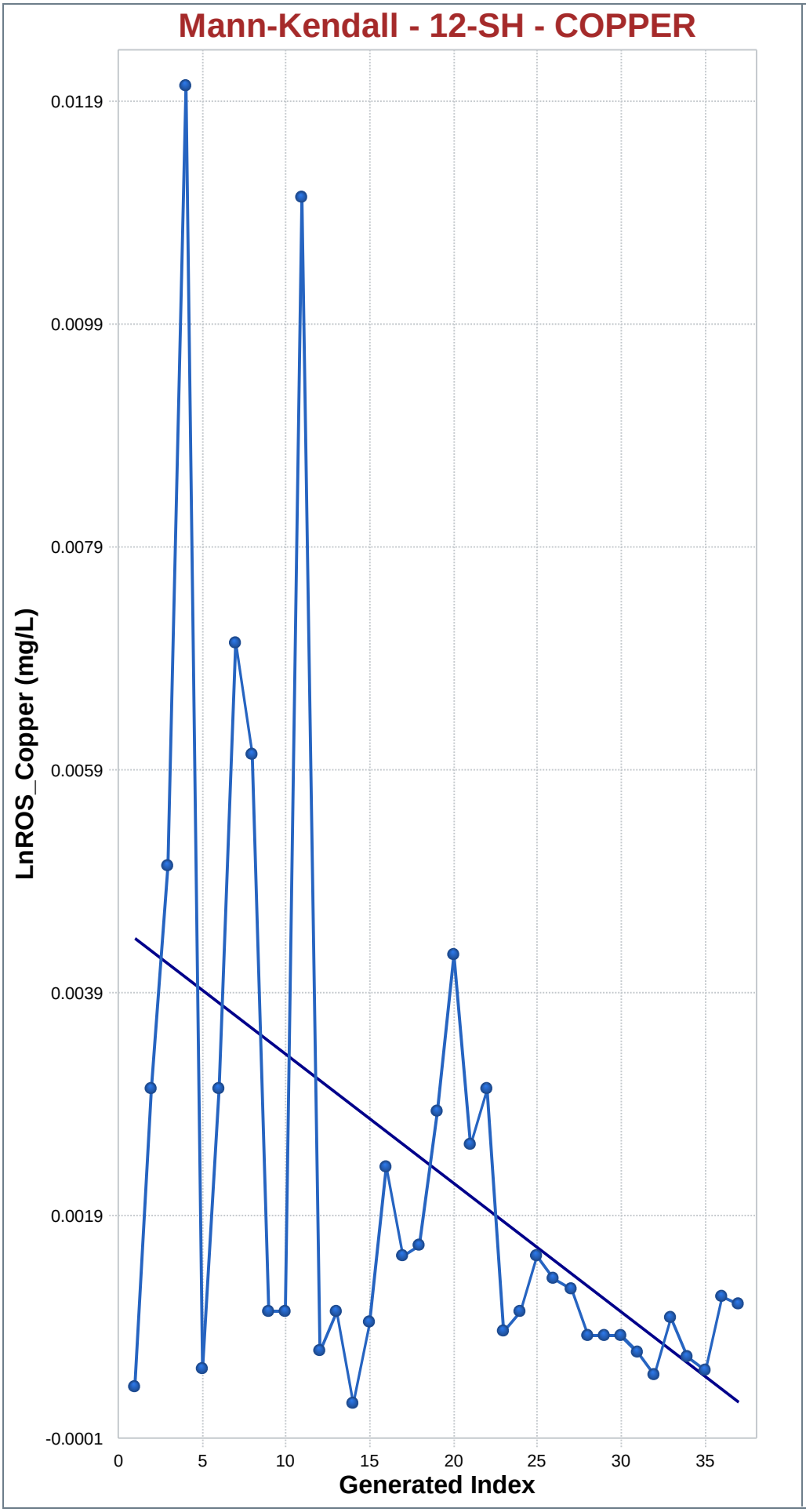

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4330 |
| Standardized Value of S | 3.8596 |
| M-K Test Value (S) | 296 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.1246 |
| OLS Regression Intercept | 48.1063 |

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



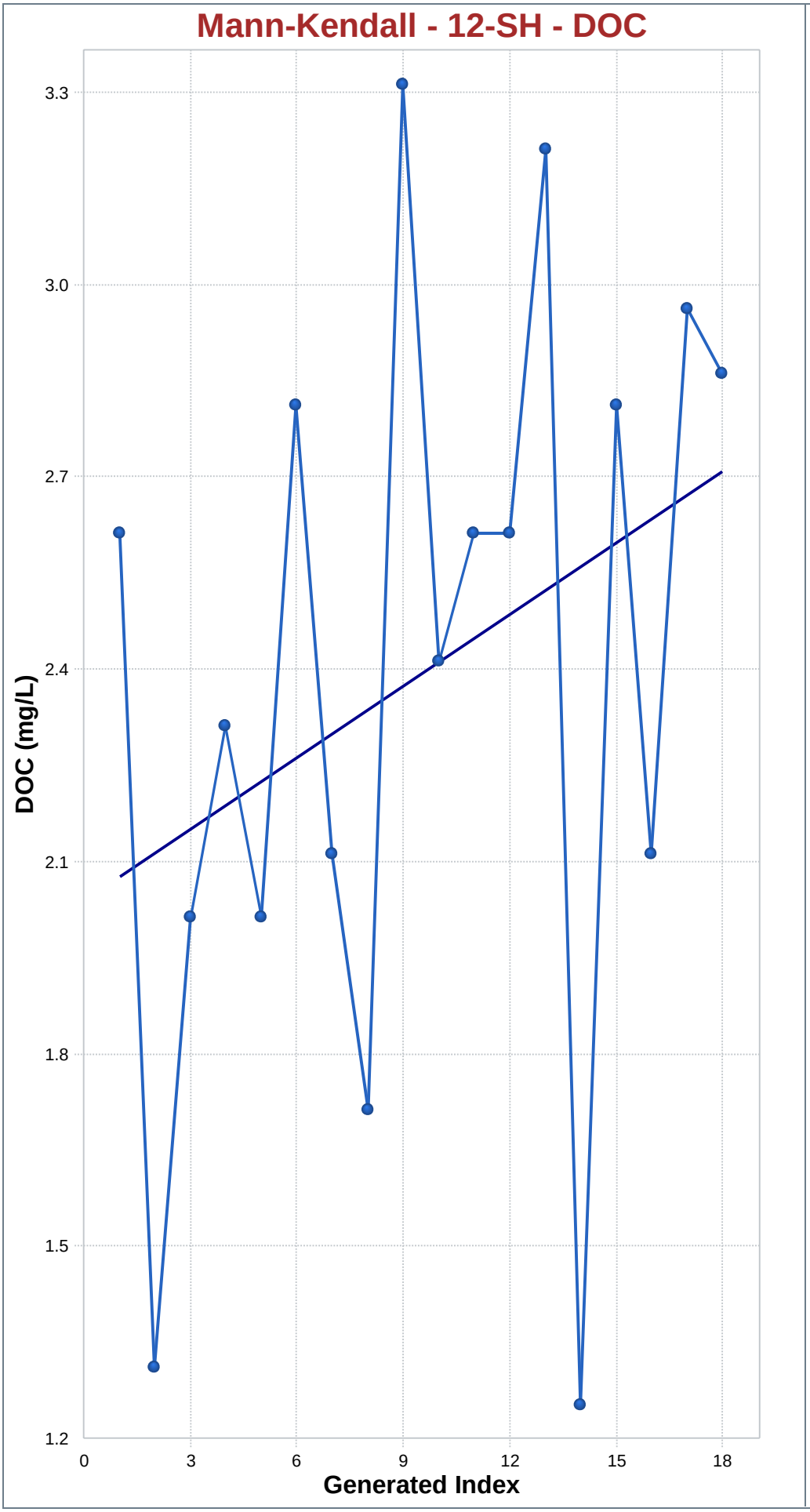

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.3653 |
| Standardized Value of S | -2.6190 |
| M-K Test Value (S) | -201 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0044 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0045 |

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



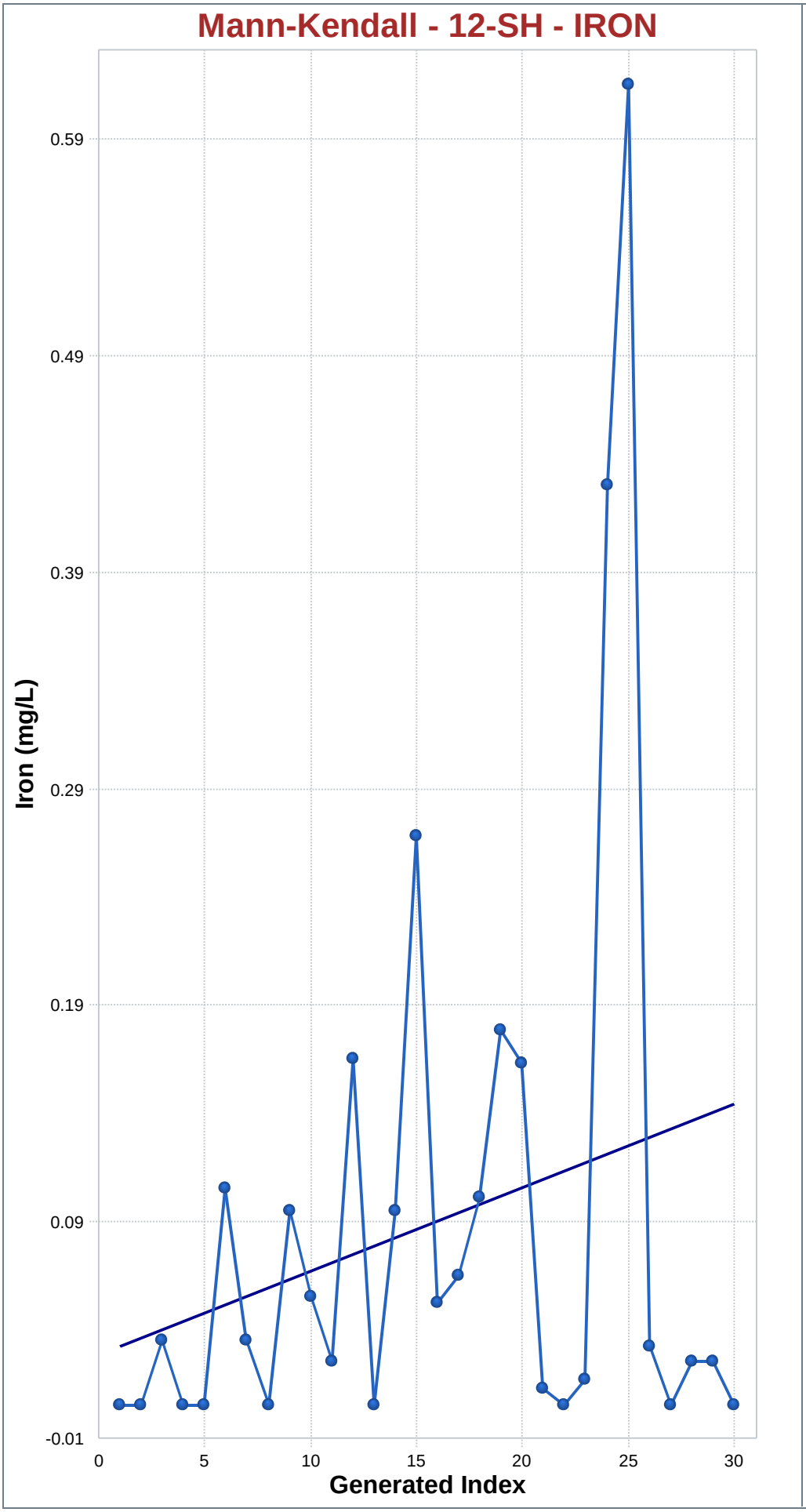

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.2742 |
| Standardized Value of S | 1.6746 |
| M-K Test Value (S) | 45 |
| Tabulated p-value | 0.0480 |
| Approximate p-value | 0.0470 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0372 |
| OLS Regression Intercept | 2.0265 |

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



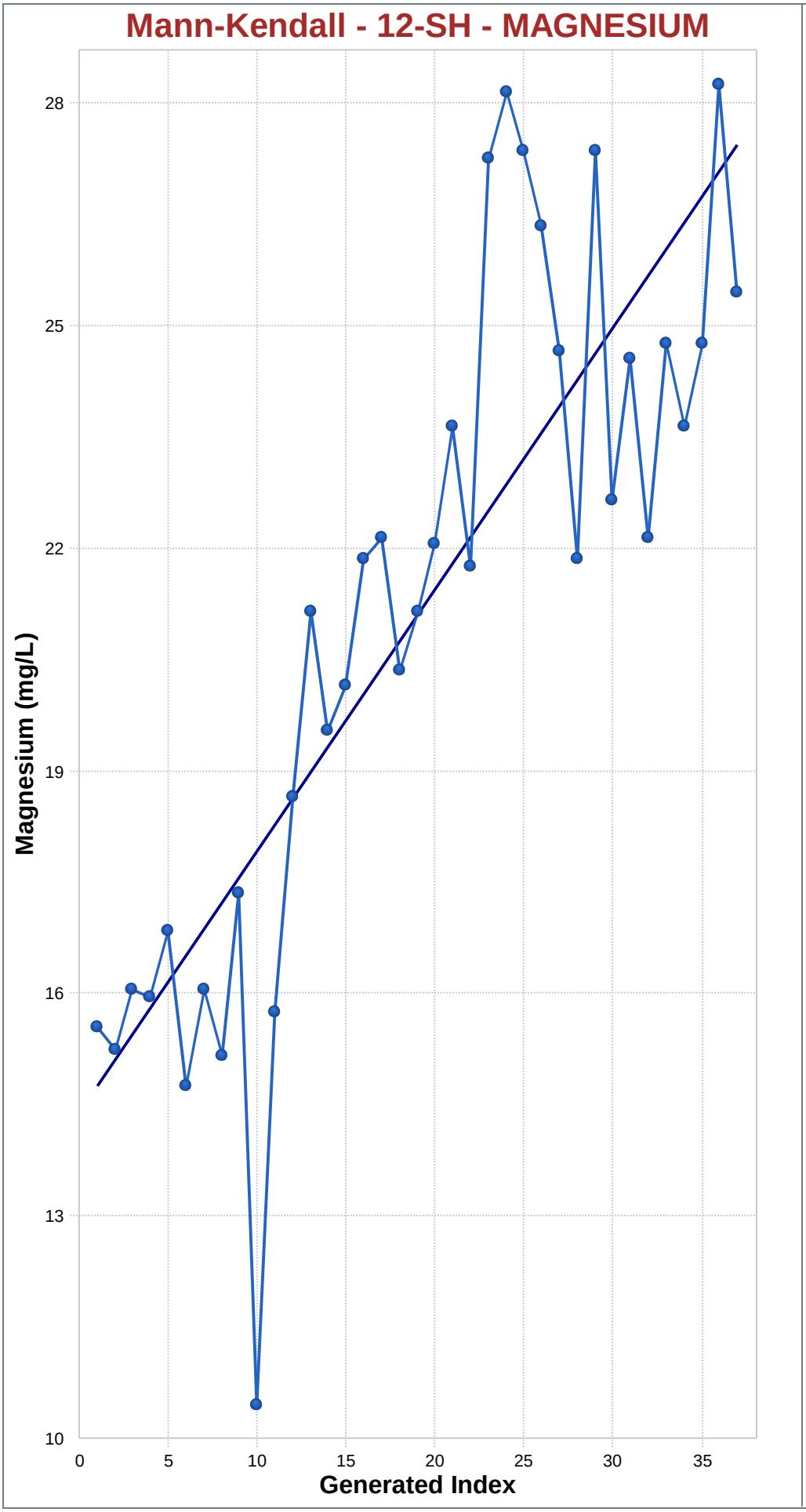

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 55.1725 |
| Standardized Value of S | 0.9244 |
| M-K Test Value (S) | 52 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1776 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0039 |
| OLS Regression Intercept | 0.0333 |

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




**Mann-Kendall Trend Analysis**

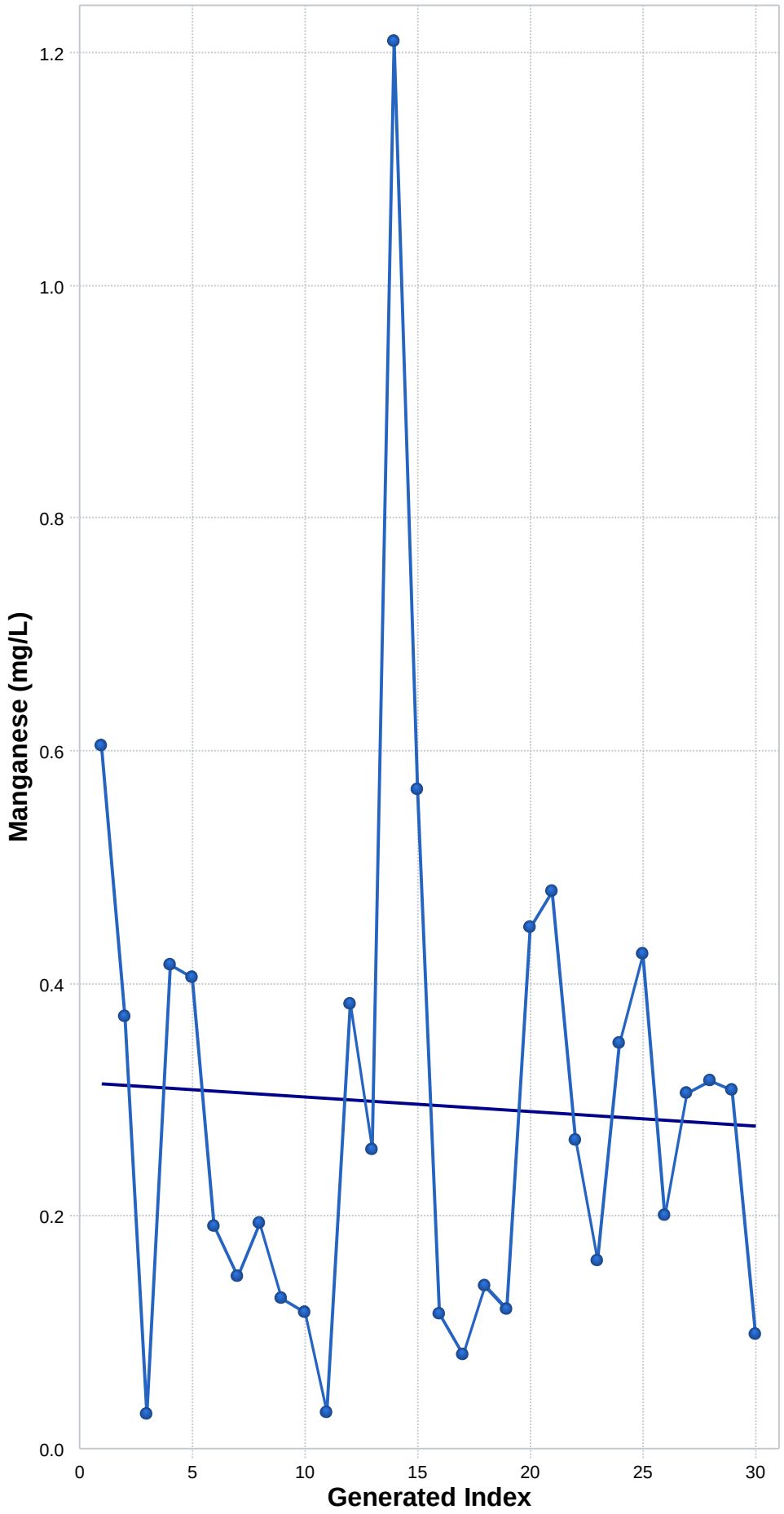
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4133 |
| Standardized Value of S | 5.9152 |
| M-K Test Value (S) | 453 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3523 |
| OLS Regression Intercept | 14.3581 |

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

# Mann-Kendall - 12-SH - MANGANESE




**Mann-Kendall Trend Analysis**

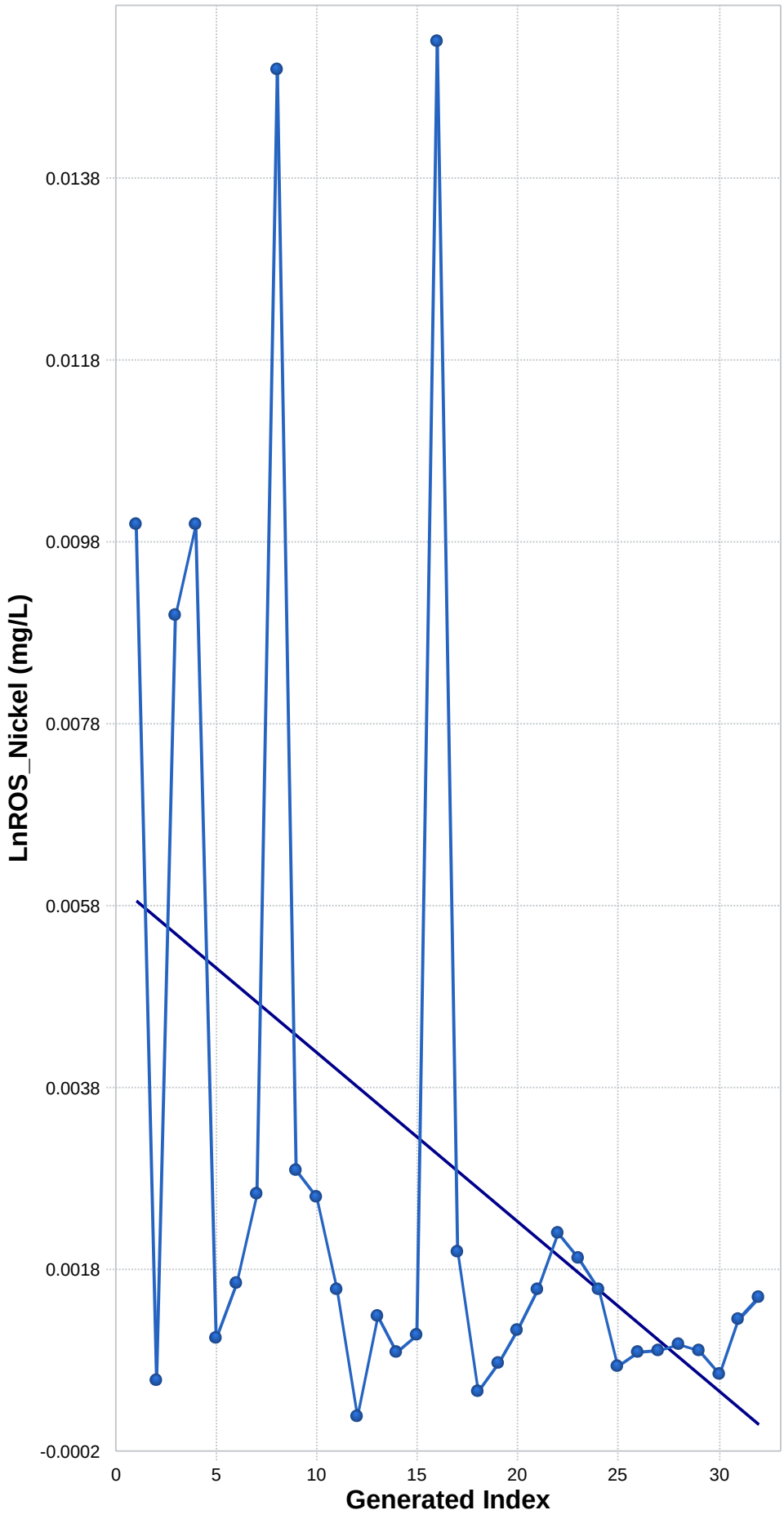
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0506 |
| Standardized Value of S | -0.0357 |
| M-K Test Value (S) | -3 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.4858 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0012 |
| OLS Regression Intercept | 0.2945 |

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

# Mann-Kendall - 12-SH - NICKEL



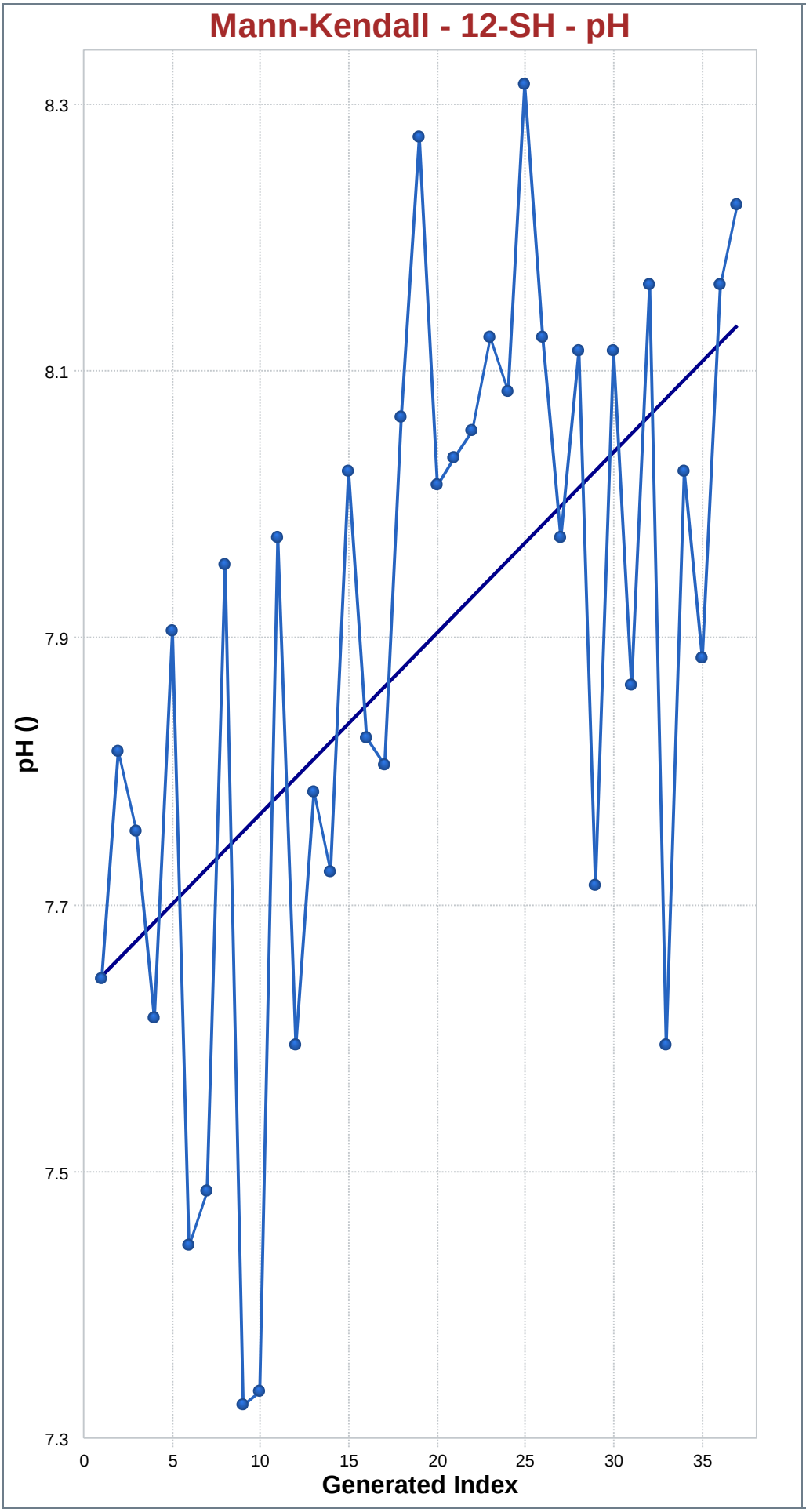

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6333 |
| Standardized Value of S | -2.2877 |
| M-K Test Value (S) | -142 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0111 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0061 |

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



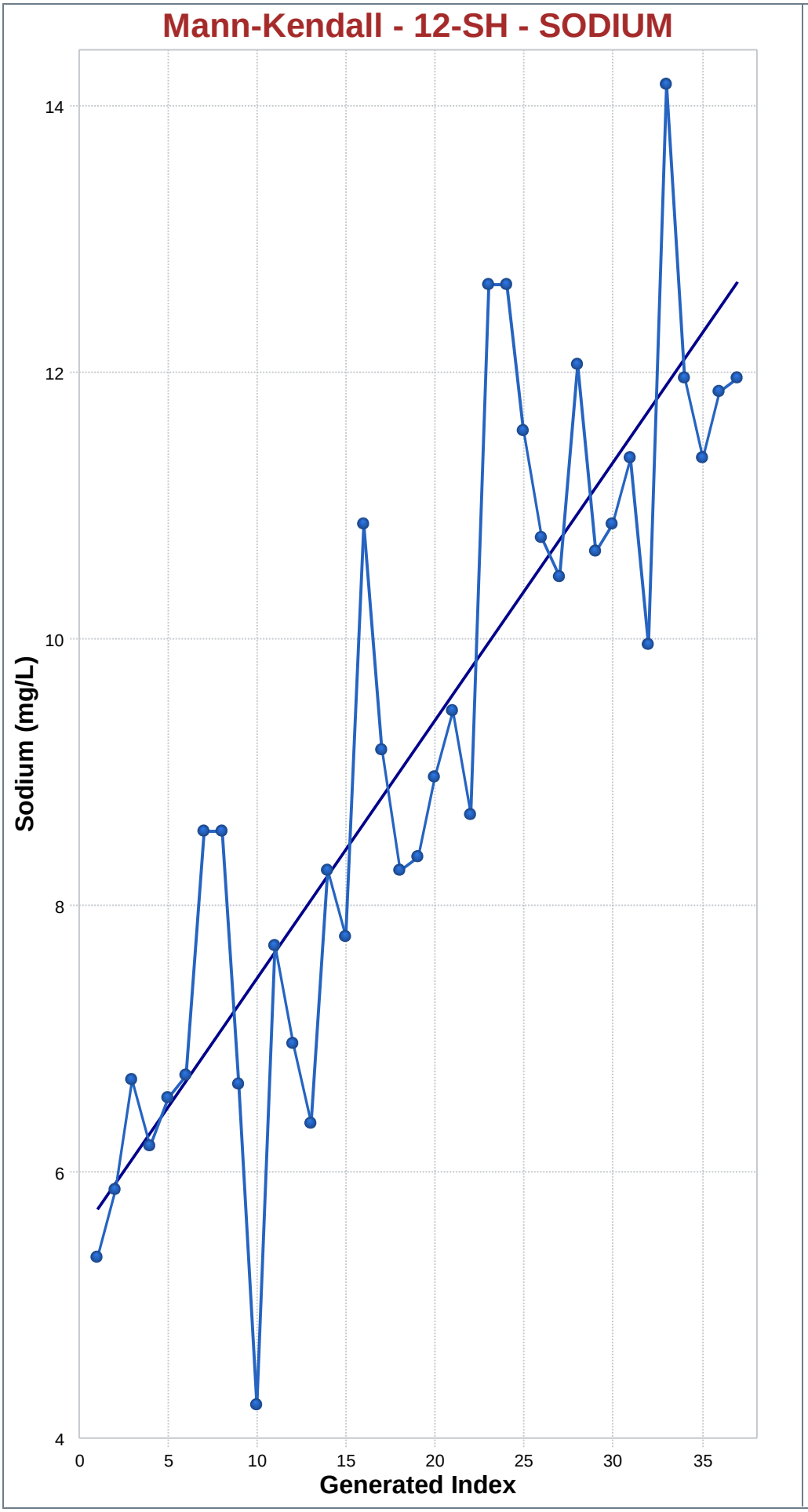

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4199 |
| Standardized Value of S | 3.7556 |
| M-K Test Value (S) | 288 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0135 |
| OLS Regression Intercept | 7.6786 |

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




**Mann-Kendall Trend Analysis**

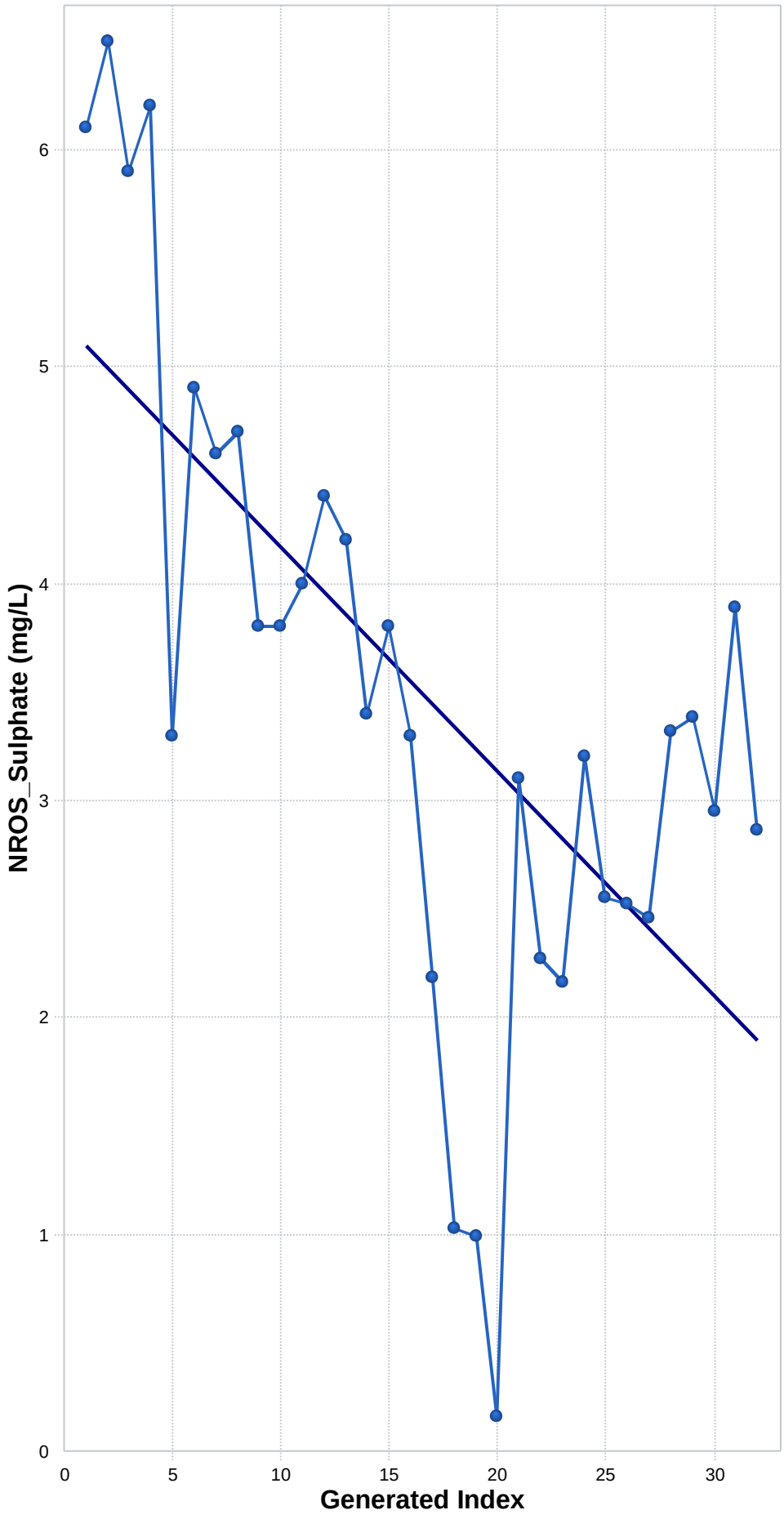
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4199 |
| Standardized Value of S | 5.8754 |
| M-K Test Value (S) | 450 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1934 |
| OLS Regression Intercept | 5.1686 |

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

# Mann-Kendall - 12-SH - SULPHATE



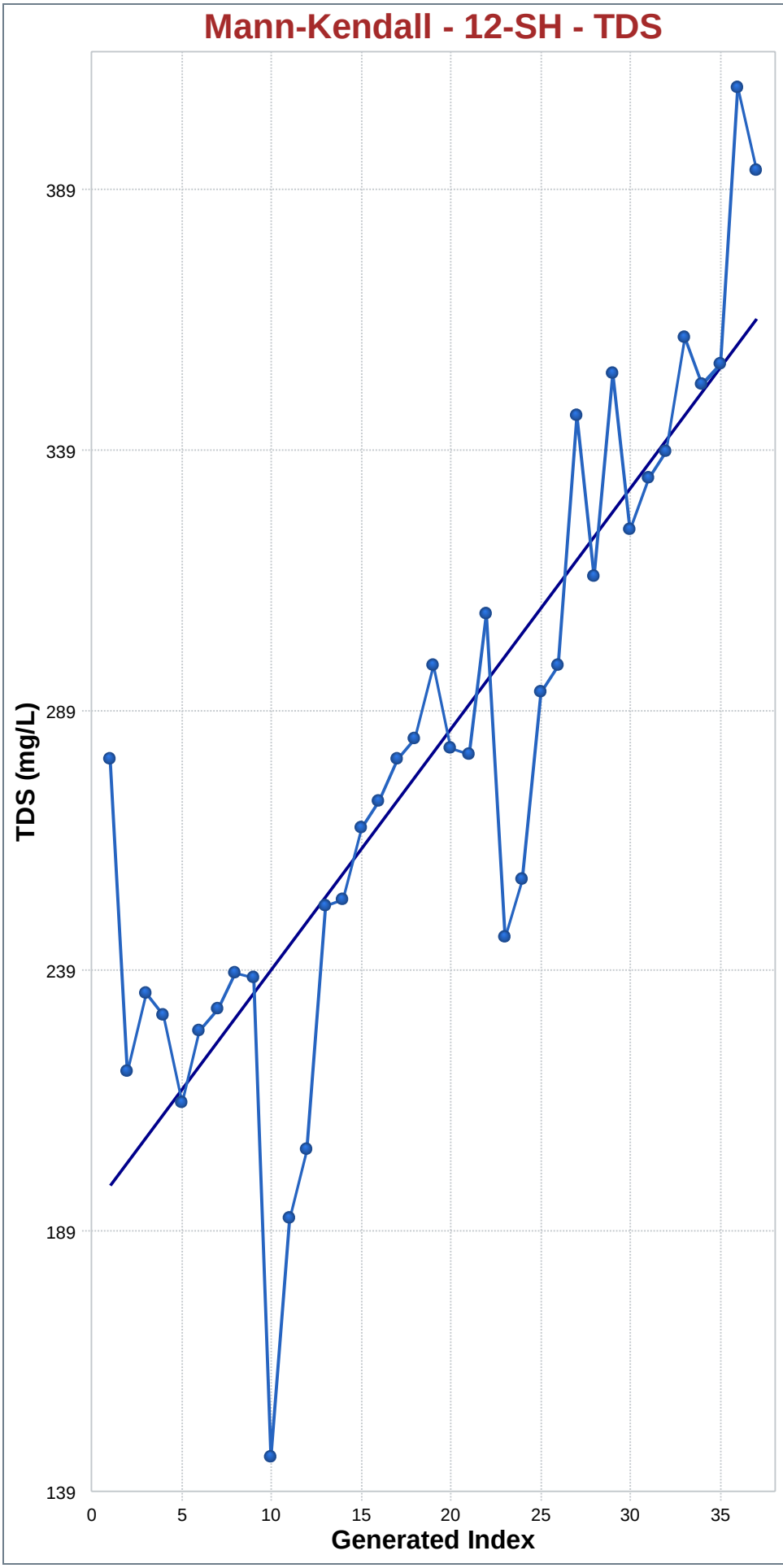

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6279 |
| Standardized Value of S | -3.9430 |
| M-K Test Value (S) | -244 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.1034 |
| OLS Regression Intercept | 5.1029 |

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



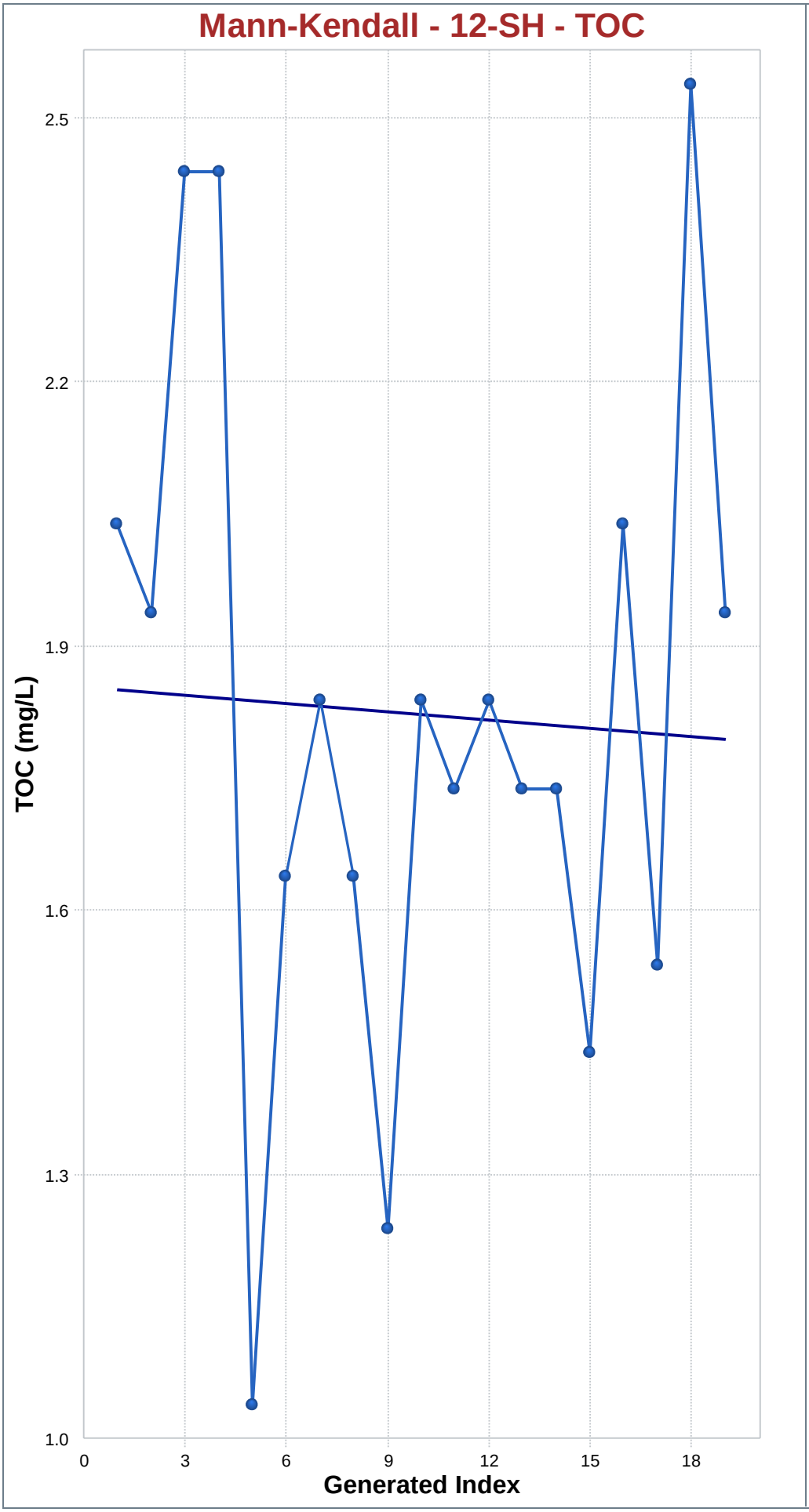

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4461 |
| Standardized Value of S | 6.4228 |
| M-K Test Value (S) | 492 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 4.6251 |
| OLS Regression Intercept | 193.5883 |

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



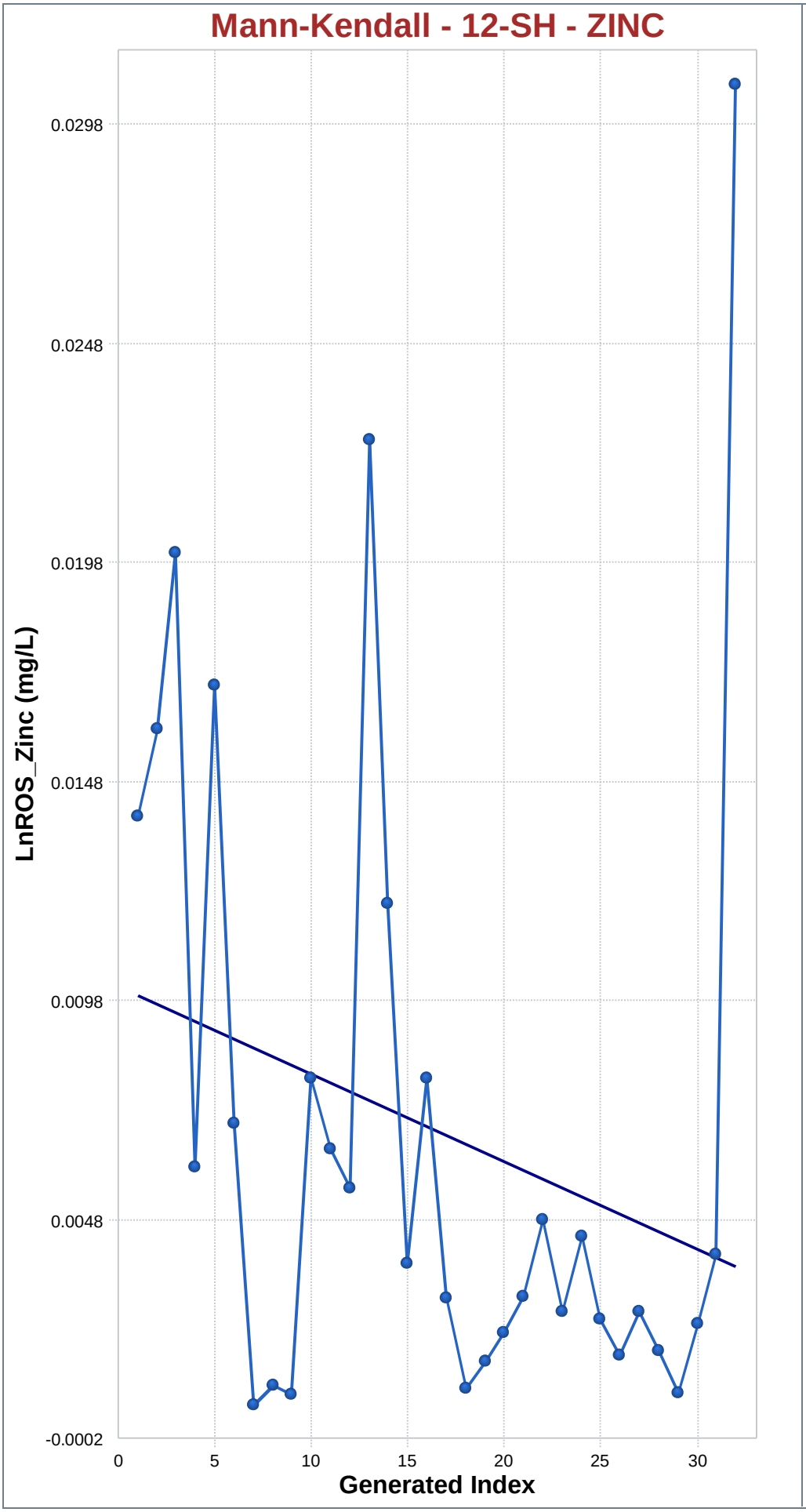

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

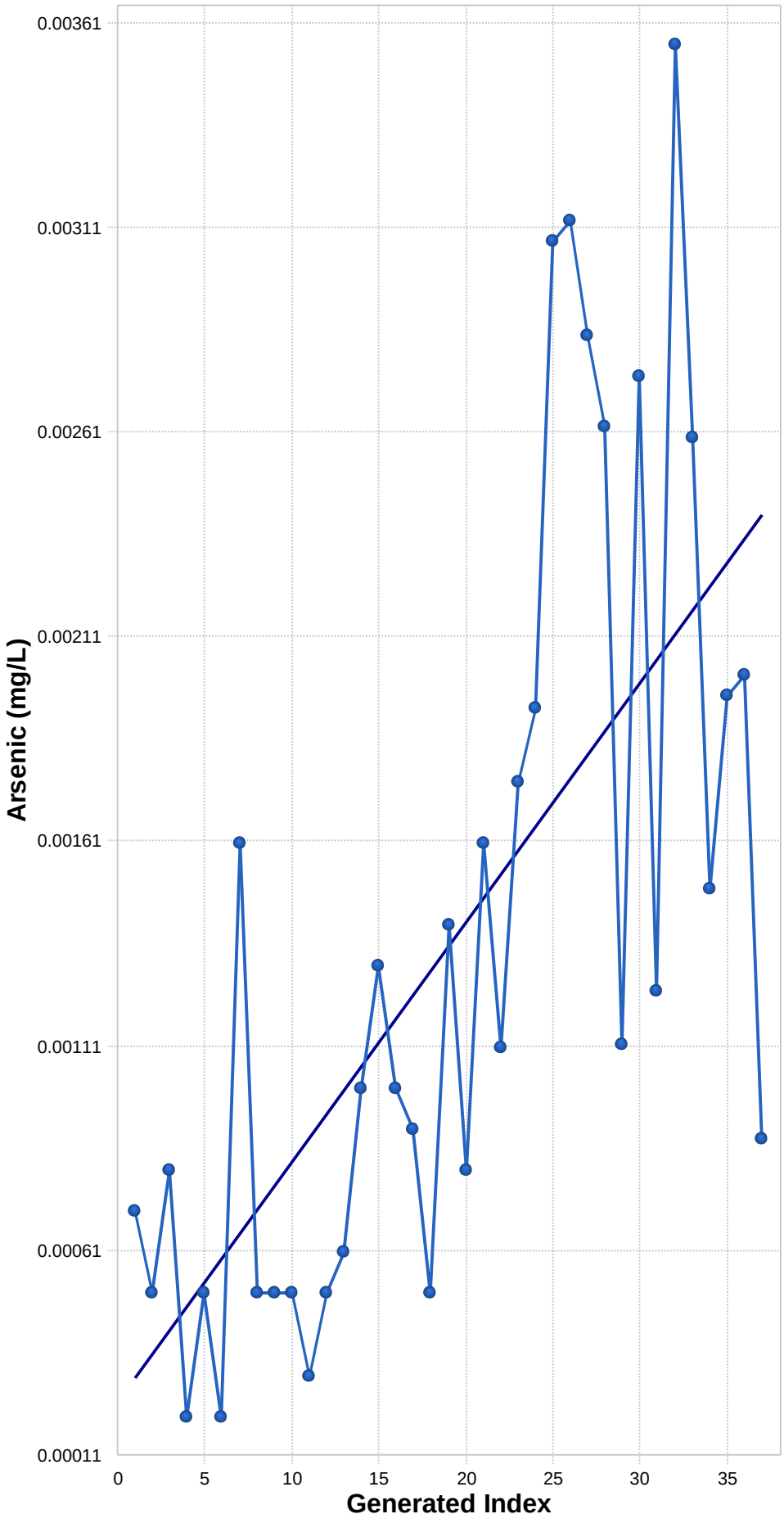
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6495 |
| Standardized Value of S | -2.1249 |
| M-K Test Value (S) | -132 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0168 |

**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 - 13-SH - ARSENIC




**Mann-Kendall Trend Analysis**

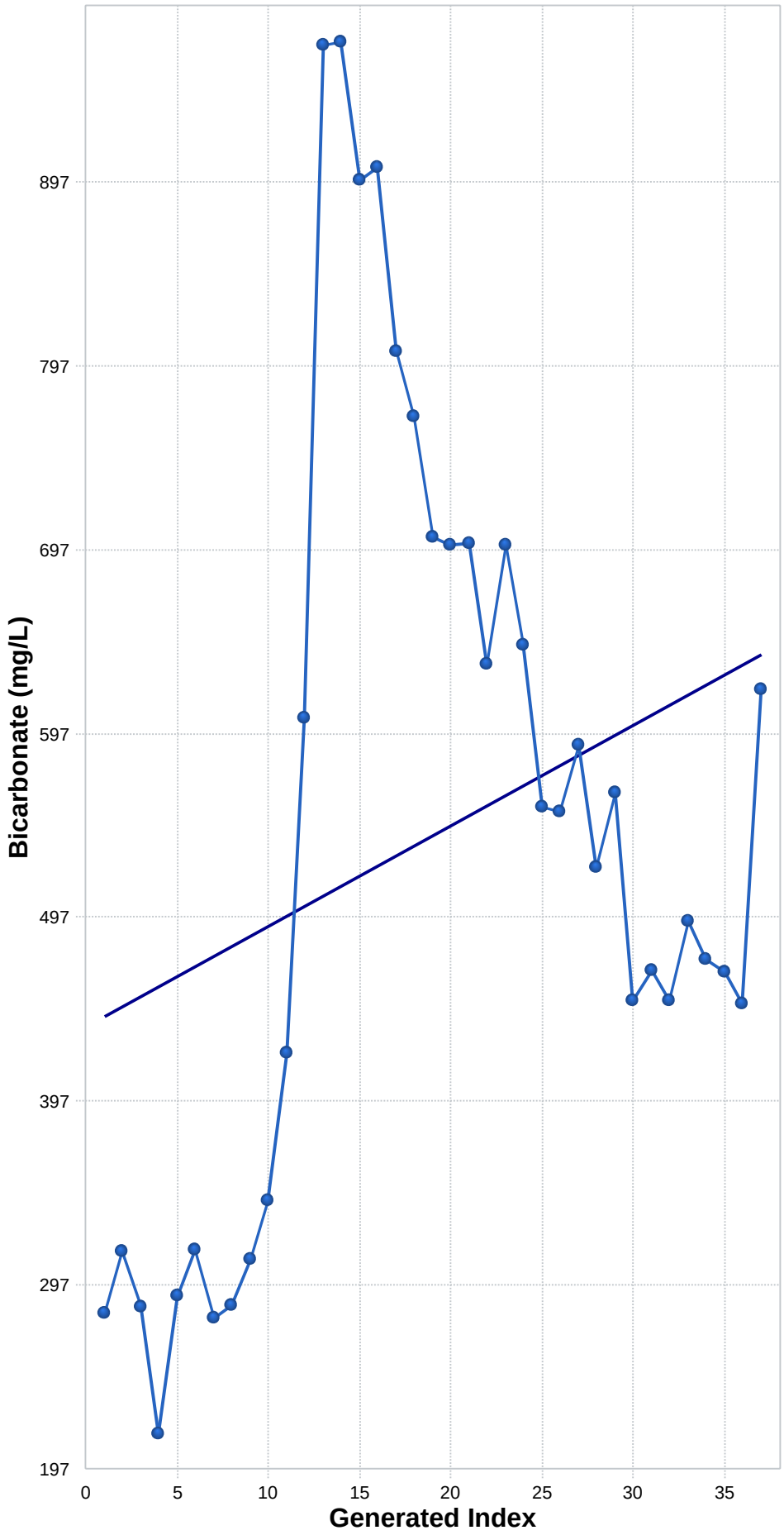
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.1424 |
| Standardized Value of S | 4.6754 |
| M-K Test Value (S) | 357 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0001 |
| OLS Regression Intercept | 0.0002 |

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

# Mann-Kendall - 13-SH - BICARBONATE




**Mann-Kendall Trend Analysis**

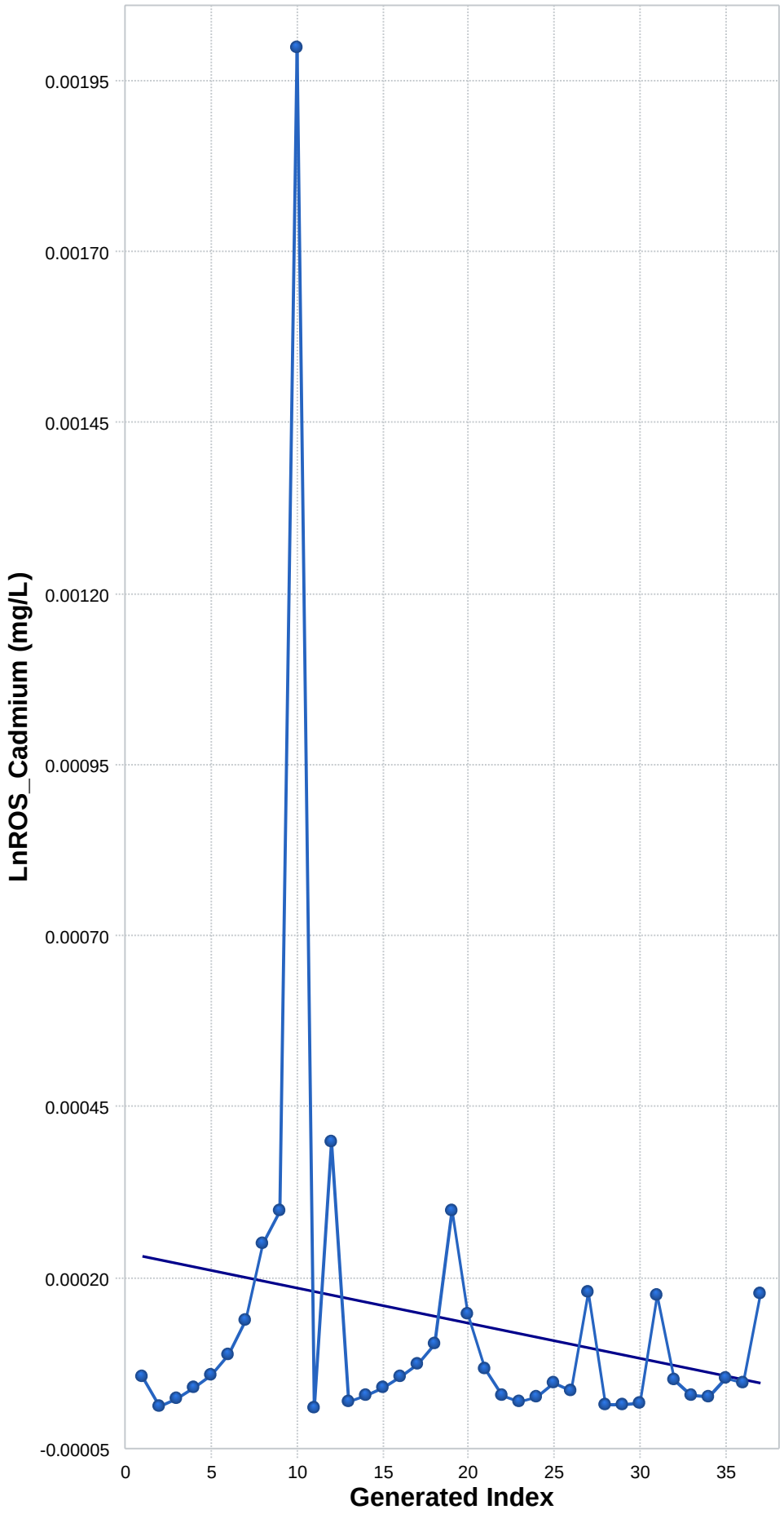
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4461 |
| Standardized Value of S | 0.9811 |
| M-K Test Value (S) | 76 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1633 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 5.4594 |
| OLS Regression Intercept | 437.5113 |

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

# Mann-Kendall - 13-SH - CADMIUM




**Mann-Kendall Trend Analysis**

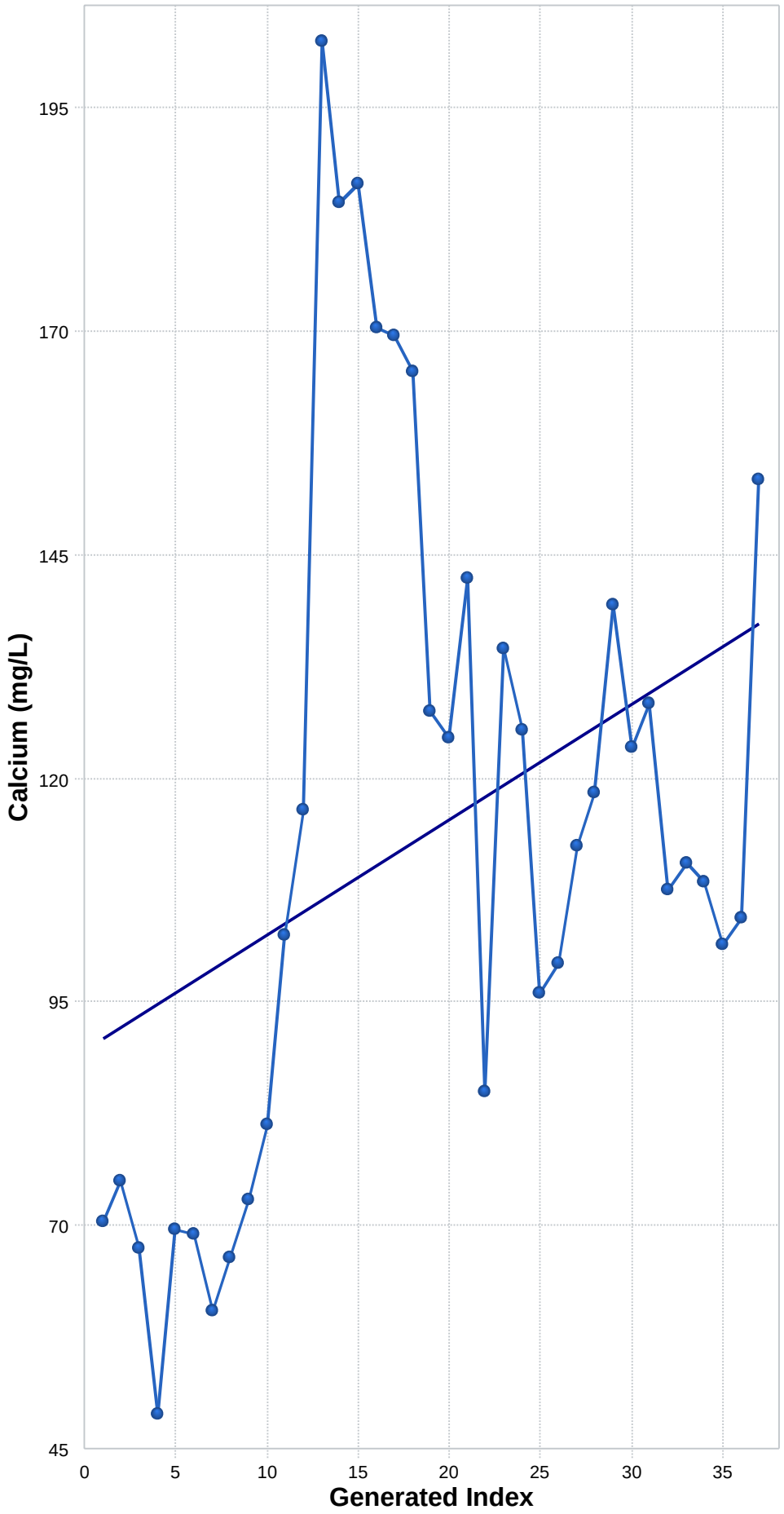
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4526 |
| Standardized Value of S | -0.4447 |
| M-K Test Value (S) | -35 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3283 |

**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 - 13-SH - CALCIUM




**Mann-Kendall Trend Analysis**

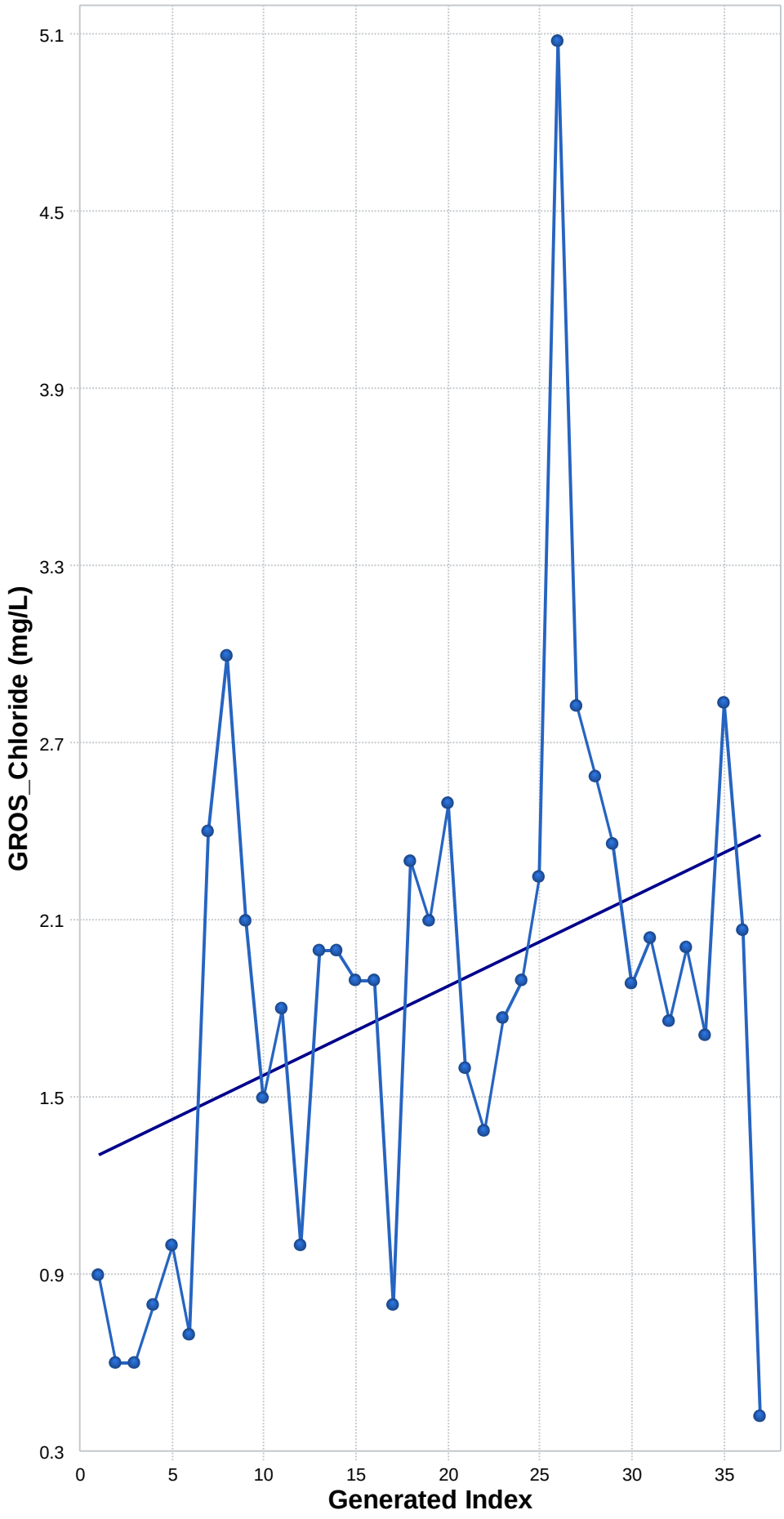
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4591 |
| Standardized Value of S | 1.9749 |
| M-K Test Value (S) | 152 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0241 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.2847 |
| OLS Regression Intercept | 89.2257 |

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

# Mann-Kendall - 13-SH - CHLORIDE




**Mann-Kendall Trend Analysis**

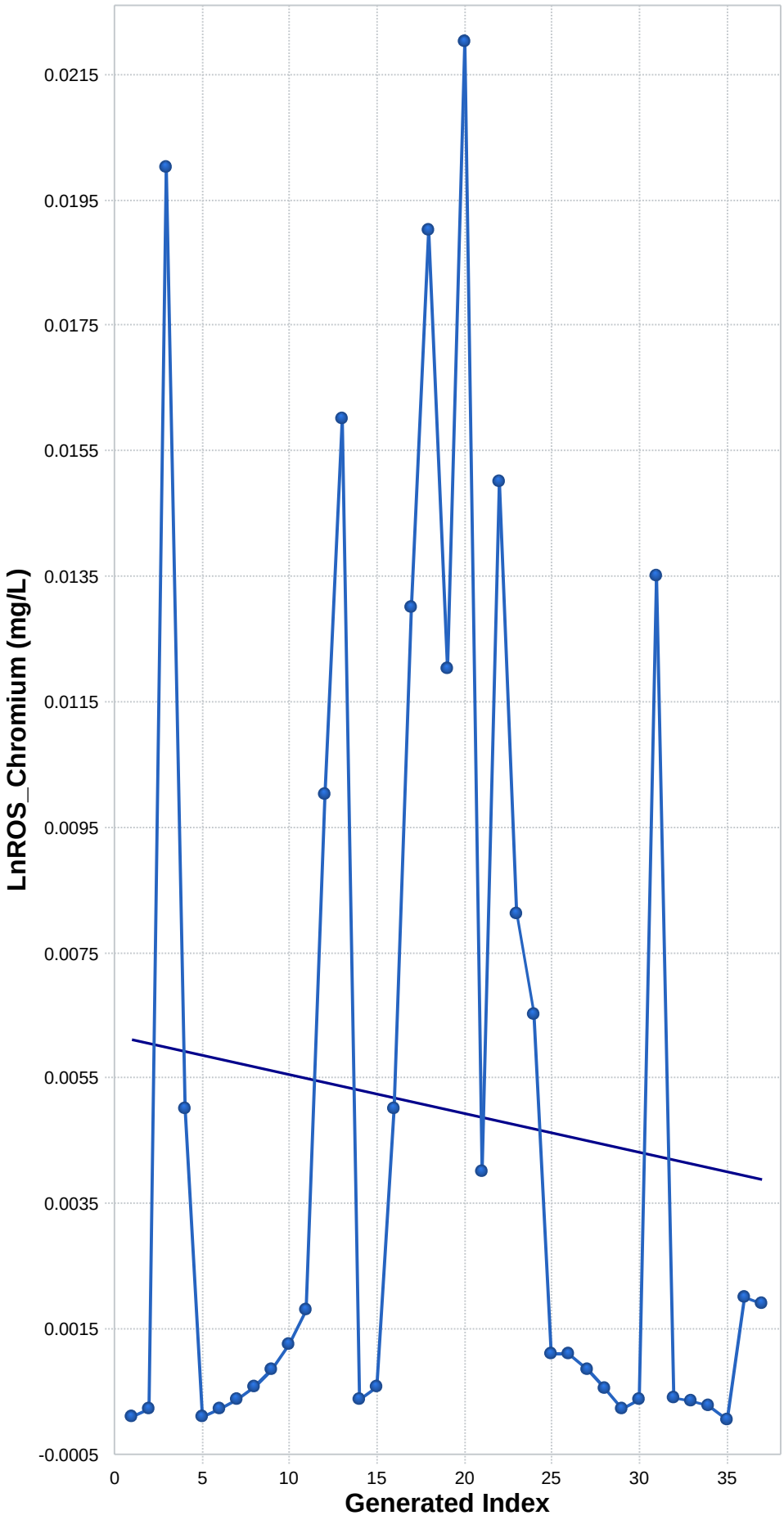
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4024 |
| Standardized Value of S | 2.2643 |
| M-K Test Value (S) | 174 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0118 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0302 |
| OLS Regression Intercept | 1.2759 |

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

# Mann-Kendall - 13-SH - CHROMIUM




**Mann-Kendall Trend Analysis**

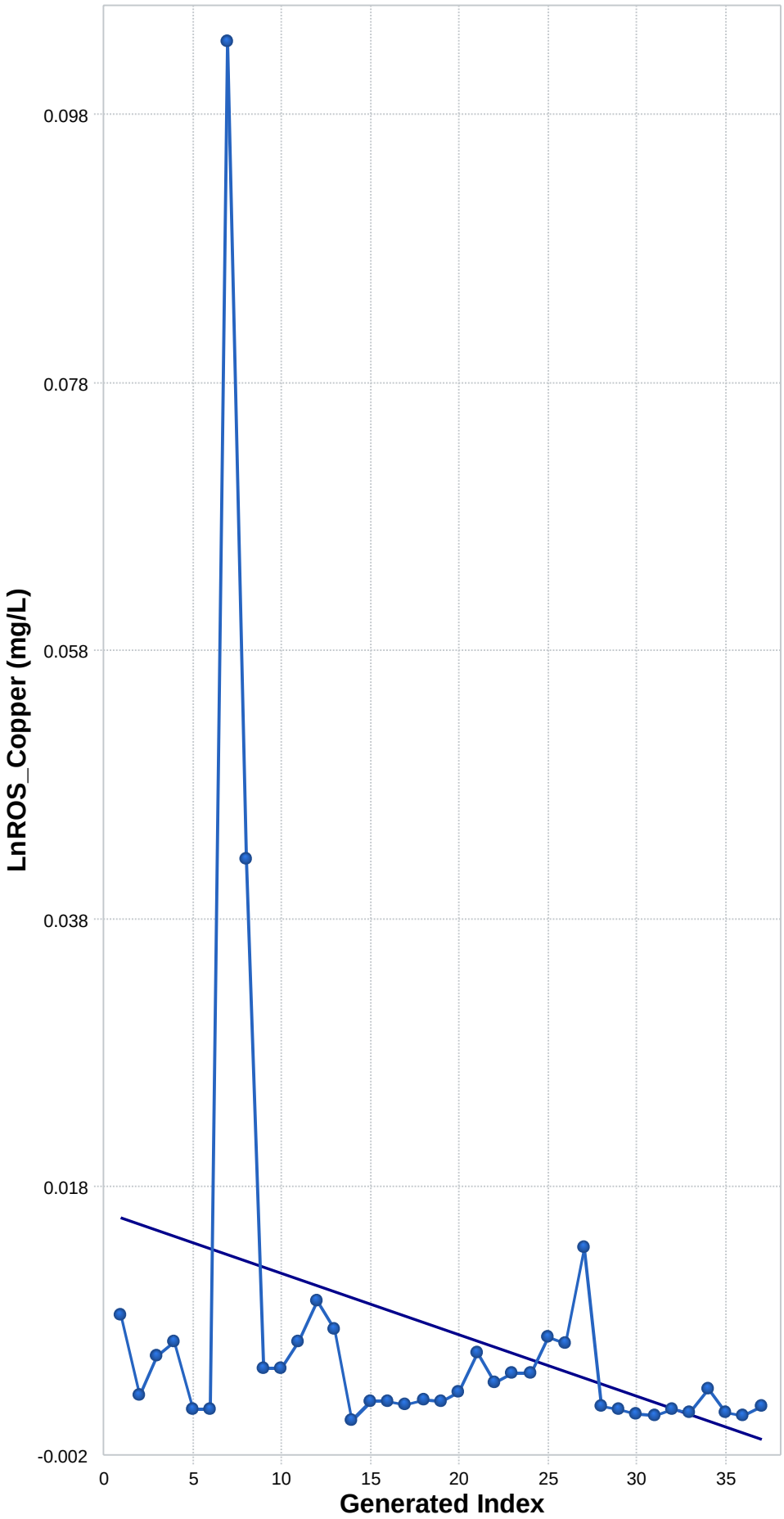
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4133 |
| Standardized Value of S | -0.0785 |
| M-K Test Value (S) | -7 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.4687 |

**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.

# Mann-Kendall - 13-SH - COPPER




**Mann-Kendall Trend Analysis**

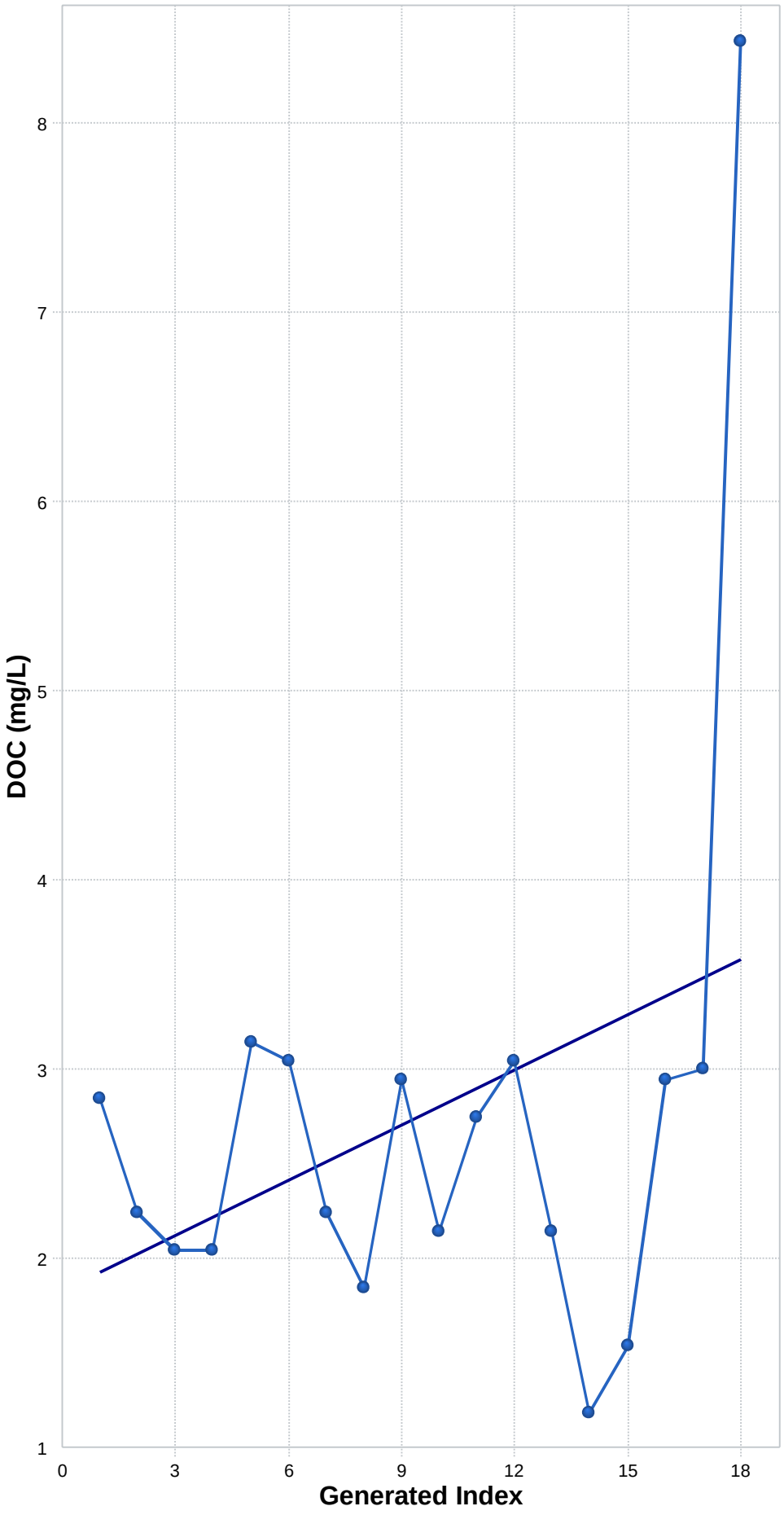
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4155 |
| Standardized Value of S | -2.8136 |
| M-K Test Value (S) | -216 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0024 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0005 |
| OLS Regression Intercept | 0.0158 |

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

# Mann-Kendall - 13-SH - DOC




**Mann-Kendall Trend Analysis**

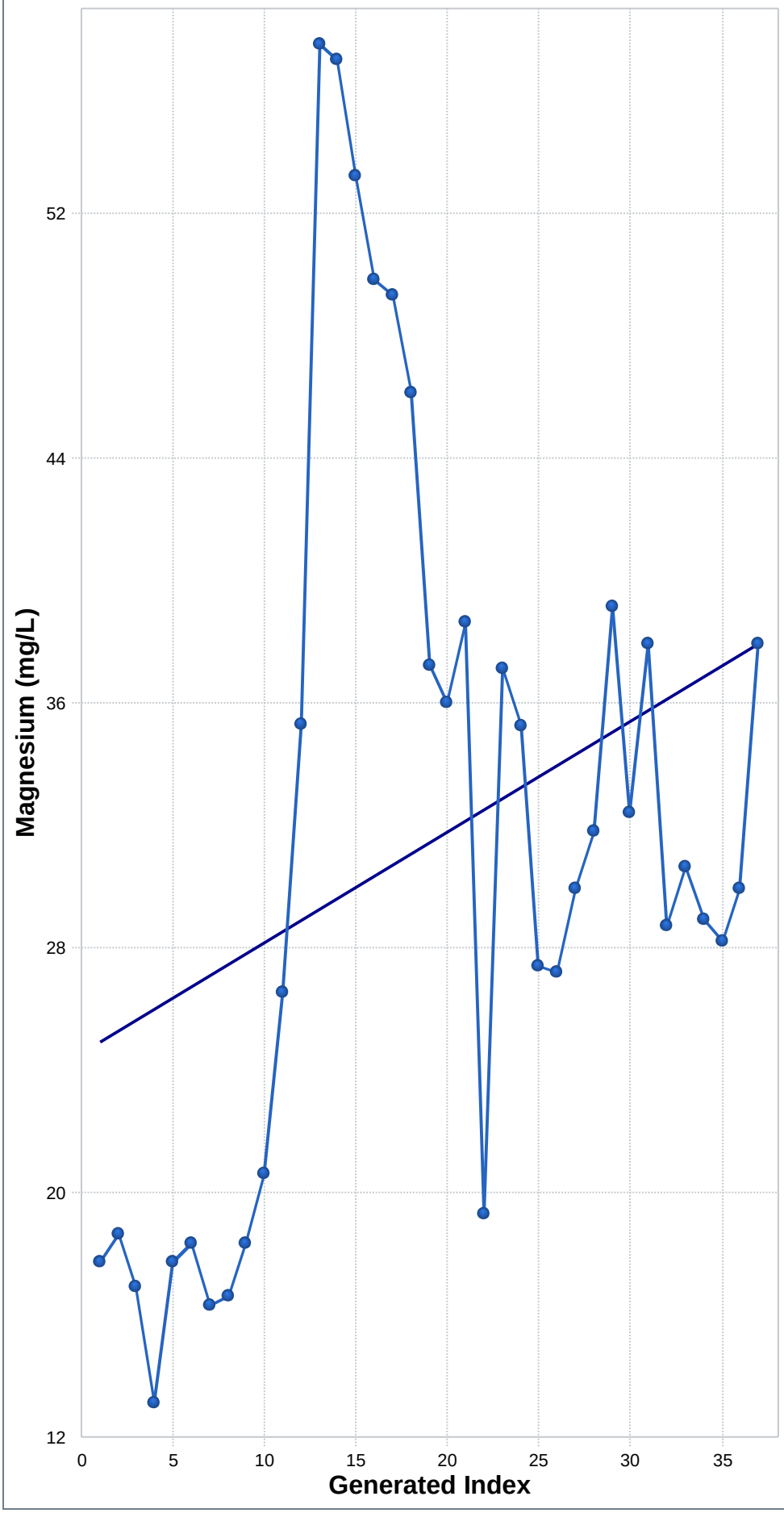
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3059 |
| Standardized Value of S | 0.3421 |
| M-K Test Value (S) | 10 |
| Tabulated p-value | 0.3540 |
| Approximate p-value | 0.3661 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0976 |
| OLS Regression Intercept | 1.7832 |

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

# Mann-Kendall - 13-SH - MAGNESIUM




**Mann-Kendall Trend Analysis**

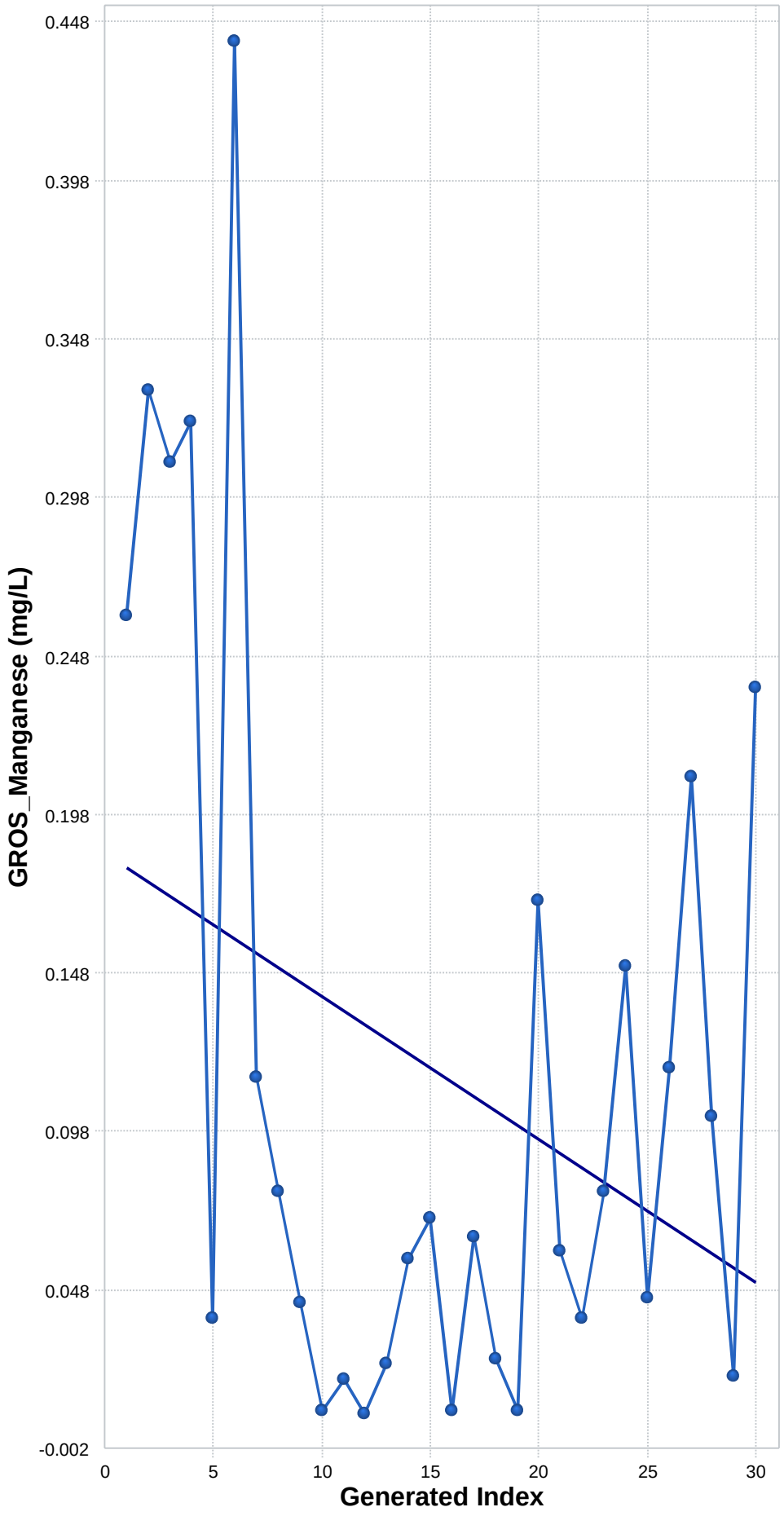
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4330 |
| Standardized Value of S | 1.9756 |
| M-K Test Value (S) | 152 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0241 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3615 |
| OLS Regression Intercept | 24.2405 |

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

# Mann-Kendall - 13-SH - MANGANESE



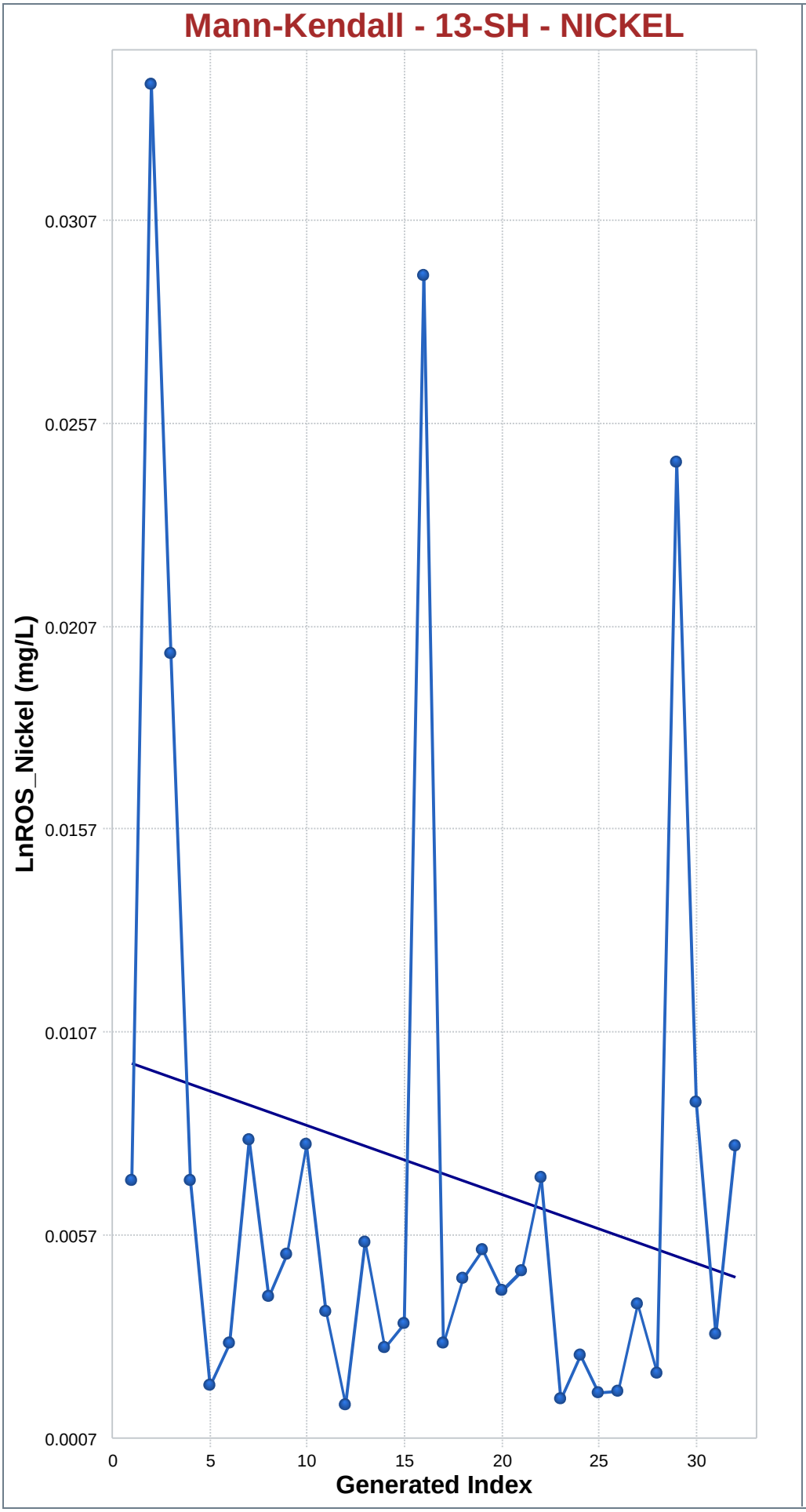

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0179 |
| Standardized Value of S | -0.4463 |
| M-K Test Value (S) | -26 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3277 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0045 |
| OLS Regression Intercept | 0.1859 |

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



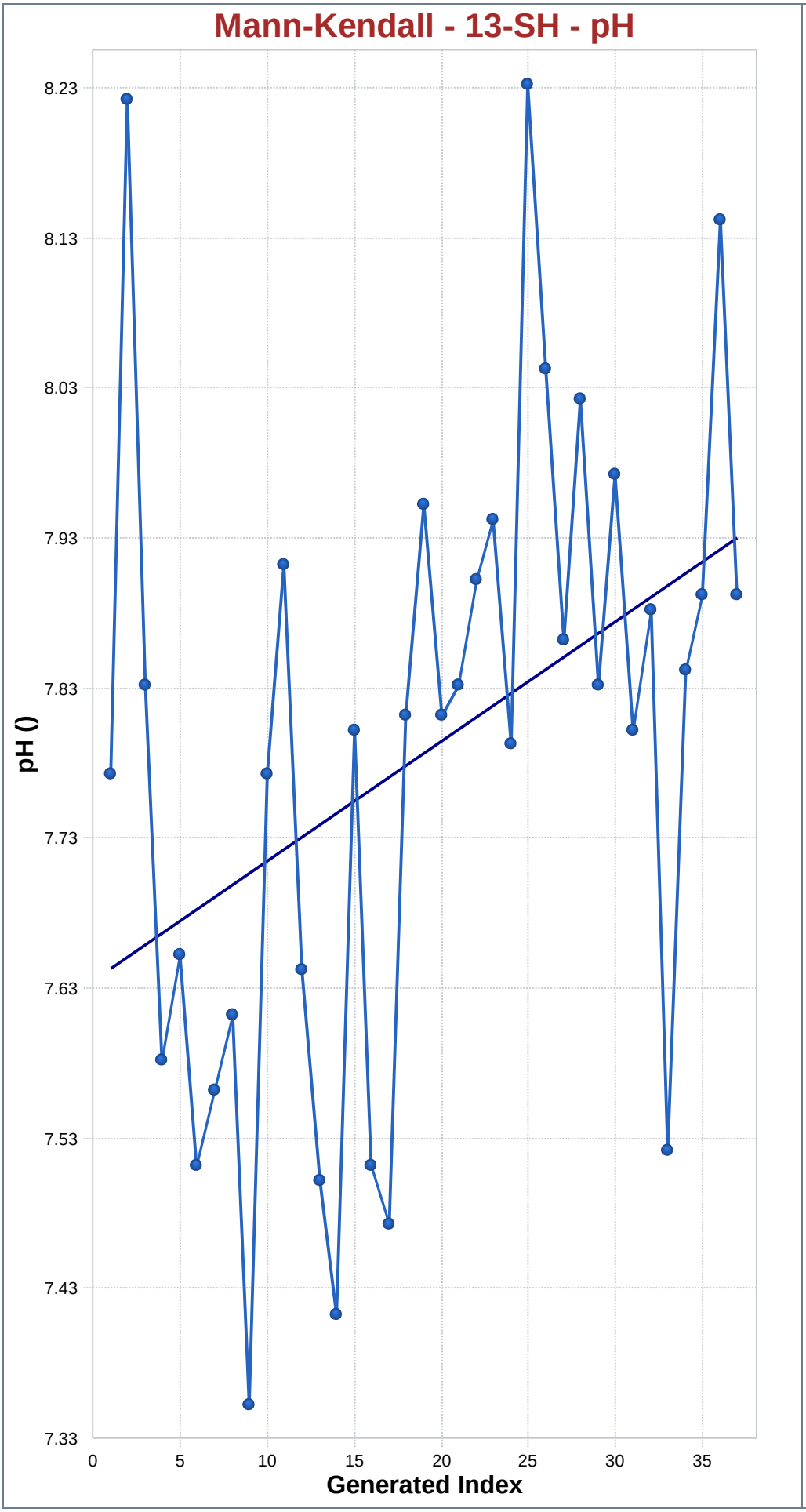

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6577 |
| Standardized Value of S | -1.1677 |
| M-K Test Value (S) | -73 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1215 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0101 |

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




**Mann-Kendall Trend Analysis**

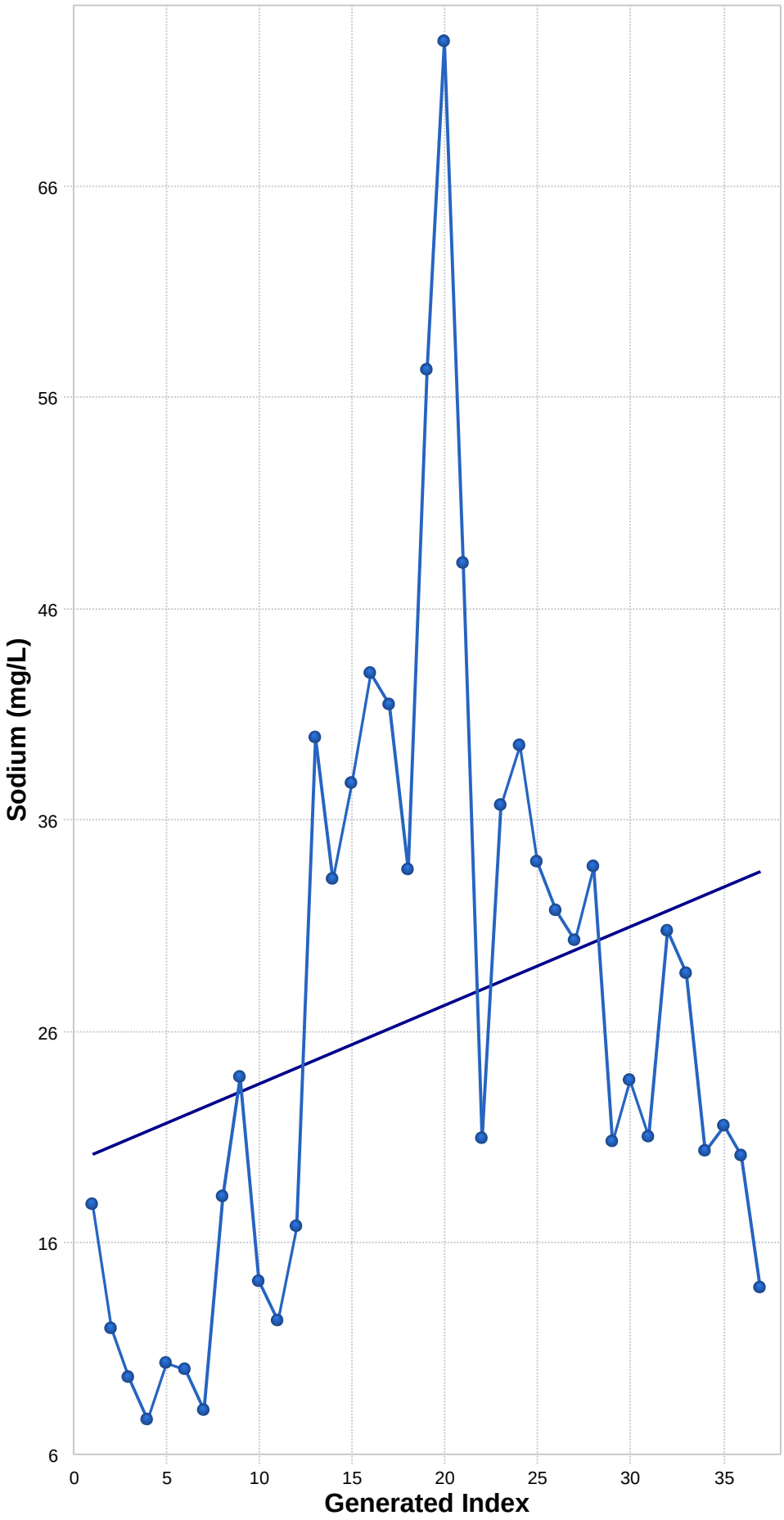
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4024 |
| Standardized Value of S | 2.7879 |
| M-K Test Value (S) | 214 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0027 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0080 |
| OLS Regression Intercept | 7.6329 |

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

# Mann-Kendall - 13-SH - SODIUM



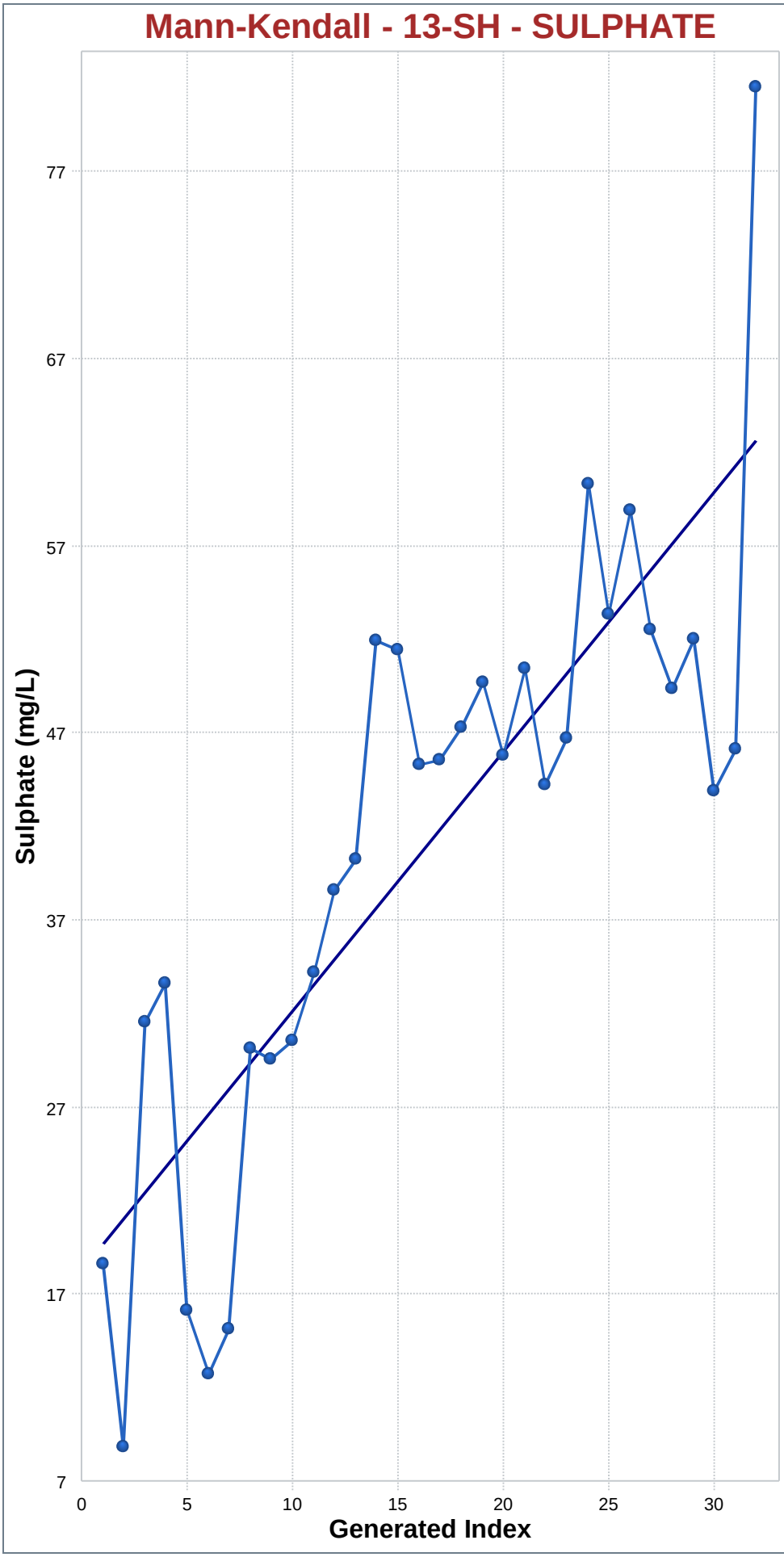

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4591 |
| Standardized Value of S | 1.4779 |
| M-K Test Value (S) | 114 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0697 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3711 |
| OLS Regression Intercept | 19.6440 |

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




**Mann-Kendall Trend Analysis**

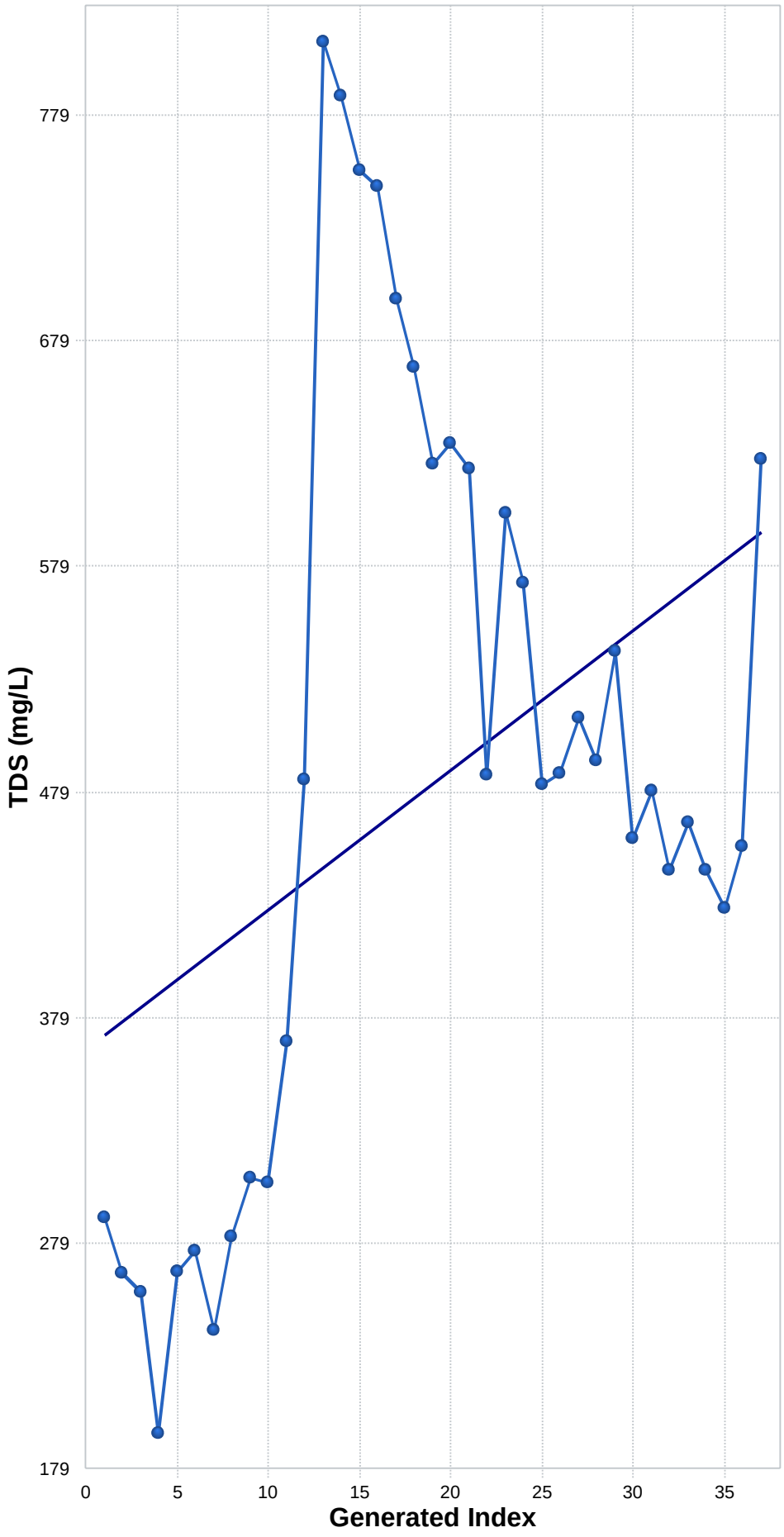
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6658 |
| Standardized Value of S | 5.0433 |
| M-K Test Value (S) | 312 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.3851 |
| OLS Regression Intercept | 18.1546 |

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

# Mann-Kendall - 13-SH - TDS



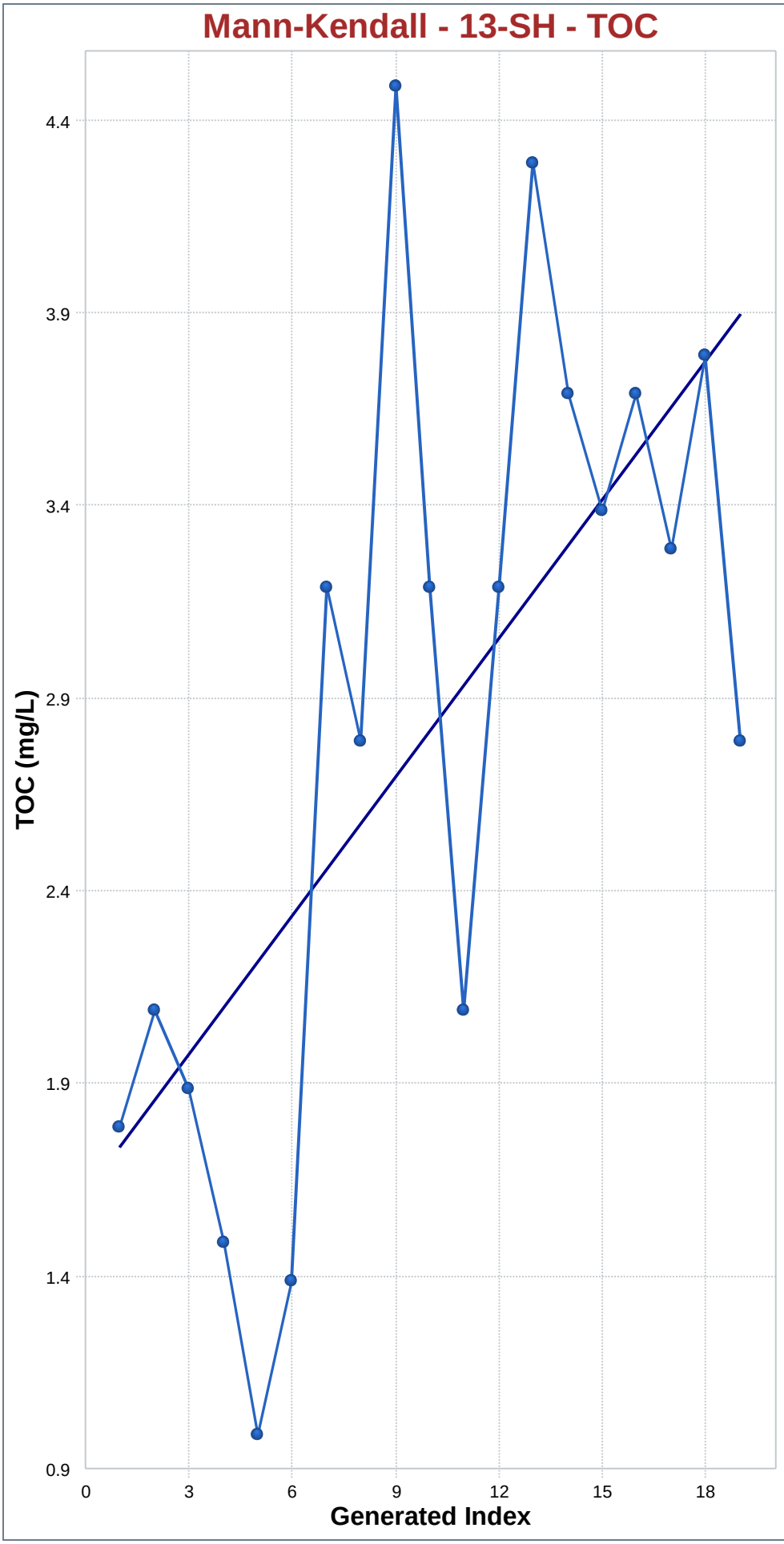

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4526 |
| Standardized Value of S | 1.2818 |
| M-K Test Value (S) | 99 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0999 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 6.1849 |
| OLS Regression Intercept | 364.7297 |

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




**Mann-Kendall Trend Analysis**

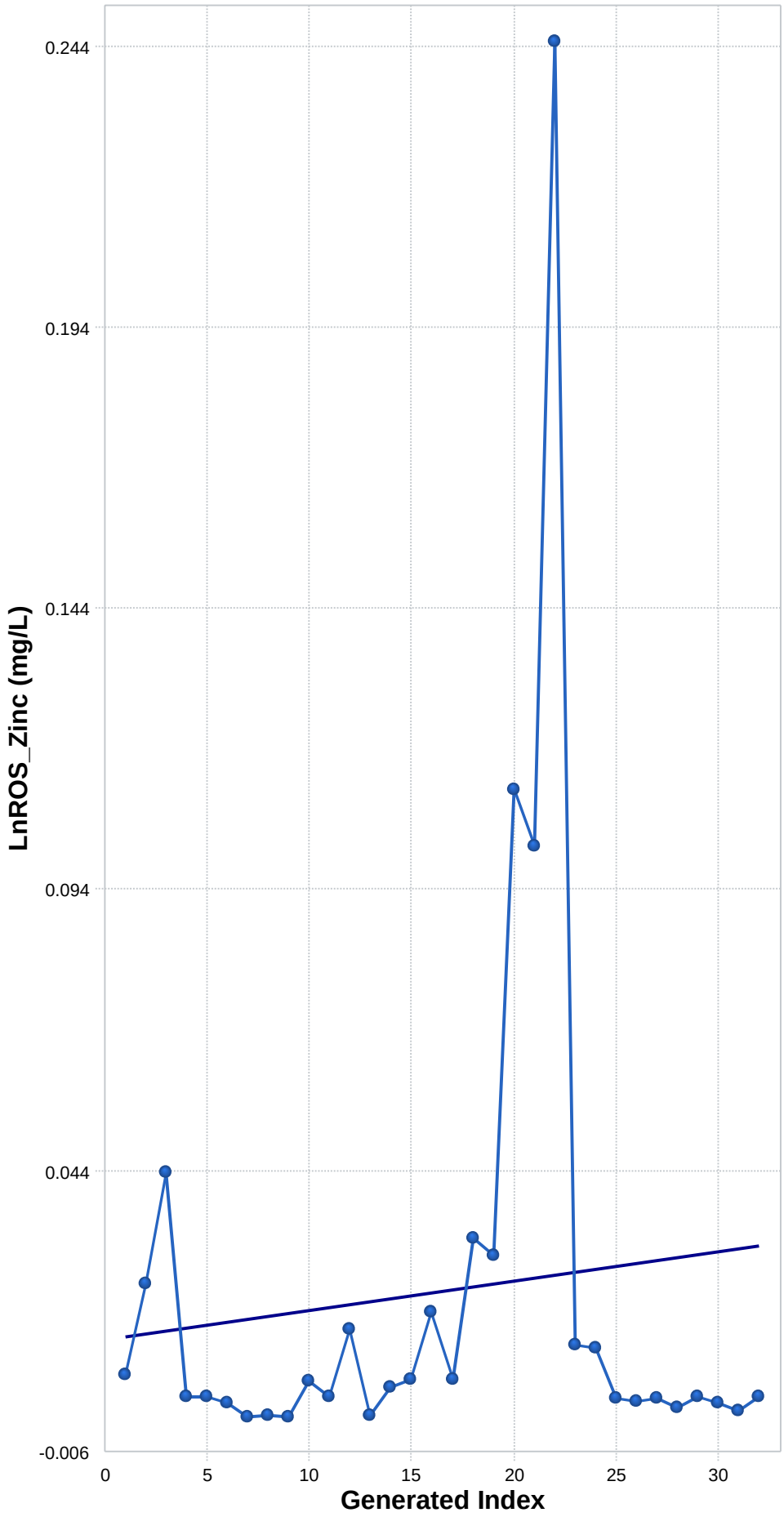
| | |
|---|---|
| n | 19 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 28.4664 |
| Standardized Value of S | 2.6698 |
| M-K Test Value (S) | 77 |
| Tabulated p-value | 0.0030 |
| Approximate p-value | 0.0038 |

**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 - 13-SH - ZINC




**Mann-Kendall Trend Analysis**

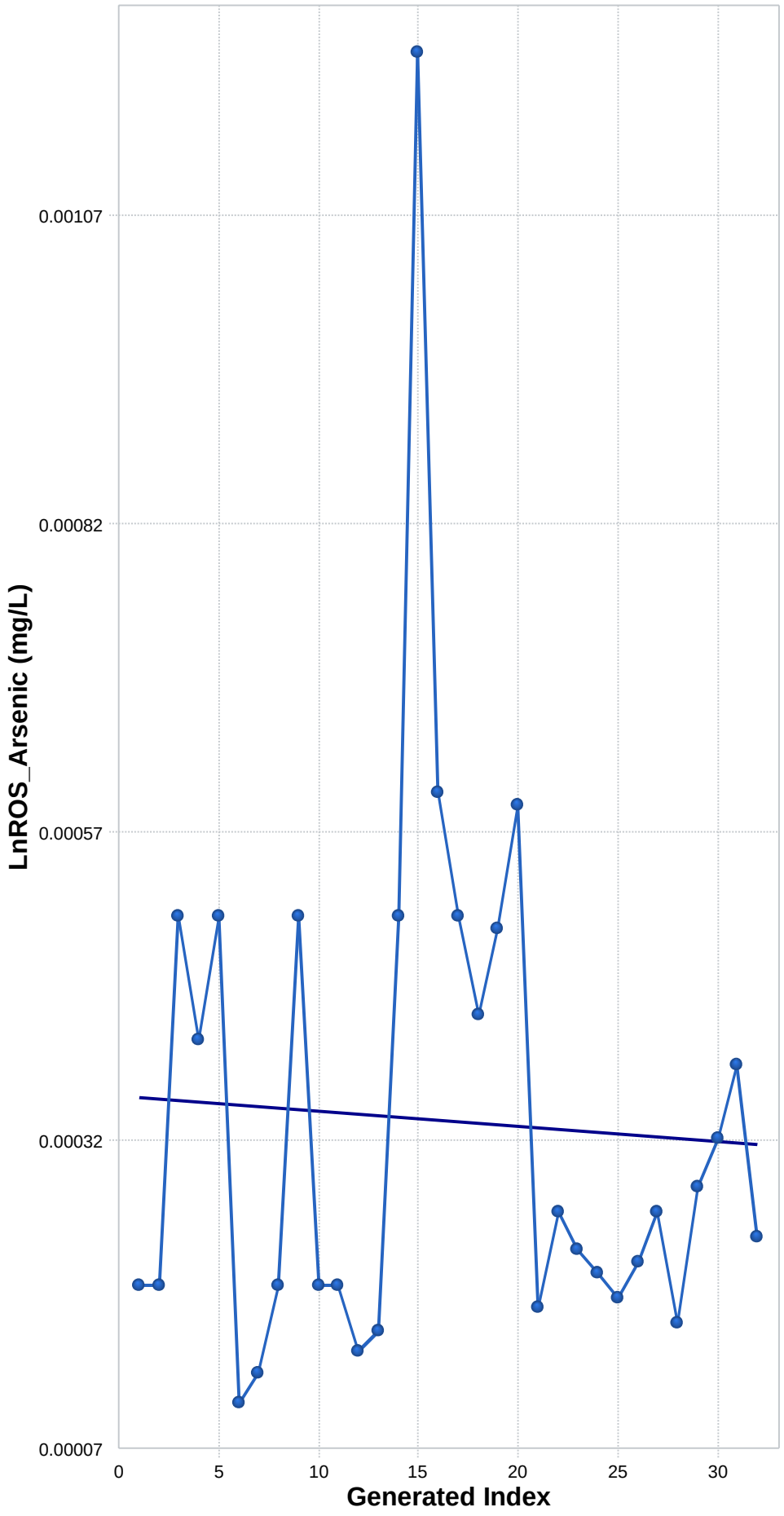
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.5792 |
| Standardized Value of S | -0.2436 |
| M-K Test Value (S) | -16 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.4038 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0005 |
| OLS Regression Intercept | 0.0141 |

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

# Mann-Kendall - 14-SH - ARSENIC




**Mann-Kendall Trend Analysis**

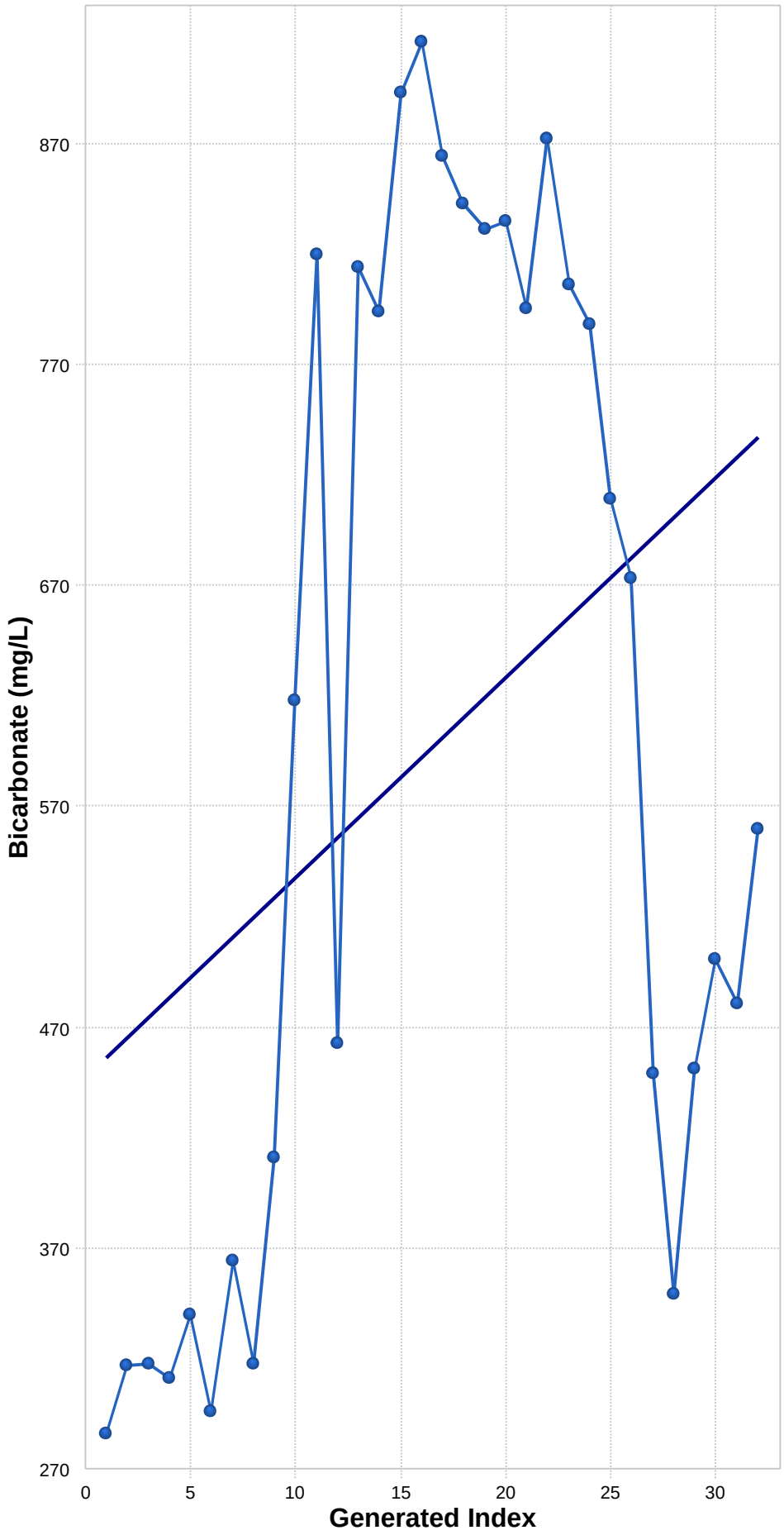
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.3949 |
| Standardized Value of S | 0.3420 |
| M-K Test Value (S) | 22 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3662 |

**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 - 14-SH - BICARBONATE



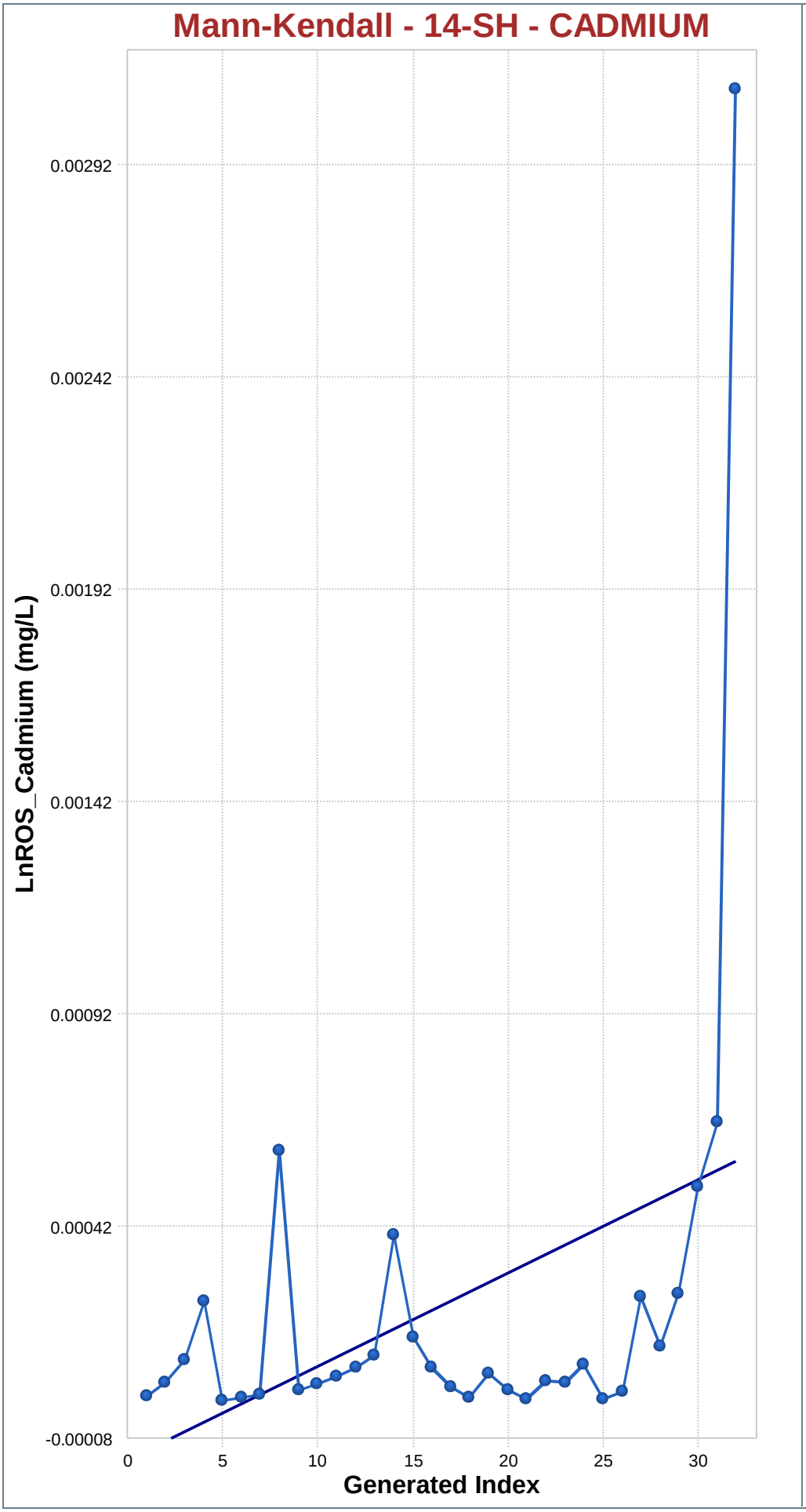

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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 | 9.0576 |
| OLS Regression Intercept | 446.9879 |

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




**Mann-Kendall Trend Analysis**

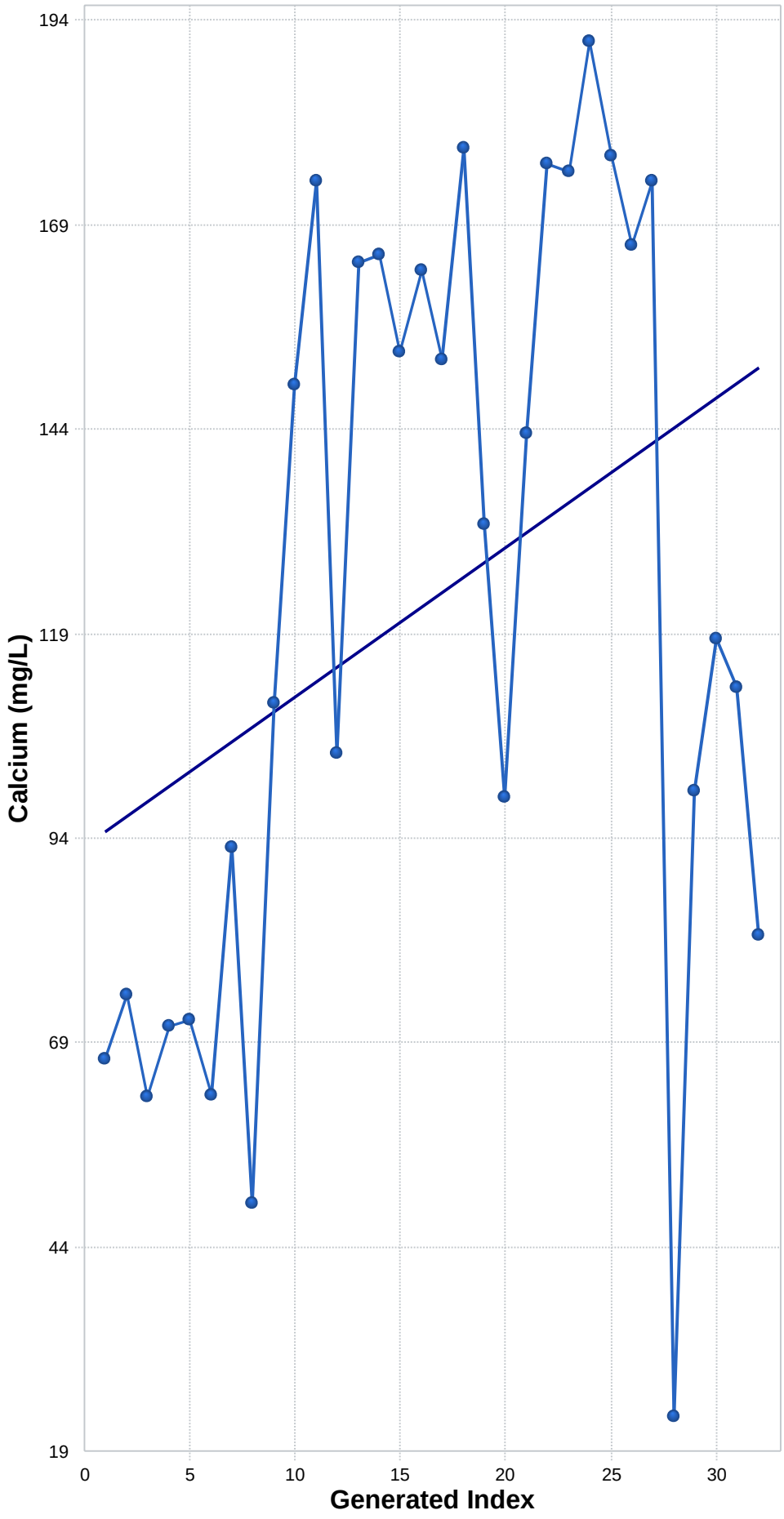
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6658 |
| Standardized Value of S | 2.1244 |
| M-K Test Value (S) | 132 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0168 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | -0.0001 |

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

# Mann-Kendall - 14-SH - CALCIUM



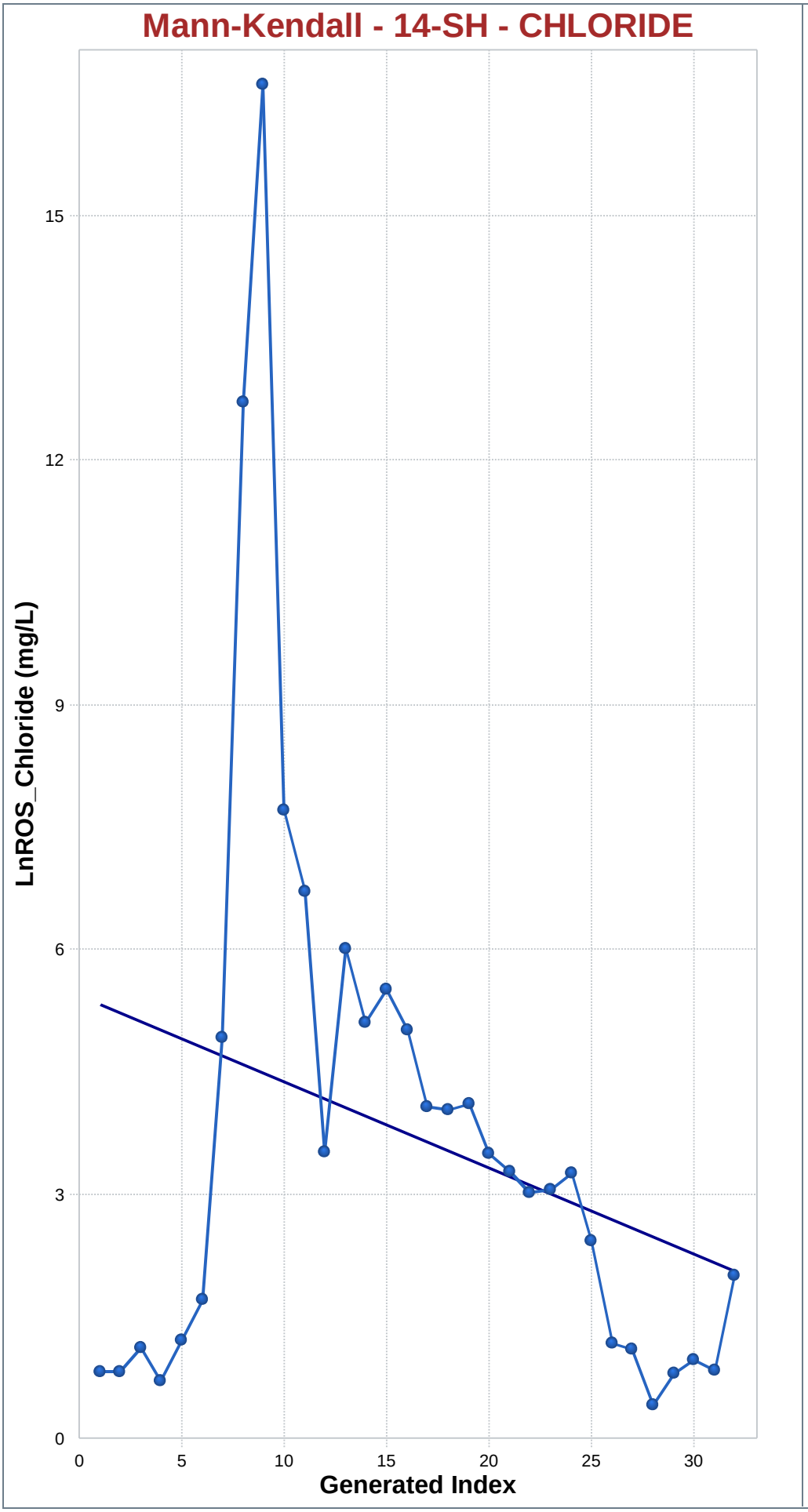

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6577 |
| Standardized Value of S | 2.3355 |
| M-K Test Value (S) | 145 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0098 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.8265 |
| OLS Regression Intercept | 92.5655 |

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




**Mann-Kendall Trend Analysis**

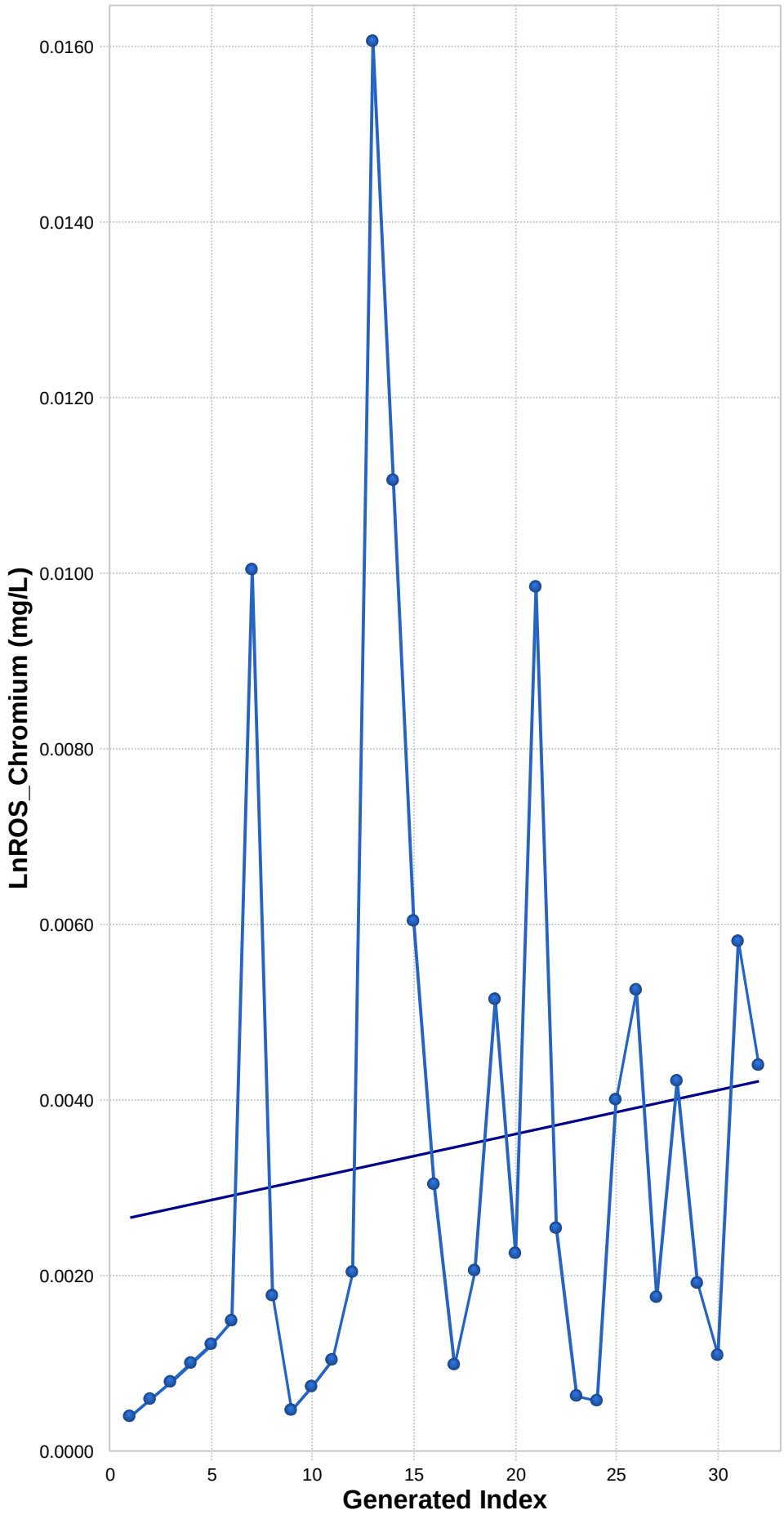
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6577 |
| Standardized Value of S | -2.2382 |
| M-K Test Value (S) | -139 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0126 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.1050 |
| OLS Regression Intercept | 5.9152 |

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

# Mann-Kendall - 14-SH - CHROMIUM




**Mann-Kendall Trend Analysis**

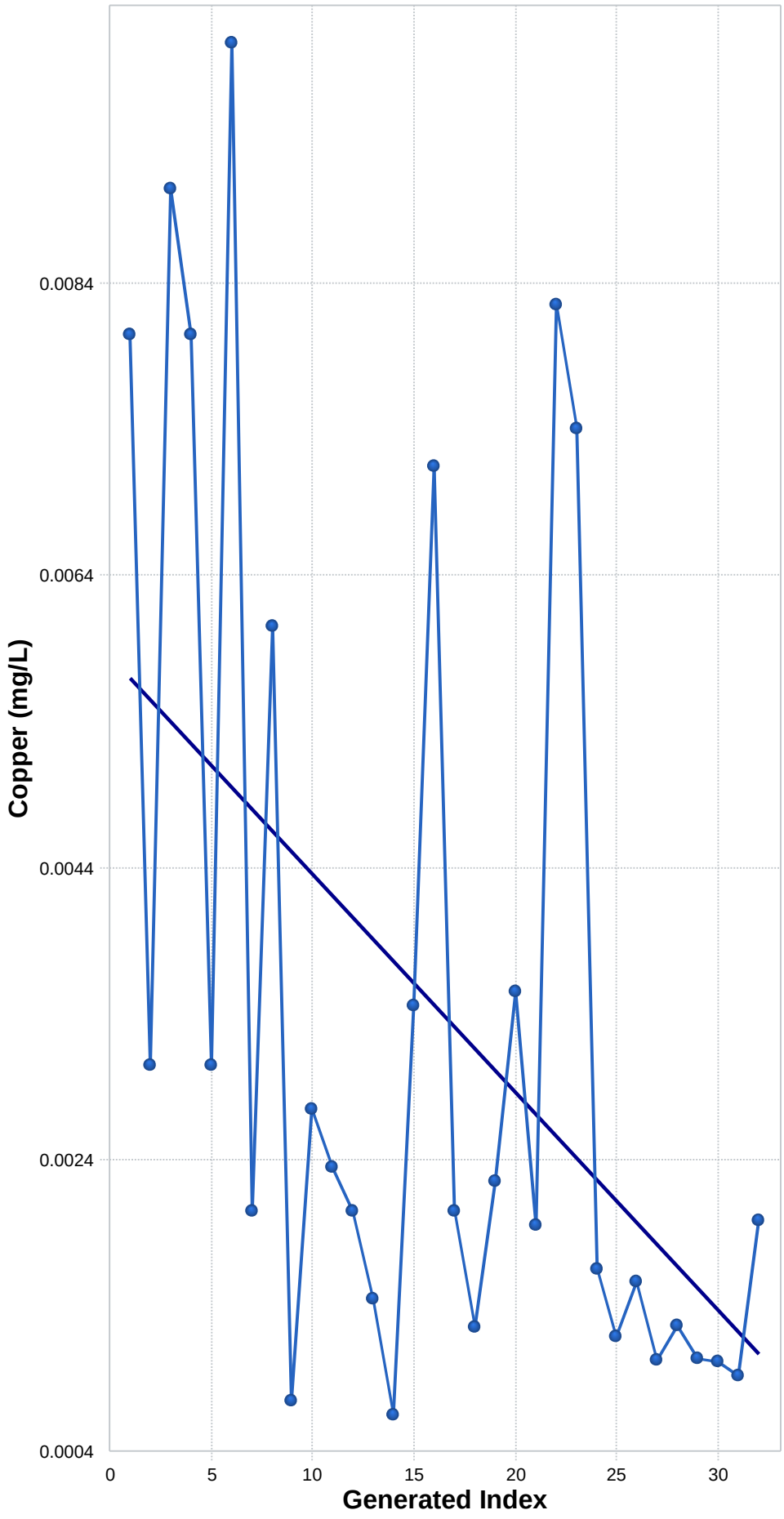
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6658 |
| Standardized Value of S | 2.1568 |
| M-K Test Value (S) | 134 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0155 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0001 |
| OLS Regression Intercept | 0.0026 |

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

# Mann-Kendall - 14-SH - COPPER



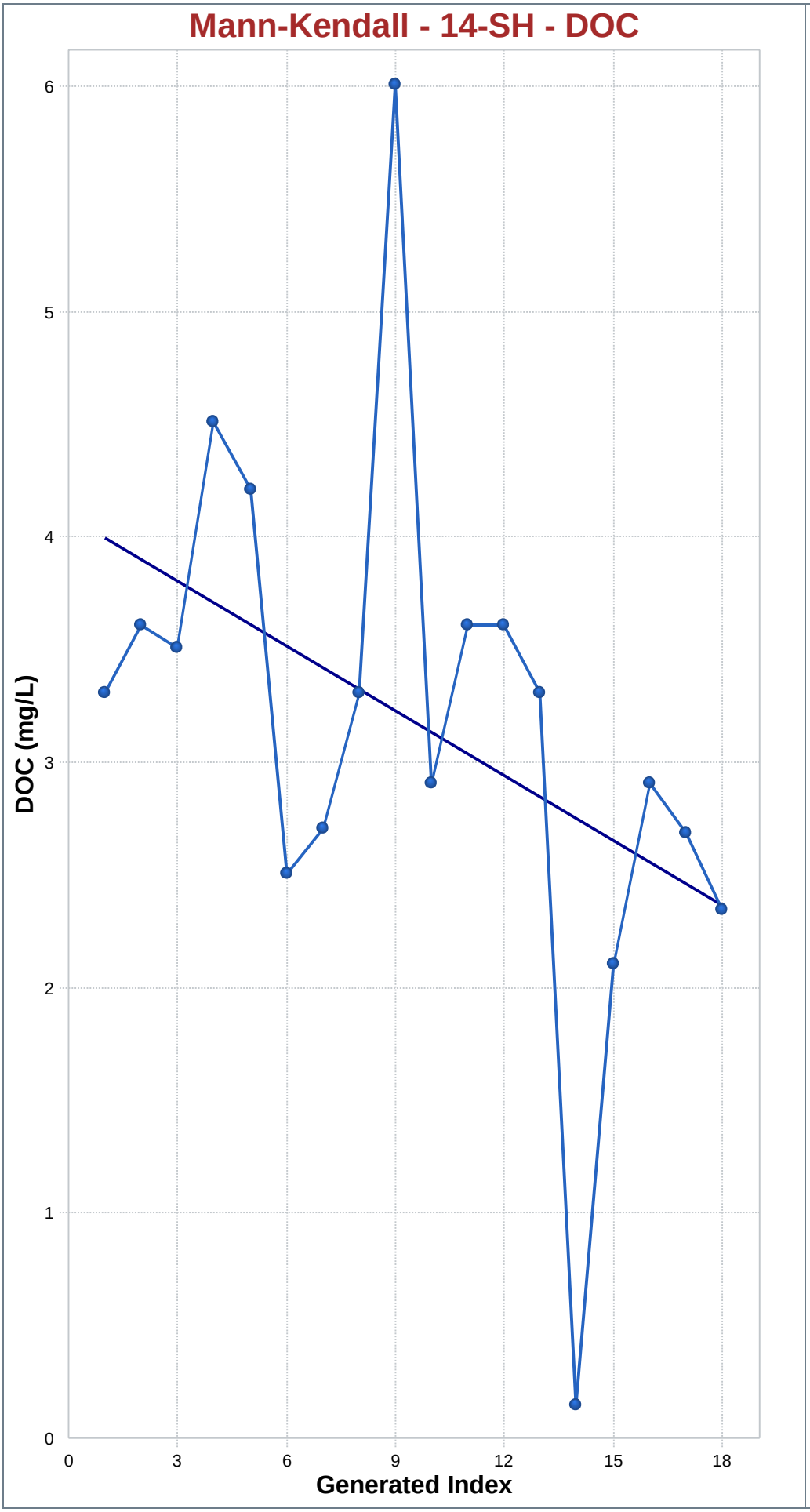

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6198 |
| Standardized Value of S | -3.4080 |
| M-K Test Value (S) | -211 |
| 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**

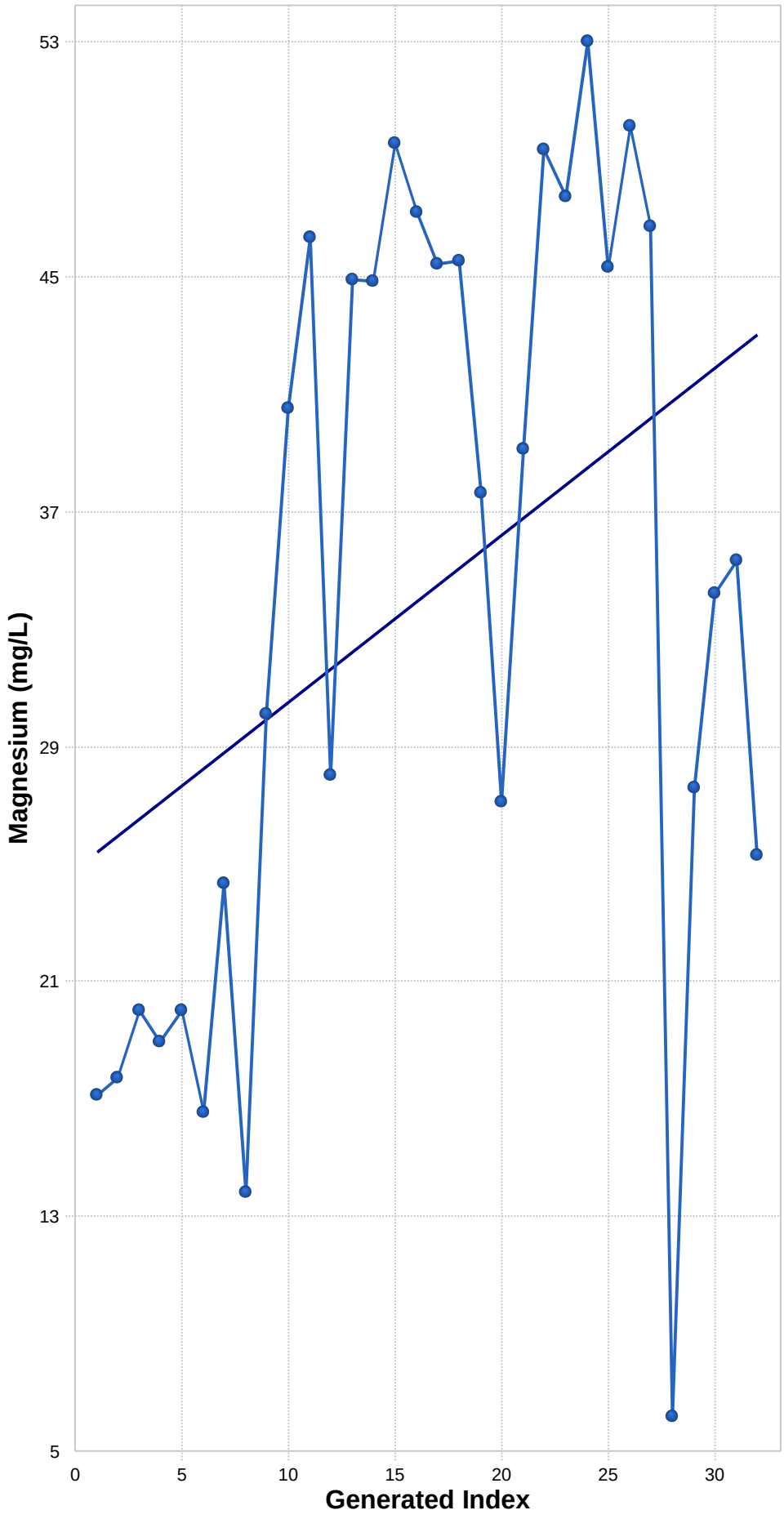
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.2425 |
| Standardized Value of S | -2.0196 |
| M-K Test Value (S) | -54 |
| Tabulated p-value | 0.0200 |
| Approximate p-value | 0.0217 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0959 |
| OLS Regression Intercept | 4.5869 |

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

# Mann-Kendall - 14-SH - MAGNESIUM



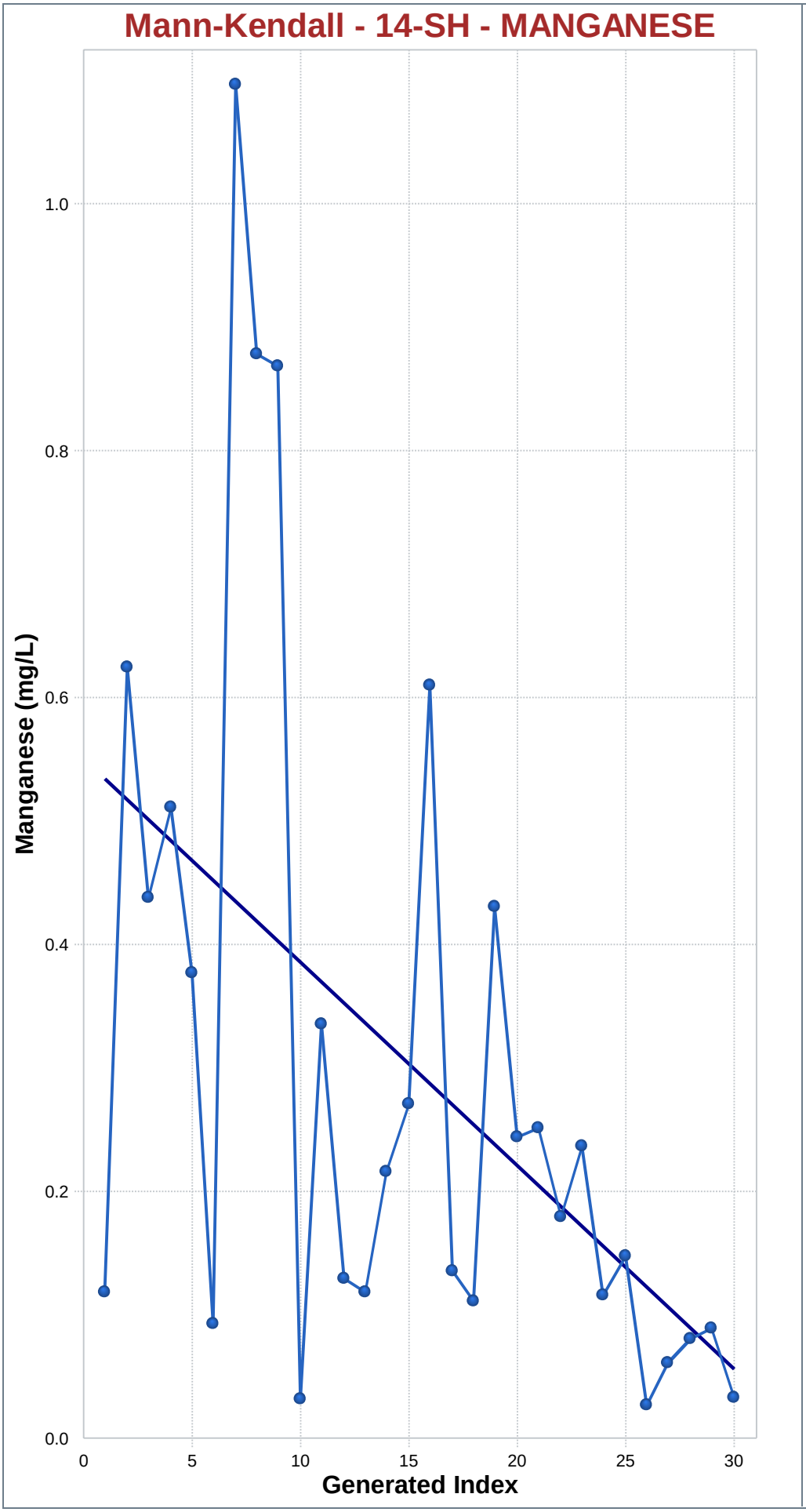

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6577 |
| Standardized Value of S | 2.4977 |
| M-K Test Value (S) | 155 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0063 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.5687 |
| OLS Regression Intercept | 24.8344 |

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



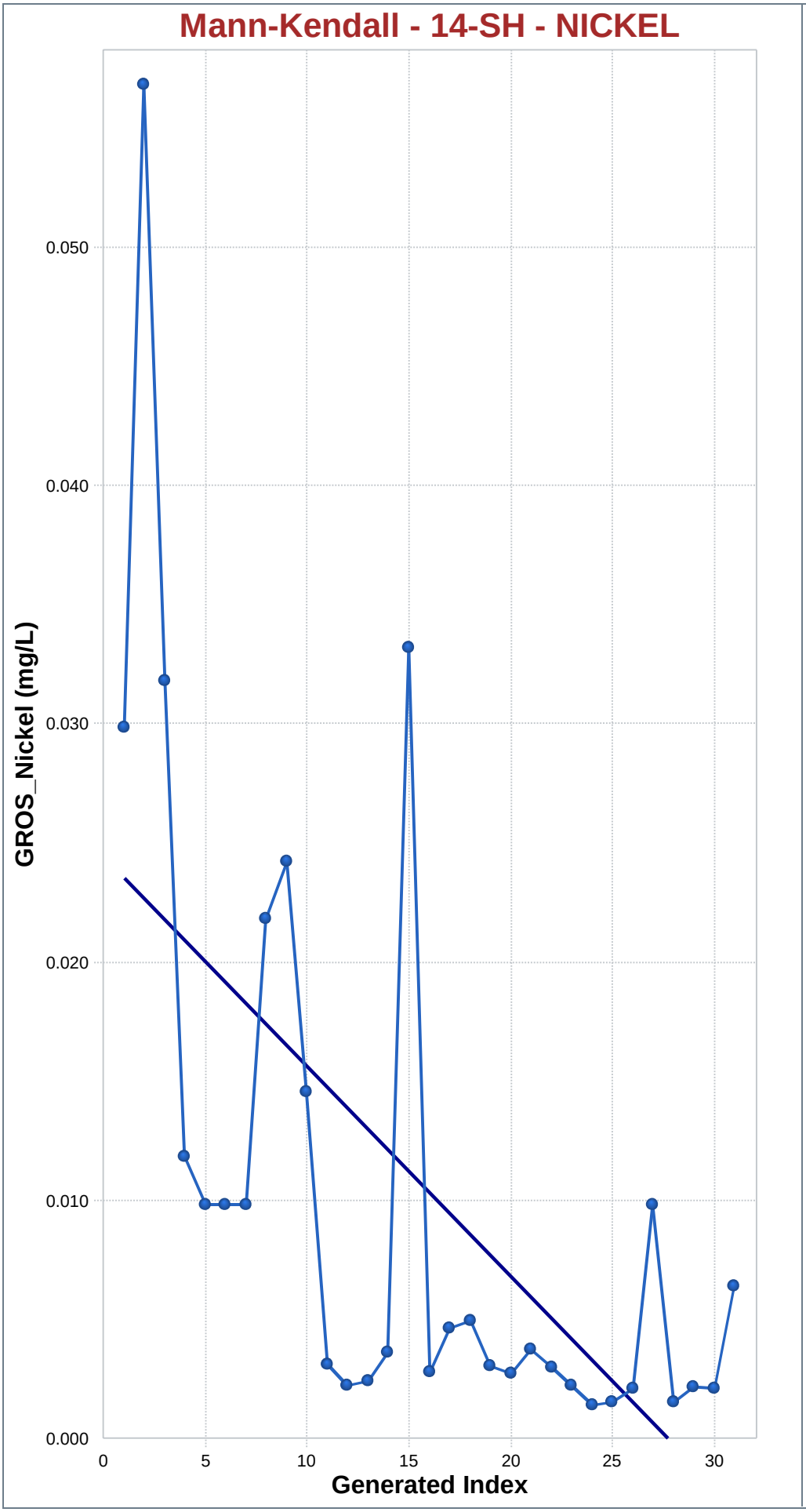

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0417 |
| Standardized Value of S | -3.2297 |
| M-K Test Value (S) | -182 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0006 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0165 |
| OLS Regression Intercept | 0.5243 |

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



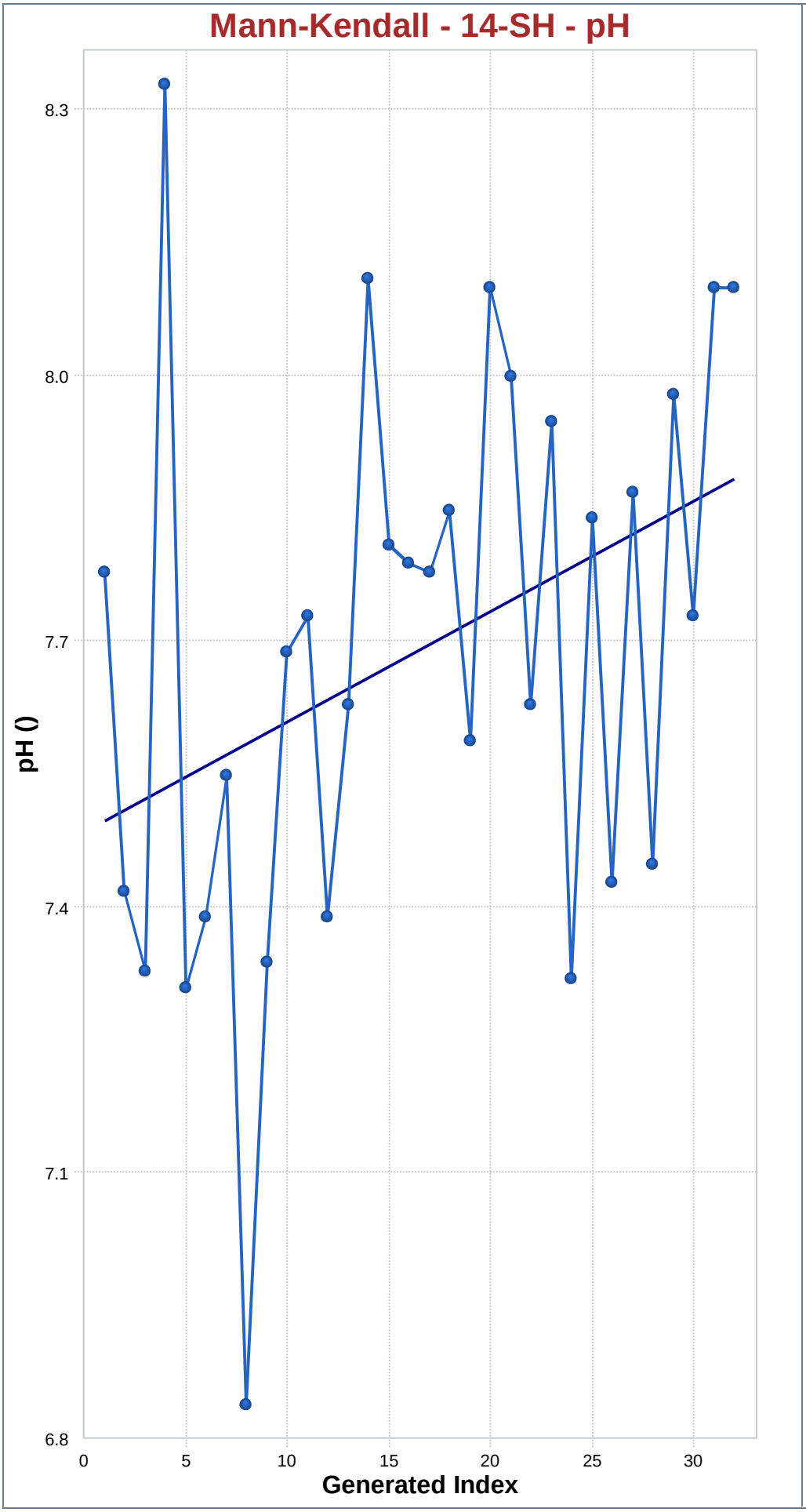

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 31 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 58.7622 |
| Standardized Value of S | -4.1523 |
| M-K Test Value (S) | -245 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0009 |
| OLS Regression Intercept | 0.0246 |

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




**Mann-Kendall Trend Analysis**

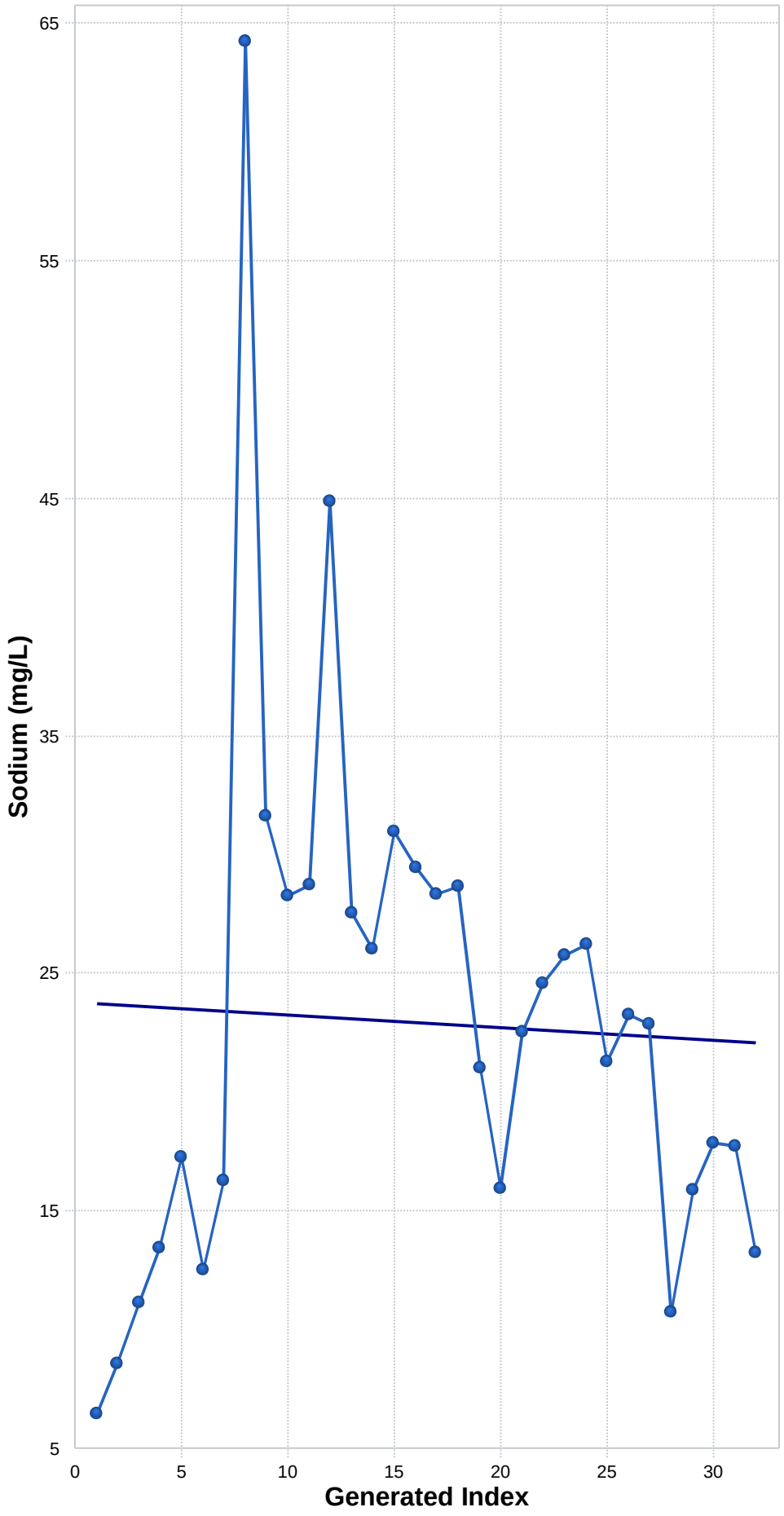
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6036 |
| Standardized Value of S | 2.4674 |
| M-K Test Value (S) | 153 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0068 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0125 |
| OLS Regression Intercept | 7.5069 |

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

# Mann-Kendall - 14-SH - SODIUM




**Mann-Kendall Trend Analysis**

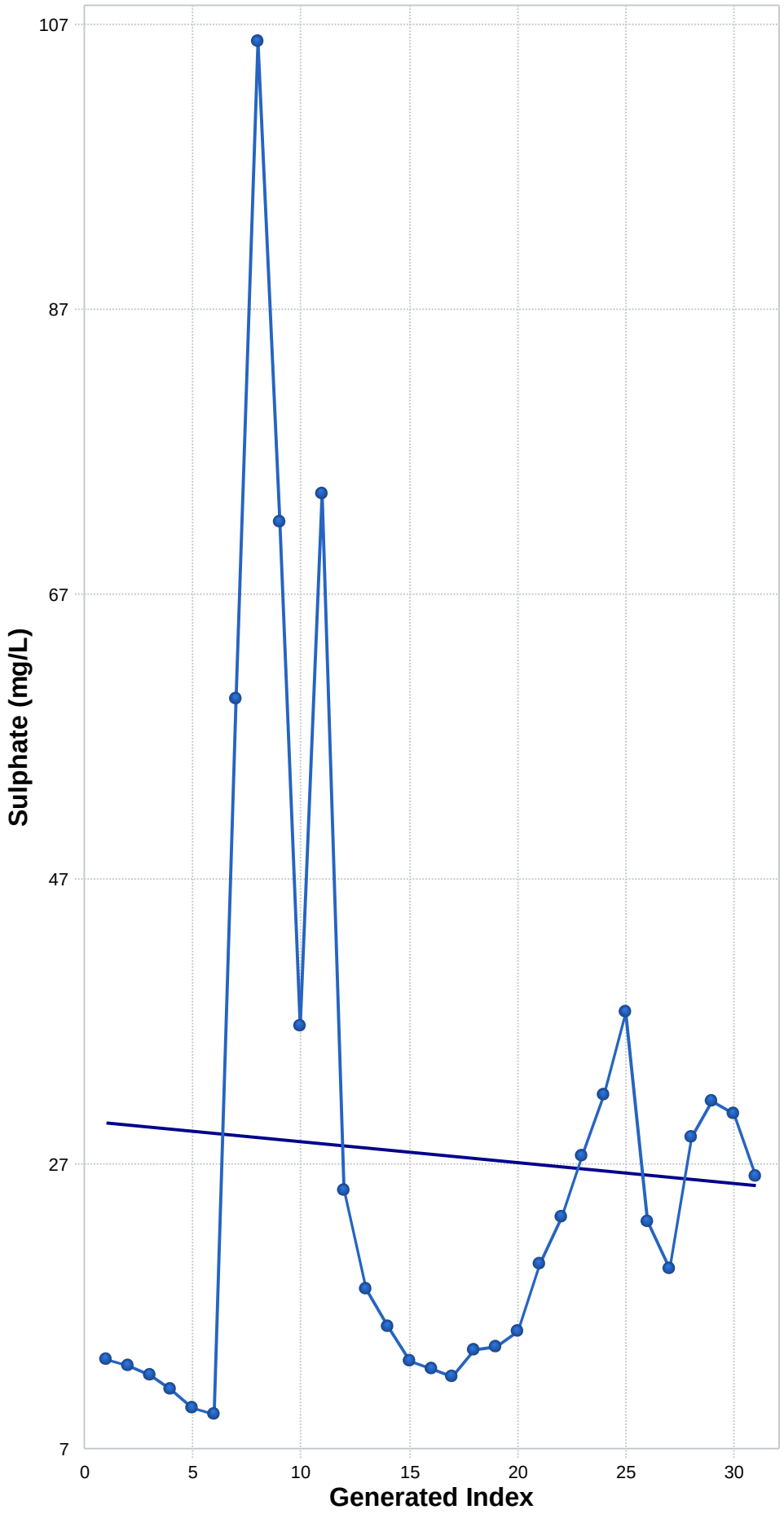
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6658 |
| Standardized Value of S | -0.4703 |
| M-K Test Value (S) | -30 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3191 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0528 |
| OLS Regression Intercept | 23.6369 |

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

# Mann-Kendall - 14-SH - SULPHATE




**Mann-Kendall Trend Analysis**

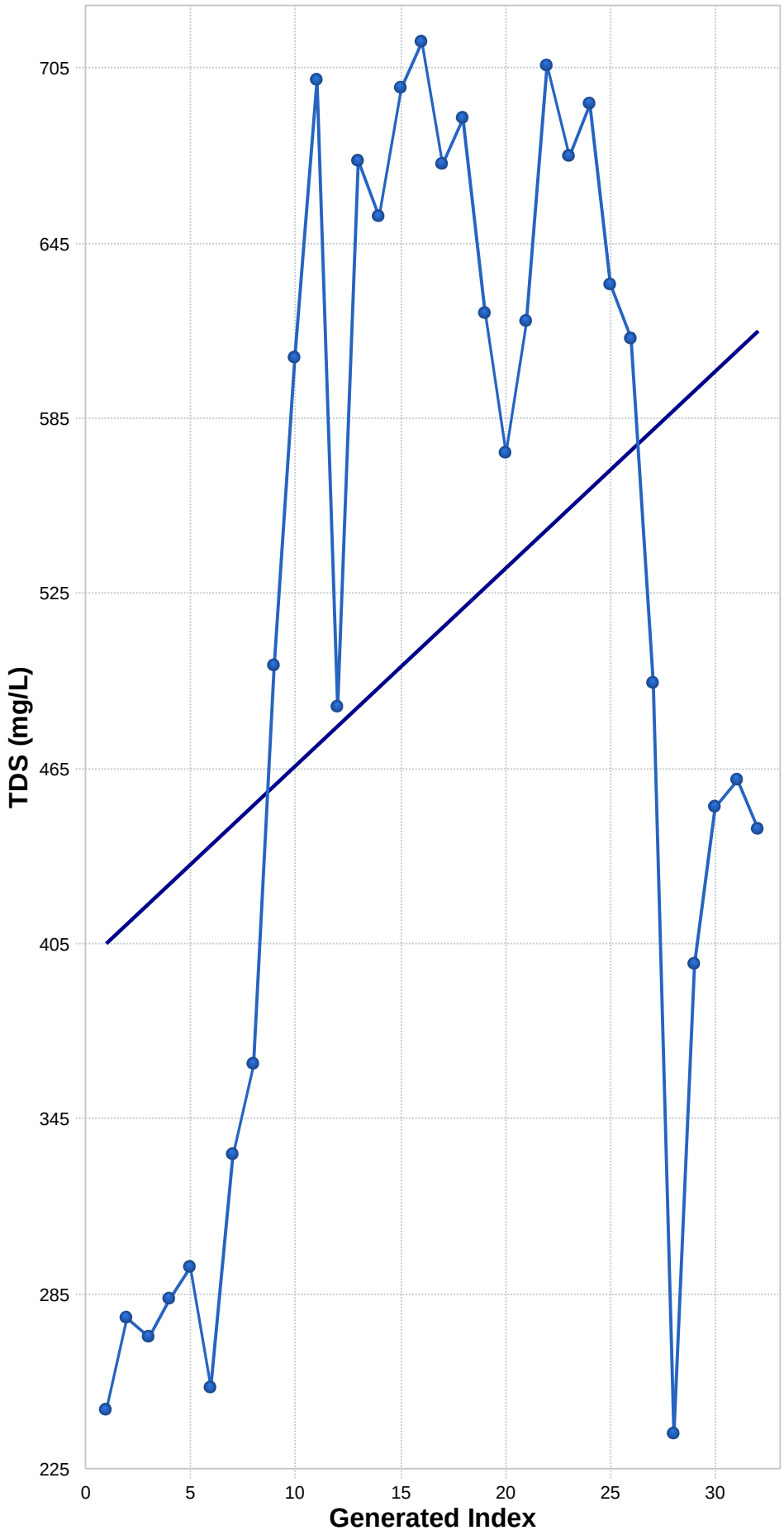
| | |
|---|---|
| n | 31 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 58.8359 |
| Standardized Value of S | 1.9036 |
| M-K Test Value (S) | 113 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0285 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.1467 |
| OLS Regression Intercept | 30.1761 |

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

# Mann-Kendall - 14-SH - TDS



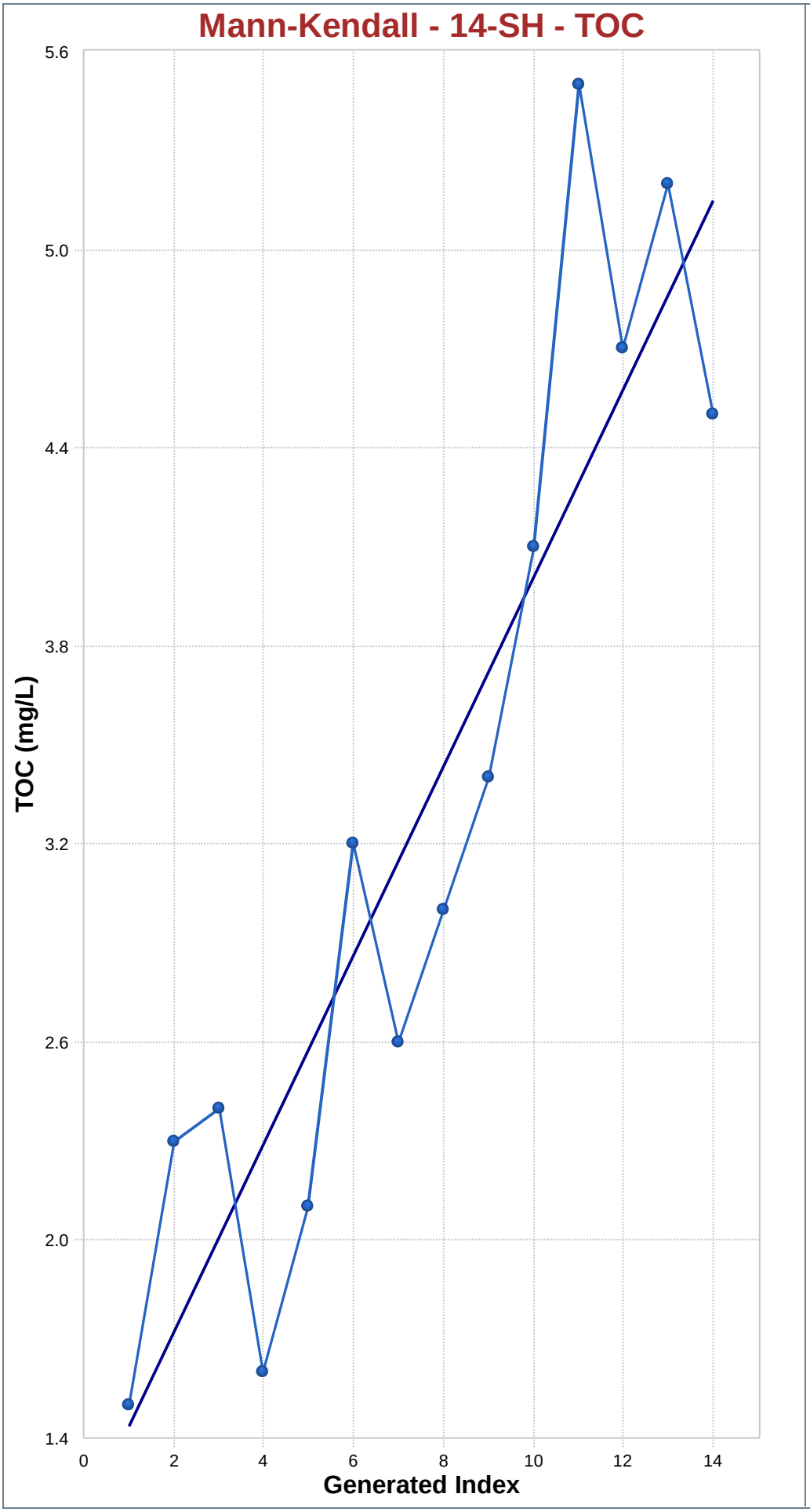

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6658 |
| Standardized Value of S | 1.6054 |
| M-K Test Value (S) | 100 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0542 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 6.7782 |
| OLS Regression Intercept | 398.3468 |

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




**Mann-Kendall Trend Analysis**

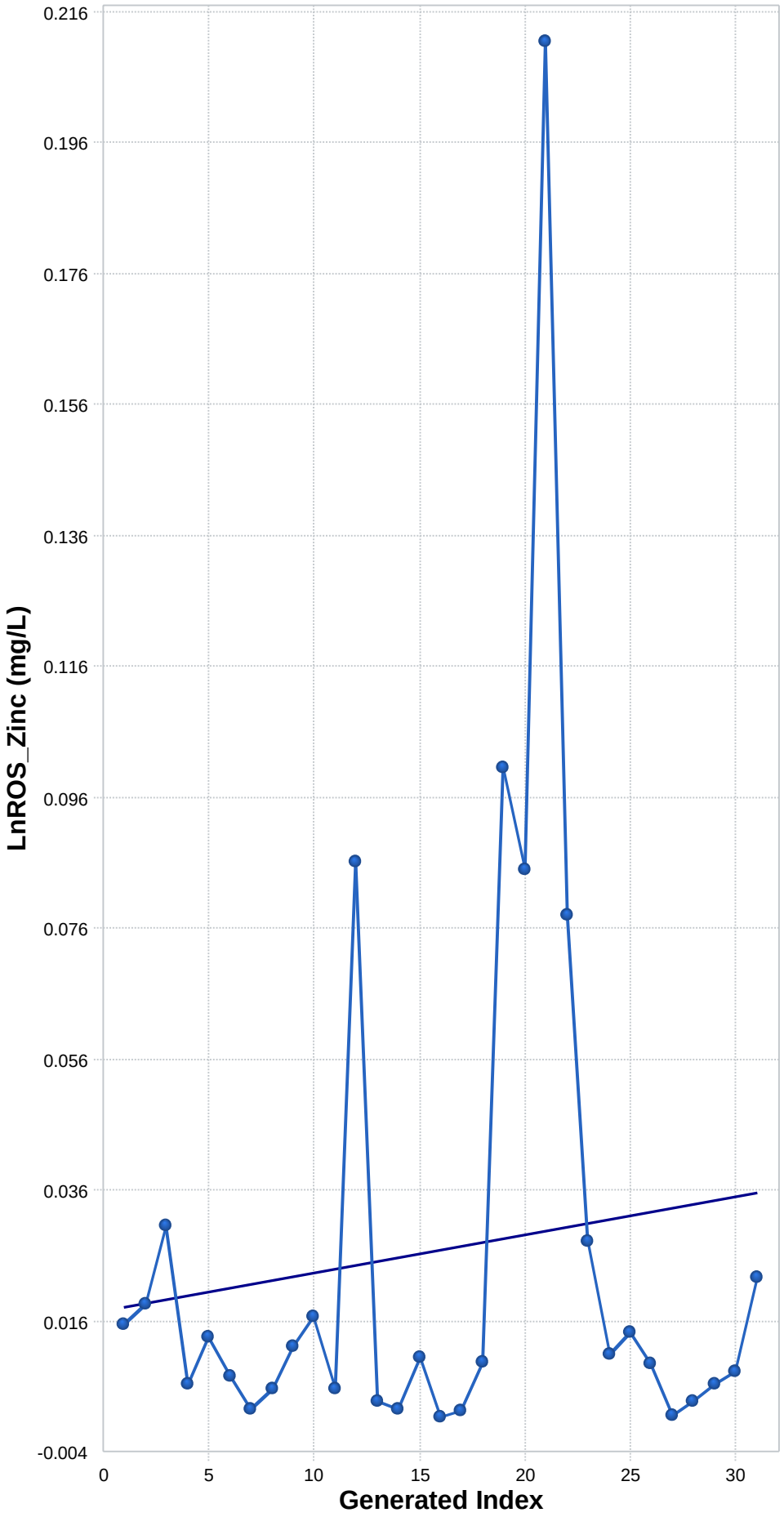
| | |
|---|---|
| n | 14 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 18.2665 |
| Standardized Value of S | 3.7227 |
| M-K Test Value (S) | 69 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.2855 |
| OLS Regression Intercept | 1.1516 |

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

# Mann-Kendall - 14-SH - ZINC



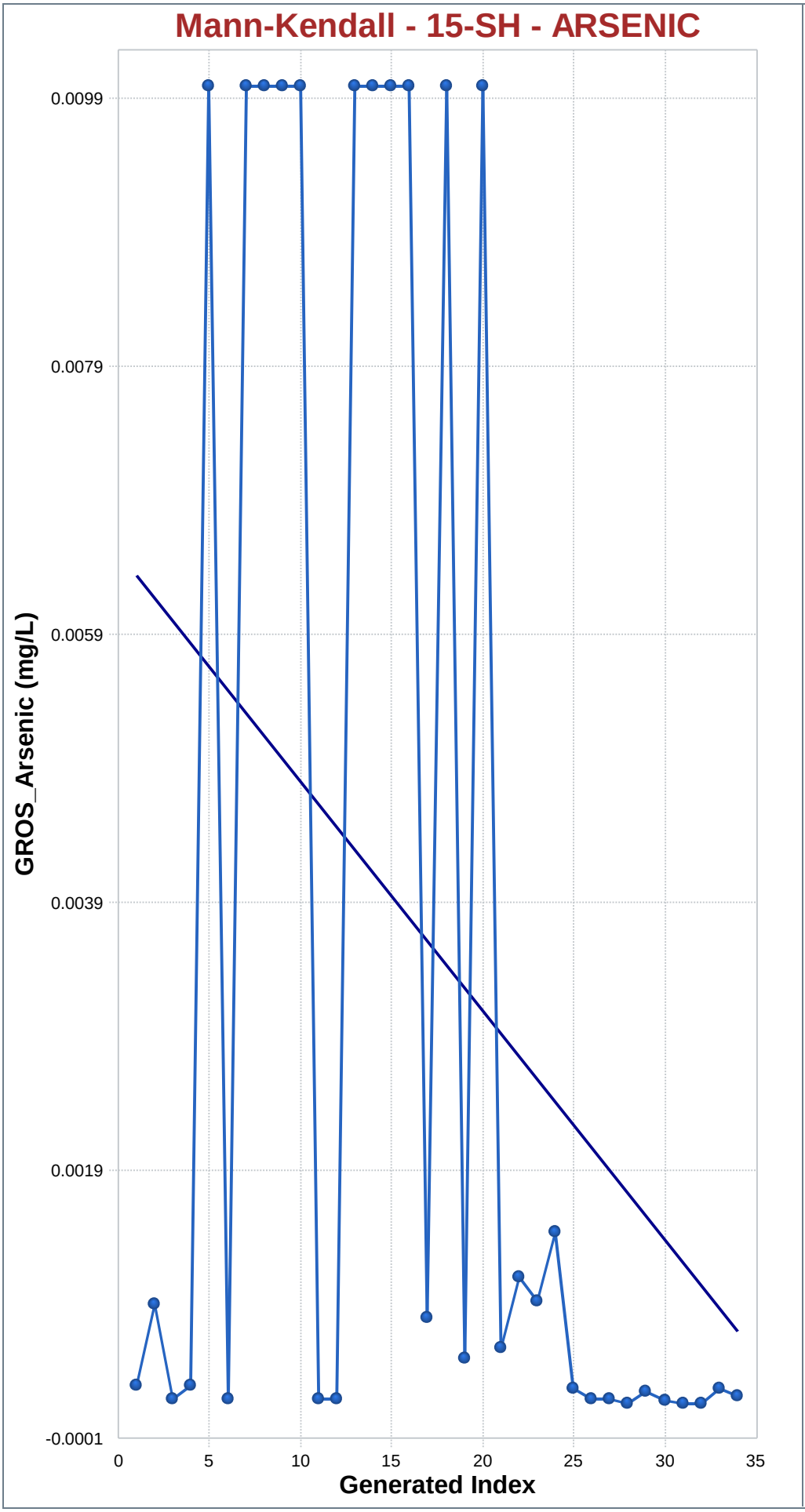

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 31 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 58.8189 |
| Standardized Value of S | -0.3740 |
| M-K Test Value (S) | -23 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3542 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0006 |
| OLS Regression Intercept | 0.0169 |

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




**Mann-Kendall Trend Analysis**

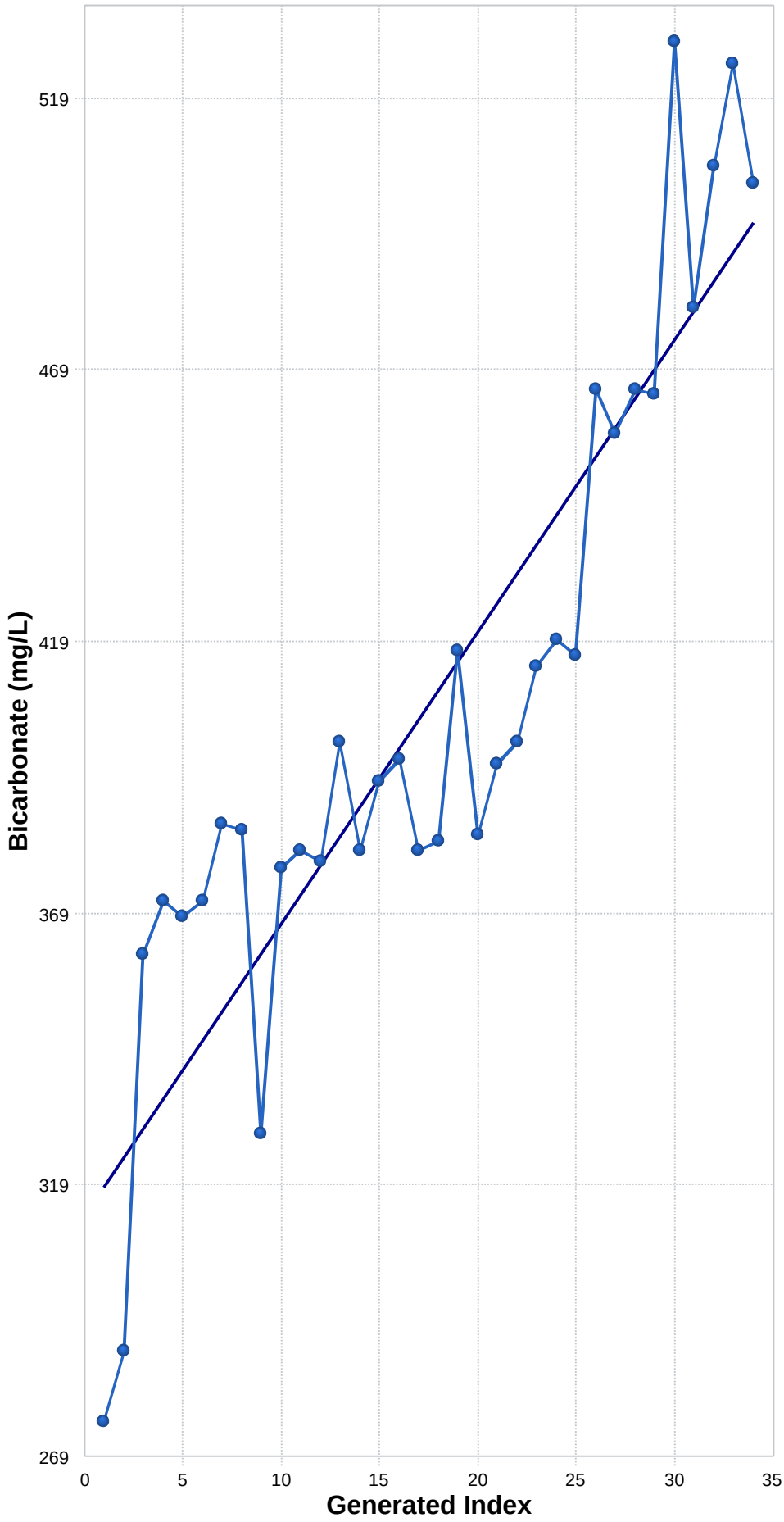
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 65.9722 |
| Standardized Value of S | -2.6678 |
| M-K Test Value (S) | -177 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0038 |

**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 - 15-SH - BICARBONATE




**Mann-Kendall Trend Analysis**

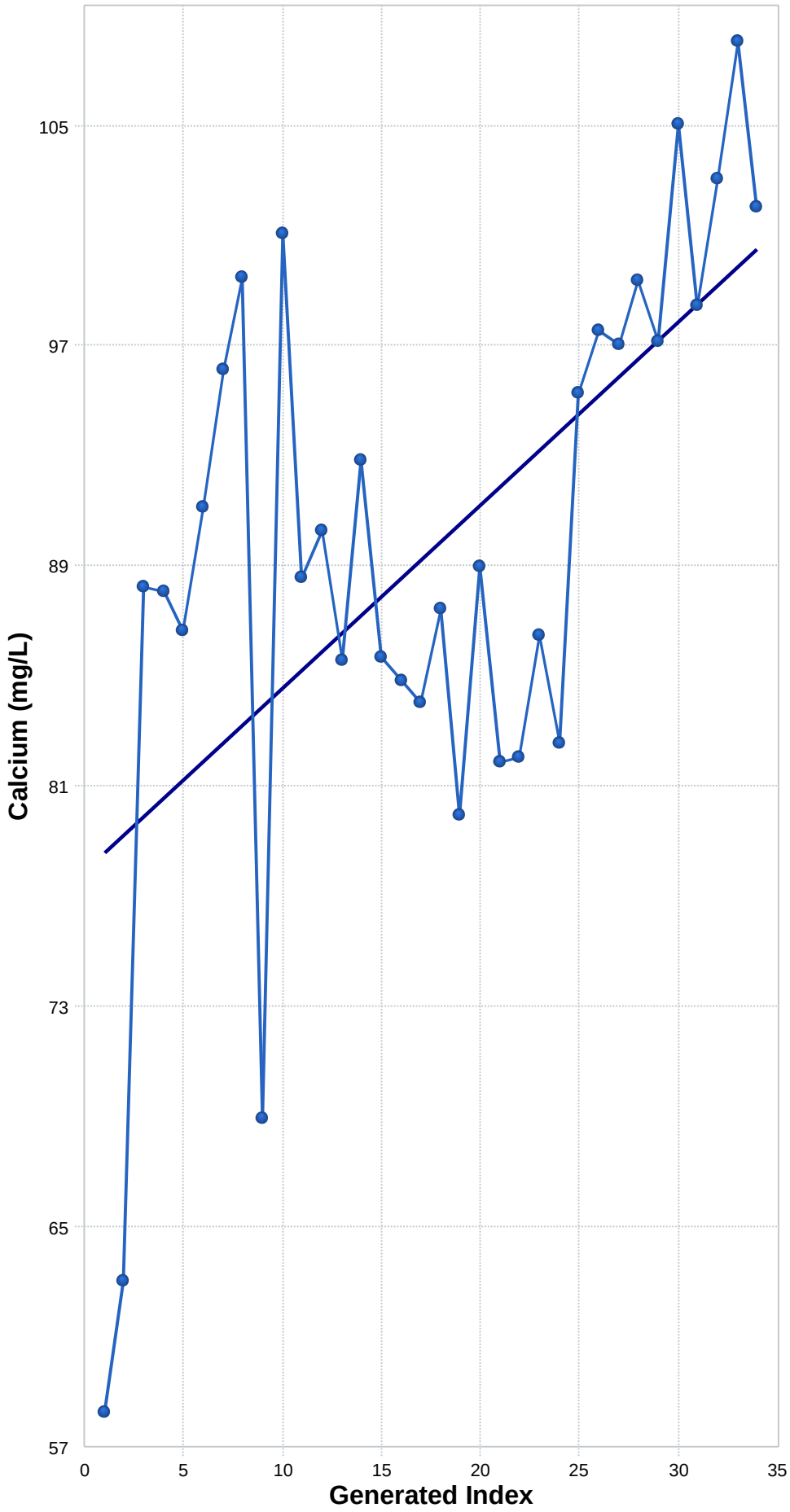
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4067 |
| Standardized Value of S | 6.6759 |
| M-K Test Value (S) | 451 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 5.3768 |
| OLS Regression Intercept | 312.8770 |

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

# Mann-Kendall - 15-SH - CALCIUM




**Mann-Kendall Trend Analysis**

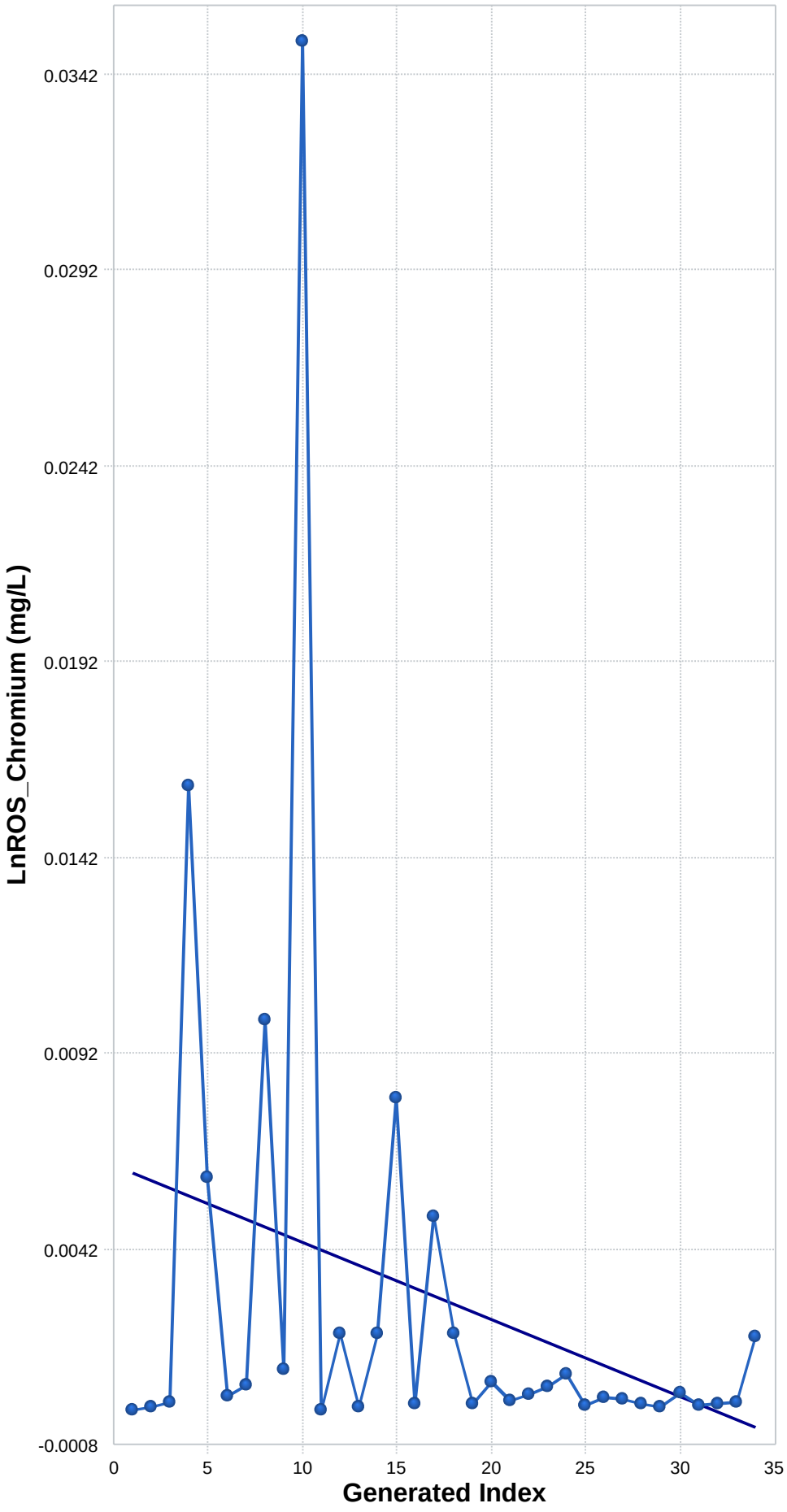
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4562 |
| Standardized Value of S | 3.0538 |
| M-K Test Value (S) | 207 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0011 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.6640 |
| OLS Regression Intercept | 77.8882 |

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

# Mann-Kendall - 15-SH - CHROMIUM



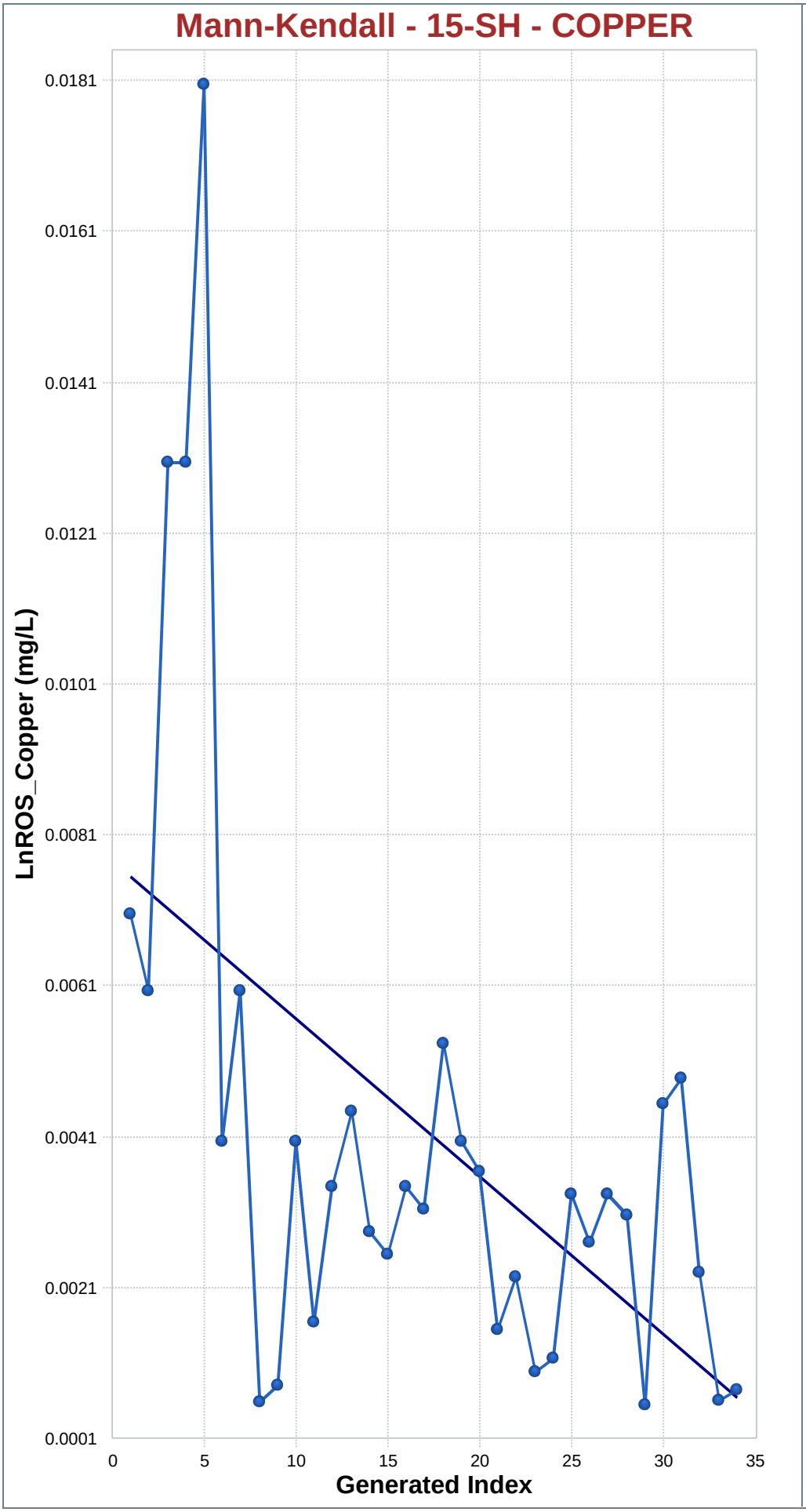

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4216 |
| Standardized Value of S | -1.1866 |
| M-K Test Value (S) | -81 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1177 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0063 |

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



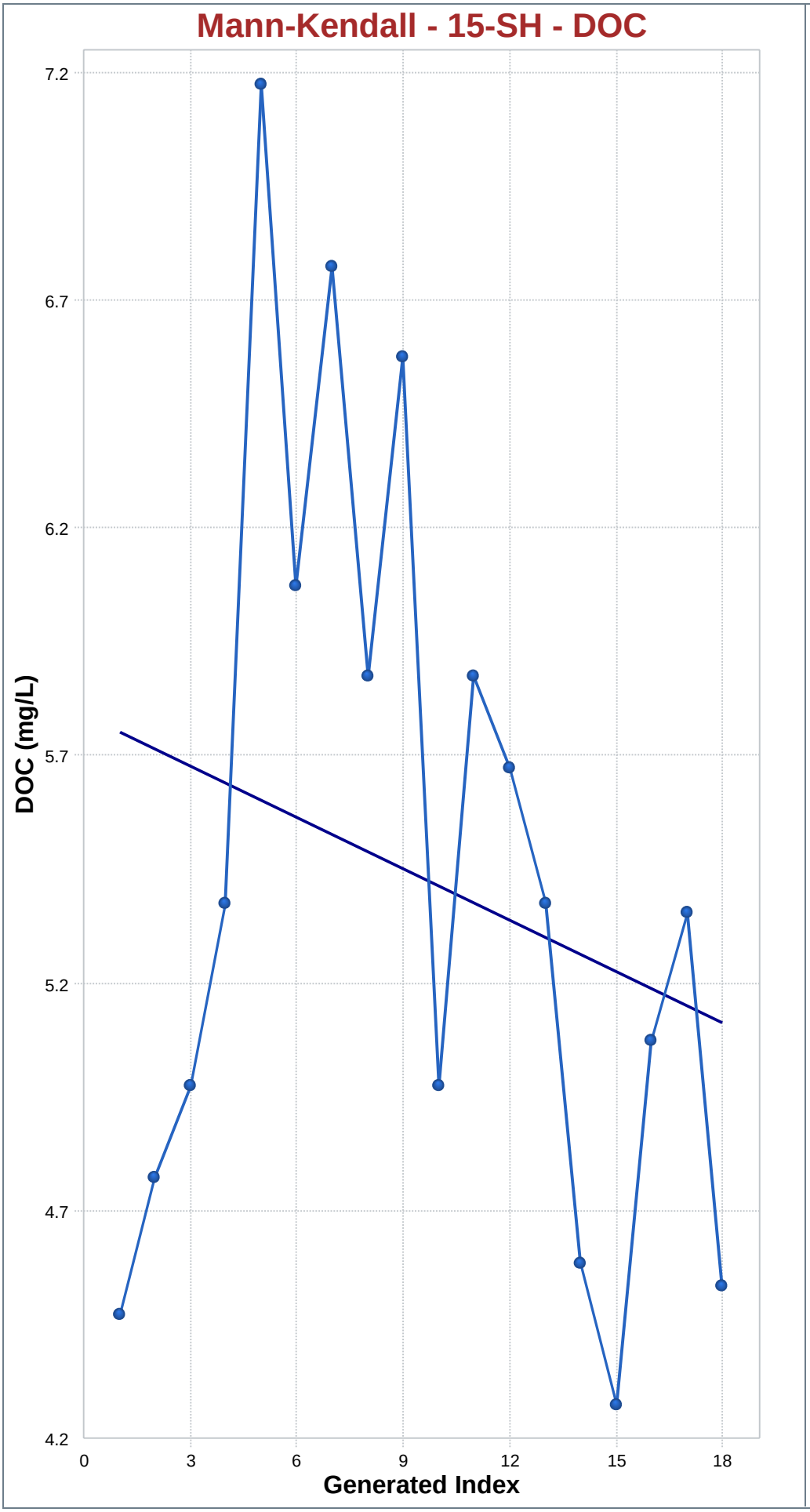

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4067 |
| Standardized Value of S | -3.0561 |
| M-K Test Value (S) | -207 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0011 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0077 |

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



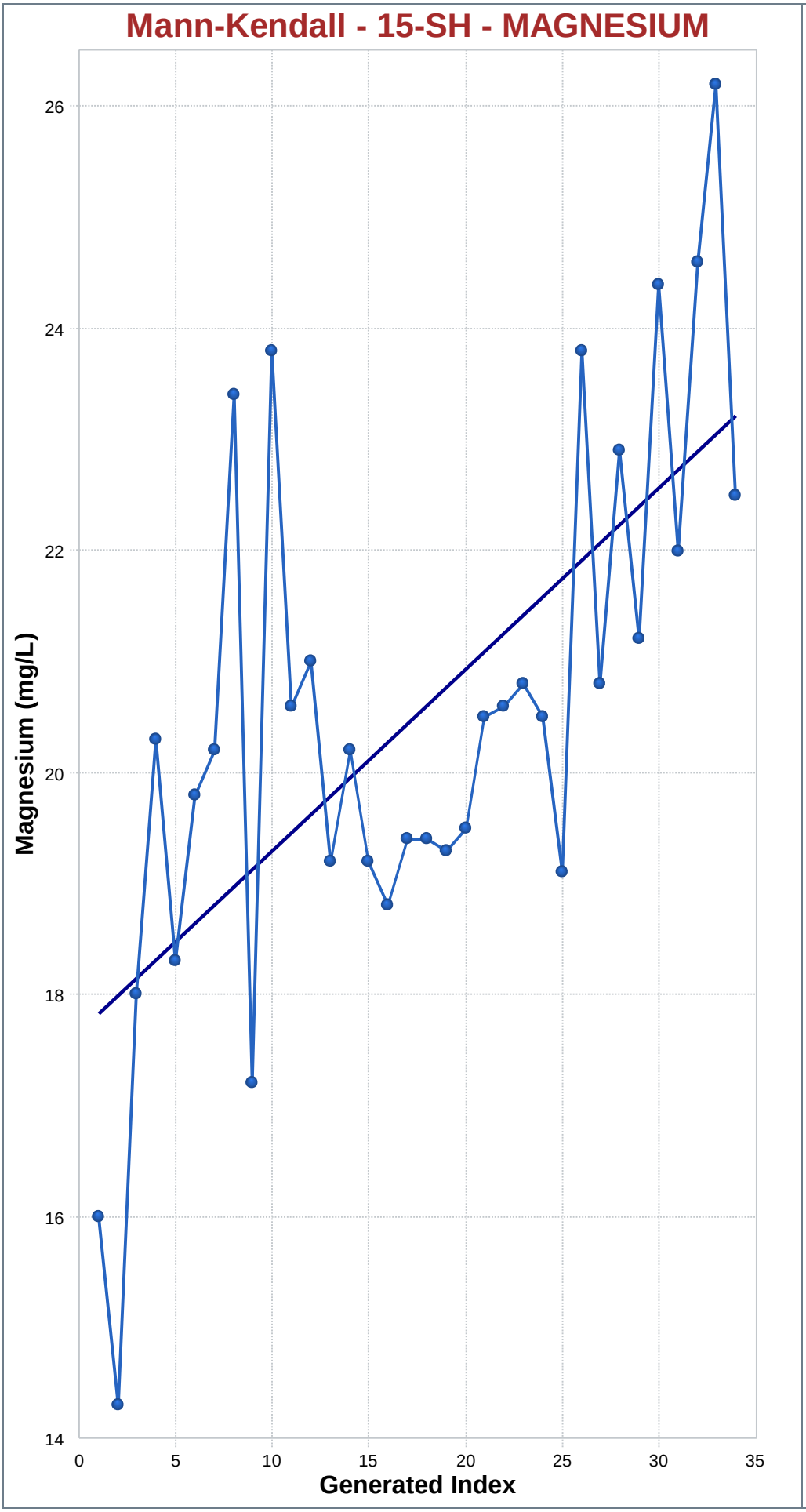

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3439 |
| Standardized Value of S | -1.0249 |
| M-K Test Value (S) | -28 |
| Tabulated p-value | 0.1470 |
| Approximate p-value | 0.1527 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0376 |
| OLS Regression Intercept | 5.8151 |

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




**Mann-Kendall Trend Analysis**

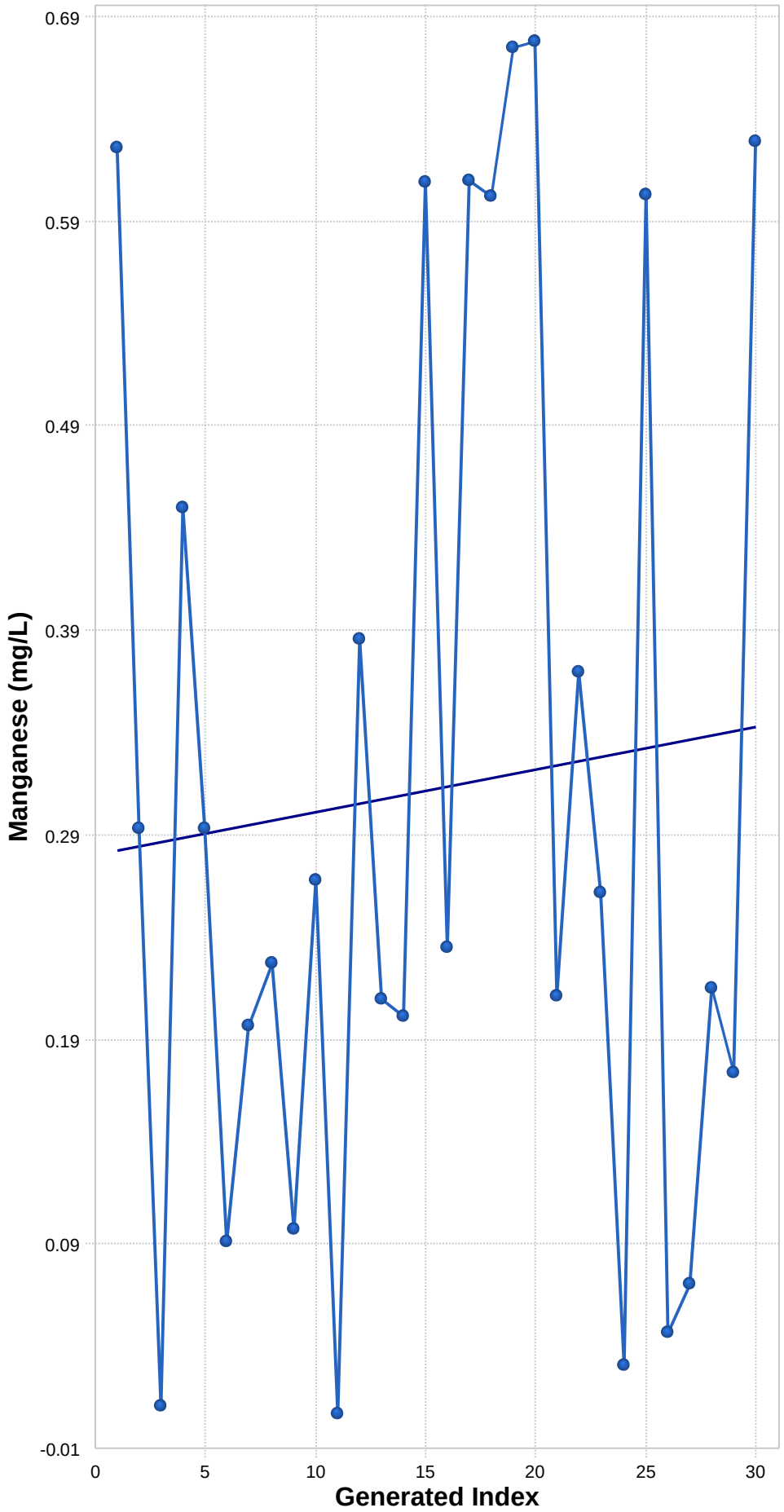
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4043 |
| Standardized Value of S | 4.1985 |
| M-K Test Value (S) | 284 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1633 |
| OLS Regression Intercept | 17.3663 |

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

# Mann-Kendall - 15-SH - MANGANESE




**Mann-Kendall Trend Analysis**

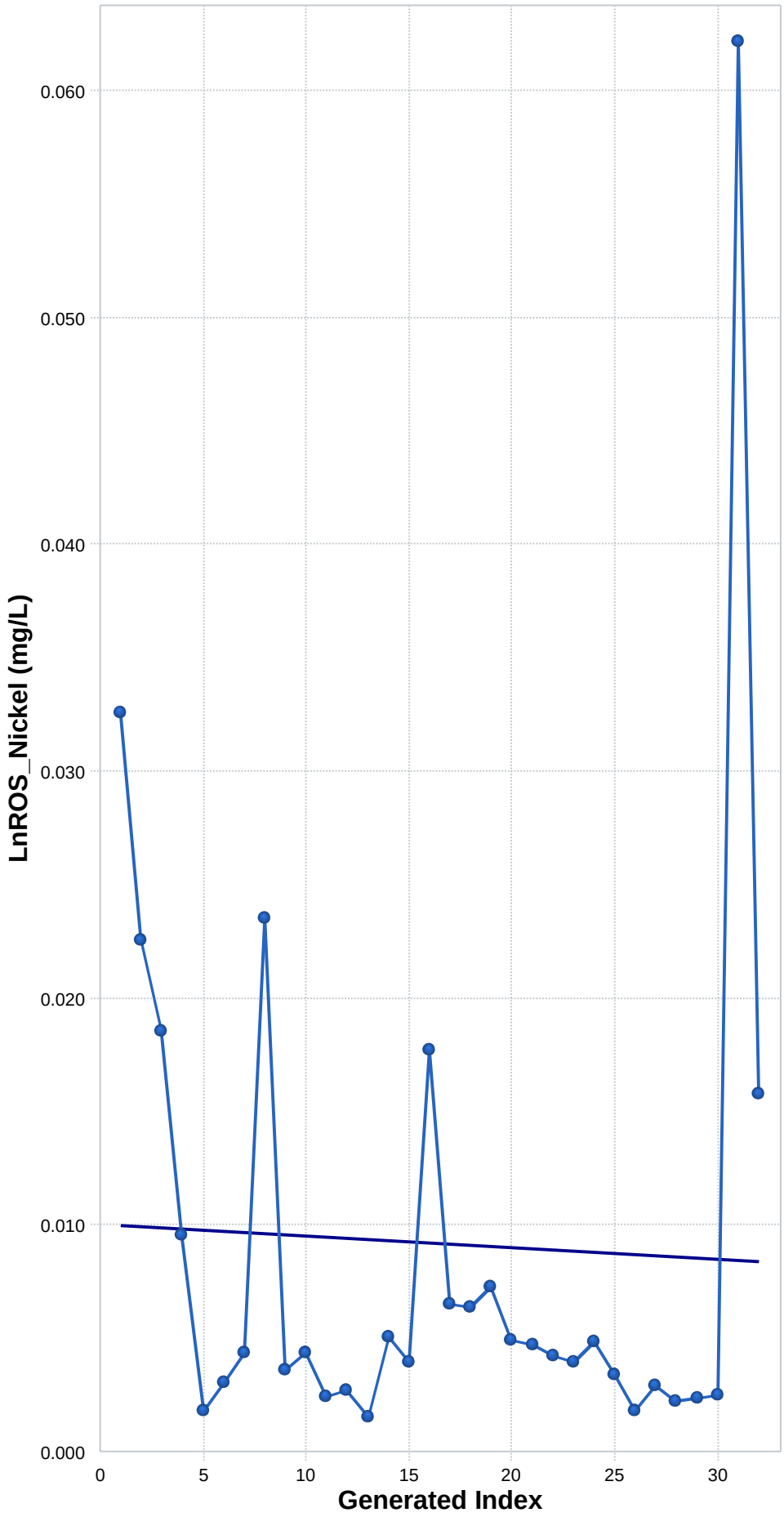
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0417 |
| Standardized Value of S | 0.2677 |
| M-K Test Value (S) | 16 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3945 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0021 |
| OLS Regression Intercept | 0.2805 |

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

# Mann-Kendall - 15-SH - NICKEL



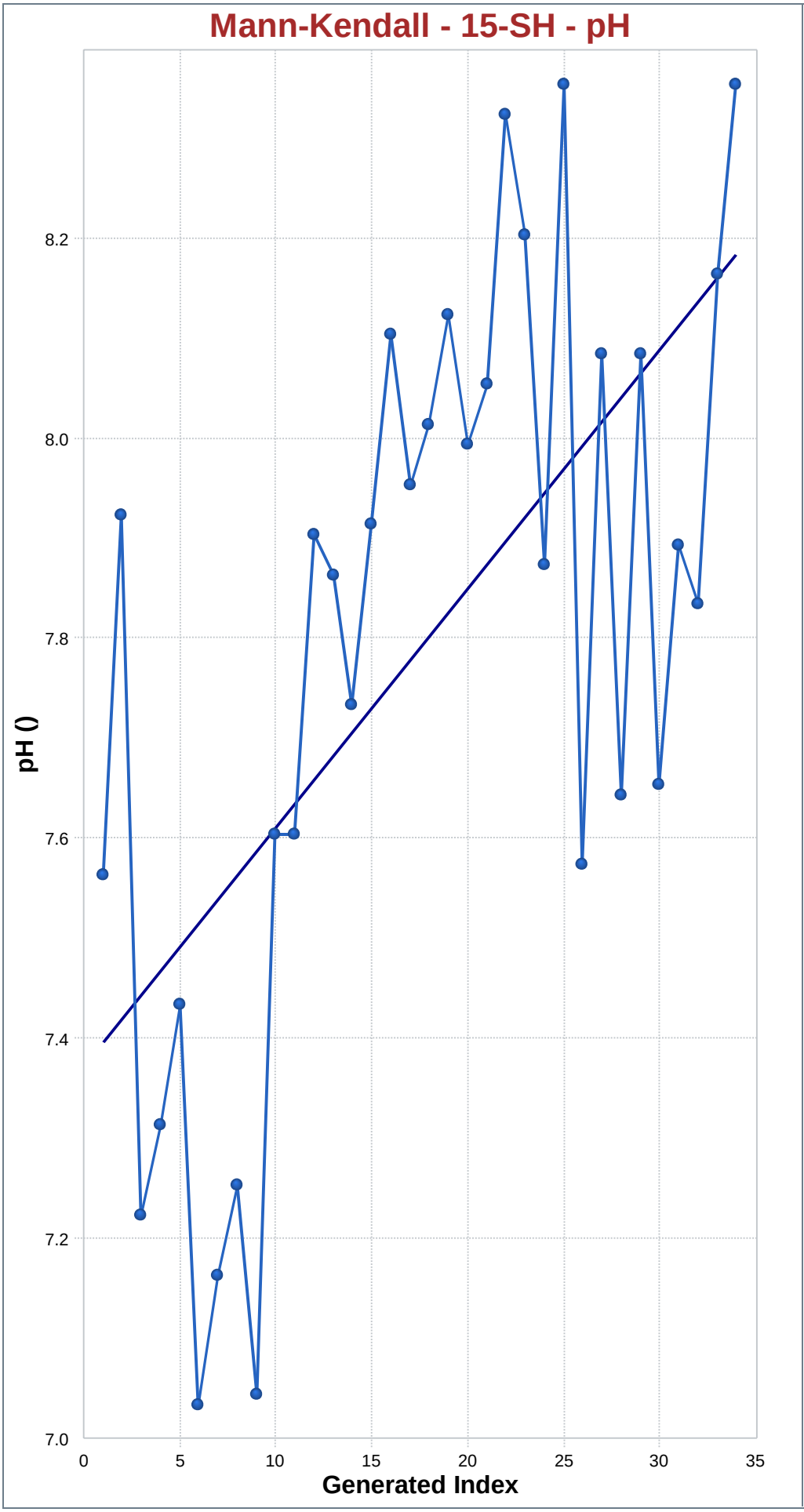

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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 | 0.0105 |

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



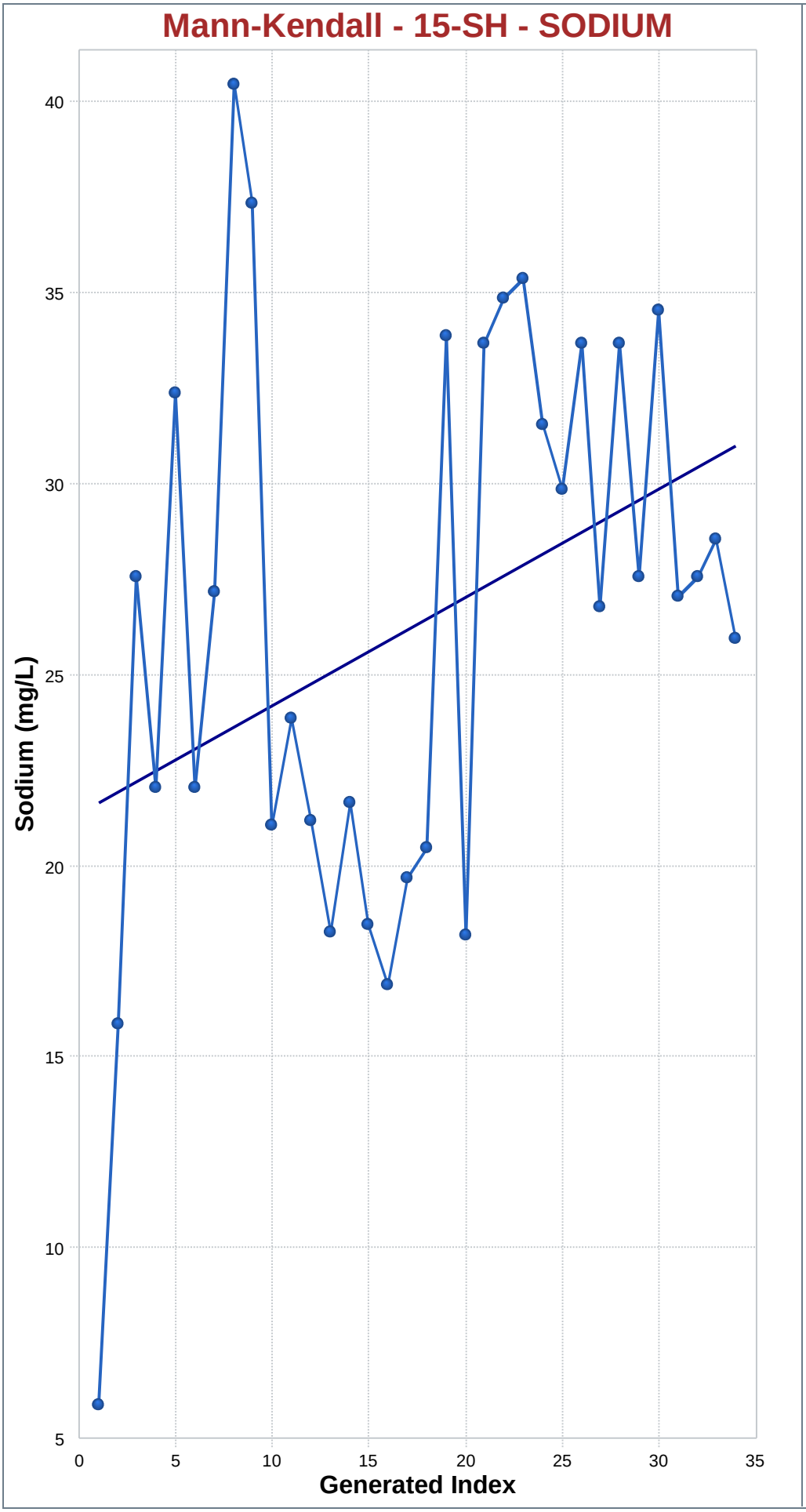

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4339 |
| Standardized Value of S | 3.8408 |
| M-K Test Value (S) | 260 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0239 |
| OLS Regression Intercept | 7.3482 |

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



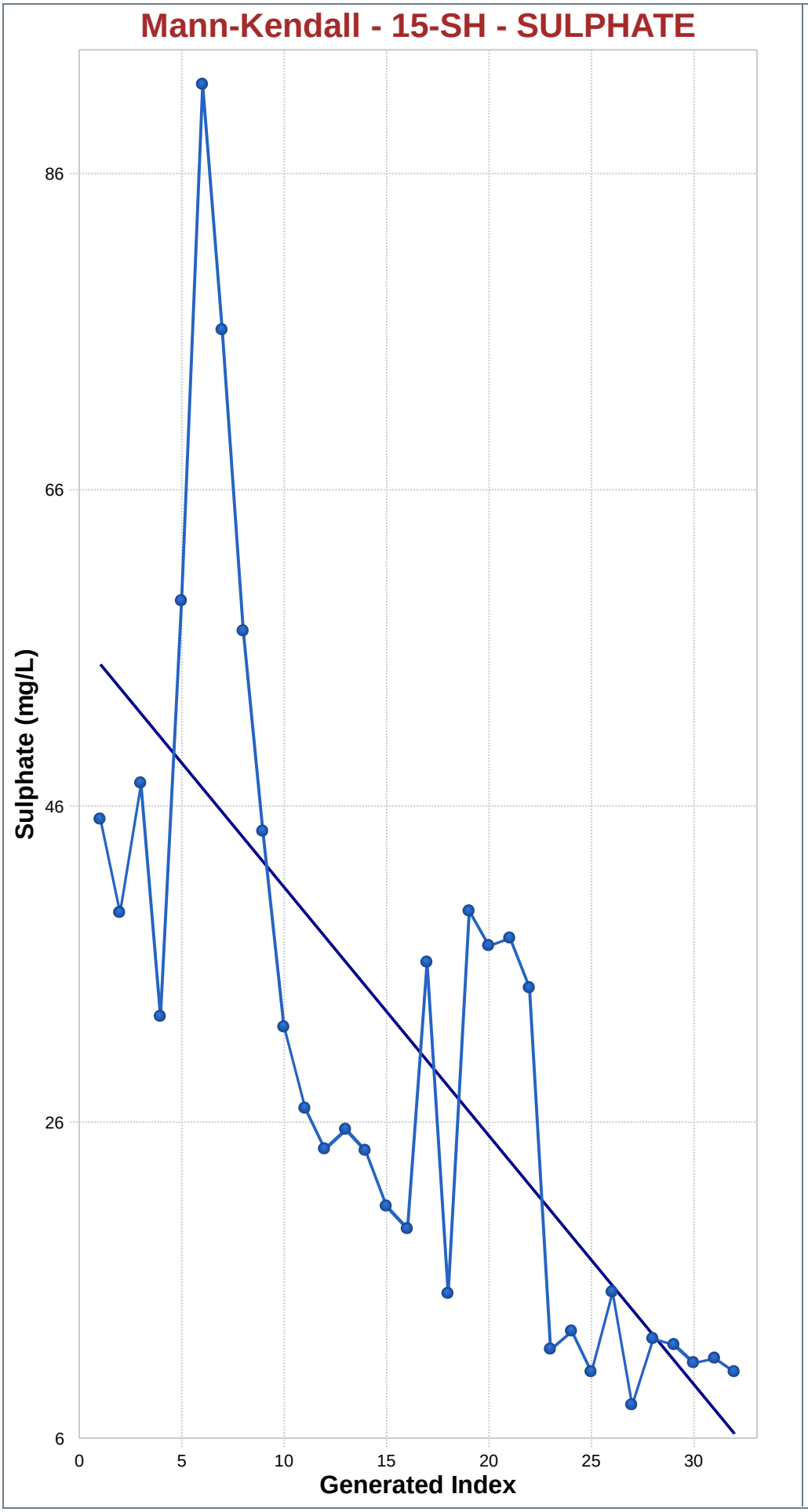

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.3944 |
| Standardized Value of S | 1.5283 |
| M-K Test Value (S) | 104 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0632 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.2840 |
| OLS Regression Intercept | 21.1899 |

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



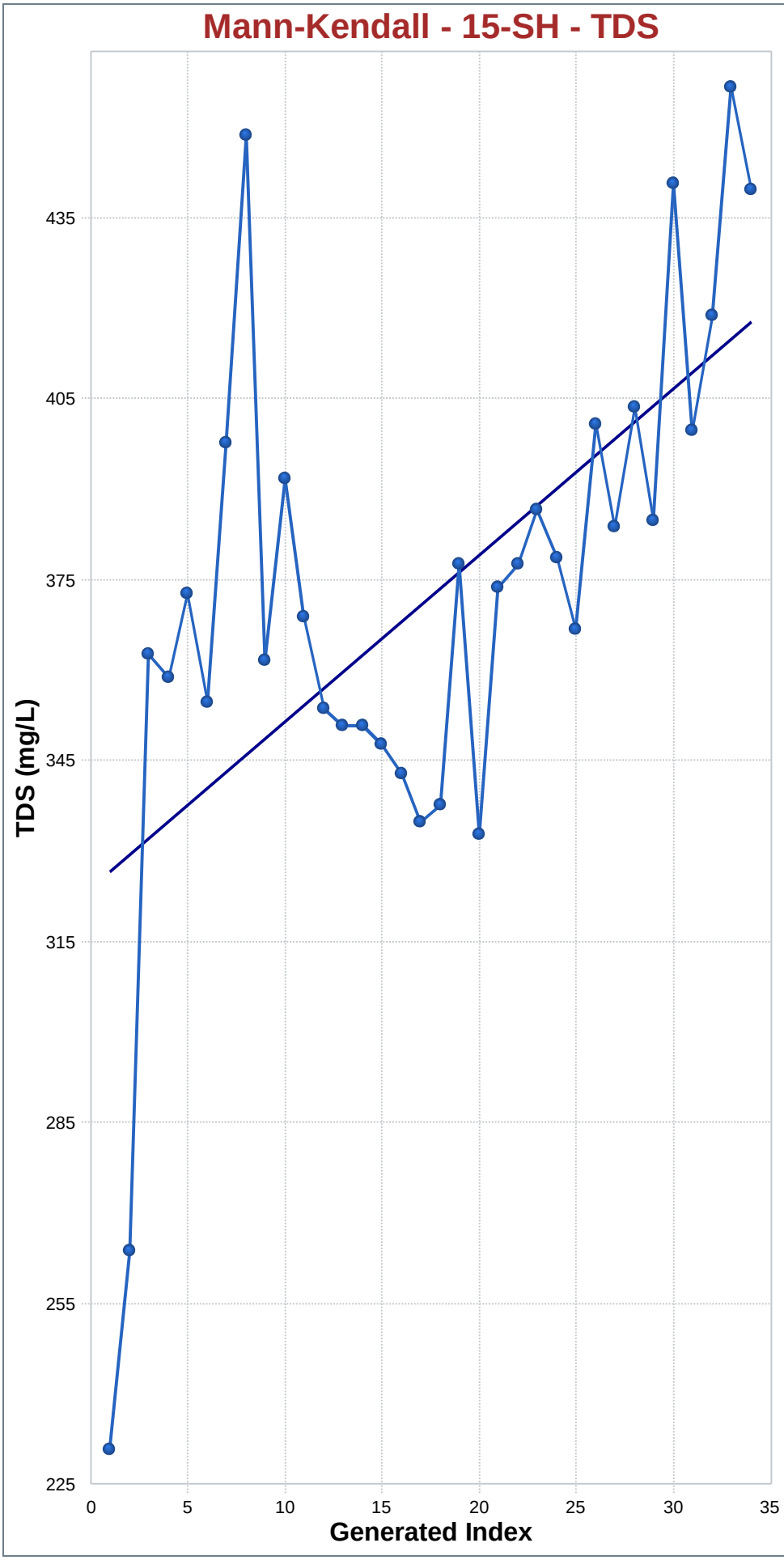

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6577 |
| Standardized Value of S | -5.1251 |
| M-K Test Value (S) | -317 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -1.5697 |
| OLS Regression Intercept | 56.3902 |

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



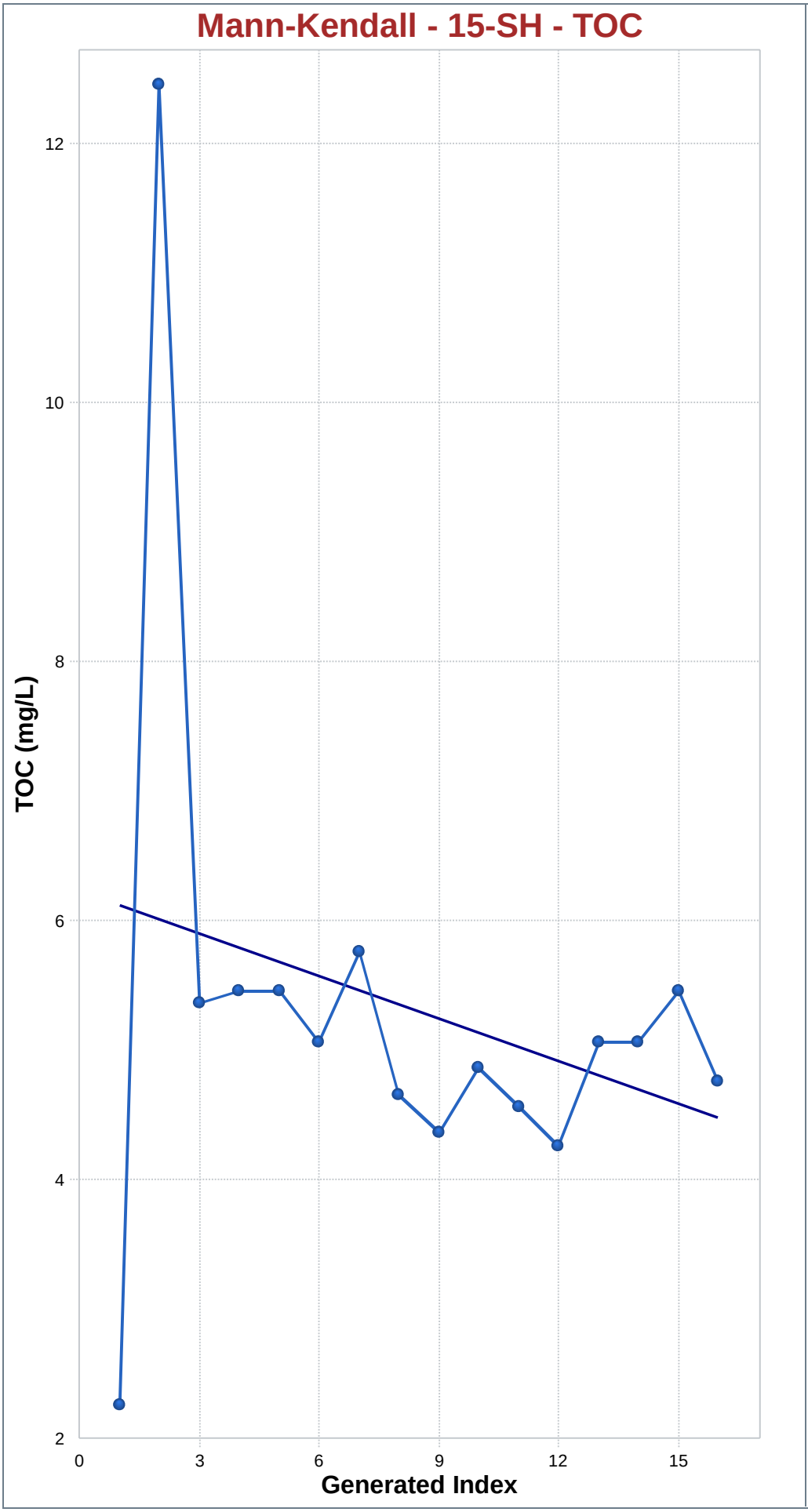

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4413 |
| Standardized Value of S | 3.4400 |
| M-K Test Value (S) | 233 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0003 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 2.7670 |
| OLS Regression Intercept | 323.9893 |

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



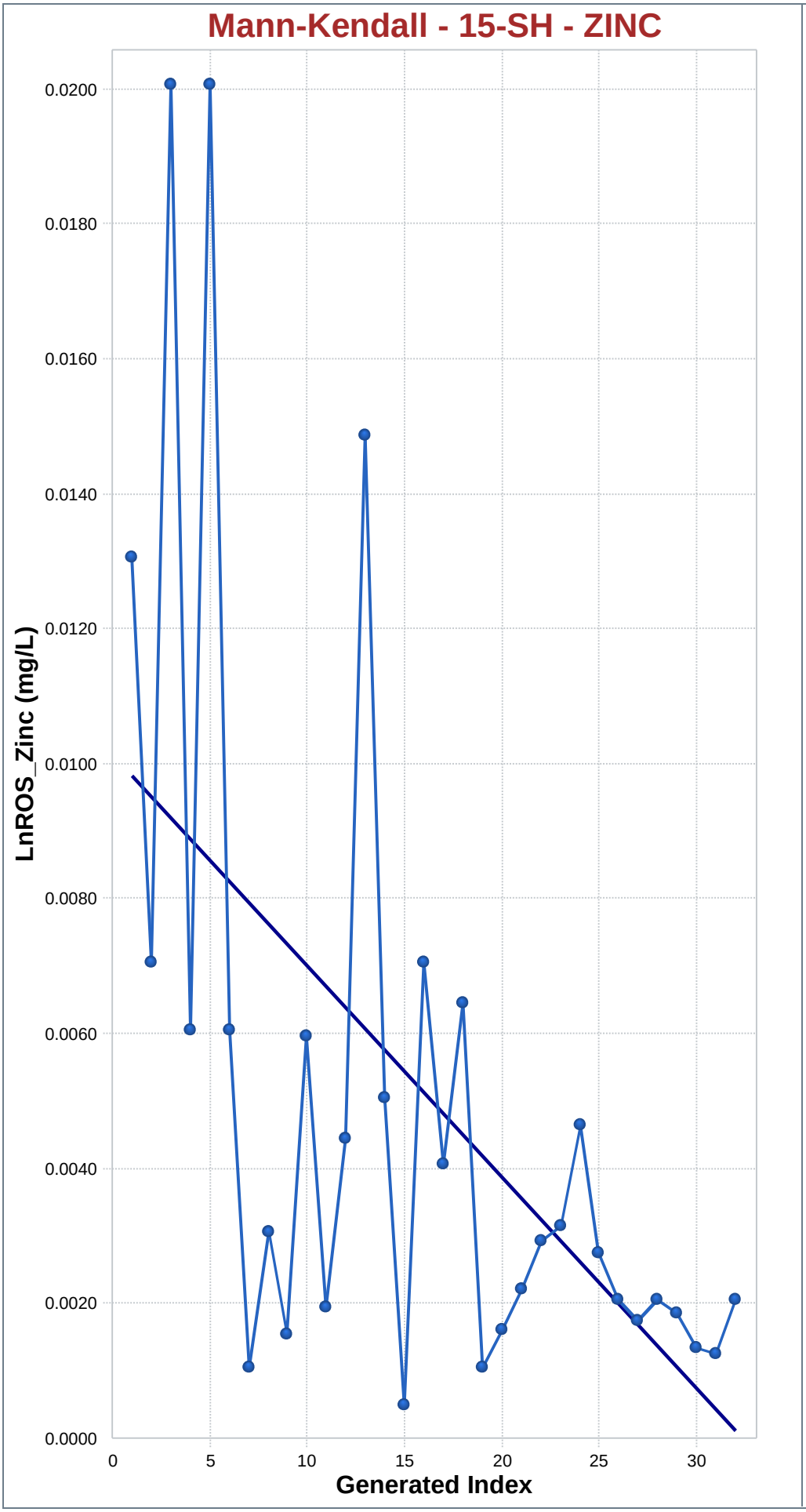

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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.



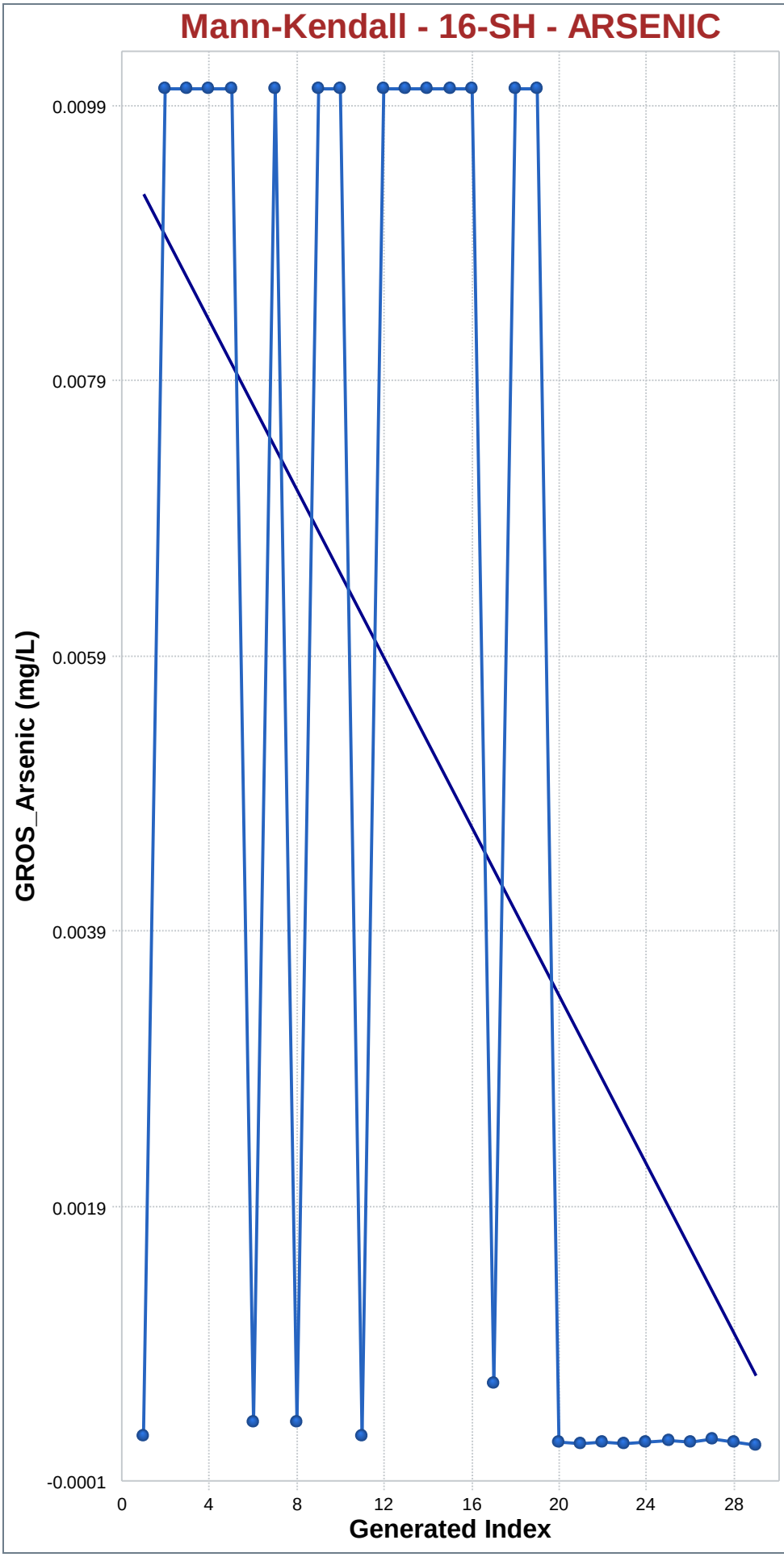

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6117 |
| Standardized Value of S | -3.2624 |
| 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 | -0.0003 |
| OLS Regression Intercept | 0.0101 |

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




**Mann-Kendall Trend Analysis**

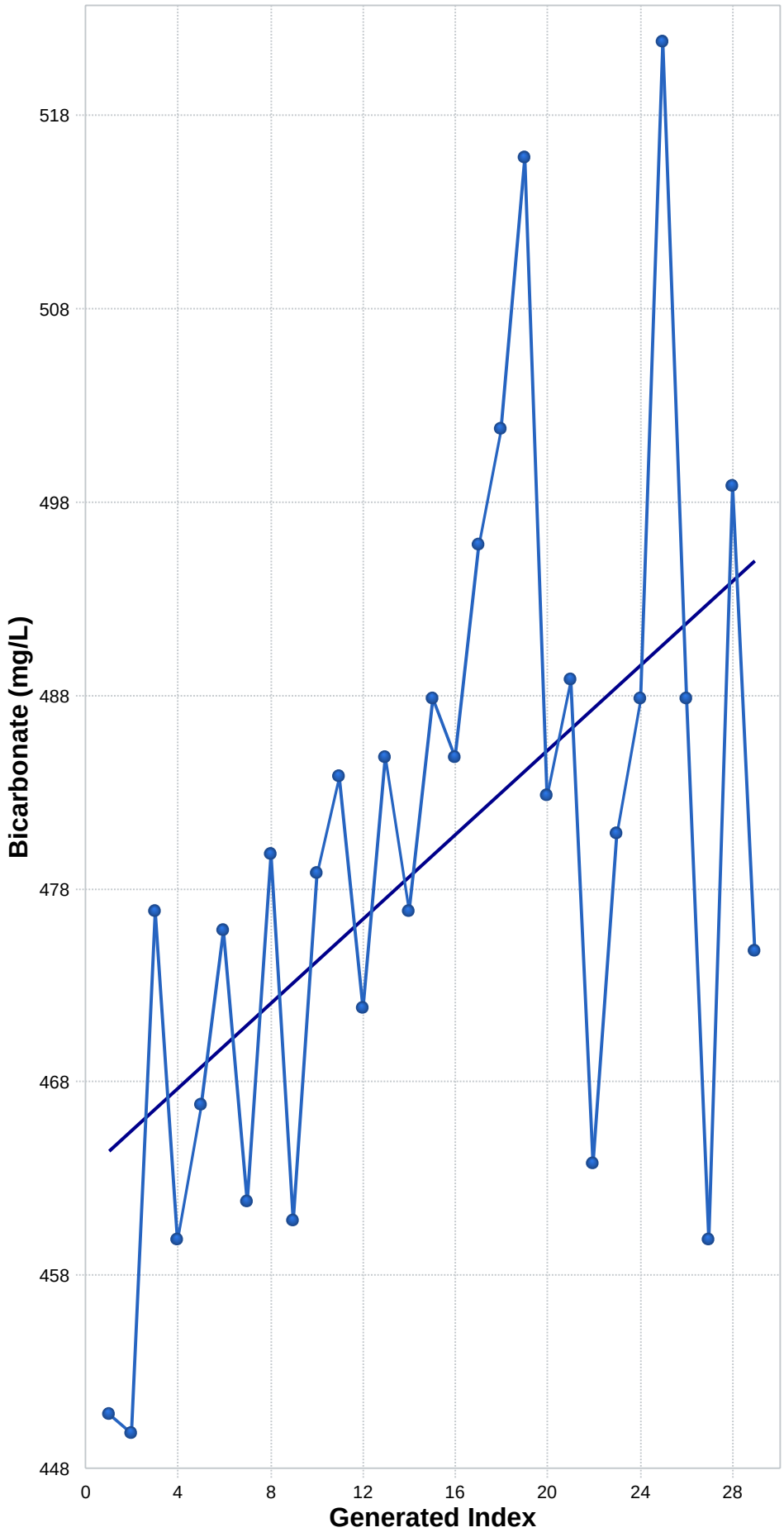
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 49.8865 |
| Standardized Value of S | -3.3476 |
| M-K Test Value (S) | -168 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0004 |

**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 - 16-SH - BICARBONATE




**Mann-Kendall Trend Analysis**

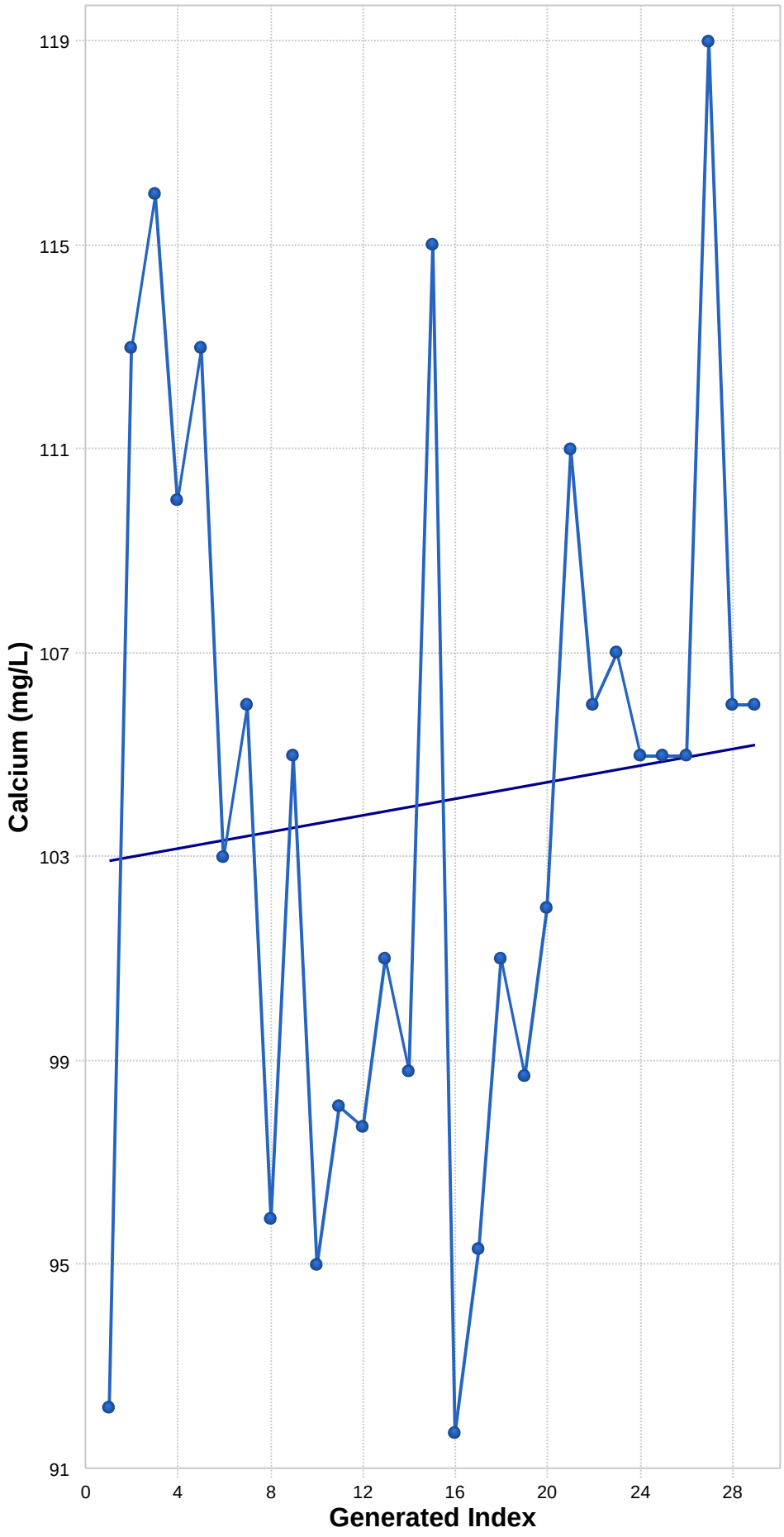
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2478 |
| Standardized Value of S | 3.2865 |
| M-K Test Value (S) | 176 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0005 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.0892 |
| OLS Regression Intercept | 463.5591 |

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

# Mann-Kendall - 16-SH - CALCIUM




**Mann-Kendall Trend Analysis**

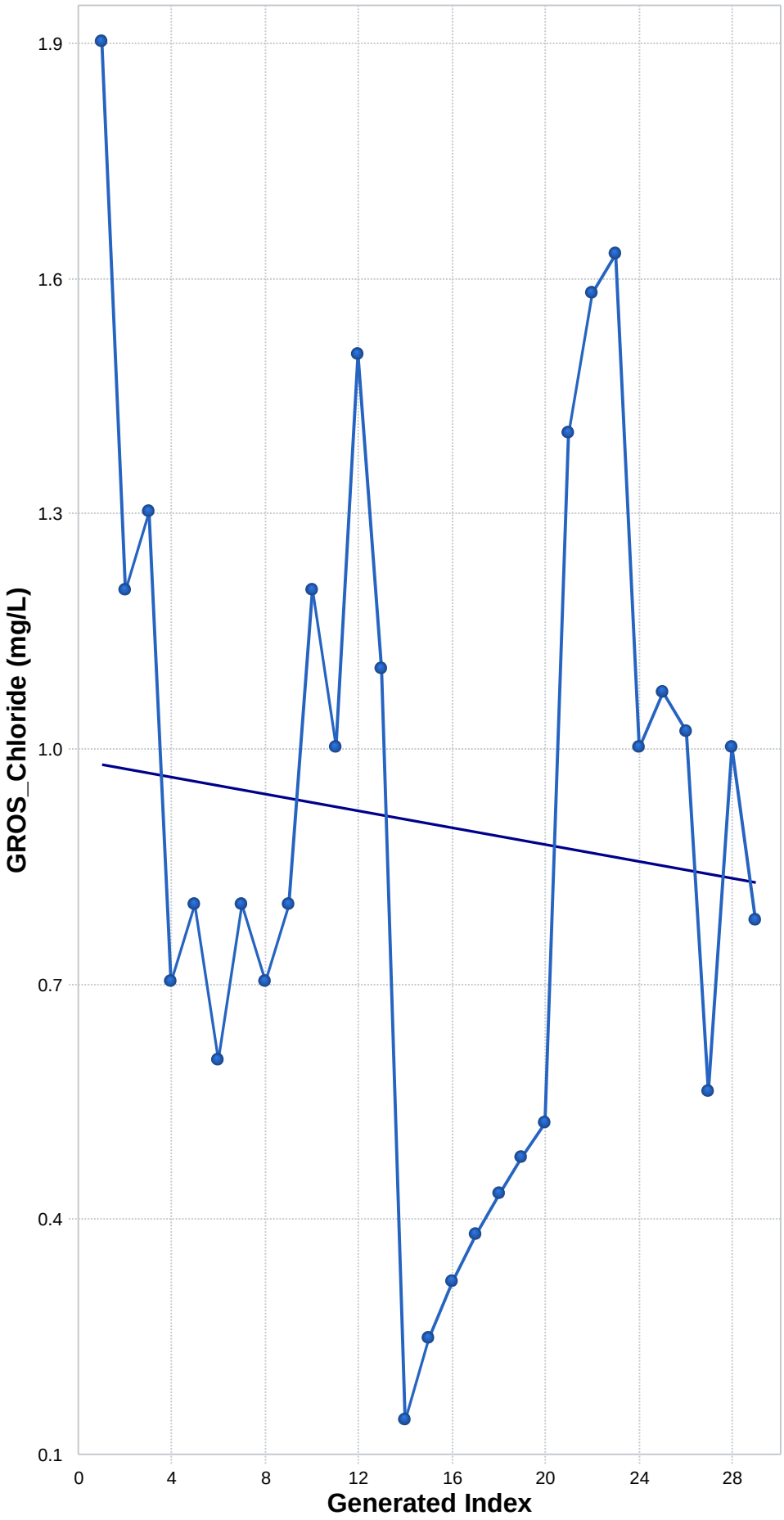
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.1288 |
| Standardized Value of S | 0.7717 |
| M-K Test Value (S) | 42 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.2201 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0811 |
| OLS Regression Intercept | 102.8658 |

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

# Mann-Kendall - 16-SH - CHLORIDE




**Mann-Kendall Trend Analysis**

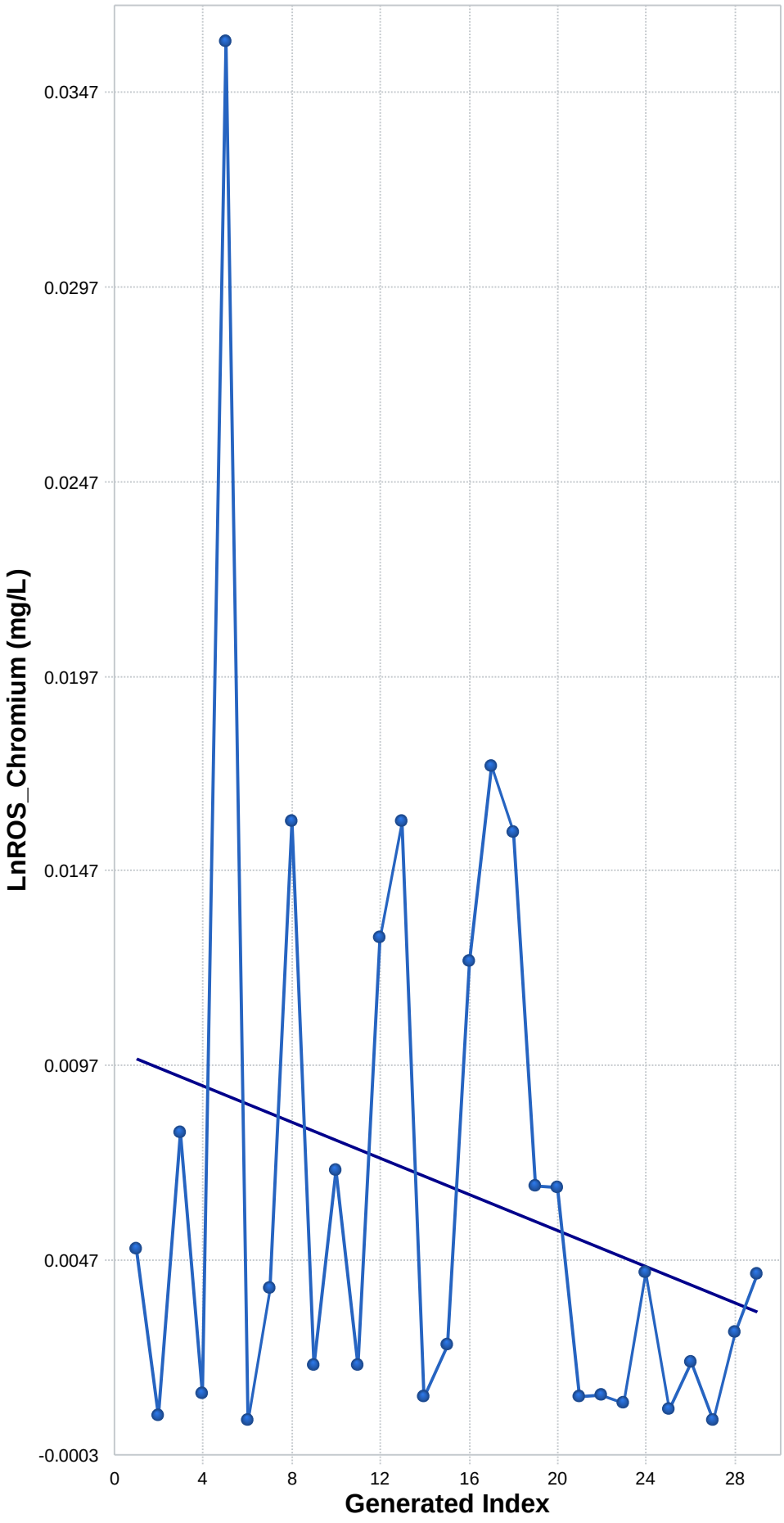
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2228 |
| Standardized Value of S | -0.2443 |
| M-K Test Value (S) | -14 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.4035 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0054 |
| OLS Regression Intercept | 0.9823 |

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

# Mann-Kendall - 16-SH - CHROMIUM




**Mann-Kendall Trend Analysis**

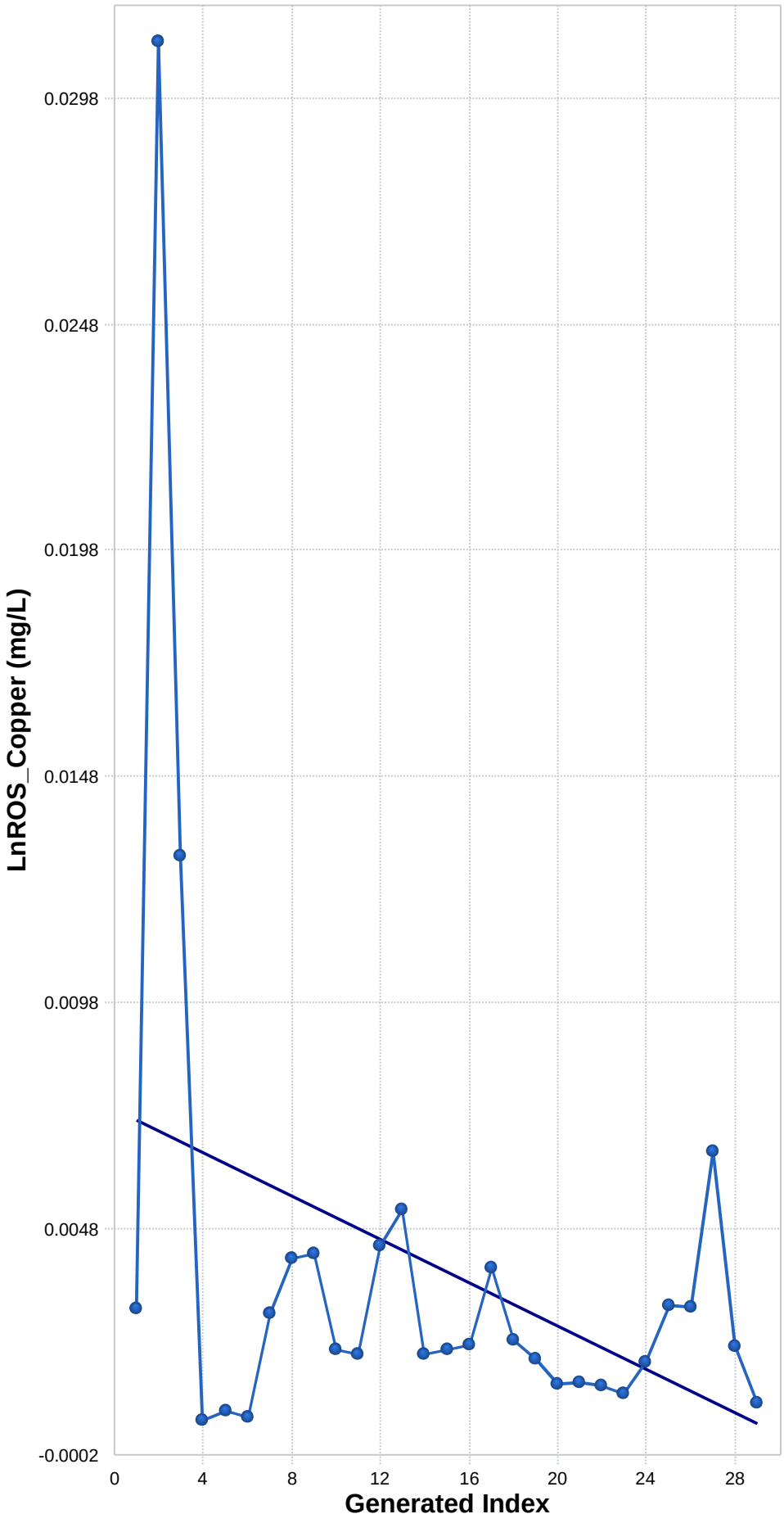
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2917 |
| Standardized Value of S | -1.1071 |
| M-K Test Value (S) | -60 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1341 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0101 |

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

# Mann-Kendall - 16-SH - COPPER



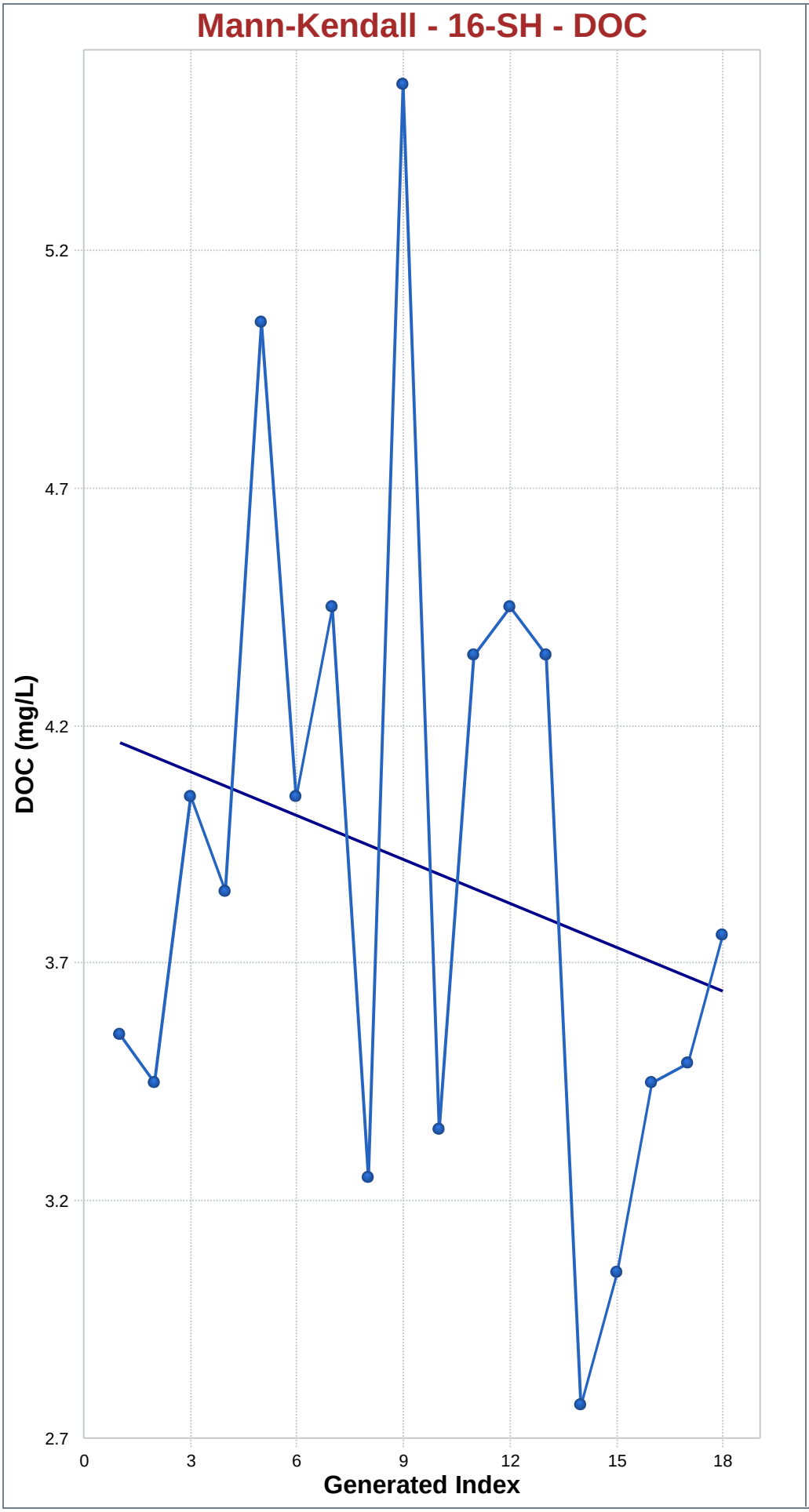

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2917 |
| Standardized Value of S | -1.0696 |
| M-K Test Value (S) | -58 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1424 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0074 |

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



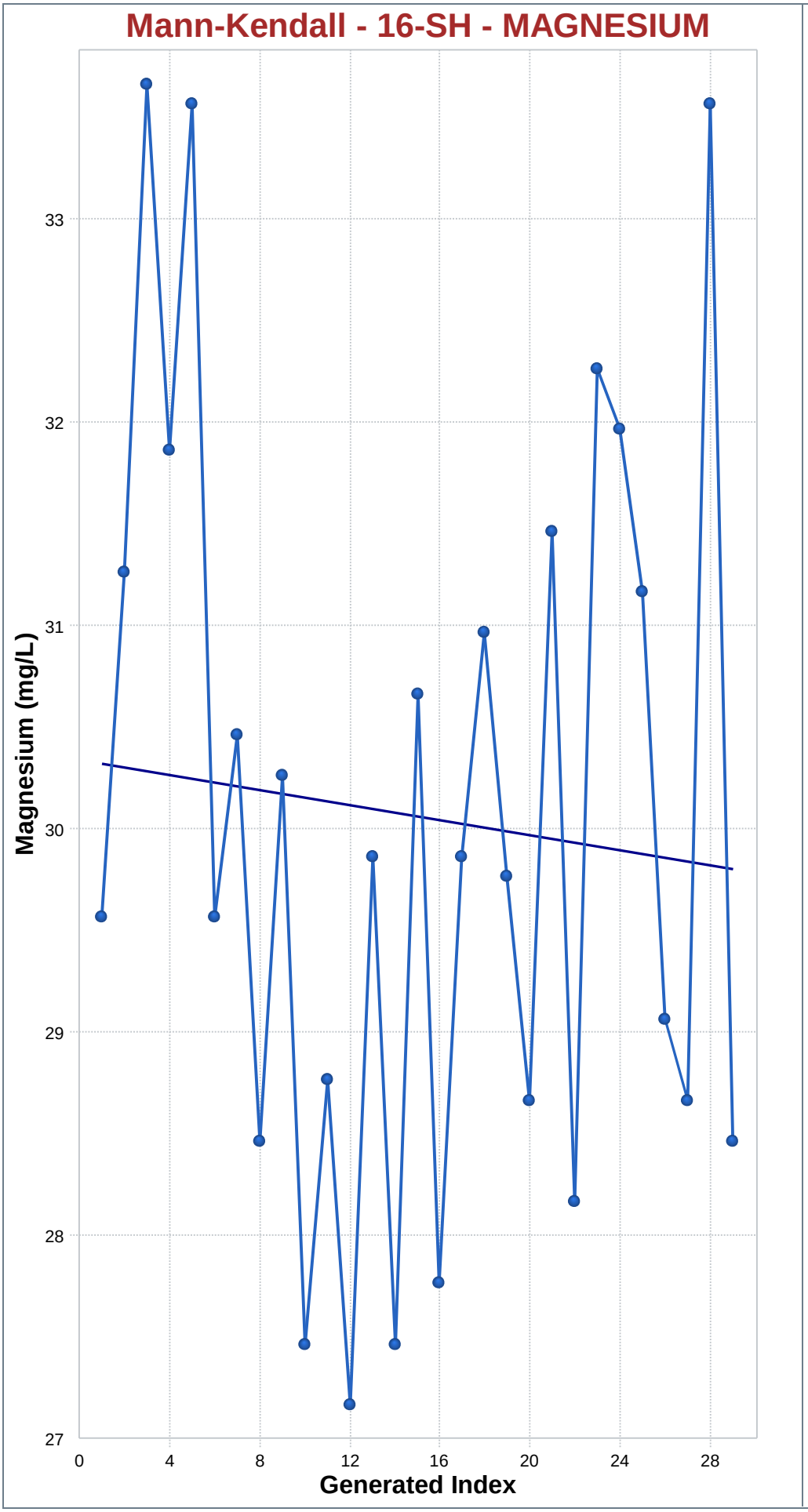

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3249 |
| Standardized Value of S | -0.6078 |
| M-K Test Value (S) | -17 |
| Tabulated p-value | 0.2750 |
| Approximate p-value | 0.2717 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0307 |
| OLS Regression Intercept | 4.1456 |

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




**Mann-Kendall Trend Analysis**

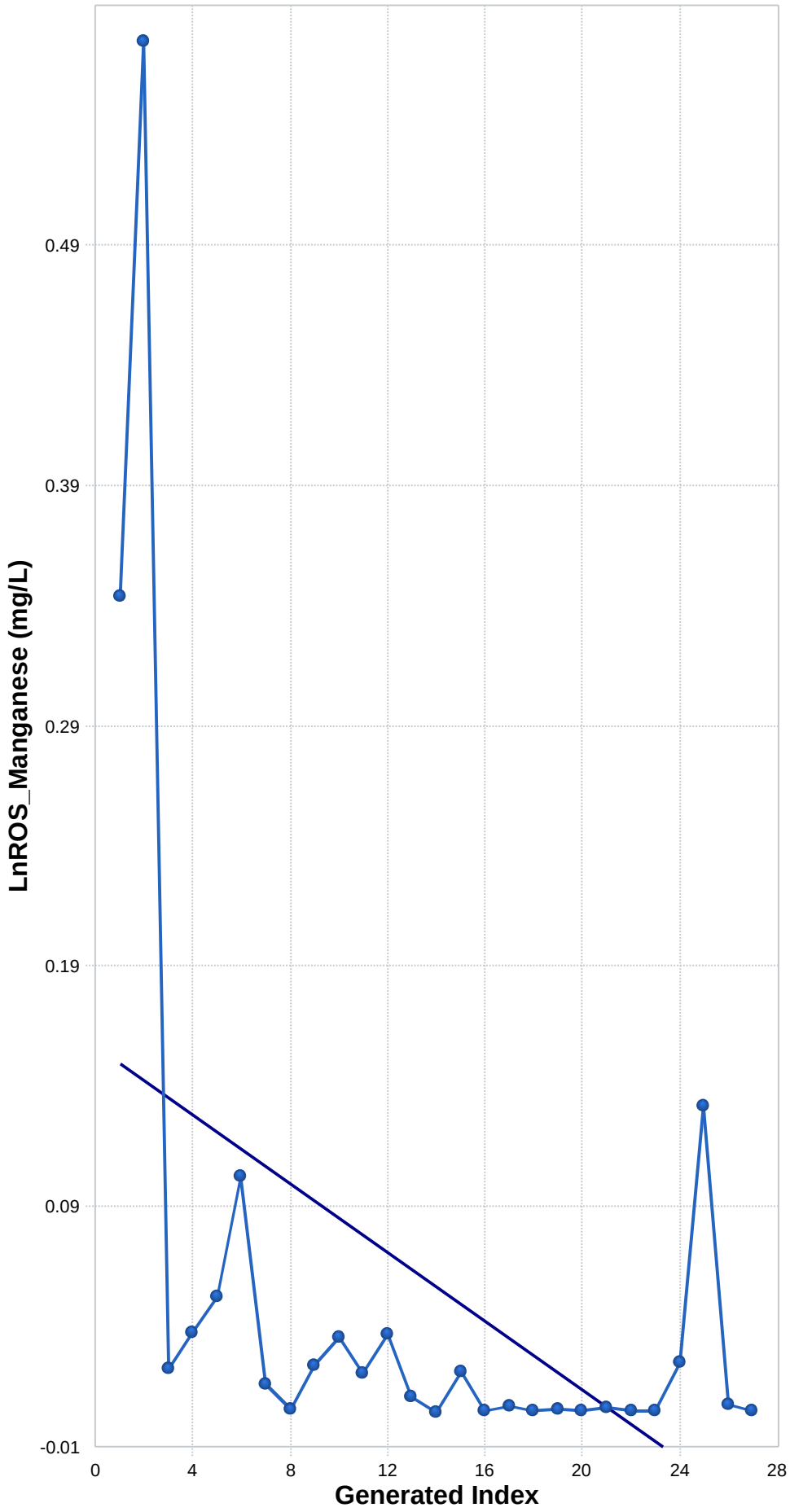
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2541 |
| Standardized Value of S | -0.3192 |
| M-K Test Value (S) | -18 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3748 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0185 |
| OLS Regression Intercept | 30.1771 |

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

# Mann-Kendall - 16-SH - MANGANESE




**Mann-Kendall Trend Analysis**

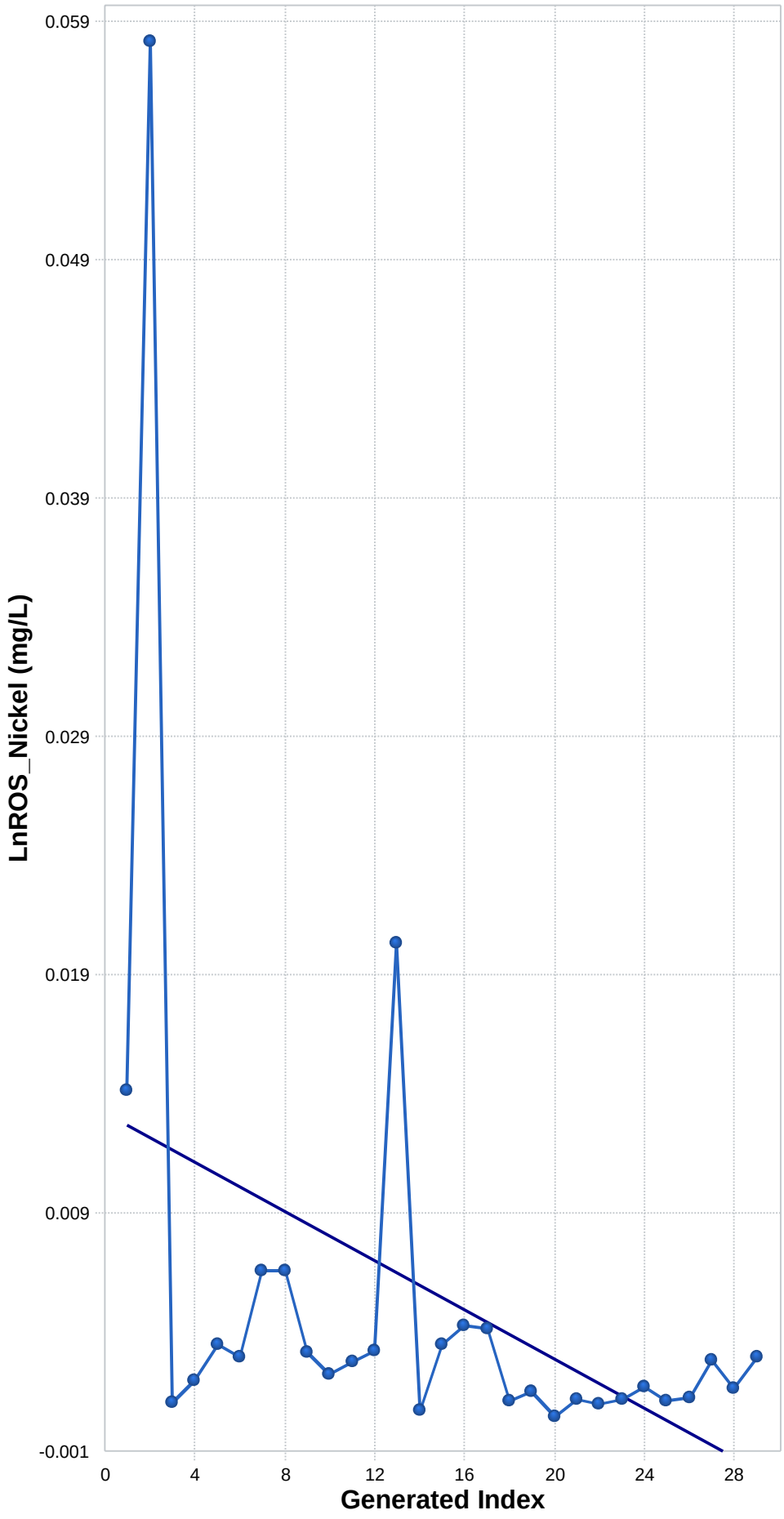
| | |
|---|---|
| n | 27 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 47.9583 |
| Standardized Value of S | -3.1069 |
| M-K Test Value (S) | -150 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0009 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0072 |
| OLS Regression Intercept | 0.1529 |

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

# Mann-Kendall - 16-SH - NICKEL



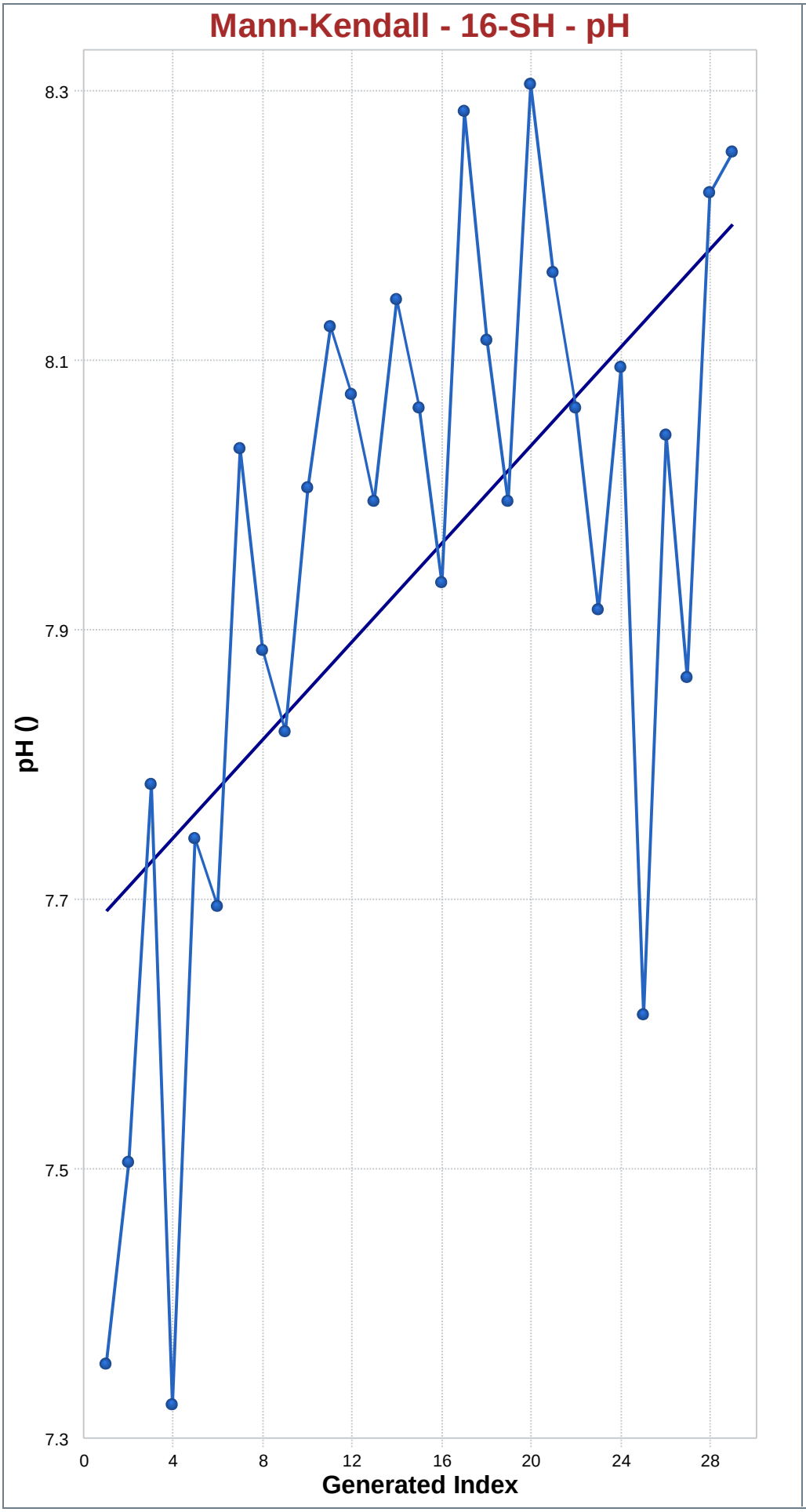

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2917 |
| Standardized Value of S | -2.1204 |
| M-K Test Value (S) | -114 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0170 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0005 |
| OLS Regression Intercept | 0.0131 |

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




**Mann-Kendall Trend Analysis**

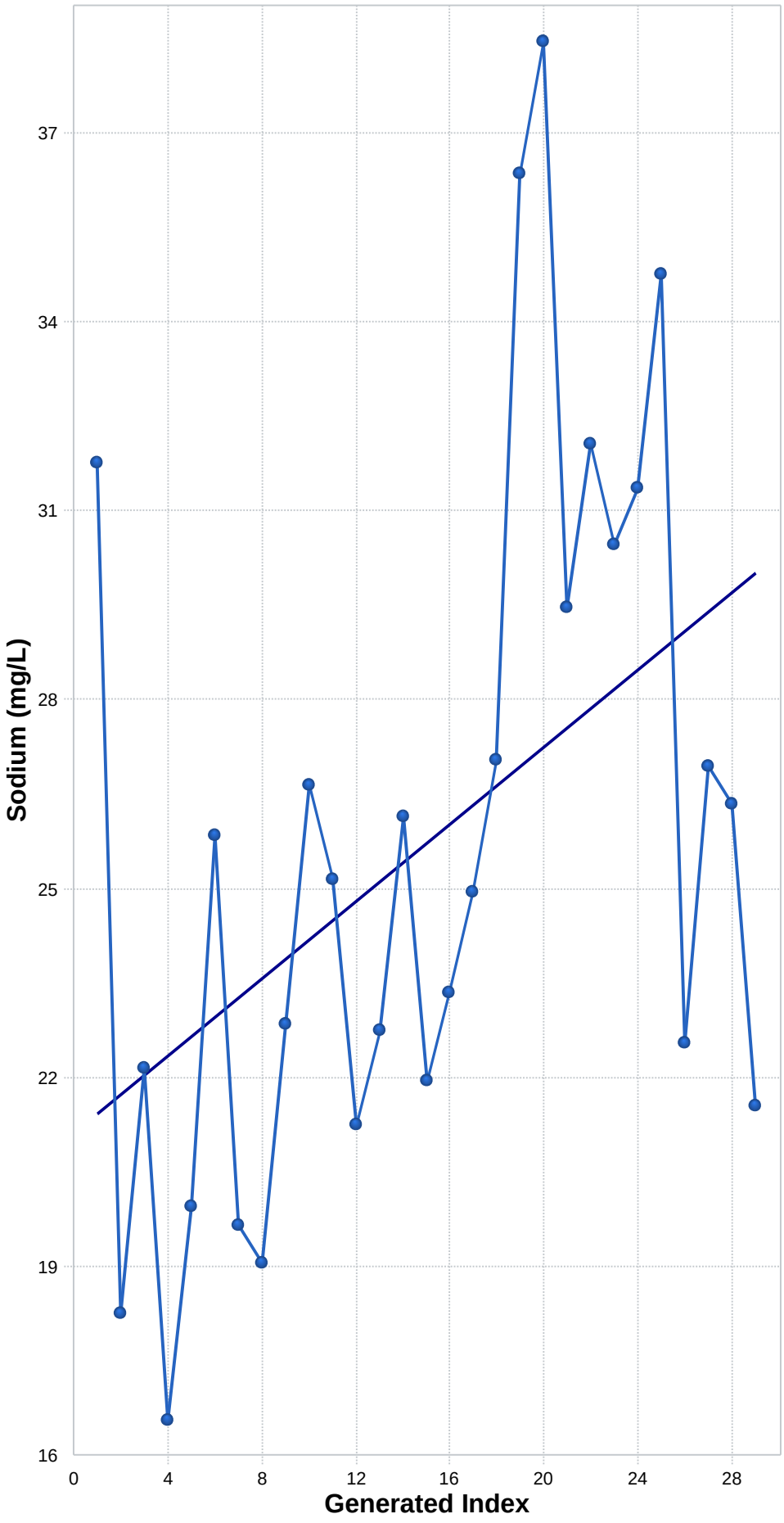
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2917 |
| Standardized Value of S | 3.1337 |
| M-K Test Value (S) | 168 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0009 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0182 |
| OLS Regression Intercept | 7.6283 |

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

# Mann-Kendall - 16-SH - SODIUM




**Mann-Kendall Trend Analysis**

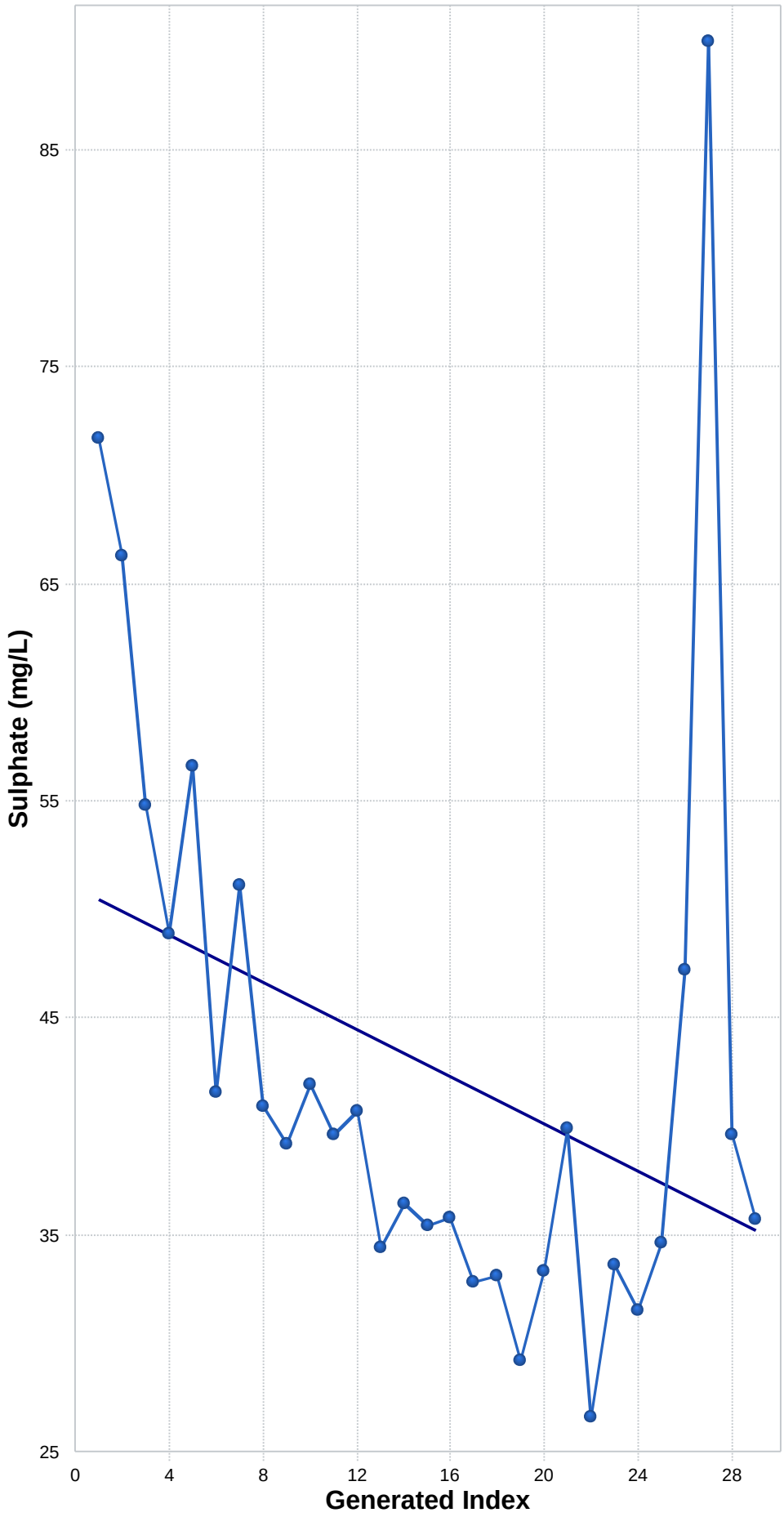
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.3104 |
| Standardized Value of S | 2.7574 |
| M-K Test Value (S) | 148 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0029 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3071 |
| OLS Regression Intercept | 20.9522 |

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

# Mann-Kendall - 16-SH - SULPHATE




**Mann-Kendall Trend Analysis**

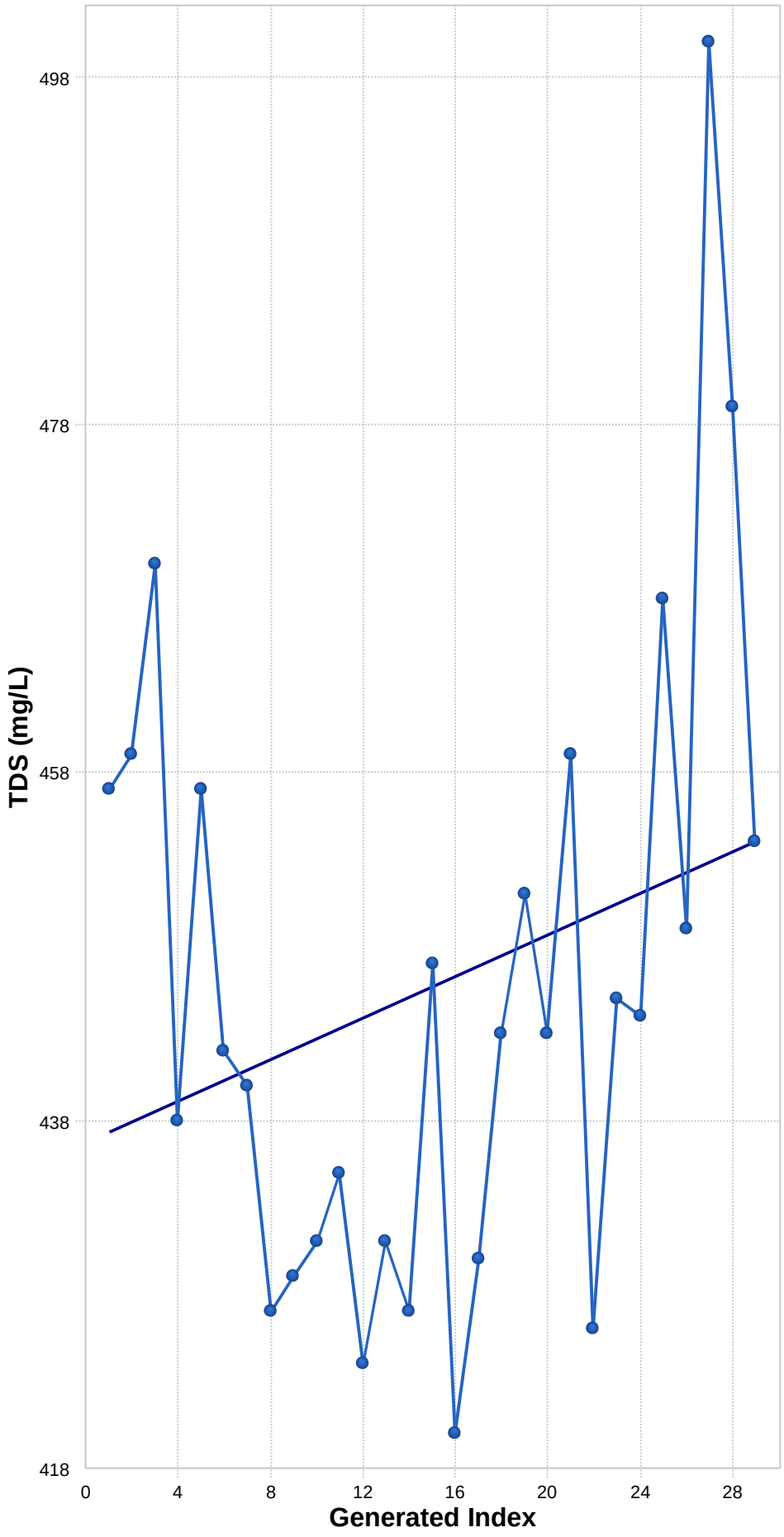
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.3010 |
| Standardized Value of S | -3.4146 |
| M-K Test Value (S) | -183 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0003 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.5445 |
| OLS Regression Intercept | 51.1094 |

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

# Mann-Kendall - 16-SH - TDS



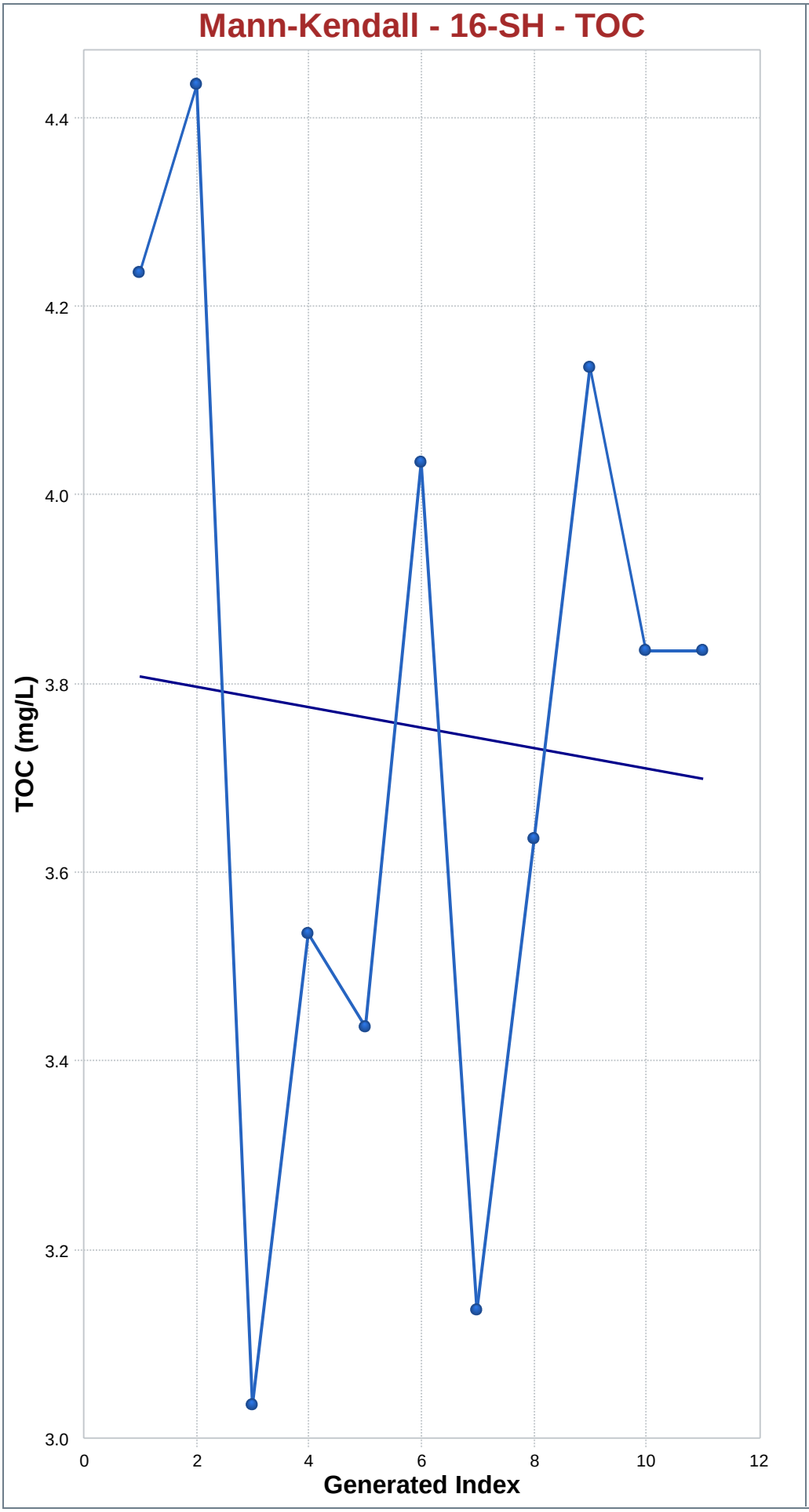

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2635 |
| Standardized Value of S | 1.1640 |
| M-K Test Value (S) | 63 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1222 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.5970 |
| OLS Regression Intercept | 436.7340 |

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




**Mann-Kendall Trend Analysis**

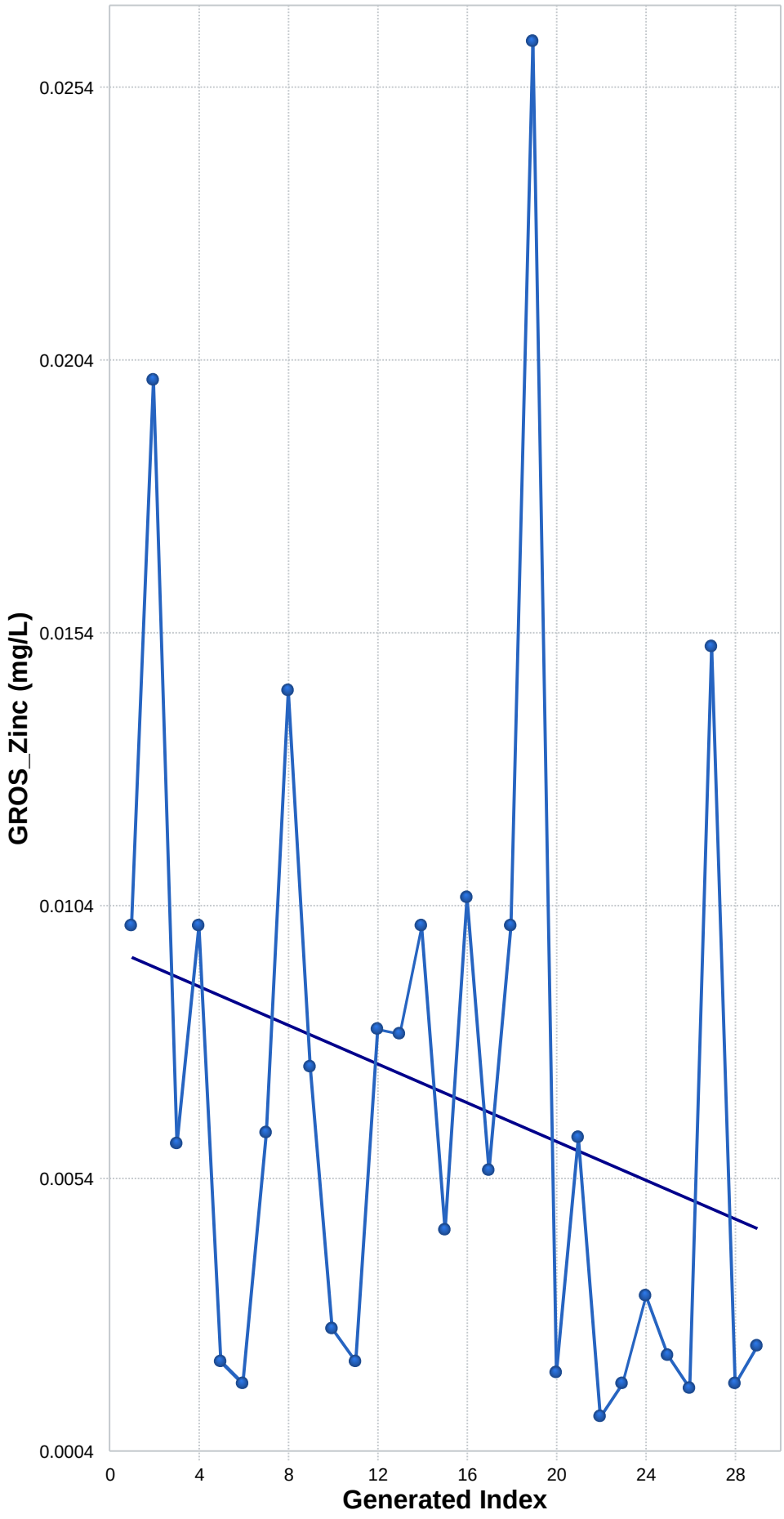
| | |
|---|---|
| n | 11 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 12.8062 |
| Standardized Value of S | |
| M-K Test Value (S) | 0 |
| Tabulated p-value | 0.5000 |
| Approximate p-value | |

**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 - 16-SH - ZINC




**Mann-Kendall Trend Analysis**

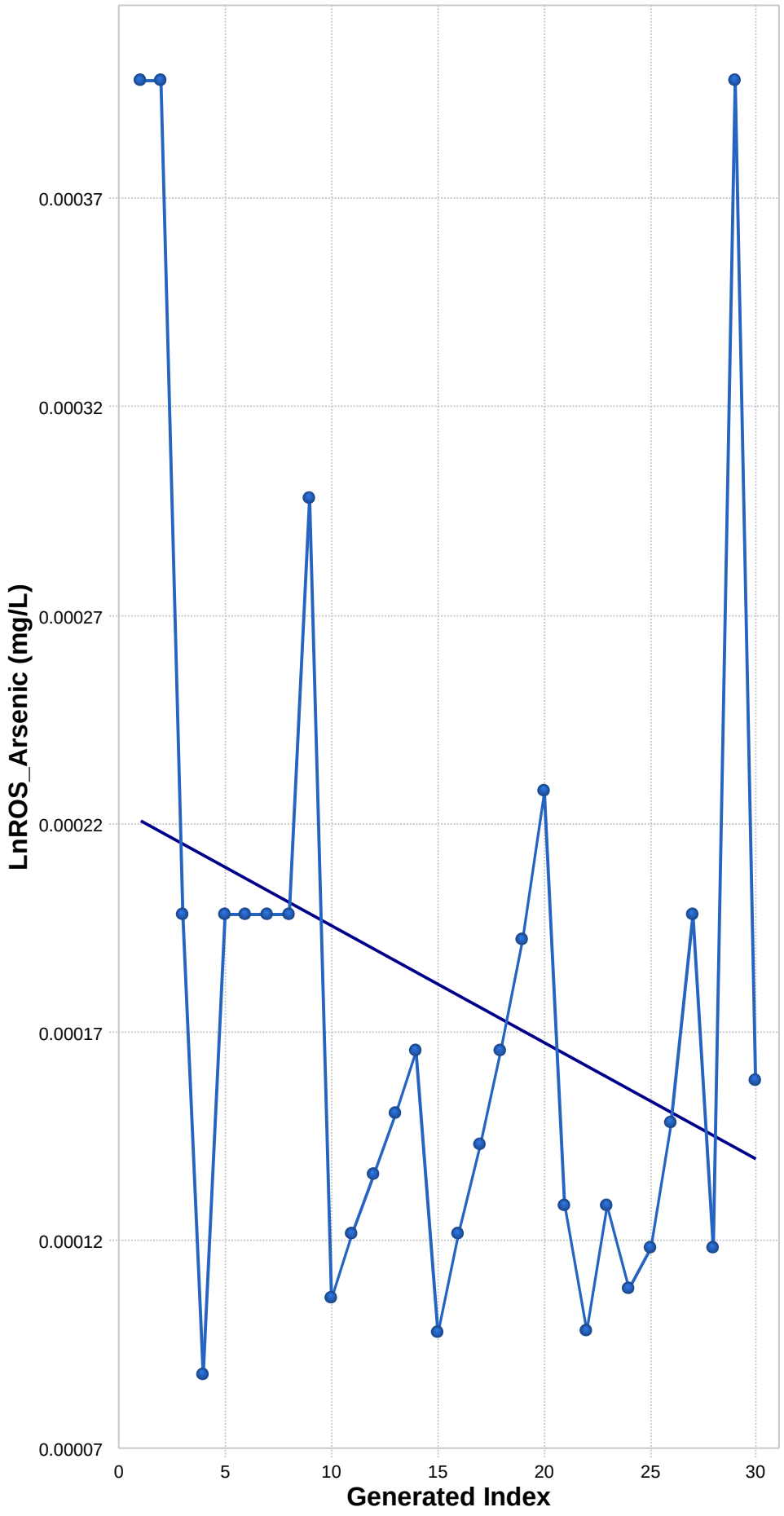
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.1852 |
| Standardized Value of S | -1.7486 |
| M-K Test Value (S) | -94 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0402 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0096 |

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

# Mann-Kendall - 17-SH - ARSENIC




**Mann-Kendall Trend Analysis**

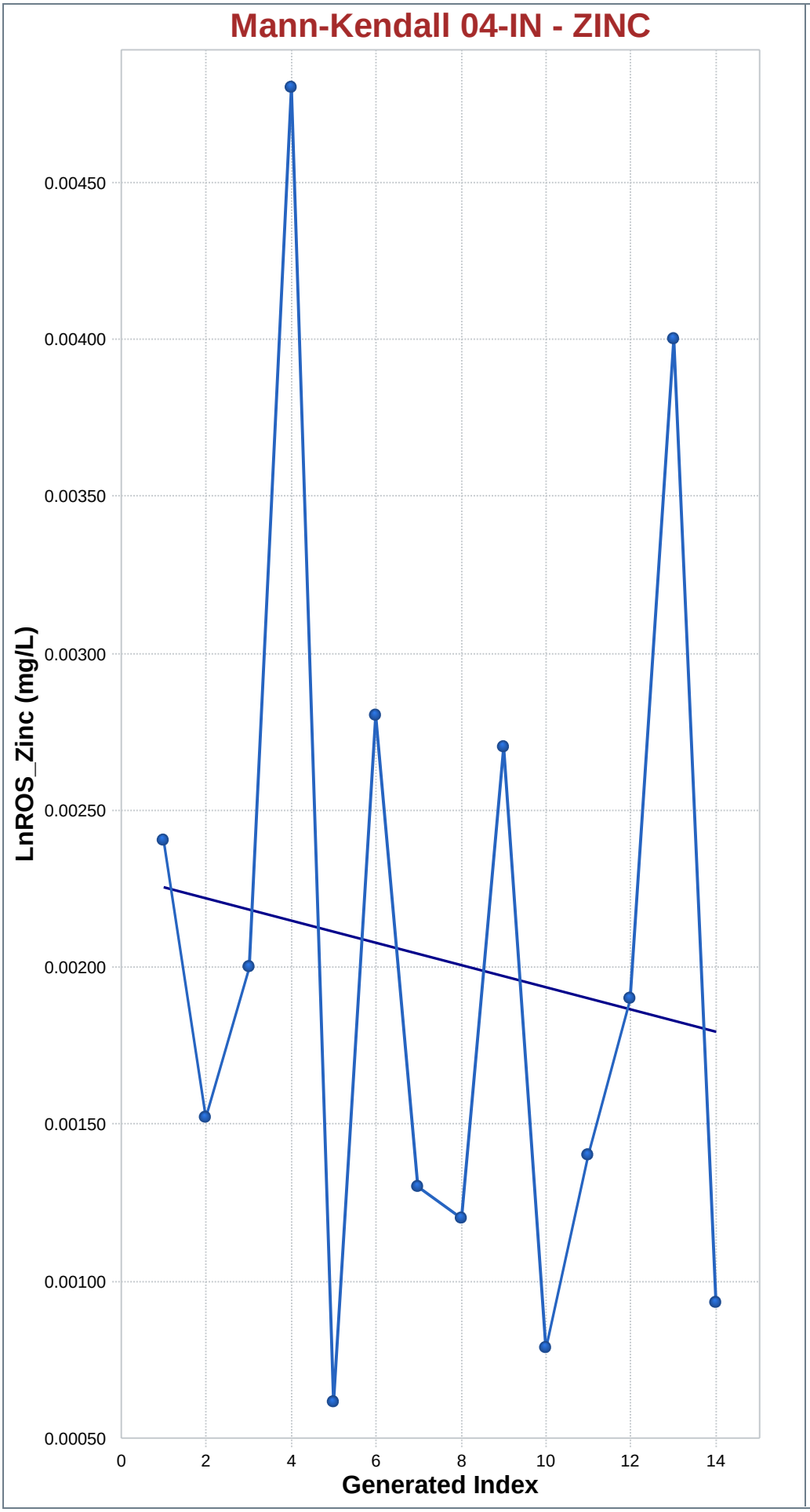
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 55.7285 |
| Standardized Value of S | -1.4355 |
| M-K Test Value (S) | -81 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0756 |

**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.

# App G5 Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Intermediate




**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 14 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 18.2665 |
| Standardized Value of S | -0.5474 |
| M-K Test Value (S) | -11 |
| Tabulated p-value | 0.2950 |
| Approximate p-value | 0.2920 |

**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.

| | | |
|---|---|---|
| | Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 10:46:04 AM | |
| From File | 2023-IntermediateProUCL-1_b.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

01A-IN

Sulphate (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 45 |
| Number of Distinct Observations | 44 |
| Minimum | 0.3 |
| Maximum | 182 |
| Mean of Raw Data | 70.33 |
| Standard Deviation of Raw Data | 49.15 |
| Khat | 0.995 |
| Theta hat | 70.67 |
| Kstar | 0.944 |
| Theta star | 74.52 |
| Mean of Log Transformed Data | 3.673 |
| Standard Deviation of Log Transformed Data | 1.55 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.974 |
| Shapiro Wilk Test Statistic | 0.931 |
| Shapiro Wilk Critical (0.05) Value | 0.945 |
| Approximate Shapiro Wilk P Value | 0.0125 |
| Lilliefors Test Statistic | 0.132 |
| Lilliefors Critical (0.05) Value | 0.131 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.937 |
| A-D Test Statistic | 2.397 |
| A-D Critical (0.05) Value | 0.777 |
| K-S Test Statistic | 0.229 |
| K-S Critical(0.05) Value | 0.136 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.875 |
| Shapiro Wilk Test Statistic | 0.764 |
| Shapiro Wilk Critical (0.05) Value | 0.945 |
| Approximate Shapiro Wilk P Value | 5.4034E-9 |
| Lilliefors Test Statistic | 0.276 |
| Lilliefors Critical (0.05) Value | 0.131 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Iron (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | Raw Statistics | | | | | | | |
| 61 | | | | | Number of Valid Observations | 27 | | | | | | |
| 62 | | | | | Number of Missing Observations | 1 | | | | | | |
| 63 | | | | | Number of Distinct Observations | 26 | | | | | | |
| 64 | | | | | Minimum | 0.02 | | | | | | |
| 65 | | | | | Maximum | 33.8 | | | | | | |
| 66 | | | | | Mean of Raw Data | 13.1 | | | | | | |
| 67 | | | | | Standard Deviation of Raw Data | 11.61 | | | | | | |
| 68 | | | | | Khat | 0.691 | | | | | | |
| 69 | | | | | Theta hat | 18.95 | | | | | | |
| 70 | | | | | Kstar | 0.639 | | | | | | |
| 71 | | | | | Theta star | 20.5 | | | | | | |
| 72 | | | | | Mean of Log Transformed Data | 1.697 | | | | | | |
| 73 | | | | | Standard Deviation of Log Transformed Data | 1.928 | | | | | | |
| 74 | | | | | | | | | | | | |
| 75 | | | | | Normal GOF Test Results | | | | | | | |
| 76 | | | | | | | | | | | | |
| 77 | | | | | Correlation Coefficient R | 0.949 | | | | | | |
| 78 | | | | | Shapiro Wilk Test Statistic | 0.879 | | | | | | |
| 79 | | | | | Shapiro Wilk Critical (0.05) Value | 0.923 | | | | | | |
| 80 | | | | | Approximate Shapiro Wilk P Value | 0.0042 | | | | | | |
| 81 | | | | | Lilliefors Test Statistic | 0.164 | | | | | | |
| 82 | | | | | Lilliefors Critical (0.05) Value | 0.167 | | | | | | |
| 83 | Data appear Approximate Normal at (0.05) Significance Level | | | | | | | | | | | |
| 84 | | | | | | | | | | | | |
| 85 | | | | | Gamma GOF Test Results | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | | | | | Correlation Coefficient R | 0.898 | | | | | | |
| 88 | | | | | A-D Test Statistic | 0.646 | | | | | | |
| 89 | | | | | A-D Critical (0.05) Value | 0.789 | | | | | | |
| 90 | | | | | K-S Test Statistic | 0.127 | | | | | | |
| 91 | | | | | K-S Critical(0.05) Value | 0.176 | | | | | | |
| 92 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 93 | | | | | | | | | | | | |
| 94 | | | | | Lognormal GOF Test Results | | | | | | | |
| 95 | | | | | | | | | | | | |
| 96 | | | | | Correlation Coefficient R | 0.912 | | | | | | |
| 97 | | | | | Shapiro Wilk Test Statistic | 0.831 | | | | | | |
| 98 | | | | | Shapiro Wilk Critical (0.05) Value | 0.923 | | | | | | |
| 99 | | | | | Approximate Shapiro Wilk P Value | 3.4051E-4 | | | | | | |
| 100 | | | | | Lilliefors Test Statistic | 0.172 | | | | | | |
| 101 | | | | | Lilliefors Critical (0.05) Value | 0.167 | | | | | | |
| 102 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | Copper (mg/L) | | | | | | | | | | | |
| 105 | | | | | | | | | | | | |
| 106 | | | | | Raw Statistics | | | | | | | |

| | | |
|---|---|---|
| 107 | Number of Valid Observations | 43 |
| 108 | Number of Missing Observations | 3 |
| 109 | Number of Distinct Observations | 29 |
| 110 | Minimum | 1.0000E-4 |
| 111 | Maximum | 0.109 |
| 112 | Mean of Raw Data | 0.00546 |
| 113 | Standard Deviation of Raw Data | 0.0165 |
| 114 | Khat | 0.572 |
| 115 | Theta hat | 0.00955 |
| 116 | Kstar | 0.547 |
| 117 | Theta star | 0.00998 |
| 118 | Mean of Log Transformed Data | -6.298 |
| 119 | Standard Deviation of Log Transformed Data | 1.349 |
| 120 | | |
| 121 | **Normal GOF Test Results** | |
| 122 | | |
| 123 | Correlation Coefficient R | 0.497 |
| 124 | Shapiro Wilk Test Statistic | 0.288 |
| 125 | Shapiro Wilk Critical (0.05) Value | 0.943 |
| 126 | Approximate Shapiro Wilk P Value | 0 |
| 127 | Lilliefors Test Statistic | 0.373 |
| 128 | Lilliefors Critical (0.05) Value | 0.134 |
| 129 | Data not Normal at (0.05) Significance Level | |
| 130 | | |
| 131 | **Gamma GOF Test Results** | |
| 132 | | |
| 133 | Correlation Coefficient R | 0.755 |
| 134 | A-D Test Statistic | 2.234 |
| 135 | A-D Critical (0.05) Value | 0.806 |
| 136 | K-S Test Statistic | 0.212 |
| 137 | K-S Critical(0.05) Value | 0.142 |
| 138 | Data not Gamma Distributed at (0.05) Significance Level | |
| 139 | | |
| 140 | **Lognormal GOF Test Results** | |
| 141 | | |
| 142 | Correlation Coefficient R | 0.983 |
| 143 | Shapiro Wilk Test Statistic | 0.978 |
| 144 | Shapiro Wilk Critical (0.05) Value | 0.943 |
| 145 | Approximate Shapiro Wilk P Value | 0.632 |
| 146 | Lilliefors Test Statistic | 0.0897 |
| 147 | Lilliefors Critical (0.05) Value | 0.134 |
| 148 | Data appear Lognormal at (0.05) Significance Level | |
| 149 | | |
| 150 | **Nickel (mg/L)** | |
| 151 | | |
| 152 | **Raw Statistics** | |
| 153 | Number of Valid Observations | 45 |
| 154 | Number of Distinct Observations | 35 |
| 155 | Minimum | 5.0000E-4 |
| 156 | Maximum | 0.13 |
| 157 | Mean of Raw Data | 0.012 |
| 158 | Standard Deviation of Raw Data | 0.0208 |
| 159 | Khat | 0.741 |

| | | |
|---|---|---|
| Theta hat | 0.0162 | |
| Kstar | 0.706 | |
| Theta star | 0.017 | |
| Mean of Log Transformed Data | -5.232 | |
| Standard Deviation of Log Transformed Data | 1.339 | |

Normal GOF Test Results

| | |
|---|---|
| Correlation Coefficient R | 0.691 |
| Shapiro Wilk Test Statistic | 0.516 |
| Shapiro Wilk Critical (0.05) Value | 0.945 |
| Approximate Shapiro Wilk P Value | 3.331E-16 |
| Lilliefors Test Statistic | 0.294 |
| Lilliefors Critical (0.05) Value | 0.131 |

Data not Normal at (0.05) Significance Level

Gamma GOF Test Results

| | |
|---|---|
| Correlation Coefficient R | 0.903 |
| A-D Test Statistic | 0.97 |
| A-D Critical (0.05) Value | 0.791 |
| K-S Test Statistic | 0.14 |
| K-S Critical(0.05) Value | 0.137 |

Data not Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

| | |
|---|---|
| Correlation Coefficient R | 0.979 |
| Shapiro Wilk Test Statistic | 0.949 |
| Shapiro Wilk Critical (0.05) Value | 0.945 |
| Approximate Shapiro Wilk P Value | 0.0718 |
| Lilliefors Test Statistic | 0.16 |
| Lilliefors Critical (0.05) Value | 0.131 |

Data appear Approximate_Lognormal at (0.05) Significance Level

Zinc (mg/L)

Raw Statistics

| | |
|---|---|
| Number of Valid Observations | 29 |
| Number of Distinct Observations | 24 |
| Minimum | 0.001 |
| Maximum | 0.021 |
| Mean of Raw Data | 0.0056 |
| Standard Deviation of Raw Data | 0.00466 |
| Khat | 1.678 |
| Theta hat | 0.00334 |
| Kstar | 1.527 |
| Theta star | 0.00367 |
| Mean of Log Transformed Data | -5.511 |
| Standard Deviation of Log Transformed Data | 0.859 |

Normal GOF Test Results

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Correlation Coefficient R | 0.91 | | | | | | |
| 214 | | | | | Shapiro Wilk Test Statistic | 0.835 | | | | | | |
| 215 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 216 | | | | | Approximate Shapiro Wilk P Value | 2.4324E-4 | | | | | | |
| 217 | | | | | Lilliefors Test Statistic | 0.162 | | | | | | |
| 218 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 219 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 220 | | | | | | | | | | | | |
| 221 | | | | Gamma GOF Test Results | | | | | | | | |
| 222 | | | | | | | | | | | | |
| 223 | | | | | Correlation Coefficient R | 0.987 | | | | | | |
| 224 | | | | | A-D Test Statistic | 0.427 | | | | | | |
| 225 | | | | | A-D Critical (0.05) Value | 0.761 | | | | | | |
| 226 | | | | | K-S Test Statistic | 0.12 | | | | | | |
| 227 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 228 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 229 | | | | | | | | | | | | |
| 230 | | | | Lognormal GOF Test Results | | | | | | | | |
| 231 | | | | | | | | | | | | |
| 232 | | | | | Correlation Coefficient R | 0.978 | | | | | | |
| 233 | | | | | Shapiro Wilk Test Statistic | 0.943 | | | | | | |
| 234 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 235 | | | | | Approximate Shapiro Wilk P Value | 0.141 | | | | | | |
| 236 | | | | | Lilliefors Test Statistic | 0.131 | | | | | | |
| 237 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 238 | 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 5.2 2023-12-13 10:56:11 AM | |
| From File | 2023-IntermediateProUCL-1_c.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |
| 03-IN | | |
| Chloride (mg/L) | | |
| Raw Statistics | | |
| Number of Valid Observations | 45 | |
| Number of Distinct Observations | 32 | |
| Minimum | 0.5 | |
| Maximum | 4.7 | |
| Mean of Raw Data | 1.967 | |
| Standard Deviation of Raw Data | 1.232 | |
| Khat | 2.368 | |
| Theta hat | 0.831 | |
| Kstar | 2.225 | |
| Theta star | 0.884 | |
| Mean of Log Transformed Data | 0.451 | |
| Standard Deviation of Log Transformed Data | 0.717 | |
| Normal GOF Test Results | | |
| Correlation Coefficient R | 0.966 | |
| Shapiro Wilk Test Statistic | 0.911 | |
| Shapiro Wilk Critical (0.05) Value | 0.945 | |
| Approximate Shapiro Wilk P Value | 0.00202 | |
| Lilliefors Test Statistic | 0.117 | |
| Lilliefors Critical (0.05) Value | 0.131 | |
| Data appear Approximate Normal at (0.05) Significance Level | | |
| Gamma GOF Test Results | | |
| Correlation Coefficient R | 0.975 | |
| A-D Test Statistic | 0.729 | |
| A-D Critical (0.05) Value | 0.759 | |
| K-S Test Statistic | 0.102 | |
| K-S Critical(0.05) Value | 0.133 | |
| Data appear Gamma Distributed at (0.05) Significance Level | | |
| Lognormal GOF Test Results | | |
| Correlation Coefficient R | 0.97 | |
| Shapiro Wilk Test Statistic | 0.913 | |
| Shapiro Wilk Critical (0.05) Value | 0.945 | |
| Approximate Shapiro Wilk P Value | 0.00239 | |
| Lilliefors Test Statistic | 0.125 | |
| Lilliefors Critical (0.05) Value | 0.131 | |
| 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 | | 21 | | | | | | |
| 58 | | | | Number of Distinct Observations | | 17 | | | | | | |
| 59 | | | | Minimum | | 5.1000E-4 | | | | | | |
| 60 | | | | Maximum | | 0.347 | | | | | | |
| 61 | | | | Mean of Raw Data | | 0.0648 | | | | | | |
| 62 | | | | Standard Deviation of Raw Data | | 0.084 | | | | | | |
| 63 | | | | Khat | | 0.58 | | | | | | |
| 64 | | | | Theta hat | | 0.112 | | | | | | |
| 65 | | | | Kstar | | 0.528 | | | | | | |
| 66 | | | | Theta star | | 0.123 | | | | | | |
| 67 | | | | Mean of Log Transformed Data | | -3.808 | | | | | | |
| 68 | | | | Standard Deviation of Log Transformed Data | | 1.796 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | Correlation Coefficient R | | 0.856 | | | | | | |
| 73 | | | | Shapiro Wilk Test Statistic | | 0.744 | | | | | | |
| 74 | | | | Shapiro Wilk Critical (0.05) Value | | 0.908 | | | | | | |
| 75 | | | | Approximate Shapiro Wilk P Value | | 4.6504E-5 | | | | | | |
| 76 | | | | Lilliefors Test Statistic | | 0.222 | | | | | | |
| 77 | | | | Lilliefors Critical (0.05) Value | | 0.188 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | Correlation Coefficient R | | 0.987 | | | | | | |
| 83 | | | | A-D Test Statistic | | 0.653 | | | | | | |
| 84 | | | | A-D Critical (0.05) Value | | 0.798 | | | | | | |
| 85 | | | | K-S Test Statistic | | 0.199 | | | | | | |
| 86 | | | | K-S Critical(0.05) Value | | 0.199 | | | | | | |
| 87 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | Correlation Coefficient R | | 0.962 | | | | | | |
| 92 | | | | Shapiro Wilk Test Statistic | | 0.92 | | | | | | |
| 93 | | | | Shapiro Wilk Critical (0.05) Value | | 0.908 | | | | | | |
| 94 | | | | Approximate Shapiro Wilk P Value | | 0.0837 | | | | | | |
| 95 | | | | Lilliefors Test Statistic | | 0.193 | | | | | | |
| 96 | | | | Lilliefors Critical (0.05) Value | | 0.188 | | | | | | |
| 97 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | Arsenic (mg/L) | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | Raw Statistics | | | | | | | | |
| 102 | | | | Number of Valid Observations | | 38 | | | | | | |
| 103 | | | | Number of Distinct Observations | | 15 | | | | | | |
| 104 | | | | Minimum | | 1.6000E-4 | | | | | | |
| 105 | | | | Maximum | | 0.00245 | | | | | | |
| 106 | | | | Mean of Raw Data | | 4.9395E-4 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Standard Deviation of Raw Data | 4.2405E-4 | | | | | | |
| 108 | | | | | Khat | 2.305 | | | | | | |
| 109 | | | | | Theta hat | 2.1432E-4 | | | | | | |
| 110 | | | | | Kstar | 2.14 | | | | | | |
| 111 | | | | | Theta star | 2.3078E-4 | | | | | | |
| 112 | | | | | Mean of Log Transformed Data | -7.845 | | | | | | |
| 113 | | | | | Standard Deviation of Log Transformed Data | 0.65 | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | | Normal GOF Test Results | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | | | | | Correlation Coefficient R | 0.817 | | | | | | |
| 118 | | | | | Shapiro Wilk Test Statistic | 0.692 | | | | | | |
| 119 | | | | | Shapiro Wilk Critical (0.05) Value | 0.938 | | | | | | |
| 120 | | | | | Approximate Shapiro Wilk P Value | 2.3447E-9 | | | | | | |
| 121 | | | | | Lilliefors Test Statistic | 0.215 | | | | | | |
| 122 | | | | | Lilliefors Critical (0.05) Value | 0.142 | | | | | | |
| 123 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | | Gamma GOF Test Results | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | | Correlation Coefficient R | 0.929 | | | | | | |
| 128 | | | | | A-D Test Statistic | 1.24 | | | | | | |
| 129 | | | | | A-D Critical (0.05) Value | 0.758 | | | | | | |
| 130 | | | | | K-S Test Statistic | 0.144 | | | | | | |
| 131 | | | | | K-S Critical(0.05) Value | 0.145 | | | | | | |
| 132 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | | | | | Lognormal GOF Test Results | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | Correlation Coefficient R | 0.961 | | | | | | |
| 137 | | | | | Shapiro Wilk Test Statistic | 0.919 | | | | | | |
| 138 | | | | | Shapiro Wilk Critical (0.05) Value | 0.938 | | | | | | |
| 139 | | | | | Approximate Shapiro Wilk P Value | 0.0105 | | | | | | |
| 140 | | | | | Lilliefors Test Statistic | 0.155 | | | | | | |
| 141 | | | | | Lilliefors Critical (0.05) Value | 0.142 | | | | | | |
| 142 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | Chromium (mg/L) | | | | | | | | | | | |
| 145 | | | | | | | | | | | | |
| 146 | | | | | Raw Statistics | | | | | | | |
| 147 | | | | | Number of Valid Observations | 38 | | | | | | |
| 148 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 149 | | | | | Minimum | 3.4000E-4 | | | | | | |
| 150 | | | | | Maximum | 0.088 | | | | | | |
| 151 | | | | | Mean of Raw Data | 0.00656 | | | | | | |
| 152 | | | | | Standard Deviation of Raw Data | 0.0145 | | | | | | |
| 153 | | | | | Khat | 0.641 | | | | | | |
| 154 | | | | | Theta hat | 0.0102 | | | | | | |
| 155 | | | | | Kstar | 0.608 | | | | | | |
| 156 | | | | | Theta star | 0.0108 | | | | | | |
| 157 | | | | | Mean of Log Transformed Data | -5.981 | | | | | | |
| 158 | | | | | Standard Deviation of Log Transformed Data | 1.253 | | | | | | |
| 159 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | Normal GOF Test Results | | | | | | | | | | | |
| 161 | | | | | | | | | | | | |
| 162 | | | | | Correlation Coefficient R | 0.617 | | | | | | |
| 163 | | | | | Shapiro Wilk Test Statistic | 0.419 | | | | | | |
| 164 | | | | | Shapiro Wilk Critical (0.05) Value | 0.938 | | | | | | |
| 165 | | | | | Approximate Shapiro Wilk P Value | 4.108E-15 | | | | | | |
| 166 | | | | | Lilliefors Test Statistic | 0.334 | | | | | | |
| 167 | | | | | Lilliefors Critical (0.05) Value | 0.142 | | | | | | |
| 168 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | Gamma GOF Test Results | | | | | | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | Correlation Coefficient R | 0.859 | | | | | | |
| 173 | | | | | A-D Test Statistic | 2.879 | | | | | | |
| 174 | | | | | A-D Critical (0.05) Value | 0.799 | | | | | | |
| 175 | | | | | K-S Test Statistic | 0.221 | | | | | | |
| 176 | | | | | K-S Critical(0.05) Value | 0.15 | | | | | | |
| 177 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 178 | | | | | | | | | | | | |
| 179 | Lognormal GOF Test Results | | | | | | | | | | | |
| 180 | | | | | | | | | | | | |
| 181 | | | | | Correlation Coefficient R | 0.943 | | | | | | |
| 182 | | | | | Shapiro Wilk Test Statistic | 0.891 | | | | | | |
| 183 | | | | | Shapiro Wilk Critical (0.05) Value | 0.938 | | | | | | |
| 184 | | | | | Approximate Shapiro Wilk P Value | 0.00113 | | | | | | |
| 185 | | | | | Lilliefors Test Statistic | 0.218 | | | | | | |
| 186 | | | | | Lilliefors Critical (0.05) Value | 0.142 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Copper (mg/L) | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | | Raw Statistics | | | | | | | |
| 196 | | | | | Number of Valid Observations | 38 | | | | | | |
| 197 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 198 | | | | | Minimum | 6.1000E-4 | | | | | | |
| 199 | | | | | Maximum | 0.021 | | | | | | |
| 200 | | | | | Mean of Raw Data | 0.0035 | | | | | | |
| 201 | | | | | Standard Deviation of Raw Data | 0.00372 | | | | | | |
| 202 | | | | | Khat | 1.481 | | | | | | |
| 203 | | | | | Theta hat | 0.00236 | | | | | | |
| 204 | | | | | Kstar | 1.381 | | | | | | |
| 205 | | | | | Theta star | 0.00253 | | | | | | |
| 206 | | | | | Mean of Log Transformed Data | -6.029 | | | | | | |
| 207 | | | | | Standard Deviation of Log Transformed Data | 0.851 | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | Normal GOF Test Results | | | | | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | | | | | Correlation Coefficient R | 0.815 | | | | | | |
| 212 | | | | | Shapiro Wilk Test Statistic | 0.691 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Shapiro Wilk Critical (0.05) Value | 0.938 | | | | | | |
| 214 | | | | | Approximate Shapiro Wilk P Value | 2.1523E-9 | | | | | | |
| 215 | | | | | Lilliefors Test Statistic | 0.218 | | | | | | |
| 216 | | | | | Lilliefors Critical (0.05) Value | 0.142 | | | | | | |
| 217 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | Gamma GOF Test Results | | | | | | | | |
| 220 | | | | | | | | | | | | |
| 221 | | | | | Correlation Coefficient R | 0.944 | | | | | | |
| 222 | | | | | A-D Test Statistic | 0.79 | | | | | | |
| 223 | | | | | A-D Critical (0.05) Value | 0.767 | | | | | | |
| 224 | | | | | K-S Test Statistic | 0.132 | | | | | | |
| 225 | | | | | K-S Critical(0.05) Value | 0.146 | | | | | | |
| 226 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | | | | Lognormal GOF Test Results | | | | | | | | |
| 229 | | | | | | | | | | | | |
| 230 | | | | | Correlation Coefficient R | 0.983 | | | | | | |
| 231 | | | | | Shapiro Wilk Test Statistic | 0.959 | | | | | | |
| 232 | | | | | Shapiro Wilk Critical (0.05) Value | 0.938 | | | | | | |
| 233 | | | | | Approximate Shapiro Wilk P Value | 0.233 | | | | | | |
| 234 | | | | | Lilliefors Test Statistic | 0.112 | | | | | | |
| 235 | | | | | Lilliefors Critical (0.05) Value | 0.142 | | | | | | |
| 236 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | Nickel (mg/L) | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | Raw Statistics | | | | | | | | |
| 241 | | | | | Number of Valid Observations | 19 | | | | | | |
| 242 | | | | | Number of Distinct Observations | 16 | | | | | | |
| 243 | | | | | Minimum | 7.0000E-4 | | | | | | |
| 244 | | | | | Maximum | 0.036 | | | | | | |
| 245 | | | | | Mean of Raw Data | 0.00405 | | | | | | |
| 246 | | | | | Standard Deviation of Raw Data | 0.0079 | | | | | | |
| 247 | | | | | Khat | 0.925 | | | | | | |
| 248 | | | | | Theta hat | 0.00438 | | | | | | |
| 249 | | | | | Kstar | 0.814 | | | | | | |
| 250 | | | | | Theta star | 0.00498 | | | | | | |
| 251 | | | | | Mean of Log Transformed Data | -6.138 | | | | | | |
| 252 | | | | | Standard Deviation of Log Transformed Data | 0.939 | | | | | | |
| 253 | | | | | | | | | | | | |
| 254 | | | | Normal GOF Test Results | | | | | | | | |
| 255 | | | | | | | | | | | | |
| 256 | | | | | Correlation Coefficient R | 0.61 | | | | | | |
| 257 | | | | | Shapiro Wilk Test Statistic | 0.402 | | | | | | |
| 258 | | | | | Shapiro Wilk Critical (0.05) Value | 0.901 | | | | | | |
| 259 | | | | | Approximate Shapiro Wilk P Value | 2.3782E-9 | | | | | | |
| 260 | | | | | Lilliefors Test Statistic | 0.392 | | | | | | |
| 261 | | | | | Lilliefors Critical (0.05) Value | 0.197 | | | | | | |
| 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 | 0.823 | | | | | | |
| 267 | | | | | A-D Test Statistic | 1.838 | | | | | | |
| 268 | | | | | A-D Critical (0.05) Value | 0.772 | | | | | | |
| 269 | | | | | K-S Test Statistic | 0.273 | | | | | | |
| 270 | | | | | K-S Critical(0.05) Value | 0.205 | | | | | | |
| 271 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | | | | Lognormal GOF Test Results | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | | | | | Correlation Coefficient R | 0.93 | | | | | | |
| 276 | | | | | Shapiro Wilk Test Statistic | 0.876 | | | | | | |
| 277 | | | | | Shapiro Wilk Critical (0.05) Value | 0.901 | | | | | | |
| 278 | | | | | Approximate Shapiro Wilk P Value | 0.0162 | | | | | | |
| 279 | | | | | Lilliefors Test Statistic | 0.163 | | | | | | |
| 280 | | | | | Lilliefors Critical (0.05) Value | 0.197 | | | | | | |
| 281 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | Zinc (mg/L) | | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | | | | Raw Statistics | | | | | | | | |
| 286 | | | | | Number of Valid Observations | 19 | | | | | | |
| 287 | | | | | Number of Distinct Observations | 16 | | | | | | |
| 288 | | | | | Minimum | 0.001 | | | | | | |
| 289 | | | | | Maximum | 0.036 | | | | | | |
| 290 | | | | | Mean of Raw Data | 0.00527 | | | | | | |
| 291 | | | | | Standard Deviation of Raw Data | 0.00768 | | | | | | |
| 292 | | | | | Khat | 1.313 | | | | | | |
| 293 | | | | | Theta hat | 0.00401 | | | | | | |
| 294 | | | | | Kstar | 1.141 | | | | | | |
| 295 | | | | | Theta star | 0.00462 | | | | | | |
| 296 | | | | | Mean of Log Transformed Data | -5.673 | | | | | | |
| 297 | | | | | Standard Deviation of Log Transformed Data | 0.83 | | | | | | |
| 298 | | | | | | | | | | | | |
| 299 | | | | Normal GOF Test Results | | | | | | | | |
| 300 | | | | | | | | | | | | |
| 301 | | | | | Correlation Coefficient R | 0.663 | | | | | | |
| 302 | | | | | Shapiro Wilk Test Statistic | 0.47 | | | | | | |
| 303 | | | | | Shapiro Wilk Critical (0.05) Value | 0.901 | | | | | | |
| 304 | | | | | Approximate Shapiro Wilk P Value | 1.4341E-8 | | | | | | |
| 305 | | | | | Lilliefors Test Statistic | 0.346 | | | | | | |
| 306 | | | | | Lilliefors Critical (0.05) Value | 0.197 | | | | | | |
| 307 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 308 | | | | | | | | | | | | |
| 309 | | | | Gamma GOF Test Results | | | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | | | | | Correlation Coefficient R | 0.829 | | | | | | |
| 312 | | | | | A-D Test Statistic | 1.145 | | | | | | |
| 313 | | | | | A-D Critical (0.05) Value | 0.762 | | | | | | |
| 314 | | | | | K-S Test Statistic | 0.21 | | | | | | |
| 315 | | | | | K-S Critical(0.05) Value | 0.203 | | | | | | |
| 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 | 0.953 | | | | | | |
| 321 | | | | | Shapiro Wilk Test Statistic | 0.921 | | | | | | |
| 322 | | | | | Shapiro Wilk Critical (0.05) Value | 0.901 | | | | | | |
| 323 | | | | | Approximate Shapiro Wilk P Value | 0.112 | | | | | | |
| 324 | | | | | Lilliefors Test Statistic | 0.133 | | | | | | |
| 325 | | | | | Lilliefors Critical (0.05) Value | 0.197 | | | | | | |
| 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 5.2 2023-12-13 10:59:09 AM | |
| From File | 2023-IntermediateProUCL-1_d.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

04-IN

Manganese (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 17 |
| Number of Distinct Observations | 17 |
| Minimum | 0.004 |
| Maximum | 0.727 |
| Mean of Raw Data | 0.328 |
| Standard Deviation of Raw Data | 0.256 |
| Khat | 1.054 |
| Theta hat | 0.311 |
| Kstar | 0.907 |
| Theta star | 0.362 |
| Mean of Log Transformed Data | -1.659 |
| Standard Deviation of Log Transformed Data | 1.376 |

Normal GOF Test Results

| | |
|---|---|
| Correlation Coefficient R | 0.958 |
| Shapiro Wilk Test Statistic | 0.895 |
| Shapiro Wilk Critical (0.05) Value | 0.892 |
| Approximate Shapiro Wilk P Value | 0.0766 |
| Lilliefors Test Statistic | 0.186 |
| Lilliefors Critical (0.05) Value | 0.207 |

Data appear Normal at (0.05) Significance Level

Gamma GOF Test Results

| | |
|---|---|
| Correlation Coefficient R | 0.904 |
| A-D Test Statistic | 0.516 |
| A-D Critical (0.05) Value | 0.765 |
| K-S Test Statistic | 0.155 |
| K-S Critical(0.05) Value | 0.215 |

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal GOF Test Results

| | |
|---|---|
| Correlation Coefficient R | 0.921 |
| Shapiro Wilk Test Statistic | 0.852 |
| Shapiro Wilk Critical (0.05) Value | 0.892 |
| Approximate Shapiro Wilk P Value | 0.0106 |
| Lilliefors Test Statistic | 0.181 |
| Lilliefors Critical (0.05) Value | 0.207 |

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 | 21 | | | | | | |
| 58 | | | | | Number of Distinct Observations | 20 | | | | | | |
| 59 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 60 | | | | | Maximum | 0.0052 | | | | | | |
| 61 | | | | | Mean of Raw Data | 0.00286 | | | | | | |
| 62 | | | | | Standard Deviation of Raw Data | 0.00105 | | | | | | |
| 63 | | | | | Khat | 4.416 | | | | | | |
| 64 | | | | | Theta hat | 6.4777E-4 | | | | | | |
| 65 | | | | | Kstar | 3.817 | | | | | | |
| 66 | | | | | Theta star | 7.4945E-4 | | | | | | |
| 67 | | | | | Mean of Log Transformed Data | -5.974 | | | | | | |
| 68 | | | | | Standard Deviation of Log Transformed Data | 0.638 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Correlation Coefficient R | 0.946 | | | | | | |
| 73 | | | | | Shapiro Wilk Test Statistic | 0.913 | | | | | | |
| 74 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk P Value | 0.0586 | | | | | | |
| 76 | | | | | Lilliefors Test Statistic | 0.193 | | | | | | |
| 77 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 78 | Data appear Approximate Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | Correlation Coefficient R | 0.94 | | | | | | |
| 83 | | | | | A-D Test Statistic | 1.551 | | | | | | |
| 84 | | | | | A-D Critical (0.05) Value | 0.746 | | | | | | |
| 85 | | | | | K-S Test Statistic | 0.213 | | | | | | |
| 86 | | | | | K-S Critical(0.05) Value | 0.19 | | | | | | |
| 87 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | | Correlation Coefficient R | 0.767 | | | | | | |
| 92 | | | | | Shapiro Wilk Test Statistic | 0.618 | | | | | | |
| 93 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 6.6191E-7 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.276 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 97 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | Chromium (mg/L) | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | Raw Statistics | | | | | | | | |
| 102 | | | | | Number of Valid Observations | 21 | | | | | | |
| 103 | | | | | Number of Distinct Observations | 15 | | | | | | |
| 104 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 105 | | | | | Maximum | 0.0124 | | | | | | |
| 106 | | | | | Mean of Raw Data | 0.00241 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Standard Deviation of Raw Data | 0.00308 | | | | | | |
| 108 | | | | | Khat | 1.001 | | | | | | |
| 109 | | | | | Theta hat | 0.00241 | | | | | | |
| 110 | | | | | Kstar | 0.889 | | | | | | |
| 111 | | | | | Theta star | 0.00271 | | | | | | |
| 112 | | | | | Mean of Log Transformed Data | -6.606 | | | | | | |
| 113 | | | | | Standard Deviation of Log Transformed Data | 1.076 | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | Normal GOF Test Results | | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | | | | | Correlation Coefficient R | 0.814 | | | | | | |
| 118 | | | | | Shapiro Wilk Test Statistic | 0.673 | | | | | | |
| 119 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 120 | | | | | Approximate Shapiro Wilk P Value | 3.8837E-6 | | | | | | |
| 121 | | | | | Lilliefors Test Statistic | 0.292 | | | | | | |
| 122 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 123 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | Gamma GOF Test Results | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | | Correlation Coefficient R | 0.969 | | | | | | |
| 128 | | | | | A-D Test Statistic | 0.927 | | | | | | |
| 129 | | | | | A-D Critical (0.05) Value | 0.77 | | | | | | |
| 130 | | | | | K-S Test Statistic | 0.271 | | | | | | |
| 131 | | | | | K-S Critical(0.05) Value | 0.195 | | | | | | |
| 132 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | | | | Lognormal GOF Test Results | | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | Correlation Coefficient R | 0.981 | | | | | | |
| 137 | | | | | Shapiro Wilk Test Statistic | 0.959 | | | | | | |
| 138 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 139 | | | | | Approximate Shapiro Wilk P Value | 0.492 | | | | | | |
| 140 | | | | | Lilliefors Test Statistic | 0.219 | | | | | | |
| 141 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 142 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | Nickel (mg/L) | | | | | | | | | | | |
| 145 | | | | | | | | | | | | |
| 146 | | | | Raw Statistics | | | | | | | | |
| 147 | | | | | Number of Valid Observations | 14 | | | | | | |
| 148 | | | | | Number of Distinct Observations | 13 | | | | | | |
| 149 | | | | | Minimum | 7.4000E-4 | | | | | | |
| 150 | | | | | Maximum | 0.0047 | | | | | | |
| 151 | | | | | Mean of Raw Data | 0.00226 | | | | | | |
| 152 | | | | | Standard Deviation of Raw Data | 0.00112 | | | | | | |
| 153 | | | | | Khat | 5.045 | | | | | | |
| 154 | | | | | Theta hat | 4.4871E-4 | | | | | | |
| 155 | | | | | Kstar | 4.011 | | | | | | |
| 156 | | | | | Theta star | 5.6431E-4 | | | | | | |
| 157 | | | | | Mean of Log Transformed Data | -6.193 | | | | | | |
| 158 | | | | | Standard Deviation of Log Transformed Data | 0.469 | | | | | | |
| 159 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | Normal GOF Test Results | | | | | | | | | | | |
| 161 | | | | | | | | | | | | |
| 162 | | | | | Correlation Coefficient R | 0.904 | | | | | | |
| 163 | | | | | Shapiro Wilk Test Statistic | 0.823 | | | | | | |
| 164 | | | | | Shapiro Wilk Critical (0.05) Value | 0.874 | | | | | | |
| 165 | | | | | Approximate Shapiro Wilk P Value | 0.00833 | | | | | | |
| 166 | | | | | Lilliefors Test Statistic | 0.255 | | | | | | |
| 167 | | | | | Lilliefors Critical (0.05) Value | 0.226 | | | | | | |
| 168 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | Gamma GOF Test Results | | | | | | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | Correlation Coefficient R | 0.944 | | | | | | |
| 173 | | | | | A-D Test Statistic | 0.632 | | | | | | |
| 174 | | | | | A-D Critical (0.05) Value | 0.738 | | | | | | |
| 175 | | | | | K-S Test Statistic | 0.193 | | | | | | |
| 176 | | | | | K-S Critical(0.05) Value | 0.229 | | | | | | |
| 177 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 178 | | | | | | | | | | | | |
| 179 | Lognormal GOF Test Results | | | | | | | | | | | |
| 180 | | | | | | | | | | | | |
| 181 | | | | | Correlation Coefficient R | 0.956 | | | | | | |
| 182 | | | | | Shapiro Wilk Test Statistic | 0.927 | | | | | | |
| 183 | | | | | Shapiro Wilk Critical (0.05) Value | 0.874 | | | | | | |
| 184 | | | | | Approximate Shapiro Wilk P Value | 0.225 | | | | | | |
| 185 | | | | | Lilliefors Test Statistic | 0.168 | | | | | | |
| 186 | | | | | Lilliefors Critical (0.05) Value | 0.226 | | | | | | |
| 187 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | Zinc (mg/L) | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | | | | Raw Statistics | | | | | | | | |
| 192 | | | | | Number of Valid Observations | 14 | | | | | | |
| 193 | | | | | Number of Distinct Observations | 12 | | | | | | |
| 194 | | | | | Minimum | 0.001 | | | | | | |
| 195 | | | | | Maximum | 0.0048 | | | | | | |
| 196 | | | | | Mean of Raw Data | 0.00218 | | | | | | |
| 197 | | | | | Standard Deviation of Raw Data | 0.00118 | | | | | | |
| 198 | | | | | Khat | 3.977 | | | | | | |
| 199 | | | | | Theta hat | 5.4777E-4 | | | | | | |
| 200 | | | | | Kstar | 3.173 | | | | | | |
| 201 | | | | | Theta star | 6.8670E-4 | | | | | | |
| 202 | | | | | Mean of Log Transformed Data | -6.26 | | | | | | |
| 203 | | | | | Standard Deviation of Log Transformed Data | 0.529 | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | Normal GOF Test Results | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | | | | | Correlation Coefficient R | 0.947 | | | | | | |
| 208 | | | | | Shapiro Wilk Test Statistic | 0.889 | | | | | | |
| 209 | | | | | Shapiro Wilk Critical (0.05) Value | 0.874 | | | | | | |
| 210 | | | | | Approximate Shapiro Wilk P Value | 0.0897 | | | | | | |
| 211 | | | | | Lilliefors Test Statistic | 0.173 | | | | | | |
| 212 | | | | | Lilliefors Critical (0.05) Value | 0.226 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Data appear Normal at (0.05) Significance Level | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | | | | Gamma GOF Test Results | | | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | Correlation Coefficient R | 0.987 | | | | | | |
| 218 | | | | | A-D Test Statistic | 0.4 | | | | | | |
| 219 | | | | | A-D Critical (0.05) Value | 0.74 | | | | | | |
| 220 | | | | | K-S Test Statistic | 0.17 | | | | | | |
| 221 | | | | | K-S Critical(0.05) Value | 0.23 | | | | | | |
| 222 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | | | | Lognormal GOF Test Results | | | | | | | | |
| 225 | | | | | | | | | | | | |
| 226 | | | | | Correlation Coefficient R | 0.974 | | | | | | |
| 227 | | | | | Shapiro Wilk Test Statistic | 0.929 | | | | | | |
| 228 | | | | | Shapiro Wilk Critical (0.05) Value | 0.874 | | | | | | |
| 229 | | | | | Approximate Shapiro Wilk P Value | 0.383 | | | | | | |
| 230 | | | | | Lilliefors Test Statistic | 0.15 | | | | | | |
| 231 | | | | | Lilliefors Critical (0.05) Value | 0.226 | | | | | | |
| 232 | 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 5.2 2023-12-13 11:03:52 AM | |
| From File | 2023-IntermediateProUCL-1_e.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

05-IN

Iron (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 26 |
| Number of Distinct Observations | 15 |
| Minimum | 0.01 |
| Maximum | 0.778 |
| Mean of Raw Data | 0.131 |
| Standard Deviation of Raw Data | 0.201 |
| Khat | 0.557 |
| Theta hat | 0.234 |
| Kstar | 0.518 |
| Theta star | 0.252 |
| Mean of Log Transformed Data | -3.158 |
| Standard Deviation of Log Transformed Data | 1.525 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.813 |
| Shapiro Wilk Test Statistic | 0.666 |
| Shapiro Wilk Critical (0.05) Value | 0.92 |
| Approximate Shapiro Wilk P Value | 3.9583E-7 |
| Lilliefors Test Statistic | 0.307 |
| Lilliefors Critical (0.05) Value | 0.17 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.978 |
| A-D Test Statistic | 2.03 |
| A-D Critical (0.05) Value | 0.803 |
| K-S Test Statistic | 0.273 |
| K-S Critical(0.05) Value | 0.181 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.926 |
| Shapiro Wilk Test Statistic | 0.837 |
| Shapiro Wilk Critical (0.05) Value | 0.92 |
| Approximate Shapiro Wilk P Value | 5.9881E-4 |
| Lilliefors Test Statistic | 0.206 |
| Lilliefors Critical (0.05) Value | 0.17 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Arsenic (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | Raw Statistics | | | | | | | |
| 61 | | | | | Number of Valid Observations | 42 | | | | | | |
| 62 | | | | | Number of Missing Observations | 1 | | | | | | |
| 63 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 64 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 65 | | | | | Maximum | 0.00341 | | | | | | |
| 66 | | | | | Mean of Raw Data | 8.2881E-4 | | | | | | |
| 67 | | | | | Standard Deviation of Raw Data | 6.7854E-4 | | | | | | |
| 68 | | | | | Khat | 2.837 | | | | | | |
| 69 | | | | | Theta hat | 2.9210E-4 | | | | | | |
| 70 | | | | | Kstar | 2.651 | | | | | | |
| 71 | | | | | Theta star | 3.1268E-4 | | | | | | |
| 72 | | | | | Mean of Log Transformed Data | -7.282 | | | | | | |
| 73 | | | | | Standard Deviation of Log Transformed Data | 0.559 | | | | | | |
| 74 | | | | | | | | | | | | |
| 75 | | | | | Normal GOF Test Results | | | | | | | |
| 76 | | | | | | | | | | | | |
| 77 | | | | | Correlation Coefficient R | 0.771 | | | | | | |
| 78 | | | | | Shapiro Wilk Test Statistic | 0.598 | | | | | | |
| 79 | | | | | Shapiro Wilk Critical (0.05) Value | 0.942 | | | | | | |
| 80 | | | | | Approximate Shapiro Wilk P Value | 1.317E-12 | | | | | | |
| 81 | | | | | Lilliefors Test Statistic | 0.303 | | | | | | |
| 82 | | | | | Lilliefors Critical (0.05) Value | 0.135 | | | | | | |
| 83 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 84 | | | | | | | | | | | | |
| 85 | | | | | Gamma GOF Test Results | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | | | | | Correlation Coefficient R | 0.88 | | | | | | |
| 88 | | | | | A-D Test Statistic | 2.414 | | | | | | |
| 89 | | | | | A-D Critical (0.05) Value | 0.756 | | | | | | |
| 90 | | | | | K-S Test Statistic | 0.222 | | | | | | |
| 91 | | | | | K-S Critical(0.05) Value | 0.137 | | | | | | |
| 92 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 93 | | | | | | | | | | | | |
| 94 | | | | | Lognormal GOF Test Results | | | | | | | |
| 95 | | | | | | | | | | | | |
| 96 | | | | | Correlation Coefficient R | 0.948 | | | | | | |
| 97 | | | | | Shapiro Wilk Test Statistic | 0.879 | | | | | | |
| 98 | | | | | Shapiro Wilk Critical (0.05) Value | 0.942 | | | | | | |
| 99 | | | | | Approximate Shapiro Wilk P Value | 0.00244 | | | | | | |
| 100 | | | | | Lilliefors Test Statistic | 0.171 | | | | | | |
| 101 | | | | | Lilliefors Critical (0.05) Value | 0.135 | | | | | | |
| 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 Significance | | | | | | | | | | | |

| | 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 | | 43 | | | | | | |
| 112 | | | | Number of Distinct Observations | | 28 | | | | | | |
| 113 | | | | Minimum | | 6.0000E-4 | | | | | | |
| 114 | | | | Maximum | | 0.0669 | | | | | | |
| 115 | | | | Mean of Raw Data | | 0.00569 | | | | | | |
| 116 | | | | Standard Deviation of Raw Data | | 0.0113 | | | | | | |
| 117 | | | | Khat | | 0.849 | | | | | | |
| 118 | | | | Theta hat | | 0.00671 | | | | | | |
| 119 | | | | Kstar | | 0.805 | | | | | | |
| 120 | | | | Theta star | | 0.00707 | | | | | | |
| 121 | | | | Mean of Log Transformed Data | | -5.862 | | | | | | |
| 122 | | | | Standard Deviation of Log Transformed Data | | 0.991 | | | | | | |
| 123 | | | | | | | | | | | | |
| 124 | | | | Normal GOF Test Results | | | | | | | | |
| 125 | | | | | | | | | | | | |
| 126 | | | | Correlation Coefficient R | | 0.635 | | | | | | |
| 127 | | | | Shapiro Wilk Test Statistic | | 0.438 | | | | | | |
| 128 | | | | Shapiro Wilk Critical (0.05) Value | | 0.943 | | | | | | |
| 129 | | | | Approximate Shapiro Wilk P Value | | 0 | | | | | | |
| 130 | | | | Lilliefors Test Statistic | | 0.362 | | | | | | |
| 131 | | | | Lilliefors Critical (0.05) Value | | 0.134 | | | | | | |
| 132 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | | | | Gamma GOF Test Results | | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | Correlation Coefficient R | | 0.869 | | | | | | |
| 137 | | | | A-D Test Statistic | | 3.907 | | | | | | |
| 138 | | | | A-D Critical (0.05) Value | | 0.785 | | | | | | |
| 139 | | | | K-S Test Statistic | | 0.28 | | | | | | |
| 140 | | | | K-S Critical(0.05) Value | | 0.14 | | | | | | |
| 141 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 142 | | | | | | | | | | | | |
| 143 | | | | Lognormal GOF Test Results | | | | | | | | |
| 144 | | | | | | | | | | | | |
| 145 | | | | Correlation Coefficient R | | 0.944 | | | | | | |
| 146 | | | | Shapiro Wilk Test Statistic | | 0.897 | | | | | | |
| 147 | | | | Shapiro Wilk Critical (0.05) Value | | 0.943 | | | | | | |
| 148 | | | | Approximate Shapiro Wilk P Value | | 6.3672E-4 | | | | | | |
| 149 | | | | Lilliefors Test Statistic | | 0.197 | | | | | | |
| 150 | | | | Lilliefors Critical (0.05) Value | | 0.134 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 156 | | | | | | | | | | | | |
| 157 | Nickel (mg/L) | | | | | | | | | | | |
| 158 | | | | | | | | | | | | |
| 159 | | | | Raw Statistics | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Number of Valid Observations | 25 | | | | | | |
| 161 | | | | | Number of Missing Observations | 1 | | | | | | |
| 162 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 163 | | | | | Minimum | 0.00111 | | | | | | |
| 164 | | | | | Maximum | 0.0082 | | | | | | |
| 165 | | | | | Mean of Raw Data | 0.00408 | | | | | | |
| 166 | | | | | Standard Deviation of Raw Data | 0.00241 | | | | | | |
| 167 | | | | | Khat | 2.943 | | | | | | |
| 168 | | | | | Theta hat | 0.00139 | | | | | | |
| 169 | | | | | Kstar | 2.617 | | | | | | |
| 170 | | | | | Theta star | 0.00156 | | | | | | |
| 171 | | | | | Mean of Log Transformed Data | -5.681 | | | | | | |
| 172 | | | | | Standard Deviation of Log Transformed Data | 0.626 | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Normal GOF Test Results | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | Correlation Coefficient R | 0.948 | | | | | | |
| 177 | | | | | Shapiro Wilk Test Statistic | 0.878 | | | | | | |
| 178 | | | | | Shapiro Wilk Critical (0.05) Value | 0.918 | | | | | | |
| 179 | | | | | Approximate Shapiro Wilk P Value | 0.00573 | | | | | | |
| 180 | | | | | Lilliefors Test Statistic | 0.193 | | | | | | |
| 181 | | | | | Lilliefors Critical (0.05) Value | 0.173 | | | | | | |
| 182 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 183 | | | | | | | | | | | | |
| 184 | | | | | Gamma GOF Test Results | | | | | | | |
| 185 | | | | | | | | | | | | |
| 186 | | | | | Correlation Coefficient R | 0.954 | | | | | | |
| 187 | | | | | A-D Test Statistic | 0.726 | | | | | | |
| 188 | | | | | A-D Critical (0.05) Value | 0.752 | | | | | | |
| 189 | | | | | K-S Test Statistic | 0.139 | | | | | | |
| 190 | | | | | K-S Critical(0.05) Value | 0.176 | | | | | | |
| 191 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | | | | | Lognormal GOF Test Results | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | | Correlation Coefficient R | 0.974 | | | | | | |
| 196 | | | | | Shapiro Wilk Test Statistic | 0.932 | | | | | | |
| 197 | | | | | Shapiro Wilk Critical (0.05) Value | 0.918 | | | | | | |
| 198 | | | | | Approximate Shapiro Wilk P Value | 0.101 | | | | | | |
| 199 | | | | | Lilliefors Test Statistic | 0.123 | | | | | | |
| 200 | | | | | Lilliefors Critical (0.05) Value | 0.173 | | | | | | |
| 201 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | Zinc (mg/L) | | | | | | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | | | | | Raw Statistics | | | | | | | |
| 206 | | | | | Number of Valid Observations | 26 | | | | | | |
| 207 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 208 | | | | | Minimum | 0.001 | | | | | | |
| 209 | | | | | Maximum | 0.0345 | | | | | | |
| 210 | | | | | Mean of Raw Data | 0.00787 | | | | | | |
| 211 | | | | | Standard Deviation of Raw Data | 0.00884 | | | | | | |
| 212 | | | | | Khat | 1.195 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Theta hat | 0.00658 | | | | | | |
| 214 | | | | | Kstar | 1.083 | | | | | | |
| 215 | | | | | Theta star | 0.00726 | | | | | | |
| 216 | | | | | Mean of Log Transformed Data | -5.319 | | | | | | |
| 217 | | | | | Standard Deviation of Log Transformed Data | 0.969 | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | | Normal GOF Test Results | | | | | | | |
| 220 | | | | | | | | | | | | |
| 221 | | | | | Correlation Coefficient R | 0.842 | | | | | | |
| 222 | | | | | Shapiro Wilk Test Statistic | 0.713 | | | | | | |
| 223 | | | | | Shapiro Wilk Critical (0.05) Value | 0.92 | | | | | | |
| 224 | | | | | Approximate Shapiro Wilk P Value | 2.3674E-6 | | | | | | |
| 225 | | | | | Lilliefors Test Statistic | 0.24 | | | | | | |
| 226 | | | | | Lilliefors Critical (0.05) Value | 0.17 | | | | | | |
| 227 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | | Gamma GOF Test Results | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | | | | | Correlation Coefficient R | 0.966 | | | | | | |
| 232 | | | | | A-D Test Statistic | 0.845 | | | | | | |
| 233 | | | | | A-D Critical (0.05) Value | 0.769 | | | | | | |
| 234 | | | | | K-S Test Statistic | 0.187 | | | | | | |
| 235 | | | | | K-S Critical(0.05) Value | 0.176 | | | | | | |
| 236 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | | | | | Lognormal GOF Test Results | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | | Correlation Coefficient R | 0.987 | | | | | | |
| 241 | | | | | Shapiro Wilk Test Statistic | 0.963 | | | | | | |
| 242 | | | | | Shapiro Wilk Critical (0.05) Value | 0.92 | | | | | | |
| 243 | | | | | Approximate Shapiro Wilk P Value | 0.483 | | | | | | |
| 244 | | | | | Lilliefors Test Statistic | 0.13 | | | | | | |
| 245 | | | | | Lilliefors Critical (0.05) Value | 0.17 | | | | | | |
| 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 5.2 2023-12-13 11:06:04 AM | |
| From File | 2023-IntermediateProUCL-1_f.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

06R-IN

Iron (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 24 |
| Number of Distinct Observations | 17 |
| Minimum | 0.01 |
| Maximum | 3.05 |
| Mean of Raw Data | 0.578 |
| Standard Deviation of Raw Data | 0.782 |
| Khat | 0.45 |
| Theta hat | 1.285 |
| Kstar | 0.421 |
| Theta star | 1.372 |
| Mean of Log Transformed Data | -1.983 |
| Standard Deviation of Log Transformed Data | 2.112 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.868 |
| Shapiro Wilk Test Statistic | 0.758 |
| Shapiro Wilk Critical (0.05) Value | 0.916 |
| Approximate Shapiro Wilk P Value | 2.9006E-5 |
| Lilliefors Test Statistic | 0.249 |
| Lilliefors Critical (0.05) Value | 0.177 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.985 |
| A-D Test Statistic | 0.942 |
| A-D Critical (0.05) Value | 0.818 |
| K-S Test Statistic | 0.202 |
| K-S Critical(0.05) Value | 0.189 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.937 |
| Shapiro Wilk Test Statistic | 0.855 |
| Shapiro Wilk Critical (0.05) Value | 0.916 |
| Approximate Shapiro Wilk P Value | 0.00219 |
| Lilliefors Test Statistic | 0.194 |
| Lilliefors Critical (0.05) Value | 0.177 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Manganese (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | Raw Statistics | | | | | | | | |
| 61 | | | | Number of Valid Observations | | 24 | | | | | | |
| 62 | | | | Number of Distinct Observations | | 22 | | | | | | |
| 63 | | | | Minimum | | 0.001 | | | | | | |
| 64 | | | | Maximum | | 3.34 | | | | | | |
| 65 | | | | Mean of Raw Data | | 1.279 | | | | | | |
| 66 | | | | Standard Deviation of Raw Data | | 0.828 | | | | | | |
| 67 | | | | Khat | | 0.858 | | | | | | |
| 68 | | | | Theta hat | | 1.491 | | | | | | |
| 69 | | | | Kstar | | 0.779 | | | | | | |
| 70 | | | | Theta star | | 1.643 | | | | | | |
| 71 | | | | Mean of Log Transformed Data | | -0.439 | | | | | | |
| 72 | | | | Standard Deviation of Log Transformed Data | | 1.998 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | Normal GOF Test Results | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | Correlation Coefficient R | | 0.982 | | | | | | |
| 77 | | | | Shapiro Wilk Test Statistic | | 0.962 | | | | | | |
| 78 | | | | Shapiro Wilk Critical (0.05) Value | | 0.916 | | | | | | |
| 79 | | | | Approximate Shapiro Wilk P Value | | 0.495 | | | | | | |
| 80 | | | | Lilliefors Test Statistic | | 0.1 | | | | | | |
| 81 | | | | Lilliefors Critical (0.05) Value | | 0.177 | | | | | | |
| 82 | Data appear Normal at (0.05) Significance Level | | | | | | | | | | | |
| 83 | | | | | | | | | | | | |
| 84 | | | | Gamma GOF Test Results | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | | | | Correlation Coefficient R | | 0.926 | | | | | | |
| 87 | | | | A-D Test Statistic | | 2.082 | | | | | | |
| 88 | | | | A-D Critical (0.05) Value | | 0.778 | | | | | | |
| 89 | | | | K-S Test Statistic | | 0.27 | | | | | | |
| 90 | | | | K-S Critical(0.05) Value | | 0.184 | | | | | | |
| 91 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | Lognormal GOF Test Results | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | Correlation Coefficient R | | 0.797 | | | | | | |
| 96 | | | | Shapiro Wilk Test Statistic | | 0.646 | | | | | | |
| 97 | | | | Shapiro Wilk Critical (0.05) Value | | 0.916 | | | | | | |
| 98 | | | | Approximate Shapiro Wilk P Value | | 4.4430E-7 | | | | | | |
| 99 | | | | Lilliefors Test Statistic | | 0.279 | | | | | | |
| 100 | | | | Lilliefors Critical (0.05) Value | | 0.177 | | | | | | |
| 101 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Arsenic (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | Number of Valid Observations | | 47 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 29 | | | | | | |
| 108 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 109 | | | | | Maximum | 0.0151 | | | | | | |
| 110 | | | | | Mean of Raw Data | 0.00175 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.00294 | | | | | | |
| 112 | | | | | Khat | 0.939 | | | | | | |
| 113 | | | | | Theta hat | 0.00186 | | | | | | |
| 114 | | | | | Kstar | 0.894 | | | | | | |
| 115 | | | | | Theta star | 0.00196 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -6.968 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 0.967 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.693 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.502 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.946 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 0 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.299 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.128 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.902 | | | | | | |
| 132 | | | | | A-D Test Statistic | 3.752 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.781 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.197 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.133 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.949 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.899 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.946 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 3.8839E-4 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.169 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.128 | | | | | | |
| 146 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | Copper (mg/L) | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | | | | | Raw Statistics | | | | | | | |
| 155 | | | | | Number of Valid Observations | 47 | | | | | | |
| 156 | | | | | Number of Distinct Observations | 22 | | | | | | |
| 157 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 158 | | | | | Maximum | 0.0171 | | | | | | |
| 159 | | | | | Mean of Raw Data | 0.00295 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Standard Deviation of Raw Data | 0.0035 | | | | | | |
| 161 | | | | | Khat | 1.088 | | | | | | |
| 162 | | | | | Theta hat | 0.00271 | | | | | | |
| 163 | | | | | Kstar | 1.033 | | | | | | |
| 164 | | | | | Theta star | 0.00285 | | | | | | |
| 165 | | | | | Mean of Log Transformed Data | -6.352 | | | | | | |
| 166 | | | | | Standard Deviation of Log Transformed Data | 1.082 | | | | | | |
| 167 | | | | | | | | | | | | |
| 168 | | | | | Normal GOF Test Results | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | | | | | Correlation Coefficient R | 0.806 | | | | | | |
| 171 | | | | | Shapiro Wilk Test Statistic | 0.663 | | | | | | |
| 172 | | | | | Shapiro Wilk Critical (0.05) Value | 0.946 | | | | | | |
| 173 | | | | | Approximate Shapiro Wilk P Value | 7.803E-13 | | | | | | |
| 174 | | | | | Lilliefors Test Statistic | 0.254 | | | | | | |
| 175 | | | | | Lilliefors Critical (0.05) Value | 0.128 | | | | | | |
| 176 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | | | | | Gamma GOF Test Results | | | | | | | |
| 179 | | | | | | | | | | | | |
| 180 | | | | | Correlation Coefficient R | 0.945 | | | | | | |
| 181 | | | | | A-D Test Statistic | 1.04 | | | | | | |
| 182 | | | | | A-D Critical (0.05) Value | 0.776 | | | | | | |
| 183 | | | | | K-S Test Statistic | 0.135 | | | | | | |
| 184 | | | | | K-S Critical(0.05) Value | 0.133 | | | | | | |
| 185 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 186 | | | | | | | | | | | | |
| 187 | | | | | Lognormal GOF Test Results | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | | | | | Correlation Coefficient R | 0.978 | | | | | | |
| 190 | | | | | Shapiro Wilk Test Statistic | 0.945 | | | | | | |
| 191 | | | | | Shapiro Wilk Critical (0.05) Value | 0.946 | | | | | | |
| 192 | | | | | Approximate Shapiro Wilk P Value | 0.0439 | | | | | | |
| 193 | | | | | Lilliefors Test Statistic | 0.149 | | | | | | |
| 194 | | | | | Lilliefors Critical (0.05) Value | 0.128 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | Nickel (mg/L) | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | | | | | Raw Statistics | | | | | | | |
| 204 | | | | | Number of Valid Observations | 25 | | | | | | |
| 205 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 206 | | | | | Minimum | 0.0016 | | | | | | |
| 207 | | | | | Maximum | 0.108 | | | | | | |
| 208 | | | | | Mean of Raw Data | 0.0188 | | | | | | |
| 209 | | | | | Standard Deviation of Raw Data | 0.0214 | | | | | | |
| 210 | | | | | Khat | 1.319 | | | | | | |
| 211 | | | | | Theta hat | 0.0142 | | | | | | |
| 212 | | | | | Kstar | 1.187 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Theta star | 0.0158 | | | | | | |
| 214 | | | | | Mean of Log Transformed Data | -4.4 | | | | | | |
| 215 | | | | | Standard Deviation of Log Transformed Data | 0.945 | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | Normal GOF Test Results | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | | Correlation Coefficient R | 0.793 | | | | | | |
| 220 | | | | | Shapiro Wilk Test Statistic | 0.655 | | | | | | |
| 221 | | | | | Shapiro Wilk Critical (0.05) Value | 0.918 | | | | | | |
| 222 | | | | | Approximate Shapiro Wilk P Value | 3.9325E-7 | | | | | | |
| 223 | | | | | Lilliefors Test Statistic | 0.212 | | | | | | |
| 224 | | | | | Lilliefors Critical (0.05) Value | 0.173 | | | | | | |
| 225 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 226 | | | | | | | | | | | | |
| 227 | | | | | Gamma GOF Test Results | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | | Correlation Coefficient R | 0.927 | | | | | | |
| 230 | | | | | A-D Test Statistic | 0.34 | | | | | | |
| 231 | | | | | A-D Critical (0.05) Value | 0.766 | | | | | | |
| 232 | | | | | K-S Test Statistic | 0.0948 | | | | | | |
| 233 | | | | | K-S Critical(0.05) Value | 0.178 | | | | | | |
| 234 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 235 | | | | | | | | | | | | |
| 236 | | | | | Lognormal GOF Test Results | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | | | | | Correlation Coefficient R | 0.992 | | | | | | |
| 239 | | | | | Shapiro Wilk Test Statistic | 0.989 | | | | | | |
| 240 | | | | | Shapiro Wilk Critical (0.05) Value | 0.918 | | | | | | |
| 241 | | | | | Approximate Shapiro Wilk P Value | 0.991 | | | | | | |
| 242 | | | | | Lilliefors Test Statistic | 0.0899 | | | | | | |
| 243 | | | | | Lilliefors Critical (0.05) Value | 0.173 | | | | | | |
| 244 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 245 | | | | | | | | | | | | |
| 246 | Zinc (mg/L) | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | | | | | Raw Statistics | | | | | | | |
| 249 | | | | | Number of Valid Observations | 25 | | | | | | |
| 250 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 251 | | | | | Minimum | 0.001 | | | | | | |
| 252 | | | | | Maximum | 0.201 | | | | | | |
| 253 | | | | | Mean of Raw Data | 0.0311 | | | | | | |
| 254 | | | | | Standard Deviation of Raw Data | 0.0529 | | | | | | |
| 255 | | | | | Khat | 0.598 | | | | | | |
| 256 | | | | | Theta hat | 0.052 | | | | | | |
| 257 | | | | | Kstar | 0.553 | | | | | | |
| 258 | | | | | Theta star | 0.0562 | | | | | | |
| 259 | | | | | Mean of Log Transformed Data | -4.504 | | | | | | |
| 260 | | | | | Standard Deviation of Log Transformed Data | 1.521 | | | | | | |
| 261 | | | | | | | | | | | | |
| 262 | | | | | Normal GOF Test Results | | | | | | | |
| 263 | | | | | | | | | | | | |
| 264 | | | | | Correlation Coefficient R | 0.743 | | | | | | |
| 265 | | | | | Shapiro Wilk Test Statistic | 0.562 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | Shapiro Wilk Critical (0.05) Value | 0.918 | | | | | | |
| 267 | | | | | Approximate Shapiro Wilk P Value | 1.6917E-8 | | | | | | |
| 268 | | | | | Lilliefors Test Statistic | 0.311 | | | | | | |
| 269 | | | | | Lilliefors Critical (0.05) Value | 0.173 | | | | | | |
| 270 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | | | | Gamma GOF Test Results | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | | | | | Correlation Coefficient R | 0.933 | | | | | | |
| 275 | | | | | A-D Test Statistic | 0.788 | | | | | | |
| 276 | | | | | A-D Critical (0.05) Value | 0.798 | | | | | | |
| 277 | | | | | K-S Test Statistic | 0.14 | | | | | | |
| 278 | | | | | K-S Critical(0.05) Value | 0.183 | | | | | | |
| 279 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | | | | Lognormal GOF Test Results | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | | | | | Correlation Coefficient R | 0.984 | | | | | | |
| 284 | | | | | Shapiro Wilk Test Statistic | 0.955 | | | | | | |
| 285 | | | | | Shapiro Wilk Critical (0.05) Value | 0.918 | | | | | | |
| 286 | | | | | Approximate Shapiro Wilk P Value | 0.337 | | | | | | |
| 287 | | | | | Lilliefors Test Statistic | 0.103 | | | | | | |
| 288 | | | | | Lilliefors Critical (0.05) Value | 0.173 | | | | | | |
| 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 5.2 2023-12-13 11:10:10 AM | |
| From File | 2023-IntermediateProUCL-1_g.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

07-IN

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 50 |
| Number of Distinct Observations | 20 |
| Minimum | 1.0000E-5 |
| Maximum | 2.9 |
| Mean of Raw Data | 0.837 |
| Standard Deviation of Raw Data | 0.602 |
| Khat | 1.276 |
| Theta hat | 0.656 |
| Kstar | 1.213 |
| Theta star | 0.69 |
| Mean of Log Transformed Data | -0.619 |
| Standard Deviation of Log Transformed Data | 1.771 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.884 |
| Shapiro Wilk Test Statistic | 0.79 |
| Shapiro Wilk Critical (0.05) Value | 0.947 |
| Approximate Shapiro Wilk P Value | 4.0939E-9 |
| Lilliefors Test Statistic | 0.253 |
| Lilliefors Critical (0.05) Value | 0.125 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.966 |
| A-D Test Statistic | 4.15 |
| A-D Critical (0.05) Value | 0.773 |
| K-S Test Statistic | 0.31 |
| K-S Critical(0.05) Value | 0.128 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.646 |
| Shapiro Wilk Test Statistic | 0.464 |
| Shapiro Wilk Critical (0.05) Value | 0.947 |
| Approximate Shapiro Wilk P Value | 0 |
| Lilliefors Test Statistic | 0.383 |
| Lilliefors Critical (0.05) Value | 0.125 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Iron (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | Raw Statistics | | | | | | | | |
| 61 | | | | Number of Valid Observations | | 25 | | | | | | |
| 62 | | | | Number of Distinct Observations | | 19 | | | | | | |
| 63 | | | | Minimum | | 0.01 | | | | | | |
| 64 | | | | Maximum | | 0.737 | | | | | | |
| 65 | | | | Mean of Raw Data | | 0.224 | | | | | | |
| 66 | | | | Standard Deviation of Raw Data | | 0.229 | | | | | | |
| 67 | | | | Khat | | 0.829 | | | | | | |
| 68 | | | | Theta hat | | 0.271 | | | | | | |
| 69 | | | | Kstar | | 0.757 | | | | | | |
| 70 | | | | Theta star | | 0.297 | | | | | | |
| 71 | | | | Mean of Log Transformed Data | | -2.206 | | | | | | |
| 72 | | | | Standard Deviation of Log Transformed Data | | 1.415 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | Normal GOF Test Results | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | Correlation Coefficient R | | 0.92 | | | | | | |
| 77 | | | | Shapiro Wilk Test Statistic | | 0.833 | | | | | | |
| 78 | | | | Shapiro Wilk Critical (0.05) Value | | 0.918 | | | | | | |
| 79 | | | | Approximate Shapiro Wilk P Value | | 6.1487E-4 | | | | | | |
| 80 | | | | Lilliefors Test Statistic | | 0.177 | | | | | | |
| 81 | | | | Lilliefors Critical (0.05) Value | | 0.173 | | | | | | |
| 82 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 83 | | | | | | | | | | | | |
| 84 | | | | Gamma GOF Test Results | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | | | | Correlation Coefficient R | | 0.963 | | | | | | |
| 87 | | | | A-D Test Statistic | | 0.373 | | | | | | |
| 88 | | | | A-D Critical (0.05) Value | | 0.78 | | | | | | |
| 89 | | | | K-S Test Statistic | | 0.0921 | | | | | | |
| 90 | | | | K-S Critical(0.05) Value | | 0.181 | | | | | | |
| 91 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | Lognormal GOF Test Results | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | Correlation Coefficient R | | 0.967 | | | | | | |
| 96 | | | | Shapiro Wilk Test Statistic | | 0.915 | | | | | | |
| 97 | | | | Shapiro Wilk Critical (0.05) Value | | 0.918 | | | | | | |
| 98 | | | | Approximate Shapiro Wilk P Value | | 0.0407 | | | | | | |
| 99 | | | | Lilliefors Test Statistic | | 0.143 | | | | | | |
| 100 | | | | Lilliefors Critical (0.05) Value | | 0.173 | | | | | | |
| 101 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Copper (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | Number of Valid Observations | | 48 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 25 | | | | | | |
| 108 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 109 | | | | | Maximum | 0.0061 | | | | | | |
| 110 | | | | | Mean of Raw Data | 0.00214 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.00151 | | | | | | |
| 112 | | | | | Khat | 1.802 | | | | | | |
| 113 | | | | | Theta hat | 0.00119 | | | | | | |
| 114 | | | | | Kstar | 1.703 | | | | | | |
| 115 | | | | | Theta star | 0.00126 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -6.448 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 0.864 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.956 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.9 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.947 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 4.0870E-4 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.2 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.127 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.976 | | | | | | |
| 132 | | | | | A-D Test Statistic | 1.038 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.764 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.157 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.13 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.965 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.918 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.947 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 0.00255 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.151 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.127 | | | | | | |
| 146 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | Nickel (mg/L) | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | | | | | Raw Statistics | | | | | | | |
| 155 | | | | | Number of Valid Observations | 26 | | | | | | |
| 156 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 157 | | | | | Minimum | 0.002 | | | | | | |
| 158 | | | | | Maximum | 0.0191 | | | | | | |
| 159 | | | | | Mean of Raw Data | 0.00506 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Standard Deviation of Raw Data | 0.00356 | | | | | | |
| 161 | | | | | Khat | 3.798 | | | | | | |
| 162 | | | | | Theta hat | 0.00133 | | | | | | |
| 163 | | | | | Kstar | 3.385 | | | | | | |
| 164 | | | | | Theta star | 0.00149 | | | | | | |
| 165 | | | | | Mean of Log Transformed Data | -5.424 | | | | | | |
| 166 | | | | | Standard Deviation of Log Transformed Data | 0.48 | | | | | | |
| 167 | | | | | | | | | | | | |
| 168 | | | | | Normal GOF Test Results | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | | | | | Correlation Coefficient R | 0.769 | | | | | | |
| 171 | | | | | Shapiro Wilk Test Statistic | 0.615 | | | | | | |
| 172 | | | | | Shapiro Wilk Critical (0.05) Value | 0.92 | | | | | | |
| 173 | | | | | Approximate Shapiro Wilk P Value | 6.0888E-8 | | | | | | |
| 174 | | | | | Lilliefors Test Statistic | 0.308 | | | | | | |
| 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 | 0.869 | | | | | | |
| 181 | | | | | A-D Test Statistic | 1.869 | | | | | | |
| 182 | | | | | A-D Critical (0.05) Value | 0.748 | | | | | | |
| 183 | | | | | K-S Test Statistic | 0.239 | | | | | | |
| 184 | | | | | K-S Critical(0.05) Value | 0.172 | | | | | | |
| 185 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 186 | | | | | | | | | | | | |
| 187 | | | | | Lognormal GOF Test Results | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | | | | | Correlation Coefficient R | 0.928 | | | | | | |
| 190 | | | | | Shapiro Wilk Test Statistic | 0.875 | | | | | | |
| 191 | | | | | Shapiro Wilk Critical (0.05) Value | 0.92 | | | | | | |
| 192 | | | | | Approximate Shapiro Wilk P Value | 0.00398 | | | | | | |
| 193 | | | | | Lilliefors Test Statistic | 0.194 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | Zinc (mg/L) | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | | | | | Raw Statistics | | | | | | | |
| 204 | | | | | Number of Valid Observations | 26 | | | | | | |
| 205 | | | | | Number of Distinct Observations | 26 | | | | | | |
| 206 | | | | | Minimum | 0.0013 | | | | | | |
| 207 | | | | | Maximum | 0.159 | | | | | | |
| 208 | | | | | Mean of Raw Data | 0.0143 | | | | | | |
| 209 | | | | | Standard Deviation of Raw Data | 0.0302 | | | | | | |
| 210 | | | | | Khat | 0.92 | | | | | | |
| 211 | | | | | Theta hat | 0.0155 | | | | | | |
| 212 | | | | | Kstar | 0.84 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Theta star | 0.017 | | | | | | |
| 214 | | | | | Mean of Log Transformed Data | -4.884 | | | | | | |
| 215 | | | | | Standard Deviation of Log Transformed Data | 0.929 | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | Normal GOF Test Results | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | | Correlation Coefficient R | 0.572 | | | | | | |
| 220 | | | | | Shapiro Wilk Test Statistic | 0.36 | | | | | | |
| 221 | | | | | Shapiro Wilk Critical (0.05) Value | 0.92 | | | | | | |
| 222 | | | | | Approximate Shapiro Wilk P Value | 2.575E-11 | | | | | | |
| 223 | | | | | Lilliefors Test Statistic | 0.358 | | | | | | |
| 224 | | | | | Lilliefors Critical (0.05) Value | 0.17 | | | | | | |
| 225 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 226 | | | | | | | | | | | | |
| 227 | | | | | Gamma GOF Test Results | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | | Correlation Coefficient R | 0.788 | | | | | | |
| 230 | | | | | A-D Test Statistic | 2.259 | | | | | | |
| 231 | | | | | A-D Critical (0.05) Value | 0.777 | | | | | | |
| 232 | | | | | K-S Test Statistic | 0.26 | | | | | | |
| 233 | | | | | K-S Critical(0.05) Value | 0.177 | | | | | | |
| 234 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 235 | | | | | | | | | | | | |
| 236 | | | | | Lognormal GOF Test Results | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | | | | | Correlation Coefficient R | 0.947 | | | | | | |
| 239 | | | | | Shapiro Wilk Test Statistic | 0.918 | | | | | | |
| 240 | | | | | Shapiro Wilk Critical (0.05) Value | 0.92 | | | | | | |
| 241 | | | | | Approximate Shapiro Wilk P Value | 0.042 | | | | | | |
| 242 | | | | | Lilliefors Test Statistic | 0.151 | | | | | | |
| 243 | | | | | Lilliefors Critical (0.05) Value | 0.17 | | | | | | |
| 244 | 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 5.2 2023-12-13 11:12:02 AM | |
| From File | 2023-IntermediateProUCL-1_h.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

08-IN

Manganese (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 20 |
| Number of Distinct Observations | 18 |
| Minimum | 0.0019 |
| Maximum | 1.09 |
| Mean of Raw Data | 0.198 |
| Standard Deviation of Raw Data | 0.361 |
| Khat | 0.397 |
| Theta hat | 0.498 |
| Kstar | 0.37 |
| Theta star | 0.534 |
| Mean of Log Transformed Data | -3.283 |
| Standard Deviation of Log Transformed Data | 2.041 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.75 |
| Shapiro Wilk Test Statistic | 0.564 |
| Shapiro Wilk Critical (0.05) Value | 0.905 |
| Approximate Shapiro Wilk P Value | 1.3088E-7 |
| Lilliefors Test Statistic | 0.362 |
| Lilliefors Critical (0.05) Value | 0.192 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.919 |
| A-D Test Statistic | 0.981 |
| A-D Critical (0.05) Value | 0.824 |
| K-S Test Statistic | 0.159 |
| K-S Critical(0.05) Value | 0.208 |

Data follow Appr. Gamma Distribution at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.976 |
| Shapiro Wilk Test Statistic | 0.936 |
| Shapiro Wilk Critical (0.05) Value | 0.905 |
| Approximate Shapiro Wilk P Value | 0.237 |
| Lilliefors Test Statistic | 0.138 |
| Lilliefors Critical (0.05) Value | 0.192 |

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 | 37 | | | | | | |
| 58 | | | | | Number of Distinct Observations | 21 | | | | | | |
| 59 | | | | | Minimum | 6.6000E-4 | | | | | | |
| 60 | | | | | Maximum | 0.075 | | | | | | |
| 61 | | | | | Mean of Raw Data | 0.00609 | | | | | | |
| 62 | | | | | Standard Deviation of Raw Data | 0.0141 | | | | | | |
| 63 | | | | | Khat | 0.617 | | | | | | |
| 64 | | | | | Theta hat | 0.00987 | | | | | | |
| 65 | | | | | Kstar | 0.585 | | | | | | |
| 66 | | | | | Theta star | 0.0104 | | | | | | |
| 67 | | | | | Mean of Log Transformed Data | -6.097 | | | | | | |
| 68 | | | | | Standard Deviation of Log Transformed Data | 1.17 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Correlation Coefficient R | 0.624 | | | | | | |
| 73 | | | | | Shapiro Wilk Test Statistic | 0.418 | | | | | | |
| 74 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk P Value | 1.121E-14 | | | | | | |
| 76 | | | | | Lilliefors Test Statistic | 0.396 | | | | | | |
| 77 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | Correlation Coefficient R | 0.892 | | | | | | |
| 83 | | | | | A-D Test Statistic | 4.543 | | | | | | |
| 84 | | | | | A-D Critical (0.05) Value | 0.801 | | | | | | |
| 85 | | | | | K-S Test Statistic | 0.253 | | | | | | |
| 86 | | | | | K-S Critical(0.05) Value | 0.152 | | | | | | |
| 87 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | | Correlation Coefficient R | 0.899 | | | | | | |
| 92 | | | | | Shapiro Wilk Test Statistic | 0.807 | | | | | | |
| 93 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 3.8068E-6 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.235 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Copper (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | | Number of Valid Observations | 37 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 108 | | | | | Minimum | 7.2000E-4 | | | | | | |
| 109 | | | | | Maximum | 0.028 | | | | | | |
| 110 | | | | | Mean of Raw Data | 0.00485 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.00623 | | | | | | |
| 112 | | | | | Khat | 1.108 | | | | | | |
| 113 | | | | | Theta hat | 0.00438 | | | | | | |
| 114 | | | | | Kstar | 1.037 | | | | | | |
| 115 | | | | | Theta star | 0.00468 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -5.843 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 0.968 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.791 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.636 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 2.202E-10 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.295 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.95 | | | | | | |
| 132 | | | | | A-D Test Statistic | 1.434 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.775 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.166 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.149 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.977 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.941 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.936 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 0.0653 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.117 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.144 | | | | | | |
| 146 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Zinc (mg/L) | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | | | | | Raw Statistics | | | | | | | |
| 151 | | | | | Number of Valid Observations | 18 | | | | | | |
| 152 | | | | | Number of Distinct Observations | 17 | | | | | | |
| 153 | | | | | Minimum | 0.001 | | | | | | |
| 154 | | | | | Maximum | 0.0198 | | | | | | |
| 155 | | | | | Mean of Raw Data | 0.007 | | | | | | |
| 156 | | | | | Standard Deviation of Raw Data | 0.00676 | | | | | | |
| 157 | | | | | Khat | 1.312 | | | | | | |
| 158 | | | | | Theta hat | 0.00534 | | | | | | |
| 159 | | | | | Kstar | 1.13 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Theta star | 0.00619 | | | | | | |
| 161 | | | | | Mean of Log Transformed Data | -5.389 | | | | | | |
| 162 | | | | | Standard Deviation of Log Transformed Data | 0.953 | | | | | | |
| 163 | | | | | | | | | | | | |
| 164 | | | | Normal GOF Test Results | | | | | | | | |
| 165 | | | | | | | | | | | | |
| 166 | | | | | Correlation Coefficient R | 0.883 | | | | | | |
| 167 | | | | | Shapiro Wilk Test Statistic | 0.766 | | | | | | |
| 168 | | | | | Shapiro Wilk Critical (0.05) Value | 0.897 | | | | | | |
| 169 | | | | | Approximate Shapiro Wilk P Value | 3.4768E-4 | | | | | | |
| 170 | | | | | Lilliefors Test Statistic | 0.277 | | | | | | |
| 171 | | | | | Lilliefors Critical (0.05) Value | 0.202 | | | | | | |
| 172 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | Gamma GOF Test Results | | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | Correlation Coefficient R | 0.941 | | | | | | |
| 177 | | | | | A-D Test Statistic | 0.787 | | | | | | |
| 178 | | | | | A-D Critical (0.05) Value | 0.76 | | | | | | |
| 179 | | | | | K-S Test Statistic | 0.187 | | | | | | |
| 180 | | | | | K-S Critical(0.05) Value | 0.208 | | | | | | |
| 181 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | | | | Lognormal GOF Test Results | | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | | | | | Correlation Coefficient R | 0.976 | | | | | | |
| 186 | | | | | Shapiro Wilk Test Statistic | 0.936 | | | | | | |
| 187 | | | | | Shapiro Wilk Critical (0.05) Value | 0.897 | | | | | | |
| 188 | | | | | Approximate Shapiro Wilk P Value | 0.297 | | | | | | |
| 189 | | | | | Lilliefors Test Statistic | 0.128 | | | | | | |
| 190 | | | | | Lilliefors Critical (0.05) Value | 0.202 | | | | | | |
| 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 5.2 2023-12-13 11:14:27 AM | |
| From File | 2023-IntermediateProUCL-1_i.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

11-IN

Iron (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 28 |
| Number of Distinct Observations | 20 |
| Minimum | 0.01 |
| Maximum | 2.79 |
| Mean of Raw Data | 0.384 |
| Standard Deviation of Raw Data | 0.592 |
| Khat | 0.519 |
| Theta hat | 0.739 |
| Kstar | 0.487 |
| Theta star | 0.788 |
| Mean of Log Transformed Data | -2.175 |
| Standard Deviation of Log Transformed Data | 1.763 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.803 |
| Shapiro Wilk Test Statistic | 0.664 |
| Shapiro Wilk Critical (0.05) Value | 0.924 |
| Approximate Shapiro Wilk P Value | 1.4526E-7 |
| Lilliefors Test Statistic | 0.264 |
| Lilliefors Critical (0.05) Value | 0.164 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.98 |
| A-D Test Statistic | 0.903 |
| A-D Critical (0.05) Value | 0.808 |
| K-S Test Statistic | 0.188 |
| K-S Critical(0.05) Value | 0.175 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.967 |
| Shapiro Wilk Test Statistic | 0.916 |
| Shapiro Wilk Critical (0.05) Value | 0.924 |
| Approximate Shapiro Wilk P Value | 0.0308 |
| Lilliefors Test Statistic | 0.157 |
| Lilliefors Critical (0.05) Value | 0.164 |

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 | 34 | | | | | | |
| 58 | | | | | Number of Distinct Observations | 28 | | | | | | |
| 59 | | | | | Minimum | 1.6000E-4 | | | | | | |
| 60 | | | | | Maximum | 0.0033 | | | | | | |
| 61 | | | | | Mean of Raw Data | 0.001 | | | | | | |
| 62 | | | | | Standard Deviation of Raw Data | 7.2074E-4 | | | | | | |
| 63 | | | | | Khat | 2.216 | | | | | | |
| 64 | | | | | Theta hat | 4.5280E-4 | | | | | | |
| 65 | | | | | Kstar | 2.04 | | | | | | |
| 66 | | | | | Theta star | 4.9185E-4 | | | | | | |
| 67 | | | | | Mean of Log Transformed Data | -7.147 | | | | | | |
| 68 | | | | | Standard Deviation of Log Transformed Data | 0.731 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Correlation Coefficient R | 0.93 | | | | | | |
| 73 | | | | | Shapiro Wilk Test Statistic | 0.868 | | | | | | |
| 74 | | | | | Shapiro Wilk Critical (0.05) Value | 0.933 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk P Value | 5.2759E-4 | | | | | | |
| 76 | | | | | Lilliefors Test Statistic | 0.175 | | | | | | |
| 77 | | | | | Lilliefors Critical (0.05) Value | 0.15 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | Correlation Coefficient R | 0.991 | | | | | | |
| 83 | | | | | A-D Test Statistic | 0.215 | | | | | | |
| 84 | | | | | A-D Critical (0.05) Value | 0.758 | | | | | | |
| 85 | | | | | K-S Test Statistic | 0.0902 | | | | | | |
| 86 | | | | | K-S Critical(0.05) Value | 0.153 | | | | | | |
| 87 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | | Correlation Coefficient R | 0.992 | | | | | | |
| 92 | | | | | Shapiro Wilk Test Statistic | 0.978 | | | | | | |
| 93 | | | | | Shapiro Wilk Critical (0.05) Value | 0.933 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 0.768 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.0775 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.15 | | | | | | |
| 97 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | Copper (mg/L) | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | Raw Statistics | | | | | | | | |
| 102 | | | | | Number of Valid Observations | 34 | | | | | | |
| 103 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 104 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 105 | | | | | Maximum | 0.0082 | | | | | | |
| 106 | | | | | Mean of Raw Data | 0.00212 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Standard Deviation of Raw Data | 0.00194 | | | | | | |
| 108 | | | | | Khat | 1.379 | | | | | | |
| 109 | | | | | Theta hat | 0.00154 | | | | | | |
| 110 | | | | | Kstar | 1.277 | | | | | | |
| 111 | | | | | Theta star | 0.00166 | | | | | | |
| 112 | | | | | Mean of Log Transformed Data | -6.56 | | | | | | |
| 113 | | | | | Standard Deviation of Log Transformed Data | 0.968 | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | | Normal GOF Test Results | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | | | | | Correlation Coefficient R | 0.903 | | | | | | |
| 118 | | | | | Shapiro Wilk Test Statistic | 0.817 | | | | | | |
| 119 | | | | | Shapiro Wilk Critical (0.05) Value | 0.933 | | | | | | |
| 120 | | | | | Approximate Shapiro Wilk P Value | 2.0267E-5 | | | | | | |
| 121 | | | | | Lilliefors Test Statistic | 0.204 | | | | | | |
| 122 | | | | | Lilliefors Critical (0.05) Value | 0.15 | | | | | | |
| 123 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | | Gamma GOF Test Results | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | | Correlation Coefficient R | 0.988 | | | | | | |
| 128 | | | | | A-D Test Statistic | 0.521 | | | | | | |
| 129 | | | | | A-D Critical (0.05) Value | 0.768 | | | | | | |
| 130 | | | | | K-S Test Statistic | 0.127 | | | | | | |
| 131 | | | | | K-S Critical(0.05) Value | 0.154 | | | | | | |
| 132 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | | | | | Lognormal GOF Test Results | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | Correlation Coefficient R | 0.983 | | | | | | |
| 137 | | | | | Shapiro Wilk Test Statistic | 0.956 | | | | | | |
| 138 | | | | | Shapiro Wilk Critical (0.05) Value | 0.933 | | | | | | |
| 139 | | | | | Approximate Shapiro Wilk P Value | 0.227 | | | | | | |
| 140 | | | | | Lilliefors Test Statistic | 0.154 | | | | | | |
| 141 | | | | | Lilliefors Critical (0.05) Value | 0.15 | | | | | | |
| 142 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | Nickel (mg/L) | | | | | | | | | | | |
| 145 | | | | | | | | | | | | |
| 146 | | | | | Raw Statistics | | | | | | | |
| 147 | | | | | Number of Valid Observations | 30 | | | | | | |
| 148 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 149 | | | | | Minimum | 0.00203 | | | | | | |
| 150 | | | | | Maximum | 0.0744 | | | | | | |
| 151 | | | | | Mean of Raw Data | 0.0137 | | | | | | |
| 152 | | | | | Standard Deviation of Raw Data | 0.0173 | | | | | | |
| 153 | | | | | Khat | 1.059 | | | | | | |
| 154 | | | | | Theta hat | 0.0129 | | | | | | |
| 155 | | | | | Kstar | 0.976 | | | | | | |
| 156 | | | | | Theta star | 0.014 | | | | | | |
| 157 | | | | | Mean of Log Transformed Data | -4.833 | | | | | | |
| 158 | | | | | Standard Deviation of Log Transformed Data | 0.997 | | | | | | |
| 159 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | Normal GOF Test Results | | | | | | | | | | | |
| 161 | | | | | | | | | | | | |
| 162 | | | | | Correlation Coefficient R | 0.811 | | | | | | |
| 163 | | | | | Shapiro Wilk Test Statistic | 0.667 | | | | | | |
| 164 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 165 | | | | | Approximate Shapiro Wilk P Value | 6.2625E-8 | | | | | | |
| 166 | | | | | Lilliefors Test Statistic | 0.29 | | | | | | |
| 167 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 168 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | Gamma GOF Test Results | | | | | | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | Correlation Coefficient R | 0.965 | | | | | | |
| 173 | | | | | A-D Test Statistic | 1.559 | | | | | | |
| 174 | | | | | A-D Critical (0.05) Value | 0.774 | | | | | | |
| 175 | | | | | K-S Test Statistic | 0.206 | | | | | | |
| 176 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 177 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 178 | | | | | | | | | | | | |
| 179 | Lognormal GOF Test Results | | | | | | | | | | | |
| 180 | | | | | | | | | | | | |
| 181 | | | | | Correlation Coefficient R | 0.97 | | | | | | |
| 182 | | | | | Shapiro Wilk Test Statistic | 0.929 | | | | | | |
| 183 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 184 | | | | | Approximate Shapiro Wilk P Value | 0.0523 | | | | | | |
| 185 | | | | | Lilliefors Test Statistic | 0.146 | | | | | | |
| 186 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 187 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | Zinc (mg/L) | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | | | | | Raw Statistics | | | | | | | |
| 192 | | | | | Number of Valid Observations | 30 | | | | | | |
| 193 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 194 | | | | | Minimum | 8.0000E-4 | | | | | | |
| 195 | | | | | Maximum | 0.03 | | | | | | |
| 196 | | | | | Mean of Raw Data | 0.00496 | | | | | | |
| 197 | | | | | Standard Deviation of Raw Data | 0.00573 | | | | | | |
| 198 | | | | | Khat | 1.482 | | | | | | |
| 199 | | | | | Theta hat | 0.00335 | | | | | | |
| 200 | | | | | Kstar | 1.356 | | | | | | |
| 201 | | | | | Theta star | 0.00366 | | | | | | |
| 202 | | | | | Mean of Log Transformed Data | -5.681 | | | | | | |
| 203 | | | | | Standard Deviation of Log Transformed Data | 0.841 | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | Normal GOF Test Results | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | | | | | Correlation Coefficient R | 0.756 | | | | | | |
| 208 | | | | | Shapiro Wilk Test Statistic | 0.599 | | | | | | |
| 209 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 210 | | | | | Approximate Shapiro Wilk P Value | 4.0269E-9 | | | | | | |
| 211 | | | | | Lilliefors Test Statistic | 0.309 | | | | | | |
| 212 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 214 | | | | | | | | | | | | |
| 215 | | | | Gamma GOF Test Results | | | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | Correlation Coefficient R | 0.905 | | | | | | |
| 218 | | | | | A-D Test Statistic | 1.292 | | | | | | |
| 219 | | | | | A-D Critical (0.05) Value | 0.763 | | | | | | |
| 220 | | | | | K-S Test Statistic | 0.194 | | | | | | |
| 221 | | | | | K-S Critical(0.05) Value | 0.163 | | | | | | |
| 222 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 223 | | | | | | | | | | | | |
| 224 | | | | Lognormal GOF Test Results | | | | | | | | |
| 225 | | | | | | | | | | | | |
| 226 | | | | | Correlation Coefficient R | 0.964 | | | | | | |
| 227 | | | | | Shapiro Wilk Test Statistic | 0.931 | | | | | | |
| 228 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 229 | | | | | Approximate Shapiro Wilk P Value | 0.0598 | | | | | | |
| 230 | | | | | Lilliefors Test Statistic | 0.173 | | | | | | |
| 231 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 232 | 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 5.2 2023-12-13 11:18:31 AM | |
| From File | 2023-IntermediateProUCL-1_j.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

12-IN

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 40 |
| Number of Distinct Observations | 14 |
| Minimum | 0.01 |
| Maximum | 2.9 |
| Mean of Raw Data | 0.934 |
| Standard Deviation of Raw Data | 0.544 |
| Khat | 2.506 |
| Theta hat | 0.373 |
| Kstar | 2.335 |
| Theta star | 0.4 |
| Mean of Log Transformed Data | -0.281 |
| Standard Deviation of Log Transformed Data | 0.856 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.921 |
| Shapiro Wilk Test Statistic | 0.866 |
| Shapiro Wilk Critical (0.05) Value | 0.94 |
| Approximate Shapiro Wilk P Value | 1.0289E-4 |
| Lilliefors Test Statistic | 0.187 |
| Lilliefors Critical (0.05) Value | 0.139 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.976 |
| A-D Test Statistic | 1.564 |
| A-D Critical (0.05) Value | 0.757 |
| K-S Test Statistic | 0.225 |
| K-S Critical(0.05) Value | 0.141 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.803 |
| Shapiro Wilk Test Statistic | 0.688 |
| Shapiro Wilk Critical (0.05) Value | 0.94 |
| Approximate Shapiro Wilk P Value | 5.366E-10 |
| Lilliefors Test Statistic | 0.29 |
| Lilliefors Critical (0.05) Value | 0.139 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Iron (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | Raw Statistics | | | | | | | |
| 61 | | | | | Number of Valid Observations | 27 | | | | | | |
| 62 | | | | | Number of Distinct Observations | 22 | | | | | | |
| 63 | | | | | Minimum | 0.01 | | | | | | |
| 64 | | | | | Maximum | 1.91 | | | | | | |
| 65 | | | | | Mean of Raw Data | 0.545 | | | | | | |
| 66 | | | | | Standard Deviation of Raw Data | 0.588 | | | | | | |
| 67 | | | | | Khat | 0.568 | | | | | | |
| 68 | | | | | Theta hat | 0.96 | | | | | | |
| 69 | | | | | Kstar | 0.529 | | | | | | |
| 70 | | | | | Theta star | 1.03 | | | | | | |
| 71 | | | | | Mean of Log Transformed Data | -1.705 | | | | | | |
| 72 | | | | | Standard Deviation of Log Transformed Data | 1.894 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | | Normal GOF Test Results | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | | Correlation Coefficient R | 0.926 | | | | | | |
| 77 | | | | | Shapiro Wilk Test Statistic | 0.845 | | | | | | |
| 78 | | | | | Shapiro Wilk Critical (0.05) Value | 0.923 | | | | | | |
| 79 | | | | | Approximate Shapiro Wilk P Value | 6.7198E-4 | | | | | | |
| 80 | | | | | Lilliefors Test Statistic | 0.182 | | | | | | |
| 81 | | | | | Lilliefors Critical (0.05) Value | 0.167 | | | | | | |
| 82 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 83 | | | | | | | | | | | | |
| 84 | | | | | Gamma GOF Test Results | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | | | | | Correlation Coefficient R | 0.946 | | | | | | |
| 87 | | | | | A-D Test Statistic | 0.78 | | | | | | |
| 88 | | | | | A-D Critical (0.05) Value | 0.801 | | | | | | |
| 89 | | | | | K-S Test Statistic | 0.143 | | | | | | |
| 90 | | | | | K-S Critical(0.05) Value | 0.177 | | | | | | |
| 91 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | | Lognormal GOF Test Results | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | | Correlation Coefficient R | 0.945 | | | | | | |
| 96 | | | | | Shapiro Wilk Test Statistic | 0.87 | | | | | | |
| 97 | | | | | Shapiro Wilk Critical (0.05) Value | 0.923 | | | | | | |
| 98 | | | | | Approximate Shapiro Wilk P Value | 0.00258 | | | | | | |
| 99 | | | | | Lilliefors Test Statistic | 0.173 | | | | | | |
| 100 | | | | | Lilliefors Critical (0.05) Value | 0.167 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 106 | | | | | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | Arsenic (mg/L) | | | | | | | | | | | |
| 108 | | | | | | | | | | | | |
| 109 | | | | Raw Statistics | | | | | | | | |
| 110 | | | | Number of Valid Observations | | 39 | | | | | | |
| 111 | | | | Number of Distinct Observations | | 27 | | | | | | |
| 112 | | | | Minimum | | 2.0000E-4 | | | | | | |
| 113 | | | | Maximum | | 0.0106 | | | | | | |
| 114 | | | | Mean of Raw Data | | 0.0027 | | | | | | |
| 115 | | | | Standard Deviation of Raw Data | | 0.00308 | | | | | | |
| 116 | | | | Khat | | 0.878 | | | | | | |
| 117 | | | | Theta hat | | 0.00308 | | | | | | |
| 118 | | | | Kstar | | 0.827 | | | | | | |
| 119 | | | | Theta star | | 0.00327 | | | | | | |
| 120 | | | | Mean of Log Transformed Data | | -6.581 | | | | | | |
| 121 | | | | Standard Deviation of Log Transformed Data | | 1.193 | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | | | | Normal GOF Test Results | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | Correlation Coefficient R | | 0.875 | | | | | | |
| 126 | | | | Shapiro Wilk Test Statistic | | 0.754 | | | | | | |
| 127 | | | | Shapiro Wilk Critical (0.05) Value | | 0.939 | | | | | | |
| 128 | | | | Approximate Shapiro Wilk P Value | | 5.5164E-8 | | | | | | |
| 129 | | | | Lilliefors Test Statistic | | 0.257 | | | | | | |
| 130 | | | | Lilliefors Critical (0.05) Value | | 0.14 | | | | | | |
| 131 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 132 | | | | | | | | | | | | |
| 133 | | | | Gamma GOF Test Results | | | | | | | | |
| 134 | | | | | | | | | | | | |
| 135 | | | | Correlation Coefficient R | | 0.956 | | | | | | |
| 136 | | | | A-D Test Statistic | | 1.857 | | | | | | |
| 137 | | | | A-D Critical (0.05) Value | | 0.783 | | | | | | |
| 138 | | | | K-S Test Statistic | | 0.179 | | | | | | |
| 139 | | | | K-S Critical(0.05) Value | | 0.146 | | | | | | |
| 140 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 141 | | | | | | | | | | | | |
| 142 | | | | Lognormal GOF Test Results | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | | | | Correlation Coefficient R | | 0.968 | | | | | | |
| 145 | | | | Shapiro Wilk Test Statistic | | 0.916 | | | | | | |
| 146 | | | | Shapiro Wilk Critical (0.05) Value | | 0.939 | | | | | | |
| 147 | | | | Approximate Shapiro Wilk P Value | | 0.00711 | | | | | | |
| 148 | | | | Lilliefors Test Statistic | | 0.153 | | | | | | |
| 149 | | | | Lilliefors Critical (0.05) Value | | 0.14 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 155 | | | | | | | | | | | | |
| 156 | Cadmium (mg/L) | | | | | | | | | | | |
| 157 | | | | | | | | | | | | |
| 158 | | | | Raw Statistics | | | | | | | | |
| 159 | | | | Number of Valid Observations | | 39 | | | | | | |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 161 | | | | | Minimum | 2.9400E-5 | | | | | | |
| 162 | | | | | Maximum | 0.003 | | | | | | |
| 163 | | | | | Mean of Raw Data | 5.3470E-4 | | | | | | |
| 164 | | | | | Standard Deviation of Raw Data | 7.9712E-4 | | | | | | |
| 165 | | | | | Khat | 0.717 | | | | | | |
| 166 | | | | | Theta hat | 7.4625E-4 | | | | | | |
| 167 | | | | | Kstar | 0.678 | | | | | | |
| 168 | | | | | Theta star | 7.8807E-4 | | | | | | |
| 169 | | | | | Mean of Log Transformed Data | -8.375 | | | | | | |
| 170 | | | | | Standard Deviation of Log Transformed Data | 1.305 | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | Normal GOF Test Results | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Correlation Coefficient R | 0.782 | | | | | | |
| 175 | | | | | Shapiro Wilk Test Statistic | 0.613 | | | | | | |
| 176 | | | | | Shapiro Wilk Critical (0.05) Value | 0.939 | | | | | | |
| 177 | | | | | Approximate Shapiro Wilk P Value | 1.512E-11 | | | | | | |
| 178 | | | | | Lilliefors Test Statistic | 0.285 | | | | | | |
| 179 | | | | | Lilliefors Critical (0.05) Value | 0.14 | | | | | | |
| 180 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | | Gamma GOF Test Results | | | | | | | |
| 183 | | | | | | | | | | | | |
| 184 | | | | | Correlation Coefficient R | 0.939 | | | | | | |
| 185 | | | | | A-D Test Statistic | 1.765 | | | | | | |
| 186 | | | | | A-D Critical (0.05) Value | 0.792 | | | | | | |
| 187 | | | | | K-S Test Statistic | 0.232 | | | | | | |
| 188 | | | | | K-S Critical(0.05) Value | 0.147 | | | | | | |
| 189 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | | | | | Lognormal GOF Test Results | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | | | | | Correlation Coefficient R | 0.977 | | | | | | |
| 194 | | | | | Shapiro Wilk Test Statistic | 0.936 | | | | | | |
| 195 | | | | | Shapiro Wilk Critical (0.05) Value | 0.939 | | | | | | |
| 196 | | | | | Approximate Shapiro Wilk P Value | 0.0384 | | | | | | |
| 197 | | | | | Lilliefors Test Statistic | 0.159 | | | | | | |
| 198 | | | | | Lilliefors Critical (0.05) Value | 0.14 | | | | | | |
| 199 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 204 | | | | | | | | | | | | |
| 205 | Copper (mg/L) | | | | | | | | | | | |
| 206 | | | | | | | | | | | | |
| 207 | | | | | Raw Statistics | | | | | | | |
| 208 | | | | | Number of Valid Observations | 39 | | | | | | |
| 209 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 210 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 211 | | | | | Maximum | 0.0726 | | | | | | |
| 212 | | | | | Mean of Raw Data | 0.00998 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Standard Deviation of Raw Data | 0.0156 | | | | | | |
| 214 | | | | | Khat | 0.737 | | | | | | |
| 215 | | | | | Theta hat | 0.0135 | | | | | | |
| 216 | | | | | Kstar | 0.698 | | | | | | |
| 217 | | | | | Theta star | 0.0143 | | | | | | |
| 218 | | | | | Mean of Log Transformed Data | -5.421 | | | | | | |
| 219 | | | | | Standard Deviation of Log Transformed Data | 1.295 | | | | | | |
| 220 | | | | | | | | | | | | |
| 221 | | | | | Normal GOF Test Results | | | | | | | |
| 222 | | | | | | | | | | | | |
| 223 | | | | | Correlation Coefficient R | 0.765 | | | | | | |
| 224 | | | | | Shapiro Wilk Test Statistic | 0.601 | | | | | | |
| 225 | | | | | Shapiro Wilk Critical (0.05) Value | 0.939 | | | | | | |
| 226 | | | | | Approximate Shapiro Wilk P Value | 8.348E-12 | | | | | | |
| 227 | | | | | Lilliefors Test Statistic | 0.268 | | | | | | |
| 228 | | | | | Lilliefors Critical (0.05) Value | 0.14 | | | | | | |
| 229 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 230 | | | | | | | | | | | | |
| 231 | | | | | Gamma GOF Test Results | | | | | | | |
| 232 | | | | | | | | | | | | |
| 233 | | | | | Correlation Coefficient R | 0.958 | | | | | | |
| 234 | | | | | A-D Test Statistic | 1.415 | | | | | | |
| 235 | | | | | A-D Critical (0.05) Value | 0.79 | | | | | | |
| 236 | | | | | K-S Test Statistic | 0.191 | | | | | | |
| 237 | | | | | K-S Critical(0.05) Value | 0.147 | | | | | | |
| 238 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | | Lognormal GOF Test Results | | | | | | | |
| 241 | | | | | | | | | | | | |
| 242 | | | | | Correlation Coefficient R | 0.982 | | | | | | |
| 243 | | | | | Shapiro Wilk Test Statistic | 0.963 | | | | | | |
| 244 | | | | | Shapiro Wilk Critical (0.05) Value | 0.939 | | | | | | |
| 245 | | | | | Approximate Shapiro Wilk P Value | 0.304 | | | | | | |
| 246 | | | | | Lilliefors Test Statistic | 0.105 | | | | | | |
| 247 | | | | | Lilliefors Critical (0.05) Value | 0.14 | | | | | | |
| 248 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 249 | | | | | | | | | | | | |
| 250 | Lead (mg/L) | | | | | | | | | | | |
| 251 | | | | | | | | | | | | |
| 252 | | | | | Raw Statistics | | | | | | | |
| 253 | | | | | Number of Valid Observations | 38 | | | | | | |
| 254 | | | | | Number of Missing Observations | 1 | | | | | | |
| 255 | | | | | Number of Distinct Observations | 22 | | | | | | |
| 256 | | | | | Minimum | 1.2100E-4 | | | | | | |
| 257 | | | | | Maximum | 0.00539 | | | | | | |
| 258 | | | | | Mean of Raw Data | 0.00127 | | | | | | |
| 259 | | | | | Standard Deviation of Raw Data | 0.00108 | | | | | | |
| 260 | | | | | Khat | 1.398 | | | | | | |
| 261 | | | | | Theta hat | 9.0669E-4 | | | | | | |
| 262 | | | | | Kstar | 1.305 | | | | | | |
| 263 | | | | | Theta star | 9.7117E-4 | | | | | | |
| 264 | | | | | Mean of Log Transformed Data | -7.07 | | | | | | |
| 265 | | | | | Standard Deviation of Log Transformed Data | 0.962 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | | | | | | | | |
| 267 | | | | Normal GOF Test Results | | | | | | | | |
| 268 | | | | | | | | | | | | |
| 269 | | | | | Correlation Coefficient R | 0.891 | | | | | | |
| 270 | | | | | Shapiro Wilk Test Statistic | 0.806 | | | | | | |
| 271 | | | | | Shapiro Wilk Critical (0.05) Value | 0.938 | | | | | | |
| 272 | | | | | Approximate Shapiro Wilk P Value | 2.5935E-6 | | | | | | |
| 273 | | | | | Lilliefors Test Statistic | 0.204 | | | | | | |
| 274 | | | | | Lilliefors Critical (0.05) Value | 0.142 | | | | | | |
| 275 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 276 | | | | | | | | | | | | |
| 277 | | | | Gamma GOF Test Results | | | | | | | | |
| 278 | | | | | | | | | | | | |
| 279 | | | | | Correlation Coefficient R | 0.937 | | | | | | |
| 280 | | | | | A-D Test Statistic | 1.883 | | | | | | |
| 281 | | | | | A-D Critical (0.05) Value | 0.768 | | | | | | |
| 282 | | | | | K-S Test Statistic | 0.199 | | | | | | |
| 283 | | | | | K-S Critical(0.05) Value | 0.146 | | | | | | |
| 284 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 285 | | | | | | | | | | | | |
| 286 | | | | Lognormal GOF Test Results | | | | | | | | |
| 287 | | | | | | | | | | | | |
| 288 | | | | | Correlation Coefficient R | 0.952 | | | | | | |
| 289 | | | | | Shapiro Wilk Test Statistic | 0.898 | | | | | | |
| 290 | | | | | Shapiro Wilk Critical (0.05) Value | 0.938 | | | | | | |
| 291 | | | | | Approximate Shapiro Wilk P Value | 0.00206 | | | | | | |
| 292 | | | | | Lilliefors Test Statistic | 0.211 | | | | | | |
| 293 | | | | | Lilliefors Critical (0.05) Value | 0.142 | | | | | | |
| 294 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 295 | | | | | | | | | | | | |
| 296 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 297 | | | | | | | | | | | | |
| 298 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 299 | | | | | | | | | | | | |
| 300 | Nickel (mg/L) | | | | | | | | | | | |
| 301 | | | | | | | | | | | | |
| 302 | | | | Raw Statistics | | | | | | | | |
| 303 | | | | | Number of Valid Observations | 29 | | | | | | |
| 304 | | | | | Number of Distinct Observations | 27 | | | | | | |
| 305 | | | | | Minimum | 0.00444 | | | | | | |
| 306 | | | | | Maximum | 1.52 | | | | | | |
| 307 | | | | | Mean of Raw Data | 0.137 | | | | | | |
| 308 | | | | | Standard Deviation of Raw Data | 0.309 | | | | | | |
| 309 | | | | | Khat | 0.408 | | | | | | |
| 310 | | | | | Theta hat | 0.335 | | | | | | |
| 311 | | | | | Kstar | 0.389 | | | | | | |
| 312 | | | | | Theta star | 0.352 | | | | | | |
| 313 | | | | | Mean of Log Transformed Data | -3.596 | | | | | | |
| 314 | | | | | Standard Deviation of Log Transformed Data | 1.727 | | | | | | |
| 315 | | | | | | | | | | | | |
| 316 | | | | Normal GOF Test Results | | | | | | | | |
| 317 | | | | | | | | | | | | |
| 318 | | | | | Correlation Coefficient R | 0.681 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | Shapiro Wilk Test Statistic | 0.491 | | | | | | |
| 320 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 321 | | | | | Approximate Shapiro Wilk P Value | 1.618E-10 | | | | | | |
| 322 | | | | | Lilliefors Test Statistic | 0.334 | | | | | | |
| 323 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 324 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 325 | | | | | | | | | | | | |
| 326 | | | | Gamma GOF Test Results | | | | | | | | |
| 327 | | | | | | | | | | | | |
| 328 | | | | | Correlation Coefficient R | 0.96 | | | | | | |
| 329 | | | | | A-D Test Statistic | 2.544 | | | | | | |
| 330 | | | | | A-D Critical (0.05) Value | 0.832 | | | | | | |
| 331 | | | | | K-S Test Statistic | 0.287 | | | | | | |
| 332 | | | | | K-S Critical(0.05) Value | 0.174 | | | | | | |
| 333 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 334 | | | | | | | | | | | | |
| 335 | | | | Lognormal GOF Test Results | | | | | | | | |
| 336 | | | | | | | | | | | | |
| 337 | | | | | Correlation Coefficient R | 0.939 | | | | | | |
| 338 | | | | | Shapiro Wilk Test Statistic | 0.868 | | | | | | |
| 339 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 340 | | | | | Approximate Shapiro Wilk P Value | 0.00158 | | | | | | |
| 341 | | | | | Lilliefors Test Statistic | 0.222 | | | | | | |
| 342 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 343 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 344 | | | | | | | | | | | | |
| 345 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 346 | | | | | | | | | | | | |
| 347 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 348 | | | | | | | | | | | | |
| 349 | Zinc (mg/L) | | | | | | | | | | | |
| 350 | | | | | | | | | | | | |
| 351 | | | | Raw Statistics | | | | | | | | |
| 352 | | | | | Number of Valid Observations | 29 | | | | | | |
| 353 | | | | | Number of Distinct Observations | 26 | | | | | | |
| 354 | | | | | Minimum | 0.001 | | | | | | |
| 355 | | | | | Maximum | 1.19 | | | | | | |
| 356 | | | | | Mean of Raw Data | 0.322 | | | | | | |
| 357 | | | | | Standard Deviation of Raw Data | 0.385 | | | | | | |
| 358 | | | | | Khat | 0.49 | | | | | | |
| 359 | | | | | Theta hat | 0.657 | | | | | | |
| 360 | | | | | Kstar | 0.462 | | | | | | |
| 361 | | | | | Theta star | 0.697 | | | | | | |
| 362 | | | | | Mean of Log Transformed Data | -2.433 | | | | | | |
| 363 | | | | | Standard Deviation of Log Transformed Data | 2.209 | | | | | | |
| 364 | | | | | | | | | | | | |
| 365 | | | | Normal GOF Test Results | | | | | | | | |
| 366 | | | | | | | | | | | | |
| 367 | | | | | Correlation Coefficient R | 0.893 | | | | | | |
| 368 | | | | | Shapiro Wilk Test Statistic | 0.783 | | | | | | |
| 369 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 370 | | | | | Approximate Shapiro Wilk P Value | 1.8061E-5 | | | | | | |
| 371 | | | | | Lilliefors Test Statistic | 0.23 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 372 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 373 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 374 | | | | | | | | | | | | |
| 375 | | | | Gamma GOF Test Results | | | | | | | | |
| 376 | | | | | | | | | | | | |
| 377 | | | | | Correlation Coefficient R | 0.94 | | | | | | |
| 378 | | | | | A-D Test Statistic | 0.446 | | | | | | |
| 379 | | | | | A-D Critical (0.05) Value | 0.814 | | | | | | |
| 380 | | | | | K-S Test Statistic | 0.108 | | | | | | |
| 381 | | | | | K-S Critical(0.05) Value | 0.172 | | | | | | |
| 382 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 383 | | | | | | | | | | | | |
| 384 | | | | Lognormal GOF Test Results | | | | | | | | |
| 385 | | | | | | | | | | | | |
| 386 | | | | | Correlation Coefficient R | 0.952 | | | | | | |
| 387 | | | | | Shapiro Wilk Test Statistic | 0.888 | | | | | | |
| 388 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 389 | | | | | Approximate Shapiro Wilk P Value | 0.00504 | | | | | | |
| 390 | | | | | Lilliefors Test Statistic | 0.202 | | | | | | |
| 391 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 392 | 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 5.2 2023-12-13 11:20:43 AM | |
| From File | 2023-IntermediateProUCL-1_k.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

13-IN

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 36 |
| Number of Distinct Observations | 14 |
| Minimum | 0.5 |
| Maximum | 2 |
| Mean of Raw Data | 0.791 |
| Standard Deviation of Raw Data | 0.369 |
| Khat | 6.121 |
| Theta hat | 0.129 |
| Kstar | 5.629 |
| Theta star | 0.141 |
| Mean of Log Transformed Data | -0.318 |
| Standard Deviation of Log Transformed Data | 0.395 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.885 |
| Shapiro Wilk Test Statistic | 0.784 |
| Shapiro Wilk Critical (0.05) Value | 0.935 |
| Approximate Shapiro Wilk P Value | 1.3256E-6 |
| Lilliefors Test Statistic | 0.215 |
| Lilliefors Critical (0.05) Value | 0.145 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.95 |
| A-D Test Statistic | 1.863 |
| A-D Critical (0.05) Value | 0.75 |
| K-S Test Statistic | 0.18 |
| K-S Critical(0.05) Value | 0.147 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.934 |
| Shapiro Wilk Test Statistic | 0.858 |
| Shapiro Wilk Critical (0.05) Value | 0.935 |
| Approximate Shapiro Wilk P Value | 1.5950E-4 |
| Lilliefors Test Statistic | 0.176 |
| Lilliefors Critical (0.05) Value | 0.145 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Iron (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | Raw Statistics | | | | | | | |
| 61 | | | | | Number of Valid Observations | 28 | | | | | | |
| 62 | | | | | Number of Distinct Observations | 22 | | | | | | |
| 63 | | | | | Minimum | 0.01 | | | | | | |
| 64 | | | | | Maximum | 1.4 | | | | | | |
| 65 | | | | | Mean of Raw Data | 0.199 | | | | | | |
| 66 | | | | | Standard Deviation of Raw Data | 0.3 | | | | | | |
| 67 | | | | | Khat | 0.601 | | | | | | |
| 68 | | | | | Theta hat | 0.331 | | | | | | |
| 69 | | | | | Kstar | 0.56 | | | | | | |
| 70 | | | | | Theta star | 0.355 | | | | | | |
| 71 | | | | | Mean of Log Transformed Data | -2.643 | | | | | | |
| 72 | | | | | Standard Deviation of Log Transformed Data | 1.582 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | | Normal GOF Test Results | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | | Correlation Coefficient R | 0.8 | | | | | | |
| 77 | | | | | Shapiro Wilk Test Statistic | 0.658 | | | | | | |
| 78 | | | | | Shapiro Wilk Critical (0.05) Value | 0.924 | | | | | | |
| 79 | | | | | Approximate Shapiro Wilk P Value | 1.1676E-7 | | | | | | |
| 80 | | | | | Lilliefors Test Statistic | 0.264 | | | | | | |
| 81 | | | | | Lilliefors Critical (0.05) Value | 0.164 | | | | | | |
| 82 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 83 | | | | | | | | | | | | |
| 84 | | | | | Gamma GOF Test Results | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | | | | | Correlation Coefficient R | 0.982 | | | | | | |
| 87 | | | | | A-D Test Statistic | 0.879 | | | | | | |
| 88 | | | | | A-D Critical (0.05) Value | 0.8 | | | | | | |
| 89 | | | | | K-S Test Statistic | 0.143 | | | | | | |
| 90 | | | | | K-S Critical(0.05) Value | 0.174 | | | | | | |
| 91 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | | Lognormal GOF Test Results | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | | Correlation Coefficient R | 0.959 | | | | | | |
| 96 | | | | | Shapiro Wilk Test Statistic | 0.9 | | | | | | |
| 97 | | | | | Shapiro Wilk Critical (0.05) Value | 0.924 | | | | | | |
| 98 | | | | | Approximate Shapiro Wilk P Value | 0.0117 | | | | | | |
| 99 | | | | | Lilliefors Test Statistic | 0.149 | | | | | | |
| 100 | | | | | Lilliefors Critical (0.05) Value | 0.164 | | | | | | |
| 101 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Arsenic (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | | Raw Statistics | | | | | | | |
| 106 | | | | | Number of Valid Observations | 35 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 22 | | | | | | |
| 108 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 109 | | | | | Maximum | 0.007 | | | | | | |
| 110 | | | | | Mean of Raw Data | 8.2000E-4 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.00121 | | | | | | |
| 112 | | | | | Khat | 1.29 | | | | | | |
| 113 | | | | | Theta hat | 6.3566E-4 | | | | | | |
| 114 | | | | | Kstar | 1.198 | | | | | | |
| 115 | | | | | Theta star | 6.8420E-4 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -7.541 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 0.804 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | Normal GOF Test Results | | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.678 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.493 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.934 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 1.604E-12 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.307 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.148 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | Gamma GOF Test Results | | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.865 | | | | | | |
| 132 | | | | | A-D Test Statistic | 2.55 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.77 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.194 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.152 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | Lognormal GOF Test Results | | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.939 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.884 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.934 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 0.00128 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.152 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.148 | | | | | | |
| 146 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | Copper (mg/L) | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | | | | Raw Statistics | | | | | | | | |
| 155 | | | | | Number of Valid Observations | 35 | | | | | | |
| 156 | | | | | Number of Distinct Observations | 21 | | | | | | |
| 157 | | | | | Minimum | 1.9000E-4 | | | | | | |
| 158 | | | | | Maximum | 0.0042 | | | | | | |
| 159 | | | | | Mean of Raw Data | 0.00125 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Standard Deviation of Raw Data | 8.9245E-4 | | | | | | |
| 161 | | | | | Khat | 2.196 | | | | | | |
| 162 | | | | | Theta hat | 5.7123E-4 | | | | | | |
| 163 | | | | | Kstar | 2.027 | | | | | | |
| 164 | | | | | Theta star | 6.1892E-4 | | | | | | |
| 165 | | | | | Mean of Log Transformed Data | -6.926 | | | | | | |
| 166 | | | | | Standard Deviation of Log Transformed Data | 0.75 | | | | | | |
| 167 | | | | | | | | | | | | |
| 168 | | | | | Normal GOF Test Results | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | | | | | Correlation Coefficient R | 0.917 | | | | | | |
| 171 | | | | | Shapiro Wilk Test Statistic | 0.847 | | | | | | |
| 172 | | | | | Shapiro Wilk Critical (0.05) Value | 0.934 | | | | | | |
| 173 | | | | | Approximate Shapiro Wilk P Value | 9.7623E-5 | | | | | | |
| 174 | | | | | Lilliefors Test Statistic | 0.283 | | | | | | |
| 175 | | | | | Lilliefors Critical (0.05) Value | 0.148 | | | | | | |
| 176 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | | | | | Gamma GOF Test Results | | | | | | | |
| 179 | | | | | | | | | | | | |
| 180 | | | | | Correlation Coefficient R | 0.979 | | | | | | |
| 181 | | | | | A-D Test Statistic | 0.939 | | | | | | |
| 182 | | | | | A-D Critical (0.05) Value | 0.759 | | | | | | |
| 183 | | | | | K-S Test Statistic | 0.199 | | | | | | |
| 184 | | | | | K-S Critical(0.05) Value | 0.15 | | | | | | |
| 185 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 186 | | | | | | | | | | | | |
| 187 | | | | | Lognormal GOF Test Results | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | | | | | Correlation Coefficient R | 0.966 | | | | | | |
| 190 | | | | | Shapiro Wilk Test Statistic | 0.929 | | | | | | |
| 191 | | | | | Shapiro Wilk Critical (0.05) Value | 0.934 | | | | | | |
| 192 | | | | | Approximate Shapiro Wilk P Value | 0.0318 | | | | | | |
| 193 | | | | | Lilliefors Test Statistic | 0.167 | | | | | | |
| 194 | | | | | Lilliefors Critical (0.05) Value | 0.148 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | Nickel (mg/L) | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | | | | | Raw Statistics | | | | | | | |
| 204 | | | | | Number of Valid Observations | 30 | | | | | | |
| 205 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 206 | | | | | Minimum | 7.0000E-4 | | | | | | |
| 207 | | | | | Maximum | 0.02 | | | | | | |
| 208 | | | | | Mean of Raw Data | 0.00446 | | | | | | |
| 209 | | | | | Standard Deviation of Raw Data | 0.00458 | | | | | | |
| 210 | | | | | Khat | 1.635 | | | | | | |
| 211 | | | | | Theta hat | 0.00273 | | | | | | |
| 212 | | | | | Kstar | 1.494 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Theta star | 0.00299 | | | | | | |
| 214 | | | | | Mean of Log Transformed Data | -5.748 | | | | | | |
| 215 | | | | | Standard Deviation of Log Transformed Data | 0.792 | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | Normal GOF Test Results | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | | Correlation Coefficient R | 0.81 | | | | | | |
| 220 | | | | | Shapiro Wilk Test Statistic | 0.667 | | | | | | |
| 221 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 222 | | | | | Approximate Shapiro Wilk P Value | 6.3259E-8 | | | | | | |
| 223 | | | | | Lilliefors Test Statistic | 0.287 | | | | | | |
| 224 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 225 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 226 | | | | | | | | | | | | |
| 227 | | | | | Gamma GOF Test Results | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | | Correlation Coefficient R | 0.936 | | | | | | |
| 230 | | | | | A-D Test Statistic | 1.176 | | | | | | |
| 231 | | | | | A-D Critical (0.05) Value | 0.762 | | | | | | |
| 232 | | | | | K-S Test Statistic | 0.179 | | | | | | |
| 233 | | | | | K-S Critical(0.05) Value | 0.163 | | | | | | |
| 234 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 235 | | | | | | | | | | | | |
| 236 | | | | | Lognormal GOF Test Results | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | | | | | Correlation Coefficient R | 0.977 | | | | | | |
| 239 | | | | | Shapiro Wilk Test Statistic | 0.953 | | | | | | |
| 240 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 241 | | | | | Approximate Shapiro Wilk P Value | 0.237 | | | | | | |
| 242 | | | | | Lilliefors Test Statistic | 0.134 | | | | | | |
| 243 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 244 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 245 | | | | | | | | | | | | |
| 246 | Zinc (mg/L) | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | | | | | Raw Statistics | | | | | | | |
| 249 | | | | | Number of Valid Observations | 30 | | | | | | |
| 250 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 251 | | | | | Minimum | 6.0000E-4 | | | | | | |
| 252 | | | | | Maximum | 0.082 | | | | | | |
| 253 | | | | | Mean of Raw Data | 0.00668 | | | | | | |
| 254 | | | | | Standard Deviation of Raw Data | 0.0146 | | | | | | |
| 255 | | | | | Khat | 0.813 | | | | | | |
| 256 | | | | | Theta hat | 0.00821 | | | | | | |
| 257 | | | | | Kstar | 0.754 | | | | | | |
| 258 | | | | | Theta star | 0.00886 | | | | | | |
| 259 | | | | | Mean of Log Transformed Data | -5.737 | | | | | | |
| 260 | | | | | Standard Deviation of Log Transformed Data | 1.056 | | | | | | |
| 261 | | | | | | | | | | | | |
| 262 | | | | | Normal GOF Test Results | | | | | | | |
| 263 | | | | | | | | | | | | |
| 264 | | | | | Correlation Coefficient R | 0.577 | | | | | | |
| 265 | | | | | Shapiro Wilk Test Statistic | 0.368 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 267 | | | | | Approximate Shapiro Wilk P Value | 1.536E-12 | | | | | | |
| 268 | | | | | Lilliefors Test Statistic | 0.339 | | | | | | |
| 269 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 270 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | | | | Gamma GOF Test Results | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | | | | | Correlation Coefficient R | 0.795 | | | | | | |
| 275 | | | | | A-D Test Statistic | 1.702 | | | | | | |
| 276 | | | | | A-D Critical (0.05) Value | 0.785 | | | | | | |
| 277 | | | | | K-S Test Statistic | 0.178 | | | | | | |
| 278 | | | | | K-S Critical(0.05) Value | 0.166 | | | | | | |
| 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 | 0.948 | | | | | | |
| 285 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 286 | | | | | Approximate Shapiro Wilk P Value | 0.177 | | | | | | |
| 287 | | | | | Lilliefors Test Statistic | 0.108 | | | | | | |
| 288 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 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 5.2 2023-12-13 11:22:32 AM | |
| From File | 2023-IntermediateProUCL-1_I.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

15-IN

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 29 |
| Number of Distinct Observations | 14 |
| Minimum | 0.5 |
| Maximum | 3.1 |
| Mean of Raw Data | 0.803 |
| Standard Deviation of Raw Data | 0.548 |
| Khat | 3.866 |
| Theta hat | 0.208 |
| Kstar | 3.489 |
| Theta star | 0.23 |
| Mean of Log Transformed Data | -0.354 |
| Standard Deviation of Log Transformed Data | 0.474 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.772 |
| Shapiro Wilk Test Statistic | 0.618 |
| Shapiro Wilk Critical (0.05) Value | 0.926 |
| Approximate Shapiro Wilk P Value | 1.4680E-8 |
| Lilliefors Test Statistic | 0.29 |
| Lilliefors Critical (0.05) Value | 0.161 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.885 |
| A-D Test Statistic | 2.947 |
| A-D Critical (0.05) Value | 0.751 |
| K-S Test Statistic | 0.274 |
| K-S Critical(0.05) Value | 0.163 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.871 |
| Shapiro Wilk Test Statistic | 0.759 |
| Shapiro Wilk Critical (0.05) Value | 0.926 |
| Approximate Shapiro Wilk P Value | 5.7002E-6 |
| Lilliefors Test Statistic | 0.275 |
| Lilliefors Critical (0.05) Value | 0.161 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Arsenic (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | Raw Statistics | | | | | | | | |
| 61 | | | | Number of Valid Observations | | 29 | | | | | | |
| 62 | | | | Number of Distinct Observations | | 14 | | | | | | |
| 63 | | | | Minimum | | 1.4000E-4 | | | | | | |
| 64 | | | | Maximum | | 0.001 | | | | | | |
| 65 | | | | Mean of Raw Data | | 3.4793E-4 | | | | | | |
| 66 | | | | Standard Deviation of Raw Data | | 2.1551E-4 | | | | | | |
| 67 | | | | Khat | | 3.389 | | | | | | |
| 68 | | | | Theta hat | | 1.0265E-4 | | | | | | |
| 69 | | | | Kstar | | 3.062 | | | | | | |
| 70 | | | | Theta star | | 1.1364E-4 | | | | | | |
| 71 | | | | Mean of Log Transformed Data | | -8.118 | | | | | | |
| 72 | | | | Standard Deviation of Log Transformed Data | | 0.548 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | Normal GOF Test Results | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | Correlation Coefficient R | | 0.899 | | | | | | |
| 77 | | | | Shapiro Wilk Test Statistic | | 0.81 | | | | | | |
| 78 | | | | Shapiro Wilk Critical (0.05) Value | | 0.926 | | | | | | |
| 79 | | | | Approximate Shapiro Wilk P Value | | 6.8813E-5 | | | | | | |
| 80 | | | | Lilliefors Test Statistic | | 0.227 | | | | | | |
| 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 | | 0.966 | | | | | | |
| 87 | | | | A-D Test Statistic | | 1.263 | | | | | | |
| 88 | | | | A-D Critical (0.05) Value | | 0.752 | | | | | | |
| 89 | | | | K-S Test Statistic | | 0.204 | | | | | | |
| 90 | | | | K-S Critical(0.05) Value | | 0.164 | | | | | | |
| 91 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | Lognormal GOF Test Results | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | Correlation Coefficient R | | 0.959 | | | | | | |
| 96 | | | | Shapiro Wilk Test Statistic | | 0.909 | | | | | | |
| 97 | | | | Shapiro Wilk Critical (0.05) Value | | 0.926 | | | | | | |
| 98 | | | | Approximate Shapiro Wilk P Value | | 0.0177 | | | | | | |
| 99 | | | | Lilliefors Test Statistic | | 0.187 | | | | | | |
| 100 | | | | Lilliefors Critical (0.05) Value | | 0.161 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 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 | | 29 | | | | | | |
| 111 | | | | Number of Distinct Observations | | 18 | | | | | | |
| 112 | | | | Minimum | | 1.0000E-5 | | | | | | |
| 113 | | | | Maximum | | 0.003 | | | | | | |
| 114 | | | | Mean of Raw Data | | 2.3270E-4 | | | | | | |
| 115 | | | | Standard Deviation of Raw Data | | 5.6358E-4 | | | | | | |
| 116 | | | | Khat | | 0.595 | | | | | | |
| 117 | | | | Theta hat | | 3.9113E-4 | | | | | | |
| 118 | | | | Kstar | | 0.556 | | | | | | |
| 119 | | | | Theta star | | 4.1824E-4 | | | | | | |
| 120 | | | | Mean of Log Transformed Data | | -9.406 | | | | | | |
| 121 | | | | Standard Deviation of Log Transformed Data | | 1.3 | | | | | | |
| 122 | | | | | | | | | | | | |
| 123 | | | | Normal GOF Test Results | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | Correlation Coefficient R | | 0.582 | | | | | | |
| 126 | | | | Shapiro Wilk Test Statistic | | 0.371 | | | | | | |
| 127 | | | | Shapiro Wilk Critical (0.05) Value | | 0.926 | | | | | | |
| 128 | | | | Approximate Shapiro Wilk P Value | | 3.827E-12 | | | | | | |
| 129 | | | | Lilliefors Test Statistic | | 0.454 | | | | | | |
| 130 | | | | Lilliefors Critical (0.05) Value | | 0.161 | | | | | | |
| 131 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 132 | | | | | | | | | | | | |
| 133 | | | | Gamma GOF Test Results | | | | | | | | |
| 134 | | | | | | | | | | | | |
| 135 | | | | Correlation Coefficient R | | 0.834 | | | | | | |
| 136 | | | | A-D Test Statistic | | 2.559 | | | | | | |
| 137 | | | | A-D Critical (0.05) Value | | 0.801 | | | | | | |
| 138 | | | | K-S Test Statistic | | 0.303 | | | | | | |
| 139 | | | | K-S Critical(0.05) Value | | 0.171 | | | | | | |
| 140 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 141 | | | | | | | | | | | | |
| 142 | | | | Lognormal GOF Test Results | | | | | | | | |
| 143 | | | | | | | | | | | | |
| 144 | | | | Correlation Coefficient R | | 0.941 | | | | | | |
| 145 | | | | Shapiro Wilk Test Statistic | | 0.891 | | | | | | |
| 146 | | | | Shapiro Wilk Critical (0.05) Value | | 0.926 | | | | | | |
| 147 | | | | Approximate Shapiro Wilk P Value | | 0.00581 | | | | | | |
| 148 | | | | Lilliefors Test Statistic | | 0.201 | | | | | | |
| 149 | | | | Lilliefors Critical (0.05) Value | | 0.161 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 155 | | | | | | | | | | | | |
| 156 | Copper (mg/L) | | | | | | | | | | | |
| 157 | | | | | | | | | | | | |
| 158 | | | | Raw Statistics | | | | | | | | |
| 159 | | | | Number of Valid Observations | | 29 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Number of Distinct Observations | 24 | | | | | | |
| 161 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 162 | | | | | Maximum | 0.01 | | | | | | |
| 163 | | | | | Mean of Raw Data | 0.00279 | | | | | | |
| 164 | | | | | Standard Deviation of Raw Data | 0.00206 | | | | | | |
| 165 | | | | | Khat | 1.97 | | | | | | |
| 166 | | | | | Theta hat | 0.00141 | | | | | | |
| 167 | | | | | Kstar | 1.789 | | | | | | |
| 168 | | | | | Theta star | 0.00156 | | | | | | |
| 169 | | | | | Mean of Log Transformed Data | -6.158 | | | | | | |
| 170 | | | | | Standard Deviation of Log Transformed Data | 0.817 | | | | | | |
| 171 | | | | | | | | | | | | |
| 172 | | | | | Normal GOF Test Results | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Correlation Coefficient R | 0.924 | | | | | | |
| 175 | | | | | Shapiro Wilk Test Statistic | 0.868 | | | | | | |
| 176 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 177 | | | | | Approximate Shapiro Wilk P Value | 0.00151 | | | | | | |
| 178 | | | | | Lilliefors Test Statistic | 0.141 | | | | | | |
| 179 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 180 | Data appear Approximate Normal at (0.05) Significance Level | | | | | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | | Gamma GOF Test Results | | | | | | | |
| 183 | | | | | | | | | | | | |
| 184 | | | | | Correlation Coefficient R | 0.984 | | | | | | |
| 185 | | | | | A-D Test Statistic | 0.306 | | | | | | |
| 186 | | | | | A-D Critical (0.05) Value | 0.758 | | | | | | |
| 187 | | | | | K-S Test Statistic | 0.0864 | | | | | | |
| 188 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 189 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 190 | | | | | | | | | | | | |
| 191 | | | | | Lognormal GOF Test Results | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | | | | | Correlation Coefficient R | 0.971 | | | | | | |
| 194 | | | | | Shapiro Wilk Test Statistic | 0.954 | | | | | | |
| 195 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 196 | | | | | Approximate Shapiro Wilk P Value | 0.259 | | | | | | |
| 197 | | | | | Lilliefors Test Statistic | 0.135 | | | | | | |
| 198 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 199 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 200 | | | | | | | | | | | | |
| 201 | Nickel (mg/L) | | | | | | | | | | | |
| 202 | | | | | | | | | | | | |
| 203 | | | | | Raw Statistics | | | | | | | |
| 204 | | | | | Number of Valid Observations | 29 | | | | | | |
| 205 | | | | | Number of Distinct Observations | 26 | | | | | | |
| 206 | | | | | Minimum | 0.0039 | | | | | | |
| 207 | | | | | Maximum | 0.092 | | | | | | |
| 208 | | | | | Mean of Raw Data | 0.013 | | | | | | |
| 209 | | | | | Standard Deviation of Raw Data | 0.0166 | | | | | | |
| 210 | | | | | Khat | 1.575 | | | | | | |
| 211 | | | | | Theta hat | 0.00827 | | | | | | |
| 212 | | | | | Kstar | 1.435 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Theta star | 0.00907 | | | | | | |
| 214 | | | | | Mean of Log Transformed Data | -4.691 | | | | | | |
| 215 | | | | | Standard Deviation of Log Transformed Data | 0.738 | | | | | | |
| 216 | | | | | | | | | | | | |
| 217 | | | | | Normal GOF Test Results | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | | Correlation Coefficient R | 0.696 | | | | | | |
| 220 | | | | | Shapiro Wilk Test Statistic | 0.515 | | | | | | |
| 221 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 222 | | | | | Approximate Shapiro Wilk P Value | 3.714E-10 | | | | | | |
| 223 | | | | | Lilliefors Test Statistic | 0.292 | | | | | | |
| 224 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 225 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 226 | | | | | | | | | | | | |
| 227 | | | | | Gamma GOF Test Results | | | | | | | |
| 228 | | | | | | | | | | | | |
| 229 | | | | | Correlation Coefficient R | 0.856 | | | | | | |
| 230 | | | | | A-D Test Statistic | 1.86 | | | | | | |
| 231 | | | | | A-D Critical (0.05) Value | 0.762 | | | | | | |
| 232 | | | | | K-S Test Statistic | 0.204 | | | | | | |
| 233 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 234 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 235 | | | | | | | | | | | | |
| 236 | | | | | Lognormal GOF Test Results | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | | | | | Correlation Coefficient R | 0.937 | | | | | | |
| 239 | | | | | Shapiro Wilk Test Statistic | 0.882 | | | | | | |
| 240 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 241 | | | | | Approximate Shapiro Wilk P Value | 0.00339 | | | | | | |
| 242 | | | | | Lilliefors Test Statistic | 0.16 | | | | | | |
| 243 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 244 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 245 | | | | | | | | | | | | |
| 246 | Zinc (mg/L) | | | | | | | | | | | |
| 247 | | | | | | | | | | | | |
| 248 | | | | | Raw Statistics | | | | | | | |
| 249 | | | | | Number of Valid Observations | 29 | | | | | | |
| 250 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 251 | | | | | Minimum | 0.001 | | | | | | |
| 252 | | | | | Maximum | 0.026 | | | | | | |
| 253 | | | | | Mean of Raw Data | 0.00508 | | | | | | |
| 254 | | | | | Standard Deviation of Raw Data | 0.00544 | | | | | | |
| 255 | | | | | Khat | 1.578 | | | | | | |
| 256 | | | | | Theta hat | 0.00322 | | | | | | |
| 257 | | | | | Kstar | 1.438 | | | | | | |
| 258 | | | | | Theta star | 0.00353 | | | | | | |
| 259 | | | | | Mean of Log Transformed Data | -5.632 | | | | | | |
| 260 | | | | | Standard Deviation of Log Transformed Data | 0.797 | | | | | | |
| 261 | | | | | | | | | | | | |
| 262 | | | | | Normal GOF Test Results | | | | | | | |
| 263 | | | | | | | | | | | | |
| 264 | | | | | Correlation Coefficient R | 0.803 | | | | | | |
| 265 | | | | | Shapiro Wilk Test Statistic | 0.662 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 267 | | | | | Approximate Shapiro Wilk P Value | 8.3898E-8 | | | | | | |
| 268 | | | | | Lilliefors Test Statistic | 0.238 | | | | | | |
| 269 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 270 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | | | | Gamma GOF Test Results | | | | | | | | |
| 273 | | | | | | | | | | | | |
| 274 | | | | | Correlation Coefficient R | 0.939 | | | | | | |
| 275 | | | | | A-D Test Statistic | 0.934 | | | | | | |
| 276 | | | | | A-D Critical (0.05) Value | 0.762 | | | | | | |
| 277 | | | | | K-S Test Statistic | 0.133 | | | | | | |
| 278 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 279 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 280 | | | | | | | | | | | | |
| 281 | | | | Lognormal GOF Test Results | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | | | | | Correlation Coefficient R | 0.981 | | | | | | |
| 284 | | | | | Shapiro Wilk Test Statistic | 0.96 | | | | | | |
| 285 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 286 | | | | | Approximate Shapiro Wilk P Value | 0.359 | | | | | | |
| 287 | | | | | Lilliefors Test Statistic | 0.106 | | | | | | |
| 288 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 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 5.2 2023-12-13 11:24:09 AM | |
| From File | 2023-IntermediateProUCL-1_m.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |
| | | |
| 16-IN | | |
| Chloride (mg/L) | | |
| | | |
| Raw Statistics | | |
| Number of Valid Observations | 26 | |
| Number of Distinct Observations | 12 | |
| Minimum | 0.5 | |
| Maximum | 1.7 | |
| Mean of Raw Data | 0.805 | |
| Standard Deviation of Raw Data | 0.335 | |
| Khat | 6.983 | |
| Theta hat | 0.115 | |
| Kstar | 6.203 | |
| Theta star | 0.13 | |
| Mean of Log Transformed Data | -0.29 | |
| Standard Deviation of Log Transformed Data | 0.38 | |
| | | |
| Normal GOF Test Results | | |
| | | |
| Correlation Coefficient R | 0.914 | |
| Shapiro Wilk Test Statistic | 0.83 | |
| Shapiro Wilk Critical (0.05) Value | 0.92 | |
| Approximate Shapiro Wilk P Value | 4.2229E-4 | |
| Lilliefors Test Statistic | 0.227 | |
| Lilliefors Critical (0.05) Value | 0.17 | |
| Data not Normal at (0.05) Significance Level | | |
| | | |
| Gamma GOF Test Results | | |
| | | |
| Correlation Coefficient R | 0.958 | |
| A-D Test Statistic | 1.264 | |
| A-D Critical (0.05) Value | 0.745 | |
| K-S Test Statistic | 0.214 | |
| K-S Critical(0.05) Value | 0.171 | |
| Data not Gamma Distributed at (0.05) Significance Level | | |
| | | |
| Lognormal GOF Test Results | | |
| | | |
| Correlation Coefficient R | 0.944 | |
| Shapiro Wilk Test Statistic | 0.875 | |
| Shapiro Wilk Critical (0.05) Value | 0.92 | |
| Approximate Shapiro Wilk P Value | 0.00419 | |
| Lilliefors Test Statistic | 0.198 | |
| Lilliefors Critical (0.05) Value | 0.17 | |
| 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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Iron (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | | Raw Statistics | | | | | | | |
| 61 | | | | | Number of Valid Observations | 24 | | | | | | |
| 62 | | | | | Number of Distinct Observations | 13 | | | | | | |
| 63 | | | | | Minimum | 0.01 | | | | | | |
| 64 | | | | | Maximum | 3.31 | | | | | | |
| 65 | | | | | Mean of Raw Data | 0.338 | | | | | | |
| 66 | | | | | Standard Deviation of Raw Data | 0.718 | | | | | | |
| 67 | | | | | Khat | 0.375 | | | | | | |
| 68 | | | | | Theta hat | 0.901 | | | | | | |
| 69 | | | | | Kstar | 0.356 | | | | | | |
| 70 | | | | | Theta star | 0.949 | | | | | | |
| 71 | | | | | Mean of Log Transformed Data | -2.86 | | | | | | |
| 72 | | | | | Standard Deviation of Log Transformed Data | 1.926 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | | Normal GOF Test Results | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | | Correlation Coefficient R | 0.704 | | | | | | |
| 77 | | | | | Shapiro Wilk Test Statistic | 0.519 | | | | | | |
| 78 | | | | | Shapiro Wilk Critical (0.05) Value | 0.916 | | | | | | |
| 79 | | | | | Approximate Shapiro Wilk P Value | 7.6401E-9 | | | | | | |
| 80 | | | | | Lilliefors Test Statistic | 0.331 | | | | | | |
| 81 | | | | | Lilliefors Critical (0.05) Value | 0.177 | | | | | | |
| 82 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 83 | | | | | | | | | | | | |
| 84 | | | | | Gamma GOF Test Results | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | | | | | Correlation Coefficient R | 0.963 | | | | | | |
| 87 | | | | | A-D Test Statistic | 2.122 | | | | | | |
| 88 | | | | | A-D Critical (0.05) Value | 0.834 | | | | | | |
| 89 | | | | | K-S Test Statistic | 0.272 | | | | | | |
| 90 | | | | | K-S Critical(0.05) Value | 0.191 | | | | | | |
| 91 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | | Lognormal GOF Test Results | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | | Correlation Coefficient R | 0.921 | | | | | | |
| 96 | | | | | Shapiro Wilk Test Statistic | 0.833 | | | | | | |
| 97 | | | | | Shapiro Wilk Critical (0.05) Value | 0.916 | | | | | | |
| 98 | | | | | Approximate Shapiro Wilk P Value | 7.5436E-4 | | | | | | |
| 99 | | | | | Lilliefors Test Statistic | 0.215 | | | | | | |
| 100 | | | | | Lilliefors Critical (0.05) Value | 0.177 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 106 | | | | | | | | | | | | |

| | 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 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 Significance | | | | | | | | | | | |
| 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 Significance** | | |
| | | |
| **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 | | | | | | | | | | | |
| 294 | | | | | | | | | | | | |
| 295 | Zinc (mg/L) | | | | | | | | | | | |
| 296 | | | | | | | | | | | | |
| 297 | Raw Statistics | | | | | | | | | | | |
| 298 | | | | | Number of Valid Observations | 26 | | | | | | |
| 299 | | | | | Number of Distinct Observations | 25 | | | | | | |
| 300 | | | | | Minimum | 0.0012 | | | | | | |
| 301 | | | | | Maximum | 0.796 | | | | | | |
| 302 | | | | | Mean of Raw Data | 0.103 | | | | | | |
| 303 | | | | | Standard Deviation of Raw Data | 0.205 | | | | | | |
| 304 | | | | | Khat | 0.575 | | | | | | |
| 305 | | | | | Theta hat | 0.179 | | | | | | |
| 306 | | | | | Kstar | 0.534 | | | | | | |
| 307 | | | | | Theta star | 0.192 | | | | | | |
| 308 | | | | | Mean of Log Transformed Data | -3.359 | | | | | | |
| 309 | | | | | Standard Deviation of Log Transformed Data | 1.467 | | | | | | |
| 310 | | | | | | | | | | | | |
| 311 | Normal GOF Test Results | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | | | | | Correlation Coefficient R | 0.68 | | | | | | |
| 314 | | | | | Shapiro Wilk Test Statistic | 0.476 | | | | | | |
| 315 | | | | | Shapiro Wilk Critical (0.05) Value | 0.92 | | | | | | |
| 316 | | | | | Approximate Shapiro Wilk P Value | 6.839E-10 | | | | | | |
| 317 | | | | | Lilliefors Test Statistic | 0.356 | | | | | | |
| 318 | | | | | Lilliefors Critical (0.05) Value | 0.17 | | | | | | |

| | 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 | 0.901 | | | | | |
| 324 | | | | | | A-D Test Statistic | 1.387 | | | | | |
| 325 | | | | | | A-D Critical (0.05) Value | 0.801 | | | | | |
| 326 | | | | | | K-S Test Statistic | 0.196 | | | | | |
| 327 | | | | | | K-S Critical(0.05) Value | 0.18 | | | | | |
| 328 | Data not 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 | 0.972 | | | | | |
| 334 | | | | | | Shapiro Wilk Critical (0.05) Value | 0.92 | | | | | |
| 335 | | | | | | Approximate Shapiro Wilk P Value | 0.693 | | | | | |
| 336 | | | | | | Lilliefors Test Statistic | 0.0877 | | | | | |
| 337 | | | | | | Lilliefors Critical (0.05) Value | 0.17 | | | | | |
| 338 | 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 5.2 2023-12-13 11:25:27 AM | |
| From File | 2023-IntermediateProUCL-1_n.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

17-IN

Arsenic (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 29 |
| Number of Distinct Observations | 15 |
| Minimum | 1.8000E-4 |
| Maximum | 0.00106 |
| Mean of Raw Data | 3.6931E-4 |
| Standard Deviation of Raw Data | 2.2058E-4 |
| Khat | 3.822 |
| Theta hat | 9.6629E-5 |
| Kstar | 3.45 |
| Theta star | 1.0706E-4 |
| Mean of Log Transformed Data | -8.04 |
| Standard Deviation of Log Transformed Data | 0.507 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.889 |
| Shapiro Wilk Test Statistic | 0.792 |
| Shapiro Wilk Critical (0.05) Value | 0.926 |
| Approximate Shapiro Wilk P Value | 2.7516E-5 |
| Lilliefors Test Statistic | 0.238 |
| Lilliefors Critical (0.05) Value | 0.161 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.962 |
| A-D Test Statistic | 1.278 |
| A-D Critical (0.05) Value | 0.751 |
| K-S Test Statistic | 0.164 |
| K-S Critical(0.05) Value | 0.164 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.953 |
| Shapiro Wilk Test Statistic | 0.896 |
| Shapiro Wilk Critical (0.05) Value | 0.926 |
| Approximate Shapiro Wilk P Value | 0.00801 |
| Lilliefors Test Statistic | 0.153 |
| Lilliefors Critical (0.05) Value | 0.161 |

Data appear Approximate_Lognormal at (0.05) Significance Level

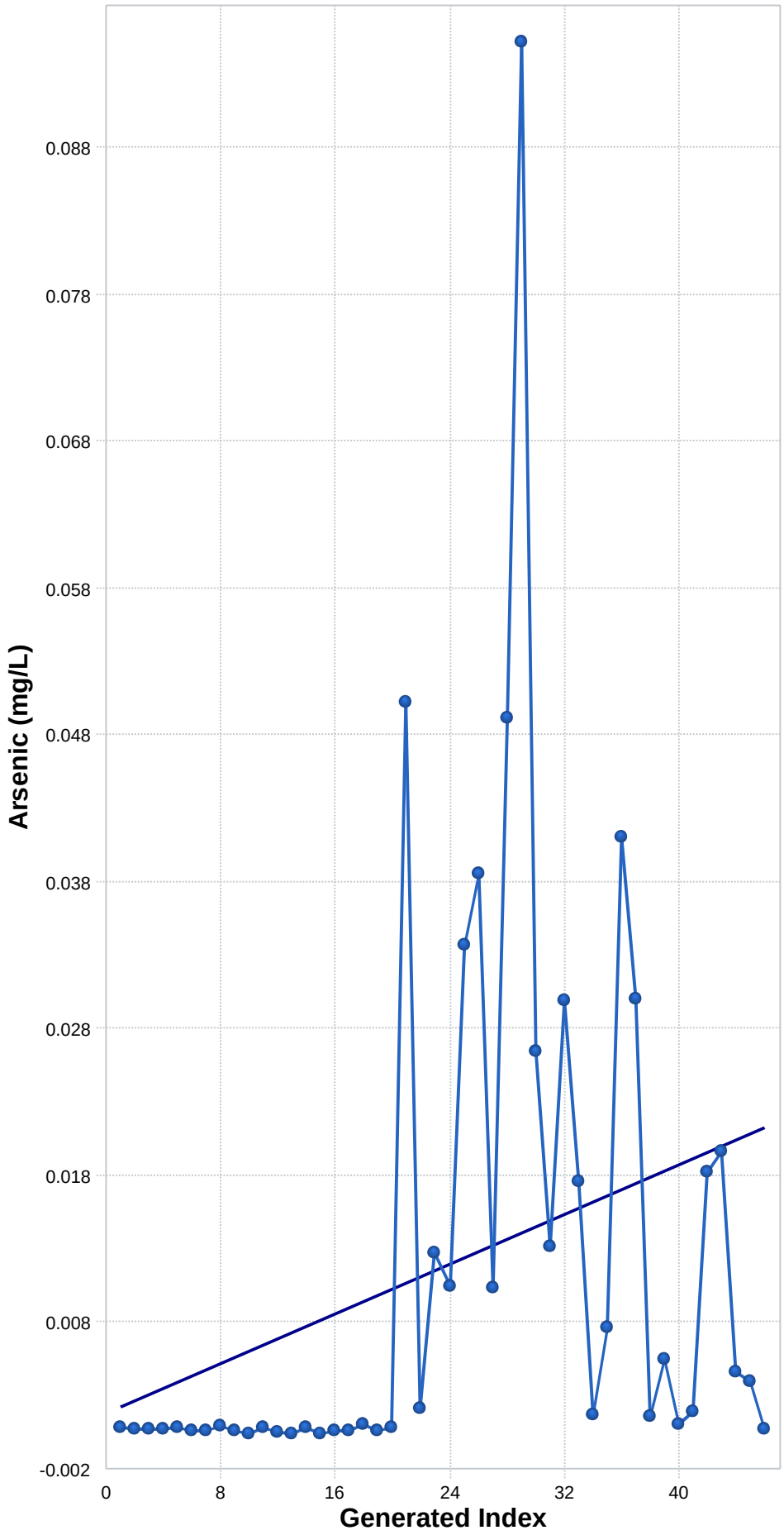
| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | Cadmium (mg/L) | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 56 | | | | Raw Statistics | | | | | | | | |
| 57 | | | | | Number of Valid Observations | 29 | | | | | | |
| 58 | | | | | Number of Distinct Observations | 18 | | | | | | |
| 59 | | | | | Minimum | 8.8000E-6 | | | | | | |
| 60 | | | | | Maximum | 3.0000E-4 | | | | | | |
| 61 | | | | | Mean of Raw Data | 1.0544E-4 | | | | | | |
| 62 | | | | | Standard Deviation of Raw Data | 9.1606E-5 | | | | | | |
| 63 | | | | | Khat | 1.084 | | | | | | |
| 64 | | | | | Theta hat | 9.7265E-5 | | | | | | |
| 65 | | | | | Kstar | 0.995 | | | | | | |
| 66 | | | | | Theta star | 1.0598E-4 | | | | | | |
| 67 | | | | | Mean of Log Transformed Data | -9.685 | | | | | | |
| 68 | | | | | Standard Deviation of Log Transformed Data | 1.146 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Correlation Coefficient R | 0.892 | | | | | | |
| 73 | | | | | Shapiro Wilk Test Statistic | 0.782 | | | | | | |
| 74 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk P Value | 1.7552E-5 | | | | | | |
| 76 | | | | | Lilliefors Test Statistic | 0.279 | | | | | | |
| 77 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | Correlation Coefficient R | 0.864 | | | | | | |
| 83 | | | | | A-D Test Statistic | 2.016 | | | | | | |
| 84 | | | | | A-D Critical (0.05) Value | 0.772 | | | | | | |
| 85 | | | | | K-S Test Statistic | 0.268 | | | | | | |
| 86 | | | | | K-S Critical(0.05) Value | 0.167 | | | | | | |
| 87 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | | Correlation Coefficient R | 0.939 | | | | | | |
| 92 | | | | | Shapiro Wilk Test Statistic | 0.864 | | | | | | |
| 93 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 0.00122 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.26 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Copper (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | | Number of Valid Observations | 29 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 25 | | | | | | |
| 108 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 109 | | | | | Maximum | 0.01 | | | | | | |
| 110 | | | | | Mean of Raw Data | 0.00295 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.00218 | | | | | | |
| 112 | | | | | Khat | 2.441 | | | | | | |
| 113 | | | | | Theta hat | 0.00121 | | | | | | |
| 114 | | | | | Kstar | 2.211 | | | | | | |
| 115 | | | | | Theta star | 0.00134 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -6.044 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 0.713 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.852 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.74 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 2.3286E-6 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.251 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.938 | | | | | | |
| 132 | | | | | A-D Test Statistic | 1.121 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.755 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.164 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.164 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.927 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.887 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 0.00459 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.148 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 146 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Nickel (mg/L) | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | | | | | Raw Statistics | | | | | | | |
| 151 | | | | | Number of Valid Observations | 29 | | | | | | |
| 152 | | | | | Number of Distinct Observations | 25 | | | | | | |
| 153 | | | | | Minimum | 0.00223 | | | | | | |
| 154 | | | | | Maximum | 0.04 | | | | | | |
| 155 | | | | | Mean of Raw Data | 0.0059 | | | | | | |
| 156 | | | | | Standard Deviation of Raw Data | 0.00693 | | | | | | |
| 157 | | | | | Khat | 2.141 | | | | | | |
| 158 | | | | | Theta hat | 0.00275 | | | | | | |
| 159 | | | | | Kstar | 1.943 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Theta star | 0.00304 | | | | | | |
| 161 | | | | | Mean of Log Transformed Data | -5.385 | | | | | | |
| 162 | | | | | Standard Deviation of Log Transformed Data | 0.597 | | | | | | |
| 163 | | | | | | | | | | | | |
| 164 | | | | | Normal GOF Test Results | | | | | | | |
| 165 | | | | | | | | | | | | |
| 166 | | | | | Correlation Coefficient R | 0.645 | | | | | | |
| 167 | | | | | Shapiro Wilk Test Statistic | 0.45 | | | | | | |
| 168 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 169 | | | | | Approximate Shapiro Wilk P Value | 4.337E-11 | | | | | | |
| 170 | | | | | Lilliefors Test Statistic | 0.322 | | | | | | |
| 171 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 172 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Gamma GOF Test Results | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | Correlation Coefficient R | 0.79 | | | | | | |
| 177 | | | | | A-D Test Statistic | 2.156 | | | | | | |
| 178 | | | | | A-D Critical (0.05) Value | 0.757 | | | | | | |
| 179 | | | | | K-S Test Statistic | 0.227 | | | | | | |
| 180 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 181 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | | | | | Lognormal GOF Test Results | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | | | | | Correlation Coefficient R | 0.916 | | | | | | |
| 186 | | | | | Shapiro Wilk Test Statistic | 0.855 | | | | | | |
| 187 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 188 | | | | | Approximate Shapiro Wilk P Value | 7.2947E-4 | | | | | | |
| 189 | | | | | Lilliefors Test Statistic | 0.154 | | | | | | |
| 190 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 191 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Zinc (mg/L) | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | | Raw Statistics | | | | | | | |
| 196 | | | | | Number of Valid Observations | 29 | | | | | | |
| 197 | | | | | Number of Distinct Observations | 23 | | | | | | |
| 198 | | | | | Minimum | 6.0000E-4 | | | | | | |
| 199 | | | | | Maximum | 0.015 | | | | | | |
| 200 | | | | | Mean of Raw Data | 0.00423 | | | | | | |
| 201 | | | | | Standard Deviation of Raw Data | 0.00346 | | | | | | |
| 202 | | | | | Khat | 1.612 | | | | | | |
| 203 | | | | | Theta hat | 0.00262 | | | | | | |
| 204 | | | | | Kstar | 1.469 | | | | | | |
| 205 | | | | | Theta star | 0.00288 | | | | | | |
| 206 | | | | | Mean of Log Transformed Data | -5.807 | | | | | | |
| 207 | | | | | Standard Deviation of Log Transformed Data | 0.875 | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | | | | | Normal GOF Test Results | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | | | | | Correlation Coefficient R | 0.93 | | | | | | |
| 212 | | | | | Shapiro Wilk Test Statistic | 0.868 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 214 | | | | | Approximate Shapiro Wilk P Value | 0.00152 | | | | | | |
| 215 | | | | | Lilliefors Test Statistic | 0.169 | | | | | | |
| 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 | 0.992 | | | | | | |
| 222 | | | | | A-D Test Statistic | 0.576 | | | | | | |
| 223 | | | | | A-D Critical (0.05) Value | 0.761 | | | | | | |
| 224 | | | | | K-S Test Statistic | 0.13 | | | | | | |
| 225 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 226 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | | | | Lognormal GOF Test Results | | | | | | | | |
| 229 | | | | | | | | | | | | |
| 230 | | | | | Correlation Coefficient R | 0.979 | | | | | | |
| 231 | | | | | Shapiro Wilk Test Statistic | 0.947 | | | | | | |
| 232 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 233 | | | | | Approximate Shapiro Wilk P Value | 0.176 | | | | | | |
| 234 | | | | | Lilliefors Test Statistic | 0.145 | | | | | | |
| 235 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 236 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |

# Mann-Kendall 01A-IN - ARSENIC




**Mann-Kendall Trend Analysis**

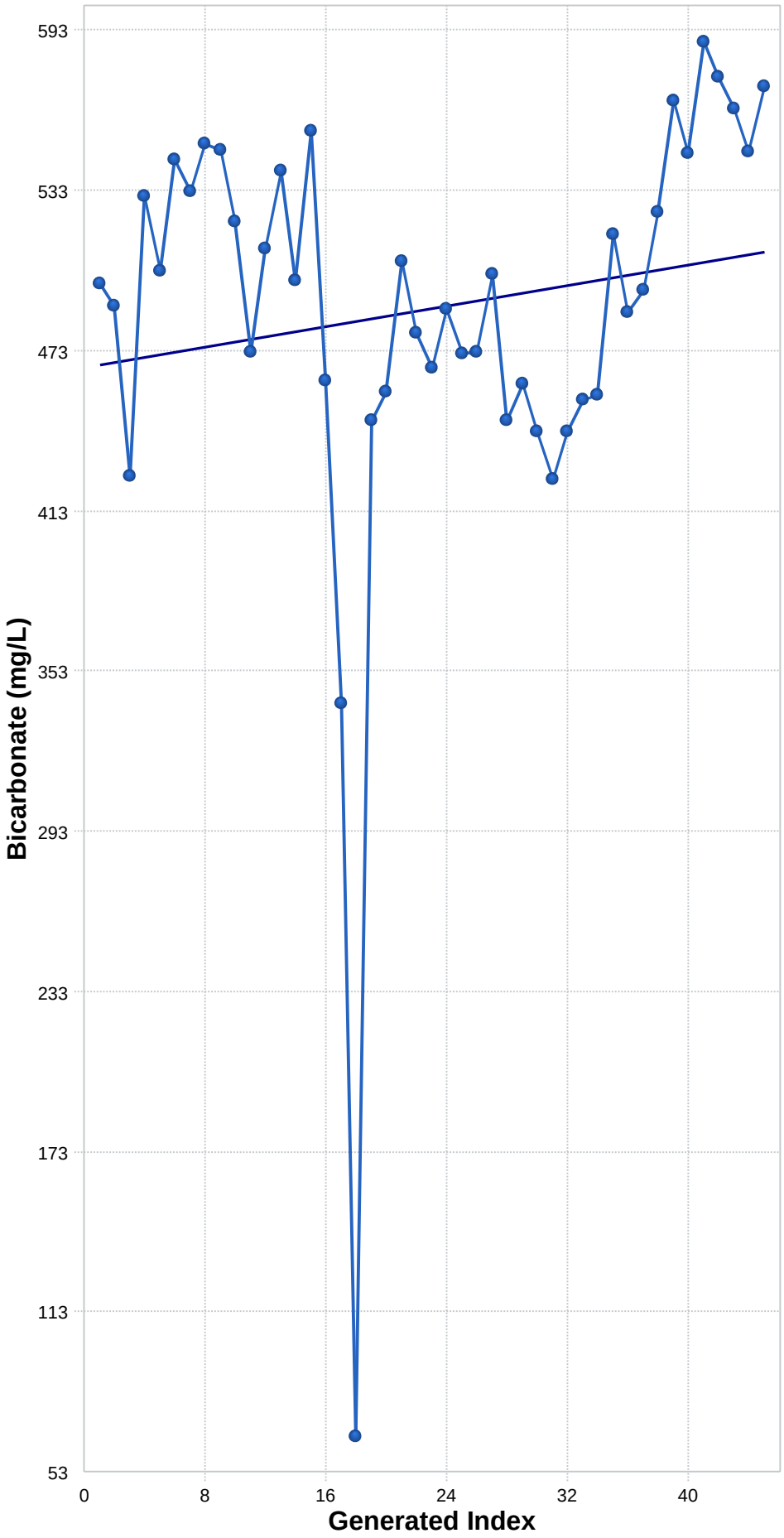
| | |
|---|---|
| n | 46 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 105.3692 |
| Standardized Value of S | 3.4830 |
| M-K Test Value (S) | 368 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0002 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0004 |
| OLS Regression Intercept | 0.0017 |

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

# Mann-Kendall 01A-IN - BICARBONATE



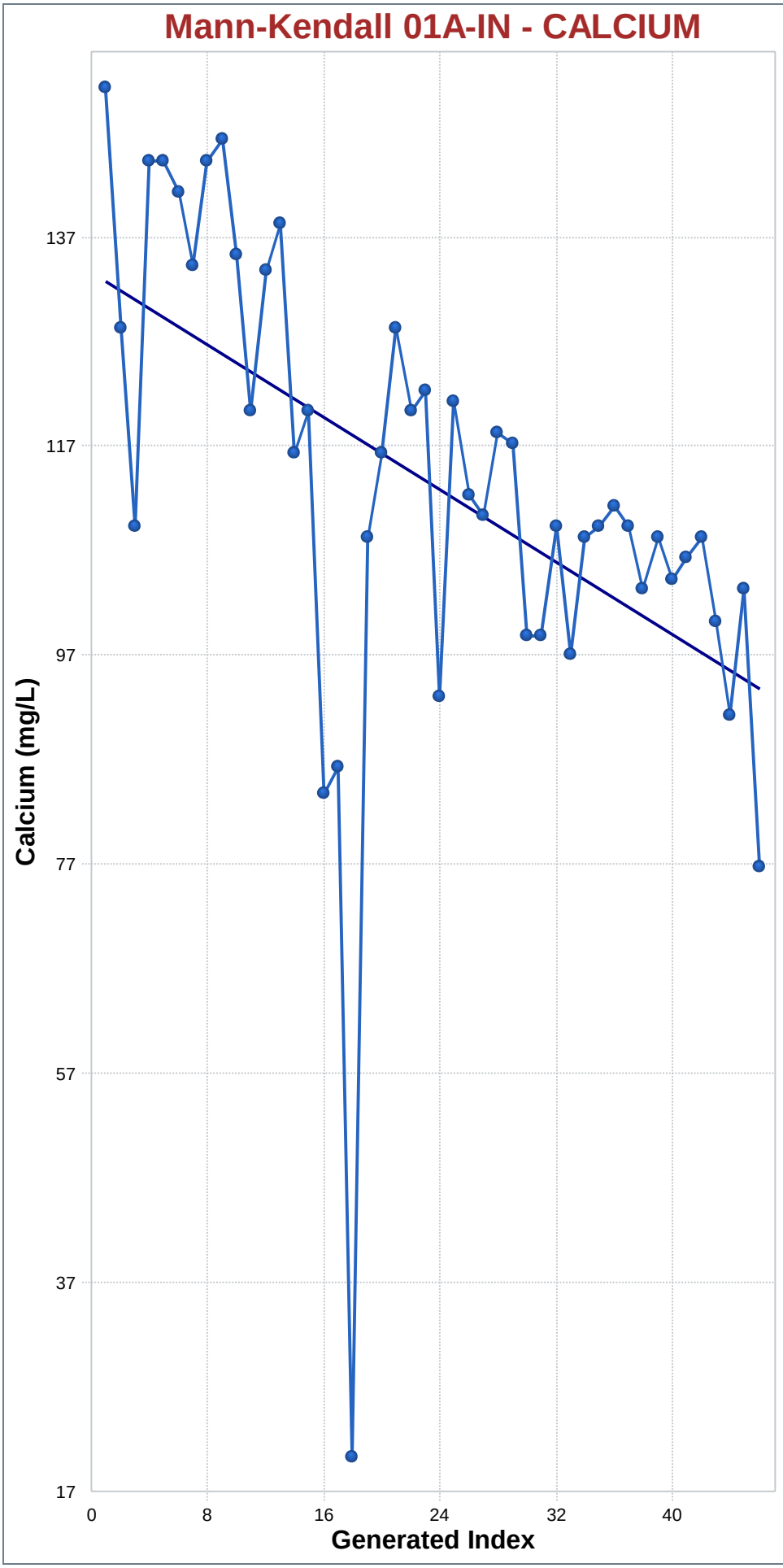

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 45 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 102.2155 |
| Standardized Value of S | 0.8707 |
| M-K Test Value (S) | 90 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1920 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.9512 |
| OLS Regression Intercept | 466.3018 |

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



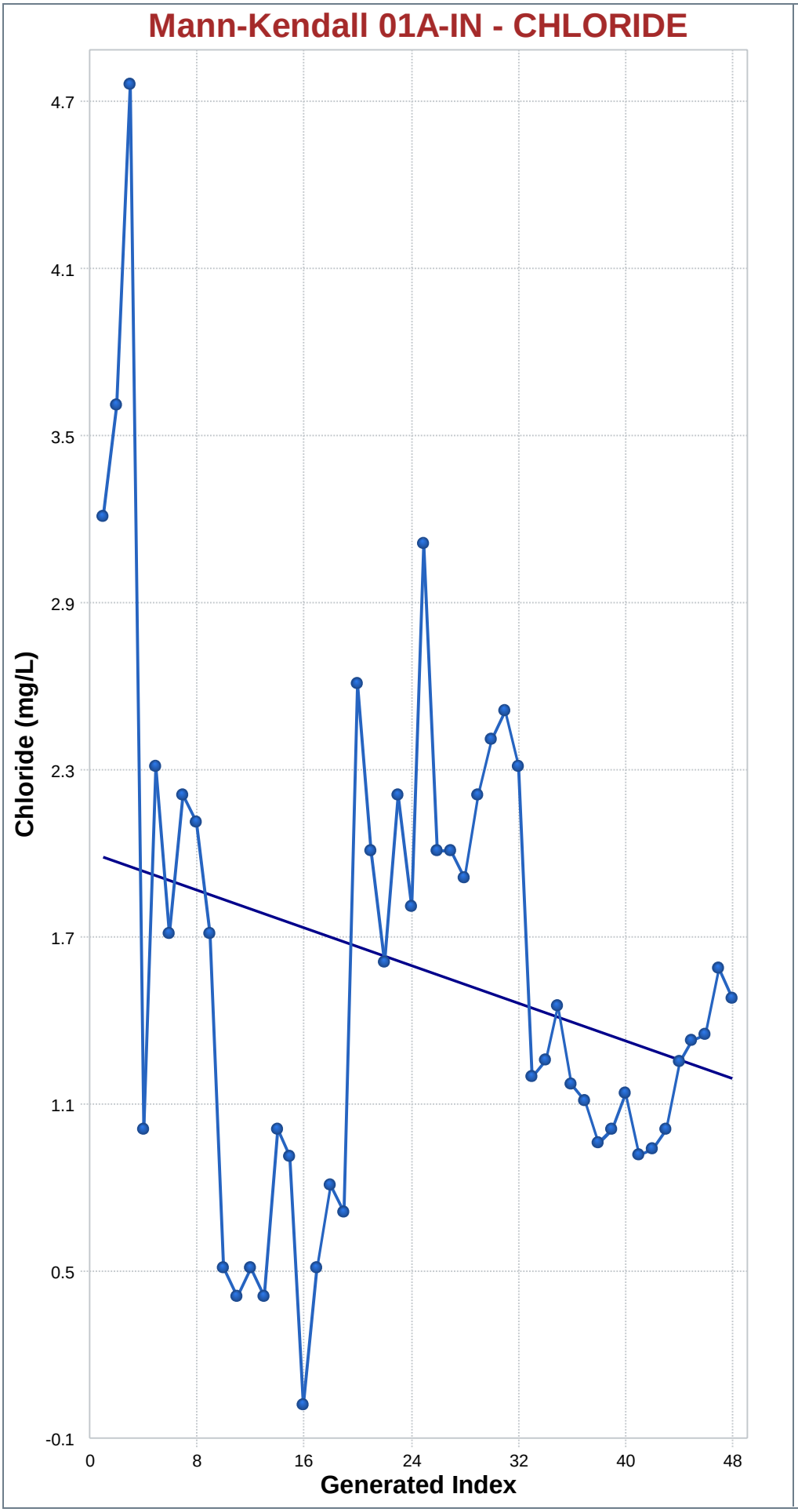

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 46 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 105.4862 |
| Standardized Value of S | -5.1286 |
| M-K Test Value (S) | -542 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.8682 |
| OLS Regression Intercept | 133.3797 |

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



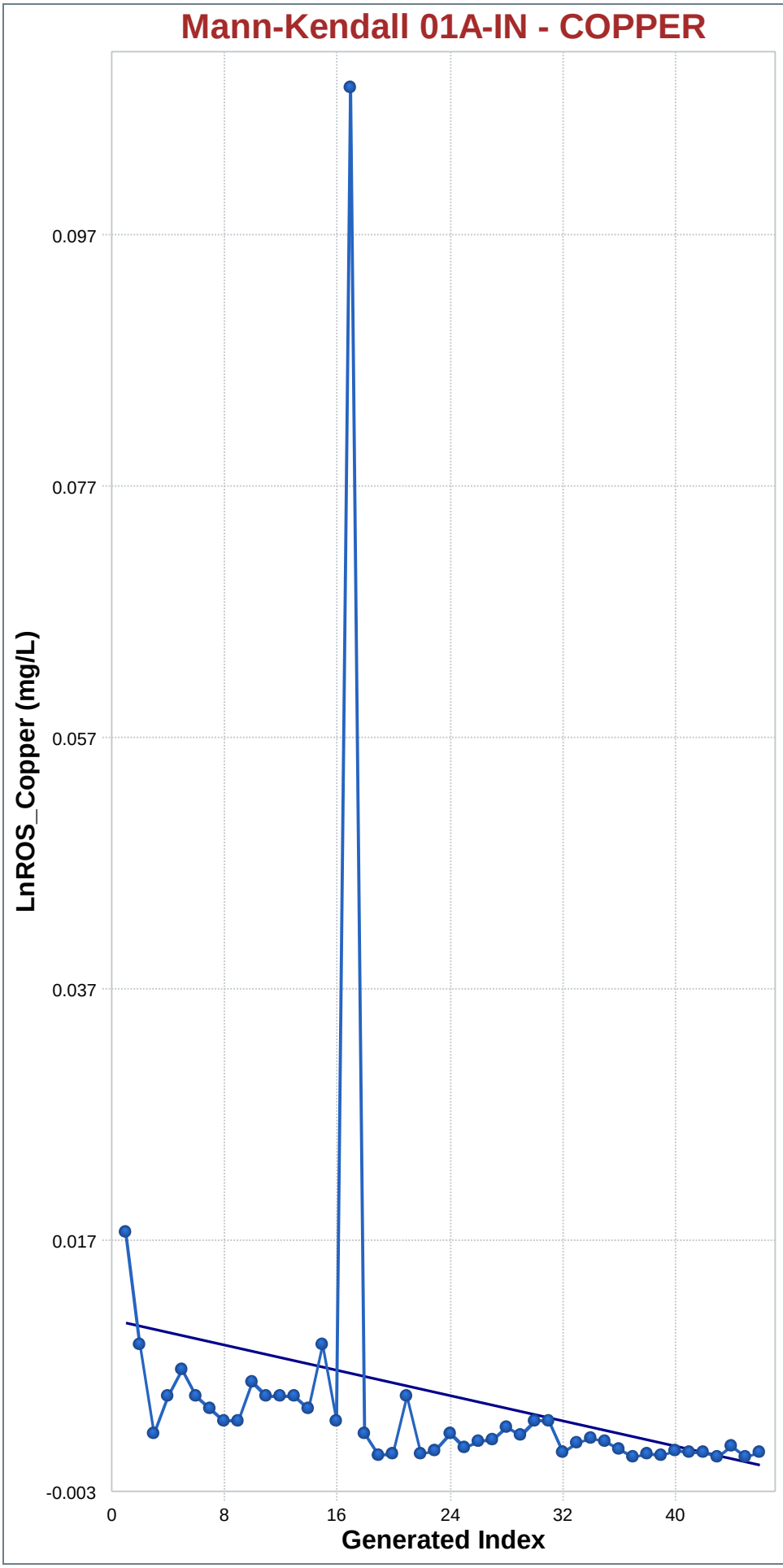

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.4100 |
| Standardized Value of S | -0.9875 |
| M-K Test Value (S) | -112 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1617 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0168 |
| OLS Regression Intercept | 1.9934 |

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




**Mann-Kendall Trend Analysis**

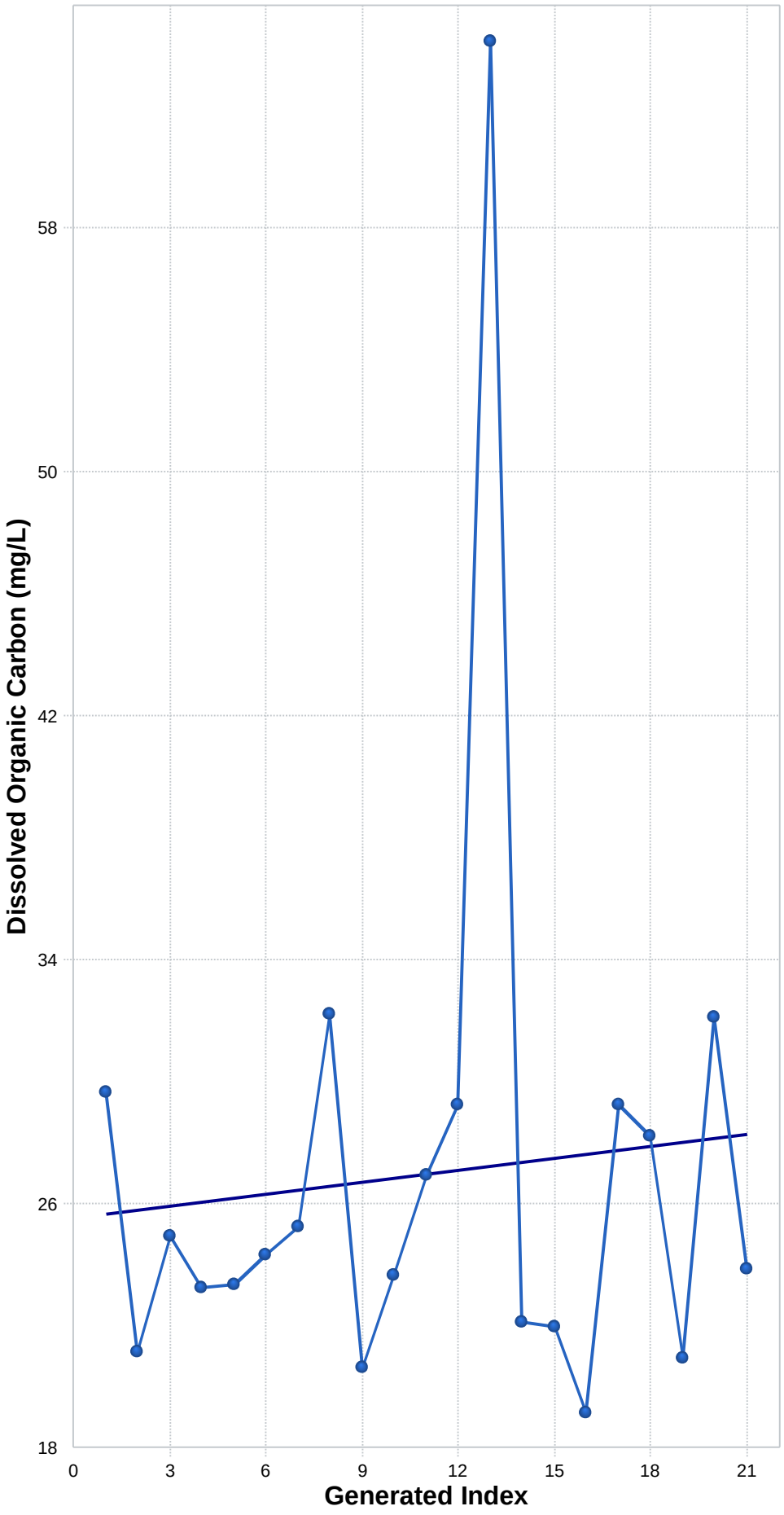
| | |
|---|---|
| n | 46 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 105.3850 |
| Standardized Value of S | -5.4941 |
| M-K Test Value (S) | -580 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0003 |
| OLS Regression Intercept | 0.0110 |

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

# Mann-Kendall 01A-IN - DOC




**Mann-Kendall Trend Analysis**

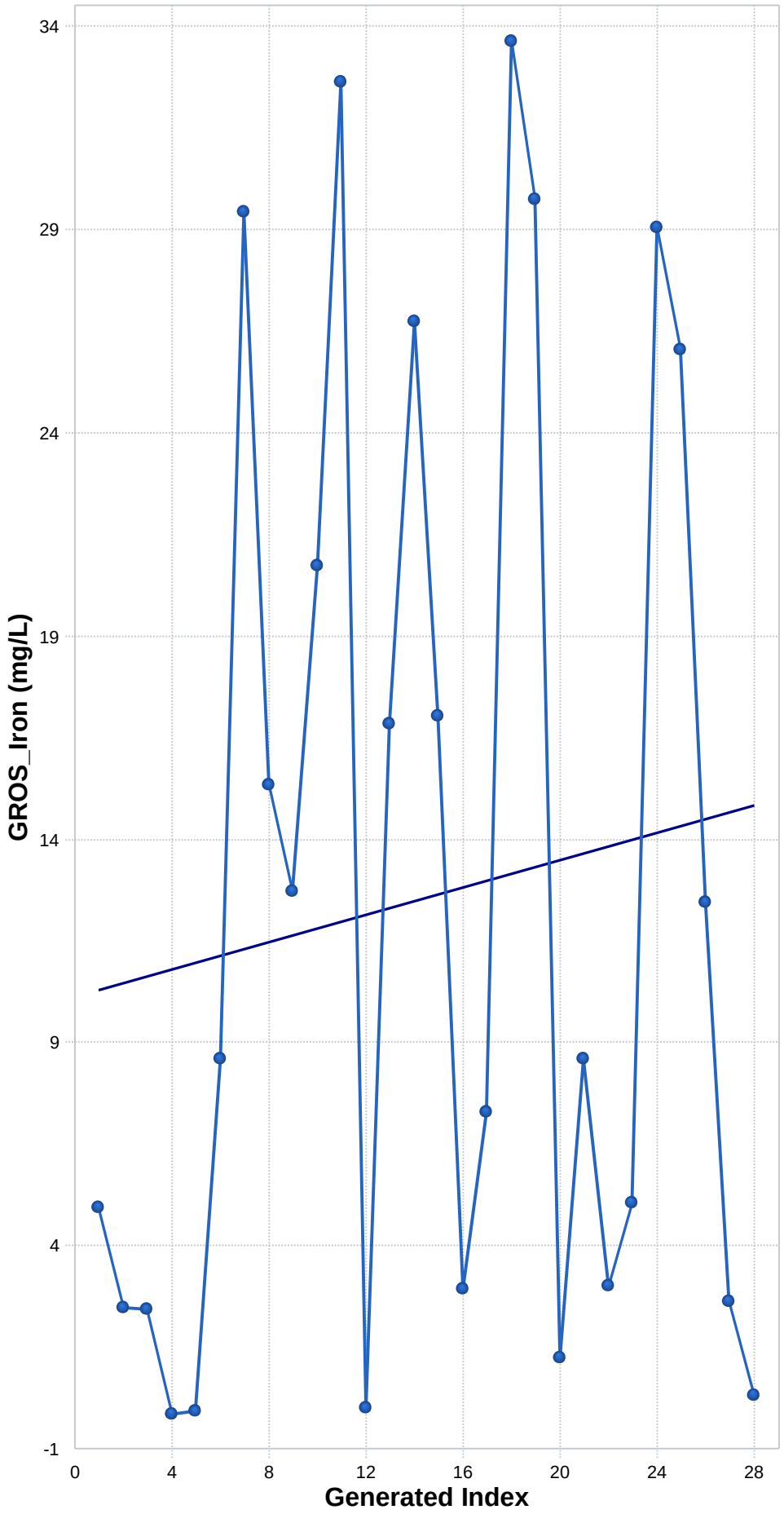
| | |
|---|---|
| n | 21 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 33.1009 |
| Standardized Value of S | 0.1813 |
| M-K Test Value (S) | 7 |
| Tabulated p-value | 0.4410 |
| Approximate p-value | 0.4281 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1331 |
| OLS Regression Intercept | 25.1643 |

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

# Mann-Kendall 01A-IN - IRON



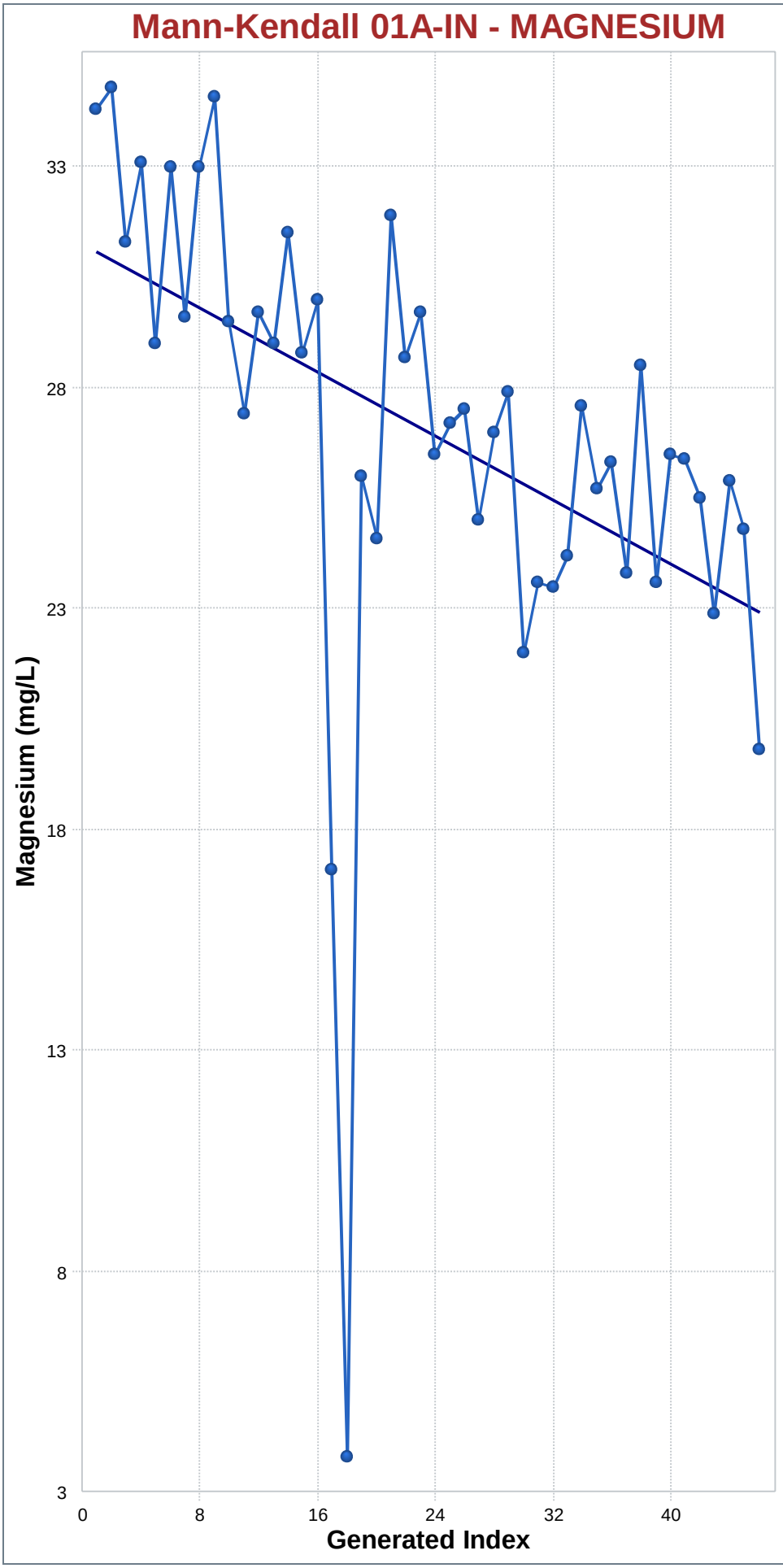

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 50.6063 |
| Standardized Value of S | 0.6719 |
| M-K Test Value (S) | 35 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.2508 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1680 |
| OLS Regression Intercept | 10.2907 |

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




**Mann-Kendall Trend Analysis**

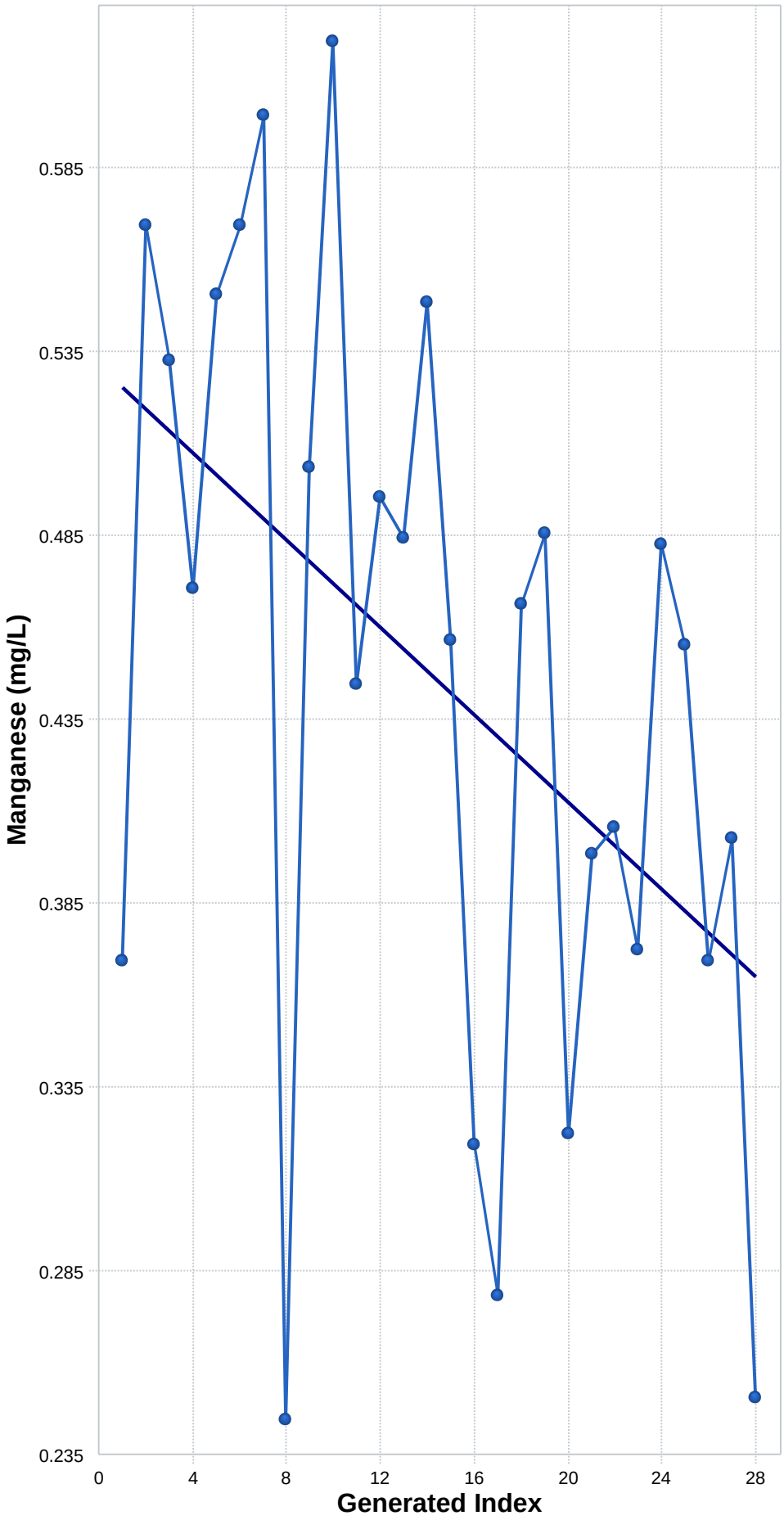
| | |
|---|---|
| n | 46 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 105.5936 |
| Standardized Value of S | -5.1613 |
| M-K Test Value (S) | -546 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.1819 |
| OLS Regression Intercept | 31.2768 |

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

# Mann-Kendall 01A-IN - MANGANESE




**Mann-Kendall Trend Analysis**

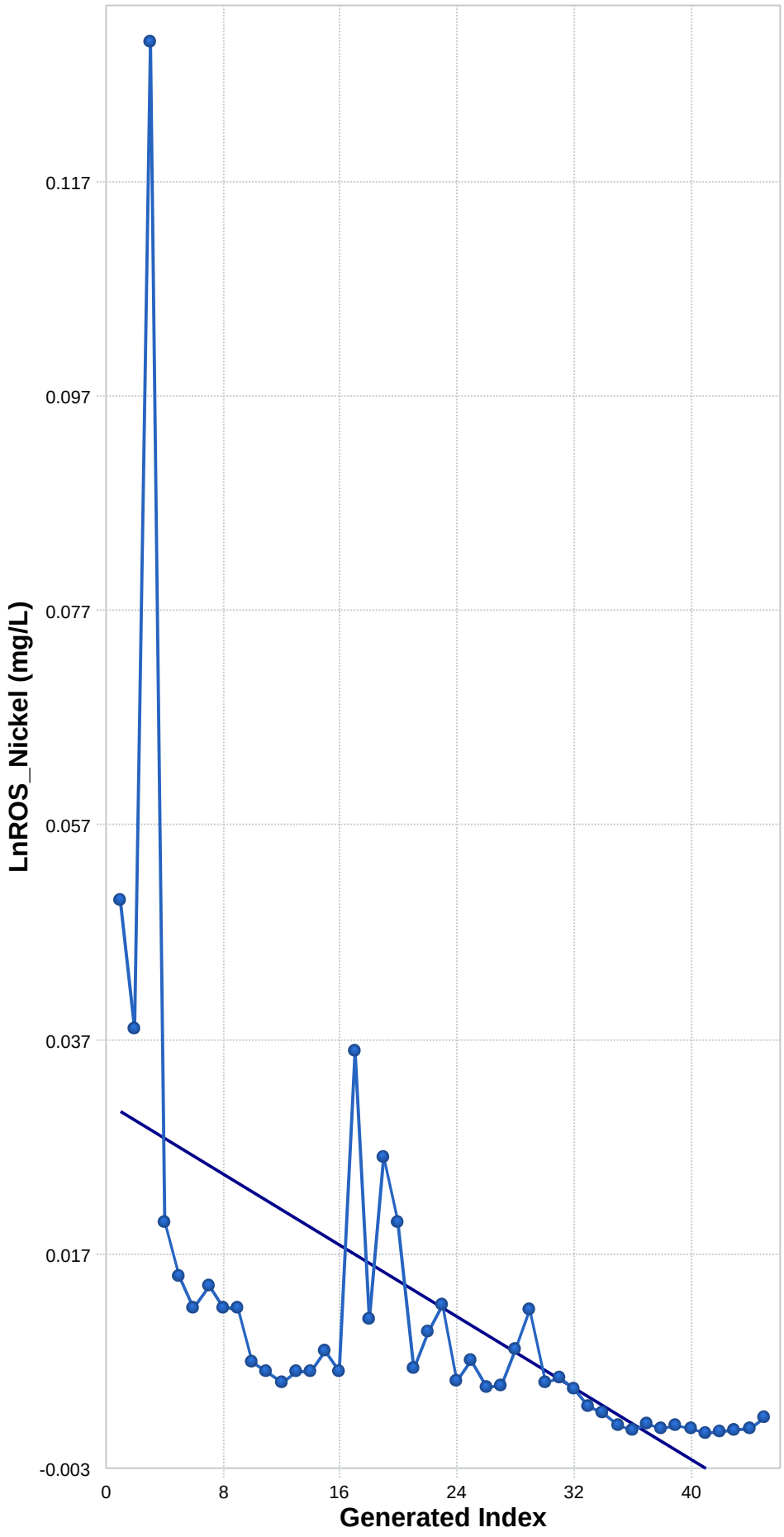
| | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 50.5964 |
| Standardized Value of S | -2.7077 |
| M-K Test Value (S) | -138 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0034 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0059 |
| OLS Regression Intercept | 0.5310 |

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

# Mann-Kendall 01A-IN - NICKEL



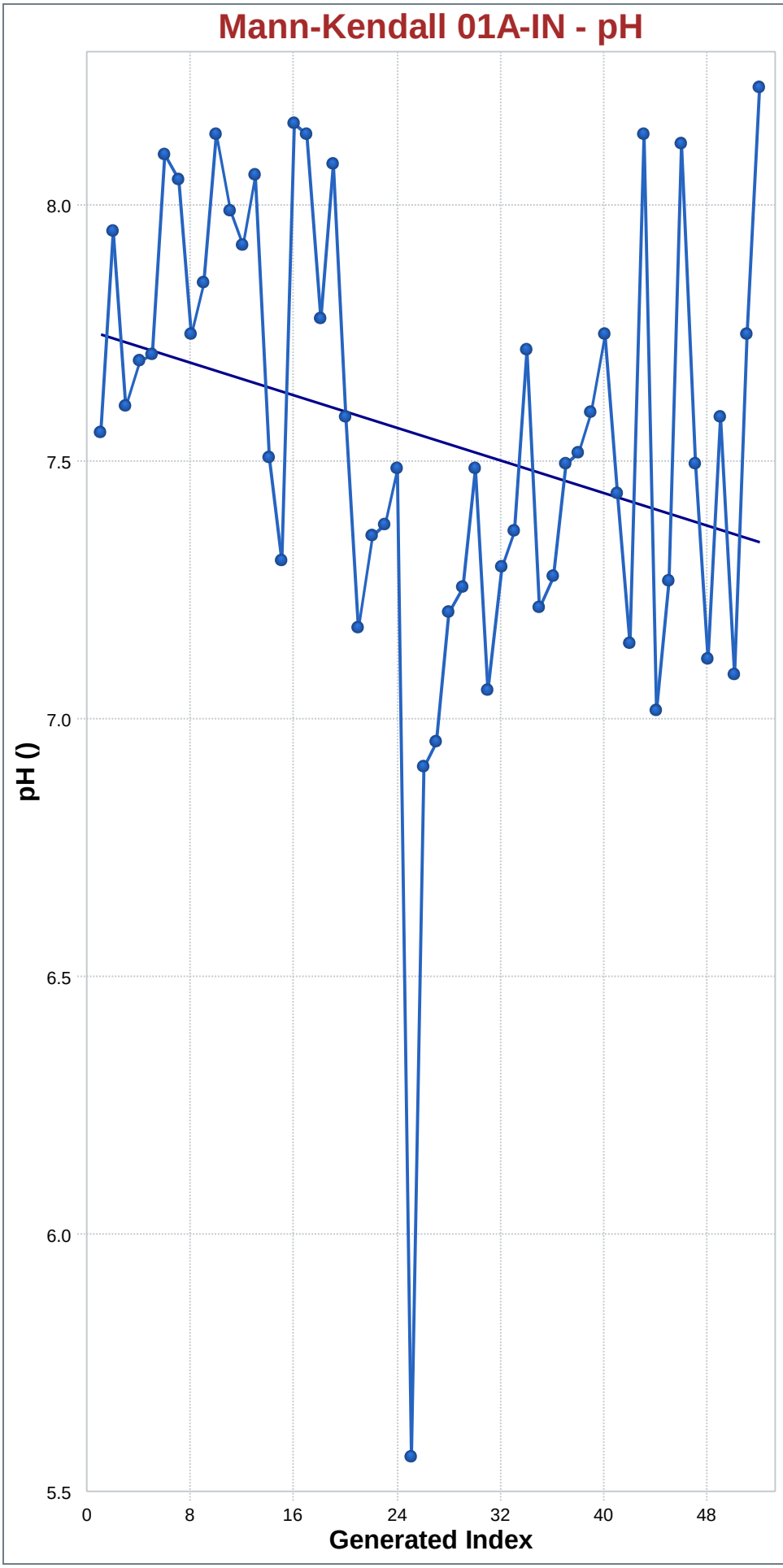

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 45 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 102.1551 |
| Standardized Value of S | -6.5782 |
| M-K Test Value (S) | -673 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0008 |
| OLS Regression Intercept | 0.0312 |

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



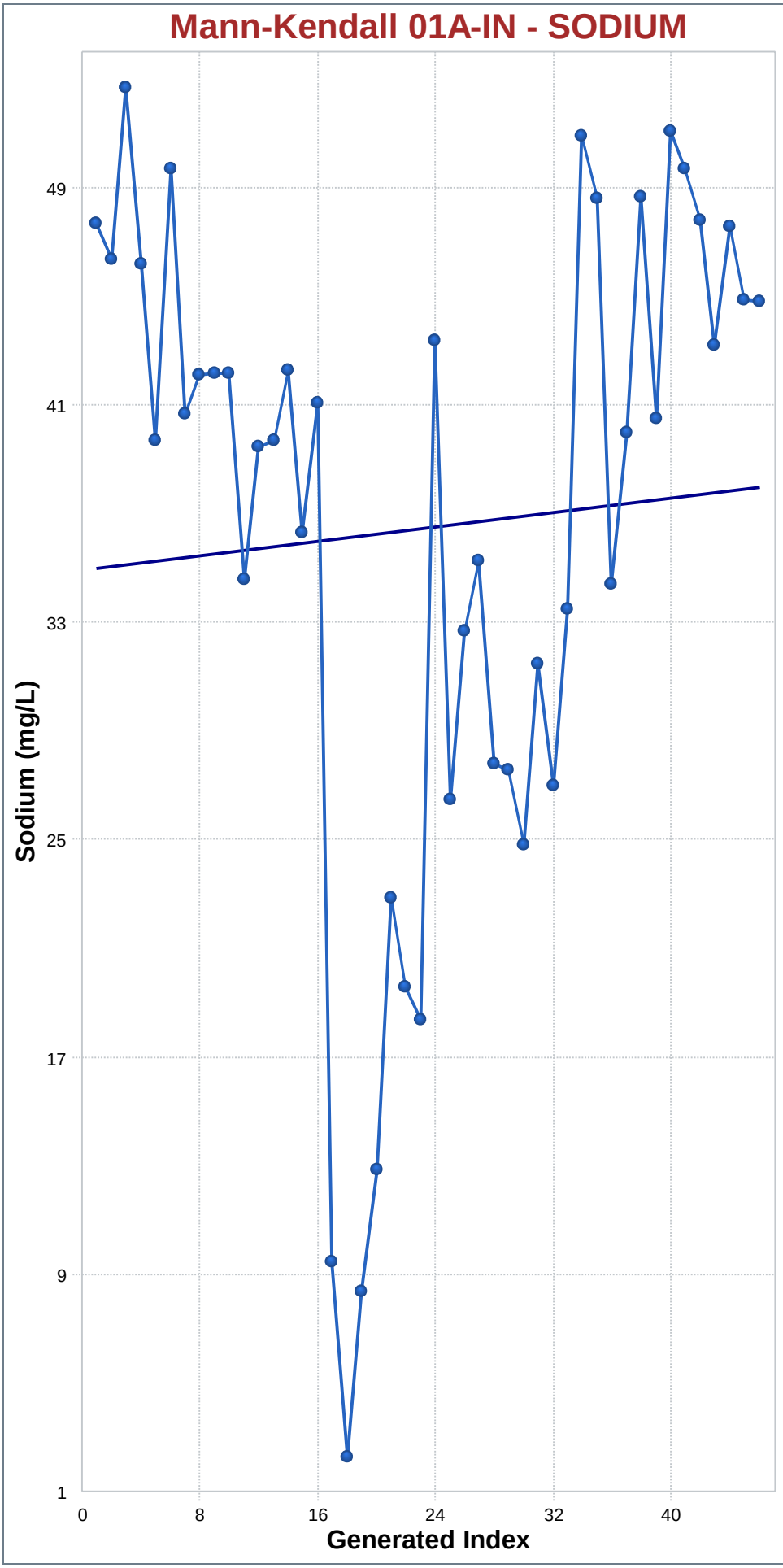

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 52 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 126.6846 |
| Standardized Value of S | -2.0523 |
| M-K Test Value (S) | -261 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0201 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0079 |
| OLS Regression Intercept | 7.7579 |

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




**Mann-Kendall Trend Analysis**

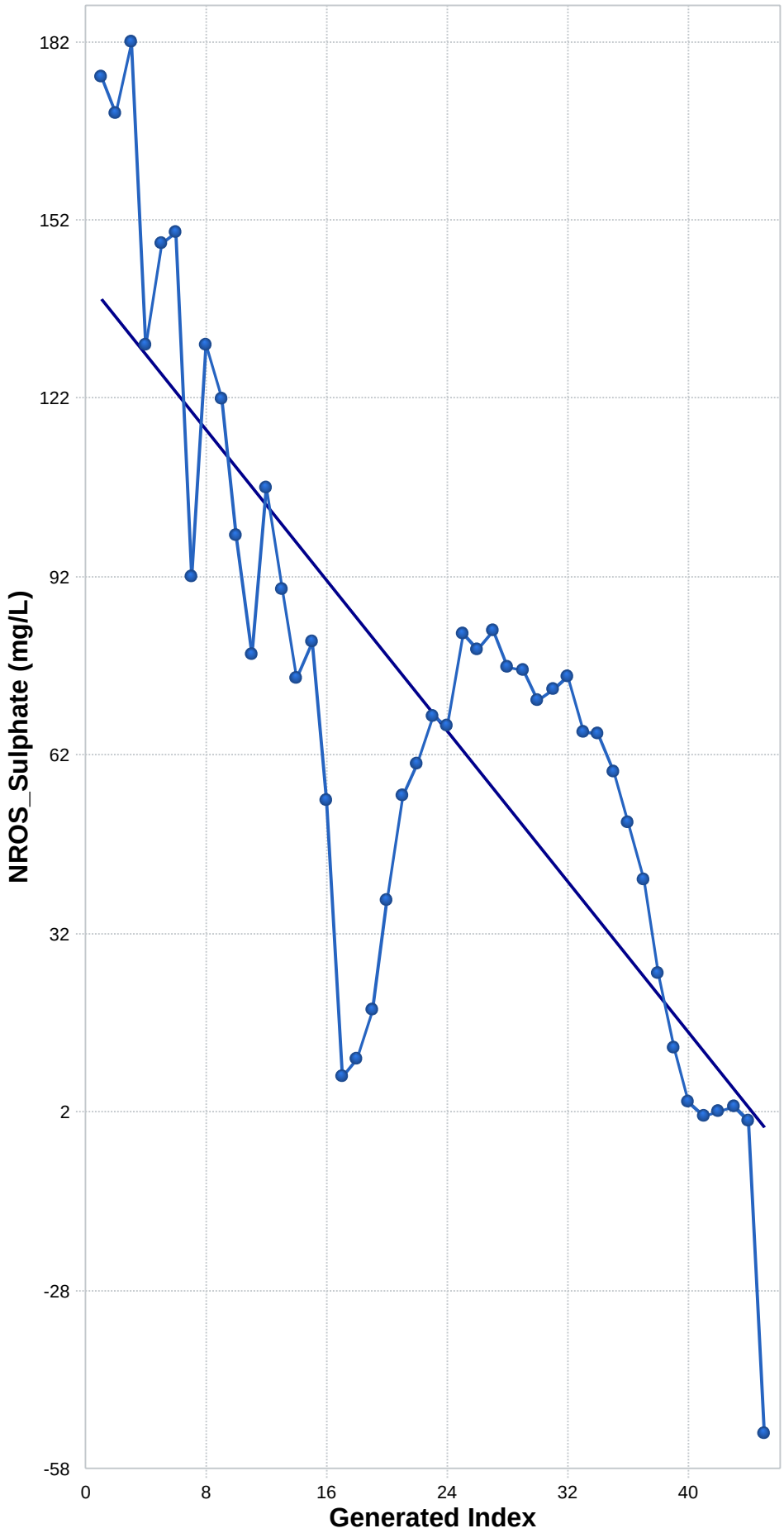
| | |
|---|---|
| n | 46 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 105.6030 |
| Standardized Value of S | 0.4829 |
| M-K Test Value (S) | 52 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3146 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0663 |
| OLS Regression Intercept | 35.2510 |

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

# Mann-Kendall 01A-IN - SULPHATE



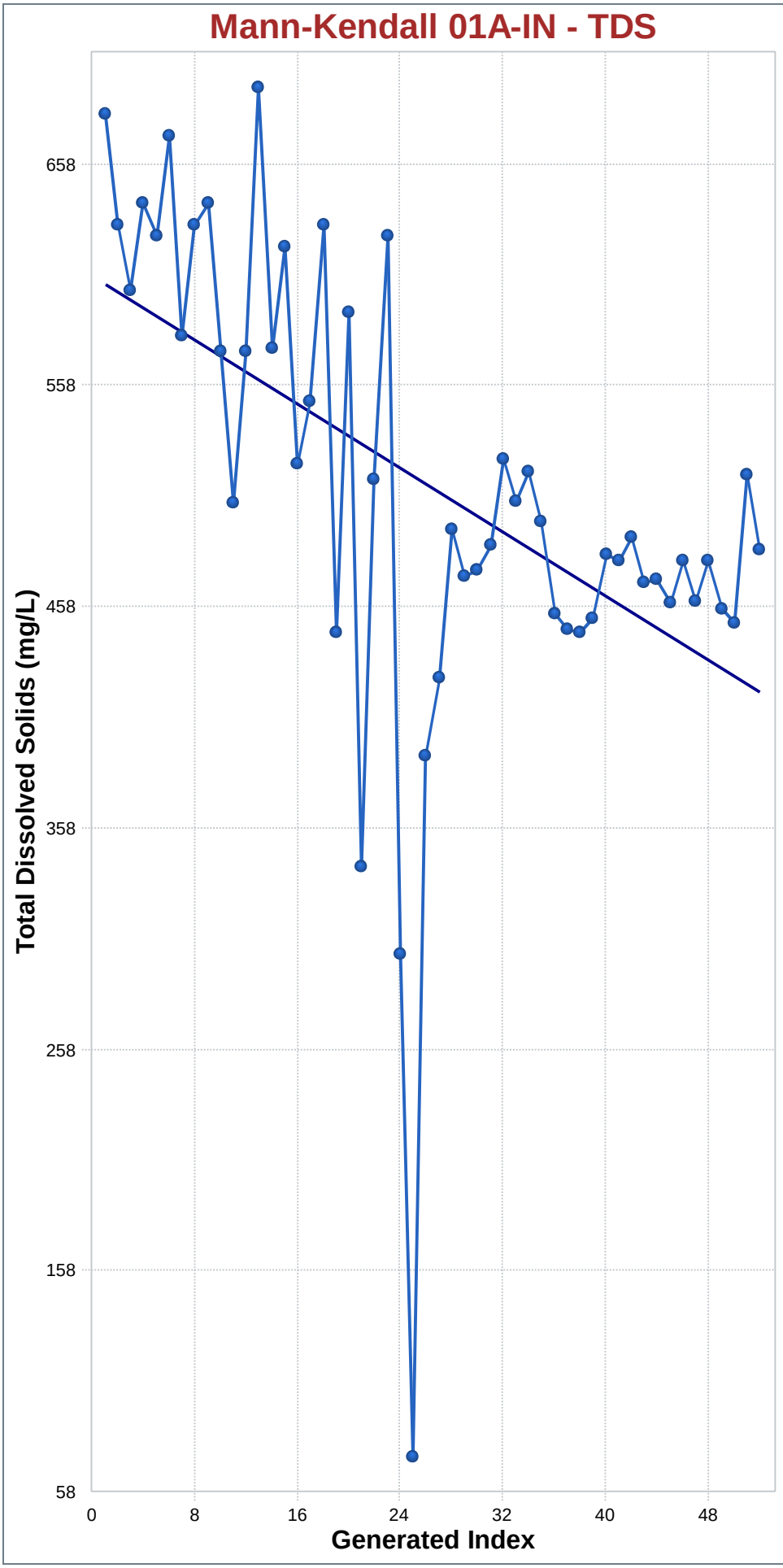

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 45 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 102.2204 |
| Standardized Value of S | -6.3588 |
| M-K Test Value (S) | -651 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -3.1667 |
| OLS Regression Intercept | 142.0012 |

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



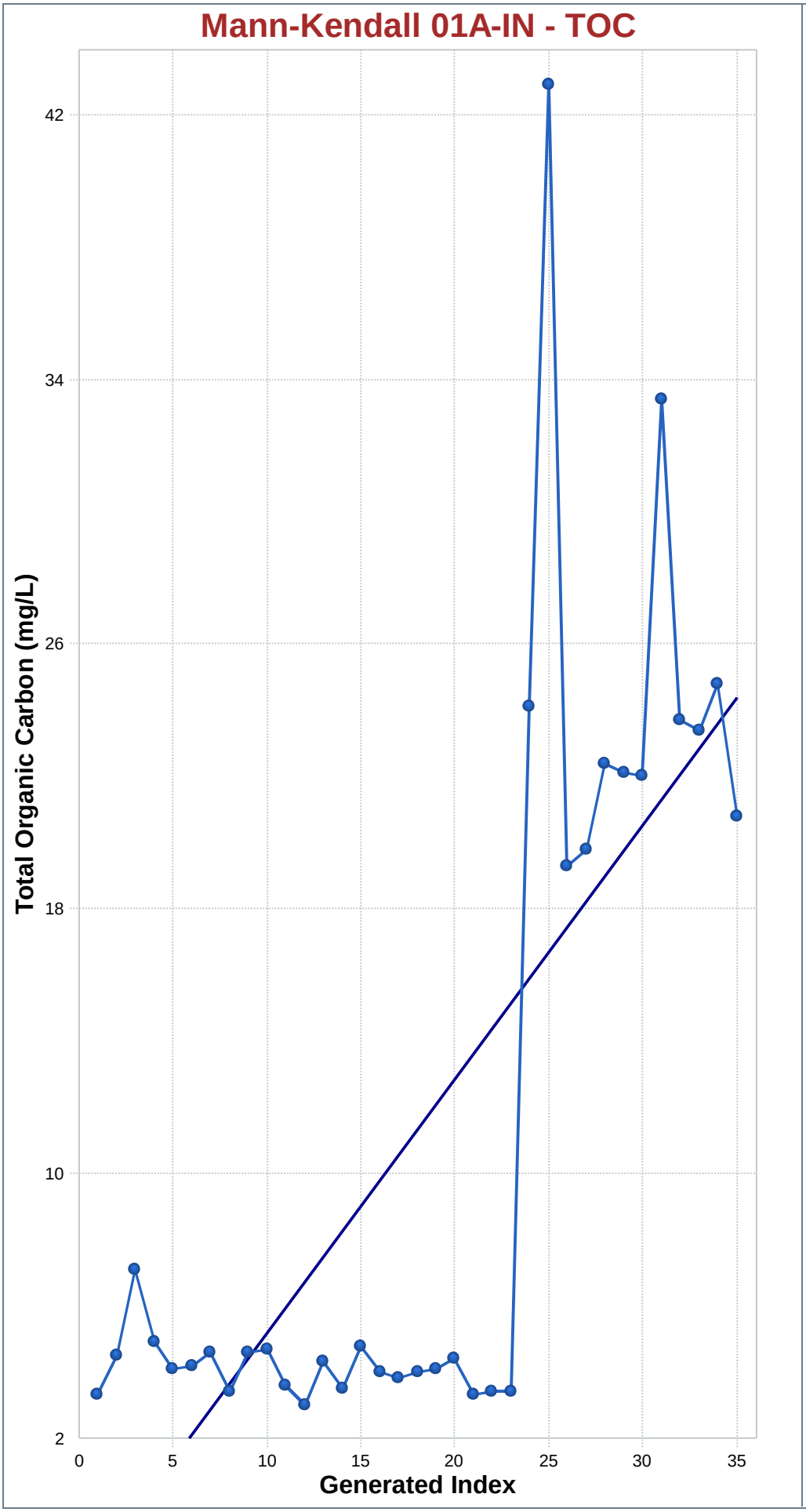

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 52 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 126.6807 |
| Standardized Value of S | -4.6811 |
| M-K Test Value (S) | -594 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -3.6025 |
| OLS Regression Intercept | 606.3891 |

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




**Mann-Kendall Trend Analysis**

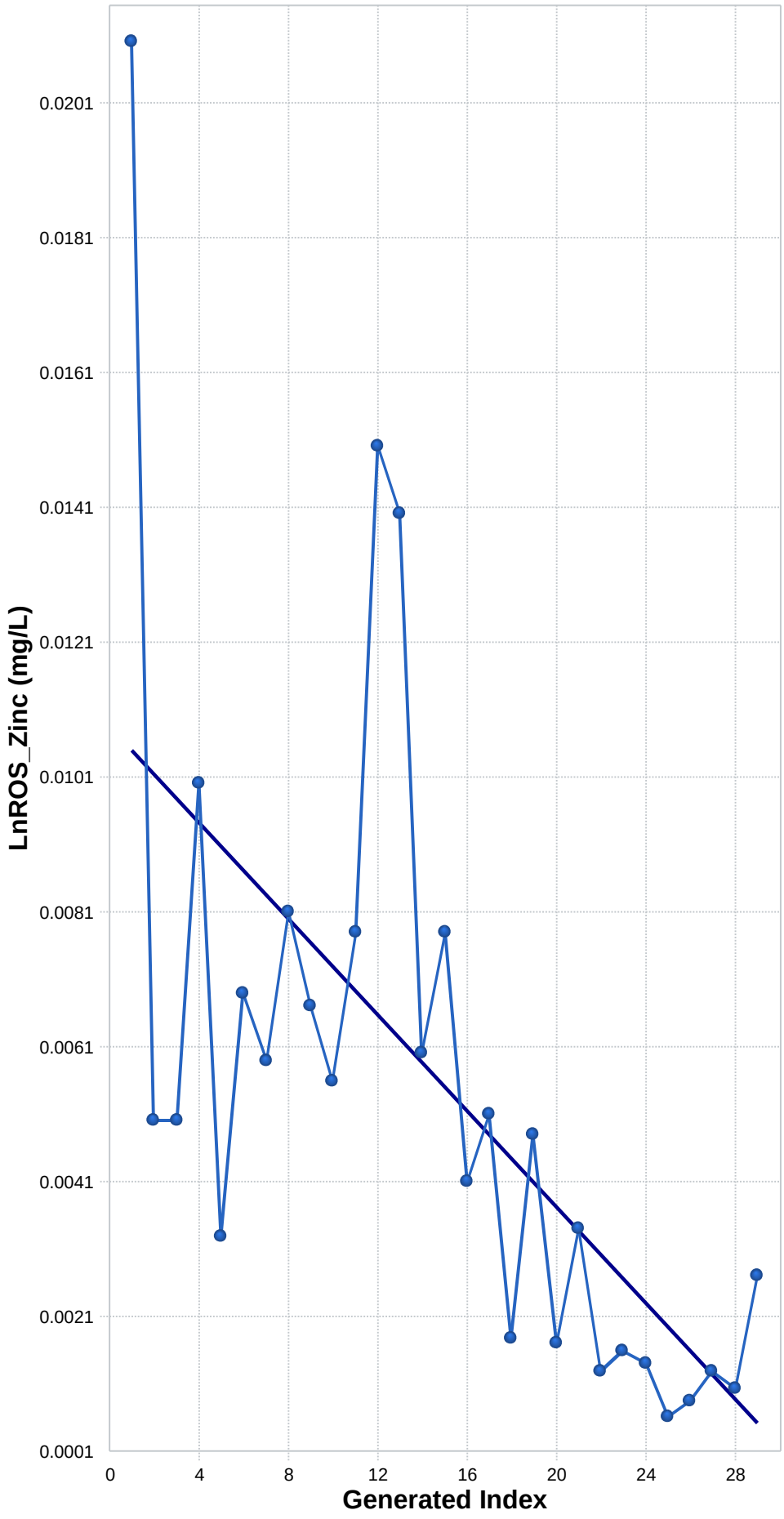
| | |
|---|---|
| n | 35 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 70.3610 |
| Standardized Value of S | 3.0272 |
| M-K Test Value (S) | 214 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0012 |

**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 01A-IN - ZINC



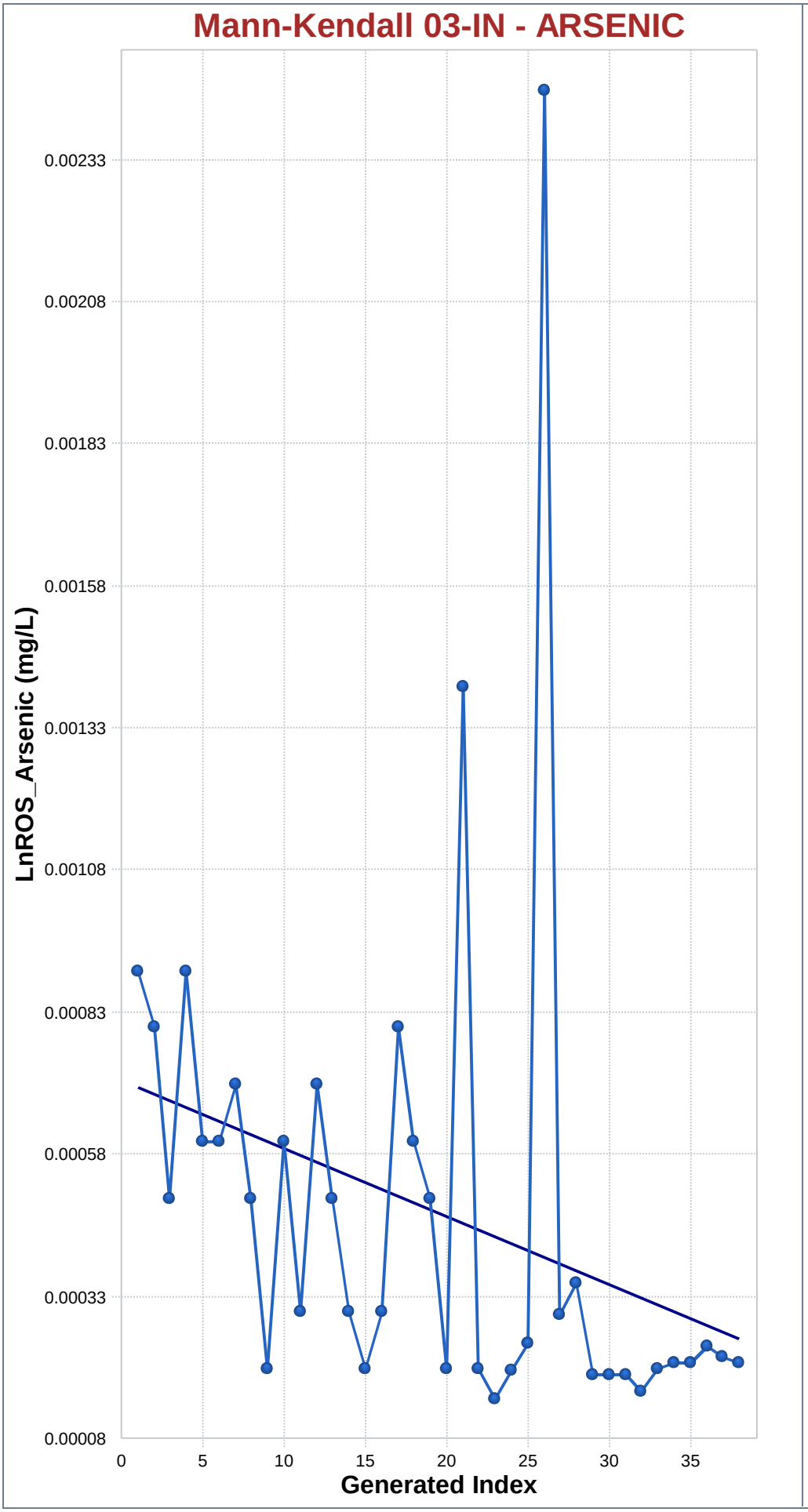

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2823 |
| Standardized Value of S | -4.2791 |
| M-K Test Value (S) | -229 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0004 |
| OLS Regression Intercept | 0.0108 |

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




**Mann-Kendall Trend Analysis**

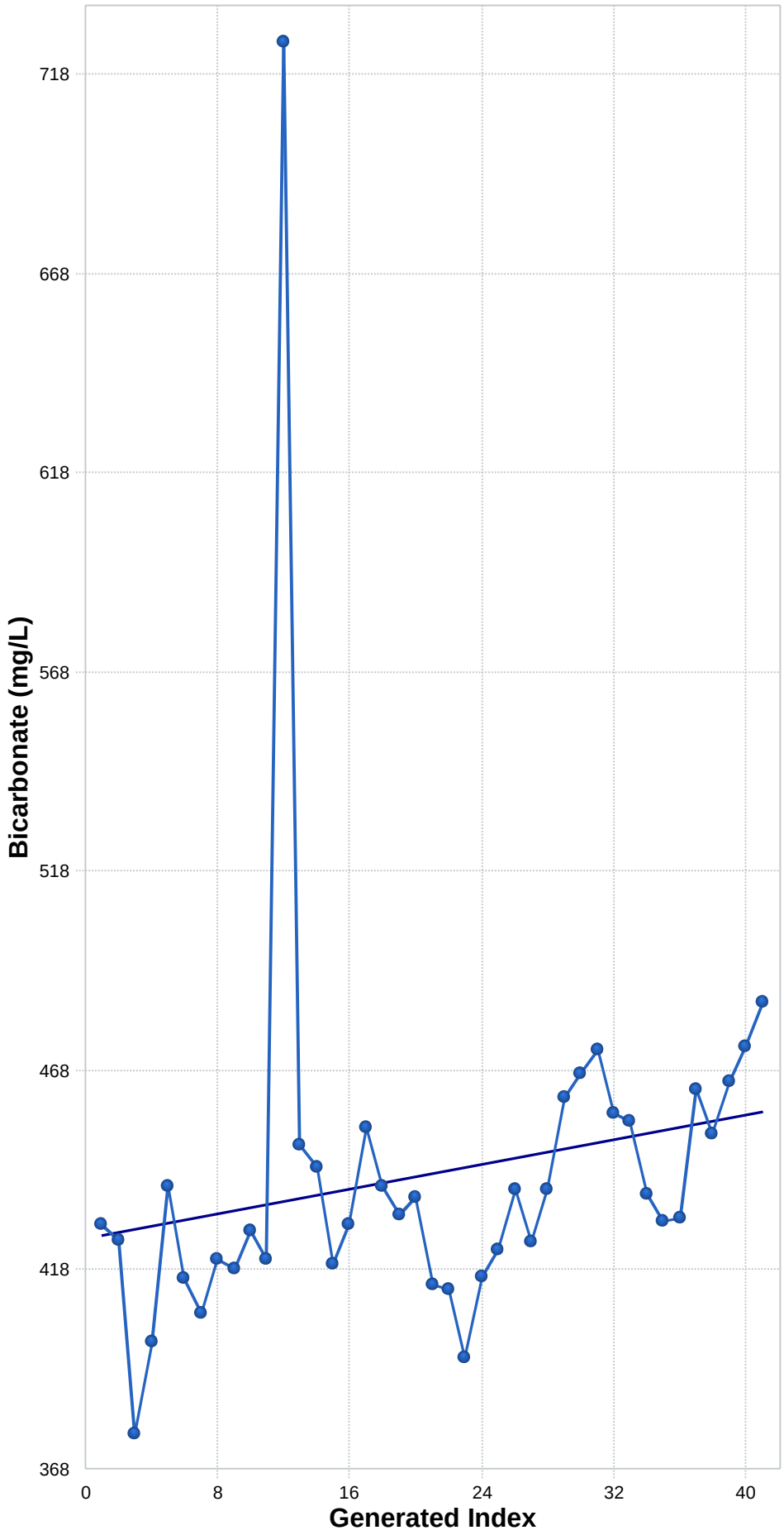
| | |
|---|---|
| n | 38 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 79.2401 |
| Standardized Value of S | -3.6850 |
| M-K Test Value (S) | -293 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0007 |

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

# Mann-Kendall 03-IN - BICARBONATE



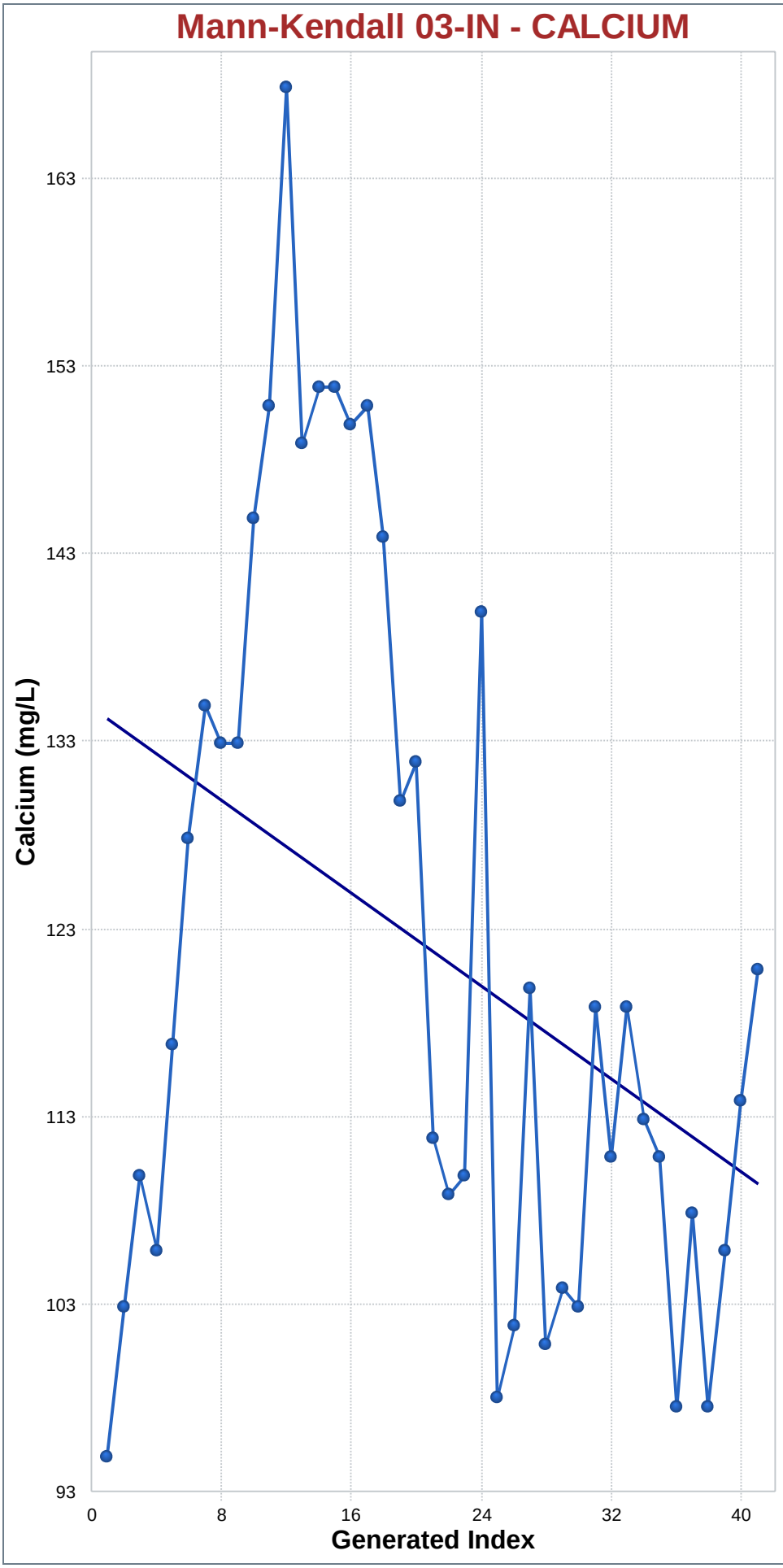

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 41 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 89.0094 |
| Standardized Value of S | 3.7636 |
| M-K Test Value (S) | 336 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.7795 |
| OLS Regression Intercept | 425.5773 |

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




**Mann-Kendall Trend Analysis**

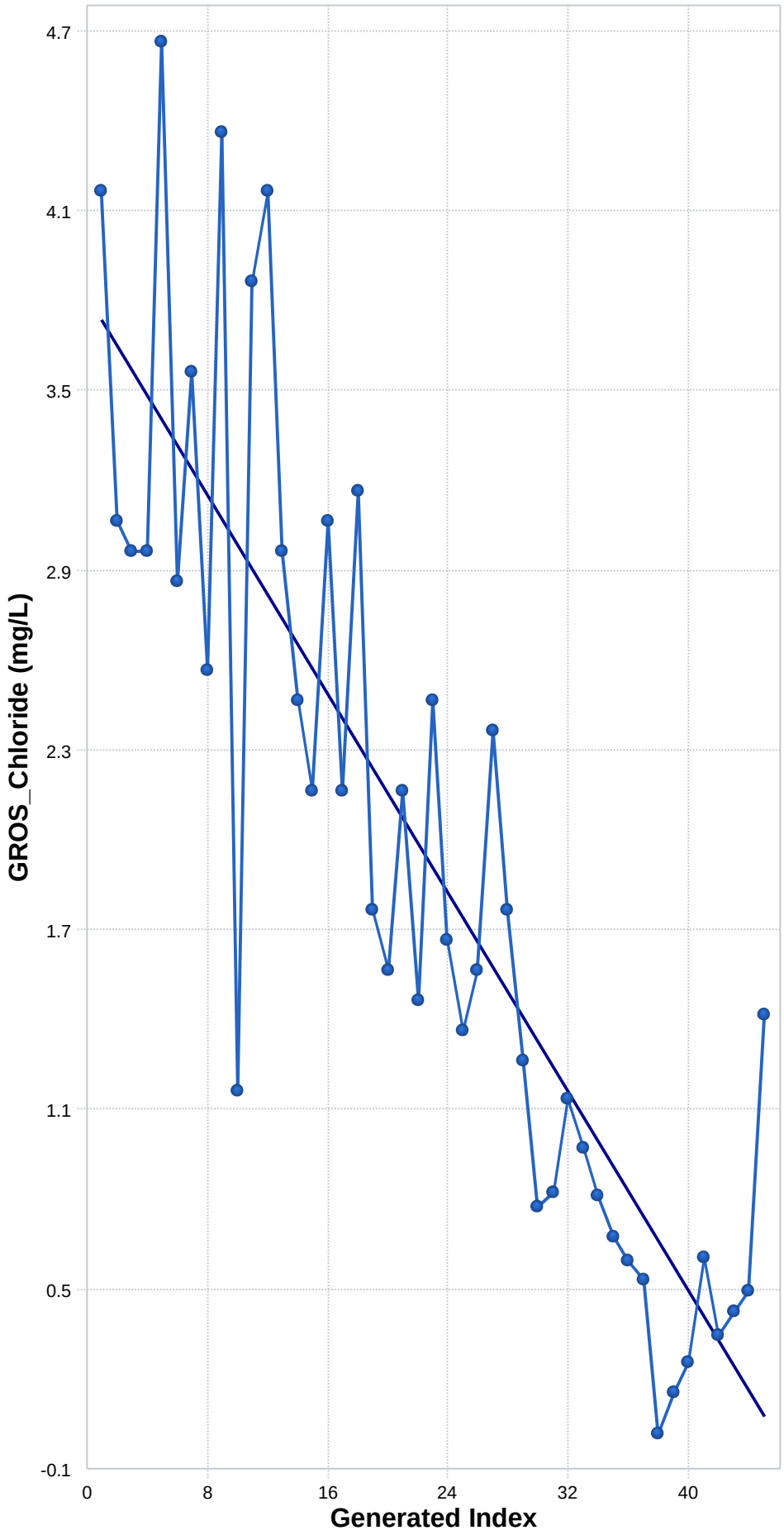
| | |
|---|---|
| n | 41 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 88.9813 |
| Standardized Value of S | -2.0229 |
| M-K Test Value (S) | -181 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0215 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.6203 |
| OLS Regression Intercept | 134.9932 |

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

# Mann-Kendall 03-IN - CHLORIDE




**Mann-Kendall Trend Analysis**

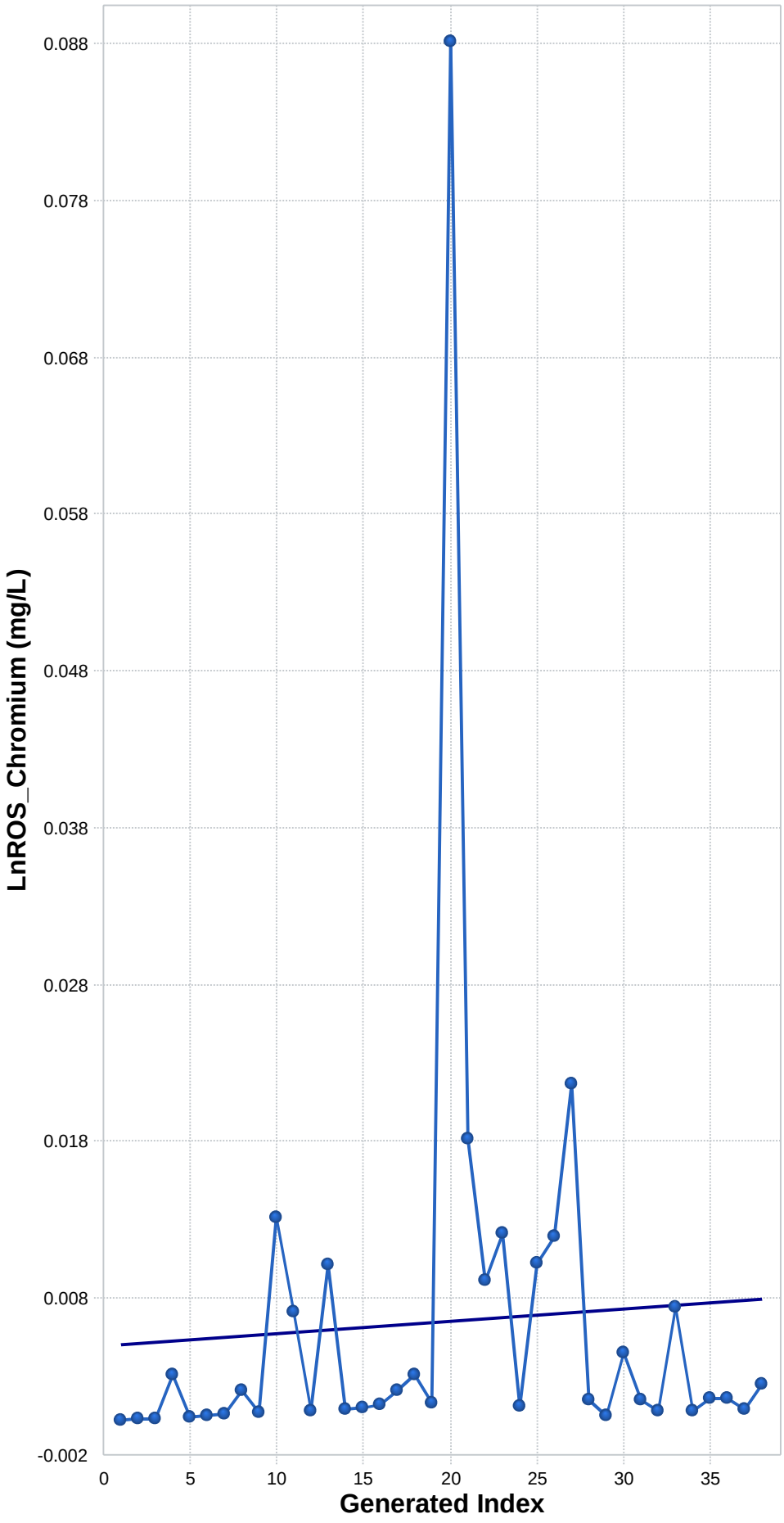
| | |
|---|---|
| n | 45 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 102.1649 |
| Standardized Value of S | -6.9104 |
| M-K Test Value (S) | -707 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0832 |
| OLS Regression Intercept | 3.8554 |

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

# Mann-Kendall 03-IN - CHROMIUM




**Mann-Kendall Trend Analysis**

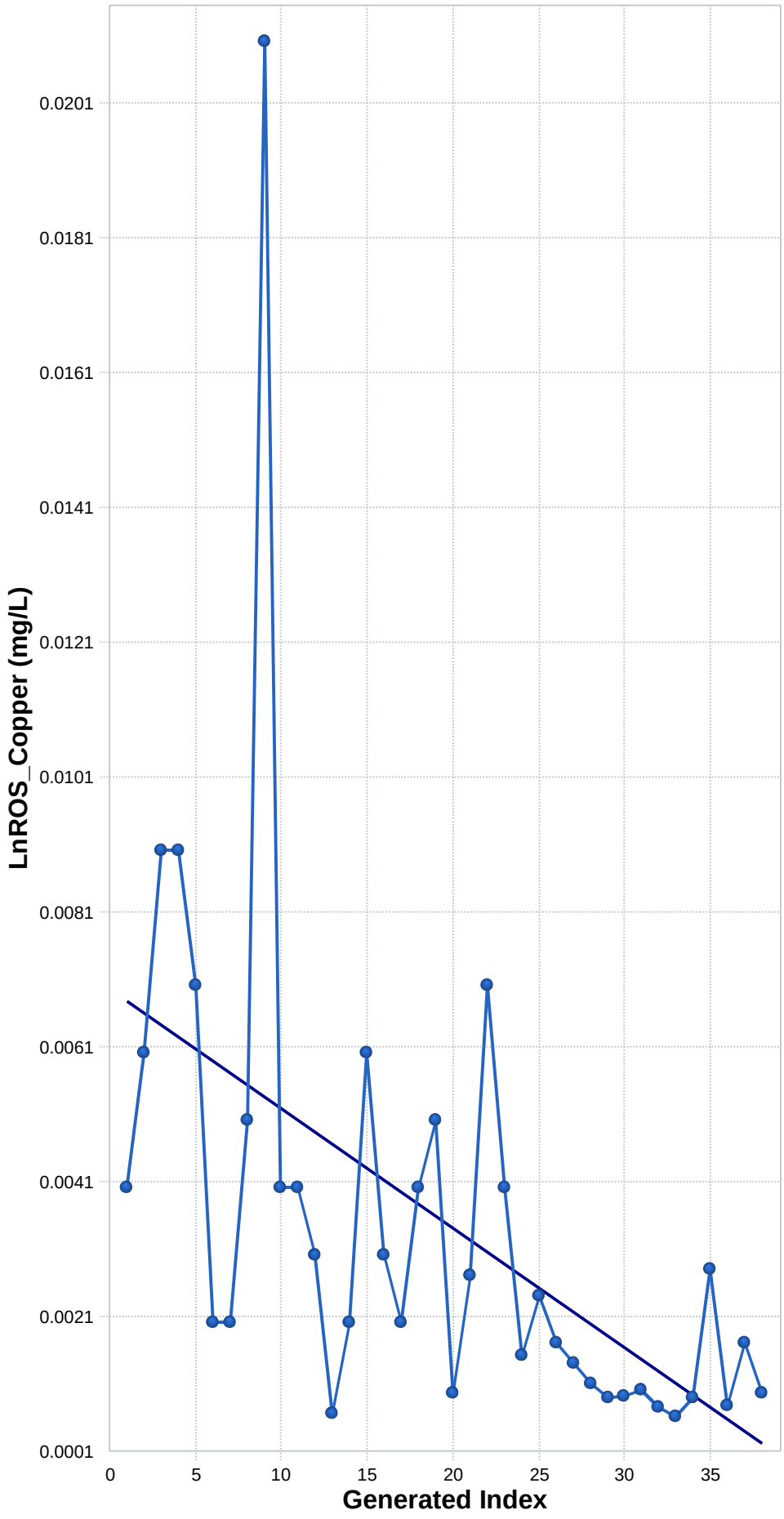
| | |
|---|---|
| n | 38 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 79.5236 |
| Standardized Value of S | 2.2509 |
| M-K Test Value (S) | 180 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0122 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0001 |
| OLS Regression Intercept | 0.0048 |

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

# Mann-Kendall 03-IN - COPPER



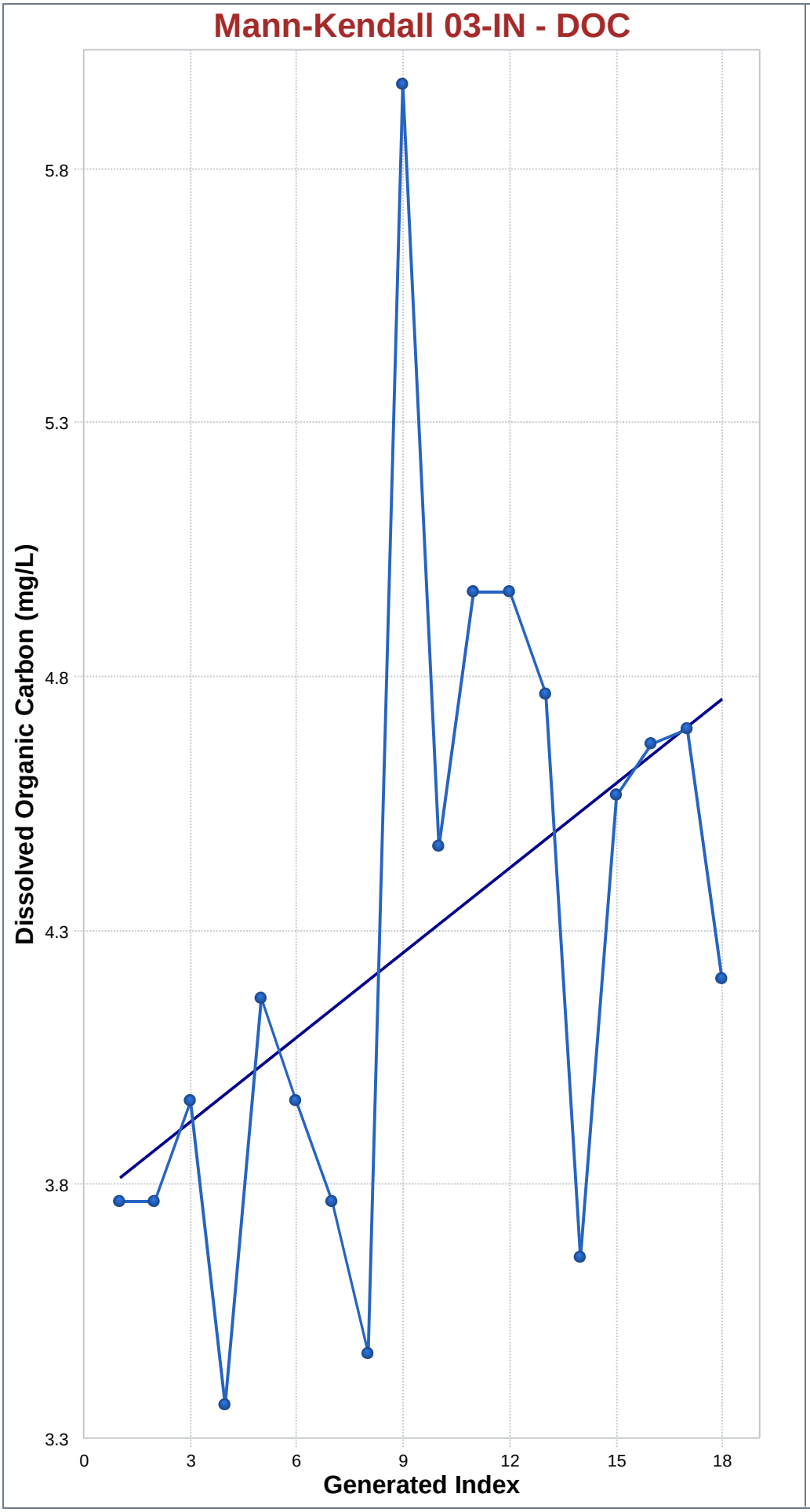

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 38 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 79.3452 |
| Standardized Value of S | -4.6128 |
| M-K Test Value (S) | -367 |
| 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.



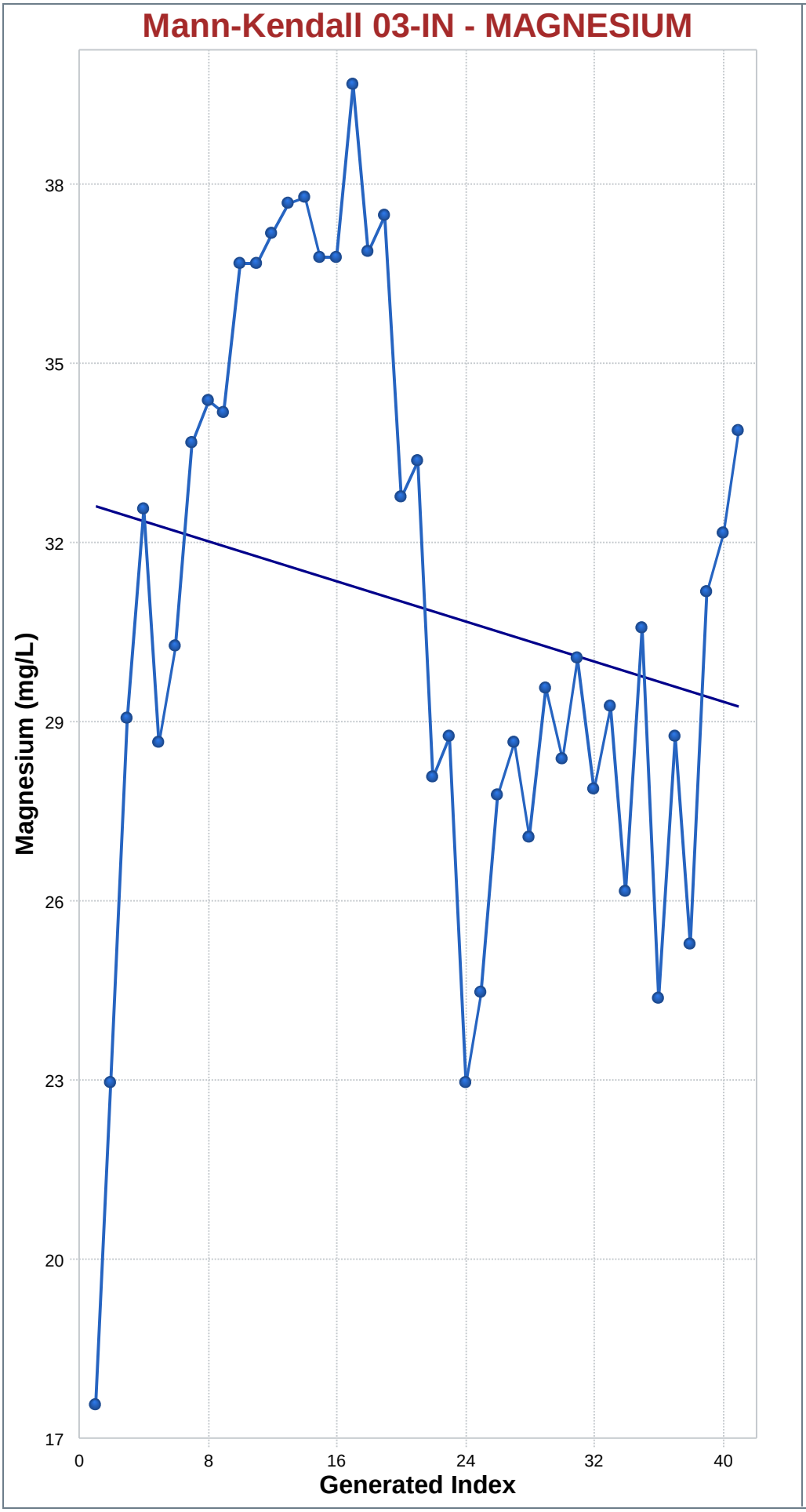

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.2932 |
| Standardized Value of S | 1.7875 |
| M-K Test Value (S) | 48 |
| Tabulated p-value | 0.0340 |
| Approximate p-value | 0.0369 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0555 |
| OLS Regression Intercept | 3.7931 |

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




**Mann-Kendall Trend Analysis**

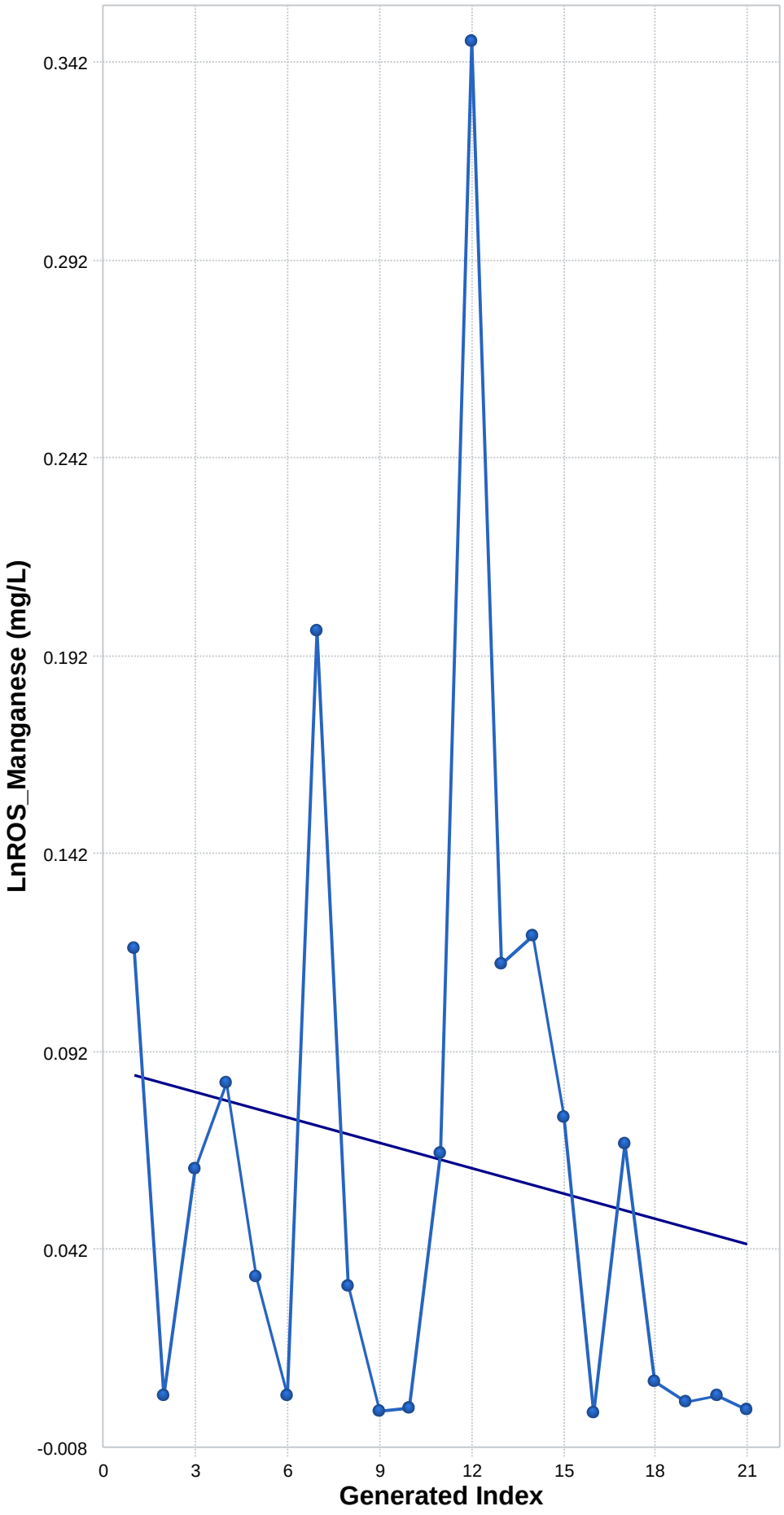
| | |
|---|---|
| n | 41 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 89.0037 |
| Standardized Value of S | -1.1685 |
| M-K Test Value (S) | -105 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1213 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0838 |
| OLS Regression Intercept | 32.2235 |

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

# Mann-Kendall 03-IN - MANGANESE



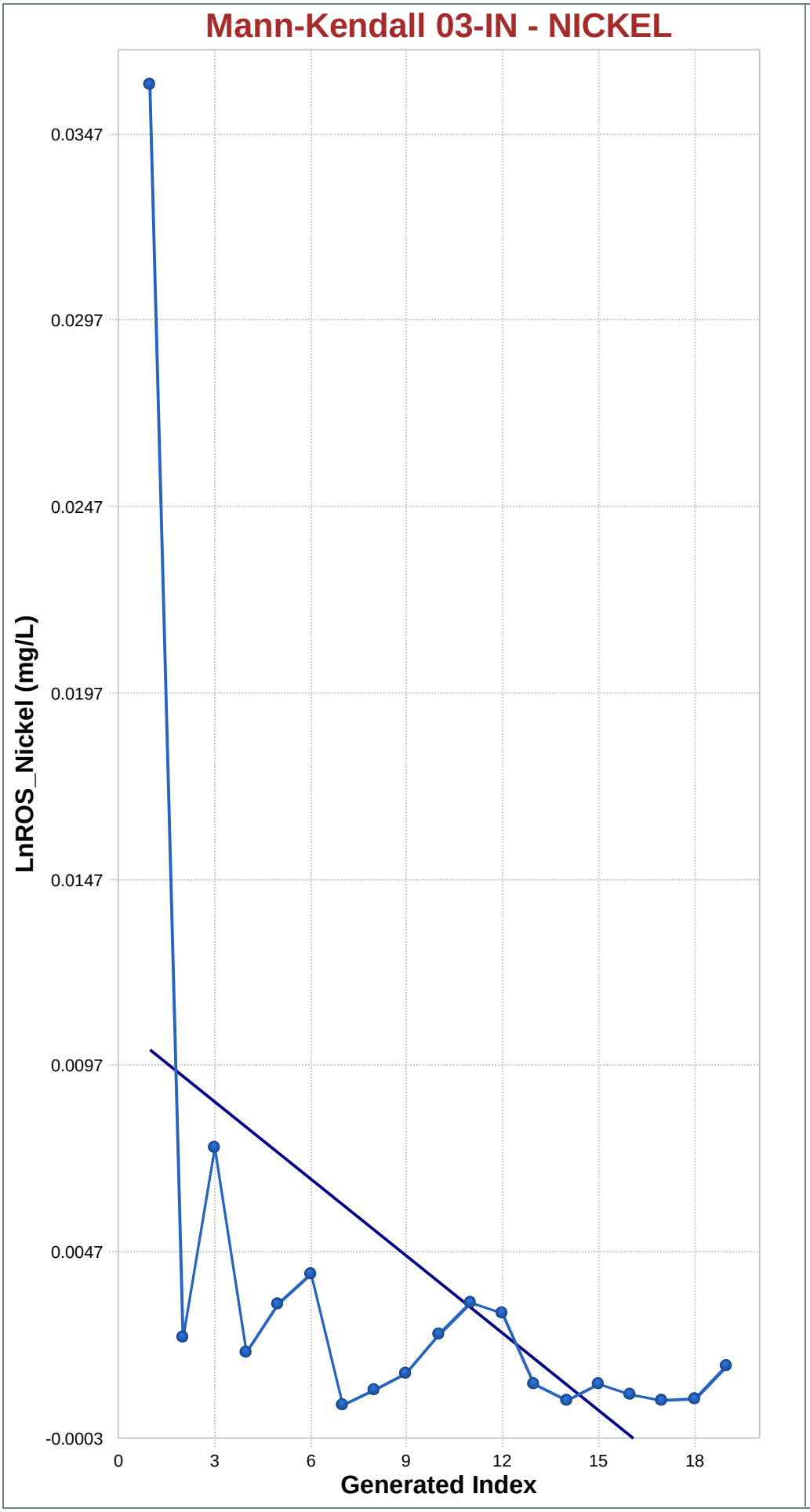

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 21 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 33.1160 |
| Standardized Value of S | -1.2985 |
| M-K Test Value (S) | -44 |
| Tabulated p-value | 0.0980 |
| Approximate p-value | 0.0971 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0021 |
| OLS Regression Intercept | 0.0878 |

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



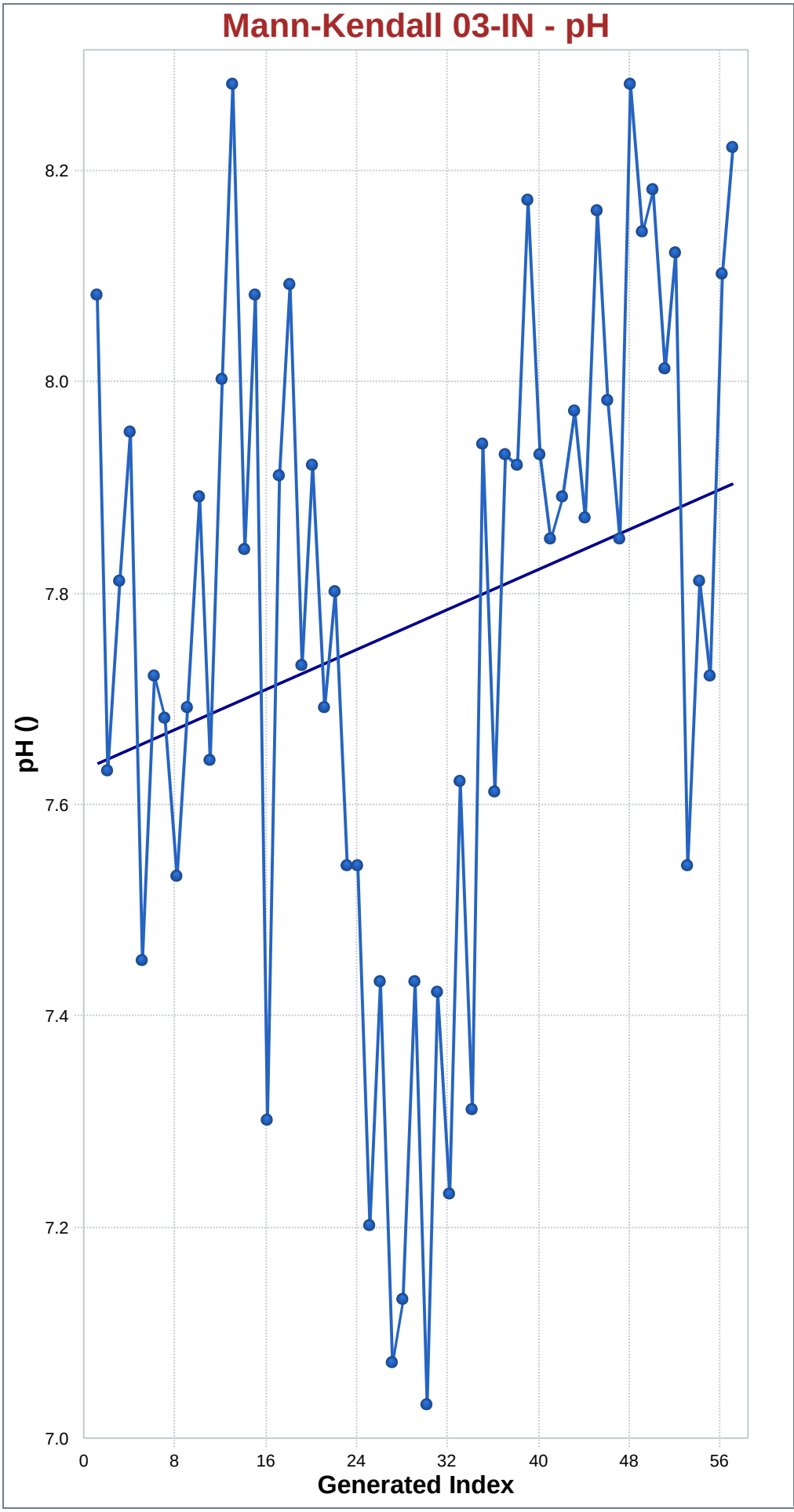

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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 | -0.0007 |
| OLS Regression Intercept | 0.0108 |

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




**Mann-Kendall Trend Analysis**

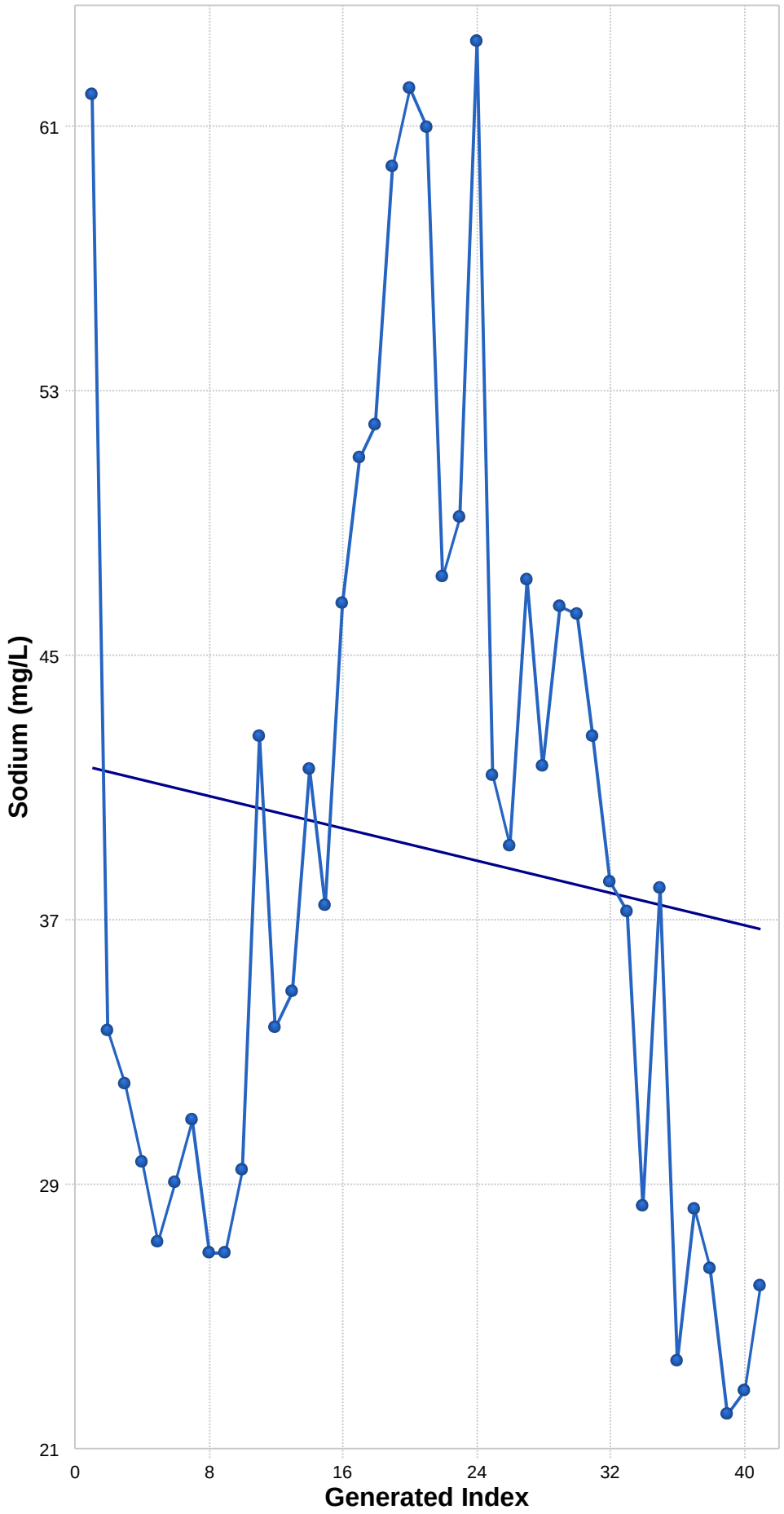
| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.2205 |
| Standardized Value of S | 2.0521 |
| M-K Test Value (S) | 299 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0201 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0047 |
| OLS Regression Intercept | 7.6421 |

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

# Mann-Kendall 03-IN - SODIUM




**Mann-Kendall Trend Analysis**

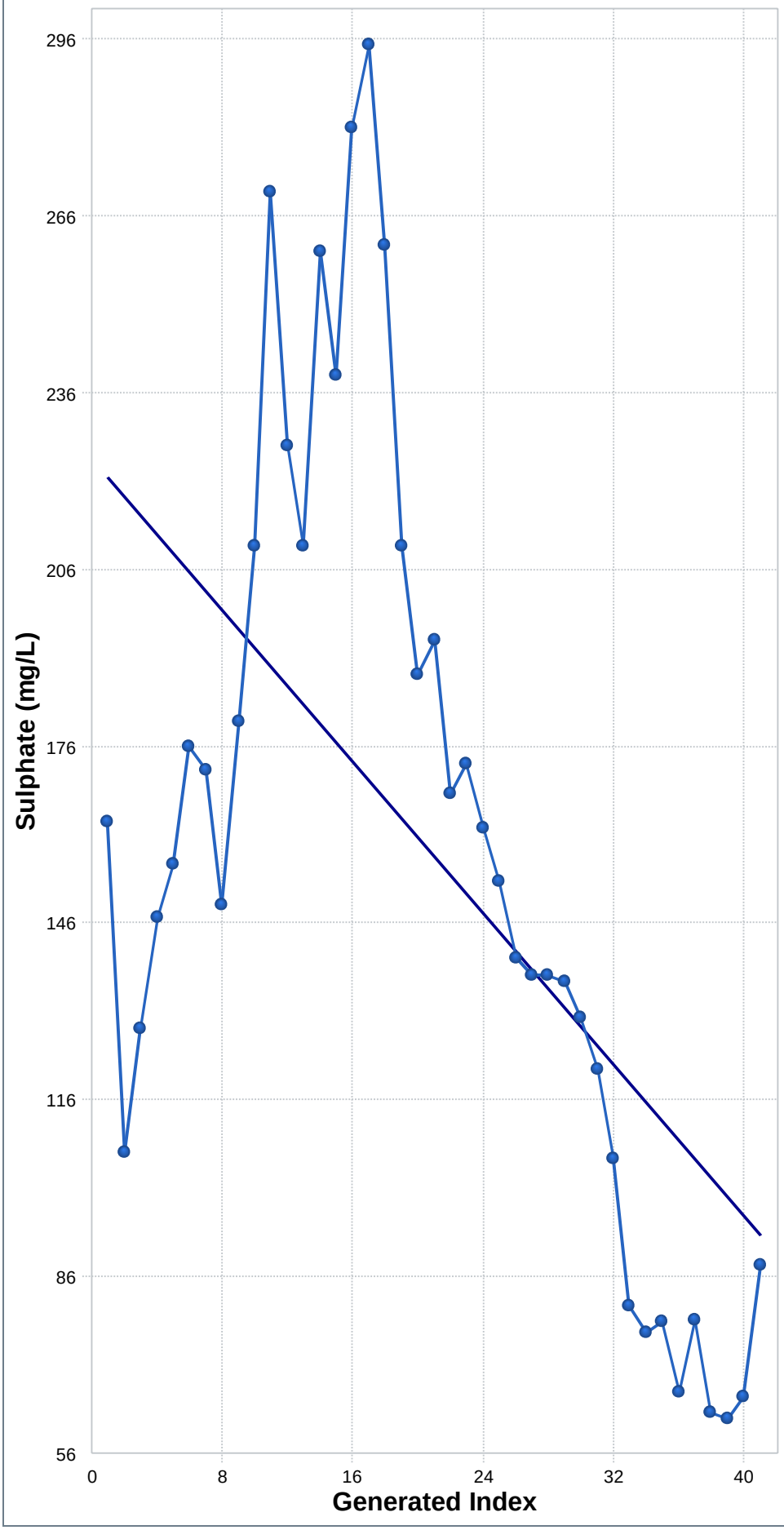
| | |
|---|---|
| n | 41 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 89.0206 |
| Standardized Value of S | -0.9548 |
| M-K Test Value (S) | -86 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1698 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.1224 |
| OLS Regression Intercept | 41.7889 |

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

# Mann-Kendall 03-IN - SULPHATE




**Mann-Kendall Trend Analysis**

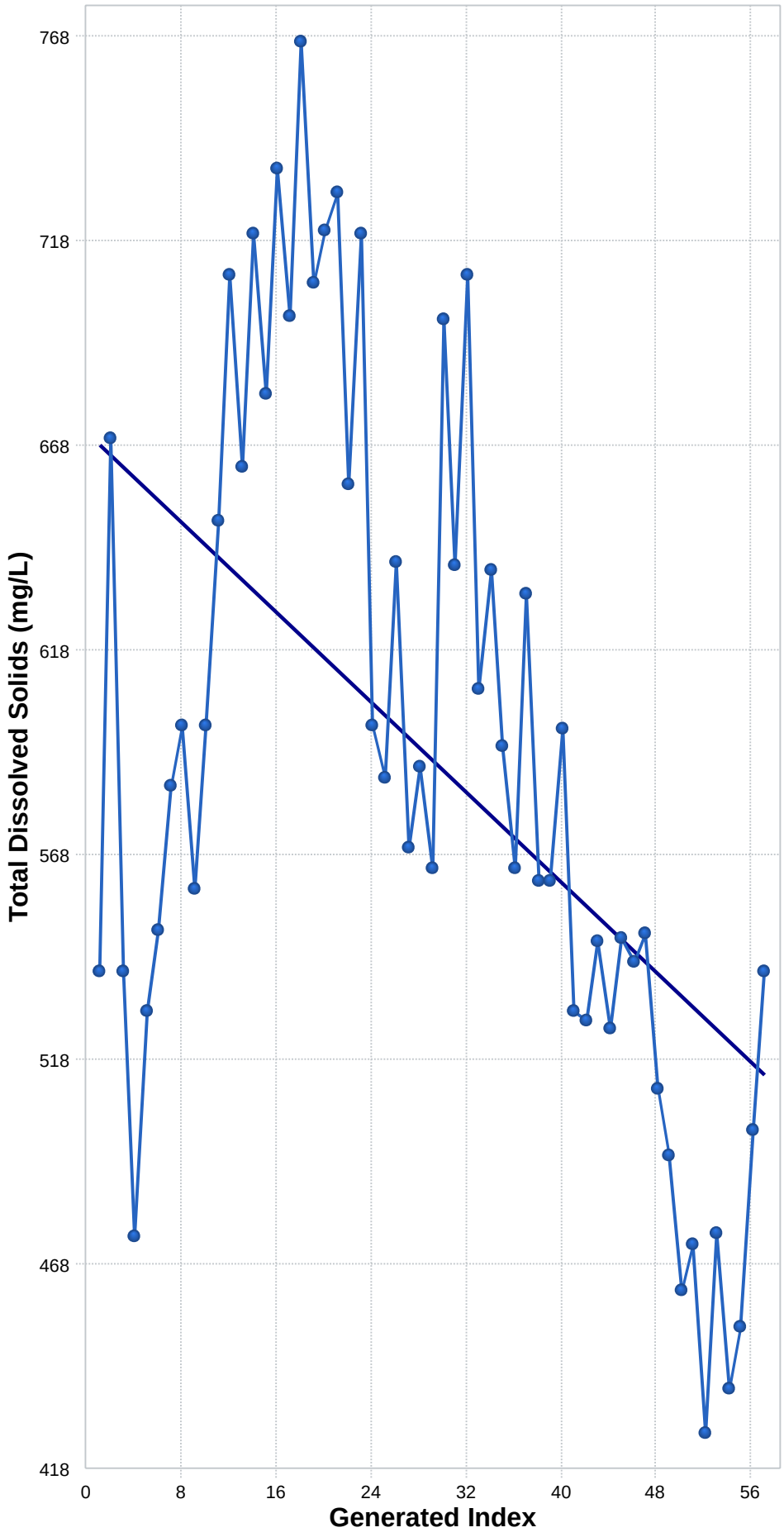
| | |
|---|---|
| n | 41 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 89.0056 |
| Standardized Value of S | -4.4379 |
| M-K Test Value (S) | -396 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -3.2177 |
| OLS Regression Intercept | 224.7672 |

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

# Mann-Kendall 03-IN - TDS




**Mann-Kendall Trend Analysis**

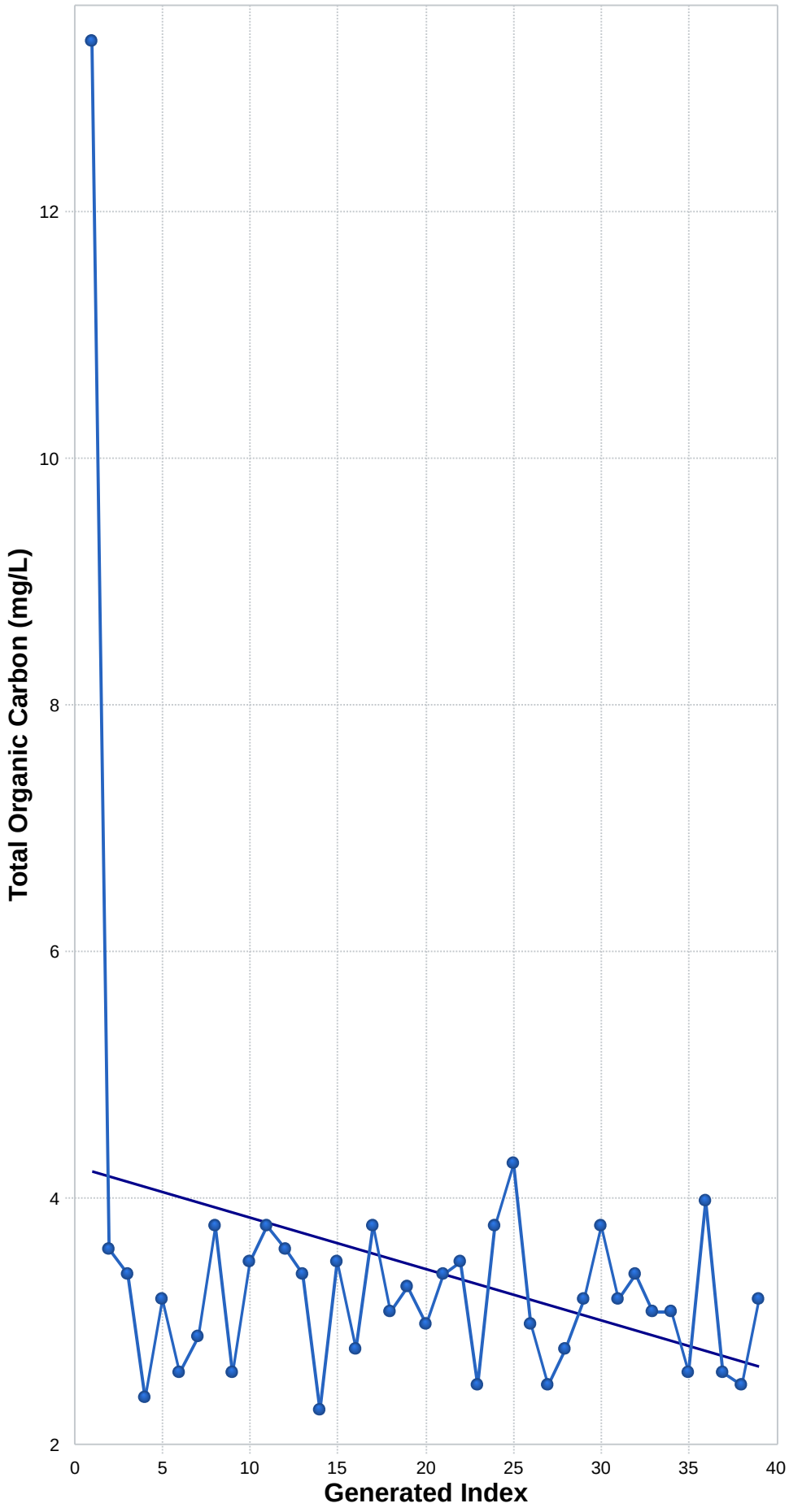
| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.2251 |
| Standardized Value of S | -4.5034 |
| M-K Test Value (S) | -655 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -2.7527 |
| OLS Regression Intercept | 671.4586 |

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

# Mann-Kendall 03-IN - TOC



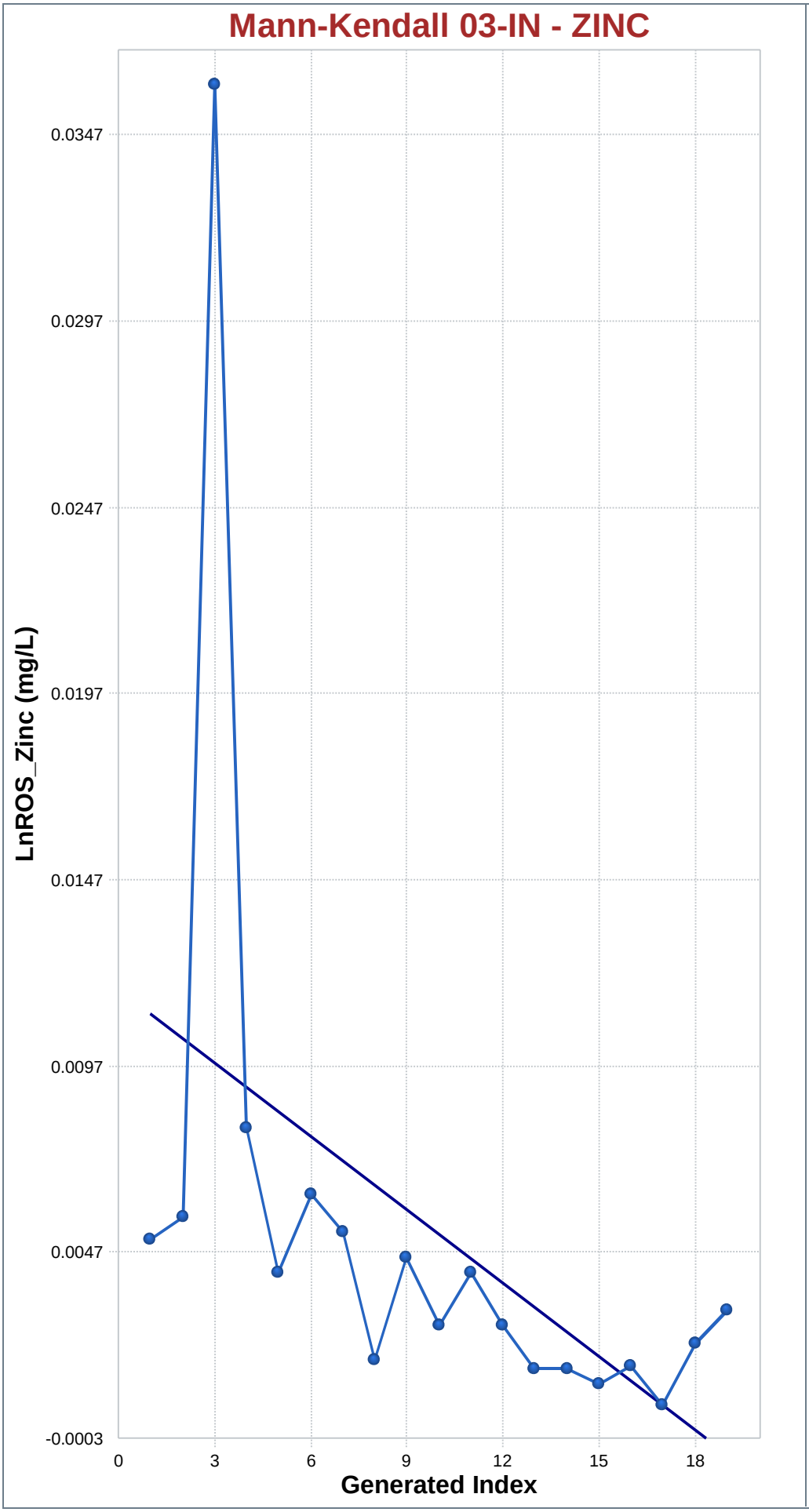

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

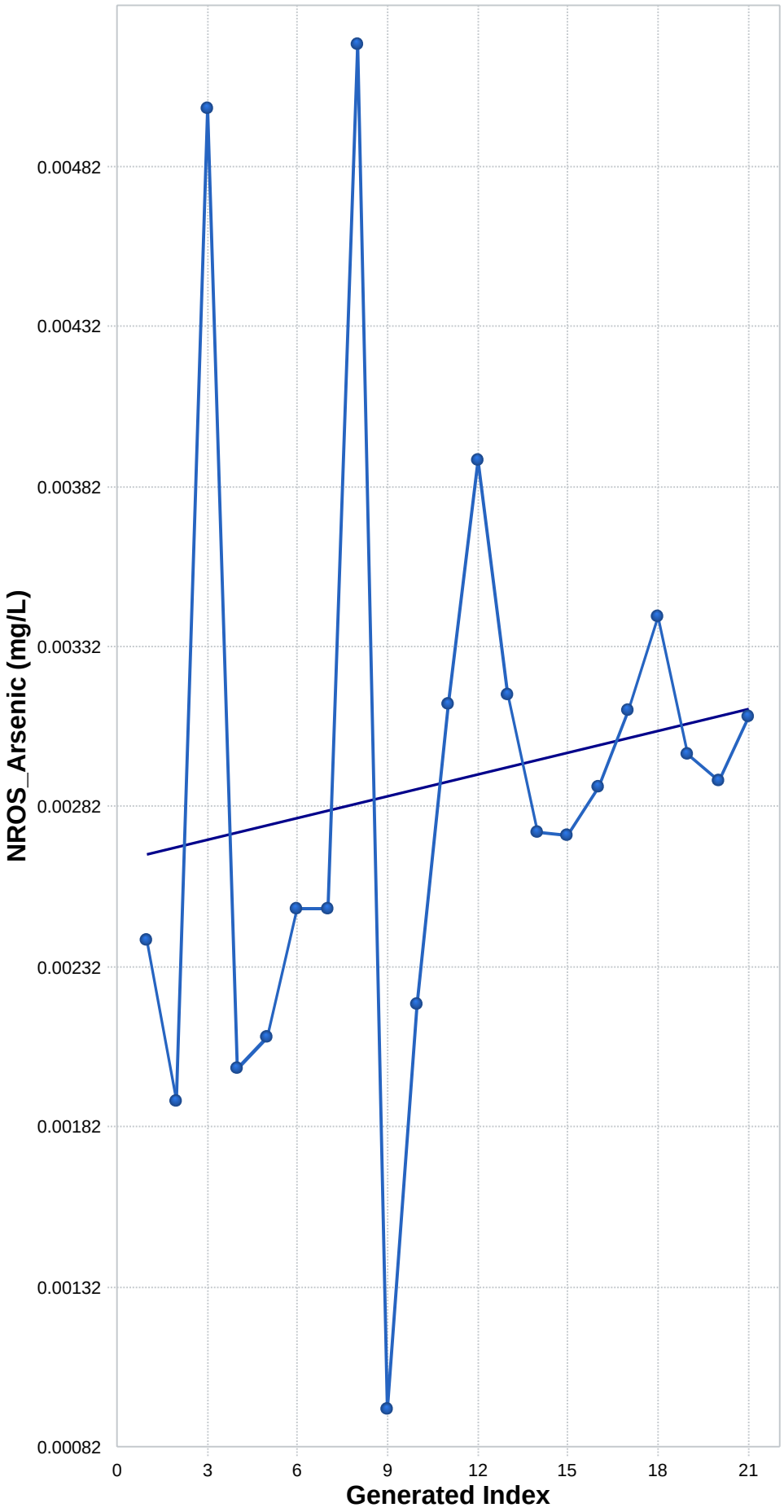
| | |
|---|---|
| n | 19 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 28.5307 |
| Standardized Value of S | -3.4699 |
| M-K Test Value (S) | -100 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0003 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0007 |
| OLS Regression Intercept | 0.0117 |

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

# Mann-Kendall 04-IN - ARSENIC



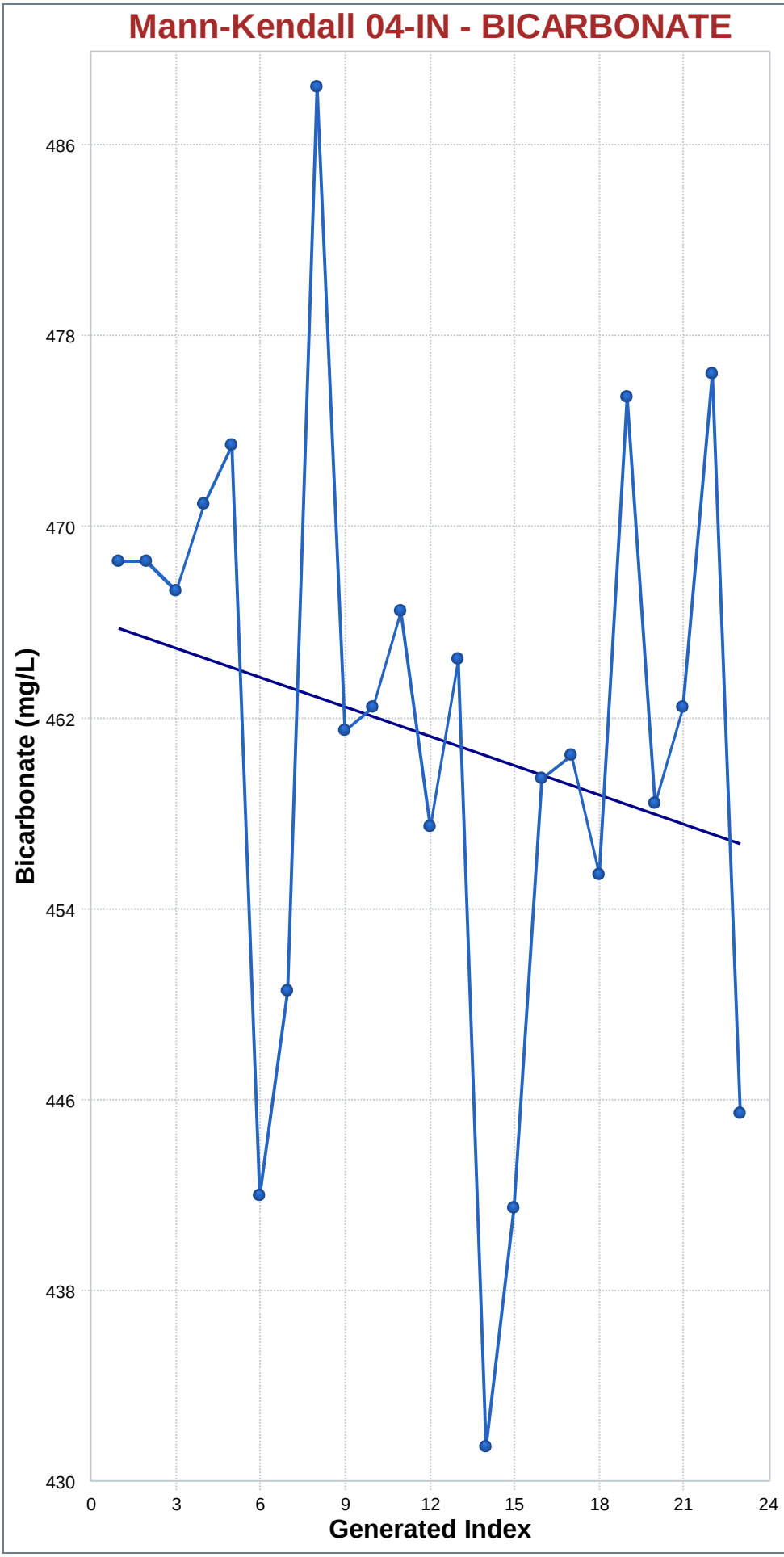

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 21 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 33.1009 |
| Standardized Value of S | 1.8731 |
| M-K Test Value (S) | 63 |
| Tabulated p-value | 0.0320 |
| Approximate p-value | 0.0305 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0026 |

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



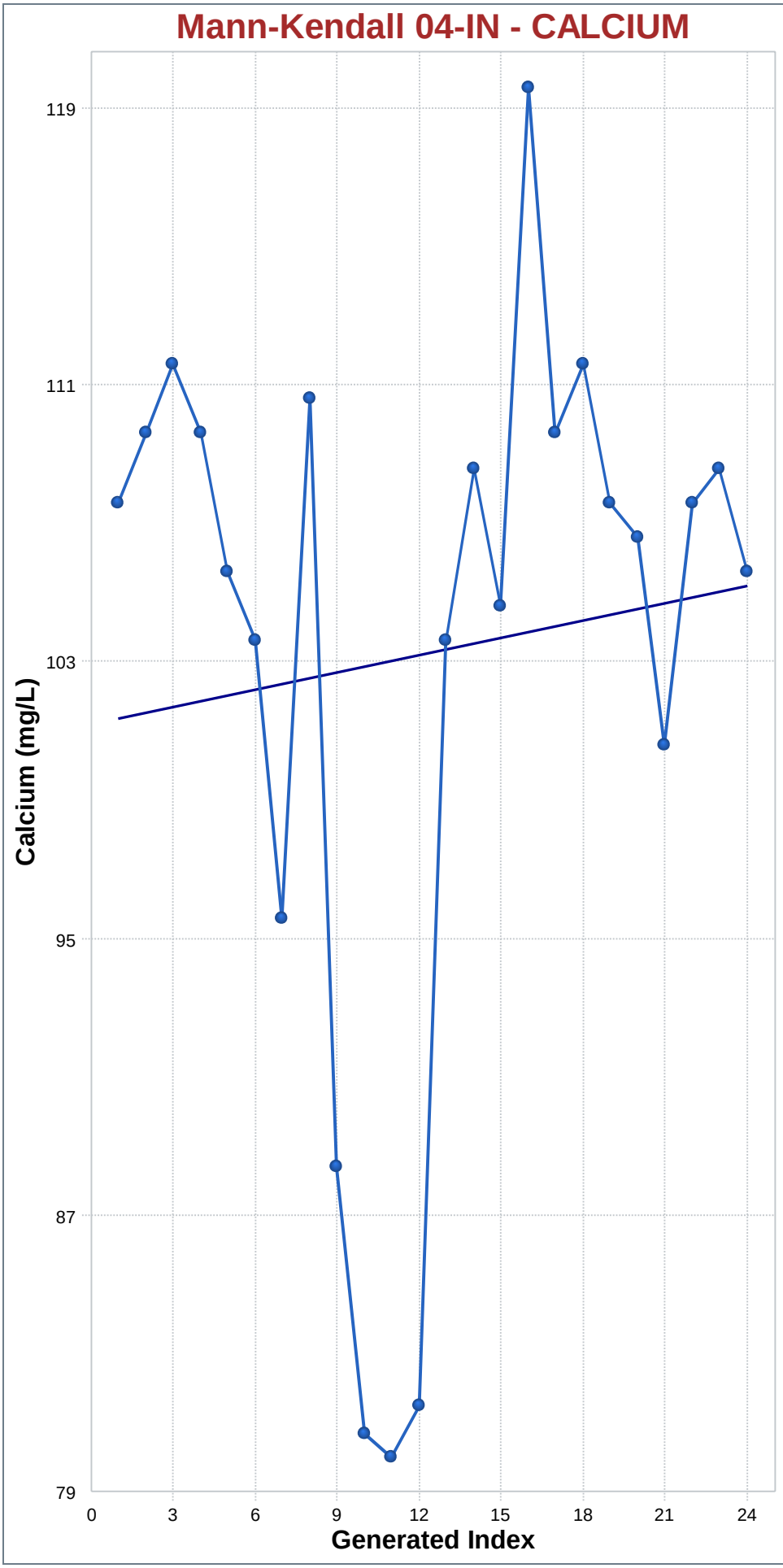

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 23 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 37.8374 |
| Standardized Value of S | -1.1629 |
| M-K Test Value (S) | -45 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1224 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.4098 |
| OLS Regression Intercept | 465.7087 |

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




**Mann-Kendall Trend Analysis**

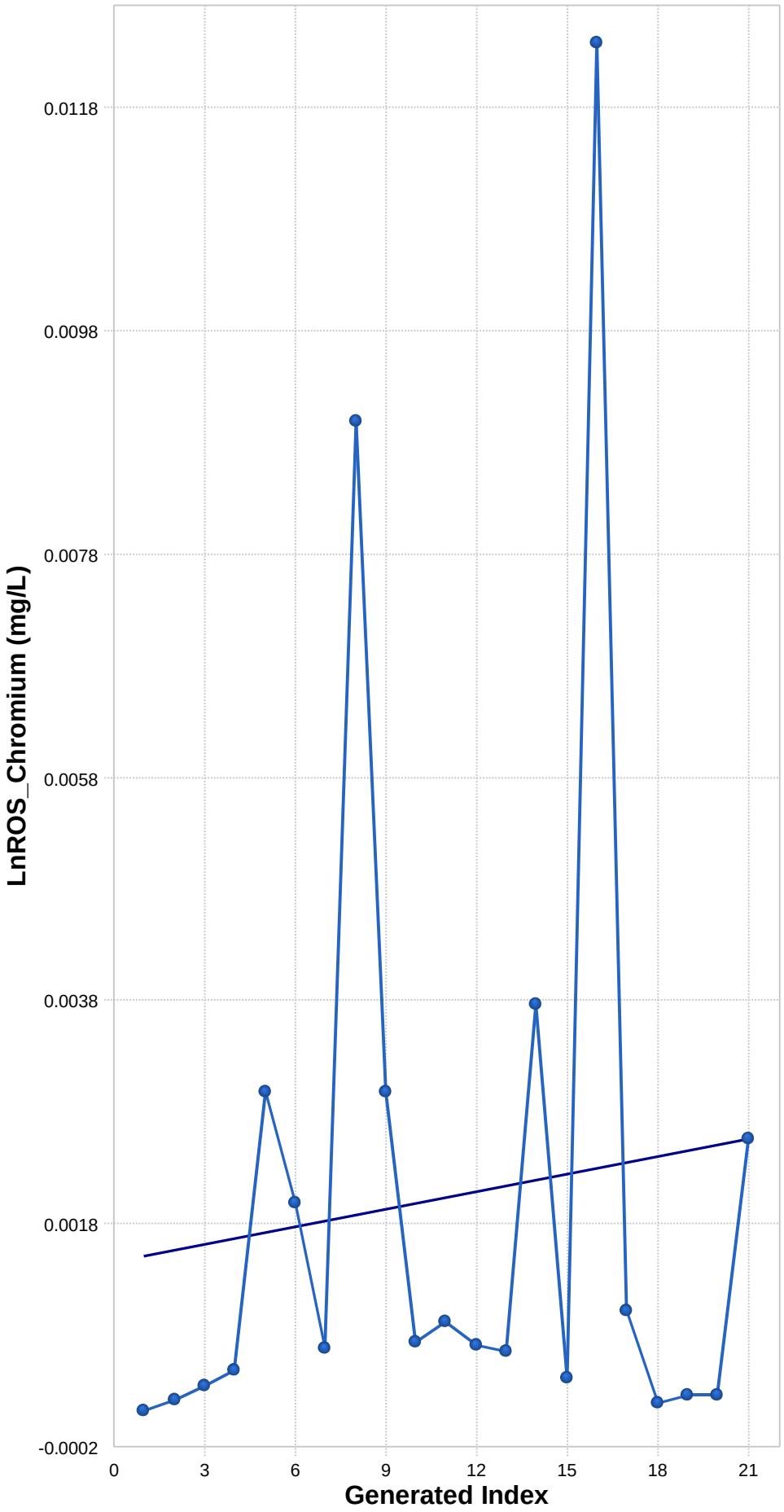
| | |
|---|---|
| n | 24 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 40.1746 |
| Standardized Value of S | -0.0747 |
| M-K Test Value (S) | -4 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.4702 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1669 |
| OLS Regression Intercept | 101.5891 |

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

# Mann-Kendall 04-IN - CHROMIUM



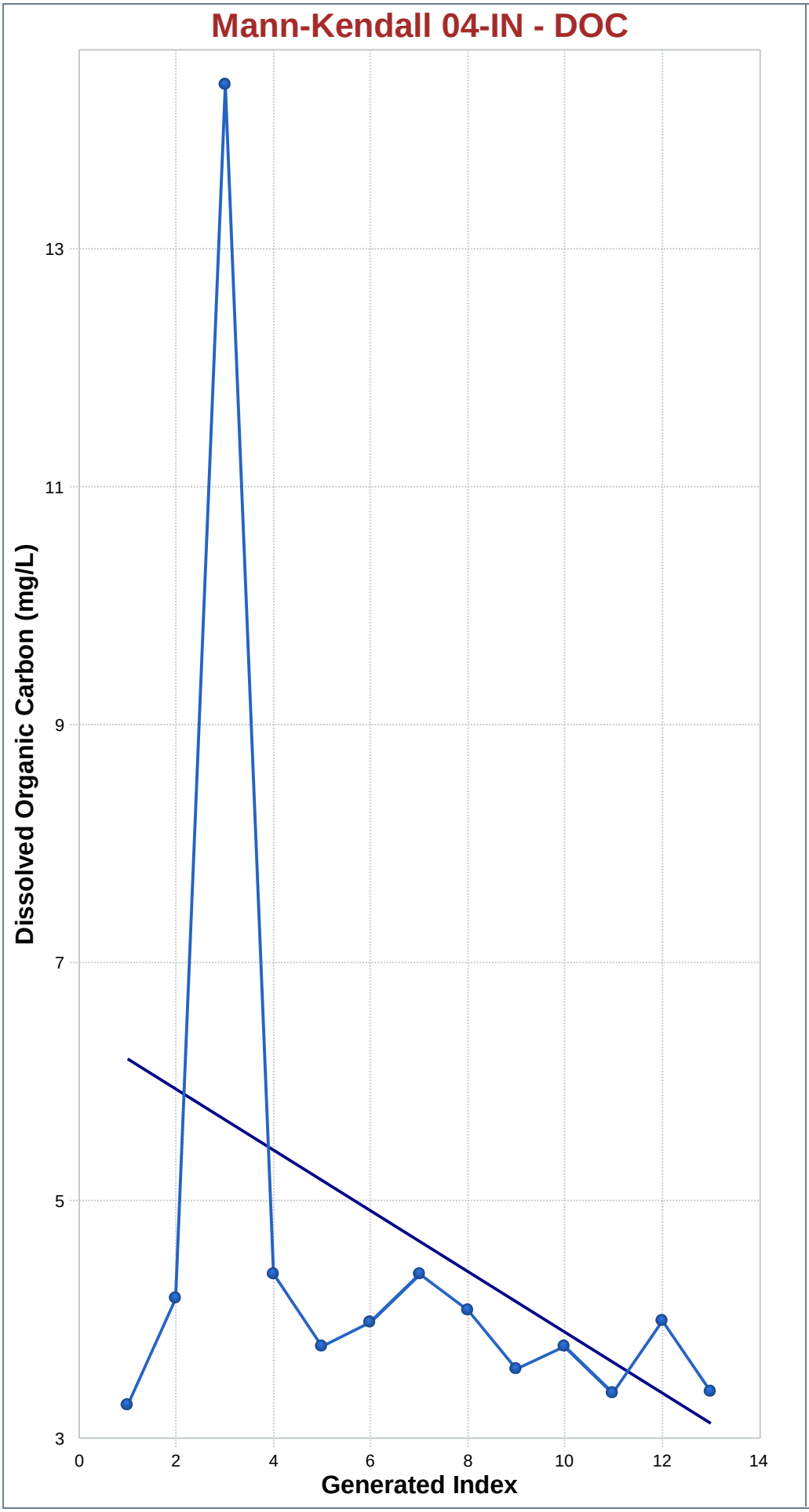

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 21 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 33.1009 |
| Standardized Value of S | 0.5438 |
| M-K Test Value (S) | 19 |
| Tabulated p-value | 0.3060 |
| Approximate p-value | 0.2933 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0001 |
| OLS Regression Intercept | 0.0015 |

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



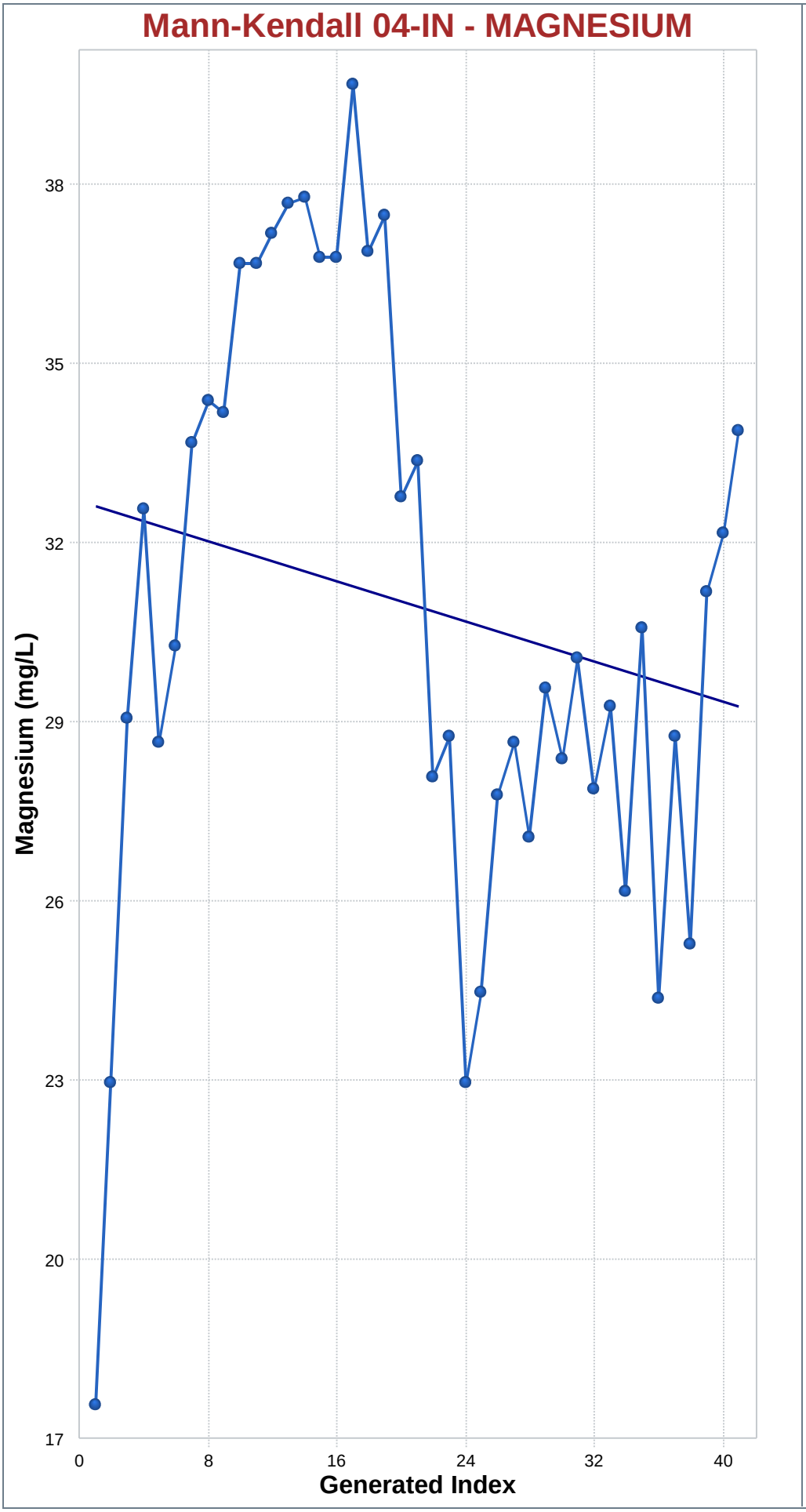

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 13 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 16.3299 |
| Standardized Value of S | -1.2860 |
| M-K Test Value (S) | -22 |
| Tabulated p-value | 0.1020 |
| Approximate p-value | 0.0992 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.2545 |
| OLS Regression Intercept | 6.2612 |

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




**Mann-Kendall Trend Analysis**

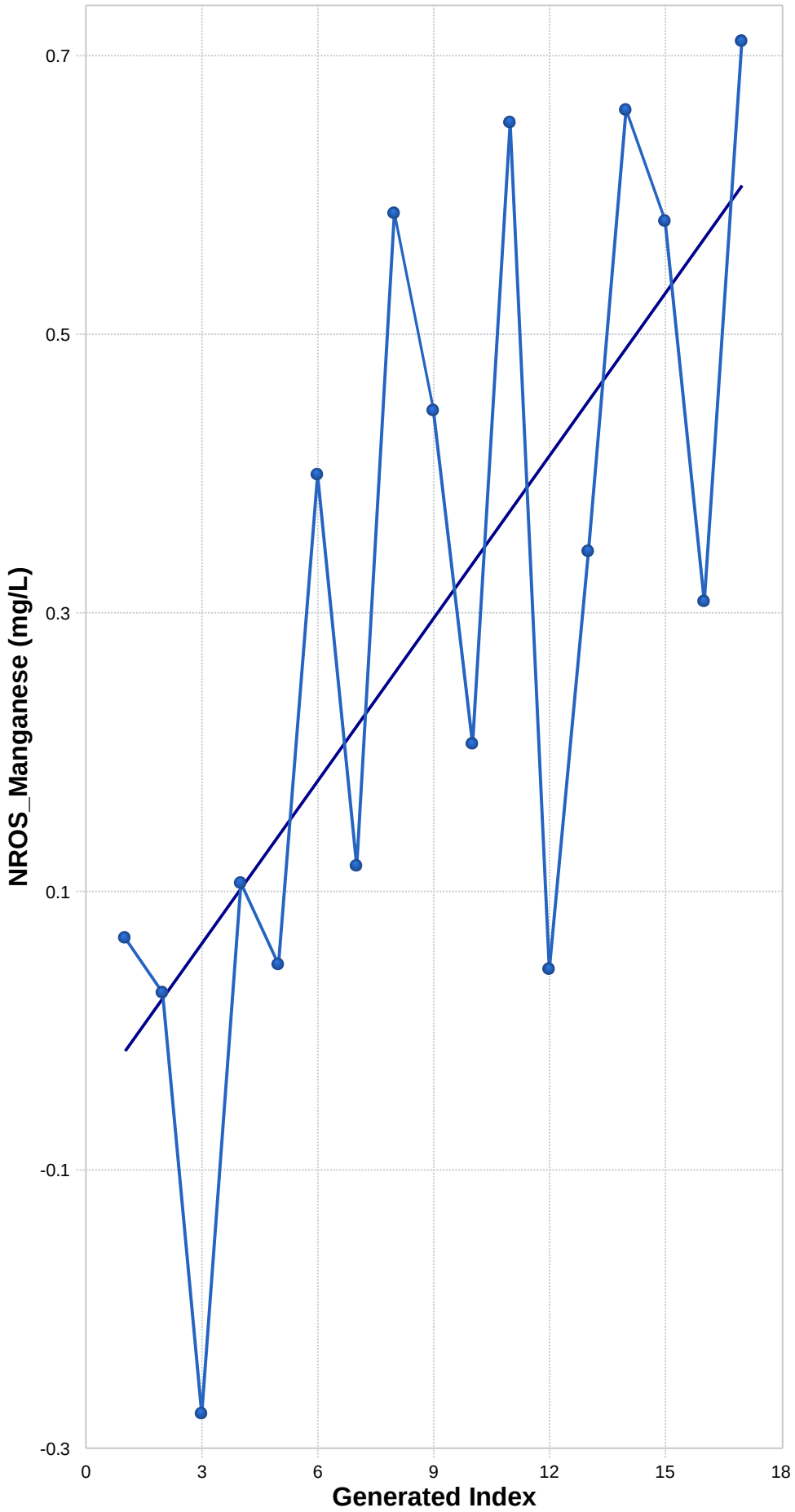
| | |
|---|---|
| n | 41 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 89.0037 |
| Standardized Value of S | -1.1685 |
| M-K Test Value (S) | -105 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1213 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0838 |
| OLS Regression Intercept | 32.2235 |

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

# Mann-Kendall 04-IN - MANGANESE



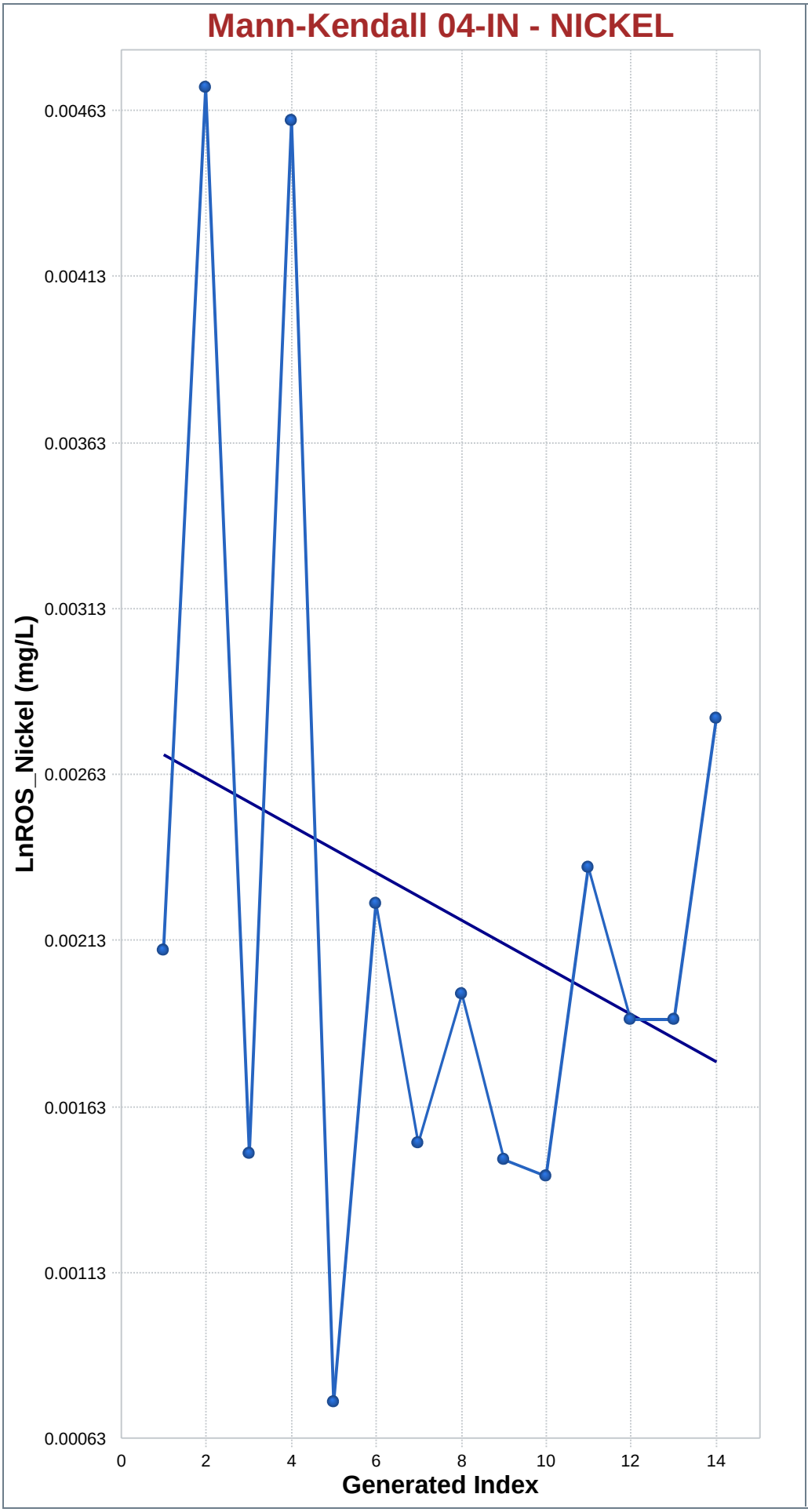

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 17 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 24.2762 |
| Standardized Value of S | 2.8423 |
| M-K Test Value (S) | 70 |
| Tabulated p-value | 0.0020 |
| Approximate p-value | 0.0022 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0388 |
| OLS Regression Intercept | -0.0370 |

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



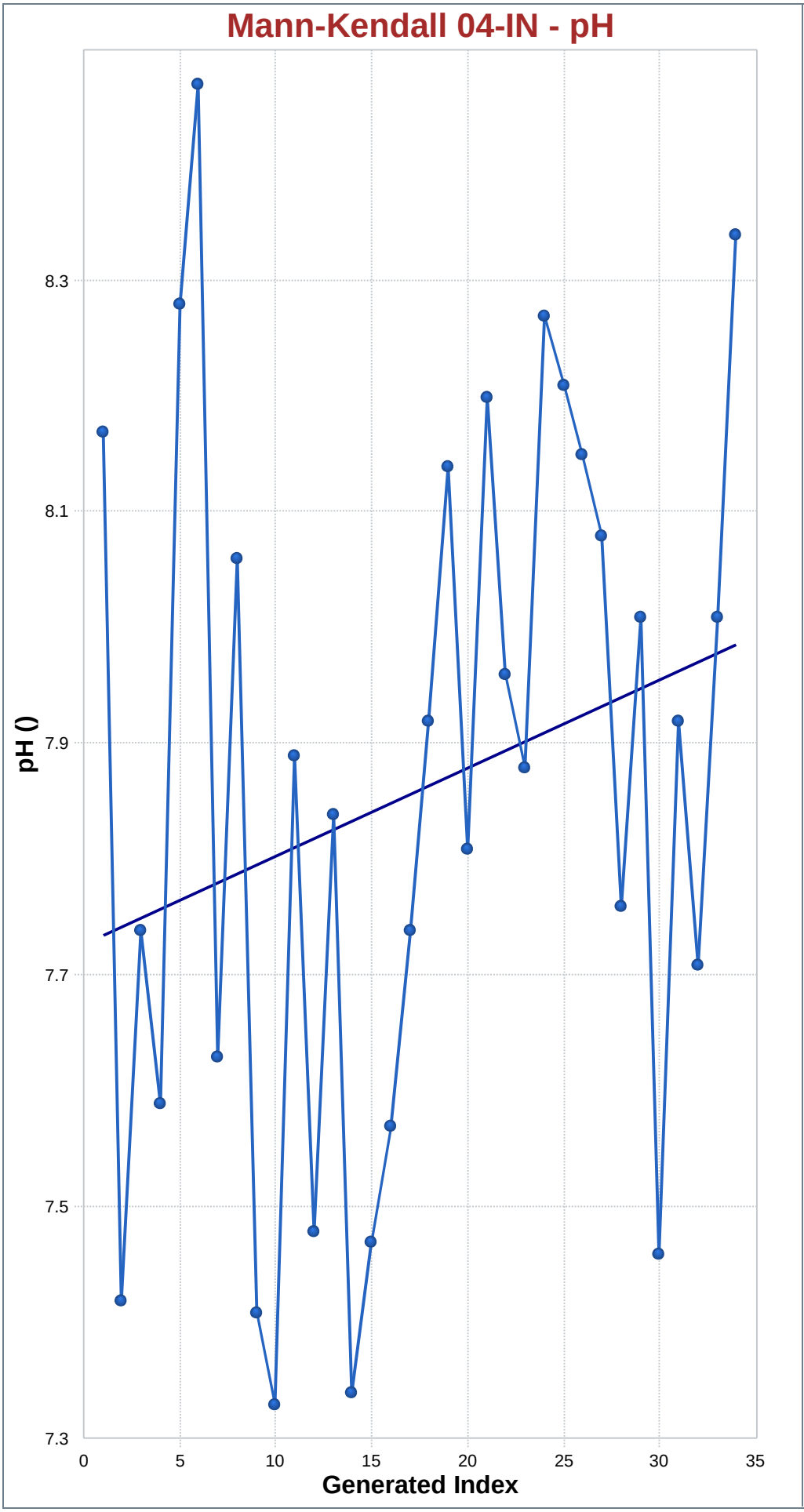

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 14 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 18.2392 |
| Standardized Value of S | -0.2741 |
| M-K Test Value (S) | -6 |
| Tabulated p-value | 0.3740 |
| Approximate p-value | 0.3920 |

**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**

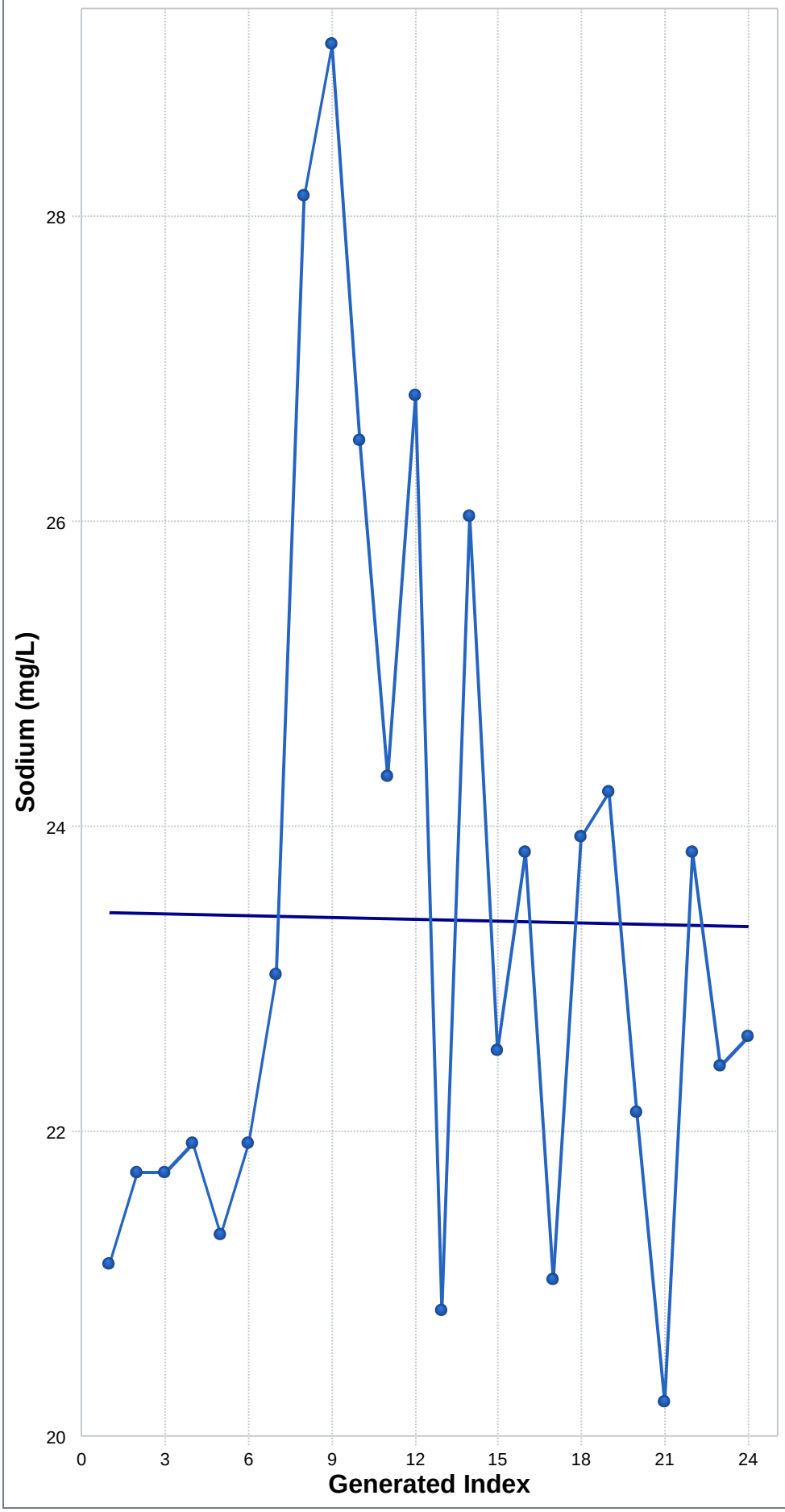
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4339 |
| Standardized Value of S | 1.4978 |
| M-K Test Value (S) | 102 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0671 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0076 |
| OLS Regression Intercept | 7.6975 |

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

# Mann-Kendall 04-IN - SODIUM




**Mann-Kendall Trend Analysis**

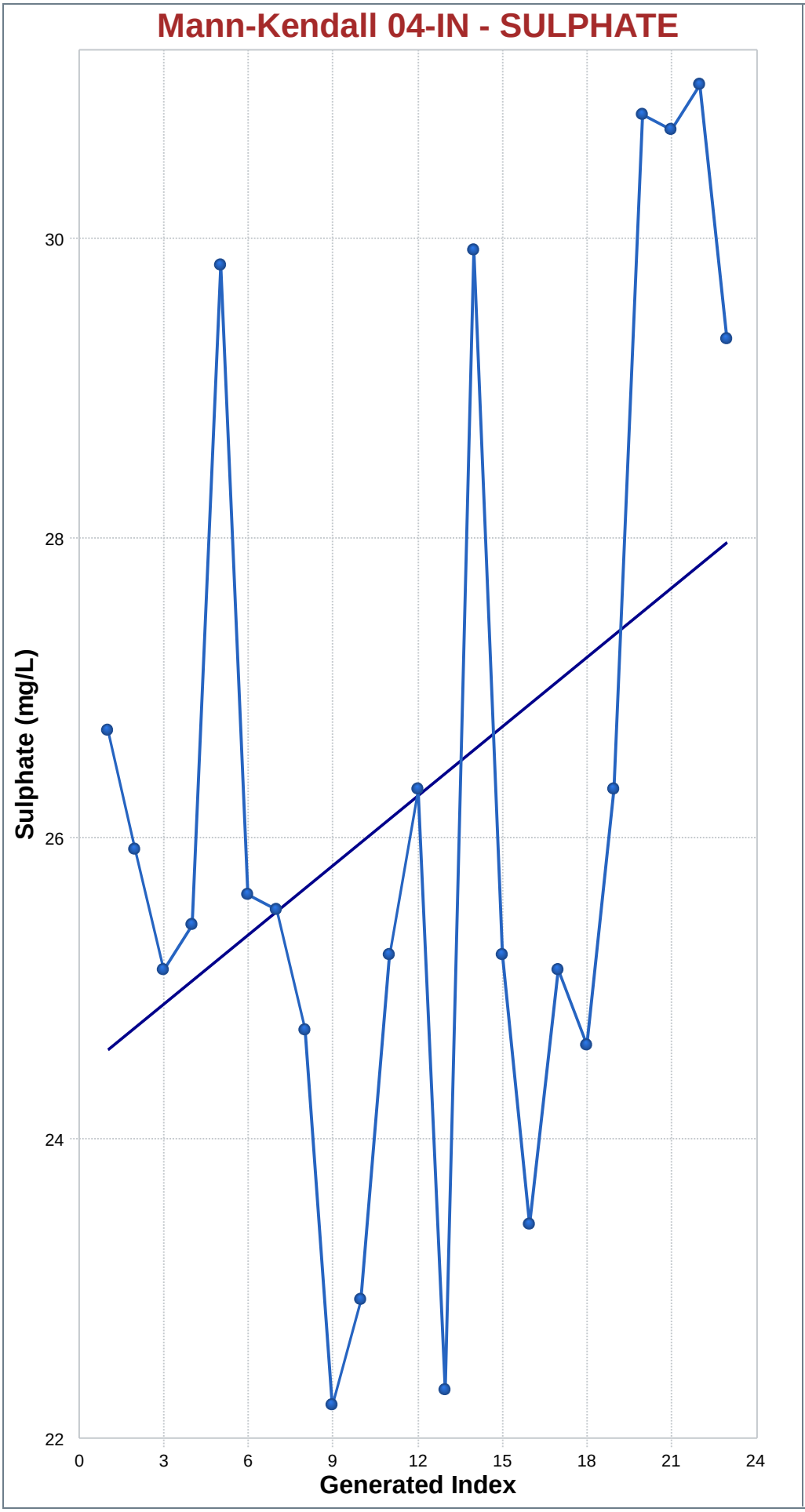
| | |
|---|---|
| n | 24 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 40.2782 |
| Standardized Value of S | 0.3972 |
| M-K Test Value (S) | 17 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3456 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0043 |
| OLS Regression Intercept | 23.6163 |

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

# Mann-Kendall 04-IN - SULPHATE



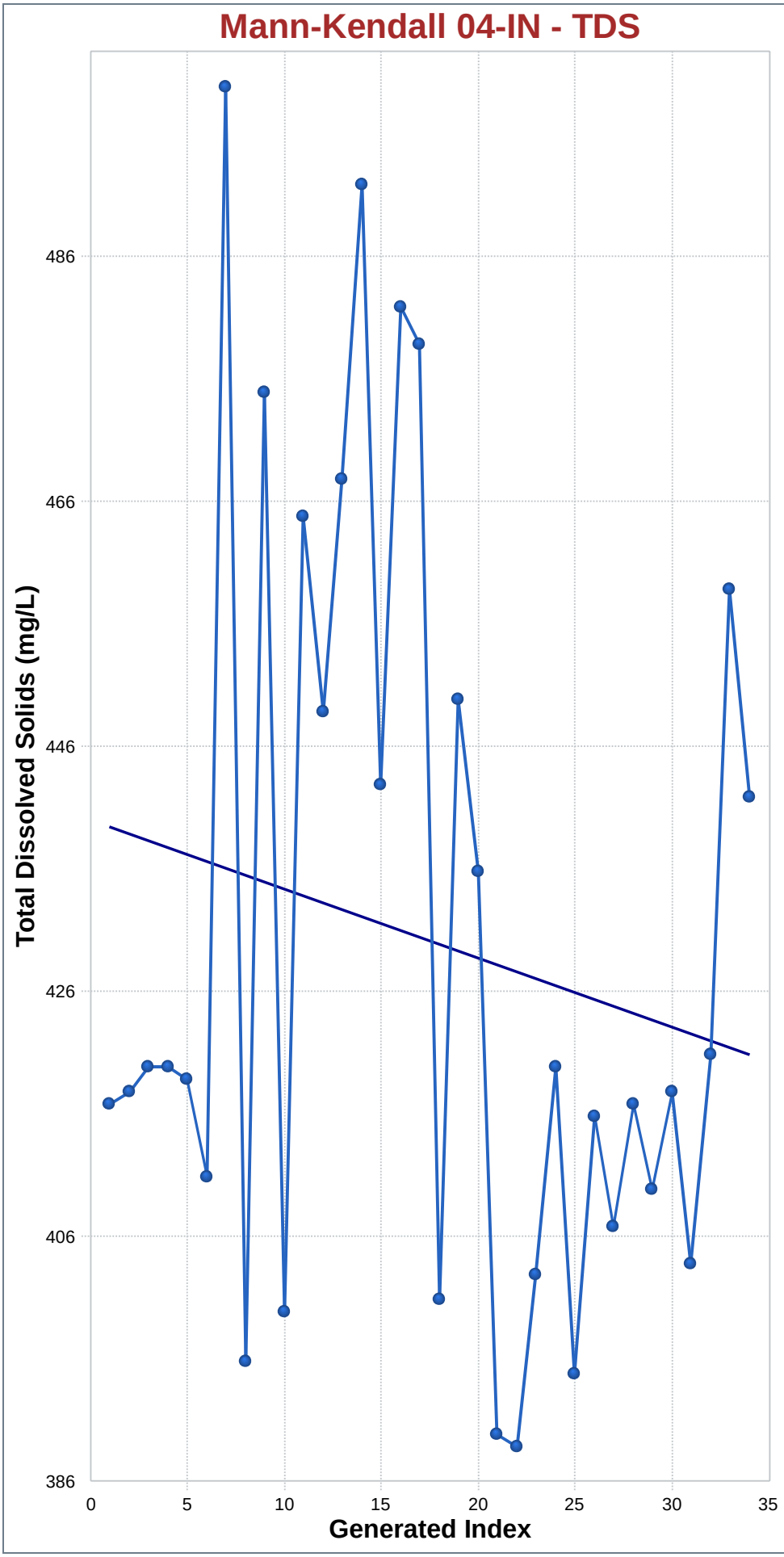

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 23 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 37.8242 |
| Standardized Value of S | 0.9782 |
| M-K Test Value (S) | 38 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1640 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1538 |
| OLS Regression Intercept | 24.4115 |

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



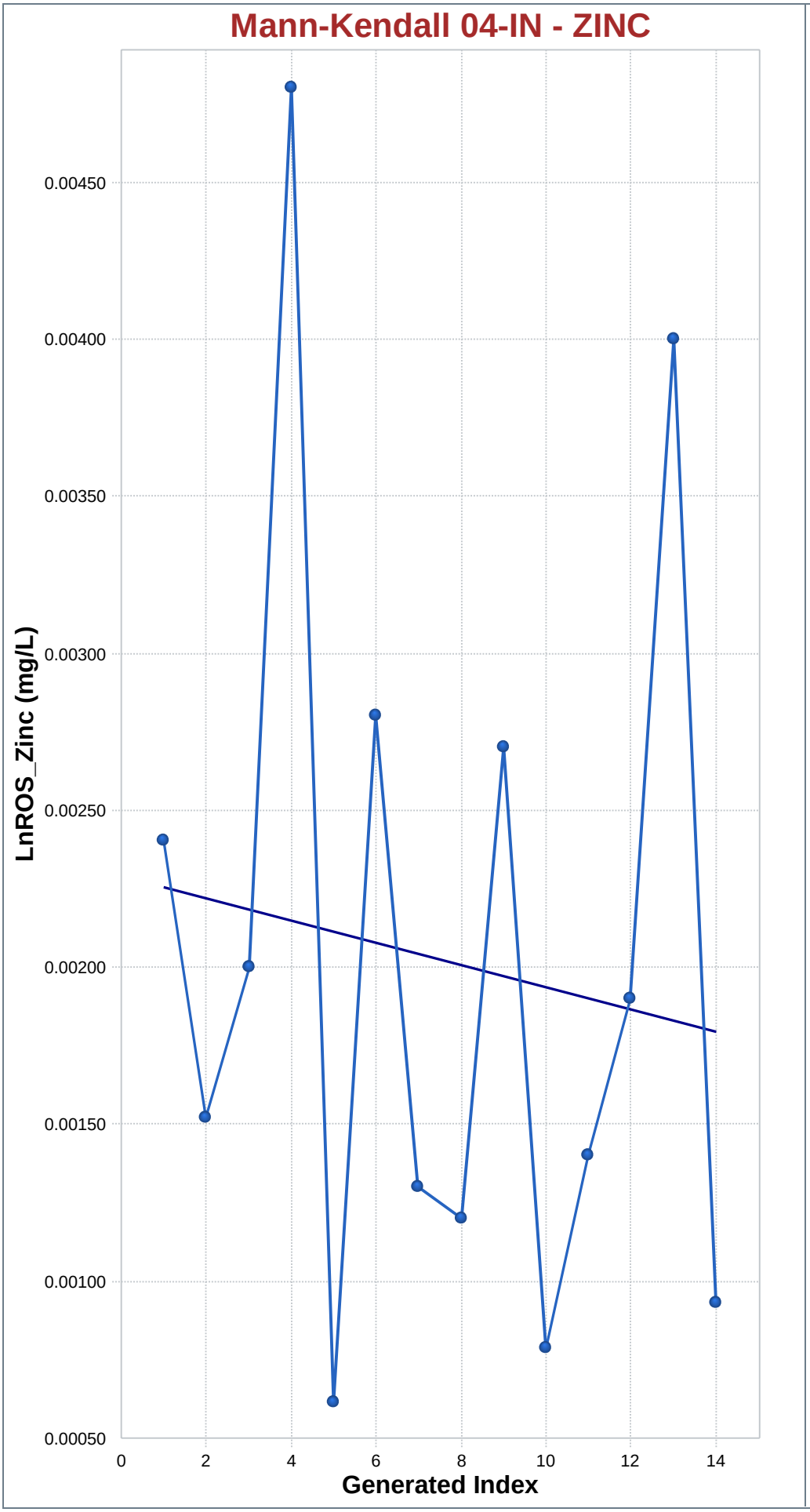

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4141 |
| Standardized Value of S | -0.7565 |
| M-K Test Value (S) | -52 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.2247 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.5641 |
| OLS Regression Intercept | 440.2246 |

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



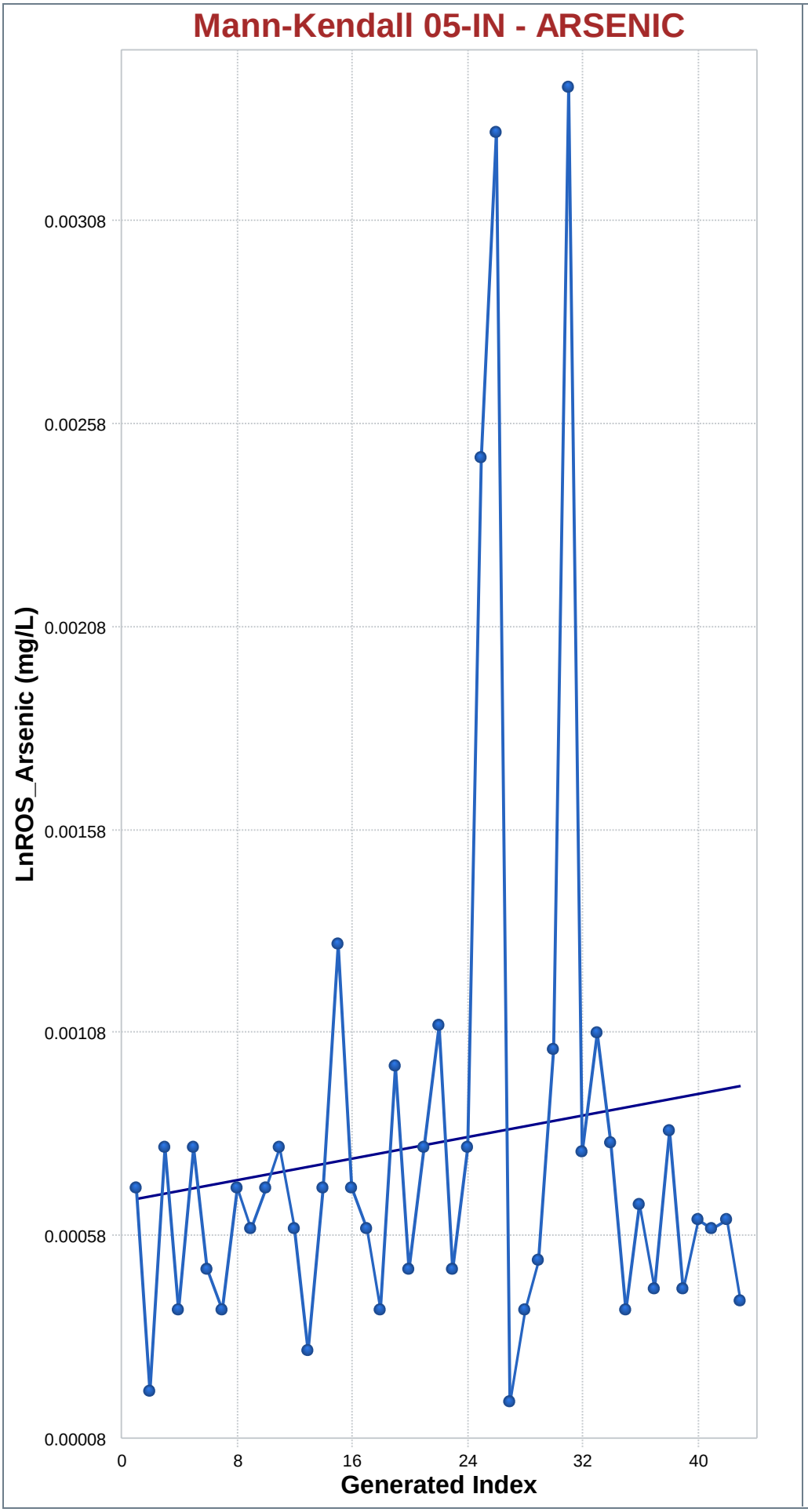

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 14 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 18.2665 |
| Standardized Value of S | -0.5474 |
| M-K Test Value (S) | -11 |
| Tabulated p-value | 0.2950 |
| Approximate p-value | 0.2920 |

**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**

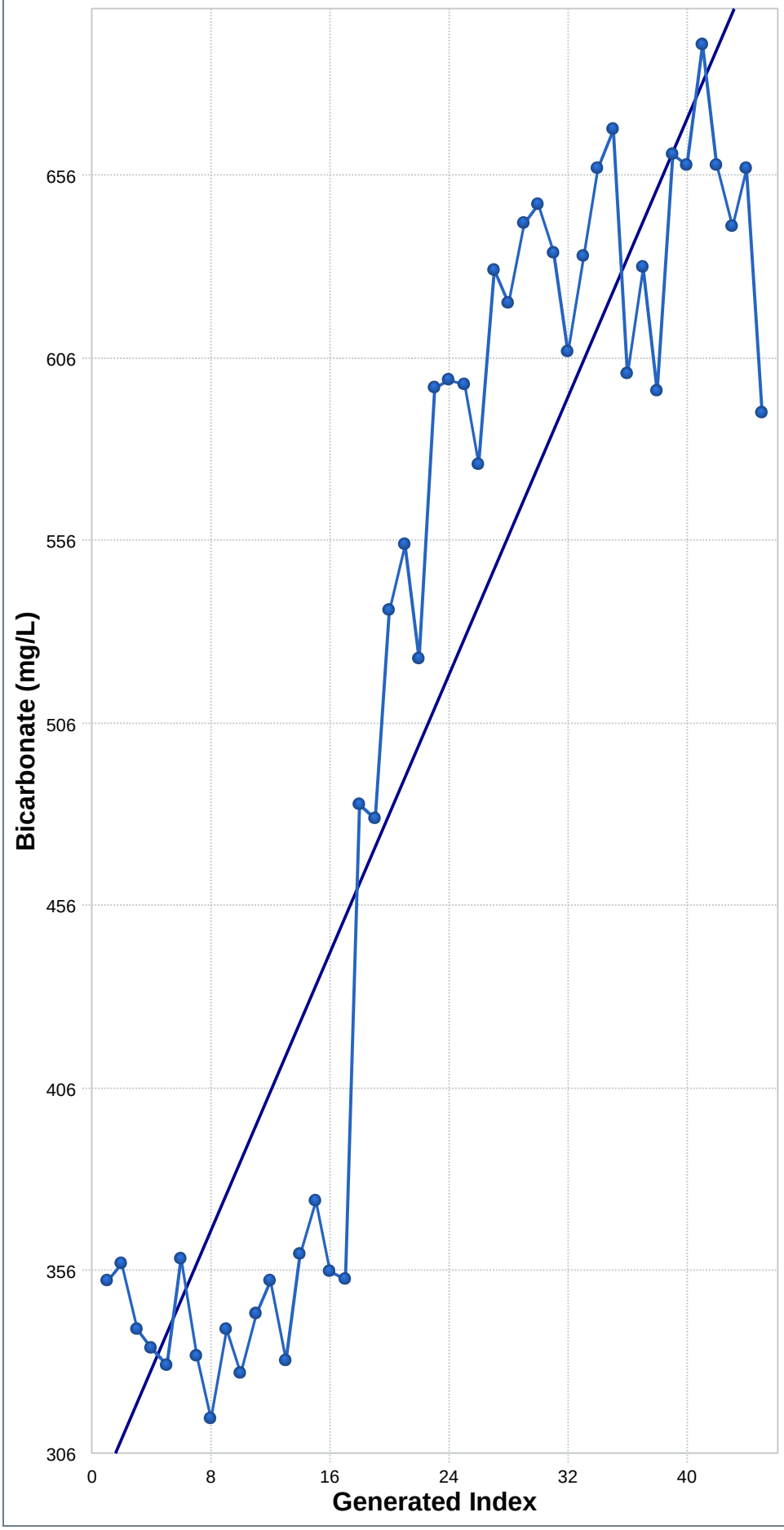
| | |
|---|---|
| n | 43 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 95.2155 |
| Standardized Value of S | 0.5146 |
| M-K Test Value (S) | 50 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3034 |

**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 05-IN - BICARBONATE



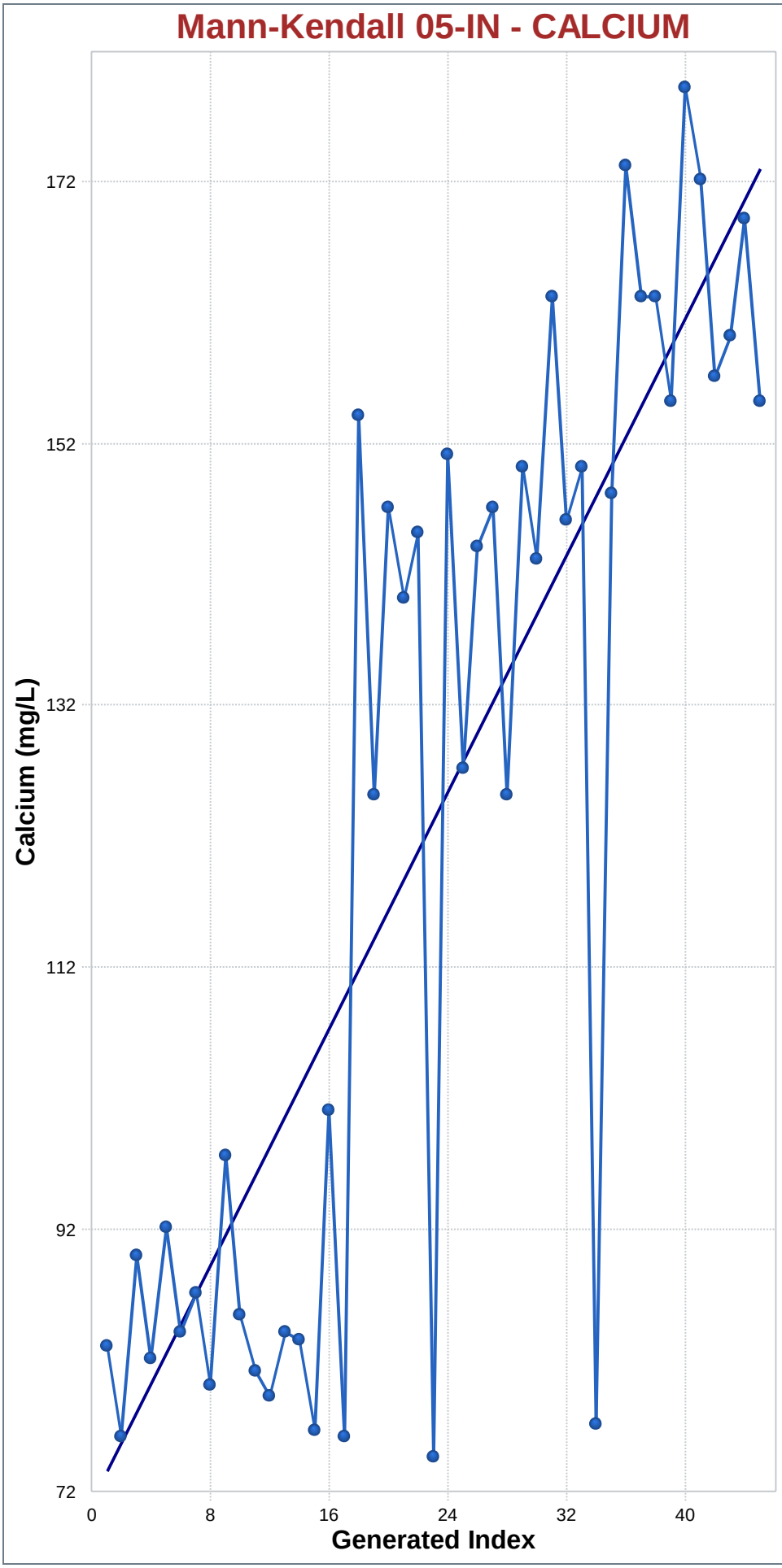

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 45 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 102.2057 |
| Standardized Value of S | 6.8587 |
| M-K Test Value (S) | 702 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 9.5314 |
| OLS Regression Intercept | 291.0579 |

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



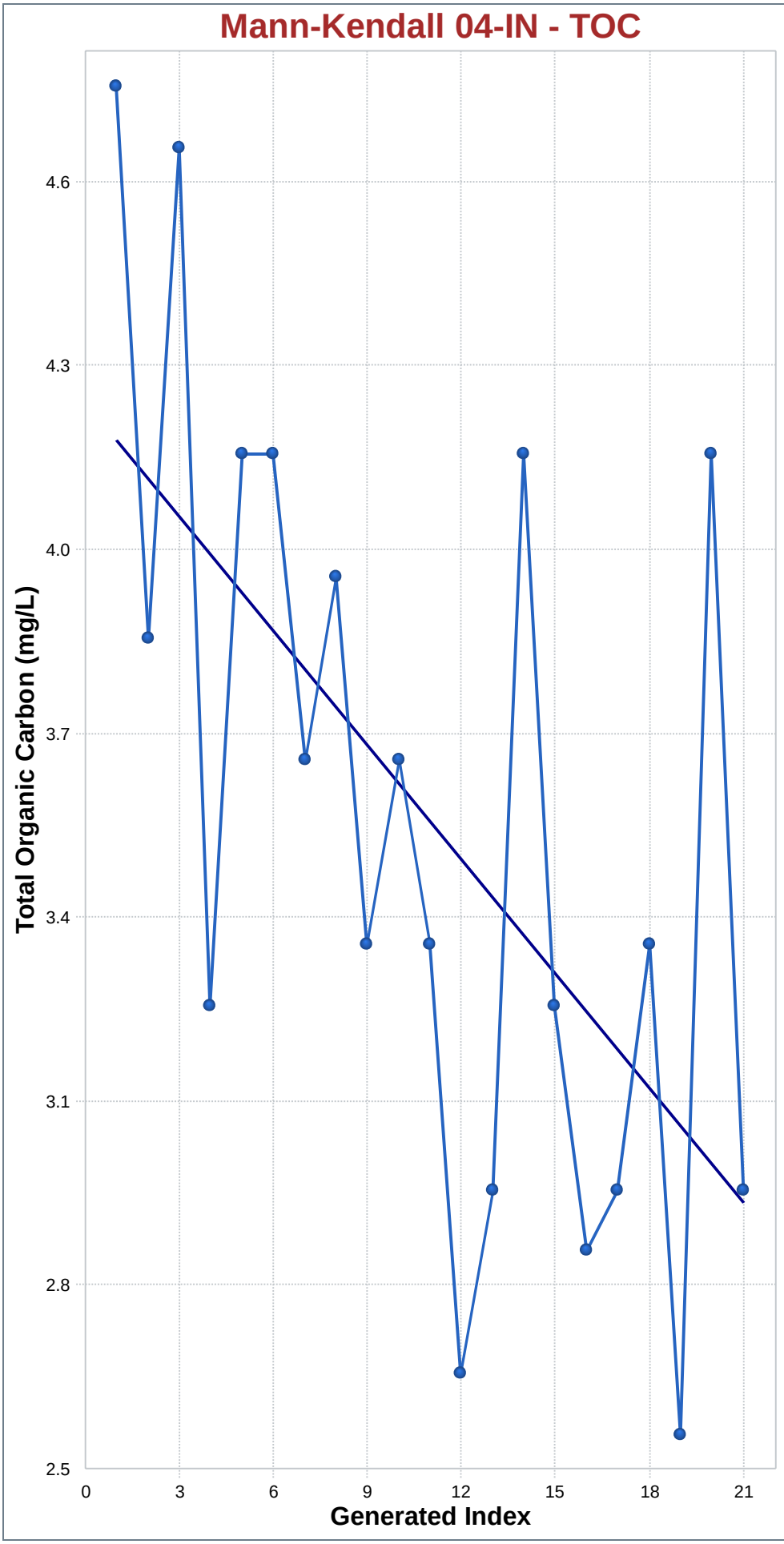

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 45 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 102.1779 |
| Standardized Value of S | 5.5394 |
| M-K Test Value (S) | 567 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 2.2601 |
| OLS Regression Intercept | 71.1404 |

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




**Mann-Kendall Trend Analysis**

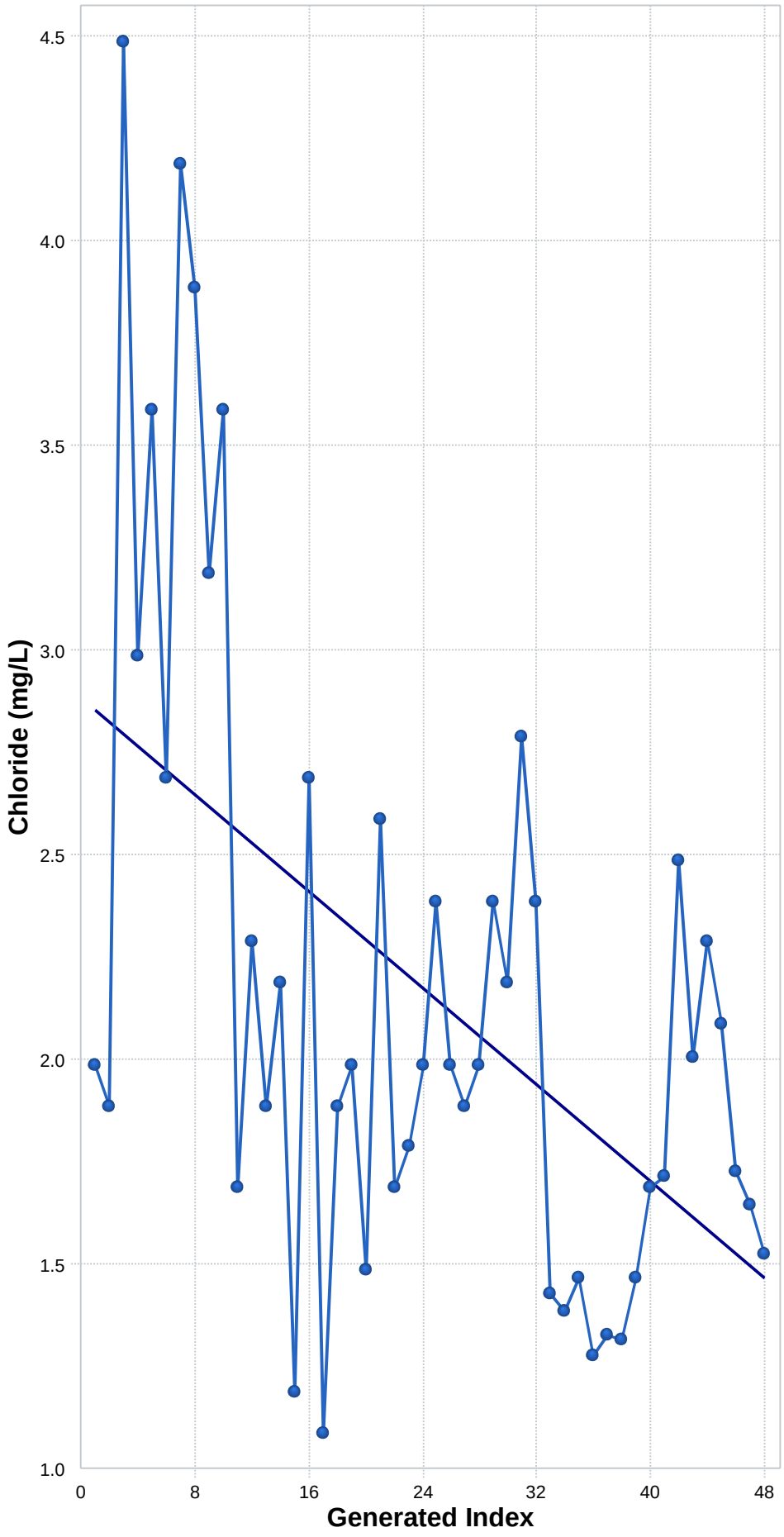
| | |
|---|---|
| n | 21 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 32.8431 |
| Standardized Value of S | -2.8316 |
| M-K Test Value (S) | -94 |
| Tabulated p-value | 0.0020 |
| Approximate p-value | 0.0023 |

**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 05-IN - CHLORIDE




**Mann-Kendall Trend Analysis**

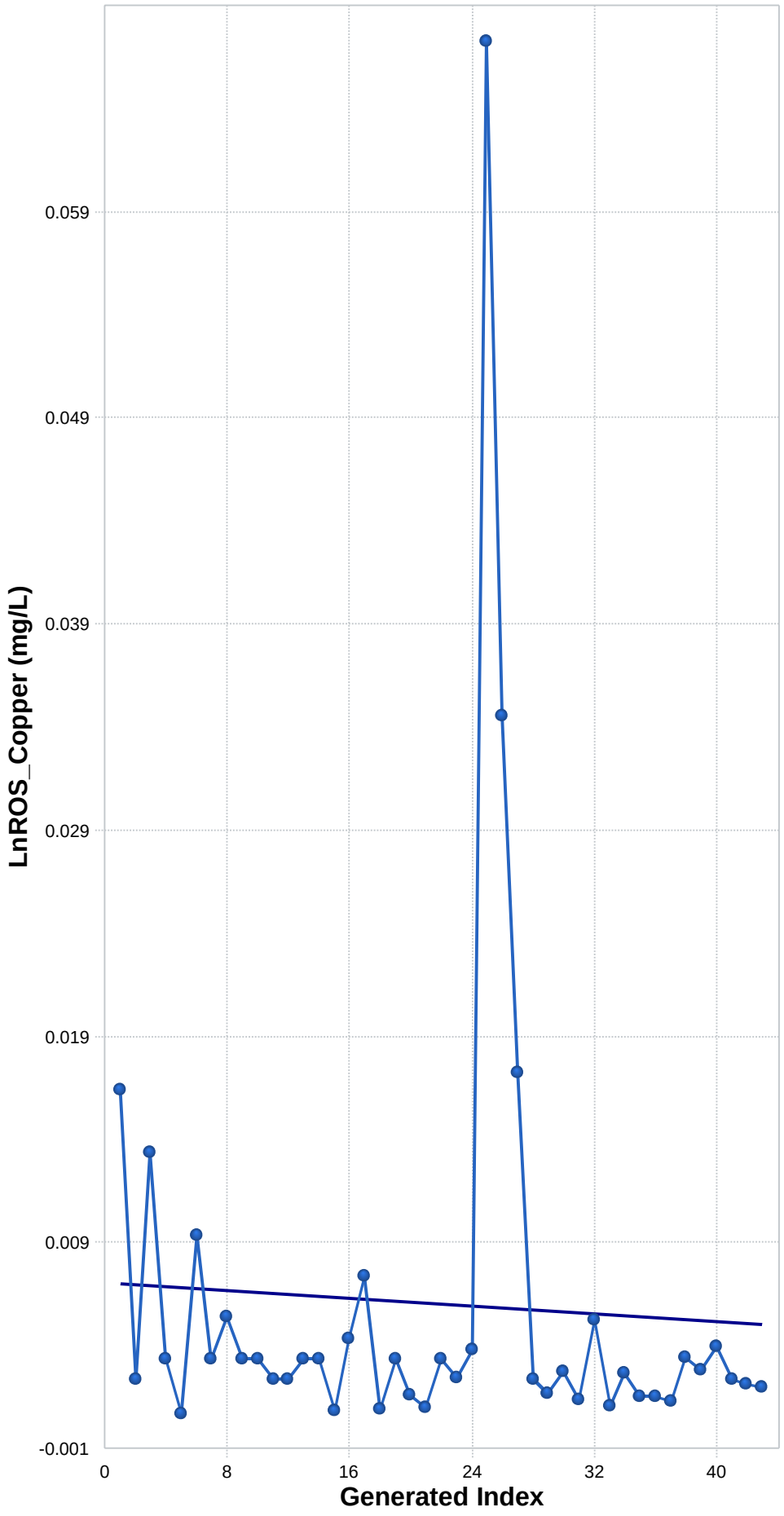
| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.3432 |
| Standardized Value of S | -3.0264 |
| M-K Test Value (S) | -341 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0012 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0295 |
| OLS Regression Intercept | 2.8979 |

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

# Mann-Kendall 05-IN - COPPER




**Mann-Kendall Trend Analysis**

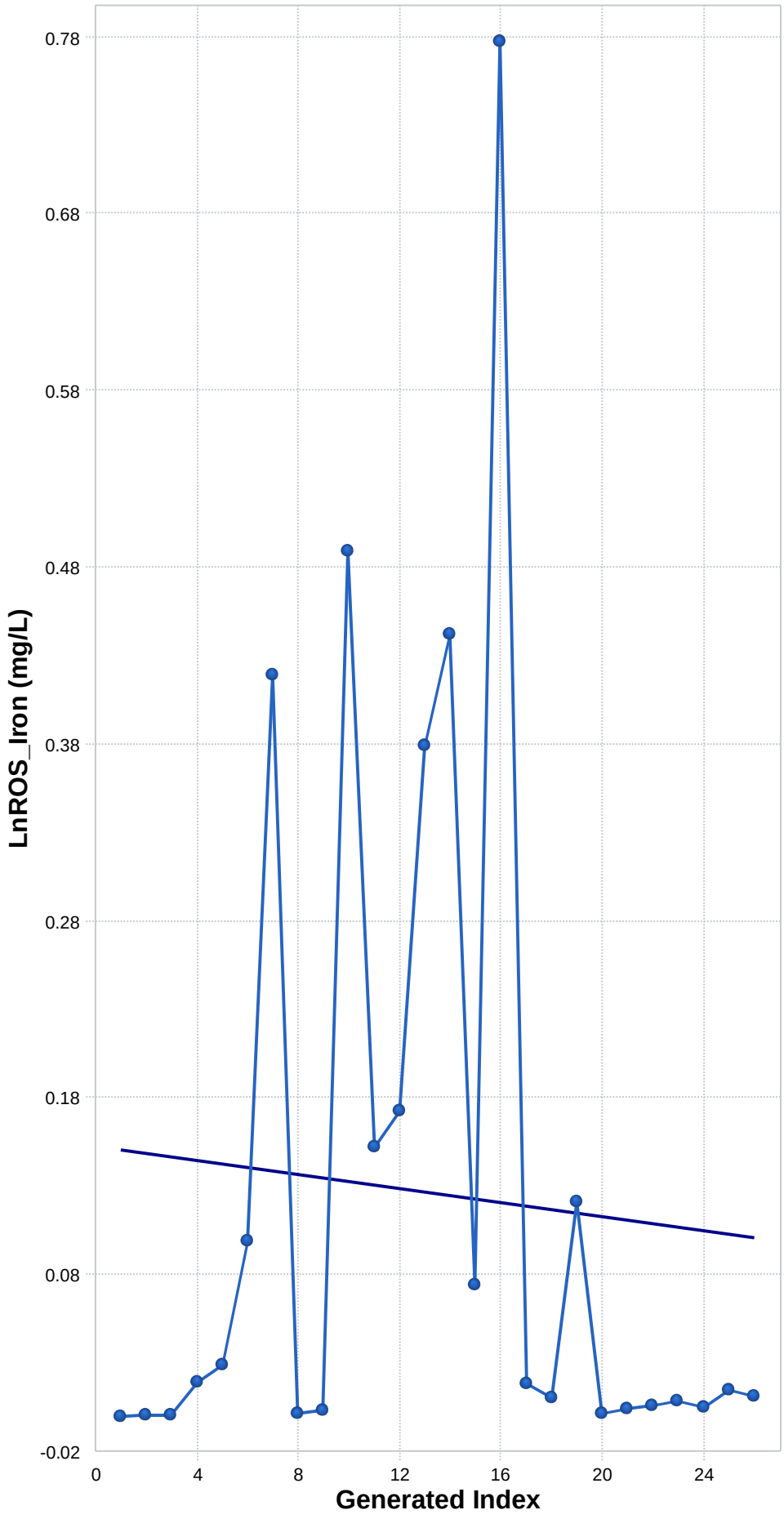
| | |
|---|---|
| n | 43 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 95.1227 |
| Standardized Value of S | -1.5769 |
| M-K Test Value (S) | -151 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0574 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0067 |

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

# Mann-Kendall 05-IN - IRON




**Mann-Kendall Trend Analysis**

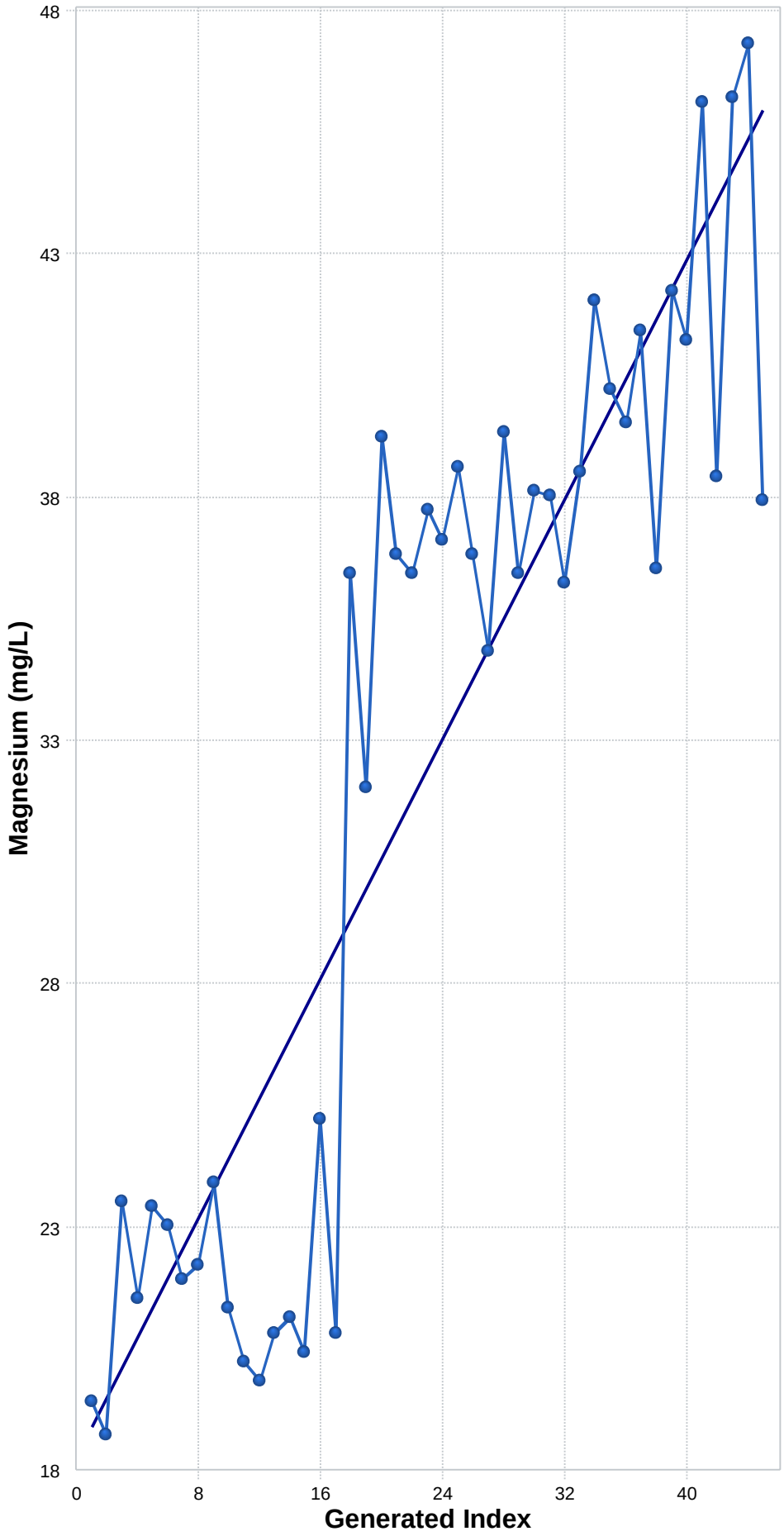
| | |
|---|---|
| n | 26 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 45.3689 |
| Standardized Value of S | 0.3967 |
| M-K Test Value (S) | 19 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3458 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0020 |
| OLS Regression Intercept | 0.1528 |

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

# Mann-Kendall 05-IN - MAGNESIUM




**Mann-Kendall Trend Analysis**

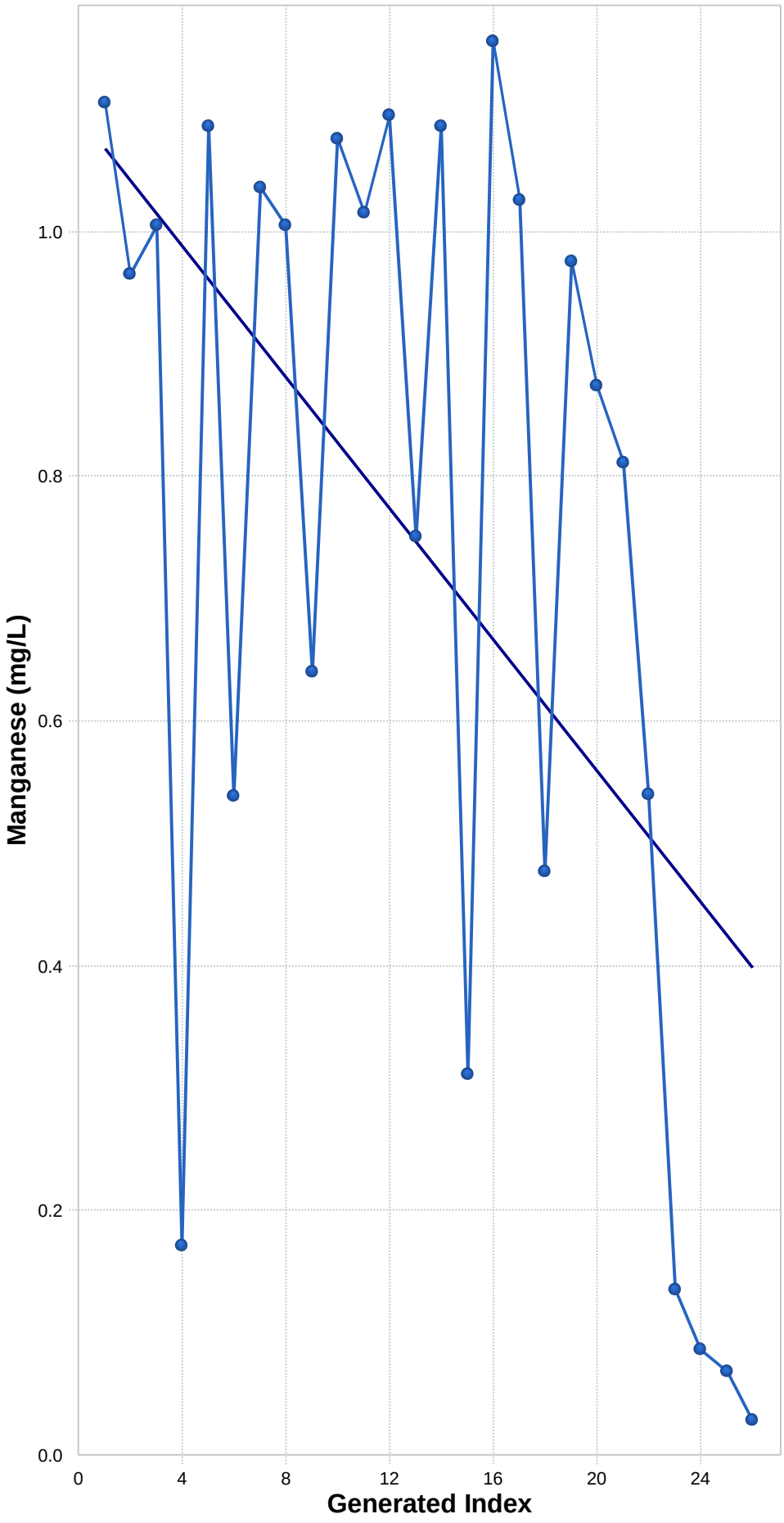
| | |
|---|---|
| n | 45 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 102.1975 |
| Standardized Value of S | 6.3407 |
| M-K Test Value (S) | 649 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.6148 |
| OLS Regression Intercept | 18.1667 |

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

# Mann-Kendall 05-IN - MANGANESE




**Mann-Kendall Trend Analysis**

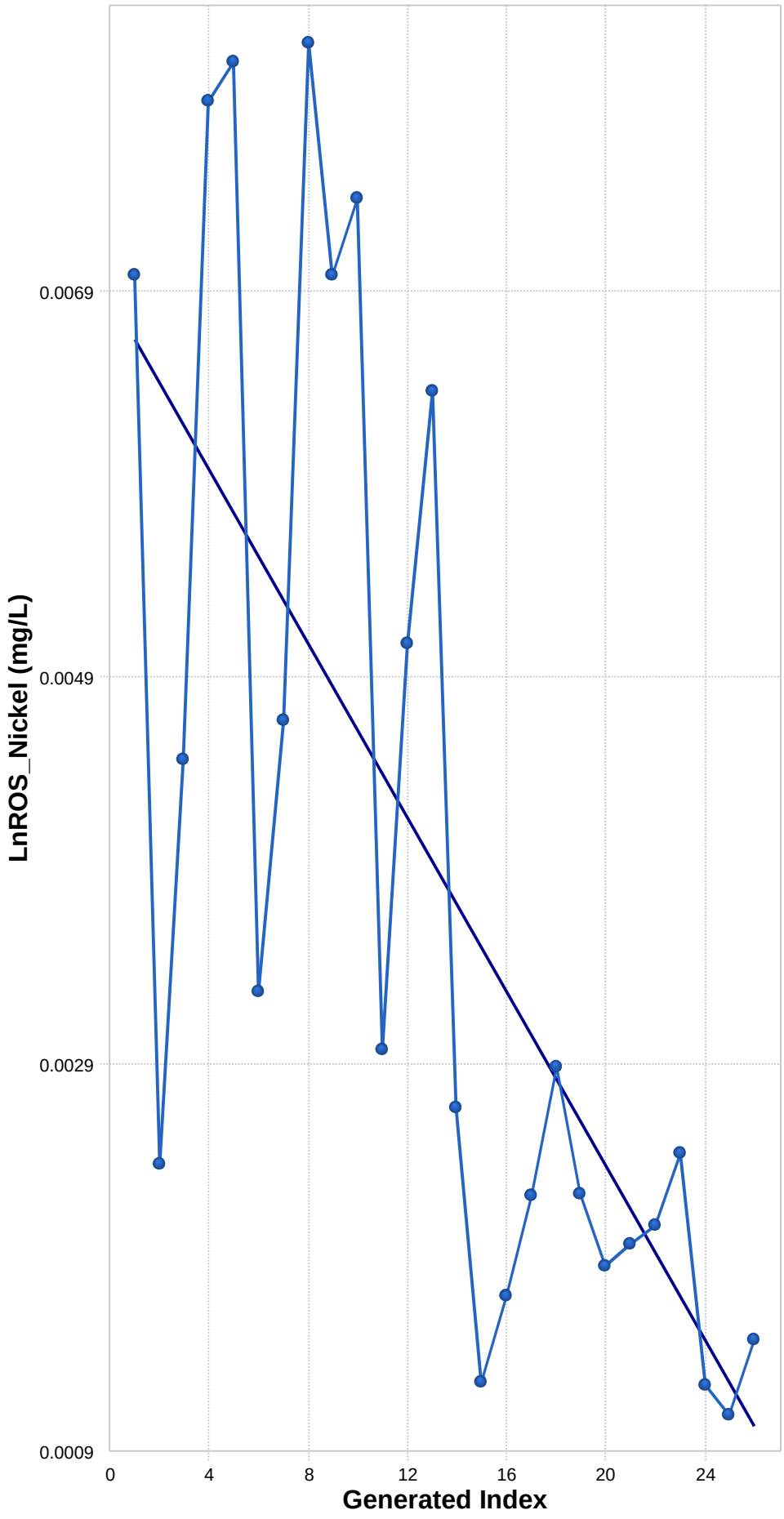
| | |
|---|---|
| n | 26 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 45.3468 |
| Standardized Value of S | -2.6904 |
| M-K Test Value (S) | -123 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0036 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0268 |
| OLS Regression Intercept | 1.1390 |

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

# Mann-Kendall 05-IN - NICKEL



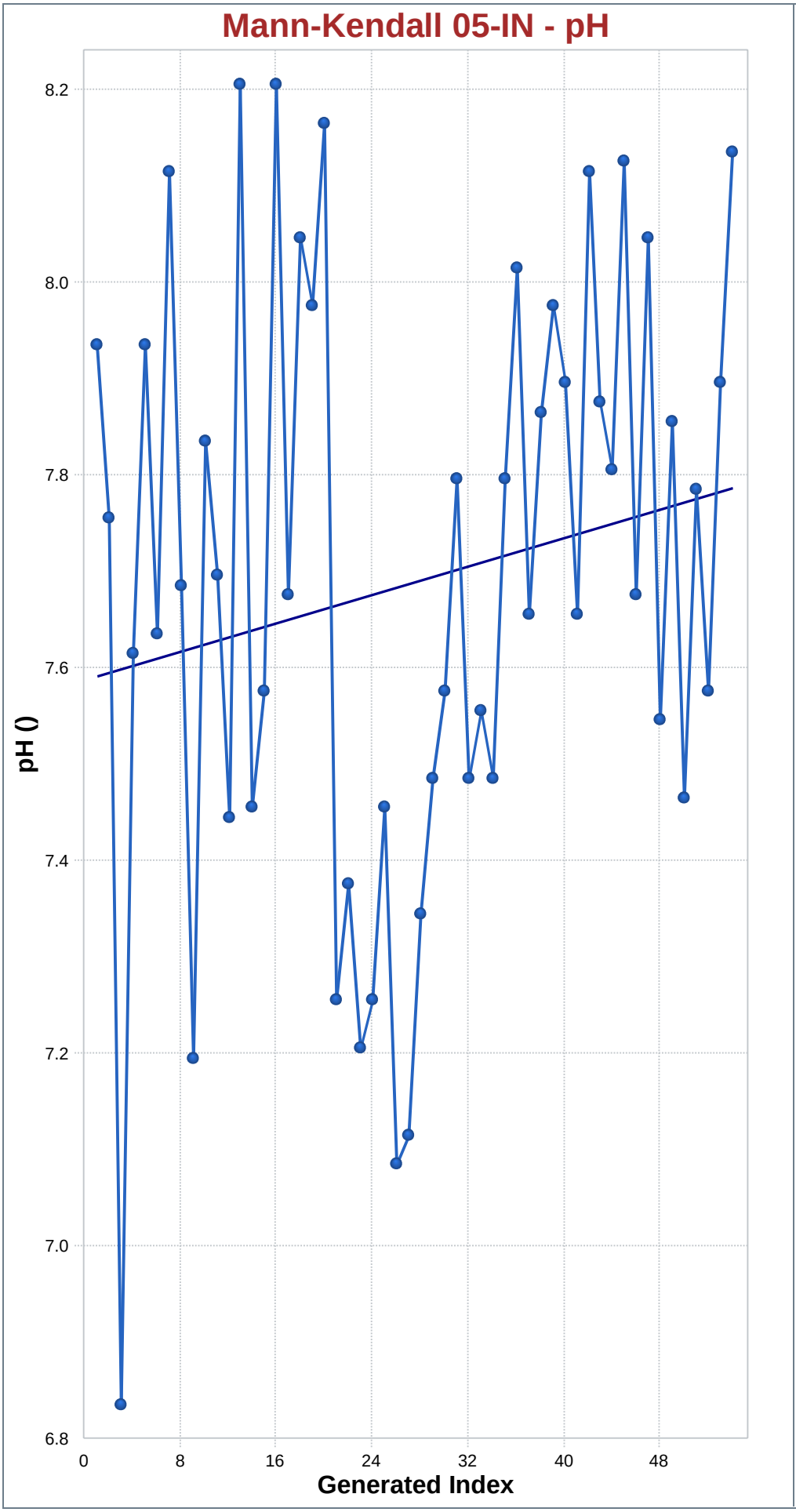

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 26 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 45.3578 |
| Standardized Value of S | -3.9023 |
| M-K Test Value (S) | -178 |
| 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**

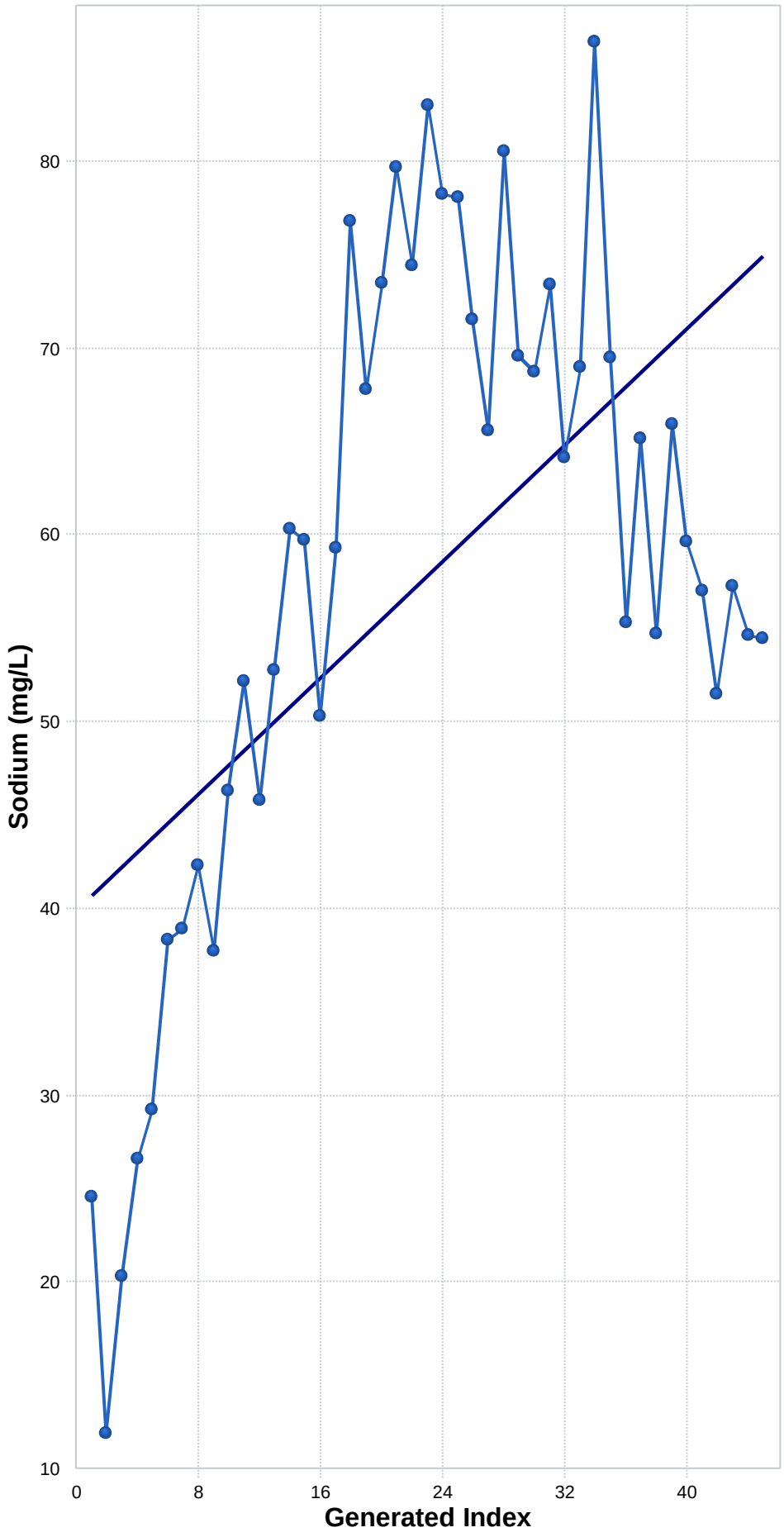
| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.9726 |
| Standardized Value of S | 1.3510 |
| M-K Test Value (S) | 182 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0883 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0037 |
| OLS Regression Intercept | 7.6129 |

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

# Mann-Kendall 05-IN - SODIUM




**Mann-Kendall Trend Analysis**

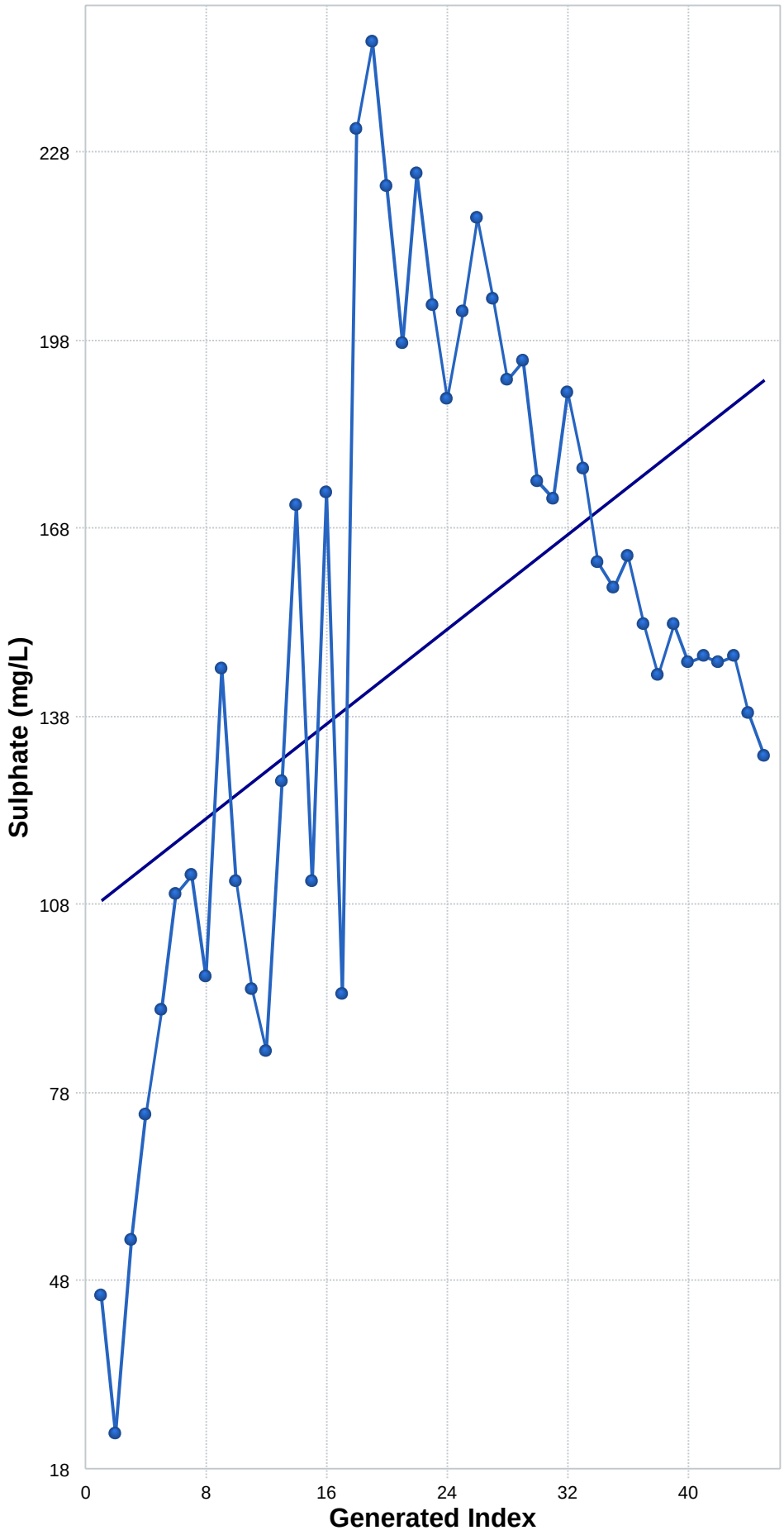
| | |
|---|---|
| n | 45 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 102.2252 |
| Standardized Value of S | 3.0814 |
| M-K Test Value (S) | 316 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0010 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.7780 |
| OLS Regression Intercept | 39.6261 |

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

# Mann-Kendall 05-IN - SULPHATE



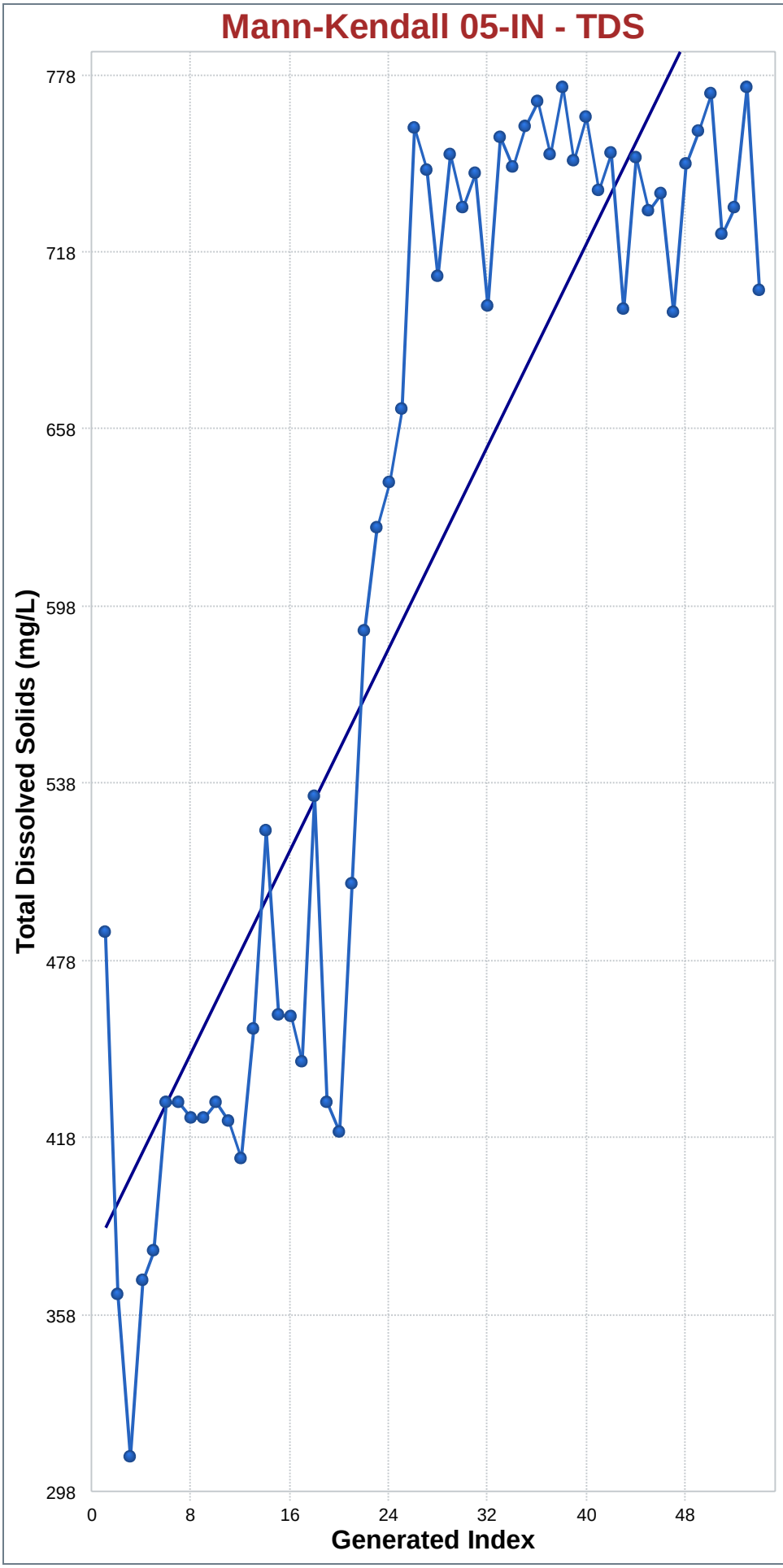

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 45 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 102.2057 |
| Standardized Value of S | 1.7514 |
| M-K Test Value (S) | 180 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0399 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.8848 |
| OLS Regression Intercept | 107.1929 |

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



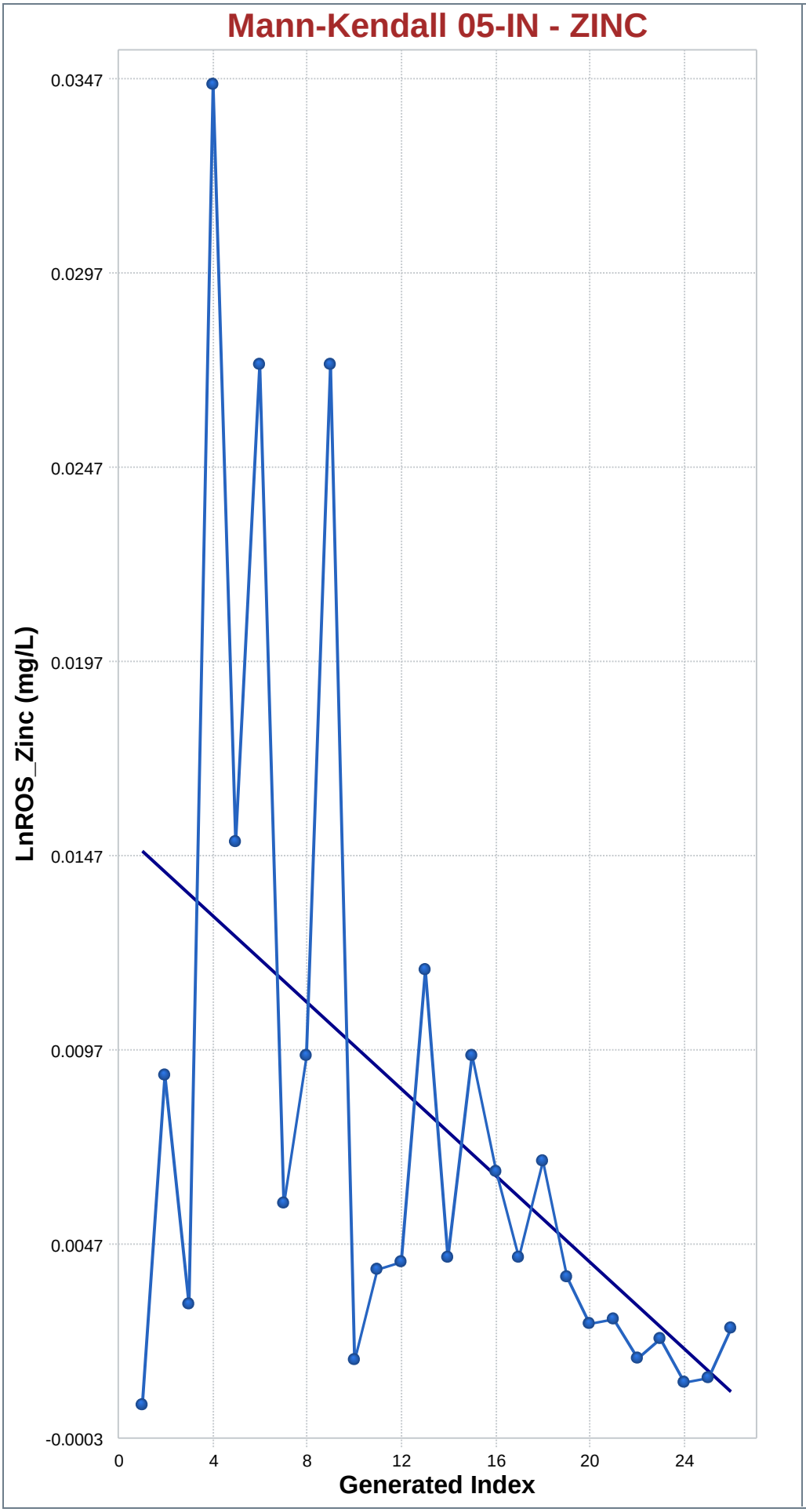

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 54 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 133.9938 |
| Standardized Value of S | 6.5376 |
| M-K Test Value (S) | 877 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 8.5531 |
| OLS Regression Intercept | 379.1607 |

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




**Mann-Kendall Trend Analysis**

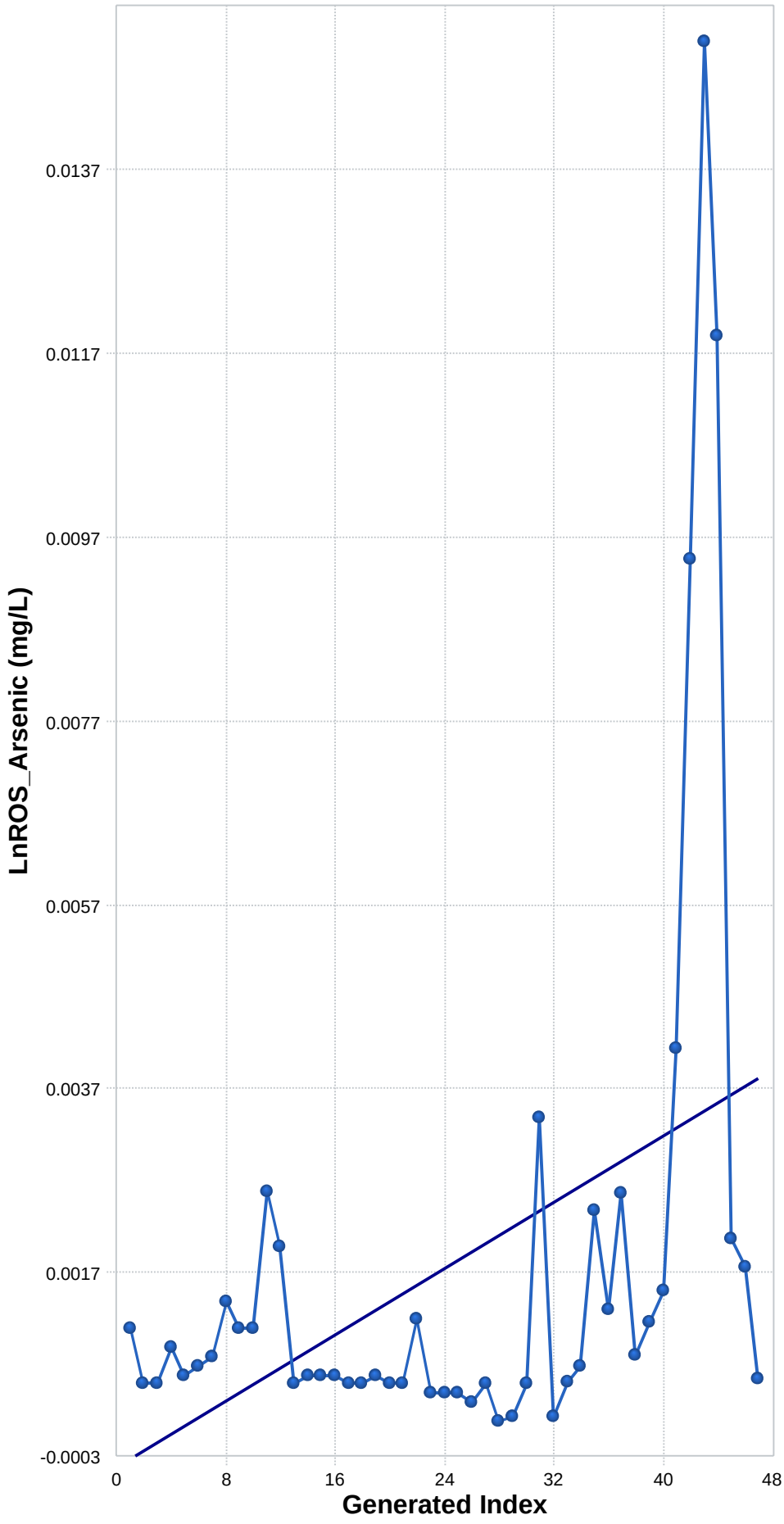
| | |
|---|---|
| n | 26 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 45.3358 |
| Standardized Value of S | -2.8454 |
| M-K Test Value (S) | -130 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0022 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0006 |
| OLS Regression Intercept | 0.0153 |

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

# Mann-Kendall 06(R)-IN - ARSENIC




**Mann-Kendall Trend Analysis**

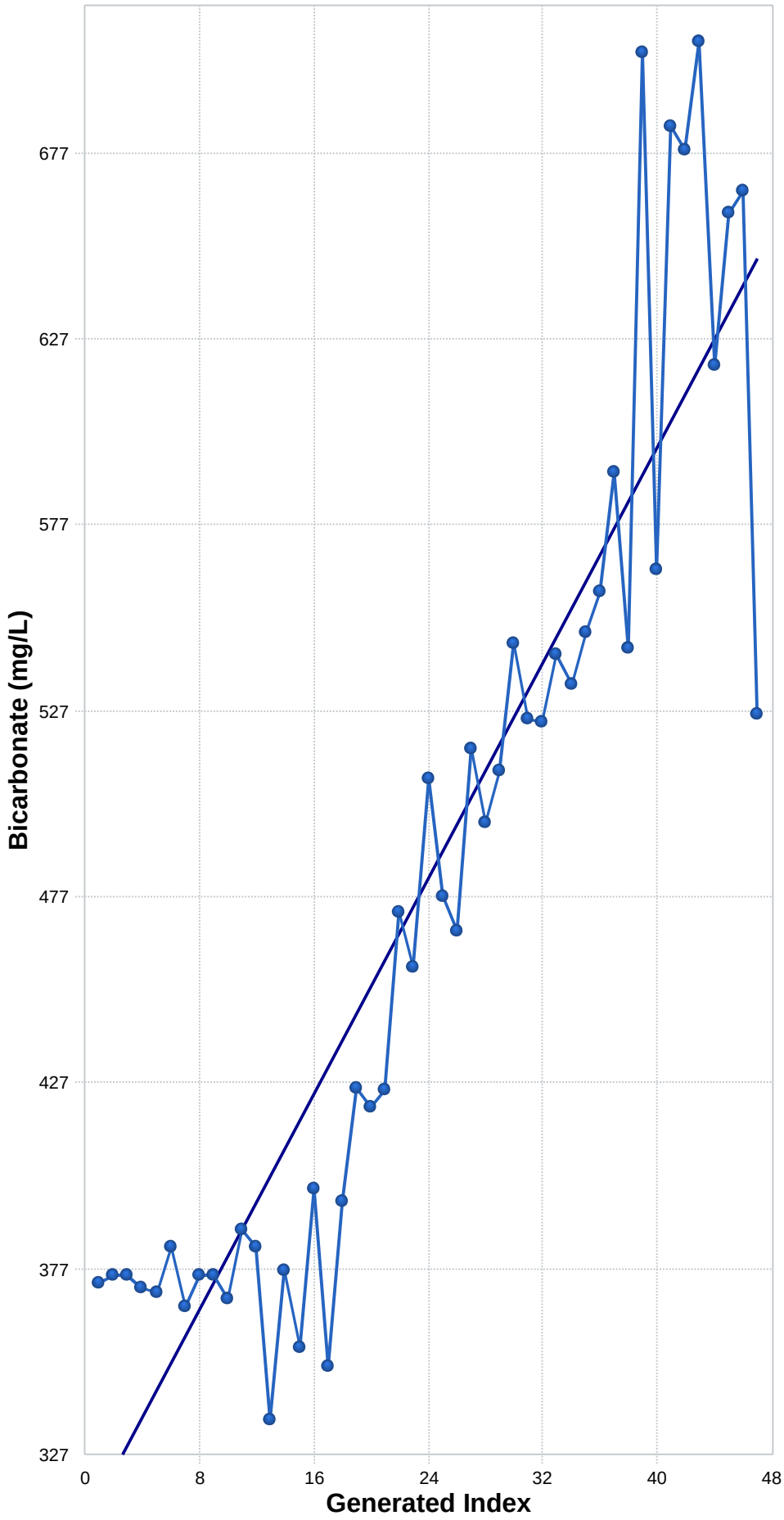
| | |
|---|---|
| n | 47 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 108.5127 |
| Standardized Value of S | 1.5851 |
| M-K Test Value (S) | 173 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0565 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0001 |
| OLS Regression Intercept | -0.0004 |

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

# Mann-Kendall 06(R)-IN - BICARBONATE




**Mann-Kendall Trend Analysis**

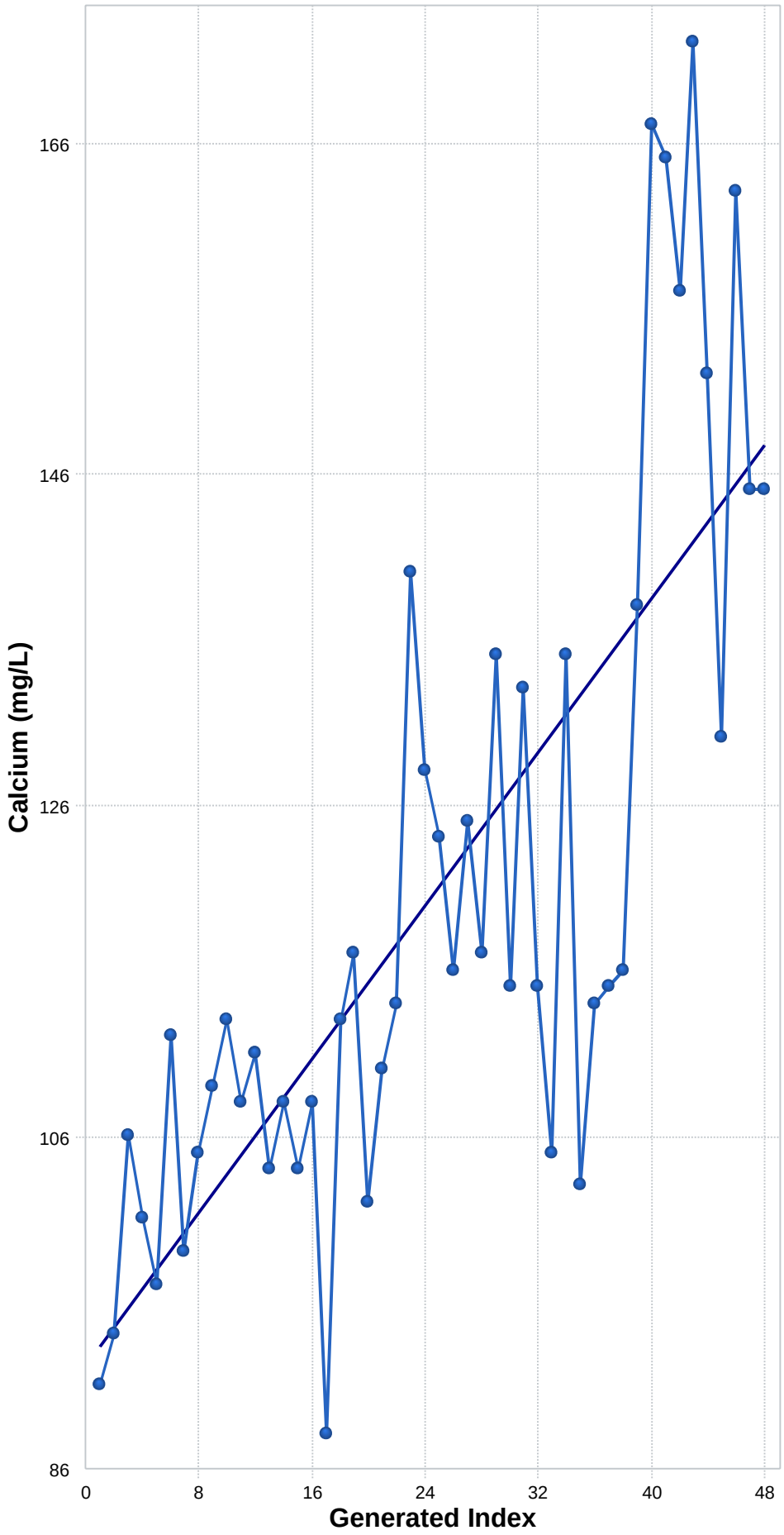
| | |
|---|---|
| n | 47 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 109.0015 |
| Standardized Value of S | 7.6421 |
| M-K Test Value (S) | 834 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 7.2703 |
| OLS Regression Intercept | 306.8893 |

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

# Mann-Kendall 06(R)-IN - CALCIUM




**Mann-Kendall Trend Analysis**

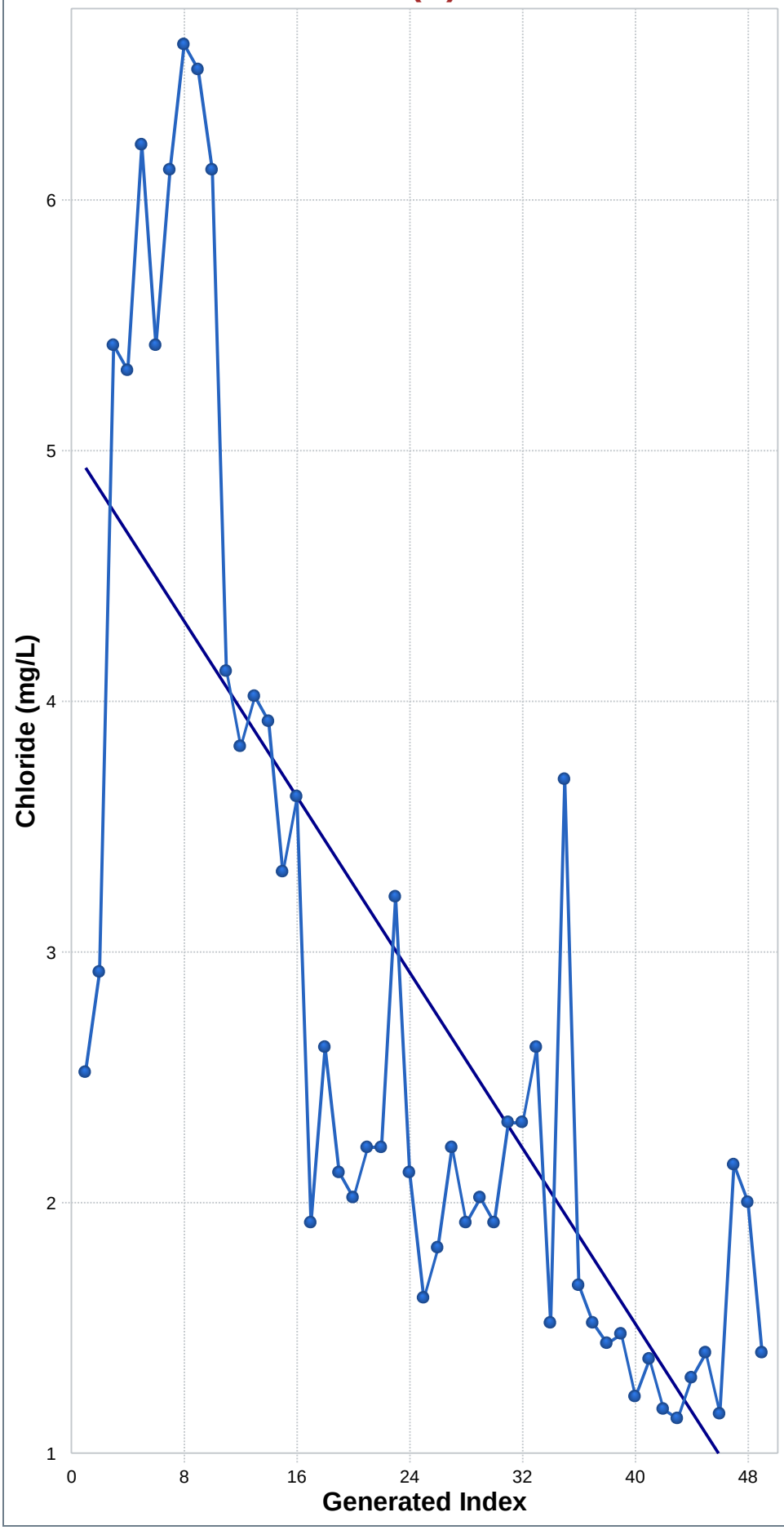
| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.4426 |
| Standardized Value of S | 6.0031 |
| M-K Test Value (S) | 676 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.1571 |
| OLS Regression Intercept | 92.1516 |

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

# Mann-Kendall 06(R)-IN - CHLORIDE




**Mann-Kendall Trend Analysis**

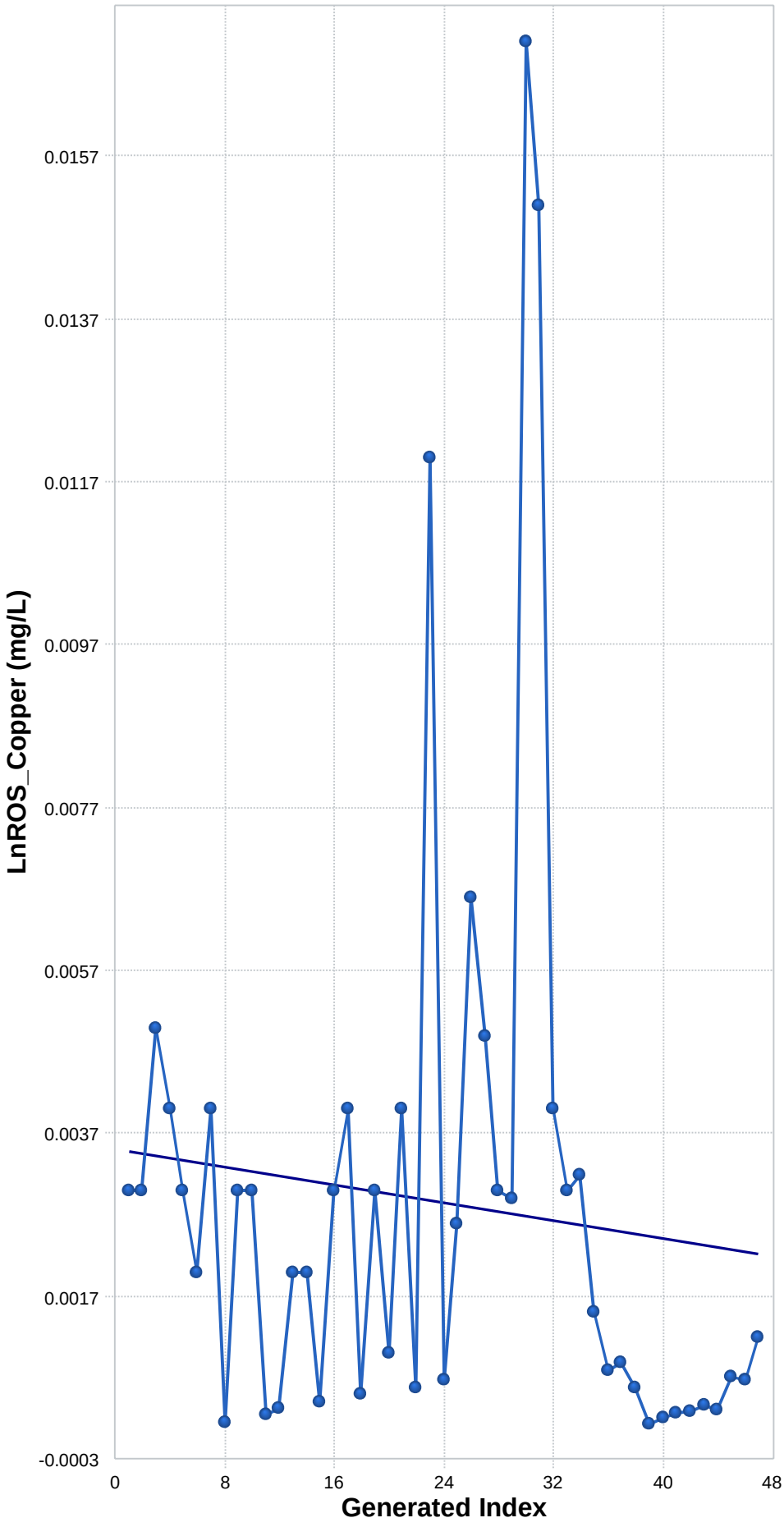
| | |
|---|---|
| n | 49 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 115.9454 |
| Standardized Value of S | -6.4944 |
| M-K Test Value (S) | -754 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0875 |
| OLS Regression Intercept | 4.7023 |

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

# Mann-Kendall 06(R)-IN - COPPER



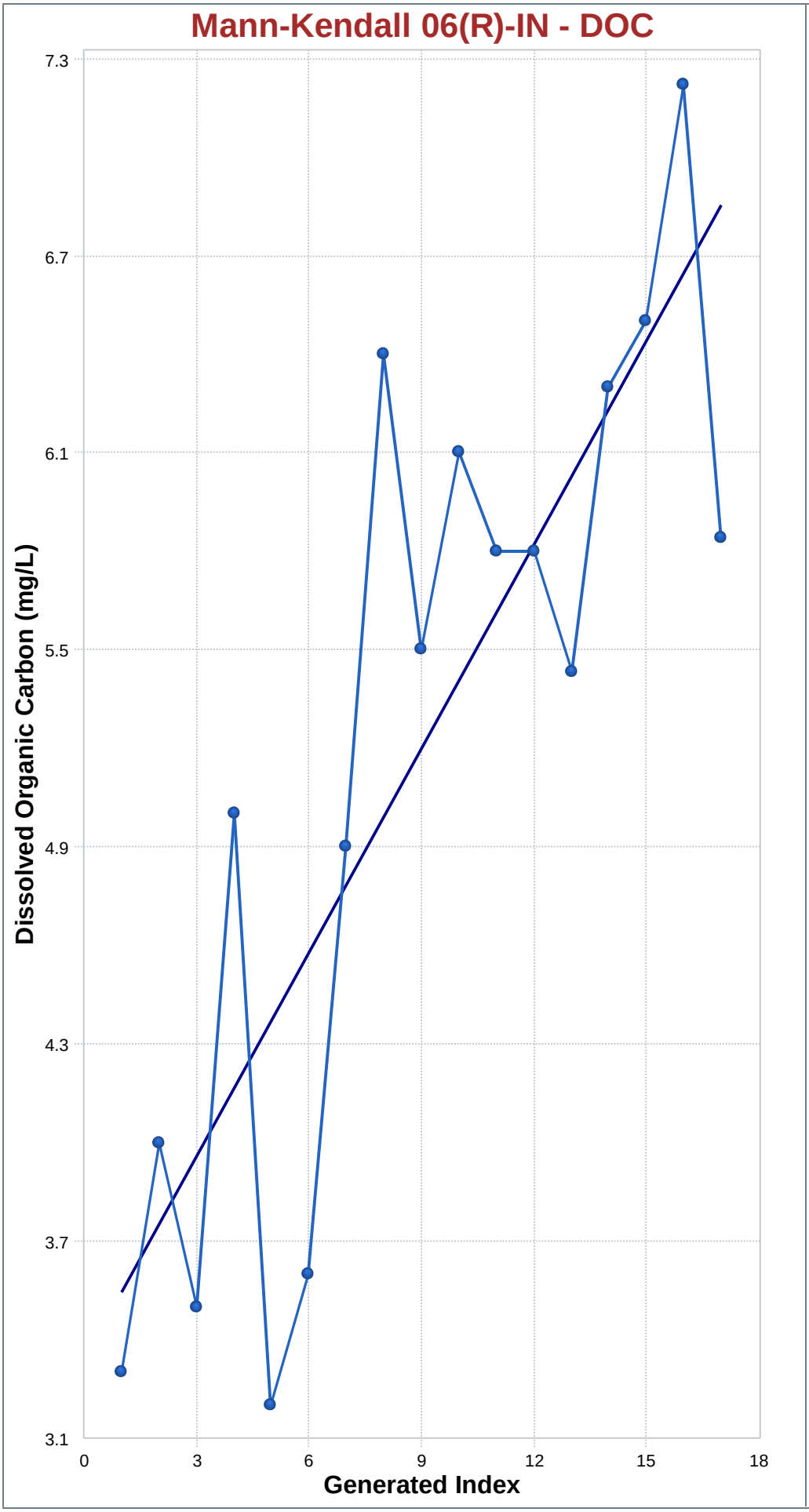

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 47 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 108.5296 |
| Standardized Value of S | -2.0547 |
| M-K Test Value (S) | -224 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0200 |

**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.



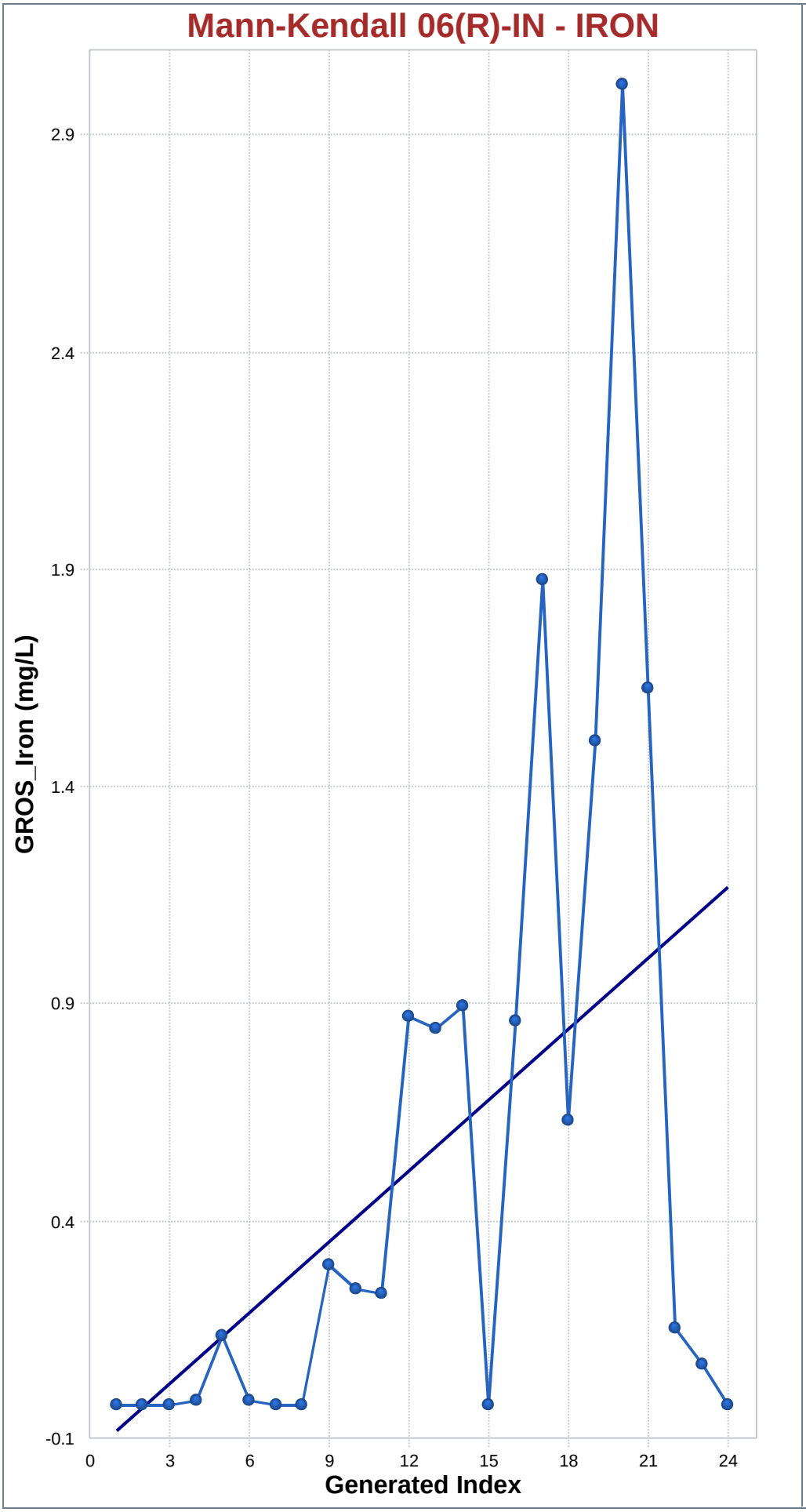

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 17 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 24.2556 |
| Standardized Value of S | 3.4631 |
| M-K Test Value (S) | 85 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0003 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.2068 |
| OLS Regression Intercept | 3.3381 |

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




**Mann-Kendall Trend Analysis**

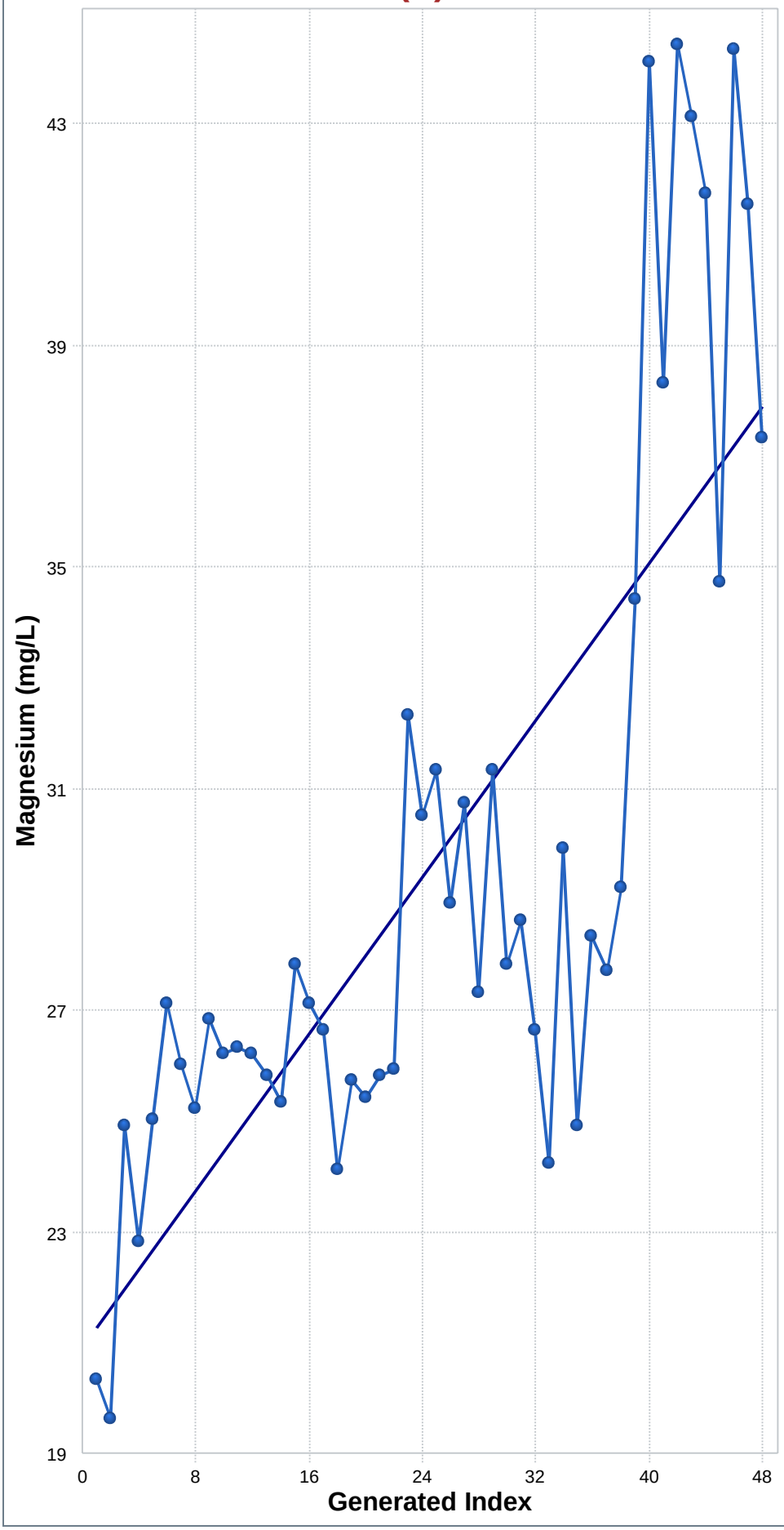
| | |
|---|---|
| n | 24 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 39.7492 |
| Standardized Value of S | 2.6919 |
| M-K Test Value (S) | 108 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0036 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0544 |
| OLS Regression Intercept | -0.1015 |

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

# Mann-Kendall 06(R)-IN - MAGNESIUM



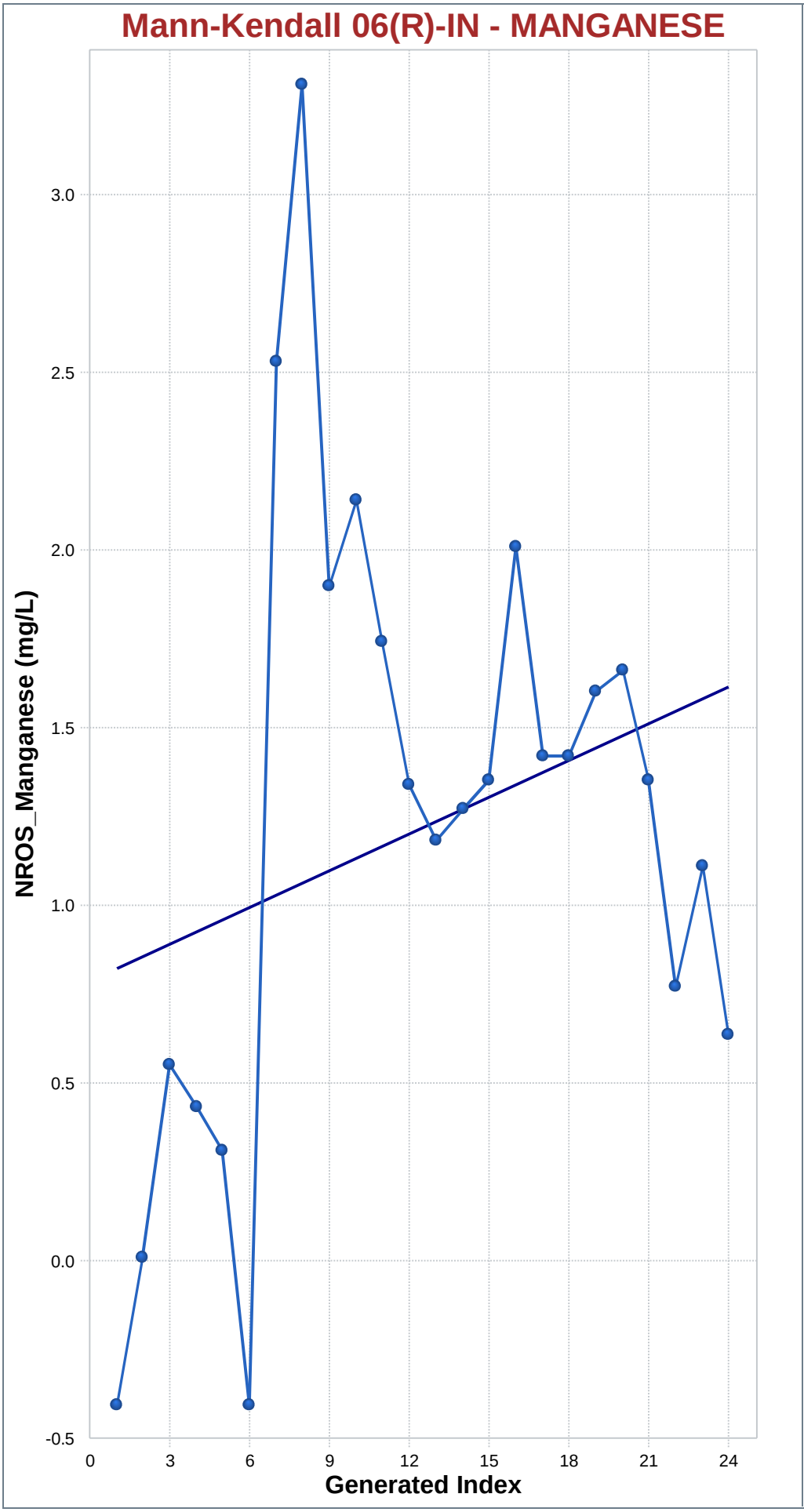

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.4796 |
| Standardized Value of S | 5.8144 |
| M-K Test Value (S) | 655 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3536 |
| OLS Regression Intercept | 21.3023 |

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




**Mann-Kendall Trend Analysis**

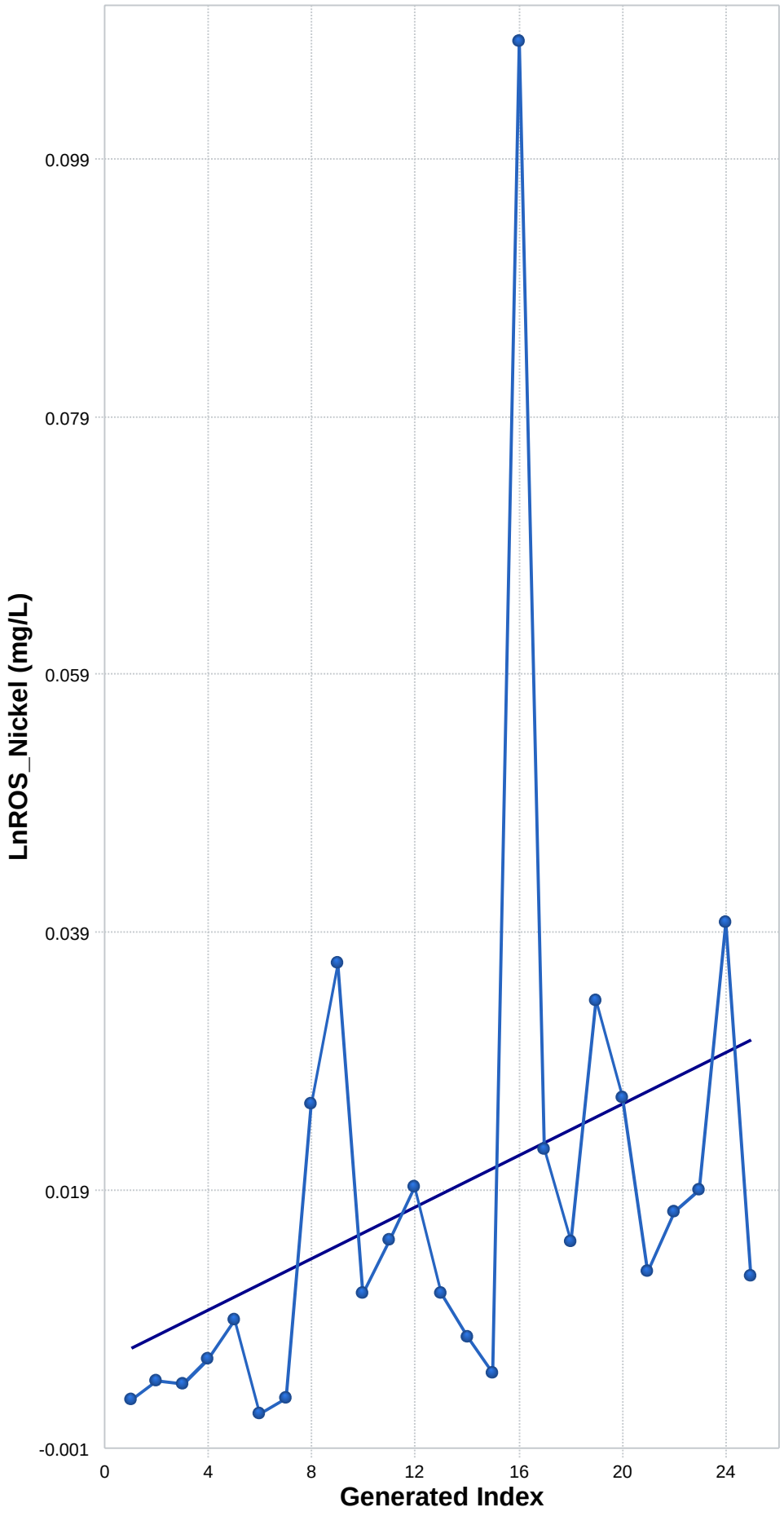
| | |
|---|---|
| n | 24 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 40.2782 |
| Standardized Value of S | 0.7448 |
| M-K Test Value (S) | 31 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.2282 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0345 |
| OLS Regression Intercept | 0.8163 |

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

# Mann-Kendall 06(R)-IN - NICKEL



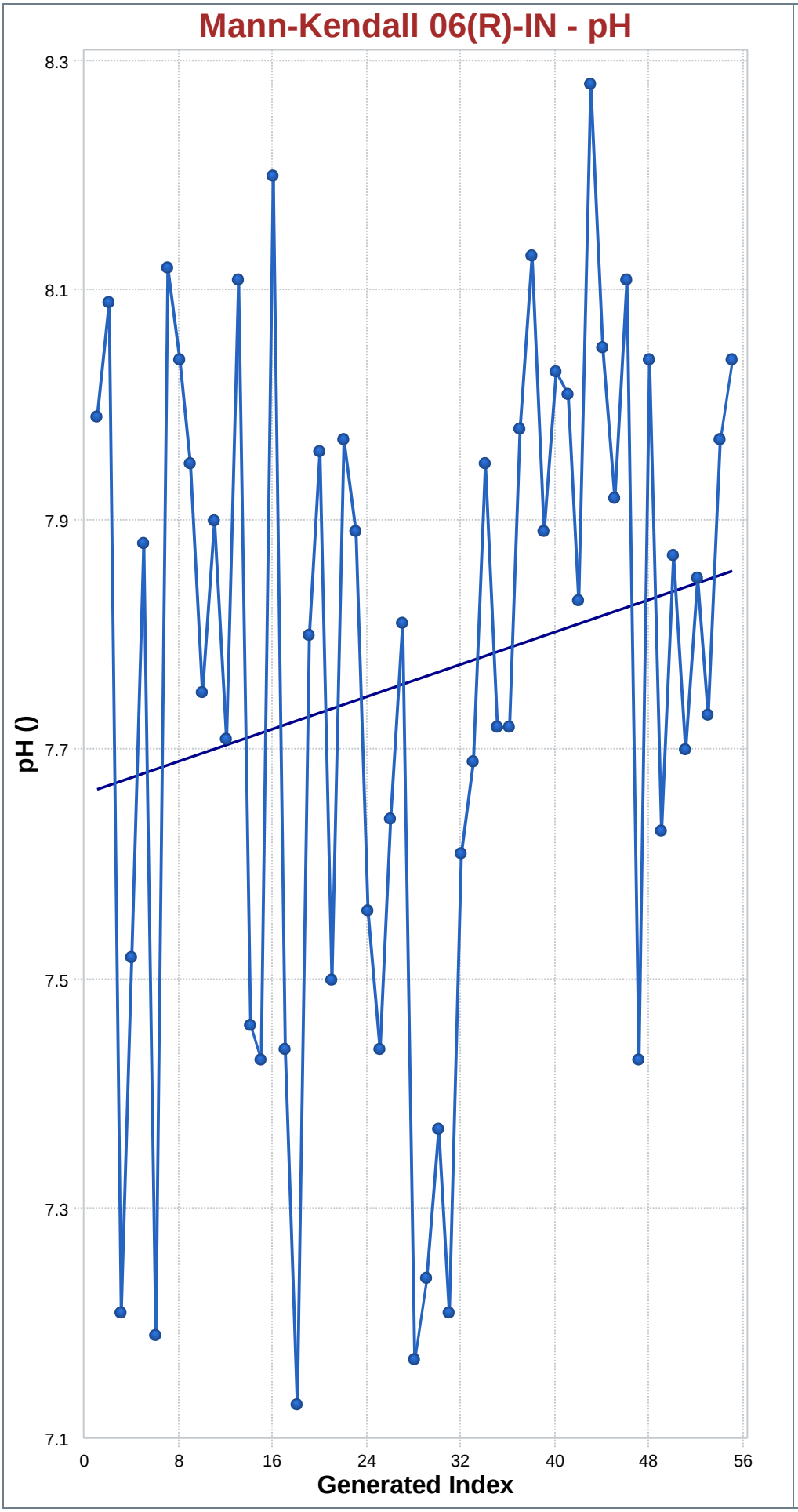

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 25 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 42.8174 |
| Standardized Value of S | 2.8727 |
| M-K Test Value (S) | 124 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0020 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0010 |
| OLS Regression Intercept | 0.0057 |

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




**Mann-Kendall Trend Analysis**

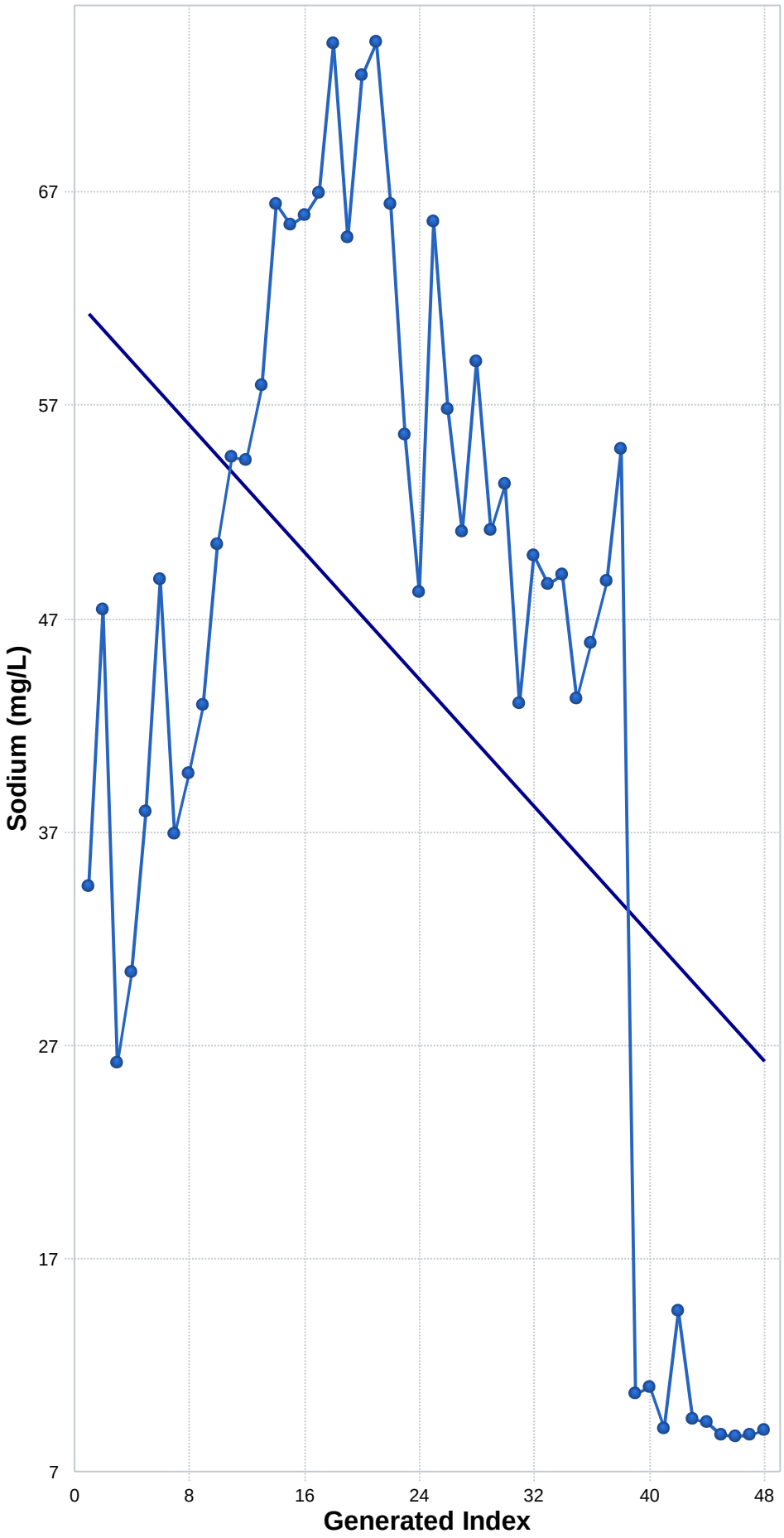
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.7074 |
| Standardized Value of S | 1.2127 |
| M-K Test Value (S) | 168 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1126 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0035 |
| OLS Regression Intercept | 7.6326 |

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

# Mann-Kendall 06(R)-IN - SODIUM



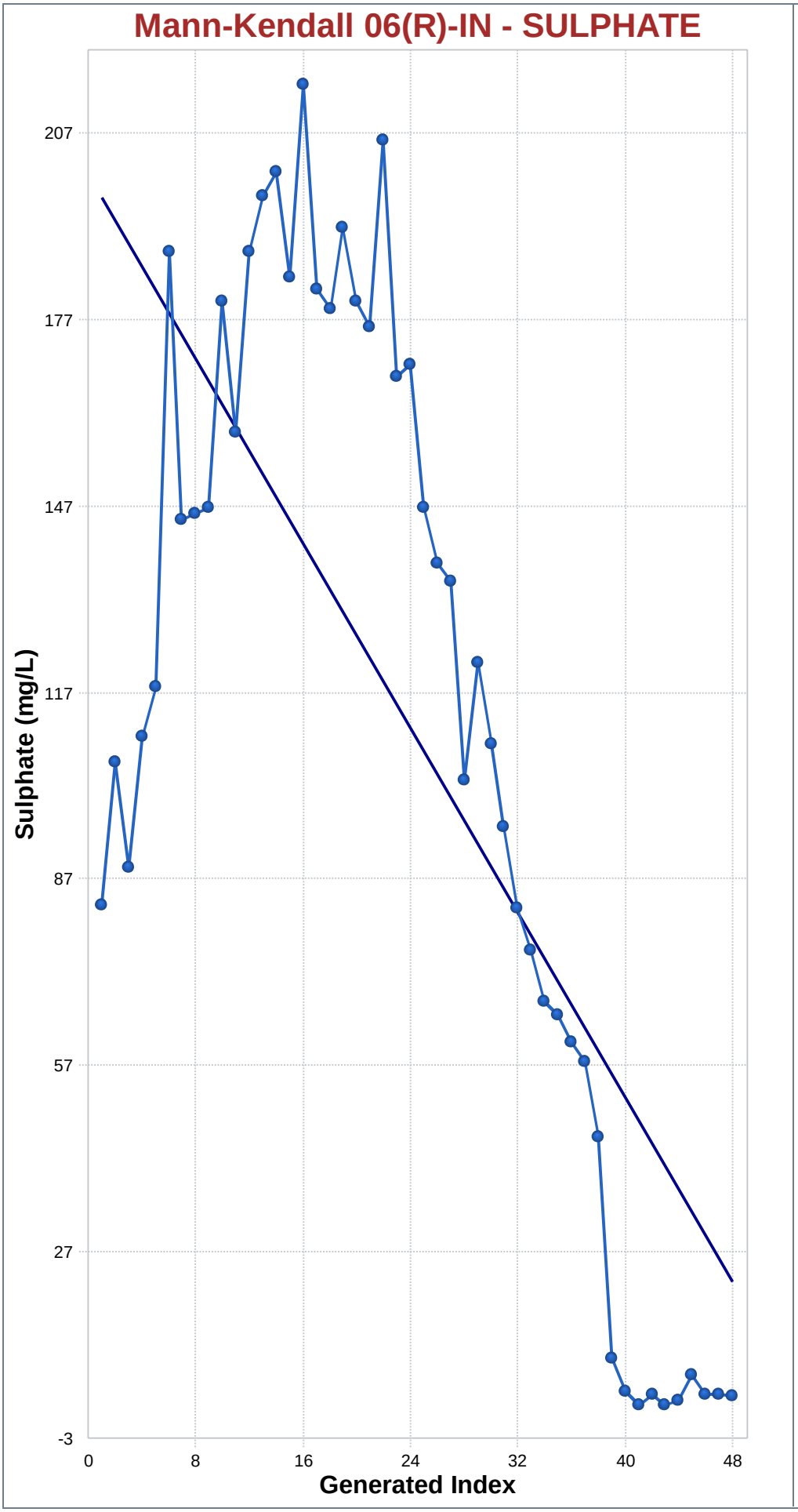

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.5063 |
| Standardized Value of S | -2.6843 |
| M-K Test Value (S) | -303 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0036 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.7457 |
| OLS Regression Intercept | 61.6212 |

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




**Mann-Kendall Trend Analysis**

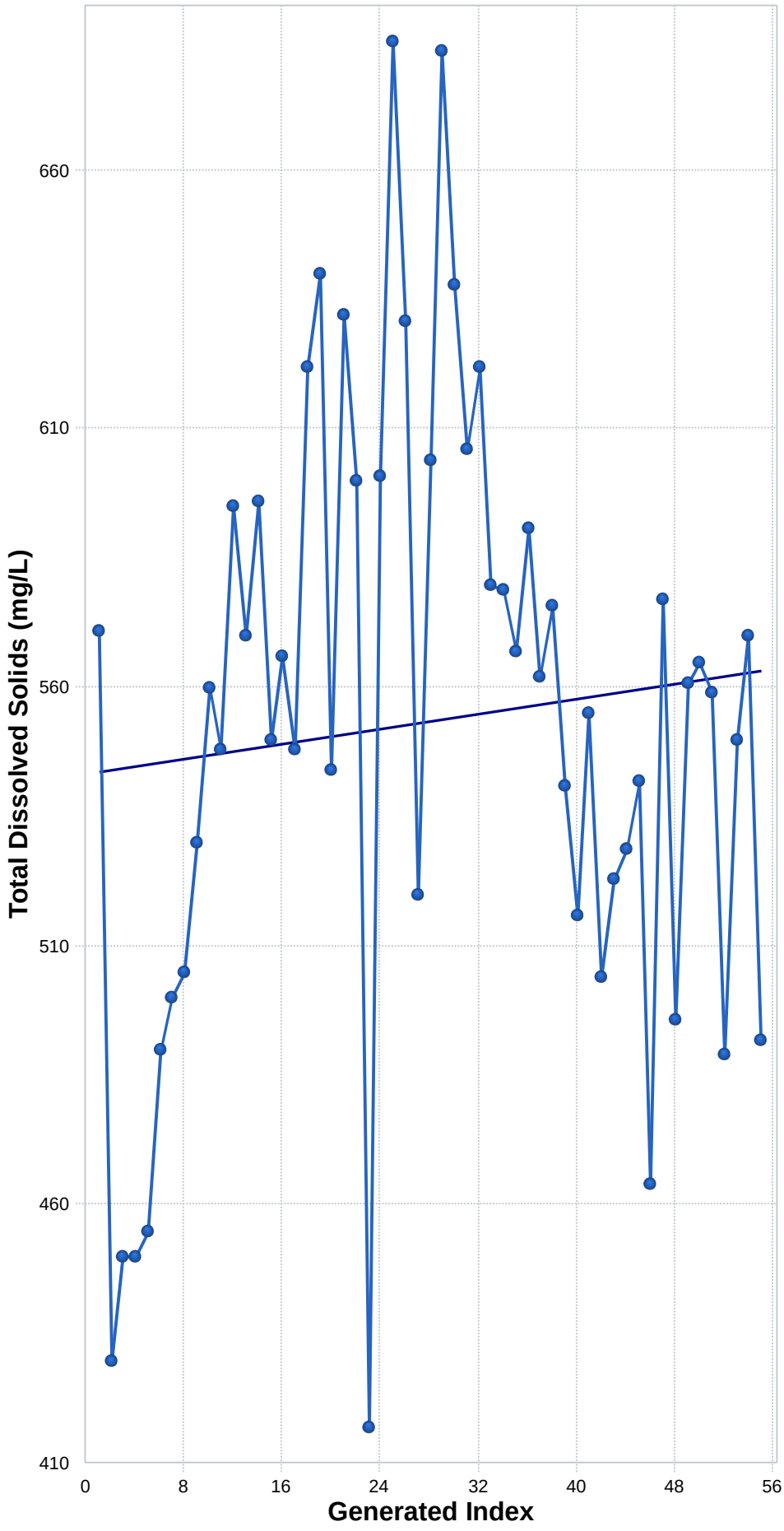
| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.4974 |
| Standardized Value of S | -5.5112 |
| M-K Test Value (S) | -621 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -3.7096 |
| OLS Regression Intercept | 200.4922 |

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

# Mann-Kendall 06(R)-IN - TDS




**Mann-Kendall Trend Analysis**

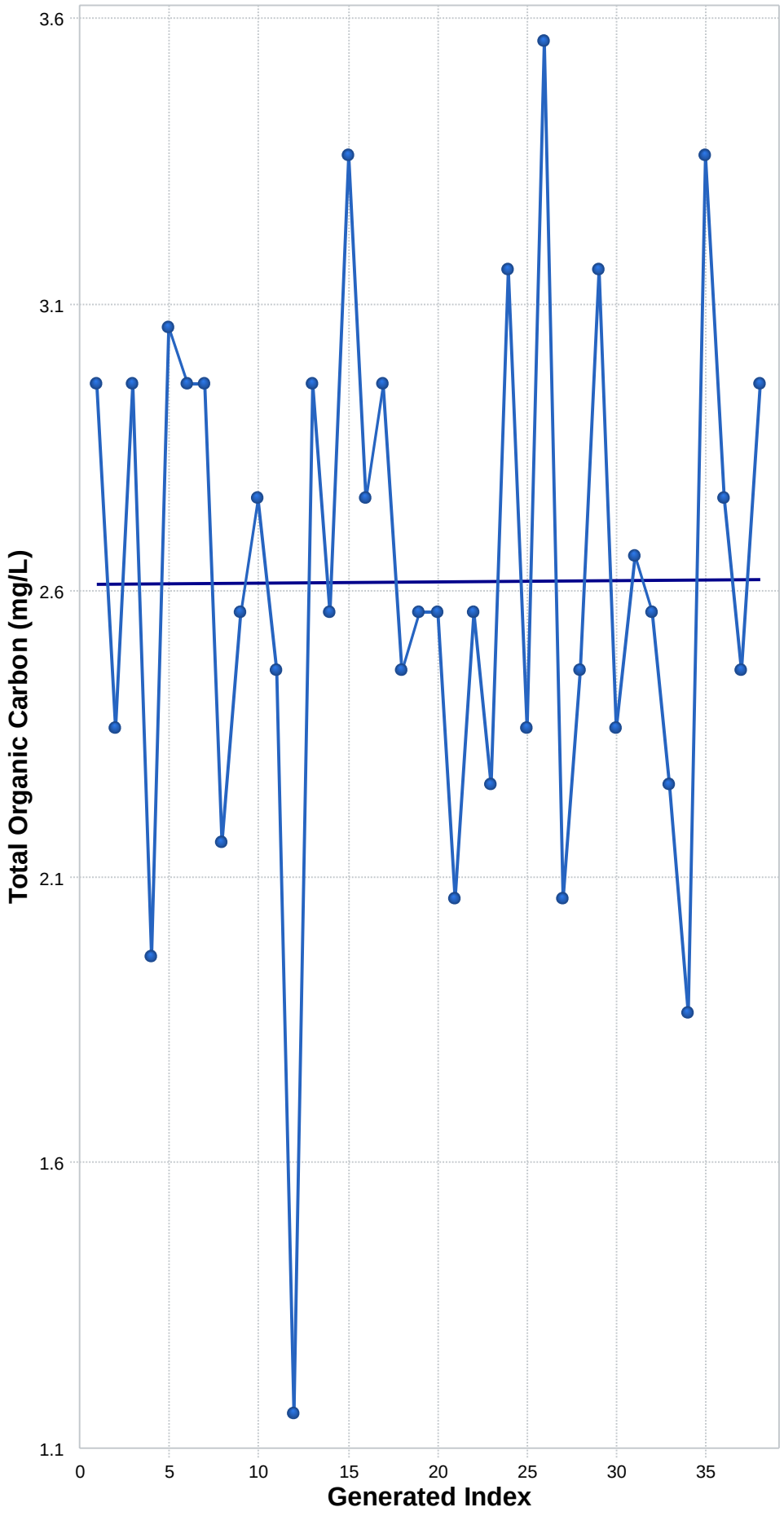
| | |
|---|---|
| n | 55 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 137.7316 |
| Standardized Value of S | 0.1379 |
| M-K Test Value (S) | 20 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.4451 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3579 |
| OLS Regression Intercept | 543.5616 |

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

# Mann-Kendall 06(R)-IN - TOC



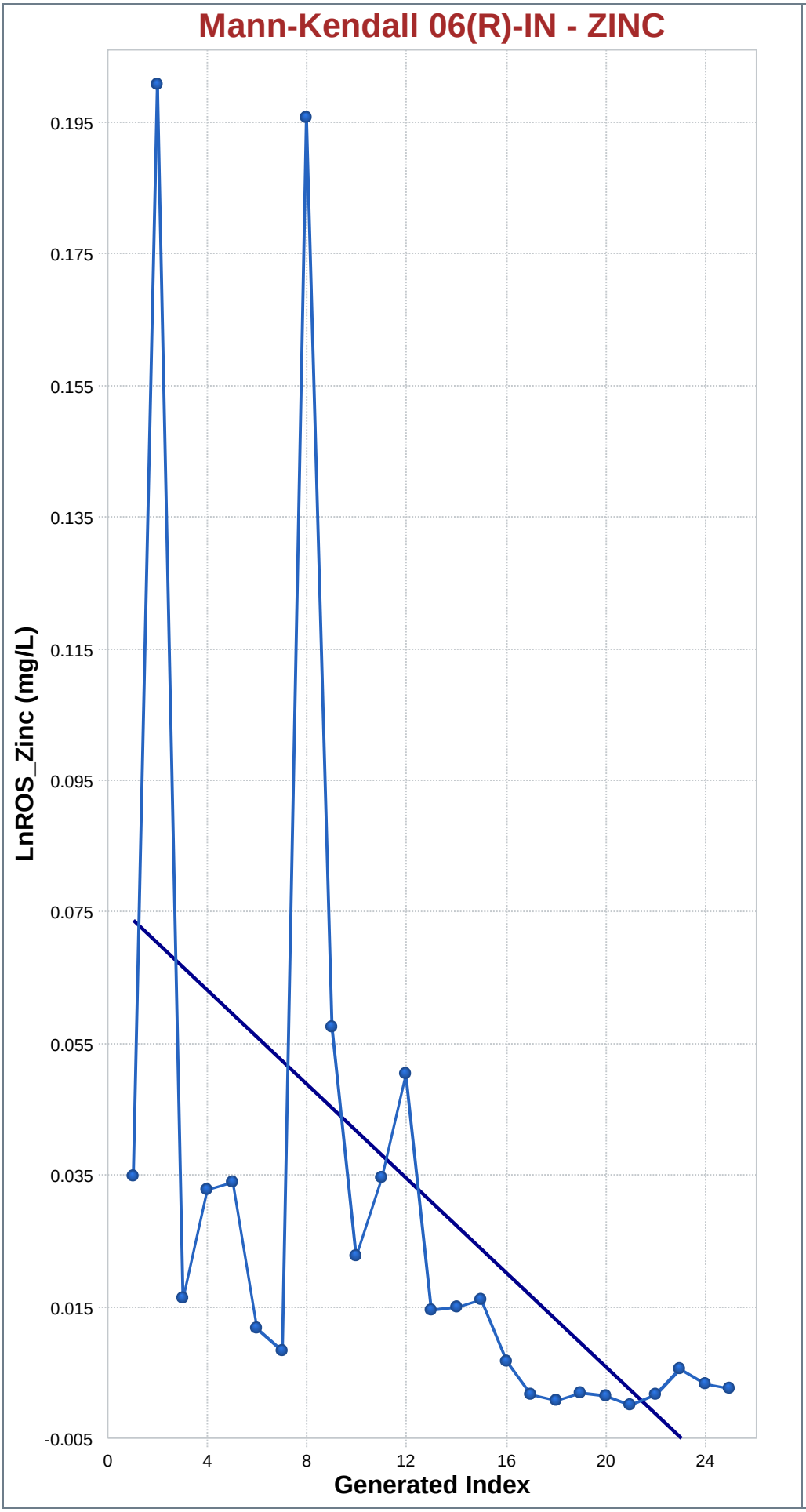

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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.



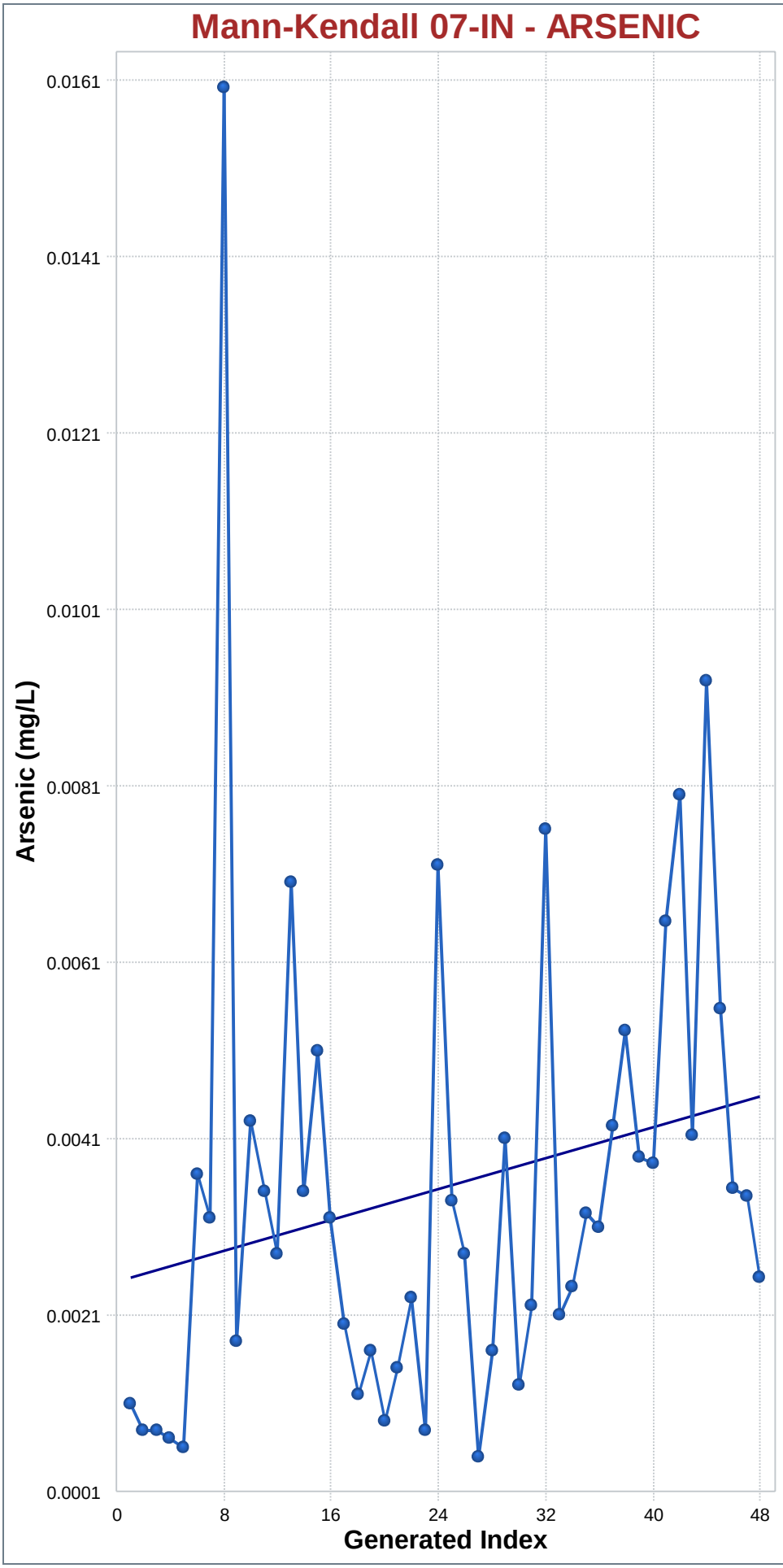

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 25 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 42.8058 |
| Standardized Value of S | -3.8780 |
| M-K Test Value (S) | -167 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0036 |
| OLS Regression Intercept | 0.0775 |

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




**Mann-Kendall Trend Analysis**

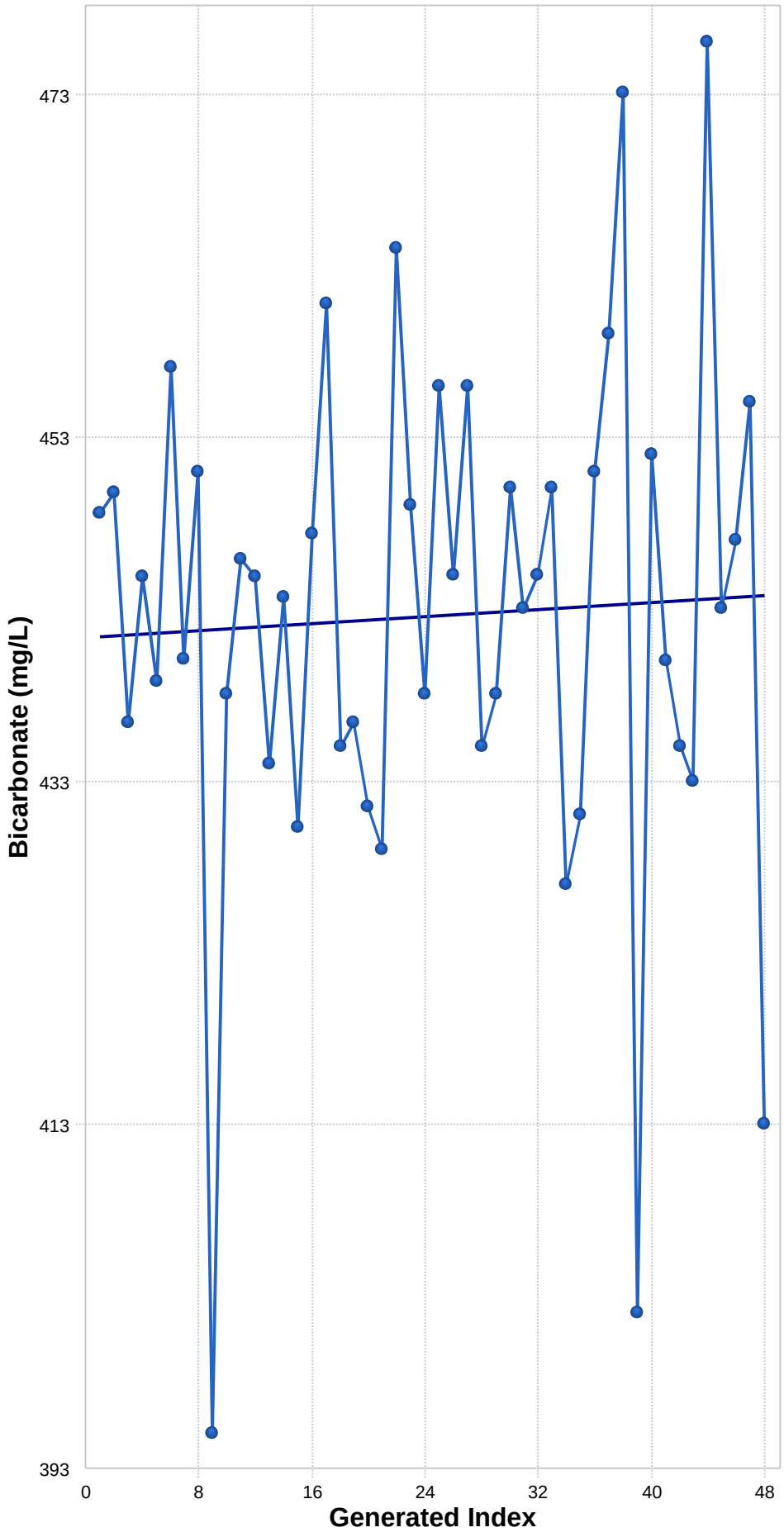
| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.4767 |
| Standardized Value of S | 2.7917 |
| M-K Test Value (S) | 315 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0026 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0025 |

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

# Mann-Kendall 07-IN - BICARBONATE




**Mann-Kendall Trend Analysis**

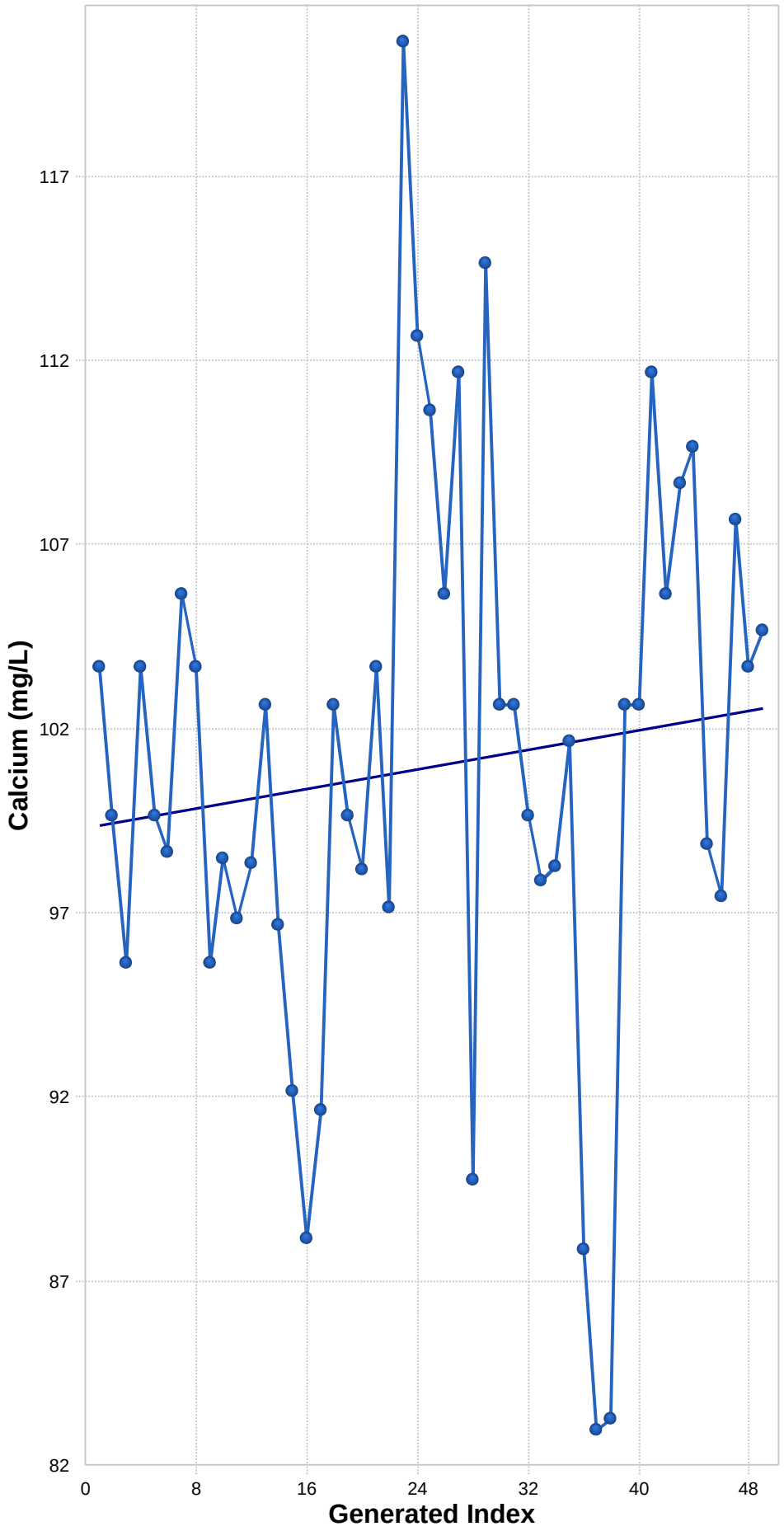
| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.4470 |
| Standardized Value of S | 0.2490 |
| M-K Test Value (S) | 29 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.4017 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0517 |
| OLS Regression Intercept | 441.3293 |

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

# Mann-Kendall 07-IN - CALCIUM



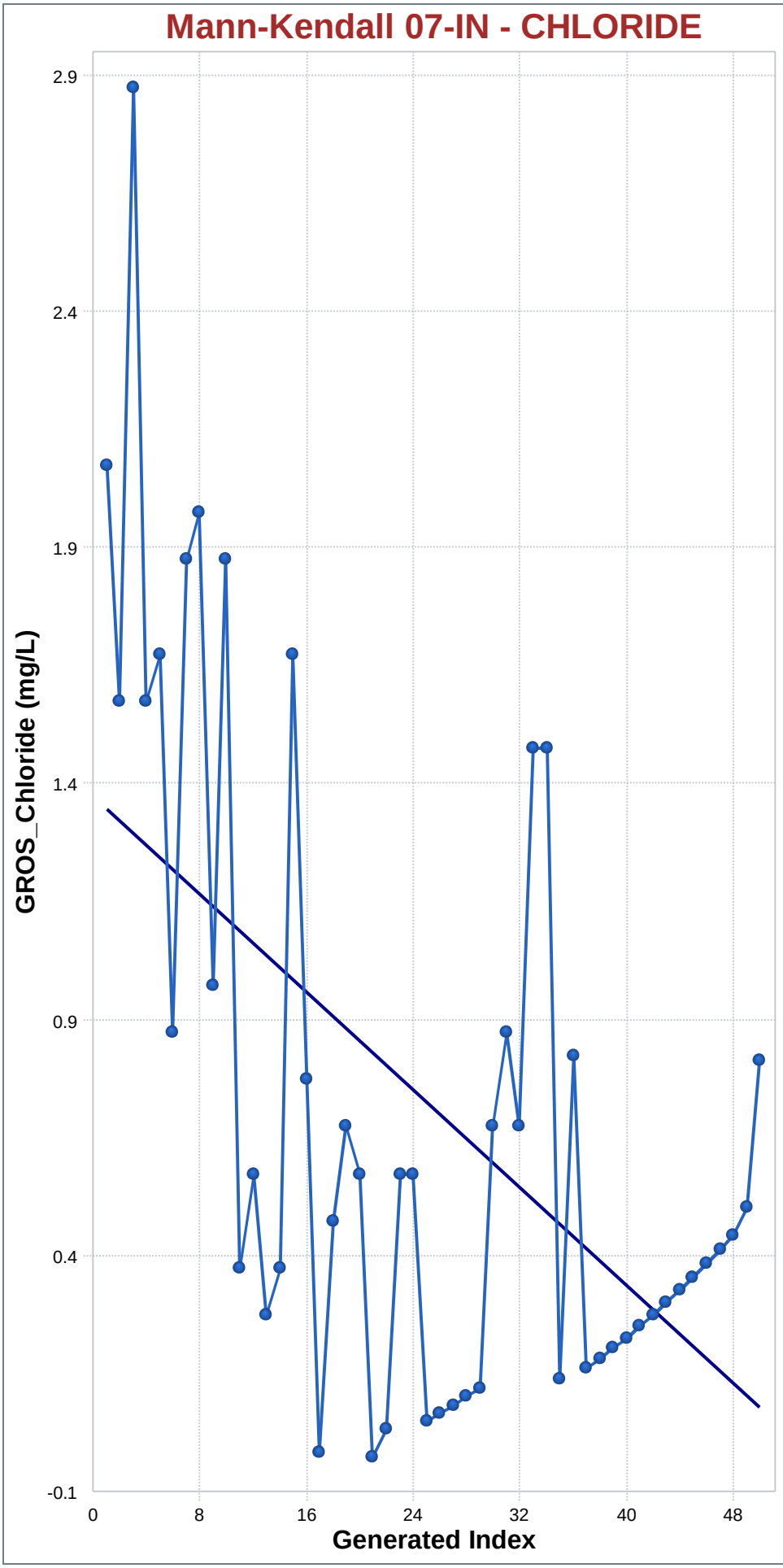

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 49 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 115.7555 |
| Standardized Value of S | 1.0453 |
| M-K Test Value (S) | 122 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1479 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0667 |
| OLS Regression Intercept | 99.6538 |

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



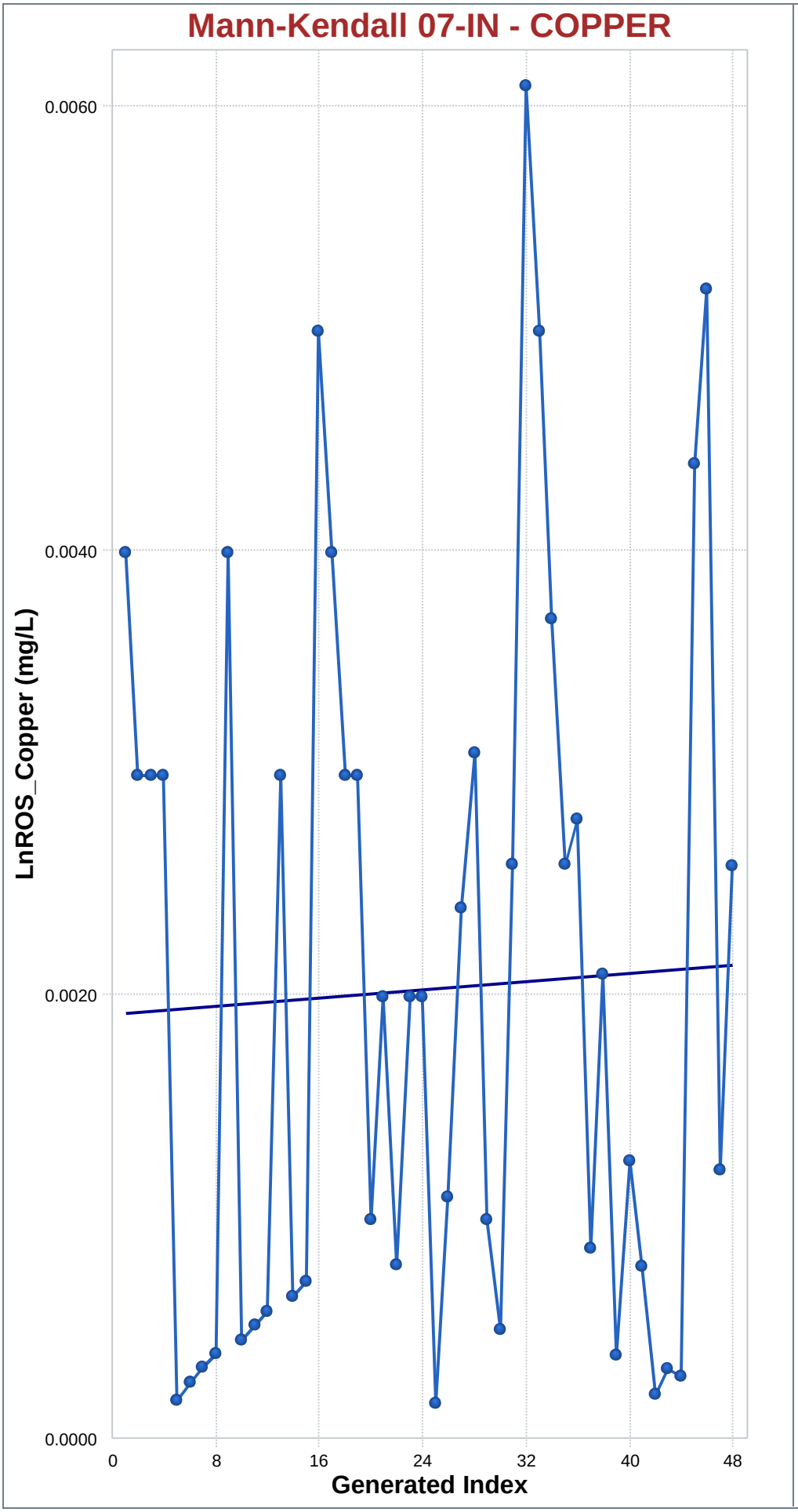

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 50 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 119.4711 |
| Standardized Value of S | -2.4023 |
| M-K Test Value (S) | -288 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0081 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0259 |
| OLS Regression Intercept | 1.3980 |

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



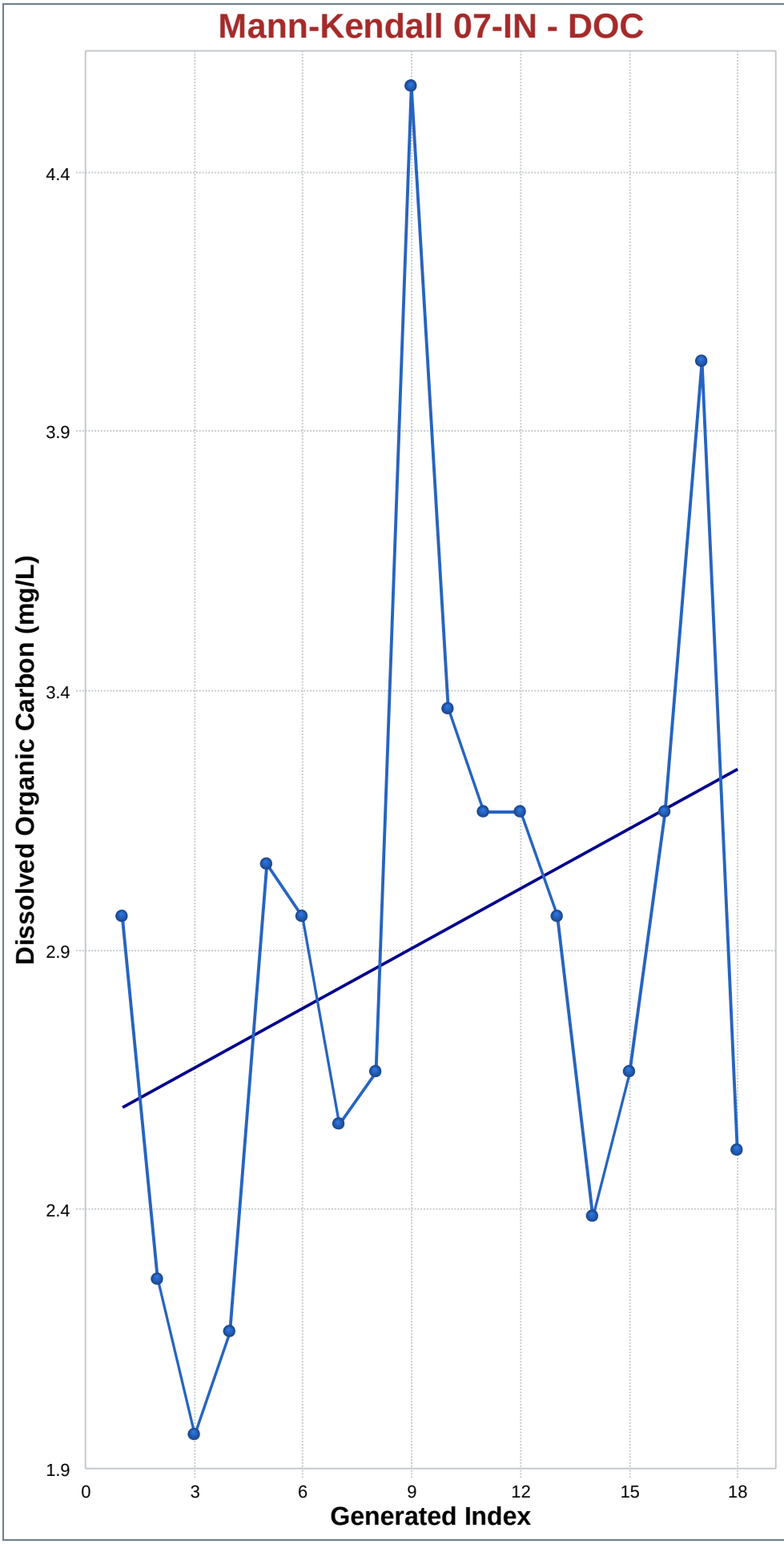

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 48 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 112.3388 |
| Standardized Value of S | 0.2938 |
| M-K Test Value (S) | 34 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3845 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0019 |

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




**Mann-Kendall Trend Analysis**

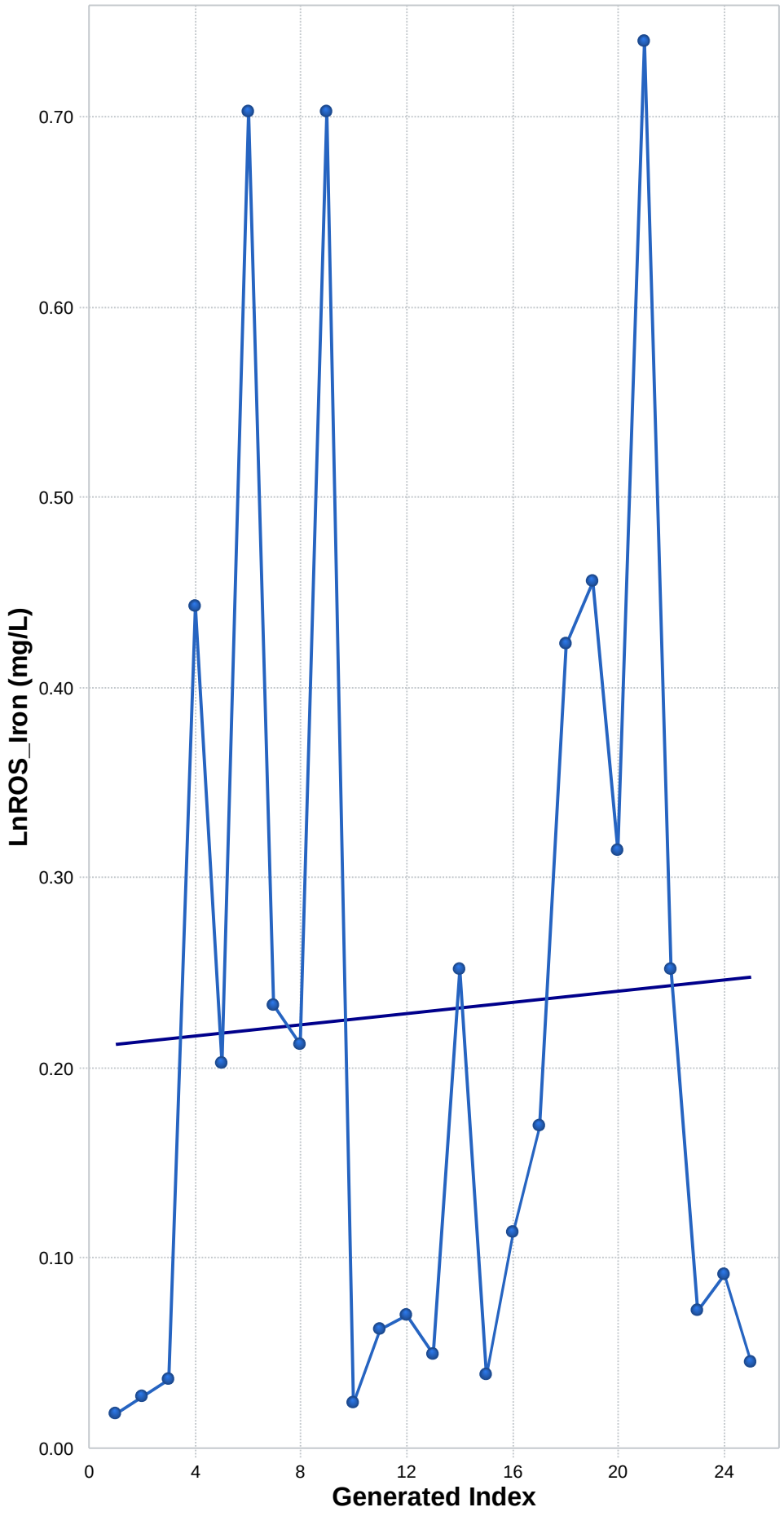
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.2425 |
| Standardized Value of S | 1.2575 |
| M-K Test Value (S) | 34 |
| Tabulated p-value | 0.1000 |
| Approximate p-value | 0.1043 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0384 |
| OLS Regression Intercept | 2.5933 |

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

# Mann-Kendall 07-IN - IRON




**Mann-Kendall Trend Analysis**

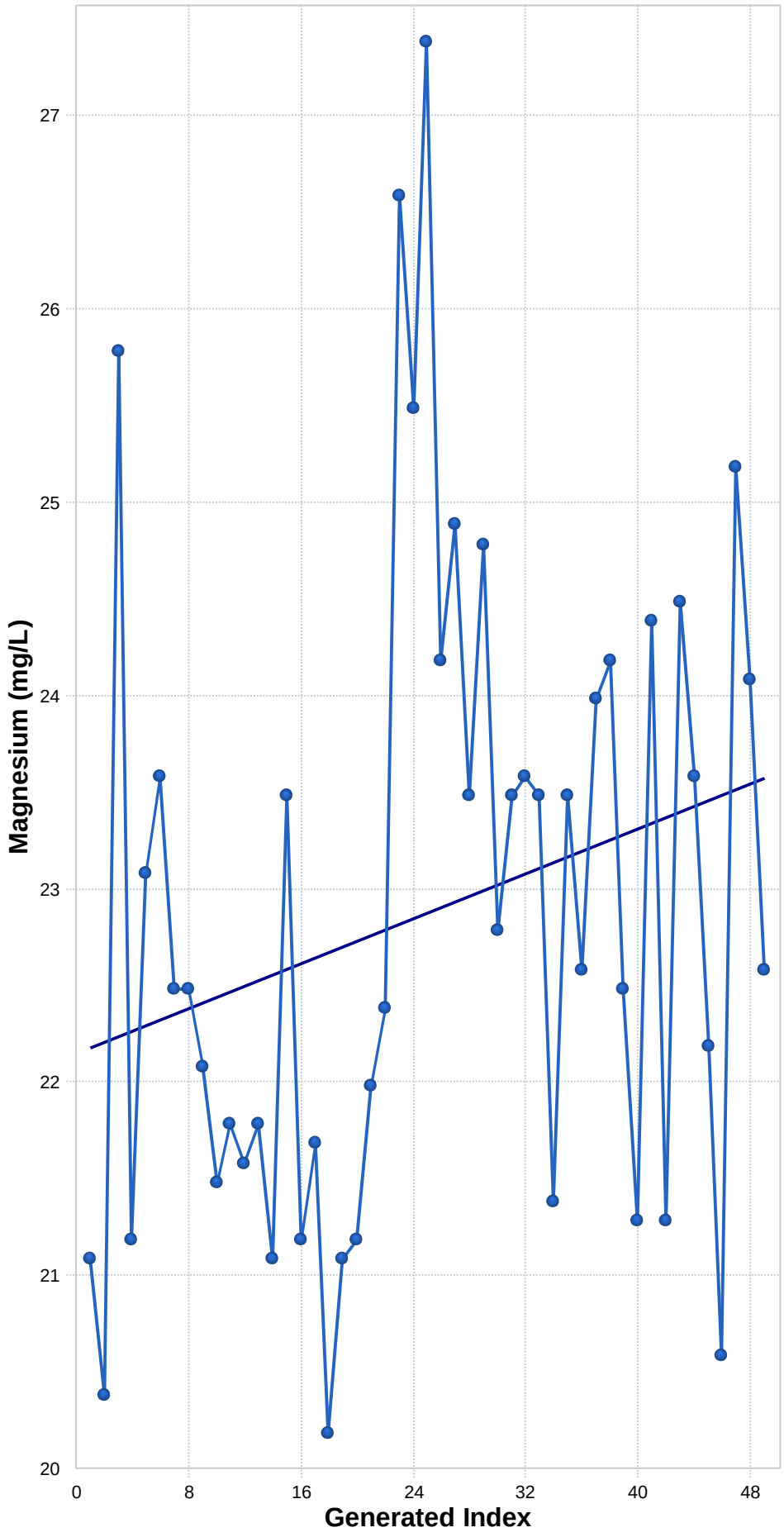
| | |
|---|---|
| n | 25 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 42.7941 |
| Standardized Value of S | 1.0983 |
| M-K Test Value (S) | 48 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1360 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0015 |
| OLS Regression Intercept | 0.2082 |

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

# Mann-Kendall 07-IN - MAGNESIUM



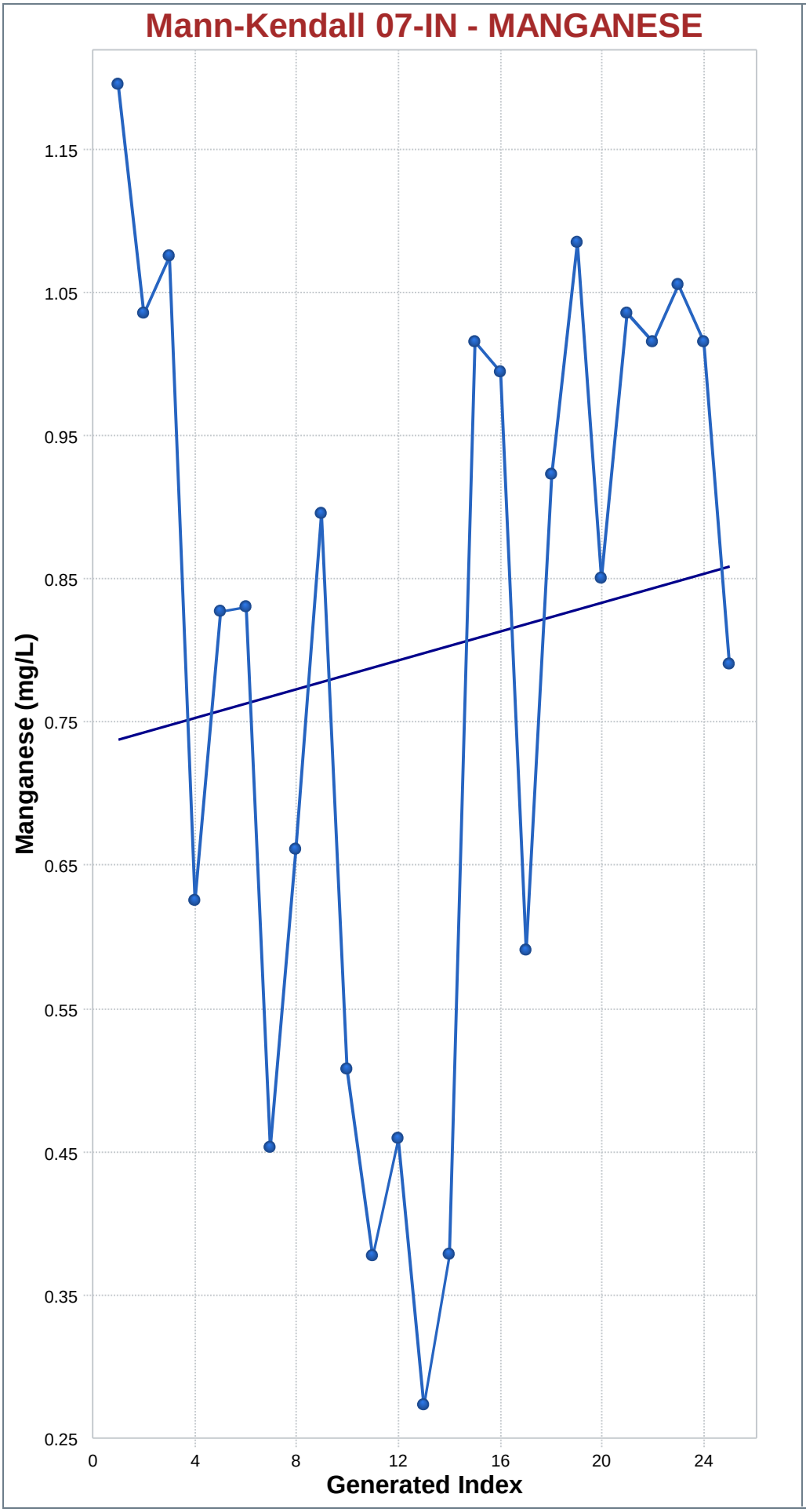

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 49 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 115.8591 |
| Standardized Value of S | 1.9593 |
| M-K Test Value (S) | 228 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0250 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0291 |
| OLS Regression Intercept | 21.9638 |

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




**Mann-Kendall Trend Analysis**

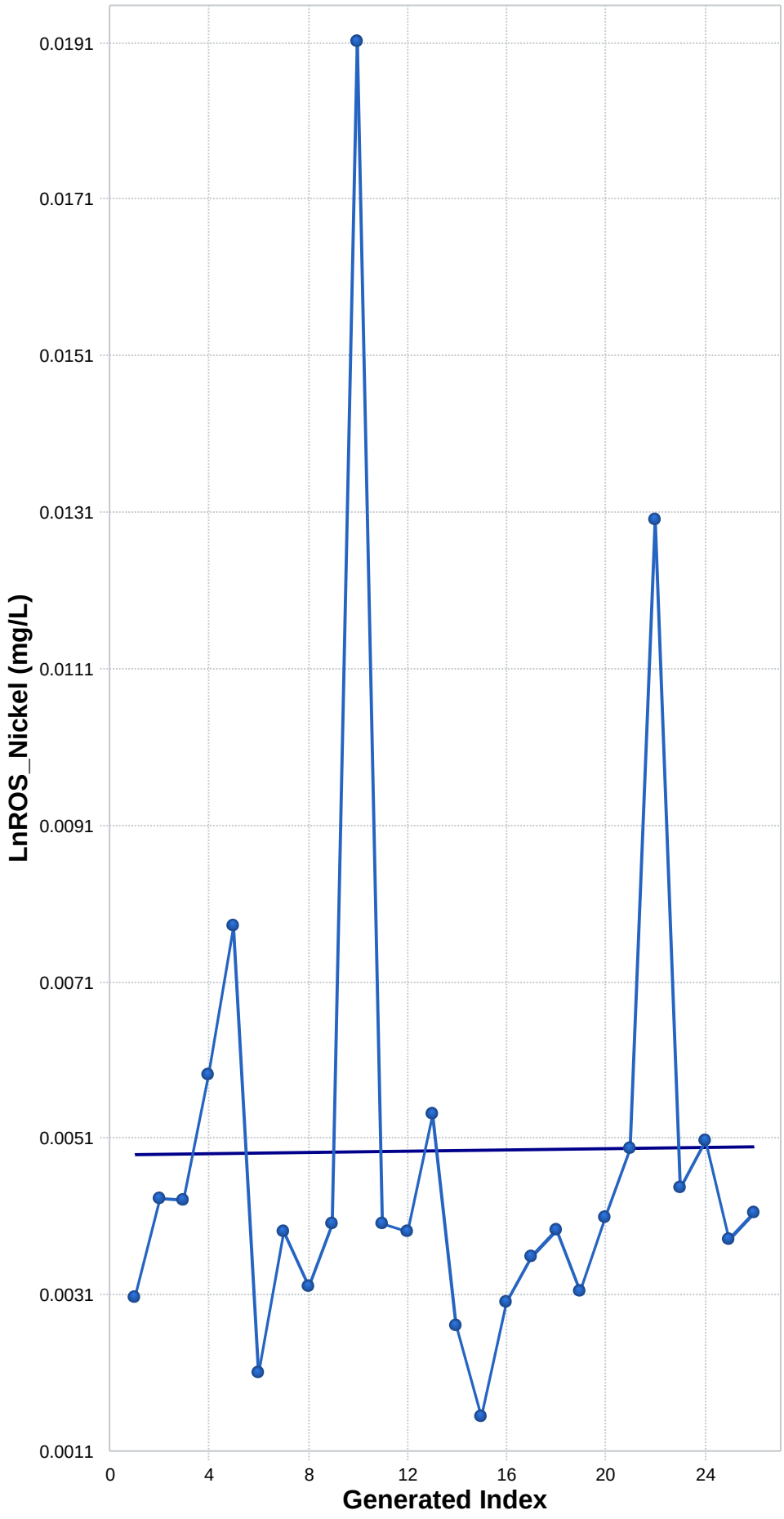
| | |
|---|---|
| n | 25 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 42.7629 |
| Standardized Value of S | 0.4443 |
| M-K Test Value (S) | 20 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3284 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0051 |
| OLS Regression Intercept | 0.7376 |

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

# Mann-Kendall 07-IN - NICKEL



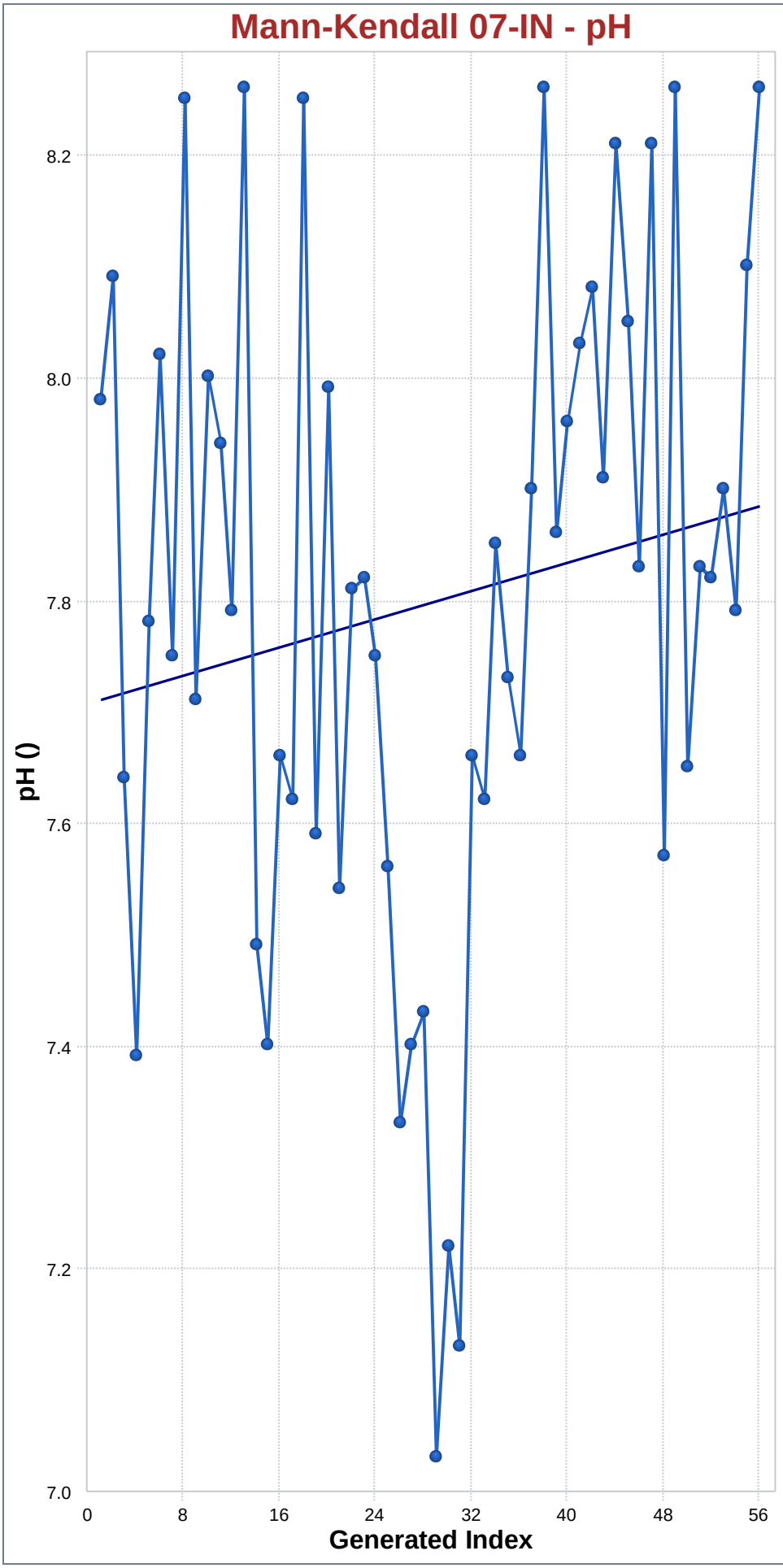

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 26 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 45.3468 |
| Standardized Value of S | 0.4410 |
| M-K Test Value (S) | 21 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3296 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0049 |

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



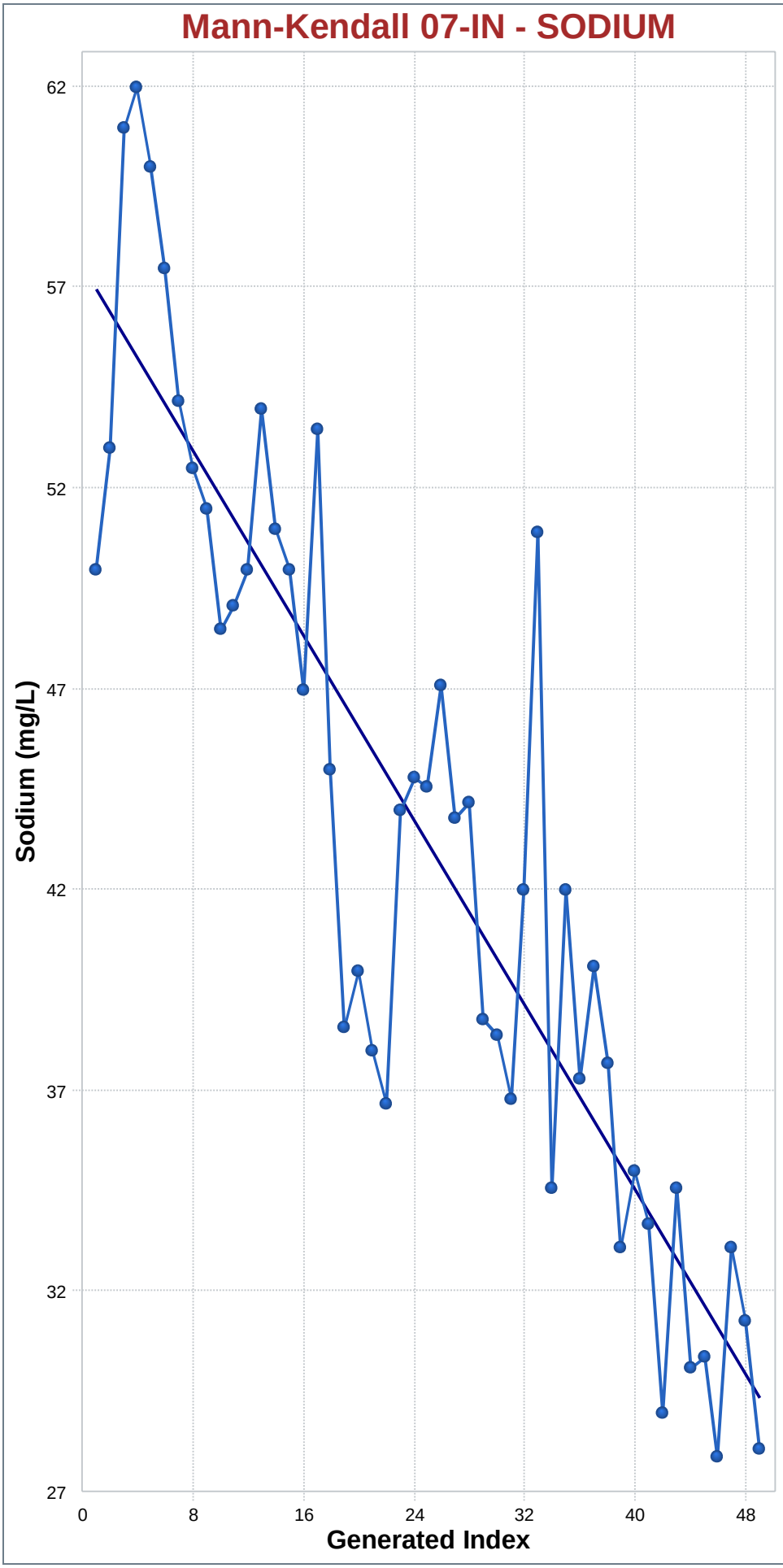

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 141.4166 |
| Standardized Value of S | 1.4779 |
| M-K Test Value (S) | 210 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0697 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0032 |
| OLS Regression Intercept | 7.6764 |

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



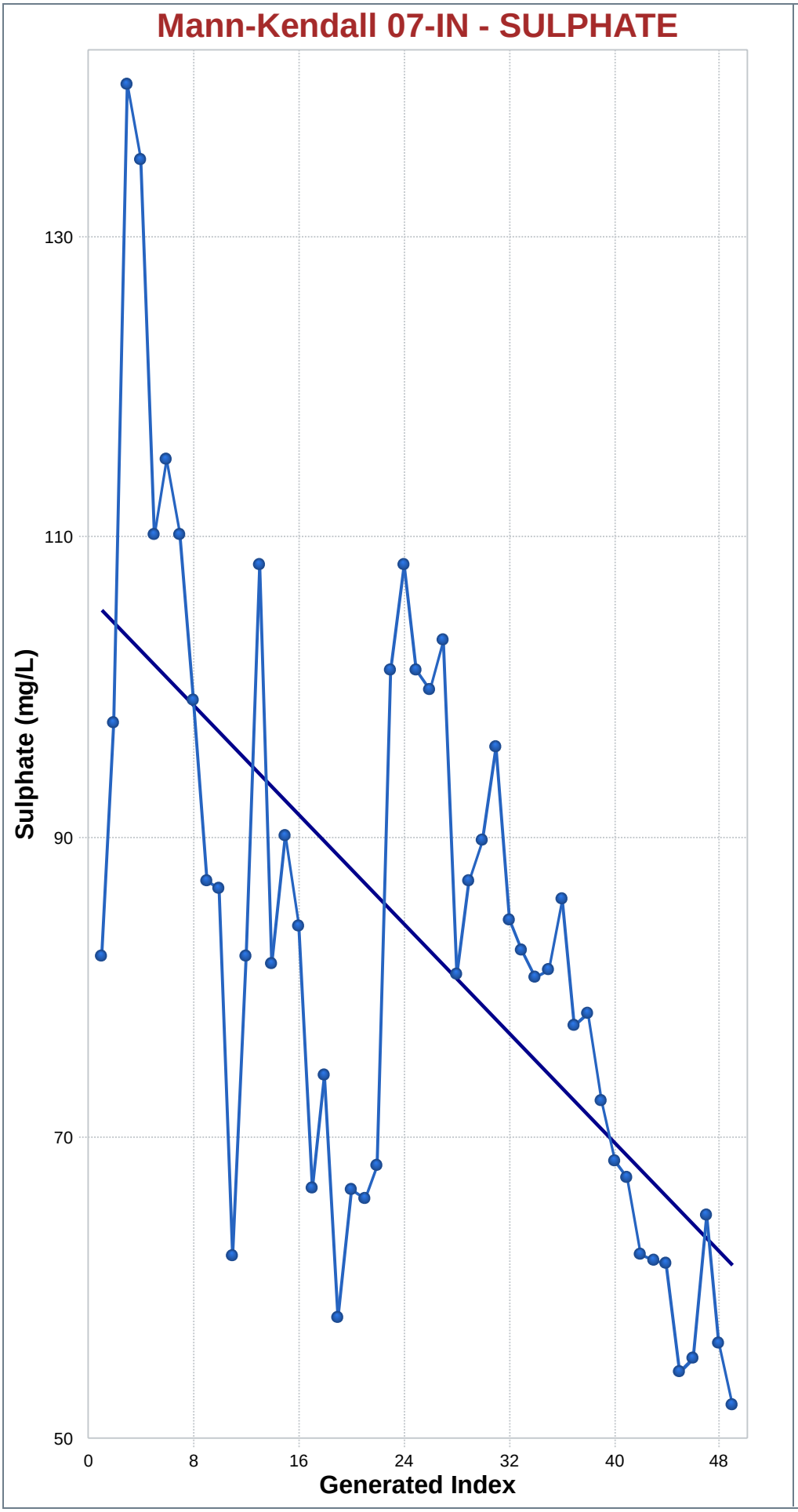

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 49 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 115.9828 |
| Standardized Value of S | -7.4925 |
| M-K Test Value (S) | -870 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.5748 |
| OLS Regression Intercept | 57.5633 |

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



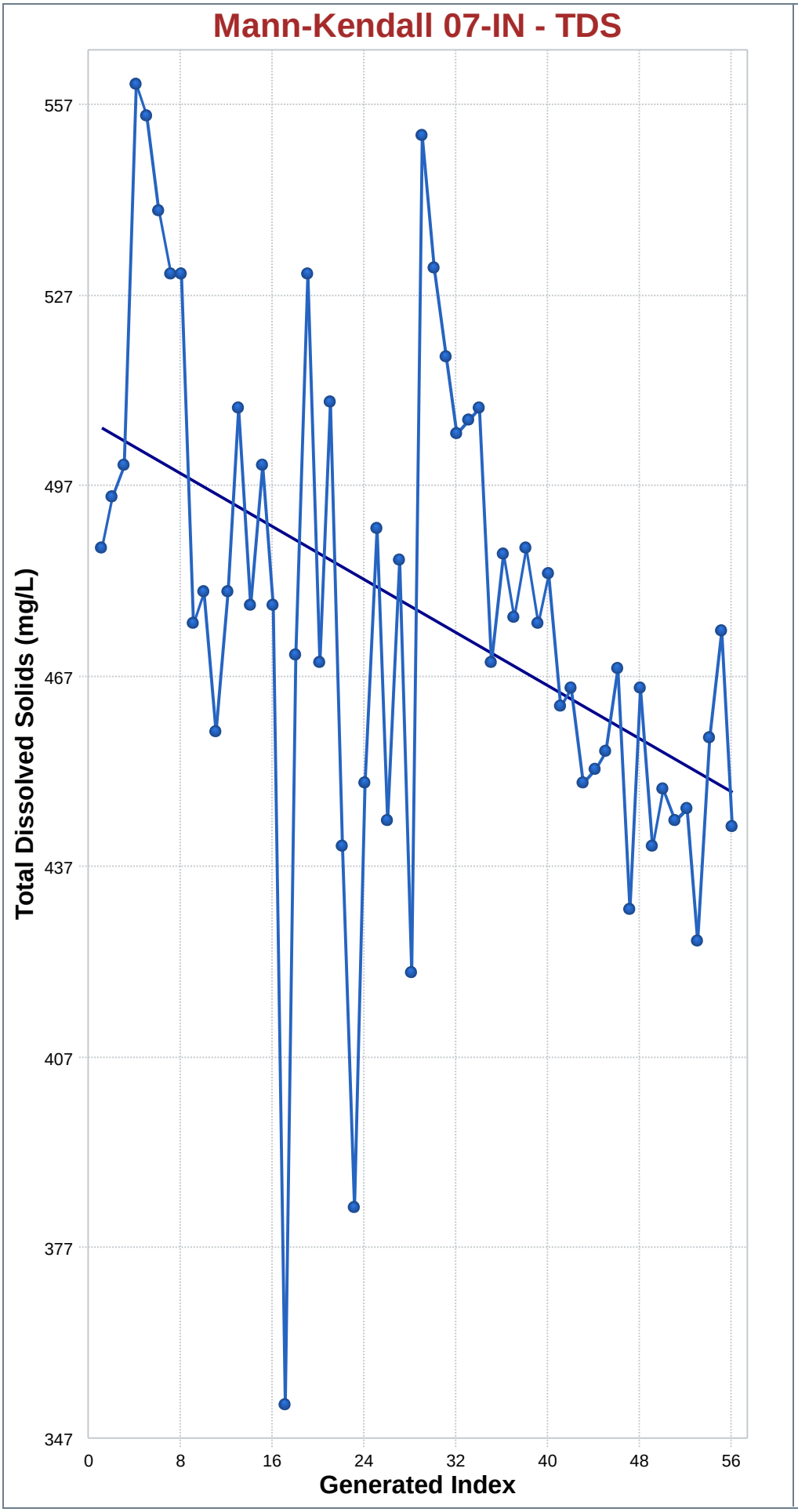

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 49 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 115.9899 |
| Standardized Value of S | -5.1901 |
| M-K Test Value (S) | -603 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.9079 |
| OLS Regression Intercept | 105.9610 |

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



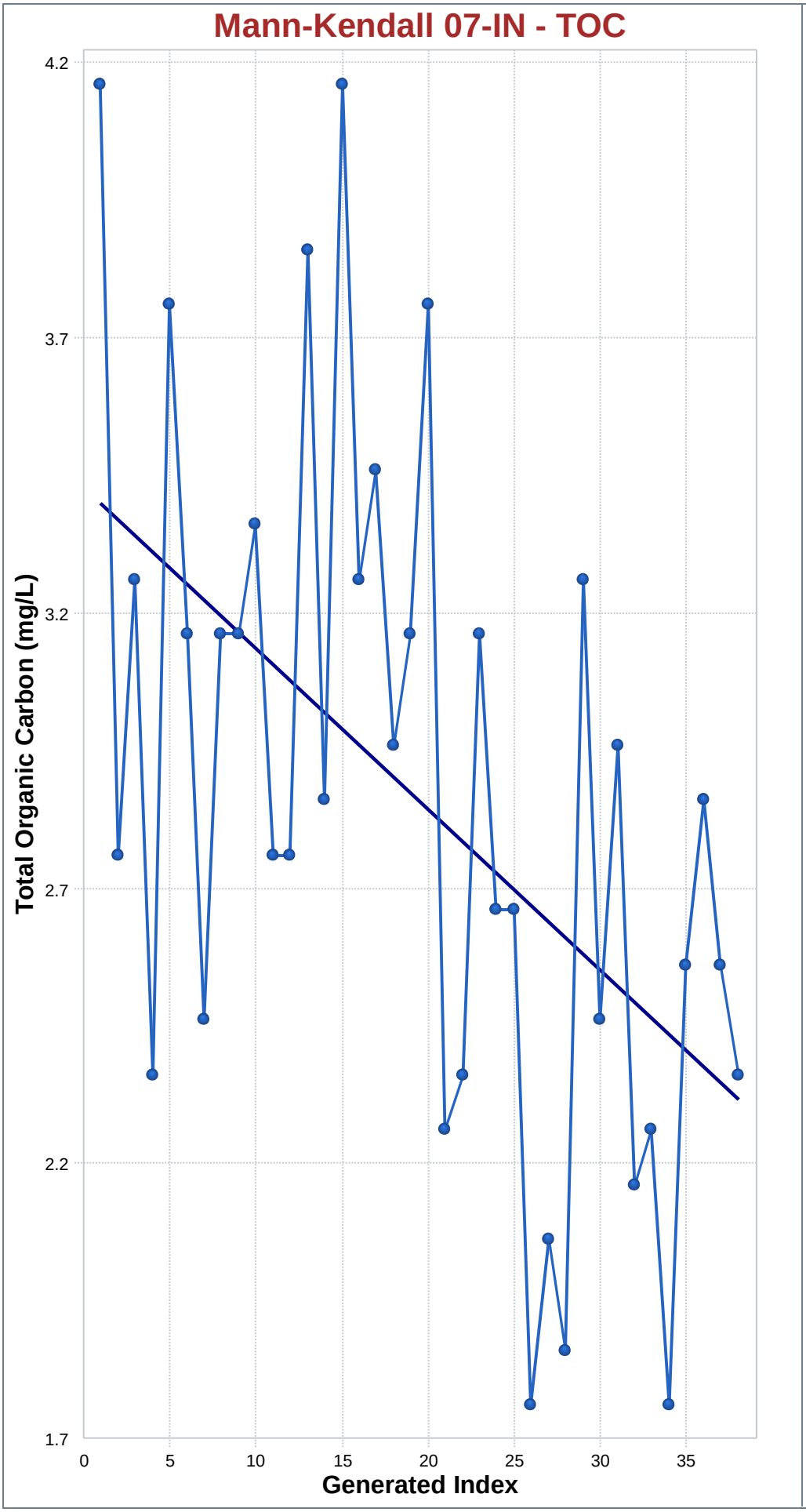

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 56 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 141.4402 |
| Standardized Value of S | -4.3198 |
| M-K Test Value (S) | -612 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -1.0431 |
| OLS Regression Intercept | 506.8701 |

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



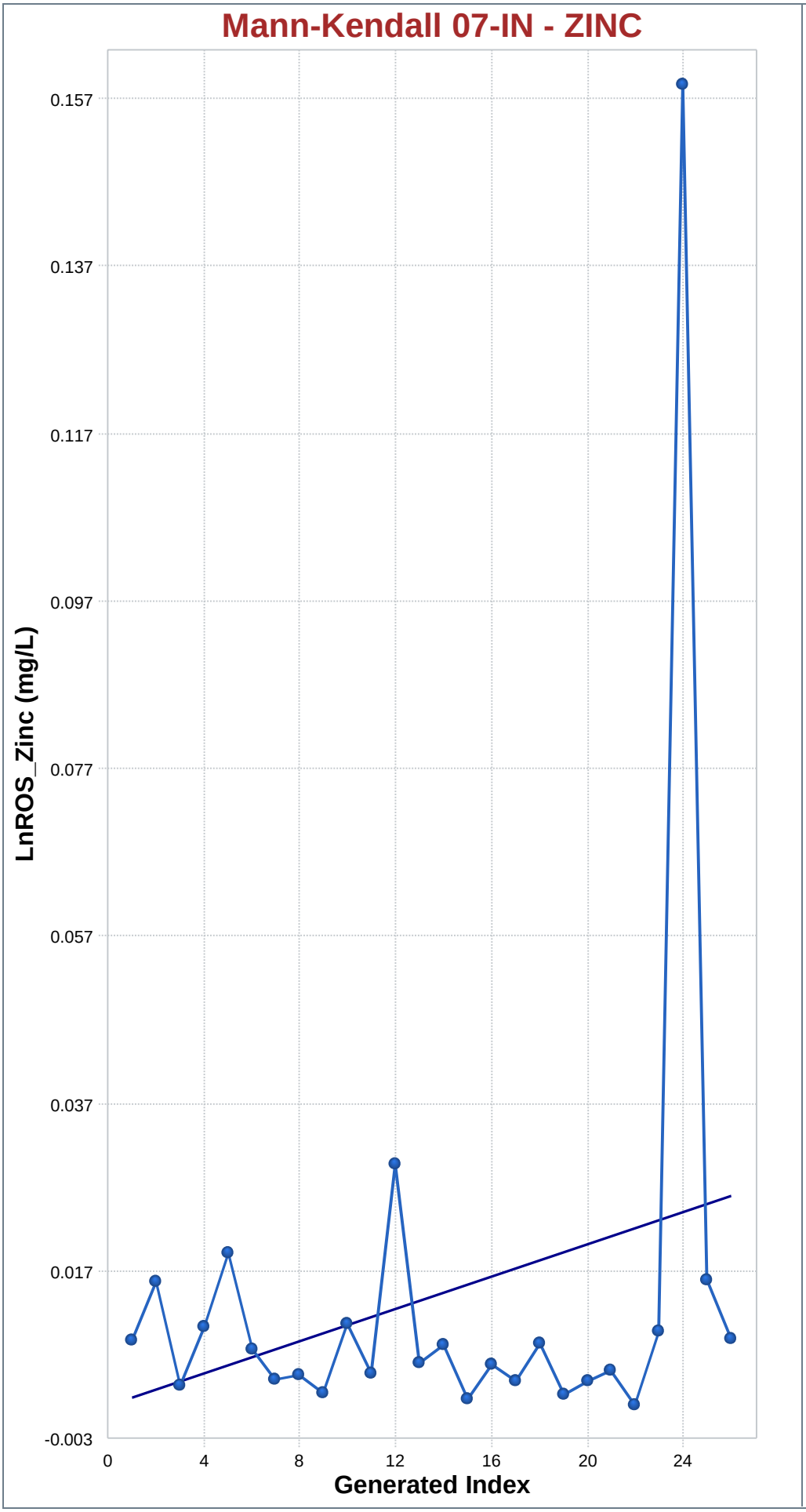

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

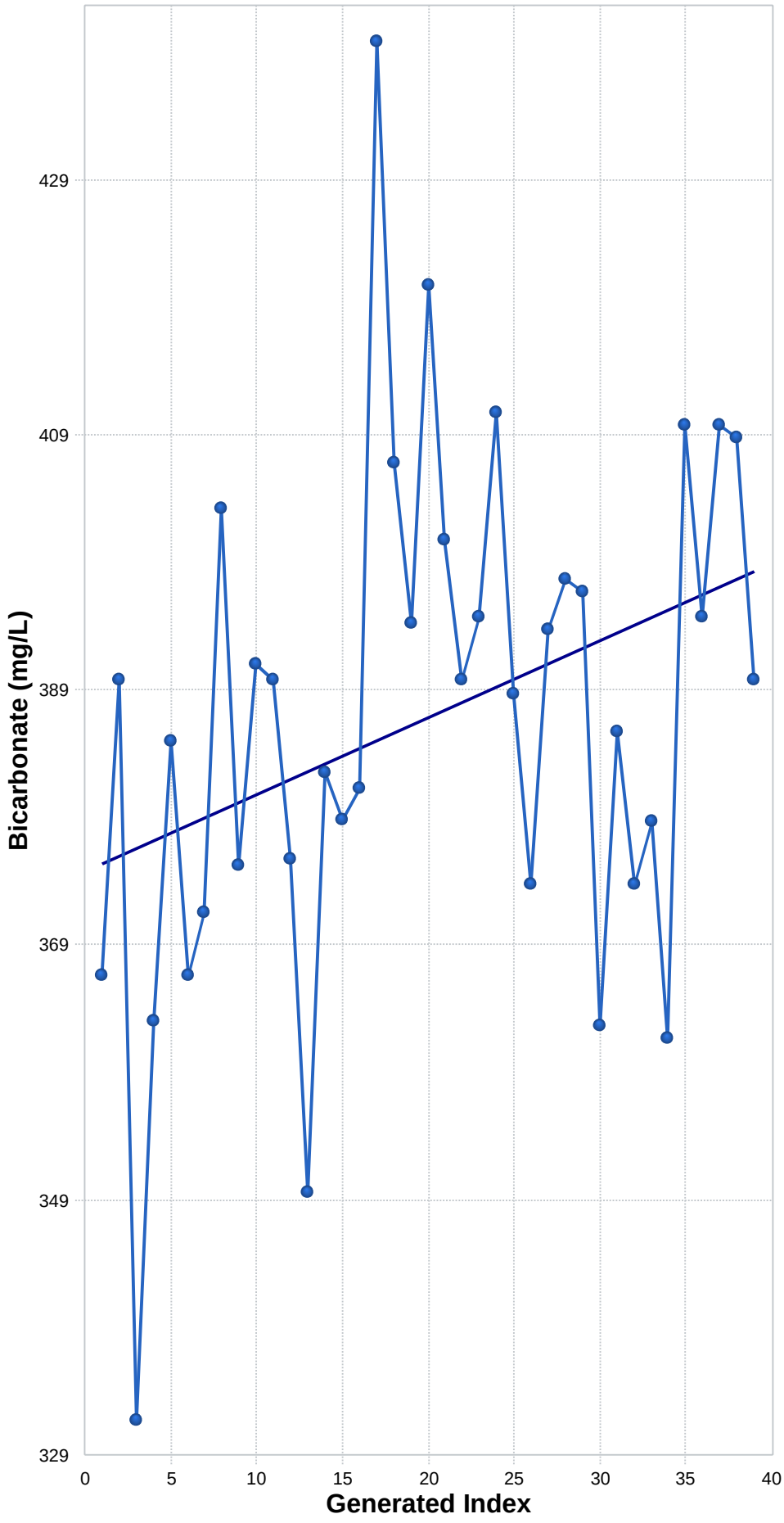
| | |
|---|---|
| n | 26 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 45.3689 |
| Standardized Value of S | -0.1763 |
| M-K Test Value (S) | -9 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.4300 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0010 |
| OLS Regression Intercept | 0.0012 |

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

# Mann-Kendall 08-IN - BICARBONATE



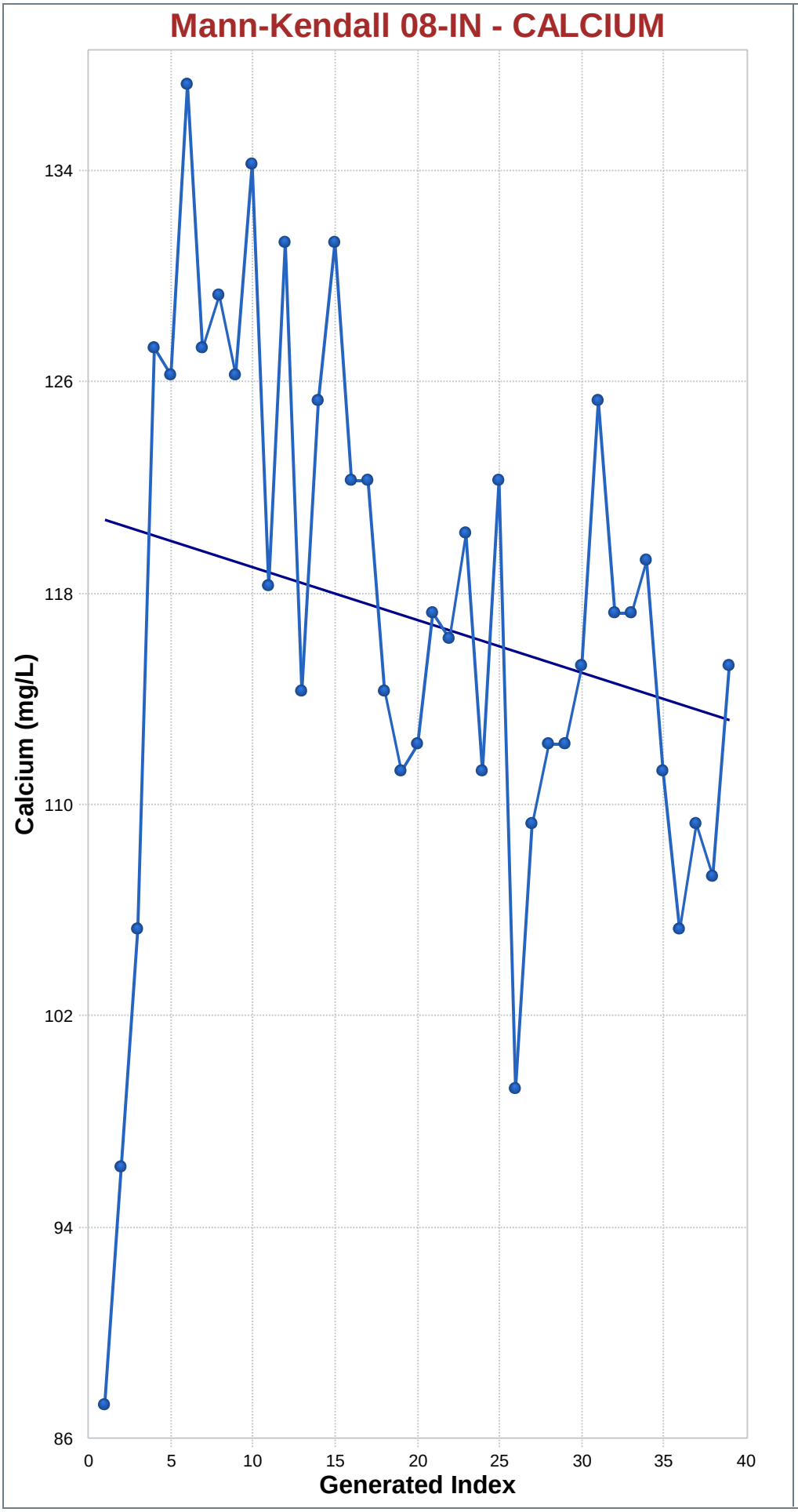

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.6297 |
| Standardized Value of S | 2.0816 |
| M-K Test Value (S) | 173 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0187 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.6045 |
| OLS Regression Intercept | 374.9764 |

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




**Mann-Kendall Trend Analysis**

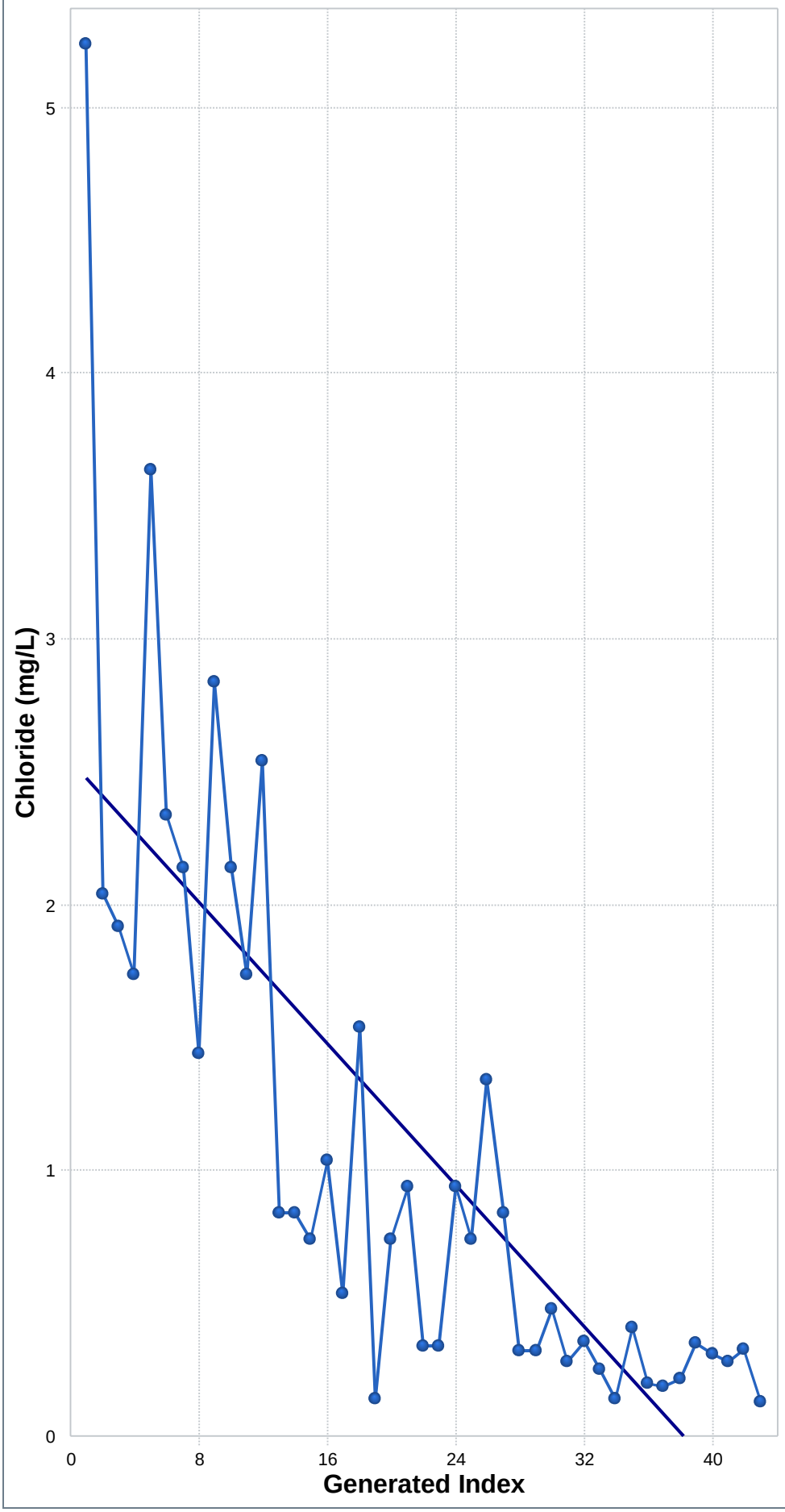
| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.5288 |
| Standardized Value of S | -2.4961 |
| M-K Test Value (S) | -207 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0063 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.2000 |
| OLS Regression Intercept | 120.7179 |

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

# Mann-Kendall 08-IN - CHLORIDE




**Mann-Kendall Trend Analysis**

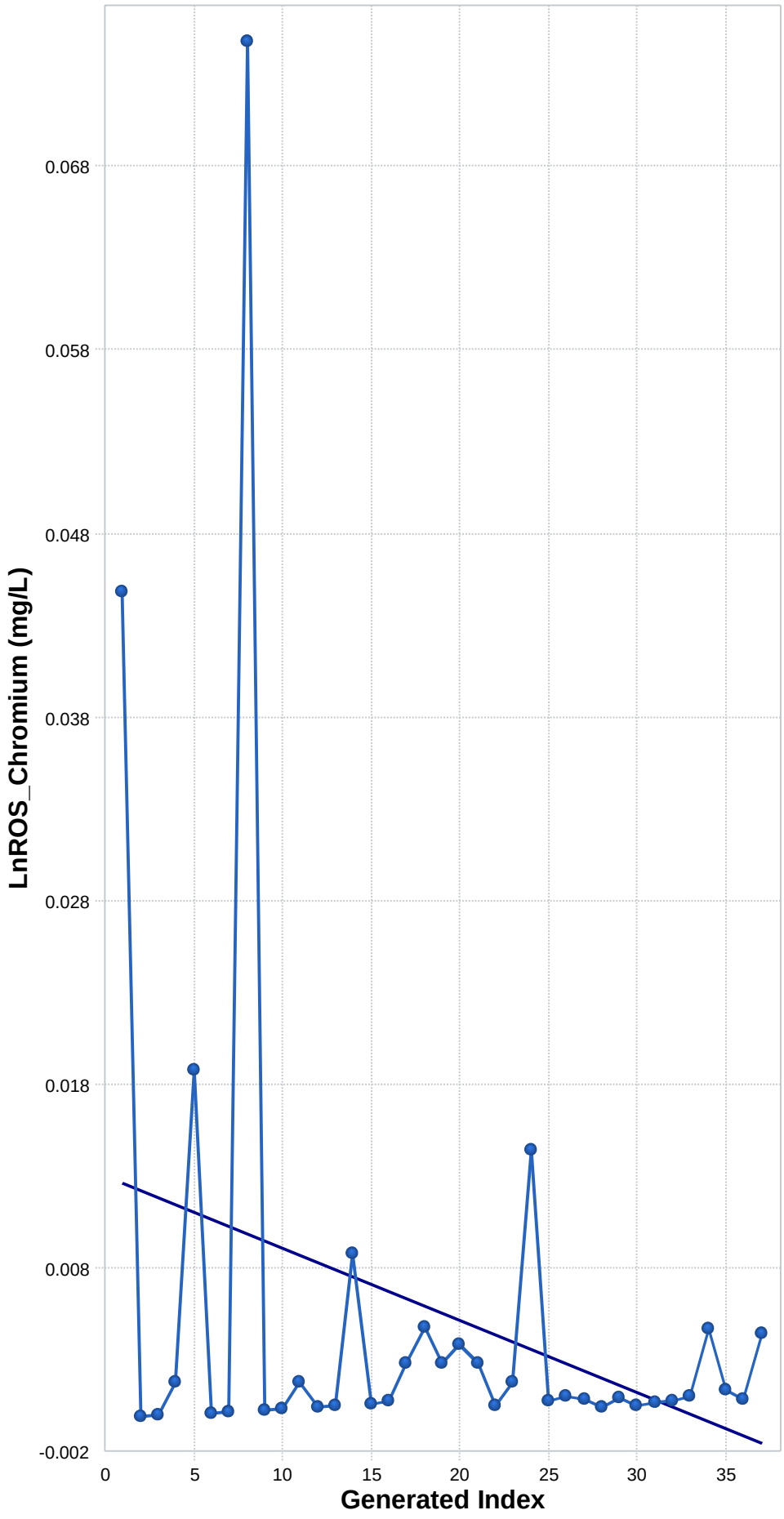
| | |
|---|---|
| n | 43 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 95.4777 |
| Standardized Value of S | -6.2737 |
| M-K Test Value (S) | -600 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0667 |
| OLS Regression Intercept | 3.0020 |

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

# Mann-Kendall 08-IN - CHROMIUM




**Mann-Kendall Trend Analysis**

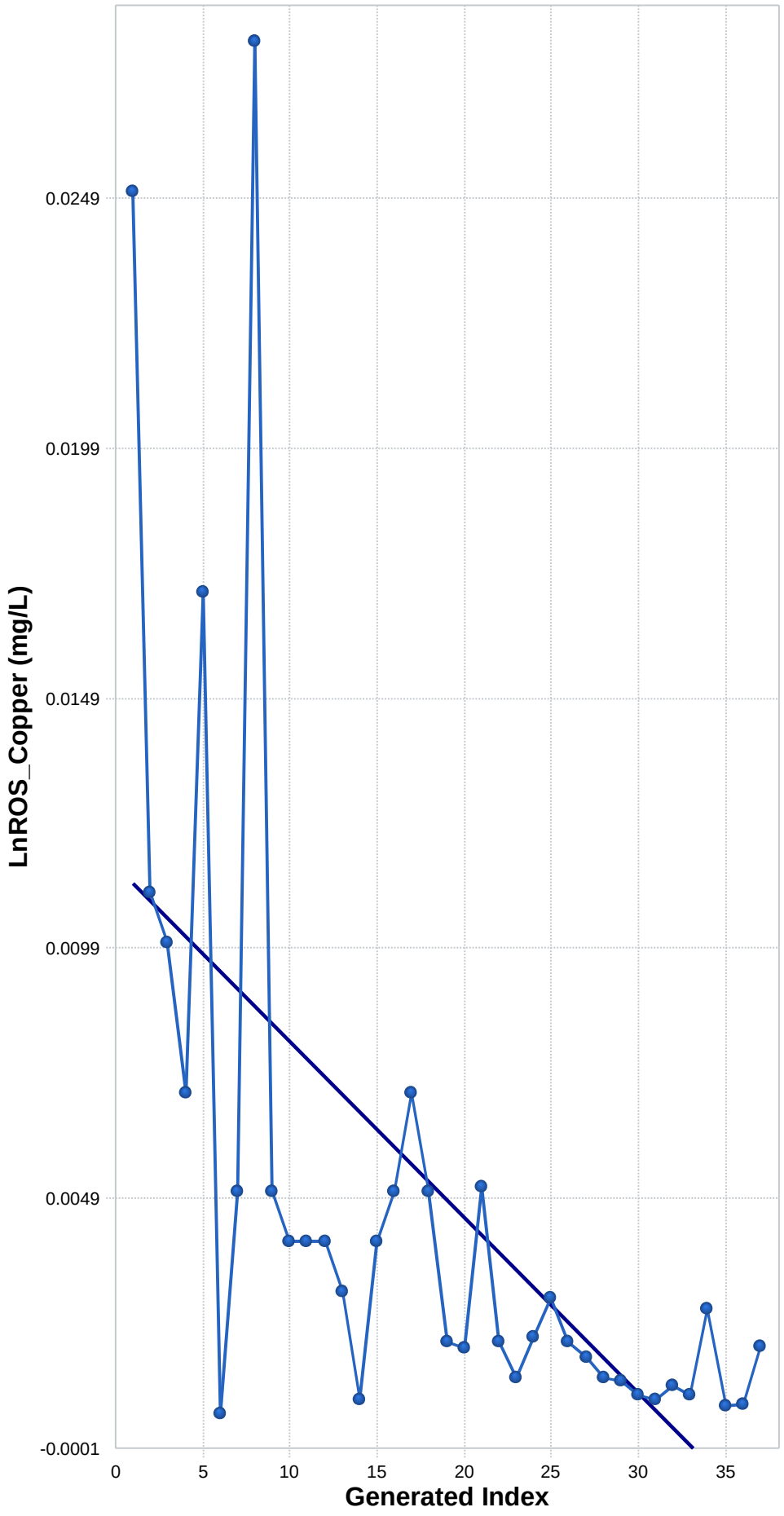
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.4286 |
| Standardized Value of S | 1.1645 |
| M-K Test Value (S) | 90 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1221 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0004 |
| OLS Regression Intercept | 0.0132 |

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

# Mann-Kendall 08-IN - COPPER




**Mann-Kendall Trend Analysis**

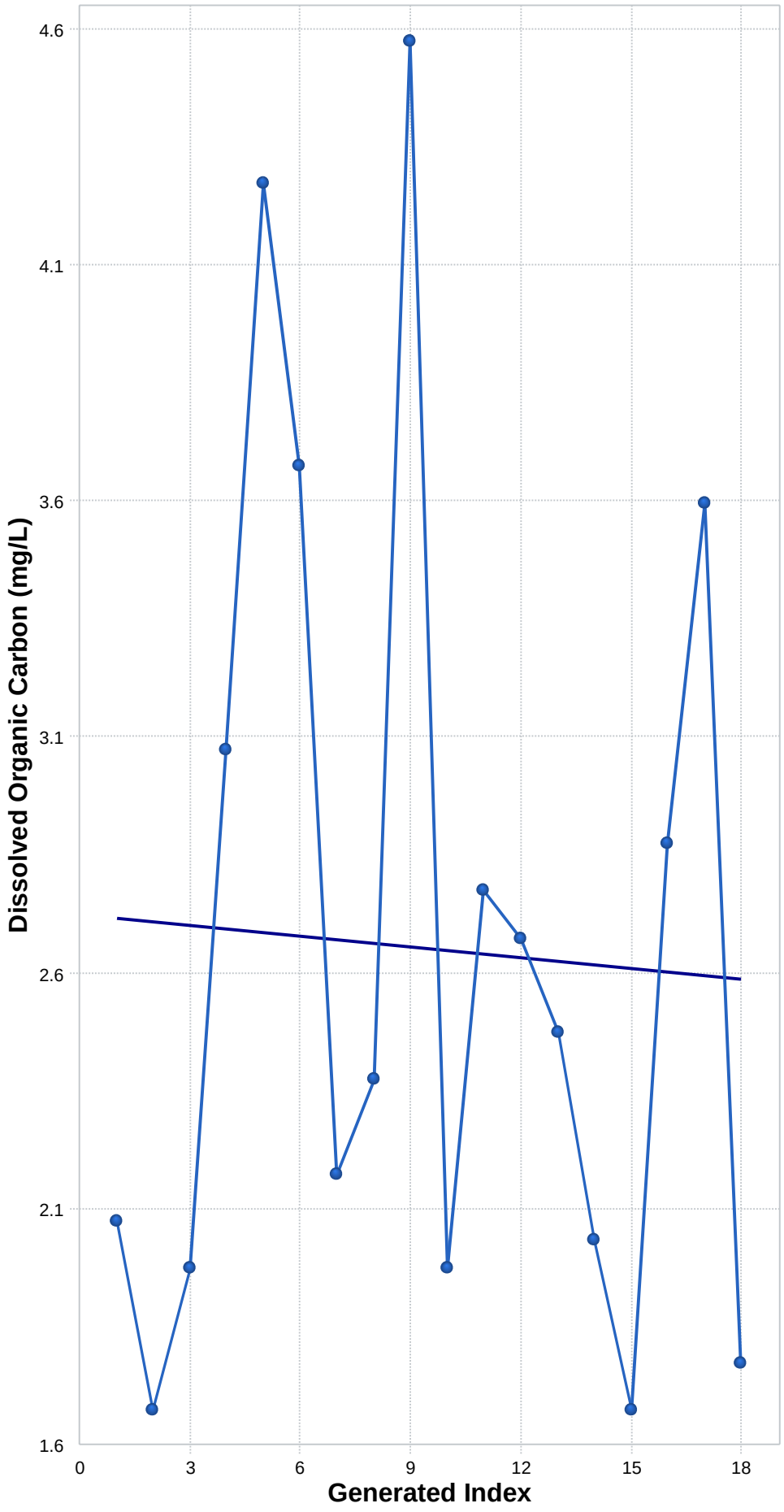
| | |
|---|---|
| n | 37 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 76.3151 |
| Standardized Value of S | -5.0449 |
| M-K Test Value (S) | -386 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0004 |
| OLS Regression Intercept | 0.0115 |

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

# Mann-Kendall 08-IN - DOC



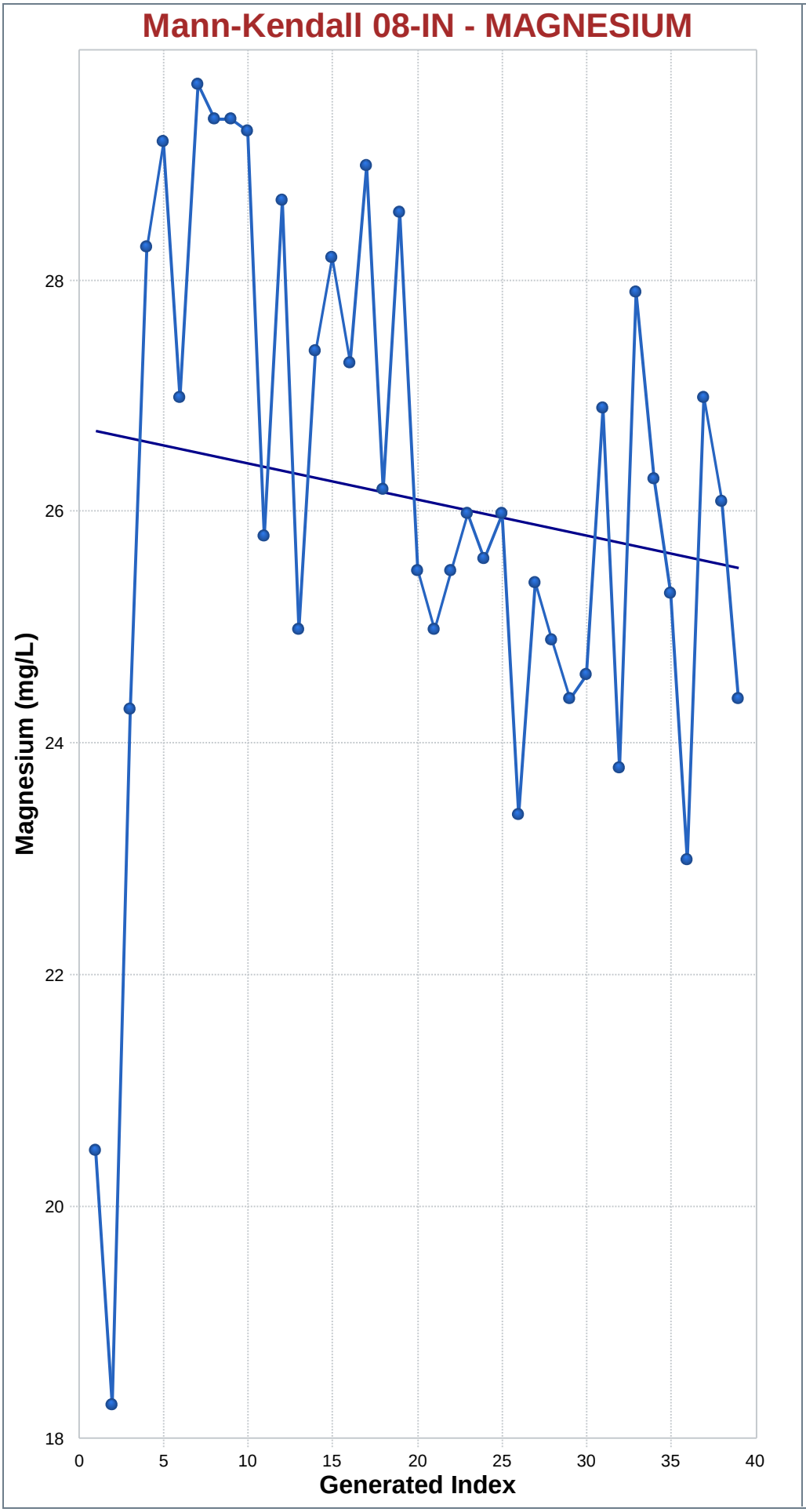

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3629 |
| Standardized Value of S | 0.0000 |
| M-K Test Value (S) | -1 |
| Tabulated p-value | 0.5000 |
| Approximate p-value | 0.5000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0077 |
| OLS Regression Intercept | 2.7498 |

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




**Mann-Kendall Trend Analysis**

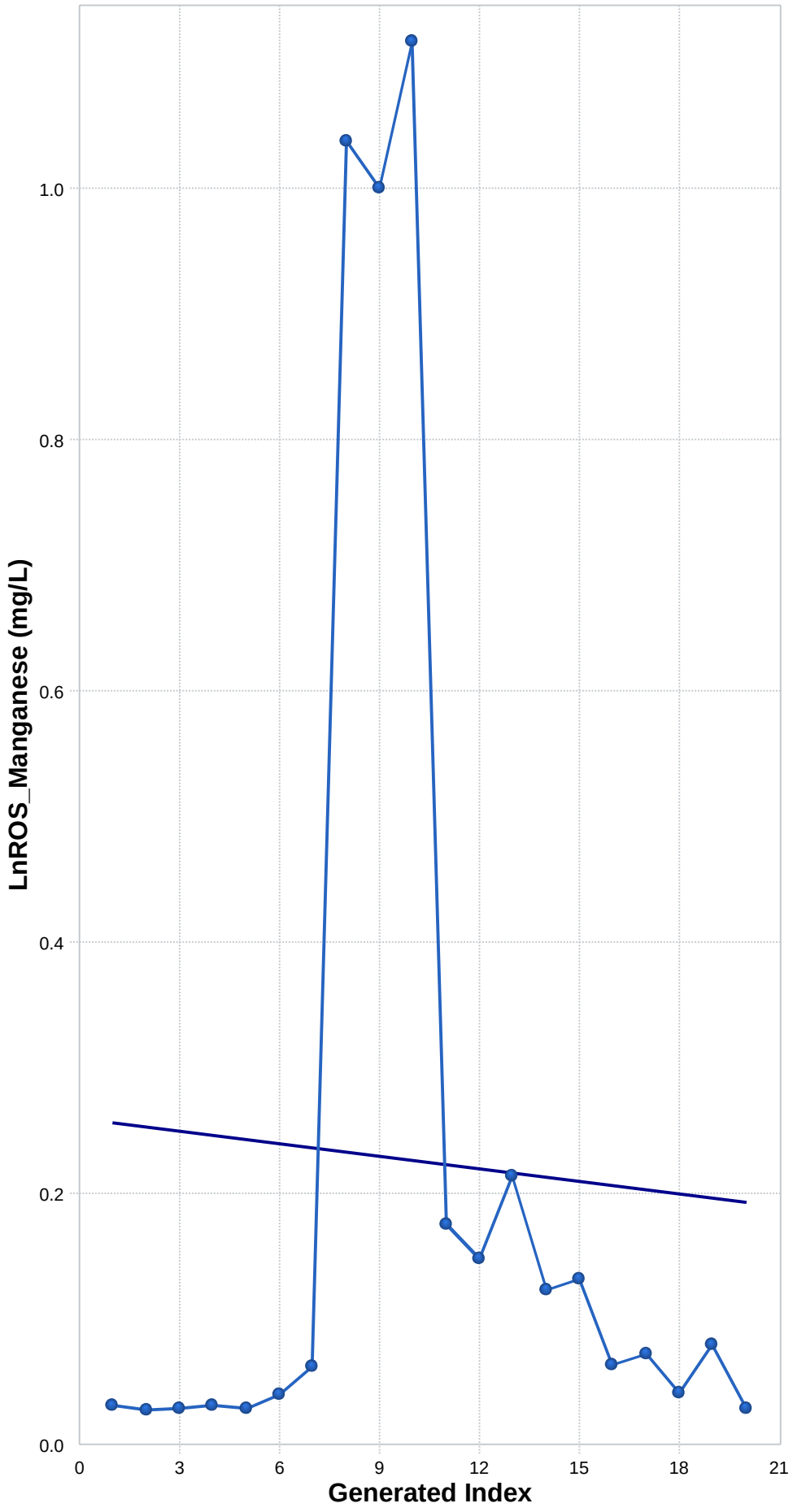
| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.6297 |
| Standardized Value of S | -2.3478 |
| M-K Test Value (S) | -195 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0094 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0311 |
| OLS Regression Intercept | 27.0406 |

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

# Mann-Kendall 08-IN - MANGANESE



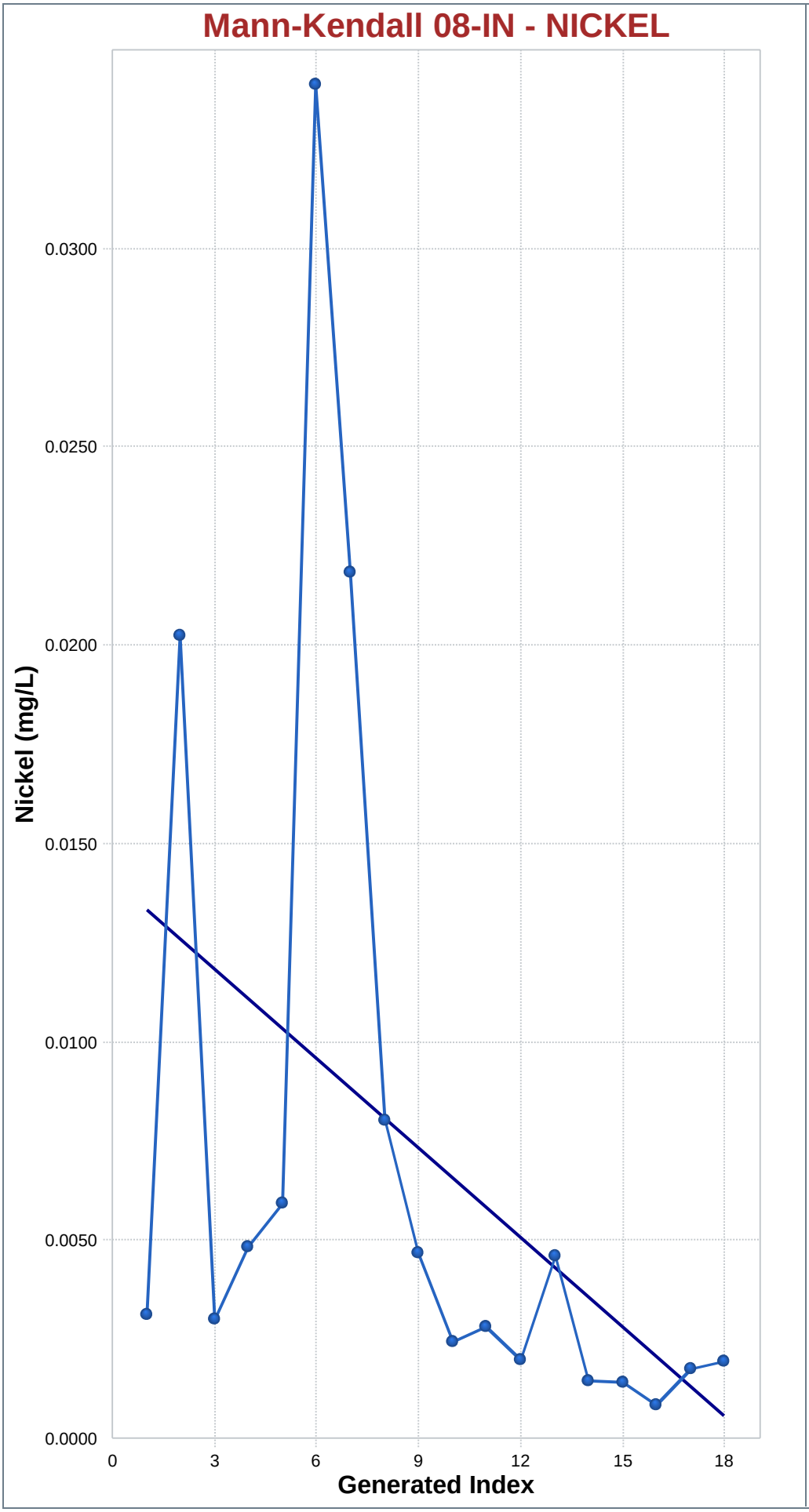

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 20 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 30.8221 |
| Standardized Value of S | 0.8760 |
| M-K Test Value (S) | 28 |
| Tabulated p-value | 0.1930 |
| Approximate p-value | 0.1905 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0033 |
| OLS Regression Intercept | 0.2323 |

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



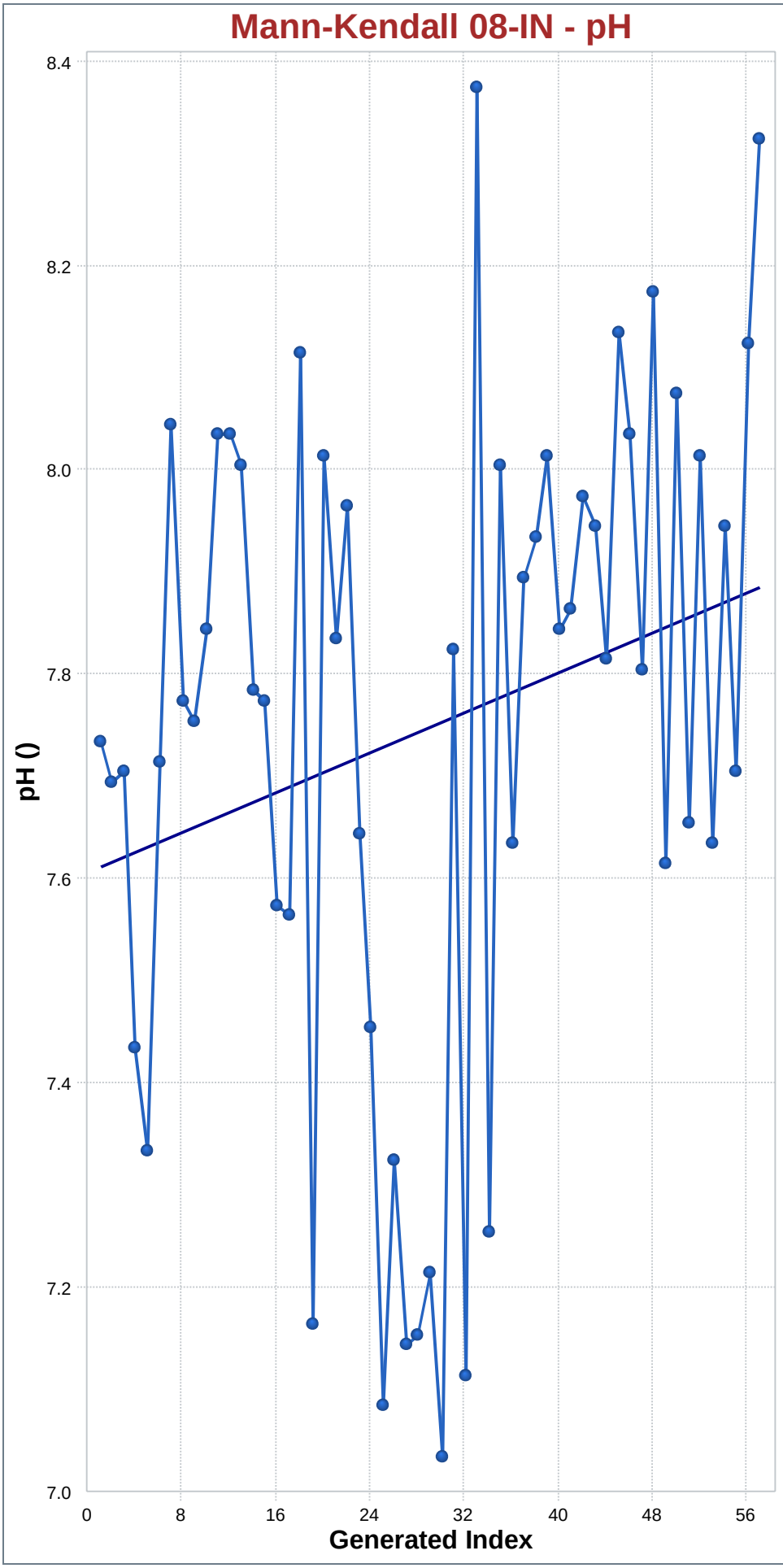

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.4008 |
| Standardized Value of S | -3.1060 |
| M-K Test Value (S) | -83 |
| Tabulated p-value | 0.0010 |
| Approximate p-value | 0.0009 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0007 |
| OLS Regression Intercept | 0.0140 |

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




**Mann-Kendall Trend Analysis**

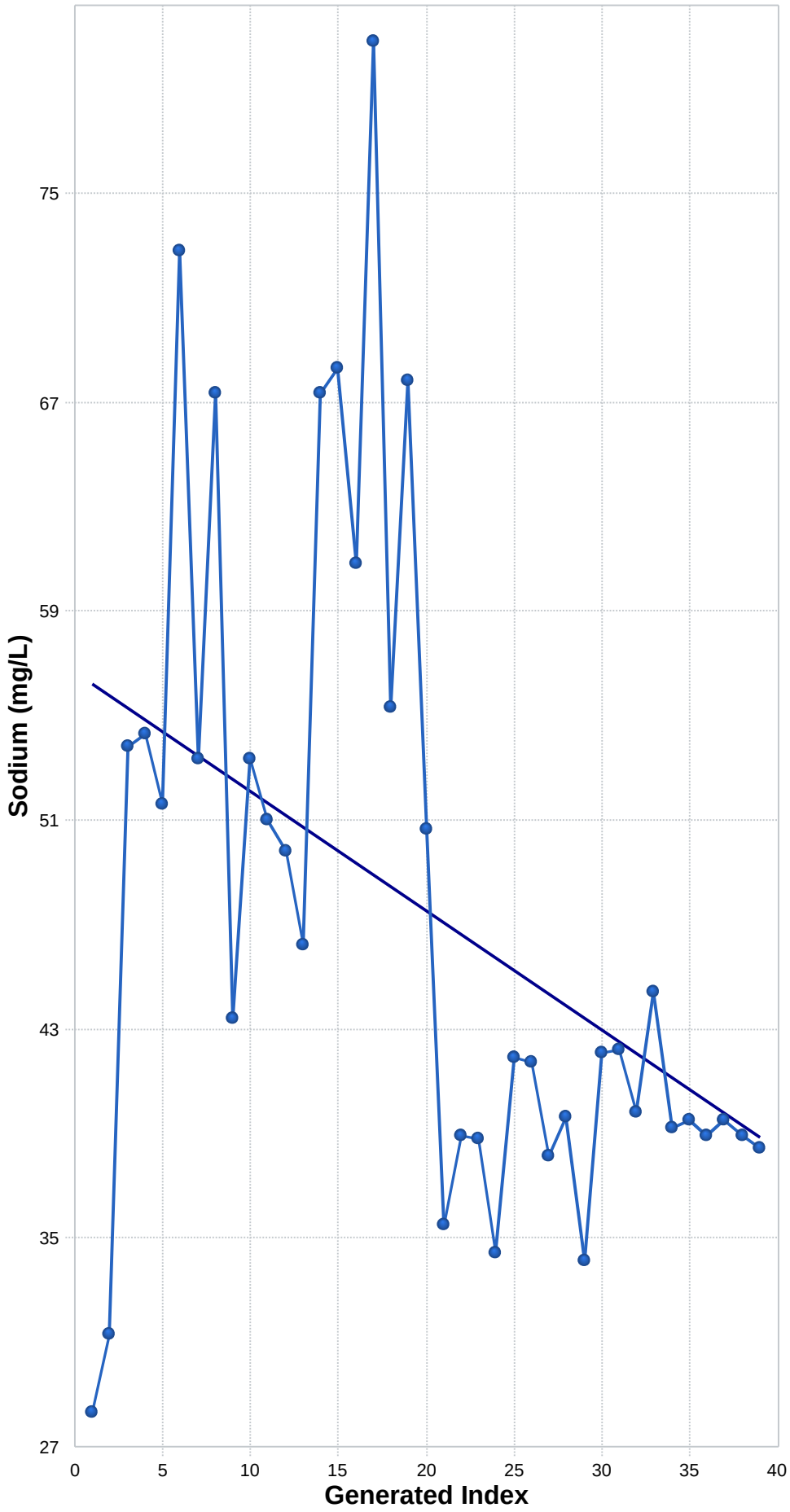
| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.2217 |
| Standardized Value of S | 1.9074 |
| M-K Test Value (S) | 278 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0282 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0049 |
| OLS Regression Intercept | 7.6322 |

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

# Mann-Kendall 08-IN - SODIUM




**Mann-Kendall Trend Analysis**

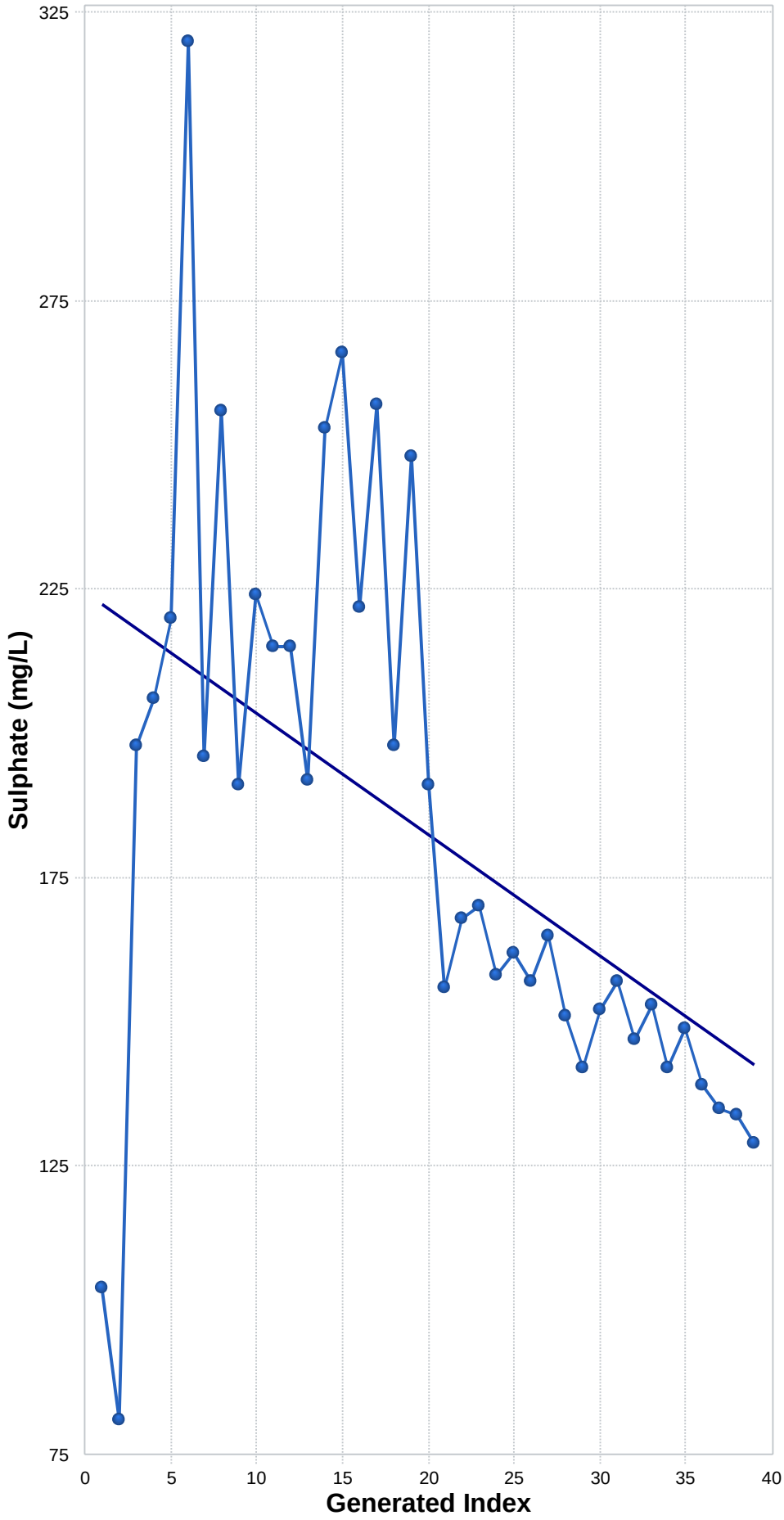
| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.6257 |
| Standardized Value of S | -2.8805 |
| M-K Test Value (S) | -239 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0020 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.4567 |
| OLS Regression Intercept | 56.8528 |

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

# Mann-Kendall 08-IN - SULPHATE



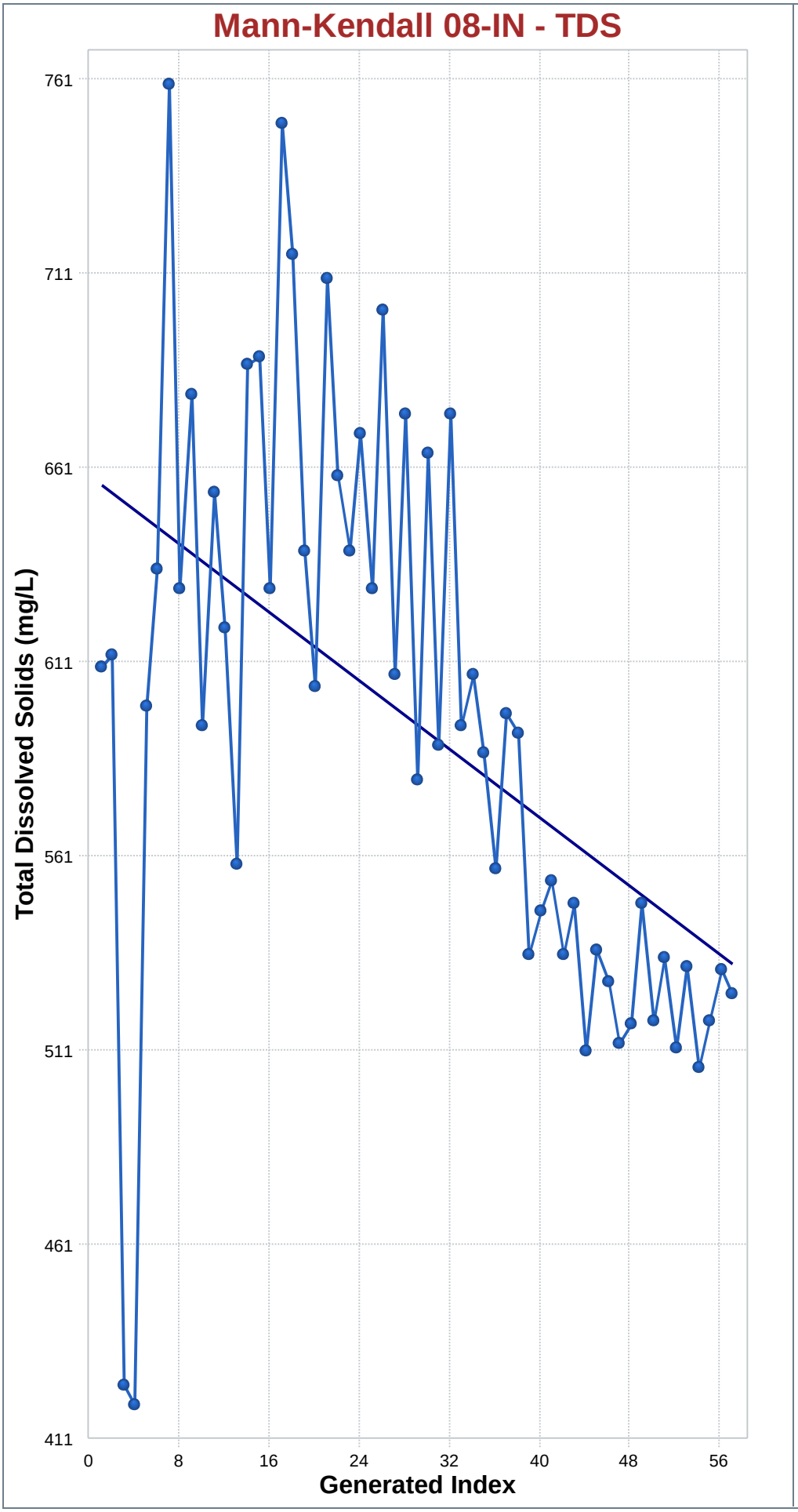

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.6357 |
| Standardized Value of S | -4.6106 |
| M-K Test Value (S) | -382 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -2.0962 |
| OLS Regression Intercept | 224.4615 |

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




**Mann-Kendall Trend Analysis**

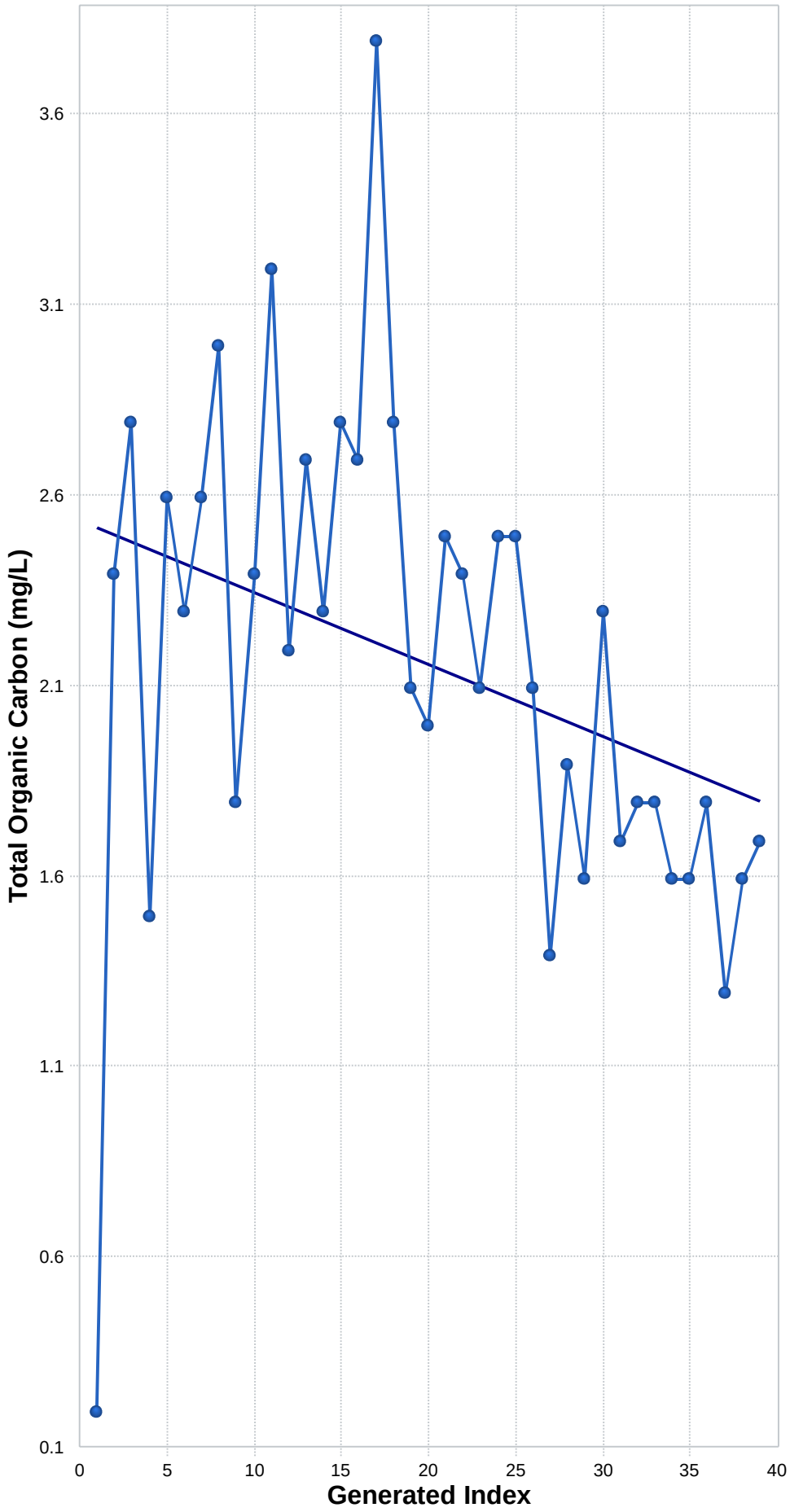
| | |
|---|---|
| n | 57 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 145.2309 |
| Standardized Value of S | -5.1986 |
| M-K Test Value (S) | -756 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -2.1951 |
| OLS Regression Intercept | 658.9035 |

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

# Mann-Kendall 08-IN - TOC




**Mann-Kendall Trend Analysis**

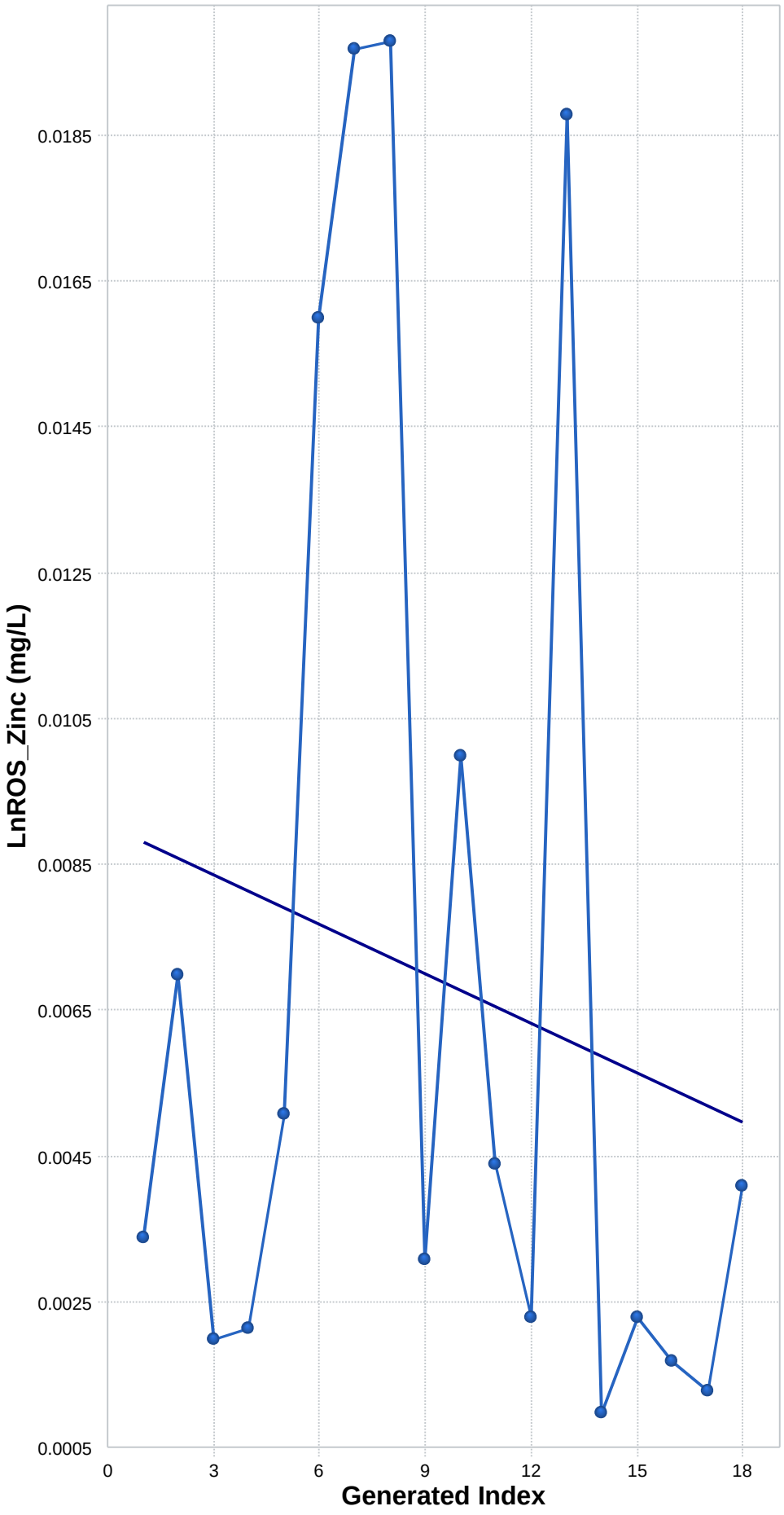
| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.4318 |
| Standardized Value of S | -3.3725 |
| M-K Test Value (S) | -279 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0004 |

**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 08-IN - ZINC




**Mann-Kendall Trend Analysis**

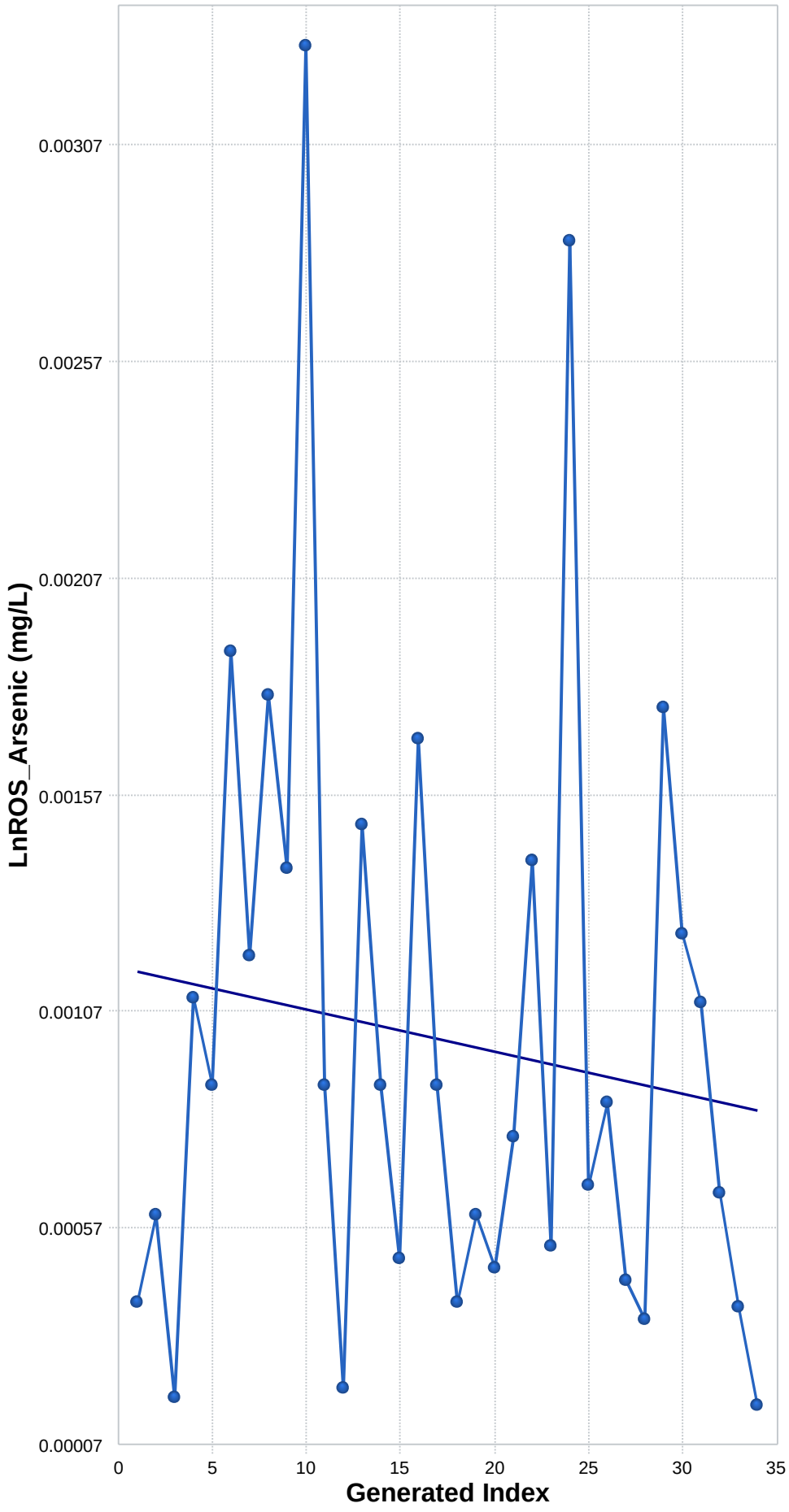
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3818 |
| Standardized Value of S | -1.0992 |
| M-K Test Value (S) | -30 |
| Tabulated p-value | 0.1300 |
| Approximate p-value | 0.1358 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0090 |

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

# Mann-Kendall 11-IN - ARSENIC




**Mann-Kendall Trend Analysis**

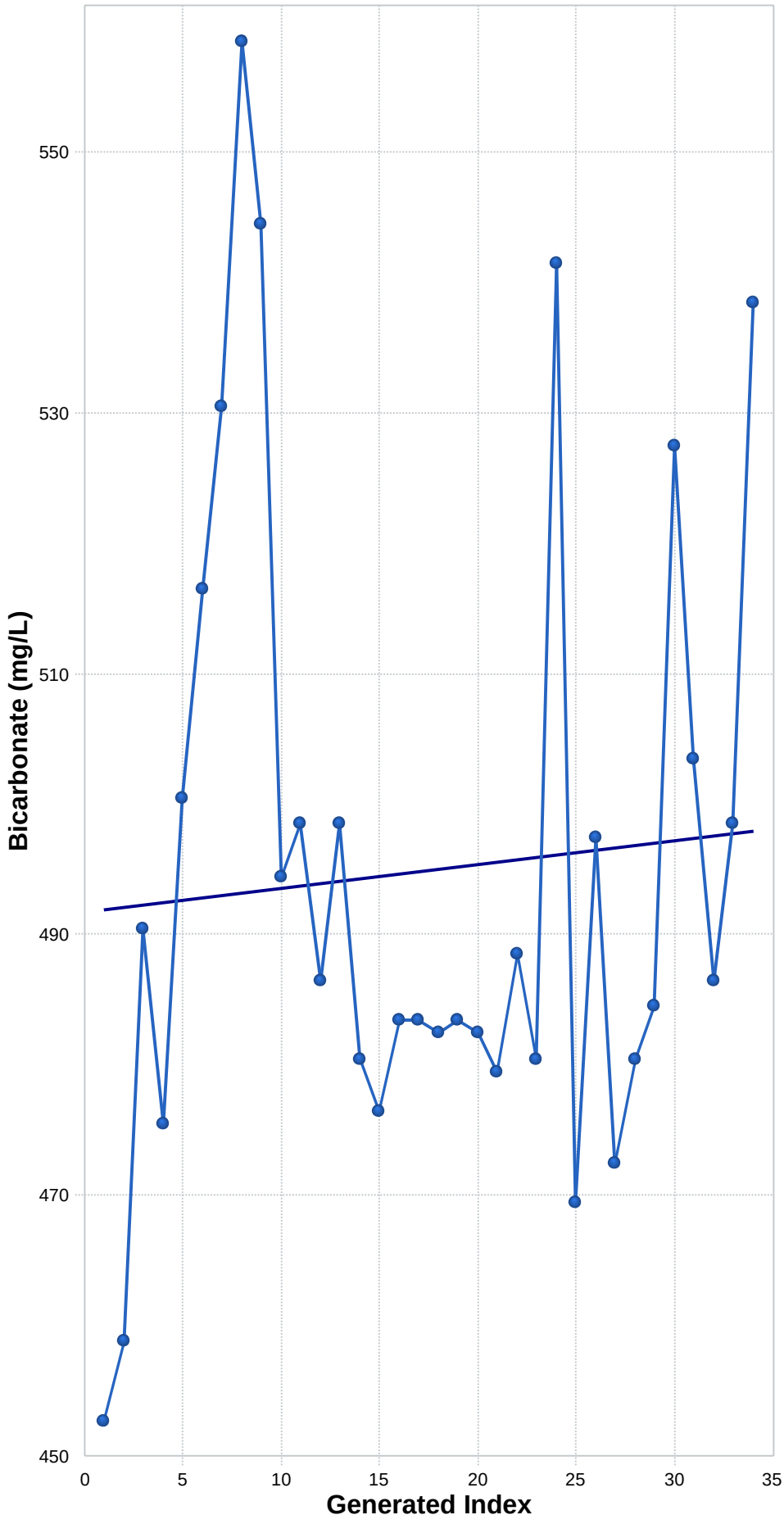
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.3770 |
| Standardized Value of S | -1.0686 |
| M-K Test Value (S) | -73 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1426 |

**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 11-IN - BICARBONATE




**Mann-Kendall Trend Analysis**

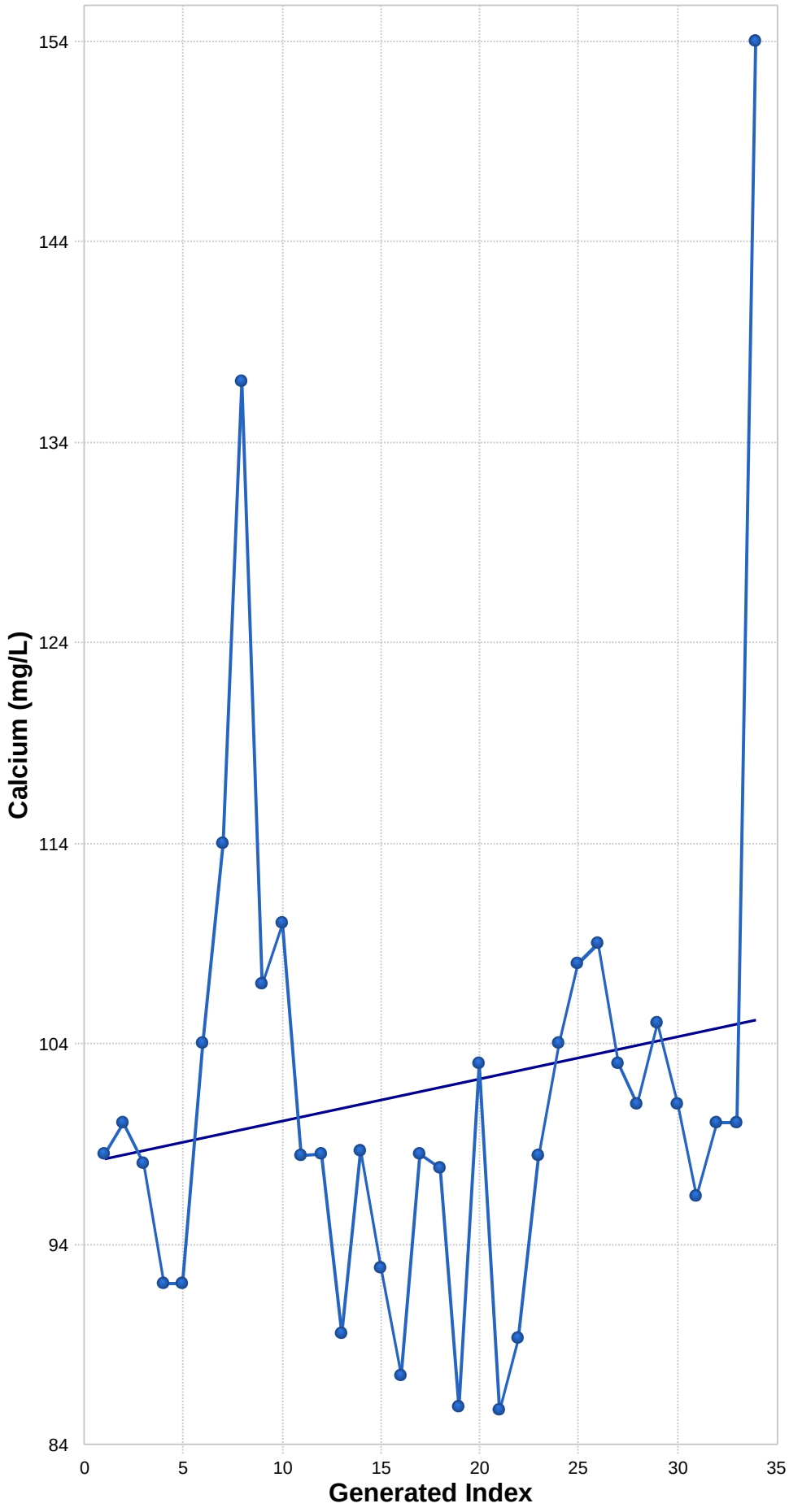
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.3597 |
| Standardized Value of S | 0.3415 |
| M-K Test Value (S) | 24 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.3664 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1846 |
| OLS Regression Intercept | 491.1963 |

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

# Mann-Kendall 11-IN - CALCIUM




**Mann-Kendall Trend Analysis**

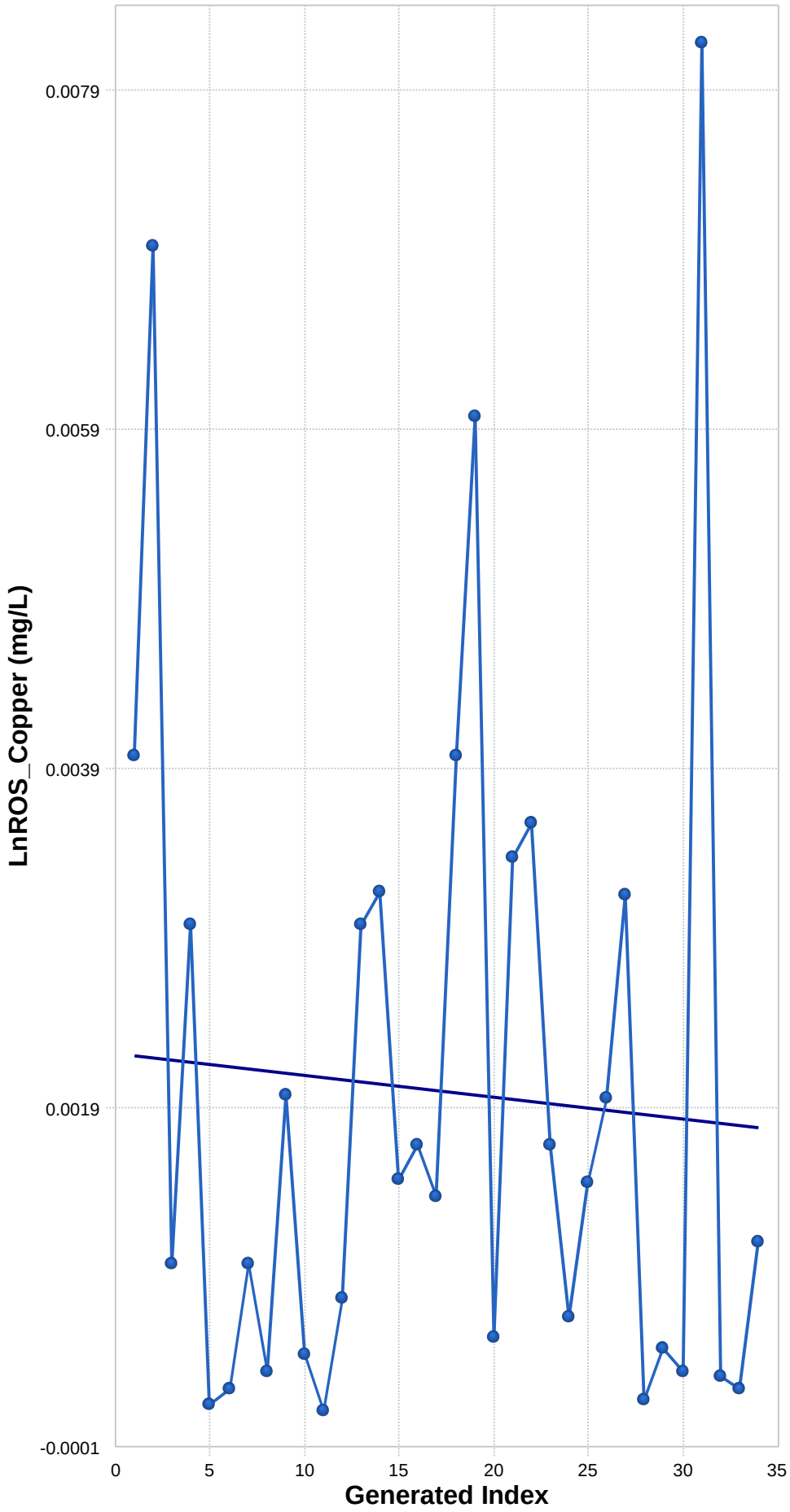
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.3647 |
| Standardized Value of S | 0.6383 |
| M-K Test Value (S) | 44 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.2616 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.2088 |
| OLS Regression Intercept | 98.0428 |

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

# Mann-Kendall 11-IN - COPPER



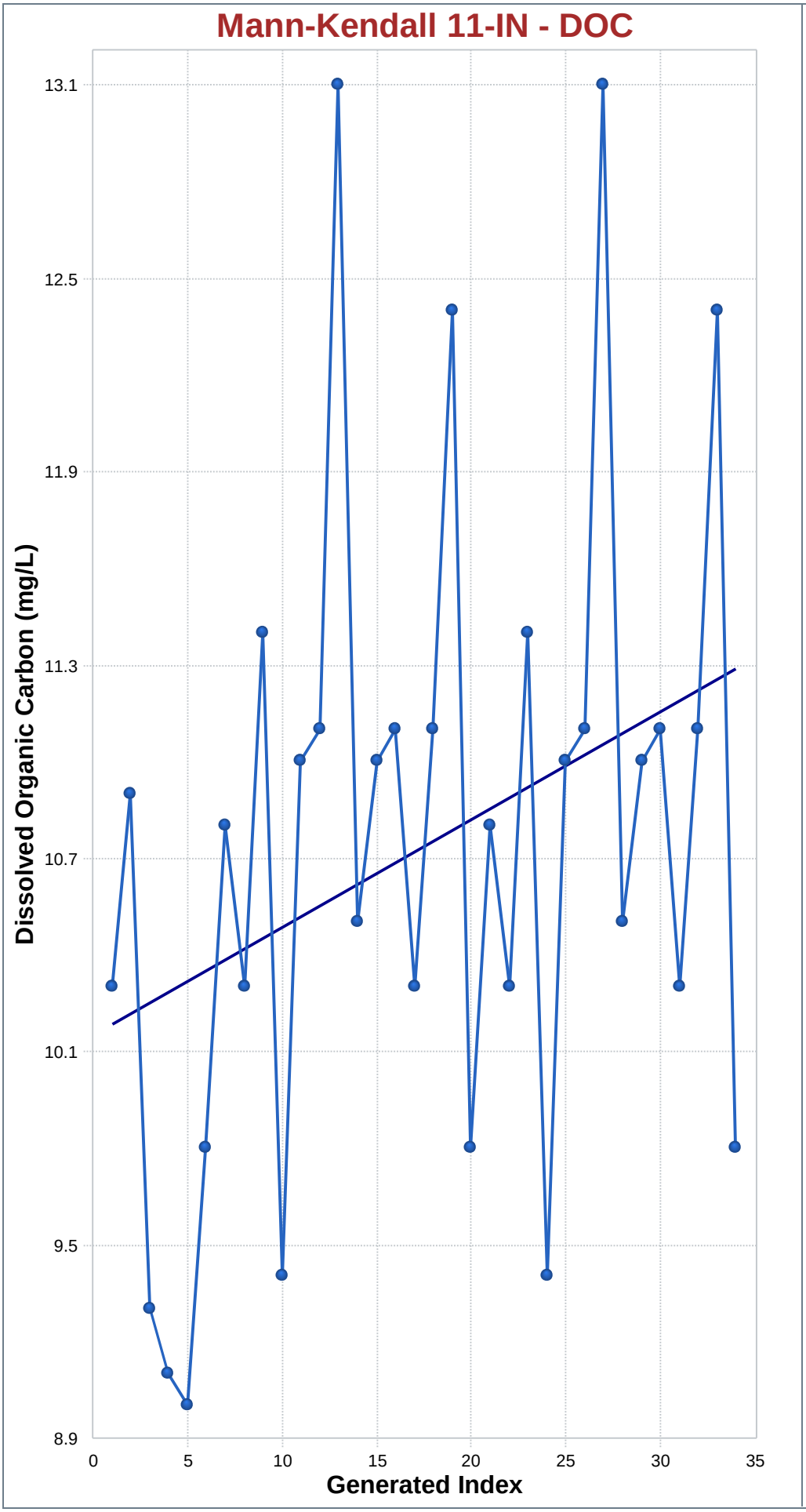

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4265 |
| Standardized Value of S | -0.4449 |
| M-K Test Value (S) | -31 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3282 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0022 |

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



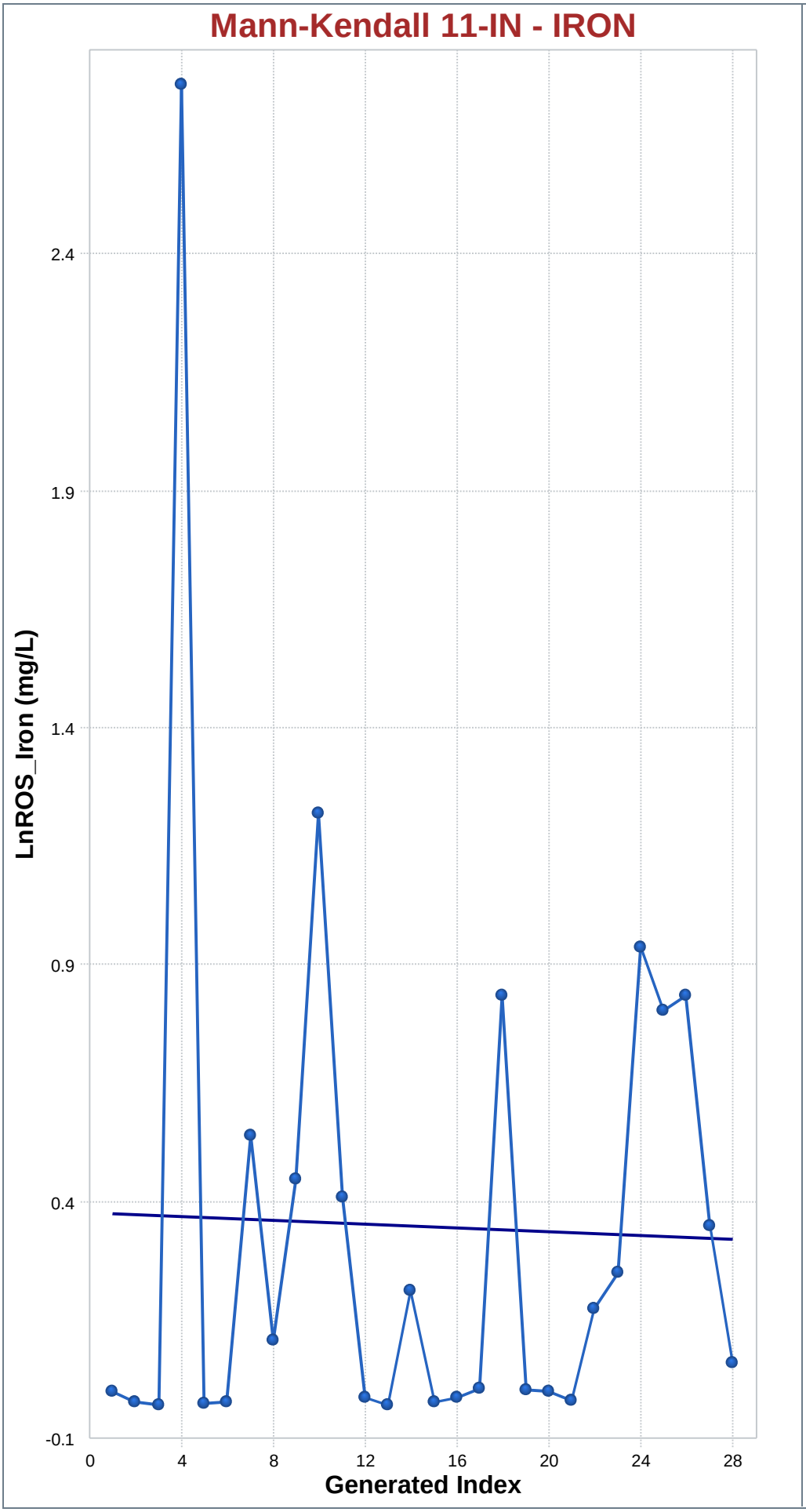

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 66.9851 |
| Standardized Value of S | 2.0004 |
| M-K Test Value (S) | 135 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0227 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0334 |
| OLS Regression Intercept | 10.1508 |

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




**Mann-Kendall Trend Analysis**

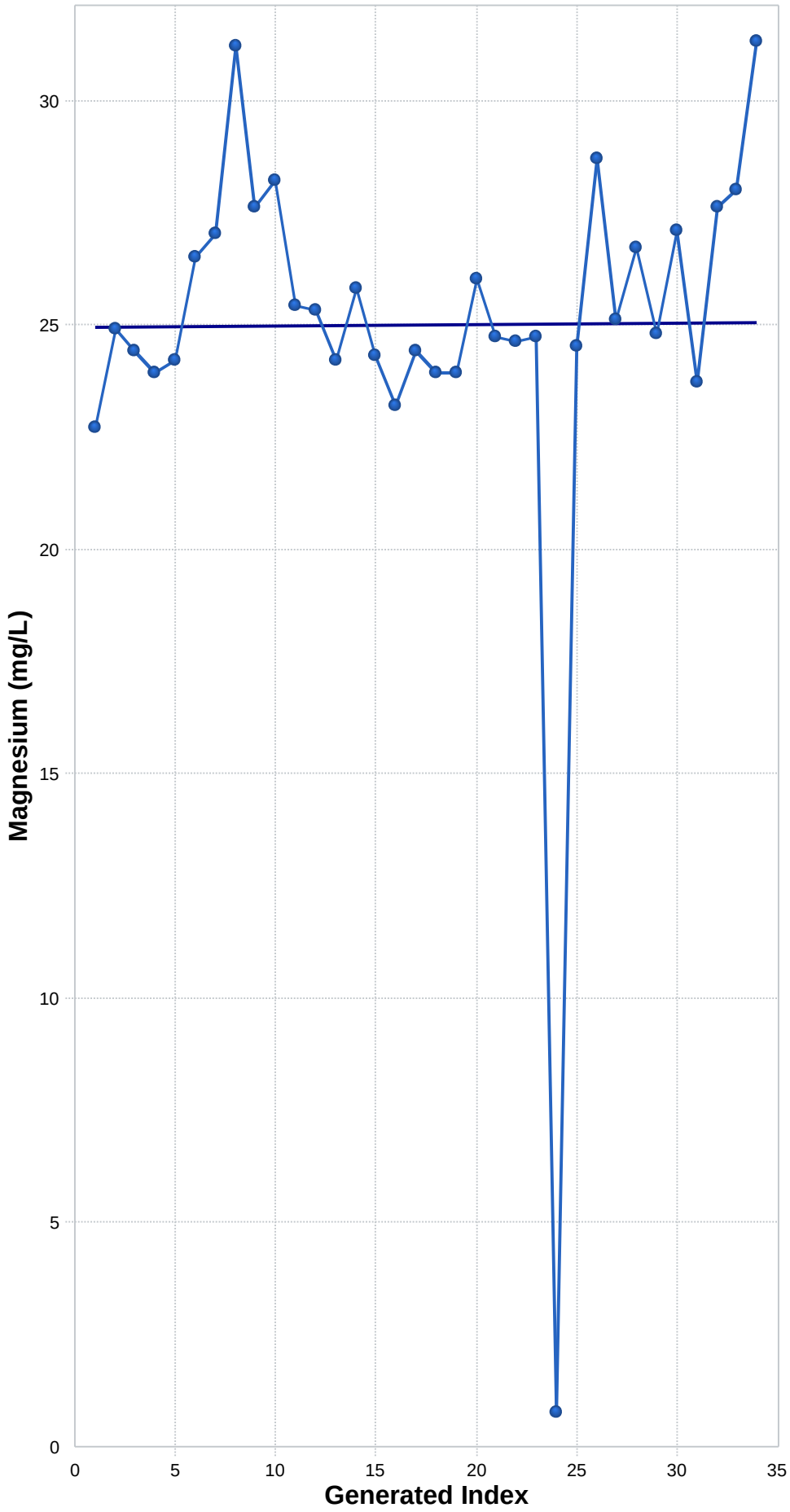
| | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 50.5964 |
| Standardized Value of S | 1.6009 |
| M-K Test Value (S) | 82 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0547 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0020 |
| OLS Regression Intercept | 0.4092 |

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

# Mann-Kendall 11-IN - MAGNESIUM




**Mann-Kendall Trend Analysis**

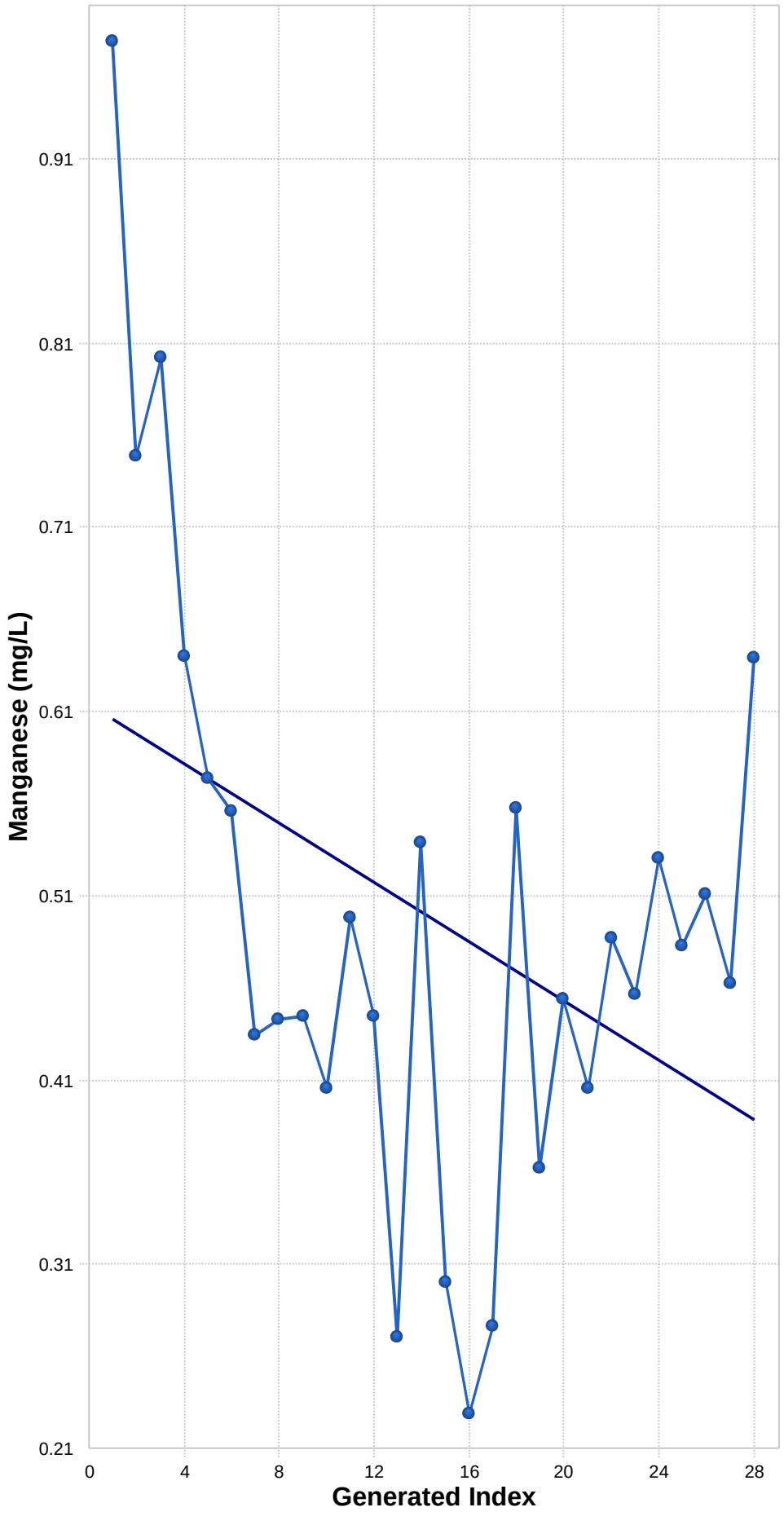
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.3993 |
| Standardized Value of S | 1.3502 |
| M-K Test Value (S) | 92 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0885 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0032 |
| OLS Regression Intercept | 24.7227 |

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

# Mann-Kendall 11-IN - MANGANESE




**Mann-Kendall Trend Analysis**

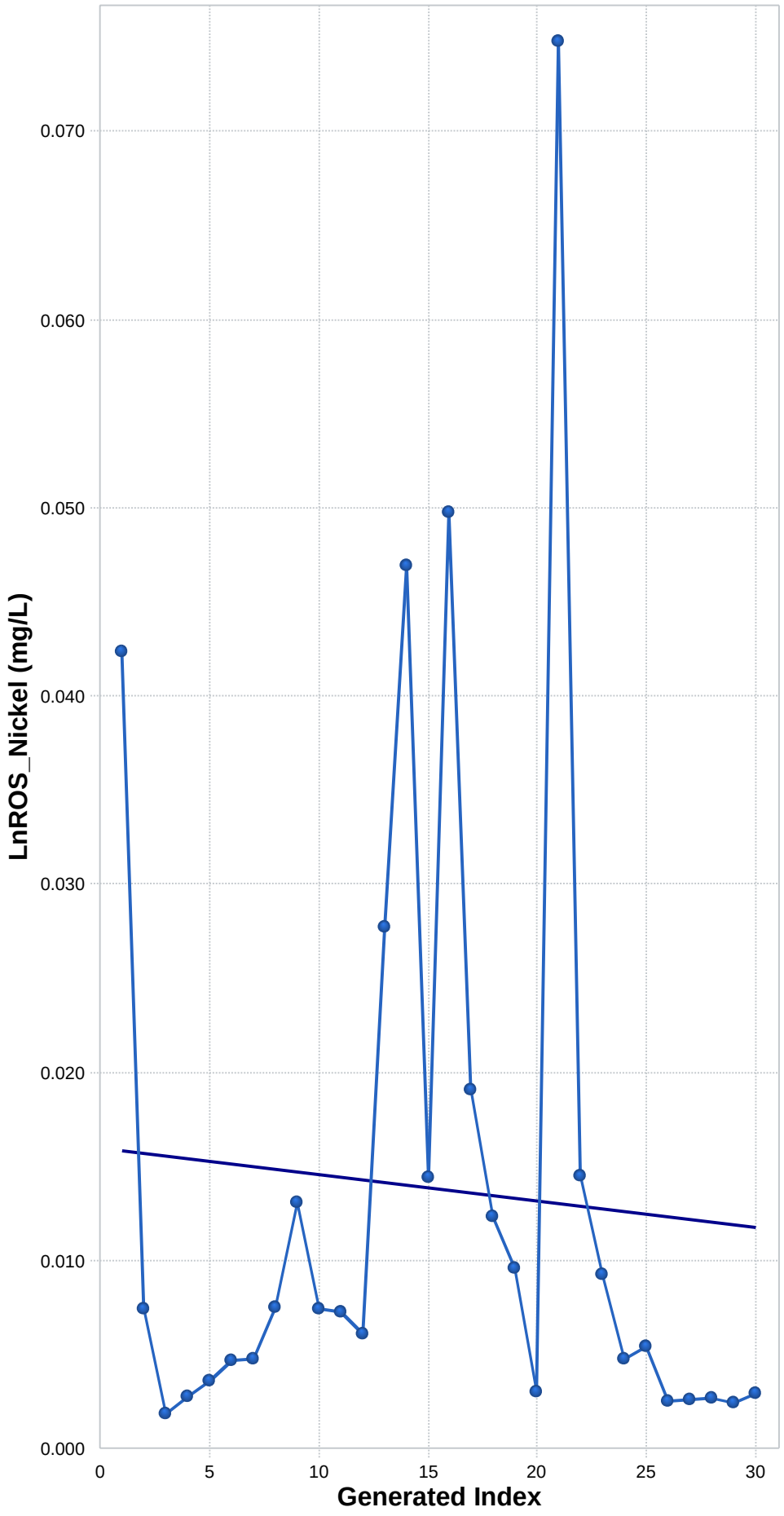
| | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 50.5964 |
| Standardized Value of S | -1.2451 |
| M-K Test Value (S) | -64 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1065 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0081 |
| OLS Regression Intercept | 0.6096 |

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

# Mann-Kendall 11-IN - NICKEL



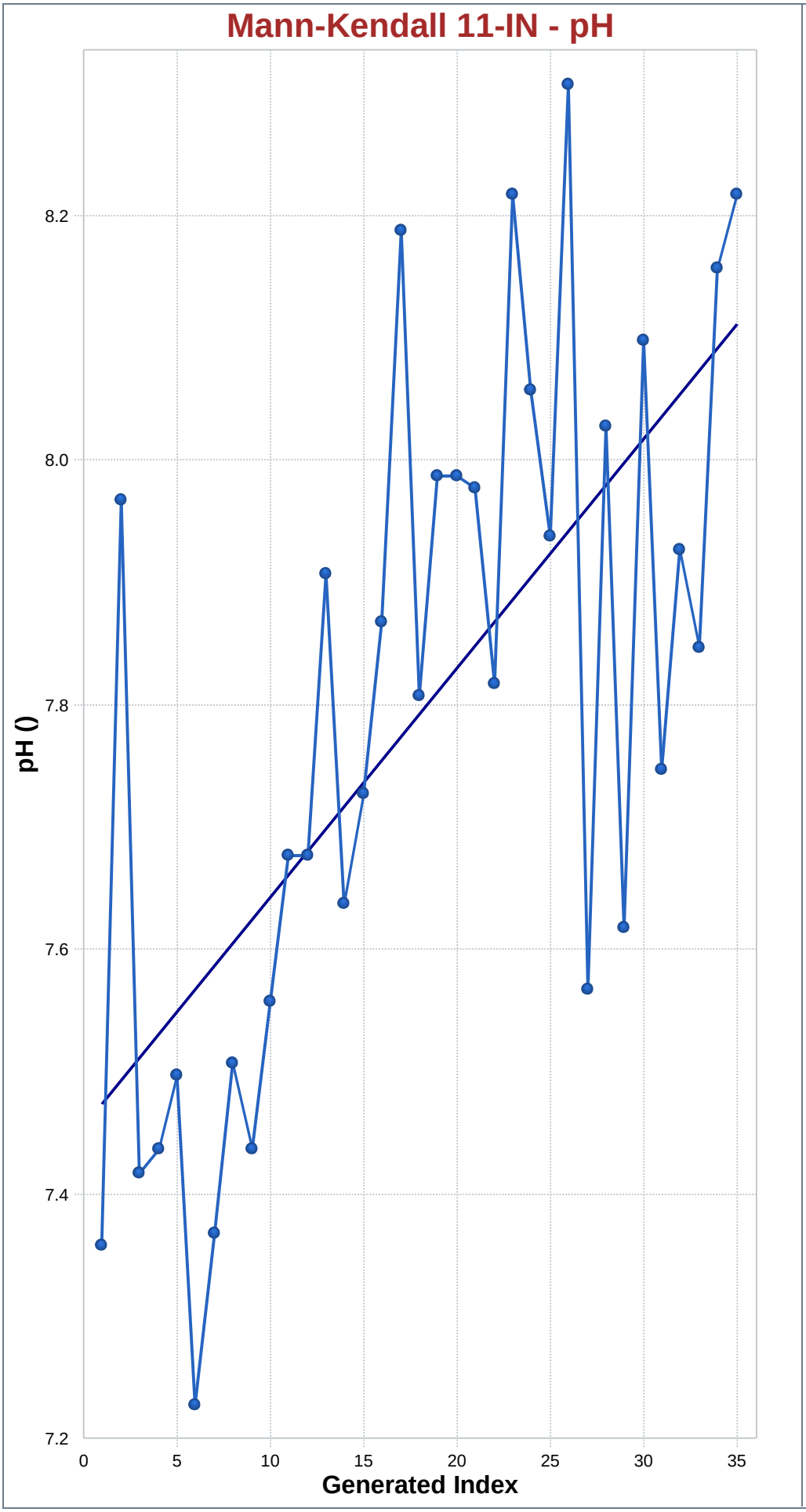

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0327 |
| Standardized Value of S | -0.8209 |
| M-K Test Value (S) | -47 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.2058 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0155 |

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




**Mann-Kendall Trend Analysis**

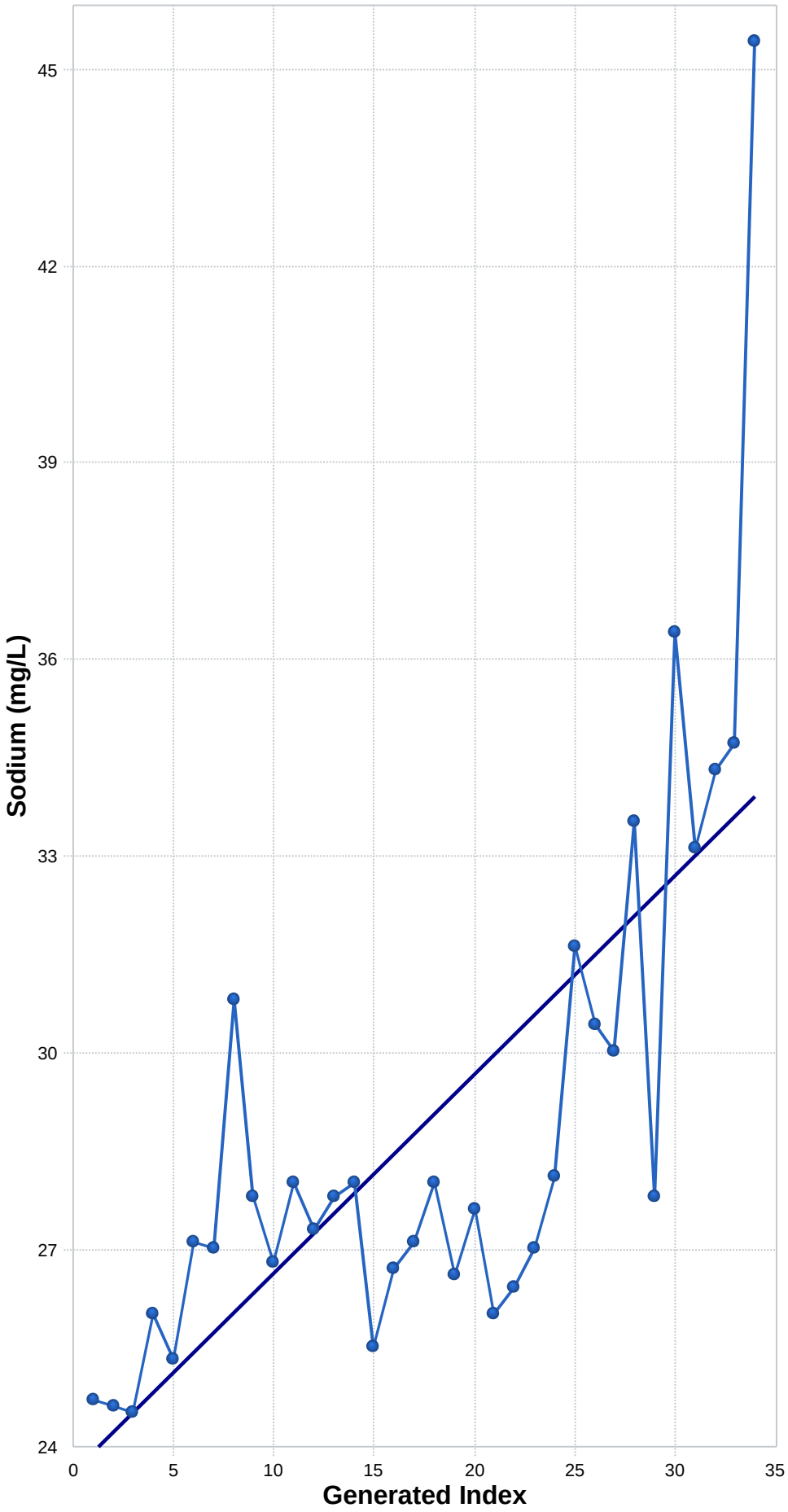
| | |
|---|---|
| n | 35 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 70.3870 |
| Standardized Value of S | 4.4326 |
| M-K Test Value (S) | 313 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0188 |
| OLS Regression Intercept | 7.4682 |

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

# Mann-Kendall 11-IN - SODIUM




**Mann-Kendall Trend Analysis**

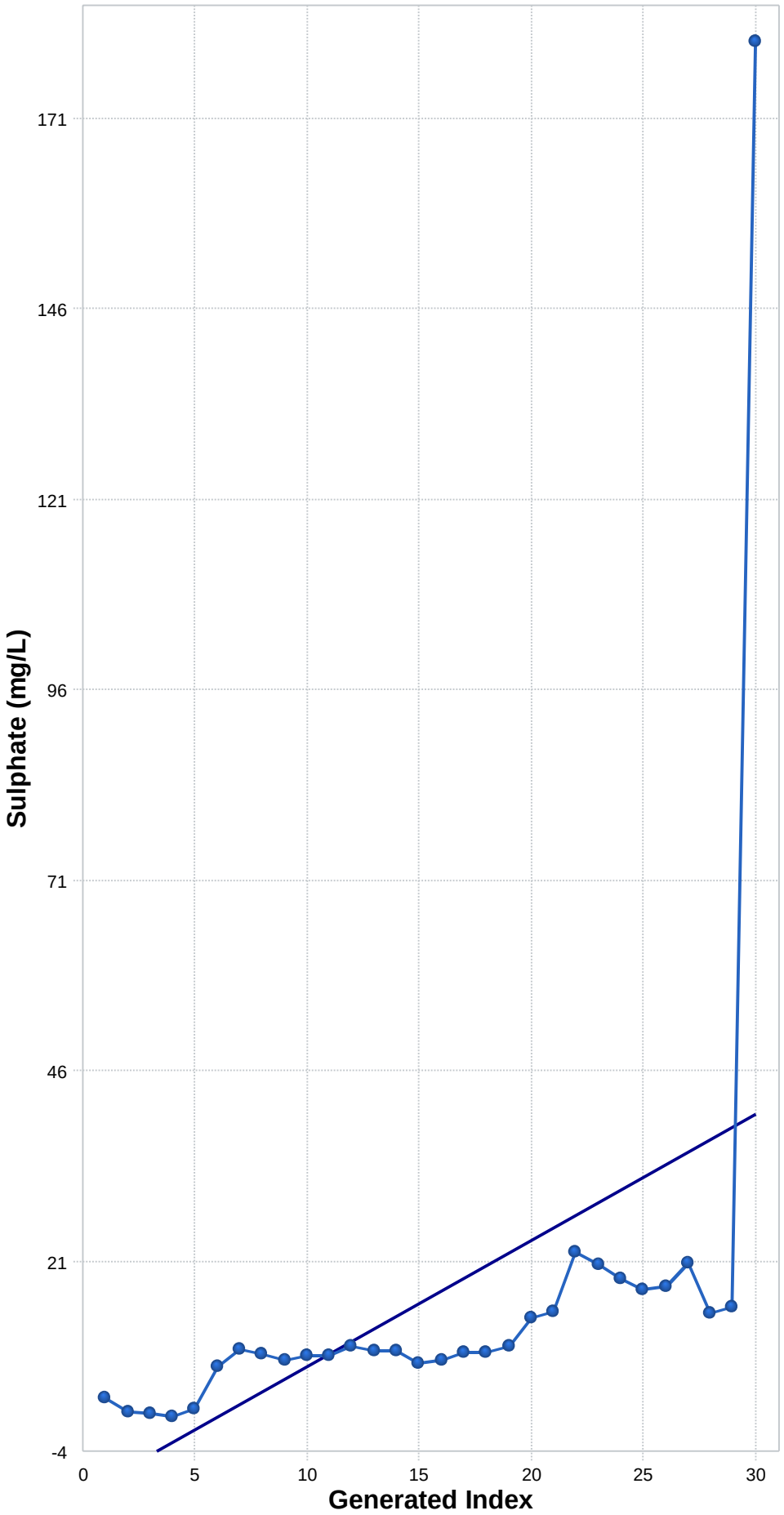
| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.3795 |
| Standardized Value of S | 4.6750 |
| M-K Test Value (S) | 316 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3034 |
| OLS Regression Intercept | 23.1701 |

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

# Mann-Kendall 11-IN - SULPHATE




**Mann-Kendall Trend Analysis**

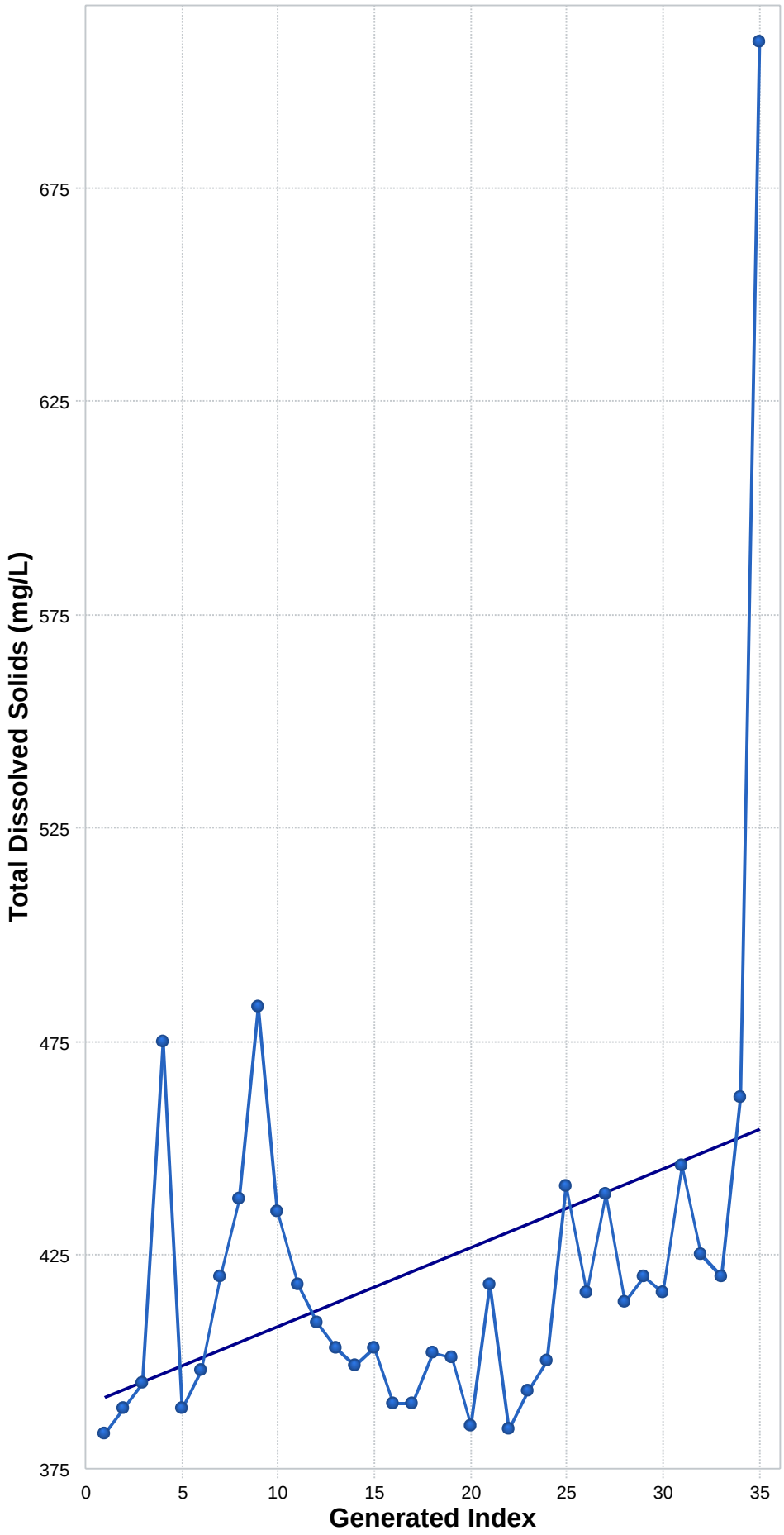
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0506 |
| Standardized Value of S | 5.3523 |
| M-K Test Value (S) | 301 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.6645 |
| OLS Regression Intercept | -9.6996 |

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

# Mann-Kendall 11-IN - TDS



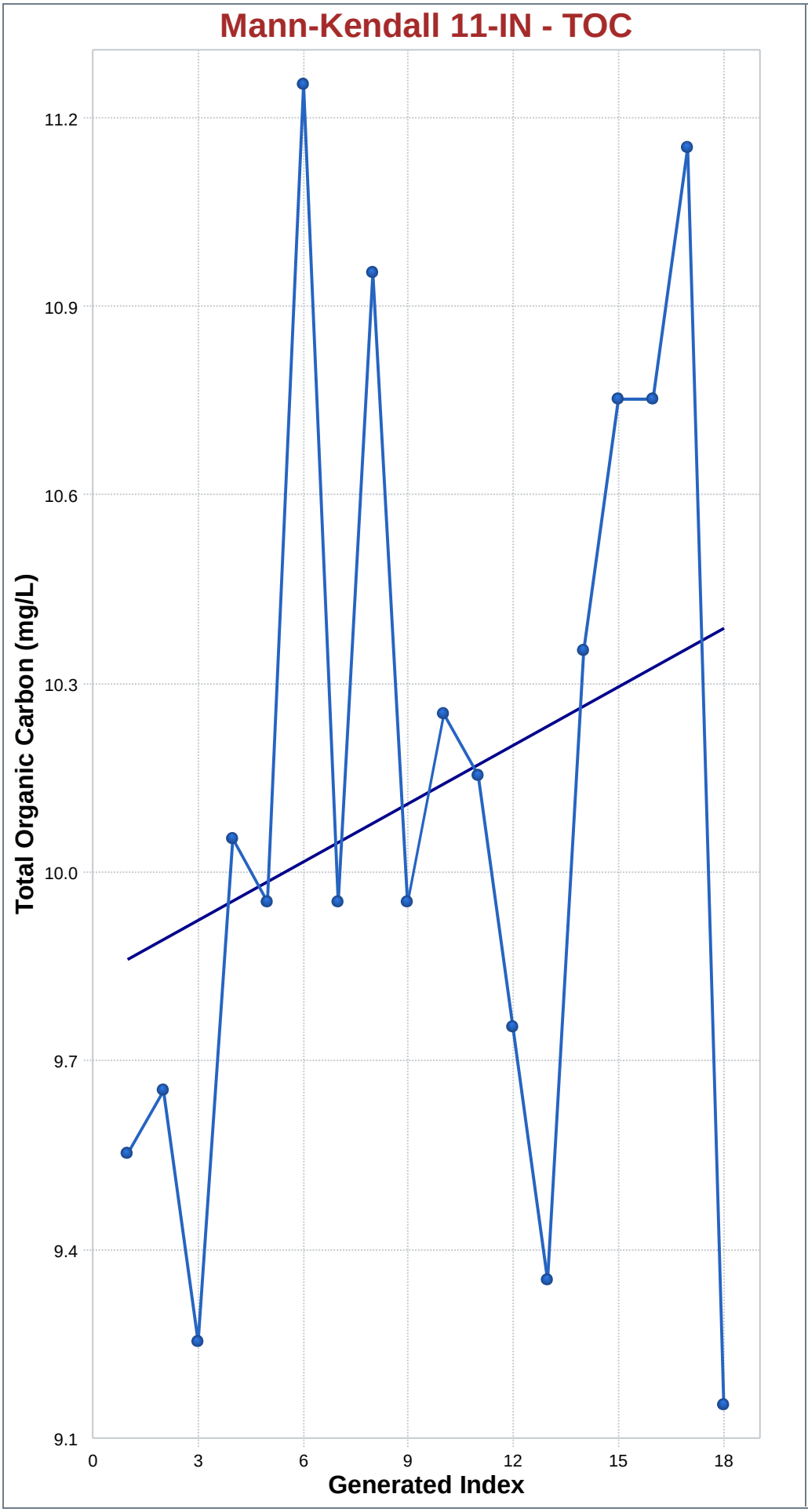

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 35 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 70.3539 |
| Standardized Value of S | 2.3026 |
| M-K Test Value (S) | 163 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0106 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.8479 |
| OLS Regression Intercept | 389.8235 |

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




**Mann-Kendall Trend Analysis**

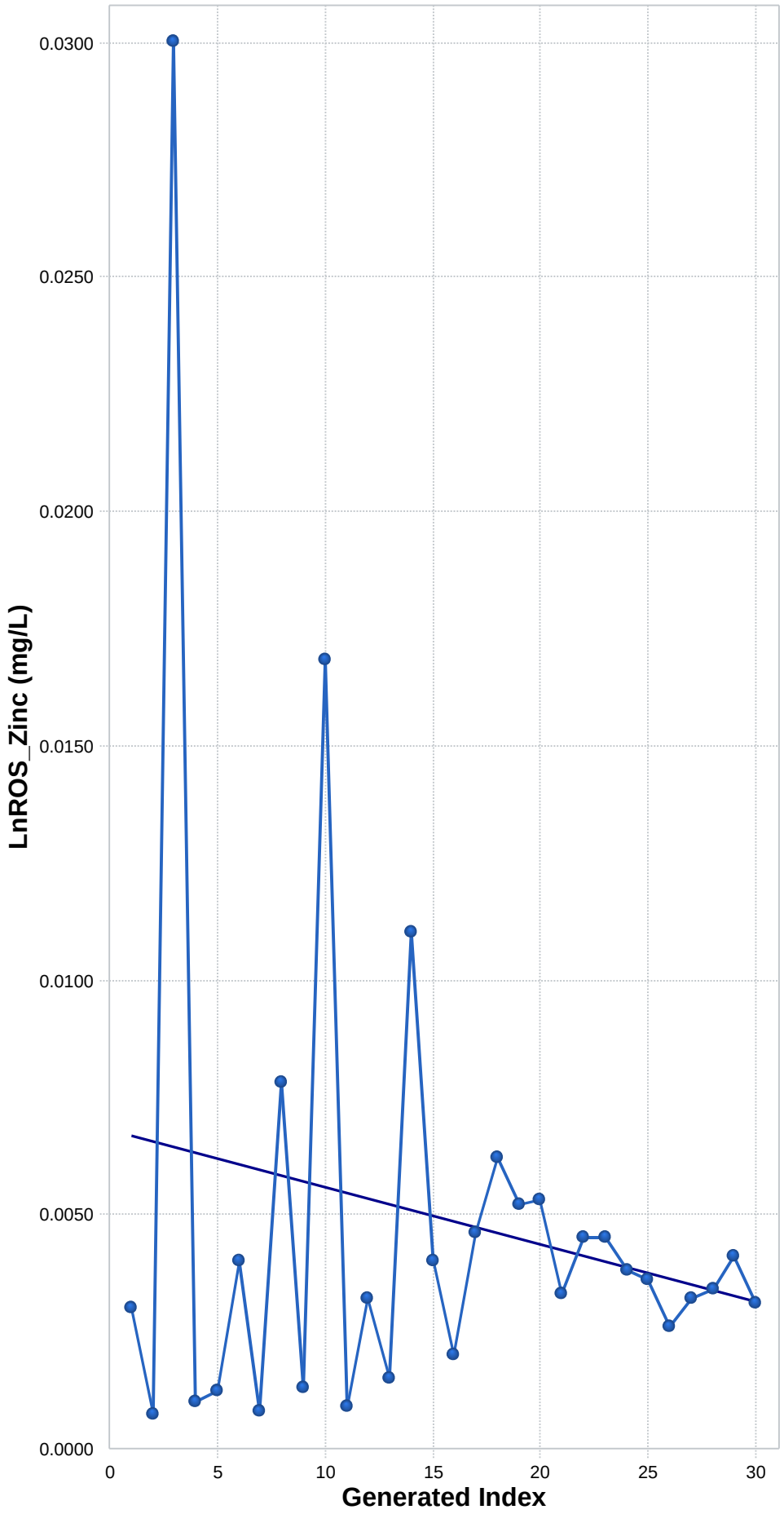
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3122 |
| Standardized Value of S | 1.2922 |
| M-K Test Value (S) | 35 |
| Tabulated p-value | 0.1000 |
| Approximate p-value | 0.0981 |

**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 11-IN - ZINC




**Mann-Kendall Trend Analysis**

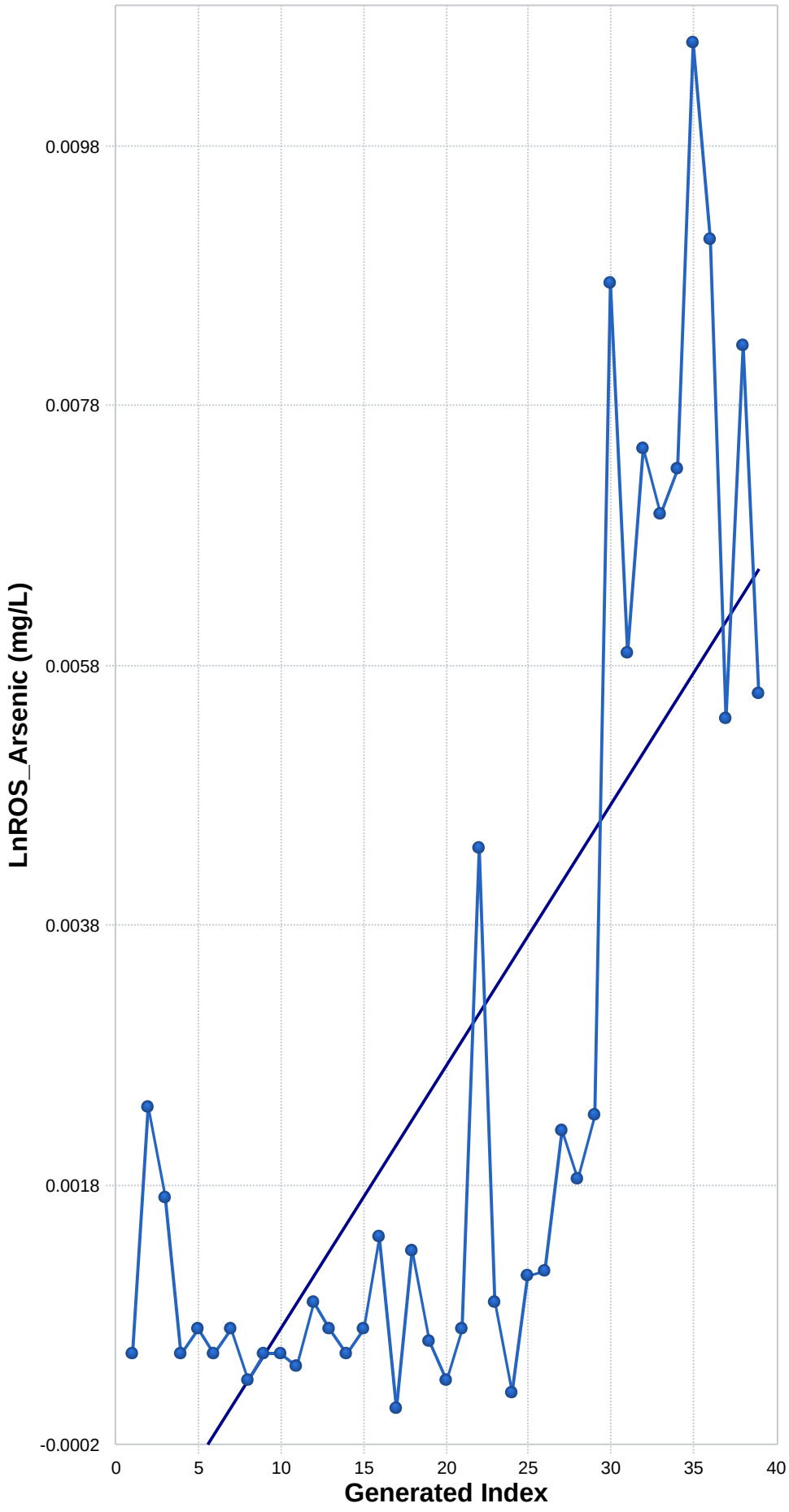
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0238 |
| Standardized Value of S | 0.8032 |
| M-K Test Value (S) | 46 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.2109 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0068 |

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

# Mann-Kendall 12-IN - ARSENIC




**Mann-Kendall Trend Analysis**

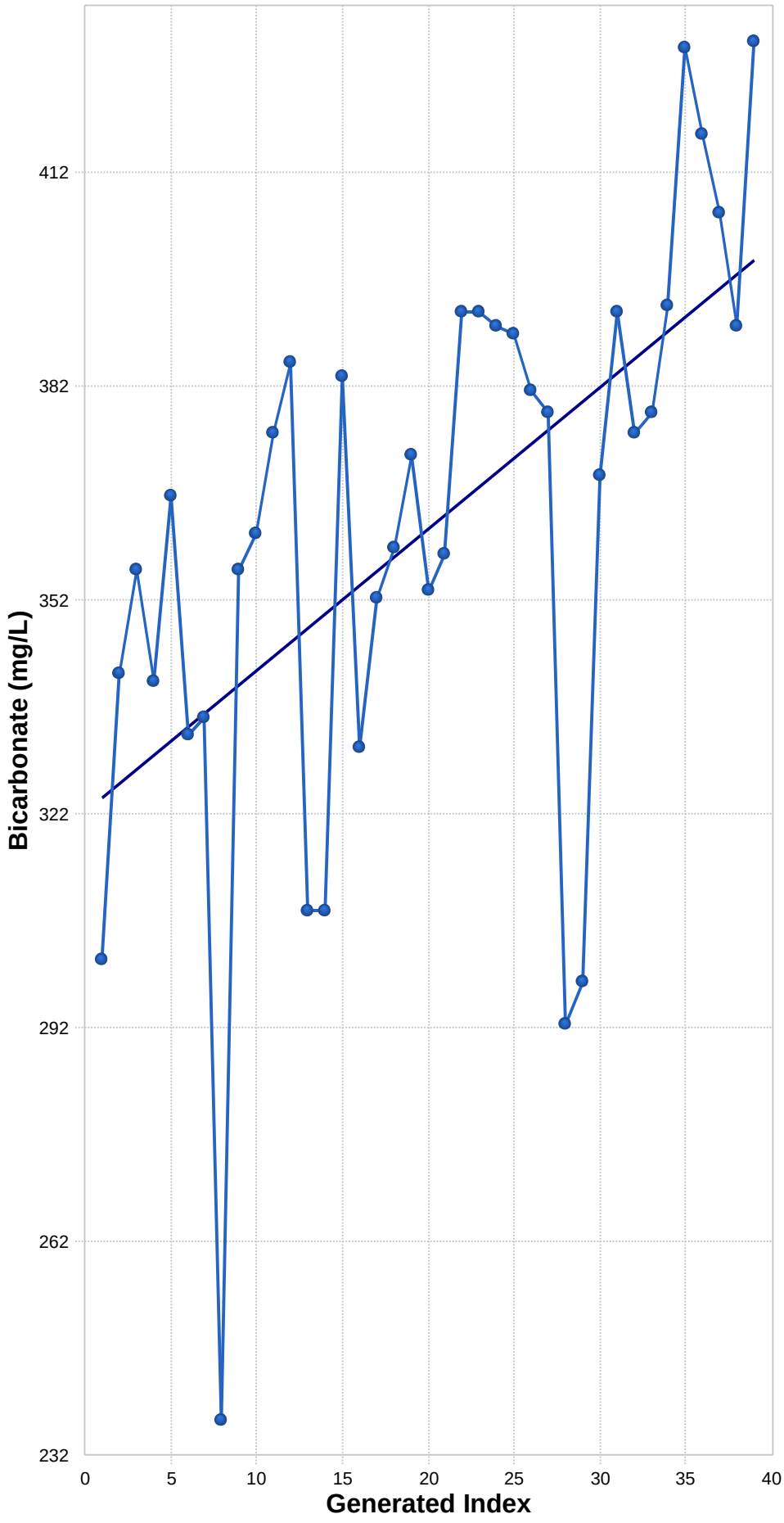
| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.3812 |
| Standardized Value of S | 4.5520 |
| M-K Test Value (S) | 376 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0002 |
| OLS Regression Intercept | -0.0014 |

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

# Mann-Kendall 12-IN - BICARBONATE




**Mann-Kendall Trend Analysis**

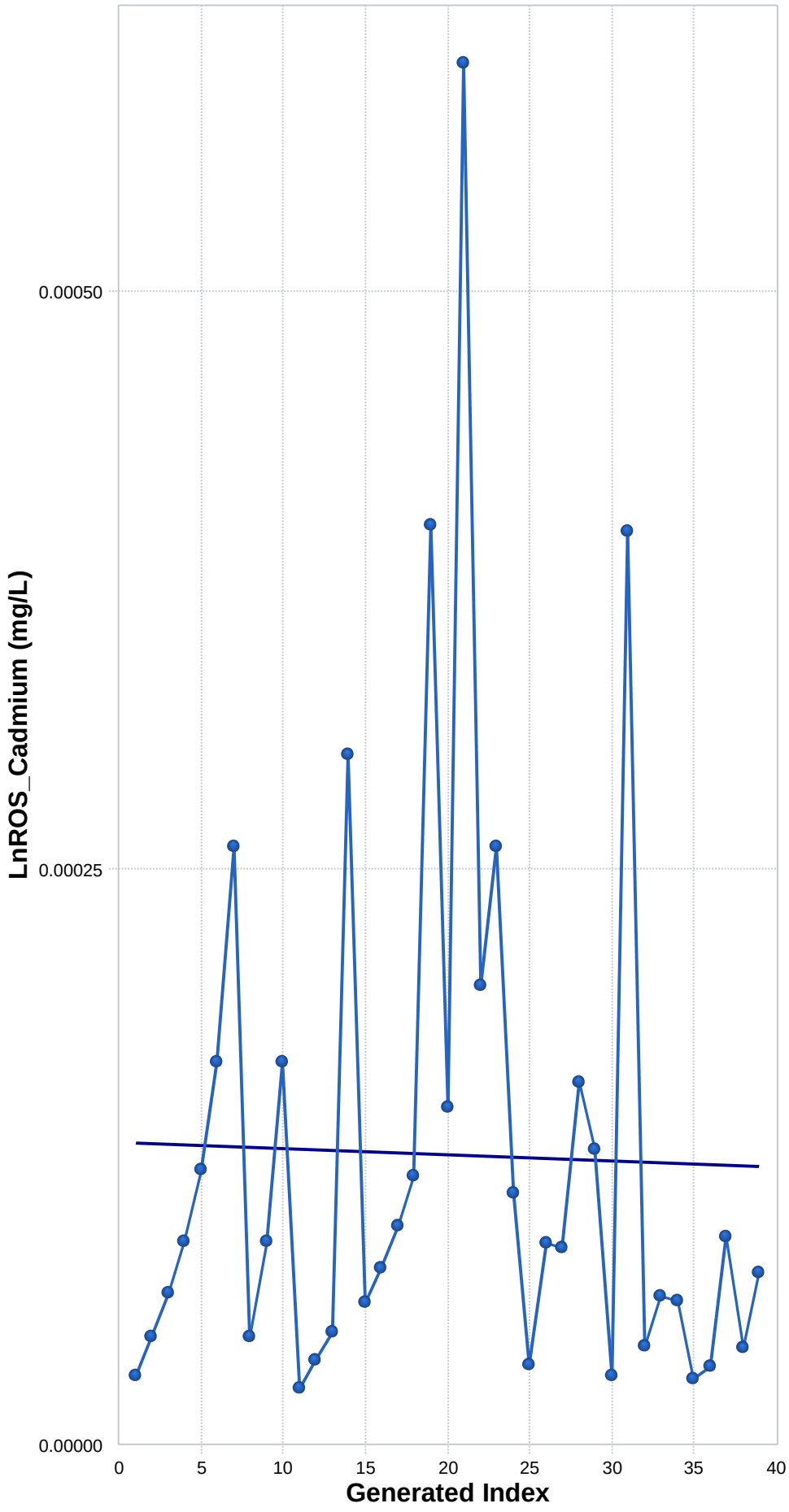
| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.6136 |
| Standardized Value of S | 4.2850 |
| M-K Test Value (S) | 355 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.9873 |
| OLS Regression Intercept | 321.8188 |

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

# Mann-Kendall 12-IN - CADMIUM




**Mann-Kendall Trend Analysis**

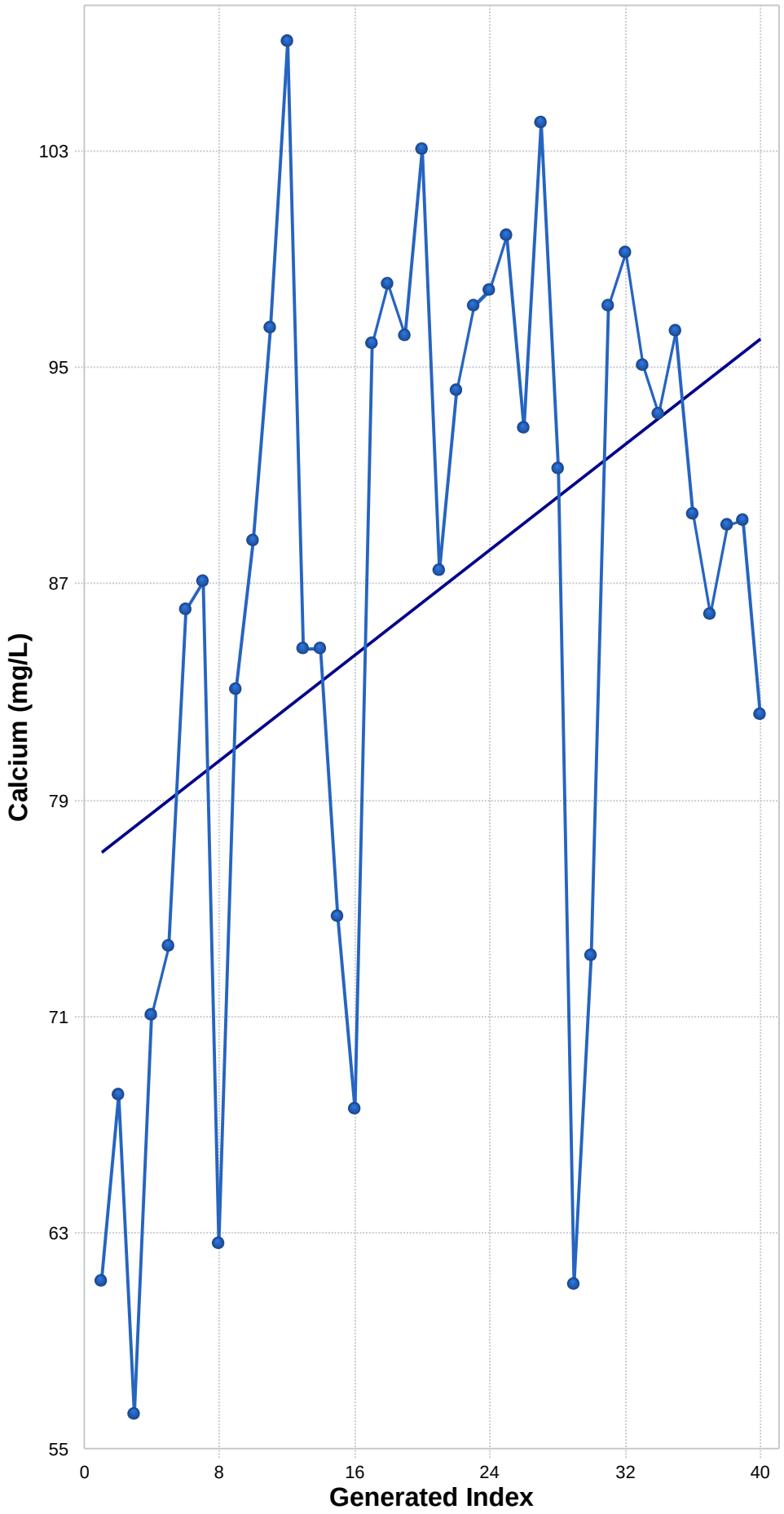
| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.6478 |
| Standardized Value of S | -0.4235 |
| M-K Test Value (S) | -36 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3360 |

**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 12-IN - CALCIUM




**Mann-Kendall Trend Analysis**

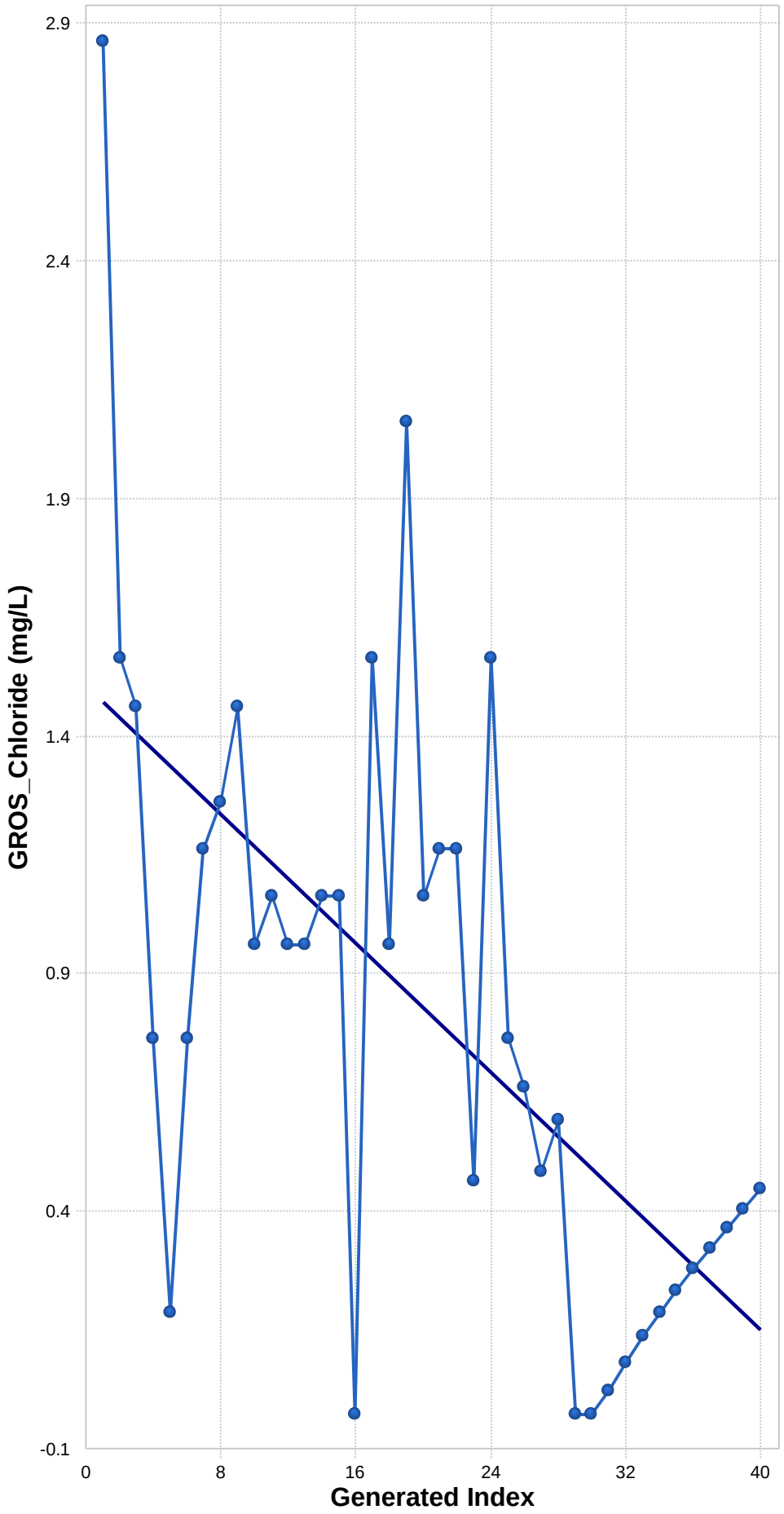
| | |
|---|---|
| n | 40 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 85.8176 |
| Standardized Value of S | 2.2256 |
| M-K Test Value (S) | 192 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0130 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.4865 |
| OLS Regression Intercept | 76.5088 |

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

# Mann-Kendall 12-IN - CHLORIDE




**Mann-Kendall Trend Analysis**

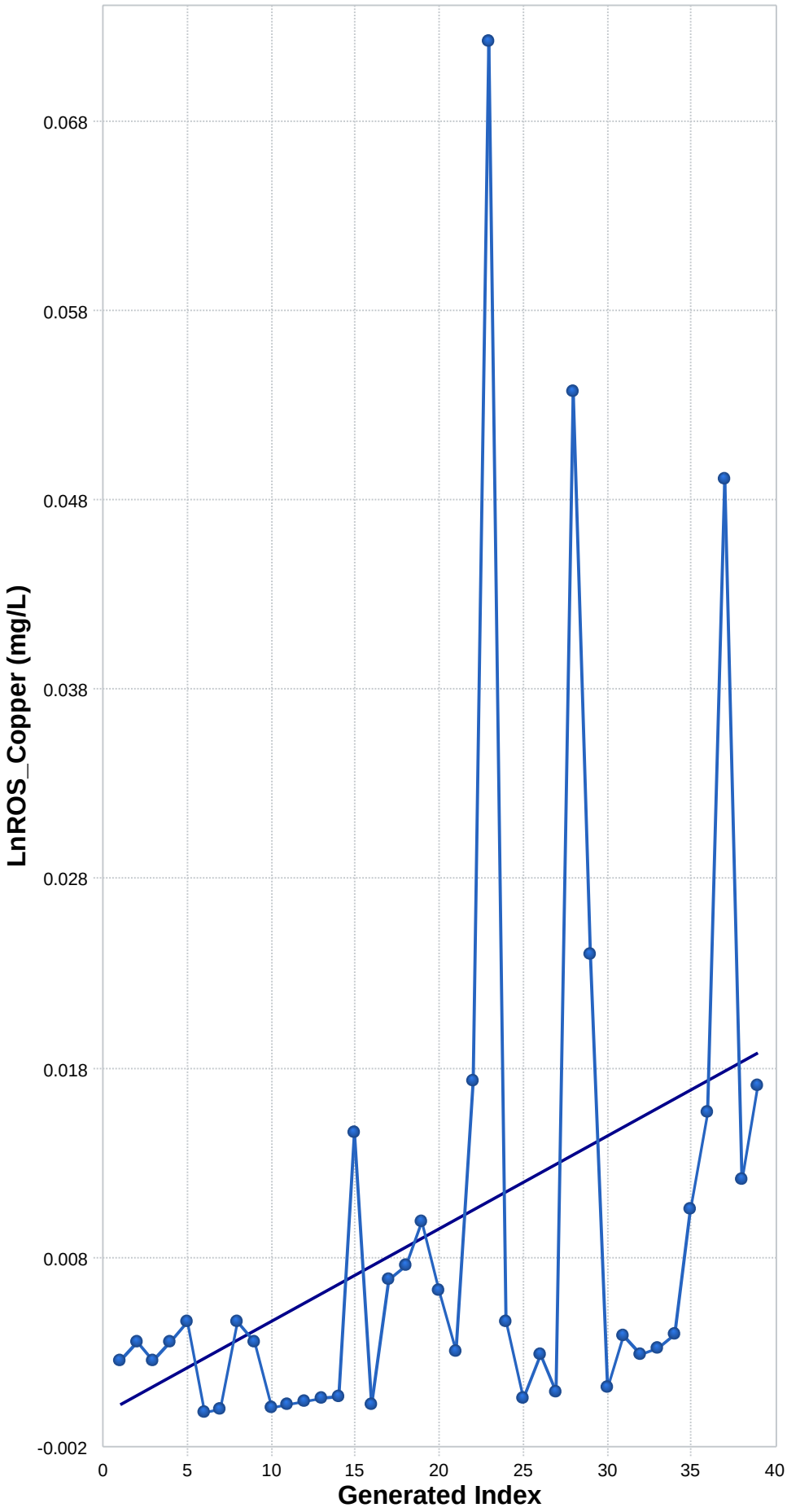
| | |
|---|---|
| n | 40 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 85.6310 |
| Standardized Value of S | -3.6552 |
| M-K Test Value (S) | -314 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0339 |
| OLS Regression Intercept | 1.5442 |

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

# Mann-Kendall 12-IN - COPPER




**Mann-Kendall Trend Analysis**

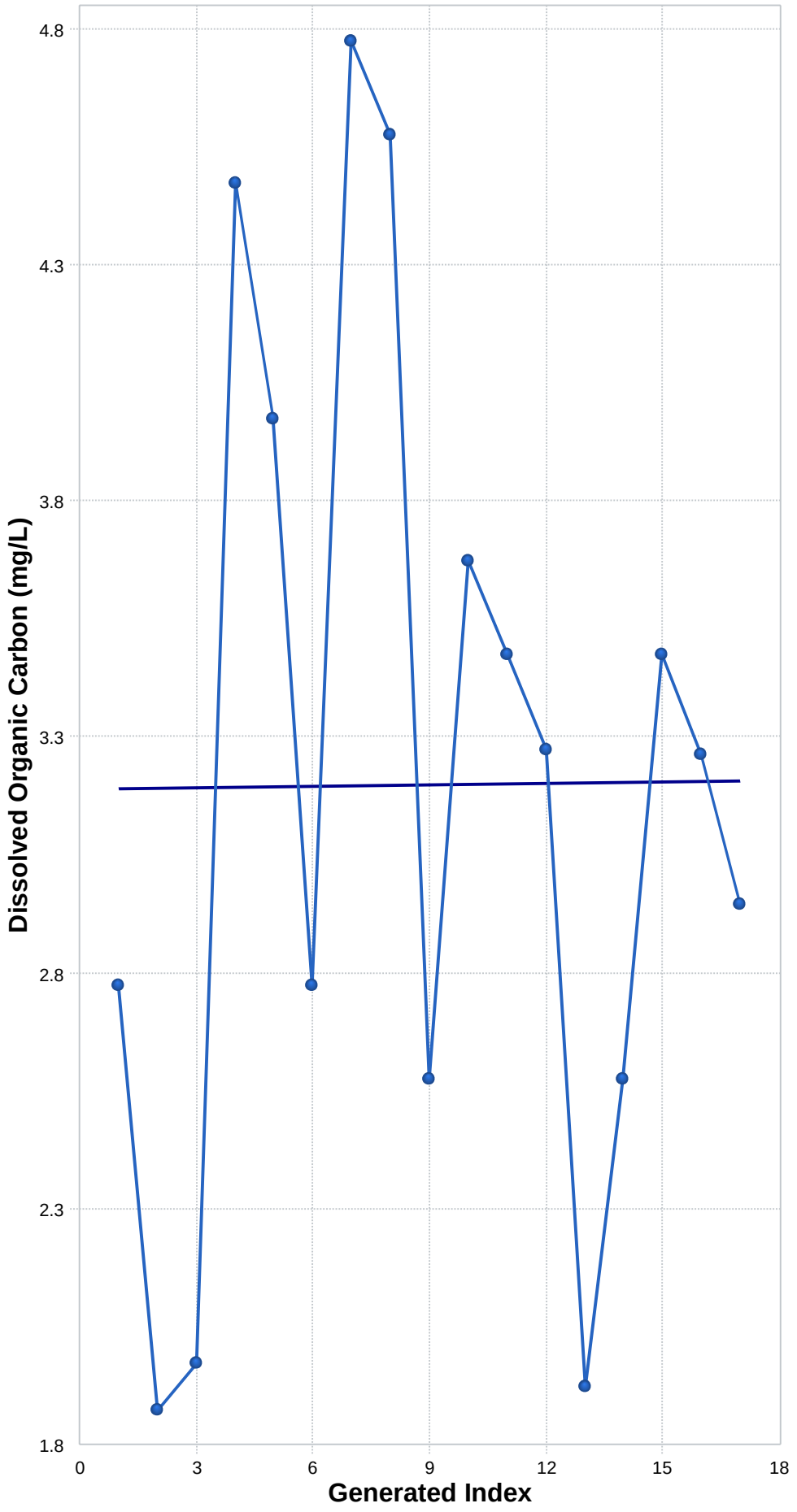
| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.6095 |
| Standardized Value of S | 3.2200 |
| M-K Test Value (S) | 267 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0006 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0005 |
| OLS Regression Intercept | 0.0002 |

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

# Mann-Kendall 12-IN - DOC



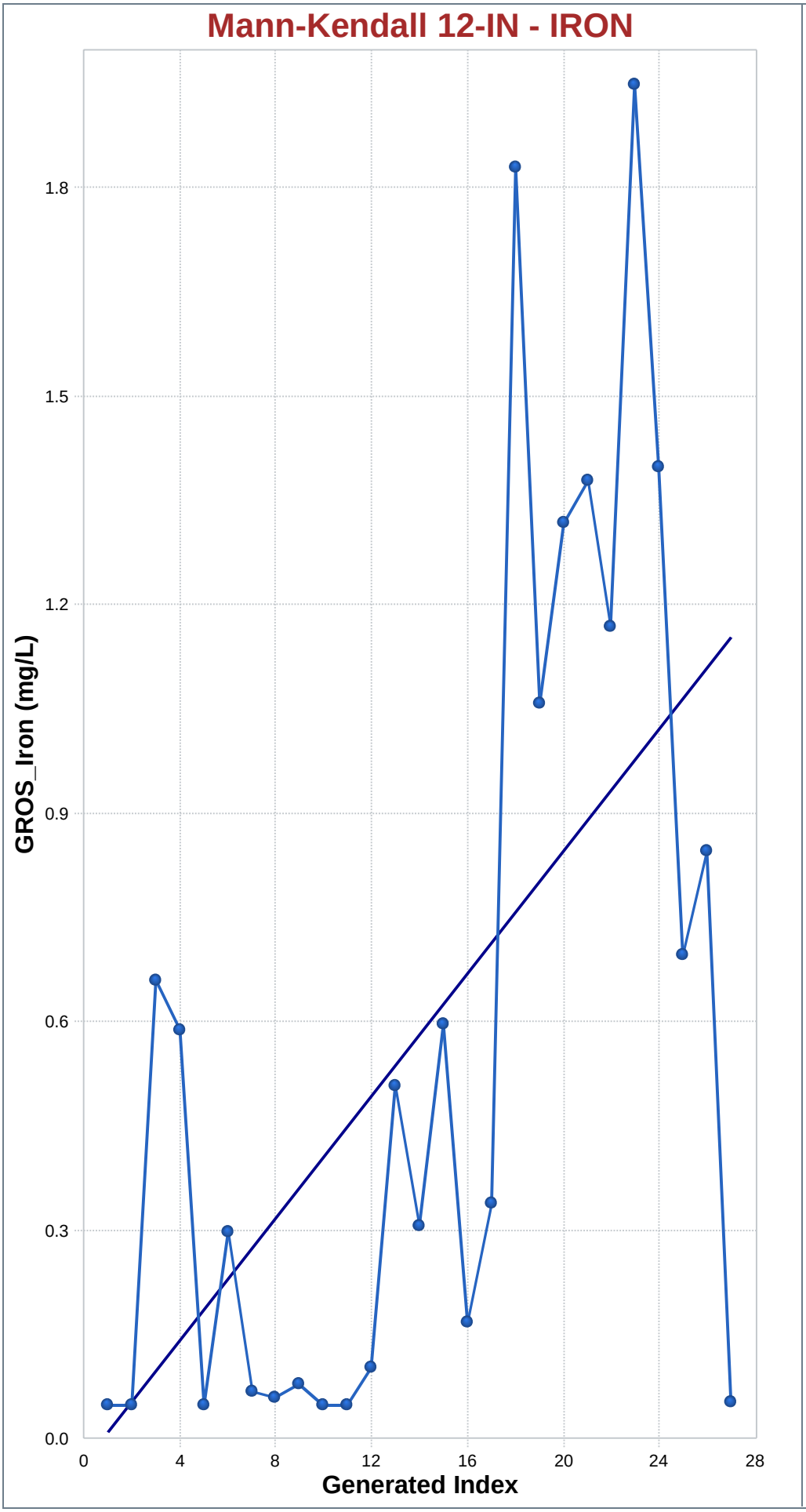

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 17 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 24.2143 |
| Standardized Value of S | -0.1652 |
| M-K Test Value (S) | -5 |
| Tabulated p-value | 0.4520 |
| Approximate p-value | 0.4344 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0010 |
| OLS Regression Intercept | 3.2155 |

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




**Mann-Kendall Trend Analysis**

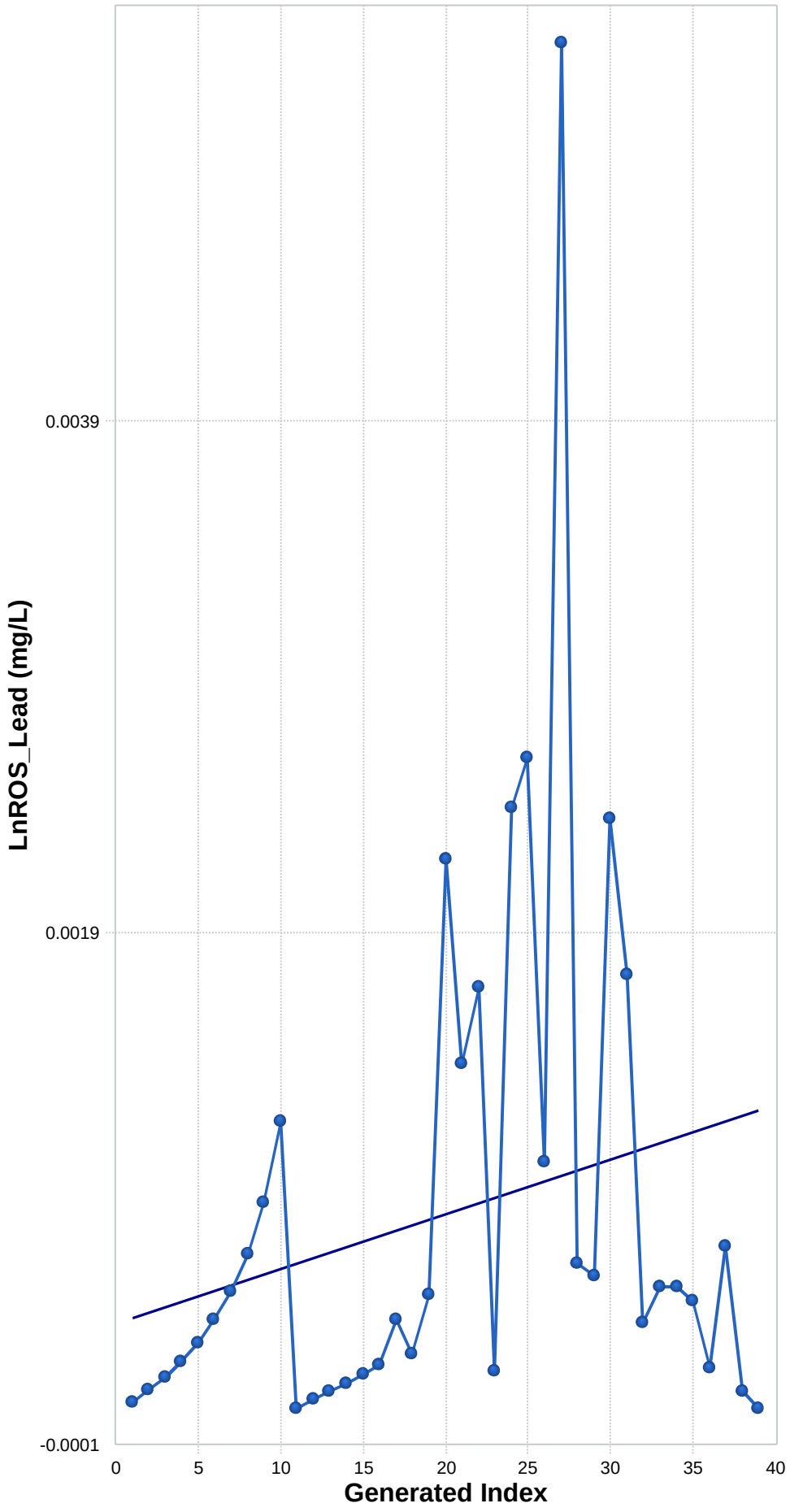
| | |
|---|---|
| n | 27 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 47.7947 |
| Standardized Value of S | 3.3895 |
| M-K Test Value (S) | 163 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0004 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0440 |
| OLS Regression Intercept | -0.0725 |

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

# Mann-Kendall 12-IN - LEAD



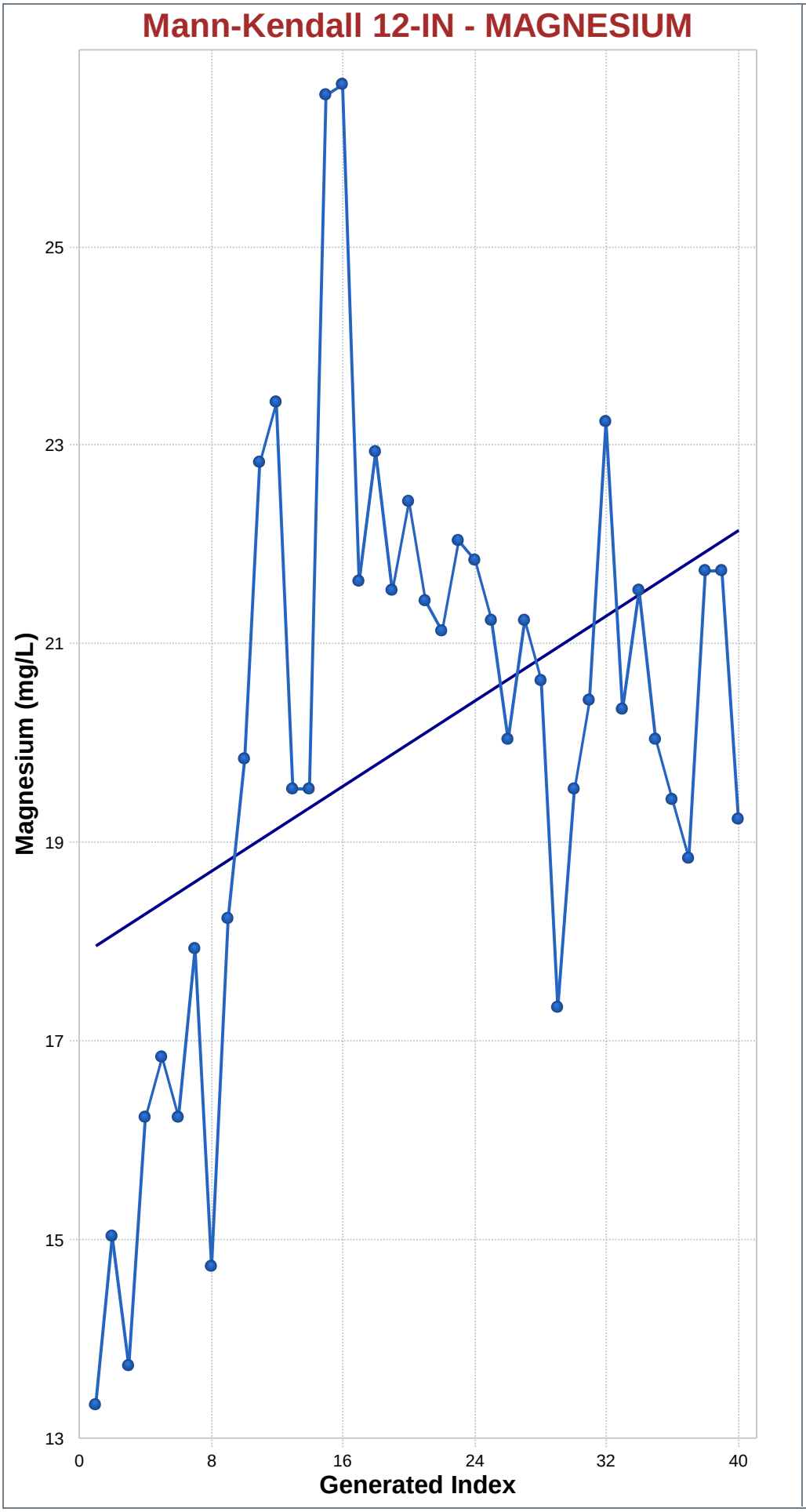

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 39 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 82.6539 |
| Standardized Value of S | 1.9842 |
| M-K Test Value (S) | 165 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0236 |

**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.



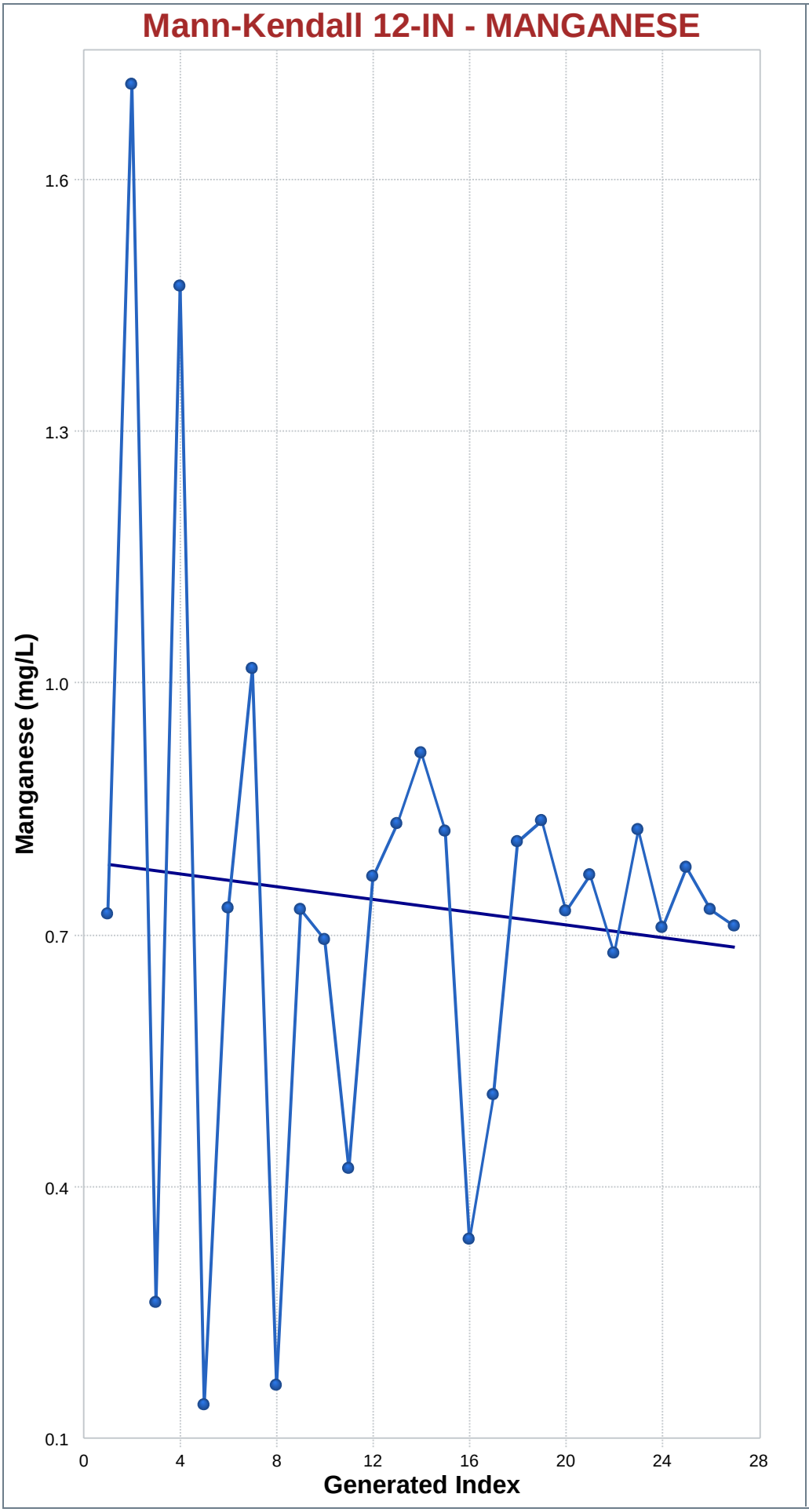

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 40 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 85.7788 |
| Standardized Value of S | 1.7837 |
| M-K Test Value (S) | 154 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0372 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1075 |
| OLS Regression Intercept | 17.6158 |

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




**Mann-Kendall Trend Analysis**

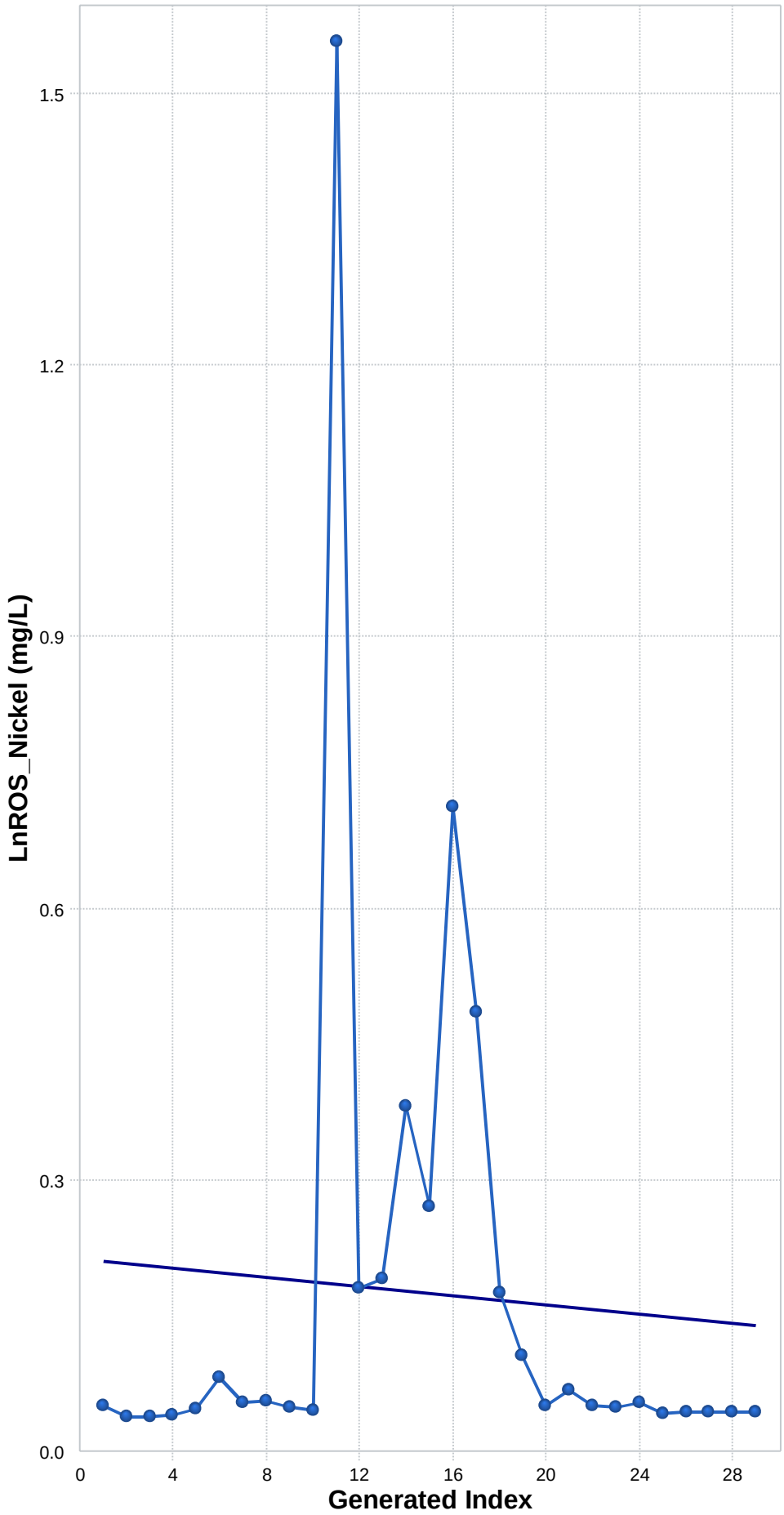
| | |
|---|---|
| n | 27 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 47.9583 |
| Standardized Value of S | |
| M-K Test Value (S) | 0 |
| Appx. Critical Value (0.05) | |
| Approximate p-value | |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0038 |
| OLS Regression Intercept | 0.7640 |

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

# Mann-Kendall 12-IN - NICKEL



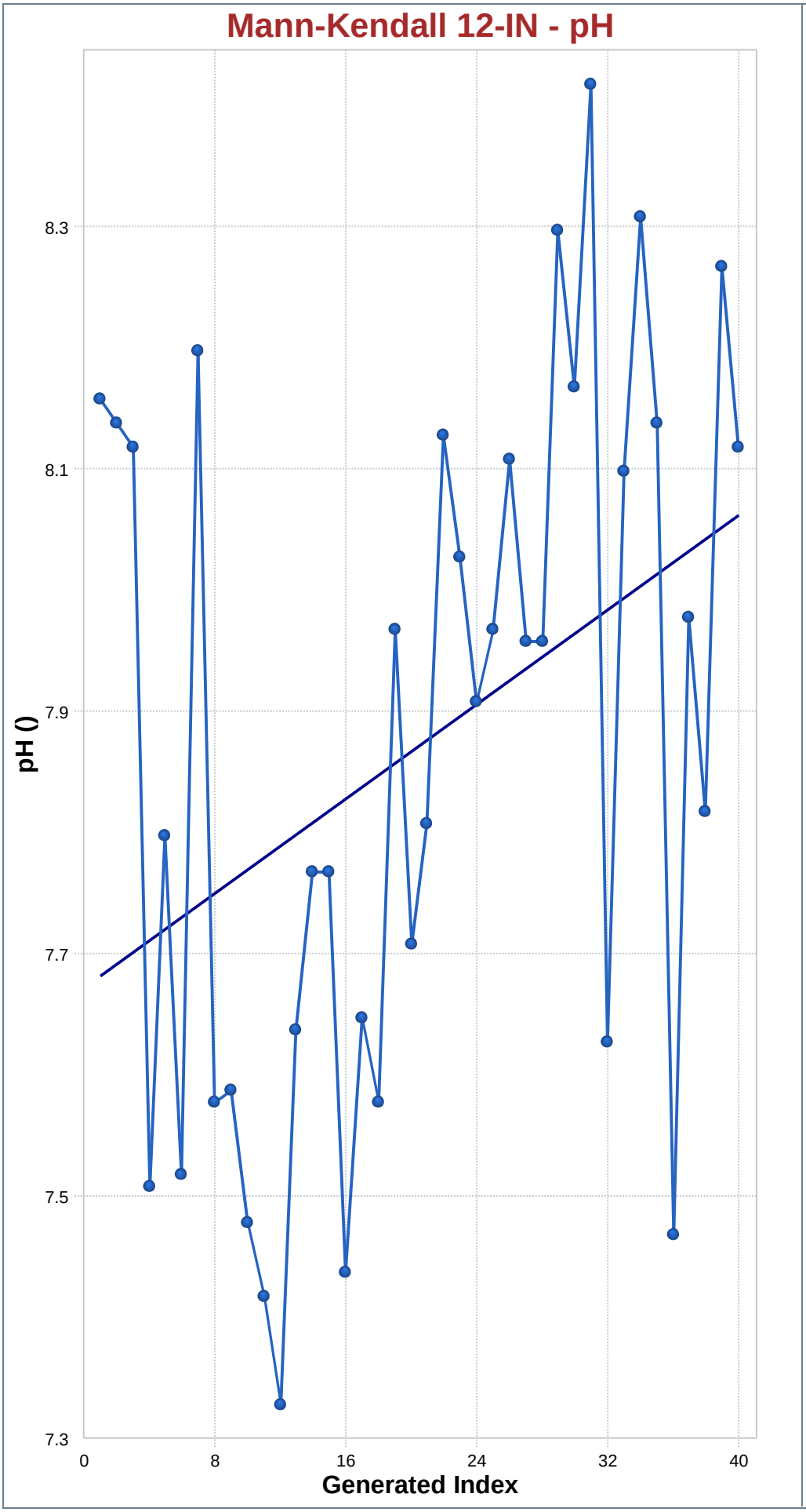

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.3104 |
| Standardized Value of S | -0.3189 |
| M-K Test Value (S) | -18 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3749 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0025 |
| OLS Regression Intercept | 0.1740 |

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



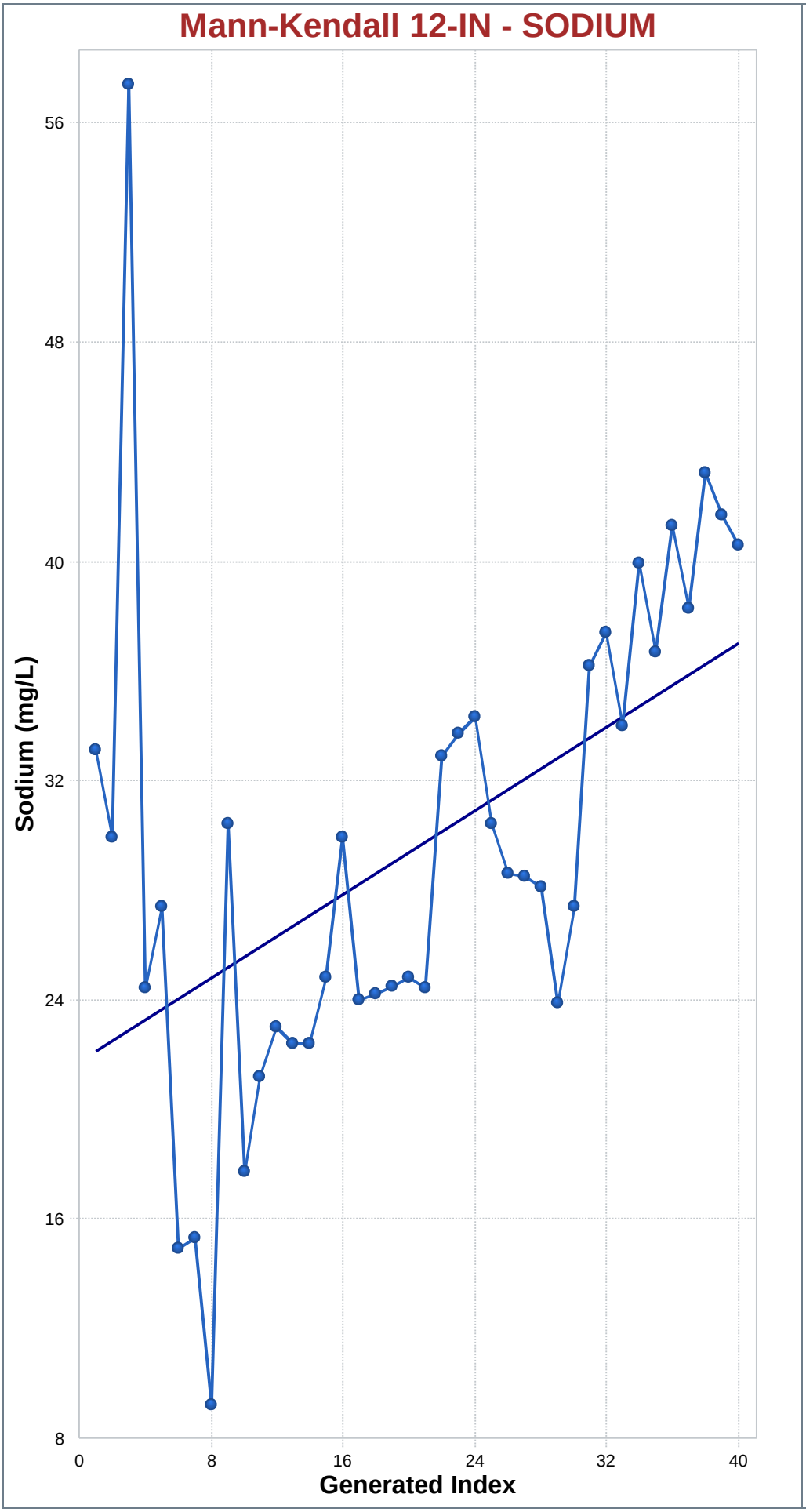

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 40 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 85.7943 |
| Standardized Value of S | 2.5759 |
| M-K Test Value (S) | 222 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0050 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0097 |
| OLS Regression Intercept | 7.6651 |

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




**Mann-Kendall Trend Analysis**

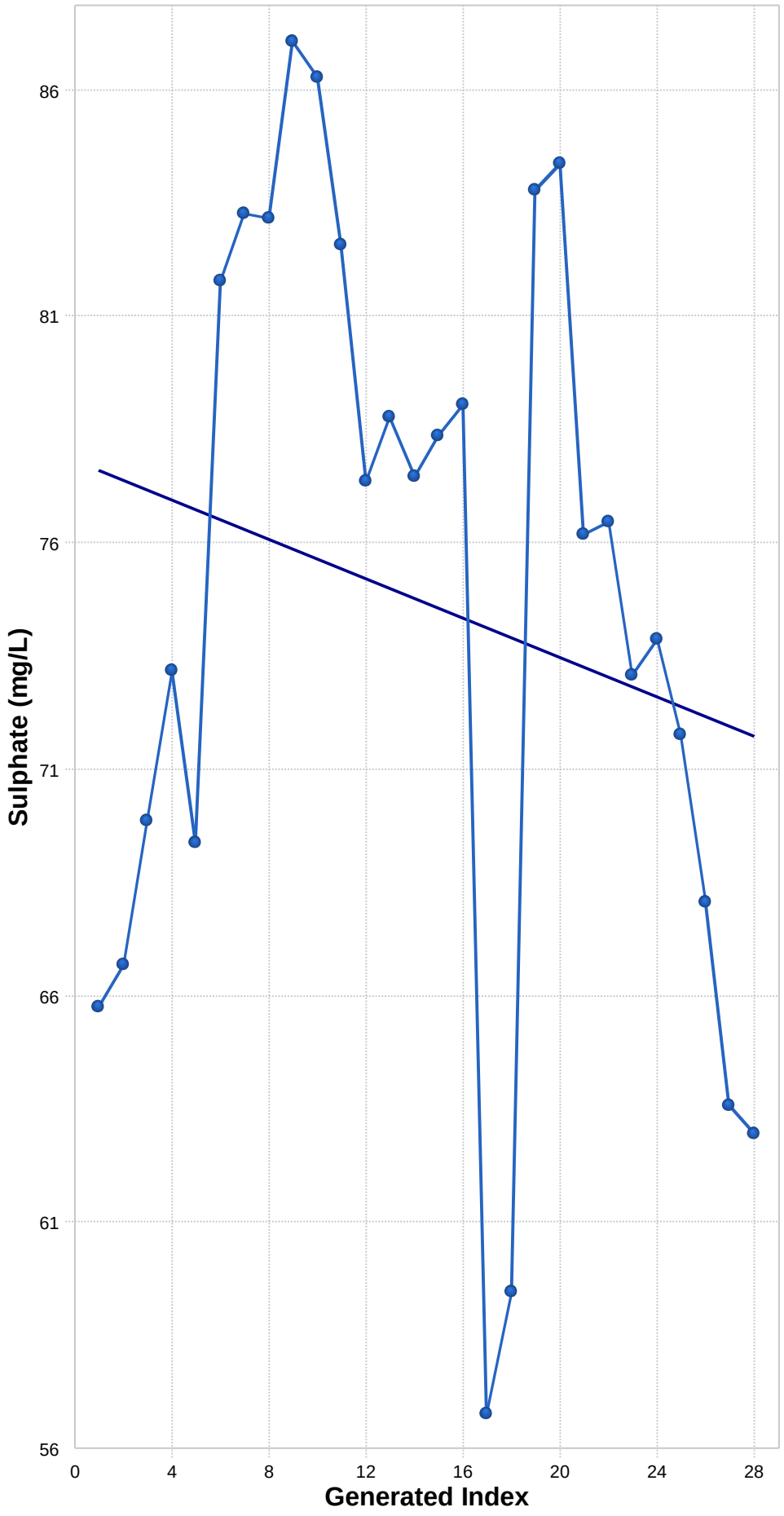
| | |
|---|---|
| n | 40 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 85.7943 |
| Standardized Value of S | 4.4409 |
| M-K Test Value (S) | 382 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3824 |
| OLS Regression Intercept | 21.8212 |

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

# Mann-Kendall 12-IN - SULPHATE



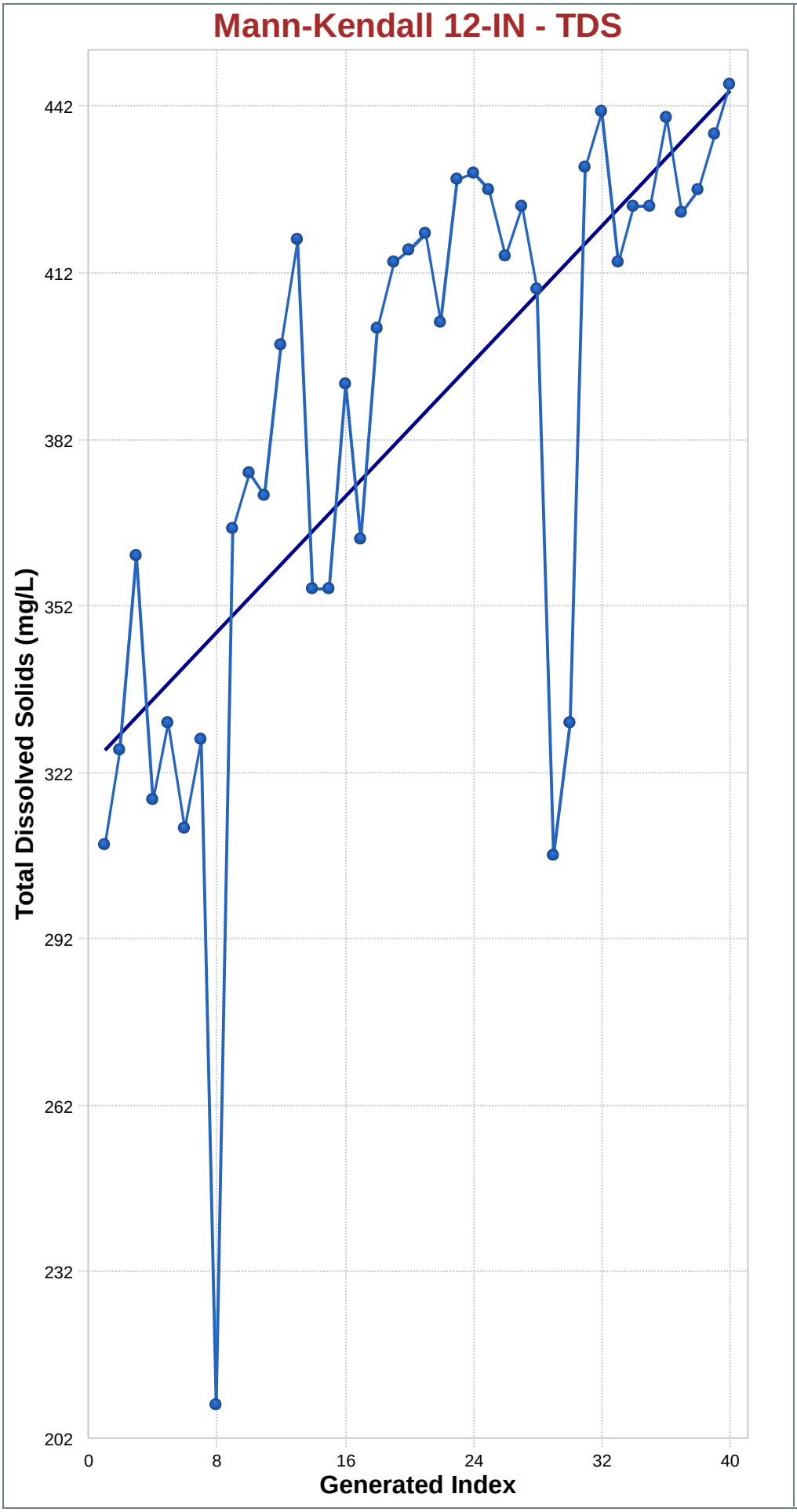

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 50.6162 |
| Standardized Value of S | -1.2447 |
| M-K Test Value (S) | -64 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1066 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.2174 |
| OLS Regression Intercept | 77.8381 |

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



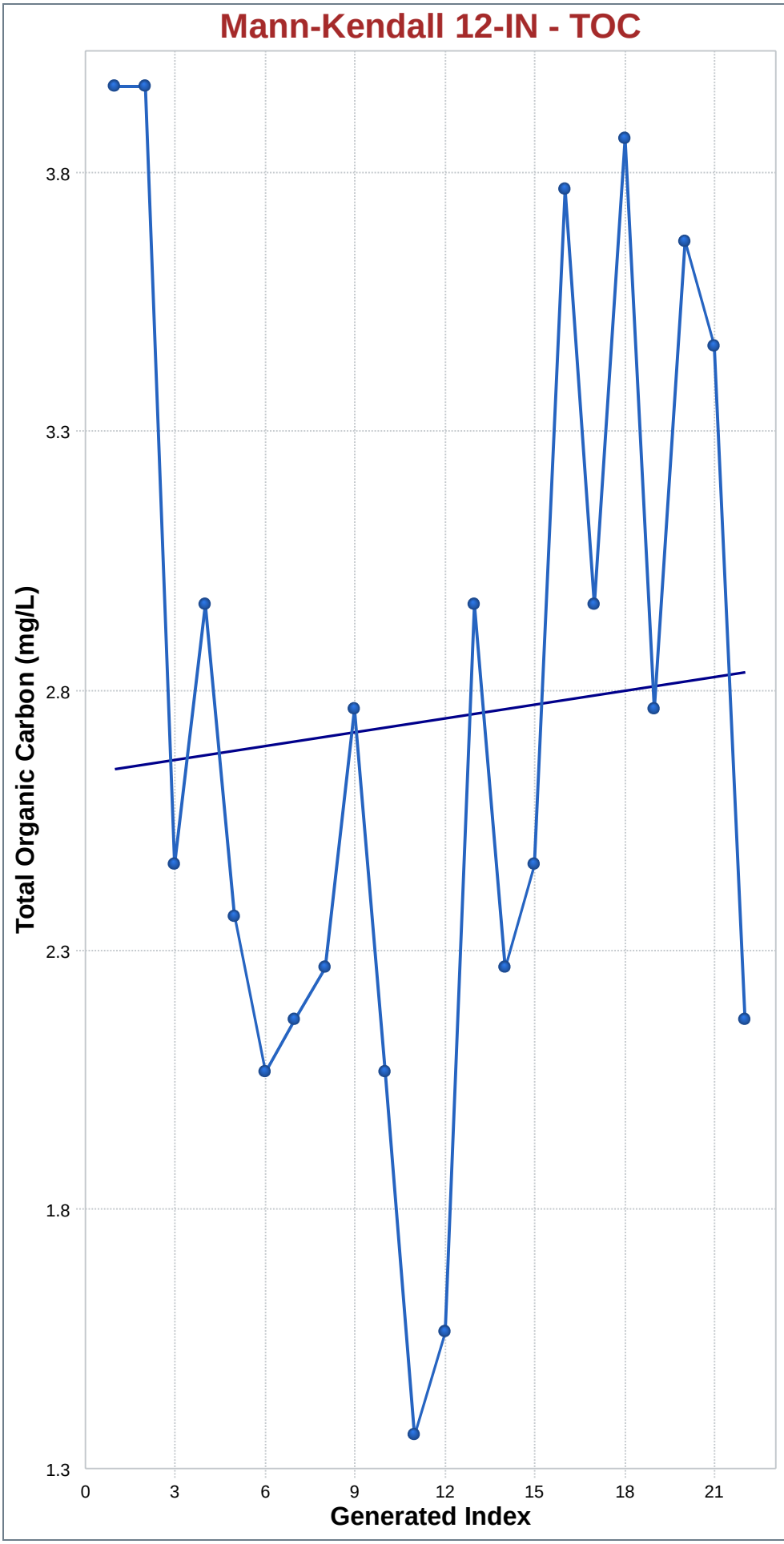

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 40 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 85.7846 |
| Standardized Value of S | 5.5255 |
| M-K Test Value (S) | 475 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 3.0458 |
| OLS Regression Intercept | 323.1115 |

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



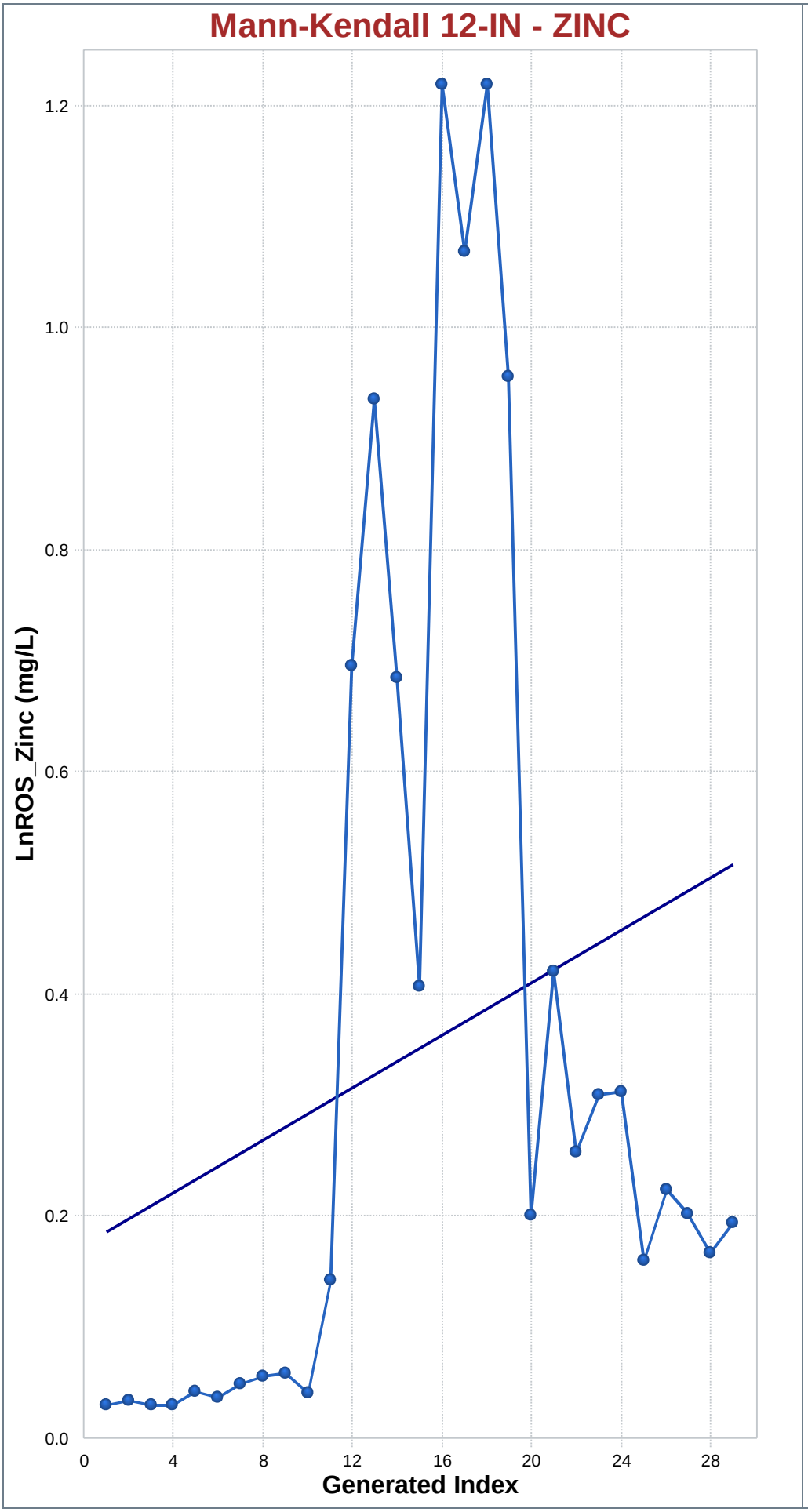

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

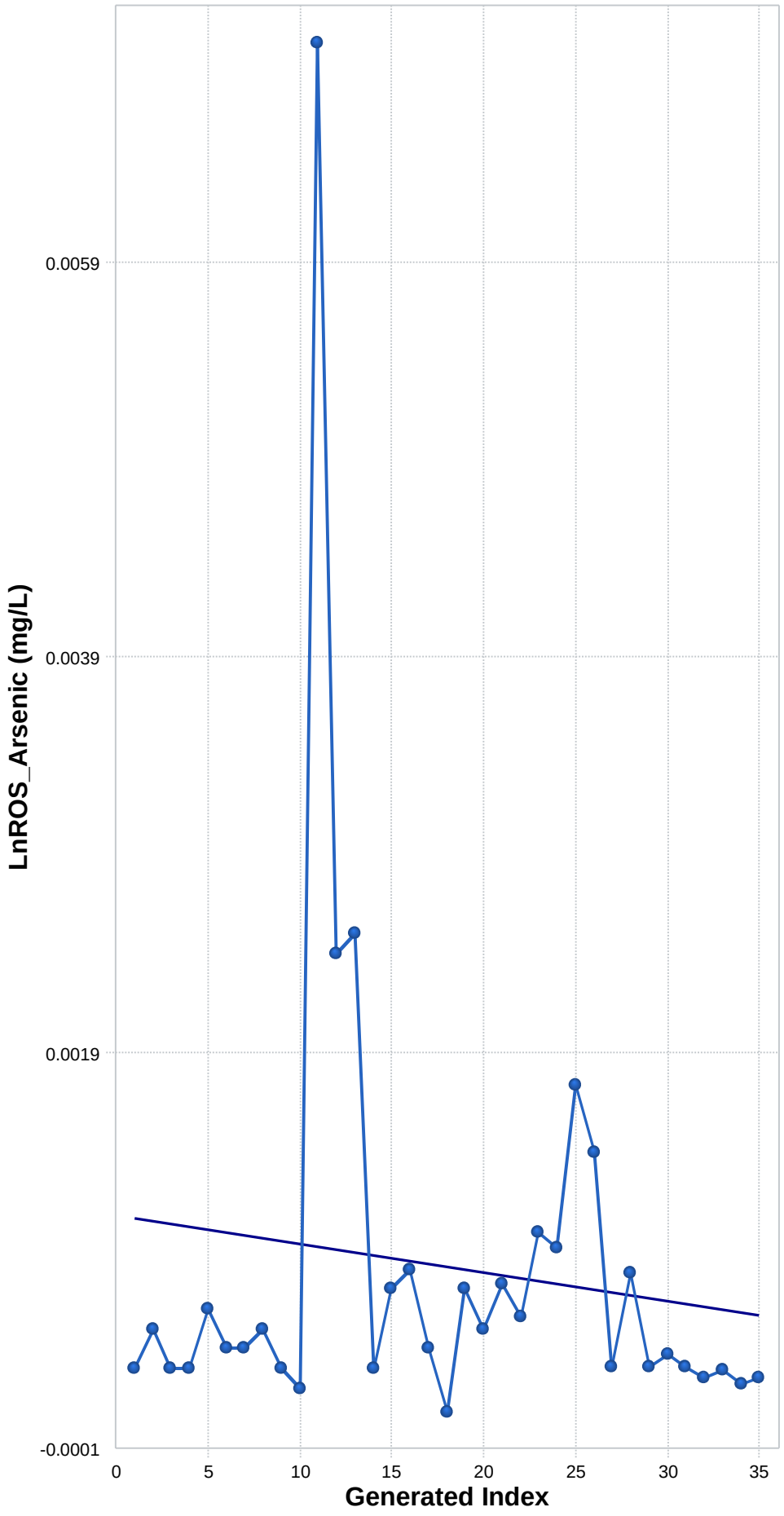
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2917 |
| Standardized Value of S | 2.7584 |
| M-K Test Value (S) | 148 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0029 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0118 |
| OLS Regression Intercept | 0.1449 |

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

# Mann-Kendall 13-IN - ARSENIC



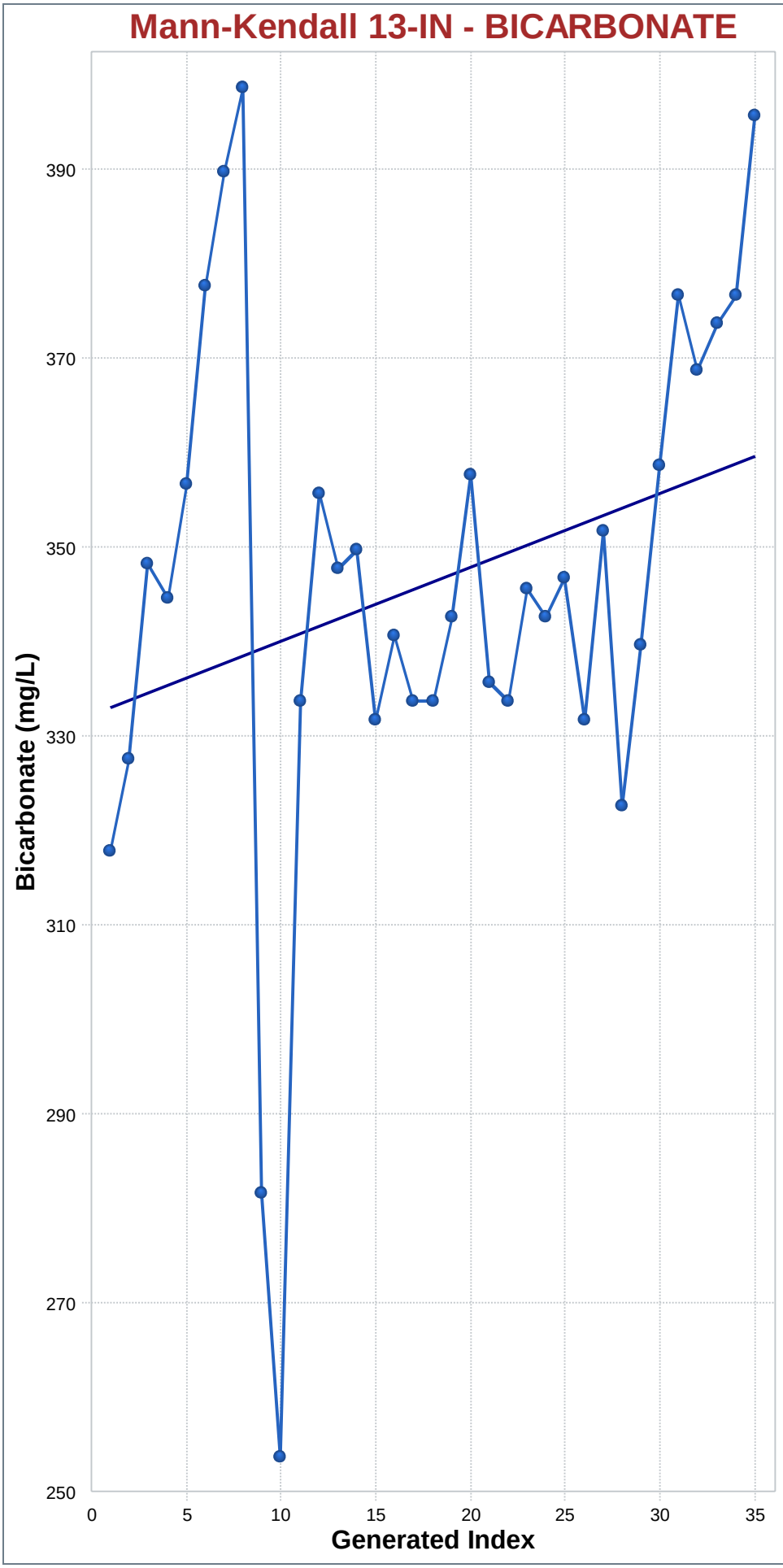

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 35 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 70.2045 |
| Standardized Value of S | -0.5270 |
| M-K Test Value (S) | -38 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.2991 |

**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**

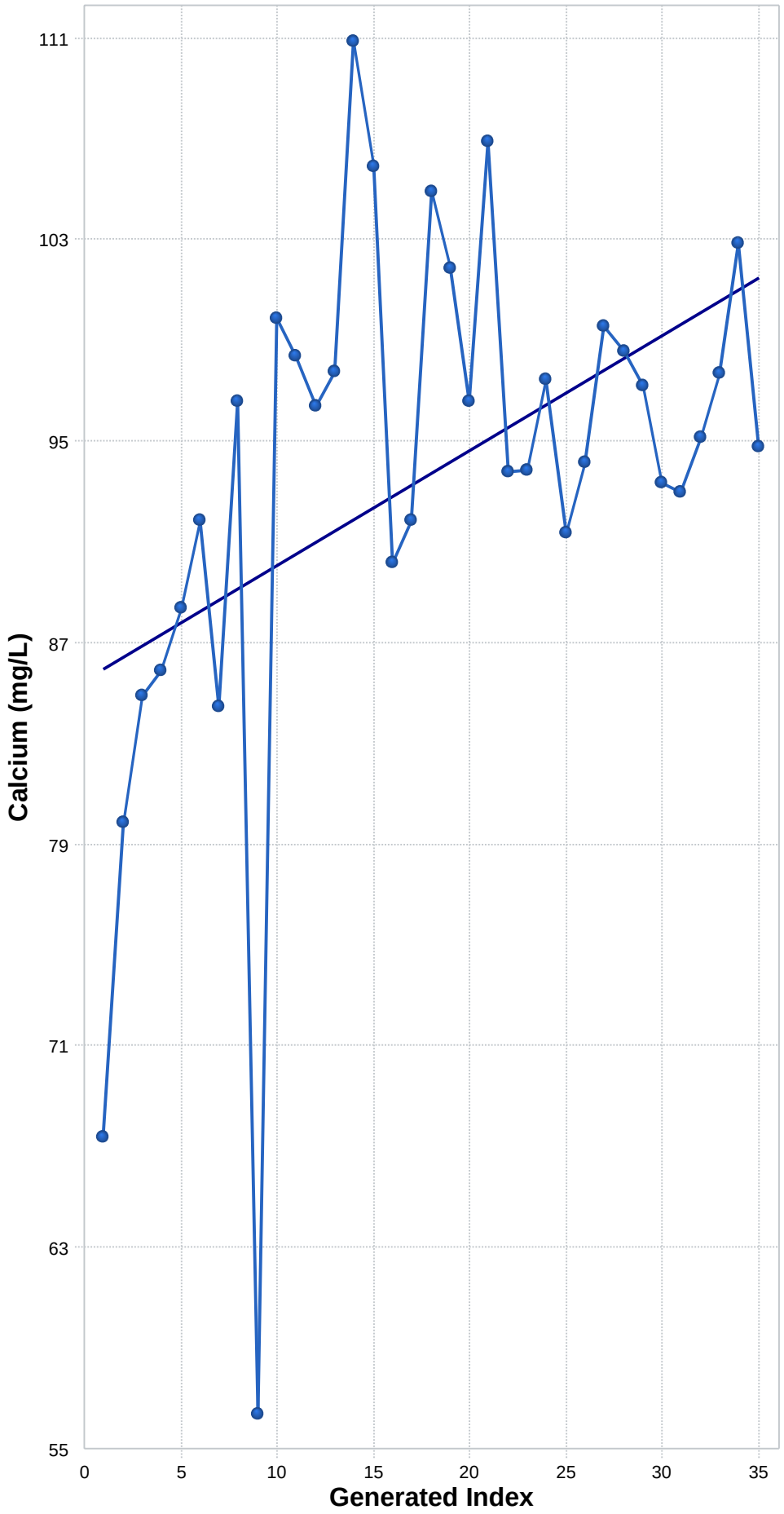
| | |
|---|---|
| n | 35 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 70.3325 |
| Standardized Value of S | 1.8341 |
| M-K Test Value (S) | 130 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0333 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.7830 |
| OLS Regression Intercept | 332.6123 |

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

# Mann-Kendall 13-IN - CALCIUM




**Mann-Kendall Trend Analysis**

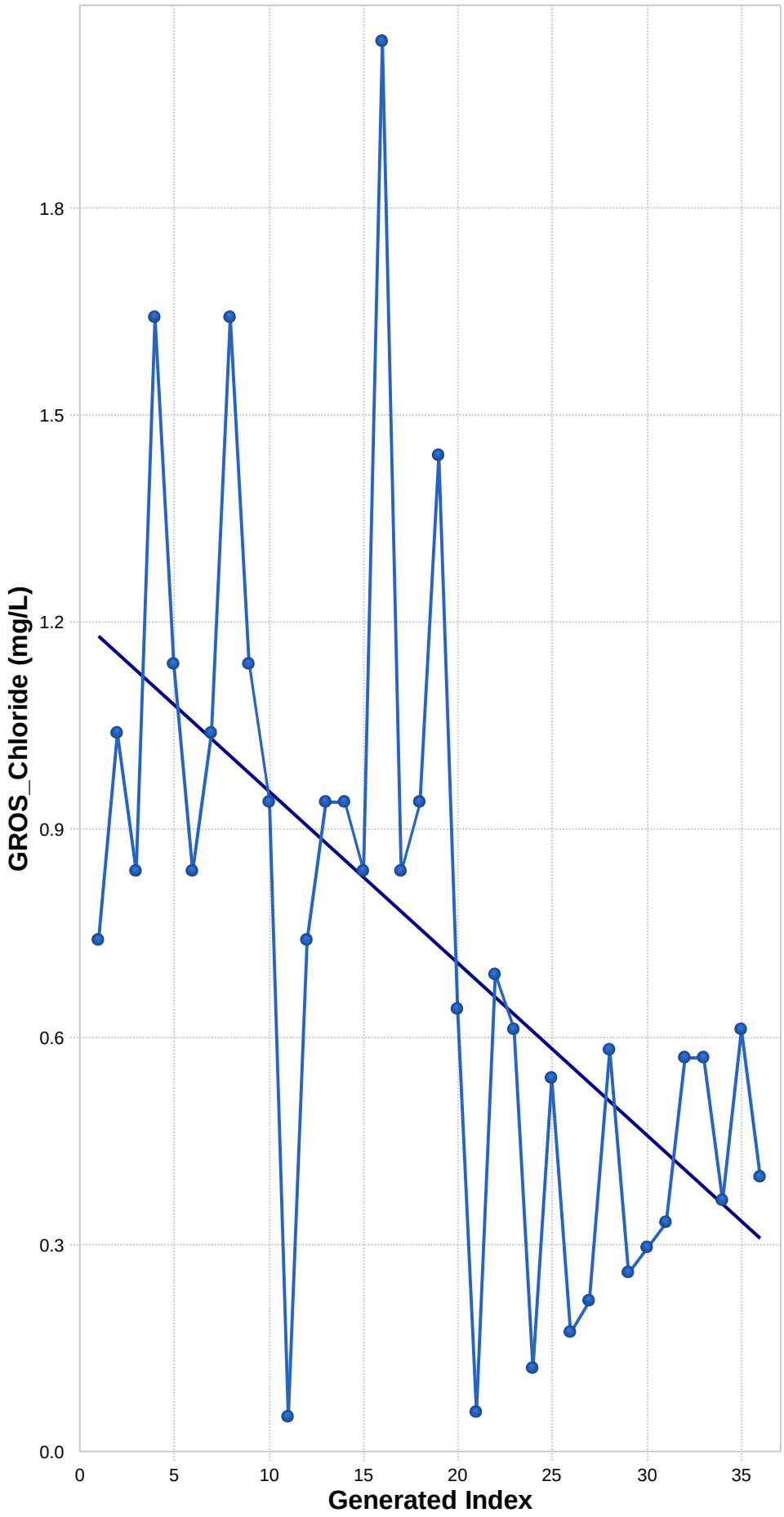
| | |
|---|---|
| n | 35 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 70.4012 |
| Standardized Value of S | 2.3579 |
| M-K Test Value (S) | 167 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0092 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.4572 |
| OLS Regression Intercept | 85.6076 |

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

# Mann-Kendall 13-IN - CHLORIDE



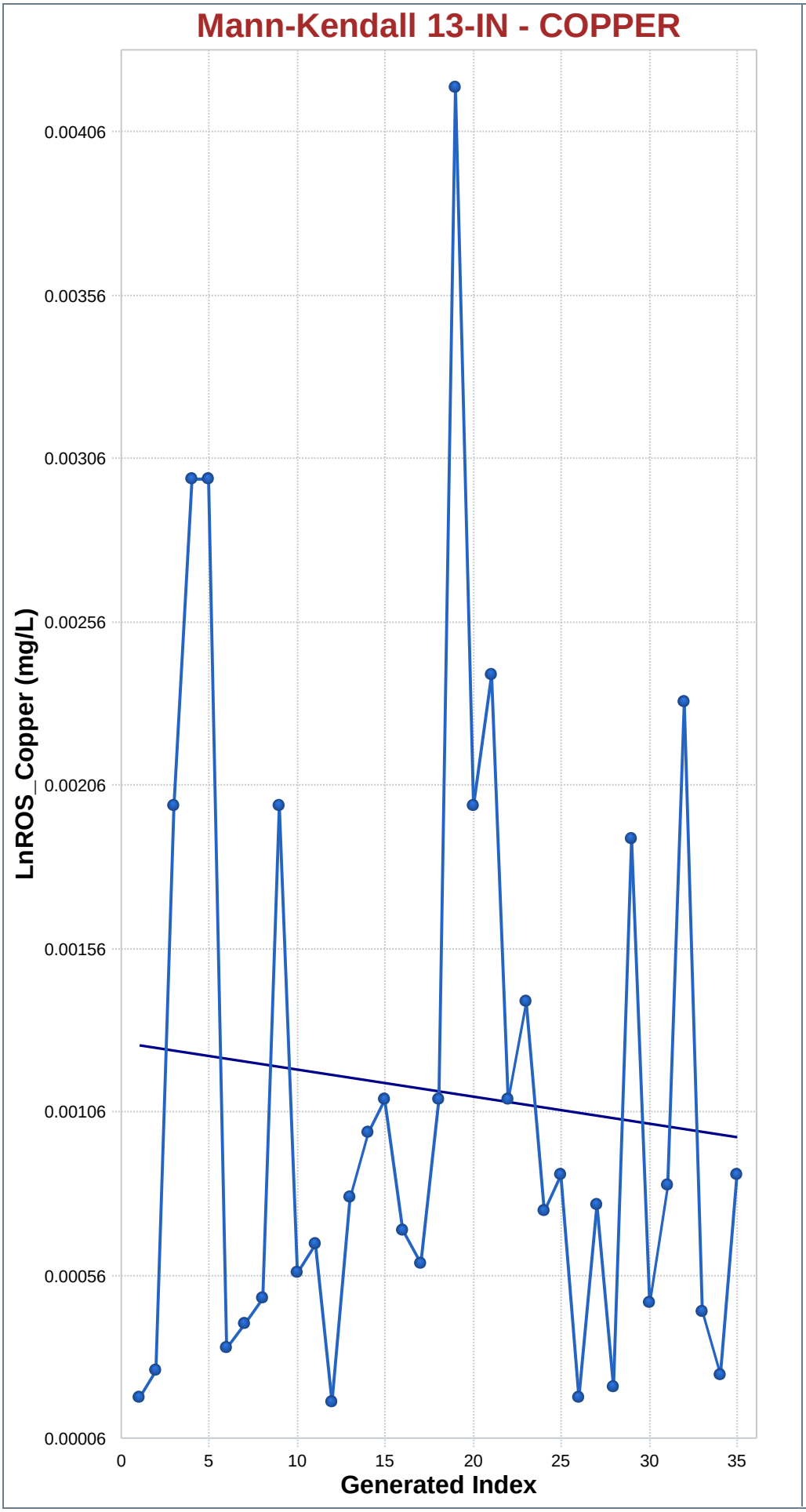

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 36 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 73.2575 |
| Standardized Value of S | -3.6720 |
| M-K Test Value (S) | -270 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0248 |
| OLS Regression Intercept | 1.1637 |

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




**Mann-Kendall Trend Analysis**

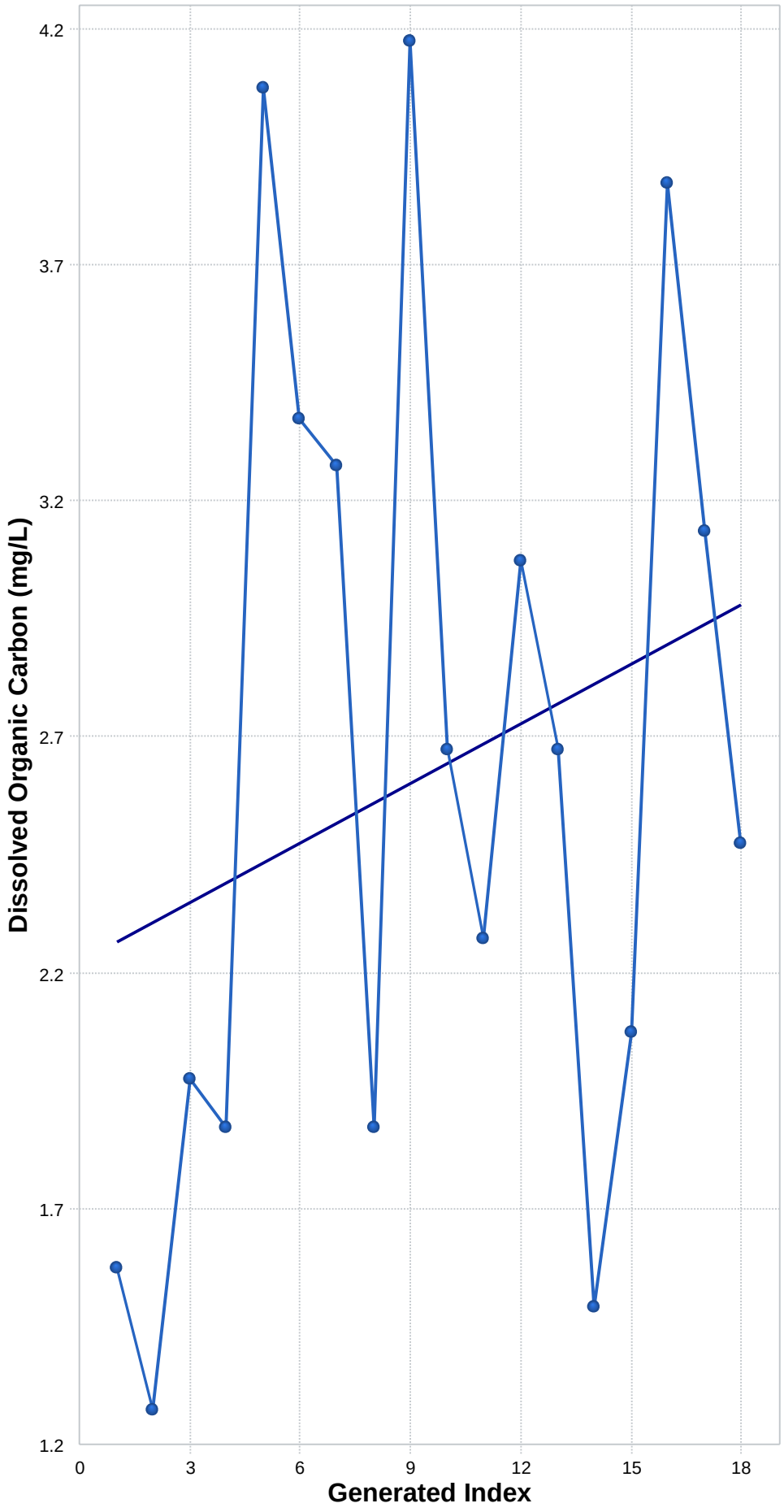
| | |
|---|---|
| n | 35 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 70.3562 |
| Standardized Value of S | 0.2416 |
| M-K Test Value (S) | 18 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.4045 |

**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 13-IN - DOC




**Mann-Kendall Trend Analysis**

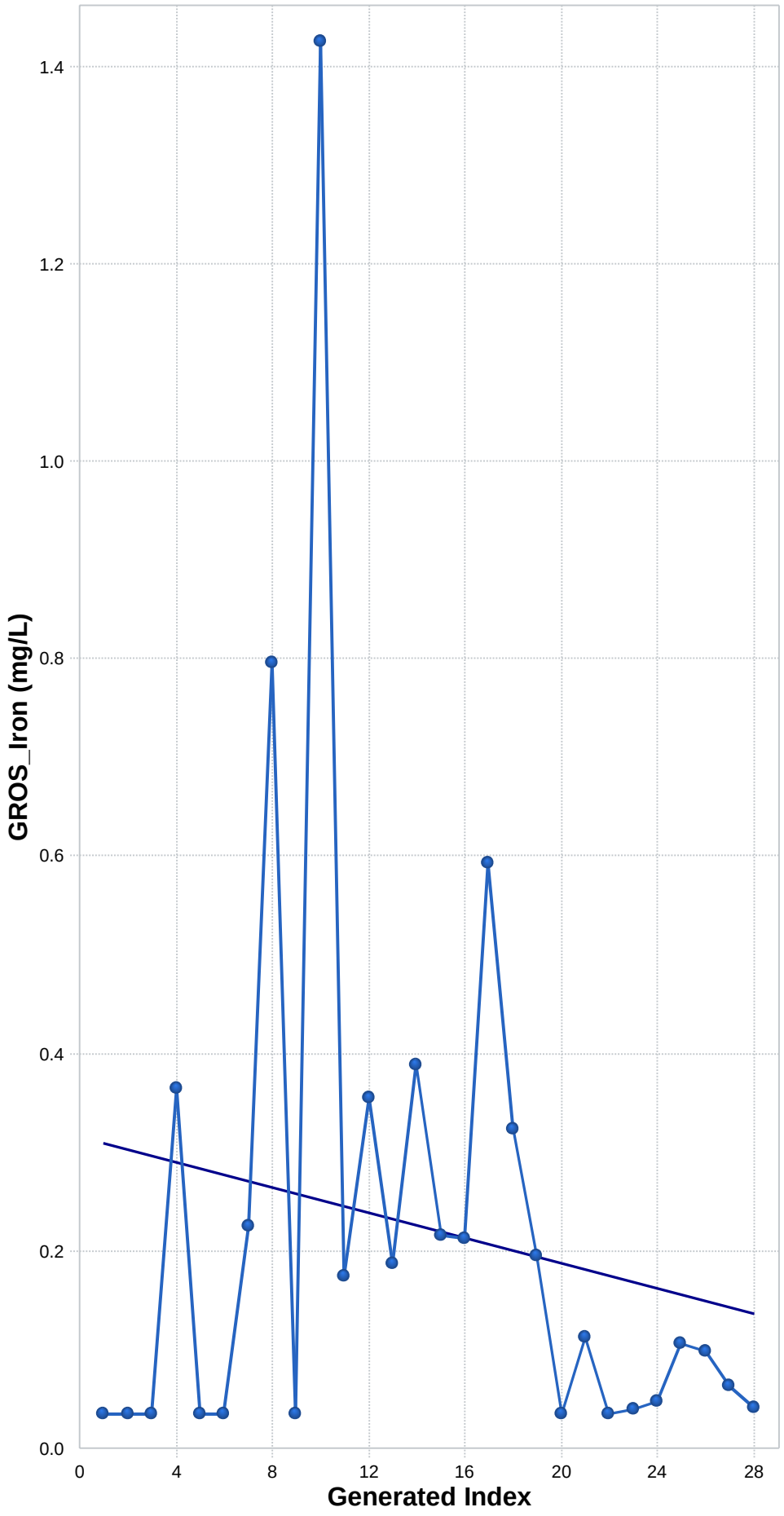
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3629 |
| Standardized Value of S | 0.9104 |
| M-K Test Value (S) | 25 |
| Tabulated p-value | 0.1840 |
| Approximate p-value | 0.1813 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0420 |
| OLS Regression Intercept | 2.2501 |

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

# Mann-Kendall 13-IN - IRON




**Mann-Kendall Trend Analysis**

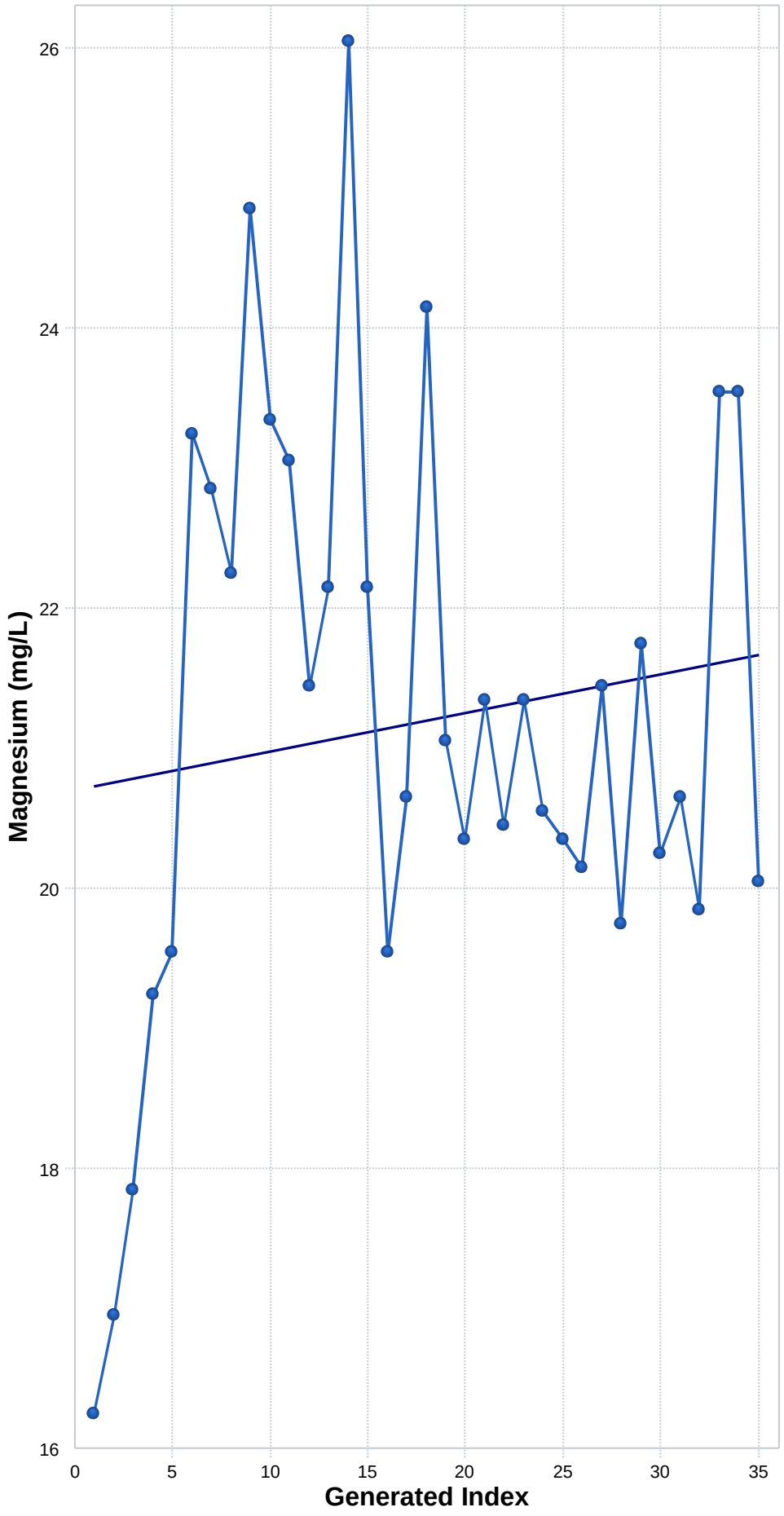
| | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 49.9667 |
| Standardized Value of S | -0.2602 |
| M-K Test Value (S) | -14 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3974 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0064 |
| OLS Regression Intercept | 0.2910 |

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

# Mann-Kendall 13-IN - MAGNESIUM



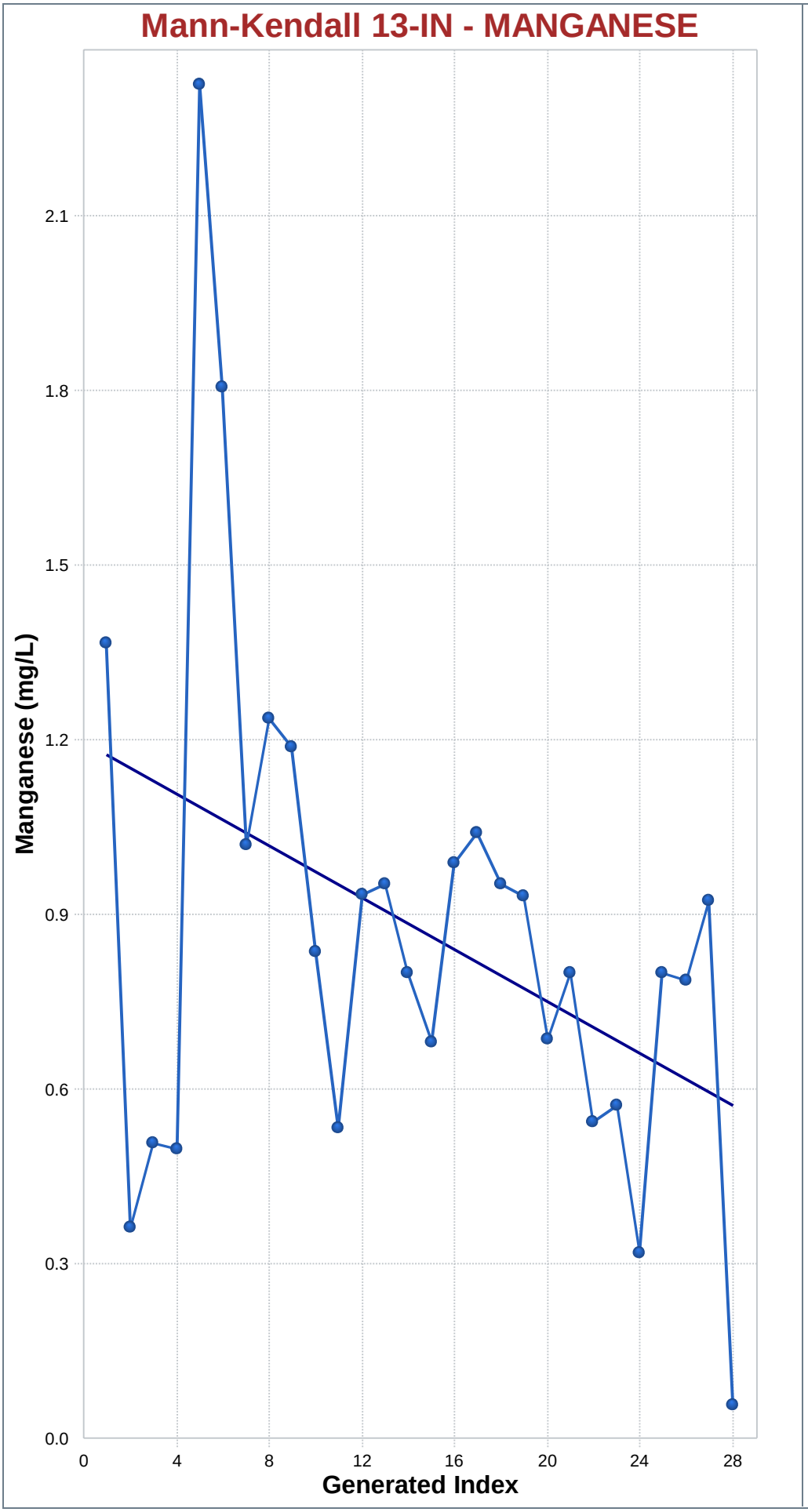

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 35 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 70.3657 |
| Standardized Value of S | 0.0142 |
| M-K Test Value (S) | 2 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.4943 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0275 |
| OLS Regression Intercept | 20.4573 |

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



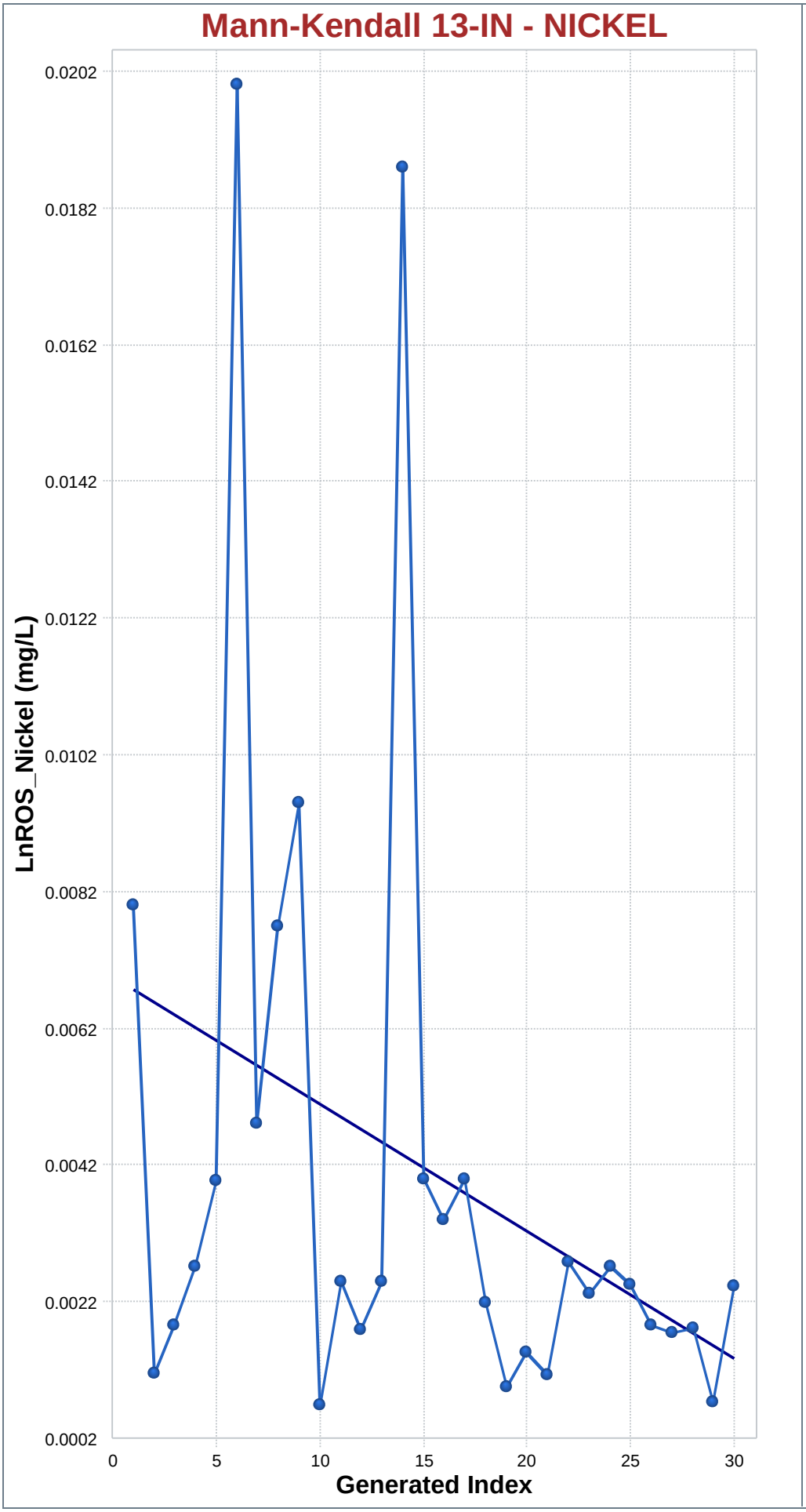

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 50.6063 |
| Standardized Value of S | -2.0551 |
| M-K Test Value (S) | -105 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0199 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0223 |
| OLS Regression Intercept | 1.1503 |

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



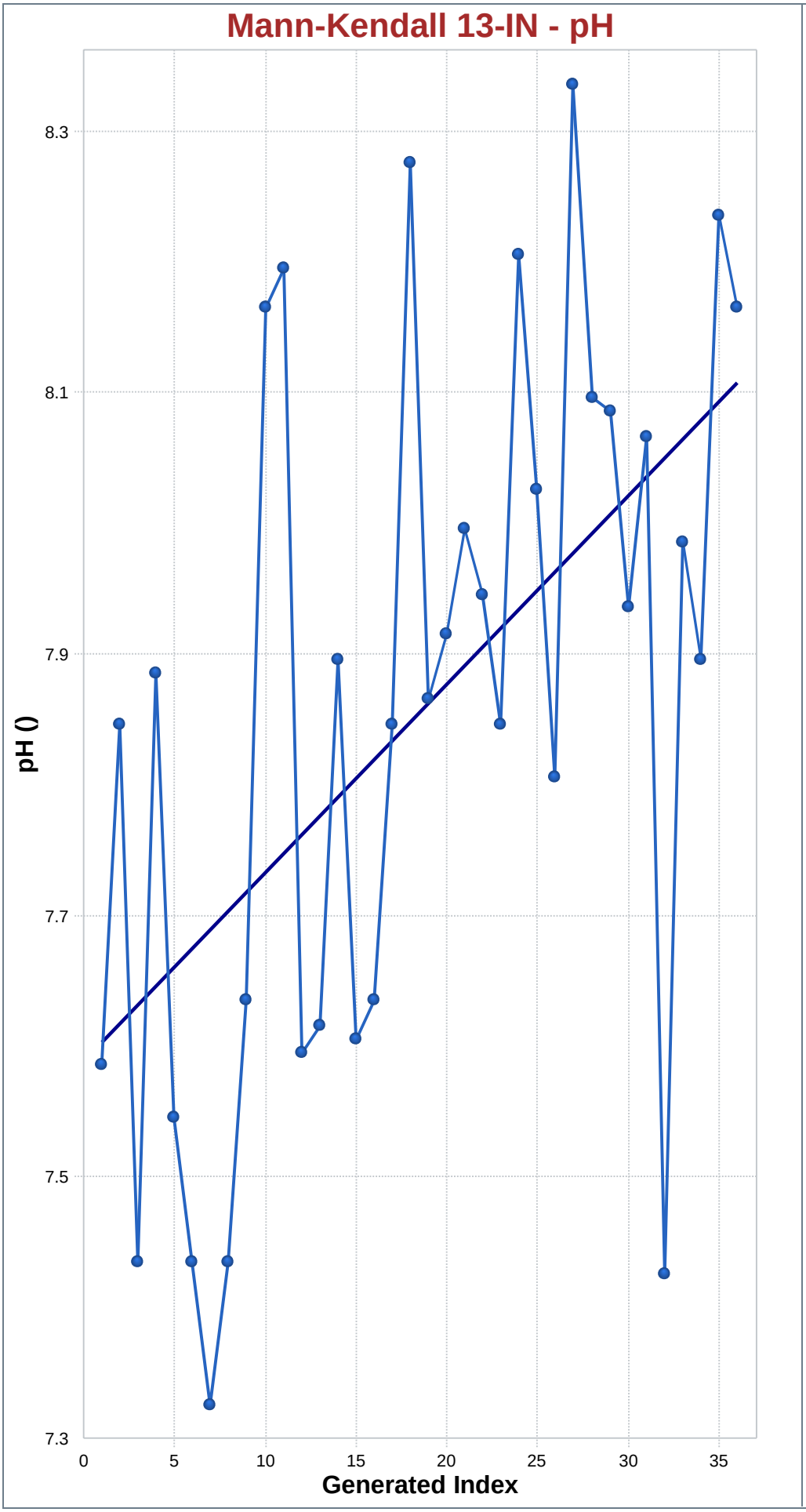

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0327 |
| Standardized Value of S | -2.2487 |
| M-K Test Value (S) | -127 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0123 |

**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**

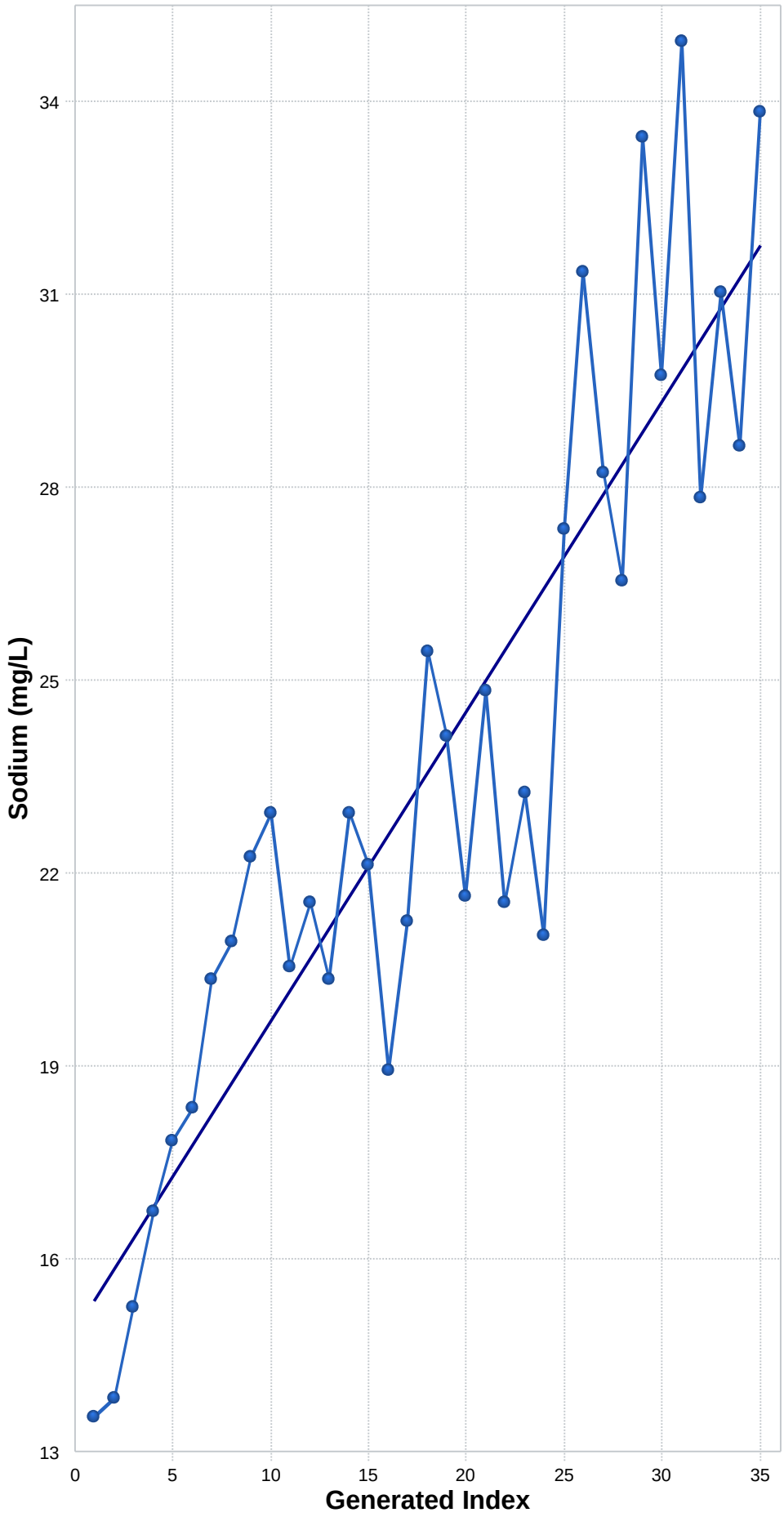
| | |
|---|---|
| n | 36 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 73.3462 |
| Standardized Value of S | 3.5176 |
| M-K Test Value (S) | 259 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0002 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0144 |
| OLS Regression Intercept | 7.5933 |

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

# Mann-Kendall 13-IN - SODIUM



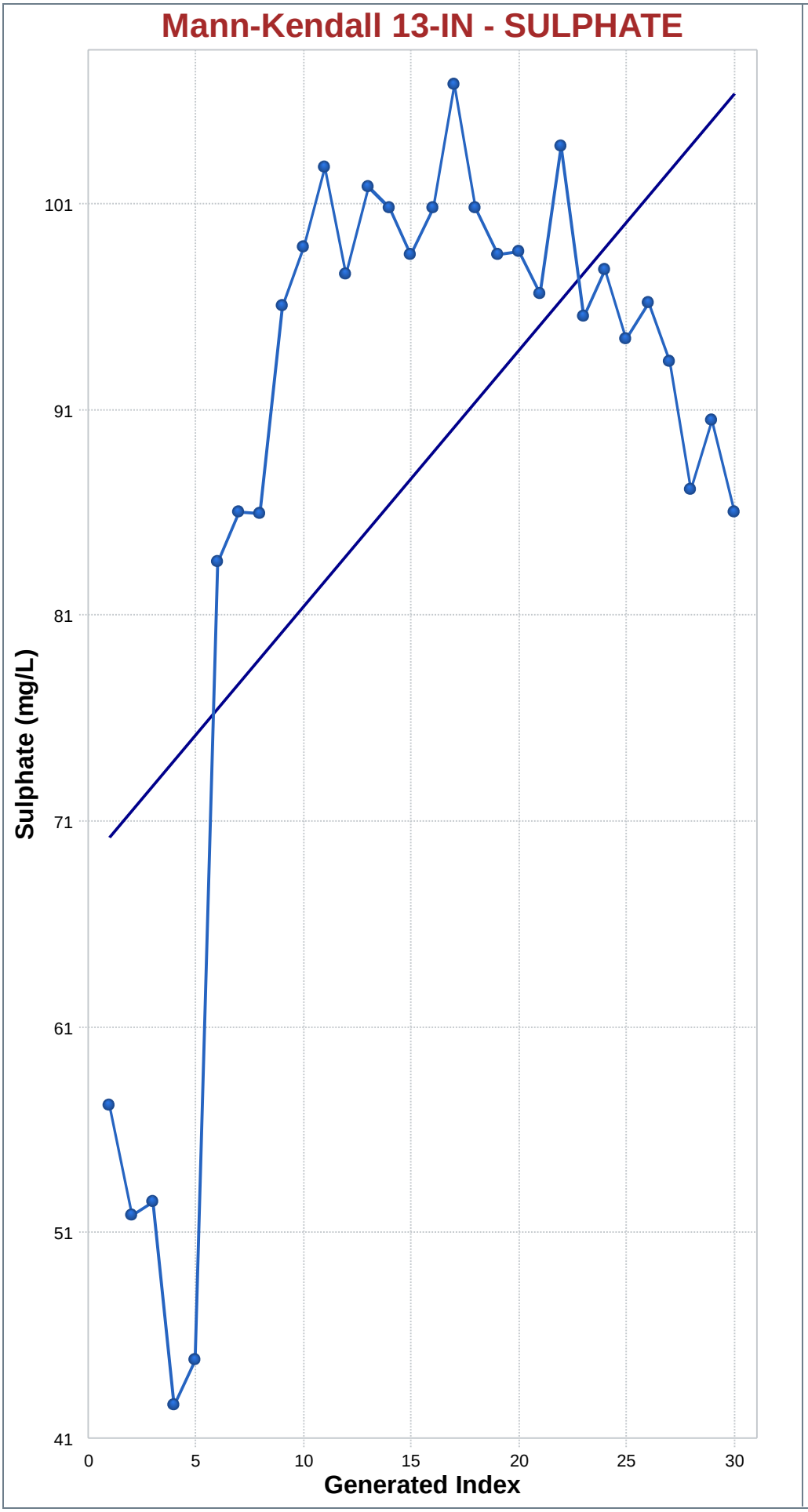

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 35 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 70.3941 |
| Standardized Value of S | 6.1795 |
| M-K Test Value (S) | 436 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.4831 |
| OLS Regression Intercept | 14.8217 |

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




**Mann-Kendall Trend Analysis**

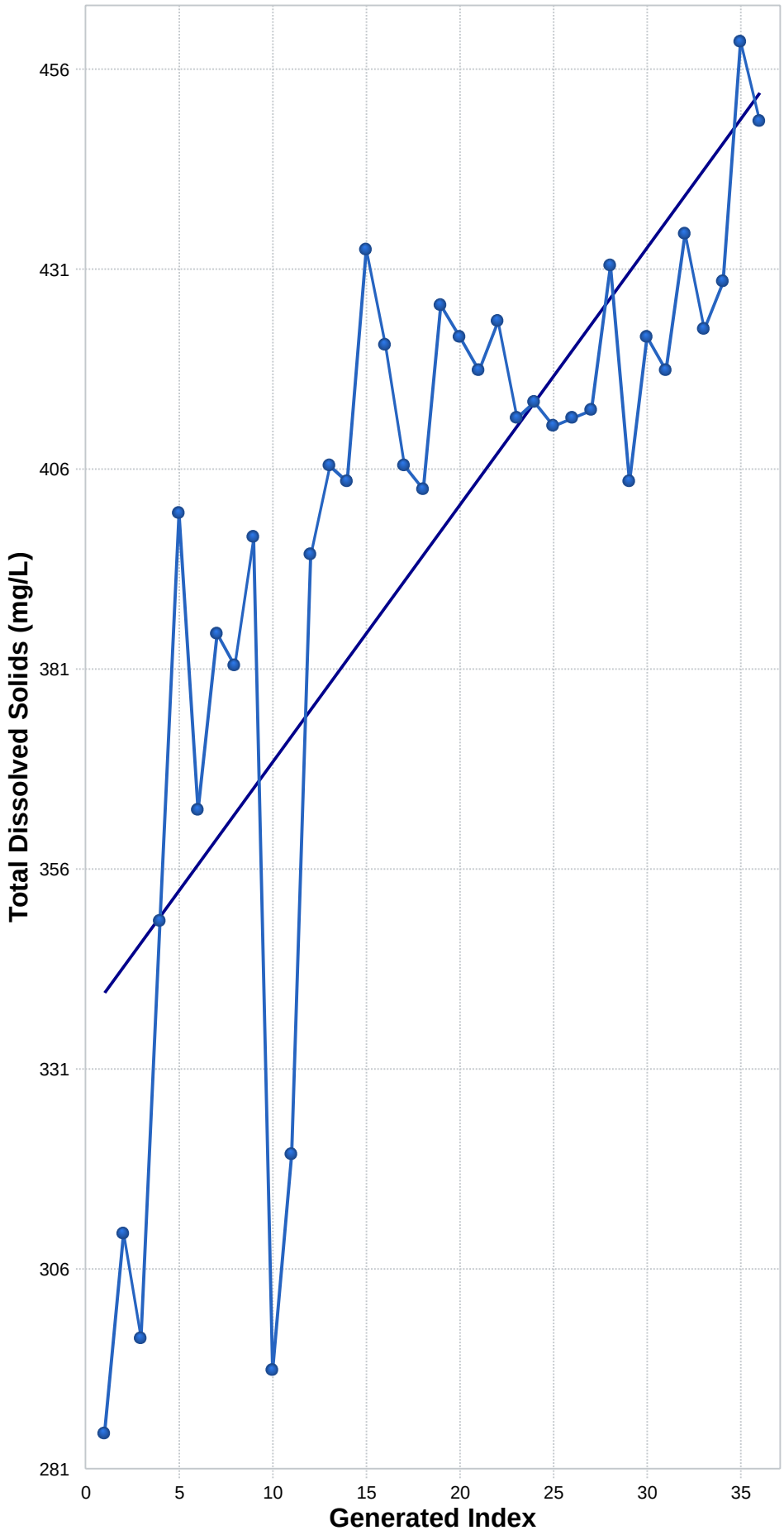
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0000 |
| Standardized Value of S | 1.1964 |
| M-K Test Value (S) | 68 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1158 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.2461 |
| OLS Regression Intercept | 69.1389 |

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

# Mann-Kendall 13-IN - TDS



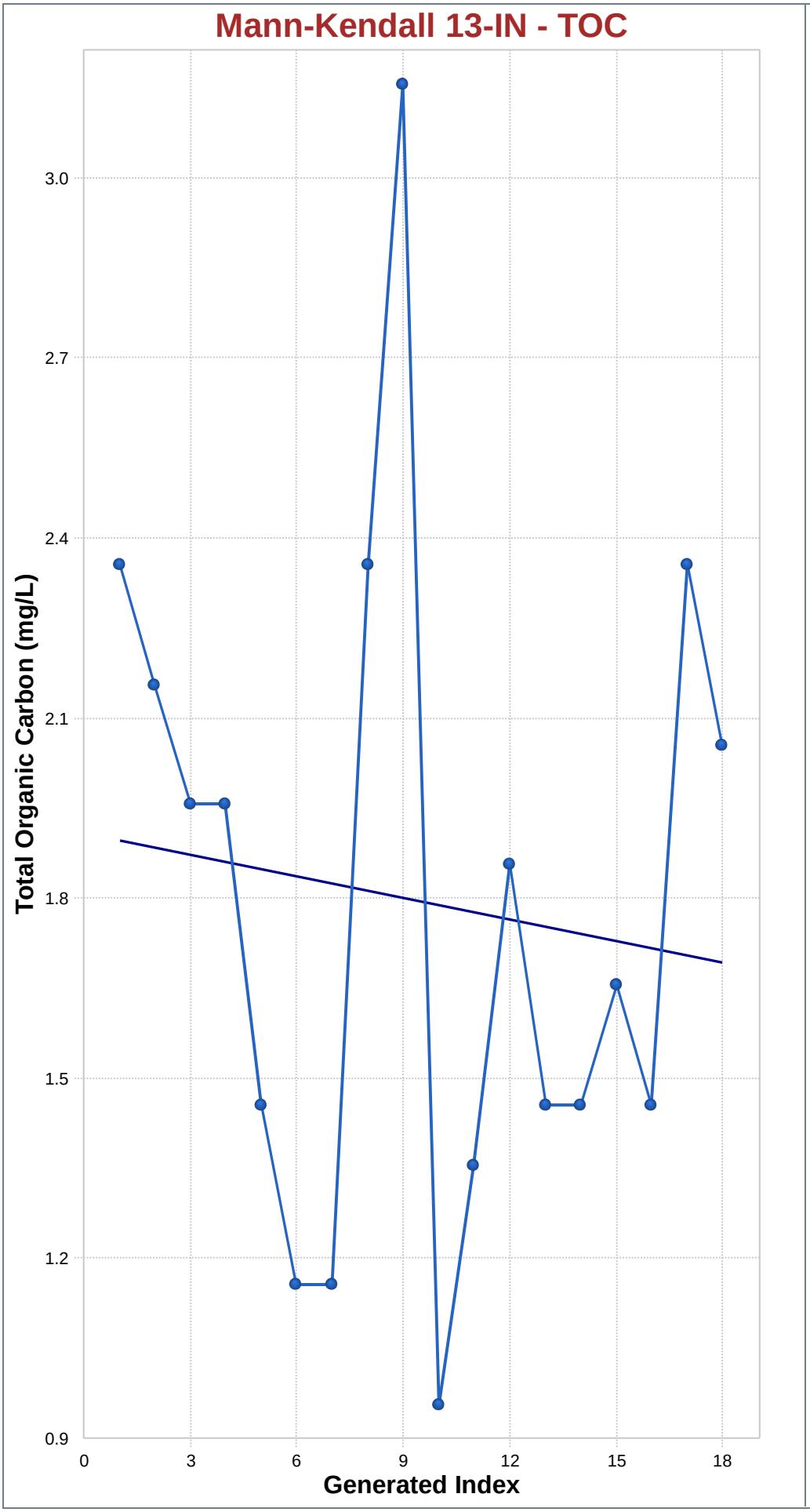

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 36 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 73.3826 |
| Standardized Value of S | 5.5326 |
| M-K Test Value (S) | 407 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 3.2144 |
| OLS Regression Intercept | 336.9222 |

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




**Mann-Kendall Trend Analysis**

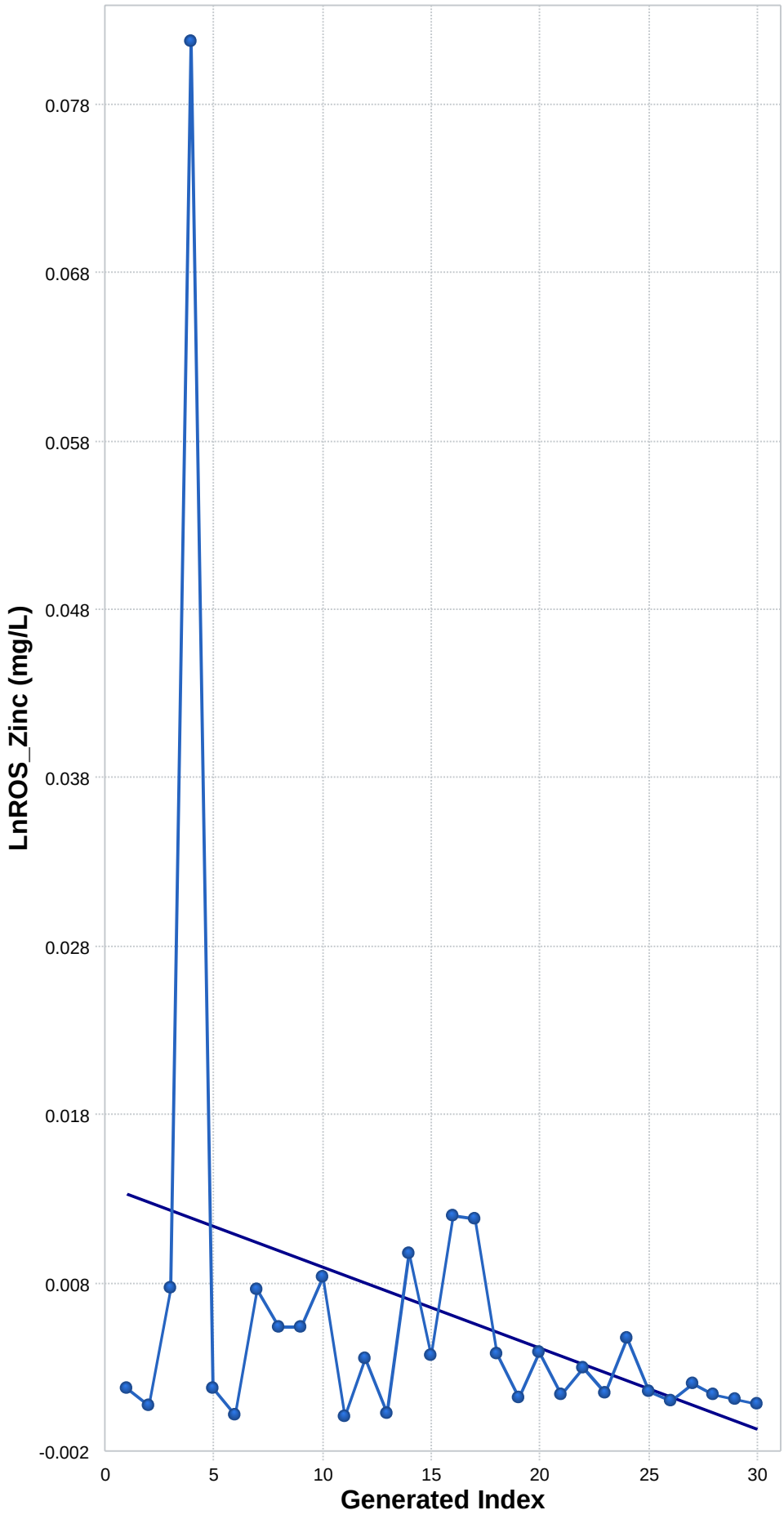
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.1279 |
| Standardized Value of S | -0.3445 |
| M-K Test Value (S) | -10 |
| Tabulated p-value | 0.3540 |
| Approximate p-value | 0.3653 |

**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 13-IN - ZINC




**Mann-Kendall Trend Analysis**

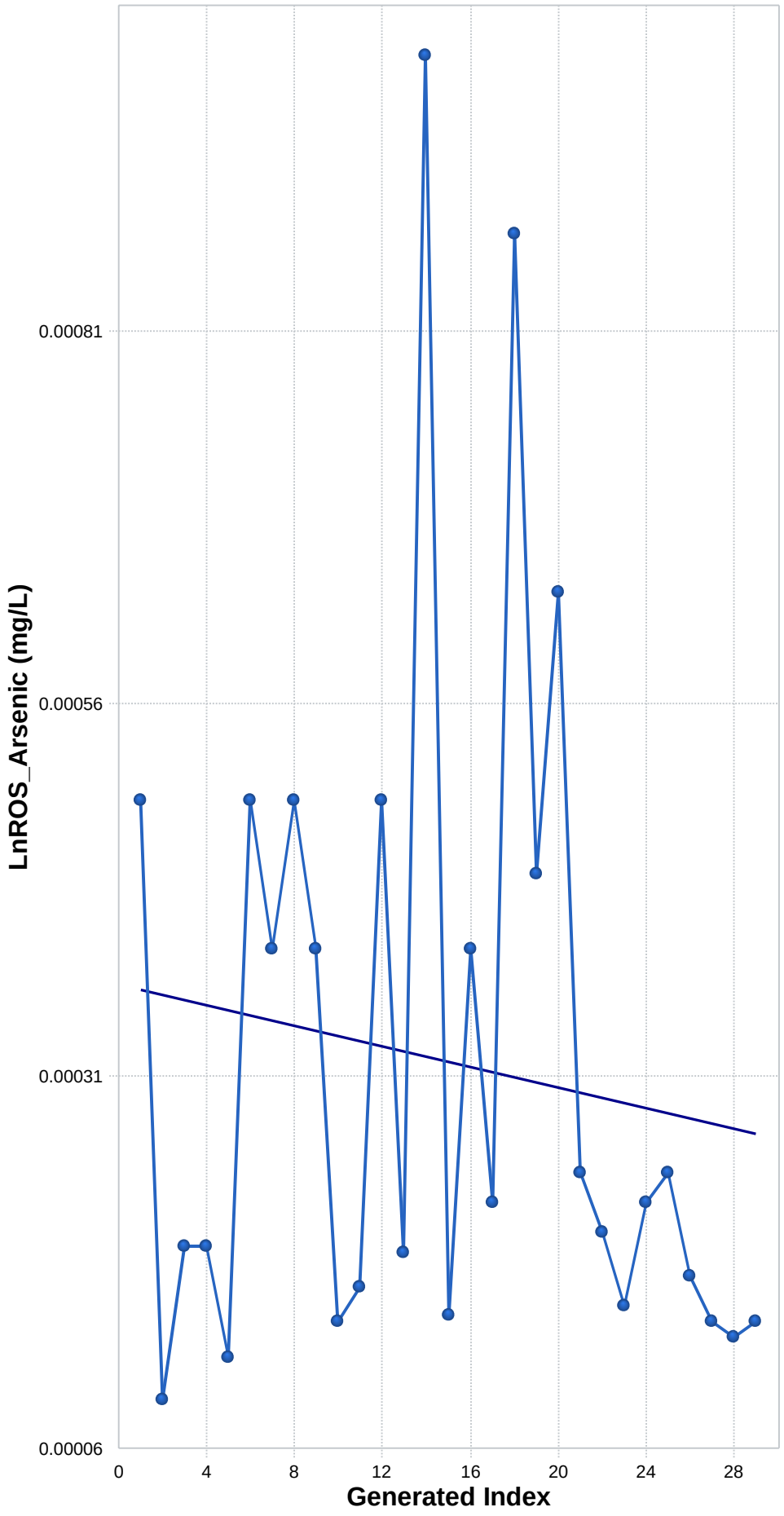
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 56.0238 |
| Standardized Value of S | -1.5529 |
| M-K Test Value (S) | -88 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0602 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0005 |
| OLS Regression Intercept | 0.0140 |

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

# Mann-Kendall 15-IN - ARSENIC




**Mann-Kendall Trend Analysis**

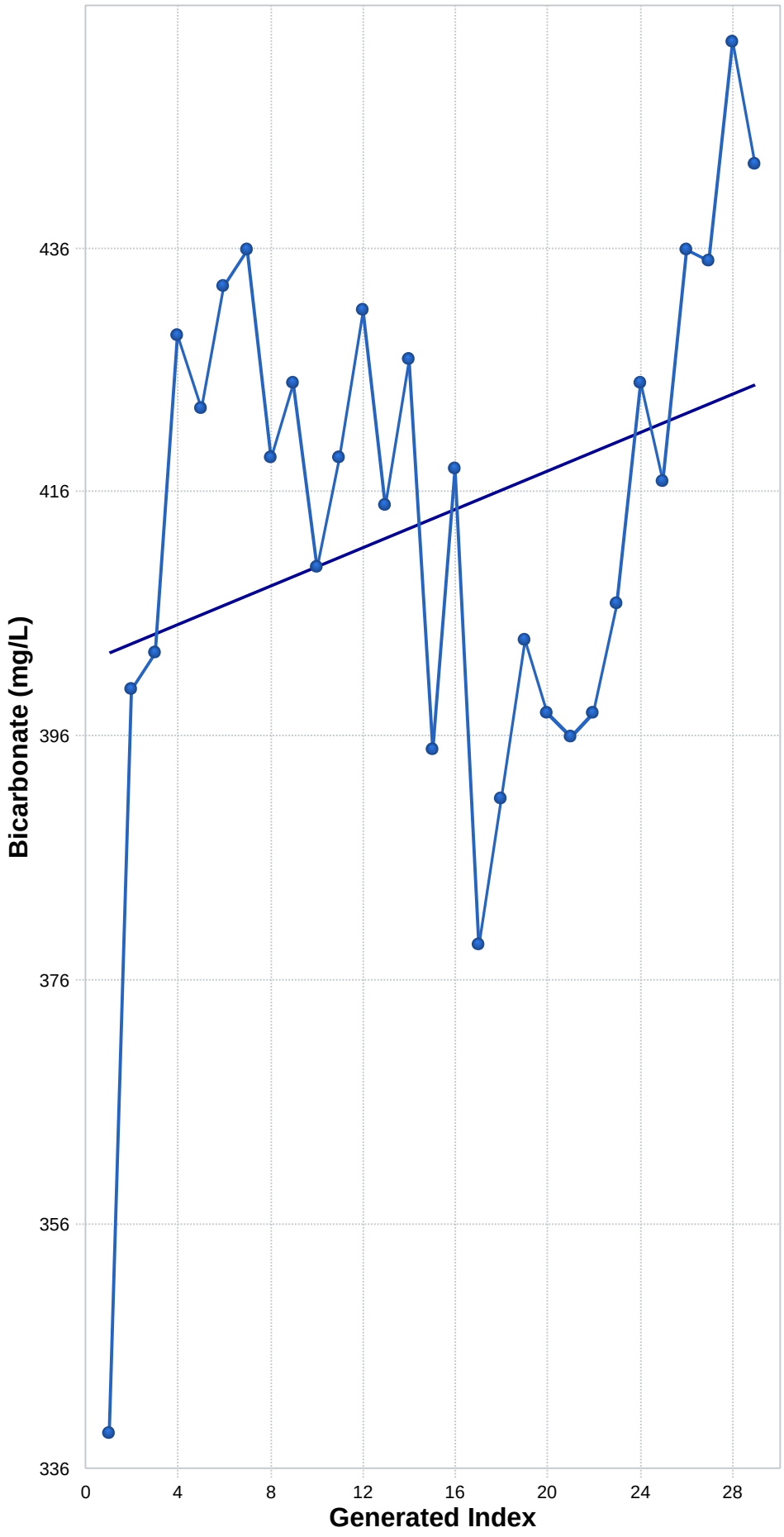
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.1664 |
| Standardized Value of S | -0.8840 |
| M-K Test Value (S) | -48 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1883 |

**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 15-IN - BICARBONATE




**Mann-Kendall Trend Analysis**

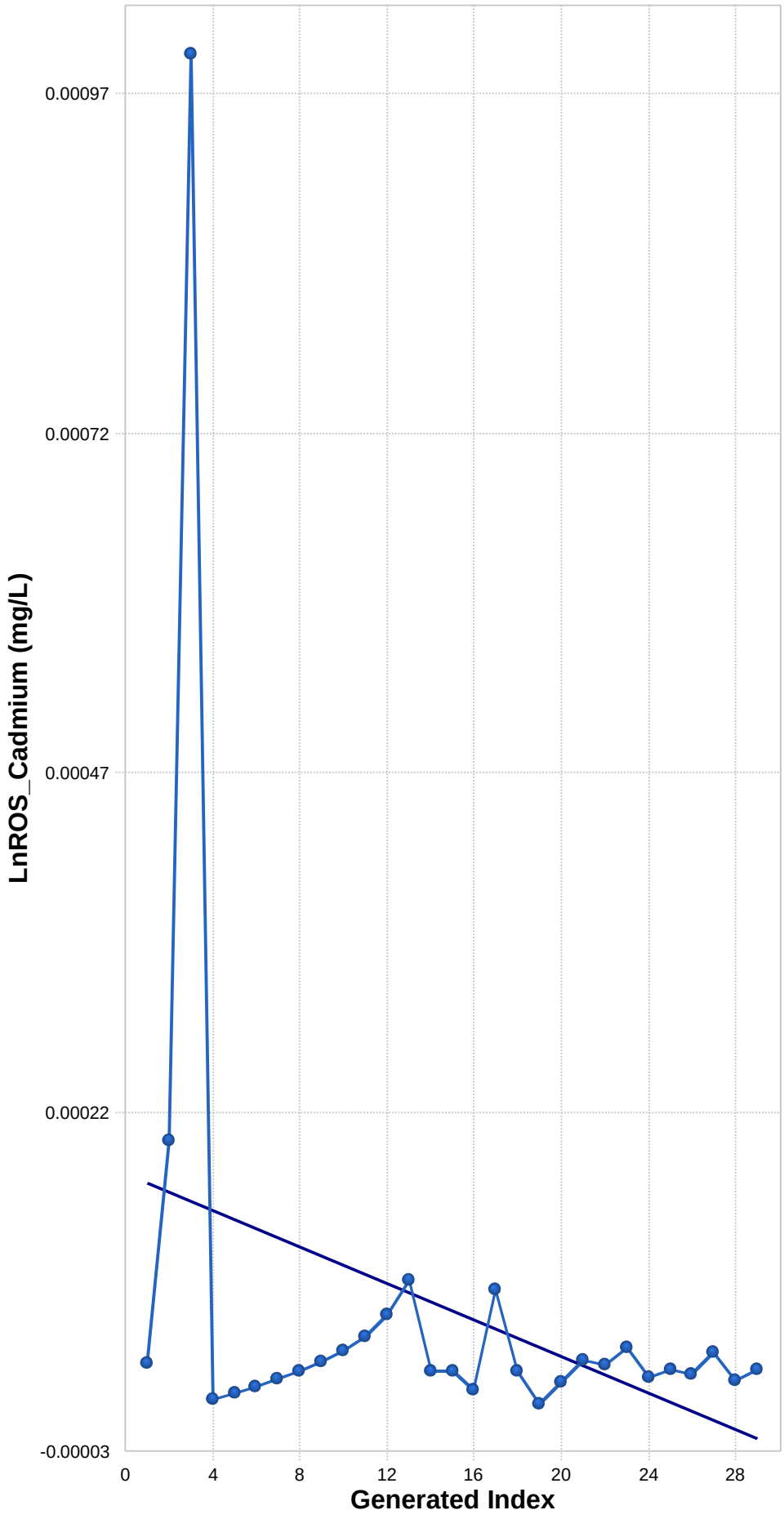
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2729 |
| Standardized Value of S | 0.9949 |
| M-K Test Value (S) | 54 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1599 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.7882 |
| OLS Regression Intercept | 402.1084 |

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

# Mann-Kendall 15-IN - CADMIUM



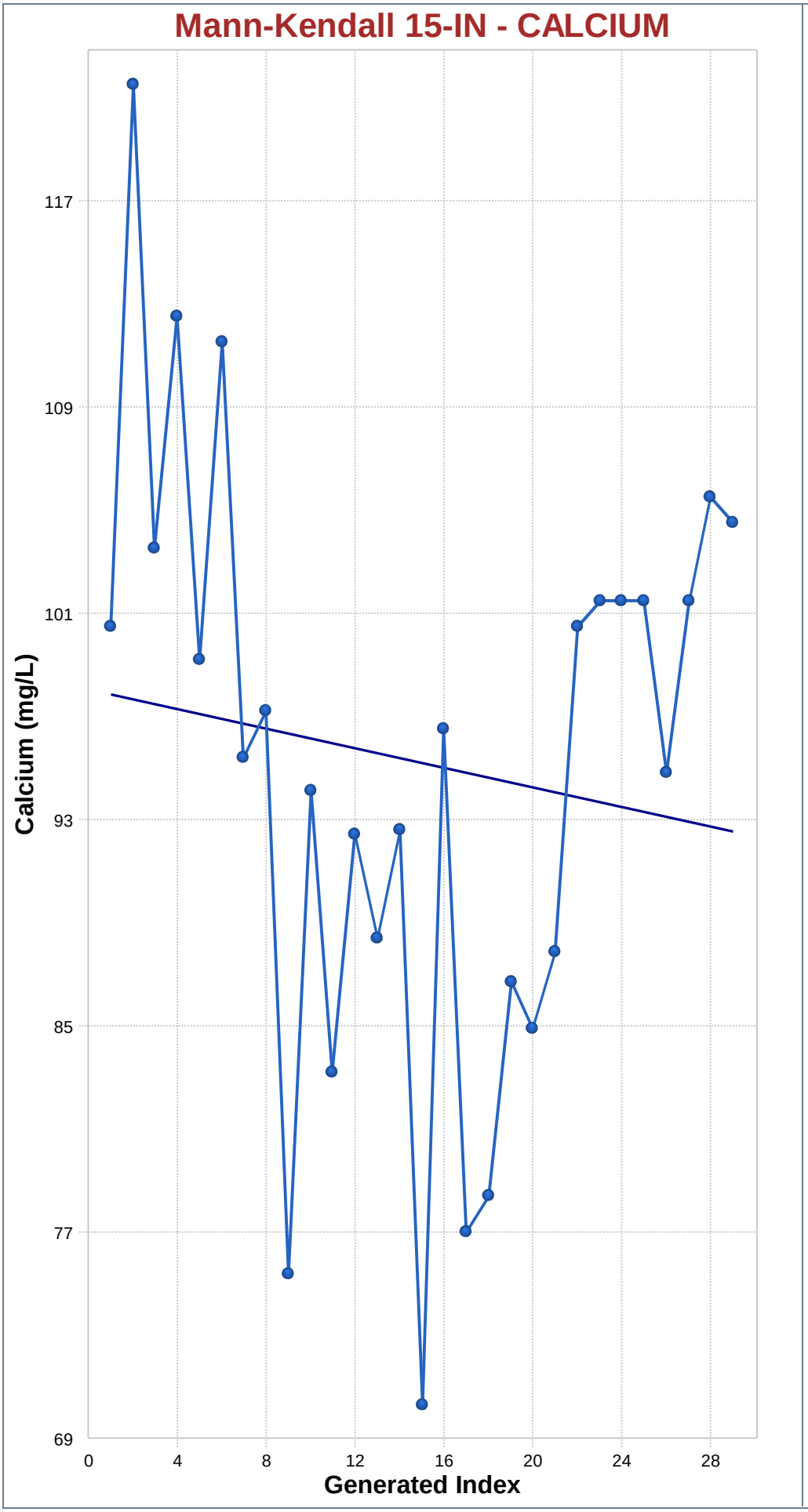

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.3010 |
| Standardized Value of S | -0.2627 |
| M-K Test Value (S) | -15 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3964 |

**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**

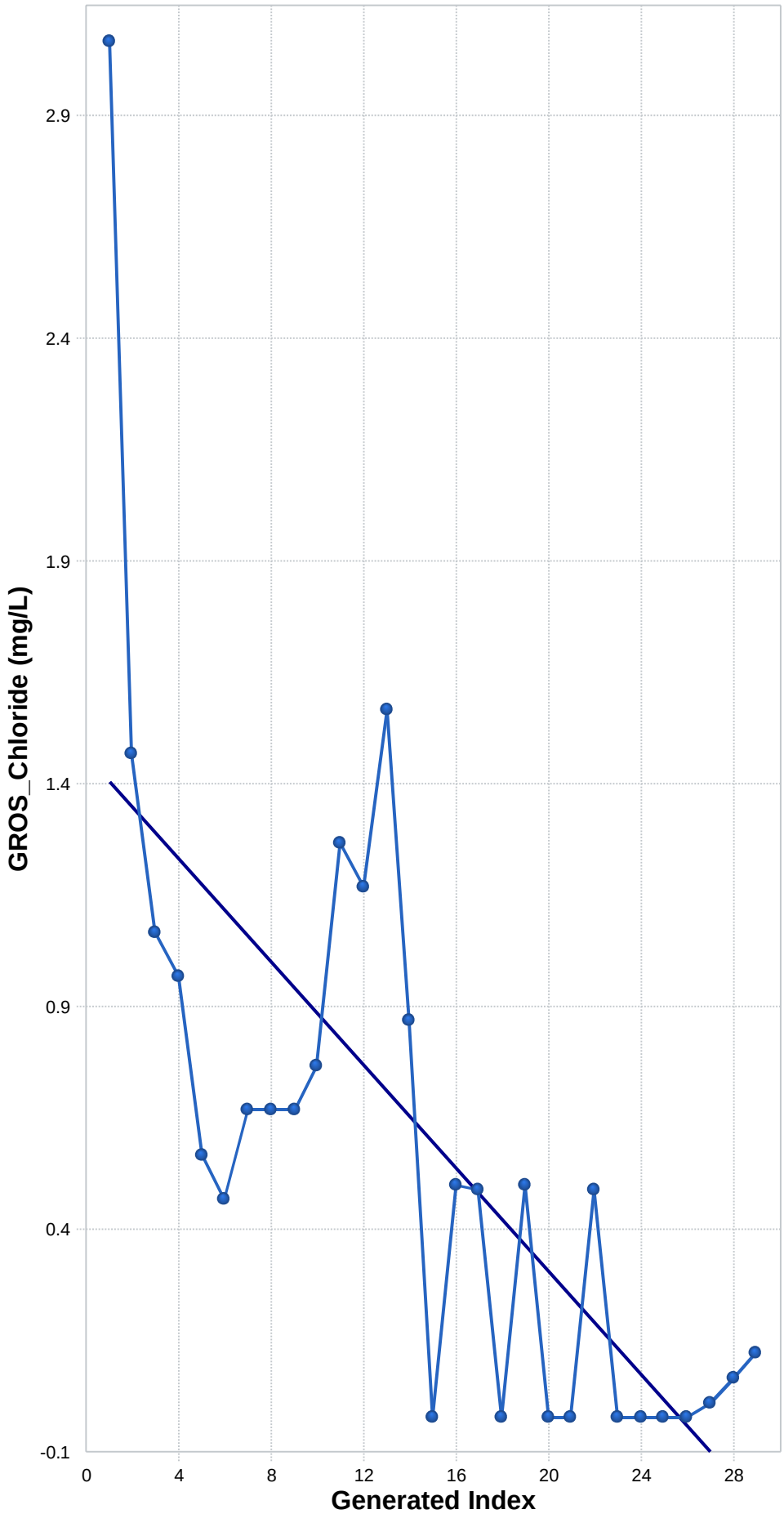
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2197 |
| Standardized Value of S | -0.0752 |
| M-K Test Value (S) | -5 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.4700 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.1890 |
| OLS Regression Intercept | 97.5214 |

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

# Mann-Kendall 15-IN - CHLORIDE




**Mann-Kendall Trend Analysis**

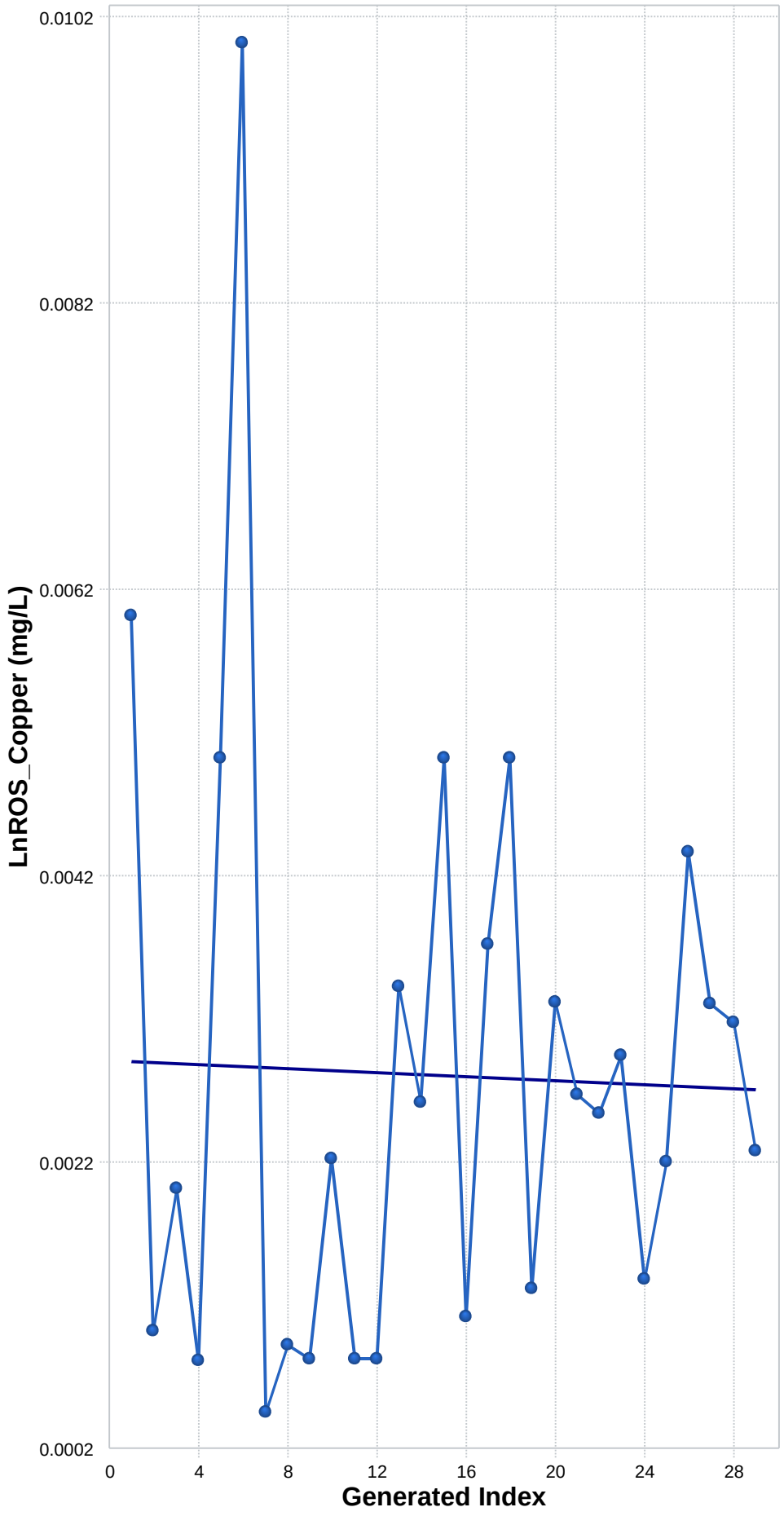
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 52.6403 |
| Standardized Value of S | -3.8754 |
| M-K Test Value (S) | -205 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0578 |
| OLS Regression Intercept | 1.4942 |

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

# Mann-Kendall 15-IN - COPPER



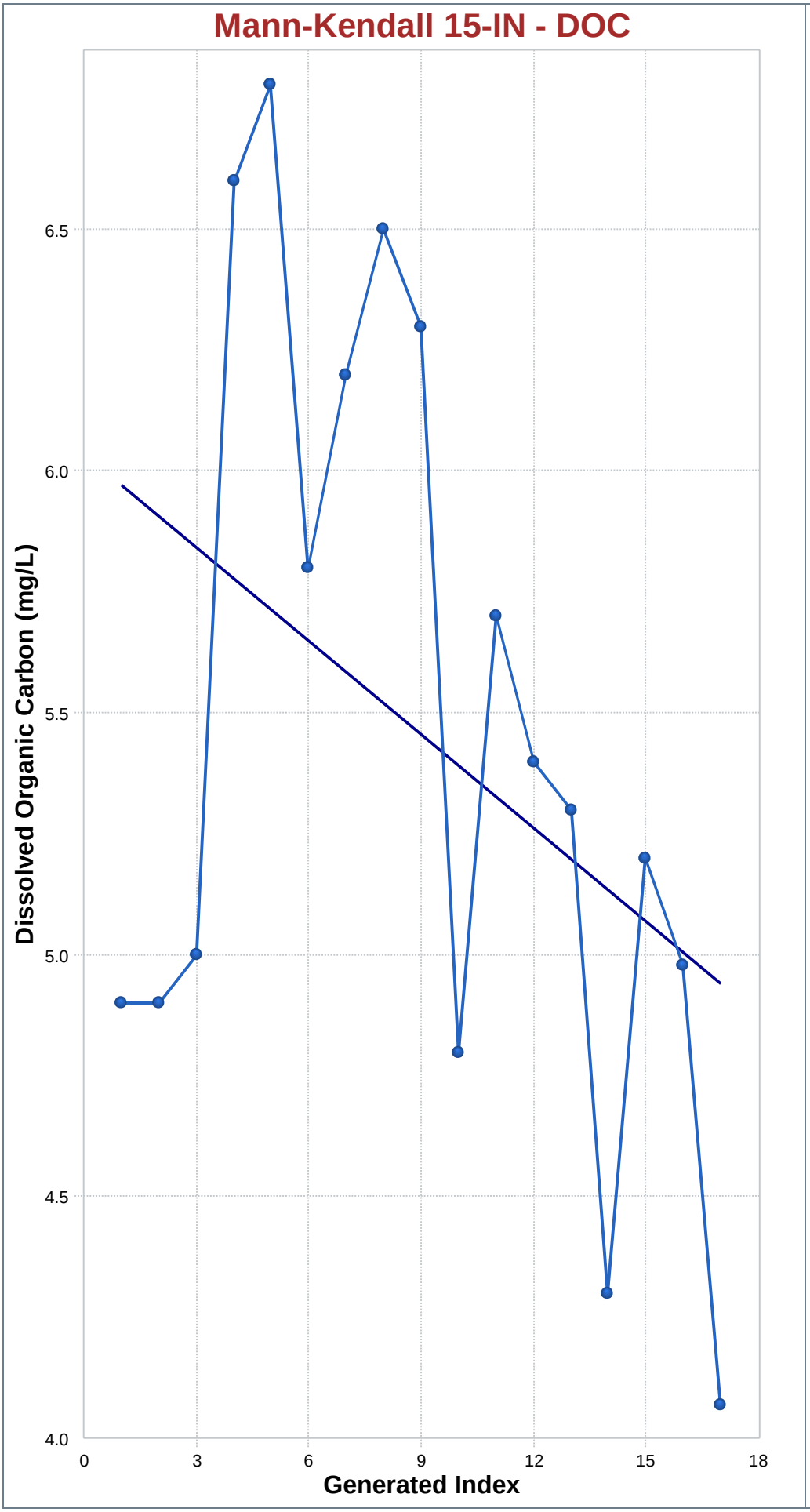

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2416 |
| Standardized Value of S | 1.0330 |
| M-K Test Value (S) | 56 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1508 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0029 |

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




**Mann-Kendall Trend Analysis**

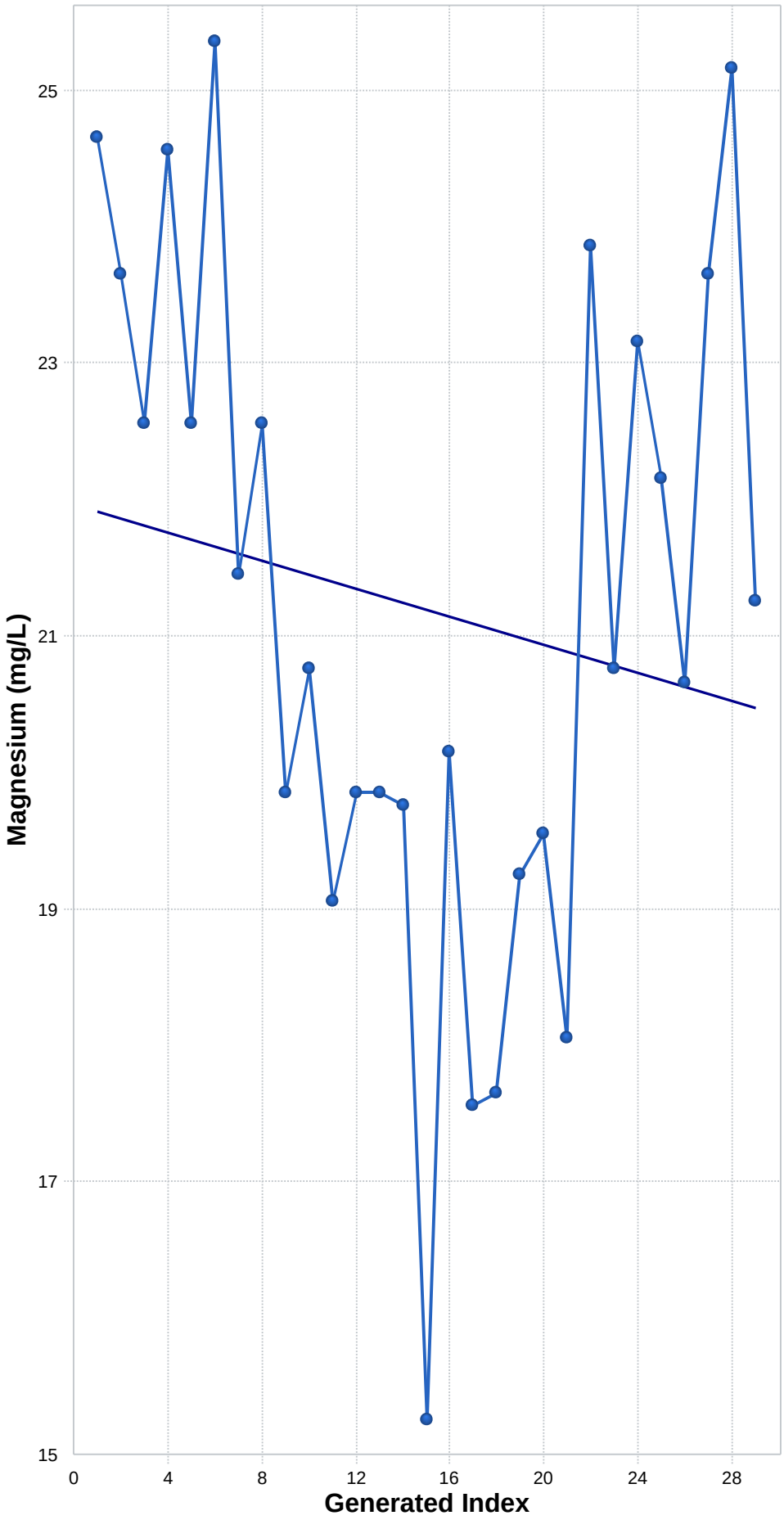
| | |
|---|---|
| n | 17 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 24.2556 |
| Standardized Value of S | -1.6491 |
| M-K Test Value (S) | -41 |
| Tabulated p-value | 0.0540 |
| Approximate p-value | 0.0496 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0644 |
| OLS Regression Intercept | 6.0356 |

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

# Mann-Kendall 15-IN - MAGNESIUM




**Mann-Kendall Trend Analysis**

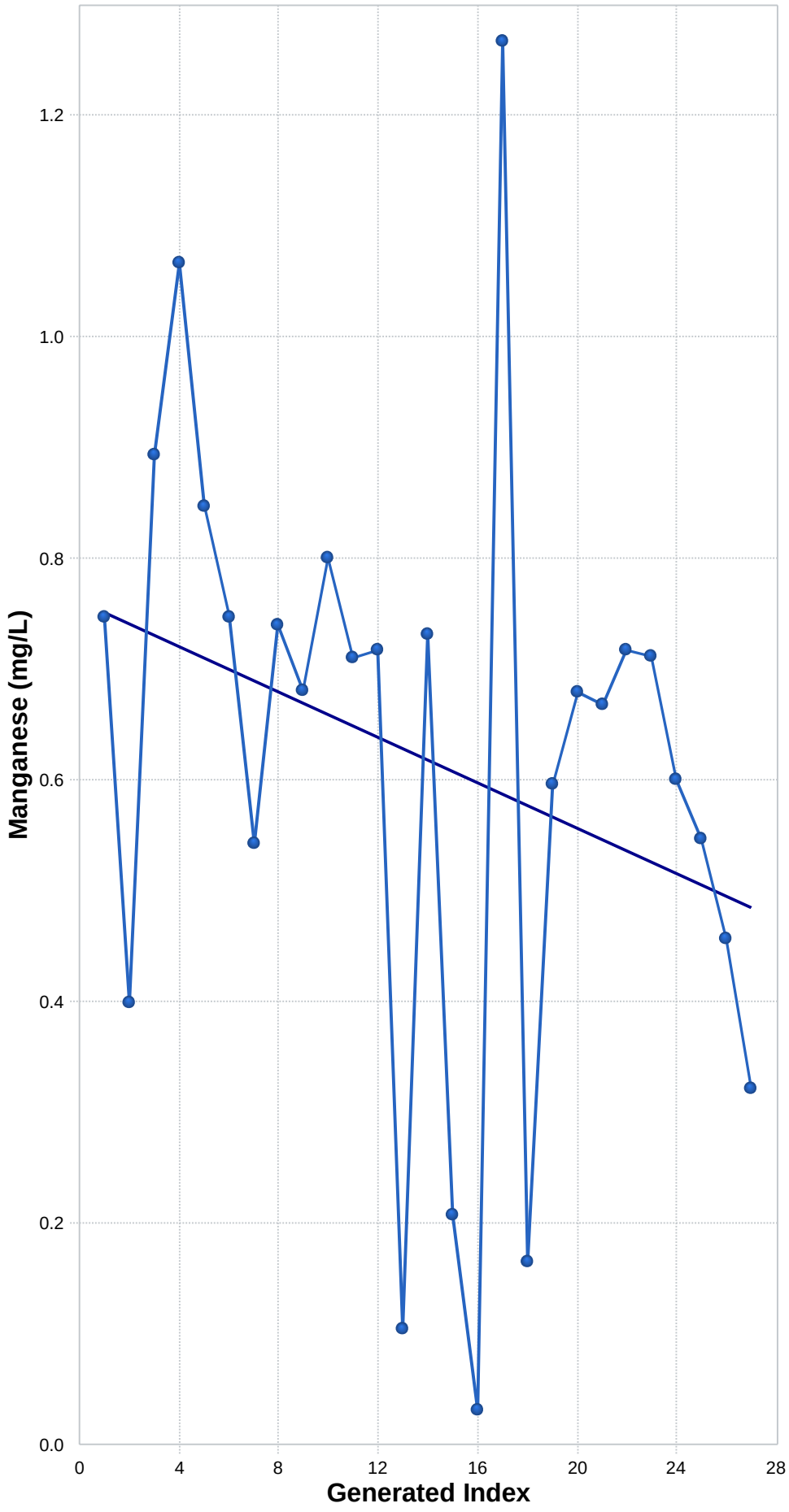
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2228 |
| Standardized Value of S | -1.0710 |
| M-K Test Value (S) | -58 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1421 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0517 |
| OLS Regression Intercept | 22.3131 |

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

# Mann-Kendall 15-IN - MANGANESE




**Mann-Kendall Trend Analysis**

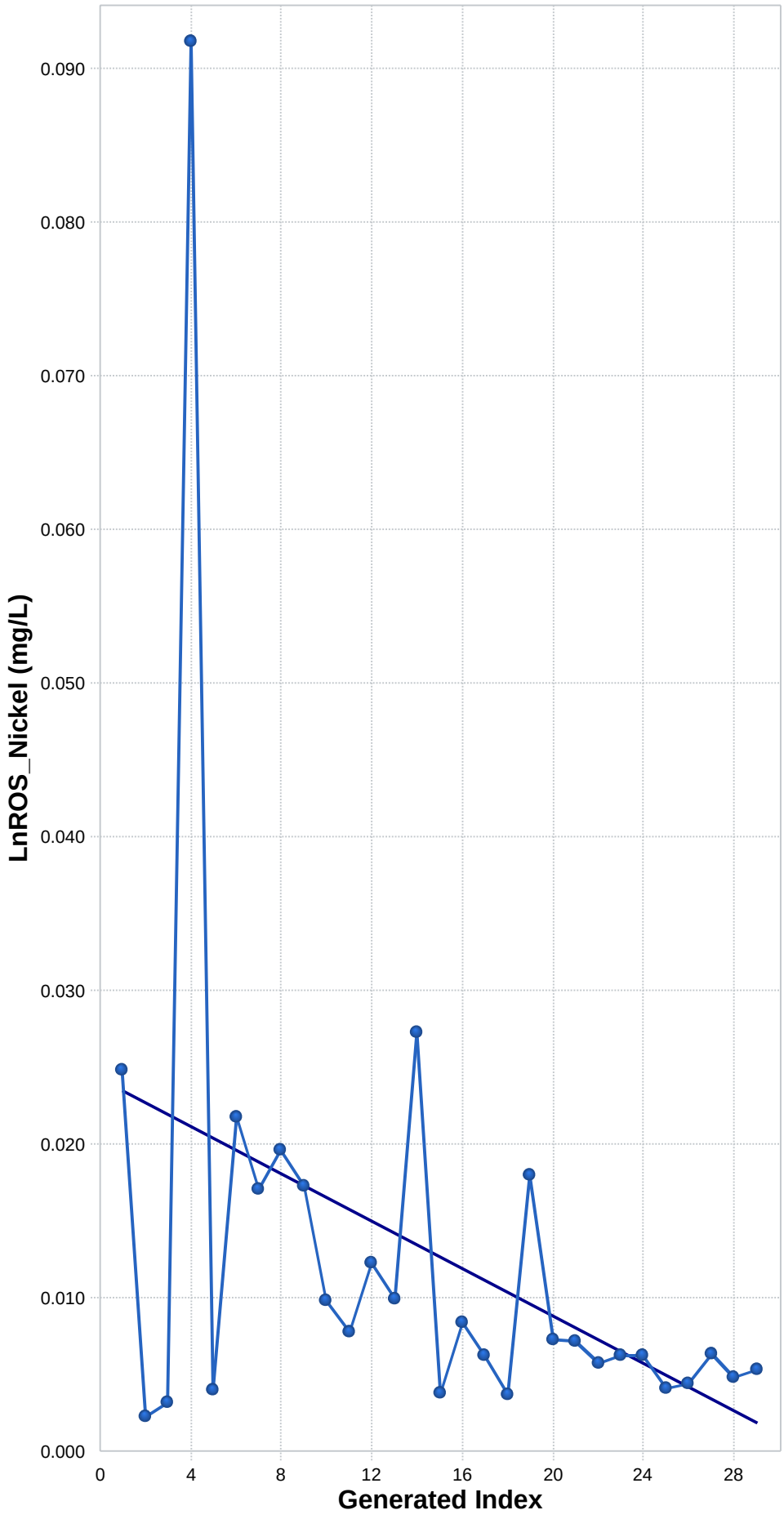
| | |
|---|---|
| n | 27 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 47.9479 |
| Standardized Value of S | -2.4610 |
| M-K Test Value (S) | -119 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0069 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0103 |
| OLS Regression Intercept | 0.7752 |

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

# Mann-Kendall 15-IN - NICKEL



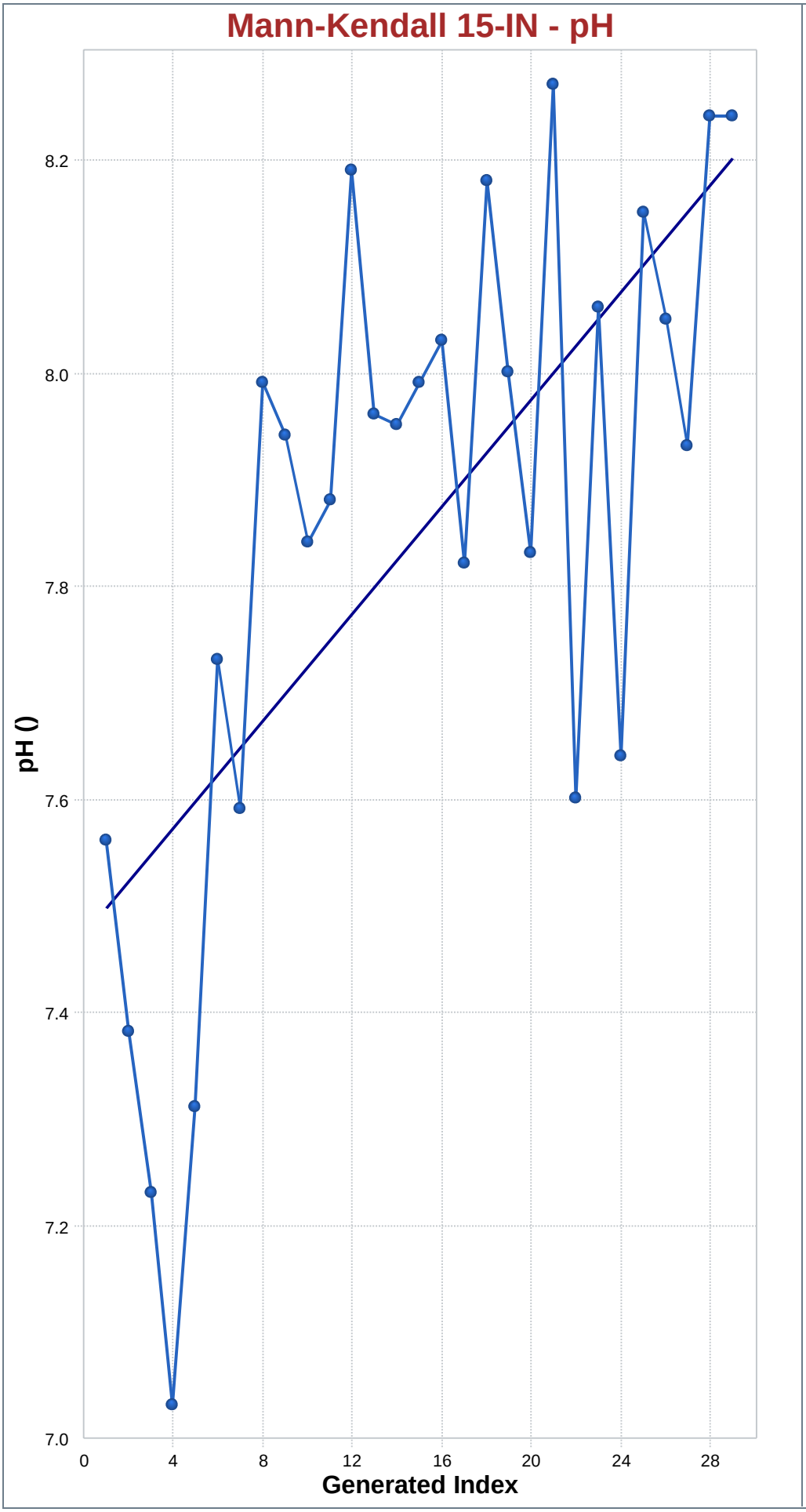

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.3010 |
| Standardized Value of S | -2.3264 |
| M-K Test Value (S) | -125 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0100 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0008 |
| OLS Regression Intercept | 0.0244 |

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




**Mann-Kendall Trend Analysis**

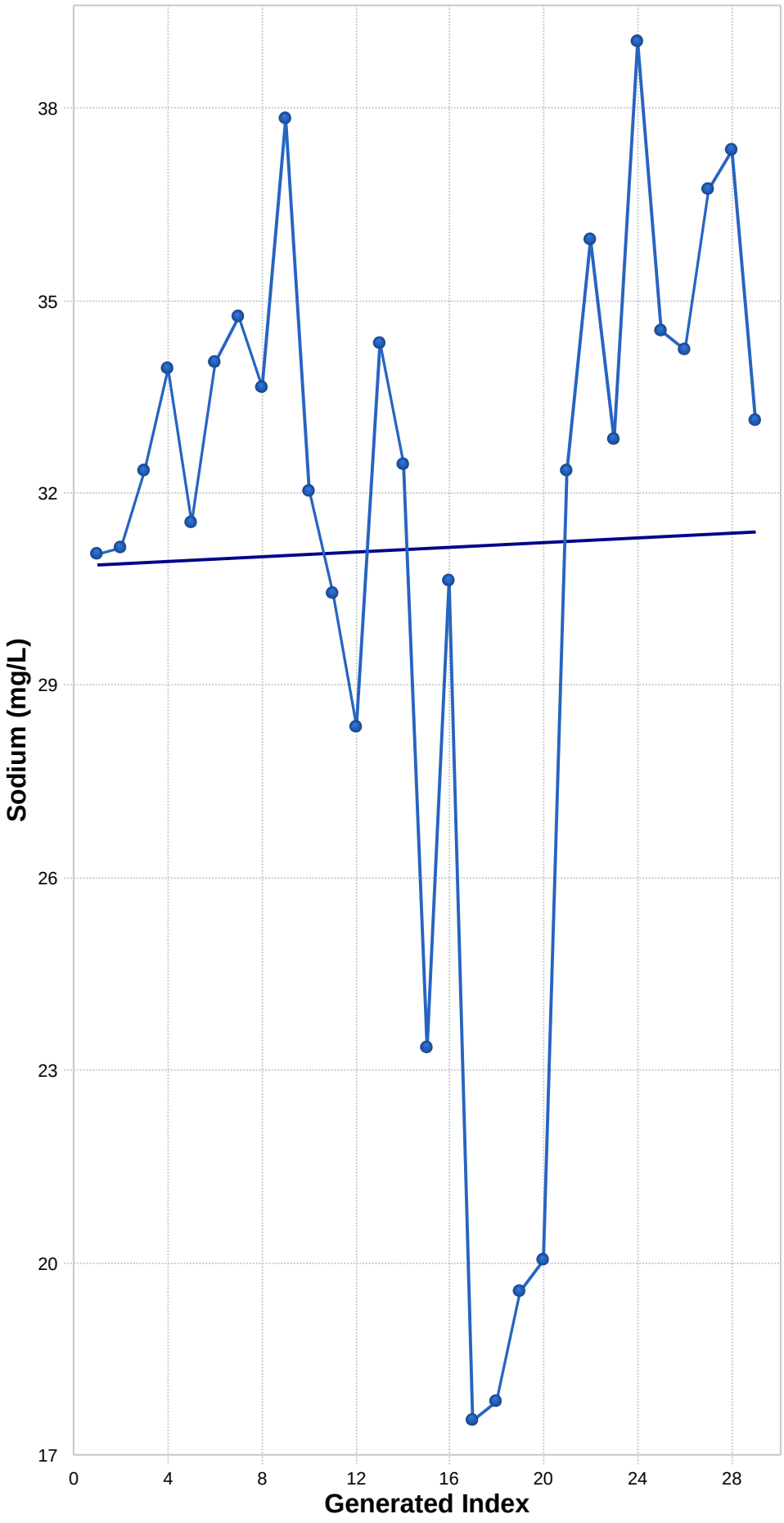
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2917 |
| Standardized Value of S | 3.7342 |
| M-K Test Value (S) | 200 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0252 |
| OLS Regression Intercept | 7.4809 |

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

# Mann-Kendall 15-IN - SODIUM




**Mann-Kendall Trend Analysis**

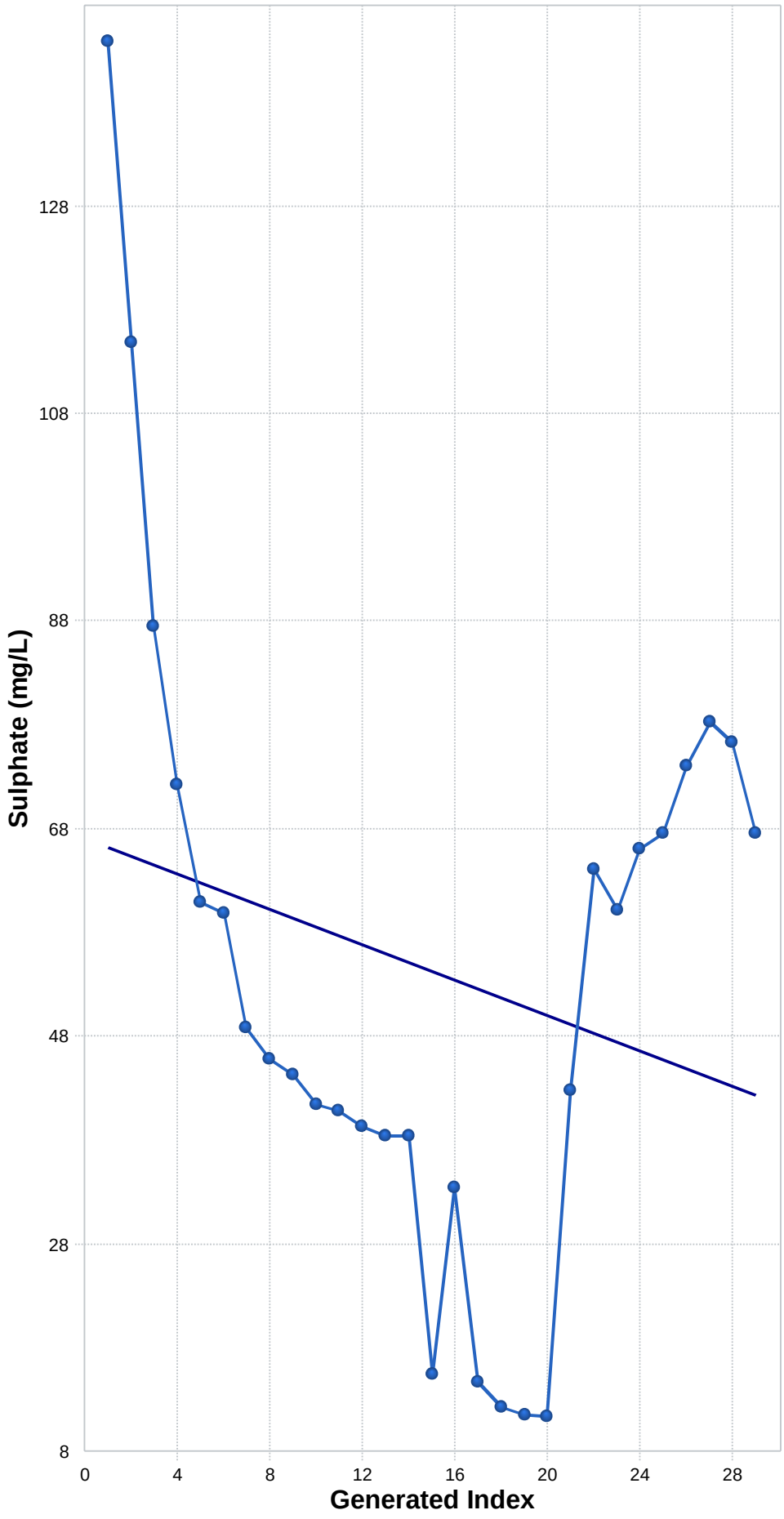
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.3010 |
| Standardized Value of S | 1.1632 |
| M-K Test Value (S) | 63 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1224 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0190 |
| OLS Regression Intercept | 30.8121 |

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

# Mann-Kendall 15-IN - SULPHATE



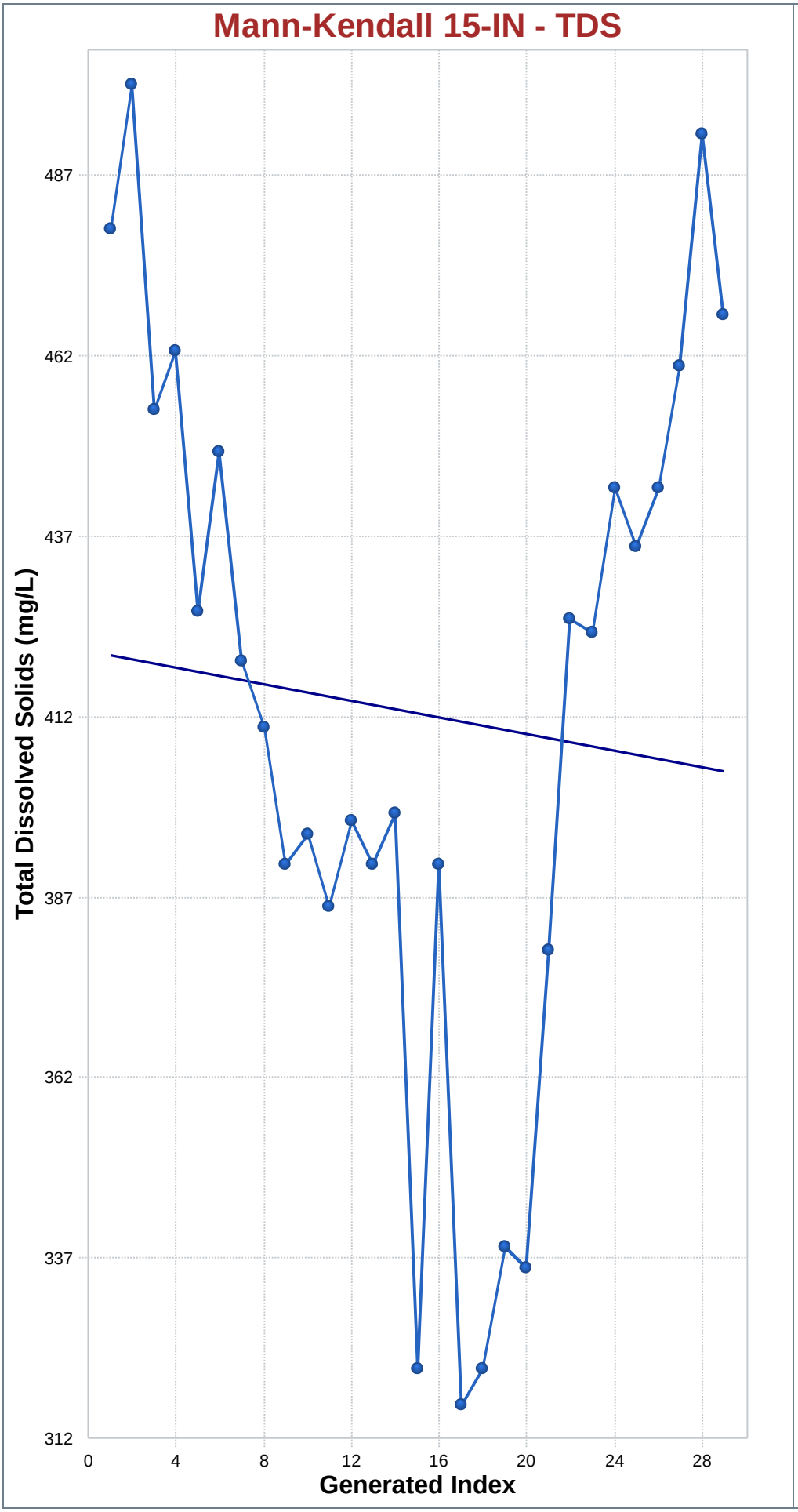

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2917 |
| Standardized Value of S | -1.1071 |
| M-K Test Value (S) | -60 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1341 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.8526 |
| OLS Regression Intercept | 67.1401 |

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



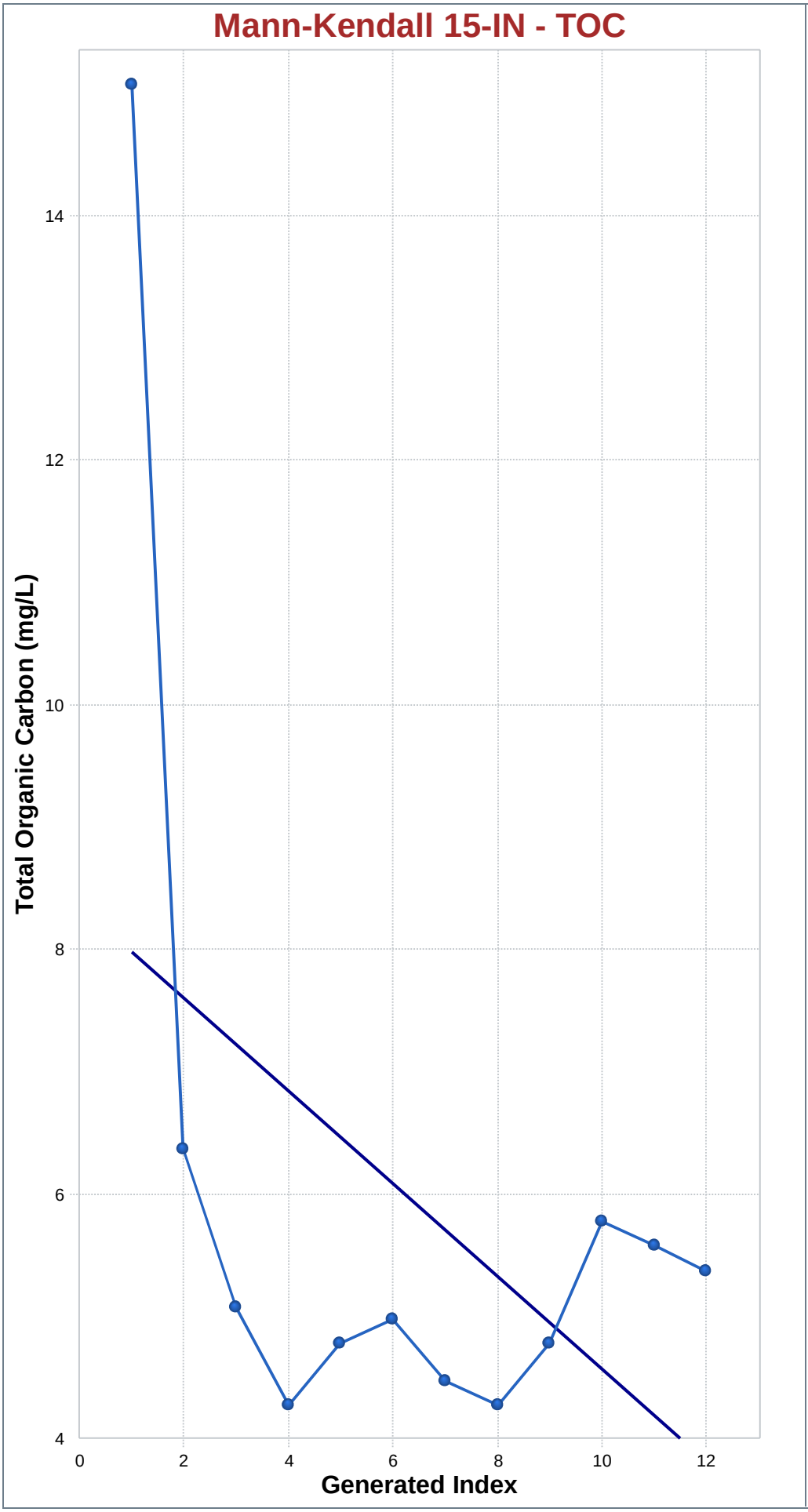

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2572 |
| Standardized Value of S | -0.5258 |
| M-K Test Value (S) | -29 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.2995 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.5709 |
| OLS Regression Intercept | 421.3916 |

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



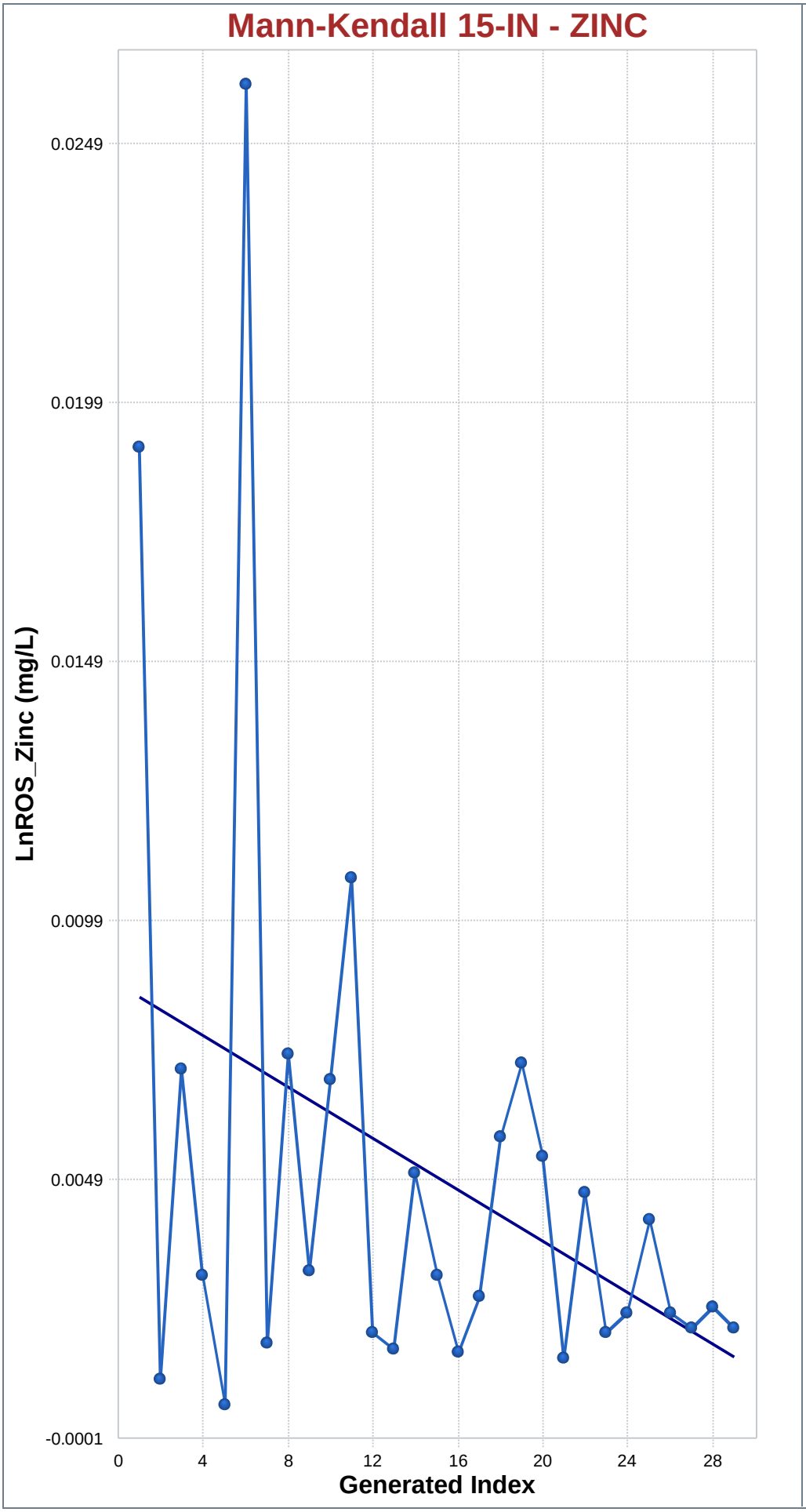

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| 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**

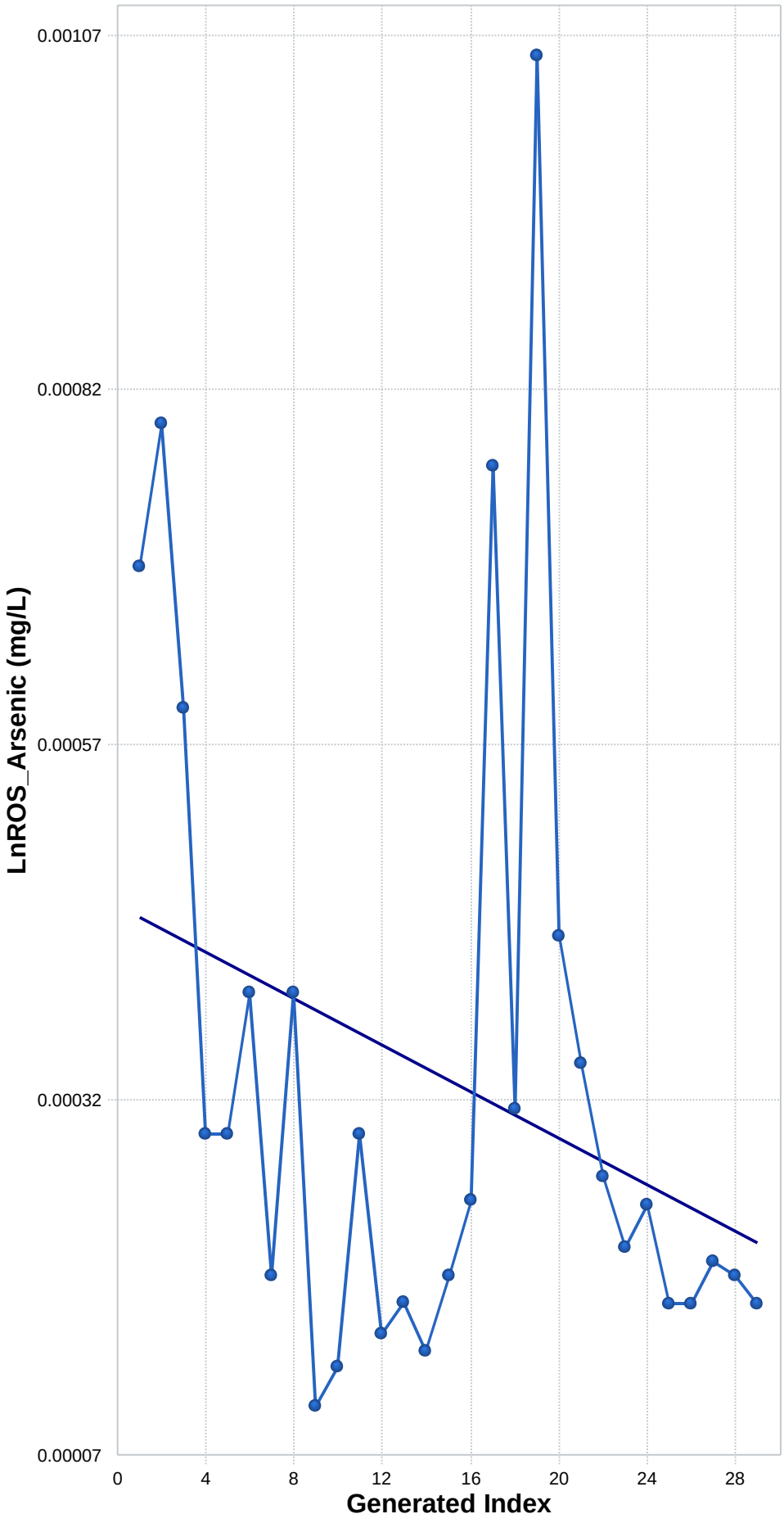
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2729 |
| Standardized Value of S | -1.2577 |
| M-K Test Value (S) | -68 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.1043 |

**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 17-IN - ARSENIC




**Mann-Kendall Trend Analysis**

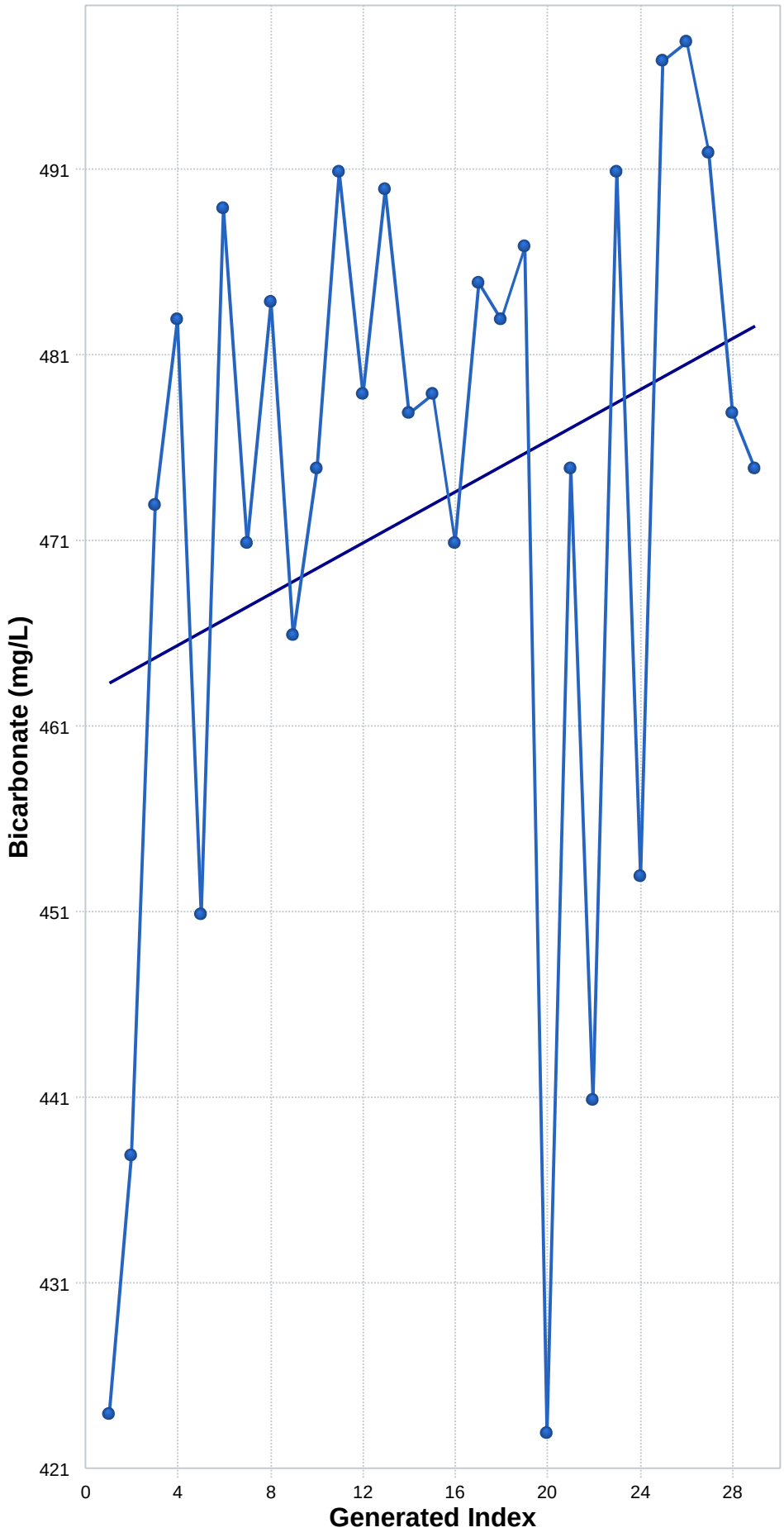
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2228 |
| Standardized Value of S | -1.7849 |
| M-K Test Value (S) | -96 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0371 |

**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 17-IN - BICARBONATE




**Mann-Kendall Trend Analysis**

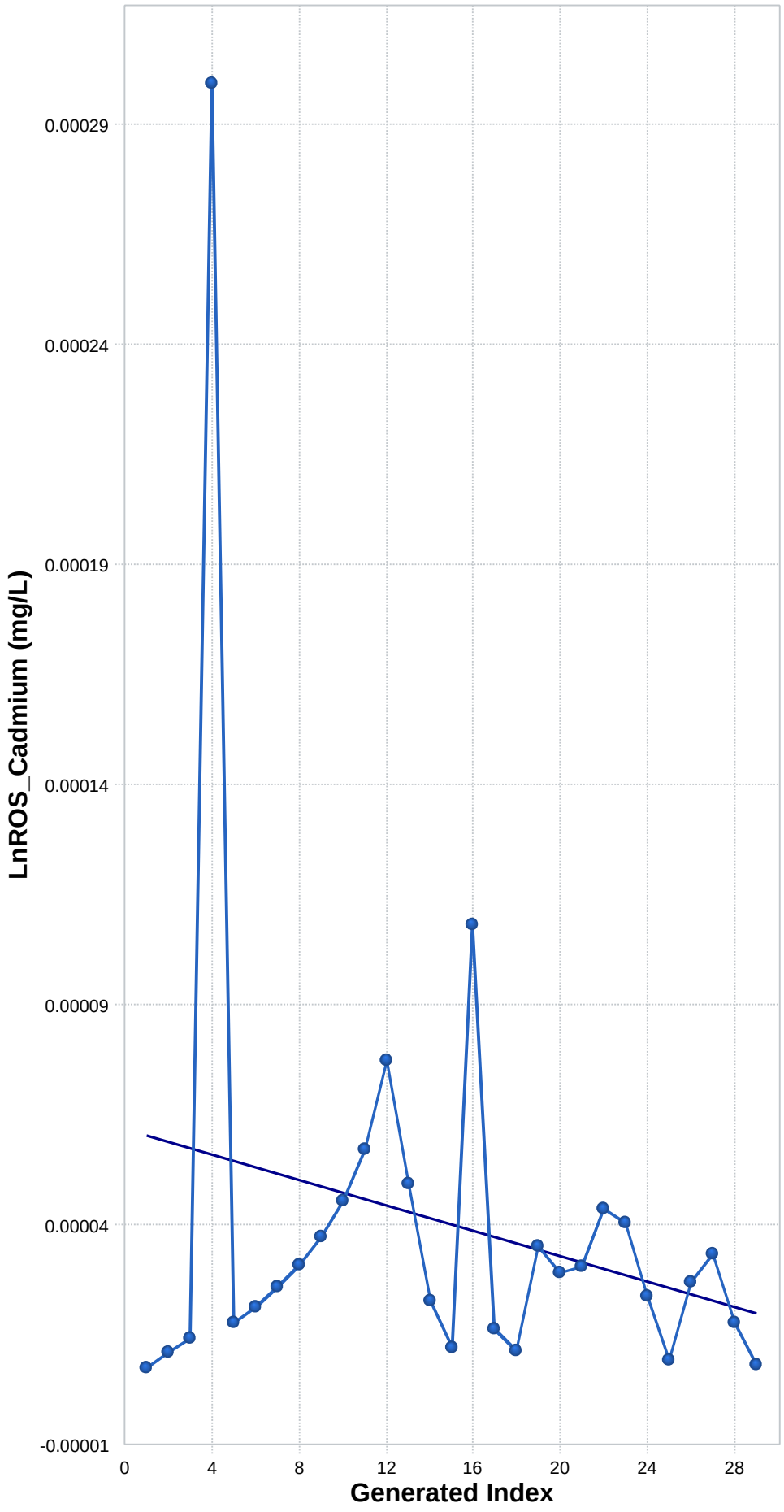
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2291 |
| Standardized Value of S | 1.8599 |
| M-K Test Value (S) | 100 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0315 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.6872 |
| OLS Regression Intercept | 462.7956 |

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

# Mann-Kendall 17-IN - CADMIUM



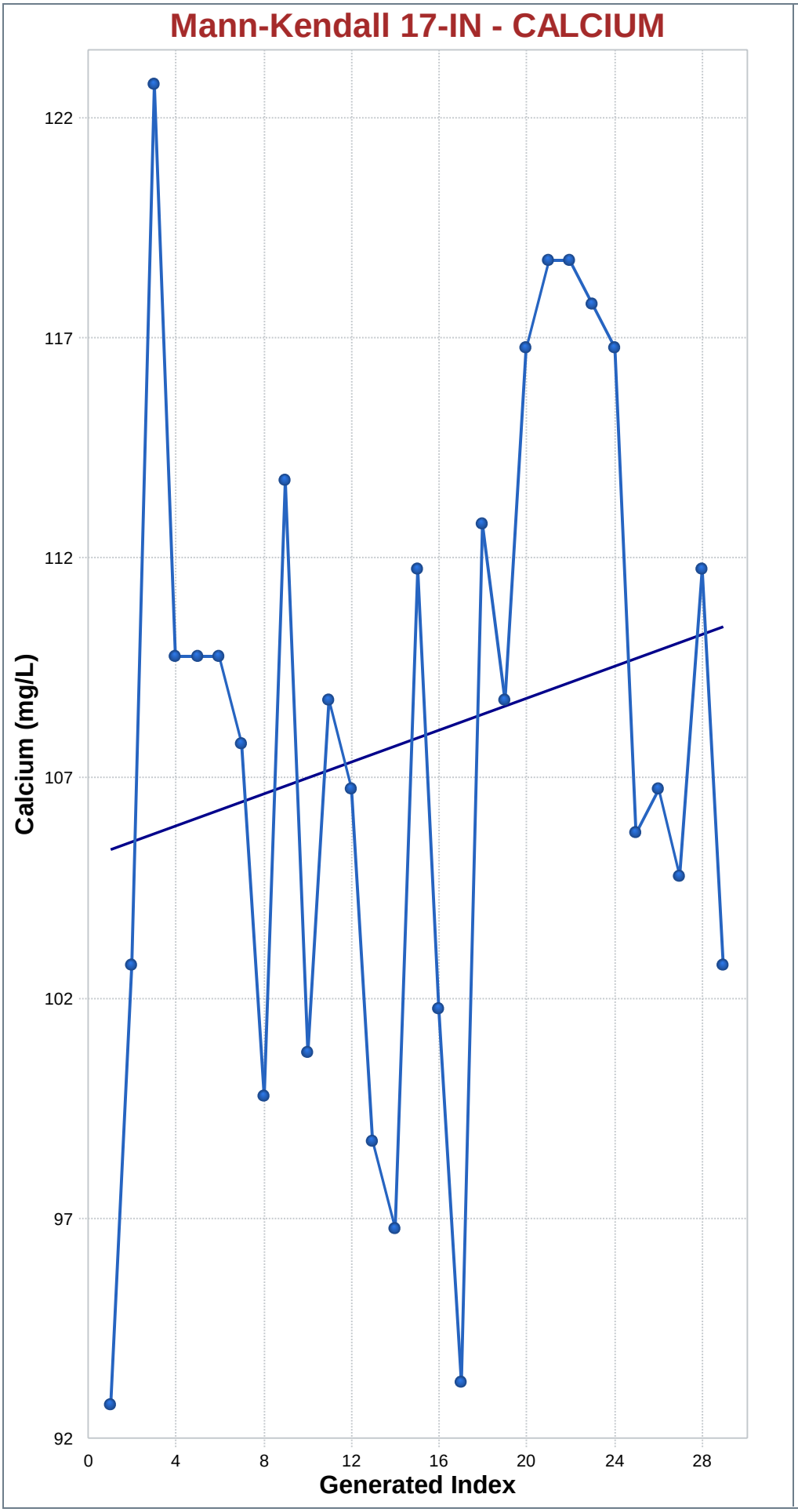

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.3104 |
| Standardized Value of S | |
| M-K Test Value (S) | 0 |
| Appx. Critical Value (0.05) | |
| Approximate p-value | |

**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.



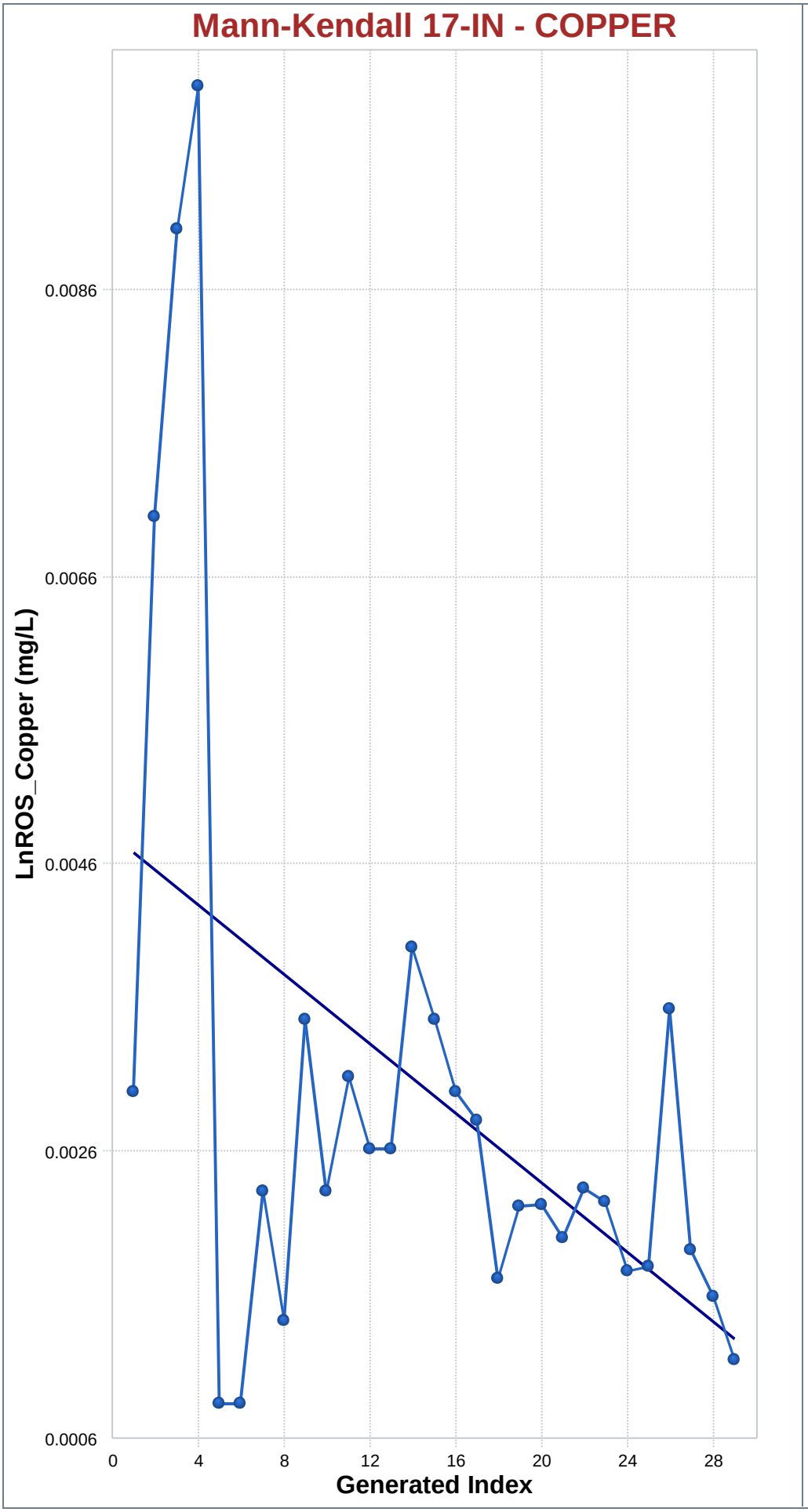

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2197 |
| Standardized Value of S | 0.7140 |
| M-K Test Value (S) | 39 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.2376 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1803 |
| OLS Regression Intercept | 105.4507 |

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




**Mann-Kendall Trend Analysis**

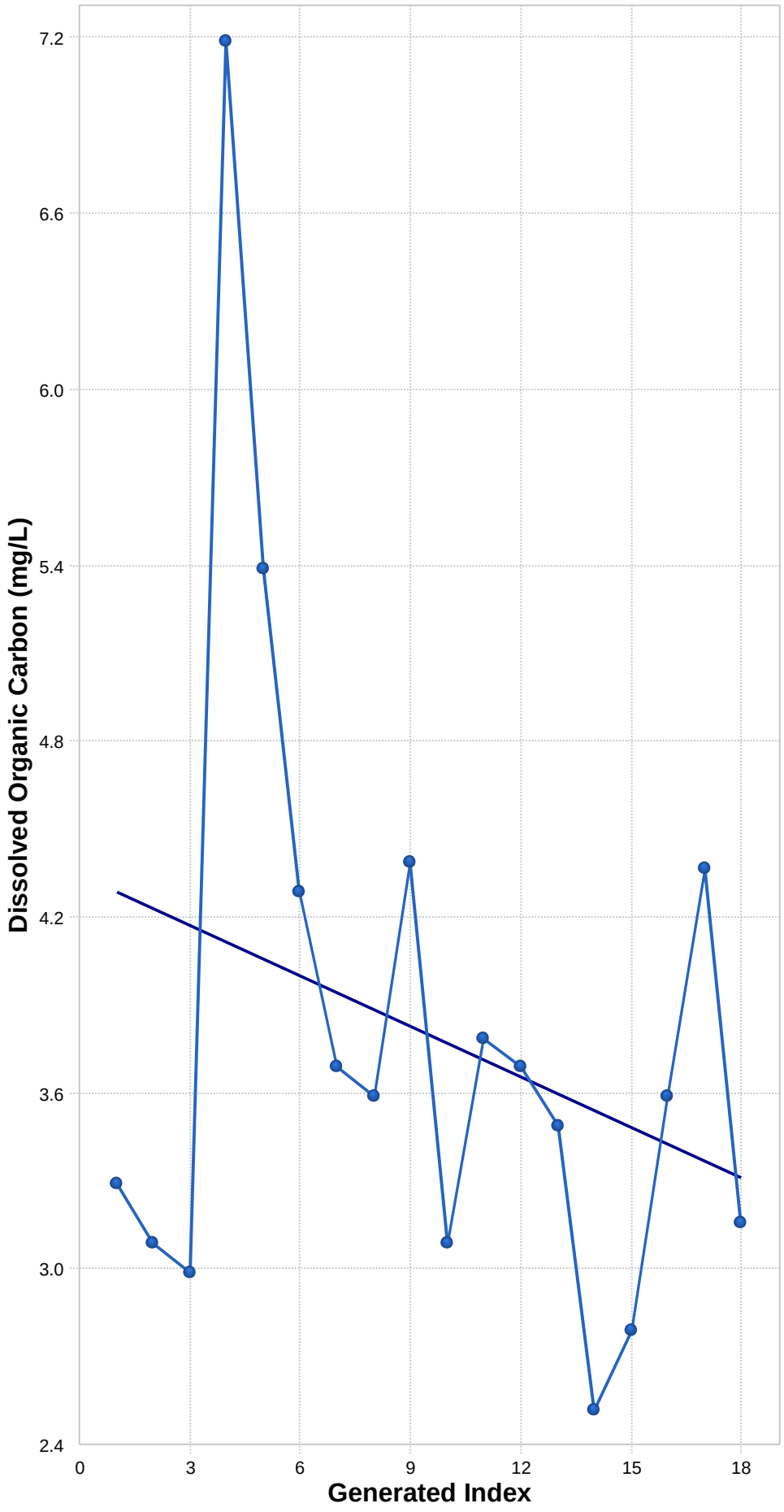
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2635 |
| Standardized Value of S | -2.2530 |
| M-K Test Value (S) | -121 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0121 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0048 |

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

# Mann-Kendall 17-IN - DOC




**Mann-Kendall Trend Analysis**

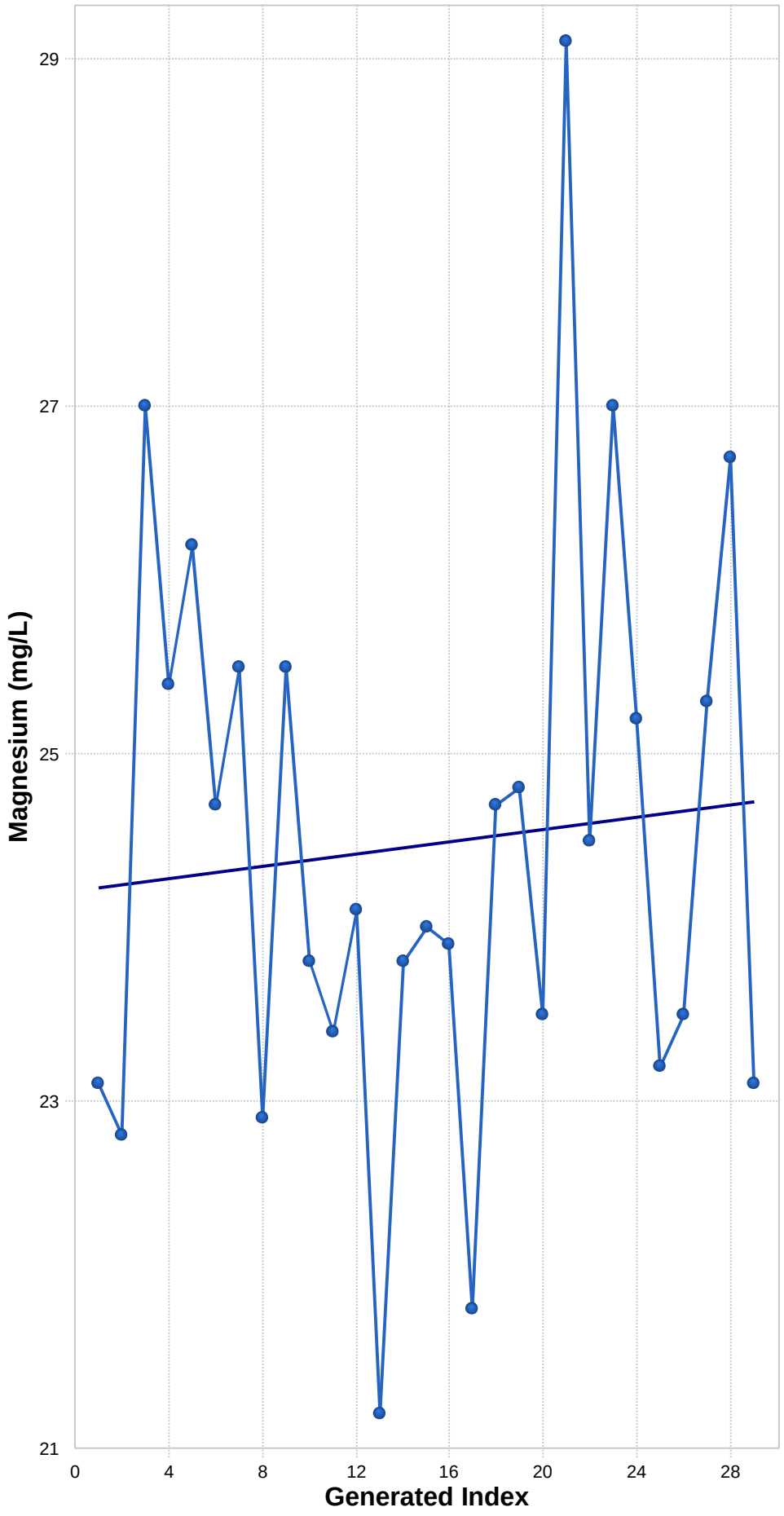
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3439 |
| Standardized Value of S | -0.8731 |
| M-K Test Value (S) | -24 |
| Tabulated p-value | 0.1840 |
| Approximate p-value | 0.1913 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0575 |
| OLS Regression Intercept | 4.3565 |

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

# Mann-Kendall 17-IN - MAGNESIUM



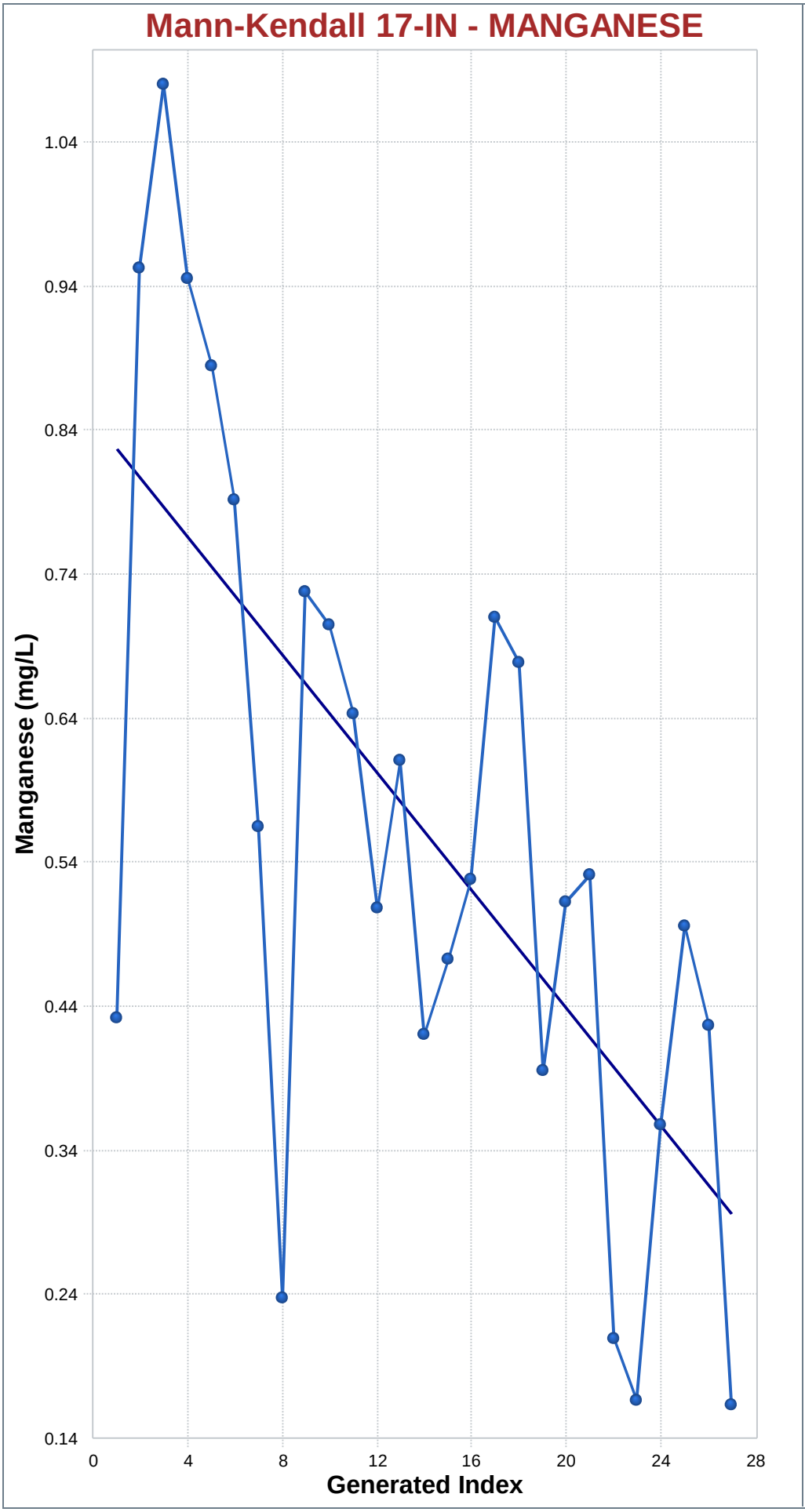

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2541 |
| Standardized Value of S | 0.2441 |
| M-K Test Value (S) | 14 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.4036 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0177 |
| OLS Regression Intercept | 23.9071 |

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




**Mann-Kendall Trend Analysis**

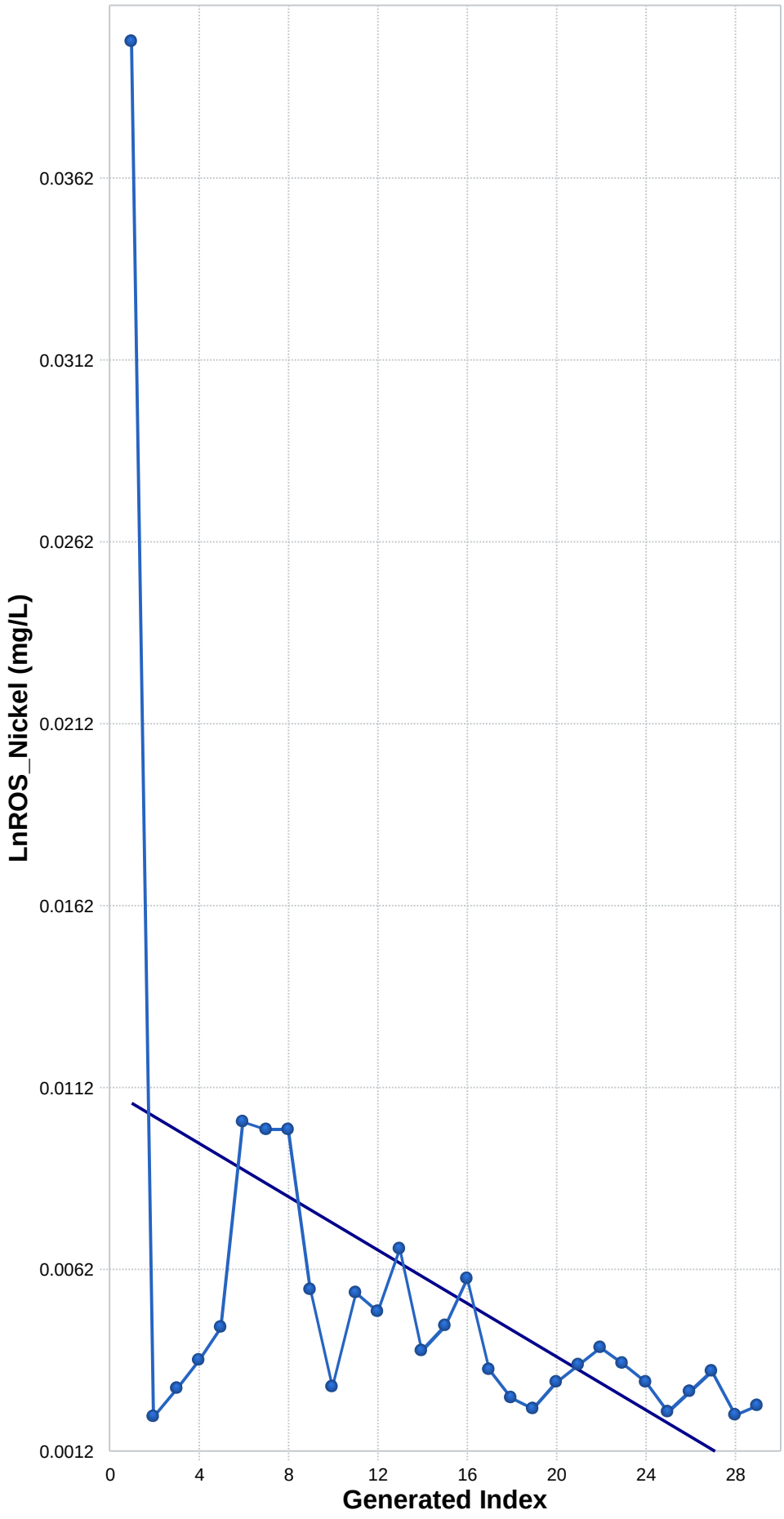
| | |
|---|---|
| n | 27 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 47.9687 |
| Standardized Value of S | -3.8775 |
| M-K Test Value (S) | -187 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0204 |
| OLS Regression Intercept | 0.8470 |

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

# Mann-Kendall 17-IN - NICKEL



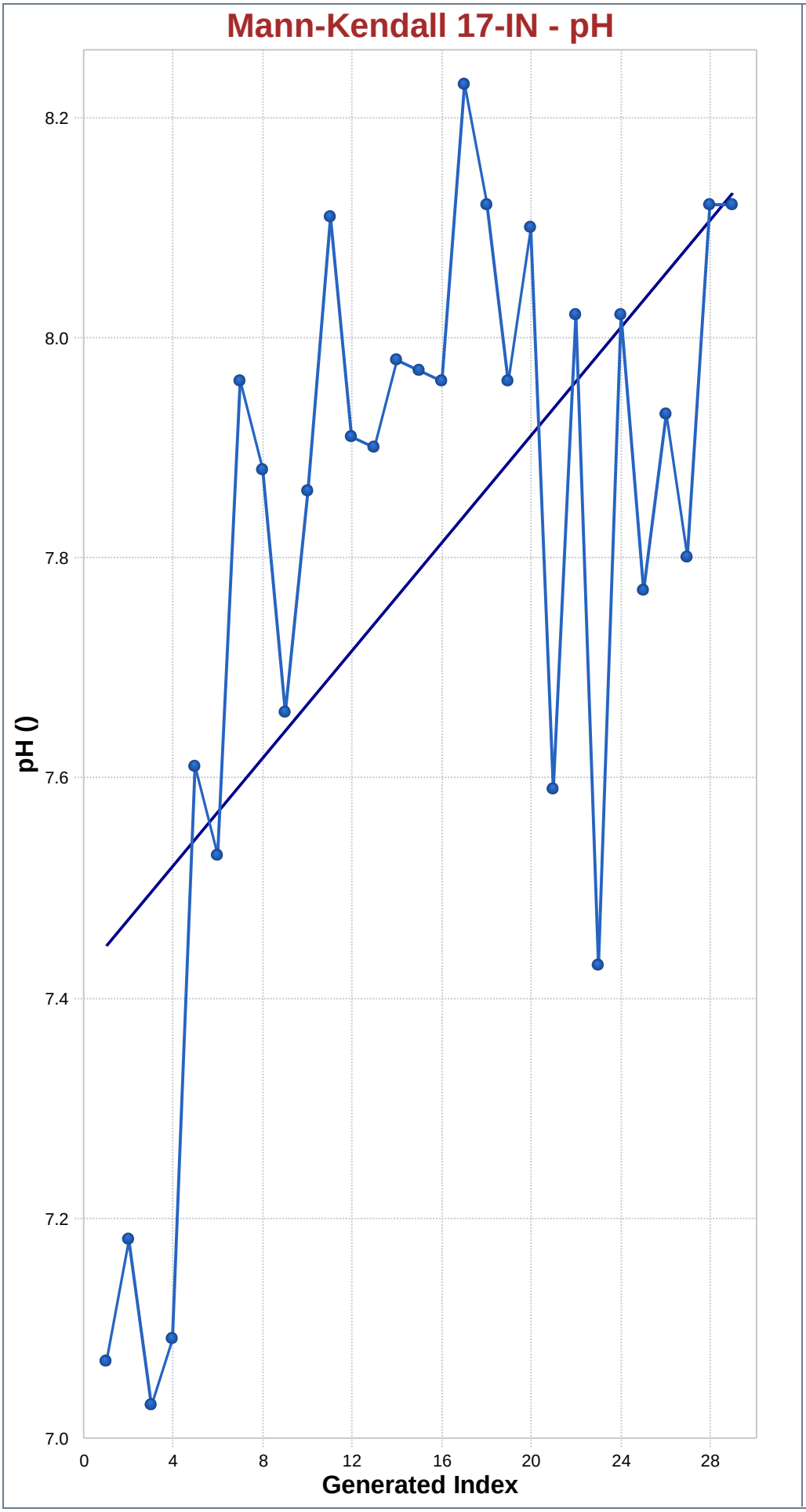

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.3010 |
| Standardized Value of S | -3.0393 |
| M-K Test Value (S) | -163 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0012 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0004 |
| OLS Regression Intercept | 0.0112 |

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



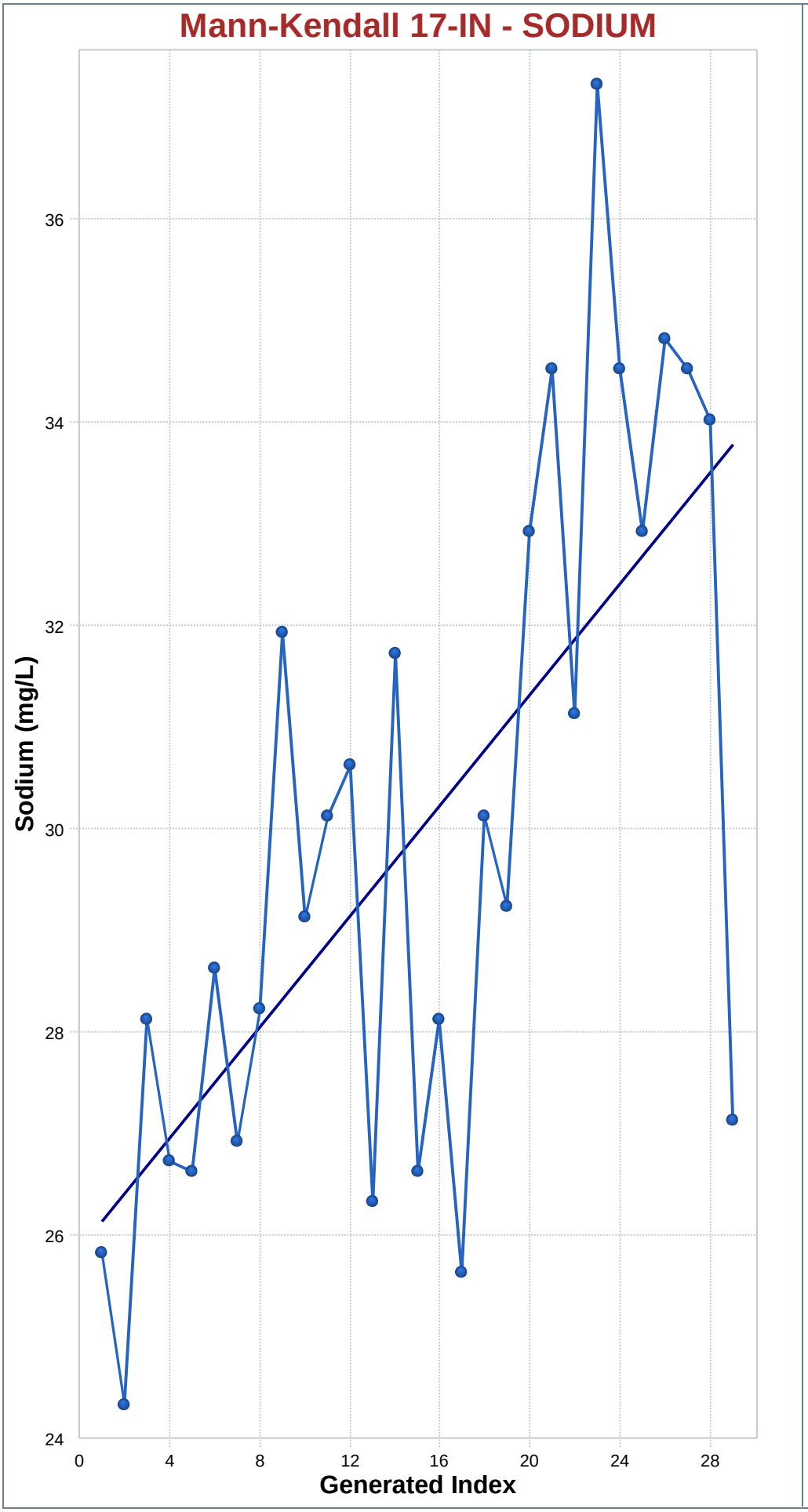

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2322 |
| Standardized Value of S | 3.1936 |
| M-K Test Value (S) | 171 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0007 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0244 |
| OLS Regression Intercept | 7.4435 |

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




**Mann-Kendall Trend Analysis**

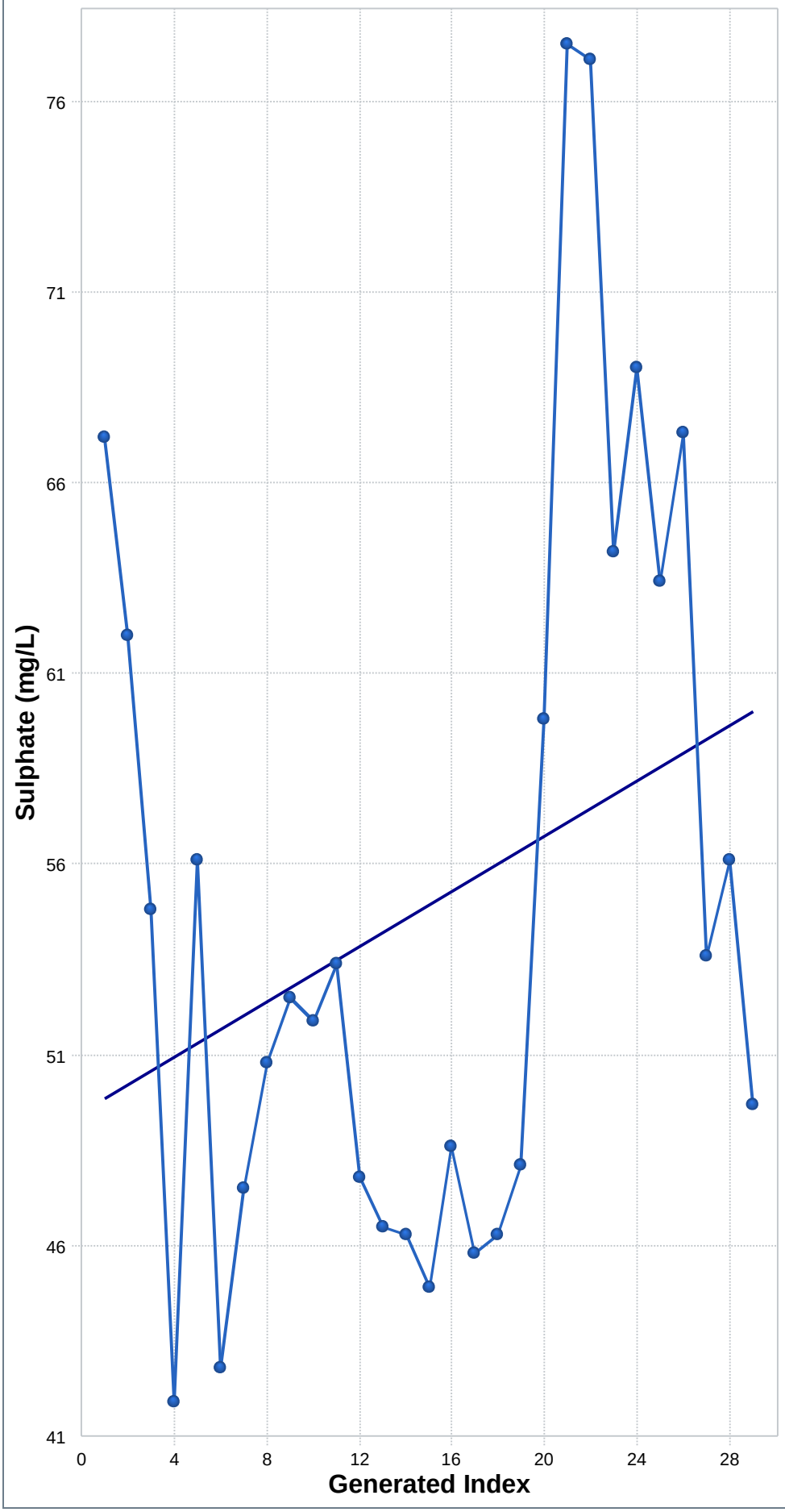
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2385 |
| Standardized Value of S | 3.8318 |
| M-K Test Value (S) | 205 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.2731 |
| OLS Regression Intercept | 26.1387 |

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

# Mann-Kendall 17-IN - SULPHATE




**Mann-Kendall Trend Analysis**

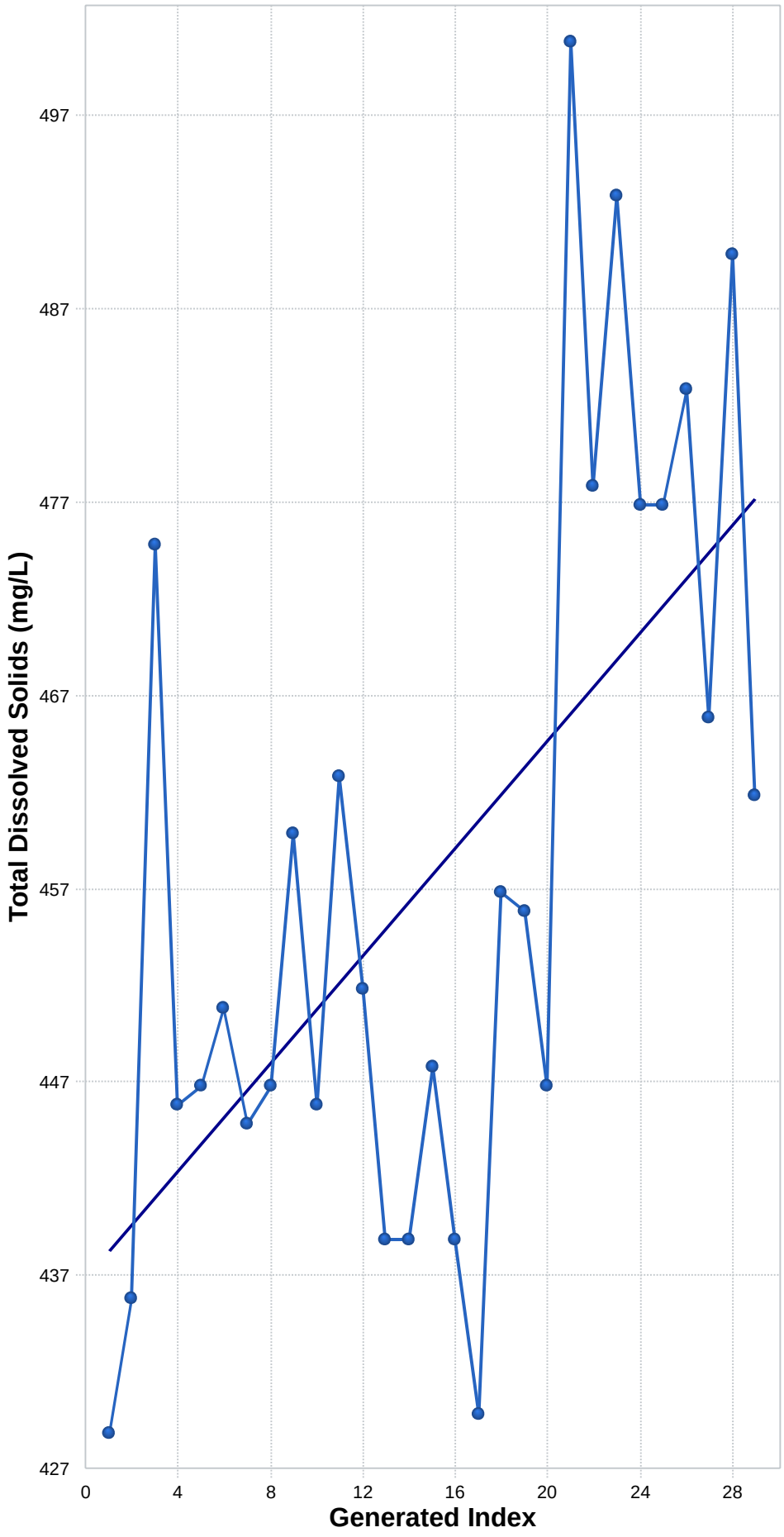
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2917 |
| Standardized Value of S | 1.2197 |
| M-K Test Value (S) | 66 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.1113 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3618 |
| OLS Regression Intercept | 49.5002 |

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

# Mann-Kendall 17-IN - TDS



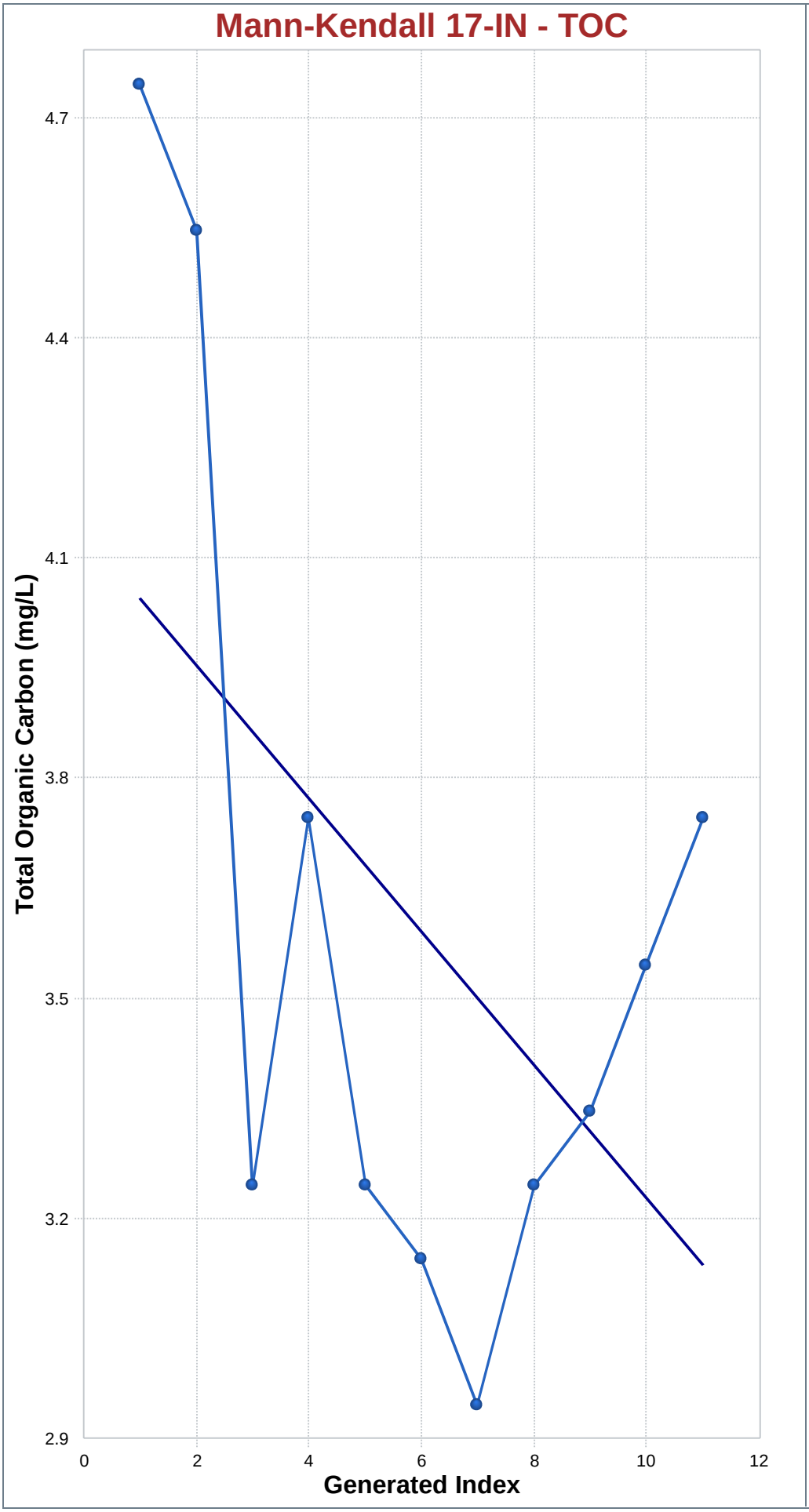

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2228 |
| Standardized Value of S | 3.1753 |
| M-K Test Value (S) | 170 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0007 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.3882 |
| OLS Regression Intercept | 437.0739 |

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




**Mann-Kendall Trend Analysis**

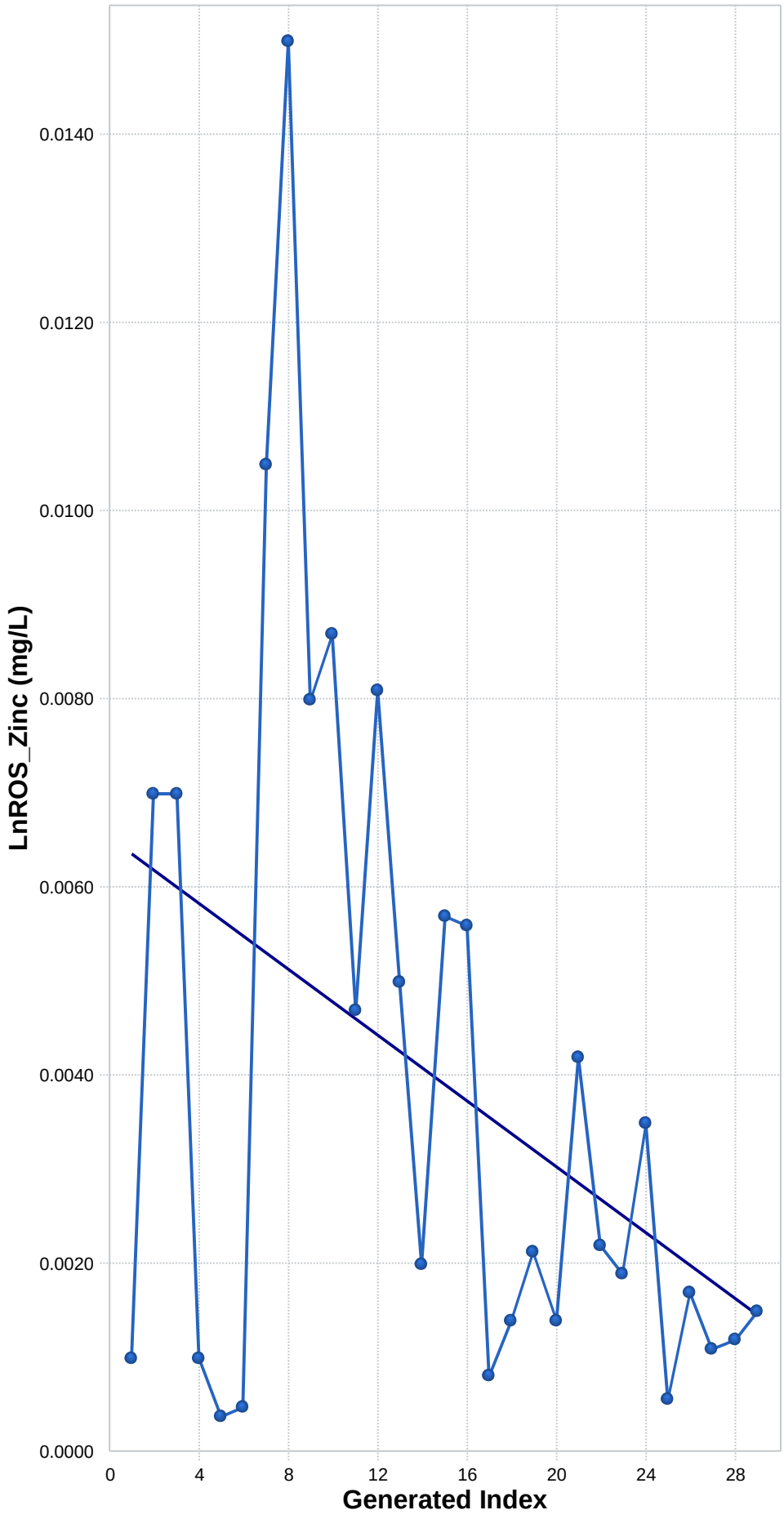
| | |
|---|---|
| n | 11 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 12.6623 |
| Standardized Value of S | -0.6318 |
| M-K Test Value (S) | -9 |
| Tabulated p-value | 0.2710 |
| Approximate p-value | 0.2638 |

**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 17-IN - ZINC




**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 | -1.8577 |
| M-K Test Value (S) | -100 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0316 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0066 |

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

# App G6 Sen's Slope/Mann-Kendall Trend Analysis Output – All Data - Sandstone

| | | |
|---|---|---|
| | Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 11:29:37 AM | |
| From File | 2023-SandstoneProUCL_b.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

04-SS

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 28 |
| Number of Missing Observations | 1 |
| Number of Distinct Observations | 10 |
| Minimum | 1.0000E-5 |
| Maximum | 1.9 |
| Mean of Raw Data | 0.483 |
| Standard Deviation of Raw Data | 0.349 |
| Khat | 0.871 |
| Theta hat | 0.554 |
| Kstar | 0.801 |
| Theta star | 0.603 |
| Mean of Log Transformed Data | -1.402 |
| Standard Deviation of Log Transformed Data | 2.277 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.852 |
| Shapiro Wilk Test Statistic | 0.756 |
| Shapiro Wilk Critical (0.05) Value | 0.924 |
| Approximate Shapiro Wilk P Value | 6.9277E-6 |
| Lilliefors Test Statistic | 0.23 |
| Lilliefors Critical (0.05) Value | 0.164 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.897 |
| A-D Test Statistic | 3.512 |
| A-D Critical (0.05) Value | 0.779 |
| K-S Test Statistic | 0.341 |
| K-S Critical(0.05) Value | 0.171 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.699 |
| Shapiro Wilk Test Statistic | 0.522 |
| Shapiro Wilk Critical (0.05) Value | 0.924 |
| Approximate Shapiro Wilk P Value | 8.719E-10 |
| Lilliefors Test Statistic | 0.392 |
| 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 | | | | | | | | | | | | |
| 55 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 56 | | | | | | | | | | | | |
| 57 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 58 | | | | | | | | | | | | |
| 59 | Copper (mg/L) | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 61 | | | | Raw Statistics | | | | | | | | |
| 62 | | | | | Number of Valid Observations | 29 | | | | | | |
| 63 | | | | | Number of Distinct Observations | 15 | | | | | | |
| 64 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 65 | | | | | Maximum | 0.014 | | | | | | |
| 66 | | | | | Mean of Raw Data | 0.00198 | | | | | | |
| 67 | | | | | Standard Deviation of Raw Data | 0.00268 | | | | | | |
| 68 | | | | | Khat | 1.172 | | | | | | |
| 69 | | | | | Theta hat | 0.00169 | | | | | | |
| 70 | | | | | Kstar | 1.073 | | | | | | |
| 71 | | | | | Theta star | 0.00184 | | | | | | |
| 72 | | | | | Mean of Log Transformed Data | -6.709 | | | | | | |
| 73 | | | | | Standard Deviation of Log Transformed Data | 0.949 | | | | | | |
| 74 | | | | | | | | | | | | |
| 75 | | | | Normal GOF Test Results | | | | | | | | |
| 76 | | | | | | | | | | | | |
| 77 | | | | | Correlation Coefficient R | 0.733 | | | | | | |
| 78 | | | | | Shapiro Wilk Test Statistic | 0.566 | | | | | | |
| 79 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 80 | | | | | Approximate Shapiro Wilk P Value | 2.1872E-9 | | | | | | |
| 81 | | | | | Lilliefors Test Statistic | 0.323 | | | | | | |
| 82 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 83 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 84 | | | | | | | | | | | | |
| 85 | | | | Gamma GOF Test Results | | | | | | | | |
| 86 | | | | | | | | | | | | |
| 87 | | | | | Correlation Coefficient R | 0.903 | | | | | | |
| 88 | | | | | A-D Test Statistic | 1.57 | | | | | | |
| 89 | | | | | A-D Critical (0.05) Value | 0.77 | | | | | | |
| 90 | | | | | K-S Test Statistic | 0.253 | | | | | | |
| 91 | | | | | K-S Critical(0.05) Value | 0.167 | | | | | | |
| 92 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 93 | | | | | | | | | | | | |
| 94 | | | | Lognormal GOF Test Results | | | | | | | | |
| 95 | | | | | | | | | | | | |
| 96 | | | | | Correlation Coefficient R | 0.965 | | | | | | |
| 97 | | | | | Shapiro Wilk Test Statistic | 0.937 | | | | | | |
| 98 | | | | | Shapiro Wilk Critical (0.05) Value | 0.926 | | | | | | |
| 99 | | | | | Approximate Shapiro Wilk P Value | 0.0927 | | | | | | |
| 100 | | | | | Lilliefors Test Statistic | 0.204 | | | | | | |
| 101 | | | | | Lilliefors Critical (0.05) Value | 0.161 | | | | | | |
| 102 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 103 | | | | | | | | | | | | |
| 104 | Iron (mg/L) | | | | | | | | | | | |
| 105 | | | | | | | | | | | | |
| 106 | | | | Raw Statistics | | | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Valid Observations | 12 | | | | | | |
| 108 | | | | | Number of Distinct Observations | 9 | | | | | | |
| 109 | | | | | Minimum | 0.01 | | | | | | |
| 110 | | | | | Maximum | 3.17 | | | | | | |
| 111 | | | | | Mean of Raw Data | 0.964 | | | | | | |
| 112 | | | | | Standard Deviation of Raw Data | 1.208 | | | | | | |
| 113 | | | | | Khat | 0.388 | | | | | | |
| 114 | | | | | Theta hat | 2.485 | | | | | | |
| 115 | | | | | Kstar | 0.347 | | | | | | |
| 116 | | | | | Theta star | 2.782 | | | | | | |
| 117 | | | | | Mean of Log Transformed Data | -1.741 | | | | | | |
| 118 | | | | | Standard Deviation of Log Transformed Data | 2.395 | | | | | | |
| 119 | | | | | | | | | | | | |
| 120 | | | | | Normal GOF Test Results | | | | | | | |
| 121 | | | | | | | | | | | | |
| 122 | | | | | Correlation Coefficient R | 0.895 | | | | | | |
| 123 | | | | | Shapiro Wilk Test Statistic | 0.783 | | | | | | |
| 124 | | | | | Shapiro Wilk Critical (0.05) Value | 0.859 | | | | | | |
| 125 | | | | | Approximate Shapiro Wilk P Value | 0.00679 | | | | | | |
| 126 | | | | | Lilliefors Test Statistic | 0.301 | | | | | | |
| 127 | | | | | Lilliefors Critical (0.05) Value | 0.243 | | | | | | |
| 128 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 129 | | | | | | | | | | | | |
| 130 | | | | | Gamma GOF Test Results | | | | | | | |
| 131 | | | | | | | | | | | | |
| 132 | | | | | Correlation Coefficient R | 0.9 | | | | | | |
| 133 | | | | | A-D Test Statistic | 0.786 | | | | | | |
| 134 | | | | | A-D Critical (0.05) Value | 0.807 | | | | | | |
| 135 | | | | | K-S Test Statistic | 0.214 | | | | | | |
| 136 | | | | | K-S Critical(0.05) Value | 0.262 | | | | | | |
| 137 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 138 | | | | | | | | | | | | |
| 139 | | | | | Lognormal GOF Test Results | | | | | | | |
| 140 | | | | | | | | | | | | |
| 141 | | | | | Correlation Coefficient R | 0.938 | | | | | | |
| 142 | | | | | Shapiro Wilk Test Statistic | 0.847 | | | | | | |
| 143 | | | | | Shapiro Wilk Critical (0.05) Value | 0.859 | | | | | | |
| 144 | | | | | Approximate Shapiro Wilk P Value | 0.057 | | | | | | |
| 145 | | | | | Lilliefors Test Statistic | 0.212 | | | | | | |
| 146 | | | | | Lilliefors Critical (0.05) Value | 0.243 | | | | | | |
| 147 | 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 5.2 2023-12-13 11:31:25 AM | |
| From File | 2023-SandstoneProUCL_c.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

05-SS

DOC (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 16 |
| Number of Distinct Observations | 12 |
| Minimum | 0.7 |
| Maximum | 10.1 |
| Mean of Raw Data | 2.538 |
| Standard Deviation of Raw Data | 2.936 |
| Khat | 1.326 |
| Theta hat | 1.914 |
| Kstar | 1.119 |
| Theta star | 2.268 |
| Mean of Log Transformed Data | 0.509 |
| Standard Deviation of Log Transformed Data | 0.853 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.796 |
| Shapiro Wilk Test Statistic | 0.638 |
| Shapiro Wilk Critical (0.05) Value | 0.887 |
| Approximate Shapiro Wilk P Value | 1.5392E-5 |
| Lilliefors Test Statistic | 0.351 |
| Lilliefors Critical (0.05) Value | 0.213 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.938 |
| A-D Test Statistic | 1.807 |
| A-D Critical (0.05) Value | 0.758 |
| K-S Test Statistic | 0.339 |
| K-S Critical(0.05) Value | 0.22 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.901 |
| Shapiro Wilk Test Statistic | 0.805 |
| Shapiro Wilk Critical (0.05) Value | 0.887 |
| Approximate Shapiro Wilk P Value | 0.00301 |
| Lilliefors Test Statistic | 0.301 |
| Lilliefors Critical (0.05) Value | 0.213 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Arsenic (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | Raw Statistics | | | | | | | | |
| 61 | | | | Number of Valid Observations | | 18 | | | | | | |
| 62 | | | | Number of Distinct Observations | | 17 | | | | | | |
| 63 | | | | Minimum | | 1.9000E-4 | | | | | | |
| 64 | | | | Maximum | | 0.0097 | | | | | | |
| 65 | | | | Mean of Raw Data | | 0.00279 | | | | | | |
| 66 | | | | Standard Deviation of Raw Data | | 0.003 | | | | | | |
| 67 | | | | Khat | | 0.871 | | | | | | |
| 68 | | | | Theta hat | | 0.0032 | | | | | | |
| 69 | | | | Kstar | | 0.763 | | | | | | |
| 70 | | | | Theta star | | 0.00365 | | | | | | |
| 71 | | | | Mean of Log Transformed Data | | -6.556 | | | | | | |
| 72 | | | | Standard Deviation of Log Transformed Data | | 1.277 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | Normal GOF Test Results | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | Correlation Coefficient R | | 0.908 | | | | | | |
| 77 | | | | Shapiro Wilk Test Statistic | | 0.816 | | | | | | |
| 78 | | | | Shapiro Wilk Critical (0.05) Value | | 0.897 | | | | | | |
| 79 | | | | Approximate Shapiro Wilk P Value | | 0.00217 | | | | | | |
| 80 | | | | Lilliefors Test Statistic | | 0.213 | | | | | | |
| 81 | | | | Lilliefors Critical (0.05) Value | | 0.202 | | | | | | |
| 82 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 83 | | | | | | | | | | | | |
| 84 | | | | Gamma GOF Test Results | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 86 | | | | Correlation Coefficient R | | 0.973 | | | | | | |
| 87 | | | | A-D Test Statistic | | 0.591 | | | | | | |
| 88 | | | | A-D Critical (0.05) Value | | 0.772 | | | | | | |
| 89 | | | | K-S Test Statistic | | 0.189 | | | | | | |
| 90 | | | | K-S Critical(0.05) Value | | 0.21 | | | | | | |
| 91 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | Lognormal GOF Test Results | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | Correlation Coefficient R | | 0.976 | | | | | | |
| 96 | | | | Shapiro Wilk Test Statistic | | 0.933 | | | | | | |
| 97 | | | | Shapiro Wilk Critical (0.05) Value | | 0.897 | | | | | | |
| 98 | | | | Approximate Shapiro Wilk P Value | | 0.278 | | | | | | |
| 99 | | | | Lilliefors Test Statistic | | 0.151 | | | | | | |
| 100 | | | | Lilliefors Critical (0.05) Value | | 0.202 | | | | | | |
| 101 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Iron (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | Number of Valid Observations | | 18 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 15 | | | | | | |
| 108 | | | | | Minimum | 0.01 | | | | | | |
| 109 | | | | | Maximum | 2.19 | | | | | | |
| 110 | | | | | Mean of Raw Data | 0.877 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.834 | | | | | | |
| 112 | | | | | Khat | 0.557 | | | | | | |
| 113 | | | | | Theta hat | 1.574 | | | | | | |
| 114 | | | | | Kstar | 0.501 | | | | | | |
| 115 | | | | | Theta star | 1.749 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -1.252 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 2.01 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.934 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.847 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.897 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 0.00876 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.22 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.202 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.848 | | | | | | |
| 132 | | | | | A-D Test Statistic | 1.083 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.795 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.223 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.214 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.927 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.837 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.897 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 0.00557 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.228 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.202 | | | | | | |
| 146 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 151 | | | | | | | | | | | | |
| 152 | Lead (mg/L) | | | | | | | | | | | |
| 153 | | | | | | | | | | | | |
| 154 | | | | | Raw Statistics | | | | | | | |
| 155 | | | | | Number of Valid Observations | 18 | | | | | | |
| 156 | | | | | Number of Distinct Observations | 11 | | | | | | |
| 157 | | | | | Minimum | 5.0000E-5 | | | | | | |
| 158 | | | | | Maximum | 0.101 | | | | | | |
| 159 | | | | | Mean of Raw Data | 0.00769 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Standard Deviation of Raw Data | 0.0236 | | | | | | |
| 161 | | | | | Khat | 0.257 | | | | | | |
| 162 | | | | | Theta hat | 0.0299 | | | | | | |
| 163 | | | | | Kstar | 0.251 | | | | | | |
| 164 | | | | | Theta star | 0.0306 | | | | | | |
| 165 | | | | | Mean of Log Transformed Data | -7.618 | | | | | | |
| 166 | | | | | Standard Deviation of Log Transformed Data | 2.486 | | | | | | |
| 167 | | | | | | | | | | | | |
| 168 | | | | | Normal GOF Test Results | | | | | | | |
| 169 | | | | | | | | | | | | |
| 170 | | | | | Correlation Coefficient R | 0.571 | | | | | | |
| 171 | | | | | Shapiro Wilk Test Statistic | 0.356 | | | | | | |
| 172 | | | | | Shapiro Wilk Critical (0.05) Value | 0.897 | | | | | | |
| 173 | | | | | Approximate Shapiro Wilk P Value | 1.9641E-9 | | | | | | |
| 174 | | | | | Lilliefors Test Statistic | 0.397 | | | | | | |
| 175 | | | | | Lilliefors Critical (0.05) Value | 0.202 | | | | | | |
| 176 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 177 | | | | | | | | | | | | |
| 178 | | | | | Gamma GOF Test Results | | | | | | | |
| 179 | | | | | | | | | | | | |
| 180 | | | | | Correlation Coefficient R | 0.906 | | | | | | |
| 181 | | | | | A-D Test Statistic | 1.687 | | | | | | |
| 182 | | | | | A-D Critical (0.05) Value | 0.862 | | | | | | |
| 183 | | | | | K-S Test Statistic | 0.231 | | | | | | |
| 184 | | | | | K-S Critical(0.05) Value | 0.223 | | | | | | |
| 185 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 186 | | | | | | | | | | | | |
| 187 | | | | | Lognormal GOF Test Results | | | | | | | |
| 188 | | | | | | | | | | | | |
| 189 | | | | | Correlation Coefficient R | 0.924 | | | | | | |
| 190 | | | | | Shapiro Wilk Test Statistic | 0.84 | | | | | | |
| 191 | | | | | Shapiro Wilk Critical (0.05) Value | 0.897 | | | | | | |
| 192 | | | | | Approximate Shapiro Wilk P Value | 0.00592 | | | | | | |
| 193 | | | | | Lilliefors Test Statistic | 0.266 | | | | | | |
| 194 | | | | | Lilliefors Critical (0.05) Value | 0.202 | | | | | | |
| 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 Significance | | | | | | | | | | | |

| | | |
|---|---|---|
| | Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 11:32:38 AM | |
| From File | 2023-SandstoneProUCL_d.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

07(R)SS

Chloride (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 34 |
| Number of Distinct Observations | 19 |
| Minimum | 0.01 |
| Maximum | 9.31 |
| Mean of Raw Data | 1.132 |
| Standard Deviation of Raw Data | 1.768 |
| Khat | 0.944 |
| Theta hat | 1.2 |
| Kstar | 0.88 |
| Theta star | 1.286 |
| Mean of Log Transformed Data | -0.492 |
| Standard Deviation of Log Transformed Data | 1.296 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.653 |
| Shapiro Wilk Test Statistic | 0.457 |
| Shapiro Wilk Critical (0.05) Value | 0.933 |
| Approximate Shapiro Wilk P Value | 9.265E-13 |
| Lilliefors Test Statistic | 0.387 |
| Lilliefors Critical (0.05) Value | 0.15 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.848 |
| A-D Test Statistic | 2.62 |
| A-D Critical (0.05) Value | 0.778 |
| K-S Test Statistic | 0.244 |
| K-S Critical(0.05) Value | 0.156 |

Data not Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.864 |
| Shapiro Wilk Test Statistic | 0.77 |
| Shapiro Wilk Critical (0.05) Value | 0.933 |
| Approximate Shapiro Wilk P Value | 1.3457E-6 |
| Lilliefors Test Statistic | 0.291 |
| Lilliefors Critical (0.05) Value | 0.15 |

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 Significance | | | | | | | | | | | |
| 57 | | | | | | | | | | | | |
| 58 | Copper (mg/L) | | | | | | | | | | | |
| 59 | | | | | | | | | | | | |
| 60 | | | | Raw Statistics | | | | | | | | |
| 61 | | | | | Number of Valid Observations | 30 | | | | | | |
| 62 | | | | | Number of Distinct Observations | 16 | | | | | | |
| 63 | | | | | Minimum | 1.7000E-4 | | | | | | |
| 64 | | | | | Maximum | 0.009 | | | | | | |
| 65 | | | | | Mean of Raw Data | 0.00202 | | | | | | |
| 66 | | | | | Standard Deviation of Raw Data | 0.0022 | | | | | | |
| 67 | | | | | Khat | 0.977 | | | | | | |
| 68 | | | | | Theta hat | 0.00207 | | | | | | |
| 69 | | | | | Kstar | 0.901 | | | | | | |
| 70 | | | | | Theta star | 0.00224 | | | | | | |
| 71 | | | | | Mean of Log Transformed Data | -6.797 | | | | | | |
| 72 | | | | | Standard Deviation of Log Transformed Data | 1.181 | | | | | | |
| 73 | | | | | | | | | | | | |
| 74 | | | | Normal GOF Test Results | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 76 | | | | | Correlation Coefficient R | 0.884 | | | | | | |
| 77 | | | | | Shapiro Wilk Test Statistic | 0.784 | | | | | | |
| 78 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 79 | | | | | Approximate Shapiro Wilk P Value | 1.3205E-5 | | | | | | |
| 80 | | | | | Lilliefors Test Statistic | 0.237 | | | | | | |
| 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 | 0.992 | | | | | | |
| 87 | | | | | A-D Test Statistic | 0.643 | | | | | | |
| 88 | | | | | A-D Critical (0.05) Value | 0.777 | | | | | | |
| 89 | | | | | K-S Test Statistic | 0.139 | | | | | | |
| 90 | | | | | K-S Critical(0.05) Value | 0.165 | | | | | | |
| 91 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 92 | | | | | | | | | | | | |
| 93 | | | | Lognormal GOF Test Results | | | | | | | | |
| 94 | | | | | | | | | | | | |
| 95 | | | | | Correlation Coefficient R | 0.975 | | | | | | |
| 96 | | | | | Shapiro Wilk Test Statistic | 0.932 | | | | | | |
| 97 | | | | | Shapiro Wilk Critical (0.05) Value | 0.927 | | | | | | |
| 98 | | | | | Approximate Shapiro Wilk P Value | 0.0656 | | | | | | |
| 99 | | | | | Lilliefors Test Statistic | 0.163 | | | | | | |
| 100 | | | | | Lilliefors Critical (0.05) Value | 0.159 | | | | | | |
| 101 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Zinc (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | | Number of Valid Observations | 11 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 7 | | | | | | |
| 108 | | | | | Minimum | 0.001 | | | | | | |
| 109 | | | | | Maximum | 0.0043 | | | | | | |
| 110 | | | | | Mean of Raw Data | 0.0019 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.0013 | | | | | | |
| 112 | | | | | Khat | 2.957 | | | | | | |
| 113 | | | | | Theta hat | 6.4257E-4 | | | | | | |
| 114 | | | | | Kstar | 2.211 | | | | | | |
| 115 | | | | | Theta star | 8.5931E-4 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -6.444 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 0.594 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.855 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.717 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.85 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 0.00148 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.318 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.251 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.926 | | | | | | |
| 132 | | | | | A-D Test Statistic | 1.303 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.734 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.263 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.257 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.886 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.763 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.85 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 0.00583 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.237 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.251 | | | | | | |
| 146 | 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 5.2 2023-12-13 1:33:24 PM | |
| From File | 2023-SandstoneProUCL_e.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

13(R)SS

DOC (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 15 |
| Number of Distinct Observations | 14 |
| Minimum | 0.73 |
| Maximum | 10.1 |
| Mean of Raw Data | 2.726 |
| Standard Deviation of Raw Data | 2.365 |
| Khat | 2.117 |
| Theta hat | 1.287 |
| Kstar | 1.738 |
| Theta star | 1.568 |
| Mean of Log Transformed Data | 0.748 |
| Standard Deviation of Log Transformed Data | 0.707 |

| Normal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.847 |
| Shapiro Wilk Test Statistic | 0.737 |
| Shapiro Wilk Critical (0.05) Value | 0.881 |
| Approximate Shapiro Wilk P Value | 3.7835E-4 |
| Lilliefors Test Statistic | 0.221 |
| Lilliefors Critical (0.05) Value | 0.22 |

Data not Normal at (0.05) Significance Level

| Gamma GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.95 |
| A-D Test Statistic | 0.412 |
| A-D Critical (0.05) Value | 0.747 |
| K-S Test Statistic | 0.136 |
| K-S Critical(0.05) Value | 0.224 |

Data appear Gamma Distributed at (0.05) Significance Level

| Lognormal GOF Test Results | |
|---|---|
| Correlation Coefficient R | 0.982 |
| Shapiro Wilk Test Statistic | 0.965 |
| Shapiro Wilk Critical (0.05) Value | 0.881 |
| Approximate Shapiro Wilk P Value | 0.755 |
| Lilliefors Test Statistic | 0.12 |
| Lilliefors Critical (0.05) Value | 0.22 |

Data appear 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 | | 20 | | | | | | |
| 58 | | | | Number of Distinct Observations | | 18 | | | | | | |
| 59 | | | | Minimum | | 5.0000E-6 | | | | | | |
| 60 | | | | Maximum | | 0.003 | | | | | | |
| 61 | | | | Mean of Raw Data | | 4.5600E-4 | | | | | | |
| 62 | | | | Standard Deviation of Raw Data | | 9.0051E-4 | | | | | | |
| 63 | | | | Khat | | 0.461 | | | | | | |
| 64 | | | | Theta hat | | 9.8960E-4 | | | | | | |
| 65 | | | | Kstar | | 0.425 | | | | | | |
| 66 | | | | Theta star | | 0.00107 | | | | | | |
| 67 | | | | Mean of Log Transformed Data | | -9.089 | | | | | | |
| 68 | | | | Standard Deviation of Log Transformed Data | | 1.701 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | Correlation Coefficient R | | 0.717 | | | | | | |
| 73 | | | | Shapiro Wilk Test Statistic | | 0.523 | | | | | | |
| 74 | | | | Shapiro Wilk Critical (0.05) Value | | 0.905 | | | | | | |
| 75 | | | | Approximate Shapiro Wilk P Value | | 3.6477E-8 | | | | | | |
| 76 | | | | Lilliefors Test Statistic | | 0.356 | | | | | | |
| 77 | | | | Lilliefors Critical (0.05) Value | | 0.192 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | Correlation Coefficient R | | 0.931 | | | | | | |
| 83 | | | | A-D Test Statistic | | 1.239 | | | | | | |
| 84 | | | | A-D Critical (0.05) Value | | 0.811 | | | | | | |
| 85 | | | | K-S Test Statistic | | 0.192 | | | | | | |
| 86 | | | | K-S Critical(0.05) Value | | 0.206 | | | | | | |
| 87 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | Correlation Coefficient R | | 0.984 | | | | | | |
| 92 | | | | Shapiro Wilk Test Statistic | | 0.965 | | | | | | |
| 93 | | | | Shapiro Wilk Critical (0.05) Value | | 0.905 | | | | | | |
| 94 | | | | Approximate Shapiro Wilk P Value | | 0.652 | | | | | | |
| 95 | | | | Lilliefors Test Statistic | | 0.13 | | | | | | |
| 96 | | | | Lilliefors Critical (0.05) Value | | 0.192 | | | | | | |
| 97 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | Copper (mg/L) | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | Raw Statistics | | | | | | | | |
| 102 | | | | Number of Valid Observations | | 19 | | | | | | |
| 103 | | | | Number of Missing Observations | | 1 | | | | | | |
| 104 | | | | Number of Distinct Observations | | 18 | | | | | | |
| 105 | | | | Minimum | | 0.001 | | | | | | |
| 106 | | | | Maximum | | 0.083 | | | | | | |

| | | |
|---|---|---|
| 107 | Mean of Raw Data | 0.0166 |
| 108 | Standard Deviation of Raw Data | 0.0247 |
| 109 | Khat | 0.669 |
| 110 | Theta hat | 0.0248 |
| 111 | Kstar | 0.598 |
| 112 | Theta star | 0.0277 |
| 113 | Mean of Log Transformed Data | -5.008 |
| 114 | Standard Deviation of Log Transformed Data | 1.342 |
| 115 | | |
| 116 | **Normal GOF Test Results** | |
| 117 | | |
| 118 | Correlation Coefficient R | 0.808 |
| 119 | Shapiro Wilk Test Statistic | 0.656 |
| 120 | Shapiro Wilk Critical (0.05) Value | 0.901 |
| 121 | Approximate Shapiro Wilk P Value | 4.2136E-6 |
| 122 | Lilliefors Test Statistic | 0.328 |
| 123 | Lilliefors Critical (0.05) Value | 0.197 |
| 124 | Data not Normal at (0.05) Significance Level | |
| 125 | | |
| 126 | **Gamma GOF Test Results** | |
| 127 | | |
| 128 | Correlation Coefficient R | 0.968 |
| 129 | A-D Test Statistic | 1.401 |
| 130 | A-D Critical (0.05) Value | 0.787 |
| 131 | K-S Test Statistic | 0.271 |
| 132 | K-S Critical(0.05) Value | 0.207 |
| 133 | Data not Gamma Distributed at (0.05) Significance Level | |
| 134 | | |
| 135 | **Lognormal GOF Test Results** | |
| 136 | | |
| 137 | Correlation Coefficient R | 0.956 |
| 138 | Shapiro Wilk Test Statistic | 0.902 |
| 139 | Shapiro Wilk Critical (0.05) Value | 0.901 |
| 140 | Approximate Shapiro Wilk P Value | 0.0593 |
| 141 | Lilliefors Test Statistic | 0.226 |
| 142 | Lilliefors Critical (0.05) Value | 0.197 |
| 143 | Data appear Approximate_Lognormal at (0.05) Significance Level | |
| 144 | | |
| 145 | **Manganese (mg/L)** | |
| 146 | | |
| 147 | **Raw Statistics** | |
| 148 | Number of Valid Observations | 18 |
| 149 | Number of Distinct Observations | 17 |
| 150 | Minimum | 0.005 |
| 151 | Maximum | 0.92 |
| 152 | Mean of Raw Data | 0.367 |
| 153 | Standard Deviation of Raw Data | 0.285 |
| 154 | Khat | 0.982 |
| 155 | Theta hat | 0.374 |
| 156 | Kstar | 0.855 |
| 157 | Theta star | 0.43 |
| 158 | Mean of Log Transformed Data | -1.59 |
| 159 | Standard Deviation of Log Transformed Data | 1.488 |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | | | | | | | | |
| 161 | | | | Normal GOF Test Results | | | | | | | | |
| 162 | | | | | | | | | | | | |
| 163 | | | | | Correlation Coefficient R | 0.973 | | | | | | |
| 164 | | | | | Shapiro Wilk Test Statistic | 0.933 | | | | | | |
| 165 | | | | | Shapiro Wilk Critical (0.05) Value | 0.897 | | | | | | |
| 166 | | | | | Approximate Shapiro Wilk P Value | 0.259 | | | | | | |
| 167 | | | | | Lilliefors Test Statistic | 0.111 | | | | | | |
| 168 | | | | | Lilliefors Critical (0.05) Value | 0.202 | | | | | | |
| 169 | Data appear Normal at (0.05) Significance Level | | | | | | | | | | | |
| 170 | | | | | | | | | | | | |
| 171 | | | | Gamma GOF Test Results | | | | | | | | |
| 172 | | | | | | | | | | | | |
| 173 | | | | | Correlation Coefficient R | 0.946 | | | | | | |
| 174 | | | | | A-D Test Statistic | 0.534 | | | | | | |
| 175 | | | | | A-D Critical (0.05) Value | 0.767 | | | | | | |
| 176 | | | | | K-S Test Statistic | 0.149 | | | | | | |
| 177 | | | | | K-S Critical(0.05) Value | 0.21 | | | | | | |
| 178 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 179 | | | | | | | | | | | | |
| 180 | | | | Lognormal GOF Test Results | | | | | | | | |
| 181 | | | | | | | | | | | | |
| 182 | | | | | Correlation Coefficient R | 0.914 | | | | | | |
| 183 | | | | | Shapiro Wilk Test Statistic | 0.834 | | | | | | |
| 184 | | | | | Shapiro Wilk Critical (0.05) Value | 0.897 | | | | | | |
| 185 | | | | | Approximate Shapiro Wilk P Value | 0.00405 | | | | | | |
| 186 | | | | | Lilliefors Test Statistic | 0.196 | | | | | | |
| 187 | | | | | Lilliefors Critical (0.05) Value | 0.202 | | | | | | |
| 188 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 189 | | | | | | | | | | | | |
| 190 | Nickel (mg/L) | | | | | | | | | | | |
| 191 | | | | | | | | | | | | |
| 192 | | | | Raw Statistics | | | | | | | | |
| 193 | | | | | Number of Valid Observations | 17 | | | | | | |
| 194 | | | | | Number of Distinct Observations | 17 | | | | | | |
| 195 | | | | | Minimum | 5.0000E-4 | | | | | | |
| 196 | | | | | Maximum | 0.0227 | | | | | | |
| 197 | | | | | Mean of Raw Data | 0.00744 | | | | | | |
| 198 | | | | | Standard Deviation of Raw Data | 0.00691 | | | | | | |
| 199 | | | | | Khat | 1.395 | | | | | | |
| 200 | | | | | Theta hat | 0.00534 | | | | | | |
| 201 | | | | | Kstar | 1.188 | | | | | | |
| 202 | | | | | Theta star | 0.00627 | | | | | | |
| 203 | | | | | Mean of Log Transformed Data | -5.3 | | | | | | |
| 204 | | | | | Standard Deviation of Log Transformed Data | 0.965 | | | | | | |
| 205 | | | | | | | | | | | | |
| 206 | | | | Normal GOF Test Results | | | | | | | | |
| 207 | | | | | | | | | | | | |
| 208 | | | | | Correlation Coefficient R | 0.885 | | | | | | |
| 209 | | | | | Shapiro Wilk Test Statistic | 0.779 | | | | | | |
| 210 | | | | | Shapiro Wilk Critical (0.05) Value | 0.892 | | | | | | |
| 211 | | | | | Approximate Shapiro Wilk P Value | 7.8004E-4 | | | | | | |
| 212 | | | | | Lilliefors Test Statistic | 0.319 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Lilliefors Critical (0.05) Value | 0.207 | | | | | | |
| 214 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 215 | | | | | | | | | | | | |
| 216 | | | | | Gamma GOF Test Results | | | | | | | |
| 217 | | | | | | | | | | | | |
| 218 | | | | | Correlation Coefficient R | 0.961 | | | | | | |
| 219 | | | | | A-D Test Statistic | 0.91 | | | | | | |
| 220 | | | | | A-D Critical (0.05) Value | 0.758 | | | | | | |
| 221 | | | | | K-S Test Statistic | 0.259 | | | | | | |
| 222 | | | | | K-S Critical(0.05) Value | 0.213 | | | | | | |
| 223 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 224 | | | | | | | | | | | | |
| 225 | | | | | Lognormal GOF Test Results | | | | | | | |
| 226 | | | | | | | | | | | | |
| 227 | | | | | Correlation Coefficient R | 0.953 | | | | | | |
| 228 | | | | | Shapiro Wilk Test Statistic | 0.916 | | | | | | |
| 229 | | | | | Shapiro Wilk Critical (0.05) Value | 0.892 | | | | | | |
| 230 | | | | | Approximate Shapiro Wilk P Value | 0.119 | | | | | | |
| 231 | | | | | Lilliefors Test Statistic | 0.203 | | | | | | |
| 232 | | | | | Lilliefors Critical (0.05) Value | 0.207 | | | | | | |
| 233 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 234 | | | | | | | | | | | | |
| 235 | Zinc (mg/L) | | | | | | | | | | | |
| 236 | | | | | | | | | | | | |
| 237 | | | | | Raw Statistics | | | | | | | |
| 238 | | | | | Number of Valid Observations | 17 | | | | | | |
| 239 | | | | | Number of Distinct Observations | 16 | | | | | | |
| 240 | | | | | Minimum | 0.0044 | | | | | | |
| 241 | | | | | Maximum | 1.61 | | | | | | |
| 242 | | | | | Mean of Raw Data | 0.228 | | | | | | |
| 243 | | | | | Standard Deviation of Raw Data | 0.405 | | | | | | |
| 244 | | | | | Khat | 0.489 | | | | | | |
| 245 | | | | | Theta hat | 0.466 | | | | | | |
| 246 | | | | | Kstar | 0.442 | | | | | | |
| 247 | | | | | Theta star | 0.516 | | | | | | |
| 248 | | | | | Mean of Log Transformed Data | -2.779 | | | | | | |
| 249 | | | | | Standard Deviation of Log Transformed Data | 1.731 | | | | | | |
| 250 | | | | | | | | | | | | |
| 251 | | | | | Normal GOF Test Results | | | | | | | |
| 252 | | | | | | | | | | | | |
| 253 | | | | | Correlation Coefficient R | 0.763 | | | | | | |
| 254 | | | | | Shapiro Wilk Test Statistic | 0.603 | | | | | | |
| 255 | | | | | Shapiro Wilk Critical (0.05) Value | 0.892 | | | | | | |
| 256 | | | | | Approximate Shapiro Wilk P Value | 2.7229E-6 | | | | | | |
| 257 | | | | | Lilliefors Test Statistic | 0.329 | | | | | | |
| 258 | | | | | Lilliefors Critical (0.05) Value | 0.207 | | | | | | |
| 259 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 260 | | | | | | | | | | | | |
| 261 | | | | | Gamma GOF Test Results | | | | | | | |
| 262 | | | | | | | | | | | | |
| 263 | | | | | Correlation Coefficient R | 0.979 | | | | | | |
| 264 | | | | | A-D Test Statistic | 0.743 | | | | | | |
| 265 | | | | | A-D Critical (0.05) Value | 0.8 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 266 | | | | | K-S Test Statistic | 0.208 | | | | | | |
| 267 | | | | | K-S Critical(0.05) Value | 0.221 | | | | | | |
| 268 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 269 | | | | | | | | | | | | |
| 270 | | | | Lognormal GOF Test Results | | | | | | | | |
| 271 | | | | | | | | | | | | |
| 272 | | | | | Correlation Coefficient R | 0.984 | | | | | | |
| 273 | | | | | Shapiro Wilk Test Statistic | 0.958 | | | | | | |
| 274 | | | | | Shapiro Wilk Critical (0.05) Value | 0.892 | | | | | | |
| 275 | | | | | Approximate Shapiro Wilk P Value | 0.651 | | | | | | |
| 276 | | | | | Lilliefors Test Statistic | 0.135 | | | | | | |
| 277 | | | | | Lilliefors Critical (0.05) Value | 0.207 | | | | | | |
| 278 | 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 5.2 2023-12-13 1:36:45 PM | |
| From File | 2023-SandstoneProUCL_g.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |

89-3

Arsenic (mg/L)

| Raw Statistics | |
|---|---|
| Number of Valid Observations | 19 |
| Number of Distinct Observations | 17 |
| Minimum | 1.0000E-4 |
| Maximum | 0.0036 |
| Mean of Raw Data | 0.00149 |
| Standard Deviation of Raw Data | 0.00113 |
| Khat | 1.188 |
| Theta hat | 0.00125 |
| Kstar | 1.036 |
| Theta star | 0.00143 |
| Mean of Log Transformed Data | -6.988 |
| Standard Deviation of Log Transformed Data | 1.192 |

Normal GOF Test Results

| | |
|---|---|
| Correlation Coefficient R | 0.97 |
| Shapiro Wilk Test Statistic | 0.923 |
| Shapiro Wilk Critical (0.05) Value | 0.901 |
| Approximate Shapiro Wilk P Value | 0.155 |
| Lilliefors Test Statistic | 0.133 |
| Lilliefors Critical (0.05) Value | 0.197 |

Data appear Normal at (0.05) Significance Level

Gamma GOF Test Results

| | |
|---|---|
| Correlation Coefficient R | 0.936 |
| A-D Test Statistic | 0.629 |
| A-D Critical (0.05) Value | 0.765 |
| K-S Test Statistic | 0.149 |
| K-S Critical(0.05) Value | 0.203 |

Data appear Gamma Distributed at (0.05) Significance Level

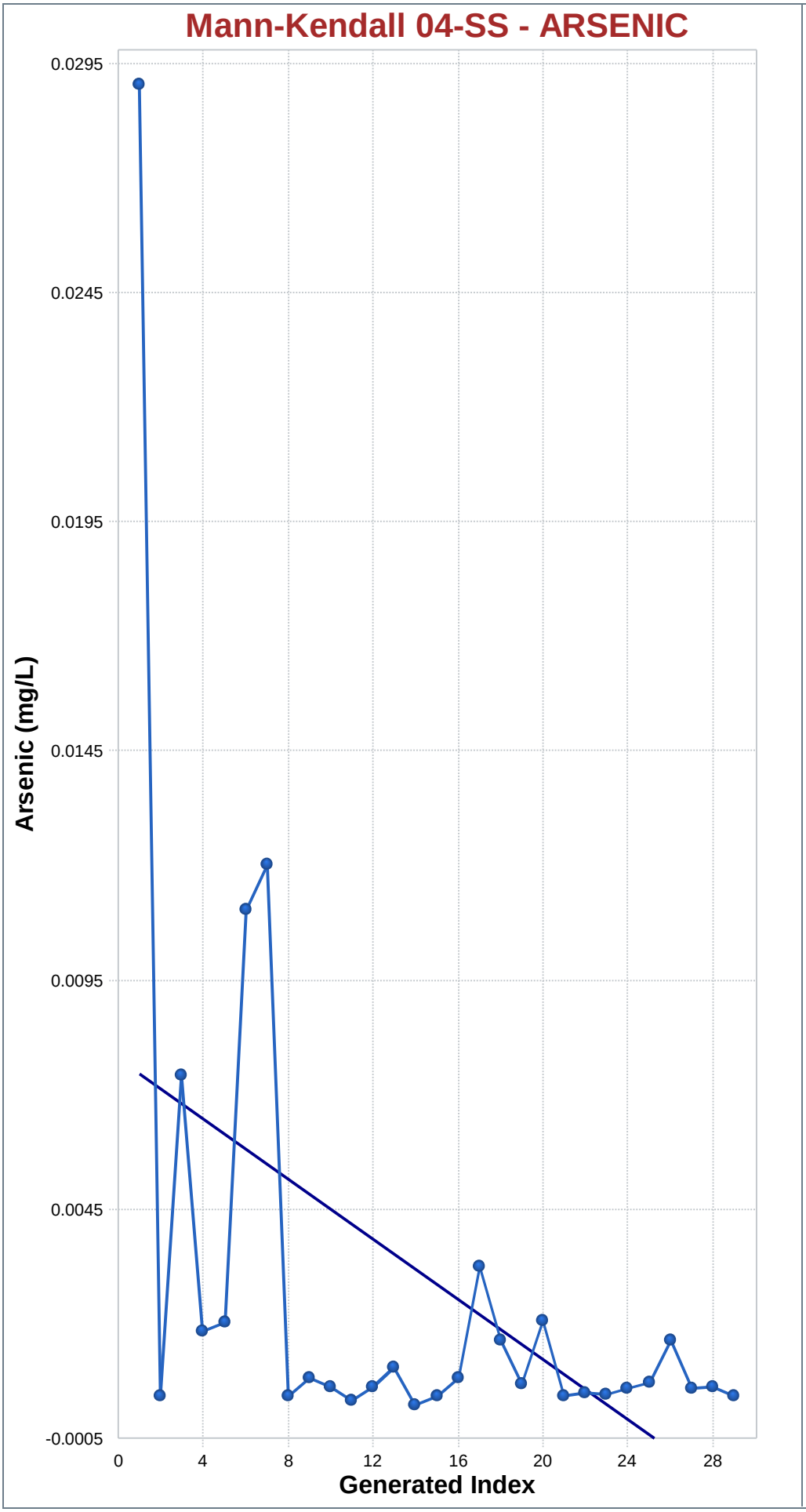
Lognormal GOF Test Results

| | |
|---|---|
| Correlation Coefficient R | 0.942 |
| Shapiro Wilk Test Statistic | 0.87 |
| Shapiro Wilk Critical (0.05) Value | 0.901 |
| Approximate Shapiro Wilk P Value | 0.0157 |
| Lilliefors Test Statistic | 0.211 |
| Lilliefors Critical (0.05) Value | 0.197 |

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 | 22 | | | | | | |
| 58 | | | | | Number of Distinct Observations | 21 | | | | | | |
| 59 | | | | | Minimum | 0.01 | | | | | | |
| 60 | | | | | Maximum | 8.95 | | | | | | |
| 61 | | | | | Mean of Raw Data | 2.691 | | | | | | |
| 62 | | | | | Standard Deviation of Raw Data | 3.13 | | | | | | |
| 63 | | | | | Khat | 0.532 | | | | | | |
| 64 | | | | | Theta hat | 5.062 | | | | | | |
| 65 | | | | | Kstar | 0.489 | | | | | | |
| 66 | | | | | Theta star | 5.499 | | | | | | |
| 67 | | | | | Mean of Log Transformed Data | -0.194 | | | | | | |
| 68 | | | | | Standard Deviation of Log Transformed Data | 2.059 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | | Correlation Coefficient R | 0.897 | | | | | | |
| 73 | | | | | Shapiro Wilk Test Statistic | 0.79 | | | | | | |
| 74 | | | | | Shapiro Wilk Critical (0.05) Value | 0.911 | | | | | | |
| 75 | | | | | Approximate Shapiro Wilk P Value | 1.9521E-4 | | | | | | |
| 76 | | | | | Lilliefors Test Statistic | 0.26 | | | | | | |
| 77 | | | | | Lilliefors Critical (0.05) Value | 0.184 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | | Correlation Coefficient R | 0.926 | | | | | | |
| 83 | | | | | A-D Test Statistic | 0.376 | | | | | | |
| 84 | | | | | A-D Critical (0.05) Value | 0.802 | | | | | | |
| 85 | | | | | K-S Test Statistic | 0.109 | | | | | | |
| 86 | | | | | K-S Critical(0.05) Value | 0.195 | | | | | | |
| 87 | Data appear Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 88 | | | | | | | | | | | | |
| 89 | | | | Lognormal GOF Test Results | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 91 | | | | | Correlation Coefficient R | 0.959 | | | | | | |
| 92 | | | | | Shapiro Wilk Test Statistic | 0.908 | | | | | | |
| 93 | | | | | Shapiro Wilk Critical (0.05) Value | 0.911 | | | | | | |
| 94 | | | | | Approximate Shapiro Wilk P Value | 0.0409 | | | | | | |
| 95 | | | | | Lilliefors Test Statistic | 0.199 | | | | | | |
| 96 | | | | | Lilliefors Critical (0.05) Value | 0.184 | | | | | | |
| 97 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 98 | | | | | | | | | | | | |
| 99 | Nickel (mg/L) | | | | | | | | | | | |
| 100 | | | | | | | | | | | | |
| 101 | | | | Raw Statistics | | | | | | | | |
| 102 | | | | | Number of Valid Observations | 19 | | | | | | |
| 103 | | | | | Number of Distinct Observations | 15 | | | | | | |
| 104 | | | | | Minimum | 4.8000E-4 | | | | | | |
| 105 | | | | | Maximum | 0.0287 | | | | | | |
| 106 | | | | | Mean of Raw Data | 0.00373 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Standard Deviation of Raw Data | 0.0065 | | | | | | |
| 108 | | | | | Khat | 0.736 | | | | | | |
| 109 | | | | | Theta hat | 0.00507 | | | | | | |
| 110 | | | | | Kstar | 0.655 | | | | | | |
| 111 | | | | | Theta star | 0.0057 | | | | | | |
| 112 | | | | | Mean of Log Transformed Data | -6.407 | | | | | | |
| 113 | | | | | Standard Deviation of Log Transformed Data | 1.222 | | | | | | |
| 114 | | | | | | | | | | | | |
| 115 | | | | Normal GOF Test Results | | | | | | | | |
| 116 | | | | | | | | | | | | |
| 117 | | | | | Correlation Coefficient R | 0.712 | | | | | | |
| 118 | | | | | Shapiro Wilk Test Statistic | 0.532 | | | | | | |
| 119 | | | | | Shapiro Wilk Critical (0.05) Value | 0.901 | | | | | | |
| 120 | | | | | Approximate Shapiro Wilk P Value | 8.4331E-8 | | | | | | |
| 121 | | | | | Lilliefors Test Statistic | 0.309 | | | | | | |
| 122 | | | | | Lilliefors Critical (0.05) Value | 0.197 | | | | | | |
| 123 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 124 | | | | | | | | | | | | |
| 125 | | | | Gamma GOF Test Results | | | | | | | | |
| 126 | | | | | | | | | | | | |
| 127 | | | | | Correlation Coefficient R | 0.921 | | | | | | |
| 128 | | | | | A-D Test Statistic | 1.19 | | | | | | |
| 129 | | | | | A-D Critical (0.05) Value | 0.78 | | | | | | |
| 130 | | | | | K-S Test Statistic | 0.202 | | | | | | |
| 131 | | | | | K-S Critical(0.05) Value | 0.206 | | | | | | |
| 132 | Data follow Appr. Gamma Distribution at (0.05) Significance Level | | | | | | | | | | | |
| 133 | | | | | | | | | | | | |
| 134 | | | | Lognormal GOF Test Results | | | | | | | | |
| 135 | | | | | | | | | | | | |
| 136 | | | | | Correlation Coefficient R | 0.945 | | | | | | |
| 137 | | | | | Shapiro Wilk Test Statistic | 0.883 | | | | | | |
| 138 | | | | | Shapiro Wilk Critical (0.05) Value | 0.901 | | | | | | |
| 139 | | | | | Approximate Shapiro Wilk P Value | 0.0262 | | | | | | |
| 140 | | | | | Lilliefors Test Statistic | 0.176 | | | | | | |
| 141 | | | | | Lilliefors Critical (0.05) Value | 0.197 | | | | | | |
| 142 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |




**Mann-Kendall Trend Analysis**

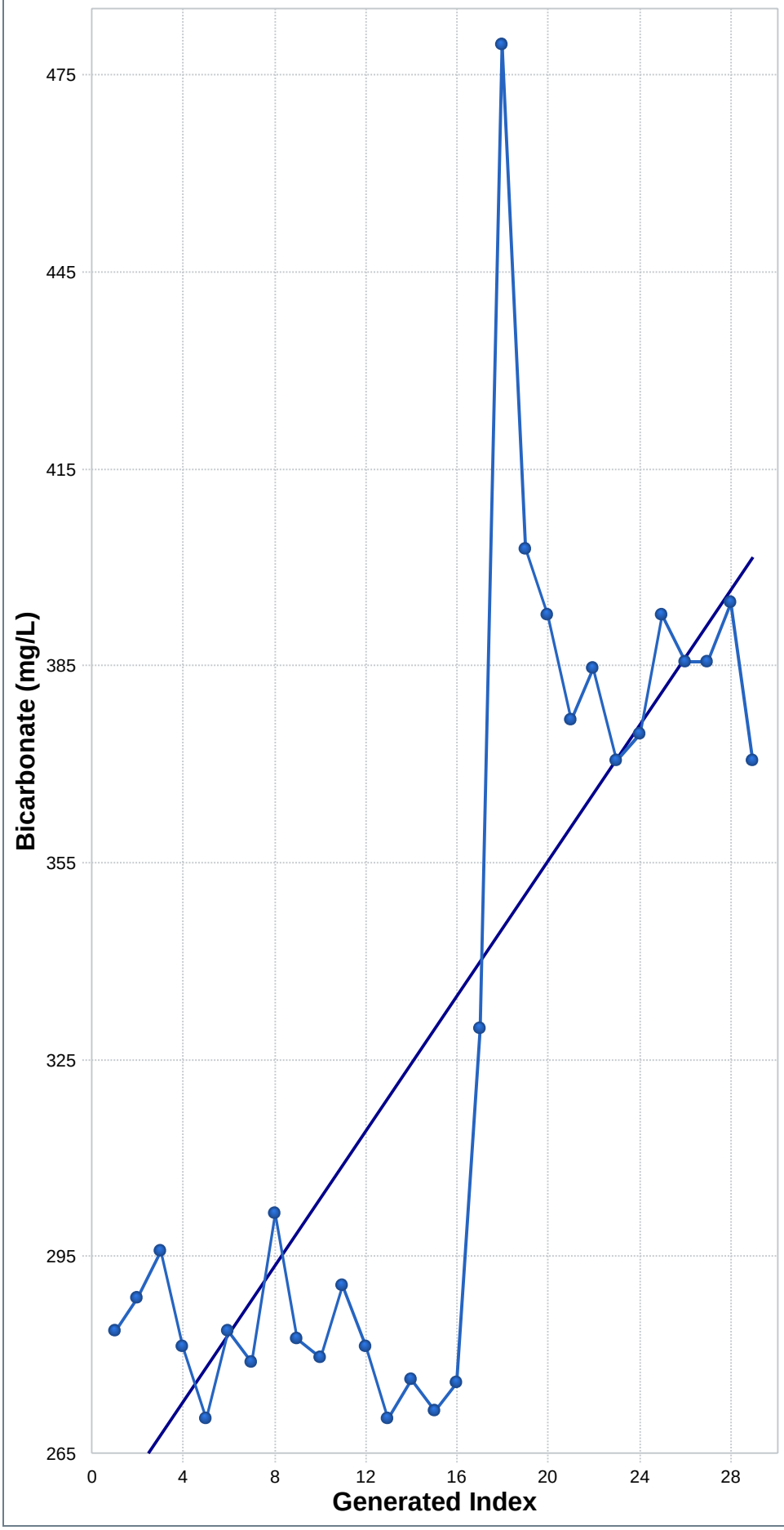
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2478 |
| Standardized Value of S | -1.8592 |
| M-K Test Value (S) | -100 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0315 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0003 |
| OLS Regression Intercept | 0.0078 |

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

# Mann-Kendall 04-SS - BICARBONATE




**Mann-Kendall Trend Analysis**

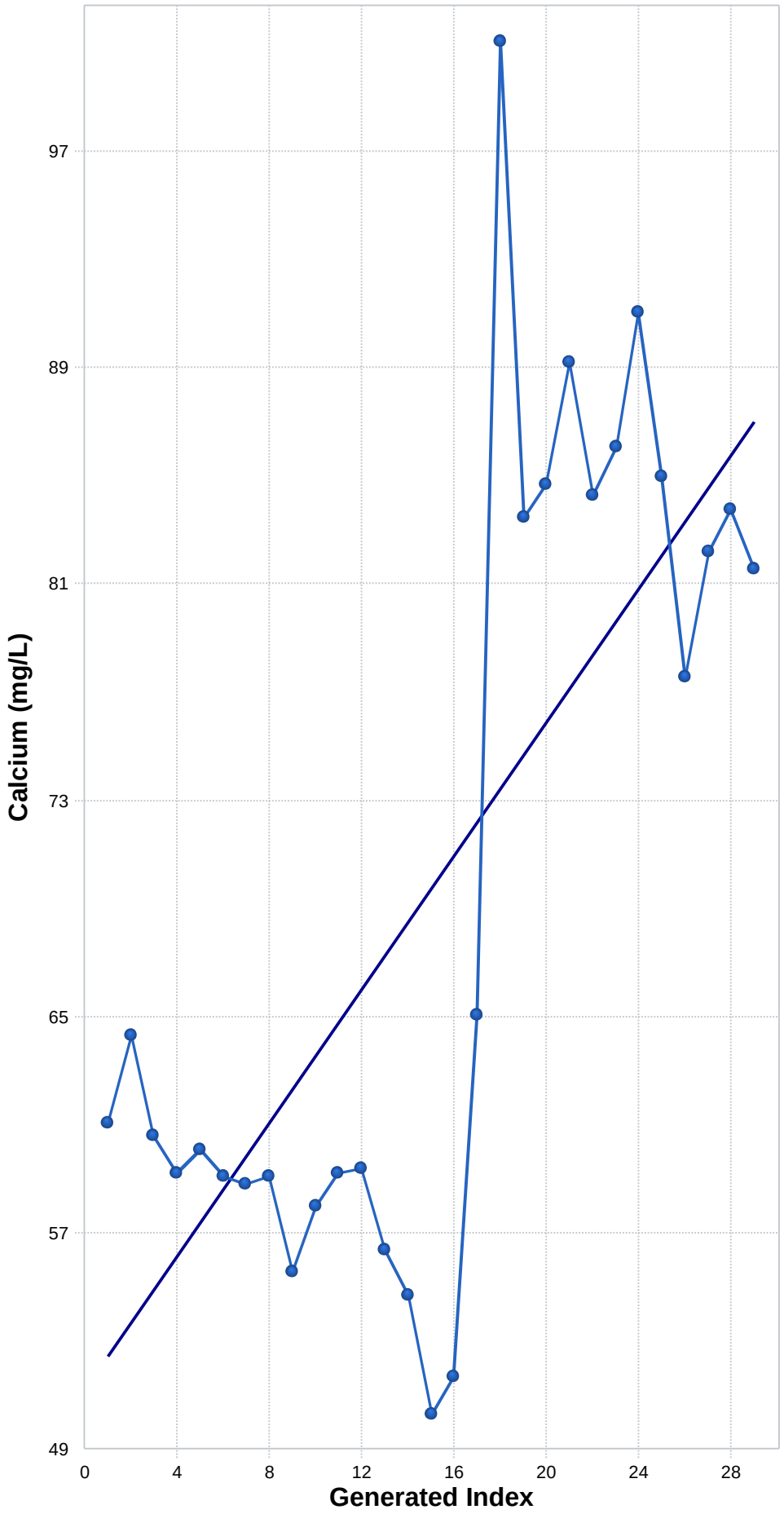
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2541 |
| Standardized Value of S | 2.9106 |
| M-K Test Value (S) | 156 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0018 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 5.1594 |
| OLS Regression Intercept | 252.3296 |

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

# Mann-Kendall 04-SS - CALCIUM




**Mann-Kendall Trend Analysis**

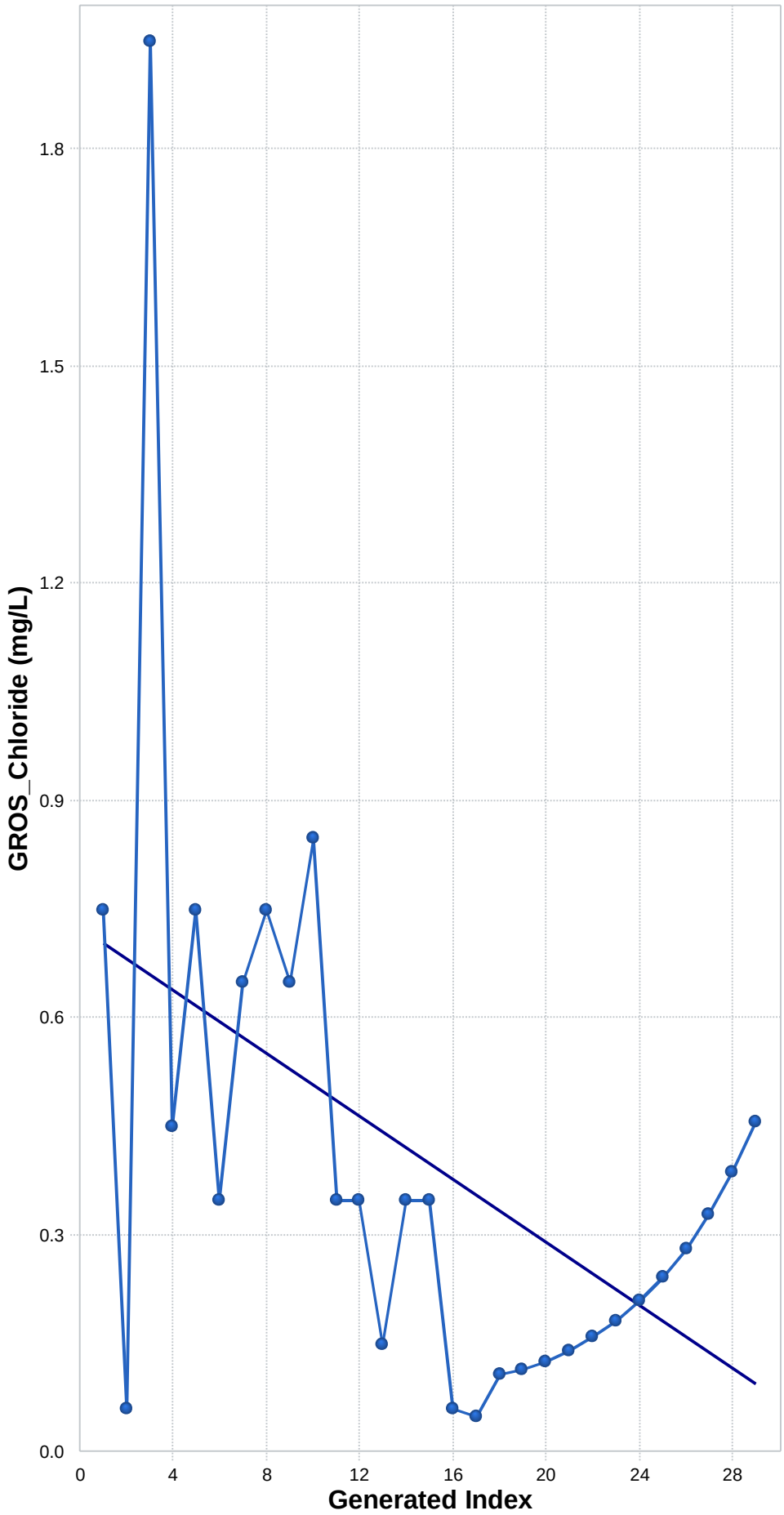
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2917 |
| Standardized Value of S | 2.0829 |
| M-K Test Value (S) | 112 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0186 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.2343 |
| OLS Regression Intercept | 51.1401 |

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

# Mann-Kendall 04-SS - CHLORIDE




**Mann-Kendall Trend Analysis**

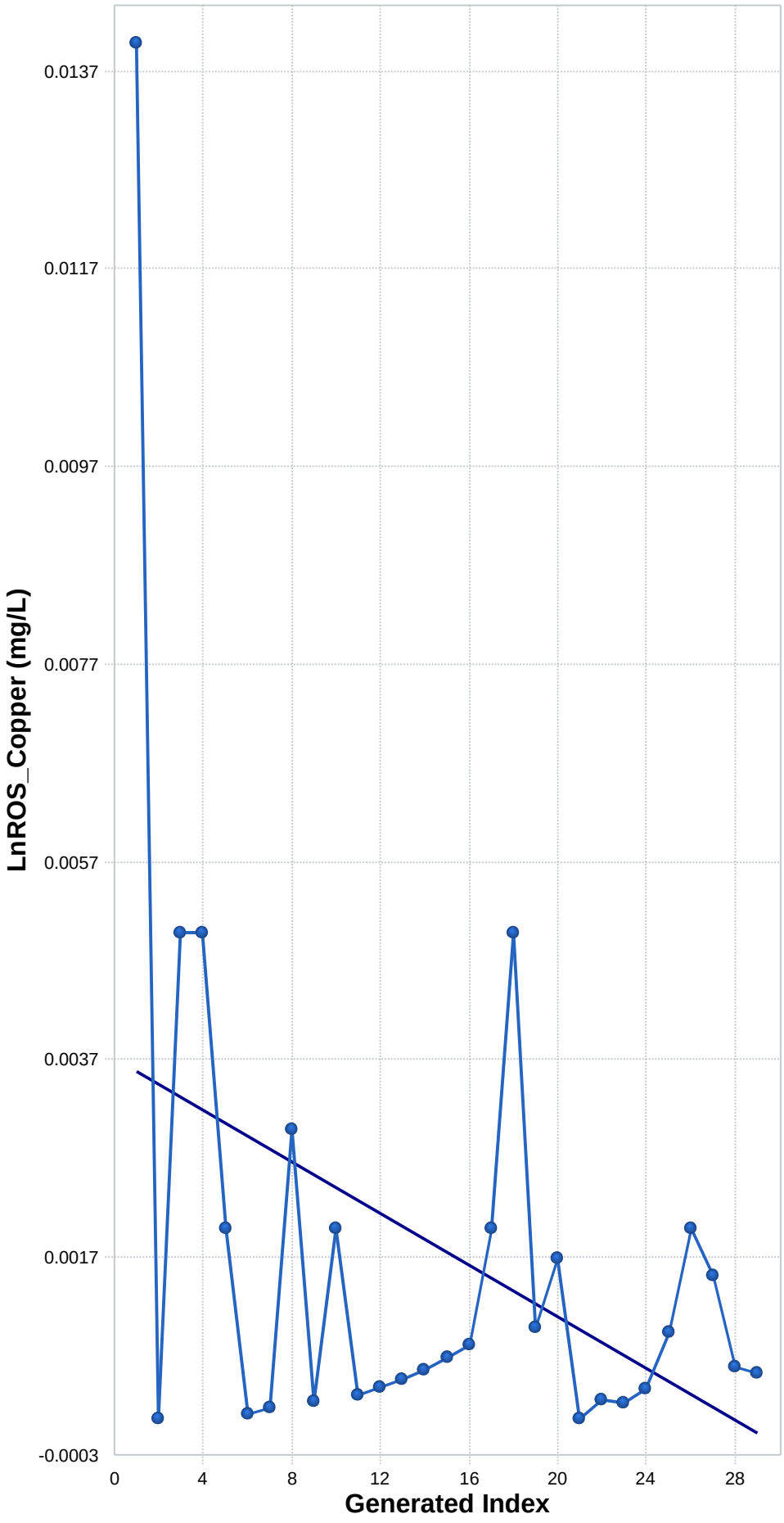
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.1005 |
| Standardized Value of S | -1.6196 |
| M-K Test Value (S) | -87 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0527 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0217 |
| OLS Regression Intercept | 0.6766 |

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

# Mann-Kendall 04-SS - COPPER



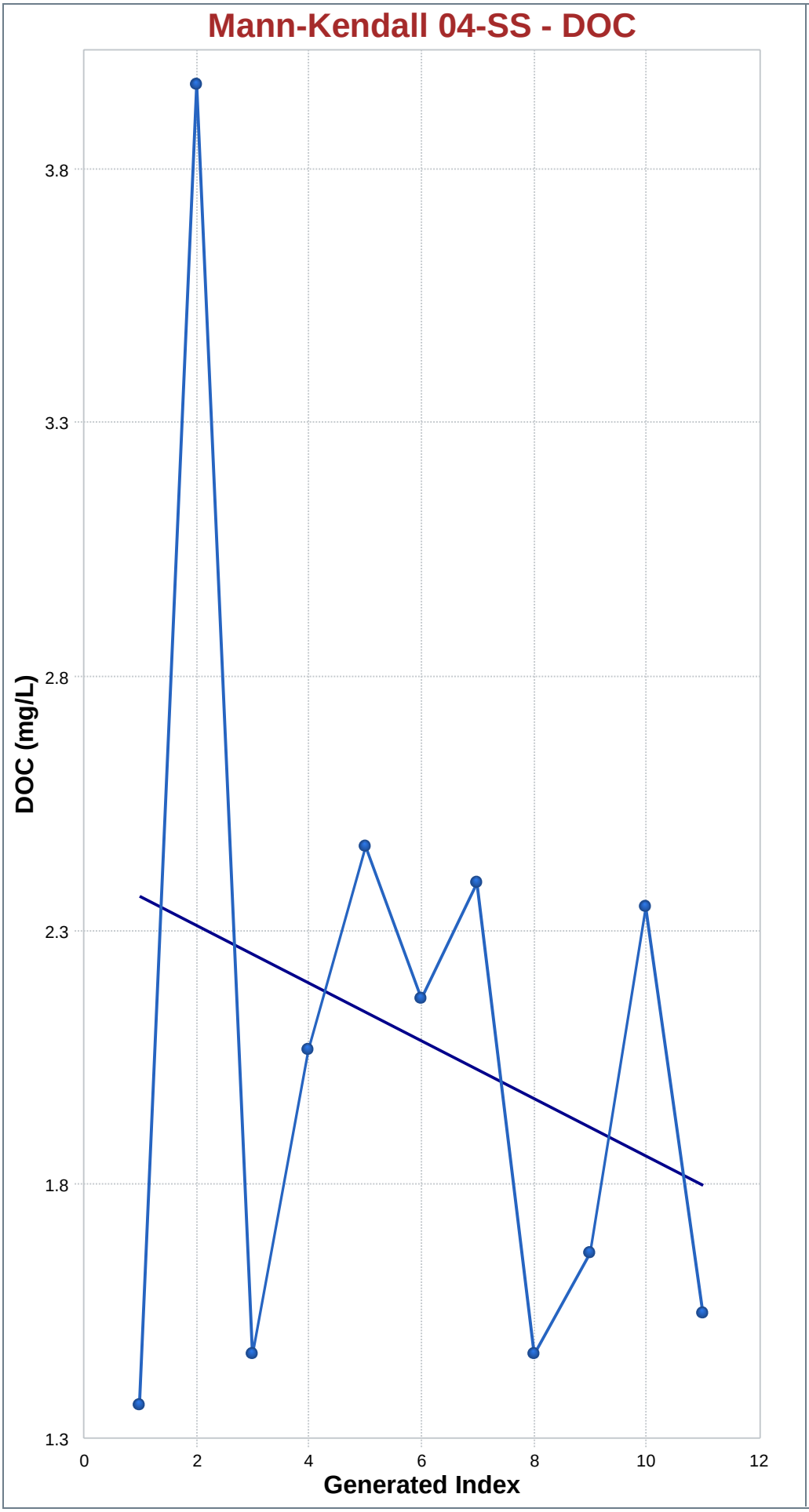

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2416 |
| Standardized Value of S | -0.3193 |
| M-K Test Value (S) | -18 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.3747 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0037 |

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




**Mann-Kendall Trend Analysis**

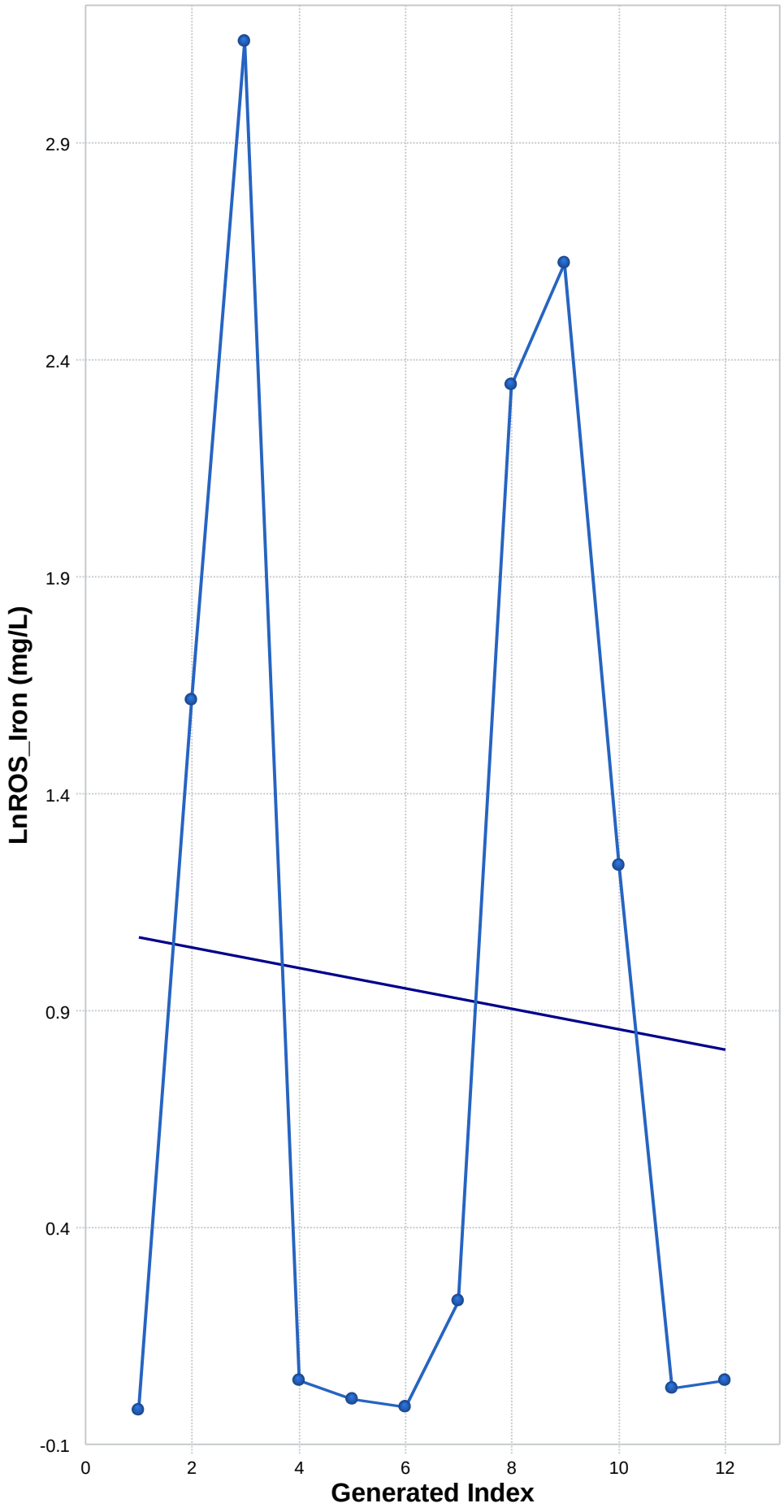
| | |
|---|---|
| n | 11 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 12.8062 |
| Standardized Value of S | |
| M-K Test Value (S) | 0 |
| Tabulated p-value | 0.5000 |
| Approximate p-value | |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0568 |
| OLS Regression Intercept | 2.4582 |

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

# Mann-Kendall 04-SS - IRON




**Mann-Kendall Trend Analysis**

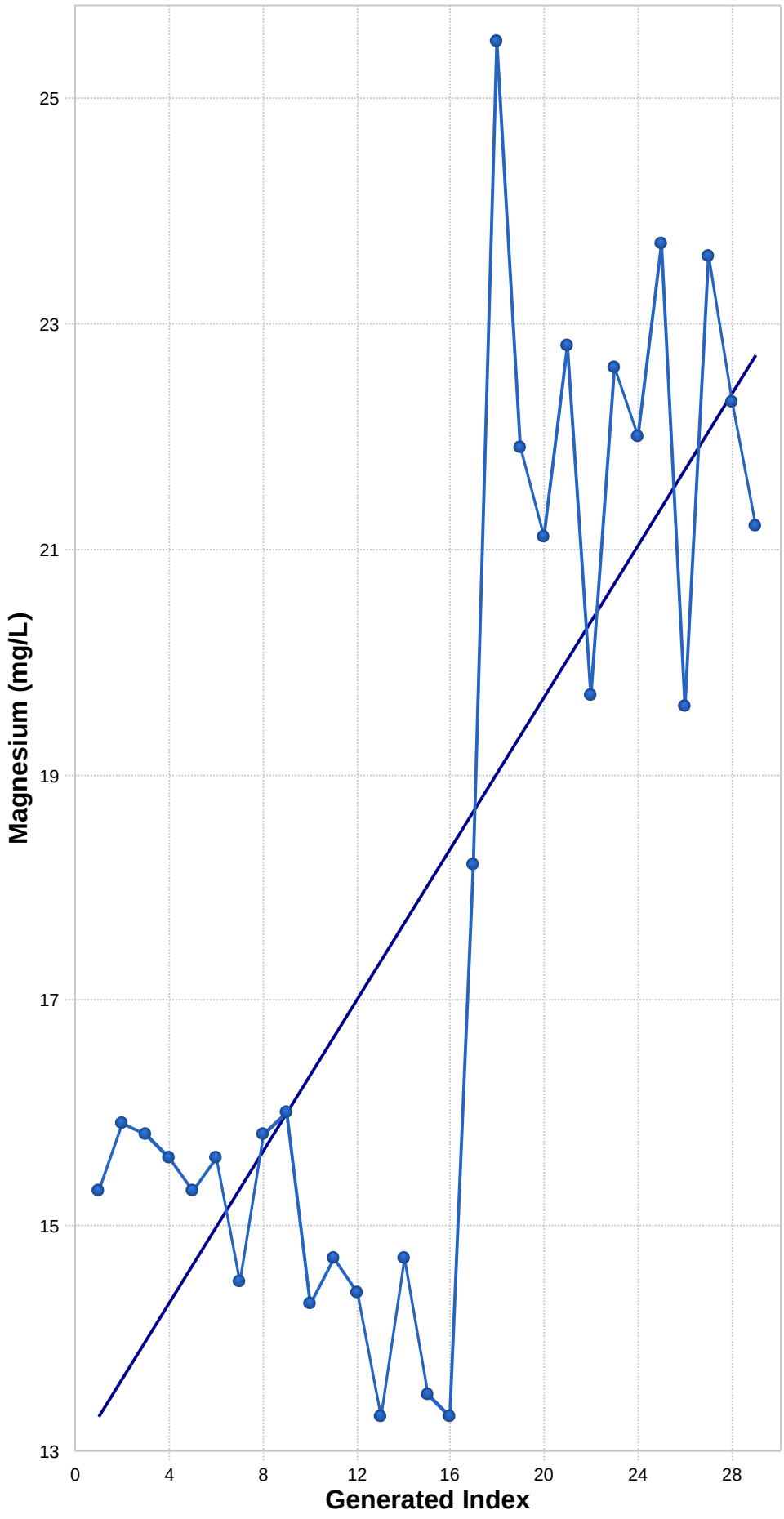
| | |
|---|---|
| n | 12 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 14.5831 |
| Standardized Value of S | 0.2057 |
| M-K Test Value (S) | 4 |
| Tabulated p-value | 0.4200 |
| Approximate p-value | 0.4185 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0233 |
| OLS Regression Intercept | 1.1269 |

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

# Mann-Kendall 04-SS - MAGNESIUM



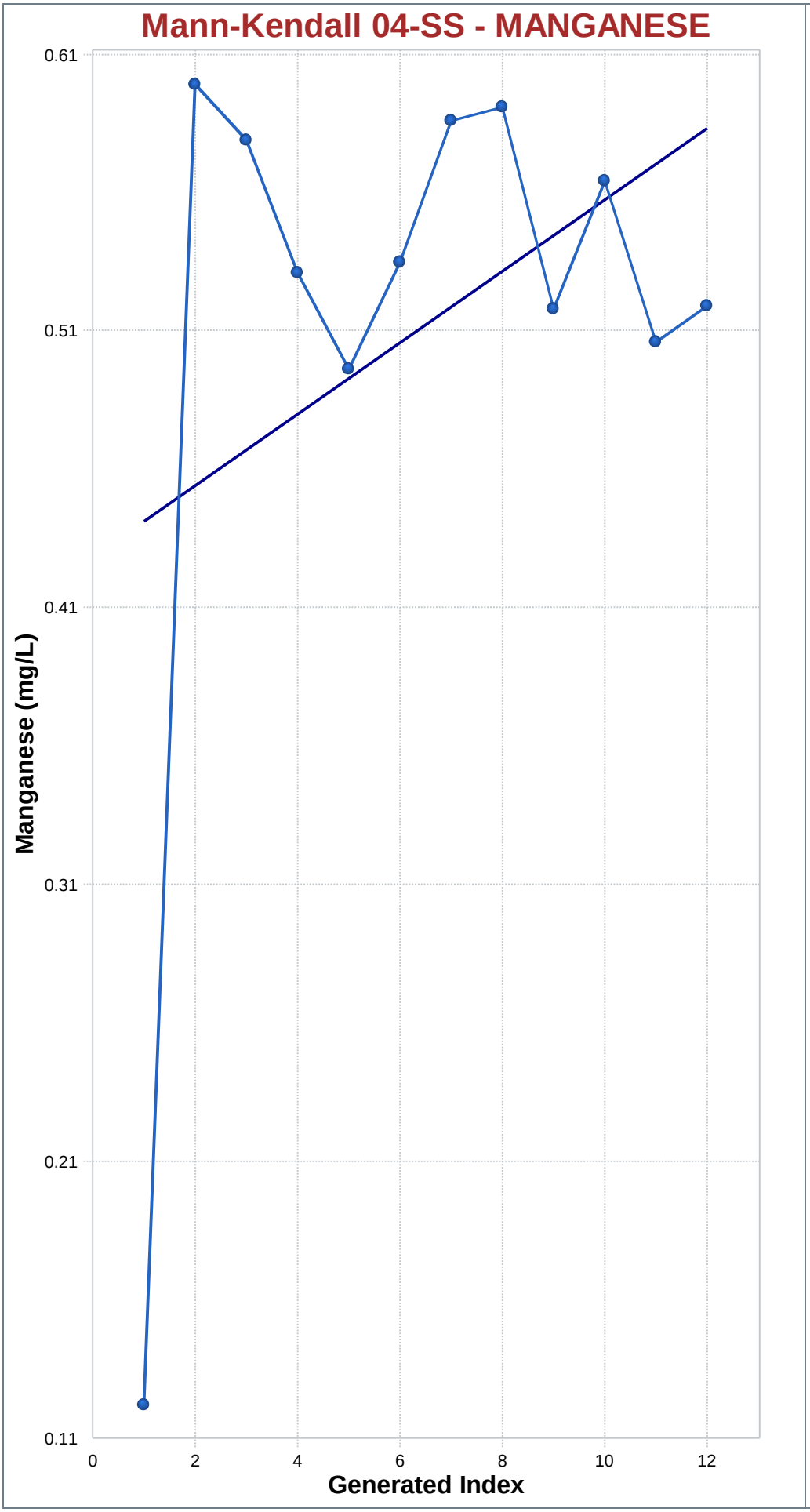

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2635 |
| Standardized Value of S | 2.7786 |
| M-K Test Value (S) | 149 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0027 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3362 |
| OLS Regression Intercept | 13.4645 |

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




**Mann-Kendall Trend Analysis**

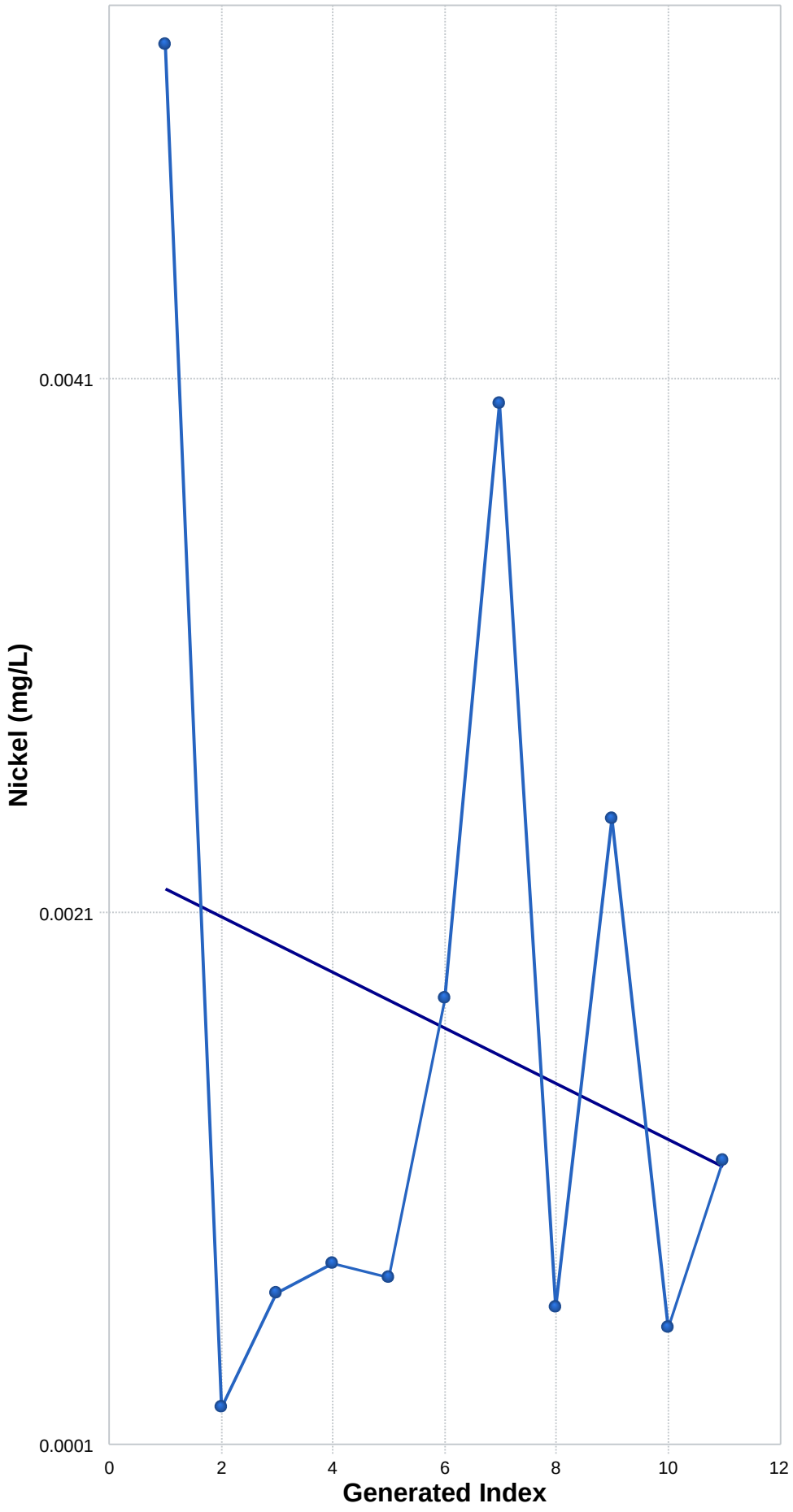
| | |
|---|---|
| n | 12 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 14.5831 |
| Standardized Value of S | -0.2057 |
| M-K Test Value (S) | -4 |
| Tabulated p-value | 0.4200 |
| Approximate p-value | 0.4185 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0129 |
| OLS Regression Intercept | 0.4302 |

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

# Mann-Kendall 04-SS - NICKEL



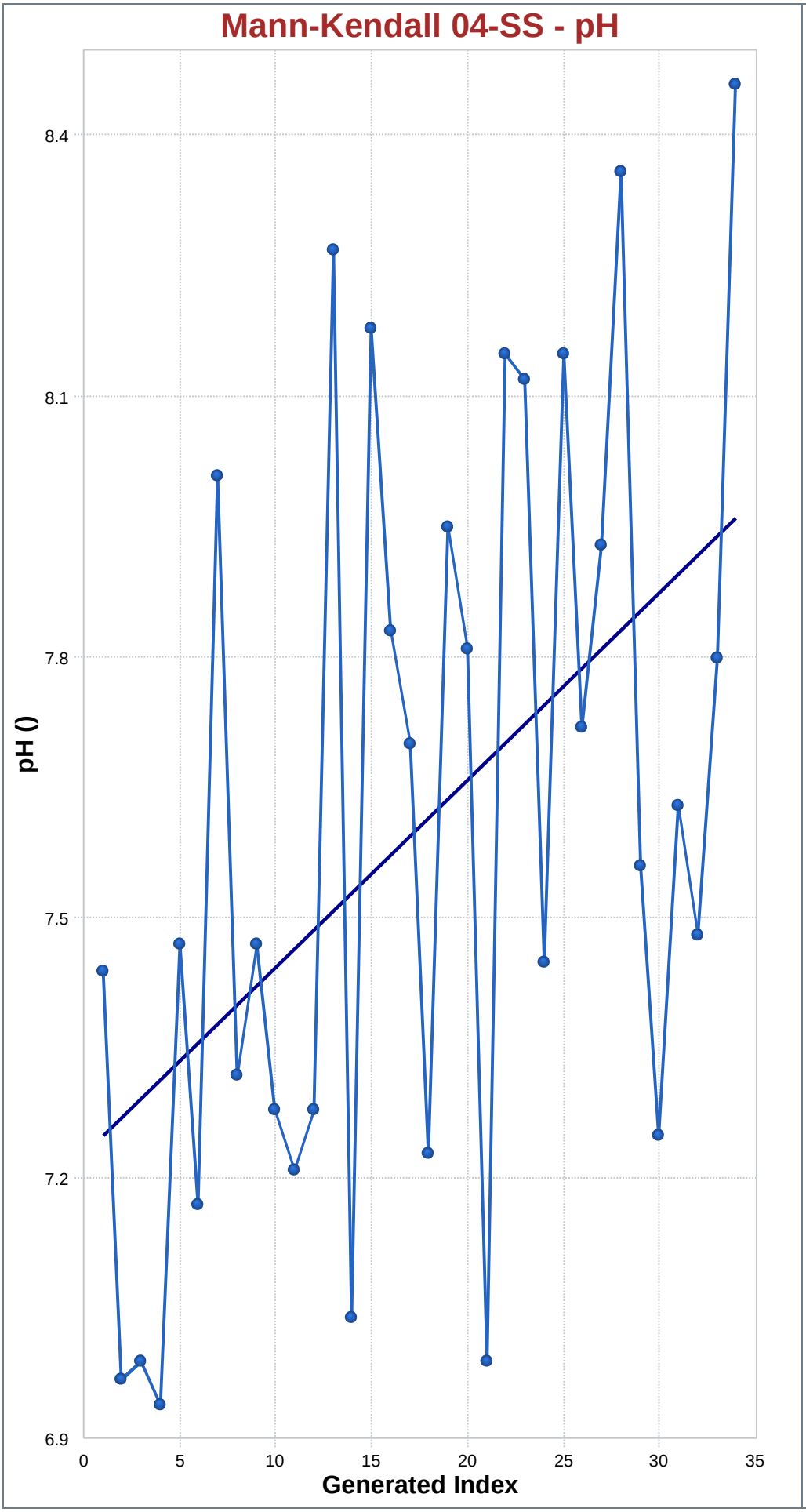

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 11 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 12.8452 |
| Standardized Value of S | 0.0000 |
| M-K Test Value (S) | 1 |
| Tabulated p-value | 0.5000 |
| Approximate p-value | 0.5000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0023 |

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



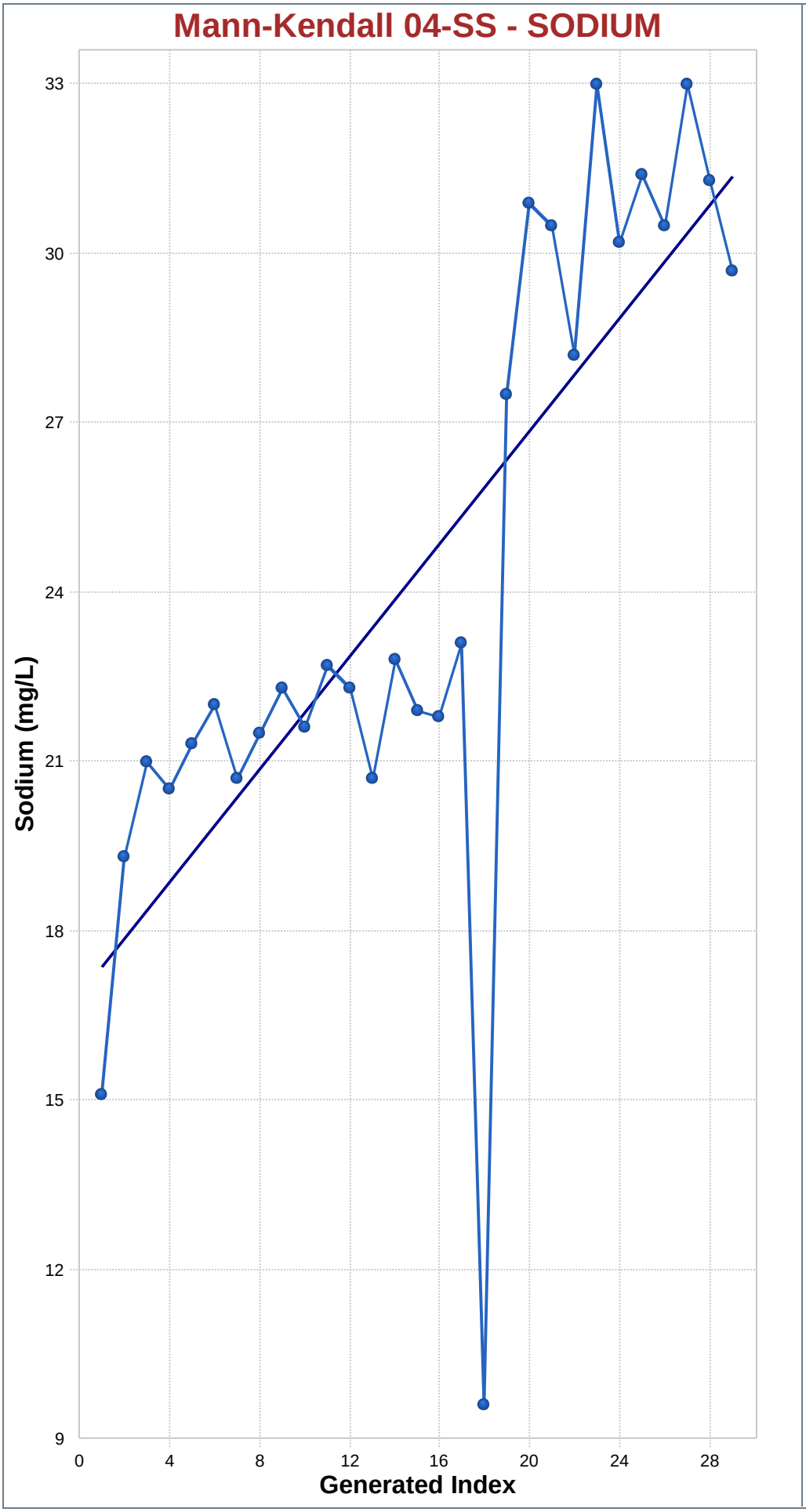

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.4265 |
| Standardized Value of S | 2.6696 |
| M-K Test Value (S) | 181 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0038 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0215 |
| OLS Regression Intercept | 7.2594 |

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




**Mann-Kendall Trend Analysis**

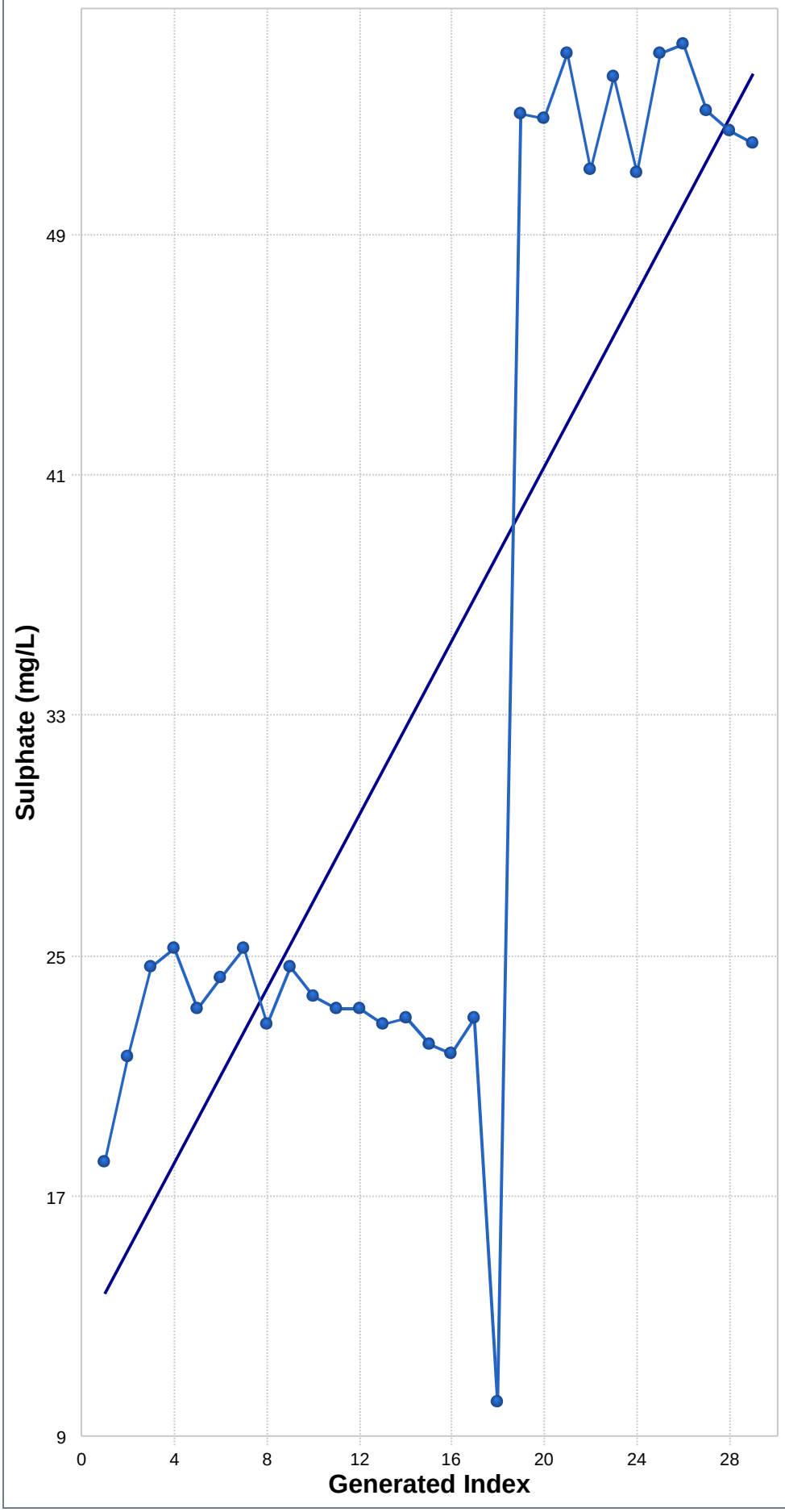
| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2729 |
| Standardized Value of S | 5.0870 |
| M-K Test Value (S) | 272 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.5000 |
| OLS Regression Intercept | 16.5579 |

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

# Mann-Kendall 04-SS - SULPHATE



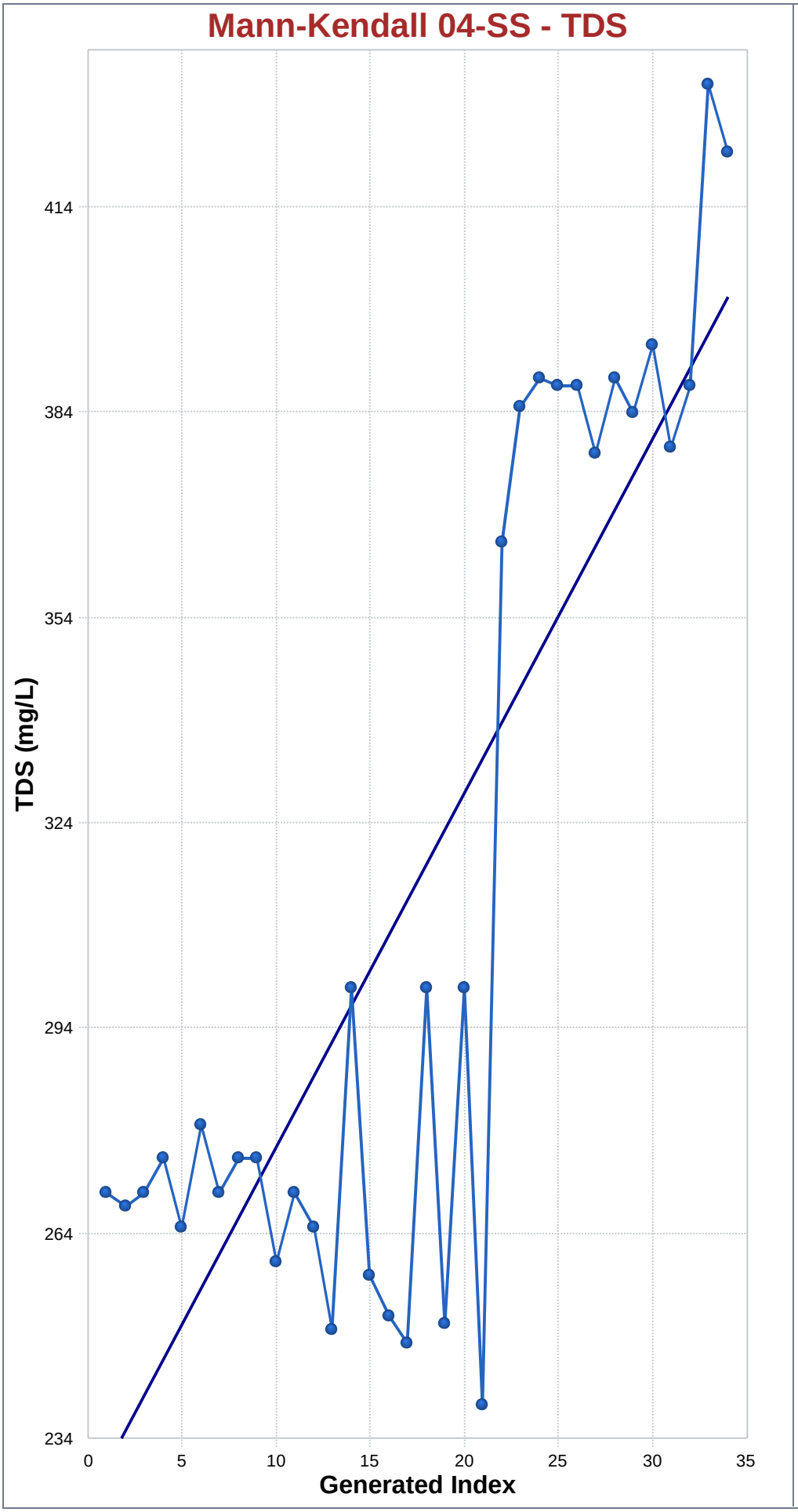

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 29 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 53.2291 |
| Standardized Value of S | 2.7241 |
| M-K Test Value (S) | 146 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0032 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.4510 |
| OLS Regression Intercept | 12.6552 |

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



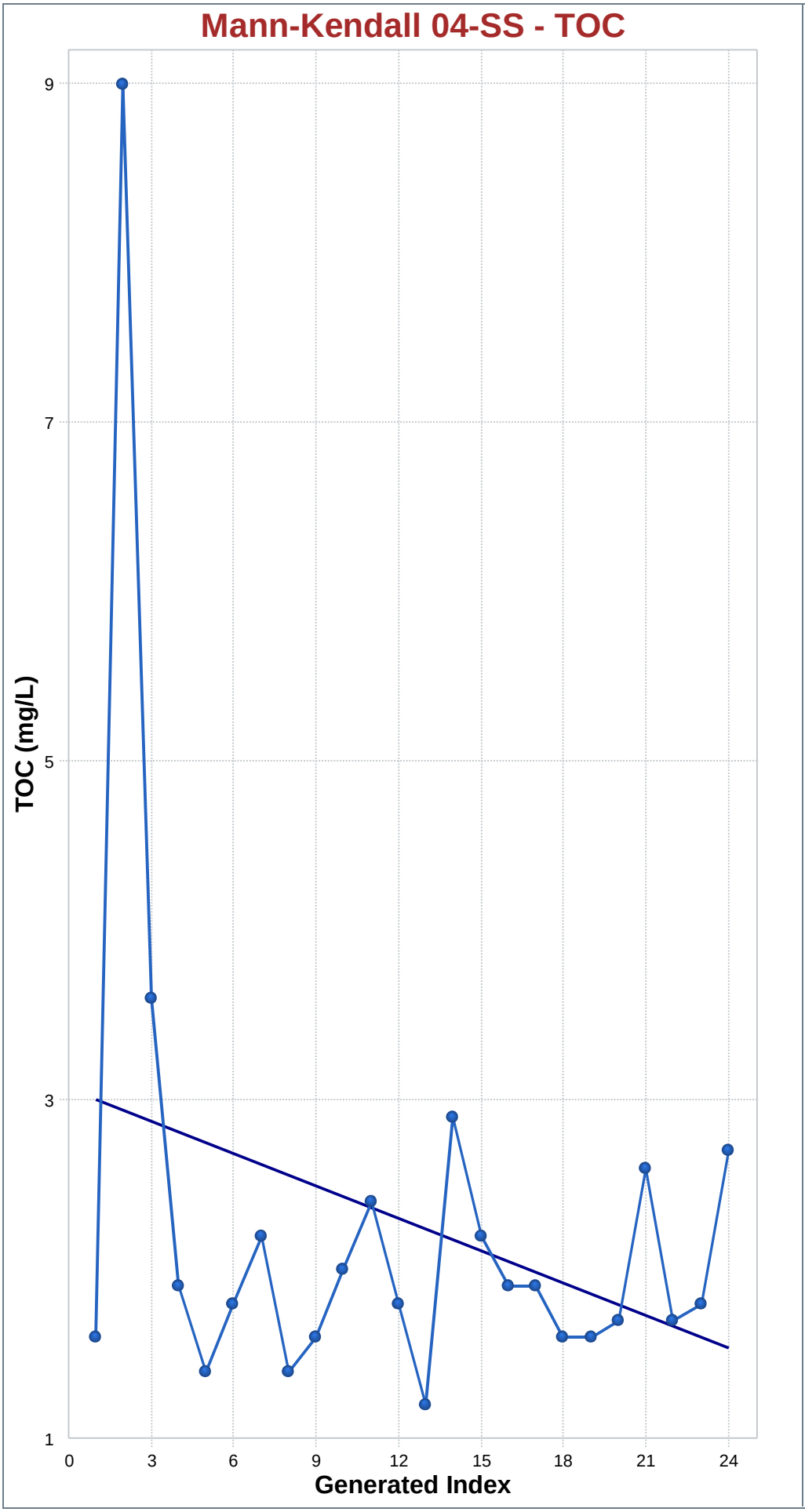

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.2954 |
| Standardized Value of S | 3.7893 |
| M-K Test Value (S) | 256 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 5.1914 |
| OLS Regression Intercept | 224.5027 |

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



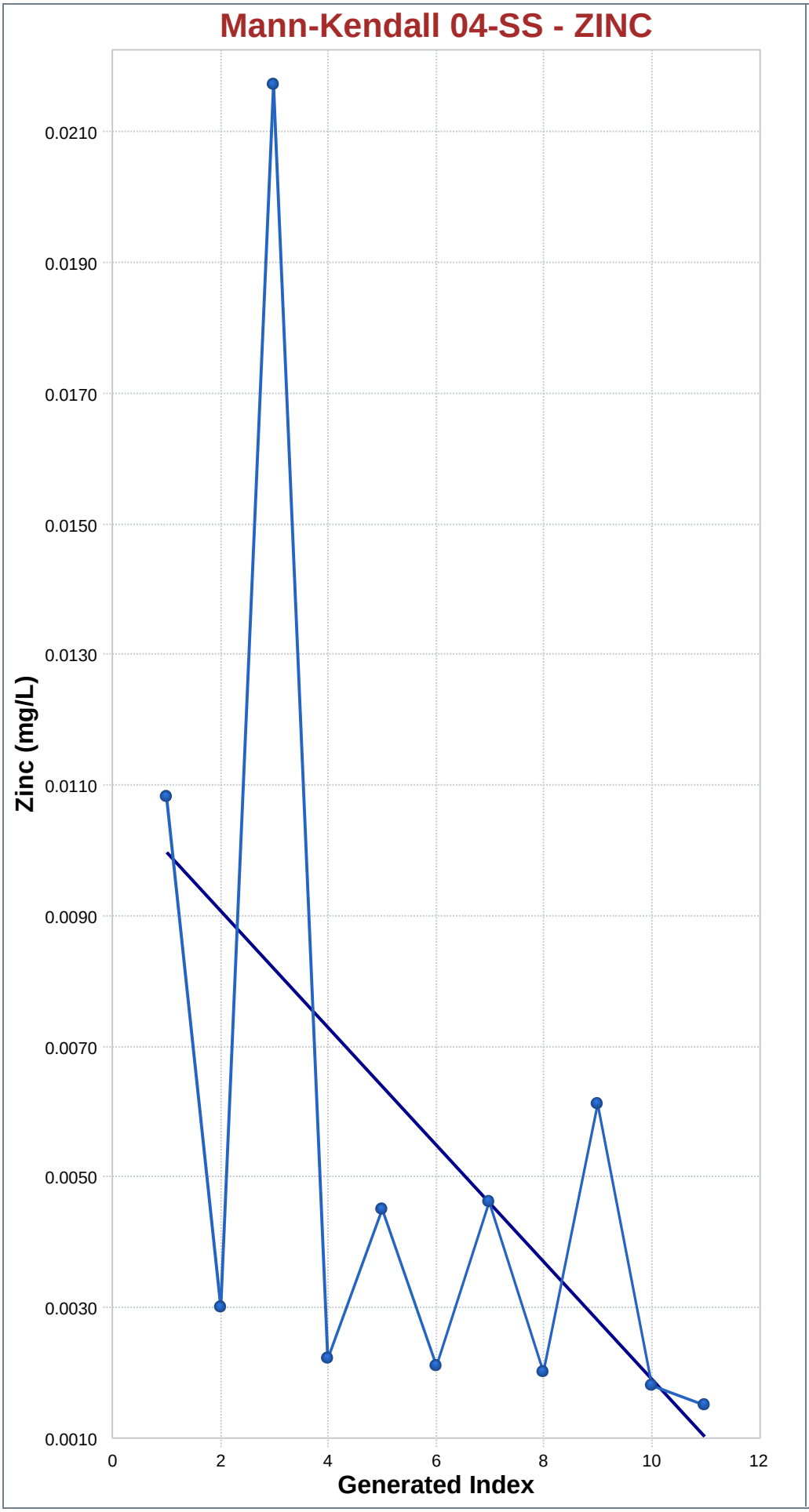

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 24 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 40.0791 |
| Standardized Value of S | -0.0499 |
| M-K Test Value (S) | -3 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.4801 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0636 |
| OLS Regression Intercept | 2.6659 |

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




**Mann-Kendall Trend Analysis**

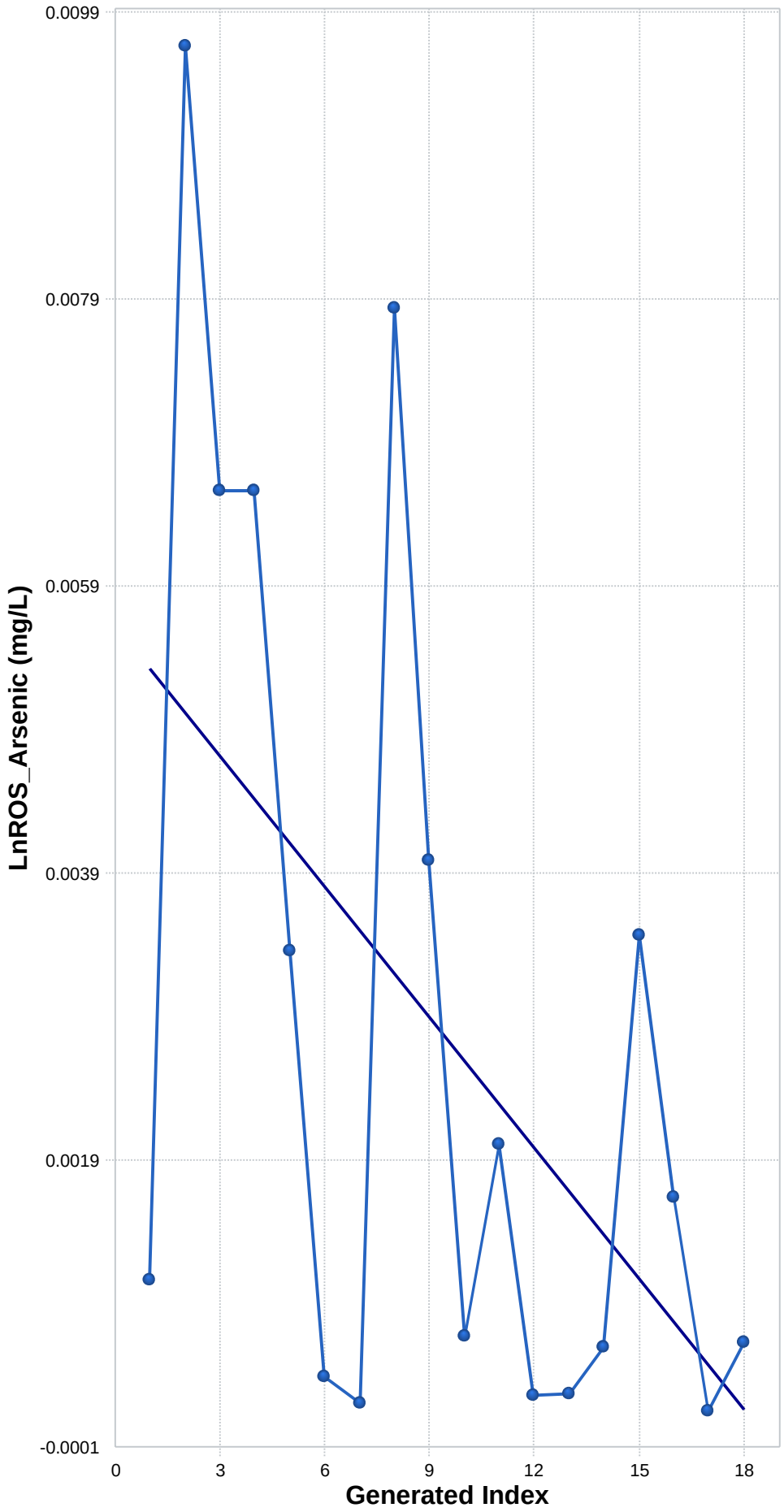
| | |
|---|---|
| n | 11 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 12.8452 |
| Standardized Value of S | -2.0241 |
| M-K Test Value (S) | -27 |
| Tabulated p-value | 0.0200 |
| Approximate p-value | 0.0215 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0009 |
| OLS Regression Intercept | 0.0108 |

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

# Mann-Kendall 05-SS - ARSENIC



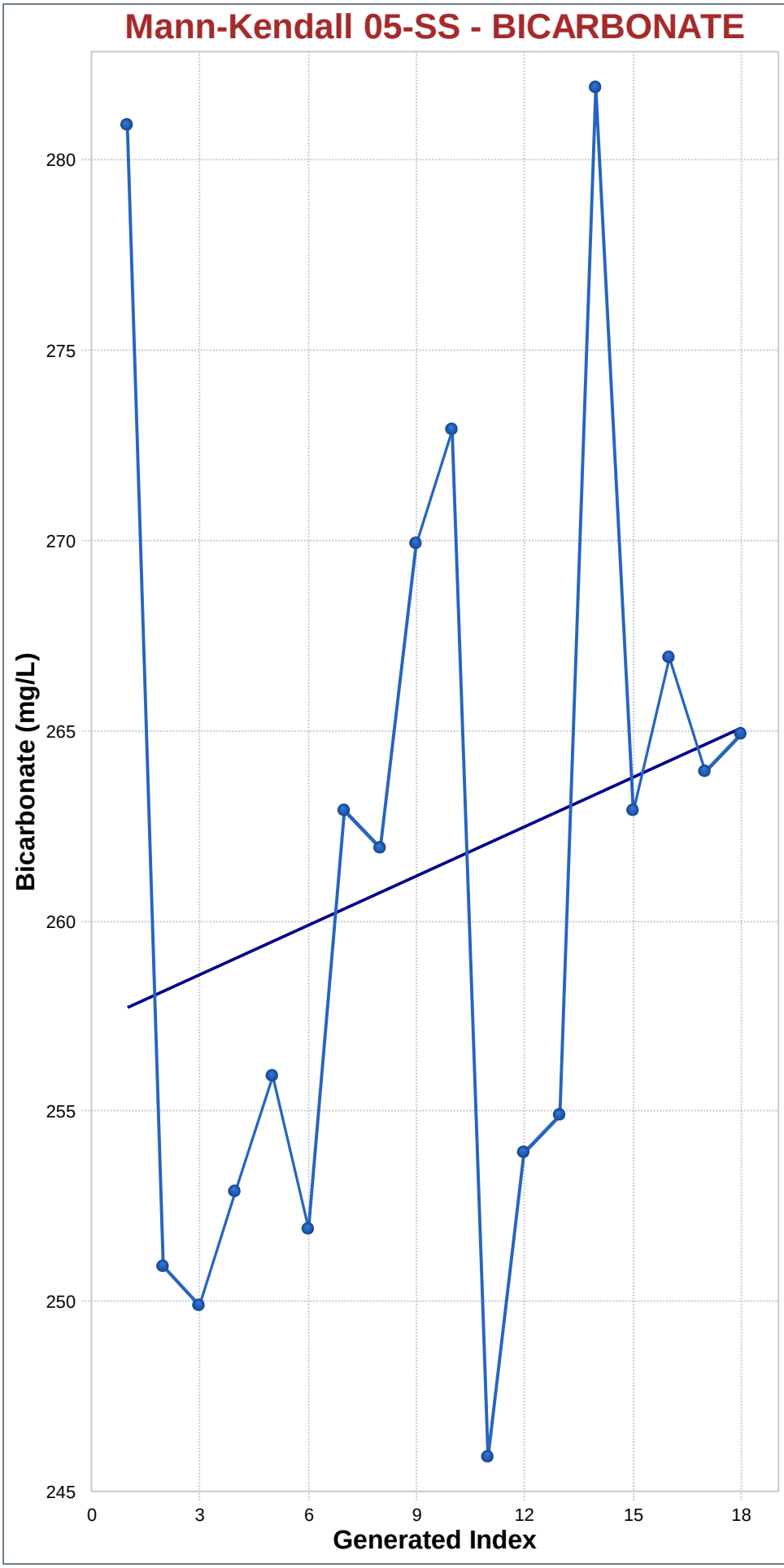

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3818 |
| Standardized Value of S | -2.0090 |
| M-K Test Value (S) | -54 |
| Tabulated p-value | 0.0200 |
| Approximate p-value | 0.0223 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0003 |
| OLS Regression Intercept | 0.0057 |

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




**Mann-Kendall Trend Analysis**

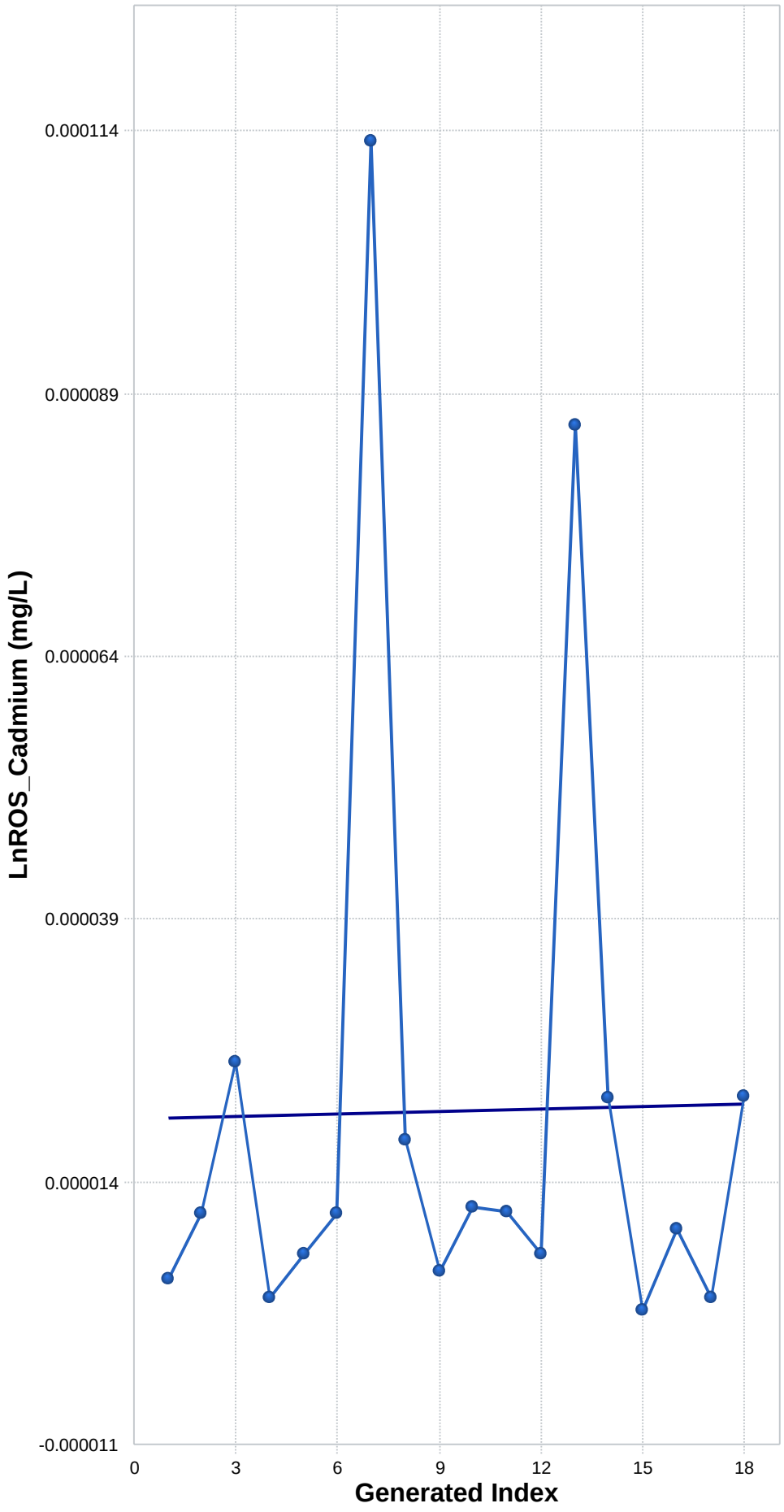
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3818 |
| Standardized Value of S | 1.7057 |
| M-K Test Value (S) | 46 |
| Tabulated p-value | 0.0410 |
| Approximate p-value | 0.0440 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.4324 |
| OLS Regression Intercept | 257.3922 |

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

# Mann-Kendall 05-SS - CADMIUM



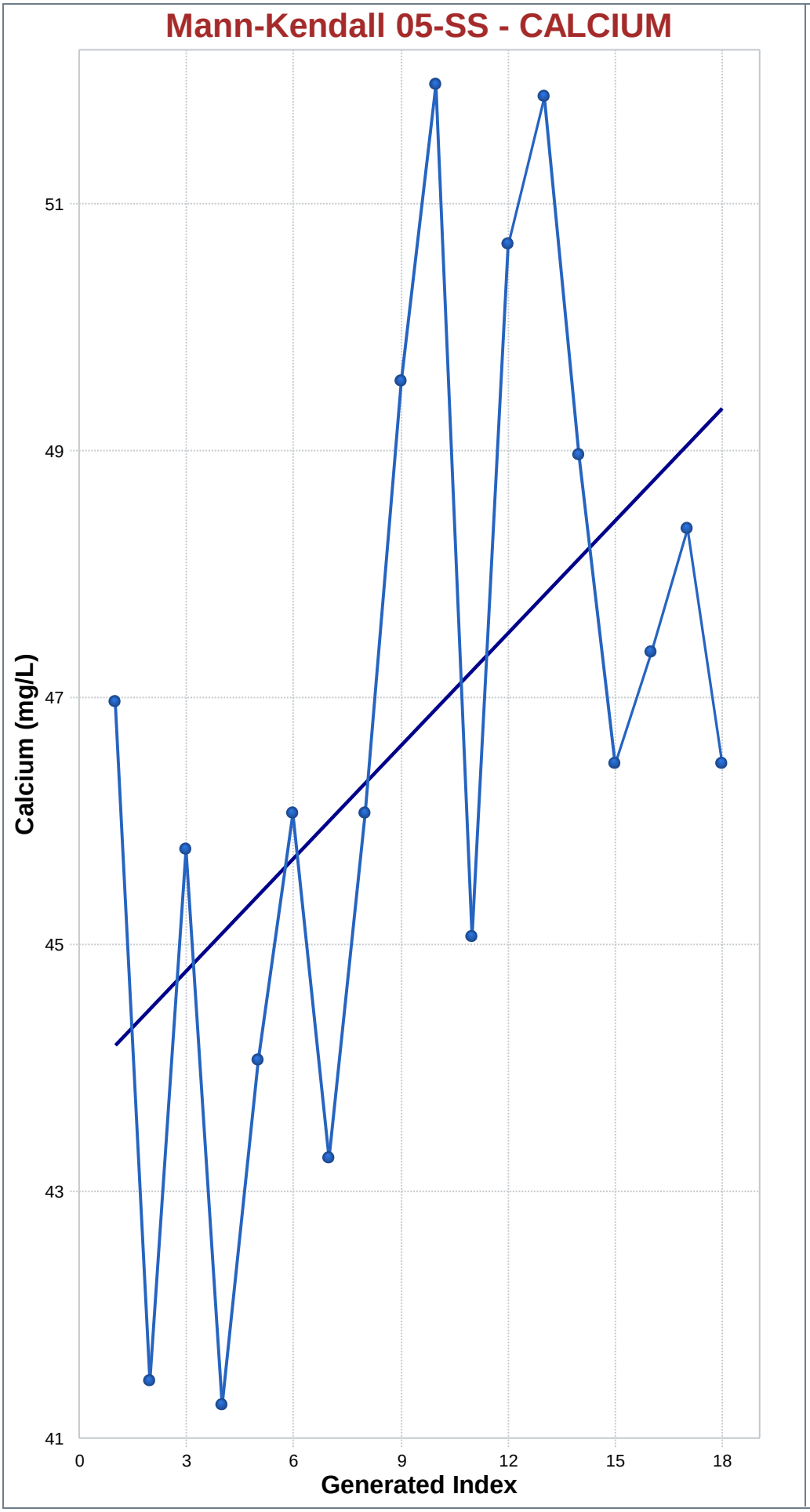

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3818 |
| Standardized Value of S | 0.2653 |
| M-K Test Value (S) | 8 |
| Tabulated p-value | 0.3830 |
| Approximate p-value | 0.3954 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0000 |

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



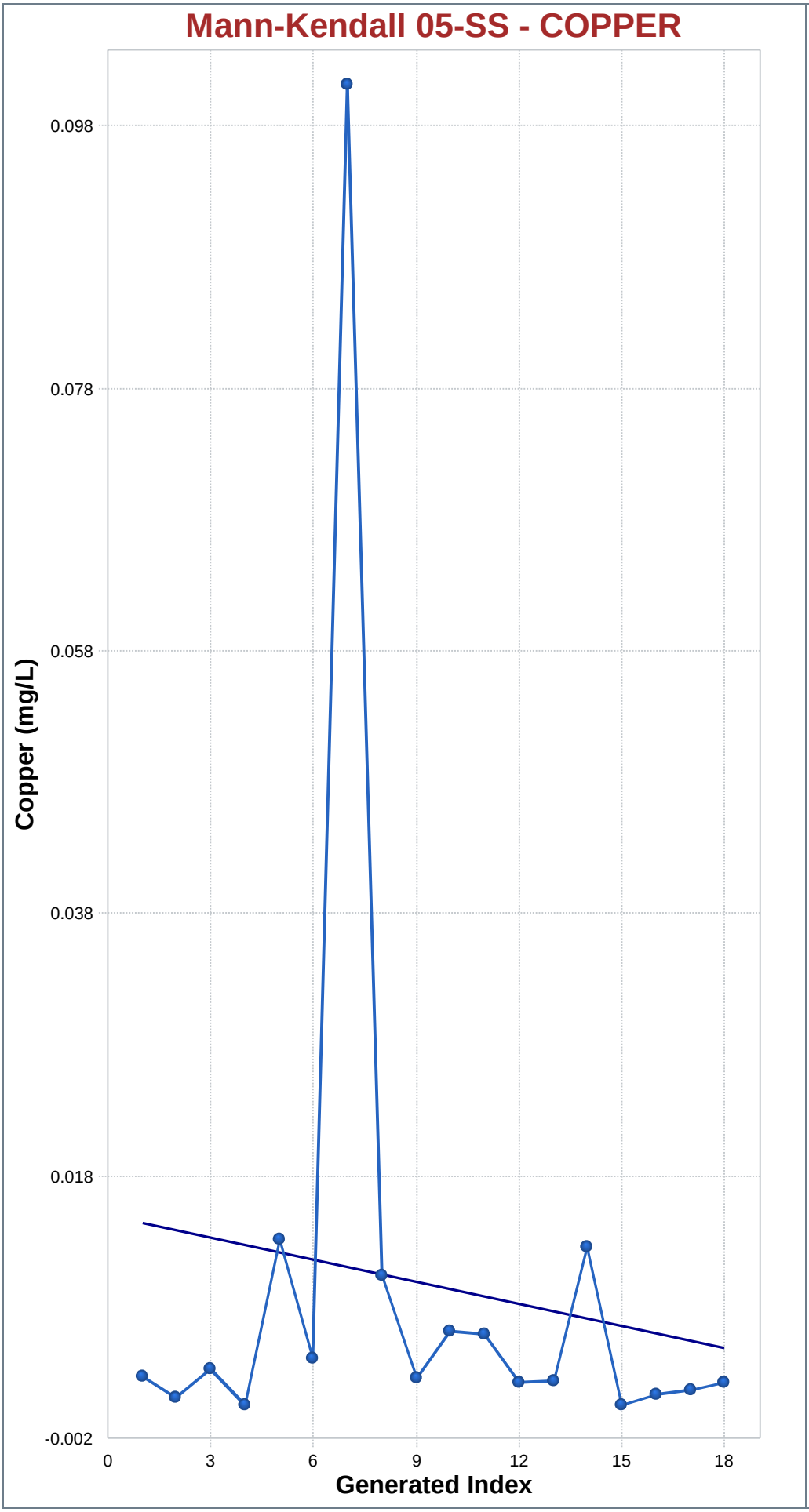

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3629 |
| Standardized Value of S | 1.9725 |
| M-K Test Value (S) | 53 |
| Tabulated p-value | 0.0240 |
| Approximate p-value | 0.0243 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3035 |
| OLS Regression Intercept | 44.3111 |

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



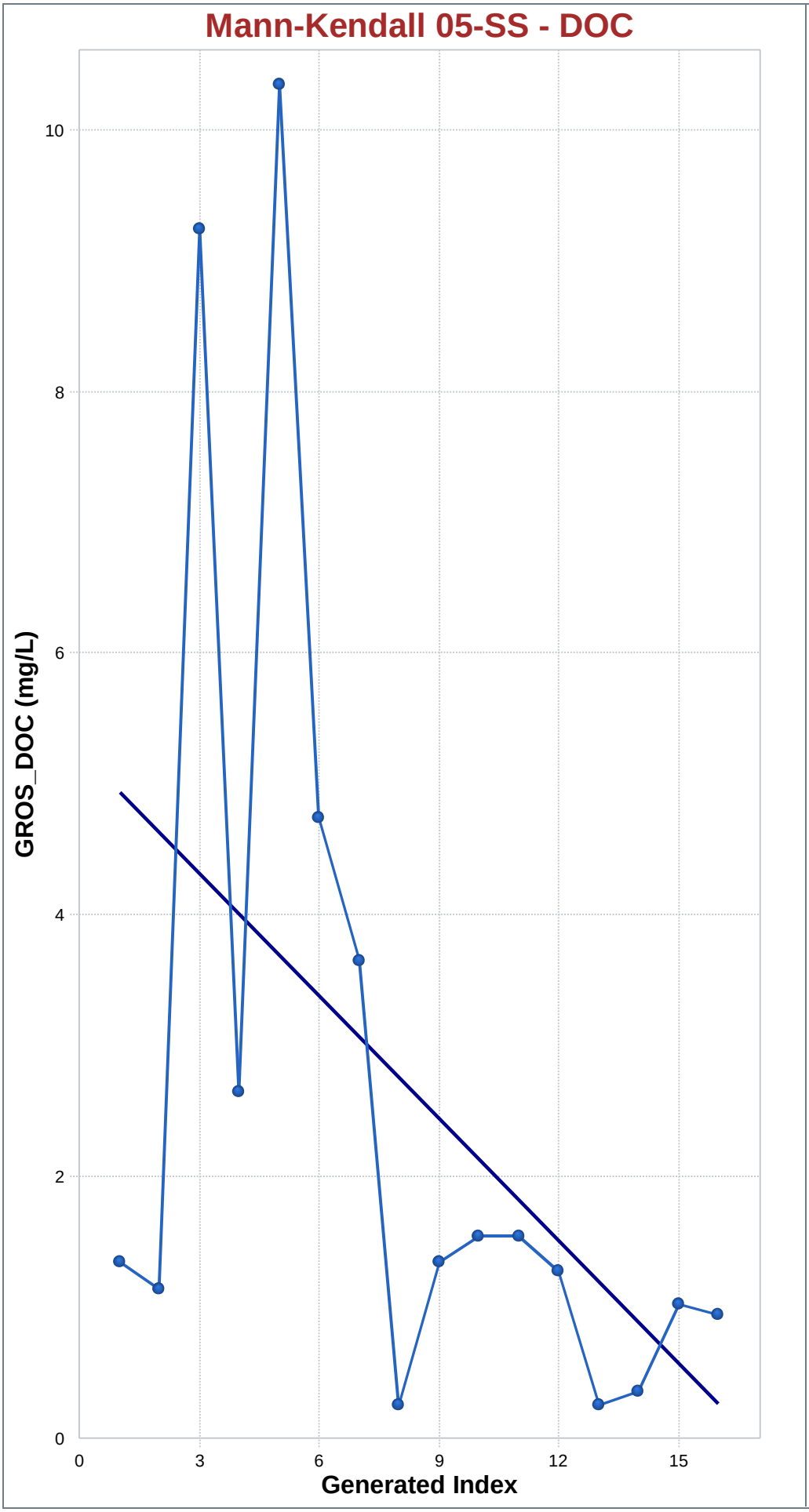

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.4008 |
| Standardized Value of S | -0.9091 |
| M-K Test Value (S) | -25 |
| Tabulated p-value | 0.1840 |
| Approximate p-value | 0.1817 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0006 |
| OLS Regression Intercept | 0.0149 |

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



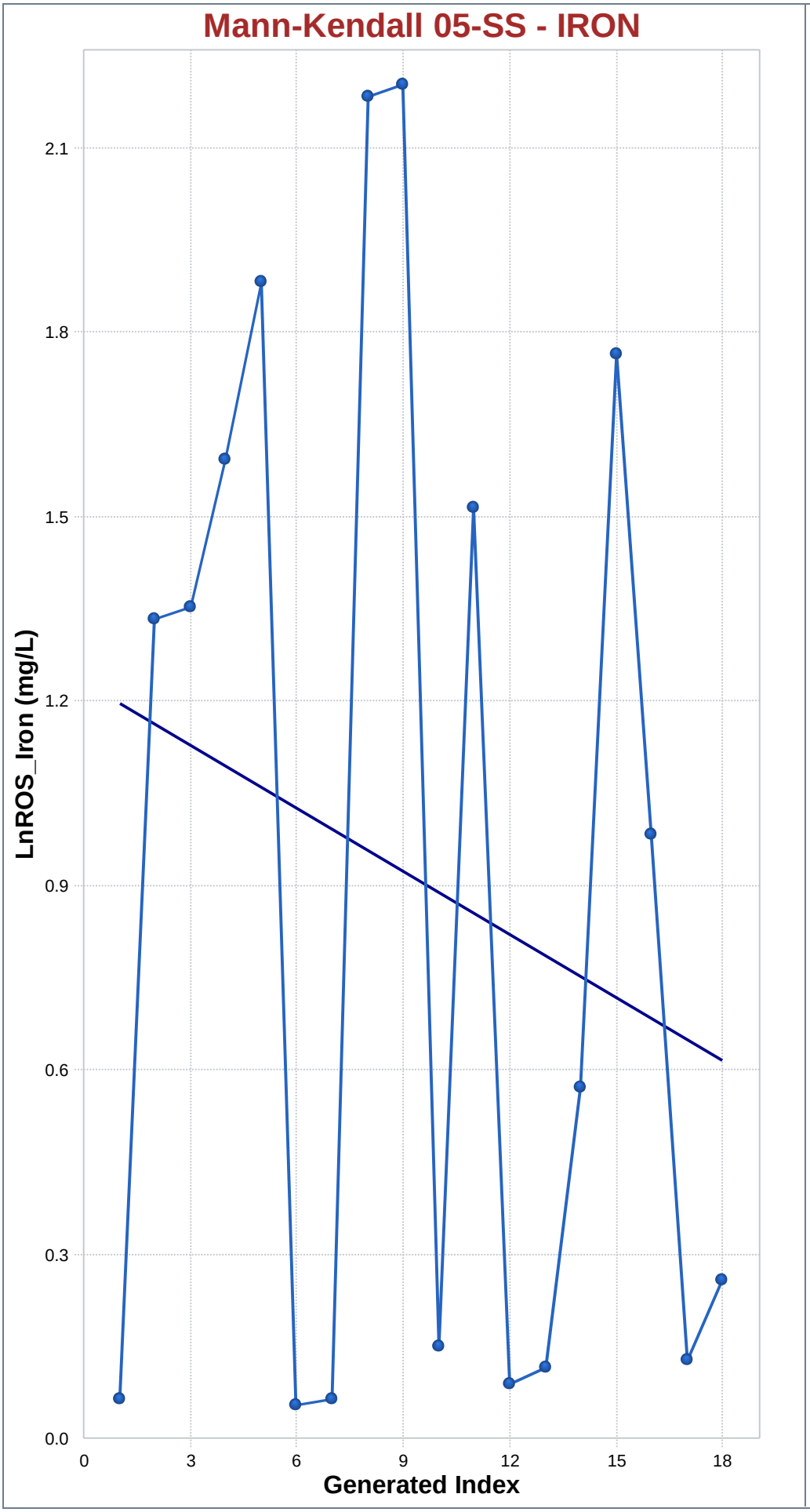

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 16 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 22.1435 |
| Standardized Value of S | -2.1677 |
| M-K Test Value (S) | -49 |
| Tabulated p-value | 0.0160 |
| Approximate p-value | 0.0151 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.3111 |
| OLS Regression Intercept | 5.0033 |

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



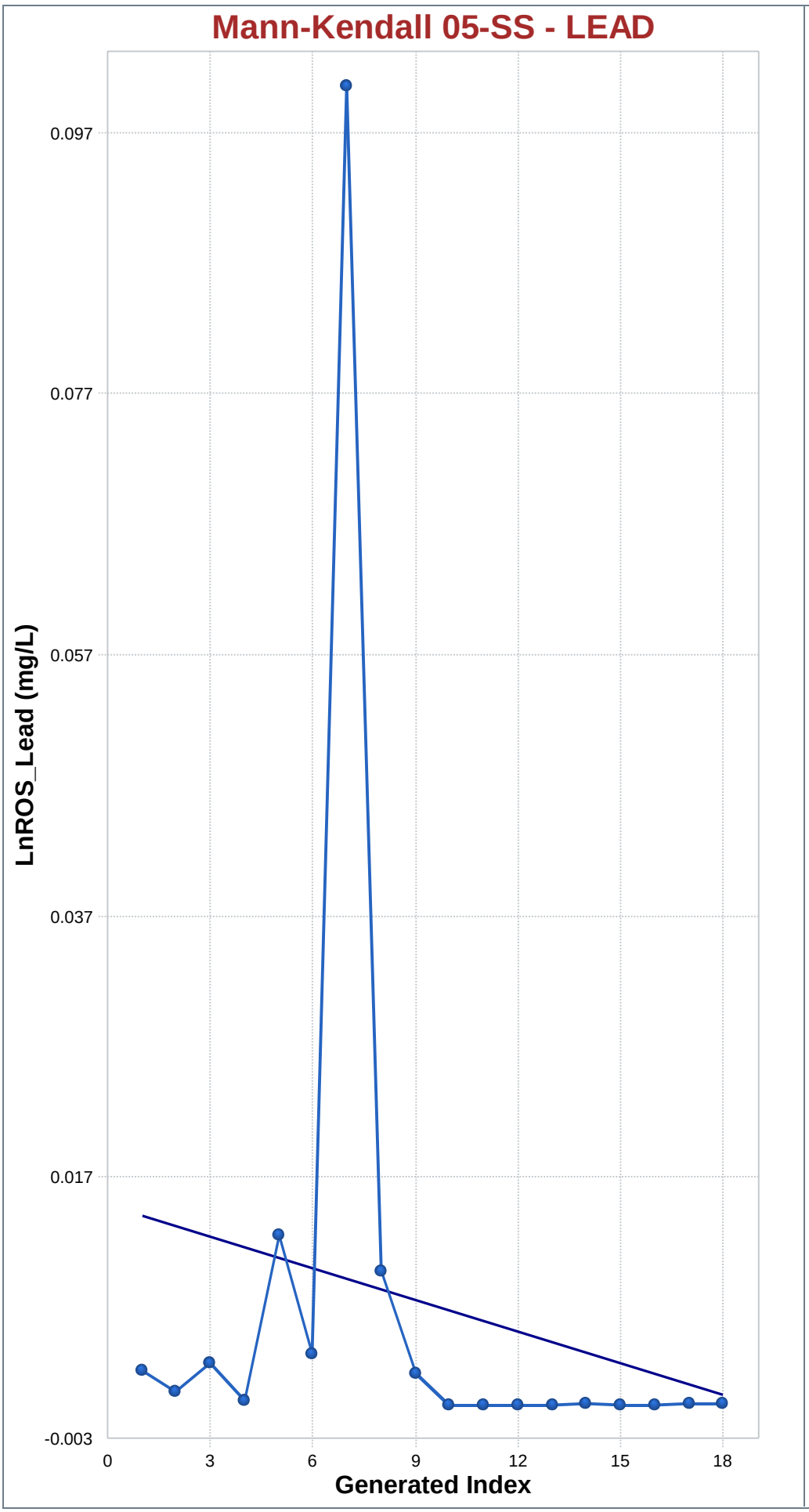

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.4008 |
| Standardized Value of S | 0.0758 |
| M-K Test Value (S) | 3 |
| Tabulated p-value | 0.4700 |
| Approximate p-value | 0.4698 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0341 |
| OLS Regression Intercept | 1.2166 |

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




**Mann-Kendall Trend Analysis**

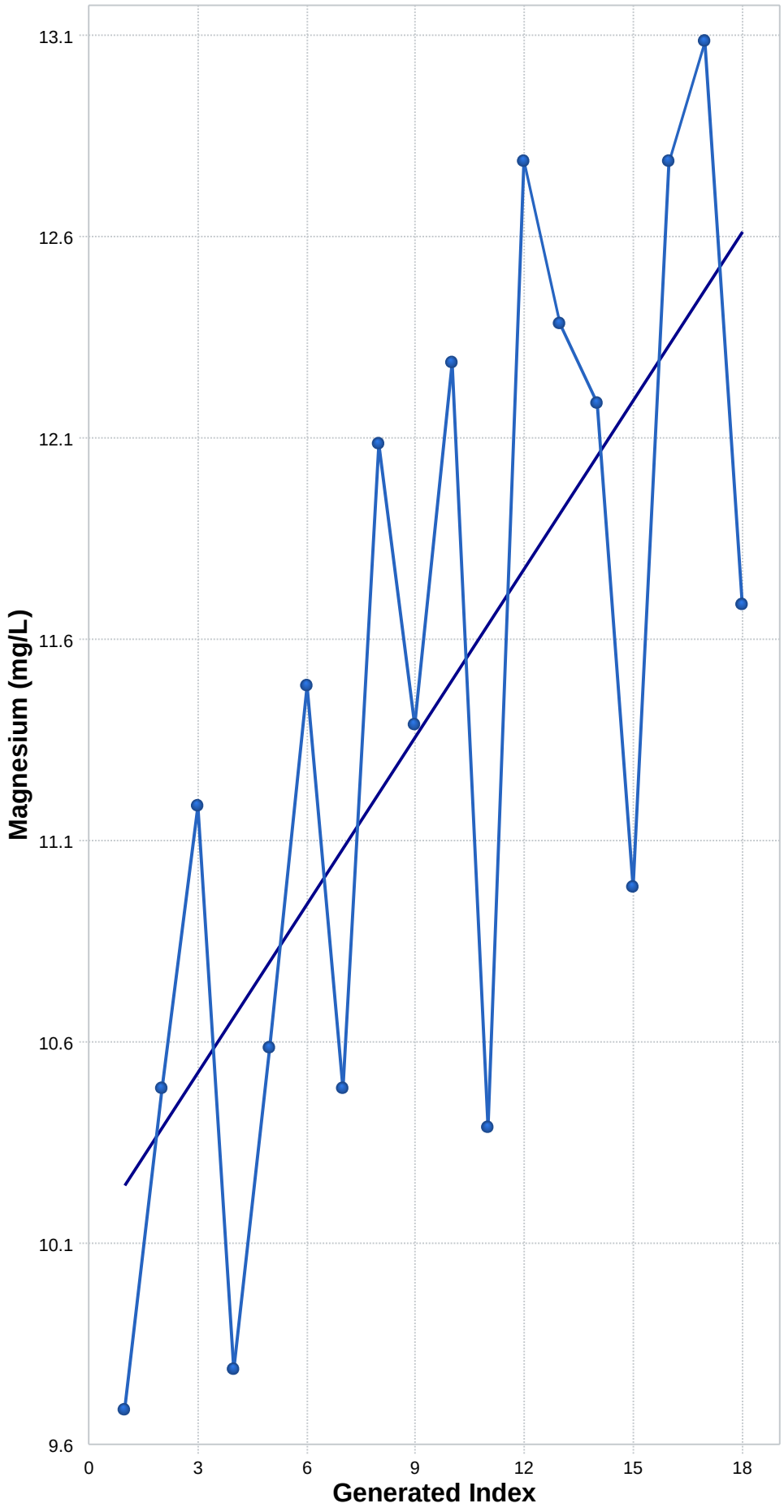
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.4008 |
| Standardized Value of S | -1.5909 |
| M-K Test Value (S) | -43 |
| Tabulated p-value | 0.0560 |
| Approximate p-value | 0.0558 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0008 |
| OLS Regression Intercept | 0.0153 |

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

# Mann-Kendall 05-SS - MAGNESIUM



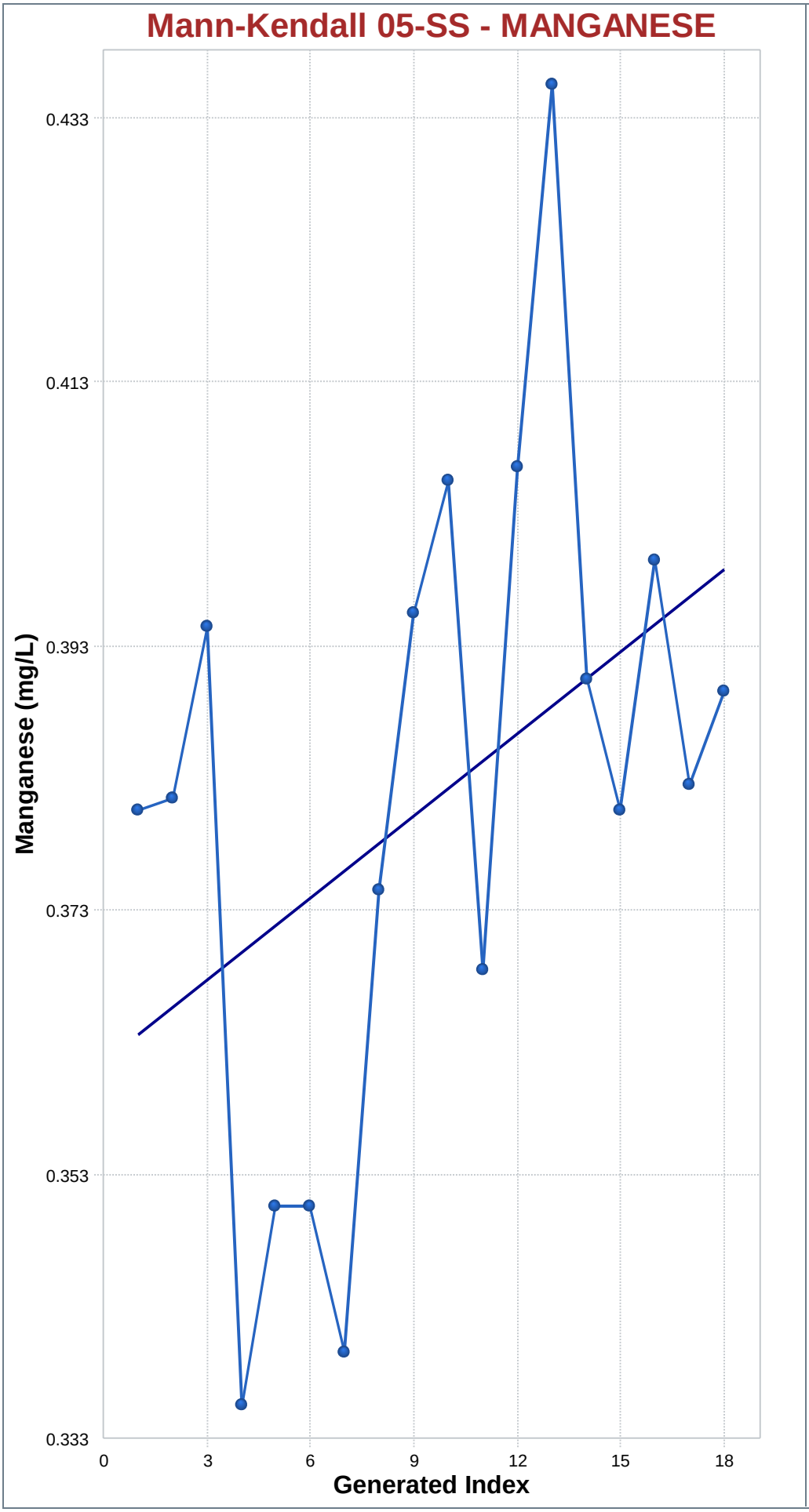

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3629 |
| Standardized Value of S | 3.0346 |
| M-K Test Value (S) | 81 |
| Tabulated p-value | 0.0010 |
| Approximate p-value | 0.0012 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1393 |
| OLS Regression Intercept | 10.1209 |

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



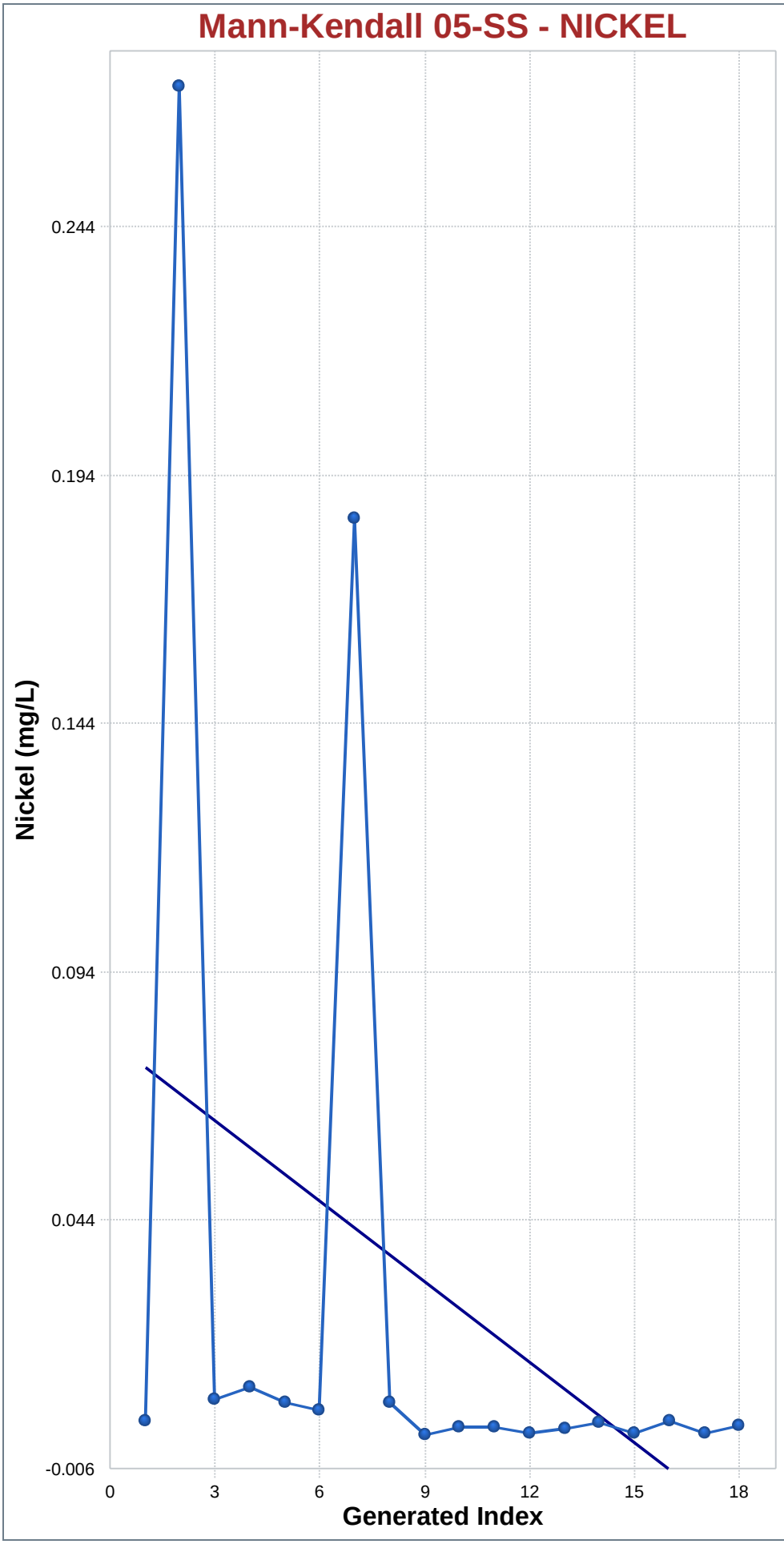

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3629 |
| Standardized Value of S | 1.7449 |
| M-K Test Value (S) | 47 |
| Tabulated p-value | 0.0410 |
| Approximate p-value | 0.0405 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0021 |
| OLS Regression Intercept | 0.3620 |

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



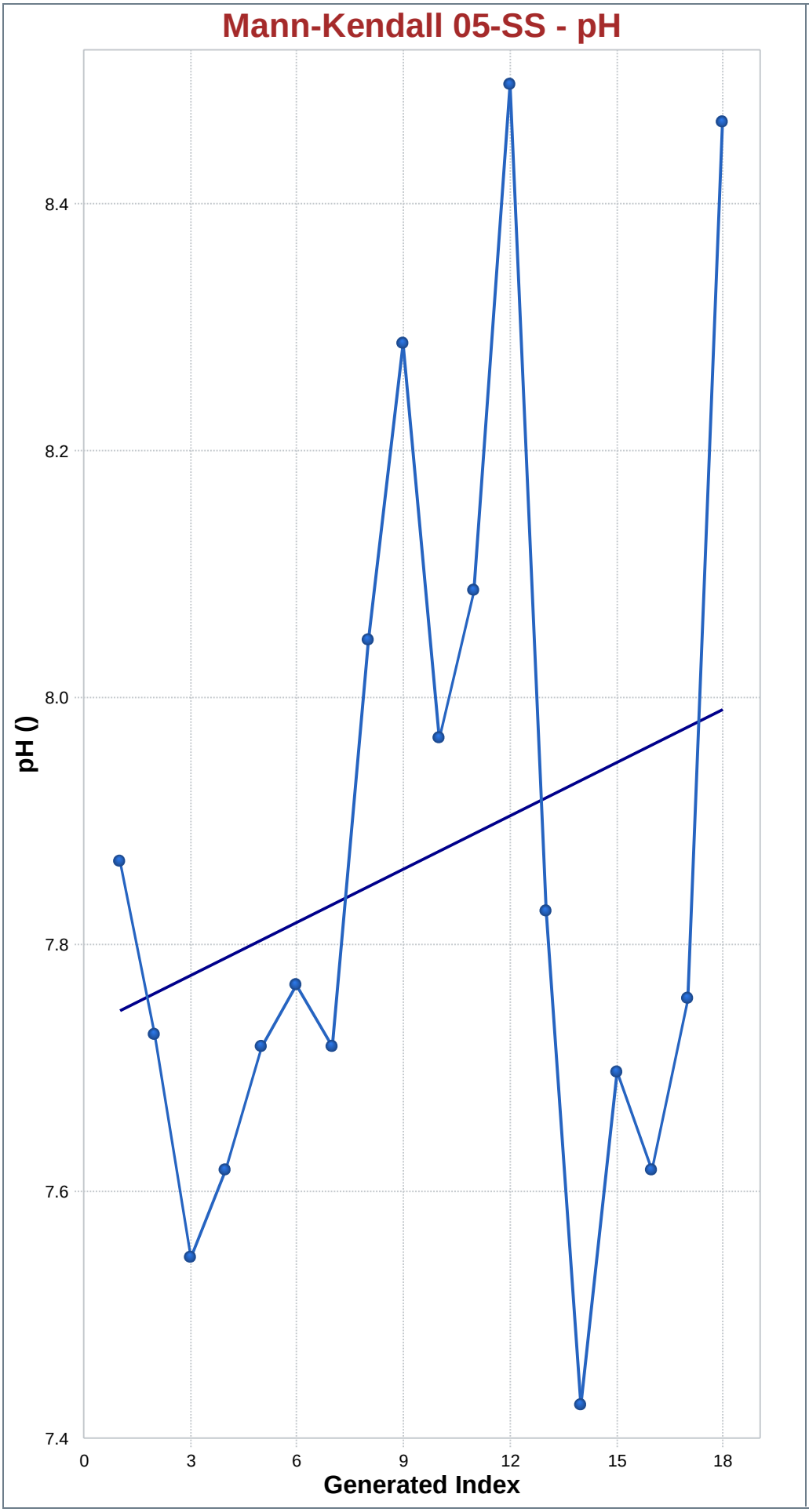

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3818 |
| Standardized Value of S | -2.6912 |
| M-K Test Value (S) | -72 |
| Tabulated p-value | 0.0030 |
| Approximate p-value | 0.0036 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0054 |
| OLS Regression Intercept | 0.0800 |

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



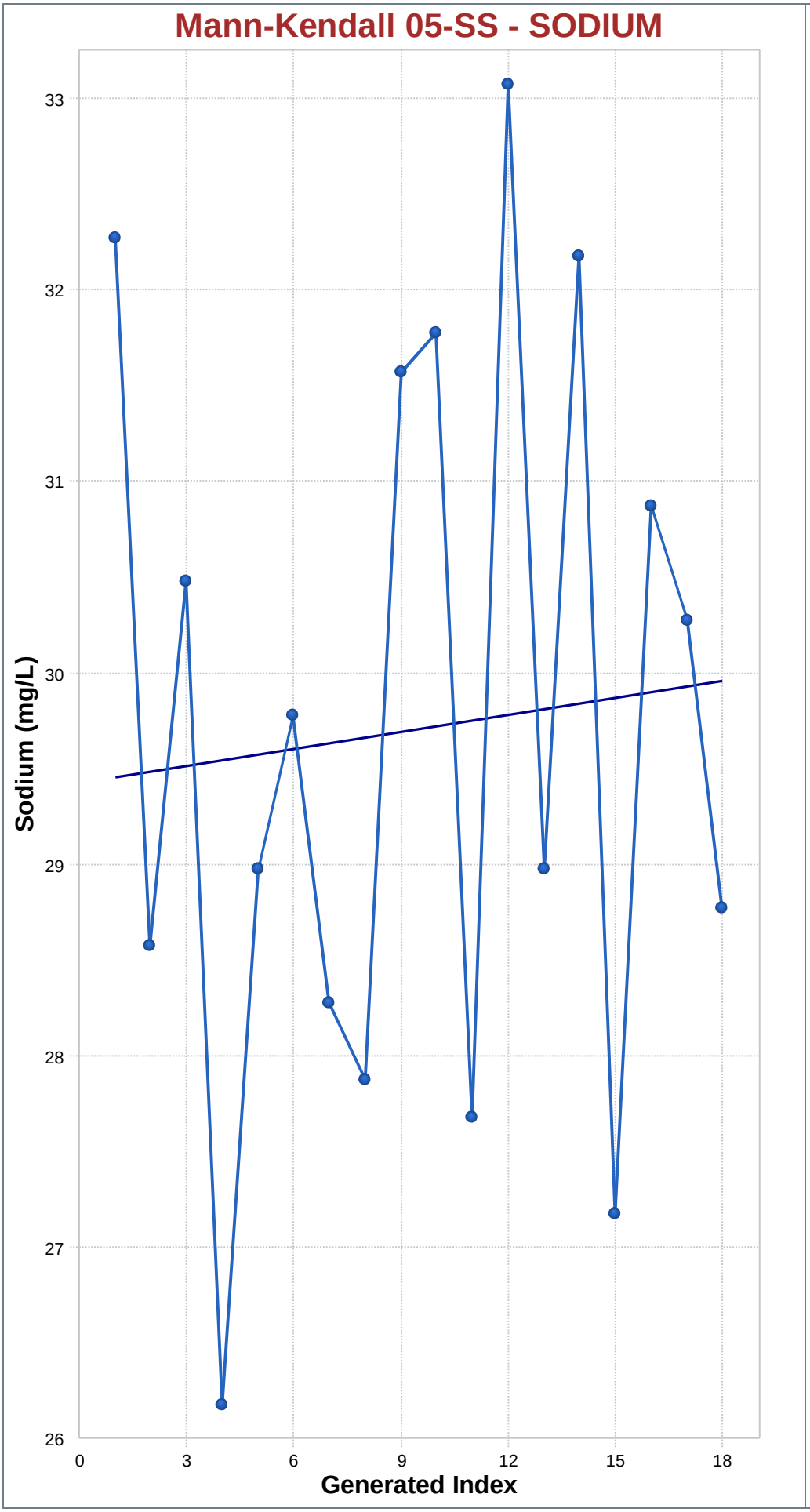

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3629 |
| Standardized Value of S | 0.7586 |
| M-K Test Value (S) | 21 |
| Tabulated p-value | 0.2270 |
| Approximate p-value | 0.2240 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0144 |
| OLS Regression Intercept | 7.7149 |

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



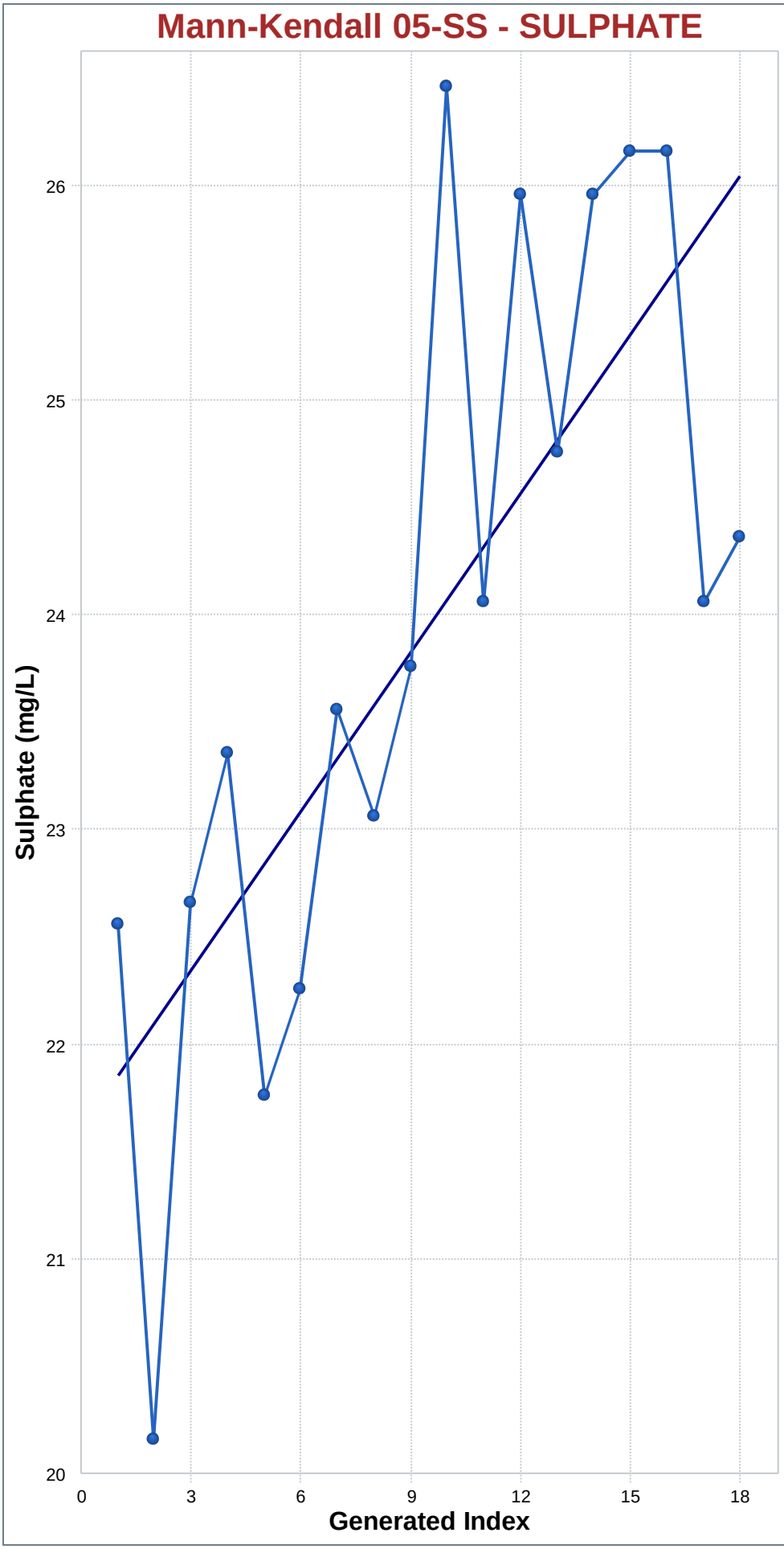

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3818 |
| Standardized Value of S | 0.0379 |
| M-K Test Value (S) | 2 |
| Tabulated p-value | 0.4700 |
| Approximate p-value | 0.4849 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0299 |
| OLS Regression Intercept | 29.1490 |

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




**Mann-Kendall Trend Analysis**

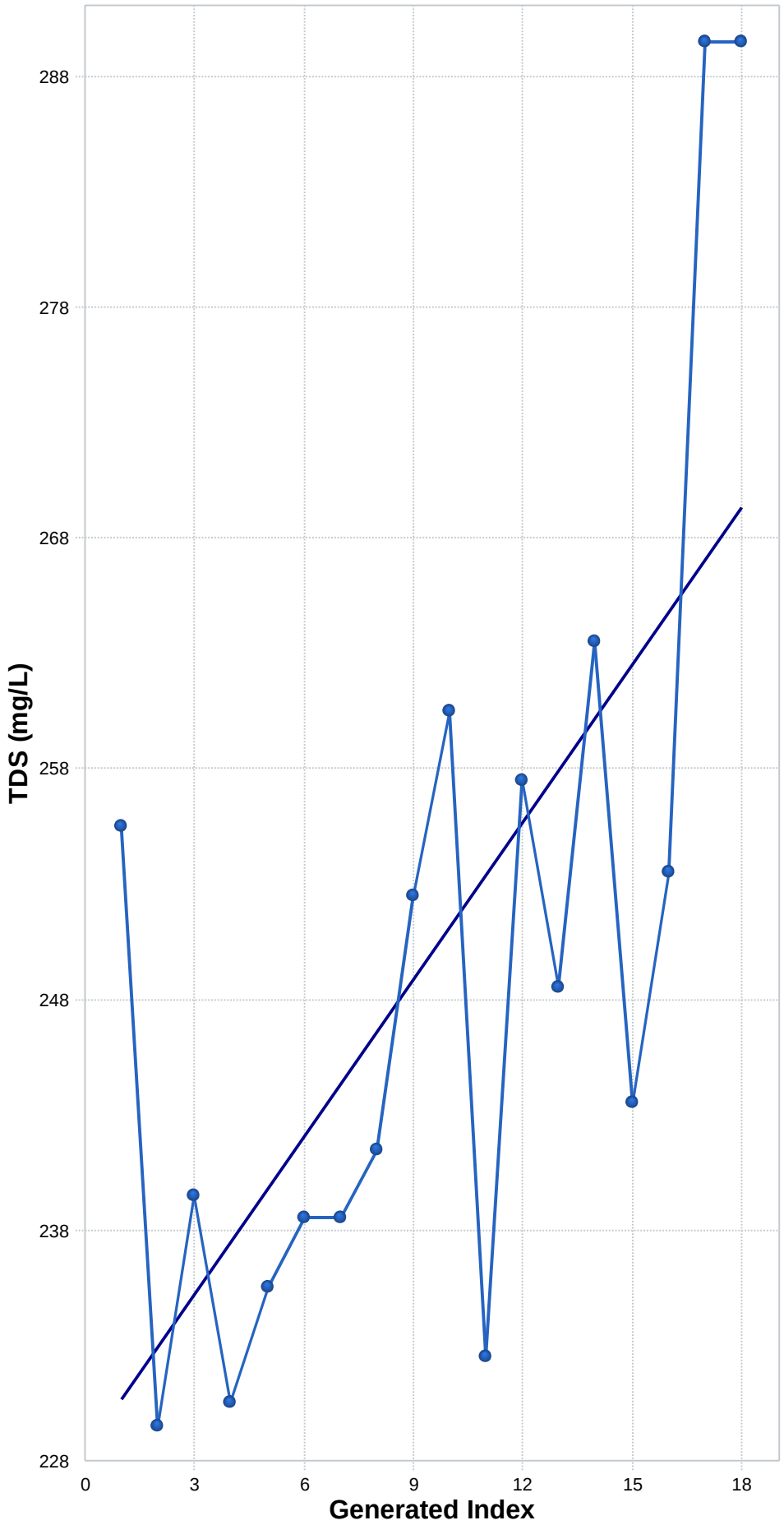
| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3439 |
| Standardized Value of S | 3.5302 |
| M-K Test Value (S) | 94 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0002 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.2460 |
| OLS Regression Intercept | 21.4516 |

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

# Mann-Kendall 05-SS - TDS



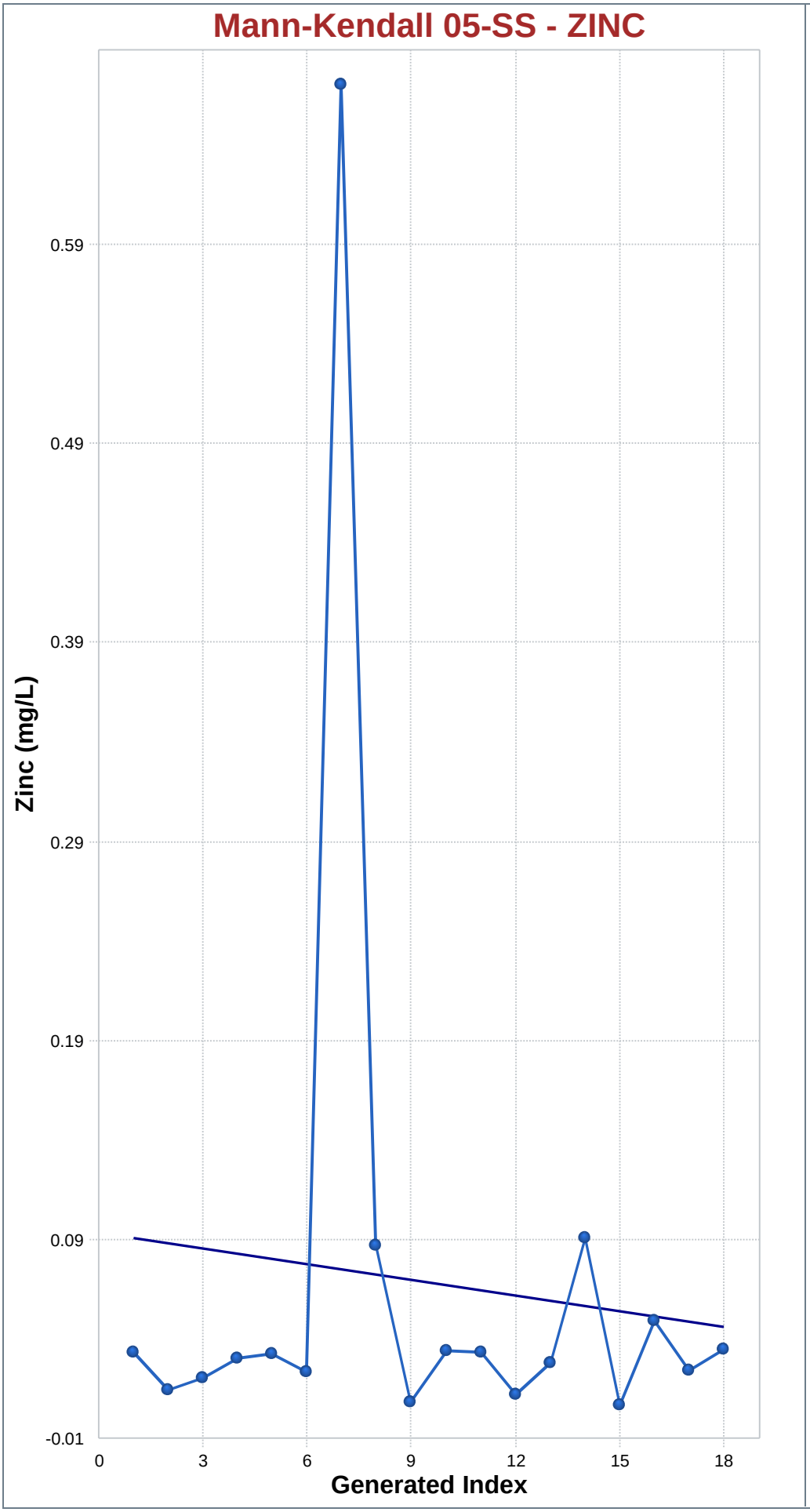

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.3629 |
| Standardized Value of S | 3.0346 |
| M-K Test Value (S) | 81 |
| Tabulated p-value | 0.0010 |
| Approximate p-value | 0.0012 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 2.2714 |
| OLS Regression Intercept | 228.9216 |

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



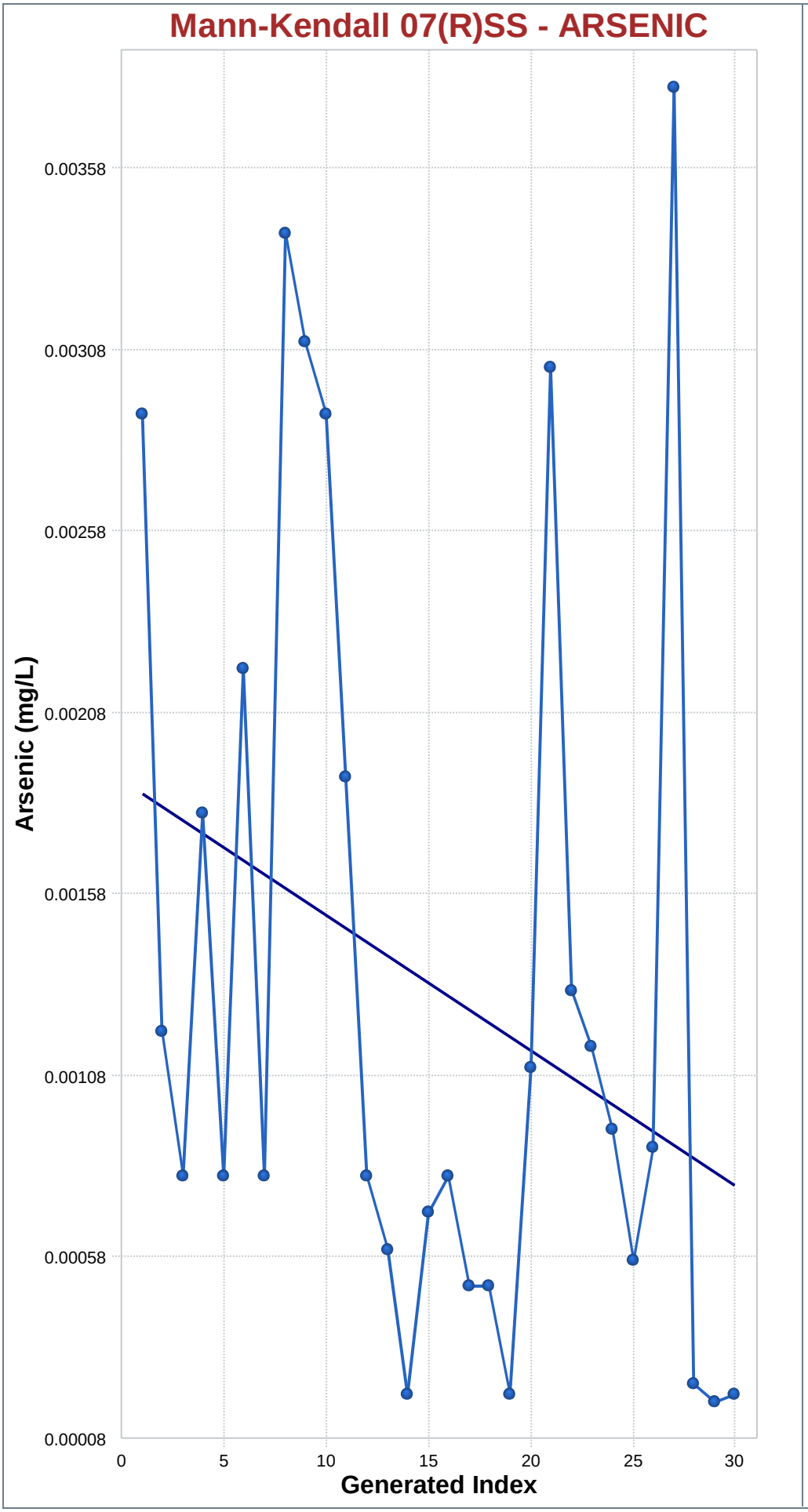

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 18 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 26.4008 |
| Standardized Value of S | 0.4545 |
| M-K Test Value (S) | 13 |
| Tabulated p-value | 0.3270 |
| Approximate p-value | 0.3247 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0027 |
| OLS Regression Intercept | 0.0902 |

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




**Mann-Kendall Trend Analysis**

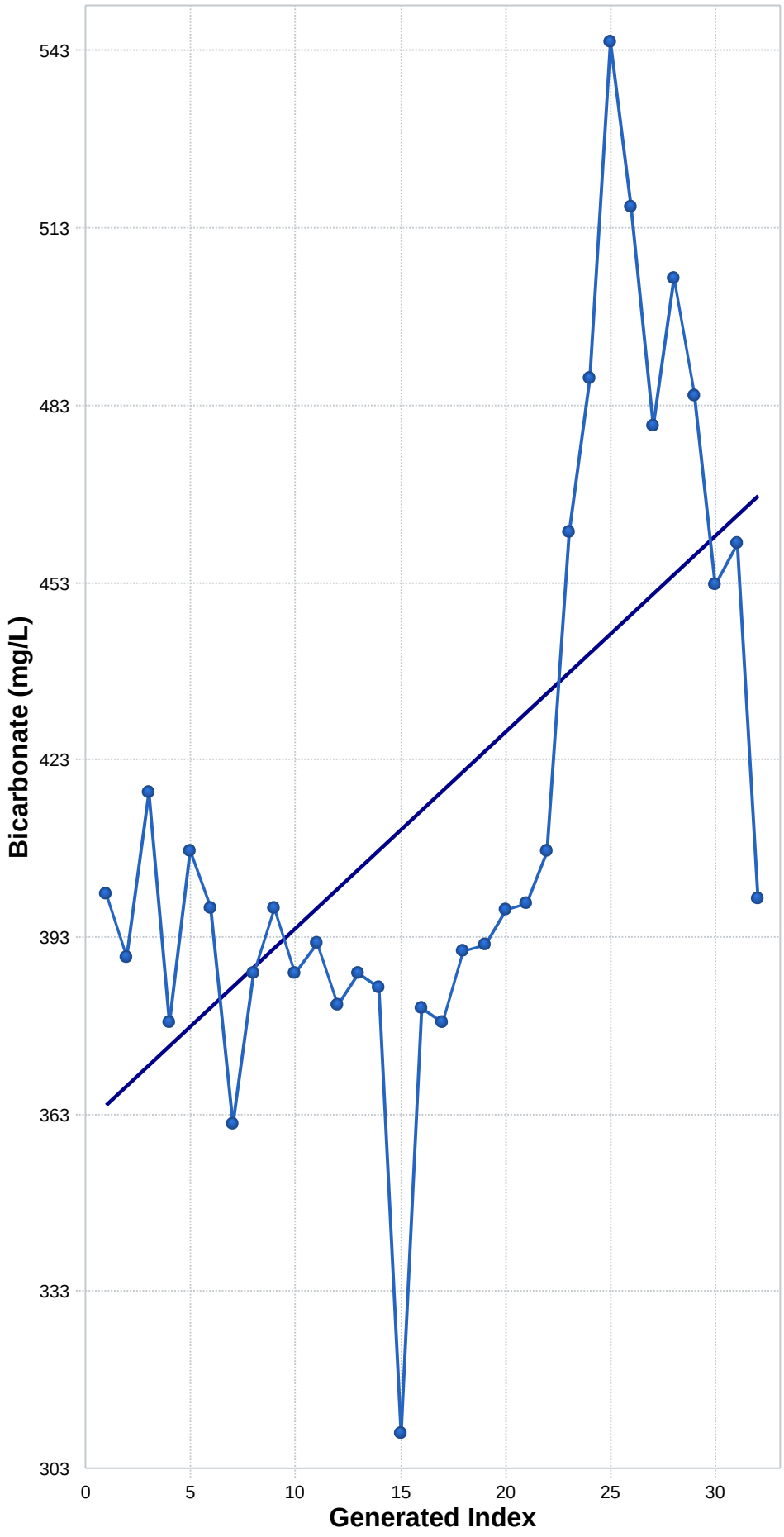
| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 55.8510 |
| Standardized Value of S | -2.2023 |
| M-K Test Value (S) | -124 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0138 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0000 |
| OLS Regression Intercept | 0.0019 |

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

# Mann-Kendall 07(R)SS - BICARBONATE




**Mann-Kendall Trend Analysis**

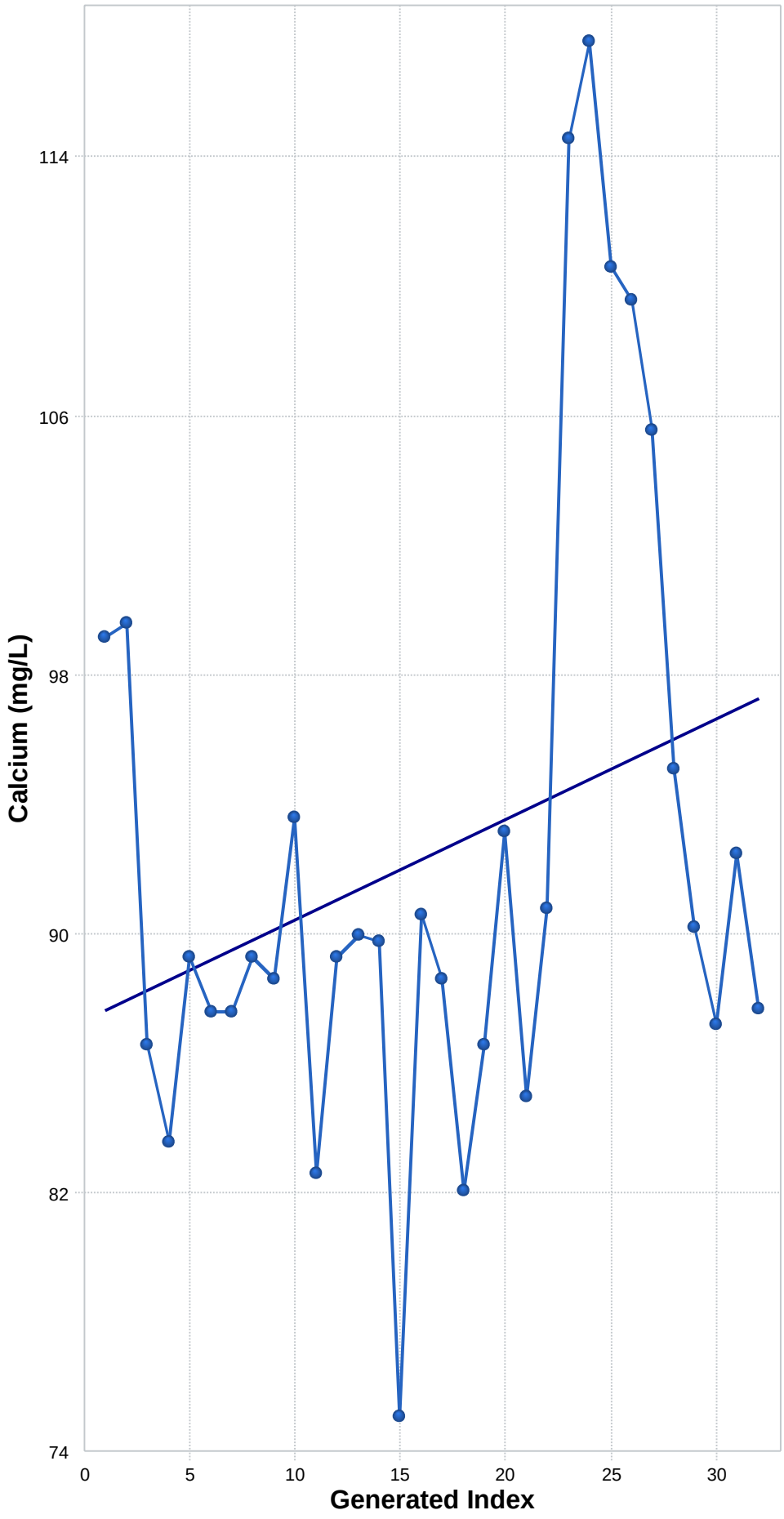
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6414 |
| Standardized Value of S | 2.8228 |
| M-K Test Value (S) | 175 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0024 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 3.3300 |
| OLS Regression Intercept | 360.5706 |

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

# Mann-Kendall 07(R)SS - CALCIUM




**Mann-Kendall Trend Analysis**

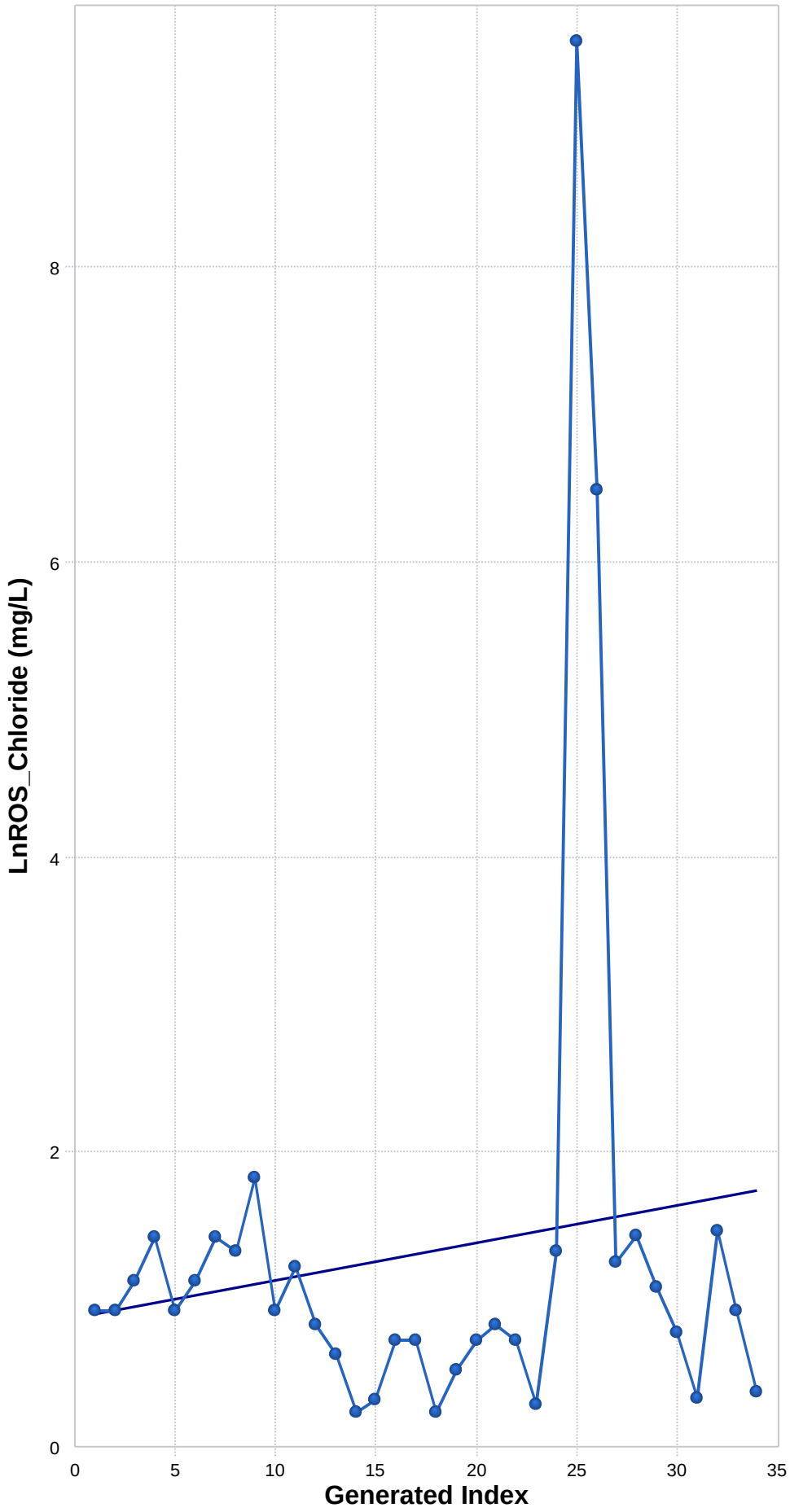
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6117 |
| Standardized Value of S | 1.4445 |
| M-K Test Value (S) | 90 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0743 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.3107 |
| OLS Regression Intercept | 87.7546 |

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

# Mann-Kendall 07(R)SS - CHLORIDE



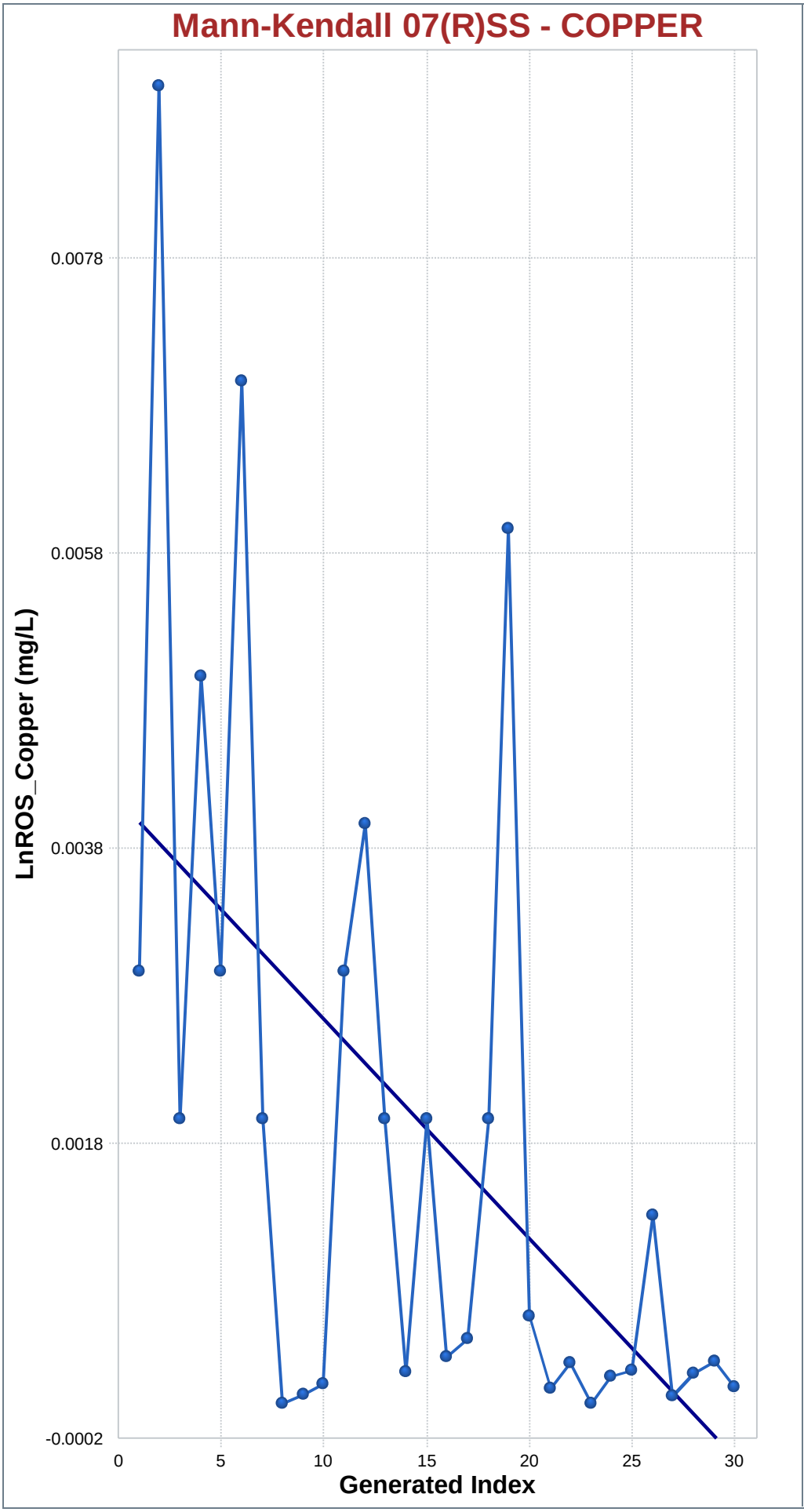

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 34 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 67.2309 |
| Standardized Value of S | -0.6098 |
| M-K Test Value (S) | -42 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.2710 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0254 |
| OLS Regression Intercept | 0.6526 |

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



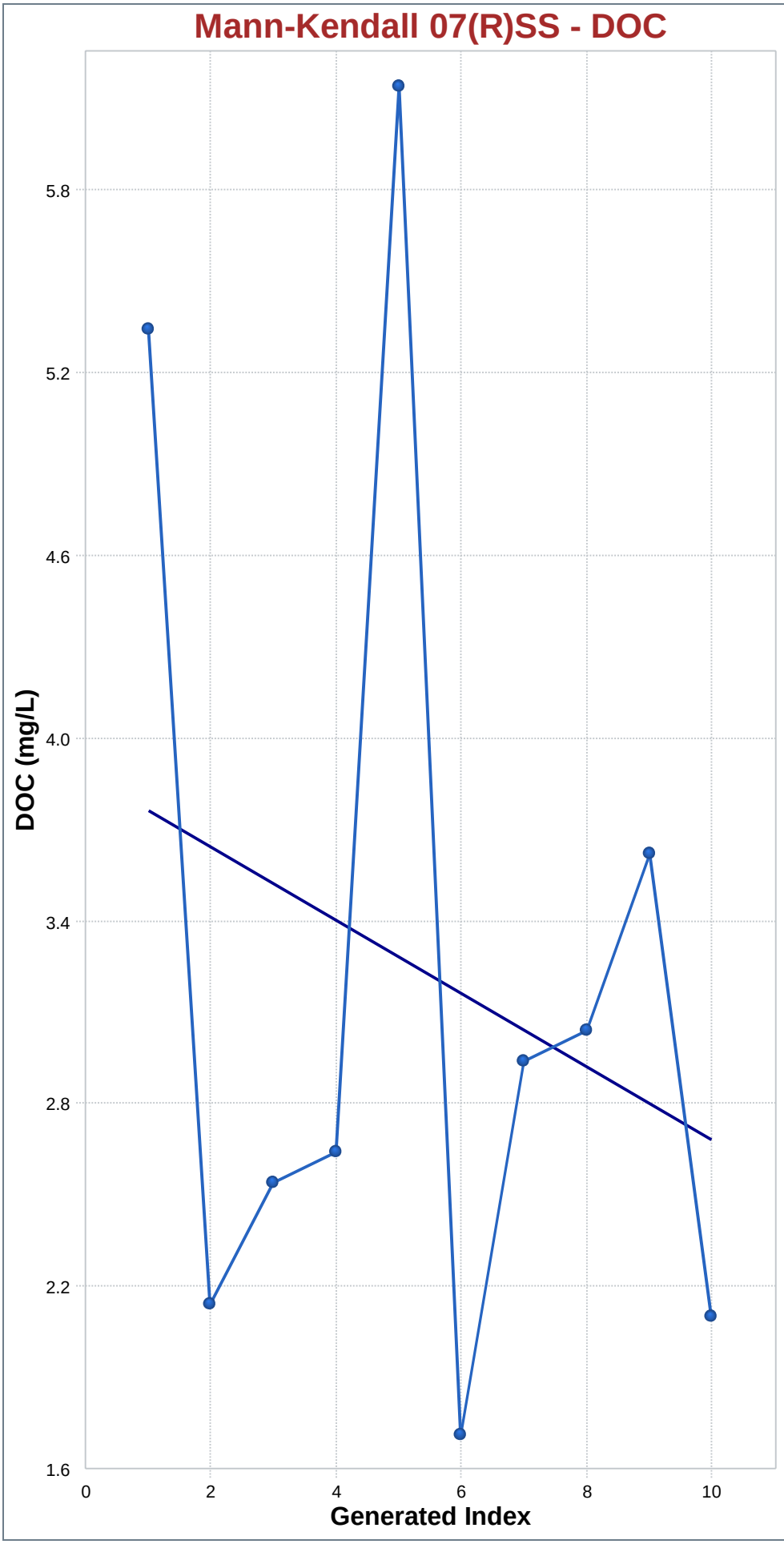

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 30 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 55.8689 |
| Standardized Value of S | -2.9891 |
| M-K Test Value (S) | -168 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0014 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0042 |

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




**Mann-Kendall Trend Analysis**

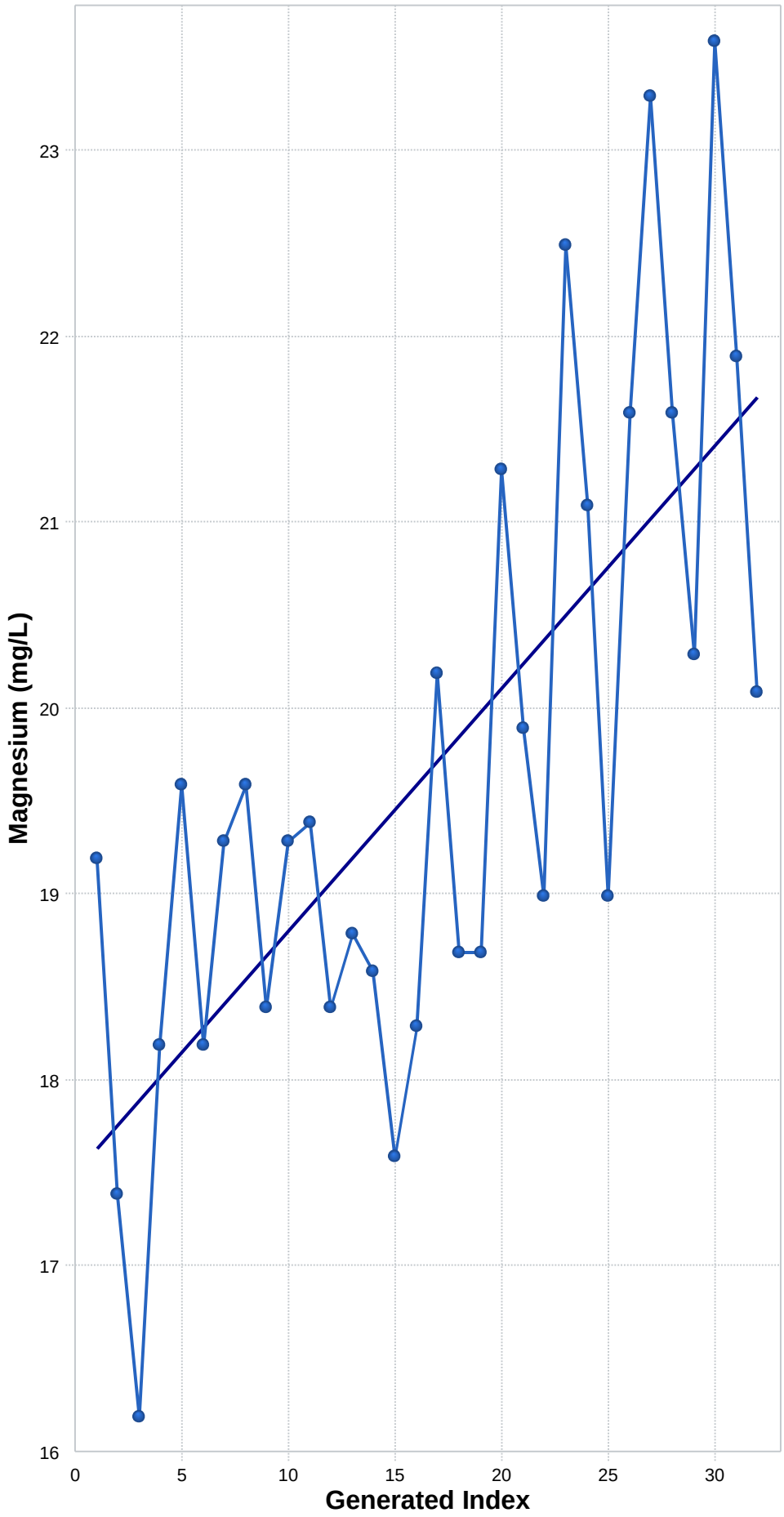
| | |
|---|---|
| n | 10 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 11.1803 |
| Standardized Value of S | 0.0000 |
| M-K Test Value (S) | 1 |
| Tabulated p-value | 0.5000 |
| Approximate p-value | 0.5000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.1202 |
| OLS Regression Intercept | 3.8420 |

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

# Mann-Kendall 07(R)SS - MAGNESIUM



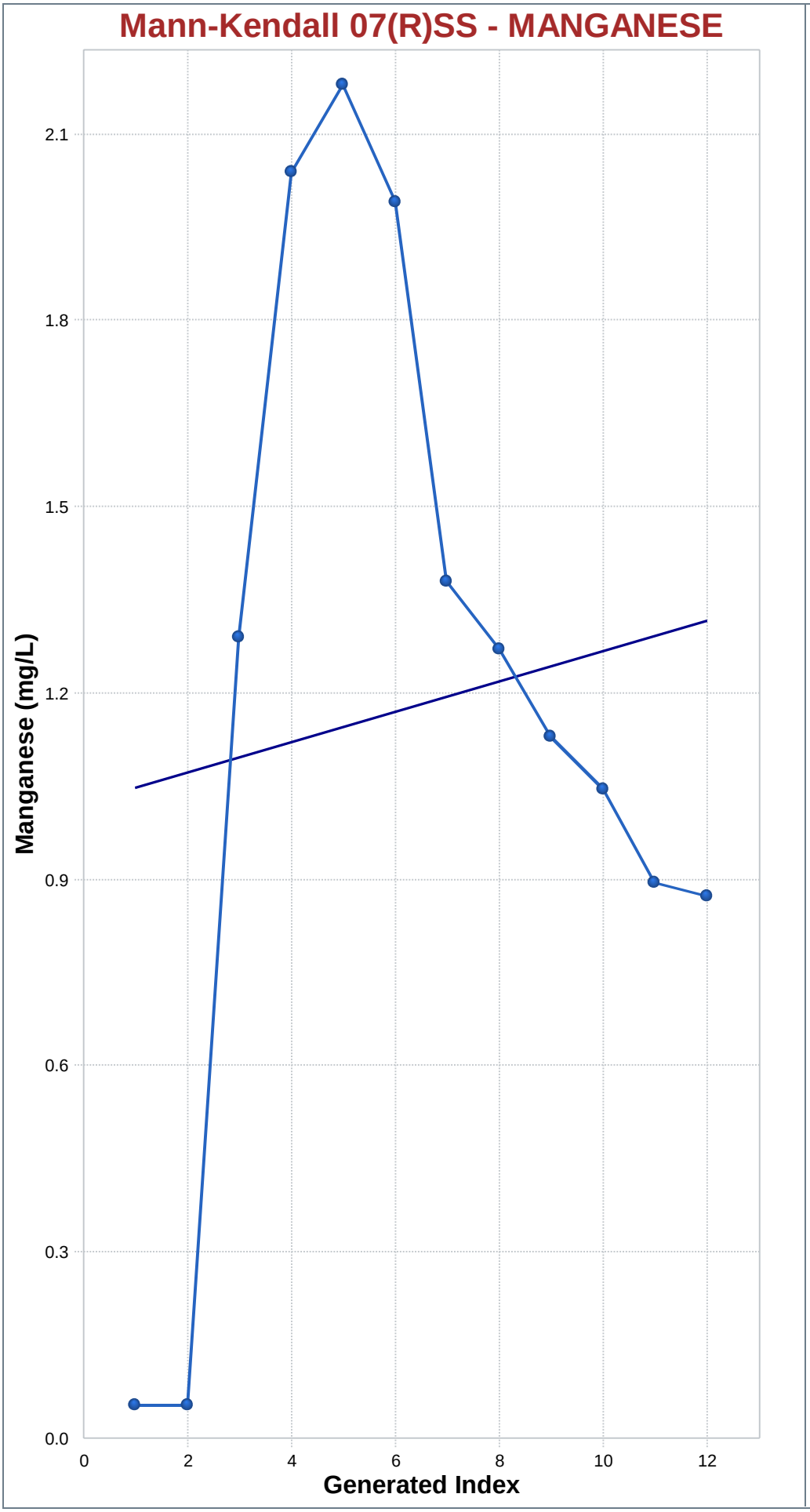

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6090 |
| Standardized Value of S | 4.0903 |
| M-K Test Value (S) | 253 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1304 |
| OLS Regression Intercept | 17.7133 |

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



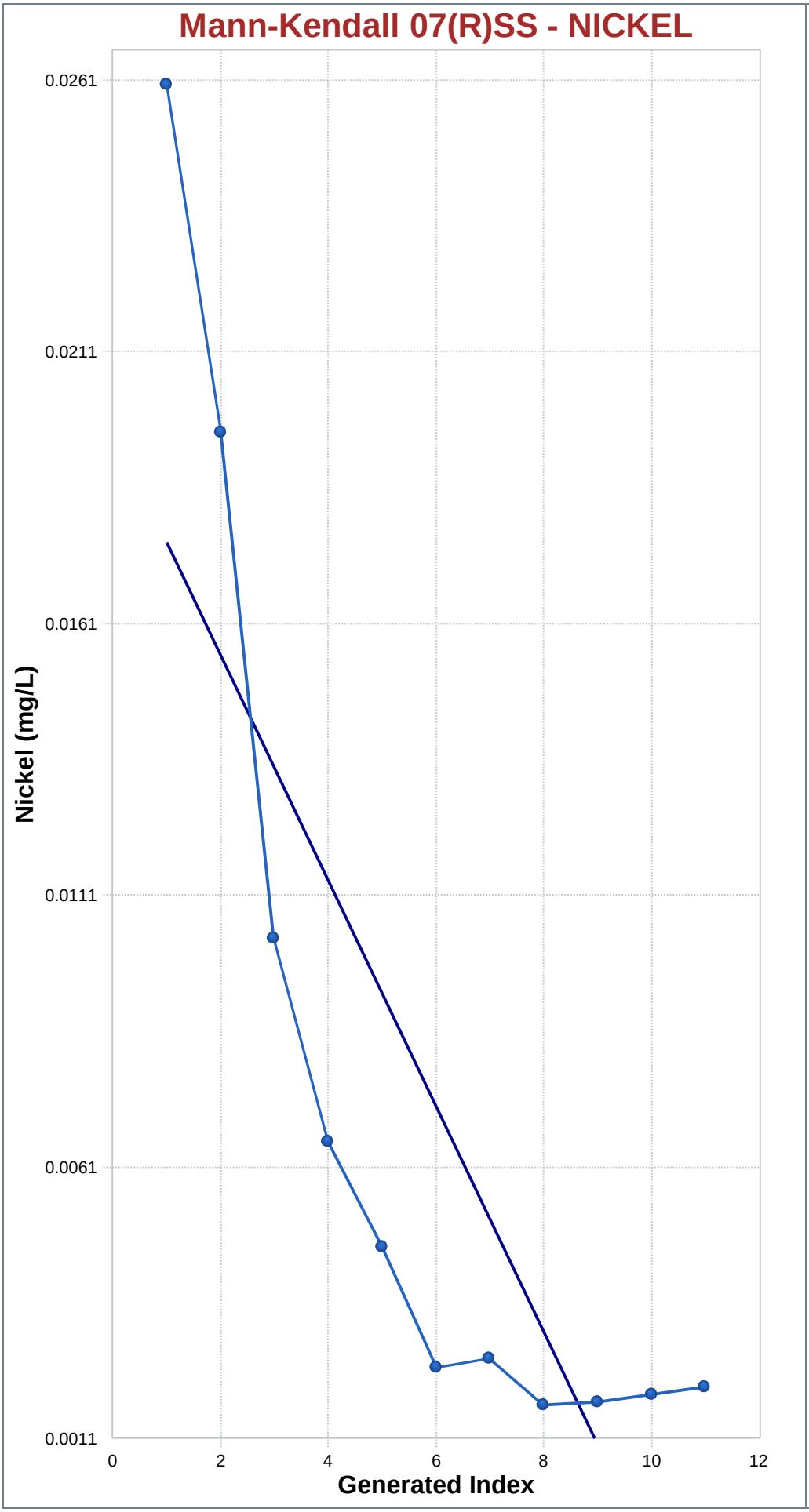

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 12 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 14.5488 |
| Standardized Value of S | -0.9623 |
| M-K Test Value (S) | -15 |
| Tabulated p-value | 0.1900 |
| Approximate p-value | 0.1680 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0245 |
| OLS Regression Intercept | 0.9747 |

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



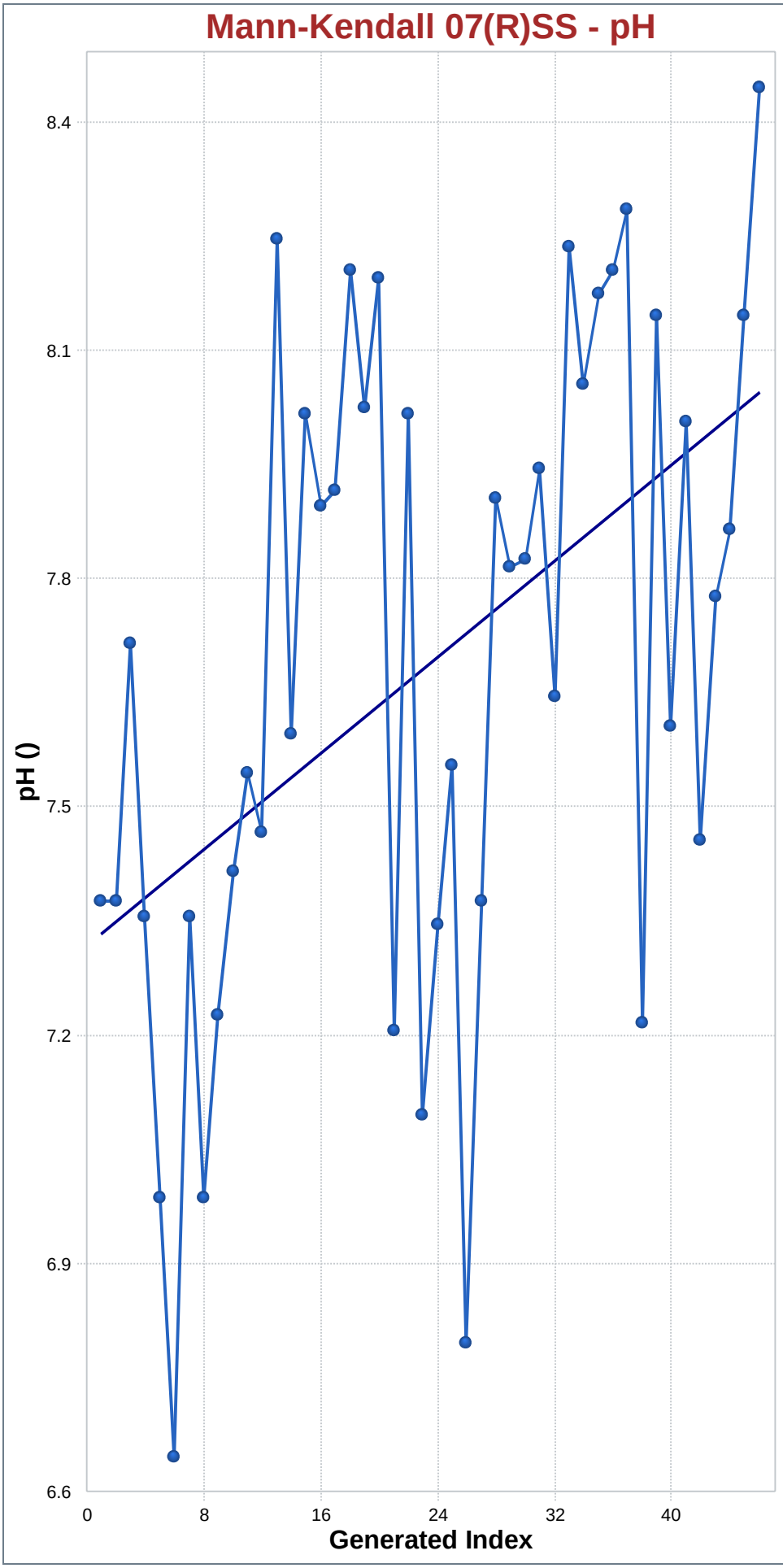

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 11 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 12.8452 |
| Standardized Value of S | -3.1140 |
| M-K Test Value (S) | -41 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0009 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0021 |
| OLS Regression Intercept | 0.0197 |

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




**Mann-Kendall Trend Analysis**

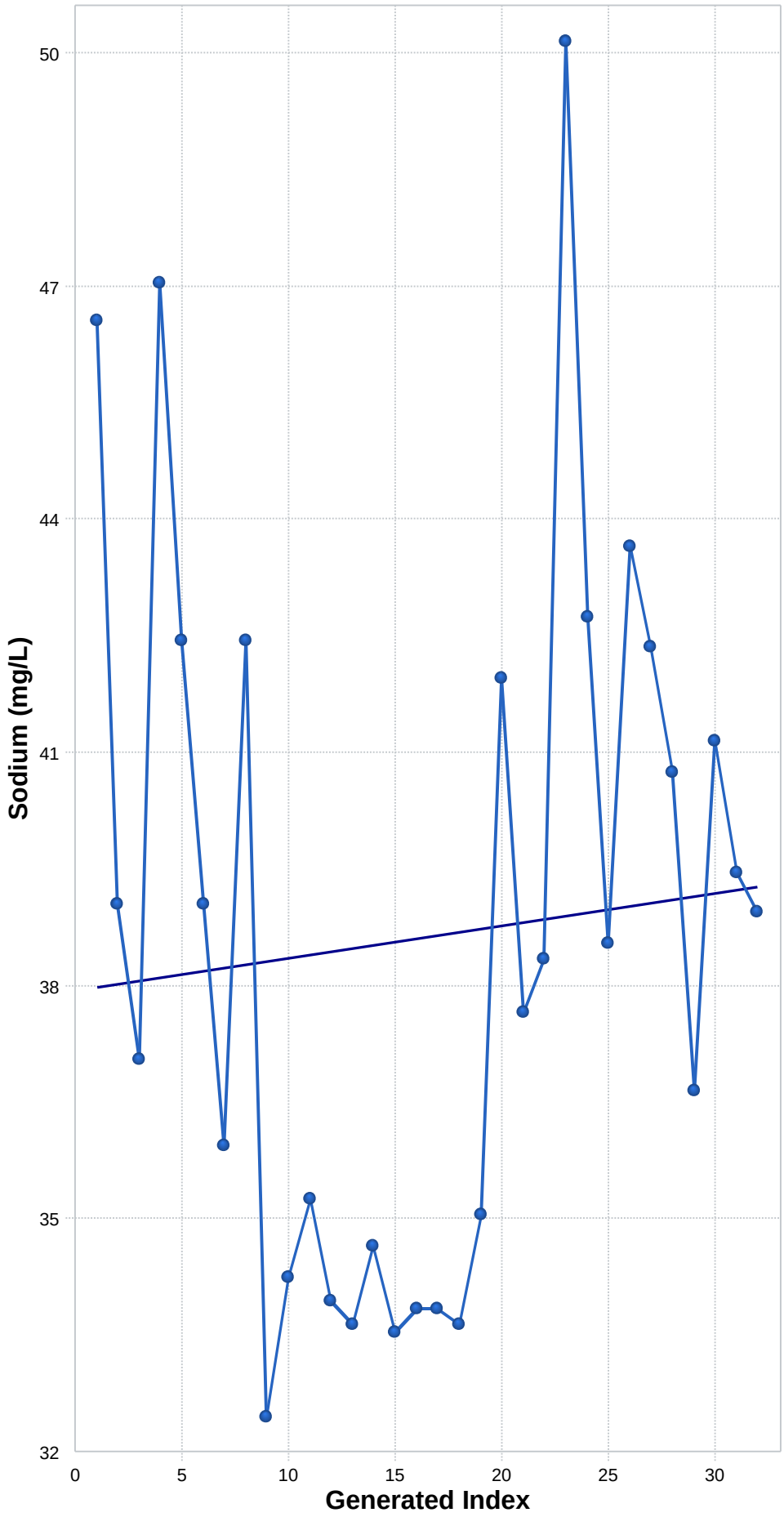
| | |
|---|---|
| n | 46 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 105.5762 |
| Standardized Value of S | 3.2773 |
| M-K Test Value (S) | 347 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0005 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0158 |
| OLS Regression Intercept | 7.3320 |

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

# Mann-Kendall 07(R)SS - SODIUM




**Mann-Kendall Trend Analysis**

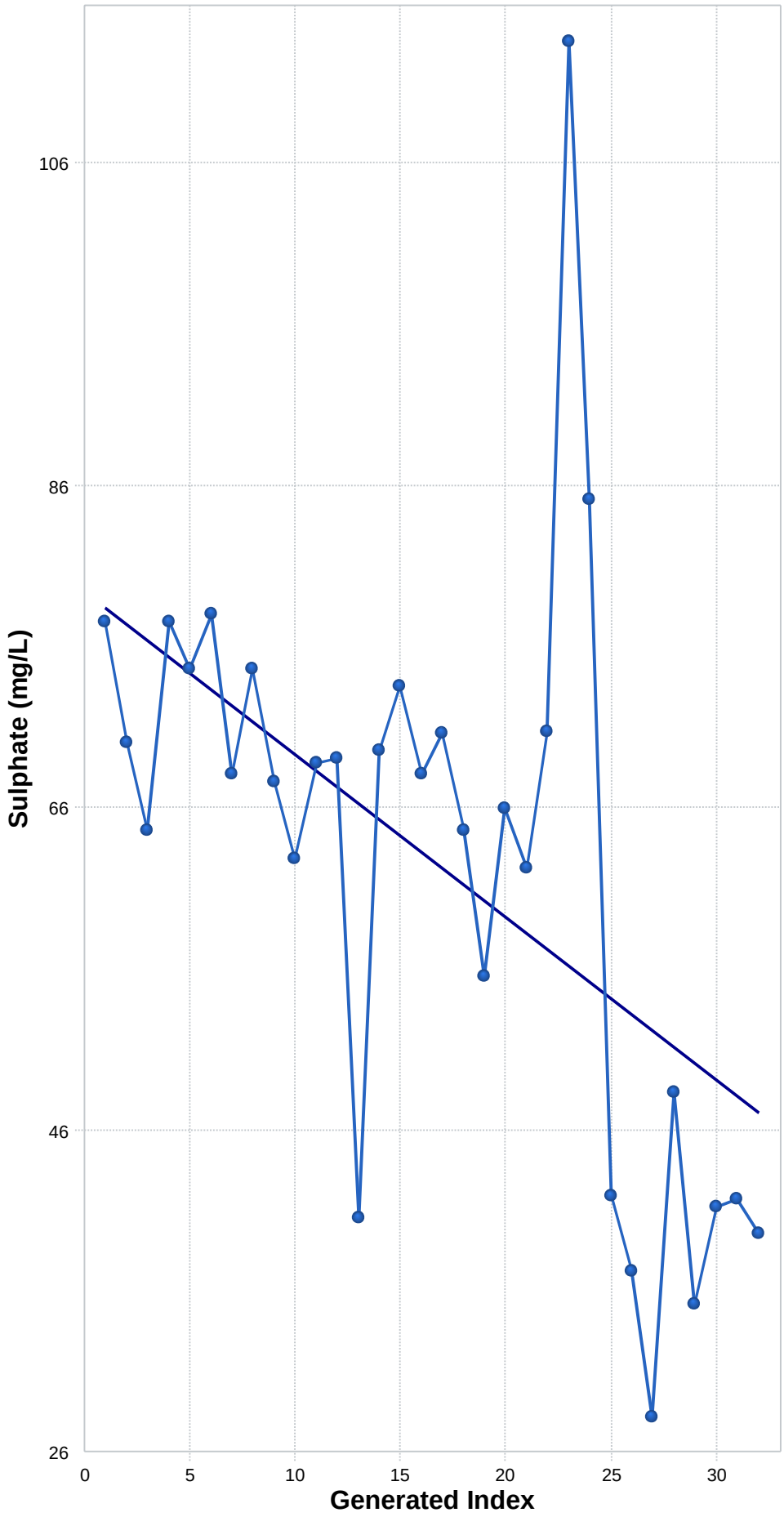
| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6333 |
| Standardized Value of S | 0.5354 |
| M-K Test Value (S) | 34 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.2962 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0414 |
| OLS Regression Intercept | 37.8950 |

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

# Mann-Kendall 07(R)SS - SULPHATE



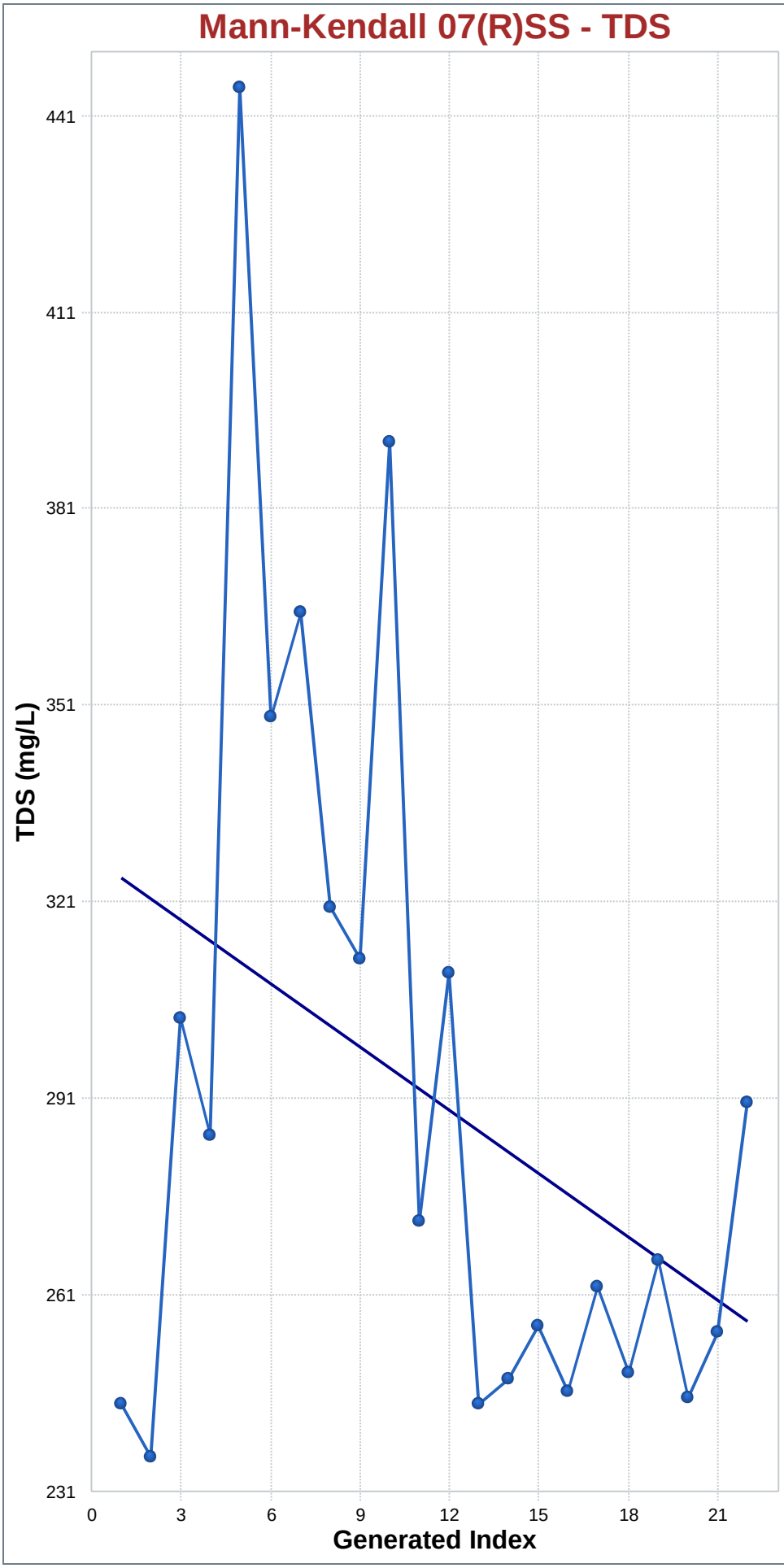

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 32 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 61.6333 |
| Standardized Value of S | -3.4235 |
| M-K Test Value (S) | -212 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0003 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -1.0108 |
| OLS Regression Intercept | 79.8284 |

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




**Mann-Kendall Trend Analysis**

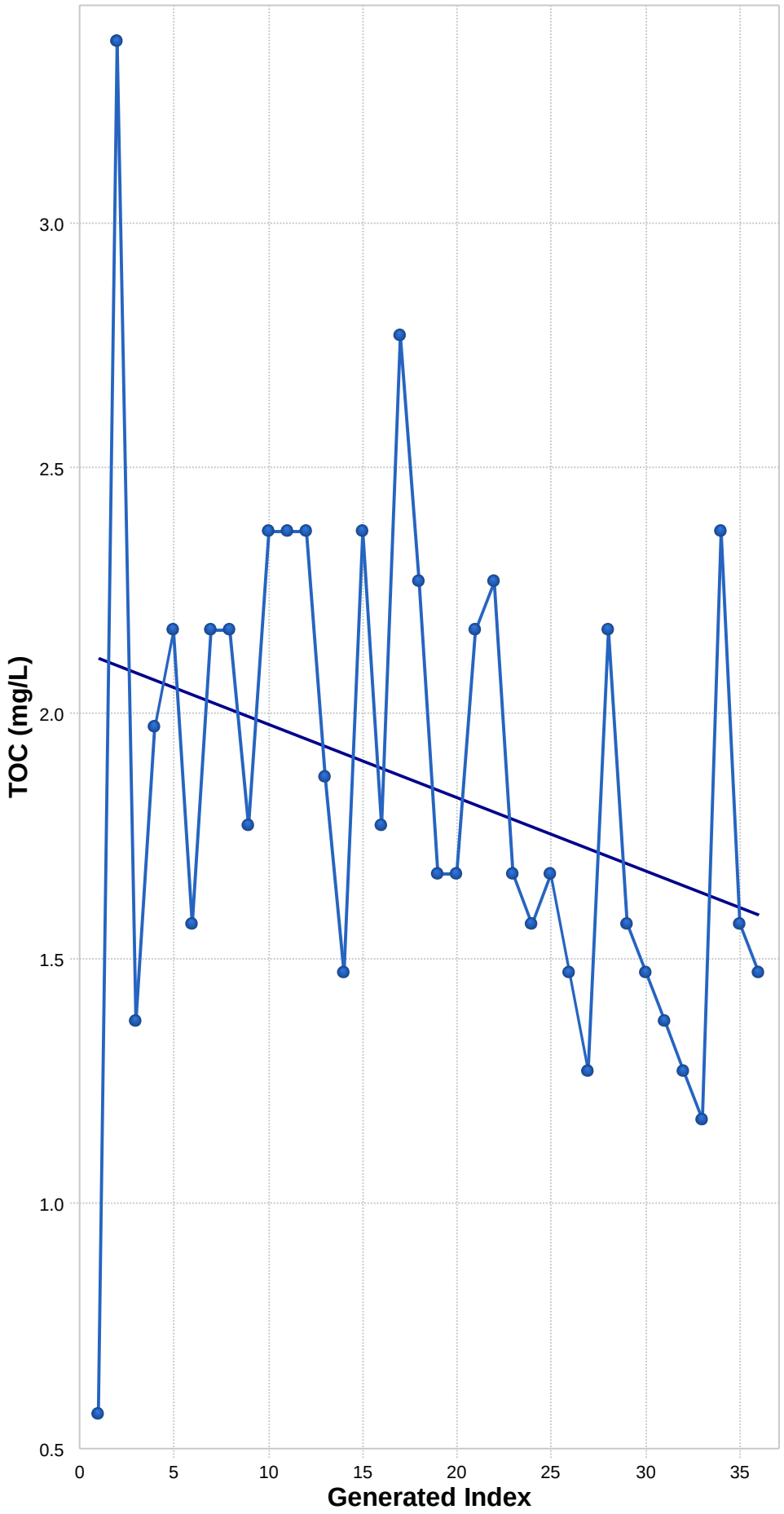
| | |
|---|---|
| n | 22 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 35.4495 |
| Standardized Value of S | -1.2130 |
| M-K Test Value (S) | -44 |
| Tabulated p-value | 0.1090 |
| Approximate p-value | 0.1126 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -3.2134 |
| OLS Regression Intercept | 327.5455 |

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

# Mann-Kendall 07(R)SS - TOC



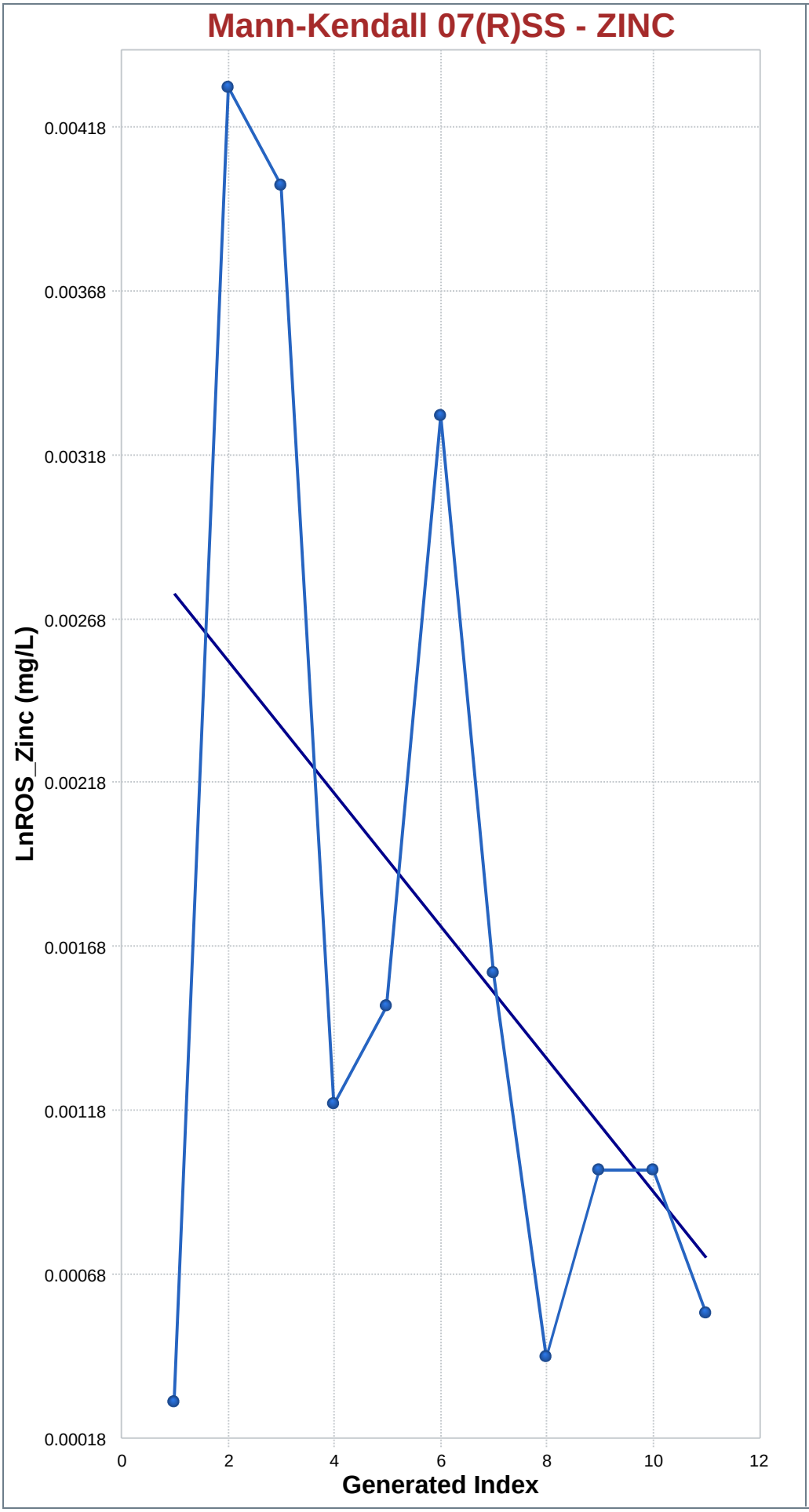

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 36 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 72.9840 |
| Standardized Value of S | -2.3978 |
| M-K Test Value (S) | -176 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0082 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0149 |
| OLS Regression Intercept | 2.1565 |

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



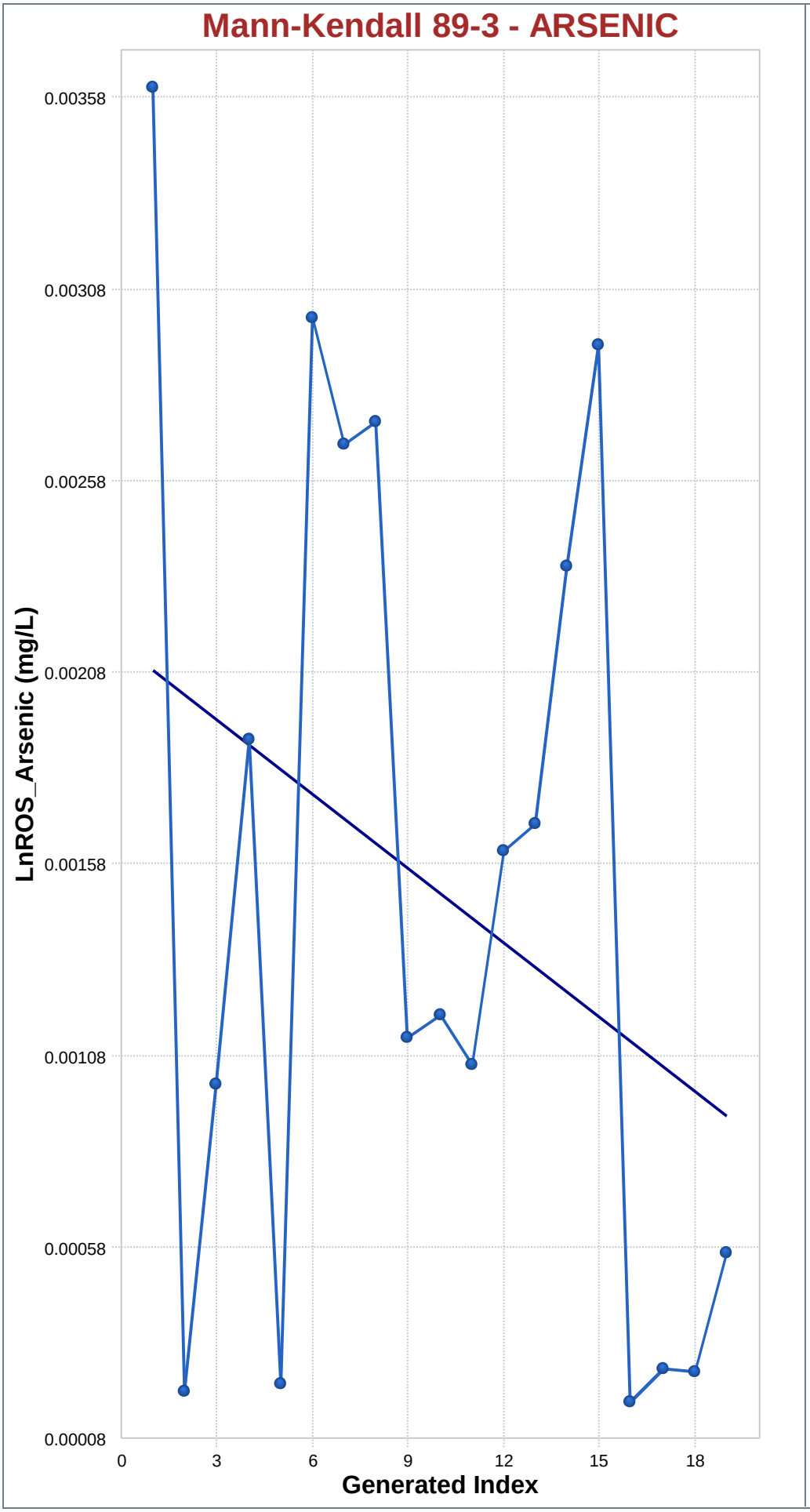

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 11 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 12.8062 |
| Standardized Value of S | -1.3275 |
| M-K Test Value (S) | -18 |
| Tabulated p-value | 0.0820 |
| Approximate p-value | 0.0922 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0030 |

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



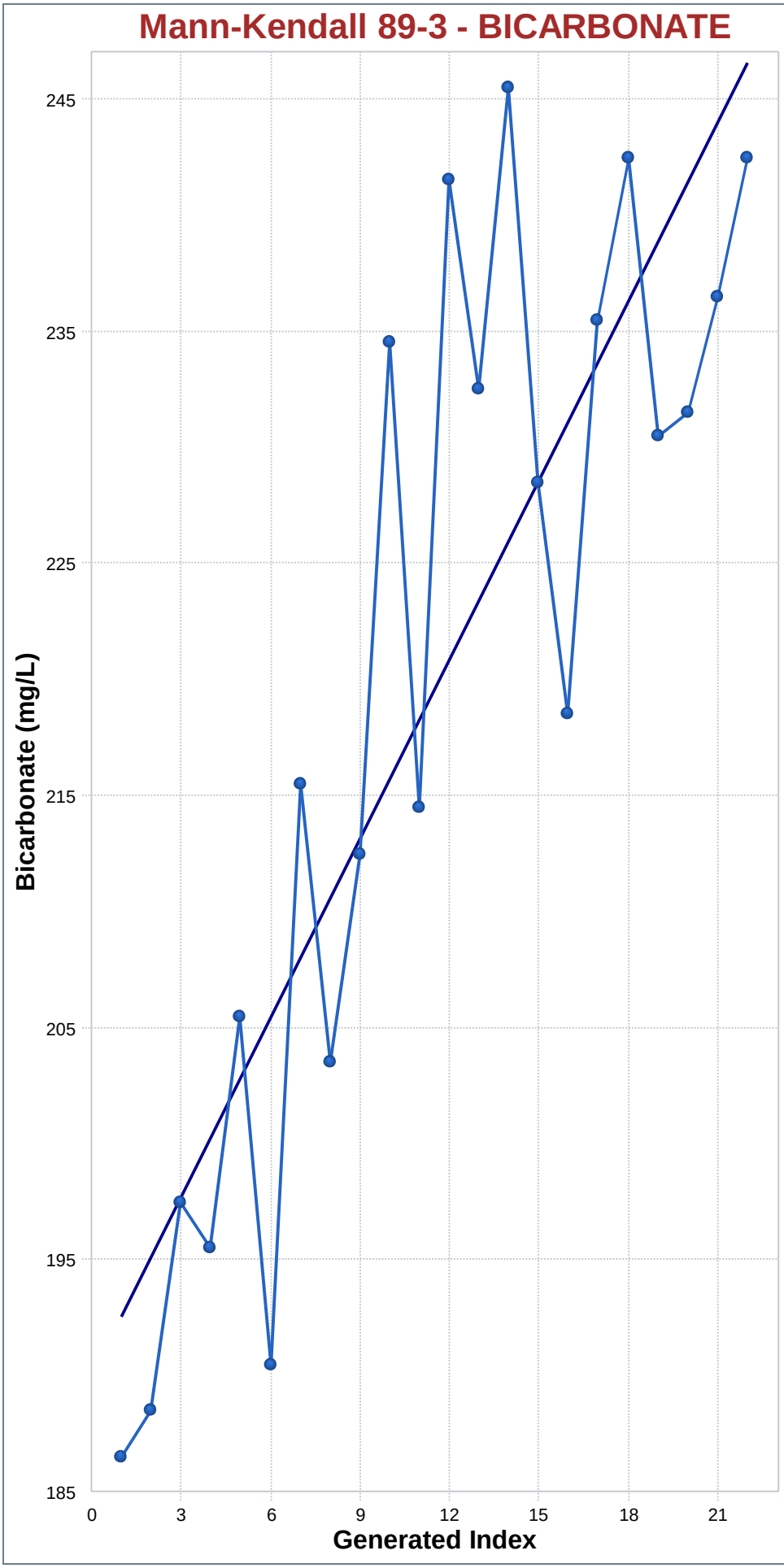

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 19 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 28.5832 |
| Standardized Value of S | -0.9096 |
| M-K Test Value (S) | -27 |
| Tabulated p-value | 0.1840 |
| Approximate p-value | 0.1815 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0001 |
| OLS Regression Intercept | 0.0021 |

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




**Mann-Kendall Trend Analysis**

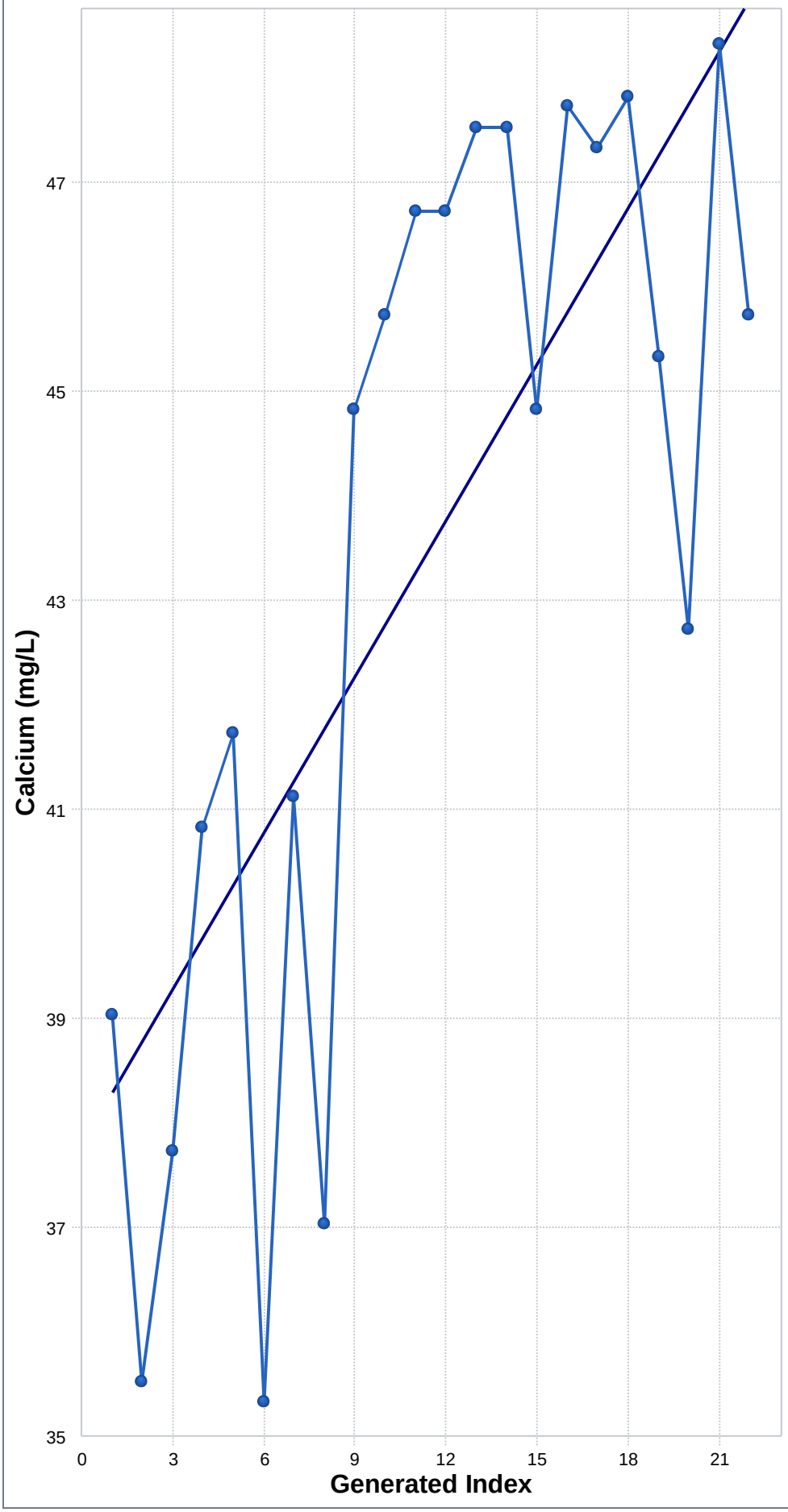
| | |
|---|---|
| n | 22 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 35.4495 |
| Standardized Value of S | 4.2596 |
| M-K Test Value (S) | 152 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0000 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 2.5720 |
| OLS Regression Intercept | 189.4675 |

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

# Mann-Kendall 89-3 - CALCIUM



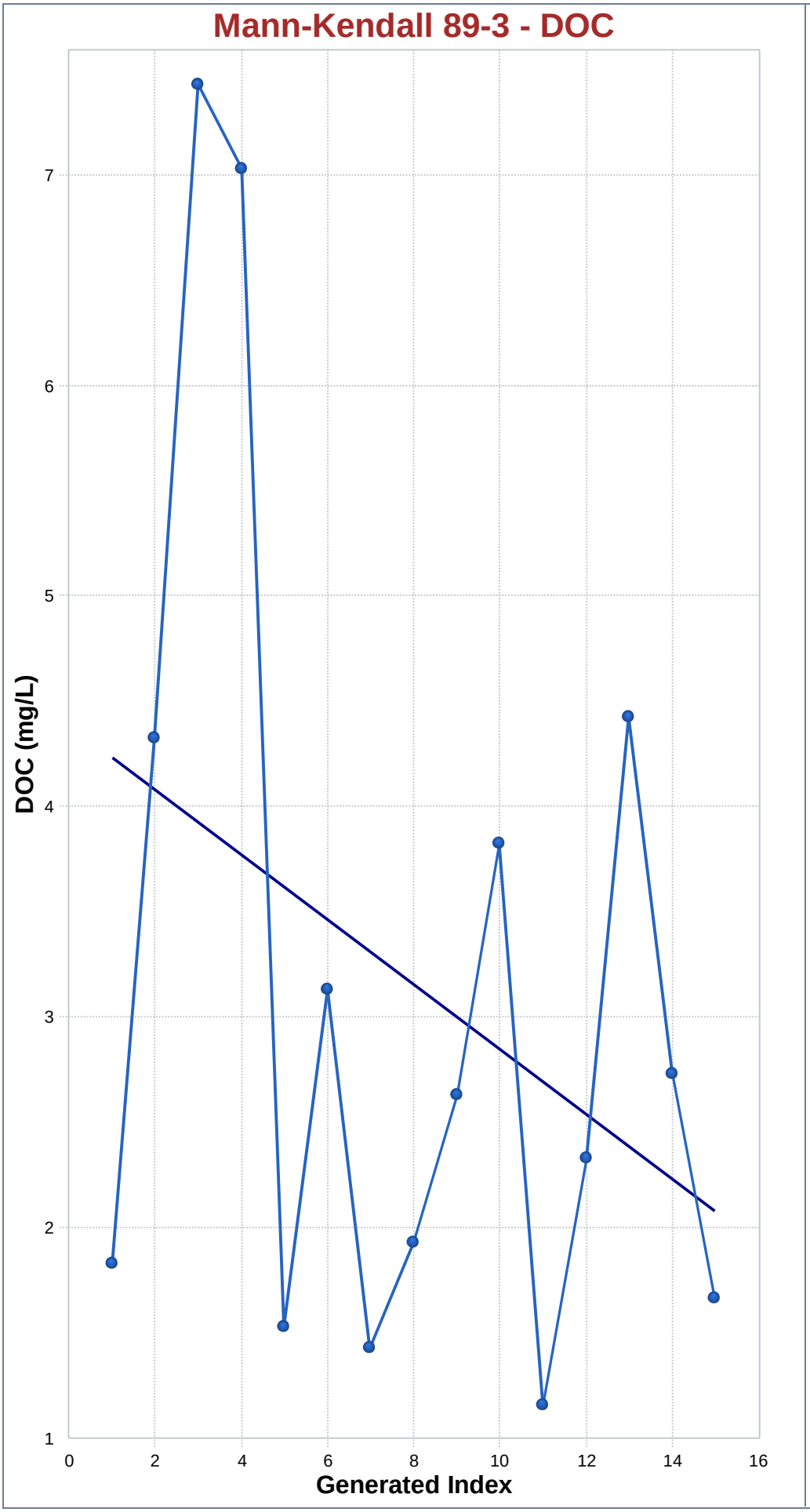

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 22 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 35.4072 |
| Standardized Value of S | 3.6716 |
| M-K Test Value (S) | 131 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0001 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.4972 |
| OLS Regression Intercept | 37.8636 |

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



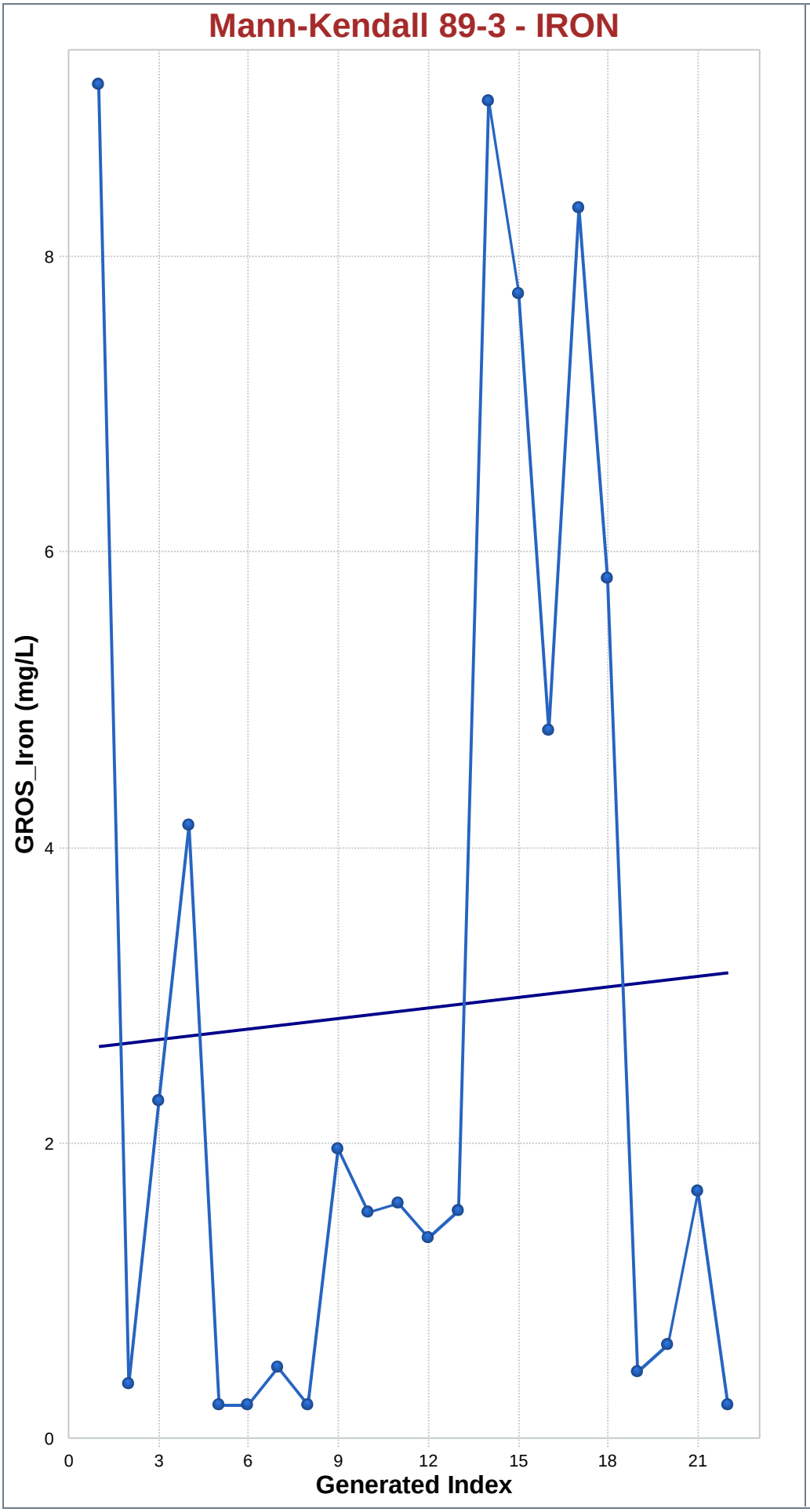

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 15 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 20.2073 |
| Standardized Value of S | -0.6928 |
| M-K Test Value (S) | -15 |
| Tabulated p-value | 0.2480 |
| Approximate p-value | 0.2442 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.1537 |
| OLS Regression Intercept | 4.0608 |

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




**Mann-Kendall Trend Analysis**

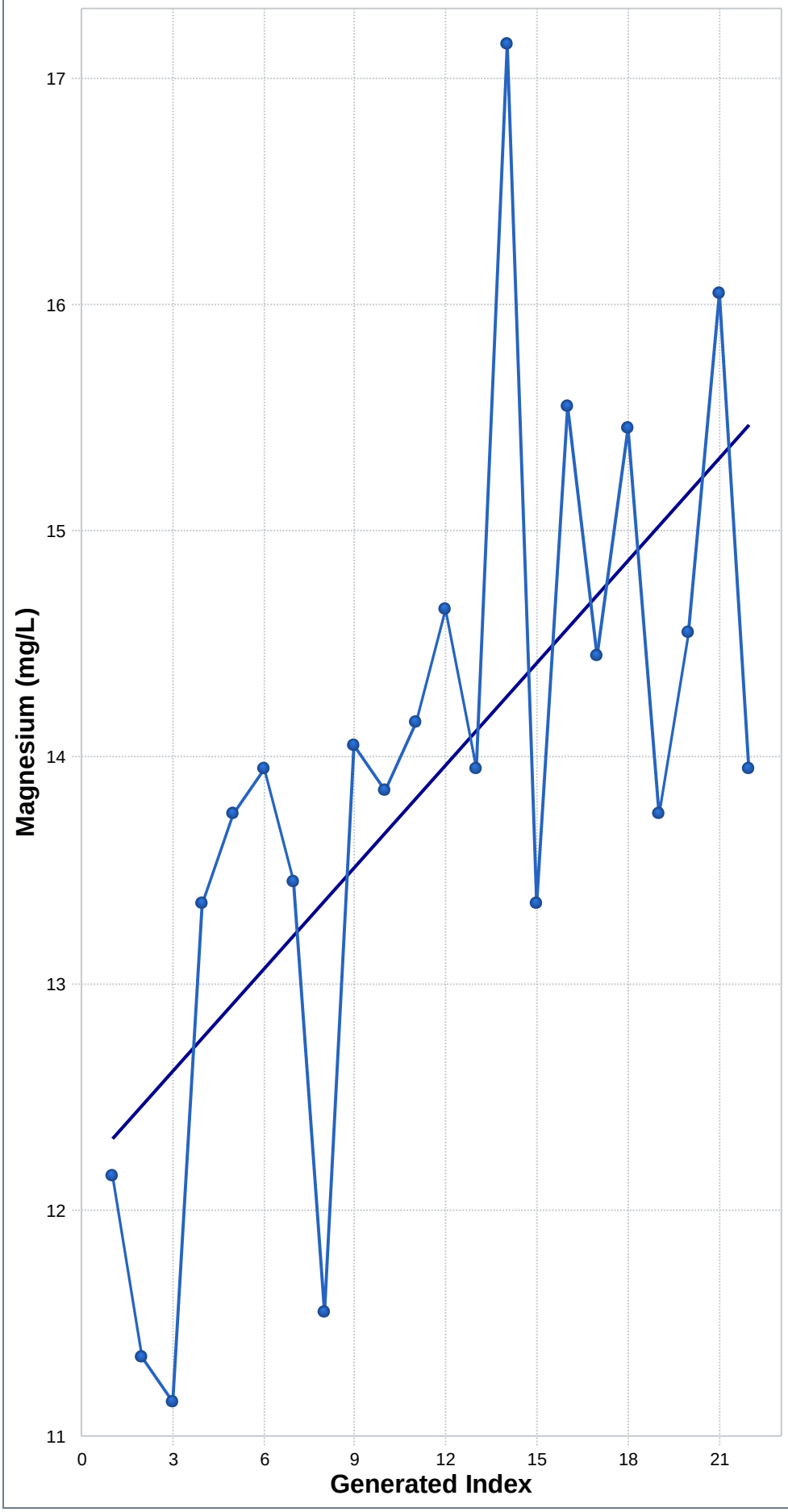
| | |
|---|---|
| n | 22 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 35.4119 |
| Standardized Value of S | 0.1977 |
| M-K Test Value (S) | 8 |
| Tabulated p-value | 0.4120 |
| Approximate p-value | 0.4217 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0238 |
| OLS Regression Intercept | 2.4126 |

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

# Mann-Kendall 89-3 - MAGNESIUM




**Mann-Kendall Trend Analysis**

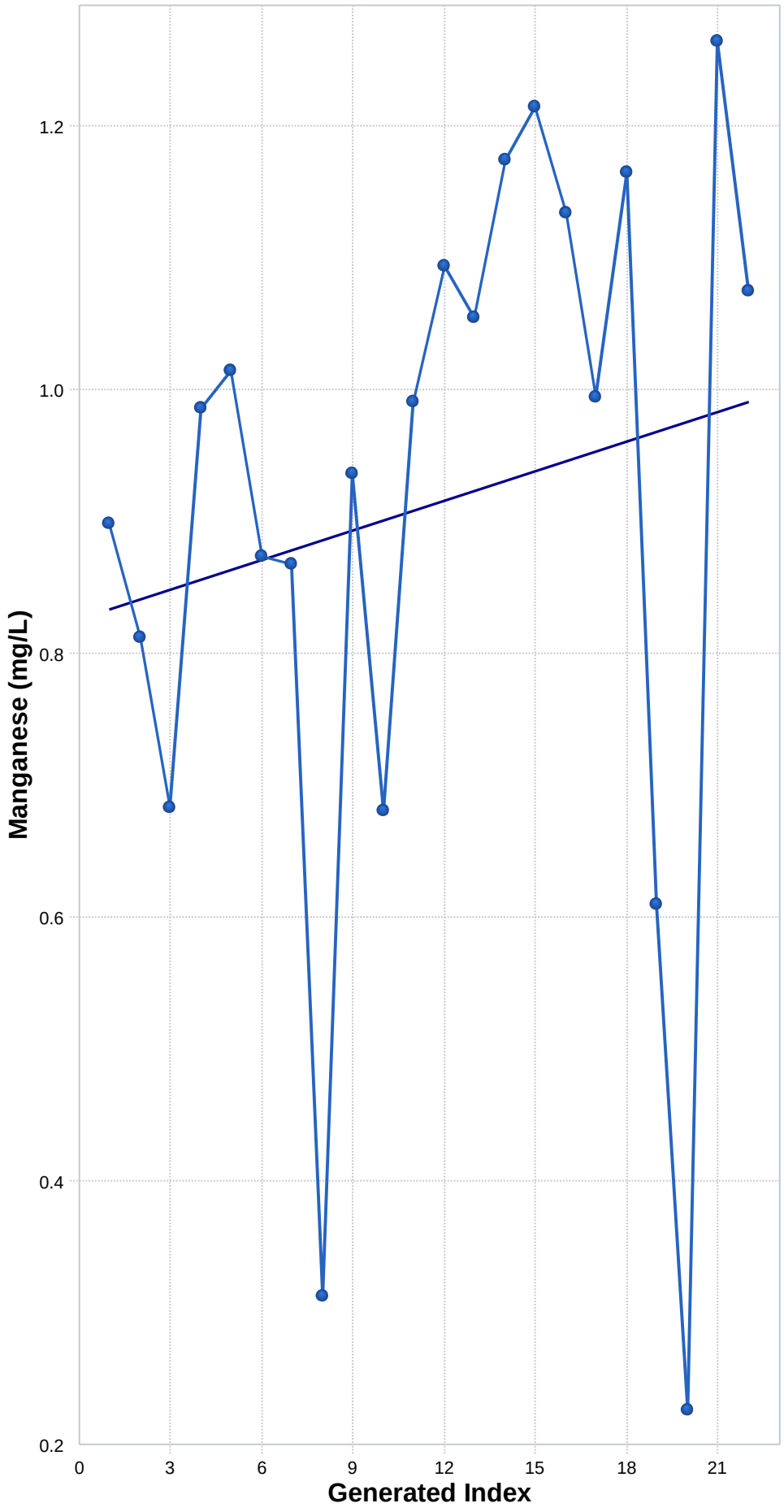
| | |
|---|---|
| n | 22 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 35.3836 |
| Standardized Value of S | 3.3066 |
| M-K Test Value (S) | 118 |
| Tabulated p-value | 0.0000 |
| Approximate p-value | 0.0005 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.1504 |
| OLS Regression Intercept | 11.9117 |

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

# Mann-Kendall 89-3 - MANGANESE




**Mann-Kendall Trend Analysis**

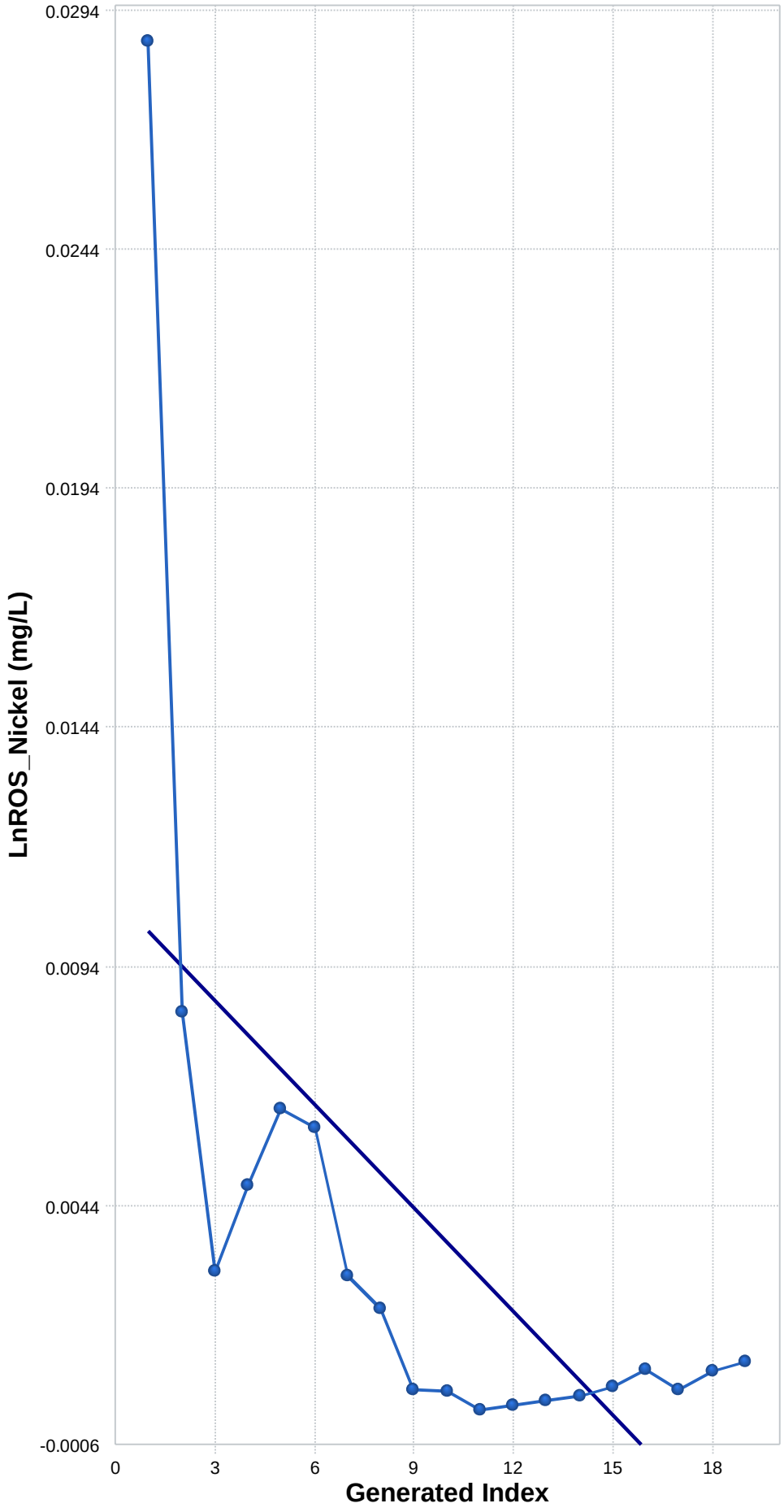
| | |
|---|---|
| n | 22 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 35.4636 |
| Standardized Value of S | 1.9175 |
| M-K Test Value (S) | 69 |
| Tabulated p-value | 0.0270 |
| Approximate p-value | 0.0276 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0075 |
| OLS Regression Intercept | 0.8313 |

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

# Mann-Kendall 89-3 - NICKEL



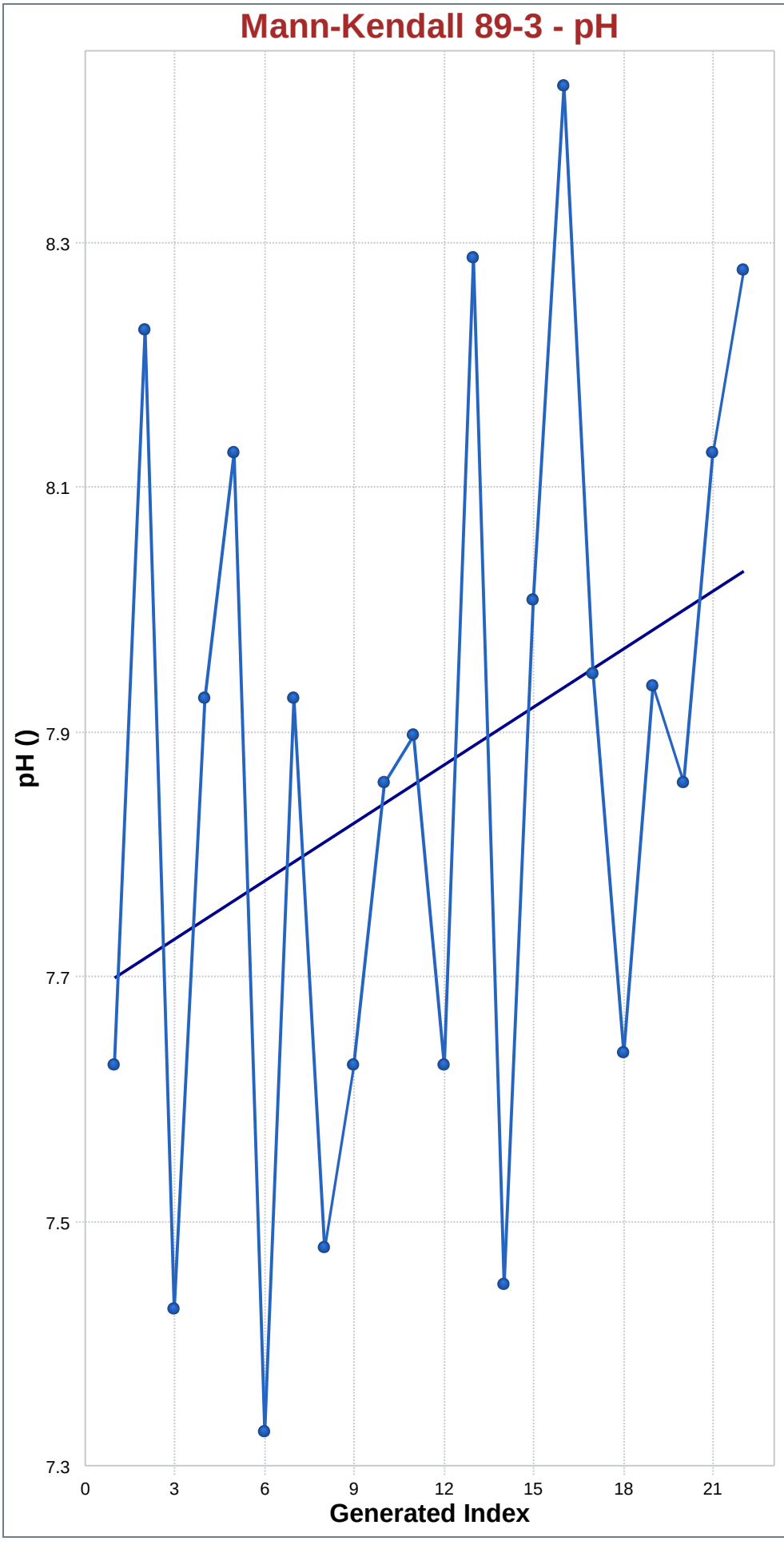

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 19 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 28.5832 |
| Standardized Value of S | -2.6589 |
| M-K Test Value (S) | -77 |
| Tabulated p-value | 0.0030 |
| Approximate p-value | 0.0039 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0007 |
| OLS Regression Intercept | 0.0108 |

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




**Mann-Kendall Trend Analysis**

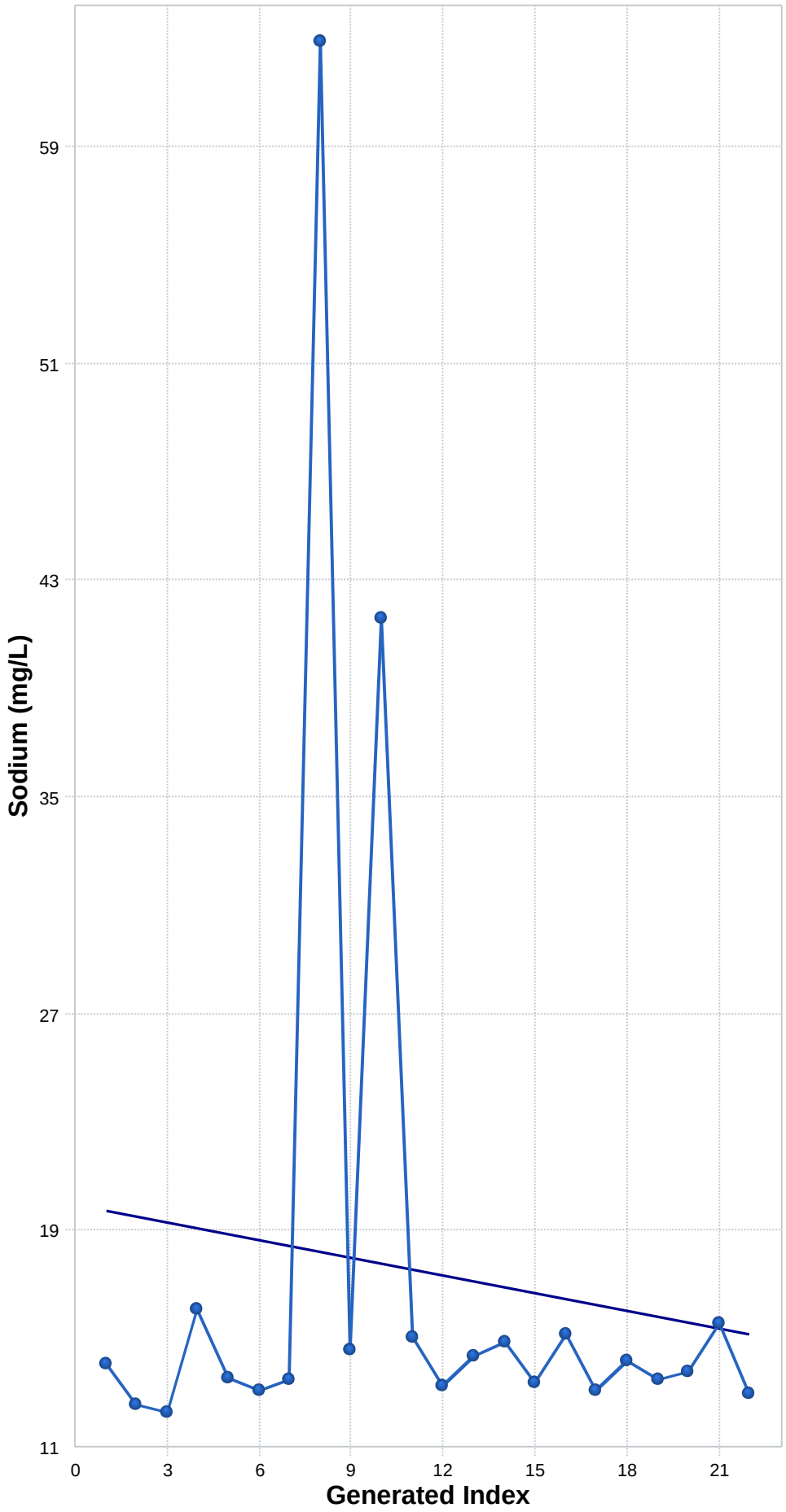
| | |
|---|---|
| n | 22 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 35.3695 |
| Standardized Value of S | 1.5833 |
| M-K Test Value (S) | 57 |
| Tabulated p-value | 0.0580 |
| Approximate p-value | 0.0567 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0158 |
| OLS Regression Intercept | 7.6560 |

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

# Mann-Kendall 89-3 - SODIUM



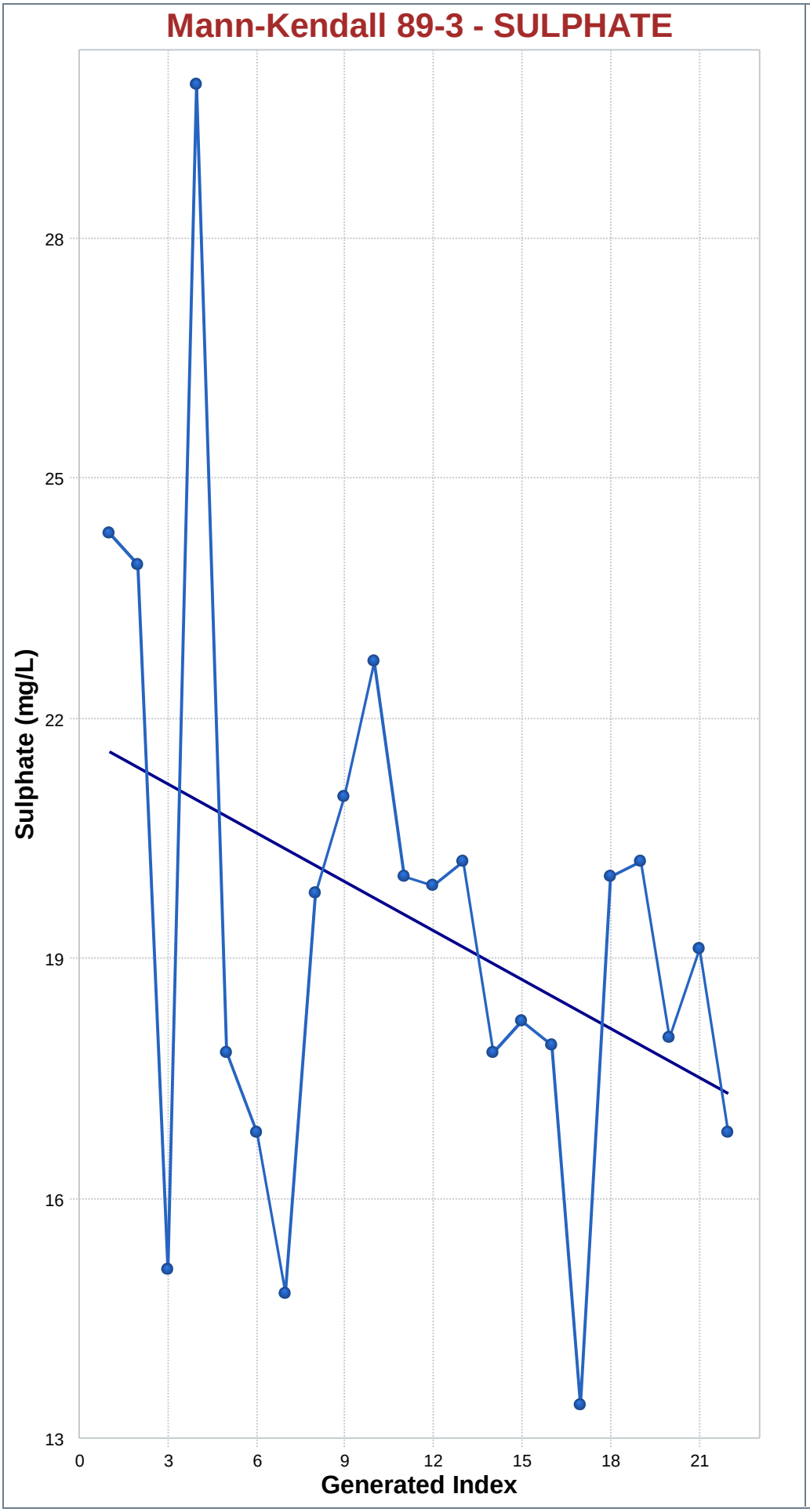

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 22 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 35.4354 |
| Standardized Value of S | 0.1693 |
| M-K Test Value (S) | 7 |
| Tabulated p-value | 0.4340 |
| Approximate p-value | 0.4328 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.2173 |
| OLS Regression Intercept | 19.4494 |

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



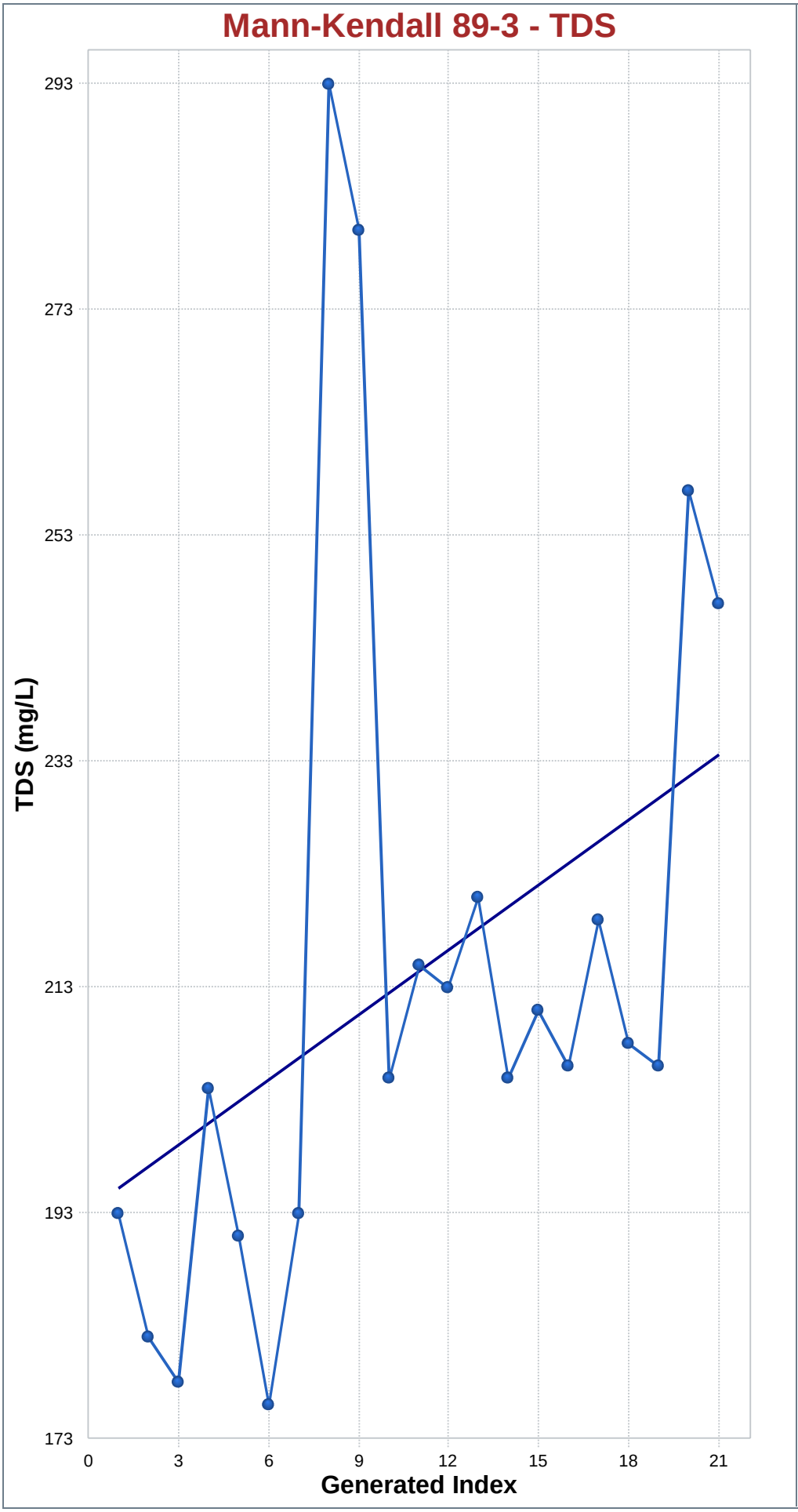

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 22 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 35.4072 |
| Standardized Value of S | -1.2427 |
| M-K Test Value (S) | -45 |
| Tabulated p-value | 0.1090 |
| Approximate p-value | 0.1070 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.2036 |
| OLS Regression Intercept | 21.9779 |

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



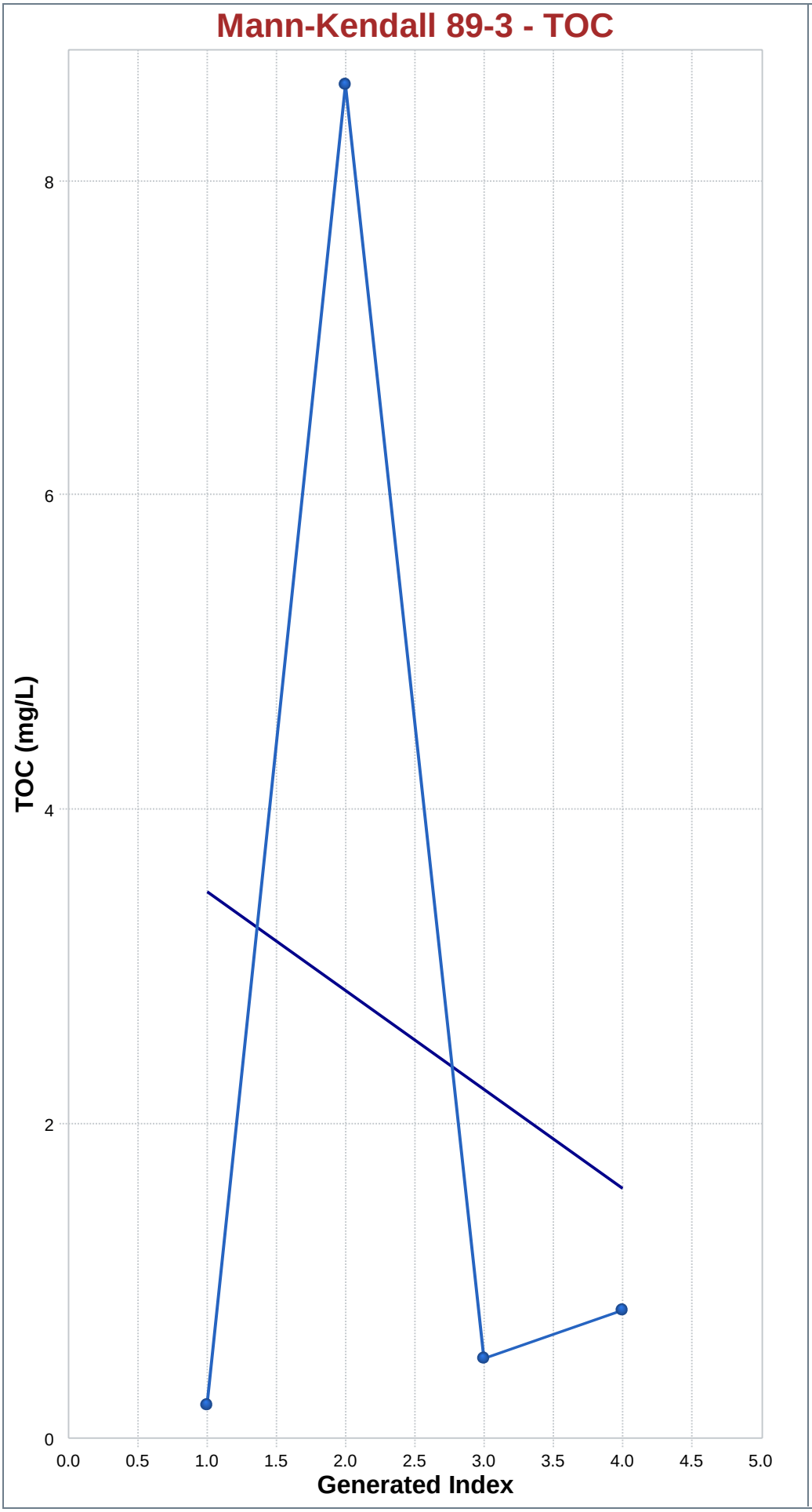

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 21 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 33.0706 |
| Standardized Value of S | 2.6005 |
| M-K Test Value (S) | 87 |
| Tabulated p-value | 0.0050 |
| Approximate p-value | 0.0047 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.9260 |
| OLS Regression Intercept | 193.2429 |

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



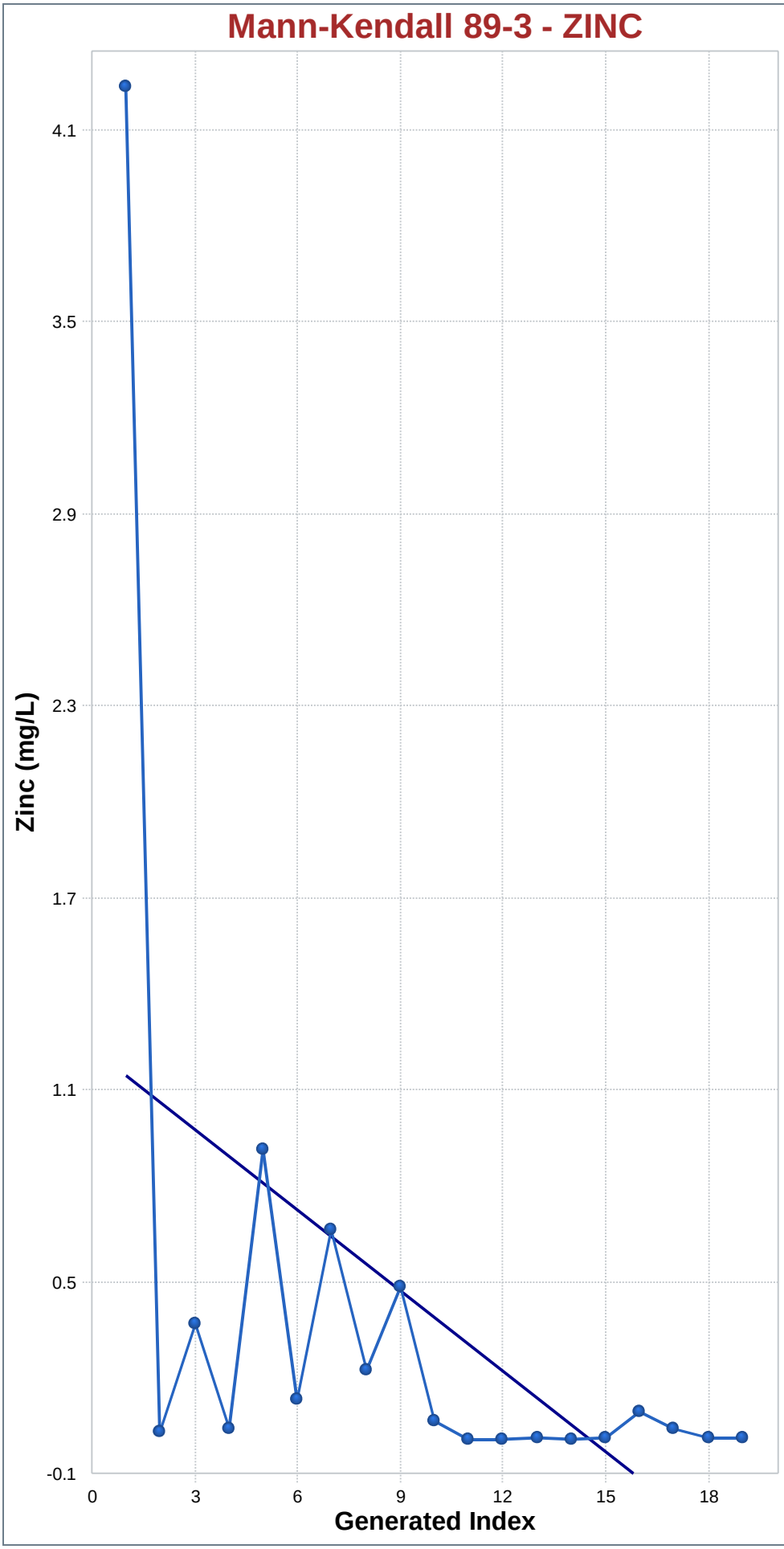

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 4 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 2.9439 |
| Standardized Value of S | 0.3397 |
| M-K Test Value (S) | 2 |
| Tabulated p-value | 0.3750 |
| Approximate p-value | 0.3670 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.6300 |
| OLS Regression Intercept | 4.5000 |

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 | -2.5889 |
| M-K Test Value (S) | -75 |
| Tabulated p-value | 0.0040 |
| Approximate p-value | 0.0048 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0842 |
| OLS Regression Intercept | 1.2238 |

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

| | | |
|---|---|---|
| | Goodness-of-Fit Test Statistics for Uncensored Full Data Sets without Non-Detects | |
| User Selected Options | | |
| Date/Time of Computation | ProUCL 5.2 2023-12-13 1:35:09 PM | |
| From File | 2023-SandstoneProUCL_f.xls | |
| Full Precision | OFF | |
| Confidence Coefficient | 0.95 | |
| | | |
| MW-15-2R-SS | | |
| Chloride (mg/L) | | |
| | | |
| Raw Statistics | | |
| Number of Valid Observations | 19 | |
| Number of Distinct Observations | 18 | |
| Minimum | 0.5 | |
| Maximum | 30.1 | |
| Mean of Raw Data | 4.947 | |
| Standard Deviation of Raw Data | 7.14 | |
| Khat | 0.892 | |
| Theta hat | 5.543 | |
| Kstar | 0.787 | |
| Theta star | 6.289 | |
| Mean of Log Transformed Data | 0.943 | |
| Standard Deviation of Log Transformed Data | 1.128 | |
| | | |
| Normal GOF Test Results | | |
| | | |
| Correlation Coefficient R | 0.777 | |
| Shapiro Wilk Test Statistic | 0.624 | |
| Shapiro Wilk Critical (0.05) Value | 0.901 | |
| Approximate Shapiro Wilk P Value | 1.3759E-6 | |
| Lilliefors Test Statistic | 0.307 | |
| Lilliefors Critical (0.05) Value | 0.197 | |
| Data not Normal at (0.05) Significance Level | | |
| | | |
| Gamma GOF Test Results | | |
| | | |
| Correlation Coefficient R | 0.956 | |
| A-D Test Statistic | 0.751 | |
| A-D Critical (0.05) Value | 0.773 | |
| K-S Test Statistic | 0.161 | |
| K-S Critical(0.05) Value | 0.205 | |
| Data appear Gamma Distributed at (0.05) Significance Level | | |
| | | |
| Lognormal GOF Test Results | | |
| | | |
| Correlation Coefficient R | 0.985 | |
| Shapiro Wilk Test Statistic | 0.965 | |
| Shapiro Wilk Critical (0.05) Value | 0.901 | |
| Approximate Shapiro Wilk P Value | 0.684 | |
| Lilliefors Test Statistic | 0.0973 | |
| Lilliefors Critical (0.05) Value | 0.197 | |
| Data appear Lognormal at (0.05) Significance Level | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54 | DOC (mg/L) | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 56 | | | | Raw Statistics | | | | | | | | |
| 57 | | | | Number of Valid Observations | | 16 | | | | | | |
| 58 | | | | Number of Distinct Observations | | 16 | | | | | | |
| 59 | | | | Minimum | | 2 | | | | | | |
| 60 | | | | Maximum | | 58.3 | | | | | | |
| 61 | | | | Mean of Raw Data | | 12.07 | | | | | | |
| 62 | | | | Standard Deviation of Raw Data | | 15.59 | | | | | | |
| 63 | | | | Khat | | 0.927 | | | | | | |
| 64 | | | | Theta hat | | 13.02 | | | | | | |
| 65 | | | | Kstar | | 0.795 | | | | | | |
| 66 | | | | Theta star | | 15.19 | | | | | | |
| 67 | | | | Mean of Log Transformed Data | | 1.863 | | | | | | |
| 68 | | | | Standard Deviation of Log Transformed Data | | 1.1 | | | | | | |
| 69 | | | | | | | | | | | | |
| 70 | | | | Normal GOF Test Results | | | | | | | | |
| 71 | | | | | | | | | | | | |
| 72 | | | | Correlation Coefficient R | | 0.827 | | | | | | |
| 73 | | | | Shapiro Wilk Test Statistic | | 0.694 | | | | | | |
| 74 | | | | Shapiro Wilk Critical (0.05) Value | | 0.887 | | | | | | |
| 75 | | | | Approximate Shapiro Wilk P Value | | 7.4404E-5 | | | | | | |
| 76 | | | | Lilliefors Test Statistic | | 0.302 | | | | | | |
| 77 | | | | Lilliefors Critical (0.05) Value | | 0.213 | | | | | | |
| 78 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 79 | | | | | | | | | | | | |
| 80 | | | | Gamma GOF Test Results | | | | | | | | |
| 81 | | | | | | | | | | | | |
| 82 | | | | Correlation Coefficient R | | 0.979 | | | | | | |
| 83 | | | | A-D Test Statistic | | 1.22 | | | | | | |
| 84 | | | | A-D Critical (0.05) Value | | 0.767 | | | | | | |
| 85 | | | | K-S Test Statistic | | 0.276 | | | | | | |
| 86 | | | | K-S Critical(0.05) Value | | 0.222 | | | | | | |
| 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 | | 0.87 | | | | | | |
| 93 | | | | Shapiro Wilk Critical (0.05) Value | | 0.887 | | | | | | |
| 94 | | | | Approximate Shapiro Wilk P Value | | 0.0329 | | | | | | |
| 95 | | | | Lilliefors Test Statistic | | 0.23 | | | | | | |
| 96 | | | | Lilliefors Critical (0.05) Value | | 0.213 | | | | | | |
| 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 Significance | | | | | | | | | | | |
| 102 | | | | | | | | | | | | |
| 103 | Arsenic (mg/L) | | | | | | | | | | | |
| 104 | | | | | | | | | | | | |
| 105 | | | | Raw Statistics | | | | | | | | |
| 106 | | | | Number of Valid Observations | | 21 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 107 | | | | | Number of Distinct Observations | 21 | | | | | | |
| 108 | | | | | Minimum | 2.0000E-4 | | | | | | |
| 109 | | | | | Maximum | 0.0765 | | | | | | |
| 110 | | | | | Mean of Raw Data | 0.0175 | | | | | | |
| 111 | | | | | Standard Deviation of Raw Data | 0.0226 | | | | | | |
| 112 | | | | | Khat | 0.821 | | | | | | |
| 113 | | | | | Theta hat | 0.0214 | | | | | | |
| 114 | | | | | Kstar | 0.735 | | | | | | |
| 115 | | | | | Theta star | 0.0239 | | | | | | |
| 116 | | | | | Mean of Log Transformed Data | -4.764 | | | | | | |
| 117 | | | | | Standard Deviation of Log Transformed Data | 1.333 | | | | | | |
| 118 | | | | | | | | | | | | |
| 119 | | | | | Normal GOF Test Results | | | | | | | |
| 120 | | | | | | | | | | | | |
| 121 | | | | | Correlation Coefficient R | 0.832 | | | | | | |
| 122 | | | | | Shapiro Wilk Test Statistic | 0.692 | | | | | | |
| 123 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 124 | | | | | Approximate Shapiro Wilk P Value | 7.3822E-6 | | | | | | |
| 125 | | | | | Lilliefors Test Statistic | 0.306 | | | | | | |
| 126 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 127 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 128 | | | | | | | | | | | | |
| 129 | | | | | Gamma GOF Test Results | | | | | | | |
| 130 | | | | | | | | | | | | |
| 131 | | | | | Correlation Coefficient R | 0.968 | | | | | | |
| 132 | | | | | A-D Test Statistic | 1.012 | | | | | | |
| 133 | | | | | A-D Critical (0.05) Value | 0.779 | | | | | | |
| 134 | | | | | K-S Test Statistic | 0.214 | | | | | | |
| 135 | | | | | K-S Critical(0.05) Value | 0.196 | | | | | | |
| 136 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 137 | | | | | | | | | | | | |
| 138 | | | | | Lognormal GOF Test Results | | | | | | | |
| 139 | | | | | | | | | | | | |
| 140 | | | | | Correlation Coefficient R | 0.948 | | | | | | |
| 141 | | | | | Shapiro Wilk Test Statistic | 0.909 | | | | | | |
| 142 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 143 | | | | | Approximate Shapiro Wilk P Value | 0.0507 | | | | | | |
| 144 | | | | | Lilliefors Test Statistic | 0.163 | | | | | | |
| 145 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 146 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 147 | | | | | | | | | | | | |
| 148 | Cadmium (mg/L) | | | | | | | | | | | |
| 149 | | | | | | | | | | | | |
| 150 | | | | | Raw Statistics | | | | | | | |
| 151 | | | | | Number of Valid Observations | 21 | | | | | | |
| 152 | | | | | Number of Distinct Observations | 17 | | | | | | |
| 153 | | | | | Minimum | 5.0000E-6 | | | | | | |
| 154 | | | | | Maximum | 0.003 | | | | | | |
| 155 | | | | | Mean of Raw Data | 2.2510E-4 | | | | | | |
| 156 | | | | | Standard Deviation of Raw Data | 6.4835E-4 | | | | | | |
| 157 | | | | | Khat | 0.378 | | | | | | |
| 158 | | | | | Theta hat | 5.9496E-4 | | | | | | |
| 159 | | | | | Kstar | 0.356 | | | | | | |

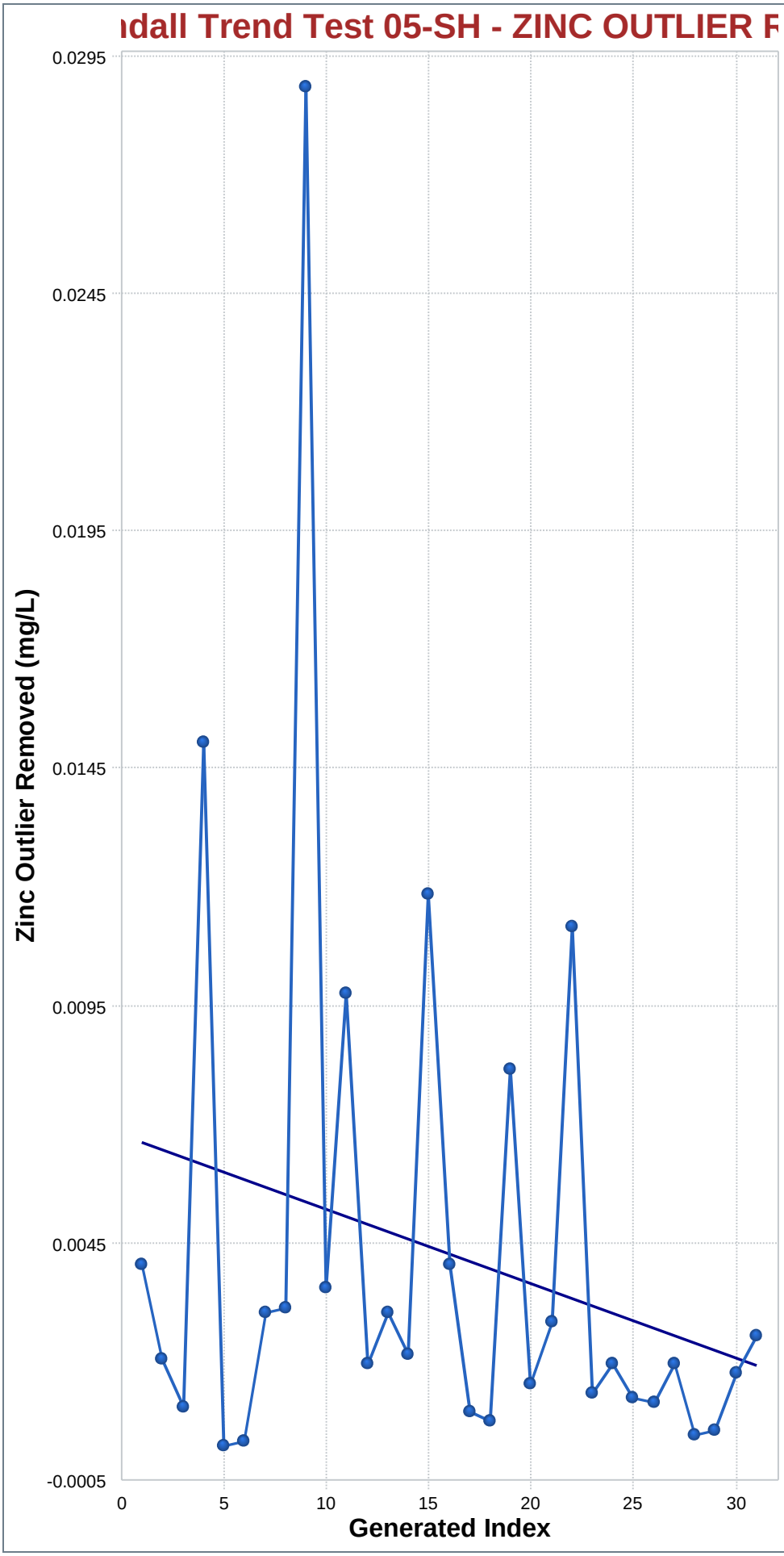
| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | | | | | Theta star | 6.3223E-4 | | | | | | |
| 161 | | | | | Mean of Log Transformed Data | -10.15 | | | | | | |
| 162 | | | | | Standard Deviation of Log Transformed Data | 1.734 | | | | | | |
| 163 | | | | | | | | | | | | |
| 164 | | | | | Normal GOF Test Results | | | | | | | |
| 165 | | | | | | | | | | | | |
| 166 | | | | | Correlation Coefficient R | 0.576 | | | | | | |
| 167 | | | | | Shapiro Wilk Test Statistic | 0.358 | | | | | | |
| 168 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 169 | | | | | Approximate Shapiro Wilk P Value | 5.901E-10 | | | | | | |
| 170 | | | | | Lilliefors Test Statistic | 0.367 | | | | | | |
| 171 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 172 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 173 | | | | | | | | | | | | |
| 174 | | | | | Gamma GOF Test Results | | | | | | | |
| 175 | | | | | | | | | | | | |
| 176 | | | | | Correlation Coefficient R | 0.876 | | | | | | |
| 177 | | | | | A-D Test Statistic | 1.849 | | | | | | |
| 178 | | | | | A-D Critical (0.05) Value | 0.83 | | | | | | |
| 179 | | | | | K-S Test Statistic | 0.236 | | | | | | |
| 180 | | | | | K-S Critical(0.05) Value | 0.203 | | | | | | |
| 181 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 182 | | | | | | | | | | | | |
| 183 | | | | | Lognormal GOF Test Results | | | | | | | |
| 184 | | | | | | | | | | | | |
| 185 | | | | | Correlation Coefficient R | 0.962 | | | | | | |
| 186 | | | | | Shapiro Wilk Test Statistic | 0.922 | | | | | | |
| 187 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 188 | | | | | Approximate Shapiro Wilk P Value | 0.0922 | | | | | | |
| 189 | | | | | Lilliefors Test Statistic | 0.142 | | | | | | |
| 190 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 191 | Data appear Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 192 | | | | | | | | | | | | |
| 193 | Copper (mg/L) | | | | | | | | | | | |
| 194 | | | | | | | | | | | | |
| 195 | | | | | Raw Statistics | | | | | | | |
| 196 | | | | | Number of Valid Observations | 21 | | | | | | |
| 197 | | | | | Number of Distinct Observations | 17 | | | | | | |
| 198 | | | | | Minimum | 1.3000E-4 | | | | | | |
| 199 | | | | | Maximum | 0.454 | | | | | | |
| 200 | | | | | Mean of Raw Data | 0.0364 | | | | | | |
| 201 | | | | | Standard Deviation of Raw Data | 0.103 | | | | | | |
| 202 | | | | | Khat | 0.25 | | | | | | |
| 203 | | | | | Theta hat | 0.146 | | | | | | |
| 204 | | | | | Kstar | 0.246 | | | | | | |
| 205 | | | | | Theta star | 0.148 | | | | | | |
| 206 | | | | | Mean of Log Transformed Data | -6.155 | | | | | | |
| 207 | | | | | Standard Deviation of Log Transformed Data | 2.349 | | | | | | |
| 208 | | | | | | | | | | | | |
| 209 | | | | | Normal GOF Test Results | | | | | | | |
| 210 | | | | | | | | | | | | |
| 211 | | | | | Correlation Coefficient R | 0.616 | | | | | | |
| 212 | | | | | Shapiro Wilk Test Statistic | 0.402 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 213 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 214 | | | | | Approximate Shapiro Wilk P Value | 1.7249E-9 | | | | | | |
| 215 | | | | | Lilliefors Test Statistic | 0.43 | | | | | | |
| 216 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 217 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 218 | | | | | | | | | | | | |
| 219 | | | | Gamma GOF Test Results | | | | | | | | |
| 220 | | | | | | | | | | | | |
| 221 | | | | | Correlation Coefficient R | 0.949 | | | | | | |
| 222 | | | | | A-D Test Statistic | 2.329 | | | | | | |
| 223 | | | | | A-D Critical (0.05) Value | 0.871 | | | | | | |
| 224 | | | | | K-S Test Statistic | 0.29 | | | | | | |
| 225 | | | | | K-S Critical(0.05) Value | 0.208 | | | | | | |
| 226 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 227 | | | | | | | | | | | | |
| 228 | | | | Lognormal GOF Test Results | | | | | | | | |
| 229 | | | | | | | | | | | | |
| 230 | | | | | Correlation Coefficient R | 0.953 | | | | | | |
| 231 | | | | | Shapiro Wilk Test Statistic | 0.901 | | | | | | |
| 232 | | | | | Shapiro Wilk Critical (0.05) Value | 0.908 | | | | | | |
| 233 | | | | | Approximate Shapiro Wilk P Value | 0.0343 | | | | | | |
| 234 | | | | | Lilliefors Test Statistic | 0.121 | | | | | | |
| 235 | | | | | Lilliefors Critical (0.05) Value | 0.188 | | | | | | |
| 236 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 237 | | | | | | | | | | | | |
| 238 | Iron (mg/L) | | | | | | | | | | | |
| 239 | | | | | | | | | | | | |
| 240 | | | | Raw Statistics | | | | | | | | |
| 241 | | | | | Number of Valid Observations | 20 | | | | | | |
| 242 | | | | | Number of Distinct Observations | 12 | | | | | | |
| 243 | | | | | Minimum | 0.01 | | | | | | |
| 244 | | | | | Maximum | 19.5 | | | | | | |
| 245 | | | | | Mean of Raw Data | 1.356 | | | | | | |
| 246 | | | | | Standard Deviation of Raw Data | 4.373 | | | | | | |
| 247 | | | | | Khat | 0.257 | | | | | | |
| 248 | | | | | Theta hat | 5.275 | | | | | | |
| 249 | | | | | Kstar | 0.252 | | | | | | |
| 250 | | | | | Theta star | 5.384 | | | | | | |
| 251 | | | | | Mean of Log Transformed Data | -2.446 | | | | | | |
| 252 | | | | | Standard Deviation of Log Transformed Data | 2.183 | | | | | | |
| 253 | | | | | | | | | | | | |
| 254 | | | | Normal GOF Test Results | | | | | | | | |
| 255 | | | | | | | | | | | | |
| 256 | | | | | Correlation Coefficient R | 0.563 | | | | | | |
| 257 | | | | | Shapiro Wilk Test Statistic | 0.346 | | | | | | |
| 258 | | | | | Shapiro Wilk Critical (0.05) Value | 0.905 | | | | | | |
| 259 | | | | | Approximate Shapiro Wilk P Value | 2.611E-10 | | | | | | |
| 260 | | | | | Lilliefors Test Statistic | 0.418 | | | | | | |
| 261 | | | | | Lilliefors Critical (0.05) Value | 0.192 | | | | | | |
| 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 | 0.913 | | | | | | |
| 267 | | | | | A-D Test Statistic | 2.541 | | | | | | |
| 268 | | | | | A-D Critical (0.05) Value | 0.865 | | | | | | |
| 269 | | | | | K-S Test Statistic | 0.313 | | | | | | |
| 270 | | | | | K-S Critical(0.05) Value | 0.212 | | | | | | |
| 271 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 272 | | | | | | | | | | | | |
| 273 | | | | Lognormal GOF Test Results | | | | | | | | |
| 274 | | | | | | | | | | | | |
| 275 | | | | | Correlation Coefficient R | 0.932 | | | | | | |
| 276 | | | | | Shapiro Wilk Test Statistic | 0.864 | | | | | | |
| 277 | | | | | Shapiro Wilk Critical (0.05) Value | 0.905 | | | | | | |
| 278 | | | | | Approximate Shapiro Wilk P Value | 0.00865 | | | | | | |
| 279 | | | | | Lilliefors Test Statistic | 0.217 | | | | | | |
| 280 | | | | | Lilliefors Critical (0.05) Value | 0.192 | | | | | | |
| 281 | Data not Lognormal at (0.05) Significance Level | | | | | | | | | | | |
| 282 | | | | | | | | | | | | |
| 283 | Non-parametric GOF Test Results | | | | | | | | | | | |
| 284 | | | | | | | | | | | | |
| 285 | Data do not follow a discernible distribution at (0.05) Level of Significance | | | | | | | | | | | |
| 286 | | | | | | | | | | | | |
| 287 | Zinc (mg/L) | | | | | | | | | | | |
| 288 | | | | | | | | | | | | |
| 289 | | | | Raw Statistics | | | | | | | | |
| 290 | | | | | Number of Valid Observations | 20 | | | | | | |
| 291 | | | | | Number of Distinct Observations | 17 | | | | | | |
| 292 | | | | | Minimum | 0.001 | | | | | | |
| 293 | | | | | Maximum | 1.85 | | | | | | |
| 294 | | | | | Mean of Raw Data | 0.113 | | | | | | |
| 295 | | | | | Standard Deviation of Raw Data | 0.41 | | | | | | |
| 296 | | | | | Khat | 0.275 | | | | | | |
| 297 | | | | | Theta hat | 0.41 | | | | | | |
| 298 | | | | | Kstar | 0.267 | | | | | | |
| 299 | | | | | Theta star | 0.422 | | | | | | |
| 300 | | | | | Mean of Log Transformed Data | -4.724 | | | | | | |
| 301 | | | | | Standard Deviation of Log Transformed Data | 2 | | | | | | |
| 302 | | | | | | | | | | | | |
| 303 | | | | Normal GOF Test Results | | | | | | | | |
| 304 | | | | | | | | | | | | |
| 305 | | | | | Correlation Coefficient R | 0.509 | | | | | | |
| 306 | | | | | Shapiro Wilk Test Statistic | 0.288 | | | | | | |
| 307 | | | | | Shapiro Wilk Critical (0.05) Value | 0.905 | | | | | | |
| 308 | | | | | Approximate Shapiro Wilk P Value | 6.145E-11 | | | | | | |
| 309 | | | | | Lilliefors Test Statistic | 0.461 | | | | | | |
| 310 | | | | | Lilliefors Critical (0.05) Value | 0.192 | | | | | | |
| 311 | Data not Normal at (0.05) Significance Level | | | | | | | | | | | |
| 312 | | | | | | | | | | | | |
| 313 | | | | Gamma GOF Test Results | | | | | | | | |
| 314 | | | | | | | | | | | | |
| 315 | | | | | Correlation Coefficient R | 0.851 | | | | | | |
| 316 | | | | | A-D Test Statistic | 2.447 | | | | | | |
| 317 | | | | | A-D Critical (0.05) Value | 0.857 | | | | | | |
| 318 | | | | | K-S Test Statistic | 0.269 | | | | | | |

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 319 | | | | | K-S Critical(0.05) Value | 0.211 | | | | | | |
| 320 | Data not Gamma Distributed at (0.05) Significance Level | | | | | | | | | | | |
| 321 | | | | | | | | | | | | |
| 322 | | | | Lognormal GOF Test Results | | | | | | | | |
| 323 | | | | | | | | | | | | |
| 324 | | | | | Correlation Coefficient R | 0.952 | | | | | | |
| 325 | | | | | Shapiro Wilk Test Statistic | 0.904 | | | | | | |
| 326 | | | | | Shapiro Wilk Critical (0.05) Value | 0.905 | | | | | | |
| 327 | | | | | Approximate Shapiro Wilk P Value | 0.0533 | | | | | | |
| 328 | | | | | Lilliefors Test Statistic | 0.137 | | | | | | |
| 329 | | | | | Lilliefors Critical (0.05) Value | 0.192 | | | | | | |
| 330 | Data appear Approximate_Lognormal at (0.05) Significance Level | | | | | | | | | | | |

# App G7 Sen's Slope/Mann-Kendall Trend Analysis Output – Outliers Removed - Shallow




**Mann-Kendall Trend Analysis**

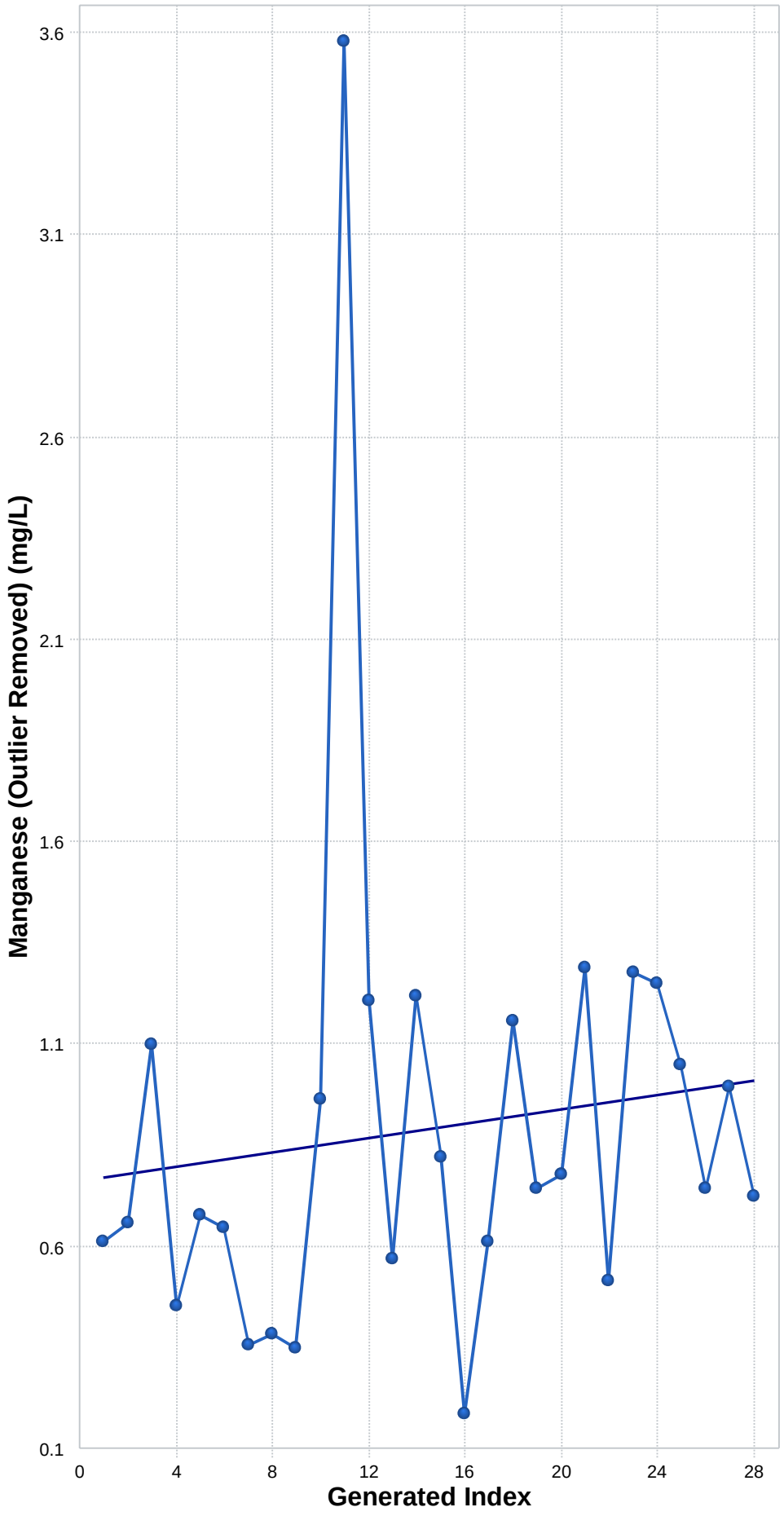
| | |
|---|---|
| n | 31 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 58.7878 |
| Standardized Value of S | -1.5479 |
| M-K Test Value (S) | -92 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0608 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -0.0002 |
| OLS Regression Intercept | 0.0067 |

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

# ll Trend Test 06-SH -MANGANESE OUTLIE



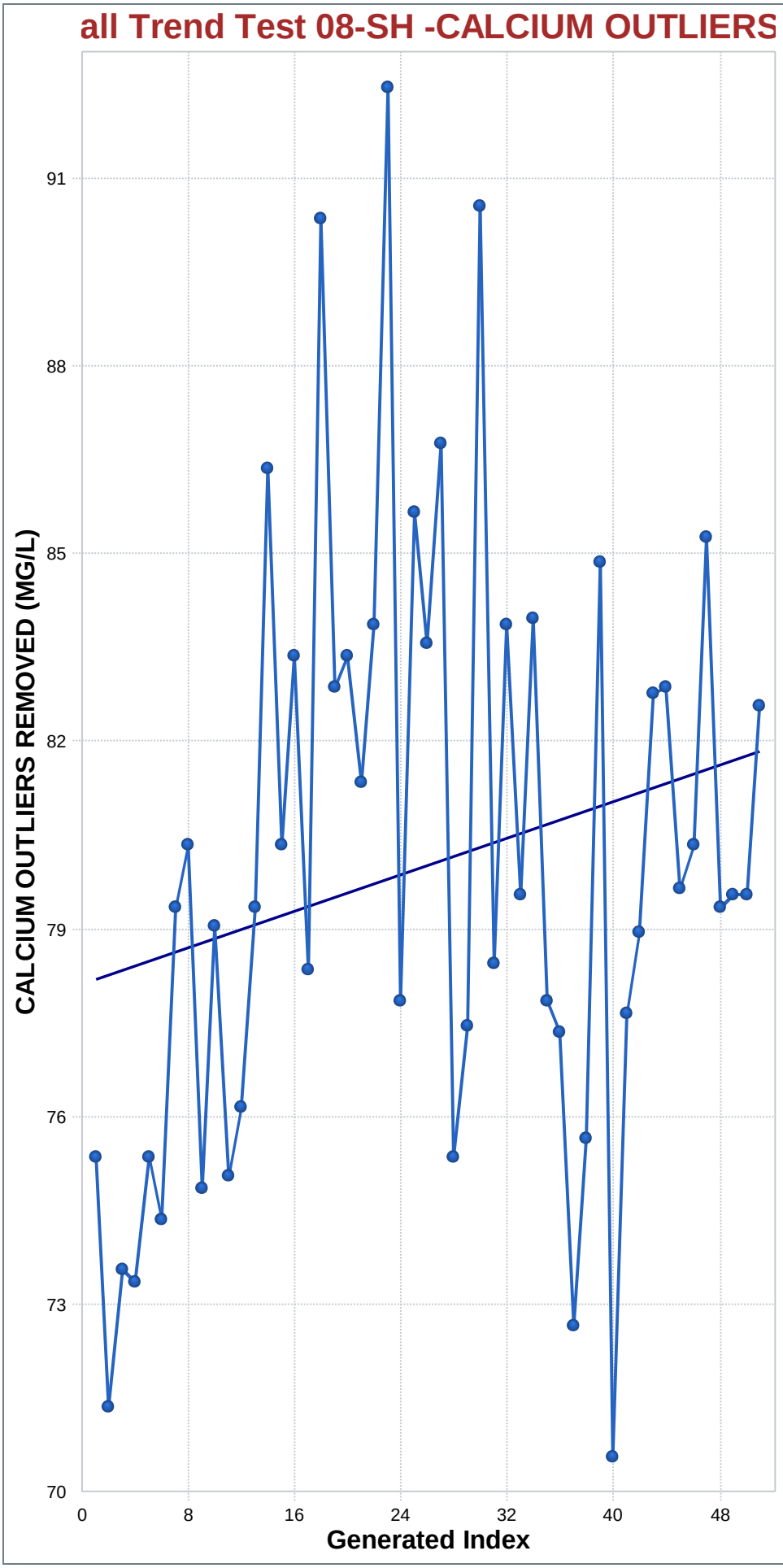

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 50.6063 |
| Standardized Value of S | 1.4623 |
| M-K Test Value (S) | 75 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0718 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 0.0090 |
| OLS Regression Intercept | 0.7307 |

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



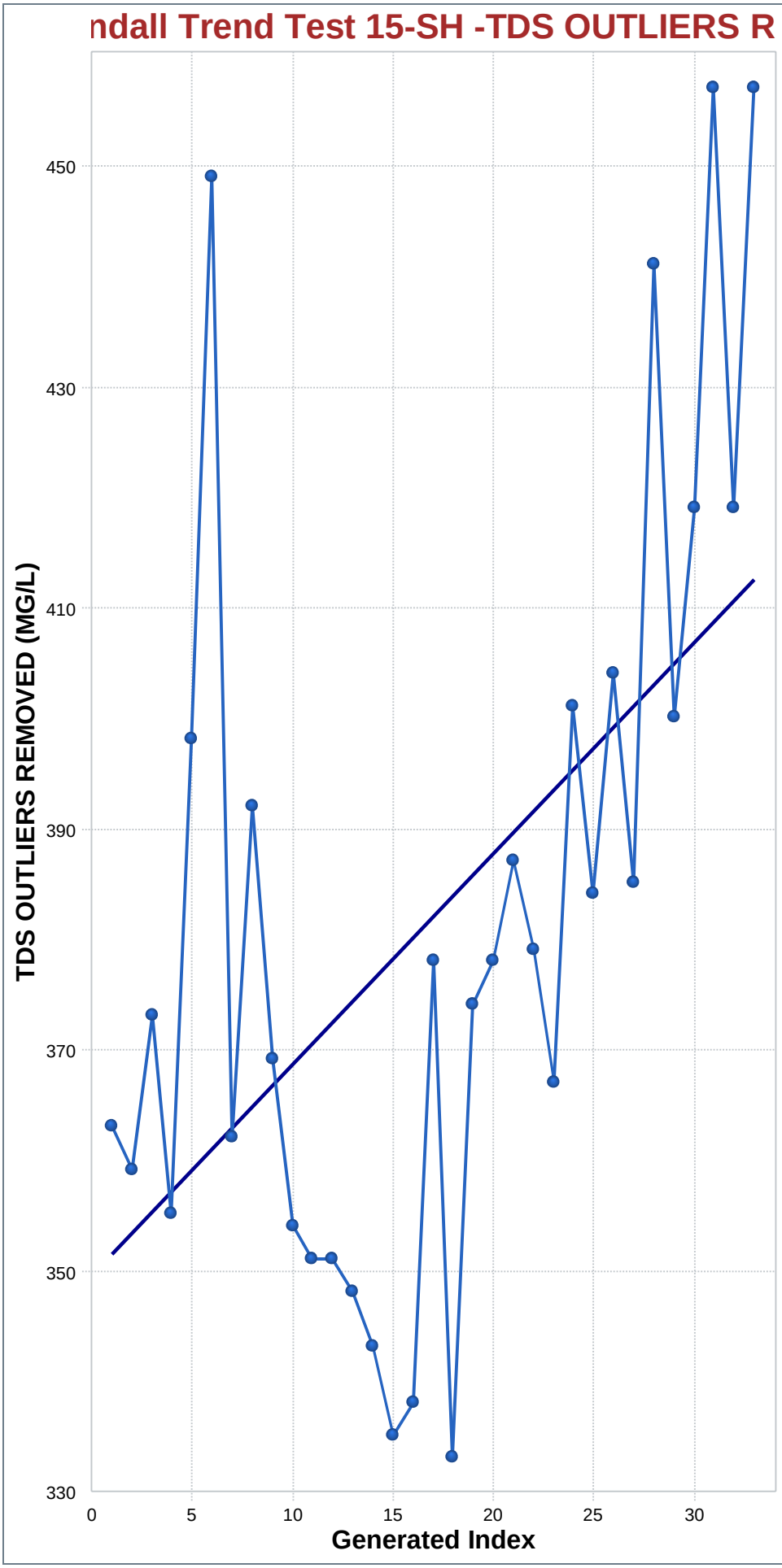

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 51 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 123.0434 |
| Standardized Value of S | 2.0806 |
| 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 | 0.0728 |
| OLS Regression Intercept | 77.7635 |

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



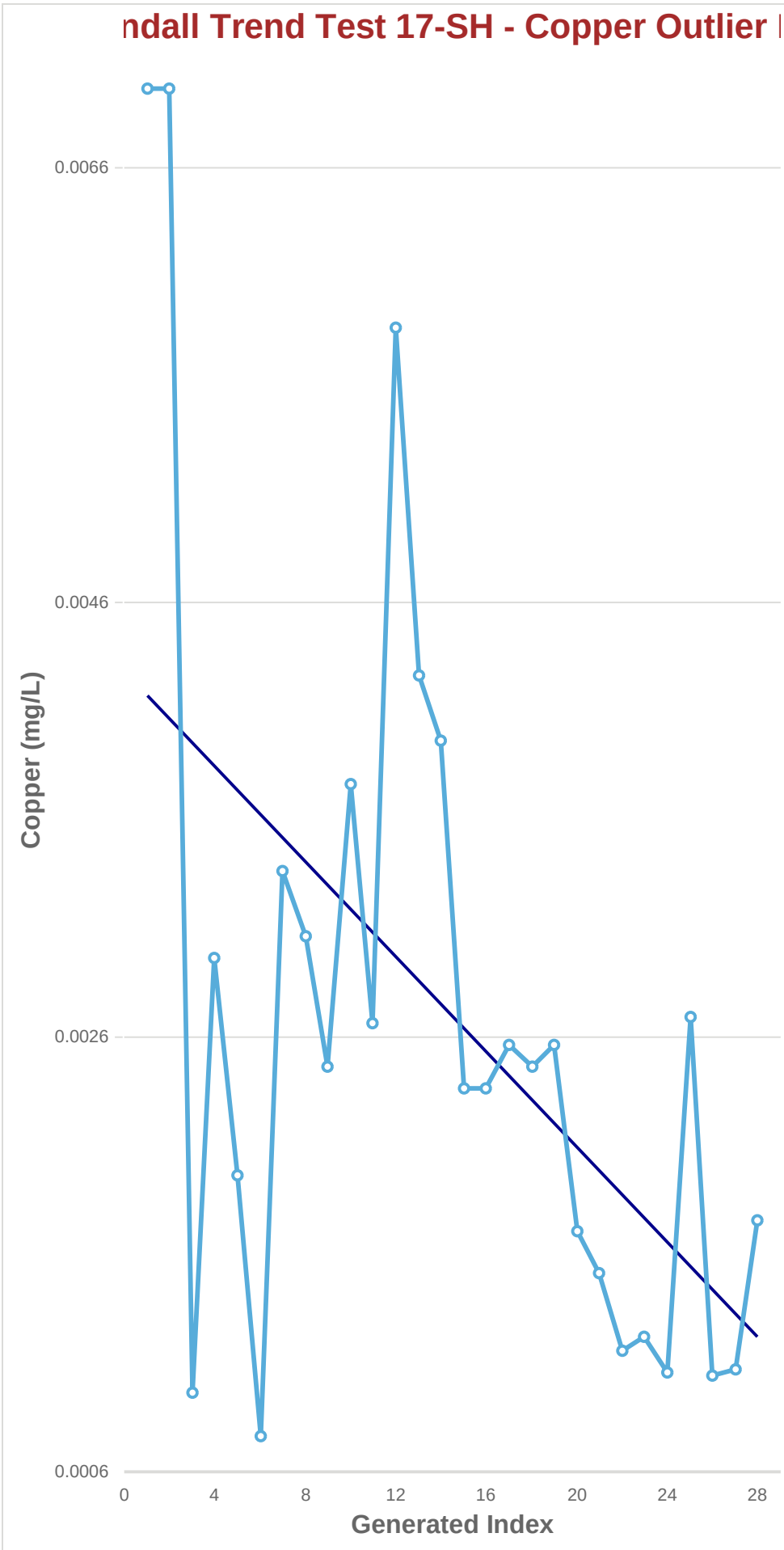

**Mann-Kendall Trend Analysis**

| | |
|---|---|
| n | 33 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 64.5084 |
| Standardized Value of S | 3.0539 |
| M-K Test Value (S) | 198 |
| Appx. Critical Value (0.05) | 1.6449 |
| Approximate p-value | 0.0011 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | 1.9068 |
| OLS Regression Intercept | 349.4943 |

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

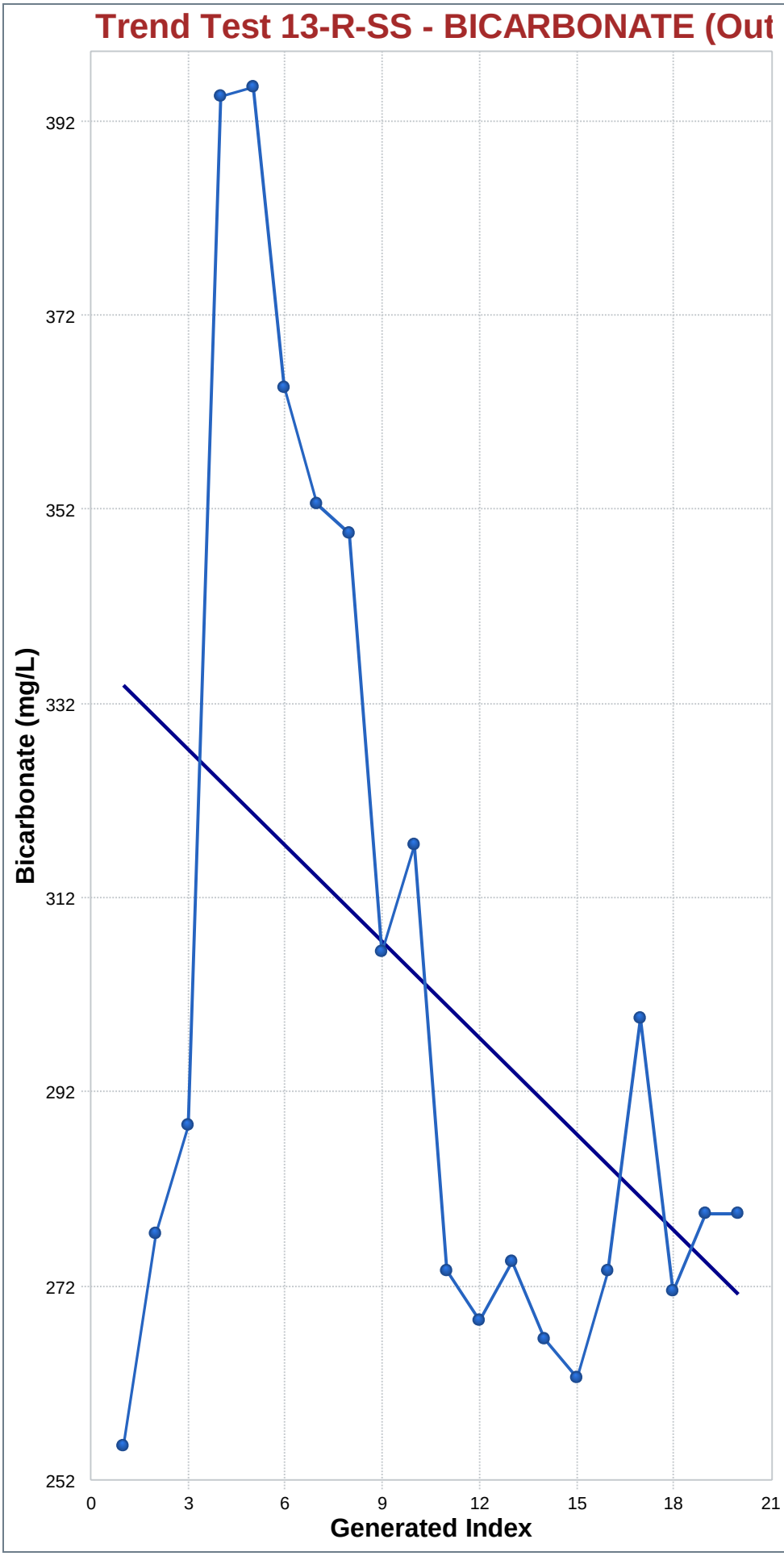



| Mann-Kendall Trend Analysis | |
|---|---|
| n | 28 |
| Confidence Coefficient | 0.9500 |
| Level of Significance | 0.0500 |
| Standard Deviation of S | 50.5767 |
| Standardized Value of S | -2.7878 |
| M-K Test Value (S) | -142 |
| Appx. Critical Value (0.05) | -1.6449 |
| Approximate p-value | 0.0027 |

| 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.

# App G8 Sen's Slope/Mann-Kendall Trend Analysis Output – Outliers Removed - Sandstone




**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 | -1.6564 |
| M-K Test Value (S) | -52 |
| Tabulated p-value | 0.0490 |
| Approximate p-value | 0.0488 |

**OLS Regression Line (Blue)**

| | |
|---|---|
| OLS Regression Slope | -3.3032 |
| OLS Regression Intercept | 337.7289 |

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

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