



2025 ANNUAL WATER QUALITY REPORT
AMSTED RAIL FOUNDRY WASTE LANDFILL
KEOKUK, IOWA
PERMIT #56-SDP-89-91C

by Haley & Aldrich, Inc.
Dayton, Ohio

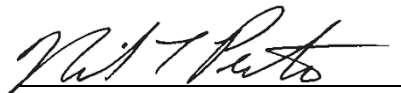
for Amsted Rail Company, Inc.
Keokuk, Iowa

File No. 129848-039
November 2025



CERTIFICATION PAGE

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.


Nick Leon Perrotta, P.E.

November 24, 2025
Date

License Number: 22717

My license renewal date is: 12/31/2026

Pages or sheets covered by this seal: Entire Document





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November 24, 2025

File No. 129848

Iowa Department of Natural Resources
502 East 9th Street
Des Moines, Iowa 50319-0034

Attention: Brad Davison
Land Quality Bureau

Subject: 2025 Annual Water Quality Report
Amsted Rail Foundry Waste Landfill
Keokuk, Iowa
Iowa Permit #56-SDP-15-89-91C

Dear Mr. Davison:

Haley & Aldrich, Inc. is submitting this *2025 Annual Water Quality Report* on behalf of Amsted Rail Company, Inc. for their Griffin Wheel Foundry Waste Landfill located in Keokuk, Iowa. Please contact me at 937.530.1412 if you have any questions or require additional information regarding this report.

Sincerely yours,
HALEY & ALDRICH, INC.

A handwritten signature in black ink that reads "Tom Vanage".

Thomas M. Vanage
Senior Project Manager

Enclosures

c: Amsted Rail Company, Inc.; Attn: Paul Sheppard

Executive Summary

This *Annual Water Quality Report* (AWQR) summarizes and evaluates groundwater and surface water quality data from the Amsted Rail Company, Inc. (Amsted) Griffin Wheel Foundry Waste Landfill (Landfill), located in Keokuk, Iowa (Site). Groundwater sampling activities were conducted on April 14 through 16 and August 25 through 28, 2025.

The results of the statistical analyses for the groundwater samples were similar to those observed during previous years. The results indicate the following parameters exceeded the upper control limits in April and/or August 2025:

- ammonia nitrogen (MW-26 and MW-27);
- boron (MW-7, MW-25, MW-26, and MW-27);
- field-measured conductivity (MW-7, MW-26, MW-27, and SW-2);
- fluoride (MW-25);
- chloride (MW-21 and SW-2);
- iron (MW-26, and MW-27);
- lithium (MW-7);
- manganese (MW-6, MW-7, MW-25, and MW-26);
- sodium (MW-26 and SW-2);
- strontium (MW-7, MW-26, and MW-27);
- sulfate (MW-7, MW-26, and MW-27); and
- total organic halogens (MW-26).

Groundwater analytical sampling results from 2025 are generally consistent with previous sampling events. The parameters that were detected at concentrations greater than the Iowa Department of Natural Resources (IDNR) Action Levels were iron, lithium, manganese, sodium, and sulfate. Groundwater and surface water samples that were detected with concentrations greater than the appropriate action levels in April and/or August 2025 are as follows:

- Iron was detected at concentrations greater than the final Secondary Drinking Water Regulation (SDWR; 0.3 milligrams per liter [mg/L]) in groundwater samples collected from monitoring wells MW-26 and MW-27.
- Sulfate was detected at concentrations greater than the final SDWR (250 mg/L) in groundwater samples collected from monitoring wells MW-7, MW-26, and MW-27.
- Manganese was detected at concentrations greater than the final Health Advisory Level (HAL; 0.3 mg/L) in groundwater samples collected from monitoring wells MW-7, MW-26, and the surface water sample collected from SW-2.
- Sodium was detected at concentrations greater than the final HAL for sodium (20 mg/L) in groundwater samples collected from monitoring wells MW-5, MW-6, MW-7, MW-12, MW-16, MW-20, MW-21, MW-25, MW-26, and MW-27, and surface water samples collected from SW-1 and SW-2.

- Lithium was detected at concentrations greater than the IDNR Action Level (0.014 mg/L) in groundwater samples from monitoring wells MW-5, MW-7, MW-16, MW-20, MW-21, MW-25, MW-26, and MW-27.

A review of the groundwater concentration vs. time graphs indicates that the detected concentrations of parameters are similar to historical sampling results. In 2025, elevated concentrations of total organic halogens (MW-26), chloride (MW-20 and MW-21), fluoride (SW-2), and strontium (MW-12) were observed. These constituents will continue to be monitored to assess whether or not this was an isolated situation.

No actions or permit amendments are needed based on this year's sampling results.

The Landfill is in post-closure monitoring. The Closure Permit (#56-SDP-15-89-91C) was provided by IDNR on September 27, 2022. Therefore, post-closure activities at the Landfill will be performed in conformance with Iowa Code Chapter 455B.

As part of the Closure Permit, an Environmental Covenant was agreed upon and implemented that prohibits on-site groundwater to be used as a source of drinking water.

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List of Acronyms/Abbreviations

Amsted	Amsted Rail Company, Inc.
AWQR	Annual Water Quality Report
DUSR	Data Usability Summary Report
EPA	U.S. Environmental Protection Agency
GWQS	Groundwater Quality Standards
HAL	Health Advisory Level
Haley & Aldrich	Haley & Aldrich, Inc.
HMSP	Hydrologic Monitoring System Plan
IAC	Iowa Administrative Code
IDNR	Iowa Department of Natural Resources
Landfill	Griffin Wheel Foundry Waste Landfill
MCL	maximum contaminant level
MCLG	Maximum Contaminant Level Goal
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
ND	non-detect
NRL	Negligible Risk Level
QA/QC	quality assurance/quality control
Site	Amsted Foundry Waste Landfill in Keokuk, Iowa
SDWR	Secondary Drinking Water Regulation
TOX	total organic halogens
UCL	upper control limit

1. Introduction

Haley & Aldrich, Inc. (Haley & Aldrich) has prepared this *2025 Annual Water Quality Report (AWQR)* on behalf of Amsted Rail Company, Inc. (Amsted) to summarize and evaluate groundwater and surface water quality data from the Griffin Wheel Foundry Waste Landfill (Landfill), located in Keokuk, Iowa (Site). Groundwater sampling activities were conducted from April 14 through 16 and August 25 through 28, 2025.

Clean closure activities for the disposal areas of the Landfill were completed from 2019 through early 2022. On September 27, 2022, Iowa Department of Natural Resources (IDNR) provided the Amsted Sanitary Disposal Project Closure Permit (#56-SDP-15-89-91C) for the Landfill. Post-Closure activities at the Landfill will be conducted in conformance with Iowa Code, Chapter 455B. As special provision #7 of the Permit, hydraulic monitoring at the Site shall be performed in accordance with the Revised *Hydrologic Monitoring System Plan* (HMSP; Haley & Aldrich, 2016) for a minimum duration of five years beginning on the issuance date of the Permit (i.e., until April 27, 2027).

The groundwater monitoring activities presented in this report were performed in accordance with the amended HMSP.

1.1 SITE HISTORY

The Site has been used as a waste landfill for materials generated at the Amsted Foundry since the mid-1970s. Prior to that time, the Site was undeveloped. The Site receives various materials generated at the Amsted facility that are then reused either on or off Site. These materials generally fall into two categories: 1) burnt foundry sand; and 2) slag that is commingled with refractory material. The slag is further processed into four sizes of aggregates (small, medium, large, and oversized).

The general geology of the Site is clayey silt or alluvium up to 10 feet below ground surface, underlain by a brown and gray sandy, silty clay unit up to 30 feet in thickness. The monitoring wells installed at the Site are either screened in the brown or gray, sandy, silty clay layer.

Surface water on the Landfill flows toward the eastern side of the Site into the upper reach of Soap Creek, which empties into the Mississippi River nearly 2 miles southeast of the Site. Shallow groundwater moves toward Soap Creek under a horizontal hydraulic gradient of approximately 0.03 foot per foot. The portions of the water table to the west, north, and east are located hydraulically upgradient of the Site. The portions of the water table near Soap Creek and southeast of the Site are generally hydraulically downgradient of the Site.

2. Groundwater Monitoring System

The monitoring system network comprises monitoring wells within the water table, the uppermost aquifer, and the surface water. The groundwater monitoring program is summarized below and in Table 1 and the groundwater monitoring schedule is summarized in Table 2. A Monitoring Point Location Map is included as Figure 1.

2.1 WATER TABLE MONITORING SYSTEM

The water table monitoring system comprises upgradient monitoring wells MW-12 and MW-20 and downgradient monitoring wells MW-5, MW-6, and MW-25. Although not part of the monitoring system network, monitoring wells MW-14 and MW-17 are retained to gather additional information pertaining to the water table elevations. Figures 2 and 3 show the water table monitoring well locations.

2.2 UPPERMOST AQUIFER MONITORING SYSTEM

The uppermost aquifer monitoring system comprises upgradient monitoring wells MW-16 and MW-21 and downgradient monitoring wells MW-7, MW-26, and MW-27. Although not part of the monitoring system network, monitoring wells MW-2, MW-3, MW-11, MW-13, MW-15, MW-19, MW-23, and MW-24 are retained to gather additional information pertaining to water elevations within the uppermost aquifer monitoring system. Figures 4 and 5 show the uppermost aquifer monitoring well locations.

2.3 SURFACE WATER MONITORING SYSTEM

The surface water monitoring system comprises upgradient surface water monitoring location SW-1 and downgradient surface water monitoring location SW-2. Surface water locations SW-3 and SW-4 are no longer monitored, as approved by the IDNR in a letter dated January 25, 2017. Figure 1 shows the surface water and monitoring well locations.

2.4 MONITORING WELL CONDITION ASSESSMENT

During the September 2025 sampling event, the hinge on the guard pipe on monitoring well MW-14 broke while attempting to access the well. Amsted workers repaired the well with a new hinge the following day. Overgrown vegetation was observed at monitoring wells MW-11, MW-13, MW-14, and MW-15 and surface water locations SW-1 and SW-2. The overgrown vegetation was reported in the Fall Semiannual Inspection Report and the overgrowth will be addressed annually.

Table 3, the Monitoring Well Maintenance and Performance Revaluation Schedule, lists the completed and scheduled tasks performed in accordance with Iowa Administrative Code (IAC) 114.21(2)d. The monitoring well maintenance and performance summary is included in Table 4. Monitoring well depth measurements and in-situ permeability tests are performed once every five years; the last event was completed in April 2023.

2.5 ANALYTICAL PARAMETERS

Groundwater and surface water samples collected during the 2025 sampling events were analyzed for the parameters shown in Table 2, consistent with IAC Section 567, Chapter 115.26(4)e and (4)f and according to the special provisions of Permit No. 56-SDP-15-89-91C. The parameters sampled for and analyzed in April and August 2025 have been agreed upon by IDNR and will be monitored during future sampling events. Samples in monitoring wells for dissolved metals were field-filtered using an in-line, 0.45-micron filter. Samples at

surface water locations for dissolved metals were filtered at the laboratory. Completed sampling forms are included in Appendix A.

2.6 LABORATORY ANALYSIS

Appropriately prepared sample containers for each sampling event were provided by Eurofins Laboratories. Eurofins's laboratory located in Barberton, Ohio performed the analyses for the April and August 2025 sampling events. However, for the August sampling event, the analysis of total organic halogens (TOX) and carbon trap preparation were completed at Eurofins's Denver-Arvada, Colorado laboratory. Copies of the analytical laboratory reports and associated Data Usability Summary Reports (DUSRs) for the 2025 sampling events are provided in Appendix B.

The laboratory analyses were completed in accordance with the procedures and methods described in the U.S. Environmental Protection Agency's (EPA's) *Test Methods for Evaluating Solid Waste, SW-846, Physical/Chemical Methods* (February 2007 with updates). The quality assurance and quality control (QA/QC) procedures used to ensure the precision and accuracy of the sample analyses are provided in the Eurofins *Laboratories Quality Assurance Manual*, which is available upon request.

The information provided in the laboratory reports includes the completed chain of custody forms, investigative sample results, and the results for the associated QA/QC samples, method blanks, laboratory control spikes, laboratory duplicates, and matrix spike (MS) and matrix spike duplicates (MSDs) analyzed concurrently with the investigative samples. The reported results for the semiannual sampling events were validated with guidance from the *National Functional Guidelines for Inorganic Data Review* (EPA, 2020). The laboratory analytical reports were evaluated for completeness, overall quality and usability, compliance with method-specific sample holding times, precision and accuracy, and potential sample cross-contamination.

As presented in the DUSRs, the laboratory reports were found to be complete and the reported results usable for Amsted's monitoring program. The April 2025 sample results for fluoride had a "J" qualifier for samples MW-26-041525-0955 and 20760-041525-0001. The August 2025 sample results for chemical oxygen demand had a "J/UJ" qualifier for all samples because the relative percent difference between the MS and MSD results were not within the specified limits, as the relative percent difference was low.

2.7 NOTABLE ISSUES

No notable issues were observed during the 2025 sampling events.

3. Groundwater Flow Conditions

3.1 HORIZONTAL GROUNDWATER FLOW

Static water levels were measured in April and August in the monitoring wells included in the network, as well as monitoring wells MW-2, MW-3, MW-11, MW-13, MW-14, MW-15, MW-17, MW-19, MW-23, and MW-24. Table 4 contains the groundwater elevations for measured groundwater monitoring wells during the 2025 sampling events. Water table and upper aquifer water elevation maps (Figures 2 through 5) were prepared using the water level measurements from the 2025 sampling events. Horizontal groundwater flow was observed during these sampling events to flow to the east, northeast, south, and southeast toward Soap Creek, located on the eastern side of the Site.

3.2 VERTICAL HYDRAULIC GRADIENTS

Water levels measured in monitoring well clusters MW-5/MW-27, MW-6/MW-7, MW-17/MW-16, and MW-20/MW-19 during the 2025 sampling events were used to calculate vertical hydraulic gradients for the Site. The vertical hydraulic gradients were calculated by the following equation:

$$\frac{\Delta H}{\Delta L} = \frac{H_d - H_s}{L_s - L_d}$$

Where: Hd = the water elevation in the deep well
Hs = the water elevation in shallow well
Ls = the elevation of the middle of saturated zone of the shallow well screen
Ld = the elevation of the middle of saturated zone of the deep well screen

The average vertical hydraulic gradients were 0.09 foot per foot in well cluster MW-5/MW-27 and 0.16 foot per foot in well cluster MW-6/MW-7 (upward-directed flow in both well clusters). The average vertical hydraulic gradients were -0.34 foot per foot in well cluster MW-17/MW-16, and -0.36 foot per foot in well cluster MW-20/MW-19 (downward-directed flow in both well clusters) during 2025. The calculated vertical hydraulic gradients were consistent with previous results and are discussed below.

3.3 WATER LEVEL AND LOCATION EVALUATION

An evaluation was completed for the high and low water level elevations at each well, and the vertical and horizontal acceptability of each well location, as required by 567 IAC 115.21(2)a. The table below shows the elevations of the historical high and low water levels and the elevations of the top and bottom of the well screen in each well.

Table 3-1: Recorded High and Low Water Level Elevations 2018 to 2025

Monitoring Well	High Water Level	Low Water Level	Bottom and Top of Well Screen
MW-02	630.25	620.95	580.02 – 590.02
MW-03	650.25	632.90	599.27 – 609.27
MW-05	623.43	621.63	605.07 – 615.07
MW-06	621.68	618.50	604.30 – 614.30
MW-07	625.41	623.91	566.06 – 576.06
MW-11	628.55	618.88	583.42 – 593.42

Monitoring Well	High Water Level	Low Water Level	Bottom and Top of Well Screen
MW-12	629.03	624.03	613.27 – 623.27
MW-13	631.98	628.58	589.79 – 599.79
MW-14	644.23	640.68	623.37 – 633.37
MW-15	640.20	637.61	589.96 – 599.96
MW-16	626.68	624.99	594.13 – 604.13
MW-17	638.38	633.65	620.60 – 630.60
MW-19	626.24	623.62	580.93 – 590.93
MW-20	640.89	638.71	620.29 – 630.29
MW-21	644.31	641.09	594.07 – 604.07
MW-23	642.92	637.26	609.40 – 619.40
MW-24	631.79	628.60	598.24 – 608.24
MW-25	626.74	621.95	613.56 – 623.56
MW-26	624.35	622.92	583.29 – 588.29
MW-27	624.57	623.87	582.20 – 587.20

Note: All groundwater elevations in feet, National Geodetic Vertical Datum.

Water level elevations in the monitoring wells for the 2025 sampling events were located above the top of the well screen, except for MW-25 during the April and August sampling event, in which case the water level was measured with an elevation of 623.48 and 622.65 feet, respectively, and the top of screen was at 623.56 feet. The monitoring wells are located within water-bearing units either upgradient or downgradient of the Landfill.

The groundwater flow underneath the Landfill during the 2025 sampling events has generally been from the southwest to the northeast. The groundwater flow for the entire Site is divided by Soap Creek. From a review of the vertical hydraulic gradients, the groundwater recharges at Soap Creek. The horizontal placement of monitoring wells is such that the spacing between downgradient monitoring wells has been maintained at less than the 600-foot maximum throughout the sampling events.

3.4 POTENTIAL GROUNDWATER MOUNDING

A potential for groundwater mounding exists if the surface elevations of the landfill increase to a significant height. The present surface elevation of the material staging areas has not increased to more than 20 feet above the ground surface where the upgradient wells are installed. The vertical component of the groundwater flow at the Site has consistently indicated downward flow at the upgradient well locations and upward flow at the downgradient well locations. It is believed that no groundwater mounding is occurring at the Site.

Construction activities of the sand and slag area, including removal of material and regrading to the base layer, along with exposure to rainfall, may have impacted the groundwater results. Now that a base layer is established and the Landfill is closed, native ground surface disturbance will decrease and future impacts to groundwater are not anticipated.

4. Analysis of Annual Monitoring Results

4.1 STATISTICAL ANALYSIS

Laboratory results were imported directly from the laboratory Excel file into the existing database with groundwater data from 2018 (field measurements were entered manually). The mean and standard deviation of each parameter for upgradient monitoring points in each monitoring network were calculated as required in 567 IAC 115.26(6). Analytical data from each sampling event was included in an Appendix C table and used in the mean and standard deviation calculations. The following formula was used to calculate the standard deviation:

$$s = \sqrt{\frac{\sum(X-M)^2}{n-1}}$$

Where: s = Sample Standard Deviation
X = Individual Data
M = Sample Mean
n = Number of Data Points in Set

Using the calculated mean and standard deviation for each analytical parameter, the upgradient control limit (the upgradient mean plus two standard deviations) for each parameter was calculated for each of the upgradient monitoring networks. The two standard deviations of the upgradient data were subtracted from the mean upgradient data to determine the lower control limit for pH. A summary of the calculated upper control limits (UCLs; or background levels) is included in Table 5.

4.2 CALCULATED CONTROL LIMITS AND ACTION LEVELS

A comparison was made to the calculated control limits for the upgradient sampling data to evaluate the status of the Site's water quality. A comparison was also made to the IDNR Action Levels established by IAC Chapter 133. IDNR Action Levels were established for specific chemical and exposure numbers, lifetime exposure, cancer risks, and drinking water exposure over a 70-year period. The following defines some of the various terms used in 567 IAC 133.2 (455B, 455E):

- IDNR Action Level – The IDNR Action Level for any contaminant is as follows: The EPA Health Advisory Level (HAL), if one exists; if there is no HAL, then the EPA Negligible Risk Level (NRL); if there is no HAL or NRL, then the EPA Maximum Contaminant Level (MCL), Secondary Drinking Water Regulation (SDWR), or Maximum Contaminant Level Goal (MCLG) is used. If there is no HAL, NRL, MCL, SDWR, or MCLG, an action level may be established by the IDNR based on current technical literature and recommended guidelines of the EPA and recognized experts on a case-by-case basis.
- HAL – A lifetime HAL for a contaminant is established by the EPA. Health advisories represent the concentration of a single contaminant, based on current toxicological information in drinking water, which is not expected to cause adverse health effects over a lifetime of exposure.
- NRL – The NRL for carcinogens is established by the EPA. The NRL estimates the concentration of a contaminant that would cause an additional cancer case per million people exposed over a lifetime to the contaminant.
- MCL – The enforceable MCL was established by the EPA pursuant to the Safe Drinking Water Act.

- **SDWR** – A SDWR exists for some contaminants that do not have HALs, NRLs, or MCLs. This number is usually based on the aesthetic qualities of the parameter and is generally not an enforceable limit. These were also established by the EPA pursuant to the Safe Drinking Water Act.
- **MCLG** – A MCLG is a non-enforceable concentration of a drinking water contaminant that is protective of adverse human health effects and allows an adequate margin of safety.

When referring to the HAL, NRL, MCL, SDWR, and MCLG in the following analysis, the status of that standard is given in terms of its final, draft, listed for regulation, proposed, or tentative form. The UCLs, the action levels, and the source of the action levels for each constituent are presented in Table 5 for each monitored aquifer.

4.3 WATER QUALITY ANALYTICAL RESULTS

Time versus concentration graphs for each analytical parameter are provided in Appendix C. Analytical data are also presented in tables where the mean and upgradient control limit is developed from the upgradient monitoring well concentrations. The upgradient control limits and the IDNR Action Levels (when within the scale of the graph) are shown on these graphs.

4.4 STATISTICAL TREND ANALYSIS

Statistical methods were used to evaluate the groundwater trends. The analysis was completed for monitoring wells in the sampling program. Trend analysis was performed for data collected from 2018 through 2025. After the descriptive statistics had been summarized, the data was evaluated to check the viability of trends, including outlier presence, data censorship (percent of non-detects [NDs]), and determination of an adequate amount of data. A simple substitution method was utilized for ND datasets by substituting each ND value with the laboratory reporting limit. A formal two-tailed statistical trend evaluation (Mann-Kendall) with minimum 95 percent confidence level test (2.5 percent significance level at each tail) was performed for the monitoring wells. The following stepwise approach was utilized for the trend analysis:

1. **For dataset with less than 70 percent non-detects:** Constituents of concern maximum concentration values at each monitoring well were compared to the Groundwater Quality Standards (GWQS). If the maximum concentration of a constituent exceeded the GWQS, then trend analysis was completed using the Mann-Kendall test.
2. **For dataset with greater than 70 percent non-detects:** Constituent concentrations were evaluated to determine if the constituents were detected during the recent sampling events. If the detected most recent concentration of a constituent in a sample from the monitoring well exceeded the GWQS, then trend analysis using the Mann-Kendall test was performed.

The statistical evaluation was performed using ChemStat software (Version 6.3.0.0). Statistical analyses were performed on constituents that have at least six data points and either had detections or exceedances of state action levels.

Increasing trends were not observed in upgradient monitoring wells; however, increasing trends were observed in downgradient wells for iron (MW-26 and MW-27) and sulfate (MW-26), which is consistent with previous years. An increasing trend was observed for sodium in the upgradient surface water sampling location (SW-1). The remaining constituents with concentrations above the Groundwater Protection Standard were either stable or decreasing. The statistical analysis results are summarized in Table 6 and the ChemStat output files for the statistical analysis are included in Appendix D.

5. Groundwater and Surface Water Quality Results

5.1 STATISTICAL RESULTS

As shown in Appendix C, similar to past sampling events, exceedances of the UCL exist in downgradient water table monitoring wells, downgradient uppermost aquifer monitoring wells, and in the downstream surface water sampling location. Constituents with no immediately preceding control limit exceedances are summarized in Table 7. A review of Appendix C indicates the following parameters exceeded the upper control limits in April and/or August 2025:

- ammonia nitrogen (MW-26 and MW-27);
- boron (MW-7, MW-25, MW-26, and MW-27);
- field-measured conductivity (MW-7, MW-26, MW-27, and SW-2);
- fluoride (MW-25);
- chloride (MW-21 and SW-2);
- iron (MW-26 and MW-27);
- lithium (MW-7);
- manganese (MW-6, MW-7, MW-25, and MW-26);
- sodium (MW-26 and SW-2);
- strontium (MW-7, MW-26, and MW-27);
- sulfate (MW-7, MW-26, and MW-27); and
- total organic halogens (MW-26).

Table 8 depicts a summary of the ongoing and newly identified control limit exceedances by showing the most recent result of each exceeding constituent compared to the UCL and action level.

Surface water is not used as a source of drinking water. All businesses and residents in the area are supplied with drinking water from the City of Keokuk public water supply. The source for the City of Keokuk public water is the Mississippi River.

5.2 ANALYTICAL RESULTS

A summary of IDNR Action Level exceedances in 2025 for groundwater and surface water samples is shown in Table 9. Groundwater sampling results from 2025 are generally consistent with previous sampling events. Table 10 presents a summary of historical IDNR Action Level exceedances and calculated control limit exceedances from 2018 through 2025. The parameters that were detected at concentrations greater than the IDNR Action Levels were the same as last year, including iron, lithium, manganese, sodium, and sulfate.

Groundwater and surface water samples that were detected with concentrations greater than the appropriate action level in April and/or August 2025 are as follows:

- Iron was detected at concentrations greater than the final SDWR (0.3 milligrams per liter [mg/L]) in groundwater samples collected from monitoring wells MW-26 and MW-27.
- Sulfate was detected at concentrations greater than the final SDWR (250 mg/L) in groundwater samples collected from monitoring wells MW-7, MW-26, and MW-27.
- Manganese was detected at concentrations greater than the final HAL (0.3 mg/L) in groundwater samples collected from monitoring wells MW-7 and MW-26 and the surface water sample collected from SW-2.
- Sodium was detected at concentrations greater than the final HAL for sodium (20 mg/L) in groundwater samples collected from monitoring wells MW-5, MW-6, MW-7, MW-12, MW-16, MW-20, MW-21, MW-25, MW-26, and MW-27, and surface water samples collected from SW-1 and SW-2.
- Lithium was detected at concentrations greater than the IDNR Action Level (0.014 mg/L) in groundwater samples from monitoring wells MW-5, MW-7, MW-16, MW-20, MW-21, MW-25, MW-26, and MW-27.

A review of the groundwater concentration vs. time graphs included in Appendix C indicates that the detected concentrations of parameters are similar to historical sampling results. In 2025, elevated concentrations of total organic halogens (MW-26), chloride (MW-20 and MW-21), fluoride (SW-2), and strontium (MW-12) were observed. These constituents will continue to be monitored to assess whether or not this was an isolated situation.

6. Leachate and Gas Monitoring

The landfill has operated and was closed under IDNR Permit #56-SDP-15-89P; Special Provision 4 states in part, that based on a completed and certified site risk assessment meeting the requirements outlined in Chapter 455B.305, Section 6 of the Iowa Code, the permit holder was conditionally exempted under the IDNR letter dated September 5, 1995 from providing and implementing a leachate control plan for the Phase I disposal area; therefore, leachate monitoring is not conducted at the Site. This facility will continue to store and process the same materials. Refer to Table 11.

The permit holder is not required to monitor or report Site gas concentrations, as the defined waste stream consists of inorganic foundry waste; therefore, no gas monitoring is required for this Site. Refer to Table 12. IDNR Permit #56-SDP-15-89P has expired and the facility is currently operating under Permit #56-SDP-15-89C.

7. Recommendations

Haley & Aldrich's review of hydrogeological conditions has indicated that the number of monitoring wells and their locations are adequate. We therefore recommend no changes to this component of the Groundwater Monitoring Plan. Per IDNR guidance, the "water table" and the "uppermost aquifer" are each monitored using two background wells and three downgradient wells in each unit. Water levels recorded at 20 of the Site's monitoring wells also provide valuable data used to document the groundwater flow direction; there is no benefit to abandoning any of these wells at this time.

Moving forward, IDNR has issued a closure Permit (56-SDP-15-89-91C); as such, the monitoring wells will be monitored for five years beginning in 2022. If IDNR determines that all monitored parameters are exhibiting stable or declining concentrations, the permit will expire, and all groundwater monitoring wells shall be abandoned with appropriate documentation submitted to IDNR.

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TABLES

Monitoring Well	Formation	Current Monitoring Program*	Change for next sampling event	Control Limit Exceedances		Total # of Samples in each monitoring program since January 1, 2018		
				April 2025	August 2025	Routine	Supplemental	Remedial Action
MW-5	Water Table (Downgradient)	Routine	NC	No Exceedance	No Exceedance	16	0	0
MW-6	Water Table (Downgradient)	Routine	NC	Manganese	Manganese	16	0	0
MW-7	Uppermost Aquifer (Downgradient)	Routine	NC	Boron, Conductivity, Strontium, Sulfate	Boron, Conductivity, Lithium, Manganese, Strontium, Sulfate	16	0	0
MW-12	Water Table (Upgradient)	Routine	NC	No Exceedance	No Exceedance	16	0	0
MW-16	Uppermost Aquifer (Upgradient)	Routine	NC	No Exceedance	No Exceedance	16	0	0
MW-20	Water Table (Upgradient)	Routine	NC	No Exceedance	No Exceedance	16	0	0
MW-21	Uppermost Aquifer (Upgradient)	Routine	NC	No Exceedance	Chloride	16	0	0
MW-25	Water Table (Downgradient)	Routine	NC	Boron, Fluoride, Manganese	Boron, Fluoride, Manganese	16	0	0
MW-26	Uppermost Aquifer (Downgradient)	Routine	NC	Ammonia, Boron, Conductivity, Iron, Manganese, Sodium, Strontium, Sulfate	Ammonia, Boron, Conductivity, Iron, Manganese, Sodium, Strontium, Sulfate, Total Organic Halogens	16	0	0
MW-27	Uppermost Aquifer (Downgradient)	Routine	NC	Ammonia, Boron, Conductivity, Iron, Strontium, Sulfate	Ammonia, Boron, Iron, Strontium, Sulfate	16	0	0
SW-1	Surface Water (Upgradient)	Routine	NC	No Exceedance	No Exceedance	16	0	0
SW-2	Surface Water (Downgradient)	Routine	NC	Chloride, Conductivity, Sodium	Chloride, Sodium	16	0	0

Notes:

* In accordance with permit #56-SDP-15-89-91C.

NC: No Change

Monitoring Well	Recent Sampling Dates and Constituents																Upcoming Sampling Dates and Constituents	
	4/16/2018 - 4/18/2018	10/08/18 - 10/10/2018	4/13/2019 - 4/14/2019	10/01/19 - 10/02/2019	4/07/2020 - 4/09/2020	9/30/2020 - 10/02/2020	4/13/2021 - 4/15/2021	10/12/2021 - 10/14/2021	4/19/2022 - 4/20/22	9/27/2022 - 9/29/2022	4/18/2023 - 4/19/2023	8/22/2023 - 8/24/2023	4/29/2024 - 5/2/24	9/9/2024 - 9/12/2024	4/14/2025 - 4/16/2025	8/26/2025 - 8/28/25	April 2026	October 2026
MW-5	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
MW-6	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
MW-7	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
MW-12	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
MW-16	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
MW-20	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
MW-21	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
MW-25	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
MW-26	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
MW-27	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
SW-1	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3
SW-2	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3	1, 3	1, 2, 3

Notes:
 1. Semiannual Parameters: pH, Conductivity, Temperature, Dissolved Iron, Total Manganese, Ammonia Nitrogen, and Chemical Oxygen Demand (COD)
 2. Annual Parameters: Total Organic Halogen, and Phenols
 3. Supplemental Parameters: Boron, Lithium, Sodium, Strontium, Fluoride, and Sulfate

Compliance with:	Monitoring Calendar Years								
	2018	2019	2020	2021	2022	2023	2024	2025	2026
567 IAC 115.21(2)"a" high and low water levels (annual)	Completed	Completed	Completed	Completed	Completed	Completed	Complete	Complete	Scheduled
567 IAC 115.21(2)"b" changes in the hydrologic setting and flow paths	Completed	Completed	Completed	Completed	Completed	Completed	Complete	Complete	Scheduled
567 IAC 115.21(2)"c" well depths	N/A	N/A	N/A	N/A	Completed	Completed ¹	N/A	N/A	N/A
567 IAC 115.21(2)"d" in-situ permeability tests (once every five years)	N/A	N/A	N/A	N/A	N/A	Completed ²	N/A	N/A	N/A

Notes:

1. Well depths were measured during the April 2023 event. Well depths will be measured every 5 years instead of once per year because dedicated pumps are installed in each sampling monitoring well.
2. In-situ permeability tests were completed by Haley & Aldrich in April 2023.

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Notes:

¹ Well depths were measured during the April 2023 event. Well depths will be measured every 5 years instead of once per year because dedicated pumps are installed in each sampling monitoring well.

² Permeability values were calculated by slug test data collected in April 2023.

³ Current permeability values were calculated by slug test data collected in April 2023.

NM - Not Measured due to the presence of designated pumps in monitoring wells

NA - Not Applicable

Water Table Background/Control Limit (MW-12 and MW-20)

Constituent	Units	Samples	Detections	Background level	Statistical Test	Action Level	Source
Semiannual							
pH	pH Units	32	32	8.003 and 5.705*	M+/I-2SD	6.5/8.5	SDWR
Conductivity	mS/cm	32	32	1.25	M+/I-2SD	NA	NA
Temperature	deg. C	32	32	22.46	M+/I-2SD	NA	NA
Dissolved Iron	mg/L	32	4	0.14	M+/I-2SD	0.3	SDWR
Total Managenese	mg/L	32	5	0.047	M+/I-2SD	0.3	HAL
Ammonia Nitrogen	mg/L	32	3	0.51	M+/I-2SD	30	IDNR AL
Chemical Oxygen Demand (COD)	mg/L	32	19	31.07	M+/I-2SD	NA	NA
Annual Parameters							
Total Organic Halogens	mg/L	16	16	0.17	M+/I-2SD	NA	NA
Phenols	mg/L	16	0	0.0246	M+/I-2SD	NA	IDNR AL
Supplemental Parameters							
Boron	mg/L	32	3	0.138	M+/I-2SD	6	HAL
Lithium	mg/L	32	20	0.06	M+/I-2SD	0.014	IDNR AL
Sodium	mg/L	32	32	99.97	M+/I-2SD	20	HAL
Strontium	mg/L	32	32	0.64	M+/I-2SD	4	HAL
Fluoride	mg/L	32	32	0.6	M+/I-2SD	4	MCL
Chloride	mg/L	32	32	65.84	M+/I-2SD	250	SDWR
Sulfate	mg/L	32	32	62.06	M+/I-2SD	250	HAL

Uppermost Aquifer Background/Control Limit (MW-16 and MW-21)

Constituent	Units	Samples	Detections	Background level	Statistical Test	Action Level	Source
Semiannual							
pH	mg/L	32	32	8.24 and 5.23*	M+/I-2SD	6.5/8.5	SDWR
Conductivity	mg/L	32	32	1.27	M+/I-2SD	NA	NA
Temperature	deg. C	32	32	22.03	M+/I-2SD	NA	NA
Dissolved Iron	mg/L	32	18	0.42	M+/I-2SD	0.3	SDWR
Total Managenese	mg/L	32	32	0.33	M+/I-2SD	0.3	HAL
Ammonia Nitrogen	mg/L	32	5	0.51	M+/I-2SD	30	IDNR AL
Chemical Oxygen Demand (COD)	mg/L	32	15	34.95	M+/I-2SD	NA	NA
Annual Parameters							
Total Organic Halogen	mg/L	16	8	0.066	M+/I-2SD	NA	NA
Phenols	mg/L	16	0	0.0249	M+/I-2SD	NA	IDNR AL
Supplemental Parameters							
Boron	mg/L	32	25	0.114	M+/I-2SD	6	HAL
Lithium	mg/L	32	31	0.0789	M+/I-2SD	0.014	IDNR AL
Sodium	mg/L	32	32	63.12	M+/I-2SD	20	HAL
Strontium	mg/L	32	32	0.6	M+/I-2SD	4	HAL
Fluoride	mg/L	32	32	0.51	M+/I-2SD	4	MCL
Chloride	mg/L	32	2	6.25	M+/I-2SD	250	SDWR
Sulfate	mg/L	32	32	92.58	M+/I-2SD	250	HAL

Surface Water Background/Control Limit (SW-1)

Constituent	Units	Samples	Detections	Background level	Statistical Test	Action Level	Source
Semiannual							
pH	mg/L	16	16	8.07 and 6.57*	M+/I-2SD	6.5/8.5	SDWR
Conductivity	mg/L	16	16	0.67	M+/I-2SD	NA	NA
Temperature	deg. C	16	16	26.43	M+/I-2SD	NA	NA
Dissolved Iron	mg/L	16	11	2.84	M+/I-2SD	0.3	SDWR
Total Managenese	mg/L	16	16	0.78	M+/I-2SD	0.3	HAL
Ammonia Nitrogen	mg/L	16	14	4.73	M+/I-2SD	30	IDNR AL
Chemical Oxygen Demand (COD)	mg/L	16	14	38.18	M+/I-2SD	NA	NA
Annual Parameters							
Total Organic Halogen	mg/L	8	7	0.07	M+/I-2SD	NA	NA
Phenols	mg/L	8	0	0.0254	M+/I-2SD	NA	IDNR AL
Supplemental Parameters							
Boron	mg/L	16	16	0.41	M+/I-2SD	6	HAL
Lithium	mg/L	16	1	0.06	M+/I-2SD	0.014	IDNR AL
Sodium	mg/L	16	16	26.34	M+/I-2SD	20	HAL
Strontium	mg/L	16	14	0.27	M+/I-2SD	4	HAL
Fluoride	mg/L	16	16	1.17	M+/I-2SD	4	MCL
Chloride	mg/L	16	16	33.2	M+/I-2SD	250	SDWR
Sulfate	mg/L	16	16	62.69	M+/I-2SD	250	HAL

Notes:

*Two control limits were established for pH, an upper and lower gradient control limit

1. AL: Action Level
2. HAL: EPA Health Advisory Level
3. IDNR AL: Iowa Department of Natural Resources Action Level
4. MCL: Maximum Contaminant Level
5. MCLG: EPA Maximum Contaminant Level Goal
6. mg/L: milligrams per liter
7. mS/cm: milliSiemens per centimeter
8. NRL: EPA Negligible Risk Level
9. SDWR: Secondary Drinking Water Regulation

TABLE 6

GROUNDWATER QUALITY ASSESSMENT PLAN TREND ANALYSIS

2025 ANNUAL WATER QUALITY REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Well	Current SSL	Trend ¹
MW-5	Lithium	Stable
	Sodium	Stable
MW-6	Sodium	Stable
MW-7	Lithium	Stable
	Manganese	Stable
	Sodium	Stable
	Sulfate	Stable
MW-12	Sodium	Stable
MW-16	Lithium	Stable
	Sodium	Stable
MW-20	Lithium	Stable
	Sodium	Stable
MW-21	Lithium	Decreasing
	Sodium	Decreasing
MW-25	Lithium	Stable
	Sodium	Stable
MW-26	Iron	Increasing
	Lithium	Stable
	Manganese	Stable
	Sodium	Stable
	Sulfate	Increasing
MW-27	Iron	Increasing
	Lithium	Stable
	Sodium	Stable
	Sulfate	Stable
SW-1	Sodium	Increasing
SW-2	Manganese	Stable
	Sodium	Stable

Notes:

SSL: Statistically Significant Level above groundwater protection standard

1: Two tailed trend analysis (Mann-Kendall) test performed at 95% confidence interval.

Well	Constituent*	Units	Most recent result		Control Limit
			April 2025	August 2025	
Water Table					
MW-5	Ammonia	mg/L	ND	ND	0.51
	Boron	mg/L	ND	ND	0.138
	Chemical Oxygen Demand	mg/L	5	ND	31.07
	Chloride	mg/L	3.43	3.97	65.84
	Fluoride	mg/L	0.374	0.502	0.6
	Iron	mg/L	ND	ND	0.14
	Lithium	mg/L	0.0222	0.0268	0.06
	Manganese	mg/L	0.0175	0.0126	0.047
	Sodium	mg/L	43.2	44.6	99.97
	Strontium	mg/L	0.308	0.306	0.64
	Sulfate	mg/L	30.8	34.2	62.06
	Total Organic Halogens	mg/L	NA	0.0352	0.17
MW-6	Total Phenols	mg/L	NA	ND	0.0246
	Ammonia	mg/L	ND	ND	0.51
	Boron	mg/L	ND	ND	0.138
	Chemical Oxygen Demand	mg/L	6.89	4.89	31.07
	Chloride	mg/L	12.9	9.83	65.84
	Fluoride	mg/L	0.293	0.474	0.6
	Iron	mg/L	ND	ND	0.14
	Lithium	mg/L	ND	ND	0.06
	Sodium	mg/L	45	41.8	99.97
	Strontium	mg/L	0.384	0.363	0.64
	Sulfate	mg/L	8.61	11	62.06
	Total Organic Halogens	mg/L	NA	0.0431	0.17
MW-25	Total Phenols	mg/L	NA	ND	0.0246
	Ammonia	mg/L	ND	ND	0.51
	Chemical Oxygen Demand	mg/L	3.41	5.58	31.07
	Chloride	mg/L	25.6	27.5	65.84
	Iron	mg/L	ND	ND	0.14
	Lithium	mg/L	0.047	0.0462	0.06
	Sodium	mg/L	60.3	61.6	99.97
	Strontium	mg/L	0.524	0.565	0.64
	Sulfate	mg/L	49.4	53.6	62.06
	Total Organic Halogens	mg/L	NA	0.0286	0.17
	Total Phenols	mg/L	NA	ND	0.0246
	Uppermost Aquifer				
MW-7	Chemical Oxygen Demand	mg/L	9.58	ND	34.9
	Ammonia	mg/L	ND	0.37	0.51
	Chloride	mg/L	1.32	1.51	6.25
	Fluoride	mg/L	0.28	0.363	0.51
	Iron	mg/L	ND	ND	0.42
	Sodium	mg/L	62.4	62.6	63.12
	Total Organic Halogens	mg/L	NA	ND	0.066
	Total Phenols	mg/L	NA	ND	0.0249
MW-26	Chemical Oxygen Demand	mg/L	7.63	8	34.9
	Chloride	mg/L	2.75	3.03	6.25
	Fluoride	mg/L	0.124	0.256	0.51
	Lithium	mg/L	ND	0.0235	0.0789
	Total Phenols	mg/L	NA	ND	0.0249
MW-27	Chloride	mg/L	1.72	1.9	6.25
	Fluoride	mg/L	0.284	0.34	0.51
	Lithium	mg/L	0.0485	0.0518	0.789
	Manganese	mg/L	0.129	0.145	0.33
	Sodium	mg/L	41.8	44.1	63.12
	Chemical Oxygen Demand	mg/L	7.31	5.58	34.9
	Total Organic Halogens	mg/L	NA	ND	0.066
	Total Phenols	mg/L	NA	ND	0.0249
Surface Water					
SW-2	Total Phenols	mg/L	NA	ND	0.0254
	Total Organic Halogens	mg/L	NA	0.0394	0.07
	Ammonia	mg/L	0.178	1.57	4.73
	Boron	mg/L	0.162	0.248	0.41
	Chemical Oxygen Demand	mg/L	14.1	21.1	38.18
	Fluoride	mg/L	0.374	1.1	1.17
	Iron	mg/L	ND	0.0493	2.84
	Lithium	mg/L	ND	ND	0.06
	Manganese	mg/L	0.622	0.109	0.78
	Strontium	mg/L	0.251	0.236	0.27
Sulfate	mg/L	32.2	29.6	62.69	

Notes:

1. "-": Exceeds background limit
2. NA: Not Analyzed in Spring
3. ND: Non-detect
4. *Field parameters (temperature, conductivity, and pH) are not included in this table due to variations from weather or equipment.

TABLE 8

SUMMARY OF ONGOING AND NEWLY IDENTIFIED CONTROL LIMIT EXCEEDANCES

2024 ANNUAL WATER QUALITY REPORT

GRIFFIN WHEEL - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Well	Constituent	Units	Most recent result		Background Standard (Upper Control Limit)	Action Level/ Statewide Standard
			April 2025	August 2025		
Downgradient Water Table						
MW-6	Manganese	mg/L	0.0721	0.138	0.047	0.3
MW-25	Boron	mg/L	0.183	0.198	0.138	6
	Fluoride	mg/L	1.55	1.93	0.6	4
	Manganese	mg/L	0.073	0.099	0.048	0.3
Upgradient Uppermost Aquifer						
MW-21	Chloride	mg/L	NE	6.6	6.25	250
Downgradient Uppermost Aquifer						
MW-7	Boron	mg/L	0.247	0.249	0.11	6
	Conductivity (Field)	mS/cm	2.75	2.48	1.27	NA
	Lithium	mg/L	NE	0.0805	0.0789	0.014
	Manganese	mg/L	NE	0.705	0.33	0.3
	Strontium	mg/L	1.79	1.82	0.6	4
	Sulfate	mg/L	1240	1410	92.58	250
MW-26	Ammonia	mg/L	1.19	1.07	0.51	30
	Boron	mg/L	0.295	0.286	0.11	6
	Conductivity (field)	mS/cm	3.11	2.81	1.27	NA
	Iron	mg/L	2.13	2.09	0.42	0.3
	Manganese	mg/L	2.81	2.58	0.33	0.3
	Sodium	mg/L	84.9	85.3	63.12	20
	Strontium	mg/L	2.03	2.09	0.6	4
	Sulfate	mg/L	1330	1450	92.58	250
	Total Organic Halogens	mg/L	NA	0.075	0.066	NA
MW-27	Ammonia	mg/L	1.38	1.32	0.51	30
	Boron	mg/L	0.16	0.156	0.11	6
	Conductivity (field)	mS/cm	1.33	NE	1.27	NA
	Iron	mg/L	2.5	2.4	0.42	0.3
	Strontium	mg/L	0.765	0.786	0.6	4
	Sulfate	mg/L	252	256	92.58	250
Downgradient Surface Water						
SW-2	Chloride	mg/L	58.4	44.8	33.2	250
	Conductivity (field)	mS/cm	0.69	NE	0.67	NA
	Sodium	mg/L	46.7	32.3	26.34	20

Notes:

1. NE: No Exceedance
2. NA: Not Applicable, only analyzed in Fall
3. Red text indicates exceedance of action level/statewide standard.

TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-05 04/18/2018 N WATER TABLE	MW-05 10/10/2018 N WATER TABLE	MW-05 04/13/2019 N WATER TABLE	MW-05 10/01/2019 N WATER TABLE	MW-05 04/09/2020 N WATER TABLE
Field Parameters							
Temperature (Deg C)	-	-	8.47	15.76	10.37	18.81	10.79
Conductivity, Field (mS/cm)	-	-	0.673	0.778	0.735	0.741	0.757
pH, Field (pH units)	6.5-8.5	SDWR	6.48	6.36	6.66	6.90	6.79
Inorganic Compounds (mg/L)							
Boron, Total	6	HAL	ND (0.05)	ND (0.05)	ND (0.05)	0.0247 J	ND (0.1)
Iron, Dissolved	0.3	SDWR	ND (0.025)	ND (0.025)	0.0463 R	ND (0.1)	ND (0.1)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0301 J	0.0662	0.0255 J	0.0251 J	0.0182 J
Manganese, Total	0.3	HAL	0.0145	ND (0.08)	0.00777 J+	0.00788	0.0901
Sodium, Total	20	HAL	42.9	57.1	26.9 J+	41.2	42.7
Strontium, Stable, Total	4	HAL	0.291 J-	0.282	0.292	0.288	0.31
Other (mg/L)							
Ammonia (as N)	30	IDNR AL	0.0851 J	ND (0.1) J	ND (0.127)	ND (0.2)	ND (0.2)
Chemical Oxygen Demand (COD)	-	-	ND (20)	ND (20)	6.97 J	ND (10)	7.2 J
Chloride	250	SDWR	3.98	4.26	3.96	4.11	3.79
Fluoride	4	MCL	0.409	0.443	0.435	0.508	0.462
Sulfate	250	SDWR	36.4	38.7	40.4	41	38.5
Total Organic Halogens	-	-	-	0.0161 J	-	0.042	-
Total Phenols	2	IDNR AL	-	ND (0.01)	-	ND (0.0196)	-

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March 2018)

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(February 2017)

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milliSiemens per centimeter

SUMMARY OF ANALYTICAL RESULTS
2025 ANNUAL GROUNDWATER MONITORING REPORT
AMSTED - KEOKUK, IOWA
PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-05 10/01/2020 N WATER TABLE	MW-05 04/14/2021 N WATER TABLE	MW-05 10/13/2021 N WATER TABLE	MW-05 04/20/2022 N WATER TABLE	MW-05 09/28/2022 N WATER TABLE	MW-05 11/01/2022 N WATER TABLE	MW-05 04/19/2023 N WATER TABLE	MW-05 08/24/2023 N WATER TABLE	MW-05 05/01/2024 N WATER TABLE
Field Parameters											
Temperature (Deg C)	-	-	15.83	13.56	17.12	9.12	15.57	12.50	13.41	20.68	20.24
Conductivity, Field (mS/cm)	-	-	1.15	0.707	0.579	0.781	0.886	0.711	0.693	0.772	0.618
pH, Field (pH units)	6.5-8.5	SDWR	6.36	5.19	6.81	3.68	6.47	7.26	6.98	6.66	6.93
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.0238 J	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	-	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Dissolved	0.3	SDWR	ND (0.1)	ND (0.1)	ND (0.1)	0.052 J	ND (0.1)	-	ND (0.1)	0.104	ND (0.1)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0249 J	0.0175 J	0.0217 J	ND (0.05)	0.0216 J	-	0.0255 J	0.0221 J	0.0259 J
Manganese, Total	0.3	HAL	0.0648	0.0337	0.0449	0.0245	0.171	-	ND (0.005)	0.0196	0.0124
Sodium, Total	20	HAL	41.9	40.8	42.2	44.3	42.6	-	42.9	43.4	42.4
Strontium, Stable, Total	4	HAL	0.265	0.267	0.251	0.295	0.276	-	0.3	0.296	0.315
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.5)	ND (0.2)	ND (0.5)	ND (0.2) J	ND (0.5)	-	ND (0.2)	ND (0.2)	ND (0.2)
Chemical Oxygen Demand (COD)	-	-	ND (25)	ND (10)	ND (25)	ND (10)	ND (25)	-	ND (10) J	ND (10)	ND (10)
Chloride	250	SDWR	3.93	3.85	4.03	3.76	3.71	-	3.62	3.69	3.26
Fluoride	4	MCL	0.502	0.463	0.517	0.456	0.461	-	0.446	0.471	0.383
Sulfate	250	SDWR	39	35.7	38.5	30.3	33.2	-	36.1	33.9	31.5
Total Organic Halogens	-	-	0.0533	-	0.0445	-	-	-	-	ND (0.04)	-
Total Phenols	2	IDNR AL	ND (0.0188)	-	ND (0.0184)	-	-	ND (0.02)	-	ND (0.01)	-

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- Results exceeding IDNR Action Levels are highlighted gray.
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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-05 09/11/2024 N	MW-05 04/15/2025 N	MW-05 08/27/2025 N	MW-06 04/18/2018 N	MW-06 10/10/2018 N	MW-06 04/14/2019 N	MW-06 10/02/2019 N	MW-06 04/08/2020 N	MW-06 09/30/2020 N
			WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE
Field Parameters											
Temperature (Deg C)	-	-	25.33	14.43	19.35	6.96	15.97	8.84	17.78	13.59	17.46
Conductivity, Field (mS/cm)	-	-	0.671	0.820	0.709	0.704	0.836	0.776	0.803	0.75	1.28
pH, Field (pH units)	6.5-8.5	SDWR	7.19	6.88	6.65	5.56	6.93	6.96	7.00	7.15	7.17
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Dissolved	0.3	SDWR	ND (0.1)	ND (0.1)	ND (0.1)	0.0186 J	ND (0.025)	0.221 R	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.02 J	0.0222 J	0.0268 J	0.0192 J	ND (0.05)	0.0196 J	0.0143 J	0.0104 J	0.013 J
Manganese, Total	0.3	HAL	0.0355	0.0175	0.0126	0.124	0.549	0.0786	0.2	0.0909	0.436
Sodium, Total	20	HAL	43.6 J-	43.2	44.6	38.5	61.5	43.5 J+	41.5	42.2	44.8
Strontium, Stable, Total	4	HAL	0.302	0.308	0.306	0.349 J-	0.365	0.362	0.393	0.394	0.355
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.1)	ND (0.1) J	ND (0.1)	ND (0.2)	ND (0.2)	ND (0.5)
Chemical Oxygen Demand (COD)	-	-	8.94 J	5.03 J	ND (10)	5.09 J+	ND (20)	8.65 J	ND (10)	7.71 J	52.3 J+
Chloride	250	SDWR	3.74	3.43	3.97	13.6	14.1	14	14.4	13.1	14.5
Fluoride	4	MCL	0.464	0.374	0.502	0.327	0.312	0.343	0.354	0.267	0.351
Sulfate	250	SDWR	35.4	30.8	34.2	12.7	10.5	13	14.8	12.2	13.7
Total Organic Halogens	-	-	0.143	-	0.0352 J	-	0.036	-	0.0524 J	-	0.0528
Total Phenols	2	IDNR AL	ND (0.01)	-	ND (0.01)	-	ND (0.01)	-	ND (0.02)	-	ND (0.0204)

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(February 2017)

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Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-06 04/13/2021 N WATER TABLE	MW-06 10/14/2021 N WATER TABLE	MW-06 04/20/2022 N WATER TABLE	MW-06 09/27/2022 N WATER TABLE	MW-06 04/18/2023 N WATER TABLE	MW-06 08/23/2023 N WATER TABLE	MW-06 05/01/2024 N WATER TABLE	MW-06 09/12/2024 N WATER TABLE	MW-06 04/16/2025 N WATER TABLE
Field Parameters											
Temperature (Deg C)	-	-	12.22	18.03	8.47	20.16	13.13	28.77	23.3	17.44	17.05
Conductivity, Field (mS/cm)	-	-	0.732	0.759	0.739	0.682	0.725	0.774	0.698	0.706	0.874
pH, Field (pH units)	6.5-8.5	SDWR	6.13	6.20	7.92	5.28	7.39	7.25	6.89	7.36	6.96
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Dissolved	0.3	SDWR	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.00696 J	0.00978 J	ND (0.05)	0.0122 J	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Manganese, Total	0.3	HAL	0.0557	0.703	0.0729	0.253	0.0149	0.575	0.0712	0.185	0.0721
Sodium, Total	20	HAL	41.4	45.9	39.9	43.2	42.5	44.7	47.1	47.6	45
Strontium, Stable, Total	4	HAL	0.328	0.355	0.33	0.357	0.377	0.386	0.38	0.351	0.384
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.2)	ND (0.5)	ND (0.2) J	ND (0.5)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chemical Oxygen Demand (COD)	-	-	ND (10)	42.8	ND (10)	ND (25)	ND (10) J	4.65 J	ND (10)	7.4 J	6.98 J
Chloride	250	SDWR	13.9	11.1	13.1	12.2	13.9	13.4	12.8	13.1	12.9
Fluoride	4	MCL	0.346	0.422	0.379	0.349	0.344	0.318	0.258	0.336	0.293
Sulfate	250	SDWR	13.2	8.35	12.3	11	15.7	9.62	9.59	12.9	8.61
Total Organic Halogens	-	-	-	0.0339 J	-	-	-	0.0643	-	0.1	-
Total Phenols	2	IDNR AL	-	ND (0.0184)	-	ND (0.02)	-	ND (0.01)	-	0.00477 J	-

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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-06 08/27/2025 N WATER TABLE	MW-07 04/18/2018 N UPPER AQUIFER	MW-07 10/10/2018 N UPPER AQUIFER	MW-07 04/14/2019 N UPPER AQUIFER	MW-07 10/02/2019 N UPPER AQUIFER	MW-07 04/08/2020 N UPPER AQUIFER	MW-07 09/30/2020 N UPPER AQUIFER	MW-07 09/30/2020 FD UPPER AQUIFER	MW-07 04/13/2021 N UPPER AQUIFER
Field Parameters											
Temperature (Deg C)	-	-	21.66	8.40	15.40	10.06	18.12	12.52	15.55	-	12.66
Conductivity, Field (mS/cm)	-	-	0.705	2.337	2.613	2.559	2.542	2.51	4.21	-	2.4
pH, Field (pH units)	6.5-8.5	SDWR	6.75	6.52	5.06	6.74	6.80	6.81	7.17	-	6.24
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	ND (0.1)	0.18	0.108	0.181	0.244	0.243	0.228	0.234	0.204
Iron, Dissolved	0.3	SDWR	ND (0.1)	ND (0.025)	0.297	0.213 R	0.204	7.93	0.801 J	0.223 J	8.8
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	ND (0.05)	0.0872	0.116	0.0916	0.0776	0.0696	0.0784	0.0773	0.0671
Manganese, Total	0.3	HAL	0.138	0.0844	2.33	0.0783	1.76	1.28	1.49	1.46	1.3
Sodium, Total	20	HAL	41.8	64.4	79.1	69.4 J+	57.7	63.4	58.3	59.3	60.9
Strontium, Stable, Total	4	HAL	0.363	1.85 J-	1.82	1.83	1.83	1.93	1.67	1.68	1.57
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.2)	ND (0.1)	0.809 J	0.165 J+	1.07 J+	0.492	0.992	0.958	0.994
Chemical Oxygen Demand (COD)	-	-	4.89 J	ND (20)	ND (20)	7.19 J	ND (10)	48.3	43.9 J+	27.2 J+	8.65 J
Chloride	250	SDWR	9.83	1.37	1.49	1.48	1.38	1.38	1.46	1.41	1.44
Fluoride	4	MCL	0.474	0.312	0.302	0.3	0.345	0.322	0.338	0.338	0.347
Sulfate	250	SDWR	11	1250	1220	1250	1240	1320	1240	1270	1370
Total Organic Halogens	-	-	0.0431 J	-	ND (0.03)	-	ND (0.01)	-	0.0779 J	0.0333 J	-
Total Phenols	2	IDNR AL	ND (0.01)	-	ND (0.01)	-	ND (0.0204)	-	ND (0.02)	ND (0.0204)	-

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(February 2017)

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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-07 04/13/2021 FD UPPER AQUIFER	MW-07 10/14/2021 N UPPER AQUIFER	MW-07 04/20/2022 N UPPER AQUIFER	MW-07 09/27/2022 N UPPER AQUIFER	MW-07 04/18/2023 N UPPER AQUIFER	MW-07 08/23/2023 N UPPER AQUIFER	MW-07 05/01/2024 N UPPER AQUIFER	MW-07 09/11/2024 N UPPER AQUIFER	MW-07 04/16/2025 N UPPER AQUIFER
Field Parameters											
Temperature (Deg C)	-	-	-	15.14	10.46	15.19	15.4	28.99	23.69	26.76	12.29
Conductivity, Field (mS/cm)	-	-	-	2.328	2.59	1.97	2.42	2.48	2.72	2.59	2.750
pH, Field (pH units)	6.5-8.5	SDWR	-	6.53	7.33	5.08	7.23	7.15	6.89	7.15	6.85
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.21	0.192	0.277	0.244	0.317	0.248	0.222	0.254	0.247
Iron, Dissolved	0.3	SDWR	8.84	9.64	8.68	9.63	2.42	2.51	0.0522 J	9.6	ND (0.1)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0676	0.073	0.0829	0.077	0.0573	0.0711	0.0808	0.0734	0.0676
Manganese, Total	0.3	HAL	1.27	1.49	1.46	1.58	0.0543	1.41	0.114	1.78	0.0666
Sodium, Total	20	HAL	62.3	60.2	65.8	62.1	59.1	59.4	63.2	61.8 J-	62.4
Strontium, Stable, Total	4	HAL	1.64	1.74	1.79	1.78	1.81	1.8	1.8	1.73	1.79
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	0.904	0.934	0.979 J	0.918	ND (0.2)	0.703	0.67	1	ND (0.2)
Chemical Oxygen Demand (COD)	-	-	ND (10)	37.4	ND (10)	ND (25)	ND (10) J	5.62 J	ND (10)	18.1	9.58 J
Chloride	250	SDWR	1.41	1.47	1.41	1.37	1.51 J+	1.34	1.2	1.44	1.32
Fluoride	4	MCL	0.344	0.329	0.324	0.288	0.309	0.331	0.275	0.331	0.28
Sulfate	250	SDWR	1390	1440	1340	1320	1330	1350	1300	1430	1240
Total Organic Halogens	-	-	-	ND (0.04)	-	-	-	ND (0.04)	-	0.0601	-
Total Phenols	2	IDNR AL	-	ND (0.0184)	-	ND (0.02)	-	ND (0.01)	-	ND (0.01)	-

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2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level Source	MW-07 08/27/2025 N UPPER AQUIFER	MW-12 04/17/2018 N WATER TABLE	MW-12 10/09/2018 N WATER TABLE	MW-12 04/14/2019 N WATER TABLE	MW-12 10/02/2019 N WATER TABLE	MW-12 04/08/2020 N WATER TABLE	MW-12 10/01/2020 N WATER TABLE	MW-12 04/15/2021 N WATER TABLE	MW-12 10/14/2021 N WATER TABLE
Field Parameters										
Temperature (Deg C)	-	-	19.46	10.60	15.86	7.72	17.42	12.10	15.15	10.52
Conductivity, Field (mS/cm)	-	-	2.48	0.903	0.943	0.945	0.964	0.948	1.51	0.931
pH, Field (pH units)	6.5-8.5	SDWR	6.71	6.46	6.84	6.55	6.75	6.76	6.07	6.54
Inorganic Compounds (mg/L)										
Boron, Total	6	HAL	0.249	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Dissolved	0.3	SDWR	ND (0.1)	0.0121 J	ND (0.025)	0.0629 R	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0805	0.0193 J	ND (0.05)	0.0175 J	ND (0.05)	ND (0.05)	0.0128 J	0.00796 J
Manganese, Total	0.3	HAL	0.705	0.00344 J	ND (0.08)	ND (0.004)	ND (0.005)	0.00282 J	0.00643	ND (0.005)
Sodium, Total	20	HAL	62.6	34.2	34.6	34.9 J+	24.9	34.4	28.4	31.1
Strontium, Stable, Total	4	HAL	1.82	0.513 J-	0.535	0.494	0.594	0.562	0.542	0.443
Other (mg/L)										
Ammonia (as N)	30	IDNR AL	0.37	ND (0.1)	ND (0.1) J	ND (0.139)	ND (0.2)	ND (0.2)	ND (0.5)	0.147 J
Chemical Oxygen Demand (COD)	-	-	ND (10)	ND (20)	5.25 J	7.52 J	8.59 J	11.3	25.5 J+	ND (10)
Chloride	250	SDWR	1.51	5.26	6.92	5.77	5.58	6.08	6.31	6.73
Fluoride	4	MCL	0.363	0.263	0.341	0.282	0.35	0.293	0.331	0.315
Sulfate	250	SDWR	1410	46.6	47.8	48.2	38.9	44	40.7	46.4
Total Organic Halogens	-	-	ND (0.06)	-	0.0231 J	-	0.021 J	-	0.0529	-
Total Phenols	2	IDNR AL	ND (0.01)	-	ND (0.01)	-	ND (0.0196)	-	ND (0.0204)	-

Notes:

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J-: Estimated result, biased low

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3. Results exceeding IDNR Action Levels are highlighted gray.

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MCL: Maximum Contaminant Level (EPA, May 2009)

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5. Surface water samples collected in September 2022/April 2023 were not lab filtered for iron analysis, results are reported as total.

6. Deg C = degrees Celsius; mg/L = milligrams per liter; mS/cm = milliSiemens per centimeter

SUMMARY OF ANALYTICAL RESULTS
 2025 ANNUAL GROUNDWATER MONITORING REPORT
 AMSTED - KEOKUK, IOWA
 PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-12 04/19/2022 N WATER TABLE	MW-12 09/28/2022 N WATER TABLE	MW-12 04/18/2023 N WATER TABLE	MW-12 08/24/2023 N WATER TABLE	MW-12 05/01/2024 N WATER TABLE	MW-12 05/01/2024 FD WATER TABLE	MW-12 09/12/2024 N WATER TABLE	MW-12 04/16/2025 N WATER TABLE	MW-12 08/28/2025 N WATER TABLE
Field Parameters											
Temperature (Deg C)	-	-	10.78	15.68	14.33	20.95	14.64	-	18.66	12.93	17.89
Conductivity, Field (mS/cm)	-	-	0.958	0.975	0.744	0.867	0.77	-	0.815	0.993	0.903
pH, Field (pH units)	6.5-8.5	SDWR	5.56	6.32	7.22	6.71	6.76	-	7.10	6.81	6.66
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Dissolved	0.3	SDWR	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Manganese, Total	0.3	HAL	ND (0.01)	ND (0.01)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)
Sodium, Total	20	HAL	32	24.3	30.8	23.9	28.2	29.1	25.5	29.8	31.3
Strontium, Stable, Total	4	HAL	0.474	0.492	0.49	0.513	0.502	0.499	0.502	0.578	0.677
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.2) J	ND (0.5)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chemical Oxygen Demand (COD)	-	-	9 J	ND (25)	ND (10) J	ND (10)	ND (10)	ND (10)	11.1	14.5	10.4
Chloride	250	SDWR	6.65	7.94	8.24	9.04	9.69	9.54	11	13.9	12.5
Fluoride	4	MCL	0.325	0.353	0.324	0.358	0.297	0.29	0.37	0.292	0.361
Sulfate	250	SDWR	43.3	35.1	45.6	37	42.4	41.7	51.8	56.2	58.9
Total Organic Halogens	-	-	-	0.0339	-	0.099	-	-	0.116	-	0.03 J
Total Phenols	2	IDNR AL	-	ND (0.02)	-	ND (0.01)	-	-	ND (0.01)	-	ND (0.01)

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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-16 04/17/2018 N UPPER AQUIFER	MW-16 10/09/2018 N UPPER AQUIFER	MW-16 04/14/2019 N UPPER AQUIFER	MW-16 10/02/2019 N UPPER AQUIFER	MW-16 04/09/2020 N UPPER AQUIFER	MW-16 10/01/2020 N UPPER AQUIFER	MW-16 04/15/2021 N UPPER AQUIFER	MW-16 10/14/2021 N UPPER AQUIFER	MW-16 04/19/2022 N UPPER AQUIFER
Field Parameters											
Temperature (Deg C)	-	-	7.99	13.71	9.80	16.81	10.59	13.72	11.88	17.32	12.56
Conductivity, Field (mS/cm)	-	-	0.923	1.008	0.907	0.984	0.93	1.55	0.947	0.928	0.992
pH, Field (pH units)	6.5-8.5	SDWR	6.42	6.23	6.72	6.87	6.90	6.31	6.84	6.73	5.83
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.0706	0.0516	0.0638	0.0767 J	0.0504 J	0.079 J	0.066 J	0.0658 J	0.0785 J
Iron, Dissolved	0.3	SDWR	ND (0.025)	0.0454	0.025 R	ND (0.1)	0.159	ND (0.1)	0.137	0.216	0.175
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0703	0.0893	0.0648	0.0617	0.0543	0.0618	0.0512	0.063	0.0684 J+
Manganese, Total	0.3	HAL	0.477	0.091	0.0971	0.0723	0.0578	0.0742	0.0755	0.0735	0.126
Sodium, Total	20	HAL	47.2	64.7	53.1 J+	44.8	47.6	45.1	47.6	49.3	50.9
Strontium, Stable, Total	4	HAL	0.523 J-	0.496	0.485	0.489	0.498	0.451	0.44	0.513	0.488
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.1)	ND (0.1) J	0.135	ND (0.2)	ND (0.2)	ND (0.5)	ND (0.2)	ND (0.5)	ND (0.2) J
Chemical Oxygen Demand (COD)	-	-	4.03 J+	ND (20)	6.31 J	ND (10)	13.4	48.9 J+	ND (10)	25 J	ND (10)
Chloride	250	SDWR	2.98	3.39	4.3	3.45	4.66	3.65	4.37	3.94	4.34
Fluoride	4	MCL	0.4	0.412	0.437	0.461	0.432	0.47	0.469	0.493	0.481
Sulfate	250	SDWR	67.1	62.6	63	69.8	60.2	69.8	65.7	71.9	66.8
Total Organic Halogens	-	-	-	ND (0.03)	-	ND (0.01) J	-	0.0185 J	-	0.0269 J	-
Total Phenols	2	IDNR AL	-	ND (0.01)	-	ND (0.02)	-	ND (0.0196)	-	ND (0.0188)	-

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SDWR: Secondary Drinking Water Regulation (EPA 822-S-12-001;
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(February 2017)5. Surface water samples collected in September 2022/April 2023
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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-16 09/28/2022 N UPPER AQUIFER	MW-16 04/18/2023 N UPPER AQUIFER	MW-16 08/24/2023 N UPPER AQUIFER	MW-16 05/02/2024 N UPPER AQUIFER	MW-16 09/12/2024 N UPPER AQUIFER	MW-16 04/16/2025 N UPPER AQUIFER	MW-16 08/28/2025 N UPPER AQUIFER	MW-20 04/17/2018 N WATER TABLE	MW-20 10/10/2018 N WATER TABLE
Field Parameters											
Temperature (Deg C)	-	-	15.28	14.65	21.28	12.56	20.25	14.38	17.97	11.62	13.77
Conductivity, Field (mS/cm)	-	-	1.13	0.819	0.963	0.861	0.867	1.000	0.925	0.806	0.924
pH, Field (pH units)	6.5-8.5	SDWR	6.52	7.35	6.82	7.09	7.46	7.02	6.87	6.48	9.21
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.0799 J	0.0764 J	0.0769 J	0.0663 J	0.0755 J	ND (0.1)	0.0727 J	0.0201 J	ND (0.05)
Iron, Dissolved	0.3	SDWR	0.113	0.819	0.204	0.0938 J	0.1	0.0737 J	0.13	0.0254	ND (0.025)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.058	0.0498 J	0.0556	0.0626	0.0515	0.0615	0.0598	0.0336 J	0.0566
Manganese, Total	0.3	HAL	0.181	0.0595	0.11	0.117	0.0616	0.0621	0.0713	ND (0.004)	ND (0.08)
Sodium, Total	20	HAL	46.8	51.6	47.7	48	42.6	49.7	49.4	67.7	97.8
Strontium, Stable, Total	4	HAL	0.484	0.525	0.497	0.494	0.425	0.499	0.524	0.329 J-	0.338
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.5)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.1)	ND (0.1) J
Chemical Oxygen Demand (COD)	-	-	ND (25)	ND (10) J	ND (10)	ND (10)	14.5	8.61 J	ND (10) F1	ND (20)	ND (20)
Chloride	250	SDWR	3.36	4.44	4.22	4.36	4.13	5.42	4.18	27.9	34.1
Fluoride	4	MCL	0.436	0.463	0.464	0.394	0.461	0.417	0.477	0.45	0.455
Sulfate	250	SDWR	70.3	72.4	70	68.4	72.2	61.2	68.1	41.3	30.9
Total Organic Halogens	-	-	0.0182	-	ND (0.04)	-	0.0607	-	ND (0.06)	-	0.0158 J
Total Phenols	2	IDNR AL	ND (0.02)	-	ND (0.01)	-	ND (0.01)	-	ND (0.01) F1	-	ND (0.01)

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(February 2017)

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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

	Location Sample Date Sample Type Unit	IDNR Action Level Source	MW-20 04/14/2019 N WATER TABLE	MW-20 10/02/2019 N WATER TABLE	MW-20 04/09/2020 N WATER TABLE	MW-20 10/02/2020 N WATER TABLE	MW-20 04/15/2021 N WATER TABLE	MW-20 10/12/2021 N WATER TABLE	MW-20 10/12/2021 FD WATER TABLE	MW-20 04/20/2022 N WATER TABLE	MW-20 09/28/2022 N WATER TABLE	
Field Parameters												
Temperature (Deg C)		-	-	9.47	16.93	12.26	13.83	12.95	14.99	-	11.02	15.15
Conductivity, Field (mS/cm)		-	-	0.927	0.91	0.939	1.41	0.895	0.672	-	0.889	1.04
pH, Field (pH units)		6.5-8.5	SDWR	6.80	7.07	6.94	6.56	6.72	6.98	-	7.43	6.59
Inorganic Compounds (mg/L)												
Boron, Total		6	HAL	ND (0.05)	0.0305 J	ND (0.1)	0.0308 J	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Dissolved		0.3	SDWR	0.025 R	ND (0.1)	0.0705 J	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Total ⁵		0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total		0.014	IDNR AL	0.0316 J	0.0295 J	0.0291 J	0.0308 J	0.0195 J	0.0251 J	0.0252 J	ND (0.05)	0.0291 J
Manganese, Total		0.3	HAL	ND (0.004)	ND (0.005)	0.00268 J	ND (0.005)	0.005	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)
Sodium, Total		20	HAL	86.9 J+	67.6	82.6	66.2	73.7	66.9	65.6	77.4	71
Strontium, Stable, Total		4	HAL	0.336	0.354	0.376	0.315	0.302	0.299	0.283	0.324	0.345
Other (mg/L)												
Ammonia (as N)		30	IDNR AL	0.12	ND (0.2)	ND (0.2)	ND (0.5)	0.102 J	ND (0.5)	ND (0.5)	ND (0.2) J	ND (0.5)
Chemical Oxygen Demand (COD)		-	-	8.15 J	ND (10)	9.25 J	38.9 J+	ND (10)	33.8	ND (25)	7.5 J	ND (25)
Chloride		250	SDWR	29.7	40.5	34.3	43.7	42.9	45.5	45.4	40	44.9
Fluoride		4	MCL	0.479	0.532	0.526	0.524	0.514	0.565	0.564	0.523	0.49
Sulfate		250	SDWR	61.3	40	63.7	27.8	39.8	26.9	27.2	48.7	24.6
Total Organic Halogens		-	-	-	0.0678 J	-	0.0508	-	0.0588	0.0599	-	0.0385
Total Phenols		2	IDNR AL	-	ND (0.018)	-	ND (0.0196)	-	ND (0.0184)	ND (0.0192)	-	ND (0.02)

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SUMMARY OF ANALYTICAL RESULTS
 2025 ANNUAL GROUNDWATER MONITORING REPORT
 AMSTED - KEOKUK, IOWA
 PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-20 04/19/2023 N WATER TABLE	MW-20 08/23/2023 N WATER TABLE	MW-20 08/23/2023 FD WATER TABLE	MW-20 04/30/2024 N WATER TABLE	MW-20 09/11/2024 N WATER TABLE	MW-20 09/11/2024 FD WATER TABLE	MW-20 04/15/2025 N WATER TABLE	MW-20 08/26/2025 N WATER TABLE	MW-21 04/17/2018 N UPPER AQUIFER
Field Parameters											
Temperature (Deg C)	-	-	13.71	26.75	-	16.12	19.39	-	14.06	20.67	10.41
Conductivity, Field (mS/cm)	-	-	0.802	0.802	-	0.806	0.849	-	1.000	0.925	1.01
pH, Field (pH units)	6.5-8.5	SDWR	7.25	7.40	-	6.92	7.34	-	7.04	6.81	6.20
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.11
Iron, Dissolved	0.3	SDWR	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.025)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0293 J	0.0287 J	0.0296 J	0.0253 J	0.0253 J	0.0306 J	0.0355 J	0.0301 J	0.0507
Manganese, Total	0.3	HAL	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	0.553
Sodium, Total	20	HAL	76.2	66.7	69.2	77.1	67 J-	72 J-	79	73.6	63.9
Strontium, Stable, Total	4	HAL	0.349	0.367	0.365	0.345	0.339	0.373	0.375	0.383	0.719 J-
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2) F1	0.267
Chemical Oxygen Demand (COD)	-	-	5.42 J	5.62 J	2.38 J	ND (10)	12.3	14.1	6.33 J	4.2 J	ND (20)
Chloride	250	SDWR	46.7	48.3	48.1	53.5	58.3	58.1	55.6	63.8	1.4
Fluoride	4	MCL	0.499	0.503	0.498	0.443	0.503	0.497	0.467	0.543	0.36
Sulfate	250	SDWR	40	23.3	23.4	38.1	25.1	25.2	32.7	32.5	45.9
Total Organic Halogens	-	-	-	0.0183 J	0.0193 J	-	0.246 J	0.133 J	-	0.0389 J	-
Total Phenols	2	IDNR AL	-	ND (0.01)	ND (0.01) J	-	ND (0.01)	ND (0.01)	-	ND (0.01)	-

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TABLE 9

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2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-21 10/10/2018 N UPPER AQUIFER	MW-21 04/13/2019 N UPPER AQUIFER	MW-21 10/01/2019 N UPPER AQUIFER	MW-21 04/07/2020 N UPPER AQUIFER	MW-21 04/07/2020 FD UPPER AQUIFER	MW-21 09/30/2020 N UPPER AQUIFER	MW-21 04/14/2021 N UPPER AQUIFER	MW-21 10/12/2021 N UPPER AQUIFER	MW-21 04/20/2022 N UPPER AQUIFER
Field Parameters											
Temperature (Deg C)	-	-	12.59	11.73	16.01	17.78	-	16.04	11.72	17.89	8.95
Conductivity, Field (mS/cm)	-	-	1.056	0.9	0.996	0.75	-	1.32	0.816	0.695	0.963
pH, Field (pH units)	6.5-8.5	SDWR	9.25	6.63	6.87	6.97	-	6.77	5.38	6.66	4.40
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.044 J	0.0567	0.0627 J	0.0375 J	0.0395 J	0.0622 J	0.051 J	ND (0.1)	0.0691 J
Iron, Dissolved	0.3	SDWR	0.0356	0.025 R	ND (0.1)	0.186	0.219	ND (0.1)	0.219	0.0768 J	0.246
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.066	0.0442 J	0.0381 J	0.0409 J	0.0387 J	0.0362 J	0.0328 J	0.0401 J	ND (0.05)
Manganese, Total	0.3	HAL	0.0695 J	0.0676	0.0475	0.0436	0.0459	0.0486	0.0512	0.0217	0.079
Sodium, Total	20	HAL	63.2	62 J+	54.2	54.8	54.8	50.1	51.4	54.5	57.2
Strontium, Stable, Total	4	HAL	0.449	0.463	0.441	0.477	0.494	0.41	0.406	0.44	0.464
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.1) J	0.173	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.5)	ND (0.2)	ND (0.5)	0.0881 J
Chemical Oxygen Demand (COD)	-	-	ND (20)	ND (20)	ND (10)	6.68 J	11.3	36.3 J+	6.11 J	26.6	ND (10)
Chloride	250	SDWR	1.53	1.58	1.86	2.05	2.04	2.2	2.57	2.86	2.98
Fluoride	4	MCL	0.34	0.355	0.393	0.372	0.382	0.393	0.372	0.387	0.392
Sulfate	250	SDWR	31.9	20.7	29.1	19.7	20.3	23.5	18.5	19.7	18.2
Total Organic Halogens	-	-	ND (0.03)	-	ND (0.01)	-	-	0.0214 J	-	0.0348 J	-
Total Phenols	2	IDNR AL	ND (0.01)	-	ND (0.02)	-	-	ND (0.02)	-	ND (0.0192)	-

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SDWR: Secondary Drinking Water Regulation (EPA 822-S-12-001; March 2018)

IDNR AL: Statewide Standards for a Protected Groundwater Source (February 2017)

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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-21 09/29/2022 N UPPER AQUIFER	MW-21 04/18/2023 N UPPER AQUIFER	MW-21 08/23/2023 N UPPER AQUIFER	MW-21 05/01/2024 N UPPER AQUIFER	MW-21 09/11/2024 N UPPER AQUIFER	MW-21 04/15/2025 N UPPER AQUIFER	MW-21 08/26/2025 N UPPER AQUIFER	MW-25 04/17/2018 N WATER TABLE	MW-25 04/17/2018 FD WATER TABLE
Field Parameters											
Temperature (Deg C)	-	-	16.30	17.04	22.32	15.35	18.6	14.77	18.63	11.28	-
Conductivity, Field (mS/cm)	-	-	1.04	0.841	0.841	0.769	0.784	0.917	0.815	1.036	-
pH, Field (pH units)	6.5-8.5	SDWR	6.39	6.97	7.51	6.72	7.20	6.94	6.74	5.79	-
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	ND (0.1)	0.0919 J	0.0652 J	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.134	0.143
Iron, Dissolved	0.3	SDWR	ND (0.1)	0.0792 J	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.0161 J	ND (0.025)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.035 J	0.0346 J	0.0352 J	0.0389 J	0.0298 J	0.0395 J	0.0383 J	0.0427 J	0.039 J
Manganese, Total	0.3	HAL	0.0444	0.161	0.0216	0.0366	0.0215	0.0266	0.0237	0.012 J	0.0346 J
Sodium, Total	20	HAL	51.1	58	52.7	51.6	50 J-	51.7	52.4	51.7	51.5
Strontium, Stable, Total	4	HAL	0.421	0.556	0.458	0.455	0.379	0.434	0.449	0.504 J-	0.52 J-
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.5)	0.11 J	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.1)	0.0604 J
Chemical Oxygen Demand (COD)	-	-	ND (25)	2.27 J	3.03 J	ND (10)	17.5	2.11 J	ND (10)	4.17 J+	6.74 J+
Chloride	250	SDWR	3.16	2.88	4.18	4.77	5.62	5.78	6.6	12.5	12.8
Fluoride	4	MCL	0.335	0.427	0.297	0.313	0.351	0.327	0.384	2.53	2.44
Sulfate	250	SDWR	17.9	32.3	14.9	15.5	17.2	15.4	16.3	62.7	61.1
Total Organic Halogens	-	-	ND (0.06)	-	ND (0.04)	-	0.0346 J	-	0.0151 J	-	-
Total Phenols	2	IDNR AL	ND (0.02)	-	ND (0.01)	-	ND (0.01)	-	ND (0.01)	-	-

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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

	Location Sample Date Sample Type Unit	IDNR Action Level Source	MW-25 10/09/2018 N	MW-25 10/09/2018 FD	MW-25 04/13/2019 N	MW-25 04/13/2019 FD	MW-25 10/01/2019 N	MW-25 10/01/2019 FD	MW-25 04/08/2020 N	MW-25 10/01/2020 N	MW-25 04/14/2021 N
			WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE	WATER TABLE
Field Parameters											
Temperature (Deg C)	-	-	16.38	-	9.79	-	18.34	-	14.27	15.86	10.75
Conductivity, Field (mS/cm)	-	-	1.156	-	0.929	-	1.037	-	0.96	1.8	0.749
pH, Field (pH units)	6.5-8.5	SDWR	7.90	-	6.59	-	6.97	-	6.97	6.32	5.36
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.167	0.17	0.163	ND (0.05)	0.234	0.235	0.188	0.278	0.165
Iron, Dissolved	0.3	SDWR	ND (0.025)	ND (0.025)	0.972 R	1.01	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0737	0.0657	0.0273 J	ND (0.05)	0.0442 J	0.0439 J	0.0358 J	0.0487 J	0.0134 J
Manganese, Total	0.3	HAL	0.277 J	0.0556 J	0.0301	0.00171 J	0.0792	0.0585	0.0545	0.0241	0.0167
Sodium, Total	20	HAL	85.4	94.1	42.3 J+	ND (1)	50	50.8	46.5	49.8	26.5
Strontium, Stable, Total	4	HAL	0.56	0.564	0.483	ND (0.05)	0.542	0.521	0.541	0.551	0.363
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.1) J	0.303 J	0.123	ND (0.1)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.5)	ND (0.2)
Chemical Oxygen Demand (COD)	-	-	ND (20)	ND (20)	6.5 J	ND (20)	5.63 J	ND (10)	12.3	ND (25)	10.7
Chloride	250	SDWR	14.5	14.8	6.5	ND (1)	10.4	10.4	11.6	18	9.36
Fluoride	4	MCL	1.77	1.73	2.53	ND (0.1)	2.01	1.99	2.01	2.09	3.8
Sulfate	250	SDWR	53.3	53	43.2	ND (1)	49.9	49.6	50	57.3	40.7
Total Organic Halogens	-	-	0.0184 J	0.0166 J	-	-	0.0165	0.015	-	0.018 J	-
Total Phenols	2	IDNR AL	ND (0.01)	ND (0.01)	-	-	ND (0.018)	ND (0.02)	-	ND (0.018)	-

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SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level Source	MW-25 10/13/2021 N WATER TABLE	MW-25 04/19/2022 N WATER TABLE	MW-25 09/29/2022 N WATER TABLE	MW-25 04/19/2023 N WATER TABLE	MW-25 08/24/2023 N WATER TABLE	MW-25 04/29/2024 N WATER TABLE	MW-25 04/30/2024 N WATER TABLE	MW-25 09/10/2024 N WATER TABLE	MW-25 04/14/2025 N WATER TABLE
Field Parameters										
Temperature (Deg C)	-	17.05	11.50	14.68	14.4	22.86	15.54	15.57	21.56	11.43
Conductivity, Field (mS/cm)	-	1.065	1.04	1.39	0.812	1.2	0.657	0.606	1.03	1.130
pH, Field (pH units)	6.5-8.5 SDWR	6.79	7.13	6.07	7.22	6.82	7.01	7.04	7.20	7.39
Inorganic Compounds (mg/L)										
Boron, Total	6 HAL	0.26	0.198	0.258	0.207	0.222	0.155	-	0.243	0.183
Iron, Dissolved	0.3 SDWR	ND (0.1)	ND (0.1)	ND (0.1)	0.0711 J	ND (0.1)	-	ND (0.1)	ND (0.1)	ND (0.1)
Iron, Total ⁵	0.3 SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014 IDNR AL	0.0429 J	ND (0.05)	0.0427 J	0.037 J	0.044 J	0.0181 J	-	0.0369 J	0.047 J
Manganese, Total	0.3 HAL	0.0297	0.0937	0.0223	0.00376 J	0.00912	0.0183	-	0.102	0.073
Sodium, Total	20 HAL	53	61.9	59.5	49.8	61.1	26.2	-	63.6 J-	60.3
Strontium, Stable, Total	4 HAL	0.592	0.548	0.563	0.476	0.571	0.387	-	0.507	0.524
Other (mg/L)										
Ammonia (as N)	30 IDNR AL	ND (0.5)	ND (0.2) J	ND (0.5)	ND (0.2)	ND (0.2)	ND (0.2)	-	ND (0.2)	ND (0.2)
Chemical Oxygen Demand (COD)	-	35.6	ND (10)	ND (25)	5.42 J	ND (10)	14.8	-	13.5	3.41 J
Chloride	250 SDWR	22.5	28.1	31.5	22.1	34.4	15.3	-	37.1	25.6
Fluoride	4 MCL	2.4	1.56	2.16	2.38	1.83	4.54	-	1.95	1.55
Sulfate	250 SDWR	60.6	55.3	57.7	61.5	55.8	47.4	-	59.2	49.4
Total Organic Halogens	-	0.0444	-	-	-	0.0341 J	-	-	0.0559	-
Total Phenols	2 IDNR AL	ND (0.0196)	-	ND (0.02)	-	ND (0.01)	-	-	ND (0.01)	-

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2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level Source	MW-25 08/26/2025 N WATER TABLE	MW-25 08/26/2025 FD WATER TABLE	MW-26 04/17/2018 N UPPER AQUIFER	MW-26 10/09/2018 N UPPER AQUIFER	MW-26 04/13/2019 N UPPER AQUIFER	MW-26 10/01/2019 N UPPER AQUIFER	MW-26 04/08/2020 N UPPER AQUIFER	MW-26 10/01/2020 N UPPER AQUIFER	MW-26 04/14/2021 N UPPER AQUIFER	
Field Parameters											
Temperature (Deg C)	-	-	17.86	17.86	13.75	15.12	11.89	18.05	14.50	15.41	14.15
Conductivity, Field (mS/cm)	-	-	1.01	1.01	2.705	2.972	2.854	2.951	2.8	4.86	2.64
pH, Field (pH units)	6.5-8.5	SDWR	6.62	6.62	6.29	7.70	6.55	6.71	6.63	6.21	4.99
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.198	0.201	0.203	0.104	0.2	0.271	0.273	0.26	0.217
Iron, Dissolved	0.3	SDWR	ND (0.1)	ND (0.1)	0.0186 J	0.5	0.025 R	ND (0.1)	1.25	ND (0.1)	1.15
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0462 J	0.0463 J	0.0284 J	ND (0.05)	0.0325 J	0.0177 J	0.0143 J	0.0287 J	0.012 J
Manganese, Total	0.3	HAL	0.099	0.114	4	5.14	2.63	3.45	2.62	3.07	2.72
Sodium, Total	20	HAL	61.6	62.9	89.6	123	87 J+	82.5	85.7	81.1	81.5
Strontium, Stable, Total	4	HAL	0.565	0.567	2.16 J-	2.03	1.92	2.1	2.18	1.82	1.7
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.2) F1	ND (0.2)	1.21	0.951 J	0.825	0.702 J+	0.921	1.18	0.818
Chemical Oxygen Demand (COD)	-	-	5.58 J	3.51 J	5.4 J+	ND (20)	10.8 J	6.68 J	56	37.2 J+	ND (10)
Chloride	250	SDWR	27.5	27.5	2.87	3.06	2.87	3	2.91	2.9	2.94
Fluoride	4	MCL	1.93	1.92	0.201	0.189	0.37	0.213	0.255	0.234	0.248
Sulfate	250	SDWR	53.6	53.6	1390	1330	1420	1370	1430	1410	1390
Total Organic Halogens	-	-	0.0286 J	0.0306 J	-	ND (0.03)	-	ND (0.01) J	-	0.0724	-
Total Phenols	2	IDNR AL	ND (0.01)	ND (0.01)	-	ND (0.01)	-	ND (0.0208)	-	ND (0.0184)	-

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AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-26 10/13/2021 N UPPER AQUIFER	MW-26 04/19/2022 N UPPER AQUIFER	MW-26 09/29/2022 N UPPER AQUIFER	MW-26 04/19/2023 N UPPER AQUIFER	MW-26 08/24/2023 N UPPER AQUIFER	MW-26 04/29/2024 N UPPER AQUIFER	MW-26 04/30/2024 N UPPER AQUIFER	MW-26 09/10/2024 N UPPER AQUIFER	MW-26 04/15/2025 N UPPER AQUIFER
Field Parameters											
Temperature (Deg C)	-	-	16.94	11.70	13.56	15.15	23.42	16.5	18.82	20.98	11.77
Conductivity, Field (mS/cm)	-	-	2.742	2.86	3.24	2.8	2.94	2.97	3.05	2.9	3.110
pH, Field (pH units)	6.5-8.5	SDWR	6.41	7.04	5.92	6.89	6.55	6.65	6.70	7.02	6.58
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.177	0.285	0.248	0.358	0.275	0.202	-	0.298	0.295
Iron, Dissolved	0.3	SDWR	1.58	1.53	1.86	1.85	1.94	-	1.99	1.77	2.13
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0147 J	ND (0.05)	0.021 J	ND (0.05)	ND (0.05)	0.0301 J	-	ND (0.05)	ND (0.05)
Manganese, Total	0.3	HAL	2.5	2.67	3.39	3.35	2.83	3.02	-	2.54	2.81
Sodium, Total	20	HAL	74.7	81.3	81.3	86.7	83.1	86.1	-	77.6 J-	84.9
Strontium, Stable, Total	4	HAL	1.59	1.88	1.92	2.08	1.97	1.94	-	1.73	2.03
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	0.93	1.03 J	1.32	1.26	1.19	1.11	-	1.11	1.19
Chemical Oxygen Demand (COD)	-	-	ND (25)	7.5 J	ND (25)	3.53 J	ND (10)	9.67 J	-	18.4	7.63 J
Chloride	250	SDWR	3.04	3.04	2.8	2.84	2.85	2.7	-	2.88	2.75
Fluoride	4	MCL	0.23	0.245	0.187	0.228	0.2	0.158	-	0.209	0.124 J
Sulfate	250	SDWR	1600	1440	1450	1500	1500	1480	-	1520	1370
Total Organic Halogens	-	-	0.0388 J	-	-	-	ND (0.04)	-	-	0.0272 J	-
Total Phenols	2	IDNR AL	ND (0.0204)	-	ND (0.02)	-	ND (0.01)	-	-	ND (0.01)	-

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AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-26 04/15/2025 FD UPPER AQUIFER	MW-26 08/26/2025 N UPPER AQUIFER	MW-27 04/18/2018 N UPPER AQUIFER	MW-27 10/09/2018 N UPPER AQUIFER	MW-27 04/13/2019 N UPPER AQUIFER	MW-27 10/01/2019 N UPPER AQUIFER	MW-27 04/09/2020 N UPPER AQUIFER	MW-27 10/01/2020 N UPPER AQUIFER	MW-27 04/14/2021 N UPPER AQUIFER
Field Parameters											
Temperature (Deg C)	-	-	-	21.36	10.28	15.38	11.98	16.39	11.73	14.31	13.26
Conductivity, Field (mS/cm)	-	-	-	2.81	1.206	1.354	1.312	1.299	1.3	2.11	1.24
pH, Field (pH units)	6.5-8.5	SDWR	-	6.57	6.45	7.61	6.55	6.81	6.55	6.28	5.24
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.299	0.286	0.15	0.142	0.152	0.172	0.152	0.177	0.144
Iron, Dissolved	0.3	SDWR	2.13	2.09	ND (0.025)	0.377	0.025 R	ND (0.1)	2.56	ND (0.1)	2.32
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	ND (0.05)	0.0235 J	0.0566	0.077	0.0584	0.0516	0.0466 J	0.0525	0.041 J
Manganese, Total	0.3	HAL	2.87	2.58	0.139	0.186	0.138	0.134	0.147	0.128	0.114
Sodium, Total	20	HAL	85.3	85.3	44.8	59.1	46.6 J+	41.4	43.6	41.3	40.7
Strontium, Stable, Total	4	HAL	2.05	2.09	0.826 J-	0.787	0.826	0.828	0.845	0.733	0.681
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	1.19	1.07	1.49	1.52 J	1.54	1.82	1.48	1.44	1.42
Chemical Oxygen Demand (COD)	-	-	8.61 J	8 J	ND (20)	ND (20)	4.14 J	ND (10)	7.2 J	30.5 J+	ND (10)
Chloride	250	SDWR	2.74	3.03	1.56	1.81	1.61	1.78	1.73	1.79	1.8
Fluoride	4	MCL	0.182 J	0.256	0.29	0.283	0.333	0.34	0.354	0.358	0.391
Sulfate	250	SDWR	1330	1450	263	263	266	268	264	275	264
Total Organic Halogens	-	-	-	ND (0.075)	-	0.0139 J	-	ND (0.01) J	-	0.0175 J	-
Total Phenols	2	IDNR AL	-	ND (0.01)	-	ND (0.01)	-	ND (0.0188)	-	ND (0.0184)	-

Notes:

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R: Rejected during validation

3. Results exceeding IDNR Action Levels are highlighted gray.

4. HAL: Health Advisory Level (EPA 822-S-12-001; March 2018)

MCL: Maximum Contaminant Level (EPA, May 2009)

SDWR: Secondary Drinking Water Regulation (EPA 822-S-12-001;
March 2018)IDNR AL: Statewide Standards for a Protected Groundwater Source
(February 2017)5. Surface water samples collected in September 2022/April 2023
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milliSiemens per centimeter

TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	MW-27 10/13/2021 N UPPER AQUIFER	MW-27 04/20/2022 N UPPER AQUIFER	MW-27 04/20/2022 FD UPPER AQUIFER	MW-27 09/28/2022 N UPPER AQUIFER	MW-27 09/28/2022 FD UPPER AQUIFER	MW-27 04/19/2023 N UPPER AQUIFER	MW-27 04/19/2023 FD UPPER AQUIFER	MW-27 08/24/2023 N UPPER AQUIFER	MW-27 05/01/2024 N UPPER AQUIFER
Field Parameters											
Temperature (Deg C)	-	-	15.20	11.21	-	13.82	-	14.05	-	19.37	22.31
Conductivity, Field (mS/cm)	-	-	0.951	1.32	-	1.46	-	1.18	-	1.33	1.05
pH, Field (pH units)	6.5-8.5	SDWR	6.66	3.62	-	6.38	-	6.98	-	6.59	6.81
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.117	0.153	0.159	0.168	0.159	0.183	0.183	0.165	0.163
Iron, Dissolved	0.3	SDWR	2.2	2.62	3.2	2.56	2.53	3.11	2.93	2.34	2.38
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	0.0391 J	ND (0.0556)	ND (0.0543)	0.0479 J	0.0411 J	0.0553	0.051	0.0447 J	0.0516
Manganese, Total	0.3	HAL	0.135	0.131	0.137	0.22	0.233	0.153	0.149	0.162	0.146
Sodium, Total	20	HAL	37.7	42.8	43.8	43.4	43.8	43.9	43.6	43.6	44.8
Strontium, Stable, Total	4	HAL	0.611	0.7	0.726	0.753	0.749	0.797	0.794	0.764	0.8
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	1.32	1.4 J	1.38 J	1.27	1.5	1.37	1.37	1.37	1.36
Chemical Oxygen Demand (COD)	-	-	ND (25)	ND (10)	ND (10)	42.6	44.9	ND (10) J	ND (10) J	ND (10)	7.36 J
Chloride	250	SDWR	1.81	1.79	1.8	1.74	1.77	1.8	1.79	1.66	1.58
Fluoride	4	MCL	0.312	0.335	0.334	0.288	0.269	0.356	0.362	0.303	0.259
Sulfate	250	SDWR	270	275	262	261	261	257	260	254	249
Total Organic Halogens	-	-	ND (0.04)	-	-	-	-	-	-	0.0222 J	-
Total Phenols	2	IDNR AL	ND (0.0192)	-	-	ND (0.02)	ND (0.02)	-	-	ND (0.01)	-

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3. Results exceeding IDNR Action Levels are highlighted gray.

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(February 2017)5. Surface water samples collected in September 2022/April 2023
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SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

	Location Sample Date Sample Type Unit	IDNR Action Level Source	MW-27 09/11/2024 N UPPER AQUIFER	MW-27 04/16/2025 N UPPER AQUIFER	MW-27 08/27/2025 N UPPER AQUIFER	SW-01 04/16/2018 N SURFACE WATER	SW-01 10/08/2018 N SURFACE WATER	SW-01 04/13/2019 N SURFACE WATER	SW-01 09/30/2019 N SURFACE WATER	SW-01 04/07/2020 N SURFACE WATER	SW-01 10/02/2020 N SURFACE WATER	
Field Parameters												
Temperature (Deg C)		-	-	20.88	16.07	19.72	7.89	18.67	9.73	23.51	13.50	15.20
Conductivity, Field (mS/cm)		-	-	1.22	1.330	1.22	0.523	0.486	0.339	0.447	0.446	0.765
pH, Field (pH units)		6.5-8.5	SDWR	7.15	6.70	6.69	7.25	7.81	6.66	7.39	7.14	7.09
Inorganic Compounds (mg/L)												
Boron, Total		6	HAL	0.177	0.16	0.156	0.253	0.229	0.199	0.239	0.193	0.301
Iron, Dissolved		0.3	SDWR	2.52	2.5	2.4	0.21	0.379	1.35 J+	0.298	4.06	ND (0.1)
Iron, Total ⁵		0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total		0.014	IDNR AL	0.0438 J	0.0485 J	0.0518	ND (0.05)	0.0159	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Manganese, Total		0.3	HAL	0.141	0.129	0.145	0.375	0.184	0.51	0.275	0.817	0.533
Sodium, Total		20	HAL	41.9 J-	41.8	44.1	19.6	14.8 J	19.4	12.3	19.8	13.1
Strontium, Stable, Total		4	HAL	0.695	0.765	0.786	0.252	0.201	0.209	0.174	0.253	0.206
Other (mg/L)												
Ammonia (as N)		30	IDNR AL	1.34	1.38	1.32	0.212	0.271 J	0.298 J+	2.78	0.281	0.483 J
Chemical Oxygen Demand (COD)		-	-	7.11 J	7.31 J	5.58 JF1	11.5 J	15.1 J	4.45 J	20.3	20.1	35.6 J+
Chloride		250	SDWR	1.79	1.72	1.9	13.7	7.22	18.5	10.8	14.5	8.78
Fluoride		4	MCL	0.322	0.284	0.34	0.636	0.374	0.988	0.569	0.944	1.14
Sulfate		250	SDWR	269	252	256	56.2	26.3	27	37	29.7	16.9
Total Organic Halogens		-	-	0.0525	-	ND (0.06)	-	ND (0.03)	-	0.0125 J	-	0.0385 J
Total Phenols		2	IDNR AL	ND (0.01)	-	ND (0.01)	-	ND (0.01)	-	ND (0.0204)	-	ND (0.0192)

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3. Results exceeding IDNR Action Levels are highlighted gray.

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(February 2017)

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were not lab filtered for iron analysis, results are reported as total.

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milliSiemens per centimeter

TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	SW-01 04/13/2021 N SURFACE WATER	SW-01 10/14/2021 N SURFACE WATER	SW-01 04/19/2022 N SURFACE WATER	SW-01 09/27/2022 N SURFACE WATER	SW-01 04/18/2023 N SURFACE WATER	SW-01 08/22/2023 N SURFACE WATER	SW-01 04/30/2024 N SURFACE WATER	SW-01 09/10/2024 N SURFACE WATER	SW-01 04/14/2025 N SURFACE WATER
Field Parameters											
Temperature (Deg C)	-	-	13.50	18.45	7.30	18.05	12.34	23.77	16.82	22	13.36
Conductivity, Field (mS/cm)	-	-	0.447	0.482	0.509	0.445	0.454	0.536	0.452	0.371	0.549
pH, Field (pH units)	6.5-8.5	SDWR	7.31	7.77	6.82	7.00	7.58	7.19	7.58	7.07	8.09
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.2	0.187	0.155	0.251	0.205	0.528	0.208	0.154	0.176
Iron, Dissolved	0.3	SDWR	ND (0.1)	1.34	ND (0.1)	-	-	0.276	0.0828 J	ND (0.1)	ND (0.1)
Iron, Total ⁵	0.3	SDWR	-	-	-	1.62	1.44	-	-	-	-
Lithium, Total	0.014	IDNR AL	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Manganese, Total	0.3	HAL	0.254	0.245	0.34	0.572	0.497	0.71	0.308	0.228	0.258
Sodium, Total	20	HAL	14.3	16.9	18.2	19.7	19.7	25.2	19.3	21 J-	25.5
Strontium, Stable, Total	4	HAL	0.202	0.168	0.23	0.213	0.219	0.165	0.233	0.138	0.215
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	0.17 J	ND (0.5)	0.147 J	0.399 J	0.212	7.68	0.23	0.128 J	0.172 J
Chemical Oxygen Demand (COD)	-	-	14.3	42.8	11	ND (25)	2.58 J	5.07 J	ND (10)	19.6	10.9
Chloride	250	SDWR	10.7	18.6	13.3	21.8	15.1	26.1	13.7	30.5	29.4
Fluoride	4	MCL	0.742	0.842	0.566	0.901	0.82	0.887	0.57	0.823	0.581
Sulfate	250	SDWR	31.3	33.1	38	29.5	38.8	69.2	43.5	36.6	45.3
Total Organic Halogens	-	-	-	0.0167 J	-	0.0212	-	0.0208 J	-	0.0657	-
Total Phenols	2	IDNR AL	-	ND (0.0196)	-	ND (0.02)	-	ND (0.01)	-	ND (0.01)	-

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(February 2017)

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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	SW-01 08/26/2025 N SURFACE WATER	SW-02 04/16/2018 N SURFACE WATER	SW-02 10/08/2018 N SURFACE WATER	SW-02 04/13/2019 N SURFACE WATER	SW-02 09/30/2019 N SURFACE WATER	SW-02 04/07/2020 N SURFACE WATER	SW-02 10/02/2020 N SURFACE WATER	SW-02 04/13/2021 N SURFACE WATER	SW-02 10/14/2021 N SURFACE WATER
Field Parameters											
Temperature (Deg C)	-	-	21.15	8.57	18.54	15.94	23.00	18.47	10.25	9.20	17.54
Conductivity, Field (mS/cm)	-	-	0.444	0.79	0.586	0.545	0.355	0.56	0.936	0.547	0.464
pH, Field (pH units)	6.5-8.5	SDWR	7.37	6.91	8.18	8.18	9.06	7.18	7.18	8.30	8.10
Inorganic Compounds (mg/L)											
Boron, Total	6	HAL	0.139	0.193	0.135	0.167	0.144	0.145	0.224	0.101	0.173
Iron, Dissolved	0.3	SDWR	0.0486 J	0.0319	0.191	1.04 J+	ND (0.1)	1.14	0.0712 J	ND (0.1)	0.408
Iron, Total ⁵	0.3	SDWR	-	-	-	-	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	ND (0.05)	0.0103 J	ND (0.05)	ND (0.05)	0.0103 J	ND (0.05)	0.00972 J	ND (0.05)	0.00794 J
Manganese, Total	0.3	HAL	0.196	0.506	0.188	0.35	0.091	0.417	0.292	0.0882	0.195
Sodium, Total	20	HAL	19.5	71.2	40.6	47.9	24.4	41	35.6	33.9	33.7
Strontium, Stable, Total	4	HAL	0.193	0.254	0.237	0.258	0.169	0.217	0.203	0.13	0.177
Other (mg/L)											
Ammonia (as N)	30	IDNR AL	ND (0.2)	0.452	0.554 J	0.381 J+	0.323 J+	0.16 J	ND (0.5)	0.29	ND (0.5)
Chemical Oxygen Demand (COD)	-	-	7.65 J	14.4 J	14.1 J	16.2 J	11.8	36.5	47.3 J+	10.2	41
Chloride	250	SDWR	30.3	13.4 J+	31.8	61.7	27.7	50	47.2	42.1	46.4
Fluoride	4	MCL	0.909	0.505	0.326	0.507	0.382	0.806	0.484	0.332	0.404
Sulfate	250	SDWR	44.5	56.3	31.4	35.7	30.7	39.2	25.3	32	34.9
Total Organic Halogens	-	-	0.0419 J	-	0.0162 J	-	0.015	-	0.0669	-	0.0439
Total Phenols	2	IDNR AL	ND (0.01) F1	-	ND (0.01)	-	ND (0.0204)	-	ND (0.0188)	-	ND (0.018)

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(February 2017)

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TABLE 9

SUMMARY OF ANALYTICAL RESULTS

2025 ANNUAL GROUNDWATER MONITORING REPORT

AMSTED - KEOKUK, IOWA

PERMIT NO. 56-SDP-15-89-91C

Location Sample Date Sample Type Unit	IDNR Action Level	Action Level Source	SW-02 04/19/2022 N SURFACE WATER	SW-02 09/27/2022 N SURFACE WATER	SW-02 04/18/2023 N SURFACE WATER	SW-02 08/22/2023 N SURFACE WATER	SW-02 04/30/2024 N SURFACE WATER	SW-02 09/10/2024 N SURFACE WATER	SW-02 04/14/2025 N SURFACE WATER	SW-02 08/26/2025 N SURFACE WATER
Field Parameters										
Temperature (Deg C)	-	-	5.12	15.72	10.17	27.59	17.1	22.37	16.02	19.39
Conductivity, Field (mS/cm)	-	-	0.721	0.33	0.595	0.745	0.365	0.71	0.690	0.496
pH, Field (pH units)	6.5-8.5	SDWR	8.48	8.30	6.71	7.96	8.21	6.78	7.20	7.66
Inorganic Compounds (mg/L)										
Boron, Total	6	HAL	0.0828 J	0.127	0.116	0.267	0.283	ND (0.1)	0.162	0.248
Iron, Dissolved	0.3	SDWR	ND (0.1)	-	-	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.0493 J
Iron, Total ⁵	0.3	SDWR	-	0.359	0.682	-	-	-	-	-
Lithium, Total	0.014	IDNR AL	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Manganese, Total	0.3	HAL	0.624	0.164	0.741	0.229	0.135	0.0427	0.622	0.109
Sodium, Total	20	HAL	44.1	36.4	39.3	35.2	31.6	25.4 J-	46.7	32.3
Strontium, Stable, Total	4	HAL	0.255	0.156	0.251	0.223	0.193	0.103	0.251	0.236
Other (mg/L)										
Ammonia (as N)	30	IDNR AL	0.117 J	0.307 J	0.191 J	0.134 J	0.89	0.097 J	0.178 J	1.57
Chemical Oxygen Demand (COD)	-	-	18	ND (25)	6.69 J	ND (10)	6.73 J	18.7	14.1	21.1
Chloride	250	SDWR	60.5	47.6	48.4	49.7	34.5	44.2	58.4	44.8
Fluoride	4	MCL	0.371	0.416	0.494	0.561	0.348	0.599	0.374	1.1
Sulfate	250	SDWR	38.9	37.4	40	30.6	40.5	53.5	32.2	29.6
Total Organic Halogens	-	-	-	-	-	0.0257 J	-	0.154	-	0.0394 J
Total Phenols	2	IDNR AL	-	ND (0.02)	-	ND (0.01)	-	ND (0.01)	-	ND (0.01)

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TABLE 10
HISTORICAL CONTROL LIMIT ACTION LEVEL EXCEEDANCES
2025 ANNUAL WATER QUALITY REPORT
GRIFFIN WHEEL - KEOKUK, IOWA
PERMIT NO. 56-SDP-15-89-91C

Key: 1 = exceeds control limit; 2 = exceeds action level		S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L
Well	Constituent	2018	2018	2019	2019	2020	2020	2021	2021	2022	2022	2023	2023	2024	2024	2025	2025
MW-5	Manganese		1			1	1				1						
	Lithium	2	1&2	2	2	2	2	2	2		2	2	2	2	2	2	2
	Sodium	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Temperature														1		
	pH (Field)	2	2				2	1&2		1&2	2						
MW-6	Chemical Oxygen Demand						1		1								
	Conductivity (Field)						1										
	Lithium	2		2	2												
	Manganese	1	1&2	1	1	1	1&2	1	1&2	1	1		1&2	1	1	1	1
	Sodium	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Temperature												1	1			
	pH (Field)	1&2						2	2		1&2						
MW-7	Ammonia		1		1		1	1	1	1	1		1	1	1		
	Boron	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Chemical Oxygen Demand					1	1		1								
	Conductivity (Field)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Temperature (Field)												1	1	1		
	Iron					1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2		1&2		
	Lithium	1&2	1&2	1&2	2	2	2	2	2	1&2	2	2	2	1&2	2	2	1&2
	Manganese		1&2		1&2	1&2	1&2	1&2	1&2	1&2	1&2		1&2		1&2		1&2
	pH (Field)		1&2					2		1&2							
	Sodium	1&2	1&2	1&2	2	1&2	2	2	2	1&2	2	2	2	1&2	2	2	2
	Strontium	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Sulfate	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2
	Total Organic Halogens						1										
MW-12	Lithium	2		2													
	Sodium	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	pH (Field)	2					2			2	2						
MW-16	Lithium	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Sodium	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	pH (Field)	2	2				2			2							
	Iron											2					
	Manganese	2															
MW-20	Sodium	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Lithium	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2
	Total Organic Halogens														1		
	pH (Field)	2	2														
MW-21	Boron	1															
	Lithium	2	2	2	2	2	2	2	2		2	2	2	2	2	2	2
	Sodium	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	pH (Field)	2	2					2		2	2						
	Chloride																1
	Manganese	2															
MW-25	Boron		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Conductivity (Field)						1				1						
	Fluoride	1	1	1	1	1	1	1	1	1	1	1	1	1&2	1	1	1
	pH (Field)	2					2	1&2			2						
	Temperature (Field)												1				
	Lithium	2	1&2	2	2	2	2		2		2	2	2	2	2	2	2
	Sodium	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Chemical Oxygen Demand								1								
	Sulfate	1															
	Manganese		1		1	1				1					1	1	1

Key: 1 = exceeds control limit; 2 = exceeds action level		S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L	S P R I N G	F A L L
Well	Constituent	2018	2018	2019	2019	2020	2020	2021	2021	2022	2022	2023	2023	2024	2024	2025	2025
MW-26	Ammonia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Boron	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Chemical Oxygen Demand					1	1							1	1		
	Conductivity (Field)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Temperature (Field)												1				
	Iron		1&2			1&2		1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2
	Manganese	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2
	Lithium	2		2	2	2	2		2		2			2			2
	pH (Field)	2					2	1&2	2		2						
	Sodium	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2
	Strontium	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Sulfate	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2
	Total Organic Halogens						1										1
MW-27	Ammonia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Boron	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Chemical Oxygen Demand										1					1	
	Conductivity (Field)		1	1	1	1	1			1	1		1			1	
	Temperature (Field)													1			
	Iron		2			1&2		1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2
	Lithium	2	2	2	2	2	2	2	2			2	2	2	2	2	2
	pH (Field)	2					2	2		1&2	2						
	Strontium	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Sodium	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Sulfate	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2
SW-1	Iron		2	2		2			2		2	2					
	Lithium		2														
	Sodium												2		2	2	
	Manganese	2		2		2	2			2	2	2	2	2			
SW-2	Chemical Oxygen Demand						1		1								
	Chloride			1		1	1	1	1	1	1	1	1	1	1	1	1
	Conductivity (Field)	1					1			1			1		1	1	
	Iron			2		2			2		2						
	Manganese	2		2		2				2		2				2	
	Temperature (Field)												1				
	pH (Field)		1	1	1&2			1	1	1	1			1			
	Sodium	1&2	1&2	1&2	2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	1&2	2	1&2	1&2
	Total Organic Halogens														1		

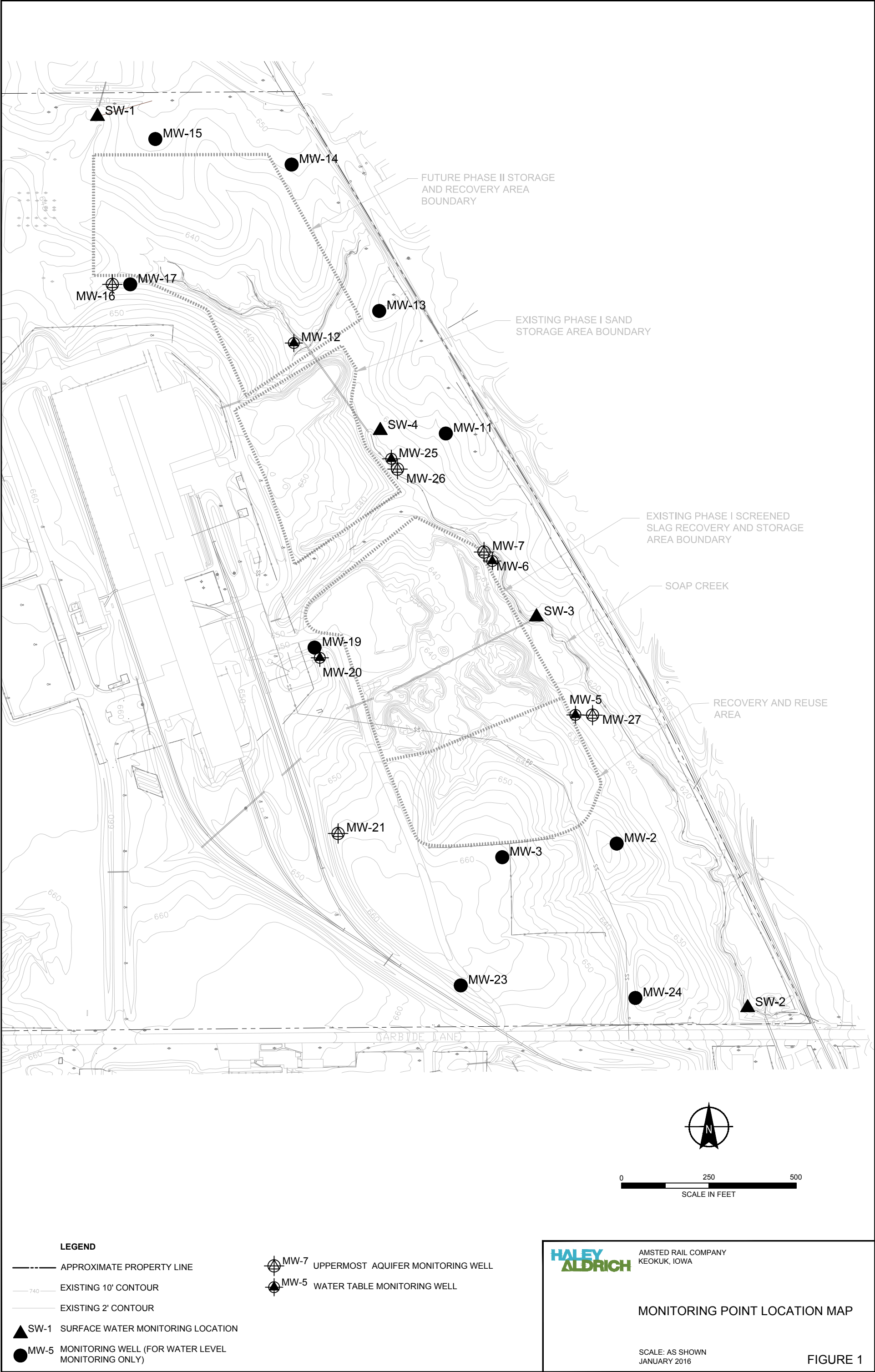
If the control limit and action level are both exceeded, the box is highlighted in black.
 Comments: (insert clarifications or notes as needed)

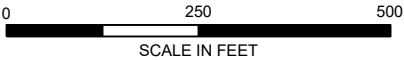
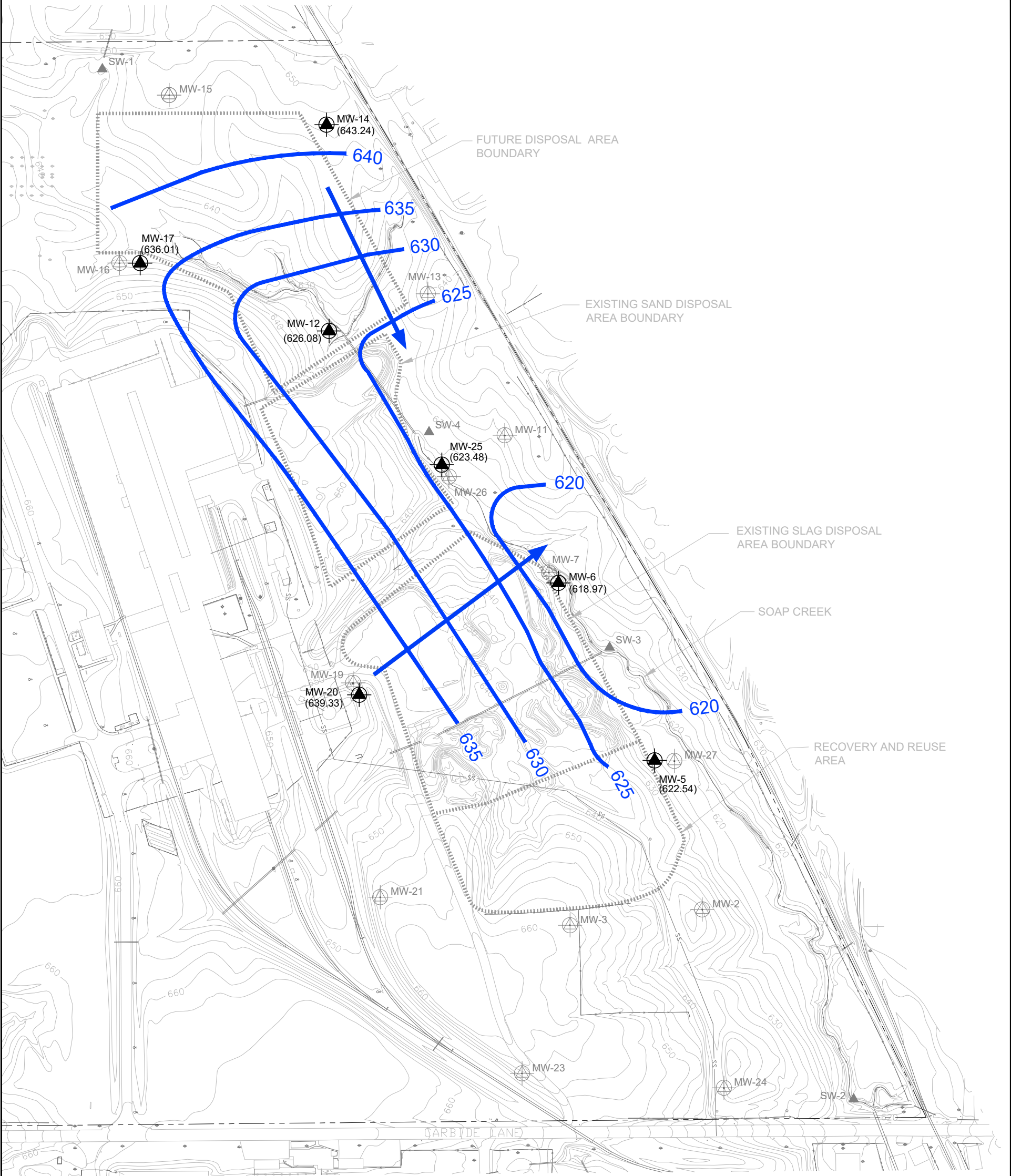
This worksheet:
 1) Summarizes the historical extent of groundwater impacts,
 2) Tracks GWQAP effectiveness, and
 3) Potentially highlights sequential degradation of
 contaminants of concern.

Month	Maximum Head on Liner (ft)	Leachate Collected (gal)	Volume Utilized for Dust Control (gal)	Discharge to
Leachate management system is not applicable for this Site.				

Monitoring Points			Methane Results (% LEL)
Name	Type	Description	Date
Gas monitoring is not applicable for this Site.			

FIGURES





LEGEND

	APPROXIMATE PROPERTY LINE		WATER TABLE MONITORING WELL
	EXISTING 10' CONTOUR		UPPER MOST AQUIFER MONITORING WELL (NOT USED)
	EXISTING 2' CONTOUR		GROUNDWATER ELEVATION (MEASURED 14 APRIL 2025)
	POTENTIOMETRIC SURFACE CONTOUR (INTERVAL 5 FT)		SURFACE WATER MONITORING LOCATION
	INFERRED SURFACE CONTOUR		
	GROUNDWATER FLOW DIRECTION		

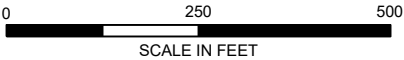
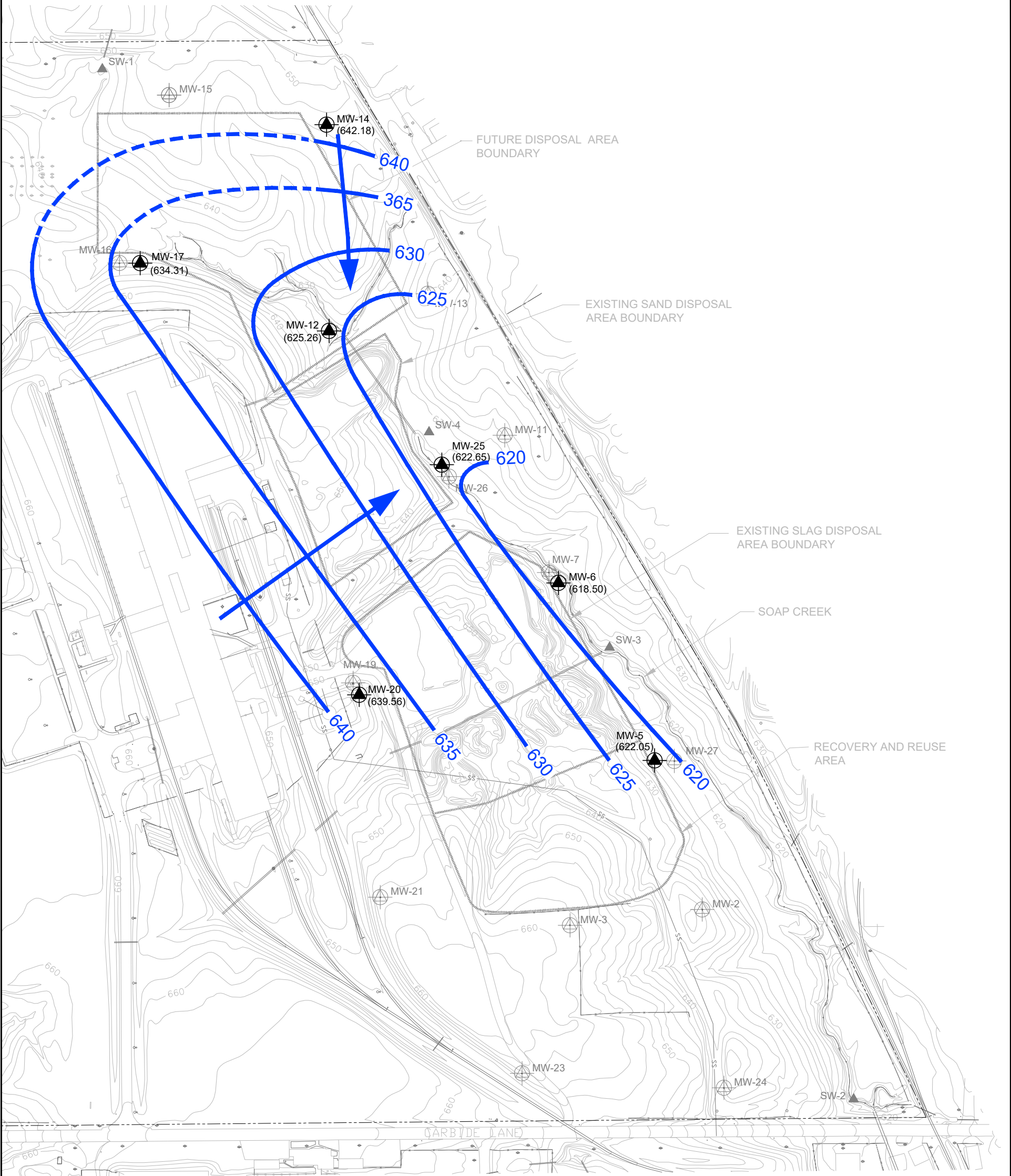


AMSTED RAIL COMPANY
KEOKUK PLANT
KEOKUK, IOWA

WATER TABLE ELEVATIONS
APRIL 2025

SCALE: AS SHOWN
AUGUST 2025

FIGURE 2



LEGEND

---	APPROXIMATE PROPERTY LINE	MW-5	WATER TABLE MONITORING WELL
---	EXISTING 10' CONTOUR	MW-23	UPPER MOST AQUIFER MONITORING WELL (NOT USED)
---	EXISTING 2' CONTOUR	(639.56)	GROUNDWATER ELEVATION (MEASURED 25 AUGUST 2025)
---	POTENTIOMETRIC SURFACE CONTOUR (INTERVAL 5 FT)	SW-2	SURFACE WATER MONITORING LOCATION
---	INFERRED SURFACE CONTOUR		
---	GROUNDWATER FLOW DIRECTION		

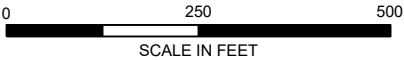
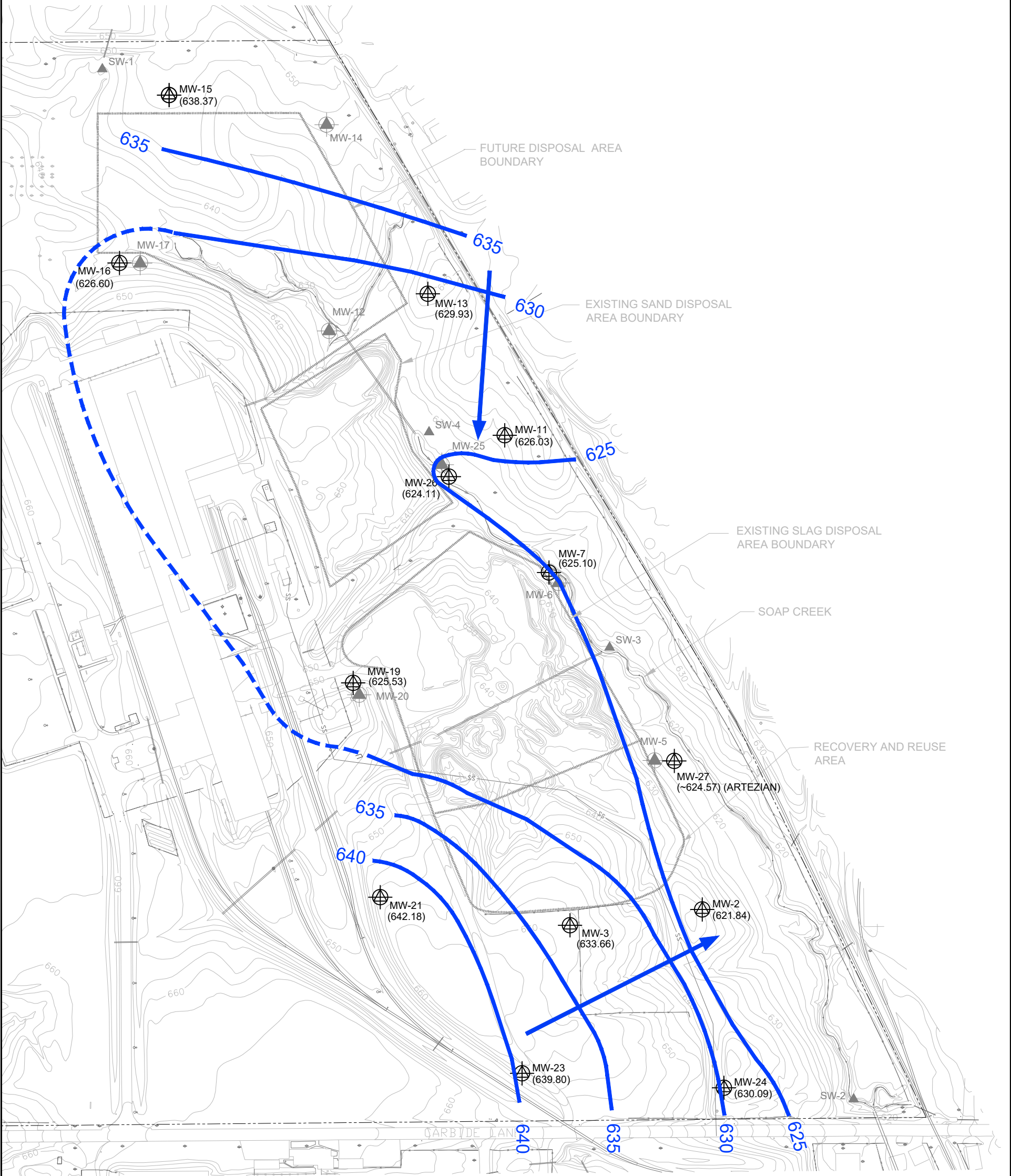
HALEY
ALDRICH

AMSTED RAIL COMPANY
KEOKUK PLANT
KEOKUK, IOWA

WATER TABLE ELEVATIONS
AUGUST 2025

SCALE: AS SHOWN
NOVEMBER 2025

FIGURE 3



LEGEND

---	APPROXIMATE PROPERTY LINE	MW-5	WATER TABLE MONITORING WELL
---	EXISTING 10' CONTOUR	MW-23	UPPER MOST AQUIFER MONITORING WELL
---	EXISTING 2' CONTOUR	(639.80)	GROUNDWATER ELEVATION (MSL)
---	POTENTIOMETRIC SURFACE CONTOUR (INTERVAL 5 FT)	(639.80)	GROUNDWATER ELEVATION (MEASURED 14 APRIL 2025)
---	INFERRED SURFACE CONTOUR	SW-2	SURFACE WATER MONITORING LOCATION
---	GROUNDWATER FLOW DIRECTION		

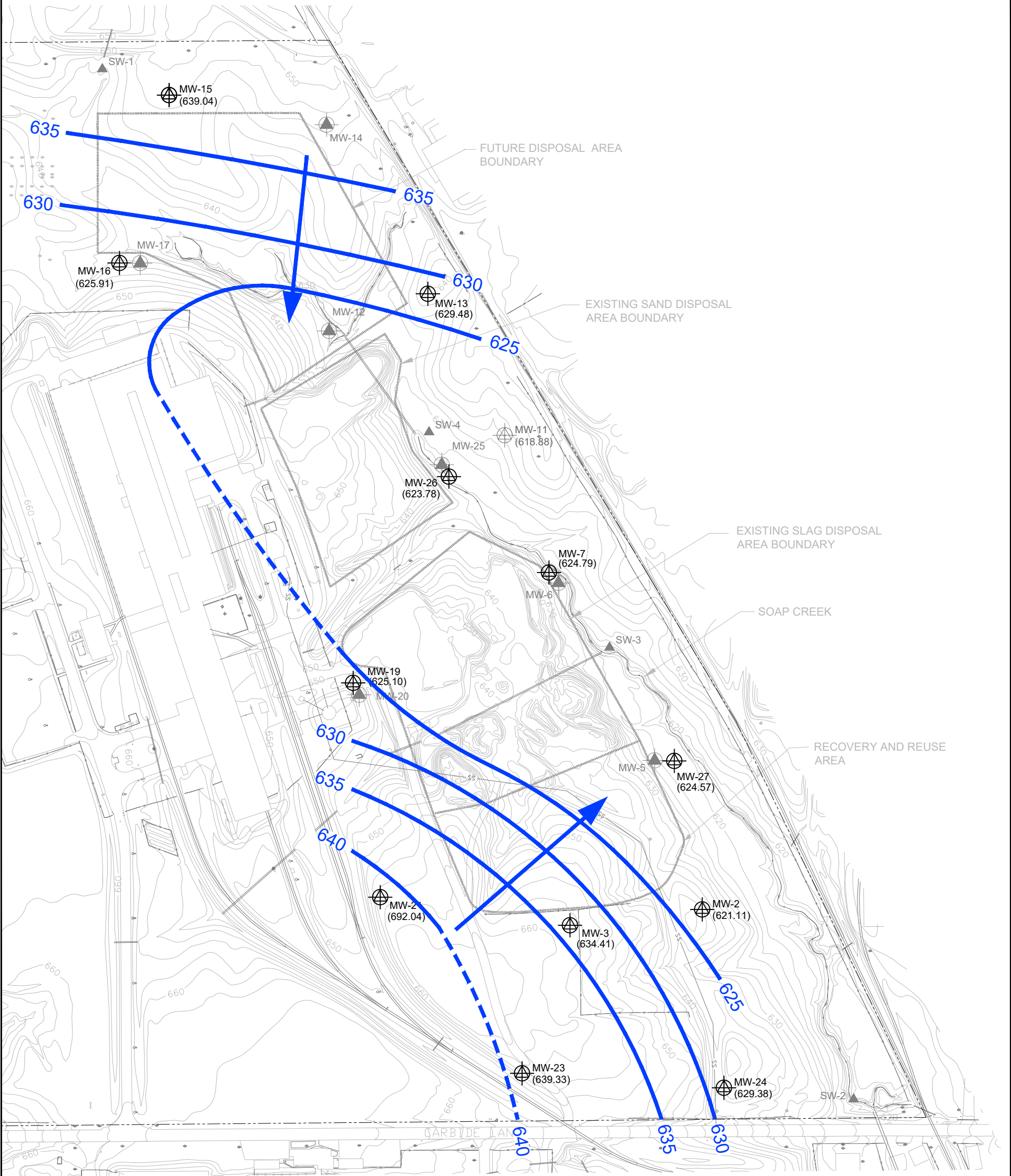


AMSTED RAIL COMPANY
KEOKUK PLANT
KEOKUK, IOWA

UPPER MOST AQUIFER ELEVATIONS
APRIL 2025

SCALE: AS SHOWN
AUGUST 2025

FIGURE 4



LEGEND

- APPROXIMATE PROPERTY LINE
 - EXISTING 10' CONTOUR
 - EXISTING 2' CONTOUR
 - POTENTIOMETRIC SURFACE CONTOUR (INTERVAL 5 FT)
 - INFERRED SURFACE CONTOUR
 - GROUNDWATER FLOW DIRECTION
 - WATER TABLE MONITORING WELL
 - UPPER MOST AQUIFER MONITORING WELL
 - GROUNDWATER ELEVATION (MEASURED 25 AUGUST 2025)
 - SURFACE WATER MONITORING LOCATION
- NOTE:
MW-11 WAS NOT USED IN GROUNDWATER CONTOURING



AMSTED RAIL COMPANY
KEOKUK PLANT
KEOKUK, IOWA

UPPER MOST AQUIFER ELEVATIONS
AUGUST 2025

SCALE: AS SHOWN
NOVEMBER 2025

FIGURE 5

APPENDIX A

IDNR Sampling Forms



SURFACE WATER SAMPLING FORM

Site Name: Griffin Wheel, Keokuk IA Permit No.: 56-SDP-89P
Surface Monitoring Point No.: SW-1 Date/Time: 04/14/25 17:30
Sampler Name: Francis Reed

A. TYPE OF MONITORING POINT

☒ Stream ☐ Open Tile
☐ Road Ditch ☐ Tile with Riser
☐ Drainage Ditch ☐ Other (describe) _____

B. PURPOSE OF MONITORING POINT

☒ Upstream ☐ Downstream
☐ Within Landfill ☐ Other (describe) _____

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: _____

Sample ID: SW-1-041425-1730

Sample Time: 17:30

Was monitoring point dry? No Too little water to sample? _____

Was water flowing? ☒ Yes ☐ No

If yes, estimate quantity ~0.4 ft³/sec If yes, estimate depth ~2' in ponded area, 0.3' in the stream

Was water discolored? ☐ Yes ☐ No

If yes, describe _____

Does water have odor? ☐ Yes ☐ No

If yes, describe _____

Was ground discolored? ☐ Yes ☐ No

If yes, describe _____

Litter present? ☒ Yes ☐ No

If yes, describe A few bottles near the stream

D. FIELD MEASUREMENT

Weather Conditions Sunny

Field Measurements (after stabilization):

Temperature 13.36 Units Degrees Celcius

Equipment Used Horiba U-52

pH 8.09 Equipment Used Horiba U-52

Specific Conditions 0.549 Units mS/cm

Equipment Used Horiba U-52



SURFACE WATER SAMPLING FORM

Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P
Surface Monitoring Point No.: SW-2 Date/Time: 04/14/25
Sampler Name: Francis Reed

A. TYPE OF MONITORING POINT

☒ Stream ☐ Open Tile
☐ Road Ditch ☐ Tile with Riser
☐ Drainage Ditch ☐ Other (describe) _____

B. PURPOSE OF MONITORING POINT

☐ Upstream ☒ Downstream
☐ Within Landfill ☐ Other (describe) _____

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: The stream is low, approximately 0.5 ft at the stream gauge

Sample ID: SW-2-041425-1630

Sample Time: 16:30

Was monitoring point dry? No Too little water to sample? _____

Was water flowing? ☒ Yes ☐ No

If yes, estimate quantity ~ 0.24 ft³/s If yes, estimate depth ~ 0.5 ft at the center of the stream

Was water discolored? ☐ Yes ☐ No

If yes, describe _____

Does water have odor? ☐ Yes ☐ No

If yes, describe _____

Was ground discolored? ☐ Yes ☐ No

If yes, describe _____

Litter present? ☒ Yes ☐ No

If yes, describe Plastic beverage bottles and food containers up hill from the stream near the road

D. FIELD MEASUREMENT

Weather Conditions Sunny

Field Measurements (after stabilization):

Temperature 16.02 Units Degrees Celsius

Equipment Used Horiba U-52

pH 7.20 Equipment Used Horiba U-52

Specific Conditions 0.69 Units mS/cm

Equipment Used Horiba U-52



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-5 Weather: Sunny, Windy

Date: 04/15/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 7.55

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 625.07 Ground Surface Elevation (ft. MSL): 622.6

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	2.63	5.65	5.87
Water Elevation (ft. MSL):	622.44	619.42	619.2

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	4/15/25 15:34	4/15/25 16:09

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and distilled rinse for WLM

Field Analysis

							Final Reading
Date/Time	4/15 15:39	4/15 15:44	4/15 15:49	4/15 15:54	4/15 15:59	4/15 16:04	4/15 16:09
Depth to Water (ft)	4.01	4.42	4.75	5.01	5.30	5.45	5.65
Volume Purged (Liter)	1.1	1.6	2.1	2.6	3.1	3.6	4.1
Temp (°C)	15.45	15.18	15.03	14.68	14.60	14.49	14.43
Sp. Cond (mS/cm)	0.817	0.811	0.812	0.816	0.817	0.818	0.820
pH	6.95	6.95	6.92	6.89	6.90	6.88	6.88
DO (mg/l)	3.30	3.19	3.13	6.25	4.77	4.72	4.54
ORP (mV)	148	145	144	146	146	150	151
Turbidity (NTU)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Equipment Depth: 14.51 Flow Rate: 100 Volume Removed: 4.7 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MW-5-041525-1615



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-6 Weather: Sunny

Date: 04/16/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 9.7

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 627.76 Ground Surface Elevation (ft. MSL): 624.0

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	8.94	12.60	12.62
Water Elevation (ft. MSL):	618.82	615.16	615.14

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	04/16/25 10:07	04/16/25 11:01

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	04/16 10:37	04/16 10:42	04/16 10:47	04/16 10:52	04/16 10:55	04/16 10:58	04/16 11:01
Depth to Water (ft)	12.65	12.70	12.60	12.63	12.67	12.68	12.60
Volume Purged (Liter)	4.8	5.3	5.8	6.3	6.6	6.9	7.2
Temp (°C)	15.04	15.45	15.95	16.42	16.62	16.81	17.05
Sp. Cond (mS/cm)	0.874	0.874	0.875	0.875	0.875	0.875	0.874
pH	7.00	7.02	6.97	6.98	6.98	6.97	6.96
DO (mg/l)	1.14	1.10	0.88	0.72	0.66	0.62	0.60
ORP (mV)	140	138	140	137	136	134	134
Turbidity (NTU)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Equipment Depth: 15.81 Flow Rate: 100 Volume Removed: 7.6 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MW-6-041625-1105



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-7 Weather: Sunny

Date: 04/16/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 48.0

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 626.06 Ground Surface Elevation (ft. MSL): 624.1

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	1.11	1.29	1.30
Water Elevation (ft. MSL):	624.95	624.77	624.76

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	04/16/25 08:53	04/16/25 09:33

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	04/16 09:03	04/16 09:08	04/16 09:13	04/16 09:18	04/16 09:23	04/16 09:28	04/16 09:33
Depth to Water (ft)	1.27	1.30	1.29	1.30	1.29	1.31	1.29
Volume Purged (Liter)	1.5	2.0	2.5	3.0	3.5	4.0	4.5
Temp (°C)	10.38	10.81	11.15	11.41	11.82	12.13	12.29
Sp. Cond (mS/cm)	2.74	2.75	2.75	2.75	2.75	2.75	2.75
pH	6.78	6.80	6.81	6.83	6.84	6.84	6.85
DO (mg/l)	4.31	4.06	4.01	3.91	3.89	3.83	3.79
ORP (mV)	221	214	208	202	195	182	176
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 20.18 Flow Rate: 100 Volume Removed: 4.7 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MW-7-041625-0935



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-12 Weather: Sunny

Date: 04/16/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 7.4

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 633.27 Ground Surface Elevation (ft. MSL): 630.7

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	6.53	9.23	9.37
Water Elevation (ft. MSL):	626.74	624.04	623.90

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	04/16/25 13:18	04/16/25 13:58

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	04/16 13:28	04/16 13:33	04/16 13:38	04/16 13:43	04/16 13:48	04/16 13:53	04/16 13:58
Depth to Water (ft)	8.45	8.74	8.98	9.08	9.15	9.25	9.23
Volume Purged (Liter)	1.5	2.0	2.5	3.0	3.5	4.0	4.5
Temp (°C)	13.30	13.16	13.00	12.93	12.82	12.93	12.93
Sp. Cond (mS/cm)	0.993	0.996	0.996	0.996	0.996	0.995	0.993
pH	6.85	6.86	6.83	6.81	6.81	6.78	6.81
DO (mg/l)	4.35	4.30	3.88	3.66	3.47	3.25	3.13
ORP (mV)	82	88	94	98	101	104	104
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 14.82 Flow Rate: 100 Volume Removed: 4.7 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MW-12-041625-1400



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-16 Weather: Sunny

Date: 04/16/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 58.1

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 640.50 Ground Surface Elevation (ft. MSL): 604.13

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	13.79	24.95	25.51
Water Elevation (ft. MSL):	626.71	615.55	614.99

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	04/16/25 14:46	04/16/25 15:51

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	04/16 15:21	04/16 15:26	04/16 15:31	04/16 15:36	04/16 15:41	04/16 15:46	04/16 15:51
Depth to Water (ft)	20.55	21.29	22.03	22.77	23.50	24.22	24.95
Volume Purged (Liter)	5.4	5.9	6.4	6.9	7.4	7.9	8.4
Temp (°C)	14.43	14.57	14.47	14.50	14.49	14.42	14.38
Sp. Cond (mS/cm)	1.01	1.01	1.00	1.00	1.00	1.00	1.00
pH	7.01	7.03	7.04	7.04	7.05	7.04	7.02
DO (mg/l)	4.23	4.33	4.49	4.53	4.54	4.55	4.50
ORP (mV)	67	70	72	72	72	71	71
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 41.75 Flow Rate: 100 Volume Removed: 8.7 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MW-16-041625-1555



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-20 Weather: Sunny

Date: 04/15/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 18.10

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 650.39 Ground Surface Elevation (ft. MSL): 648.50

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	11.20	11.71	11.72
Water Elevation (ft. MSL):	639.19	638.68	638.67

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	04/15/25 13:25	04/15/25 14:10

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	04/15 13:40	04/15 13:45	04/15 13:50	04/15 13:55	04/15 14:00	04/15 14:05	04/15 14:10
Depth to Water (ft)	11.70	11.67	11.71	11.70	11.71	11.73	11.71
Volume Purged (Liter)	2.9	3.4	3.9	4.4	4.9	5.4	5.9
Temp (°C)	13.94	14.00	14.03	14.00	13.97	14.08	14.06
Sp. Cond (mS/cm)	1.01	1.01	1.01	1.01	1.00	1.00	1.00
pH	7.07	7.10	7.06	7.04	7.05	7.04	7.04
DO (mg/l)	3.67	3.51	3.21	3.01	2.74	2.63	2.51
ORP (mV)	124	122	124	124	122	122	121
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 28.88 Flow Rate: 100 Volume Removed: 6.4 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MS/MSD sample MW-20-041525-1415



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-21 Weather: Sunny

Date: 04/15/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 53.85

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 660.72 Ground Surface Elevation (ft. MSL): 658.0

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	18.76	27.96	28.33
Water Elevation (ft. MSL):	641.96	632.76	632.39

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	04/15/25 11:18	04/15/25 12:23

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	04/15 11:53	04/15 11:58	04/15 12:03	04/15 12:08	04/15 12:13	04/15 12:18	04/15 12:23
Depth to Water (ft)	25.06	25.60	26.12	26.63	27.10	27.55	27.96
Volume Purged (Liter)	5.1	5.6	6.1	6.6	7.1	7.6	8.1
Temp (°C)	13.77	13.88	14.05	14.18	14.36	14.59	14.77
Sp. Cond (mS/cm)	0.943	0.935	0.930	0.926	0.923	0.920	0.917
pH	6.98	6.92	6.90	6.92	6.94	6.98	6.94
DO (mg/l)	0.77	1.02	1.13	1.23	1.20	1.27	1.27
ORP (mV)	43	54	61	64	67	68	73
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 66.49 Flow Rate: 100 Volume Removed: 8.3 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MW-21-041525-1225



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-25 Weather: Sunny

Date: 04/14/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 5.0

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 631.77 Ground Surface Elevation (ft. MSL): 628.56

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	8.28	8.71	8.75
Water Elevation (ft. MSL):	623.49	623.06	623.02

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	04/14/25 19:20	04/14/25 20:00

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	04/14 19:30	04/14 19:35	04/14 19:40	04/14 19:45	04/14 19:50	04/14 19:55	04/14 20:00
Depth to Water (ft)	8.60	8.63	8.66	8.66	8.68	8.70	8.71
Volume Purged (Liter)	2.4	3.0	3.6	4.2	4.8	5.4	6.0
Temp (°C)	11.84	11.77	11.71	11.62	11.53	11.49	11.43
Sp. Cond (mS/cm)	1.13	1.13	1.13	1.13	1.13	1.13	1.13
pH	7.46	7.45	7.38	7.42	7.37	7.37	7.39
DO (mg/l)	1.42	0.78	0.60	0.48	0.43	0.41	0.40
ORP (mV)	230	228	225	227	222	221	222
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 14.10 Flow Rate: 120 Volume Removed: 6.6 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MW-25-041425-2005



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-26 Weather: Sunny, windy

Date: 04/15/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 37.5

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 631.03 Ground Surface Elevation (ft. MSL): 628.29

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	7.06	11.70	11.76
Water Elevation (ft. MSL):	623.97	619.33	619.27

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	04/15/25 08:52	04/15/25 09:52

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	04/15 09:22	04/15 09:27	04/15 09:32	04/15 09:37	04/15 09:42	04/15 09:47	04/15 09:52
Depth to Water (ft)	8.60	8.63	8.66	8.66	8.68	8.70	8.71
Volume Purged (Liter)	3.9	4.4	4.9	5.4	5.9	6.4	6.9
Temp (°C)	10.95	11.14	11.29	11.41	11.44	11.66	11.77
Sp. Cond (mS/cm)	3.11	3.11	3.11	3.11	3.11	3.11	3.11
pH	6.59	6.60	6.60	6.60	6.62	6.61	6.58
DO (mg/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ORP (mV)	-28	-29	-29	-29	-30	-30	-29
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 42.97 Flow Rate: 100 Volume Removed: 7.2 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MW-26-041525-0955 and Field Duplicate 20760-041525-0001



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-27 Weather: Sunny

Date: 04/16/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 35

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 624.57 Ground Surface Elevation (ft. MSL): 622.20

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	0.0	0.15	0.15
Water Elevation (ft. MSL):	624.57	624.42	624.42

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	04/16/25 11:59	04/16/25 12:29

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	04/16 11:59	04/16 12:04	04/16 12:09	04/16 12:14	04/16 12:19	04/16 12:24	04/16 12:29
Depth to Water (ft)	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Volume Purged (Liter)	2.3	3.0	3.7	4.4	5.0	5.8	6.5
Temp (°C)	16.16	15.83	15.67	15.76	15.69	15.63	16.07
Sp. Cond (mS/cm)	1.30	1.32	1.33	1.33	1.33	1.33	1.33
pH	6.79	6.75	6.72	6.74	6.71	6.73	6.70
DO (mg/l)	0.18	0.12	0.06	0.09	0.00	0.00	0.00
ORP (mV)	-114	-107	-98	-95	-90	-89	-86
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 36.51 Flow Rate: 140 Volume Removed: 6.6 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☐ No Color? ☐ Yes ☐ No

Comments: MW-27-041625-1230



SURFACE WATER SAMPLING FORM

Site Name: Griffin Wheel, Keokuk IA Permit No.: 56-SDP-89P
Surface Monitoring Point No.: SW-1 Date/Time: 08/26/25 18:50
Sampler Name: Francis Reed

A. TYPE OF MONITORING POINT

☒ Stream ☐ Open Tile
☐ Road Ditch ☐ Tile with Riser
☐ Drainage Ditch ☐ Other (describe) _____

B. PURPOSE OF MONITORING POINT

☒ Upstream ☐ Downstream
☐ Within Landfill ☐ Other (describe) _____

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Water Poned at the outfall
Sample ID: SW-1-082625-1850
Sample Time: 18:50

Was monitoring point dry? No Too little water to sample? _____
Was water flowing? ☒ Yes ☐ No
If yes, estimate quantity ~0.5 ft³/sec If yes, estimate depth ~2' in ponded area, 0.3' in the stream
Was water discolored? ☐ Yes ☒ No
If yes, describe _____
Does water have odor? ☐ Yes ☒ No
If yes, describe _____
Was ground discolored? ☐ Yes ☒ No
If yes, describe _____
Litter present? ☐ Yes ☒ No
If yes, describe _____

D. FIELD MEASUREMENT

Weather Conditions Sunny, Warm

Field Measurements (after stabilization):

Temperature 21.15 Units Degrees Celcius
Equipment Used Horiba U-52
pH 7.37 Equipment Used Horiba U-52
Specific Conditions 0.444 Units mS/cm
Equipment Used Horiba U-52



SURFACE WATER SAMPLING FORM

Site Name: Griffin Wheel, Keokuk IA Permit No.: 56-SDP-89P
Surface Monitoring Point No.: SW-2 Date/Time: 08/26/25 17:50
Sampler Name: Francis Reed

A. TYPE OF MONITORING POINT

☒ Stream ☐ Open Tile
☐ Road Ditch ☐ Tile with Riser
☐ Drainage Ditch ☐ Other (describe) _____

B. PURPOSE OF MONITORING POINT

☐ Upstream ☒ Downstream
☐ Within Landfill ☐ Other (describe) _____

C. MONITORING POINT CONDITIONS

Condition commentary/field notes: Visible stream flow, some ponding leading into the culvert inlet.

Some erosion/ evidence of overland flow on the east bank.

Sample ID: SW-2-082625-1750

Sample Time: 17:50

Was monitoring point dry? No Too little water to sample? _____

Was water flowing? ☒ Yes ☐ No

If yes, estimate quantity ~0.25 ft³/sec If yes, estimate depth 0.5'

Was water discolored? ☐ Yes ☒ No

If yes, describe _____

Does water have odor? ☐ Yes ☒ No

If yes, describe _____

Was ground discolored? ☐ Yes ☒ No

If yes, describe _____

Litter present? ☐ Yes ☒ No

If yes, describe _____

D. FIELD MEASUREMENT

Weather Conditions Sunny, Warm

Field Measurements (after stabilization):

Temperature 19.39 Units Degrees Celcius

Equipment Used Horiba U-52

pH 7.66 Equipment Used Horiba U-52

Specific Conditions 0.496 Units mS/cm

Equipment Used Horiba U-52



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Wheel, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-5 Weather: Partly Cloudy

Date: 08/27/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 7.55

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 625.07 Ground Surface Elevation (ft. MSL): 622.6

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	3.17	7.05	7.10
Water Elevation (ft. MSL):	621.9	618.02	617.97

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	08/27/25 12:03	08/27/25 12:48

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and distilled rinse for WLM

Field Analysis

	Final Reading						
Date/Time	8/25 12:18	8/25 12:23	8/25 12:28	8/25 12:33	8/25 12:38	8/25 12:43	8/25 12:48
Depth to Water (ft)	5.97	6.25	6.45	6.61	6.79	6.94	7.05
Volume Purged (Liter)	2.5	3.0	3.5	4.0	4.5	5.0	5.5
Temp (°C)	19.93	19.66	19.86	19.80	19.63	19.45	19.35
Sp. Cond (umhos/cm)	749	725	715	711	708	707	709
pH	6.66	6.65	6.64	6.63	6.62	6.64	6.65
DO (mg/l)	0.72	0.77	0.71	0.83	0.80	.78	.65
ORP (mV)	244	272	286	293	298	300	300
Turbidity (NTU)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Equipment Depth: 14.51 Flow Rate: 100 mL/min Volume Removed: 5.5 Volume Sampled: 1.6 L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: MW-5-082725-1250



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Wheel, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-6 Weather: Cloudy

Date: 08/27/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 9.7

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 627.76 Ground Surface Elevation (ft. MSL): 624.0

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	9.28	12.72	12.74
Water Elevation (ft. MSL):	618.48	615.04	615.02

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	08/27/25 09:50	08/27/25 10:55

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and distilled rinse for WLM

Field Analysis

							Final Reading
Date/Time	8/25 10:25	8/25 10:30	8/25 10:35	8/25 10:40	8/25 10:45	8/25 10:50	8/25 10:55
Depth to Water (ft)	12.70	12.72	12.70	12.71	12.75	12.72	12.72
Volume Purged (Liter)	5.0	5.5	6.0	6.5	7.0	7.5	8.0
Temp (°C)	22.01	22.07	21.92	21.92	21.74	21.65	21.66
Sp. Cond (umhos/cm)	718	719	716	712	710	708	705
pH	6.80	6.80	6.80	6.78	6.77	6.75	6.75
DO (mg/l)	0.89	0.71	0.58	0.39	0.25	0.17	0.06
ORP (mV)	181	180	179	180	179	179	178
Turbidity (NTU)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Equipment Depth: 15.81 Flow Rate: 100 mL/min Volume Removed: 8.5 Volume Sampled: 1.6 L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: MW-6-082725-1100



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-7 Weather: Partly cloudy

Date: 08/27/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 48.0

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 626.06 Ground Surface Elevation (ft. MSL): 624.1

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	1.36	1.51	1.54
Water Elevation (ft. MSL):	624.70	624.55	624.52

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	08/27/25 08:27	08/27/25 09:02

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	08/27 08:32	08/27 08:37	08/27 08:42	08/27 08:47	08/27 08:52	08/27 08:57	08/27 09:02
Depth to Water (ft)	1.53	1.54	1.54	1.51	1.54	1.54	1.51
Volume Purged (Liter)	1.8	2	2.5	3	3.5	4	4.5
Temp (°C)	17.17	17.57	18.13	18.58	19.00	19.29	19.46
Sp. Cond (umhos/cm)	2400	2420	2440	2450	2470	2480	2480
pH	6.65	6.67	6.69	6.70	6.70	6.70	6.71
DO (mg/l)	0.88	0.38	0.22	0.06	0.00	0.00	0.00
ORP (mV)	131	135	140	144	147	151	153
Turbidity (NTU)	15.4	11.1	8.3	7.2	7.6	7.8	7.7

Equipment Depth: 20.18 Flow Rate: 100 mL/min Volume Removed: 5 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: MW-7-082725-0905



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-12 Weather: Sunny

Date: 08/28/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 7.4

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 633.27 Ground Surface Elevation (ft. MSL): 630.7

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	7.84	9.70	9.82
Water Elevation (ft. MSL):	625.43	623.57	623.45

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☐ Yes ☒ No

	Start	End
Purge Date/Time	08/28/25 10:07	08/28/25 10:37

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

	Final Reading						
Date/Time	8/28 10:07	8/28 10:12	8/28 10:17	8/28 10:22	8/28 10:27	8/28 10:32	8/28 10:37
Depth to Water (ft)	8.96	9.11	9.20	9.30	9.48	9.56	9.70
Volume Purged (Liter)	1.2	1.8	2.0	2.5	3.0	3.5	4.0
Temp (°C)	17.66	17.89	18.06	18.09	17.93	17.71	17.89
Sp. Cond (umhos/cm)	858	858	870	880	898	904	903
pH	6.50	6.56	6.58	6.60	6.63	6.65	6.66
DO (mg/l)	1.80	1.29	0.98	0.78	0.76	0.76	0.76
ORP (mV)	237	230	225	221	217	214	213
Turbidity (NTU)	0.4	0.4	0.1	0.0	0.0	0.0	0.0

Equipment Depth: 14.82 Flow Rate: 100 mL/min Volume Removed: 5 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: MW-12-082825-1040



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-16 Weather: Sunny

Date: 08/28/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 58.1

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 640.50 Ground Surface Elevation (ft. MSL): 604.13

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	14.66	24.99	25.47
Water Elevation (ft. MSL):	625.84	615.51	615.03

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	08/28/25 11:32	08/28/25 12:37

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	08/28 12:07	08/28 12:12	08/28 12:17	08/28 12:22	08/28 12:27	08/28 12:32	08/28 12:37
Depth to Water (ft)	21.21	21.79	22.44	23.10	23.68	24.40	24.99
Volume Purged (Liter)	4.5	5.0	5.5	6.0	6.5	7.0	7.5
Temp (°C)	18.12	18.05	18.10	18.10	17.96	17.99	17.97
Sp. Cond (umhos/cm)	922	923	923	923	925	923	925
pH	6.87	6.86	6.87	6.87	6.87	6.88	6.87
DO (mg/l)	1.66	1.71	1.60	1.60	1.60	1.58	1.62
ORP (mV)	66	66	67	68	67	66	67
Turbidity (NTU)	1.2	1.2	1.2	1.2	1.2	1.0	1.0

Equipment Depth: 41.75 Flow Rate: 100 mL/sec Volume Removed: 8 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: MW-16-082825-1240



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-20 Weather: Sunny, Hot

Date: 08/26/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 18.10

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 650.39 Ground Surface Elevation (ft. MSL): 648.50

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	10.93	11.32	11.31
Water Elevation (ft. MSL):	639.46	639.07	639.08

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	08/26/25 13:00	08/26/25 13:35

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

	Final Reading						
Date/Time	08/26 13:05	08/26 13:10	08/26 13:15	08/26 13:20	08/26 13:25	08/26 13:30	08/26 13:35
Depth to Water (ft)	11.38	11.36	11.36	11.35	11.32	11.30	11.32
Volume Purged (Liter)	1.5	2.0	2.5	3.0	3.5	4.0	4.5
Temp (°C)	20.02	20.24	19.63	19.74	20.16	20.46	20.67
Sp. Cond (umhos/cm)	921	922	918	921	922	925	925
pH	6.84	6.84	6.83	6.81	6.82	6.81	6.81
DO (mg/l)	2.14	1.90	1.26	1.16	1.03	1.05	1.02
ORP (mV)	162	162	162	163	162	163	164
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 24.88 Flow Rate: 100 mL/min Volume Removed: 5 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: MS/MSD sample MW-20-0082625-1340



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-21 Weather: Sunny

Date: 08/26/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 53.85

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 660.72 Ground Surface Elevation (ft. MSL): 658.0

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	19.81	28.06	28.74
Water Elevation (ft. MSL):	640.91	632.66	631.98

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	08/26/25 15:19	08/26/25 16:24

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	08/26 16:54	08/26 16:59	08/26 16:04	08/26 16:09	08/26 16:14	08/26 16:19	08/26 16:24
Depth to Water (ft)	25.08	25.67	25.14	26.62	27.12	27.61	28.06
Volume Purged (Liter)	4.9	5.5	6.0	6.5	7.0	7.5	8.0
Temp (°C)	18.78	18.50	18.60	18.43	18.42	18.47	18.63
Sp. Cond (umhos/cm)	845	834	825	822	820	816	815
pH	6.73	6.73	6.72	6.72	6.72	6.72	6.74
DO (mg/l)	0.86	1.25	1.66	1.87	1.98	2.09	2.16
ORP (mV)	141	150	160	164	169	172	175
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 61.50 Flow Rate: 100 mL/min Volume Removed: 9.5 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: MW-21-082625-1630



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-25 Weather: Sunny, hot

Date: 08/26/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 5.0

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 631.77 Ground Surface Elevation (ft. MSL): 628.56

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	9.03	9.39	9.39
Water Elevation (ft. MSL):	622.74	622.38	622.38

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☐ Yes ☒ No

	Start	End
Purge Date/Time	08/26/25 09:12	08/26/25 09:37

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	08/26 9:17	08/26 9:22	08/26 9:27	08/26 9:32	08/26 9:37	08/26 9:42	08/26 9:42
Depth to Water (ft)	9.35	9.37	9.36	9.39	9.39	9.39	9.39
Volume Purged (Liter)	2.1	2.8	3.2	3.8	4.2	4.8	5.3
Temp (°C)	17.39	17.42	17.48	17.48	17.61	17.77	17.86
Sp. Cond (umohs/cm)	1.01	1.00	1.01	1.01	1.01	1.01	1.01
pH	6.57	6.57	6.59	6.59	6.60	6.59	6.62
DO (mg/l)	0.22	0.13	0.03	0.04	0.00	0.00	0.00
ORP (mV)	252	246	240	236	232	230	224
Turbidity (NTU)	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Equipment Depth: 13.80 Flow Rate: 100 nL/min Volume Removed: 7 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: MW-25-0825-0950 , Field Duplicate: 20760-082625-0001



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-26 Weather: Sunny, hot

Date: 08/26/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 37.5

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 631.03 Ground Surface Elevation (ft. MSL): 628.29

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	7.32	13.08	13.23
Water Elevation (ft. MSL):	623.71	617.95	617.80

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	08/26/25 10:55	08/26/25 11:52

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	08/26 11:30	08/26 11:35	08/26 11:40	08/26 11:43	08/26 11:46	08/26 11:49	08/26 11:52
Depth to Water (ft)	12.21	12.46	12.70	12.77	12.89	12.99	13.08
Volume Purged (Liter)	4.9	5.4	6.0	6.3	6.7	7.1	7.4
Temp (°C)	20.12	20.49	20.68	20.80	20.97	21.28	21.36
Sp. Cond (umhos/cm)	2810	2800	2800	2800	2820	2800	2810
pH	6.58	6.58	6.58	5.59	6.57	6.57	6.57
DO (mg/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ORP (mV)	-12	-14	-15	-16	-15	-15	-16
Turbidity (NTU)	0.0	0.0	0.5	0.0	0.0	0.0	0.0

Equipment Depth: 42.97 Flow Rate: 100 mL/min Volume Removed: 8 L Volume Sampled: 1.6 L

Odor? ☐ Yes ☒ No Color? ☐ Yes ☒ No

Comments: MW-26-082625-1155



Groundwater Sampling Field Sheet

Disposal Site Name: Griffin Rail, Keokuk IA Permit No.: 56-SDP-89P

Well/Piezometer: MW-27 Weather: Partly cloudy, hot

Date: 08/27/25 Sampler Name: Francis Reed

Monitoring Well Details

Construction Data

Borehole Diameter (in): 7-7/8 Depth to Top of Screen (ft): 35

Casing Diameter (in): 2 Casing Material: PVC

Top of Casing Elevation (ft. MSL): 624.57 Ground Surface Elevation (ft. MSL): 622.20

Field Observations

Locked: ☒ Yes ☐ No

	Before Purging	After Purging	Before Sampling
Depth to Water Level (ft.):	0.0	0.25	0.25
Water Elevation (ft. MSL):	624.57	624.32	624.32

Screen Submerged? (Depth to Water Level < Depth to Top of Screen) ☒ Yes ☐ No

	Start	End
Purge Date/Time	08/27/25 13:30	08/27/25 14:00

Well Conditions Commentary: NA

Sampling Equipment (check one)

☒ Pump ☐ Interval Sampler
☐ Bailer ☐ Other (specify): NA

Equipment Name & Description: MP-50, Solinst WLM, Horiba U-52

Pump Types (check one)

☐ Submersible ☐ Peristaltic ☒ Bladder ☐ Inertial Lift Pump ☐ Other (specify): NA

Method (check one)

☒ Low Flow ☐ No Purge ☐ Purge

Options (check one)

☒ Dedicated ☐ Disposable ☐ Portable

Decontamination Method: NA for pump, Alconox wash and DI water rinse for WLM

Field Analysis

							Final Reading
Date/Time	08/27 13:30	08/27 13:35	08/27 13:40	08/27 13:45	08/27 13:50	08/27 13:55	08/27 14:00
Depth to Water (ft)	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Volume Purged (Liter)	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Temp (°C)	19.95	19.64	19.60	19.29	19.31	19.31	19.72
Sp. Cond (umhos/cm)	1200	1210	1210	1200	1190	1210	1220
pH	6.69	6.67	6.67	6.68	6.69	6.68	6.69
DO (mg/l)	0.41	0.15	0.00	0.00	0.00	0.00	0.00
ORP (mV)	-111	-105	-95	-88	-84	-80	-78
Turbidity (NTU)	0.0	0.4	0.6	1.1	0.9	0.8	0.8

Equipment Depth: 36.51 Flow Rate: 100 mL/min Volume Removed: 4.5 L Volume Sampled: 1.6 L

Odor? ☒ Yes ☐ No Color? ☐ Yes ☒ No

Comments: Egg like odor, MW-27-082725-1405

APPENDIX B
Analytical Laboratory Reports and Data Usability Summary
Reports

ANALYTICAL REPORT

PREPARED FOR

Attn: Thomas Vanage
Haley & Aldrich, Inc.
8899 Gander Creek Drive
Miamisburg, Ohio 45342-4418

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JOB DESCRIPTION

Amsted - Keokuk, Iowa GW

JOB NUMBER

240-222449-1

Eurofins Cleveland

Job Notes

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Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: Haley & Aldrich, Inc.
Project: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Job ID: 240-222449-1

Eurofins Cleveland

Job Narrative 240-222449-1

Receipt

The samples were received on 4/16/2025 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.5°C, 2.4°C and 3.3°C.

Metals

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

General Chemistry

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

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Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET CLE
6020B	Metals (ICP/MS)	SW846	EET CLE
350.1	Nitrogen, Ammonia	EPA	EET CLE
5220D-2011	Chemical Oxygen Demand	SM	EET CLE
9056A	Anions, Ion Chromatography	SW846	EET CLE
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CLE
FILTRATION	Sample Filtration	None	EET CLE

Protocol References:

EPA = US Environmental Protection Agency

None = None

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

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

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-222449-1	SW-2-041425-1630	Water	04/14/25 16:30	04/16/25 09:30
240-222449-2	SW-1-041425-1730	Water	04/14/25 17:30	04/16/25 09:30
240-222449-3	MW-25-041425-2005	Water	04/14/25 20:05	04/16/25 09:30
240-222449-4	MW-26-041525-0955	Water	04/15/25 09:55	04/16/25 09:30
240-222449-5	MW-21-041525-1225	Water	04/15/25 12:25	04/16/25 09:30
240-222449-6	MW-20-041525-1415	Water	04/15/25 14:15	04/16/25 09:30
240-222449-7	MW-5-041525-1615	Water	04/15/25 16:15	04/16/25 09:30
240-222449-8	20760-041525-0001	Water	04/15/25 00:01	04/16/25 09:30

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: SW-2-041425-1630

Lab Sample ID: 240-222449-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.162		0.100	0.0573	mg/L	1		6010D	Total Recoverable
Strontium	0.251		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Manganese	0.622		0.00500	0.00353	mg/L	1		6020B	Total Recoverable
Sodium	46.7		1.00	0.882	mg/L	1		6020B	Total Recoverable
Ammonia	0.178	J	0.200	0.147	mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	14.1		10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	58.4		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.374		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	32.2		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: SW-1-041425-1730

Lab Sample ID: 240-222449-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.176		0.100	0.0573	mg/L	1		6010D	Total Recoverable
Strontium	0.215		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Manganese	0.258		0.00500	0.00353	mg/L	1		6020B	Total Recoverable
Sodium	25.5		1.00	0.882	mg/L	1		6020B	Total Recoverable
Ammonia	0.172	J	0.200	0.147	mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	10.9		10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	29.4		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.581		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	45.3		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-25-041425-2005

Lab Sample ID: 240-222449-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.183		0.100	0.0573	mg/L	1		6010D	Total Recoverable
Lithium	0.0470	J	0.0500	0.0172	mg/L	1		6010D	Total Recoverable
Strontium	0.524		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Manganese	0.0730		0.00500	0.00353	mg/L	1		6020B	Total Recoverable
Sodium	60.3		1.00	0.882	mg/L	1		6020B	Total Recoverable
Chemical Oxygen Demand	3.41	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	25.6		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	1.55		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	49.4		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-26-041525-0955

Lab Sample ID: 240-222449-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.295		0.100	0.0573	mg/L	1		6010D	Total Recoverable
Strontium	2.03		0.0500	0.00927	mg/L	1		6010D	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: MW-26-041525-0955 (Continued)

Lab Sample ID: 240-222449-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Manganese	2.81		0.00500	0.00353	mg/L	1		6020B	Total Recoverable
Sodium	84.9		1.00	0.882	mg/L	1		6020B	Total Recoverable
Iron	2.13		0.100	0.0470	mg/L	1		6020B	Dissolved
Ammonia	1.19		0.200	0.147	mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	7.63	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	2.75		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.124		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	1370		10.0	3.48	mg/L	10		9056A	Total/NA

Client Sample ID: MW-21-041525-1225

Lab Sample ID: 240-222449-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0395	J	0.0500	0.0172	mg/L	1		6010D	Total Recoverable
Strontium	0.434		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Manganese	0.0266		0.00500	0.00353	mg/L	1		6020B	Total Recoverable
Sodium	51.7		1.00	0.882	mg/L	1		6020B	Total Recoverable
Chemical Oxygen Demand	2.11	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	5.78		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.327		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	15.4		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-20-041525-1415

Lab Sample ID: 240-222449-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0355	J	0.0500	0.0172	mg/L	1		6010D	Total Recoverable
Strontium	0.375		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Sodium	79.0		1.00	0.882	mg/L	1		6020B	Total Recoverable
Chemical Oxygen Demand	6.33	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	55.6		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.467		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	32.7		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-5-041525-1615

Lab Sample ID: 240-222449-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0222	J	0.0500	0.0172	mg/L	1		6010D	Total Recoverable
Strontium	0.308		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Manganese	0.0175		0.00500	0.00353	mg/L	1		6020B	Total Recoverable
Sodium	43.2		1.00	0.882	mg/L	1		6020B	Total Recoverable
Chemical Oxygen Demand	5.03	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	3.43		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.374		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	30.8		1.00	0.348	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: 20760-041525-0001

Lab Sample ID: 240-222449-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	0.299		0.100	0.0573	mg/L	1			6010D	Total
										Recoverable
Strontium	2.05		0.0500	0.00927	mg/L	1			6010D	Total
										Recoverable
Manganese	2.87		0.00500	0.00353	mg/L	1			6020B	Total
										Recoverable
Sodium	85.3		1.00	0.882	mg/L	1			6020B	Total
										Recoverable
Iron	2.13		0.100	0.0470	mg/L	1			6020B	Dissolved
Ammonia	1.19		0.200	0.147	mg/L	1			350.1	Total/NA
Chemical Oxygen Demand	8.61	J	10.0	1.80	mg/L	1			5220D-2011	Total/NA
Chloride	2.74		1.00	0.128	mg/L	1			9056A	Total/NA
Fluoride	0.182		0.0500	0.0240	mg/L	1			9056A	Total/NA
Sulfate	1330		10.0	3.48	mg/L	10			9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: SW-2-041425-1630

Lab Sample ID: 240-222449-1

Date Collected: 04/14/25 16:30

Matrix: Water

Date Received: 04/16/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.162		0.100	0.0573	mg/L		04/17/25 14:00	04/18/25 22:02	1
Lithium	ND		0.0500	0.0172	mg/L		04/17/25 14:00	04/18/25 22:02	1
Strontium	0.251		0.0500	0.00927	mg/L		04/17/25 14:00	04/18/25 22:02	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.622		0.00500	0.00353	mg/L		04/17/25 14:00	04/18/25 16:46	1
Sodium	46.7		1.00	0.882	mg/L		04/17/25 14:00	04/18/25 16:46	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 13:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	0.178	J	0.200	0.147	mg/L			04/21/25 18:17	1
Chemical Oxygen Demand (SM 5220D-2011)	14.1		10.0	1.80	mg/L			04/22/25 10:59	1
Chloride (SW846 9056A)	58.4		1.00	0.128	mg/L			04/17/25 23:56	1
Fluoride (SW846 9056A)	0.374		0.0500	0.0240	mg/L			04/17/25 23:56	1
Sulfate (SW846 9056A)	32.2		1.00	0.348	mg/L			04/17/25 23:56	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: SW-1-041425-1730

Lab Sample ID: 240-222449-2

Date Collected: 04/14/25 17:30

Matrix: Water

Date Received: 04/16/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.176		0.100	0.0573	mg/L		04/17/25 14:00	04/18/25 22:07	1
Lithium	ND		0.0500	0.0172	mg/L		04/17/25 14:00	04/18/25 22:07	1
Strontium	0.215		0.0500	0.00927	mg/L		04/17/25 14:00	04/18/25 22:07	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.258		0.00500	0.00353	mg/L		04/17/25 14:00	04/18/25 16:48	1
Sodium	25.5		1.00	0.882	mg/L		04/17/25 14:00	04/18/25 16:48	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 13:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	0.172	J	0.200	0.147	mg/L			04/21/25 18:20	1
Chemical Oxygen Demand (SM 5220D-2011)	10.9		10.0	1.80	mg/L			04/22/25 10:59	1
Chloride (SW846 9056A)	29.4		1.00	0.128	mg/L			04/18/25 00:05	1
Fluoride (SW846 9056A)	0.581		0.0500	0.0240	mg/L			04/18/25 00:05	1
Sulfate (SW846 9056A)	45.3		1.00	0.348	mg/L			04/18/25 00:05	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: MW-25-041425-2005

Lab Sample ID: 240-222449-3

Date Collected: 04/14/25 20:05

Matrix: Water

Date Received: 04/16/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.183		0.100	0.0573	mg/L		04/17/25 14:00	04/18/25 22:11	1
Lithium	0.0470	J	0.0500	0.0172	mg/L		04/17/25 14:00	04/18/25 22:11	1
Strontium	0.524		0.0500	0.00927	mg/L		04/17/25 14:00	04/18/25 22:11	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0730		0.00500	0.00353	mg/L		04/17/25 14:00	04/18/25 16:51	1
Sodium	60.3		1.00	0.882	mg/L		04/17/25 14:00	04/18/25 16:51	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 16:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			04/21/25 18:29	1
Chemical Oxygen Demand (SM 5220D-2011)	3.41	J	10.0	1.80	mg/L			04/22/25 10:59	1
Chloride (SW846 9056A)	25.6		1.00	0.128	mg/L			04/18/25 00:33	1
Fluoride (SW846 9056A)	1.55		0.0500	0.0240	mg/L			04/18/25 00:33	1
Sulfate (SW846 9056A)	49.4		1.00	0.348	mg/L			04/18/25 00:33	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: MW-26-041525-0955

Lab Sample ID: 240-222449-4

Date Collected: 04/15/25 09:55

Matrix: Water

Date Received: 04/16/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.295		0.100	0.0573	mg/L		04/17/25 14:00	04/18/25 22:19	1
Lithium	ND		0.0500	0.0172	mg/L		04/17/25 14:00	04/18/25 22:19	1
Strontium	2.03		0.0500	0.00927	mg/L		04/17/25 14:00	04/18/25 22:19	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	2.81		0.00500	0.00353	mg/L		04/17/25 14:00	04/18/25 17:02	1
Sodium	84.9		1.00	0.882	mg/L		04/17/25 14:00	04/18/25 17:02	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	2.13		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 17:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	1.19		0.200	0.147	mg/L			04/21/25 17:53	1
Chemical Oxygen Demand (SM 5220D-2011)	7.63	J	10.0	1.80	mg/L			04/22/25 10:59	1
Chloride (SW846 9056A)	2.75		1.00	0.128	mg/L			04/18/25 00:51	1
Fluoride (SW846 9056A)	0.124		0.0500	0.0240	mg/L			04/18/25 00:51	1
Sulfate (SW846 9056A)	1370		10.0	3.48	mg/L			04/18/25 01:00	10

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: MW-21-041525-1225

Lab Sample ID: 240-222449-5

Date Collected: 04/15/25 12:25

Matrix: Water

Date Received: 04/16/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		04/17/25 14:00	04/18/25 22:24	1
Lithium	0.0395	J	0.0500	0.0172	mg/L		04/17/25 14:00	04/18/25 22:24	1
Strontium	0.434		0.0500	0.00927	mg/L		04/17/25 14:00	04/18/25 22:24	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0266		0.00500	0.00353	mg/L		04/17/25 14:00	04/18/25 17:07	1
Sodium	51.7		1.00	0.882	mg/L		04/17/25 14:00	04/18/25 17:07	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 17:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			04/21/25 18:02	1
Chemical Oxygen Demand (SM 5220D-2011)	2.11	J	10.0	1.80	mg/L			04/22/25 10:59	1
Chloride (SW846 9056A)	5.78		1.00	0.128	mg/L			04/18/25 01:09	1
Fluoride (SW846 9056A)	0.327		0.0500	0.0240	mg/L			04/18/25 01:09	1
Sulfate (SW846 9056A)	15.4		1.00	0.348	mg/L			04/18/25 01:09	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: MW-20-041525-1415

Lab Sample ID: 240-222449-6

Date Collected: 04/15/25 14:15

Matrix: Water

Date Received: 04/16/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		04/17/25 14:00	04/18/25 21:25	1
Lithium	0.0355	J	0.0500	0.0172	mg/L		04/17/25 14:00	04/18/25 21:25	1
Strontium	0.375		0.0500	0.00927	mg/L		04/17/25 14:00	04/18/25 21:25	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.00500	0.00353	mg/L		04/17/25 14:00	04/18/25 16:14	1
Sodium	79.0		1.00	0.882	mg/L		04/17/25 14:00	04/18/25 16:14	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 16:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			04/21/25 17:17	1
Chemical Oxygen Demand (SM 5220D-2011)	6.33	J	10.0	1.80	mg/L			04/22/25 10:59	1
Chloride (SW846 9056A)	55.6		1.00	0.128	mg/L			04/17/25 23:01	1
Fluoride (SW846 9056A)	0.467		0.0500	0.0240	mg/L			04/17/25 23:01	1
Sulfate (SW846 9056A)	32.7		1.00	0.348	mg/L			04/17/25 23:01	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: MW-5-041525-1615

Lab Sample ID: 240-222449-7

Date Collected: 04/15/25 16:15

Matrix: Water

Date Received: 04/16/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		04/17/25 14:00	04/18/25 22:36	1
Lithium	0.0222	J	0.0500	0.0172	mg/L		04/17/25 14:00	04/18/25 22:36	1
Strontium	0.308		0.0500	0.00927	mg/L		04/17/25 14:00	04/18/25 22:36	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0175		0.00500	0.00353	mg/L		04/17/25 14:00	04/18/25 17:13	1
Sodium	43.2		1.00	0.882	mg/L		04/17/25 14:00	04/18/25 17:13	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 17:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			04/21/25 17:26	1
Chemical Oxygen Demand (SM 5220D-2011)	5.03	J	10.0	1.80	mg/L			04/22/25 10:59	1
Chloride (SW846 9056A)	3.43		1.00	0.128	mg/L			04/18/25 01:28	1
Fluoride (SW846 9056A)	0.374		0.0500	0.0240	mg/L			04/18/25 01:28	1
Sulfate (SW846 9056A)	30.8		1.00	0.348	mg/L			04/18/25 01:28	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: 20760-041525-0001

Lab Sample ID: 240-222449-8

Date Collected: 04/15/25 00:01

Matrix: Water

Date Received: 04/16/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.299		0.100	0.0573	mg/L		04/17/25 14:00	04/18/25 22:41	1
Lithium	ND		0.0500	0.0172	mg/L		04/17/25 14:00	04/18/25 22:41	1
Strontium	2.05		0.0500	0.00927	mg/L		04/17/25 14:00	04/18/25 22:41	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	2.87		0.00500	0.00353	mg/L		04/17/25 14:00	04/18/25 17:18	1
Sodium	85.3		1.00	0.882	mg/L		04/17/25 14:00	04/18/25 17:18	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	2.13		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 17:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	1.19		0.200	0.147	mg/L			04/21/25 17:29	1
Chemical Oxygen Demand (SM 5220D-2011)	8.61	J	10.0	1.80	mg/L			04/22/25 10:59	1
Chloride (SW846 9056A)	2.74		1.00	0.128	mg/L			04/18/25 01:37	1
Fluoride (SW846 9056A)	0.182		0.0500	0.0240	mg/L			04/18/25 01:37	1
Sulfate (SW846 9056A)	1330		10.0	3.48	mg/L			04/18/25 01:46	10

QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 240-652508/1-A

Matrix: Water

Analysis Batch: 652748

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 652508

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		04/17/25 14:00	04/18/25 21:16	1
Lithium	ND		0.0500	0.0172	mg/L		04/17/25 14:00	04/18/25 21:16	1
Strontium	ND		0.0500	0.00927	mg/L		04/17/25 14:00	04/18/25 21:16	1

Lab Sample ID: LCS 240-652508/2-A

Matrix: Water

Analysis Batch: 652748

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 652508

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	1.00	1.089		mg/L		109	80 - 120
Lithium	1.00	1.026		mg/L		103	80 - 120
Strontium	1.00	0.9530		mg/L		95	80 - 120

Lab Sample ID: 240-222449-6 MS

Matrix: Water

Analysis Batch: 652748

Client Sample ID: MW-20-041525-1415

Prep Type: Total Recoverable

Prep Batch: 652508

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	ND		1.00	1.149		mg/L		115	75 - 125
Lithium	0.0355	J	1.00	1.077		mg/L		104	75 - 125
Strontium	0.375		1.00	1.349		mg/L		97	75 - 125

Lab Sample ID: 240-222449-6 MSD

Matrix: Water

Analysis Batch: 652748

Client Sample ID: MW-20-041525-1415

Prep Type: Total Recoverable

Prep Batch: 652508

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	ND		1.00	1.167		mg/L		117	75 - 125	2	20
Lithium	0.0355	J	1.00	1.086		mg/L		105	75 - 125	1	20
Strontium	0.375		1.00	1.351		mg/L		98	75 - 125	0	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 240-652508/1-A

Matrix: Water

Analysis Batch: 652752

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 652508

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 16:08	1
Manganese	ND		0.00500	0.00353	mg/L		04/17/25 14:00	04/18/25 16:08	1
Sodium	ND		1.00	0.882	mg/L		04/17/25 14:00	04/18/25 16:08	1

Lab Sample ID: LCS 240-652508/3-A

Matrix: Water

Analysis Batch: 652752

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 652508

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5.00	4.927		mg/L		99	80 - 120
Manganese	0.500	0.4813		mg/L		96	80 - 120
Sodium	25.0	24.48		mg/L		98	80 - 120

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: 240-222449-6 MS

Matrix: Water

Analysis Batch: 652752

Client Sample ID: MW-20-041525-1415

Prep Type: Total Recoverable

Prep Batch: 652508

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	ND		0.500	0.4862		mg/L		97	80 - 120
Sodium	79.0		25.0	103.3		mg/L		97	80 - 120

Lab Sample ID: 240-222449-6 MSD

Matrix: Water

Analysis Batch: 652752

Client Sample ID: MW-20-041525-1415

Prep Type: Total Recoverable

Prep Batch: 652508

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Manganese	ND		0.500	0.4814		mg/L		96	80 - 120	1	20
Sodium	79.0		25.0	102.2		mg/L		93	80 - 120	1	20

Lab Sample ID: MB 240-652522/1-A

Matrix: Water

Analysis Batch: 652752

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 652522

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/17/25 14:00	04/18/25 12:45	1

Lab Sample ID: LCS 240-652522/2-A

Matrix: Water

Analysis Batch: 652752

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 652522

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5.00	4.893		mg/L		98	80 - 120

Lab Sample ID: 240-222415-C-1-B MS

Matrix: Water

Analysis Batch: 652752

Client Sample ID: Matrix Spike

Prep Type: Total Recoverable

Prep Batch: 652522

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	0.454		5.00	5.271		mg/L		96	80 - 120

Lab Sample ID: 240-222415-C-1-C MSD

Matrix: Water

Analysis Batch: 652752

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total Recoverable

Prep Batch: 652522

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Iron	0.454		5.00	5.304		mg/L		97	80 - 120	1	20

Lab Sample ID: 240-222449-6 MS

Matrix: Water

Analysis Batch: 652752

Client Sample ID: MW-20-041525-1415

Prep Type: Dissolved

Prep Batch: 652508

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	ND		5.00	5.013		mg/L		100	80 - 120

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 240-222449-6 MSD

Matrix: Water

Analysis Batch: 652752

Client Sample ID: MW-20-041525-1415

Prep Type: Dissolved

Prep Batch: 652508

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	ND		5.00	5.008		mg/L		100	80 - 120	0	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 240-653034/76

Matrix: Water

Analysis Batch: 653034

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.200	0.147	mg/L			04/21/25 17:11	1

Lab Sample ID: LCS 240-653034/77

Matrix: Water

Analysis Batch: 653034

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	8.50	7.853		mg/L		92	90 - 110

Lab Sample ID: 240-222449-6 MS

Matrix: Water

Analysis Batch: 653034

Client Sample ID: MW-20-041525-1415

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	ND		2.50	2.350		mg/L		94	90 - 110

Lab Sample ID: 240-222449-6 MSD

Matrix: Water

Analysis Batch: 653034

Client Sample ID: MW-20-041525-1415

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ammonia	ND		2.50	2.358		mg/L		94	90 - 110	0	20

Method: 5220D-2011 - Chemical Oxygen Demand

Lab Sample ID: MB 240-653105/3

Matrix: Water

Analysis Batch: 653105

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10.0	1.80	mg/L			04/22/25 10:59	1

Lab Sample ID: LCS 240-653105/4

Matrix: Water

Analysis Batch: 653105

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	27.0	28.41		mg/L		105	90 - 110

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Method: 5220D-2011 - Chemical Oxygen Demand (Continued)

Lab Sample ID: 240-222449-6 MS

Matrix: Water

Analysis Batch: 653105

Client Sample ID: MW-20-041525-1415

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chemical Oxygen Demand	6.33	J	50.0	55.04		mg/L		97	90 - 110		

Lab Sample ID: 240-222449-6 MSD

Matrix: Water

Analysis Batch: 653105

Client Sample ID: MW-20-041525-1415

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	6.33	J	50.0	52.44		mg/L		92	90 - 110	5	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 240-652603/3

Matrix: Water

Analysis Batch: 652603

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.128	mg/L			04/17/25 22:43	1
Fluoride	ND		0.0500	0.0240	mg/L			04/17/25 22:43	1
Sulfate	ND		1.00	0.348	mg/L			04/17/25 22:43	1

Lab Sample ID: LCS 240-652603/4

Matrix: Water

Analysis Batch: 652603

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	50.0	49.73		mg/L		99	90 - 110		
Fluoride	2.50	2.539		mg/L		102	90 - 110		
Sulfate	50.0	49.03		mg/L		98	90 - 110		

Lab Sample ID: 240-222449-6 MS

Matrix: Water

Analysis Batch: 652603

Client Sample ID: MW-20-041525-1415

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	55.6		50.0	106.0		mg/L		101	80 - 120		
Fluoride	0.467		2.50	2.945		mg/L		99	80 - 120		
Sulfate	32.7		50.0	83.92		mg/L		103	80 - 120		

Lab Sample ID: 240-222449-6 MSD

Matrix: Water

Analysis Batch: 652603

Client Sample ID: MW-20-041525-1415

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	55.6		50.0	105.5		mg/L		100	80 - 120	0	15
Fluoride	0.467		2.50	2.915		mg/L		98	80 - 120	1	15
Sulfate	32.7		50.0	83.49		mg/L		102	80 - 120	1	15

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QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Metals

Prep Batch: 652508

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222449-1	SW-2-041425-1630	Total Recoverable	Water	3005A	
240-222449-2	SW-1-041425-1730	Total Recoverable	Water	3005A	
240-222449-3	MW-25-041425-2005	Dissolved	Water	3005A	
240-222449-3	MW-25-041425-2005	Total Recoverable	Water	3005A	
240-222449-4	MW-26-041525-0955	Dissolved	Water	3005A	
240-222449-4	MW-26-041525-0955	Total Recoverable	Water	3005A	
240-222449-5	MW-21-041525-1225	Dissolved	Water	3005A	
240-222449-5	MW-21-041525-1225	Total Recoverable	Water	3005A	
240-222449-6	MW-20-041525-1415	Dissolved	Water	3005A	
240-222449-6	MW-20-041525-1415	Total Recoverable	Water	3005A	
240-222449-7	MW-5-041525-1615	Dissolved	Water	3005A	
240-222449-7	MW-5-041525-1615	Total Recoverable	Water	3005A	
240-222449-8	20760-041525-0001	Dissolved	Water	3005A	
240-222449-8	20760-041525-0001	Total Recoverable	Water	3005A	
MB 240-652508/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-652508/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-652508/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-222449-6 MS	MW-20-041525-1415	Dissolved	Water	3005A	
240-222449-6 MS	MW-20-041525-1415	Total Recoverable	Water	3005A	
240-222449-6 MS	MW-20-041525-1415	Total Recoverable	Water	3005A	
240-222449-6 MSD	MW-20-041525-1415	Dissolved	Water	3005A	
240-222449-6 MSD	MW-20-041525-1415	Total Recoverable	Water	3005A	
240-222449-6 MSD	MW-20-041525-1415	Total Recoverable	Water	3005A	

Filtration Batch: 652520

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222449-1	SW-2-041425-1630	Dissolved	Water	FILTRATION	
240-222449-2	SW-1-041425-1730	Dissolved	Water	FILTRATION	

Prep Batch: 652522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222449-1	SW-2-041425-1630	Dissolved	Water	3005A	652520
240-222449-2	SW-1-041425-1730	Dissolved	Water	3005A	652520
MB 240-652522/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-652522/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-222415-C-1-B MS	Matrix Spike	Total Recoverable	Water	3005A	
240-222415-C-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Analysis Batch: 652748

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222449-1	SW-2-041425-1630	Total Recoverable	Water	6010D	652508
240-222449-2	SW-1-041425-1730	Total Recoverable	Water	6010D	652508
240-222449-3	MW-25-041425-2005	Total Recoverable	Water	6010D	652508
240-222449-4	MW-26-041525-0955	Total Recoverable	Water	6010D	652508
240-222449-5	MW-21-041525-1225	Total Recoverable	Water	6010D	652508
240-222449-6	MW-20-041525-1415	Total Recoverable	Water	6010D	652508
240-222449-7	MW-5-041525-1615	Total Recoverable	Water	6010D	652508
240-222449-8	20760-041525-0001	Total Recoverable	Water	6010D	652508
MB 240-652508/1-A	Method Blank	Total Recoverable	Water	6010D	652508
LCS 240-652508/2-A	Lab Control Sample	Total Recoverable	Water	6010D	652508
240-222449-6 MS	MW-20-041525-1415	Total Recoverable	Water	6010D	652508

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QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Metals (Continued)

Analysis Batch: 652748 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222449-6 MSD	MW-20-041525-1415	Total Recoverable	Water	6010D	652508

Analysis Batch: 652752

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222449-1	SW-2-041425-1630	Dissolved	Water	6020B	652522
240-222449-1	SW-2-041425-1630	Total Recoverable	Water	6020B	652508
240-222449-2	SW-1-041425-1730	Dissolved	Water	6020B	652522
240-222449-2	SW-1-041425-1730	Total Recoverable	Water	6020B	652508
240-222449-3	MW-25-041425-2005	Dissolved	Water	6020B	652508
240-222449-3	MW-25-041425-2005	Total Recoverable	Water	6020B	652508
240-222449-4	MW-26-041525-0955	Dissolved	Water	6020B	652508
240-222449-4	MW-26-041525-0955	Total Recoverable	Water	6020B	652508
240-222449-5	MW-21-041525-1225	Dissolved	Water	6020B	652508
240-222449-5	MW-21-041525-1225	Total Recoverable	Water	6020B	652508
240-222449-6	MW-20-041525-1415	Dissolved	Water	6020B	652508
240-222449-6	MW-20-041525-1415	Total Recoverable	Water	6020B	652508
240-222449-7	MW-5-041525-1615	Dissolved	Water	6020B	652508
240-222449-7	MW-5-041525-1615	Total Recoverable	Water	6020B	652508
240-222449-8	20760-041525-0001	Dissolved	Water	6020B	652508
240-222449-8	20760-041525-0001	Total Recoverable	Water	6020B	652508
MB 240-652508/1-A	Method Blank	Total Recoverable	Water	6020B	652508
MB 240-652522/1-A	Method Blank	Total Recoverable	Water	6020B	652522
LCS 240-652508/3-A	Lab Control Sample	Total Recoverable	Water	6020B	652508
LCS 240-652522/2-A	Lab Control Sample	Total Recoverable	Water	6020B	652522
240-222415-C-1-B MS	Matrix Spike	Total Recoverable	Water	6020B	652522
240-222415-C-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020B	652522
240-222449-6 MS	MW-20-041525-1415	Dissolved	Water	6020B	652508
240-222449-6 MS	MW-20-041525-1415	Total Recoverable	Water	6020B	652508
240-222449-6 MSD	MW-20-041525-1415	Dissolved	Water	6020B	652508
240-222449-6 MSD	MW-20-041525-1415	Total Recoverable	Water	6020B	652508

General Chemistry

Analysis Batch: 652603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222449-1	SW-2-041425-1630	Total/NA	Water	9056A	
240-222449-2	SW-1-041425-1730	Total/NA	Water	9056A	
240-222449-3	MW-25-041425-2005	Total/NA	Water	9056A	
240-222449-4	MW-26-041525-0955	Total/NA	Water	9056A	
240-222449-4	MW-26-041525-0955	Total/NA	Water	9056A	
240-222449-5	MW-21-041525-1225	Total/NA	Water	9056A	
240-222449-6	MW-20-041525-1415	Total/NA	Water	9056A	
240-222449-7	MW-5-041525-1615	Total/NA	Water	9056A	
240-222449-8	20760-041525-0001	Total/NA	Water	9056A	
240-222449-8	20760-041525-0001	Total/NA	Water	9056A	
MB 240-652603/3	Method Blank	Total/NA	Water	9056A	
LCS 240-652603/4	Lab Control Sample	Total/NA	Water	9056A	
240-222449-6 MS	MW-20-041525-1415	Total/NA	Water	9056A	
240-222449-6 MSD	MW-20-041525-1415	Total/NA	Water	9056A	

Eurofins Cleveland

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

General Chemistry

Analysis Batch: 653034

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222449-1	SW-2-041425-1630	Total/NA	Water	350.1	
240-222449-2	SW-1-041425-1730	Total/NA	Water	350.1	
240-222449-3	MW-25-041425-2005	Total/NA	Water	350.1	
240-222449-4	MW-26-041525-0955	Total/NA	Water	350.1	
240-222449-5	MW-21-041525-1225	Total/NA	Water	350.1	
240-222449-6	MW-20-041525-1415	Total/NA	Water	350.1	
240-222449-7	MW-5-041525-1615	Total/NA	Water	350.1	
240-222449-8	20760-041525-0001	Total/NA	Water	350.1	
MB 240-653034/76	Method Blank	Total/NA	Water	350.1	
LCS 240-653034/77	Lab Control Sample	Total/NA	Water	350.1	
240-222449-6 MS	MW-20-041525-1415	Total/NA	Water	350.1	
240-222449-6 MSD	MW-20-041525-1415	Total/NA	Water	350.1	

Analysis Batch: 653105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222449-1	SW-2-041425-1630	Total/NA	Water	5220D-2011	
240-222449-2	SW-1-041425-1730	Total/NA	Water	5220D-2011	
240-222449-3	MW-25-041425-2005	Total/NA	Water	5220D-2011	
240-222449-4	MW-26-041525-0955	Total/NA	Water	5220D-2011	
240-222449-5	MW-21-041525-1225	Total/NA	Water	5220D-2011	
240-222449-6	MW-20-041525-1415	Total/NA	Water	5220D-2011	
240-222449-7	MW-5-041525-1615	Total/NA	Water	5220D-2011	
240-222449-8	20760-041525-0001	Total/NA	Water	5220D-2011	
MB 240-653105/3	Method Blank	Total/NA	Water	5220D-2011	
LCS 240-653105/4	Lab Control Sample	Total/NA	Water	5220D-2011	
240-222449-6 MS	MW-20-041525-1415	Total/NA	Water	5220D-2011	
240-222449-6 MSD	MW-20-041525-1415	Total/NA	Water	5220D-2011	

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: SW-2-041425-1630

Lab Sample ID: 240-222449-1

Date Collected: 04/14/25 16:30

Matrix: Water

Date Received: 04/16/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6010D		1	652748	AJC	EET CLE	04/18/25 22:02
Dissolved	Filtration	FILTRATION			652520	BN	EET CLE	04/17/25 12:00
Dissolved	Prep	3005A			652522	BN	EET CLE	04/17/25 14:00
Dissolved	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 13:49
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 16:46
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 18:17
Total/NA	Analysis	5220D-2011		1	653105	AAP	EET CLE	04/22/25 10:59
Total/NA	Analysis	9056A		1	652603	JMR	EET CLE	04/17/25 23:56

Client Sample ID: SW-1-041425-1730

Lab Sample ID: 240-222449-2

Date Collected: 04/14/25 17:30

Matrix: Water

Date Received: 04/16/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6010D		1	652748	AJC	EET CLE	04/18/25 22:07
Dissolved	Filtration	FILTRATION			652520	BN	EET CLE	04/17/25 12:00
Dissolved	Prep	3005A			652522	BN	EET CLE	04/17/25 14:00
Dissolved	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 13:52
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 16:48
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 18:20
Total/NA	Analysis	5220D-2011		1	653105	AAP	EET CLE	04/22/25 10:59
Total/NA	Analysis	9056A		1	652603	JMR	EET CLE	04/18/25 00:05

Client Sample ID: MW-25-041425-2005

Lab Sample ID: 240-222449-3

Date Collected: 04/14/25 20:05

Matrix: Water

Date Received: 04/16/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6010D		1	652748	AJC	EET CLE	04/18/25 22:11
Dissolved	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Dissolved	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 16:54
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 16:51
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 18:29
Total/NA	Analysis	5220D-2011		1	653105	AAP	EET CLE	04/22/25 10:59
Total/NA	Analysis	9056A		1	652603	JMR	EET CLE	04/18/25 00:33

Eurofins Cleveland

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: MW-26-041525-0955

Lab Sample ID: 240-222449-4

Date Collected: 04/15/25 09:55

Matrix: Water

Date Received: 04/16/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6010D		1	652748	AJC	EET CLE	04/18/25 22:19
Dissolved	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Dissolved	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 17:05
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 17:02
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 17:53
Total/NA	Analysis	5220D-2011		1	653105	AAP	EET CLE	04/22/25 10:59
Total/NA	Analysis	9056A		1	652603	JMR	EET CLE	04/18/25 00:51
Total/NA	Analysis	9056A		10	652603	JMR	EET CLE	04/18/25 01:00

Client Sample ID: MW-21-041525-1225

Lab Sample ID: 240-222449-5

Date Collected: 04/15/25 12:25

Matrix: Water

Date Received: 04/16/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6010D		1	652748	AJC	EET CLE	04/18/25 22:24
Dissolved	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Dissolved	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 17:10
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 17:07
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 18:02
Total/NA	Analysis	5220D-2011		1	653105	AAP	EET CLE	04/22/25 10:59
Total/NA	Analysis	9056A		1	652603	JMR	EET CLE	04/18/25 01:09

Client Sample ID: MW-20-041525-1415

Lab Sample ID: 240-222449-6

Date Collected: 04/15/25 14:15

Matrix: Water

Date Received: 04/16/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6010D		1	652748	AJC	EET CLE	04/18/25 21:25
Dissolved	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Dissolved	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 16:32
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 16:14
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 17:17
Total/NA	Analysis	5220D-2011		1	653105	AAP	EET CLE	04/22/25 10:59
Total/NA	Analysis	9056A		1	652603	JMR	EET CLE	04/17/25 23:01

Eurofins Cleveland

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Client Sample ID: MW-5-041525-1615

Lab Sample ID: 240-222449-7

Date Collected: 04/15/25 16:15

Matrix: Water

Date Received: 04/16/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6010D		1	652748	AJC	EET CLE	04/18/25 22:36
Dissolved	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Dissolved	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 17:15
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 17:13
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 17:26
Total/NA	Analysis	5220D-2011		1	653105	AAP	EET CLE	04/22/25 10:59
Total/NA	Analysis	9056A		1	652603	JMR	EET CLE	04/18/25 01:28

Client Sample ID: 20760-041525-0001

Lab Sample ID: 240-222449-8

Date Collected: 04/15/25 00:01

Matrix: Water

Date Received: 04/16/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6010D		1	652748	AJC	EET CLE	04/18/25 22:41
Dissolved	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Dissolved	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 17:21
Total Recoverable	Prep	3005A			652508	MN7X	EET CLE	04/17/25 14:00
Total Recoverable	Analysis	6020B		1	652752	S4FJ	EET CLE	04/18/25 17:18
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 17:29
Total/NA	Analysis	5220D-2011		1	653105	AAP	EET CLE	04/22/25 10:59
Total/NA	Analysis	9056A		1	652603	JMR	EET CLE	04/18/25 01:37
Total/NA	Analysis	9056A		10	652603	JMR	EET CLE	04/18/25 01:46

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222449-1

Laboratory: Eurofins Cleveland

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	421	06-01-25

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Eurofins Cleveland

180 S. Van Buren Avenue

Barberton, OH 44203

Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record



Environment Testing

Client Information		Sampler: <u>Francis Reed</u>		Lab PM: <u>Heckler, Denise D</u>		Carrier Tracking No(s):		COC No: <u>240-131756-41930.1</u>					
Client Contact: <u>Thomas Vanage</u>		Phone: <u>614-288-8619</u>		E-Mail: <u>Denise.Heckler@et.eurofinsus.com</u>		State of Origin: <u>IA</u>		Page: <u>Page 1 of 2</u>					
Company: <u>Haley & Aldrich, Inc.</u>		FWSID:		Analysis Requested						Job #: <u>0129848-038</u>			
Address: <u>8899 Gander Creek Drive</u>		Due Date Requested:								Preservation Codes: N - None S - H2SO4 D - HNO3			
City: <u>Miamisburg</u>		TAT Requested (days): <u>STD</u>											
State, Zip: <u>OH, 45342-4418</u>		Compliance Project: ☐ Yes ☐ No											
Phone: <u>937-530-1412(Tel)</u>		PO #: <u>0129848-034</u>											
Email: <u>TVanage@haleyaldrich.com</u>		WO #:											
Project Name: <u>Amsted - Keokuk, Iowa Spring 2025</u>		Project #: <u>24024753</u>		Total Number of containers						Other:			
Site:		SSOW#:											
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soil/sediment, ST=Soil, A=Air)	Field Filtered Sample (Yes or No)	9056A_28D - Chloride, Fluoride, Sulfate	350.1, 5220D	6010D, 6020B	6020B - Iron - Field Filtered	6020B - Iron, Lab to filter	Special Instructions/Note:	
SW-2-091425-1630		04/14/25	16:30	G	Water	N	N	X	X	X	X	6	Lab Filter
SW-1-041425-1730		04/14/25	17:30	G	Water	N	N	X	X	X	X	6	Lab Filter
MW-25-091425-2005		04/14/25	20:05	G	Water	Y	N	X	X	X	X	6	
MW-26-091525-0955		04/15/25	09:55	G	Water	Y	N	X	X	X	X	6	
MW-21-091525-1225		04/15/25	12:25	G	Water	Y	N	X	X	X	X	6	
MW-20-091525-1415		04/15/25	14:15	G	Water	Y	Y	X	X	X	X	18	MS/MSD
MW-5-091525-1615		04/15/25	16:15	G	Water	Y	N	X	X	X	X	6	
20760-091525-0001		04/15/25	00:01	G	Water	Y	N	X	X	X	X	6	Field Duplicate
					Water								
					Water								
					Water								
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological													
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months													
Deliverable Requested: I, II, III, IV, Other (specify)													
Special Instructions/QC Requirements:													
Empty Kit Relinquished by:				Date:				Time:				Method of Shipment:	
Relinquished by: <u>Francis Reed</u> <u>H+A</u>				Date/Time: <u>04/15/25 18:30</u>				Company: <u>H+A</u>				Received by: <u>[Signature]</u>	
Relinquished by:				Date/Time:				Company:				Date/Time: <u>4/16/25 0930</u>	
Relinquished by:				Date/Time:				Company:				Date/Time:	
Custody Seals Intact: ☐ Yes ☐ No				Custody Seal No.:				Cooler Temperature(s) °C and Other Remarks:					

Eurofins - Cleveland Sample Receipt Form/Narrative		Login # : _____	
Barberton Facility			
Client <u>Wadey & Albrecht</u>	Site Name _____	Cooler unpacked by: _____	
Cooler Received on <u>4/16/25</u>	Opened on <u>4/16/25</u>		
FedEx 1 st Grd <u>Exp</u> UPS FAS Waypoint	Client Drop Off _____	Eurofins Courier _____ Other <u>LB</u>	
Receipt After-hours Drop-off Date/Time _____		Storage Location _____	
Eurofins Cooler # <u>LC</u>	Roam Box _____	Client Cooler _____	Box _____ Other _____
Packing material used <u>Bubble Wrap</u> Foam Plastic Bag _____ None _____ Other _____			
1 Cooler temperature upon receipt _____ °C ☒ See Multiple Cooler Form			
IR GUN # _____ (CF _____ °C) Observed Cooler Temp _____ °C Corrected Cooler Temp _____ °C			
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity <u>1</u>			
-Were the seals on the outside of the cooler(s) signed & dated? <u>Yes</u> <u>No</u> <u>NA</u>			
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/Methg)? <u>Yes</u> <u>No</u> <u>NA</u>			
-Were tamper/custody seals intact and uncompromised? <u>Yes</u> <u>No</u> <u>NA</u>			
3 Shippers' packing slip attached to the cooler(s)? <u>Yes</u> <u>No</u> <u>NA</u>			
4 Did custody papers accompany the sample(s)? <u>Yes</u> <u>No</u> <u>NA</u>			
5 Were the custody papers relinquished & signed in the appropriate place? <u>Yes</u> <u>No</u> <u>NA</u>			
6 Was/were the person(s) who collected the samples clearly identified on the COC? <u>Yes</u> <u>No</u> <u>NA</u>			
7 Did all bottles arrive in good condition (Unbroken)? <u>Yes</u> <u>No</u> <u>NA</u>			
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? <u>Yes</u> <u>No</u> <u>NA</u>			
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? <u>Yes</u> <u>No</u> <u>NA</u>			
10 Were correct bottle(s) used for the test(s) indicated? <u>Yes</u> <u>No</u> <u>NA</u>			
11 Sufficient quantity received to perform indicated analyses? <u>Yes</u> <u>No</u> <u>NA</u>			
12 Are these work share samples and all listed on the COC? <u>Yes</u> <u>No</u> <u>NA</u>			
13 If yes, Questions 13-17 have been checked at the originating laboratory			
13 Were all preserved sample(s) at the correct pH upon receipt? <u>Yes</u> <u>No</u> <u>NA</u> pH Strip Lot# HC457151			
14 Were VOAs on the COC? <u>Yes</u> <u>No</u> <u>NA</u>			
15 Were air bubbles >6 mm in any VOA vials? <u>Yes</u> <u>No</u> <u>NA</u>			
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ <u>Yes</u> <u>No</u> <u>NA</u>			
17 Was a LL Hg or Me Hg trip blank present? <u>Yes</u> <u>No</u> <u>NA</u>			
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____			
Concerning _____			
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page		Samples processed by: _____	
19 SAMPLE CONDITION			
Sample(s) _____ were received after the recommended holding time had expired.			
Sample(s) _____ were received in a broken container			
Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)			
20 SAMPLE PRESERVATION			
Sample(s) _____ were further preserved in the laboratory			
Time preserved _____ Preservative(s) added/Lot number(s). _____			
VOA Sample Preservation - Date/Time VOAs Frozen _____			

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

4/16/2025

Login Container Summary Report

240-222449

4/24/2025

Temperature readings

Client Sample ID	Lab ID	Container Type	Container pH	Preservation Temp	Preservation Added	Preservation Lot Number
SW-2-041425-1630	240-222449-A-1	Voa Vial 40ml Amber - with Sulfuric Acid				
SW-2-041425-1630	240-222449-B-1	Plastic 60 mL - unpreserved				
SW-2-041425-1630	240-222449-C-1	Amber Glass 250ml - Sulfuric Acid				
SW-2-041425-1630	240-222449-D-1	Plastic 250ml - with Sulfuric Acid	<2			
SW-2-041425-1630	240-222449-E-1	Plastic 500 mL - unpreserved - dis				
SW-2-041425-1630	240-222449-F-1	Plastic 500ml - with Nitric Acid	<2			
SW-1-041425-1730	240-222449-A-2	Voa Vial 40ml Amber - with Sulfuric Acid				
SW-1-041425-1730	240-222449-B-2	Plastic 60 mL - unpreserved				
SW-1-041425-1730	240-222449-C-2	Amber Glass 250ml - Sulfuric Acid				
SW-1-041425-1730	240-222449-D-2	Plastic 250ml - with Sulfuric Acid	<2			
SW-1-041425-1730	240-222449-E-2	Plastic 500 mL - unpreserved - dis				
SW-1-041425-1730	240-222449-F-2	Plastic 500ml - with Nitric Acid	<2			
MMW-25-041425-2005	240-222449-A-3	Voa Vial 40ml Amber - with Sulfuric Acid				
MMW-25-041425-2005	240-222449-B-3	Plastic 60 mL - unpreserved				
MMW-25-041425-2005	240-222449-C-3	Amber Glass 250ml - Sulfuric Acid	<2			
MMW-25-041425-2005	240-222449-D-3	Plastic 250ml - with Sulfuric Acid				
MMW-25-041425-2005	240-222449-E-3	Plastic 500ml - with Nitric Acid	<2			
MMW-25-041425-2005	240-222449-F-3	Plastic 500ml - w/ Nitric - Dis	<2			
MMW-26-041525-0955	240-222449-A-4	Voa Vial 40ml Amber - with Sulfuric Acid				
MMW-26-041525-0955	240-222449-B-4	Plastic 60 mL - unpreserved				
MMW-26-041525-0955	240-222449-C-4	Amber Glass 250ml - Sulfuric Acid	<2			
MMW-26-041525-0955	240-222449-D-4	Plastic 250ml - with Sulfuric Acid				
MMW-26-041525-0955	240-222449-E-4	Plastic 500ml - with Nitric Acid	<2			
MMW-26-041525-0955	240-222449-F-4	Plastic 500ml - w/ Nitric - Dis.	<2			
MMW-21-041525-1225	240-222449-A-5	Voa Vial 40ml Amber - with Sulfuric Acid				
MMW-21-041525-1225	240-222449-B-5	Plastic 60 mL - unpreserved				
MMW-21-041525-1225	240-222449-C-5	Amber Glass 250ml - Sulfuric Acid	<2			
MMW-21-041525-1225	240-222449-D-5	Plastic 250ml - with Sulfuric Acid				
MMW-21-041525-1225	240-222449-E-5	Plastic 500ml - with Nitric Acid	<2			
MMW-21-041525-1225	240-222449-F-5	Plastic 500ml - w/ Nitric - Dis.	<2			
MMW-20-041525-1415	240-222449-A-6	Voa Vial 40ml Amber - with Sulfuric Acid				
MMW-20-041525-1415	240-222449-A-6 MS	Voa Vial 40ml Amber - with Sulfuric Acid				
MMW-20-041525-1415	240-222449-A-6 MSD	Voa Vial 40ml Amber - with Sulfuric Acid				
MMW-20-041525-1415	240-222449-B-6	Plastic 60 mL - unpreserved				
MMW-20-041525-1415	240-222449-B-6 MS	Plastic 60 mL - unpreserved				

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u> pH	<u>Preservation</u> Temp	<u>Preservation</u> Added	<u>Preservation</u> Lot Number
MW-20-041525-1415	240-222449-B-6 MSD	Plastic 60 mL - unpreserved	_____	_____	_____	_____
MW-20-041525-1415	240-222449-C-6	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
MW-20-041525-1415	240-222449-C-6 MS	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
MW-20-041525-1415	240-222449-C-6 MSD	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
MW-20-041525-1415	240-222449-D-6	Plastic 250ml - with Sulfuric Acid	_____	_____	_____	_____
MW-20-041525-1415	240-222449-D-6 MS	Plastic 250ml - with Sulfuric Acid	_____	_____	_____	_____
MW-20-041525-1415	240-222449-D-6 MSD	Plastic 250ml - with Sulfuric Acid	_____	_____	_____	_____
MW-20-041525-1415	240-222449-E-6	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
MW-20-041525-1415	240-222449-E-6 MS	Plastic 500ml with Nitric Acid	<2	_____	_____	_____
MW-20-041525-1415	240-222449-E-6 MSD	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
MW-20-041525-1415	240-222449-F-6	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____
MW-20-041525-1415	240-222449-F-6 MS	Plastic 500ml - w/ Nitric - Dis	<2	_____	_____	_____
MW-20-041525-1415	240-222449-F-6 MSD	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____
MW-5-041525-1615	240-222449-A-7	Voa Vial 40ml Amber - with Sulfuric Acid	_____	_____	_____	_____
MW-5-041525-1615	240-222449-B-7	Plastic 60 mL - unpreserved	_____	_____	_____	_____
MW-5-041525-1615	240-222449-C-7	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
MW-5-041525-1615	240-222449-D-7	Plastic 250ml - with Sulfuric Acid	_____	_____	_____	_____
MW-5-041525-1615	240-222449-E-7	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
MW-5-041525-1615	240-222449 F-7	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____
20760-041525-0001	240-222449-A-8	Voa Vial 40ml Amber - with Sulfuric Acid	_____	_____	_____	_____
20760-041525-0001	240-222449-B-8	Plastic 60 mL - unpreserved	_____	_____	_____	_____
20760-041525-0001	240-222449-C-8	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
20760-041525-0001	240-222449-D-8	Plastic 250ml - with Sulfuric Acid	_____	_____	_____	_____
20760-041525-0001	240-222449-E-8	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
20760-041525-0001	240-222449-F-8	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____

ANALYTICAL REPORT

PREPARED FOR

Attn: Thomas Vanage
Haley & Aldrich, Inc.
8899 Gander Creek Drive
Miamisburg, Ohio 45342-4418

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JOB DESCRIPTION

Amsted - Keokuk, Iowa GW

JOB NUMBER

240-222546-1

Eurofins Cleveland

Job Notes

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Authorization



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Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: Haley & Aldrich, Inc.
Project: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Job ID: 240-222546-1

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Job Narrative 240-222546-1

Receipt

The samples were received on 4/17/2025 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 2.2°C and 3.3°C.

Metals

Method 6010D - Total Recoverable: The continuing calibration verification (CCV) associated with batch 240-652978 recovered above the upper control limit for Boron. The samples associated with this CCV were below the reporting limit for the affected analytes; therefore, the data have been reported. The associated samples are: MW-6-041625-1105 (240-222546-3), MW-12-041625-1400 (240-222546-4) and MW-16-041625-1555 (240-222546-5).

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

General Chemistry

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

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Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET CLE
6020B	Metals (ICP/MS)	SW846	EET CLE
350.1	Nitrogen, Ammonia	EPA	EET CLE
5220D-2011	Chemical Oxygen Demand	SM	EET CLE
9056A	Anions, Ion Chromatography	SW846	EET CLE
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CLE

Protocol References:

EPA = US Environmental Protection Agency

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

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

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-222546-1	MW-27-041625-1230	Water	04/16/25 12:30	04/17/25 09:30
240-222546-2	MW-7-041625-0935	Water	04/16/25 09:35	04/17/25 09:30
240-222546-3	MW-6-041625-1105	Water	04/16/25 11:05	04/17/25 09:30
240-222546-4	MW-12-041625-1400	Water	04/16/25 14:00	04/17/25 09:30
240-222546-5	MW-16-041625-1555	Water	04/16/25 15:55	04/17/25 09:30

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Client Sample ID: MW-27-041625-1230

Lab Sample ID: 240-222546-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.160		0.100	0.0573	mg/L	1		6010D	Total
									Recoverable
Lithium	0.0485	J	0.0500	0.0172	mg/L	1		6010D	Total
									Recoverable
Strontium	0.765		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.129		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	41.8		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Iron	2.50		0.100	0.0470	mg/L	1		6020B	Dissolved
Ammonia	1.38		0.200	0.147	mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	7.31	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	1.72		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.284		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	252		5.00	1.74	mg/L	5		9056A	Total/NA

Client Sample ID: MW-7-041625-0935

Lab Sample ID: 240-222546-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.247		0.100	0.0573	mg/L	1		6010D	Total
									Recoverable
Lithium	0.0676		0.0500	0.0172	mg/L	1		6010D	Total
									Recoverable
Strontium	1.79		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.0666		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	62.4		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Chemical Oxygen Demand	9.58	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	1.32		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.280		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	1240		10.0	3.48	mg/L	10		9056A	Total/NA

Client Sample ID: MW-6-041625-1105

Lab Sample ID: 240-222546-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Strontium	0.384		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.0721		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	45.0		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Chemical Oxygen Demand	6.98	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	12.9		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.293		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	8.61		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-12-041625-1400

Lab Sample ID: 240-222546-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Strontium	0.578		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Sodium	29.8		1.00	0.882	mg/L	1		6020B	Total
									Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Client Sample ID: MW-12-041625-1400 (Continued)

Lab Sample ID: 240-222546-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chemical Oxygen Demand	14.5		10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	13.9		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.292		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	56.2		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-16-041625-1555

Lab Sample ID: 240-222546-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0615		0.0500	0.0172	mg/L	1		6010D	Total Recoverable
Strontium	0.499		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Manganese	0.0621		0.00500	0.00353	mg/L	1		6020B	Total Recoverable
Sodium	49.7		1.00	0.882	mg/L	1		6020B	Total Recoverable
Iron	0.0737	J	0.100	0.0470	mg/L	1		6020B	Dissolved
Chemical Oxygen Demand	8.61	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	5.42		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.417		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	61.2		1.00	0.348	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Client Sample ID: MW-27-041625-1230

Lab Sample ID: 240-222546-1

Date Collected: 04/16/25 12:30

Matrix: Water

Date Received: 04/17/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.160		0.100	0.0573	mg/L		04/18/25 14:00	04/22/25 11:23	1
Lithium	0.0485	J	0.0500	0.0172	mg/L		04/18/25 14:00	04/22/25 00:10	1
Strontium	0.765		0.0500	0.00927	mg/L		04/18/25 14:00	04/22/25 00:10	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.129		0.00500	0.00353	mg/L		04/18/25 14:00	04/21/25 15:08	1
Sodium	41.8		1.00	0.882	mg/L		04/18/25 14:00	04/21/25 15:08	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	2.50		0.100	0.0470	mg/L		04/18/25 14:00	04/21/25 15:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	1.38		0.200	0.147	mg/L			04/21/25 17:38	1
Chemical Oxygen Demand (SM 5220D-2011)	7.31	J	10.0	1.80	mg/L			04/22/25 12:04	1
Chloride (SW846 9056A)	1.72		1.00	0.128	mg/L			04/23/25 02:33	1
Fluoride (SW846 9056A)	0.284		0.0500	0.0240	mg/L			04/23/25 02:33	1
Sulfate (SW846 9056A)	252		5.00	1.74	mg/L			04/23/25 02:42	5

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Client Sample ID: MW-7-041625-0935

Lab Sample ID: 240-222546-2

Date Collected: 04/16/25 09:35

Matrix: Water

Date Received: 04/17/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.247		0.100	0.0573	mg/L		04/18/25 14:00	04/22/25 11:27	1
Lithium	0.0676		0.0500	0.0172	mg/L		04/18/25 14:00	04/22/25 00:14	1
Strontium	1.79		0.0500	0.00927	mg/L		04/18/25 14:00	04/22/25 00:14	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0666		0.00500	0.00353	mg/L		04/18/25 14:00	04/21/25 15:13	1
Sodium	62.4		1.00	0.882	mg/L		04/18/25 14:00	04/21/25 15:13	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/18/25 14:00	04/21/25 15:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			04/21/25 17:41	1
Chemical Oxygen Demand (SM 5220D-2011)	9.58	J	10.0	1.80	mg/L			04/22/25 12:04	1
Chloride (SW846 9056A)	1.32		1.00	0.128	mg/L			04/23/25 02:51	1
Fluoride (SW846 9056A)	0.280		0.0500	0.0240	mg/L			04/23/25 02:51	1
Sulfate (SW846 9056A)	1240		10.0	3.48	mg/L			04/23/25 03:00	10

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Client Sample ID: MW-6-041625-1105

Lab Sample ID: 240-222546-3

Date Collected: 04/16/25 11:05

Matrix: Water

Date Received: 04/17/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND	^+	0.100	0.0573	mg/L		04/18/25 14:00	04/22/25 00:18	1
Lithium	ND		0.0500	0.0172	mg/L		04/18/25 14:00	04/22/25 00:18	1
Strontium	0.384		0.0500	0.00927	mg/L		04/18/25 14:00	04/22/25 00:18	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0721		0.00500	0.00353	mg/L		04/18/25 14:00	04/21/25 15:18	1
Sodium	45.0		1.00	0.882	mg/L		04/18/25 14:00	04/21/25 15:18	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/18/25 14:00	04/21/25 15:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			04/21/25 17:44	1
Chemical Oxygen Demand (SM 5220D-2011)	6.98	J	10.0	1.80	mg/L			04/22/25 12:04	1
Chloride (SW846 9056A)	12.9		1.00	0.128	mg/L			04/23/25 03:10	1
Fluoride (SW846 9056A)	0.293		0.0500	0.0240	mg/L			04/23/25 03:10	1
Sulfate (SW846 9056A)	8.61		1.00	0.348	mg/L			04/23/25 03:10	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Client Sample ID: MW-12-041625-1400

Lab Sample ID: 240-222546-4

Date Collected: 04/16/25 14:00

Matrix: Water

Date Received: 04/17/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND	^+	0.100	0.0573	mg/L		04/18/25 14:00	04/22/25 00:23	1
Lithium	ND		0.0500	0.0172	mg/L		04/18/25 14:00	04/22/25 00:23	1
Strontium	0.578		0.0500	0.00927	mg/L		04/18/25 14:00	04/22/25 00:23	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.00500	0.00353	mg/L		04/18/25 14:00	04/21/25 15:28	1
Sodium	29.8		1.00	0.882	mg/L		04/18/25 14:00	04/21/25 15:28	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/18/25 14:00	04/21/25 15:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			04/21/25 17:47	1
Chemical Oxygen Demand (SM 5220D-2011)	14.5		10.0	1.80	mg/L			04/22/25 12:04	1
Chloride (SW846 9056A)	13.9		1.00	0.128	mg/L			04/23/25 03:28	1
Fluoride (SW846 9056A)	0.292		0.0500	0.0240	mg/L			04/23/25 03:28	1
Sulfate (SW846 9056A)	56.2		1.00	0.348	mg/L			04/23/25 03:28	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Client Sample ID: MW-16-041625-1555

Lab Sample ID: 240-222546-5

Date Collected: 04/16/25 15:55

Matrix: Water

Date Received: 04/17/25 09:30

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND	^+	0.100	0.0573	mg/L		04/18/25 14:00	04/22/25 00:27	1
Lithium	0.0615		0.0500	0.0172	mg/L		04/18/25 14:00	04/22/25 00:27	1
Strontium	0.499		0.0500	0.00927	mg/L		04/18/25 14:00	04/22/25 00:27	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0621		0.00500	0.00353	mg/L		04/18/25 14:00	04/21/25 15:33	1
Sodium	49.7		1.00	0.882	mg/L		04/18/25 14:00	04/21/25 15:33	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.0737	J	0.100	0.0470	mg/L		04/18/25 14:00	04/21/25 15:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			04/21/25 17:50	1
Chemical Oxygen Demand (SM 5220D-2011)	8.61	J	10.0	1.80	mg/L			04/22/25 12:04	1
Chloride (SW846 9056A)	5.42		1.00	0.128	mg/L			04/23/25 04:05	1
Fluoride (SW846 9056A)	0.417		0.0500	0.0240	mg/L			04/23/25 04:05	1
Sulfate (SW846 9056A)	61.2		1.00	0.348	mg/L			04/23/25 04:05	1

QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 240-652701/1-A
Matrix: Water
Analysis Batch: 652978

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 652701

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.0172	mg/L		04/18/25 14:00	04/21/25 23:32	1
Strontium	ND		0.0500	0.00927	mg/L		04/18/25 14:00	04/21/25 23:32	1

Lab Sample ID: MB 240-652701/1-A
Matrix: Water
Analysis Batch: 652978

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 652701

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		04/18/25 14:00	04/22/25 07:07	1

Lab Sample ID: LCS 240-652701/2-A
Matrix: Water
Analysis Batch: 652978

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 652701

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	1.00	0.9403		mg/L		94	80 - 120
Strontium	1.00	0.9290		mg/L		93	80 - 120

Lab Sample ID: LCS 240-652701/2-A
Matrix: Water
Analysis Batch: 652978

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 652701

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	1.00	1.041		mg/L		104	80 - 120

Lab Sample ID: 240-222569-F-7-B MS
Matrix: Water
Analysis Batch: 652978

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 652701

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	0.0936		1.00	1.056		mg/L		96	75 - 125
Strontium	1.35		1.00	2.259		mg/L		91	75 - 125

Lab Sample ID: 240-222569-F-7-C MSD
Matrix: Water
Analysis Batch: 652978

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 652701

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Lithium	0.0936		1.00	1.055		mg/L		96	75 - 125	0	20
Strontium	1.35		1.00	2.264		mg/L		91	75 - 125	0	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 240-652701/1-A
Matrix: Water
Analysis Batch: 653065

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 652701

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		04/18/25 14:00	04/21/25 14:46	1
Manganese	ND		0.00500	0.00353	mg/L		04/18/25 14:00	04/21/25 14:46	1

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 240-652701/1-A

Matrix: Water

Analysis Batch: 653065

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 652701

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	ND		1.00	0.882	mg/L		04/18/25 14:00	04/21/25 14:46	1

Lab Sample ID: LCS 240-652701/3-A

Matrix: Water

Analysis Batch: 653065

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 652701

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5.00	4.937		mg/L		99	80 - 120
Manganese	0.500	0.4729		mg/L		95	80 - 120
Sodium	25.0	24.49		mg/L		98	80 - 120

Lab Sample ID: 240-222569-F-7-D MS

Matrix: Water

Analysis Batch: 653065

Client Sample ID: Matrix Spike

Prep Type: Total Recoverable

Prep Batch: 652701

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	29100		5.00	33.94	4	mg/L		-5823 20	80 - 120
Manganese	0.629		0.500	1.151		mg/L		104	80 - 120
Sodium	20.7		25.0	43.89		mg/L		93	80 - 120

Lab Sample ID: 240-222569-F-7-E MSD

Matrix: Water

Analysis Batch: 653065

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total Recoverable

Prep Batch: 652701

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	29100		5.00	34.39	4	mg/L		-5823 11	80 - 120	1	20
Manganese	0.629		0.500	1.158		mg/L		106	80 - 120	1	20
Sodium	20.7		25.0	43.52		mg/L		91	80 - 120	1	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 240-653034/76

Matrix: Water

Analysis Batch: 653034

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.200	0.147	mg/L			04/21/25 17:11	1

Lab Sample ID: LCS 240-653034/77

Matrix: Water

Analysis Batch: 653034

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	8.50	7.853		mg/L		92	90 - 110

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: 240-222449-D-6 MS

Matrix: Water

Analysis Batch: 653034

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	ND		2.50	2.350		mg/L		94	90 - 110

Lab Sample ID: 240-222449-D-6 MSD

Matrix: Water

Analysis Batch: 653034

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ammonia	ND		2.50	2.358		mg/L		94	90 - 110	0	20

Method: 5220D-2011 - Chemical Oxygen Demand

Lab Sample ID: MB 240-653123/3

Matrix: Water

Analysis Batch: 653123

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10.0	1.80	mg/L			04/22/25 12:04	1

Lab Sample ID: LCS 240-653123/4

Matrix: Water

Analysis Batch: 653123

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	27.0	29.71		mg/L		110	90 - 110

Lab Sample ID: 240-222546-1 MS

Matrix: Water

Analysis Batch: 653123

Client Sample ID: MW-27-041625-1230

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chemical Oxygen Demand	7.31	J	50.0	56.99		mg/L		99	90 - 110

Lab Sample ID: 240-222546-1 MSD

Matrix: Water

Analysis Batch: 653123

Client Sample ID: MW-27-041625-1230

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	7.31	J	50.0	54.06		mg/L		94	90 - 110	5	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 240-653135/3

Matrix: Water

Analysis Batch: 653135

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.128	mg/L			04/23/25 00:15	1
Fluoride	ND		0.0500	0.0240	mg/L			04/23/25 00:15	1
Sulfate	ND		1.00	0.348	mg/L			04/23/25 00:15	1

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 240-653135/4

Matrix: Water

Analysis Batch: 653135

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			50.0	47.34		mg/L		95	90 - 110		
Fluoride			2.50	2.368		mg/L		95	90 - 110		
Sulfate			50.0	46.92		mg/L		94	90 - 110		

Lab Sample ID: 240-222534-G-1 MS

Matrix: Water

Analysis Batch: 653135

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Fluoride	0.0363	J	2.50	2.504		mg/L		99	80 - 120		
Sulfate	45.4		50.0	93.78		mg/L		97	80 - 120		

Lab Sample ID: 240-222534-G-1 MS

Matrix: Water

Analysis Batch: 653135

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	584		500	1060		mg/L		95	80 - 120		
Fluoride	ND		25.0	25.12		mg/L		100	80 - 120		
Sulfate	44.2		500	541.5		mg/L		99	80 - 120		

Lab Sample ID: 240-222534-G-1 MSD

Matrix: Water

Analysis Batch: 653135

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	0.0363	J	2.50	2.525		mg/L		100	80 - 120	1	15
Sulfate	45.4		50.0	94.15		mg/L		98	80 - 120	0	15

Lab Sample ID: 240-222534-G-1 MSD

Matrix: Water

Analysis Batch: 653135

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	584		500	1062		mg/L		96	80 - 120	0	15
Fluoride	ND		25.0	25.21		mg/L		101	80 - 120	0	15
Sulfate	44.2		500	543.1		mg/L		100	80 - 120	0	15

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QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Metals

Prep Batch: 652701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222546-1	MW-27-041625-1230	Dissolved	Water	3005A	
240-222546-1	MW-27-041625-1230	Total Recoverable	Water	3005A	
240-222546-2	MW-7-041625-0935	Dissolved	Water	3005A	
240-222546-2	MW-7-041625-0935	Total Recoverable	Water	3005A	
240-222546-3	MW-6-041625-1105	Dissolved	Water	3005A	
240-222546-3	MW-6-041625-1105	Total Recoverable	Water	3005A	
240-222546-4	MW-12-041625-1400	Dissolved	Water	3005A	
240-222546-4	MW-12-041625-1400	Total Recoverable	Water	3005A	
240-222546-5	MW-16-041625-1555	Dissolved	Water	3005A	
240-222546-5	MW-16-041625-1555	Total Recoverable	Water	3005A	
MB 240-652701/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-652701/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-652701/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-222569-F-7-B MS	Matrix Spike	Total Recoverable	Water	3005A	
240-222569-F-7-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	
240-222569-F-7-D MS	Matrix Spike	Total Recoverable	Water	3005A	
240-222569-F-7-E MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Analysis Batch: 652978

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222546-1	MW-27-041625-1230	Total Recoverable	Water	6010D	652701
240-222546-2	MW-7-041625-0935	Total Recoverable	Water	6010D	652701
240-222546-3	MW-6-041625-1105	Total Recoverable	Water	6010D	652701
240-222546-4	MW-12-041625-1400	Total Recoverable	Water	6010D	652701
240-222546-5	MW-16-041625-1555	Total Recoverable	Water	6010D	652701
MB 240-652701/1-A	Method Blank	Total Recoverable	Water	6010D	652701
MB 240-652701/1-A	Method Blank	Total Recoverable	Water	6010D	652701
LCS 240-652701/2-A	Lab Control Sample	Total Recoverable	Water	6010D	652701
LCS 240-652701/2-A	Lab Control Sample	Total Recoverable	Water	6010D	652701
240-222569-F-7-B MS	Matrix Spike	Total Recoverable	Water	6010D	652701
240-222569-F-7-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	6010D	652701

Analysis Batch: 653065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222546-1	MW-27-041625-1230	Dissolved	Water	6020B	652701
240-222546-1	MW-27-041625-1230	Total Recoverable	Water	6020B	652701
240-222546-2	MW-7-041625-0935	Dissolved	Water	6020B	652701
240-222546-2	MW-7-041625-0935	Total Recoverable	Water	6020B	652701
240-222546-3	MW-6-041625-1105	Dissolved	Water	6020B	652701
240-222546-3	MW-6-041625-1105	Total Recoverable	Water	6020B	652701
240-222546-4	MW-12-041625-1400	Dissolved	Water	6020B	652701
240-222546-4	MW-12-041625-1400	Total Recoverable	Water	6020B	652701
240-222546-5	MW-16-041625-1555	Dissolved	Water	6020B	652701
240-222546-5	MW-16-041625-1555	Total Recoverable	Water	6020B	652701
MB 240-652701/1-A	Method Blank	Total Recoverable	Water	6020B	652701
LCS 240-652701/3-A	Lab Control Sample	Total Recoverable	Water	6020B	652701
240-222569-F-7-D MS	Matrix Spike	Total Recoverable	Water	6020B	652701
240-222569-F-7-E MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020B	652701

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QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Metals

Analysis Batch: 653188

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222546-1	MW-27-041625-1230	Total Recoverable	Water	6010D	652701
240-222546-2	MW-7-041625-0935	Total Recoverable	Water	6010D	652701

General Chemistry

Analysis Batch: 653034

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222546-1	MW-27-041625-1230	Total/NA	Water	350.1	
240-222546-2	MW-7-041625-0935	Total/NA	Water	350.1	
240-222546-3	MW-6-041625-1105	Total/NA	Water	350.1	
240-222546-4	MW-12-041625-1400	Total/NA	Water	350.1	
240-222546-5	MW-16-041625-1555	Total/NA	Water	350.1	
MB 240-653034/76	Method Blank	Total/NA	Water	350.1	
LCS 240-653034/77	Lab Control Sample	Total/NA	Water	350.1	
240-222449-D-6 MS	Matrix Spike	Total/NA	Water	350.1	
240-222449-D-6 MSD	Matrix Spike Duplicate	Total/NA	Water	350.1	

Analysis Batch: 653123

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222546-1	MW-27-041625-1230	Total/NA	Water	5220D-2011	
240-222546-2	MW-7-041625-0935	Total/NA	Water	5220D-2011	
240-222546-3	MW-6-041625-1105	Total/NA	Water	5220D-2011	
240-222546-4	MW-12-041625-1400	Total/NA	Water	5220D-2011	
240-222546-5	MW-16-041625-1555	Total/NA	Water	5220D-2011	
MB 240-653123/3	Method Blank	Total/NA	Water	5220D-2011	
LCS 240-653123/4	Lab Control Sample	Total/NA	Water	5220D-2011	
240-222546-1 MS	MW-27-041625-1230	Total/NA	Water	5220D-2011	
240-222546-1 MSD	MW-27-041625-1230	Total/NA	Water	5220D-2011	

Analysis Batch: 653135

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-222546-1	MW-27-041625-1230	Total/NA	Water	9056A	
240-222546-1	MW-27-041625-1230	Total/NA	Water	9056A	
240-222546-2	MW-7-041625-0935	Total/NA	Water	9056A	
240-222546-2	MW-7-041625-0935	Total/NA	Water	9056A	
240-222546-3	MW-6-041625-1105	Total/NA	Water	9056A	
240-222546-4	MW-12-041625-1400	Total/NA	Water	9056A	
240-222546-5	MW-16-041625-1555	Total/NA	Water	9056A	
MB 240-653135/3	Method Blank	Total/NA	Water	9056A	
LCS 240-653135/4	Lab Control Sample	Total/NA	Water	9056A	
240-222534-G-1 MS	Matrix Spike	Total/NA	Water	9056A	
240-222534-G-1 MS	Matrix Spike	Total/NA	Water	9056A	
240-222534-G-1 MSD	Matrix Spike Duplicate	Total/NA	Water	9056A	
240-222534-G-1 MSD	Matrix Spike Duplicate	Total/NA	Water	9056A	

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Client Sample ID: MW-27-041625-1230

Lab Sample ID: 240-222546-1

Date Collected: 04/16/25 12:30

Matrix: Water

Date Received: 04/17/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6010D		1	652978	AJC	EET CLE	04/22/25 00:10
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6010D		1	653188	AJC	EET CLE	04/22/25 11:23
Dissolved	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Dissolved	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:10
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:08
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 17:38
Total/NA	Analysis	5220D-2011		1	653123	AAP	EET CLE	04/22/25 12:04
Total/NA	Analysis	9056A		1	653135	JMR	EET CLE	04/23/25 02:33
Total/NA	Analysis	9056A		5	653135	JMR	EET CLE	04/23/25 02:42

Client Sample ID: MW-7-041625-0935

Lab Sample ID: 240-222546-2

Date Collected: 04/16/25 09:35

Matrix: Water

Date Received: 04/17/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6010D		1	652978	AJC	EET CLE	04/22/25 00:14
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6010D		1	653188	AJC	EET CLE	04/22/25 11:27
Dissolved	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Dissolved	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:15
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:13
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 17:41
Total/NA	Analysis	5220D-2011		1	653123	AAP	EET CLE	04/22/25 12:04
Total/NA	Analysis	9056A		1	653135	JMR	EET CLE	04/23/25 02:51
Total/NA	Analysis	9056A		10	653135	JMR	EET CLE	04/23/25 03:00

Client Sample ID: MW-6-041625-1105

Lab Sample ID: 240-222546-3

Date Collected: 04/16/25 11:05

Matrix: Water

Date Received: 04/17/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6010D		1	652978	AJC	EET CLE	04/22/25 00:18
Dissolved	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Dissolved	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:20
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:18
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 17:44
Total/NA	Analysis	5220D-2011		1	653123	AAP	EET CLE	04/22/25 12:04

Eurofins Cleveland

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Client Sample ID: MW-6-041625-1105

Lab Sample ID: 240-222546-3

Date Collected: 04/16/25 11:05

Matrix: Water

Date Received: 04/17/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	653135	JMR	EET CLE	04/23/25 03:10

Client Sample ID: MW-12-041625-1400

Lab Sample ID: 240-222546-4

Date Collected: 04/16/25 14:00

Matrix: Water

Date Received: 04/17/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6010D		1	652978	AJC	EET CLE	04/22/25 00:23
Dissolved	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Dissolved	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:30
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:28
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 17:47
Total/NA	Analysis	5220D-2011		1	653123	AAP	EET CLE	04/22/25 12:04
Total/NA	Analysis	9056A		1	653135	JMR	EET CLE	04/23/25 03:28

Client Sample ID: MW-16-041625-1555

Lab Sample ID: 240-222546-5

Date Collected: 04/16/25 15:55

Matrix: Water

Date Received: 04/17/25 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6010D		1	652978	AJC	EET CLE	04/22/25 00:27
Dissolved	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Dissolved	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:36
Total Recoverable	Prep	3005A			652701	XWS6	EET CLE	04/18/25 14:00
Total Recoverable	Analysis	6020B		1	653065	S4FJ	EET CLE	04/21/25 15:33
Total/NA	Analysis	350.1		1	653034	AJ	EET CLE	04/21/25 17:50
Total/NA	Analysis	5220D-2011		1	653123	AAP	EET CLE	04/22/25 12:04
Total/NA	Analysis	9056A		1	653135	JMR	EET CLE	04/23/25 04:05

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-222546-1

Laboratory: Eurofins Cleveland

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	421	06-01-25

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13

Eurofins Cleveland

180 S. Van Buren Avenue

Barberton, OH 44203

Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record



Environment Testing

Client Information		Sampler: <u>Francis Reed</u>		Lab PM: Heckler, Denise D		Carrier Tracking No(s):		COC No: 240-131756-41930.2					
Client Contact: Thomas Vanage		Phone: <u>614-288-8619</u>		E-Mail: Denise.Heckler@et.eurofinsus.com		State of Origin: <u>IA</u>		Page: Page 2 of 2					
Company: Haley & Aldrich, Inc.		PWSID:		Analysis Requested						Job #: <u>0129848-038</u>			
Address: 8899 Gander Creek Drive		Due Date Requested:								Preservation Codes: N - None S - H2SO4 D - HNO3			
City: Miamisburg		TAT Requested (days): <u>STD</u>											
State, Zip: OH, 45342-4418		Compliance Project: ☐ Yes ☐ No											
Phone: 937-530-1412(Tel)		PO #: 0129848-034											
Email: TVanage@haleyaldrich.com		WO #:											
Project Name: Amsted - Keokuk, Iowa Spring 2025		Project #: 24024753		Field Filtered Sample (Yes or No)						Total Number of Containers			
Site:		SSOW#:											
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	9056A_28D - Chloride, Fluoride, Sulfate	350.1, 6220D	6010D, 6020B	6020B - Iron - Field Filtered	6020B - Iron, Lab to filter	Special Instructions/Note:	
MW-27-041625-1230		04/16/25	12:30	G	Water	Y	N	X	X	X	X		
MW-7-041625-0935		04/16/25	09:35	G	Water	Y	N	X	X	X	X		
MW-6-041625-1105		04/16/25	11:05	G	Water	Y	N	X	X	X	X		
MW-12-041625-1400		04/16/25	14:00	G	Water	Y	N	X	X	X	X		
MW-16-041625-1555		04/16/25	15:55	G	Water	Y	N	X	X	X	X		
					Water								
					Water								
					Water								
					Water								
					Water								
					Water								
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological													
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months													
Deliverable Requested: I, II, III, IV, Other (specify)													
Special Instructions/QC Requirements:													
Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:							
Relinquished by: <u>Francis Reed</u>		Date/Time: <u>04/16/25 18:00</u>		Company: <u>H+A</u>		Received by: 		Date/Time: <u>4-17-25 930</u>		Company: <u>EC</u>			
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:			
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:			
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:									

Eurofins - Cleveland Sample Receipt Form/Narrative
Barberton Facility

Client Maly & Hanch Site Name 4-17-25 Login # _____
Cooler Received on 4-17-25 Opened on 4-17-25 Cooler unpacked by _____

FedEx: 1st Grd Exp UPS FAS Waypoint Client Drop Off Eurofins Courier Other _____
Receipt After-hours Drop-off Date/Time Storage Location _____

Eurofins Cooler # EC Foam Box Client Cooler Box Other _____

Packing material used. Bubble Wrap Foam Plastic Bag None Other _____

COOLANT Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN # 18 (CF -01°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2
-Were the seals on the outside of the cooler(s) signed & dated? ☒ Yes ☒ No ☒ NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? ☒ Yes ☒ No ☒ NA
-Were tamper/custody seals intact and uncompromised? ☒ Yes ☒ No ☒ NA
3 Shippers' packing slip attached to the cooler(s)? ☒ Yes ☒ No ☒ NA
4. Did custody papers accompany the sample(s)? ☒ Yes ☒ No ☒ NA
5 Were the custody papers relinquished & signed in the appropriate place? ☒ Yes ☒ No ☒ NA
6 Was/were the person(s) who collected the samples clearly identified on the COC? ☒ Yes ☒ No ☒ NA
7 Did all bottles arrive in good condition (Unbroken)? ☒ Yes ☒ No ☒ NA
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? ☒ Yes ☒ No ☒ NA
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? ☒ Yes ☒ No ☒ NA
10 Were correct bottle(s) used for the test(s) indicated? ☒ Yes ☒ No ☒ NA
11 Sufficient quantity received to perform indicated analyses? ☒ Yes ☒ No ☒ NA
12. Are these work share samples and all listed on the COC? ☒ Yes ☒ No ☒ NA

Tests that are not checked for pH by Receiving
VOAs
Oil and Grease
TOC

13 Were all preserved sample(s) at the correct pH upon receipt? ☒ Yes ☒ No ☒ NA pH Strip Lot# HC4448976
14 Were VOAs on the COC? ☒ Yes ☒ No ☒ NA
15 Were air bubbles >6 mm in any VOA vials? ☒ Yes ☒ No ☒ NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ ☒ Yes ☒ No ☒ NA
17 Was a LL Hg or Me Hg trip blank present? ☒ Yes ☒ No ☒ NA

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____
Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by _____

19. SAMPLE CONDITION
Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container
Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION
Sample(s) _____ were further preserved in the laboratory
Time preserved _____ Preservative(s) added/Lot number(s) _____
VOA Sample Preservation - Date/Time VOAs Frozen _____

4/17/2025

Login Container Summary Report

240-222546

4/26/2025

Temperature readings

Client Sample ID	Lab ID	Container Type	Container	Preservation	Preservation
			pH	Temp	Added Lot Number
MW-27-041625-1230	240-222546-A-1	Voa Vial 40mL Amber - H2SO4			
MW-27-041625-1230	240-222546-B-1	Plastic 60 mL - unpreserved			
MW-27-041625-1230	240-222546-C-1	Plastic 250ml - with Sulfuric Acid	<2		
MW-27-041625-1230	240-222546-D-1	Amber Glass 250ml - Sulfuric Acid			
MW-27-041625-1230	240-222546-E-1	Plastic 500ml - with Nitric Acid	<2		
MW-27-041625-1230	240-222546-F-1	Plastic 500ml - w/ Nitric - Dis	<2		
MW-7-041625-0935	240-222546-A-2	Voa Vial 40mL Amber - H2SO4			
MW-7-041625-0935	240-222546-B-2	Plastic 60 mL - unpreserved			
MW-7-041625-0935	240-222546-C-2	Plastic 250ml - with Sulfuric Acid	<2		
MW-7-041625-0935	240-222546-D-2	Amber Glass 250ml - Sulfuric Acid			
MW-7-041625-0935	240-222546-E-2	Plastic 500ml - with Nitric Acid	<2		
MW-7-041625-0935	240-222546-F-2	Plastic 500ml - w/ Nitric - Dis.	<2		
MW-6-041625-1105	240-222546-A-3	Voa Vial 40mL Amber - H2SO4			
MW-6-041625-1105	240-222546-B-3	Plastic 60 mL - unpreserved			
MW-6-041625-1105	240-222546-C-3	Plastic 250ml - with Sulfuric Acid	<2		
MW-6-041625-1105	240-222546-D-3	Amber Glass 250ml - Sulfuric Acid			
MW-6-041625-1105	240-222546-E-3	Plastic 500ml - with Nitric Acid	<2		
MW-6-041625-1105	240-222546-F-3	Plastic 500ml - w/ Nitric - Dis.	<2		
MW-12-041625-1400	240-222546-A-4	Voa Vial 40mL Amber - H2SO4			
MW-12-041625-1400	240-222546-B-4	Plastic 60 mL - unpreserved			
MW-12-041625-1400	240-222546-C-4	Plastic 250ml - with Sulfuric Acid	<2		
MW-12-041625-1400	240-222546-D-4	Amber Glass 250ml - Sulfuric Acid			
MW-12-041625-1400	240-222546-E-4	Plastic 500ml - with Nitric Acid	<2		
MW-12-041625-1400	240-222546-F-4	Plastic 500ml - w/ Nitric - Dis.	<2		
MW-16-041625-1555	240-222546-A-5	Voa Vial 40mL Amber - H2SO4			
MW-16-041625-1555	240-222546-B-5	Plastic 60 mL - unpreserved			
MW-16-041625-1555	240-222546-C-5	Plastic 250ml - with Sulfuric Acid	<2		
MW-16-041625-1555	240-222546-D-5	Amber Glass 250ml - Sulfuric Acid			
MW-16-041625-1555	240-222546-E-5	Plastic 500ml - with Nitric Acid	<2		
MW-16-041625-1555	240-222546-F-5	Plastic 500ml - w/ Nitric - Dis	<2		

ANALYTICAL REPORT

PREPARED FOR

Attn: Thomas Vanage
Haley & Aldrich, Inc.
8899 Gander Creek Drive
Miamisburg, Ohio 45342-4418

Generated 9/12/2025 2:49:08 PM

JOB DESCRIPTION

Amsted - Keokuk, Iowa GW

JOB NUMBER

240-231956-1

Eurofins Cleveland

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



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Authorized for release by
Denise Heckler, Project Manager II
Denise.Heckler@et.eurofinsus.com
(330)966-9477

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Definitions/Glossary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Qualifiers

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: Haley & Aldrich, Inc.
Project: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Job ID: 240-231956-1

Eurofins Cleveland

Job Narrative 240-231956-1

Receipt

The samples were received on 8/29/2025 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 5 coolers at receipt time were 0.3° C, 0.6° C, 0.6° C, 1.1° C and 1.9° C.

Receipt Exceptions

The Total Organic Halides container for sample: MW-26-082625-1155 (240-231956-2) was received broken in Denver. Unpreserved volume was used for analysis.

Metals

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

General Chemistry

Method 9020B: The following samples for batch 280-712165 (Total Organic Halides) were diluted to 2x due to the nature of the sample matrix based on CI pre-screen test: MW-25-082625-0950 (240-231956-1), MW-20-082625-1340 (240-231956-3), MW-21-082625-1630 (240-231956-4), SW-2-082625-1750 (240-231956-5), SW-1-082625-1850 (240-231956-6), 20760-082625-0001 (240-231956-7), MW-7-082725-0905 (240-231956-8), MW-6-082725-1100 (240-231956-9), MW-5-082725-1250 (240-231956-10), MW-27-082725-1405 (240-231956-11) and MW-12-082825-1040 (240-231969-1). Elevated reporting limits (RLs) are provided.

Method 9020B: The following samples for batch 280-712258 (Total Organic Halides) were diluted to 2x due to the nature of the sample matrix based on CI pre-screen test: MW-16-082825-1240 (240-231969-2). Elevated reporting limits (RLs) are provided.

Method 9020B: Elevated reporting limits are provided for the following sample due to insufficient sample provided for analysis: MW-26-082625-1155 (240-231956-2).

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

Eurofins Cleveland

Method Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET CLE
6020B	Metals (ICP/MS)	SW846	EET CLE
350.1	Nitrogen, Ammonia	EPA	EET CLE
420.4	Phenolics, Total Recoverable	EPA	EET CLE
5220D-2011	Chemical Oxygen Demand	SM	EET CLE
9020B	Organic Halides, Total (TOX)	SW846	EET DEN
9056A	Anions, Ion Chromatography	SW846	EET CLE
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET CLE
FILTRATION	Sample Filtration	None	EET CLE

Protocol References:

EPA = US Environmental Protection Agency

None = None

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

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

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Sample Origin
240-231956-1	MW-25-082625-0950	Water	08/26/25 09:50	08/29/25 10:00	Iowa
240-231956-2	MW-26-082625-1155	Water	08/26/25 11:55	08/29/25 10:00	Iowa
240-231956-3	MW-20-082625-1340	Water	08/26/25 13:40	08/29/25 10:00	Iowa
240-231956-4	MW-21-082625-1630	Water	08/26/25 16:30	08/29/25 10:00	Iowa
240-231956-5	SW-2-082625-1750	Water	08/26/25 17:50	08/29/25 10:00	Iowa
240-231956-6	SW-1-082625-1850	Water	08/26/25 18:50	08/29/25 10:00	Iowa
240-231956-7	20760-082625-0001	Water	08/26/25 12:00	08/29/25 10:00	Iowa
240-231956-8	MW-7-082725-0905	Water	08/27/25 09:05	08/29/25 10:00	Iowa
240-231956-9	MW-6-082725-1100	Water	08/27/25 11:00	08/29/25 10:00	Iowa
240-231956-10	MW-5-082725-1250	Water	08/27/25 12:50	08/29/25 10:00	Iowa
240-231956-11	MW-27-082725-1405	Water	08/27/25 14:05	08/29/25 10:00	Iowa
240-231969-1	MW-12-082825-1040	Water	08/28/25 10:40	08/29/25 10:00	Iowa
240-231969-2	MW-16-082825-1240	Water	08/28/25 12:40	08/29/25 10:00	Iowa

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-25-082625-0950

Lab Sample ID: 240-231956-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.198		0.100	0.0573	mg/L	1		6010D	Total
									Recoverable
Lithium	0.0462	J	0.0500	0.0172	mg/L	1		6010D	Total
									Recoverable
Strontium	0.565		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.0990		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	61.6		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Chemical Oxygen Demand	5.58	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
TOX Dup	28.6	J	60.0	15.0	ug/L	1		9020B	Total/NA
Chloride	27.5		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	1.93		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	53.6		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-26-082625-1155

Lab Sample ID: 240-231956-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.286		0.100	0.0573	mg/L	1		6010D	Total
									Recoverable
Lithium	0.0235	J	0.0500	0.0172	mg/L	1		6010D	Total
									Recoverable
Strontium	2.09		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	2.58		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	85.3		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Iron	2.09		0.100	0.0470	mg/L	1		6020B	Dissolved
Ammonia	1.07		0.200	0.147	mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	8.00	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	3.03		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.256		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	1450		10.0	3.48	mg/L	10		9056A	Total/NA

Client Sample ID: MW-20-082625-1340

Lab Sample ID: 240-231956-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0301	J	0.0500	0.0172	mg/L	1		6010D	Total
									Recoverable
Strontium	0.383		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Sodium	73.6		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Chemical Oxygen Demand	4.20	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
TOX Dup	38.9	J	60.0	15.0	ug/L	1		9020B	Total/NA
Chloride	63.8		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.543		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	32.5		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-21-082625-1630

Lab Sample ID: 240-231956-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0383	J	0.0500	0.0172	mg/L	1		6010D	Total
									Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-21-082625-1630 (Continued)

Lab Sample ID: 240-231956-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Strontium	0.449		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.0237		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	52.4		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
TOX Dup	15.1	J	60.0	15.0	ug/L	1		9020B	Total/NA
Chloride	6.60		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.384		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	16.3		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: SW-2-082625-1750

Lab Sample ID: 240-231956-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.248		0.100	0.0573	mg/L	1		6010D	Total
									Recoverable
Strontium	0.236		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.109		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	32.3		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Iron	0.0493	J	0.100	0.0470	mg/L	1		6020B	Dissolved
Ammonia	1.57		0.200	0.147	mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	21.1		10.0	1.80	mg/L	1		5220D-2011	Total/NA
TOX Dup	39.4	J	60.0	15.0	ug/L	1		9020B	Total/NA
Chloride	44.8		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	1.10		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	29.6		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: SW-1-082625-1850

Lab Sample ID: 240-231956-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.139		0.100	0.0573	mg/L	1		6010D	Total
									Recoverable
Strontium	0.193		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.196		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	19.5		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Iron	0.0486	J	0.100	0.0470	mg/L	1		6020B	Dissolved
Chemical Oxygen Demand	7.65	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
TOX Dup	41.9	J	60.0	15.0	ug/L	1		9020B	Total/NA
Chloride	30.3		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.909		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	44.5		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: 20760-082625-0001

Lab Sample ID: 240-231956-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.201		0.100	0.0573	mg/L	1		6010D	Total
									Recoverable
Lithium	0.0463	J	0.0500	0.0172	mg/L	1		6010D	Total
									Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: 20760-082625-0001 (Continued)

Lab Sample ID: 240-231956-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Strontium	0.567		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.114		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	62.9		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Chemical Oxygen Demand	3.51	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
TOX Dup	30.6	J	60.0	15.0	ug/L	1		9020B	Total/NA
Chloride	27.5		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	1.92		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	53.6		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-7-082725-0905

Lab Sample ID: 240-231956-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.249		0.100	0.0573	mg/L	1		6010D	Total
									Recoverable
Lithium	0.0805		0.0500	0.0172	mg/L	1		6010D	Total
									Recoverable
Strontium	1.82		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.705		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	62.6		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Ammonia	0.370		0.200	0.147	mg/L	1		350.1	Total/NA
Chloride	1.51		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.363		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	1410		10.0	3.48	mg/L	10		9056A	Total/NA

Client Sample ID: MW-6-082725-1100

Lab Sample ID: 240-231956-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Strontium	0.363		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.138		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	41.8		1.00	0.882	mg/L	1		6020B	Total
									Recoverable
Chemical Oxygen Demand	4.89	J	10.0	1.80	mg/L	1		5220D-2011	Total/NA
TOX Dup	43.1	J	60.0	15.0	ug/L	1		9020B	Total/NA
Chloride	9.83		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.474		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	11.0		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-5-082725-1250

Lab Sample ID: 240-231956-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0268	J	0.0500	0.0172	mg/L	1		6010D	Total
									Recoverable
Strontium	0.306		0.0500	0.00927	mg/L	1		6010D	Total
									Recoverable
Manganese	0.0126		0.00500	0.00353	mg/L	1		6020B	Total
									Recoverable
Sodium	44.6		1.00	0.882	mg/L	1		6020B	Total
									Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Detection Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-5-082725-1250 (Continued)

Lab Sample ID: 240-231956-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
TOX Dup	35.2	J	60.0	15.0	ug/L	1		9020B	Total/NA
Chloride	3.97		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.502		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	34.2		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-27-082725-1405

Lab Sample ID: 240-231956-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.156		0.100	0.0573	mg/L	1		6010D	Total Recoverable
Lithium	0.0518		0.0500	0.0172	mg/L	1		6010D	Total Recoverable
Strontium	0.786		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Manganese	0.145		0.00500	0.00353	mg/L	1		6020B	Total Recoverable
Sodium	44.1		1.00	0.882	mg/L	1		6020B	Total Recoverable
Iron	2.40		0.100	0.0470	mg/L	1		6020B	Dissolved
Ammonia	1.32		0.200	0.147	mg/L	1		350.1	Total/NA
Chemical Oxygen Demand	5.58	J F1	10.0	1.80	mg/L	1		5220D-2011	Total/NA
Chloride	1.90		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.340		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	256		5.00	1.74	mg/L	5		9056A	Total/NA

Client Sample ID: MW-12-082825-1040

Lab Sample ID: 240-231969-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Strontium	0.677		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Sodium	31.3		1.00	0.882	mg/L	1		6020B	Total Recoverable
Chemical Oxygen Demand	10.4		10.0	1.80	mg/L	1		5220D-2011	Total/NA
TOX Dup	30.0	J	60.0	15.0	ug/L	1		9020B	Total/NA
Chloride	12.5		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.361		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	58.9		1.00	0.348	mg/L	1		9056A	Total/NA

Client Sample ID: MW-16-082825-1240

Lab Sample ID: 240-231969-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.0727	J	0.100	0.0573	mg/L	1		6010D	Total Recoverable
Lithium	0.0598		0.0500	0.0172	mg/L	1		6010D	Total Recoverable
Strontium	0.524		0.0500	0.00927	mg/L	1		6010D	Total Recoverable
Manganese	0.0713		0.00500	0.00353	mg/L	1		6020B	Total Recoverable
Sodium	49.4		1.00	0.882	mg/L	1		6020B	Total Recoverable
Iron	0.130		0.100	0.0470	mg/L	1		6020B	Dissolved
Chloride	4.18		1.00	0.128	mg/L	1		9056A	Total/NA
Fluoride	0.477		0.0500	0.0240	mg/L	1		9056A	Total/NA
Sulfate	68.1		1.00	0.348	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cleveland

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-25-082625-0950

Lab Sample ID: 240-231956-1

Date Collected: 08/26/25 09:50

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.198		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:00	1
Lithium	0.0462	J	0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:00	1
Strontium	0.565		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:00	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0990		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 13:16	1
Sodium	61.6		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 13:16	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 13:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND	F1	0.200	0.147	mg/L			09/04/25 16:22	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/08/25 14:52	1
Chemical Oxygen Demand (SM 5220D-2011)	5.58	J	10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	28.6	J	60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	27.5		1.00	0.128	mg/L			09/03/25 10:07	1
Fluoride (SW846 9056A)	1.93		0.0500	0.0240	mg/L			09/03/25 10:07	1
Sulfate (SW846 9056A)	53.6		1.00	0.348	mg/L			09/03/25 10:07	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-26-082625-1155

Lab Sample ID: 240-231956-2

Date Collected: 08/26/25 11:55

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.286		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:05	1
Lithium	0.0235	J	0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:05	1
Strontium	2.09		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:05	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	2.58		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 13:21	1
Sodium	85.3		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 13:21	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	2.09		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 13:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	1.07		0.200	0.147	mg/L			09/04/25 16:31	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/08/25 14:56	1
Chemical Oxygen Demand (SM 5220D-2011)	8.00	J	10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	ND		75.0	18.8	ug/L			09/08/25 11:06	1
Chloride (SW846 9056A)	3.03		1.00	0.128	mg/L			09/03/25 10:44	1
Fluoride (SW846 9056A)	0.256		0.0500	0.0240	mg/L			09/03/25 10:44	1
Sulfate (SW846 9056A)	1450		10.0	3.48	mg/L			09/03/25 10:54	10

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-20-082625-1340

Lab Sample ID: 240-231956-3

Date Collected: 08/26/25 13:40

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 03:30	1
Lithium	0.0301	J	0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 03:30	1
Strontium	0.383		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 03:30	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 12:45	1
Sodium	73.6		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 12:45	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 12:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND	F1	0.200	0.147	mg/L			09/04/25 14:46	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/08/25 14:30	1
Chemical Oxygen Demand (SM 5220D-2011)	4.20	J	10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	38.9	J	60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	63.8		1.00	0.128	mg/L			09/03/25 09:12	1
Fluoride (SW846 9056A)	0.543		0.0500	0.0240	mg/L			09/03/25 09:12	1
Sulfate (SW846 9056A)	32.5		1.00	0.348	mg/L			09/03/25 09:12	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-21-082625-1630

Lab Sample ID: 240-231956-4

Date Collected: 08/26/25 16:30

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:09	1
Lithium	0.0383	J	0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:09	1
Strontium	0.449		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:09	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0237		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 13:26	1
Sodium	52.4		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 13:26	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 13:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			09/04/25 16:34	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/08/25 15:14	1
Chemical Oxygen Demand (SM 5220D-2011)	ND		10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	15.1	J	60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	6.60		1.00	0.128	mg/L			09/03/25 11:03	1
Fluoride (SW846 9056A)	0.384		0.0500	0.0240	mg/L			09/03/25 11:03	1
Sulfate (SW846 9056A)	16.3		1.00	0.348	mg/L			09/03/25 11:03	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: SW-2-082625-1750

Lab Sample ID: 240-231956-5

Date Collected: 08/26/25 17:50

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.248		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:14	1
Lithium	ND		0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:14	1
Strontium	0.236		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:14	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.109		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 13:37	1
Sodium	32.3		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 13:37	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.0493	J	0.100	0.0470	mg/L		09/02/25 14:00	09/03/25 17:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	1.57		0.200	0.147	mg/L			09/04/25 16:37	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/08/25 15:18	1
Chemical Oxygen Demand (SM 5220D-2011)	21.1		10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	39.4	J	60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	44.8		1.00	0.128	mg/L			09/03/25 11:21	1
Fluoride (SW846 9056A)	1.10		0.0500	0.0240	mg/L			09/03/25 11:21	1
Sulfate (SW846 9056A)	29.6		1.00	0.348	mg/L			09/03/25 11:21	1

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Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: SW-1-082625-1850

Lab Sample ID: 240-231956-6

Date Collected: 08/26/25 18:50

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.139		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:18	1
Lithium	ND		0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:18	1
Strontium	0.193		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:18	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.196		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 13:39	1
Sodium	19.5		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 13:39	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.0486	J	0.100	0.0470	mg/L		09/02/25 14:00	09/03/25 17:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			09/04/25 16:40	1
Phenolics, Total Recoverable (EPA 420.4)	ND	F1	0.0100	0.00300	mg/L			09/09/25 13:05	1
Chemical Oxygen Demand (SM 5220D-2011)	7.65	J	10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	41.9	J	60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	30.3		1.00	0.128	mg/L			09/03/25 11:30	1
Fluoride (SW846 9056A)	0.909		0.0500	0.0240	mg/L			09/03/25 11:30	1
Sulfate (SW846 9056A)	44.5		1.00	0.348	mg/L			09/03/25 11:30	1

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Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: 20760-082625-0001

Lab Sample ID: 240-231956-7

Date Collected: 08/26/25 12:00

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.201		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:23	1
Lithium	0.0463	J	0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:23	1
Strontium	0.567		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:23	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.114		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 13:42	1
Sodium	62.9		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 13:42	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 13:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			09/04/25 16:43	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/09/25 13:16	1
Chemical Oxygen Demand (SM 5220D-2011)	3.51	J	10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	30.6	J	60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	27.5		1.00	0.128	mg/L			09/03/25 11:39	1
Fluoride (SW846 9056A)	1.92		0.0500	0.0240	mg/L			09/03/25 11:39	1
Sulfate (SW846 9056A)	53.6		1.00	0.348	mg/L			09/03/25 11:39	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-7-082725-0905

Lab Sample ID: 240-231956-8

Date Collected: 08/27/25 09:05

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.249		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:27	1
Lithium	0.0805		0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:27	1
Strontium	1.82		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:27	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.705		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 13:47	1
Sodium	62.6		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 13:47	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 13:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	0.370		0.200	0.147	mg/L			09/04/25 16:46	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/09/25 13:19	1
Chemical Oxygen Demand (SM 5220D-2011)	ND		10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	ND		60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	1.51		1.00	0.128	mg/L			09/03/25 11:58	1
Fluoride (SW846 9056A)	0.363		0.0500	0.0240	mg/L			09/03/25 11:58	1
Sulfate (SW846 9056A)	1410		10.0	3.48	mg/L			09/03/25 12:07	10

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-6-082725-1100

Lab Sample ID: 240-231956-9

Date Collected: 08/27/25 11:00

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:40	1
Lithium	ND		0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:40	1
Strontium	0.363		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:40	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.138		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 13:52	1
Sodium	41.8		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 13:52	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 13:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			09/04/25 16:49	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/09/25 13:23	1
Chemical Oxygen Demand (SM 5220D-2011)	4.89	J	10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	43.1	J	60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	9.83		1.00	0.128	mg/L			09/03/25 12:34	1
Fluoride (SW846 9056A)	0.474		0.0500	0.0240	mg/L			09/03/25 12:34	1
Sulfate (SW846 9056A)	11.0		1.00	0.348	mg/L			09/03/25 12:34	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-5-082725-1250

Lab Sample ID: 240-231956-10

Date Collected: 08/27/25 12:50

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:45	1
Lithium	0.0268	J	0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:45	1
Strontium	0.306		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:45	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0126		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 14:00	1
Sodium	44.6		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 14:00	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 13:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			09/04/25 16:58	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/09/25 13:27	1
Chemical Oxygen Demand (SM 5220D-2011)	ND		10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	35.2	J	60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	3.97		1.00	0.128	mg/L			09/03/25 13:02	1
Fluoride (SW846 9056A)	0.502		0.0500	0.0240	mg/L			09/03/25 13:02	1
Sulfate (SW846 9056A)	34.2		1.00	0.348	mg/L			09/03/25 13:02	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-27-082725-1405

Lab Sample ID: 240-231956-11

Date Collected: 08/27/25 14:05

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.156		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 04:49	1
Lithium	0.0518		0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 04:49	1
Strontium	0.786		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 04:49	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.145		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 14:08	1
Sodium	44.1		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 14:08	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	2.40		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 14:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	1.32		0.200	0.147	mg/L			09/04/25 17:01	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/09/25 13:30	1
Chemical Oxygen Demand (SM 5220D-2011)	5.58	J F1	10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	ND		60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	1.90		1.00	0.128	mg/L			09/03/25 12:44	1
Fluoride (SW846 9056A)	0.340		0.0500	0.0240	mg/L			09/03/25 12:44	1
Sulfate (SW846 9056A)	256		5.00	1.74	mg/L			09/03/25 12:53	5

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Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-12-082825-1040

Lab Sample ID: 240-231969-1

Date Collected: 08/28/25 10:40

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 01:40	1
Lithium	ND		0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 01:40	1
Strontium	0.677		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 01:40	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	ND		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 15:21	1
Sodium	31.3		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 15:21	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 15:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			09/04/25 17:40	1
Phenolics, Total Recoverable (EPA 420.4)	ND		0.0100	0.00300	mg/L			09/09/25 17:14	1
Chemical Oxygen Demand (SM 5220D-2011)	10.4		10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	30.0 J		60.0	15.0	ug/L			09/04/25 11:49	1
Chloride (SW846 9056A)	12.5		1.00	0.128	mg/L			09/03/25 19:50	1
Fluoride (SW846 9056A)	0.361		0.0500	0.0240	mg/L			09/03/25 19:50	1
Sulfate (SW846 9056A)	58.9		1.00	0.348	mg/L			09/03/25 19:50	1

Client Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-16-082825-1240

Lab Sample ID: 240-231969-2

Date Collected: 08/28/25 12:40

Matrix: Water

Date Received: 08/29/25 10:00

Method: SW846 6010D - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0727	J	0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 01:44	1
Lithium	0.0598		0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 01:44	1
Strontium	0.524		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 01:44	1

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	0.0713		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 15:26	1
Sodium	49.4		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 15:26	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.130		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 15:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (EPA 350.1)	ND		0.200	0.147	mg/L			09/04/25 17:43	1
Phenolics, Total Recoverable (EPA 420.4)	ND	F1	0.0100	0.00300	mg/L			09/09/25 14:03	1
Chemical Oxygen Demand (SM 5220D-2011)	ND	F1	10.0	1.80	mg/L			09/04/25 11:10	1
TOX Dup (SW846 9020B)	ND		60.0	15.0	ug/L			09/05/25 17:10	1
Chloride (SW846 9056A)	4.18		1.00	0.128	mg/L			09/03/25 20:29	1
Fluoride (SW846 9056A)	0.477		0.0500	0.0240	mg/L			09/03/25 20:29	1
Sulfate (SW846 9056A)	68.1		1.00	0.348	mg/L			09/03/25 20:29	1

QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 240-669957/1-A
Matrix: Water
Analysis Batch: 670217

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 669957

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		09/01/25 12:00	09/03/25 03:22	1
Lithium	ND		0.0500	0.0172	mg/L		09/01/25 12:00	09/03/25 03:22	1
Strontium	ND		0.0500	0.00927	mg/L		09/01/25 12:00	09/03/25 03:22	1

Lab Sample ID: LCS 240-669957/2-A
Matrix: Water
Analysis Batch: 670217

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 669957

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	1.00	1.018		mg/L		102	80 - 120
Lithium	1.00	0.9761		mg/L		98	80 - 120
Strontium	1.00	1.024		mg/L		102	80 - 120

Lab Sample ID: 240-231956-3 MS
Matrix: Water
Analysis Batch: 670217

Client Sample ID: MW-20-082625-1340
Prep Type: Total Recoverable
Prep Batch: 669957

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	ND		1.00	1.043		mg/L		104	75 - 125
Lithium	0.0301	J	1.00	1.004		mg/L		97	75 - 125
Strontium	0.383		1.00	1.390		mg/L		101	75 - 125

Lab Sample ID: 240-231956-3 MSD
Matrix: Water
Analysis Batch: 670217

Client Sample ID: MW-20-082625-1340
Prep Type: Total Recoverable
Prep Batch: 669957

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Boron	ND		1.00	1.031		mg/L		103	75 - 125	1	20
Lithium	0.0301	J	1.00	1.014		mg/L		98	75 - 125	1	20
Strontium	0.383		1.00	1.397		mg/L		101	75 - 125	0	20

Lab Sample ID: MB 240-669958/1-A
Matrix: Water
Analysis Batch: 670217

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 669958

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.100	0.0573	mg/L		09/01/25 12:00	09/02/25 23:45	1
Lithium	ND		0.0500	0.0172	mg/L		09/01/25 12:00	09/02/25 23:45	1
Strontium	ND		0.0500	0.00927	mg/L		09/01/25 12:00	09/02/25 23:45	1

Lab Sample ID: LCS 240-669958/2-A
Matrix: Water
Analysis Batch: 670217

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 669958

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	1.00	1.006		mg/L		101	80 - 120
Lithium	1.00	0.9466		mg/L		95	80 - 120
Strontium	1.00	0.9777		mg/L		98	80 - 120

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: 240-231976-H-1-B MS
Matrix: Water
Analysis Batch: 670217

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 669958

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	2.30		1.00	3.244		mg/L		95	75 - 125
Lithium	0.0759		1.00	1.065		mg/L		99	75 - 125
Strontium	1.74		1.00	2.706		mg/L		97	75 - 125

Lab Sample ID: 240-231976-H-1-C MSD
Matrix: Water
Analysis Batch: 670217

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 669958

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	2.30		1.00	3.288		mg/L		99	75 - 125	1	20
Lithium	0.0759		1.00	1.064		mg/L		99	75 - 125	0	20
Strontium	1.74		1.00	2.714		mg/L		98	75 - 125	0	20

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 240-669957/1-A
Matrix: Water
Analysis Batch: 670373

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 669957

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 12:40	1
Manganese	ND		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 12:40	1
Sodium	ND		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 12:40	1

Lab Sample ID: LCS 240-669957/3-A
Matrix: Water
Analysis Batch: 670373

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 669957

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5.00	5.005		mg/L		100	80 - 120
Manganese	0.500	0.4909		mg/L		98	80 - 120
Sodium	25.0	24.83		mg/L		99	80 - 120

Lab Sample ID: 240-231956-3 MS
Matrix: Water
Analysis Batch: 670373

Client Sample ID: MW-20-082625-1340
Prep Type: Total Recoverable
Prep Batch: 669957

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	ND		0.500	0.4916		mg/L		98	80 - 120
Sodium	73.6		25.0	99.48		mg/L		104	80 - 120

Lab Sample ID: 240-231956-3 MSD
Matrix: Water
Analysis Batch: 670373

Client Sample ID: MW-20-082625-1340
Prep Type: Total Recoverable
Prep Batch: 669957

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Manganese	ND		0.500	0.4832		mg/L		97	80 - 120	2	20
Sodium	73.6		25.0	98.37		mg/L		99	80 - 120	1	20

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 240-669958/1-A

Matrix: Water

Analysis Batch: 670373

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 669958

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/01/25 12:00	09/03/25 14:13	1
Manganese	ND		0.00500	0.00353	mg/L		09/01/25 12:00	09/03/25 14:13	1
Sodium	ND		1.00	0.882	mg/L		09/01/25 12:00	09/03/25 14:13	1

Lab Sample ID: LCS 240-669958/3-A

Matrix: Water

Analysis Batch: 670373

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 669958

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5.00	4.973		mg/L		99	80 - 120
Manganese	0.500	0.4802		mg/L		96	80 - 120
Sodium	25.0	24.44		mg/L		98	80 - 120

Lab Sample ID: 240-231976-H-1-D MS

Matrix: Water

Analysis Batch: 670373

Client Sample ID: Matrix Spike

Prep Type: Total Recoverable

Prep Batch: 669958

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	0.00694		0.500	0.5123		mg/L		101	80 - 120
Sodium	208		25.0	236.6	4	mg/L		115	80 - 120

Lab Sample ID: 240-231976-H-1-E MSD

Matrix: Water

Analysis Batch: 670373

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total Recoverable

Prep Batch: 669958

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Manganese	0.00694		0.500	0.4999		mg/L		99	80 - 120	2	20
Sodium	208		25.0	232.6	4	mg/L		99	80 - 120	2	20

Lab Sample ID: MB 240-670115/1-A

Matrix: Water

Analysis Batch: 670373

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 670115

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.100	0.0470	mg/L		09/02/25 14:00	09/03/25 17:22	1

Lab Sample ID: LCS 240-670115/3-A

Matrix: Water

Analysis Batch: 670373

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 670115

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	5.00	5.138		mg/L		103	80 - 120

Lab Sample ID: 240-231946-A-1-C MS

Matrix: Water

Analysis Batch: 670373

Client Sample ID: Matrix Spike

Prep Type: Total Recoverable

Prep Batch: 670115

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	0.394		5.00	5.581		mg/L		104	80 - 120

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 240-231946-A-1-D MSD

Matrix: Water

Analysis Batch: 670373

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total Recoverable

Prep Batch: 670115

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	0.394		5.00	5.704		mg/L		106	80 - 120	2	20

Lab Sample ID: 240-231956-3 MS

Matrix: Water

Analysis Batch: 670373

Client Sample ID: MW-20-082625-1340

Prep Type: Dissolved

Prep Batch: 669957

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Iron	ND		5.00	5.252		mg/L		105	80 - 120		

Lab Sample ID: 240-231956-3 MSD

Matrix: Water

Analysis Batch: 670373

Client Sample ID: MW-20-082625-1340

Prep Type: Dissolved

Prep Batch: 669957

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Iron	ND		5.00	5.203		mg/L		104	80 - 120	1	20

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 240-670559/14

Matrix: Water

Analysis Batch: 670559

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.200	0.147	mg/L			09/04/25 13:58	1

Lab Sample ID: MB 240-670559/44

Matrix: Water

Analysis Batch: 670559

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.200	0.147	mg/L			09/04/25 15:28	1

Lab Sample ID: MB 240-670559/76

Matrix: Water

Analysis Batch: 670559

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		0.200	0.147	mg/L			09/04/25 17:04	1

Lab Sample ID: LCS 240-670559/15

Matrix: Water

Analysis Batch: 670559

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Ammonia	8.55	8.126		mg/L		95	90 - 110		

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 350.1 - Nitrogen, Ammonia (Continued)

Lab Sample ID: LCS 240-670559/45

Matrix: Water

Analysis Batch: 670559

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	8.55	7.998		mg/L		94	90 - 110

Lab Sample ID: LCS 240-670559/77

Matrix: Water

Analysis Batch: 670559

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	8.55	7.895		mg/L		92	90 - 110

Lab Sample ID: 240-231835-A-2 MS

Matrix: Water

Analysis Batch: 670559

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	1.29	F1	2.50	3.569		mg/L		91	90 - 110

Lab Sample ID: 240-231835-A-2 MSD

Matrix: Water

Analysis Batch: 670559

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ammonia	1.29	F1	2.50	3.585		mg/L		92	90 - 110	0	20

Lab Sample ID: 240-231956-1 MS

Matrix: Water

Analysis Batch: 670559

Client Sample ID: MW-25-082625-0950

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	ND	F1	2.50	2.349		mg/L		94	90 - 110

Lab Sample ID: 240-231956-1 MSD

Matrix: Water

Analysis Batch: 670559

Client Sample ID: MW-25-082625-0950

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ammonia	ND	F1	2.50	2.416		mg/L		97	90 - 110	3	20

Lab Sample ID: 240-231956-3 MS

Matrix: Water

Analysis Batch: 670559

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	ND	F1	2.50	2.395		mg/L		96	90 - 110

Lab Sample ID: 240-231956-3 MSD

Matrix: Water

Analysis Batch: 670559

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ammonia	ND	F1	2.50	2.418		mg/L		97	90 - 110	1	20

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: MB 240-670958/17

Matrix: Water

Analysis Batch: 670958

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0100	0.00300	mg/L			09/08/25 13:09	1

Lab Sample ID: LCS 240-670958/38

Matrix: Water

Analysis Batch: 670958

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Phenolics, Total Recoverable	1.00	1.099		mg/L		110	90 - 110

Lab Sample ID: 240-231956-3 MS

Matrix: Water

Analysis Batch: 670958

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Phenolics, Total Recoverable	ND		0.0500	0.05268		mg/L		105	90 - 110

Lab Sample ID: 240-231956-3 MSD

Matrix: Water

Analysis Batch: 670958

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND		0.0500	0.05312		mg/L		106	90 - 110	1	20

Lab Sample ID: MB 240-671162/17

Matrix: Water

Analysis Batch: 671162

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0100	0.00300	mg/L			09/09/25 12:43	1

Lab Sample ID: MB 240-671162/55

Matrix: Water

Analysis Batch: 671162

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phenolics, Total Recoverable	ND		0.0100	0.00300	mg/L			09/09/25 15:02	1

Lab Sample ID: LCS 240-671162/18

Matrix: Water

Analysis Batch: 671162

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Phenolics, Total Recoverable	1.00	1.103		mg/L		110	90 - 110

Lab Sample ID: LCS 240-671162/65

Matrix: Water

Analysis Batch: 671162

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Phenolics, Total Recoverable	1.00	1.009		mg/L		101	90 - 110

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 420.4 - Phenolics, Total Recoverable

Lab Sample ID: 240-231956-6 MS

Matrix: Water

Analysis Batch: 671162

Client Sample ID: SW-1-082625-1850

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Phenolics, Total Recoverable	ND	F1	0.0500	0.05442		mg/L		109	90 - 110		

Lab Sample ID: 240-231956-6 MSD

Matrix: Water

Analysis Batch: 671162

Client Sample ID: SW-1-082625-1850

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND	F1	0.0500	0.05542	F1	mg/L		111	90 - 110	2	20

Lab Sample ID: 240-231969-2 MS

Matrix: Water

Analysis Batch: 671162

Client Sample ID: MW-16-082825-1240

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Phenolics, Total Recoverable	ND	F1	0.0500	0.05603	F1	mg/L		112	90 - 110		

Lab Sample ID: 240-231969-2 MSD

Matrix: Water

Analysis Batch: 671162

Client Sample ID: MW-16-082825-1240

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Phenolics, Total Recoverable	ND	F1	0.0500	0.05783	F1	mg/L		116	90 - 110	3	20

Method: 5220D-2011 - Chemical Oxygen Demand

Lab Sample ID: MB 240-670464/9

Matrix: Water

Analysis Batch: 670464

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10.0	1.80	mg/L			09/04/25 11:10	1

Lab Sample ID: LCS 240-670464/10

Matrix: Water

Analysis Batch: 670464

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chemical Oxygen Demand	44.6	41.17		mg/L		92	90 - 110		

Lab Sample ID: 240-231956-3 MS

Matrix: Water

Analysis Batch: 670464

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chemical Oxygen Demand	4.20	J	50.0	51.88		mg/L		95	90 - 110		

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 5220D-2011 - Chemical Oxygen Demand (Continued)

Lab Sample ID: 240-231956-3 MSD

Matrix: Water

Analysis Batch: 670464

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	4.20	J	50.0	49.81		mg/L		91	90 - 110	4	20

Lab Sample ID: 240-231956-11 MS

Matrix: Water

Analysis Batch: 670464

Client Sample ID: MW-27-082725-1405

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	5.58	J F1	50.0	52.91		mg/L		95	90 - 110		

Lab Sample ID: 240-231956-11 MSD

Matrix: Water

Analysis Batch: 670464

Client Sample ID: MW-27-082725-1405

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	5.58	J F1	50.0	46.00	F1	mg/L		81	90 - 110	14	20

Lab Sample ID: MB 240-670478/3

Matrix: Water

Analysis Batch: 670478

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10.0	1.80	mg/L			09/04/25 11:10	1

Lab Sample ID: LCS 240-670478/4

Matrix: Water

Analysis Batch: 670478

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	44.6	43.59		mg/L		98	90 - 110		

Lab Sample ID: 240-231969-2 MS

Matrix: Water

Analysis Batch: 670478

Client Sample ID: MW-16-082825-1240

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	ND	F1	50.0	47.04		mg/L		94	90 - 110		

Lab Sample ID: 240-231969-2 MSD

Matrix: Water

Analysis Batch: 670478

Client Sample ID: MW-16-082825-1240

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chemical Oxygen Demand	ND	F1	50.0	45.31		mg/L		91	90 - 110	4	20

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 9020B - Organic Halides, Total (TOX)

Lab Sample ID: MB 280-712165/2

Matrix: Water

Analysis Batch: 712165

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOX Dup	ND		30.0	7.50	ug/L			09/04/25 11:49	1

Lab Sample ID: LCS 280-712165/4

Matrix: Water

Analysis Batch: 712165

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
TOX Result 1	100	95.83		ug/L		96	78 - 114
TOX Dup	100	95.83		ug/L		96	78 - 114

Lab Sample ID: 240-231956-3 MS

Matrix: Water

Analysis Batch: 712165

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
TOX Result 1	38.9	J	100	138.0		ug/L		99	78 - 114
TOX Dup	38.9	J	100	138.0		ug/L		99	78 - 114

Lab Sample ID: 240-231956-3 MSD

Matrix: Water

Analysis Batch: 712165

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
TOX Result 1	38.9	J	100	131.9		ug/L		93	78 - 114	4	23
TOX Dup	38.9	J	100	131.9		ug/L		93	78 - 114	5	23

Lab Sample ID: MB 280-712258/2

Matrix: Water

Analysis Batch: 712258

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOX Dup	ND		30.0	7.50	ug/L			09/05/25 17:10	1

Lab Sample ID: LCS 280-712258/4

Matrix: Water

Analysis Batch: 712258

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
TOX Result 1	100	103.3		ug/L		103	78 - 114
TOX Dup	100	103.3		ug/L		103	78 - 114

Lab Sample ID: 240-231969-2 MS

Matrix: Water

Analysis Batch: 712258

Client Sample ID: MW-16-082825-1240

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
TOX Result 1	ND		100	104.9		ug/L		105	78 - 114
TOX Dup	ND		100	104.9		ug/L		105	78 - 114

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 9020B - Organic Halides, Total (TOX) (Continued)

Lab Sample ID: 240-231969-2 MSD

Matrix: Water

Analysis Batch: 712258

Client Sample ID: MW-16-082825-1240

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
TOX Result 1	ND		100	105.8		ug/L		106	78 - 114	1	23
TOX Dup	ND		100	105.8		ug/L		106	78 - 114	1	23

Lab Sample ID: MB 280-712571/2

Matrix: Water

Analysis Batch: 712571

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOX Dup	ND		30.0	7.50	ug/L			09/08/25 11:06	1

Lab Sample ID: LCS 280-712571/4

Matrix: Water

Analysis Batch: 712571

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
TOX Result 1	100	100.4		ug/L		100	78 - 114
TOX Dup	100	100.4		ug/L		100	78 - 114

Lab Sample ID: 180-194992-A-1 MS

Matrix: Water

Analysis Batch: 712571

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
TOX Result 1	15.2	J	100	114.6		ug/L		99	78 - 114
TOX Dup	15.2	J	100	114.6		ug/L		99	78 - 114

Lab Sample ID: 180-194992-A-1 MSD

Matrix: Water

Analysis Batch: 712571

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
TOX Result 1	15.2	J	100	111.6		ug/L		96	78 - 114	3	23
TOX Dup	15.2	J	100	111.6		ug/L		96	78 - 114	3	23

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 240-670170/3

Matrix: Water

Analysis Batch: 670170

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.128	mg/L			09/03/25 08:54	1
Fluoride	ND		0.0500	0.0240	mg/L			09/03/25 08:54	1
Sulfate	ND		1.00	0.348	mg/L			09/03/25 08:54	1

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 240-670170/4

Matrix: Water

Analysis Batch: 670170

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	50.0	51.26		mg/L		103	90 - 110
Fluoride	2.50	2.650		mg/L		106	90 - 110
Sulfate	50.0	52.06		mg/L		104	90 - 110

Lab Sample ID: 240-231956-3 MS

Matrix: Water

Analysis Batch: 670170

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	63.8		50.0	113.3		mg/L		99	80 - 120
Fluoride	0.543		2.50	3.186		mg/L		106	80 - 120
Sulfate	32.5		50.0	82.86		mg/L		101	80 - 120

Lab Sample ID: 240-231956-3 MSD

Matrix: Water

Analysis Batch: 670170

Client Sample ID: MW-20-082625-1340

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	63.8		50.0	113.7		mg/L		100	80 - 120	0	15
Fluoride	0.543		2.50	3.179		mg/L		105	80 - 120	0	15
Sulfate	32.5		50.0	82.82		mg/L		101	80 - 120	0	15

Lab Sample ID: 240-231956-10 MS

Matrix: Water

Analysis Batch: 670170

Client Sample ID: MW-5-082725-1250

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	3.97		50.0	56.80		mg/L		106	80 - 120
Fluoride	0.502		2.50	3.067		mg/L		103	80 - 120
Sulfate	34.2		50.0	83.77		mg/L		99	80 - 120

Lab Sample ID: 240-231956-10 MSD

Matrix: Water

Analysis Batch: 670170

Client Sample ID: MW-5-082725-1250

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	3.97		50.0	57.89		mg/L		108	80 - 120	2	15
Fluoride	0.502		2.50	3.124		mg/L		105	80 - 120	2	15
Sulfate	34.2		50.0	84.91		mg/L		101	80 - 120	1	15

Lab Sample ID: MB 240-670344/3

Matrix: Water

Analysis Batch: 670344

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.128	mg/L			09/03/25 16:37	1
Fluoride	ND		0.0500	0.0240	mg/L			09/03/25 16:37	1
Sulfate	ND		1.00	0.348	mg/L			09/03/25 16:37	1

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QC Sample Results

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 240-670344/4

Matrix: Water

Analysis Batch: 670344

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	50.0	48.17		mg/L		96	90 - 110
Fluoride	2.50	2.477		mg/L		99	90 - 110
Sulfate	50.0	48.23		mg/L		96	90 - 110

Lab Sample ID: 240-231965-G-3 MS

Matrix: Water

Analysis Batch: 670344

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	19.8		50.0	69.93		mg/L		100	80 - 120
Fluoride	0.223		2.50	2.804		mg/L		103	80 - 120
Sulfate	38.7		50.0	87.12		mg/L		97	80 - 120

Lab Sample ID: 240-231965-G-3 MSD

Matrix: Water

Analysis Batch: 670344

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	19.8		50.0	70.49		mg/L		101	80 - 120	1	15
Fluoride	0.223		2.50	2.828		mg/L		104	80 - 120	1	15
Sulfate	38.7		50.0	87.62		mg/L		98	80 - 120	1	15

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Metals

Prep Batch: 669957

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-1	MW-25-082625-0950	Dissolved	Water	3005A	
240-231956-1	MW-25-082625-0950	Total Recoverable	Water	3005A	
240-231956-2	MW-26-082625-1155	Dissolved	Water	3005A	
240-231956-2	MW-26-082625-1155	Total Recoverable	Water	3005A	
240-231956-3	MW-20-082625-1340	Dissolved	Water	3005A	
240-231956-3	MW-20-082625-1340	Total Recoverable	Water	3005A	
240-231956-4	MW-21-082625-1630	Dissolved	Water	3005A	
240-231956-4	MW-21-082625-1630	Total Recoverable	Water	3005A	
240-231956-5	SW-2-082625-1750	Total Recoverable	Water	3005A	
240-231956-6	SW-1-082625-1850	Total Recoverable	Water	3005A	
240-231956-7	20760-082625-0001	Dissolved	Water	3005A	
240-231956-7	20760-082625-0001	Total Recoverable	Water	3005A	
240-231956-8	MW-7-082725-0905	Dissolved	Water	3005A	
240-231956-8	MW-7-082725-0905	Total Recoverable	Water	3005A	
240-231956-9	MW-6-082725-1100	Dissolved	Water	3005A	
240-231956-9	MW-6-082725-1100	Total Recoverable	Water	3005A	
240-231956-10	MW-5-082725-1250	Dissolved	Water	3005A	
240-231956-10	MW-5-082725-1250	Total Recoverable	Water	3005A	
240-231956-11	MW-27-082725-1405	Dissolved	Water	3005A	
240-231956-11	MW-27-082725-1405	Total Recoverable	Water	3005A	
MB 240-669957/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-669957/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-669957/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-231956-3 MS	MW-20-082625-1340	Dissolved	Water	3005A	
240-231956-3 MS	MW-20-082625-1340	Total Recoverable	Water	3005A	
240-231956-3 MS	MW-20-082625-1340	Total Recoverable	Water	3005A	
240-231956-3 MSD	MW-20-082625-1340	Dissolved	Water	3005A	
240-231956-3 MSD	MW-20-082625-1340	Total Recoverable	Water	3005A	
240-231956-3 MSD	MW-20-082625-1340	Total Recoverable	Water	3005A	

Prep Batch: 669958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231969-1	MW-12-082825-1040	Dissolved	Water	3005A	
240-231969-1	MW-12-082825-1040	Total Recoverable	Water	3005A	
240-231969-2	MW-16-082825-1240	Dissolved	Water	3005A	
240-231969-2	MW-16-082825-1240	Total Recoverable	Water	3005A	
MB 240-669958/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-669958/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-669958/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-231976-H-1-B MS	Matrix Spike	Total Recoverable	Water	3005A	
240-231976-H-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	
240-231976-H-1-D MS	Matrix Spike	Total Recoverable	Water	3005A	
240-231976-H-1-E MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Filtration Batch: 670112

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-5	SW-2-082625-1750	Dissolved	Water	FILTRATION	
240-231956-6	SW-1-082625-1850	Dissolved	Water	FILTRATION	

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QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Metals

Prep Batch: 670115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-5	SW-2-082625-1750	Dissolved	Water	3005A	670112
240-231956-6	SW-1-082625-1850	Dissolved	Water	3005A	670112
MB 240-670115/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-670115/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
240-231946-A-1-C MS	Matrix Spike	Total Recoverable	Water	3005A	
240-231946-A-1-D MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Analysis Batch: 670217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-1	MW-25-082625-0950	Total Recoverable	Water	6010D	669957
240-231956-2	MW-26-082625-1155	Total Recoverable	Water	6010D	669957
240-231956-3	MW-20-082625-1340	Total Recoverable	Water	6010D	669957
240-231956-4	MW-21-082625-1630	Total Recoverable	Water	6010D	669957
240-231956-5	SW-2-082625-1750	Total Recoverable	Water	6010D	669957
240-231956-6	SW-1-082625-1850	Total Recoverable	Water	6010D	669957
240-231956-7	20760-082625-0001	Total Recoverable	Water	6010D	669957
240-231956-8	MW-7-082725-0905	Total Recoverable	Water	6010D	669957
240-231956-9	MW-6-082725-1100	Total Recoverable	Water	6010D	669957
240-231956-10	MW-5-082725-1250	Total Recoverable	Water	6010D	669957
240-231956-11	MW-27-082725-1405	Total Recoverable	Water	6010D	669957
240-231969-1	MW-12-082825-1040	Total Recoverable	Water	6010D	669958
240-231969-2	MW-16-082825-1240	Total Recoverable	Water	6010D	669958
MB 240-669957/1-A	Method Blank	Total Recoverable	Water	6010D	669957
MB 240-669958/1-A	Method Blank	Total Recoverable	Water	6010D	669958
LCS 240-669957/2-A	Lab Control Sample	Total Recoverable	Water	6010D	669957
LCS 240-669958/2-A	Lab Control Sample	Total Recoverable	Water	6010D	669958
240-231956-3 MS	MW-20-082625-1340	Total Recoverable	Water	6010D	669957
240-231956-3 MSD	MW-20-082625-1340	Total Recoverable	Water	6010D	669957
240-231976-H-1-B MS	Matrix Spike	Total Recoverable	Water	6010D	669958
240-231976-H-1-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	6010D	669958

Analysis Batch: 670373

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-1	MW-25-082625-0950	Dissolved	Water	6020B	669957
240-231956-1	MW-25-082625-0950	Total Recoverable	Water	6020B	669957
240-231956-2	MW-26-082625-1155	Dissolved	Water	6020B	669957
240-231956-2	MW-26-082625-1155	Total Recoverable	Water	6020B	669957
240-231956-3	MW-20-082625-1340	Dissolved	Water	6020B	669957
240-231956-3	MW-20-082625-1340	Total Recoverable	Water	6020B	669957
240-231956-4	MW-21-082625-1630	Dissolved	Water	6020B	669957
240-231956-4	MW-21-082625-1630	Total Recoverable	Water	6020B	669957
240-231956-5	SW-2-082625-1750	Dissolved	Water	6020B	670115
240-231956-5	SW-2-082625-1750	Total Recoverable	Water	6020B	669957
240-231956-6	SW-1-082625-1850	Dissolved	Water	6020B	670115
240-231956-6	SW-1-082625-1850	Total Recoverable	Water	6020B	669957
240-231956-7	20760-082625-0001	Dissolved	Water	6020B	669957
240-231956-7	20760-082625-0001	Total Recoverable	Water	6020B	669957
240-231956-8	MW-7-082725-0905	Dissolved	Water	6020B	669957
240-231956-8	MW-7-082725-0905	Total Recoverable	Water	6020B	669957
240-231956-9	MW-6-082725-1100	Dissolved	Water	6020B	669957
240-231956-9	MW-6-082725-1100	Total Recoverable	Water	6020B	669957

Eurofins Cleveland

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Metals (Continued)

Analysis Batch: 670373 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-10	MW-5-082725-1250	Dissolved	Water	6020B	669957
240-231956-10	MW-5-082725-1250	Total Recoverable	Water	6020B	669957
240-231956-11	MW-27-082725-1405	Dissolved	Water	6020B	669957
240-231956-11	MW-27-082725-1405	Total Recoverable	Water	6020B	669957
240-231969-1	MW-12-082825-1040	Dissolved	Water	6020B	669958
240-231969-1	MW-12-082825-1040	Total Recoverable	Water	6020B	669958
240-231969-2	MW-16-082825-1240	Dissolved	Water	6020B	669958
240-231969-2	MW-16-082825-1240	Total Recoverable	Water	6020B	669958
MB 240-669957/1-A	Method Blank	Total Recoverable	Water	6020B	669957
MB 240-669958/1-A	Method Blank	Total Recoverable	Water	6020B	669958
MB 240-670115/1-A	Method Blank	Total Recoverable	Water	6020B	670115
LCS 240-669957/3-A	Lab Control Sample	Total Recoverable	Water	6020B	669957
LCS 240-669958/3-A	Lab Control Sample	Total Recoverable	Water	6020B	669958
LCS 240-670115/3-A	Lab Control Sample	Total Recoverable	Water	6020B	670115
240-231946-A-1-C MS	Matrix Spike	Total Recoverable	Water	6020B	670115
240-231946-A-1-D MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020B	670115
240-231956-3 MS	MW-20-082625-1340	Dissolved	Water	6020B	669957
240-231956-3 MS	MW-20-082625-1340	Total Recoverable	Water	6020B	669957
240-231956-3 MSD	MW-20-082625-1340	Dissolved	Water	6020B	669957
240-231956-3 MSD	MW-20-082625-1340	Total Recoverable	Water	6020B	669957
240-231976-H-1-D MS	Matrix Spike	Total Recoverable	Water	6020B	669958
240-231976-H-1-E MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020B	669958

General Chemistry

Analysis Batch: 670170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-1	MW-25-082625-0950	Total/NA	Water	9056A	
240-231956-2	MW-26-082625-1155	Total/NA	Water	9056A	
240-231956-2	MW-26-082625-1155	Total/NA	Water	9056A	
240-231956-3	MW-20-082625-1340	Total/NA	Water	9056A	
240-231956-4	MW-21-082625-1630	Total/NA	Water	9056A	
240-231956-5	SW-2-082625-1750	Total/NA	Water	9056A	
240-231956-6	SW-1-082625-1850	Total/NA	Water	9056A	
240-231956-7	20760-082625-0001	Total/NA	Water	9056A	
240-231956-8	MW-7-082725-0905	Total/NA	Water	9056A	
240-231956-8	MW-7-082725-0905	Total/NA	Water	9056A	
240-231956-9	MW-6-082725-1100	Total/NA	Water	9056A	
240-231956-10	MW-5-082725-1250	Total/NA	Water	9056A	
240-231956-11	MW-27-082725-1405	Total/NA	Water	9056A	
240-231956-11	MW-27-082725-1405	Total/NA	Water	9056A	
MB 240-670170/3	Method Blank	Total/NA	Water	9056A	
LCS 240-670170/4	Lab Control Sample	Total/NA	Water	9056A	
240-231956-3 MS	MW-20-082625-1340	Total/NA	Water	9056A	
240-231956-3 MSD	MW-20-082625-1340	Total/NA	Water	9056A	
240-231956-10 MS	MW-5-082725-1250	Total/NA	Water	9056A	
240-231956-10 MSD	MW-5-082725-1250	Total/NA	Water	9056A	

Analysis Batch: 670344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231969-1	MW-12-082825-1040	Total/NA	Water	9056A	

Eurofins Cleveland

QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

General Chemistry (Continued)

Analysis Batch: 670344 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231969-2	MW-16-082825-1240	Total/NA	Water	9056A	
MB 240-670344/3	Method Blank	Total/NA	Water	9056A	
LCS 240-670344/4	Lab Control Sample	Total/NA	Water	9056A	
240-231965-G-3 MS	Matrix Spike	Total/NA	Water	9056A	
240-231965-G-3 MSD	Matrix Spike Duplicate	Total/NA	Water	9056A	

Analysis Batch: 670464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-1	MW-25-082625-0950	Total/NA	Water	5220D-2011	
240-231956-2	MW-26-082625-1155	Total/NA	Water	5220D-2011	
240-231956-3	MW-20-082625-1340	Total/NA	Water	5220D-2011	
240-231956-4	MW-21-082625-1630	Total/NA	Water	5220D-2011	
240-231956-5	SW-2-082625-1750	Total/NA	Water	5220D-2011	
240-231956-6	SW-1-082625-1850	Total/NA	Water	5220D-2011	
240-231956-7	20760-082625-0001	Total/NA	Water	5220D-2011	
240-231956-8	MW-7-082725-0905	Total/NA	Water	5220D-2011	
240-231956-9	MW-6-082725-1100	Total/NA	Water	5220D-2011	
240-231956-10	MW-5-082725-1250	Total/NA	Water	5220D-2011	
240-231956-11	MW-27-082725-1405	Total/NA	Water	5220D-2011	
MB 240-670464/9	Method Blank	Total/NA	Water	5220D-2011	
LCS 240-670464/10	Lab Control Sample	Total/NA	Water	5220D-2011	
240-231956-3 MS	MW-20-082625-1340	Total/NA	Water	5220D-2011	
240-231956-3 MSD	MW-20-082625-1340	Total/NA	Water	5220D-2011	
240-231956-11 MS	MW-27-082725-1405	Total/NA	Water	5220D-2011	
240-231956-11 MSD	MW-27-082725-1405	Total/NA	Water	5220D-2011	

Analysis Batch: 670478

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231969-1	MW-12-082825-1040	Total/NA	Water	5220D-2011	
240-231969-2	MW-16-082825-1240	Total/NA	Water	5220D-2011	
MB 240-670478/3	Method Blank	Total/NA	Water	5220D-2011	
LCS 240-670478/4	Lab Control Sample	Total/NA	Water	5220D-2011	
240-231969-2 MS	MW-16-082825-1240	Total/NA	Water	5220D-2011	
240-231969-2 MSD	MW-16-082825-1240	Total/NA	Water	5220D-2011	

Analysis Batch: 670559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-1	MW-25-082625-0950	Total/NA	Water	350.1	
240-231956-2	MW-26-082625-1155	Total/NA	Water	350.1	
240-231956-3	MW-20-082625-1340	Total/NA	Water	350.1	
240-231956-4	MW-21-082625-1630	Total/NA	Water	350.1	
240-231956-5	SW-2-082625-1750	Total/NA	Water	350.1	
240-231956-6	SW-1-082625-1850	Total/NA	Water	350.1	
240-231956-7	20760-082625-0001	Total/NA	Water	350.1	
240-231956-8	MW-7-082725-0905	Total/NA	Water	350.1	
240-231956-9	MW-6-082725-1100	Total/NA	Water	350.1	
240-231956-10	MW-5-082725-1250	Total/NA	Water	350.1	
240-231956-11	MW-27-082725-1405	Total/NA	Water	350.1	
240-231969-1	MW-12-082825-1040	Total/NA	Water	350.1	
240-231969-2	MW-16-082825-1240	Total/NA	Water	350.1	
MB 240-670559/14	Method Blank	Total/NA	Water	350.1	

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QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

General Chemistry (Continued)

Analysis Batch: 670559 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-670559/44	Method Blank	Total/NA	Water	350.1	
MB 240-670559/76	Method Blank	Total/NA	Water	350.1	
LCS 240-670559/15	Lab Control Sample	Total/NA	Water	350.1	
LCS 240-670559/45	Lab Control Sample	Total/NA	Water	350.1	
LCS 240-670559/77	Lab Control Sample	Total/NA	Water	350.1	
240-231835-A-2 MS	Matrix Spike	Total/NA	Water	350.1	
240-231835-A-2 MSD	Matrix Spike Duplicate	Total/NA	Water	350.1	
240-231956-1 MS	MW-25-082625-0950	Total/NA	Water	350.1	
240-231956-1 MSD	MW-25-082625-0950	Total/NA	Water	350.1	
240-231956-3 MS	MW-20-082625-1340	Total/NA	Water	350.1	
240-231956-3 MSD	MW-20-082625-1340	Total/NA	Water	350.1	

Analysis Batch: 670958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-1	MW-25-082625-0950	Total/NA	Water	420.4	
240-231956-2	MW-26-082625-1155	Total/NA	Water	420.4	
240-231956-3	MW-20-082625-1340	Total/NA	Water	420.4	
240-231956-4	MW-21-082625-1630	Total/NA	Water	420.4	
240-231956-5	SW-2-082625-1750	Total/NA	Water	420.4	
MB 240-670958/17	Method Blank	Total/NA	Water	420.4	
LCS 240-670958/38	Lab Control Sample	Total/NA	Water	420.4	
240-231956-3 MS	MW-20-082625-1340	Total/NA	Water	420.4	
240-231956-3 MSD	MW-20-082625-1340	Total/NA	Water	420.4	

Analysis Batch: 671162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-6	SW-1-082625-1850	Total/NA	Water	420.4	
240-231956-7	20760-082625-0001	Total/NA	Water	420.4	
240-231956-8	MW-7-082725-0905	Total/NA	Water	420.4	
240-231956-9	MW-6-082725-1100	Total/NA	Water	420.4	
240-231956-10	MW-5-082725-1250	Total/NA	Water	420.4	
240-231956-11	MW-27-082725-1405	Total/NA	Water	420.4	
240-231969-1	MW-12-082825-1040	Total/NA	Water	420.4	
240-231969-2	MW-16-082825-1240	Total/NA	Water	420.4	
MB 240-671162/17	Method Blank	Total/NA	Water	420.4	
MB 240-671162/55	Method Blank	Total/NA	Water	420.4	
LCS 240-671162/18	Lab Control Sample	Total/NA	Water	420.4	
LCS 240-671162/65	Lab Control Sample	Total/NA	Water	420.4	
240-231956-6 MS	SW-1-082625-1850	Total/NA	Water	420.4	
240-231956-6 MSD	SW-1-082625-1850	Total/NA	Water	420.4	
240-231969-2 MS	MW-16-082825-1240	Total/NA	Water	420.4	
240-231969-2 MSD	MW-16-082825-1240	Total/NA	Water	420.4	

Analysis Batch: 712165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-1	MW-25-082625-0950	Total/NA	Water	9020B	
240-231956-3	MW-20-082625-1340	Total/NA	Water	9020B	
240-231956-4	MW-21-082625-1630	Total/NA	Water	9020B	
240-231956-5	SW-2-082625-1750	Total/NA	Water	9020B	
240-231956-6	SW-1-082625-1850	Total/NA	Water	9020B	
240-231956-7	20760-082625-0001	Total/NA	Water	9020B	

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QC Association Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

General Chemistry (Continued)

Analysis Batch: 712165 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-8	MW-7-082725-0905	Total/NA	Water	9020B	
240-231956-9	MW-6-082725-1100	Total/NA	Water	9020B	
240-231956-10	MW-5-082725-1250	Total/NA	Water	9020B	
240-231956-11	MW-27-082725-1405	Total/NA	Water	9020B	
240-231969-1	MW-12-082825-1040	Total/NA	Water	9020B	
MB 280-712165/2	Method Blank	Total/NA	Water	9020B	
LCS 280-712165/4	Lab Control Sample	Total/NA	Water	9020B	
240-231956-3 MS	MW-20-082625-1340	Total/NA	Water	9020B	
240-231956-3 MSD	MW-20-082625-1340	Total/NA	Water	9020B	

Analysis Batch: 712258

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231969-2	MW-16-082825-1240	Total/NA	Water	9020B	
MB 280-712258/2	Method Blank	Total/NA	Water	9020B	
LCS 280-712258/4	Lab Control Sample	Total/NA	Water	9020B	
240-231969-2 MS	MW-16-082825-1240	Total/NA	Water	9020B	
240-231969-2 MSD	MW-16-082825-1240	Total/NA	Water	9020B	

Analysis Batch: 712571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-231956-2	MW-26-082625-1155	Total/NA	Water	9020B	
MB 280-712571/2	Method Blank	Total/NA	Water	9020B	
LCS 280-712571/4	Lab Control Sample	Total/NA	Water	9020B	
180-194992-A-1 MS	Matrix Spike	Total/NA	Water	9020B	
180-194992-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	9020B	

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-25-082625-0950

Lab Sample ID: 240-231956-1

Date Collected: 08/26/25 09:50

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:00
Dissolved	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:18
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:16
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 16:22
Total/NA	Analysis	420.4		1	670958	VH6H	EET CLE	09/08/25 14:52
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 10:07

Client Sample ID: MW-26-082625-1155

Lab Sample ID: 240-231956-2

Date Collected: 08/26/25 11:55

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:05
Dissolved	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:23
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:21
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 16:31
Total/NA	Analysis	420.4		1	670958	VH6H	EET CLE	09/08/25 14:56
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712571	CAI	EET DEN	09/08/25 11:06
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 10:44
Total/NA	Analysis	9056A		10	670170	JMR	EET CLE	09/03/25 10:54

Client Sample ID: MW-20-082625-1340

Lab Sample ID: 240-231956-3

Date Collected: 08/26/25 13:40

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 03:30
Dissolved	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 12:58
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 12:45
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 14:46
Total/NA	Analysis	420.4		1	670958	VH6H	EET CLE	09/08/25 14:30

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Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-20-082625-1340

Lab Sample ID: 240-231956-3

Date Collected: 08/26/25 13:40

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 09:12

Client Sample ID: MW-21-082625-1630

Lab Sample ID: 240-231956-4

Date Collected: 08/26/25 16:30

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:09
Dissolved	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:29
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:26
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 16:34
Total/NA	Analysis	420.4		1	670958	VH6H	EET CLE	09/08/25 15:14
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 11:03

Client Sample ID: SW-2-082625-1750

Lab Sample ID: 240-231956-5

Date Collected: 08/26/25 17:50

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:14
Dissolved	Filtration	FILTRATION			670112	F3PF	EET CLE	09/02/25 12:00
Dissolved	Prep	3005A			670115	F3PF	EET CLE	09/02/25 14:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 17:48
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:37
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 16:37
Total/NA	Analysis	420.4		1	670958	VH6H	EET CLE	09/08/25 15:18
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 11:21

Eurofins Cleveland

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: SW-1-082625-1850

Lab Sample ID: 240-231956-6

Date Collected: 08/26/25 18:50

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:18
Dissolved	Filtration	FILTRATION			670112	F3PF	EET CLE	09/02/25 12:00
Dissolved	Prep	3005A			670115	F3PF	EET CLE	09/02/25 14:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 17:51
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:39
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 16:40
Total/NA	Analysis	420.4		1	671162	VH6H	EET CLE	09/09/25 13:05
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 11:30

Client Sample ID: 20760-082625-0001

Lab Sample ID: 240-231956-7

Date Collected: 08/26/25 12:00

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:23
Dissolved	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:44
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:42
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 16:43
Total/NA	Analysis	420.4		1	671162	VH6H	EET CLE	09/09/25 13:16
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 11:39

Client Sample ID: MW-7-082725-0905

Lab Sample ID: 240-231956-8

Date Collected: 08/27/25 09:05

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:27
Dissolved	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:50
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:47
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 16:46
Total/NA	Analysis	420.4		1	671162	VH6H	EET CLE	09/09/25 13:19
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10

Eurofins Cleveland

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-7-082725-0905

Lab Sample ID: 240-231956-8

Date Collected: 08/27/25 09:05

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 11:58
Total/NA	Analysis	9056A		10	670170	JMR	EET CLE	09/03/25 12:07

Client Sample ID: MW-6-082725-1100

Lab Sample ID: 240-231956-9

Date Collected: 08/27/25 11:00

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:40
Dissolved	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:55
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:52
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 16:49
Total/NA	Analysis	420.4		1	671162	VH6H	EET CLE	09/09/25 13:23
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 12:34

Client Sample ID: MW-5-082725-1250

Lab Sample ID: 240-231956-10

Date Collected: 08/27/25 12:50

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:45
Dissolved	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 13:57
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 14:00
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 16:58
Total/NA	Analysis	420.4		1	671162	VH6H	EET CLE	09/09/25 13:27
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 13:02

Eurofins Cleveland

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-27-082725-1405

Lab Sample ID: 240-231956-11

Date Collected: 08/27/25 14:05

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 04:49
Dissolved	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 14:10
Total Recoverable	Prep	3005A			669957	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 14:08
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 17:01
Total/NA	Analysis	420.4		1	671162	VH6H	EET CLE	09/09/25 13:30
Total/NA	Analysis	5220D-2011		1	670464	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670170	JMR	EET CLE	09/03/25 12:44
Total/NA	Analysis	9056A		5	670170	JMR	EET CLE	09/03/25 12:53

Client Sample ID: MW-12-082825-1040

Lab Sample ID: 240-231969-1

Date Collected: 08/28/25 10:40

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669958	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 01:40
Dissolved	Prep	3005A			669958	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 15:24
Total Recoverable	Prep	3005A			669958	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 15:21
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 17:40
Total/NA	Analysis	420.4		1	671162	VH6H	EET CLE	09/09/25 17:14
Total/NA	Analysis	5220D-2011		1	670478	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712165	CAI	EET DEN	09/04/25 11:49
Total/NA	Analysis	9056A		1	670344	JMR	EET CLE	09/03/25 19:50

Client Sample ID: MW-16-082825-1240

Lab Sample ID: 240-231969-2

Date Collected: 08/28/25 12:40

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			669958	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6010D		1	670217	AJC	EET CLE	09/03/25 01:44
Dissolved	Prep	3005A			669958	KLC	EET CLE	09/01/25 12:00
Dissolved	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 15:34
Total Recoverable	Prep	3005A			669958	KLC	EET CLE	09/01/25 12:00
Total Recoverable	Analysis	6020B		1	670373	S4FJ	EET CLE	09/03/25 15:26
Total/NA	Analysis	350.1		1	670559	AJ	EET CLE	09/04/25 17:43
Total/NA	Analysis	420.4		1	671162	VH6H	EET CLE	09/09/25 14:03

Eurofins Cleveland

Lab Chronicle

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Client Sample ID: MW-16-082825-1240

Lab Sample ID: 240-231969-2

Date Collected: 08/28/25 12:40

Matrix: Water

Date Received: 08/29/25 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	5220D-2011		1	670478	SC3B	EET CLE	09/04/25 11:10
Total/NA	Analysis	9020B		1	712258	CAI	EET DEN	09/05/25 17:10
Total/NA	Analysis	9056A		1	670344	JMR	EET CLE	09/03/25 20:29

Laboratory References:

EET CLE = Eurofins Cleveland, 180 S. Van Buren Avenue, Barberton, OH 44203, TEL (330)497-9396

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Haley & Aldrich, Inc.
Project/Site: Amsted - Keokuk, Iowa GW

Job ID: 240-231956-1

Laboratory: Eurofins Cleveland

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	421	06-01-27

Laboratory: Eurofins Denver

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

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-26
A2LA	ISO/IEC 17025	2907.01	10-31-26
Alabama	State Program	40730	09-30-12 *
Alaska (UST)	State	18-001	11-30-25
Arizona	State	AZ0713	12-20-25
Arkansas DEQ	State	88-00687	04-02-26
California	State	2513	01-08-26
Colorado	Petroleum Storage Tank Program	2907.01 (A2LA)	10-31-26
Colorado	State	CO00026	06-30-26
Connecticut	State	PH-0686	09-30-26
Florida	NELAP	E87667	06-30-26
Georgia	State	4025	01-08-26
Illinois	NELAP	200017	05-31-26
Iowa	State	370	12-01-26
Kansas	NELAP	E-10166	04-30-26
Kentucky (WW)	State	KY98047	12-31-25
Louisiana	NELAP	30785	06-30-14 *
Louisiana (All)	NELAP	30785	06-30-26
Minnesota	NELAP	1788752	12-31-25
Montana (DW)	State	CERT0117	01-01-26
Nevada	State	CO00026	07-31-26
New Hampshire	NELAP	2053	04-28-26
New Jersey	NELAP	CO004	06-30-26
New York	NELAP	11964	04-01-26
North Dakota	State	R-034	07-25-25 *
Oklahoma	NELAP	8614	12-31-25
Oregon	NELAP	4025	01-08-26
Pennsylvania	NELAP	68-00664	07-31-26
South Carolina	State	72002001	01-18-26
Texas	NELAP	TX104704183-08-TX	09-30-09 *
Texas	NELAP	T104704183	09-30-25
US Fish & Wildlife	US Federal Programs	058448	07-31-26
USDA	US Federal Programs	P330-20-00065	12-19-25
Utah	NELAP	QUAN5	06-30-13 *
Utah	NELAP	CO00026	07-31-25 *
Virginia	NELAP	460232	06-14-26
Washington	State	C583	08-03-26
West Virginia DEP	State	354	11-30-25
Wisconsin	State	999615430	08-31-26
Wyoming (UST)	A2LA	2907.01	06-09-26

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins Cleveland

1.8 / 1.1

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Eurofins - Cleveland Sample Receipt Form/Narrative		Login # _____	
Barberton Facility			
Client <u>H & A</u>	Site Name _____	Cooler unpacked by: <u>W Martin</u>	
Cooler Received on <u>8/29/25</u>	Opened on <u>8/29/25</u>		
FedEx 1 st Grd <u>EXP</u>	UPS FAS Waypoint	Client Drop Off	Eurofins Courier Other _____
Receipt After-hours Drop-off Date/Time _____		Storage Location _____	
Eurofins Cooler # <u>EC</u>	Foam Box	Client Cooler	Box Other _____
Packing material used. Bubble Wrap ☒ Foam Plastic Bag None Other _____			
COOLANT <u>Wet Ice</u>	Blue Ice	Dry Ice	Water None
1 Cooler temperature upon receipt	☒ See Multiple Cooler Form		
IR GUN # <u>17,13 (CF-D, 7, +0.2)</u>	Observed Cooler Temp. _____ °C	Corrected Cooler Temp _____ °C	
2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity <u>1</u> ☒ Yes ☒ No -Were the seals on the outside of the cooler(s) signed & dated? ☒ Yes ☒ No -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? ☒ Yes ☒ No -Were tamper/custody seals intact and uncompromised? ☒ Yes ☒ No 3 Shippers' packing slip attached to the cooler(s)? ☒ Yes ☒ No 4 Did custody papers accompany the sample(s)? ☒ Yes ☒ No 5 Were the custody papers relinquished & signed in the appropriate place? ☒ Yes ☒ No 6 Was/were the person(s) who collected the samples clearly identified on the COC? ☒ Yes ☒ No 7 Did all bottles arrive in good condition (Unbroken)? ☒ Yes ☒ No 8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? ☒ Yes ☒ No 9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? ☒ Yes ☒ No 10 Were correct bottle(s) used for the test(s) indicated? ☒ Yes ☒ No 11 Sufficient quantity received to perform indicated analyses? ☒ Yes ☒ No 12 Are these work share samples and all listed on the COC? ☒ Yes ☒ No 13 If yes, Questions 13-17 have been checked at the originating laboratory 13 Were all preserved sample(s) at the correct pH upon receipt? ☒ Yes ☒ No NA pH Strp Lot# HC463162 14 Were VOAs on the COC? ☒ Yes ☒ No 15 Were air bubbles >6 mm in any VOA vials? ☒ Yes ☒ No ☒ Larger than this. 16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ ☒ Yes ☒ No 17 Was a LL Hg or Me Hg trip blank present? ☒ Yes ☒ No			
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____ Concerning _____			
18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page		Labeled by: _____	
<u>no usable salvageable from the 3 coolers received 8/29</u> <u>MW-6 2 samples received on 8/28, all other samples</u> <u>MW-5 MW-27 3 received 8/29</u>		Labels Verified by: _____	
19. SAMPLE CONDITION			
Sample(s) _____ were received after the recommended holding time had expired			
Sample(s) _____ were received in a broken container			
Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)			
20. SAMPLE PRESERVATION			
Sample(s) _____ were further preserved in the laboratory			
Time preserved _____ Preservative(s) added/Lot number(s) _____			
VOA Sample Preservation - Date/Time VOAs Frozen _____			

Tests that are not checked for pH by Receiving.
VOAs
Oil and Grease
TOC

Temperature readings

Client Sample ID	Lab ID	Container Type	Container			Preservation	Preservation
			pH	Temp	Added		Lot Number
MMW-25-082625-0950	240-231956-A-1	Voa Vial 40mL Amber - H2SO4	_____	_____	_____	_____	_____
MMW-25-082625-0950	240-231956 B 1	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
MMW-25-082625-0950	240-231956-C-1	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____	_____
MMW-25-082625-0950	240-231956-D-1	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____	_____
MMW-25-082625-0950	240-231956-E-1	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____	_____
MMW-25-082625-0950	240-231956-F-1	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____	_____
MMW-26-082625 1155	240-231956 A-2	Voa Vial 40mL Amber - H2SO4	_____	_____	_____	_____	_____
MMW-26-082625-1155	240-231956-B-2	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
MMW-26-082625-1155	240-231956-C-2	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____	_____
MMW-26-082625-1155	240-231956-D-2	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____	_____
MMW-26-082625 1155	240-231956 E-2	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____	_____
MMW-26-082625-1155	240-231956-F-2	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-A-3	Voa Vial 40mL Amber - H2SO4	_____	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-A-3 MS	Voa Vial 40mL Amber - H2SO4	_____	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-A-3 MSD	Voa Vial 40mL Amber - H2SO4	_____	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-B-3	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-B-3 MS	Plastic 60 mL unpreserved	_____	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-B-3 MSD	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-C-3	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-C-3 MS	Amber Glass 250ml Sulfuric Acid	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-C-3 MSD	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____	_____
MMW-20-082625 1340	240-231956-D-3	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-D-3 MS	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-D-3 MSD	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-E-3	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-E-3 MS	Plastic 500ml with Nitric Acid	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-E-3 MSD	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-F-3	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-F-3 MS	Plastic 500ml w/ Nitric - Dis.	<2	_____	_____	_____	_____
MMW-20-082625-1340	240-231956-F-3 MSD	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____	_____
MMW 21-082625-1630	240-231956-A-4	Voa Vial 40mL Amber H2SO4	_____	_____	_____	_____	_____
MMW-21-082625-1630	240-231956-B-4	Plastic 60 mL - unpreserved	_____	_____	_____	_____	_____

Client Sample ID	Lab ID	Container Type	Container pH	Preservation Temp	Preservation Added	Preservation Lot Number
MMW-21-082625-1630	240-231956-C-4	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
MMW-21-082625-1630	240-231956-D-4	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____
MMW-21-082625-1630	240-231956-E-4	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
MMW-21-082625-1630	240-231956-F-4	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____
SW-2-082625-1750	240-231956-A-5	Voa Vial 40ml,Amber - H2SO4	_____	_____	_____	_____
SW-2-082625-1750	240-231956-B-5	Plastic 60 mL - unpreserved	_____	_____	_____	_____
SW-2-082625-1750	240-231956-C-5	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
SW-2-082625-1750	240-231956-D-5	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____
SW-2-082625-1750	240-231956-E-5	Plastic 500 mL - unpreserved - dis	_____	_____	_____	_____
SW-2-082625-1750	240-231956-F-5	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
SW-1-082625-1850	240-231956-A-6	Voa Vial 40ml,Amber - H2SO4	_____	_____	_____	_____
SW-1-082625-1850	240-231956-B-6	Plastic 60 mL - unpreserved	_____	_____	_____	_____
SW-1-082625-1850	240-231956-C-6	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
SW-1-082625-1850	240-231956-D-6	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____
SW-1-082625-1850	240-231956-E-6	Plastic 500 mL - unpreserved - dis	_____	_____	_____	_____
SW-1-082625-1850	240-231956-F-6	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
20760-082625-0001	240-231956-A-7	Voa Vial 40ml,Amber - H2SO4	_____	_____	_____	_____
20760-082625-0001	240-231956-B-7	Plastic 60 mL - unpreserved	_____	_____	_____	_____
20760-082625-0001	240-231956-C-7	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
20760-082625-0001	240-231956-D-7	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____
20760-082625-0001	240-231956-E-7	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
20760-082625-0001	240-231956-F-7	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____
MMW-7-082725-0905	240-231956-A-8	Voa Vial 40ml,Amber - H2SO4	_____	_____	_____	_____
MMW-7-082725-0905	240-231956-B-8	Plastic 60 mL - unpreserved	_____	_____	_____	_____
MMW-7-082725-0905	240-231956-C-8	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
MMW-7-082725-0905	240-231956-D-8	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____
MMW-7-082725-0905	240-231956-E-8	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
MMW-7-082725-0905	240-231956-F-8	Plastic 500ml - w/ Nitric - Dis	<2	_____	_____	_____
MMW-6-082725-1100	240-231956-A-9	Voa Vial 40ml,Amber - H2SO4	_____	_____	_____	_____
MMW-6-082725-1100	240-231956-B-9	Plastic 60 mL unpreserved	_____	_____	_____	_____
MMW-6-082725-1100	240-231956-C-9	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
MMW-6-082725-1100	240-231956-D-9	Plastic 250ml with Sulfuric Acid	<2	_____	_____	_____
MMW-6-082725-1100	240-231956-E-9	Plastic 500ml - with Nitric Acid	<2	_____	_____	_____
MMW-6-082725-1100	240-231956-F-9	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____	_____
MMW-5-082725-1250	240-231956-A-10	Voa Vial 40ml,Amber - H2SO4	_____	_____	_____	_____
MMW-5-082725-1250	240-231956-B-10	Plastic 60 mL - unpreserved	_____	_____	_____	_____
MMW-5-082725-1250	240-231956-C-10	Amber Glass 250ml - Sulfuric Acid	<2	_____	_____	_____
MMW-5-082725-1250	240-231956-D-10	Plastic 250ml - with Sulfuric Acid	<2	_____	_____	_____

Client Sample ID	Lab ID	Container Type	Container	Preservation	Preservation
			pH Temp		
MMW-5-082725-1250	240 231956-E-10	Plastic 500ml - with Nitric Acid	<2		
MMW-5-082725-1250	240-231956-F-10	Plastic 500ml - w/ Nitric - Dis.	<2		
MMW-27-082725-1405	240-231956-A-11	Voa Vial 40mL Amber - H2SO4			
MMW-27-082725-1405	240-231956-B-11	Plastic 60 mL - unpreserved			
MMW-27-082725-1405	240-231956-C-11	Amber Glass 250ml - Sulfuric Acid	<2		
MMW-27-082725-1405	240-231956-D-11	Plastic 250ml - with Sulfuric Acid	<2		
MMW-27-082725-1405	240-231956-E-11	Plastic 500ml - with Nitric Acid	<2		
MMW 27-082725-1405	240-231956-F-11	Plastic 500ml - w/ Nitric - Dis	<2		

0.4/0.6

Environment Testing

[illegible]

Eurofins - Cleveland Sample Receipt Form/Narrative		Login # _____	
Barberton Facility			
Client <u>Haley Hanna</u>	Site Name _____	Cooler unpacked by: <u>JM/ies</u>	
Cooler Received on <u>8/29/25</u>	Opened on <u>8/29/25</u>		
FedEx: 1 st Grd <u>EXP</u>	UPS FAS Waypoint	Client Drop Off	Eurofins Courier Other
Receipt After-hours Drop-off Date/Time _____		Storage Location _____	
Eurofins Cooler # <u>EC</u>	Room Box	Client Cooler	Box Other
Packing material used. <u>Bubble Wrap</u> Foam Plastic Bag None Other _____			
COOLANT: <u>Wet Ice</u> Blue Ice Dry Ice Water None _____			
1 Cooler temperature upon receipt ☐ See Multiple Cooler Form			
IR GUN # <u>13</u> (CF + <u>2</u> °C) Observed Cooler Temp. <u>04</u> °C Corrected Cooler Temp <u>06</u> °C			
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____			
-Were the seals on the outside of the cooler(s) signed & dated? <u>Yes</u> No NA			
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? <u>Yes</u> No NA			
-Were tamper/custody seals intact and uncompromised? <u>Yes</u> No NA			
3 Shippers' packing slip attached to the cooler(s)? <u>Yes</u> No			
4. Did custody papers accompany the sample(s)? <u>Yes</u> No			
5 Were the custody papers relinquished & signed in the appropriate place? <u>Yes</u> No			
6. Was/were the person(s) who collected the samples clearly identified on the COC? <u>Yes</u> No			
7 Did all bottles arrive in good condition (Unbroken)? <u>Yes</u> No			
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? <u>Yes</u> No			
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? <u>Yes</u> No			
10 Were correct bottle(s) used for the test(s) indicated? <u>Yes</u> No			
11 Sufficient quantity received to perform indicated analyses? <u>Yes</u> No			
12 Are these work share samples and all listed on the COC? <u>Yes</u> No			
13 If yes, Questions 13-17 have been checked at the originating laboratory			
14 Were all preserved sample(s) at the correct pH upon receipt? <u>Yes</u> No NA pH Strip Lot# <u>HC463162</u>			
15 Were all preserved sample(s) at the correct pH upon receipt? <u>Yes</u> No NA			
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes <u>No</u>			
17 Was a LL Hg or Me Hg trip blank present? <u>Yes</u> No			
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____			
Concerning _____			
18 CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page		Labeled by _____	
		Labels Verified by _____	
19 SAMPLE CONDITION			
Sample(s) _____ were received after the recommended holding time had expired			
Sample(s) _____ were received in a broken container			
Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)			
20. SAMPLE PRESERVATION			
Sample(s) _____ were further preserved in the laboratory			
Time preserved _____ Preservative(s) added/Lot number(s) _____			
VOA Sample Preservation - Date/Time VOAs Frozen _____			

Tests that are not checked for pH by Receiving: VOA's Oil and Grease TOC

8/29/2025

Login Container Summary Report

240-231969

9/12/2025

Temperature readings						
Client Sample ID	Lab ID	Container Type	Container pH	Preservation Temp	Preservation Added	Preservation Lot Number
MW-12-082825-1040	240-231969-A-1	Voa Vial 40ml Amber - with Sulfuric Acid				
MW-12-082825 1040	240-231969-B-1	Plastic 60 mL - unpreserved				
MW 12-082825-1040	240-231969-C-1	Amber Glass 250ml - Sulfuric Acid				
MW-12-082825-1040	240-231969-D-1	Plastic 250ml - with Sulfuric Acid	<2			
MW-12-082825-1040	240-231969-E-1	Plastic 500ml - with Nitric Acid	<2			
MW-12-082825-1040	240-231969-F-1	Plastic 250ml - w/nitric - dis	<2			
MW-16-082825-1240	240 231969-A-2	Voa Vial 40ml Amber - with Sulfuric Acid				
MW-16-082825-1240	240-231969 B 2	Plastic 60 mL - unpreserved				
MW-16-082825-1240	240-231969-C-2	Amber Glass 250ml - Sulfuric Acid				
MW-16-082825-1240	240-231969-D-2	Plastic 250ml - with Sulfuric Acid	<2			
MW-16-082825-1240	240-231969-E-2	Plastic 500ml - with Nitric Acid	<2			
MW-16-082825-1240	240-231969-F-2	Plastic 250ml - w/nitric - dis	<2			



Eurofins Cleveland
180 S. Van Buren Avenue
Barberton, OH 44203
Phone: 330-497-9396 Fax: 330-497-0772

Client Information (Sub Contract Lab)				Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:		
Client Contact				N/A	Heckler, Denise D	N/A	240-207145.1		
Shipping/Receiving				Phone:	E-Mail:	State of Origin:	Page:		
Company:				N/A	Denise.Heckler@et.eurofinsus.com	Iowa	Page 1 of 2		
Address:				Accreditations Required (See note):					
TestAmerica Laboratories, Inc.				State - Iowa					
Due Date Requested:				Preservation Codes:					
9/15/2025				240-231956-1					
TAT Requested (days):				Analysis Requested					
N/A									
PO #:									
N/A									
WO #:									
N/A									
Project #:									
24024753									
SSOW#:									
N/A									
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=water/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9020B Cal/COX in duplicate	Total Number of Containers	Special Instructions/Note:
MMW-25-082625-0950 (240-231956-1)	8/26/25	09:50 Central	G	Water		X		1	
MMW-26-082625-1155 (240-231956-2)	8/26/25	11:55 Central	G	Water		X		1	
MMW-20-082625-1340 (240-231956-3)	8/26/25	13:40 Central	G	Water		X		1	
MMW-20-082625-1340 (240-231956-3MS)	8/26/25	13:40 Central	G	Water		X		1	
MMW-20-082625-1340 (240-231956-3MSD)	8/26/25	13:40 Central	G	Water		X		1	
MMW-21-082625-1630 (240-231956-4)	8/26/25	16:30 Central	G	Water		X		1	
SW-2-082625-1750 (240-231956-5)	8/26/25	17:50 Central	G	Water		X		1	
SW-1-082625-1850 (240-231956-6)	8/26/25	18:50 Central	G	Water		X		1	
20760-082625-0001 (240-231956-7)	8/26/25	12:00 Central	G	Water		X		1	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	
Unconfirmed	Return To Client	Disposal By Lab	Archive For
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 2		Months

Empty Kit Relinquished by:		Time:	
Date/Time:	Date:	Method of Shipment:	
Relinquished by: <i>SW</i>	8/26/25	Company: <i>BC</i>	Received by: <i>Denise Heckler</i>
Relinquished by:		Company:	Received by:
Relinquished by:		Company:	Received by:

Custody Seals Intact:		Custody Seal No.:	
Yes	No	Company:	
A	N	Company:	8/30/25 0935
A	N	Company:	EEEDEN

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 240-231956-1

Login Number: 231956

List Number: 2

Creator: Padgett, Dylan T

List Source: Eurofins Denver

List Creation: 08/30/25 11:57 AM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	False	Refer to Job Narrative for details.
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Haley & Aldrich, Inc.

Job Number: 240-231956-1

Login Number: 231969

List Number: 2

Creator: Padgett, Dylan T

List Source: Eurofins Denver

List Creation: 08/30/25 12:00 PM

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

This receipt checklist is generated for all samples received in this Login. It may not be applicable to all Jobs associated with this Login.

Eurofins Cleveland

Data Usability Summary Report

Project Name: Keokuk, Iowa Groundwater

Project Description: Groundwater Samples

Sample Date(s): April 14 through 16, 2025

Analytical Laboratory: Eurofins Test America Laboratories, Inc. – Barberton, OH

Validation Performed by: Therese Rowland

Validation Reviewed by: Eric Hitchens

Validation Date: May 8, 2025

Haley & Aldrich, Inc. prepared this Data Usability Summary Report (DUSR) to summarize the review and validation of the analytical results for Sample Delivery Group(s) (SDG[s]) listed. This DUSR is organized into the following sections:

- 1. Sample Delivery Group Numbers**
 - 2. Precision and Accuracy [for SDG(s) above]**
 - 3. Explanations**
 - 4. Glossary**
 - 5. Abbreviations**
 - 6. Qualifiers**
- References**

This data validation and usability assessment was performed per the guidance and requirements established by the United States Environmental Protection Agency (USEPA) using the following reference materials:

- National Functional Guidelines (NFG) for Inorganic Data Review.
- The project-specific Work Plan (WP), herein referred to as the specified limits (see references section).

Data reported in this sampling event were reported to the laboratory method detection limit (MDL). Results found between the MDL and reporting limit (RL) are flagged J as estimated.

Sample data were qualified in accordance with the laboratory's standard operating procedures (SOPs). The results presented in each laboratory report were found to be compliant with the data quality objectives (DQOs) for the project and are therefore usable; any exceptions are noted in the following pages and listed below.

A subset of data was qualified as estimated due to field duplicate RPD exceedances. A summary of qualifications is provided in Section 1.9.

1. Sample Delivery Group Numbers

1.1 SAMPLE MANAGEMENT

This DUSR summarizes the review of SDG number(s):

- 240-222449-1, dated April 24, 2025; and
- 240-222546-1, dated April 26, 2025.

Samples were collected, preserved, and shipped following standard chain of custody (COC) protocols. Samples were also received appropriately, identified correctly, and analyzed according to the COC. Analyses were performed on the following samples:

Sample ID	Sample Type	Lab ID	Sample Date	Matrix	Methods
SW-2-041425-1630	N	240-222449-1	04/14/2025	WS	A, B, C, D, E
SW-1-041425-1730	N	240-222449-2	04/14/2025	WS	A, B, C, D, E
MW-25-041425-2005	N	240-222449-3	04/14/2025	WG	A, B, C, D, E
MW-26-041525-0955	N	240-222449-4	04/15/2025	WG	A, B, C, D, E
MW-21-041525-1225	N	240-222449-5	04/15/2025	WG	A, B, C, D, E
MW-20-041525-1415	N	240-222449-6	04/15/2025	WG	A, B, C, D, E
MW-5-041525-1615	N	240-222449-7	04/15/2025	WG	A, B, C, D, E
20760-041525-0001	FD	240-222449-8	04/15/2025	WG	A, B, C, D, E
MW-27-041625-1230	N	240-222546-1	04/16/2025	WG	A, B, C, D, E
MW-7-041625-0935	N	240-222546-2	04/16/2025	WG	A, B, C, D, E
MW-6-041625-1105	N	240-222546-3	04/16/2025	WG	A, B, C, D, E
MW-12-041625-1400	N	240-222546-4	04/16/2025	WG	A, B, C, D, E
MW-16-041625-1555	N	240-222546-5	04/16/2025	WG	A, B, C, D, E

Method Holding Times			
A.	E350.1	Ammonia (as N)	28 days for liquid, preserved
B.	SM5220D	Chemical Oxygen Demand (COD)	28 days for liquid, preserved
C.	SW6010D	Metals (by Optical Emission Spectrometry)	180 days for liquid, preserved
D.	SW6020B	Metals	180 days for liquid, preserved
E.	SW9056A	Inorganic Anions	28 days for liquid unpreserved

1.2 CASE NARRATIVE

The laboratory report case narrative lists various additional quality control issues, such as internal standard exceedances and initial calibration verification (ICV) and/or continuing calibration verification (CCV) exceedances. Since these additional quality control issues were not required for the project's data quality objectives, these quality control issues were not reviewed.

1.3 HOLDING TIMES/PRESERVATION

The samples arrived at the laboratory at the proper temperature and were prepared and analyzed within the holding time and preservation criteria specified per method protocol.

1.4 REPORTING LIMITS AND SAMPLE DILUTIONS

All sample dilutions were reviewed and found to be justified. Only detected analytes were reported from a sample dilution analysis.

1.5 LABORATORY CONTROL SAMPLES

[Refer to Section E 1.3.](#) Compounds associated with the laboratory control samples/laboratory control sample duplicate (LCS/LCSD) analyses associated with client samples exhibited recoveries and relative percent differences (RPDs) within the specified limits.

1.6 MATRIX SPIKE SAMPLES

[Refer to Section E 1.4.](#) The sample(s) below were used for matrix spike/matrix spike duplicate (MS/MSD):

Lab Sample Number	Matrix Spike/Matrix Spike Duplicate Sample Client ID	Method(s)
240-222449-6	MW-20-041525-1415	SW6010D, SW6020B, E350.1, SM5220D, SW9056A
240-222546-1	MW-27-041625-1230	SM5220D

The MS/MSD recoveries and the relative percent difference (RPD) between the MS and MSD results were within the specified limits.

1.7 BLANK SAMPLE ANALYSIS

[Refer to Section E 1.5.](#) Method blank samples had no detections, indicating that no contamination from laboratory activities occurred.

1.8 DUPLICATE SAMPLE ANALYSIS

[Refer to Section E 1.6.](#) No client samples were used for laboratory duplicate analysis.

The following sample(s) were used for field duplicate analysis. RPDs were all below 35 percent for water (or the absolute difference rule was satisfied if detects were less than 5 times the RL). Any exceptions are noted below and qualified.

Primary Sample ID	Duplicate Sample ID	Method(s)
MW-26-041525-0955	20760-041525-0001	E350.1, SM 5220D, EPA 6010D, EPA 6020B, EPA 9056A

Field Duplicate RPD Calculations:

Method	Analyte (mg/L)	Primary Sample ID	Duplicate Sample ID	% RPD	Qualification
		MW-26-041525-0955	20760-041525-0001		
SW9056A	Fluoride	0.124	0.182	NA	J/UJ, Abs Diff > RL

1.9 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

The results presented in this report were found to comply with the DQOs for the project and the guidelines specified by the analytical method. Based on the review of this report, the data are useable and acceptable as no data was rejected. The qualifiers applied to this dataset are summarized in the table below.

Sample ID	Analyte	Reported Result	Validated Result	Reason for Qualifier
MW-26-041525-0955	Fluoride	0.124	0.124 J	Field Duplicate calculations
20760-041525-0001		0.182	0.182 J	

2. Precision and Accuracy [for SDG(s) above]

[Refer to Section E 1.7.](#) Where required by the method, some measurement of analytical accuracy and precision was reported for each method with the site samples.

3. Explanations

The following explanations include more detailed information regarding each of the sections in the DUSR above. Not all sections in the Explanations are represented:

- E 1.3 Laboratory Control Samples
 - The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) analyses are used to assess the precision and accuracy of the analytical method independent of matrix interferences.
- E 1.4 Matrix Spike Samples
 - Matrix spike/matrix spike duplicate (MS/MSD) data are used to assess the precision and accuracy of the analytical method and evaluate the effects of the sample matrix on the sample preparation procedures and measurement methodologies.
 - For inorganic methods, when a matrix spike recovery falls outside of the control limits and the sample result is less than four times the spike added, a post-digestion spike (PDS) is performed.
- E 1.5 Blank Sample Analysis
 - Method blanks are prepared by the analytical laboratory and analyzed concurrently with the project samples to assess possible laboratory contamination.
- E 1.6 Laboratory and Field Duplicate Sample Analysis
 - The laboratory duplicate sample analysis is used by the laboratory at the time of the analysis to demonstrate acceptable method precision. The RPD or absolute difference was evaluated for each duplicate sample pair to monitor the reproducibility of the data.
 - The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The relative percent difference (RPD) or absolute difference was evaluated for each duplicate sample pair to monitor the reproducibility of the data.
- E 1.7 Precision and Accuracy
 - Precision measures the reproducibility of repetitive measurements. In a laboratory environment, this will be measured by determining the relative percent difference (RPD) found between a primary and a duplicate sample. This can be an LCS/LCSD pair, a MS/MSD pair, a laboratory duplicate performed on a site sample, or a field duplicate collected and analyzed concurrently with a site sample.
 - Accuracy is a statistical measurement of the correctness of a measured value and includes components of random error (variability caused by imprecision) and systematic error. In a laboratory environment, this will be measured by determining the percent recovery (%R) of certain spiked compounds. This can be assessed using LCS, blank spike (BS), MS, and/or surrogate recoveries.

4. Glossary

*Analyte names may be abbreviated for simplicity. Please reference the laboratory report for the full analyte name.

Not all of the following symbols, acronyms, or qualifiers occur in this document.

- Sample Types:
 - EB Equipment Blank Sample
 - FB Field Blank Sample
 - FD Field Duplicate Sample
 - N Primary Sample
 - TB Trip Blank Sample
- Units:

– ng/kg	nanograms per kilogram	– ppbv/v	parts per billion volume/volume
– µg/L	micrograms per liter	– pCi/L	picocuries per liter
– µg/m ³	micrograms per cubic meter	– pg/g	picograms per gram
– mg/kg	milligrams per kilogram	– pg/L	picograms per liter
– mg/L	milligrams per liter		
- Matrices:

– AA	Ambient Air	– SSV	Sub-slab Vapor
– GS	Soil Gas	– ST	Solid Waste
– GW/WG	Groundwater	– WQ	Water Quality control matrix
– IA	Indoor Air	– WS	Surface Water
– SE	Sediment	– WW	Waste Water
– SO	Soil		
- Table Footnotes:
 - NA Not applicable
 - ND Non-detect
 - NR Not reported
- Common Symbols:

– %	percent
– <	less than
– ≤	less than or equal to
– >	greater than
– ≥	greater than or equal to
– =	equal
– °C	degrees Celsius
– ±	plus or minus
– ~	approximately
– x	times (multiplier)
- Fractions:

– N	Normal (method cannot be filtered)
– D	Dissolved (filtered)
– T	Total (unfiltered)

5. Abbreviations

%D	Percent Difference	MDL	Laboratory Method Detection Limit
%R	Percent Recovery	MS/MSD	Matrix Spike/Matrix Spike Duplicate
%RSD	Percent Relative Standard Deviation	NA	not applicable
%v/v	Percent volume by volume	ND	Non-Detect
2s	2 sigma	NFG	National Functional Guidelines
4,4-DDT	4 4-dichlorodiphenyltrichloroethane	NH ₃	Ammonia
Abs Diff	Absolute Difference	NYSDEC	New York State Department of Environmental Conservation
amu	atomic mass unit	PAH	Polycyclic Aromatic Hydrocarbon
BPJ	Best Professional Judgement	PCB	Polychlorinated Biphenyl
BS	Blank Spike	PDS	Post-Digestion Spike
CCB	Continuing Calibration Blank	PEM	Performance Evaluation Mixture
CCV	Continuing Calibration Verification	PFAS	Per- and Polyfluoroalkyl Substances
CCVL	Continuing Calibration Verification Low	PFBA	Perfluorobutanoic Acid
COC	Chain of Custody	PFD	Perfluorodecalin
COM	Combined Isotope Calculation	PFOA	Perfluorooctanoic Acid
Cr (VI)	Hexavalent Chromium	PFOS	Perfluorooctane sulfonate
CRI	Collision Reaction Interface	PFPeA	Perfluoropentanoic Acid
DoD	Department of Defense	QAPP	Quality Assurance Project Plan
DQO	data quality objective	QC	Quality Control
DUSR	Data Usability Summary Report	QSM	Quality Systems Manual
EIS	Extraction Internal Standard	R ²	R-squared value
EMPC	Estimated Maximum Possible Concentration	Ra-226	Radium-226
FBK	Field Blank Contamination	Ra-228	Radium-228
FDP	Field Duplicate	RESC	Resolution Check Measure
GC	Gas Chromatograph	RL	Laboratory Reporting Limit
GC/MS	Gas Chromatography/Mass Spectrometry	RPD	Relative Percent Difference
GPC	Gel Permeation Chromatography	RRF	Relative Response Factor
H ₂	Hydrogen gas	RT	Retention Time
HCl	Hydrochloric Acid	SAP	Sampling Analysis Plan
ICAL	Initial Calibration	SDG	Sample Delivery Group
ICB	Initial Calibration Blank	SIM	Selected ion monitoring
ICP/MS	Inductively Coupled Plasma/Mass Spectrometry	SOP	Standard Operating Procedure
ICV	Initial Calibration Verification	SPE	Solid-Phase Extraction
ICVL	Initial Calibration Verification Low	SVOC	Semi-Volatile Organic Compound
IPA	Isopropyl Alcohol	TCLP	Toxicity Characteristic Leaching Procedure
LC	Laboratory Control	TIC	Tentatively Identified Compound
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate	TKN	Total Kjeldahl Nitrogen
MBK	Method Blank Contamination	TPH	Total Petroleum Hydrocarbon
MDC	Minimum Detectable Concentration	TPU	Total Propagated Uncertainty
		USEPA	U.S. Environmental Protection Agency
		VOC	Volatile Organic Compound
		WP	Work Plan

6. Qualifiers

The qualifiers below are from the USEPA National Functional Guidelines and the data in the DUSR may contain these qualifiers:

- Concentration (C) Qualifiers:
 - U The compound was analyzed for but not detected. The associated value is either the compound quantitation limit if not detected by the analytical instrument or could be the reported or blank concentration if qualified by blank contamination. This can also be displayed as less than the associated compound quantitation limit (<RL or <MDL), or “ND”.
 - B The compound was found in the sample and its associated blank. Its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers:
 - E The compound was quantitated above the calibration range.
 - D The concentration is based on a diluted sample analysis.
- Validation Qualifiers:
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - J+ The result is an estimated quantity, but the result may be biased high.
 - J- The result is an estimated quantity, but the result may be biased low.
 - J/UJ as listed in exception tables J applies to detected data and UJ applies to non-detected data as reported by the laboratory.
 - UJ The compound was not detected. The reported sample quantitation limit is approximate.
 - NJ The analysis indicated the presence of a compound for which there is presumptive evidence to make a tentative identification; the associated numerical value is an estimated concentration only.
 - R The sample results were rejected as unusable; the compound may or may not be present in the sample.
 - S Result is suspect. See DUSR for details.

References

1. Haley & Aldrich, Inc, 2016. Revised Hydrologic Monitoring System Plan. Amsted Foundry Materials Recovery and Reuse Area. Keokuk, Iowa. January 2016
2. United States Environmental Protection Agency, 2020a. National Functional Guidelines for Inorganic Superfund Methods Data Review. EPA-542-R-20-006. November.

Data Usability Summary Report

Project Name: Amsted - Keokuk, Iowa GW

Project Description: Groundwater Samples

Sample Dates: August 26 through 28, 2025

Analytical Laboratory: Eurofins Cleveland – Barberton, OH

Validation Performed by: Kristina Ilina

Validation Reviewed by: Katherine Miller

Validation Date: September 17, 2025

Haley & Aldrich, Inc. prepared this Data Usability Summary Report (DUSR) to summarize the review and validation of the analytical results for the Sample Delivery Groups (SDGs) listed. This DUSR is organized into the following sections:

- 1. Sample Delivery Group 240-231956-1**
 - 2. Explanations**
 - 3. Glossary**
 - 4. Abbreviations**
 - 5. Qualifiers**
- References**

This data validation and usability assessment was performed per the guidance and requirements established by the United States Environmental Protection Agency (USEPA) using the following reference materials:

- National Functional Guidelines (NFG) for Inorganic Data Review.
- National Functional Guidelines (NFG) for Organic Data Review.

Data reported in this sampling event were reported to the laboratory reporting limit (RL).

Sample data were qualified in accordance with the laboratory's standard operating procedures (SOPs). The results presented in each laboratory report were found to be compliant with the data quality objectives (DQOs) for the project and are therefore usable; any exceptions are noted in the following pages and listed below.

A subset of data was qualified as estimated due to low MSD %Recovery. All results are usable. A summary of qualifications is provided in Section 1.9.

1. Sample Delivery Group 240-231956-1

1.1 SAMPLE MANAGEMENT

This DUSR summarizes the review of SDG number 240-231956-1, dated September 12, 2025.

Samples were collected, preserved, and shipped following standard chain of custody (COC) protocols.

- Samples for SW9020 analysis were subcontracted to Eurofins Denver – Arvada, CO.

Samples were also received appropriately, identified correctly, and analyzed according to the COC.

Analyses were performed on the following samples:

Sample ID	Sample Type	Lab ID	Sample Date	Matrix	Methods
MW-12-082825-1040	N	240-231969-1	08/28/2025	WG	A, B, C, D, E, F, G
MW-25-082625-0950	N	240-231956-1	08/26/2025	WG	A, B, C, D, E, F, G
MW-16-082825-1240	N	240-231969-2	08/28/2025	WG	A, B, C, D, E, F, G
MW-26-082625-1155	N	240-231956-2	08/26/2025	WG	A, B, C, D, E, F, G
MW-20-082625-1340	N	240-231956-3	08/26/2025	WG	A, B, C, D, E, F, G
MW-21-082625-1630	N	240-231956-4	08/26/2025	WG	A, B, C, D, E, F, G
SW-2-082625-1750	N	240-231956-5	08/26/2025	WG	A, B, C, D, E, F, G
SW-1-082625-1850	N	240-231956-6	08/26/2025	WG	A, B, C, D, E, F, G
20760-082625-0001	FD	240-231956-7	08/26/2025	WG	A, B, C, D, E, F, G
MW-7-082725-0905	N	240-231956-8	08/27/2025	WG	A, B, C, D, E, F, G
MW-6-082725-1100	N	240-231956-9	08/27/2025	WG	A, B, C, D, E, F, G
MW-5-082725-1250	N	240-231956-10	08/27/2025	WG	A, B, C, D, E, F, G
MW-27-082725-1405	N	240-231956-11	08/27/2025	WG	A, B, C, D, E, F, G

Method Holding Times			
A.	SW6020B	Metals	180 days for liquid, preserved
B.	SW9020	TOTAL ORGANIC HALIDES (TOX)	28 days for liquid preserved
C.	SW9056A	Inorganic Anions (Fluoride, Chloride, Sulfate)	28 days for liquid unpreserved
D.	E350.1	Nitrogen, Ammonia (NH ₃)	28 days for liquid, preserved
E.	E420.4	TOTAL RECOVERABLE PHENOLS	28 days for liquid preserved
F.	SM5220D	Chemical Oxygen Demand (COD)	28 days for liquid, preserved
G.	SW6010D	Metals (by Optical Emission Spectrometry)	180 days for liquid, preserved

1.2 HOLDING TIMES/PRESERVATION

The samples arrived at the laboratory at the proper temperature and were prepared and analyzed within the holding time and preservation criteria specified per method protocol.

1.3 REPORTING LIMITS AND SAMPLE DILUTIONS

All sample dilutions were reviewed and found to be justified. Dilution of the project samples were required to bring calibration of target analytes within calibration range, matrix interference, foaming at the time of purging, or abundance of non-target analytes.

- The following samples for batch 280-712165 (Total Organic Halides) were diluted to 2x due to the nature of the sample matrix based on CI pre-screen test: MW-25-082625-0950 (240-231956-1), MW-20-082625-1340 (240-231956-3), MW-21-082625-1630 (240-231956-4), SW-2-082625-1750 (240-231956-5), SW-1-082625-1850 (240-231956-6), 20760-082625-0001 (240-231956-7), MW-7-082725-0905 (240-231956-8), MW-6-082725-1100 (240-231956-9), MW-5-082725-1250 (240-231956-10), MW-27-082725-1405 (240-231956-11) and MW-12-082825-1040 (240-231969-1). Elevated reporting limits (RLs) are provided.
- The following samples for batch 280-712258 (Total Organic Halides) were diluted to 2x due to the nature of the sample matrix based on CI pre-screen test: MW-16-082825-1240 (240-231969-2). Elevated reporting limits (RLs) are provided.
- Elevated reporting limits for method 9020B are provided for the following sample due to insufficient sample provided for analysis: MW-26-082625-1155 (240-231956-2).

1.4 BLANK SAMPLE ANALYSIS

[Refer to Section E 1.2.](#) Method blank samples had no detections, indicating that no contamination from laboratory activities occurred.

1.5 LABORATORY CONTROL SAMPLES

[Refer to Section E 1.3.](#) Compounds associated with the laboratory control sample/laboratory control sample duplicate (LCS/LCSD) analyses exhibited recoveries and relative percent differences (RPDs) within the specified limits.

1.6 MATRIX SPIKE SAMPLES

[Refer to Section E 1.4.](#) The sample(s) below were used for matrix spike/matrix spike duplicate (MS/MSD):

Lab Sample Number	Matrix Spike/Matrix Spike Duplicate Sample Client ID	Method(s)
240-231956-3	MW-20-082625-1340	E350.1, E420.4, SM 5220D, EPA 6010D, EPA 6020B, EPA 9020, EPA 9056A
240-231956-6	SW-1-082625-1850	E420.4 E420.4,
240-231969-2	MW-16-082825-1240	E420.4, SM 5220D, EPA 9020
240-231956-11	MW-27-082725-1405	SM 5220D
240-231956-10	MW-5-082725-1250	EPA 9056A

The MS/MSD recoveries and the relative percent difference (RPD) between the MS and MSD results were within the specified limits, with the following exceptions:

Sample Type	Method	Parent Sample	Analyte	%R/RPD	Qualifier	Affected Samples
MSD	E420.4	SW-1-082625-1850	Phenolics, Total Recoverable	111%	J+/None	None, samples are ND
MS/MSD		MW-16-082825-1240		112%/116%		
MSD	SM 5220D	MW-27-082725-1405	Chemical Oxygen Demand	81%	J-/UJ	All samples

1.7 DUPLICATE SAMPLE ANALYSIS

[Refer to Section E 1.5.](#) The laboratory did not analyze any laboratory duplicates as per the method or laboratory SOP.

The following sample(s) were used for field duplicate analysis. RPDs were all below 35 percent for water (or the absolute difference rule was satisfied if detects were less than 5 times the RL).

Primary Sample ID	Duplicate Sample ID	Method(s)
MW-25-082625-0950	20760-082625-0001	E350.1, E420.4, SM 5220D, EPA 6010D, EPA 6020B, EPA 9020, EPA 9056A

1.8 PRECISION AND ACCURACY

[Refer to Section E 1.6.](#) Where required by the method, some measurement of analytical accuracy and precision was reported for each method with the site samples.

1.9 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

The results presented in this report were found to comply with the DQOs for the project and the guidelines specified by the analytical method. Based on the review of this report, the data are useable and acceptable, as no data was rejected. The qualifiers applied to this dataset are summarized in the table below.

Sample ID	Analyte	Reported Result	Validated Result	Reason for Qualifier
All samples	Chemical Oxygen Demand (COD)	Detect/Non-Detect U	Detect J-/Non-Detect UJ	Low MSD %Rec

2. Explanations

The following explanations include more detailed information regarding each of the sections in the DUSR above. Not all sections in the Explanations are represented:

- E 1.2 Blank Sample Analysis
 - Method blanks are prepared by the analytical laboratory and analyzed concurrently with the project samples to assess possible laboratory contamination.
- E 1.3 Laboratory Control Samples
 - The LCS/LCSD analyses are used to assess the precision and accuracy of the analytical method independent of matrix interferences.
- E 1.4 Matrix Spike Samples
 - MS/MSD data are used to assess the precision and accuracy of the analytical method and evaluate the effects of the sample matrix on the sample preparation procedures and measurement methodologies.
 - For inorganic methods, when a matrix spike recovery falls outside of the control limits and the sample result is less than four times the spike added, a post-digestion spike (PDS) is performed.
- E 1.5 Laboratory and Field Duplicate Sample Analysis
 - The laboratory duplicate sample analysis is used by the laboratory at the time of the analysis to demonstrate acceptable method precision. The RPD or absolute difference was evaluated for each duplicate sample pair to monitor the reproducibility of the data.
 - The field duplicate sample analysis is used to assess the precision of the field sampling procedures and analytical method. The relative percent difference (RPD) or absolute difference was evaluated for each duplicate sample pair to monitor the reproducibility of the data.
- E 1.6 Precision and Accuracy
 - Precision measures the reproducibility of repetitive measurements. In a laboratory environment, this will be measured by determining the RPD found between a primary and a duplicate sample. This can be an LCS/LCSD pair, a MS/MSD pair, a laboratory duplicate performed on a site sample, or a field duplicate collected and analyzed concurrently with a site sample.
 - Accuracy is a statistical measurement of the correctness of a measured value and includes components of random error (variability caused by imprecision) and systematic error. In a laboratory environment, this will be measured by determining the percent recovery (%R) of certain spiked compounds. This can be assessed using LCS, blank spike (BS), MS, and/or surrogate recoveries.

3. Glossary

*Analyte names may be abbreviated for simplicity. Please reference the laboratory report for the full analyte name.

Not all of the following symbols, acronyms, or qualifiers occur in this document.

- Sample Types:
 - EB Equipment Blank Sample
 - FB Field Blank Sample
 - FD Field Duplicate Sample
 - N Primary Sample
 - TB Trip Blank Sample
- Units:

– ng/kg nanograms per kilogram – µg/L micrograms per liter – µg/m³ micrograms per cubic meter – mg/kg milligrams per kilogram – mg/L milligrams per liter	– ppbv/v parts per billion volume/volume – pCi/L picocuries per liter – pg/g picograms per gram – pg/L picograms per liter
- Matrices:

– AA Ambient Air – GS Soil Gas – GW/WG Groundwater – IA Indoor Air – SE Sediment – SO Soil	– SSV Sub-slab Vapor – ST Solid Waste – WQ Water Quality control matrix – WS Surface Water – WW Waste Water
- Table Footnotes:
 - NA Not applicable
 - ND Non-detect
 - NR Not reported
- Common Symbols:
 - % percent
 - < less than
 - ≤ less than or equal to
 - > greater than
 - ≥ greater than or equal to
 - = equal
 - °C degrees Celsius
 - ± plus or minus
 - ~ approximately
 - x times (multiplier)
- Fractions:
 - N Normal (method cannot be filtered)
 - D Dissolved (filtered)
 - T Total (unfiltered)

4. Abbreviations

%D	Percent Difference	MDL	Laboratory Method Detection Limit
%R	Percent Recovery	MS/MSD	Matrix Spike/Matrix Spike Duplicate
%RSD	Percent Relative Standard Deviation	NA	not applicable
%v/v	Percent volume by volume	ND	Non-Detect
2s	2 sigma	NFG	National Functional Guidelines
4,4-DDT	4 4-dichlorodiphenyltrichloroethane	NH ₃	Ammonia
Abs Diff	Absolute Difference	NYSDEC	New York State Department of Environmental Conservation
amu	atomic mass unit	PAH	Polycyclic Aromatic Hydrocarbon
BPJ	Best Professional Judgement	PCB	Polychlorinated Biphenyl
BS	Blank Spike	PDS	Post-Digestion Spike
CCB	Continuing Calibration Blank	PEM	Performance Evaluation Mixture
CCV	Continuing Calibration Verification	PFAS	Per- and Polyfluoroalkyl Substances
CCVL	Continuing Calibration Verification Low	PFBA	Perfluorobutanoic Acid
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Cr (VI)	Hexavalent Chromium	PFOS	Perfluorooctane sulfonate
CRI	Collision Reaction Interface	PFPeA	Perfluoropentanoic Acid
DoD	Department of Defense	QAPP	Quality Assurance Project Plan
DQO	data quality objective	QC	Quality Control
DUSR	Data Usability Summary Report	QSM	Quality Systems Manual
EIS	Extraction Internal Standard	R ²	R-squared value
EMPC	Estimated Maximum Possible Concentration	Ra-226	Radium-226
FBK	Field Blank Contamination	Ra-228	Radium-228
FDP	Field Duplicate	RESC	Resolution Check Measure
GC	Gas Chromatograph	RL	Laboratory Reporting Limit
GC/MS	Gas Chromatography/Mass Spectrometry	RPD	Relative Percent Difference
GPC	Gel Permeation Chromatography	RRF	Relative Response Factor
H ₂	Hydrogen gas	RT	Retention Time
HCl	Hydrochloric Acid	SAP	Sampling Analysis Plan
ICAL	Initial Calibration	SDG	Sample Delivery Group
ICB	Initial Calibration Blank	SIM	Selected ion monitoring
ICP/MS	Inductively Coupled Plasma/Mass Spectrometry	SOP	Standard Operating Procedure
ICV	Initial Calibration Verification	SPE	Solid-Phase Extraction
ICVL	Initial Calibration Verification Low	SVOC	Semi-Volatile Organic Compound
IPA	Isopropyl Alcohol	TCLP	Toxicity Characteristic Leaching Procedure
LC	Laboratory Control	TIC	Tentatively Identified Compound
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate	TKN	Total Kjeldahl Nitrogen
MBK	Method Blank Contamination	TPH	Total Petroleum Hydrocarbon
MDC	Minimum Detectable Concentration	TPU	Total Propagated Uncertainty
		USEPA	U.S. Environmental Protection Agency
		VOC	Volatile Organic Compound
		WP	Work Plan

5. Qualifiers

The qualifiers below are from the USEPA NFG and the data in the DUSR may contain these qualifiers:

- Concentration (C) Qualifiers:
 - U The compound was analyzed for but not detected. The associated value is either the compound quantitation limit if not detected by the analytical instrument or could be the reported or blank concentration if qualified by blank contamination. This can also be displayed as less than the associated compound quantitation limit (<RL or <MDL), or “ND”.
 - B The compound was found in the sample and its associated blank. Its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers:
 - E The compound was quantitated above the calibration range.
 - D The concentration is based on a diluted sample analysis.
- Validation Qualifiers:
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - J+ The result is an estimated quantity, but the result may be biased high.
 - J- The result is an estimated quantity, but the result may be biased low.
 - J/UJ as listed in exception tables J applies to detected data and UJ applies to non-detected data as reported by the laboratory.
 - UJ The compound was not detected. The reported sample quantitation limit is approximate.
 - NJ The analysis indicated the presence of a compound for which there is presumptive evidence to make a tentative identification; the associated numerical value is an estimated concentration only.
 - R The sample results were rejected as unusable; the compound may or may not be present in the sample.
 - S Result is suspect. See DUSR for details.

References

1. United States Environmental Protection Agency, 2020a. National Functional Guidelines for Inorganic Superfund Methods Data Review. EPA-542-R-20-006. November.
2. United States Environmental Protection Agency, 2020b. National Functional Guidelines for Organic Superfund Methods Data Review. EPA-540-R-20-005. November.

APPENDIX C
Groundwater and Surface Water Quality Data Summaries,
including Time vs. Concentration Graphs

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

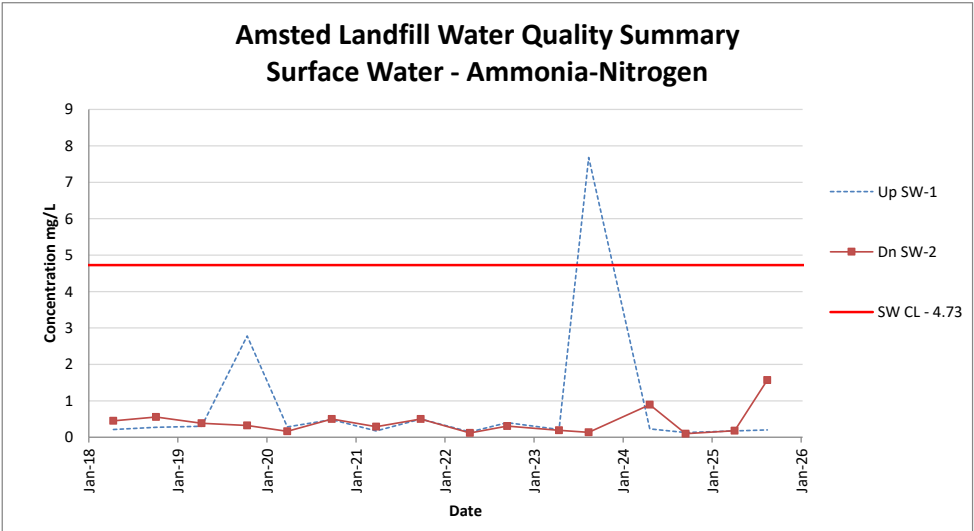
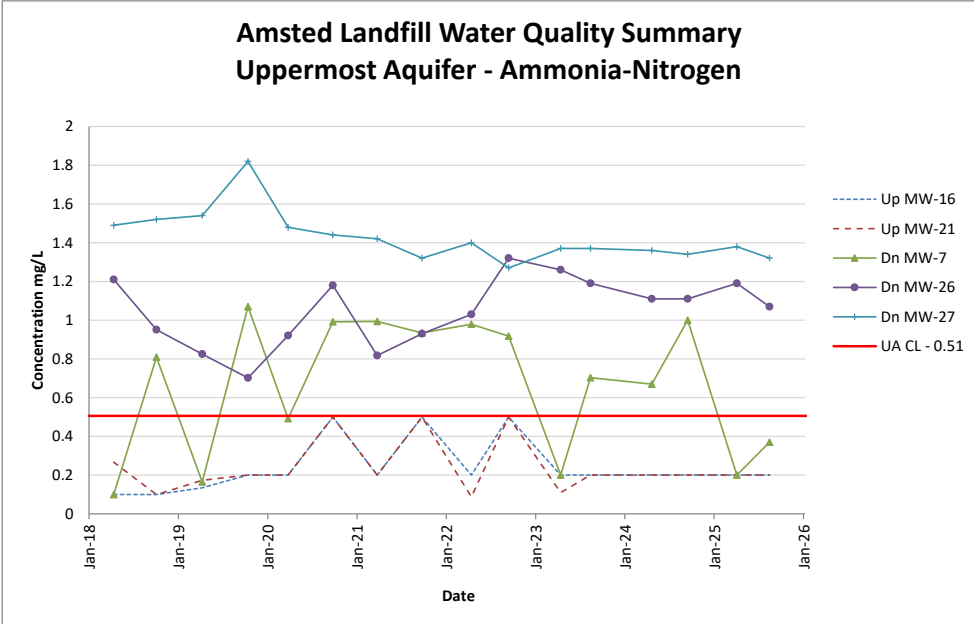
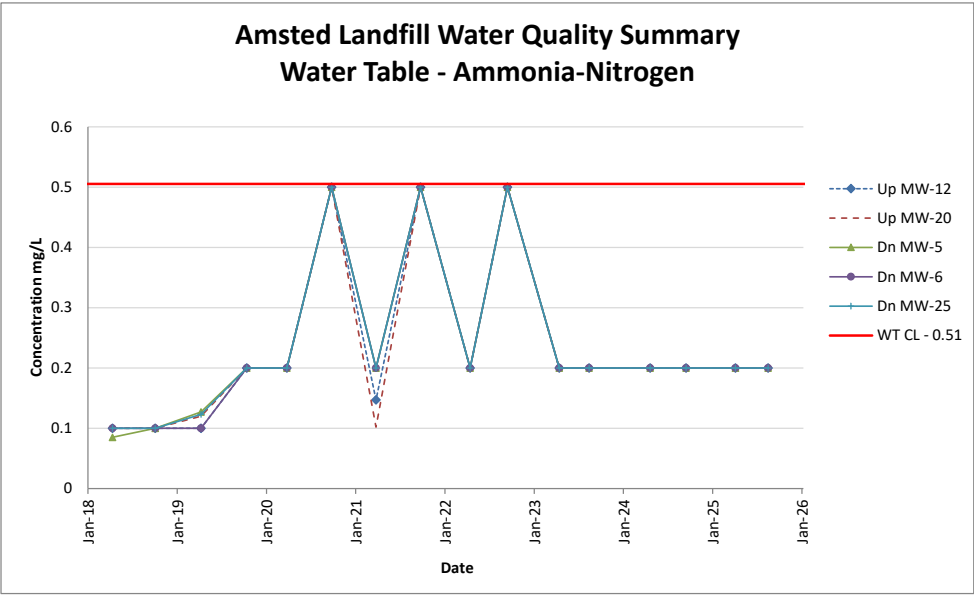
Ammonia (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	0.1	0.1	0.1	0.0851	0.1	0.1	0.1	0.267	0.1	1.21	1.49	0.212	0.452
Oct-18	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.809	0.951	1.52	0.271	0.554
Apr-19	0.1	0.139	0.12	0.127	0.1	0.123	0.135	0.173	0.165	0.825	1.54	0.298	0.381
Oct-19	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.07	0.702	1.82	2.78	0.323
Apr-20	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.492	0.921	1.48	0.281	0.16
Oct-20	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.992	1.18	1.44	0.483	0.5
Apr-21	0.2	0.147	0.102	0.2	0.2	0.2	0.2	0.2	0.994	0.818	1.42	0.17	0.29
Oct-21	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.934	0.93	1.32	0.5	0.5
Apr-22	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0881	0.979	1.03	1.4	0.147	0.117
Sep-22	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.918	1.32	1.27	0.399	0.307
Apr-23	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.11	0.2	1.26	1.37	0.212	0.191
Aug-23	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.703	1.19	1.37	7.68	0.134
Apr-24	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.67	1.11	1.36	0.23	0.89
Sep-24	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.0	1.11	1.34	0.128	0.097
Apr-25	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.19	1.38	0.172	0.178
Aug-25	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.37	1.07	1.32	0.2	1.57
Mean 0.23 Mean 0.24 Mean 0.89 WT UCL 0.50 UA UCL 0.51 SW UCL 4.73													

Notes:

CL = Control Limit
 NA = Not applicable
 NS = Not sampled due to insufficient amount of water
 SW = Surface Water
 UA = Uppermost Aquifer
 WT = Water Table
 R = Rejected during validation

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - GRIFFIN WHEEL AMSTED LANDFILL

Boron (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	0.05	0.05	0.0201	0.05	0.05	0.134	0.0706	0.11	0.18	0.203	0.15	0.253	0.193
Oct-18	0.05	0.05	0.05	0.05	0.05	0.167	0.0516	0.044	0.108	0.104	0.142	0.229	0.135
Apr-19	0.05	0.05	0.05	0.05	0.05	0.163	0.0638	0.0567	0.181	0.2	0.152	0.199	0.167
Oct-19	0.1	0.1	0.0305	0.0247	0.1	0.234	0.0767	0.0627	0.244	0.271	0.172	0.239	0.144
Apr-20	0.1	0.1	0.1	0.1	0.1	0.188	0.0504	0.0375	0.243	0.273	0.152	0.193	0.145
Oct-20	0.1	0.1	0.0308	0.0238	0.1	0.278	0.079	0.0395	0.228	0.26	0.177	0.301	0.224
Apr-21	0.1	0.1	0.1	0.1	0.1	0.165	0.066	0.051	0.204	0.217	0.144	0.2	0.101
Oct-21	0.1	0.1	0.1	0.1	0.1	0.26	0.0658	0.1	0.192	0.177	0.117	0.187	0.173
Apr-22	0.1	0.1	0.1	0.1	0.1	0.198	0.0785	0.0691	0.277	0.285	0.153	0.155	0.0828
Sep-22	0.1	0.1	0.1	0.1	0.1	0.258	0.0799	0.1	0.244	0.248	0.168	0.251	0.127
Apr-23	0.1	0.1	0.1	0.1	0.1	0.207	0.0764	0.0919	0.317	0.358	0.183	0.205	0.116
Aug-23	0.1	0.1	0.1	0.1	0.1	0.222	0.0769	0.0652	0.248	0.275	0.165	0.528	0.267
Apr-24	0.1	0.1	0.1	0.1	0.1	0.155	0.0663	0.1	0.222	0.202	0.163	0.208	0.283
Sep-24	0.1	0.1	0.1	0.1	0.1	0.243	0.0755	0.1	0.254	0.298	0.177	0.154	0.1
Apr-25	0.1	0.1	0.1	0.1	0.1	0.183	0.1	0.1	0.247	0.295	0.16	0.176	0.162
Aug-25	0.1	0.1	0.1	0.1	0.1	0.198	0.0727	0.1	0.249	0.286	0.156	0.139	0.248
Mean 0.085 Mean 0.07 Mean 0.23 WT UCL 0.138 UA UCL 0.11 SW UCL 0.41													

Notes:

CL = Control Limit

NA = Not applicable.

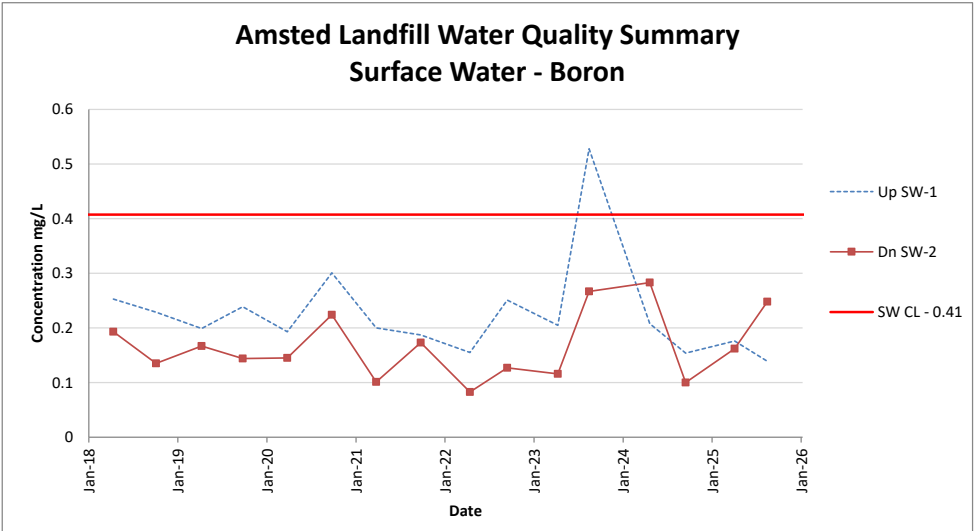
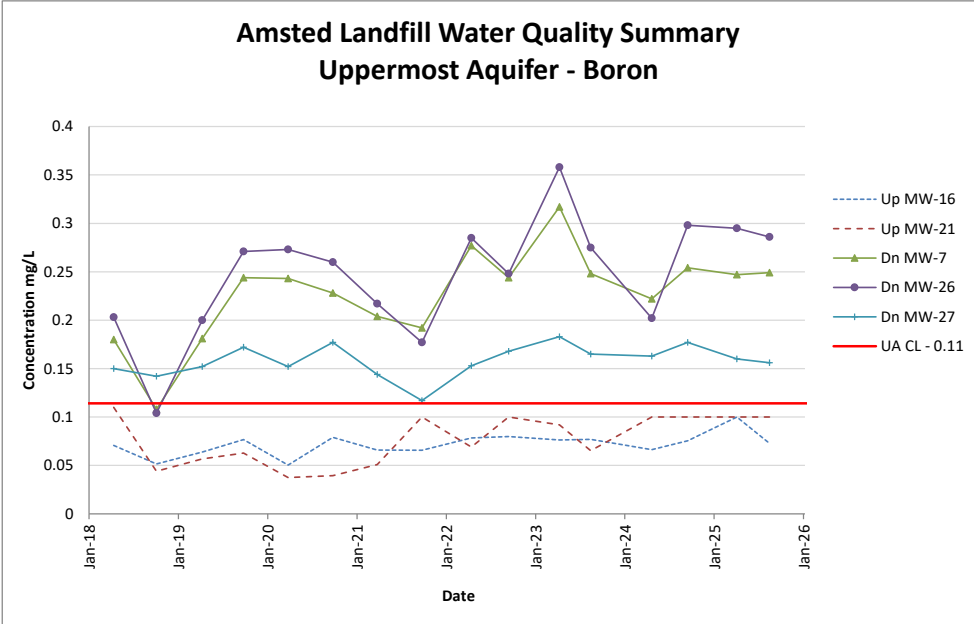
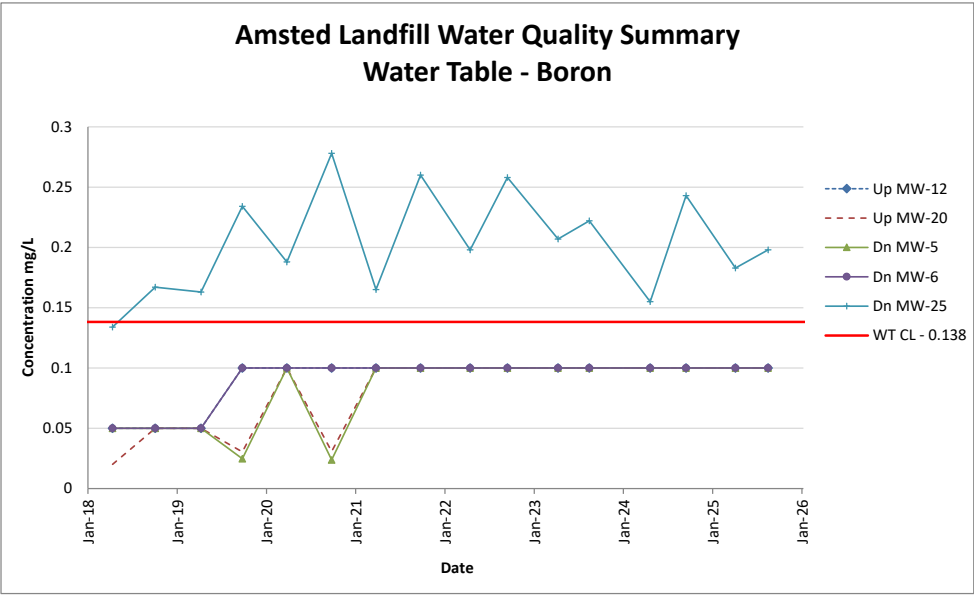
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Chemical Oxygen Demand (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	20	20	20	20	5.09	4.17	4.03	20	20	5.4	20	11.5	14.4
Oct-18	20	5.25	20	20	20	20	20	20	20	20	20	15.1	14.1
Apr-19	20	7.52	8.15	6.97	8.65	6.5	6.31	20	7.19	10.8	4.14	4.45	16.2
Oct-19	10	8.59	10	10	10	5.63	10	10	10	6.68	10	20.3	11.8
Apr-20	10	11.3	9.25	7.2	7.71	12.3	13.4	6.68	48.3	56	7.2	20.1	36.5
Oct-20	25	25.5	38.9	25	52.3	25	48.9	36.3	43.9	37.2	30.5	35.6	47.3
Apr-21	10	10	10	10	10	10.7	10	6.11	8.65	10	10	14.3	10.2
Oct-21	25	25	33.8	25	42.8	35.6	25	26.6	37.4	25	25	42.8	41
Apr-22	10	9	7.5	10	10	10	10	10	10	7.5	10	11	18
Sep-22	25	25	25	25	25	25	25	25	25	25	42.6	25	25
Apr-23	10	10	5.42	10	10	5.42	10	2.27	10	3.53	10	2.58	6.69
Aug-23	10	10	5.62	10	4.65	10	10	3.03	5.62	10	10	5.07	10
Apr-24	10	10	10	10	10	14.8	10	10	10	9.67	7.36	10	6.73
Sep-24	10	11.1	12.3	8.94	7.4	13.5	14.5	17.5	18.1	18.4	7.11	19.6	18.7
Apr-25	10	14.5	6.33	5.03	6.89	3.41	8.61	2.11	9.58	7.63	7.31	10.9	14.1
Aug-25	10	10.4	4.2	10	4.89	5.58	10	10	10	8	5.58	7.65	21.1
Mean 13.74 Mean 14.4 Mean 16.00 WT UCL 31.07 UA UCL 34.9 SW UCL 38.18													

Notes:

CL = Control Limit

NA = Not applicable.

NS = Not sampled due to insufficient amount of water.

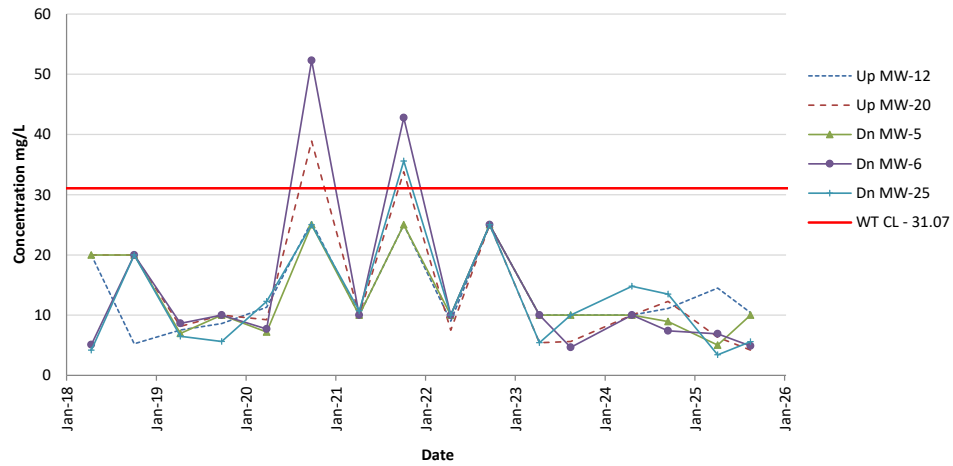
SW = Surface Water

UA = Uppermost Aquifer

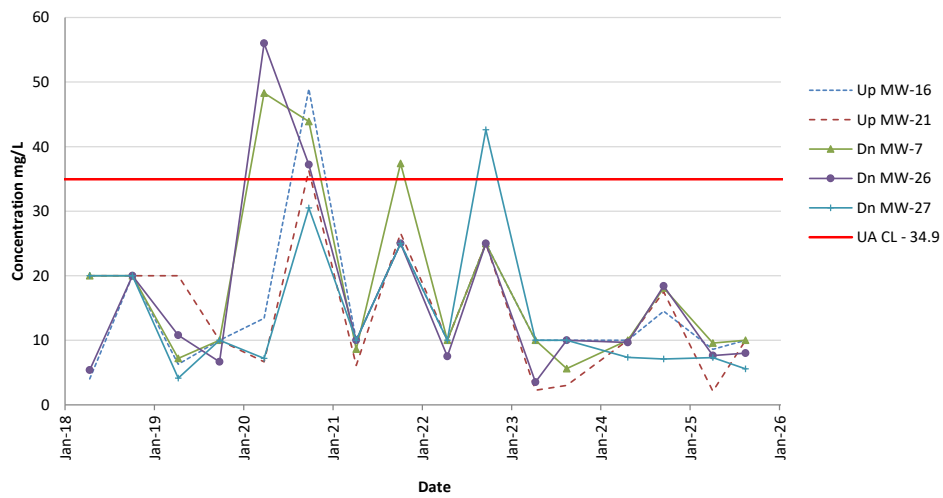
WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.

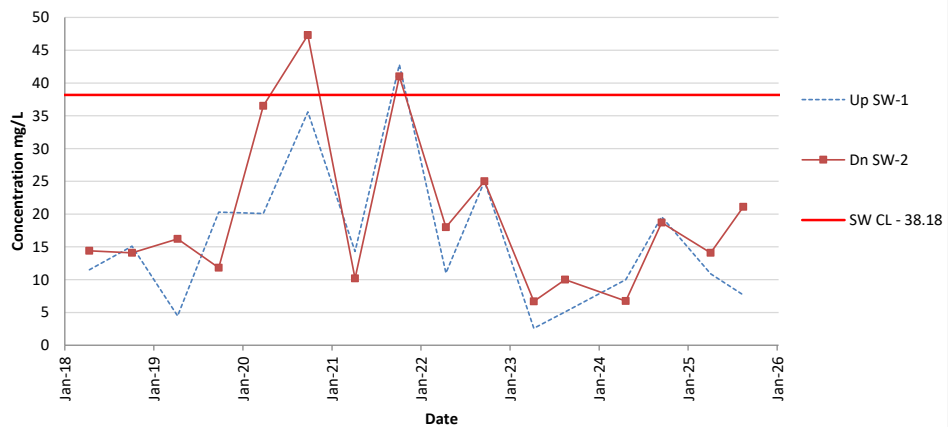
Amsted Landfill Water Quality Summary Water Table - Chemical Oxygen Demand



Amsted Landfill Water Quality Summary Uppermost Aquifer - Chemical Oxygen Demand



Amsted Landfill Water Quality Summary Surface Water - Chemical Oxygen Demand



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Chloride (mg/L)

Date	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
		MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	1.0-5.0	5.26	27.9	3.98	13.6	12.5	2.98	1.4	1.37	2.87	1.56	13.7	13.4
Oct-18	1.0	6.92	34.1	4.26	14.1	14.5	3.39	1.53	1.49	3.06	1.81	7.22	31.8
Apr-19	1.0-5.0	5.77	29.7	3.96	14	6.5	4.3	1.58	1.48	2.87	1.61	18.5	61.7
Oct-19	1.0	5.58	40.5	4.11	14.4	10.4	3.45	1.86	1.38	3	1.78	10.8	27.7
Apr-20	1.0	6.08	34.3	3.79	13.1	11.6	4.66	2.05	1.38	2.91	1.73	14.5	50
Oct-20	1.0	6.31	43.7	3.93	14.5	18	3.65	2.2	1.46	2.9	1.79	8.78	47.2
Apr-21	1.0	6.73	42.9	3.85	13.9	9.36	4.37	2.57	1.44	2.94	1.8	10.7	42.1
Oct-21	1.0	7.4	45.5	4.03	11.1	22.5	3.94	2.86	1.47	3.04	1.81	18.6	46.4
Apr-22	1.0	6.65	40	3.76	13.1	28.1	4.34	2.98	1.41	3.04	1.79	13.3	60.5
Sep-22	1.0	7.94	44.9	3.71	12.2	31.5	3.36	3.16	1.37	2.8	1.74	21.8	47.6
Apr-23	1.0	8.24	46.7	3.62	13.9	22.1	4.44	2.88	1.51	2.84	1.8	15.1	48.4
Aug-23	1.0	9.04	48.3	3.69	13.4	34.4	4.22	4.18	1.34	2.85	1.66	26.1	49.7
Apr-24	1.0	9.54	53.5	3.26	12.8	15.3	4.36	4.77	1.20	2.70	1.58	13.7	34.5
Sep-24	1.0	11	58.3	3.74	13.1	37.1	4.13	5.62	1.44	2.88	1.79	30.5	44.2
Apr-25	1.0	13.9	55.6	3.43	12.9	25.6	5.42	5.78	1.32	2.75	1.72	29.4	58.4
Aug-25	1.0	12.50	63.8	3.97	9.83	27.5	4.18	6.6	1.51	3.03	1.9	30.3	44.8
Mean WT UCL 26.21 65.84 Mean UA UCL 3.7 6.25 Mean SW UCL 17.69 33.20													

Notes:

CL = Control Limit

NA = Not applicable.

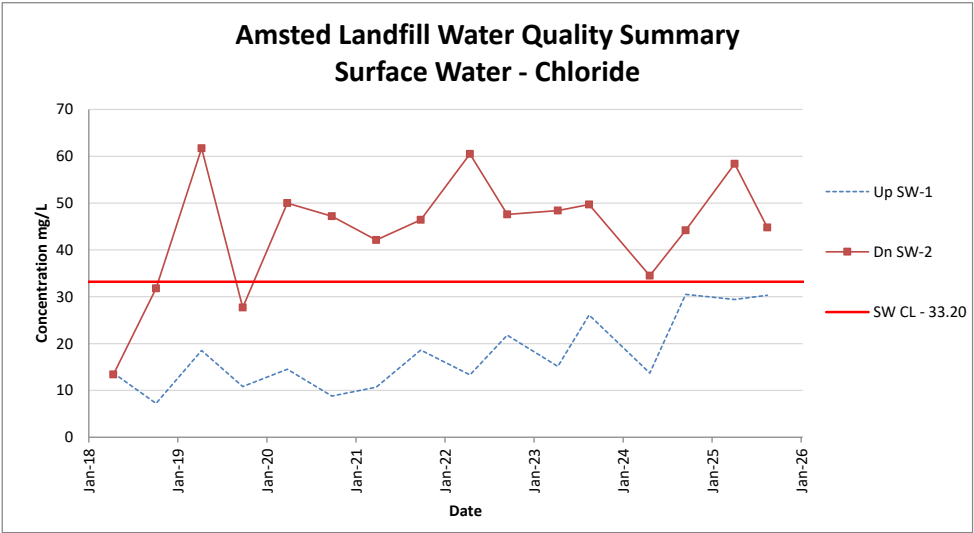
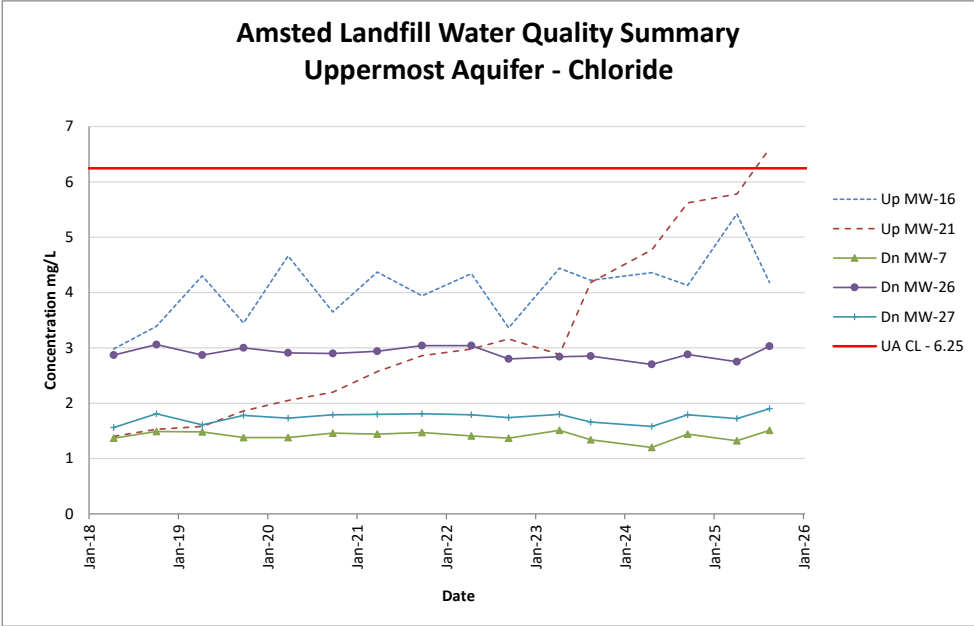
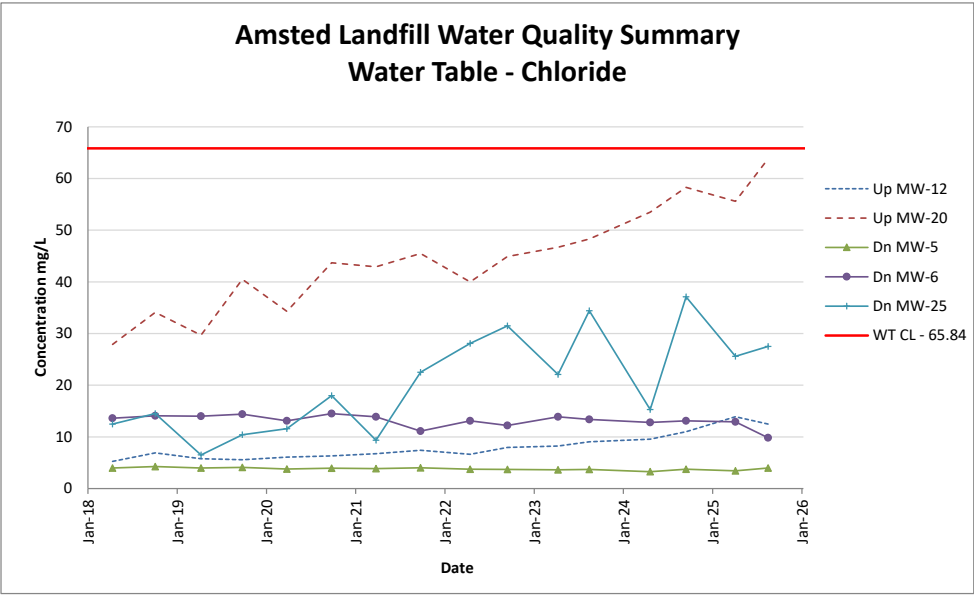
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

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Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Conductivity, Field (mS/cm)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	NA	0.903	0.806	0.673	0.704	1.036	0.923	1.01	2.337	2.705	1.206	0.523	0.79
Oct-18	NA	0.943	0.924	0.778	0.836	1.156	1.008	1.056	2.613	2.972	1.354	0.486	0.586
Apr-19	NA	0.945	0.927	0.735	0.776	0.929	0.907	0.9	2.559	2.854	1.312	0.339	0.545
Oct-19	NA	0.964	0.91	0.741	0.803	1.037	0.984	0.996	2.542	2.951	1.299	0.447	0.355
Apr-20	NA	0.948	0.939	0.757	0.75	0.96	0.93	0.75	2.51	2.8	1.3	0.446	0.56
Oct-20	NA	1.51	1.41	1.15	1.28	1.8	1.55	1.32	4.21	4.86	2.11	0.765	0.936
Apr-21	NA	0.931	0.895	0.707	0.732	0.749	0.947	0.816	2.4	2.64	1.24	0.447	0.547
Oct-21	NA	0.759	0.672	0.579	0.759	1.065	0.928	0.695	2.328	2.742	0.951	0.482	0.464
Apr-22	NA	0.958	0.889	0.781	0.739	1.04	0.992	0.963	2.59	2.86	1.32	0.509	0.721
Sep-22	NA	0.975	1.04	0.886	0.682	1.39	1.13	1.04	1.97	3.24	1.46	0.445	0.33
Apr-23	NA	0.744	0.802	0.693	0.725	0.812	0.819	0.841	2.42	2.8	1.18	0.454	0.595
Aug-23	NA	0.867	0.802	0.772	0.774	1.2	0.963	0.841	2.48	2.94	1.33	0.536	0.745
Apr-24	NA	0.77	0.806	0.618	0.698	0.657	0.861	0.769	2.72	2.97	1.05	0.452	0.365
Sep-24	NA	0.815	0.849	0.671	0.706	1.03	0.867	0.784	2.59	2.90	1.22	0.371	0.71
Apr-25	NA	0.993	1.00	0.820	0.874	1.13	1.00	0.917	2.75	3.11	1.33	0.549	0.69
Aug-25	NA	0.903	0.925	0.709	0.705	1.01	0.925	0.815	2.48	2.81	1.22	0.444	0.496
Mean 0.92 Mean 0.9 Mean 0.48													
WT UCL 1.25 UA UCL 1.27 SW UCL 0.67													

Notes:

CL = Control Limit

NA = Not applicable.

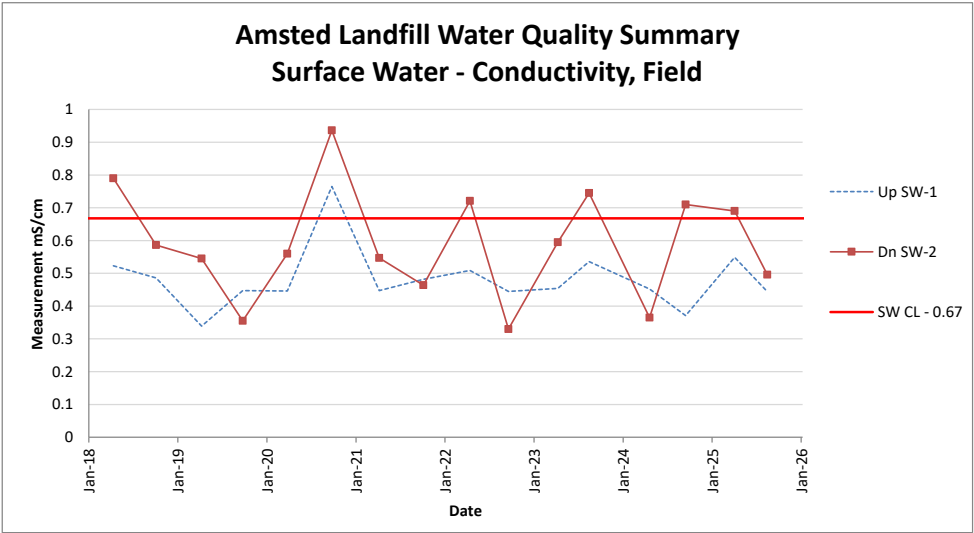
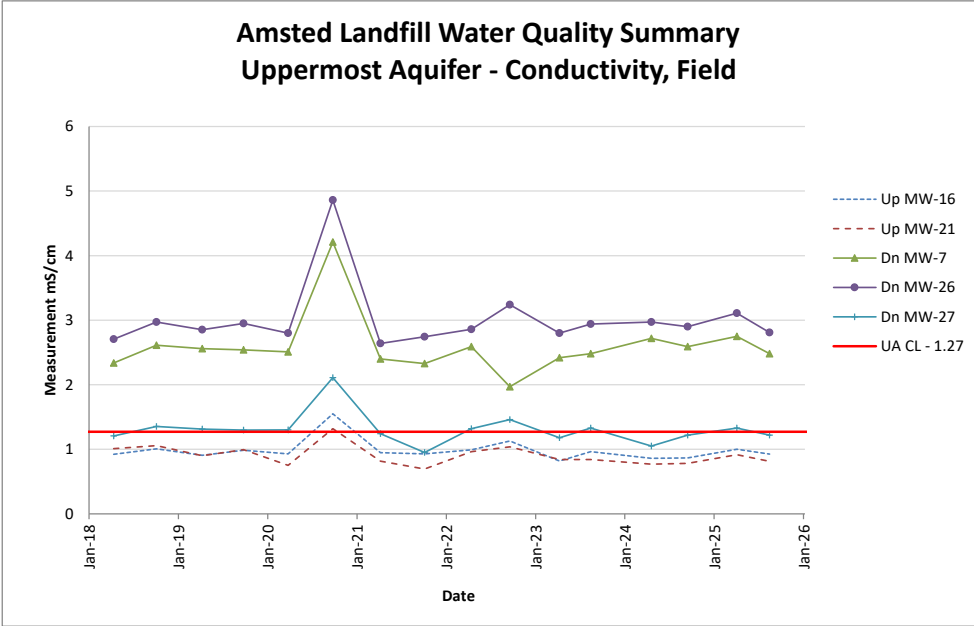
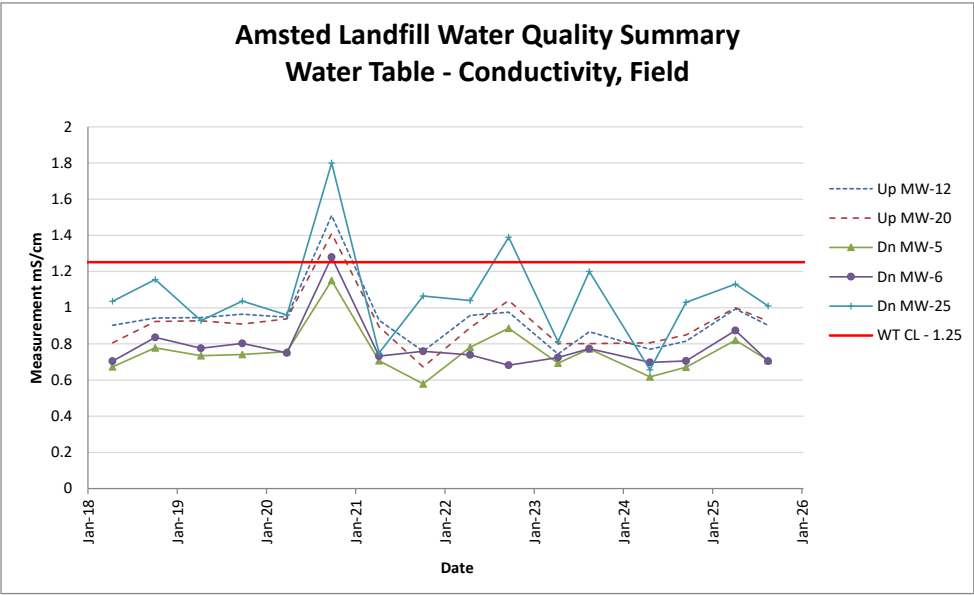
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Fluoride (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	0.1	0.263	0.45	0.409	0.327	2.53	0.4	0.36	0.312	0.201	0.29	0.636	0.505
Oct-18	0.1	0.341	0.455	0.443	0.312	1.77	0.412	0.34	0.302	0.189	0.283	0.374	0.326
Apr-19	0.1	0.282	0.479	0.435	0.343	2.53	0.437	0.355	0.3	0.37	0.333	0.988	0.507
Oct-19	0.05	0.35	0.532	0.508	0.354	2.01	0.461	0.393	0.345	0.213	0.34	0.569	0.382
Apr-20	0.1	0.293	0.526	0.462	0.267	2.01	0.432	0.372	0.322	0.255	0.354	0.944	0.806
Oct-20	0.05	0.331	0.524	0.502	0.351	2.09	0.47	0.393	0.338	0.234	0.358	1.14	0.484
Apr-21	0.1	0.315	0.514	0.463	0.346	3.8	0.469	0.372	0.347	0.248	0.391	0.742	0.332
Oct-21	0.05	0.392	0.565	0.517	0.422	2.4	0.493	0.387	0.329	0.23	0.312	0.842	0.404
Apr-22	0.01	0.325	0.523	0.456	0.379	1.56	0.481	0.392	0.324	0.245	0.335	0.566	0.371
Sep-22	0.05	0.353	0.49	0.461	0.349	2.16	0.436	0.335	0.288	0.187	0.288	0.901	0.416
Apr-23	0.05	0.324	0.499	0.446	0.344	2.38	0.463	0.427	0.309	0.228	0.356	0.82	0.494
Aug-23	0.25	0.358	0.503	0.471	0.318	1.83	0.464	0.297	0.331	0.2	0.303	0.887	0.561
Apr-24	0.05	0.29	0.443	0.383	0.258	4.54	0.394	0.313	0.275	0.158	0.259	0.570	0.348
Sep-24	0.05	0.37	0.503	0.464	0.336	1.95	0.461	0.351	0.331	0.209	0.322	0.823	0.599
Apr-25	0.05	0.292	0.467	0.374	0.293	1.55	0.417	0.327	0.28	0.124	0.284	0.581	0.374
Aug-25	0.05	0.361	0.543	0.502	0.474	1.93	0.477	0.384	0.363	0.256	0.34	0.909	1.1
Mean 0.41 Mean 0.4 Mean 0.77 WT UCL 0.60 UA UCL 0.51 SW UCL 1.17													

Notes:

CL = Control Limit

NA = Not applicable.

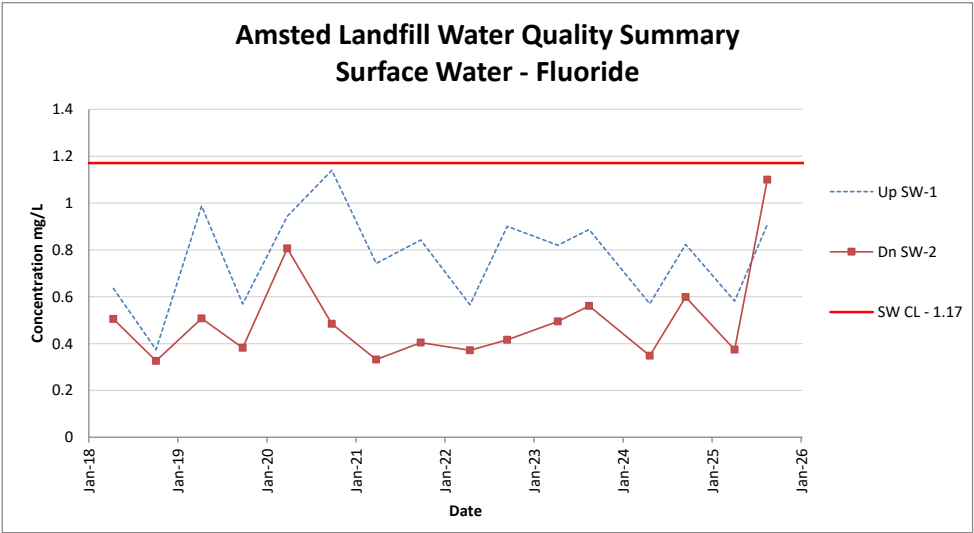
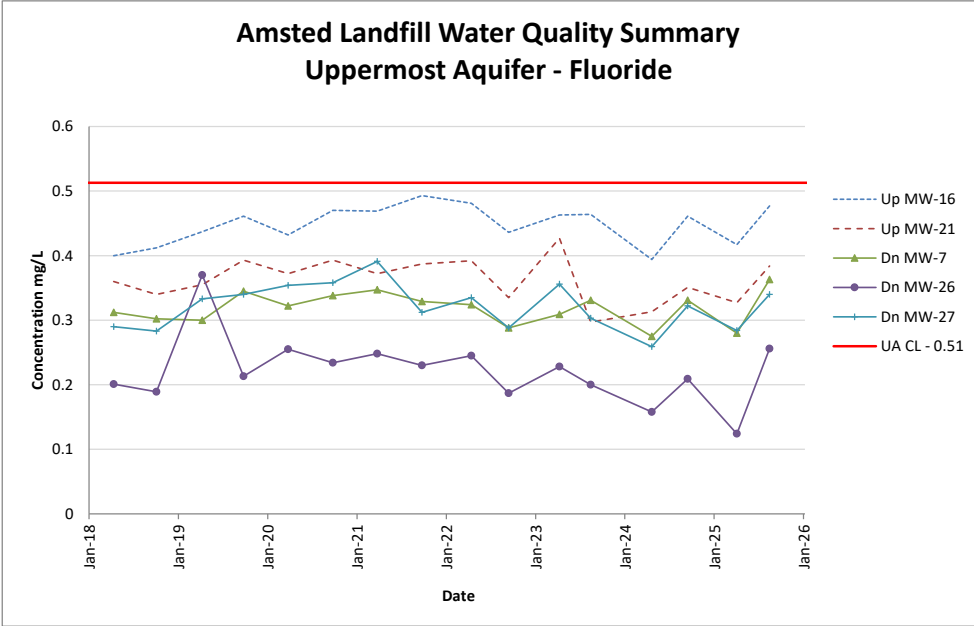
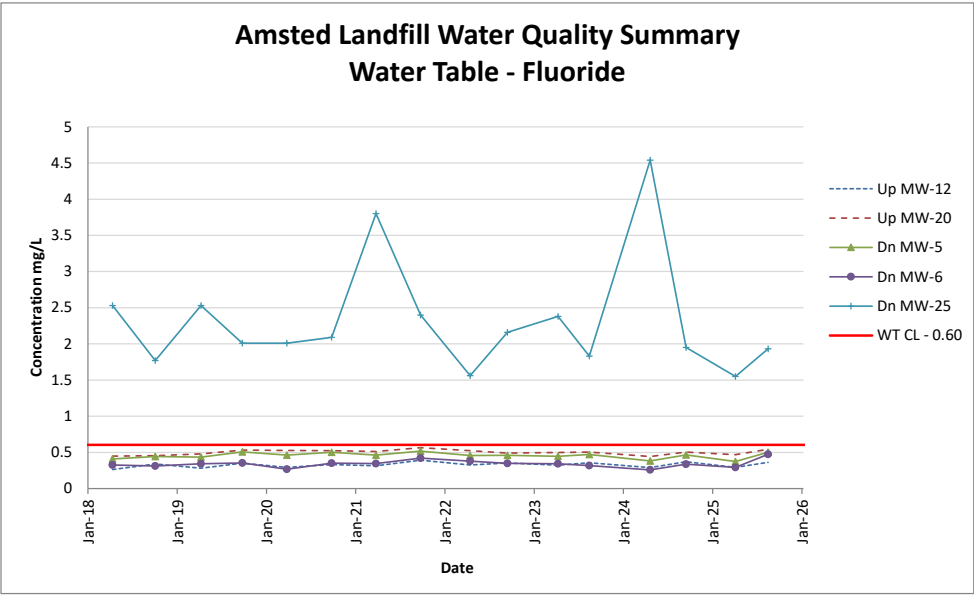
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Iron (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	0.025	0.0121	0.0254	0.025	0.0186	0.0161	0.025	0.025	0.025	0.0186	0.025	0.21	0.0319
Oct-18	0.025	0.025	0.025	0.025	0.025	0.025	0.0454	0.0356	0.297	0.5	0.377	0.379	0.191
Apr-19	0.025	R	R	R	R	R	R	R	R	R	R	1.35	1.04
Oct-19	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.204	0.1	0.1	0.298	0.1
Apr-20	0.1	0.1	0.0705	0.1	0.1	0.1	0.159	0.186	7.93	1.25	2.56	4.06	1.14
Oct-20	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.801	0.1	0.1	0.1	0.0712
Apr-21	0.1	0.1	0.1	0.1	0.1	0.1	0.137	0.219	8.8	1.15	2.32	0.1	0.1
Oct-21	0.1	0.051	0.1	0.1	0.1	0.1	0.216	0.0768	9.64	1.58	2.2	1.34	0.408
Apr-22	0.1	0.1	0.1	0.052	0.1	0.1	0.175	0.246	8.68	1.53	2.62	0.1	0.1
Sep-22	0.1	0.1	0.1	0.1	0.1	0.1	0.113	0.1	9.63	1.86	2.56	1.62	0.359
Apr-23	0.1	0.1	0.1	0.1	0.1	0.0711	0.819	0.0792	2.42	1.85	3.11	1.44	0.682
Aug-23	0.1	0.1	0.1	0.104	0.1	0.1	0.204	0.1	2.51	1.94	2.34	0.276	0.1
Apr-24	0.1	0.1	0.1	0.1	0.1	0.1	0.0938	0.1	0.0522	1.99	2.38	0.0828	0.1
Sep-24	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	9.6	1.77	2.52	0.1	0.1
Apr-25	0.1	0.1	0.1	0.1	0.1	0.1	0.0737	0.1	0.1	2.13	2.5	0.1	0.1
Aug-25	0.1	0.1	0.1	0.1	0.1	0.1	0.13	0.1	0.1	2.09	2.4	0.0486	0.0493
Mean 0.09 Mean 0.1 Mean 0.73 WT UCL 0.14 UA UCL 0.42 SW UCL 2.84													

Notes:

CL = Control Limit

NA = Not applicable.

NS = Not sampled due to insufficient amount of water.

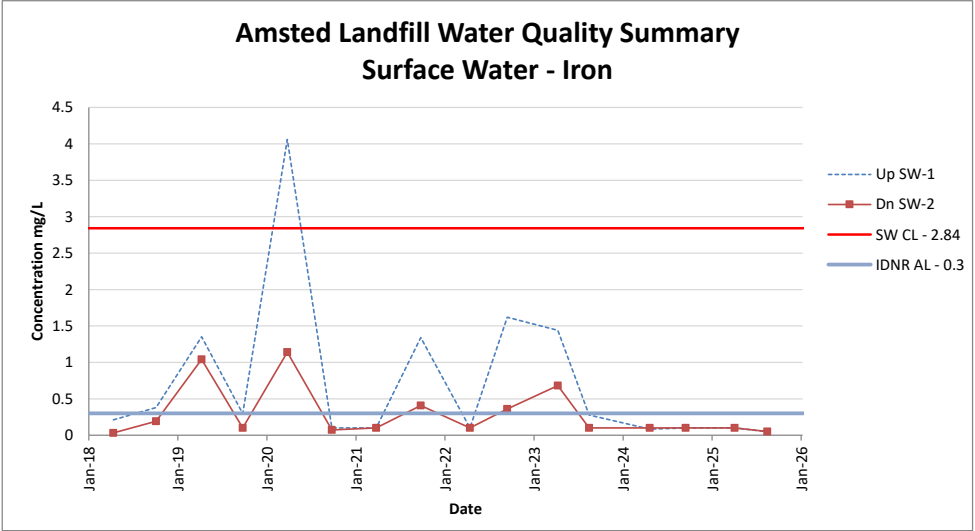
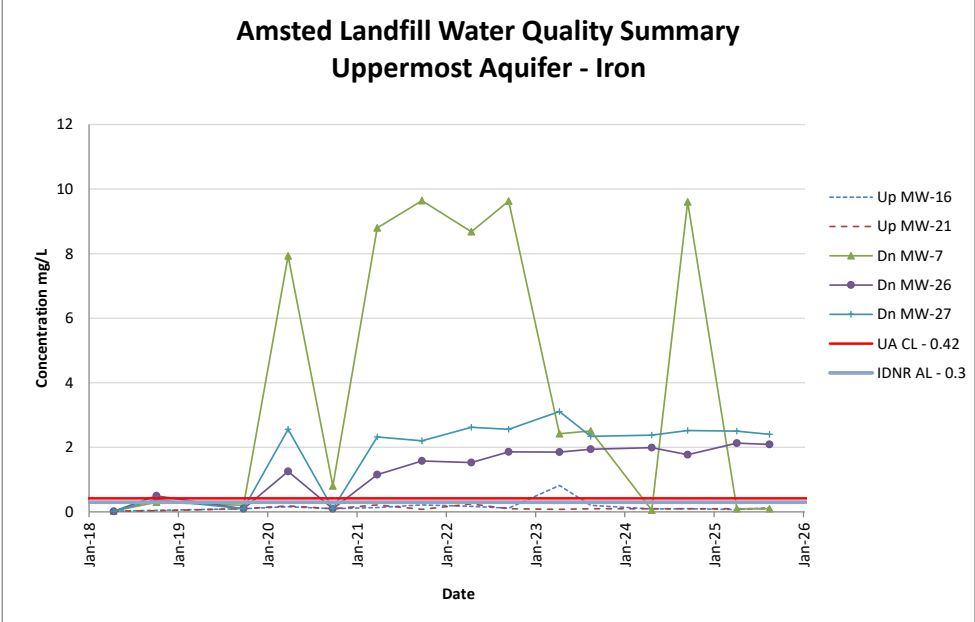
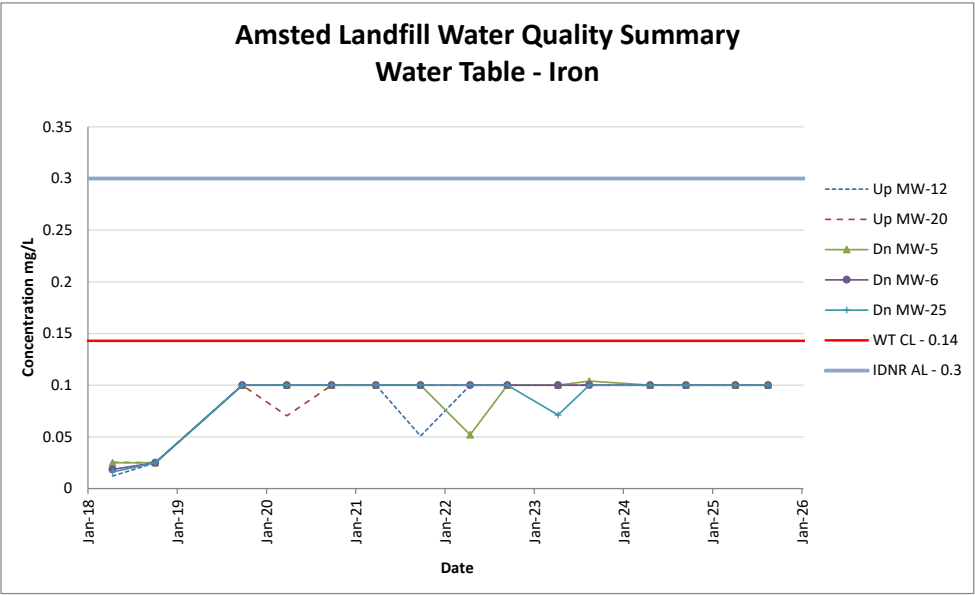
SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

R = Rejected during validation

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Lithium (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	0.05	0.0193	0.0336	0.0301	0.0192	0.0427	0.0703	0.0507	0.0872	0.0284	0.0566	0.05	0.0103
Oct-18	0.05	0.05	0.0566	0.0662	0.05	0.0737	0.0893	0.066	0.116	0.05	0.077	0.0159	0.05
Apr-19	0.05	0.0175	0.0316	0.0255	0.0196	0.0273	0.0648	0.0442	0.0916	0.0325	0.0584	0.05	0.05
Oct-19	0.05	0.05	0.0295	0.0251	0.0143	0.0442	0.0617	0.0381	0.0776	0.0177	0.0516	0.05	0.0103
Apr-20	0.05	0.05	0.0291	0.0182	0.0104	0.0358	0.0543	0.0409	0.0696	0.0143	0.0466	0.05	0.05
Oct-20	0.05	0.0128	0.0308	0.0249	0.013	0.0487	0.0618	0.0362	0.0784	0.0287	0.0525	0.05	0.00972
Apr-21	0.05	0.00796	0.0195	0.0175	0.00696	0.0134	0.0512	0.0328	0.0671	0.012	0.041	0.05	0.05
Oct-21	0.05	0.0102	0.0251	0.0217	0.00978	0.0429	0.063	0.0401	0.073	0.0147	0.0391	0.05	0.00794
Apr-22	0.05	0.05	0.05	0.05	0.05	0.05	0.0684	0.05	0.0829	0.05	0.0556	0.05	0.05
Sep-22	0.05	0.05	0.0291	0.0216	0.0122	0.0427	0.058	0.035	0.077	0.021	0.0479	0.05	0.05
Apr-23	0.05	0.05	0.0293	0.0255	0.05	0.037	0.0498	0.0346	0.0573	0.05	0.0553	0.05	0.05
Aug-23	0.05	0.05	0.0287	0.0221	0.05	0.044	0.0556	0.0352	0.0711	0.05	0.0447	0.05	0.05
Apr-24	0.05	0.05	0.0253	0.0259	0.05	0.0181	0.0626	0.0389	0.0808	0.0301	0.0516	0.05	0.05
Sep-24	0.05	0.05	0.0253	0.02	0.05	0.0369	0.0515	0.0298	0.0734	0.05	0.0438	0.05	0.05
Apr-25	0.05	0.05	0.0355	0.0222	0.05	0.047	0.0615	0.0395	0.0676	0.05	0.0485	0.05	0.05
Aug-25	0.05	0.05	0.0301	0.0268	0.05	0.0462	0.0598	0.0383	0.0805	0.0235	0.0518	0.05	0.05
Mean 0.04 Mean 0.05 Mean 0.05 WT UCL 0.06 UA UCL 0.0789 SW UCL 0.06													

Notes:

CL = Control Limit

NA = Not applicable.

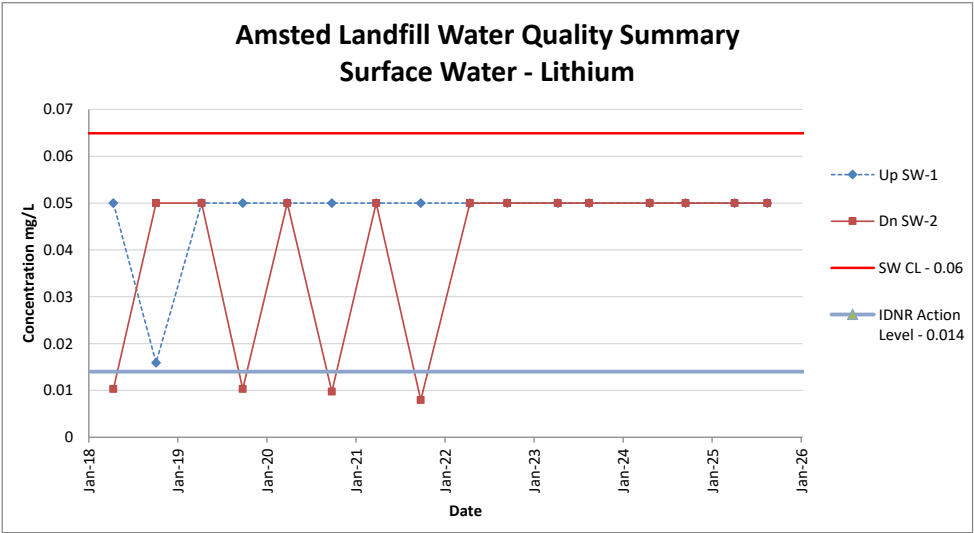
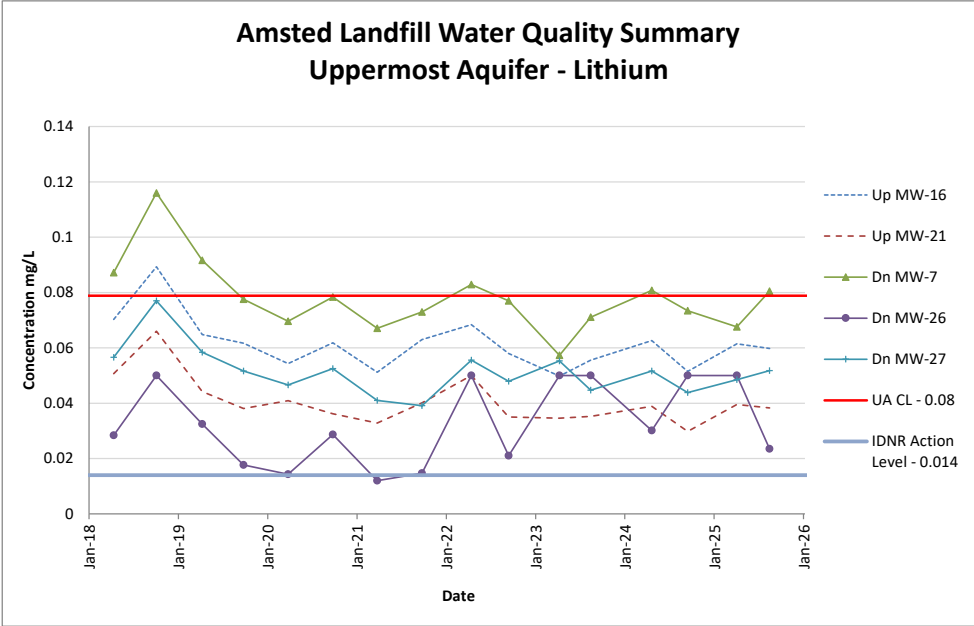
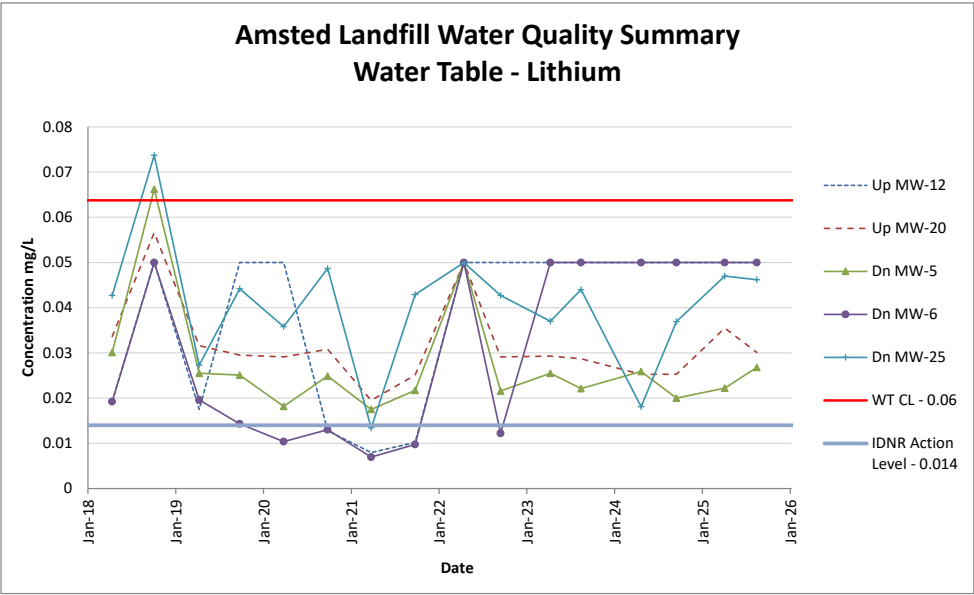
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Manganese (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	0.004	0.00344	0.004	0.0145	0.124	0.012	0.477	0.553	0.0844	4	0.139	0.375	0.506
Oct-18	0.08	0.08	0.08	0.08	0.549	0.277	0.091	0.0695	2.33	5.14	0.186	0.184	0.188
Apr-19	0.004-0.0200	0.004	0.004	0.00777	0.0786	0.0301	0.0971	0.0676	0.0783	2.63	0.138	0.51	0.35
Oct-19	0.005	0.005	0.005	0.00788	0.2	0.0792	0.0723	0.0475	1.76	3.45	0.134	0.275	0.091
Apr-20	0.005	0.00282	0.00268	0.0901	0.0909	0.0545	0.0578	0.0436	1.28	2.62	0.147	0.817	0.417
Oct-20	0.005	0.00643	0.005	0.0648	0.436	0.0241	0.0742	0.0486	1.49	3.07	0.128	0.533	0.292
Apr-21	0.005	0.005	0.005	0.0337	0.0557	0.0167	0.0755	0.0512	1.3	2.72	0.114	0.254	0.0882
Oct-21	0.01	0.01	0.01	0.0449	0.703	0.0297	0.0735	0.0217	1.49	2.5	0.135	0.245	0.195
Apr-22	0.01	0.01	0.01	0.0245	0.0729	0.0937	0.126	0.079	1.46	2.67	0.131	0.34	0.624
Sep-22	0.01	0.01	0.01	0.171	0.253	0.0223	0.181	0.0444	1.58	3.39	0.22	0.572	0.164
Apr-23	0.005	0.005	0.005	0.005	0.0149	0.00376	0.0595	0.161	0.0543	3.35	0.153	0.497	0.741
Aug-23	0.005	0.005	0.005	0.0196	0.575	0.00912	0.11	0.0216	1.41	2.83	0.162	0.71	0.229
Apr-24	0.005	0.005	0.005	0.0124	0.0712	0.0183	0.117	0.0366	0.114	3.02	0.146	0.308	0.135
Sep-24	0.005	0.005	0.005	0.0355	0.185	0.102	0.0616	0.0215	1.78	2.54	0.141	0.228	0.0427
Apr-25	0.005	0.005	0.005	0.0175	0.0721	0.073	0.0621	0.0266	0.0666	2.81	0.129	0.258	0.622
Aug-25	0.005	0.005	0.005	0.0126	0.138	0.099	0.0713	0.0237	0.705	2.58	0.145	0.196	0.109
Mean 0.010 Mean 0.10 Mean 0.39 WT UCL 0.047 UA UCL 0.33 SW UCL 0.78													

Notes:

CL = Control Limit

NA = Not applicable.

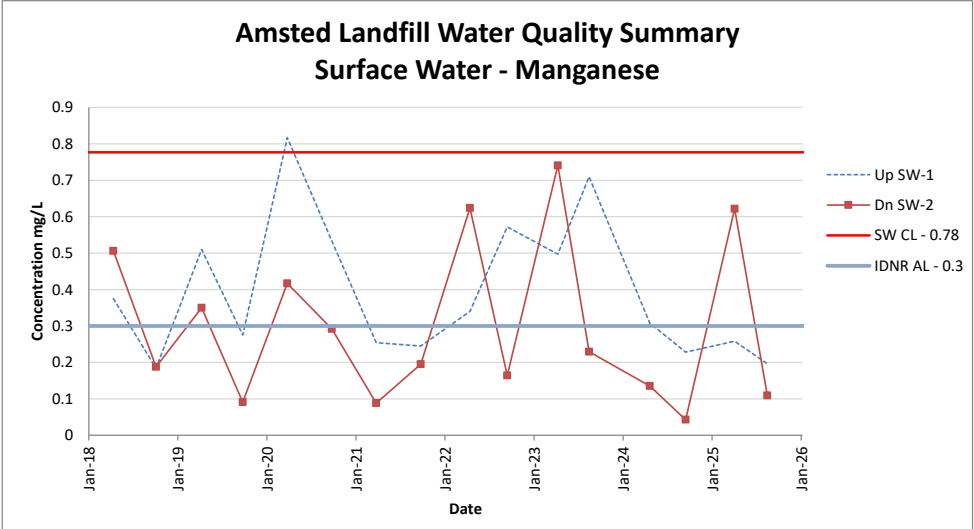
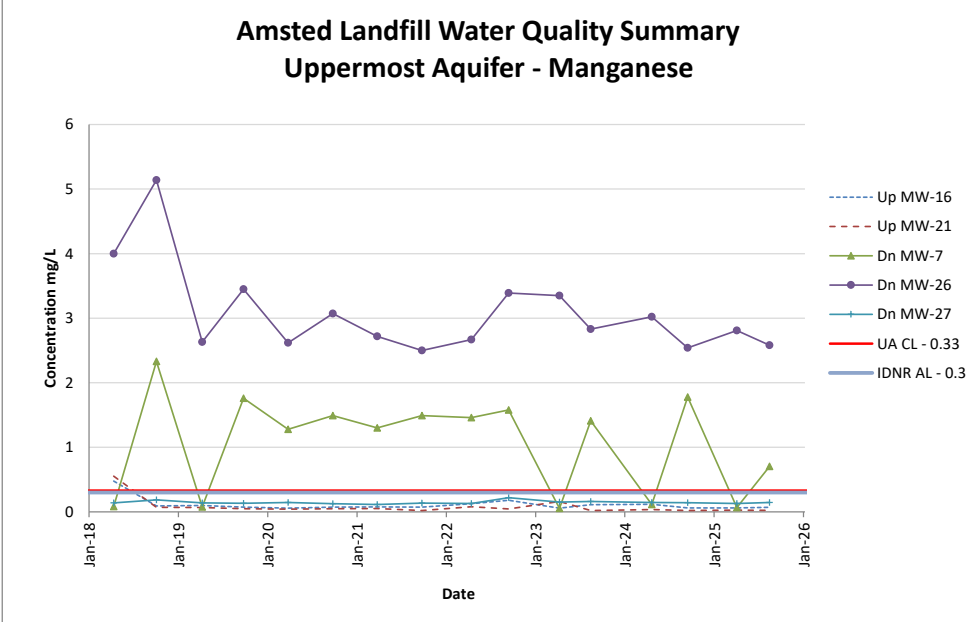
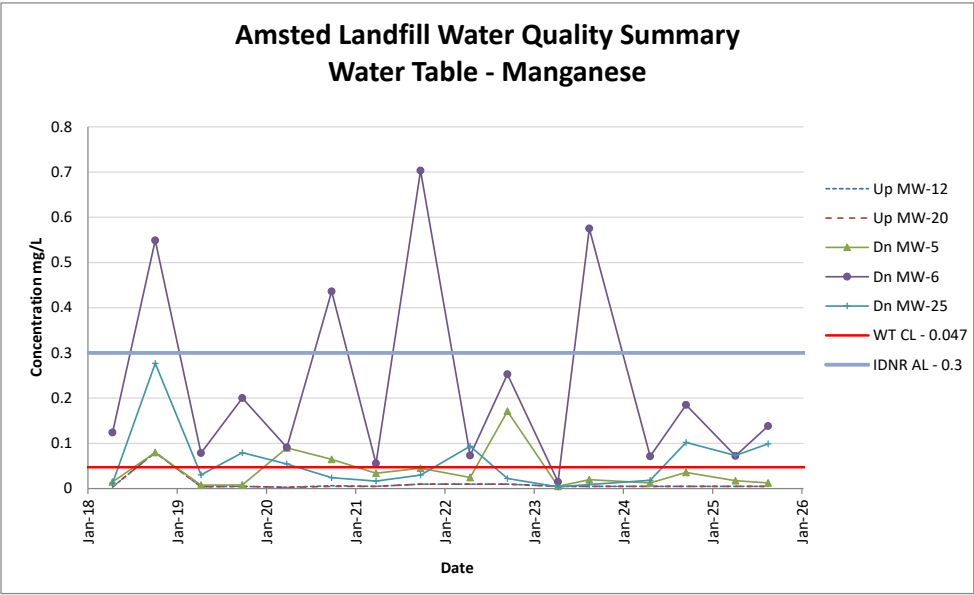
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

pH, Field (pH Units)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	NA	6.46	6.48	6.48	5.56	5.79	6.42	6.2	6.52	6.29	6.45	7.25	6.91
Oct-18	NA	6.84	9.21	6.36	6.93	7.9	6.23	9.25	5.06	7.7	7.61	7.81	8.18
Apr-19	NA	6.55	6.8	6.66	6.96	6.59	6.72	6.63	6.74	6.55	6.55	6.66	8.18
Oct-19	NA	6.75	7.07	6.9	7	6.97	6.87	6.87	6.8	6.71	6.81	7.39	9.06
Apr-20	NA	6.76	6.94	6.79	7.15	6.97	6.9	6.97	6.81	6.63	6.55	7.14	7.18
Oct-20	NA	6.07	6.56	6.36	7.17	6.32	6.31	6.77	7.17	6.21	6.28	7.09	7.18
Apr-21	NA	6.54	6.72	5.19	6.13	5.36	6.84	5.38	6.24	4.99	5.24	7.31	8.3
Oct-21	NA	6.69	6.98	6.81	6.2	6.79	6.73	6.66	6.53	6.41	6.66	7.77	8.1
Apr-22	NA	5.56	7.43	3.68	7.92	7.13	5.83	4.4	7.33	7.04	3.62	6.82	8.48
Sep-22	NA	6.32	6.59	6.47	5.28	6.07	6.52	6.39	5.08	5.92	6.38	7	8.3
Apr-23	NA	7.22	7.25	6.98	7.39	7.22	7.35	6.97	7.23	6.89	6.98	7.58	6.71
Aug-23	NA	6.71	7.4	6.66	7.25	6.82	6.82	7.51	7.15	6.55	6.59	7.19	7.96
Apr-24	NA	6.76	6.92	6.93	6.89	7.01	7.09	6.72	6.89	6.65	6.81	7.58	8.21
Sep-24	NA	7.1	7.34	7.19	7.36	7.2	7.46	7.2	7.15	7.02	7.15	7.07	6.78
Apr-25	NA	6.81	7.04	6.88	6.96	7.39	7.02	6.94	6.85	6.58	6.7	8.09	7.2
Aug-25	NA	6.66	6.81	6.65	6.75	6.62	6.87	6.74	6.71	6.57	6.69	7.37	7.66
Mean 6.854 Mean 6.74 Mean 7.32 WT UCL 8.003 UA UCL 8.24 SW UCL 8.07 WT LCL 5.705 UA LCL 5.23 SW LCL 6.57													

Notes:

LCL = Lower Control Limit

UCL = Upper Control Limit

NA = Not applicable.

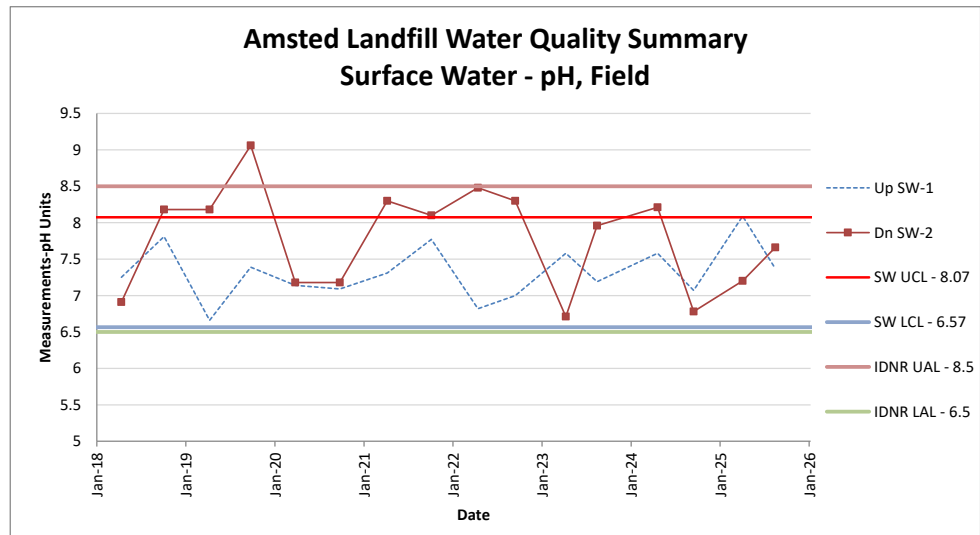
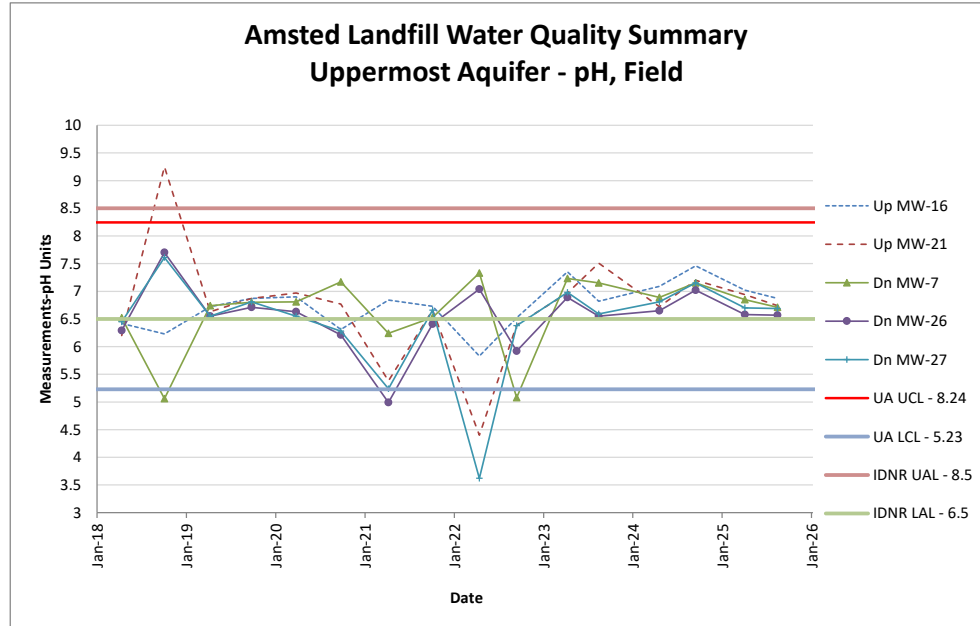
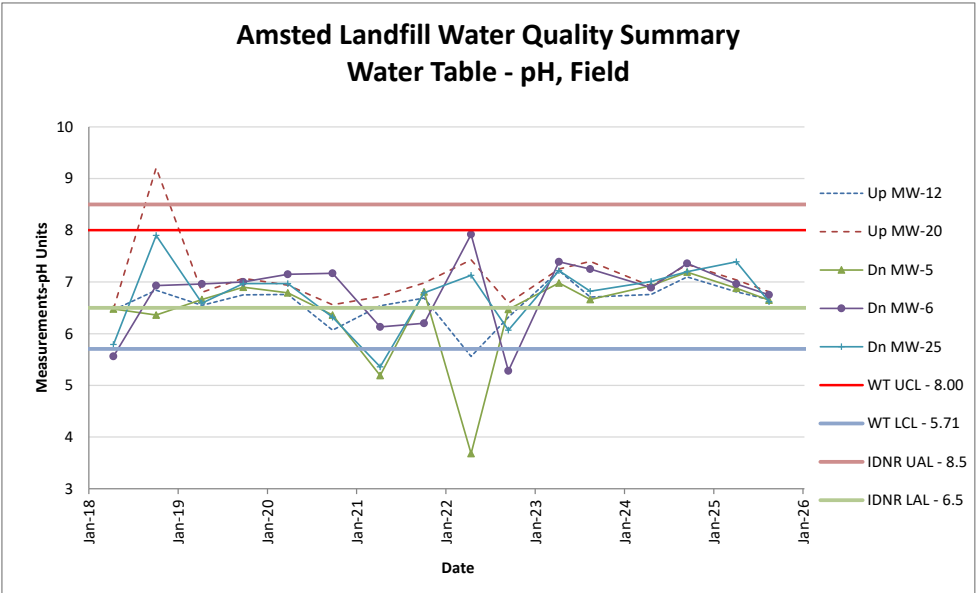
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Sodium (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	1.00	34.2	67.7	42.9	38.5	51.7	47.2	63.9	64.4	89.6	44.8	19.6	71.2
Oct-18	20	34.6	97.8	57.1	61.5	85.4	64.7	63.2	79.1	123	59.1	14.8	40.6
Apr-19	1.00	34.9	86.9	26.9	43.5	42.3	53.1	62	69.4	87	46.6	19.4	47.9
Oct-19	1.00	24.9	67.6	41.2	41.5	50	44.8	54.2	57.7	82.5	41.4	12.3	24.4
Apr-20	1.00	34.4	82.6	42.7	42.2	46.5	47.6	54.8	63.4	85.7	43.6	19.8	41
Oct-20	1.00	28.4	66.2	41.9	44.8	49.8	45.1	50.1	58.3	81.1	41.3	13.1	35.6
Apr-21	1.00	31.1	73.7	40.8	41.4	26.5	47.6	51.4	60.9	81.5	40.7	14.3	33.9
Oct-21	1.00	27.4	66.9	42.2	45.9	53	49.3	54.5	60.2	74.7	37.7	16.9	33.7
Apr-22	1.00	32	77.4	44.3	39.9	61.9	50.9	57.2	65.8	81.3	42.8	18.2	44.1
Sep-22	1.00	24.3	71	42.6	43.2	59.5	46.8	51.1	62.1	81.3	43.4	19.7	36.4
Apr-23	1.00	30.8	76.2	42.9	42.5	49.8	51.6	58	59.1	86.7	43.9	19.7	39.3
Aug-23	1.00	23.9	66.7	43.4	44.7	61.1	47.7	52.7	59.4	83.1	43.6	25.2	35.2
Apr-24	1.00	29.1	77.1	42.4	47.1	26.2	48	51.6	63.2	86.1	44.8	19.3	31.6
Sep-24	1.00	25.5	67	43.6	47.6	63.6	42.6	50	61.8	77.6	41.9	21	25.4
Apr-25	1.00	29.8	79	43.2	45	60.3	49.7	51.7	62.4	84.9	41.8	25.5	46.7
Aug-25	1.00	31.30	73.60	44.6	41.8	61.6	49.4	52.4	62.6	85.3	44.1	19.5	32.3
Mean 52.313 Mean 52.03 Mean 18.90 WT UCL 99.97 UA UCL 63.12 SW UCL 26.34													

Notes:

CL = Control Limit

NA = Not applicable.

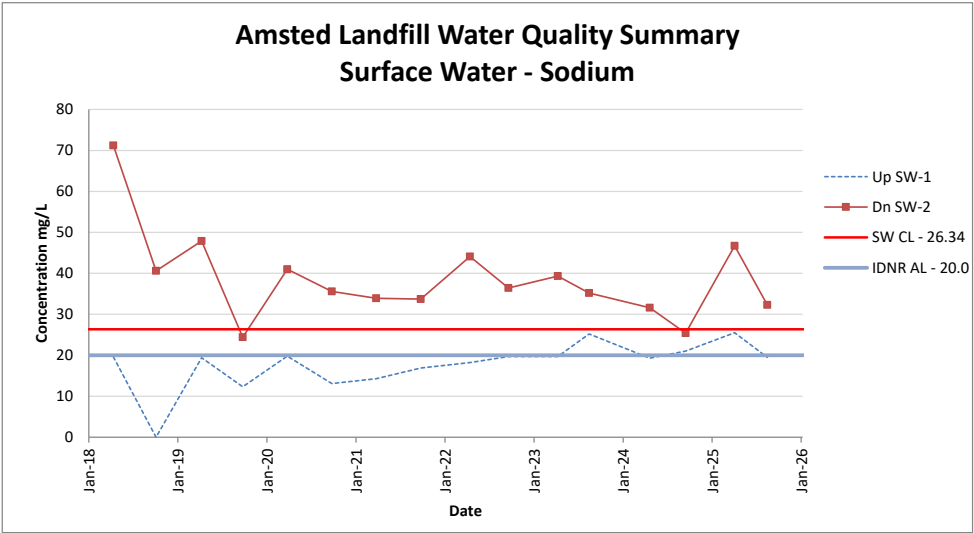
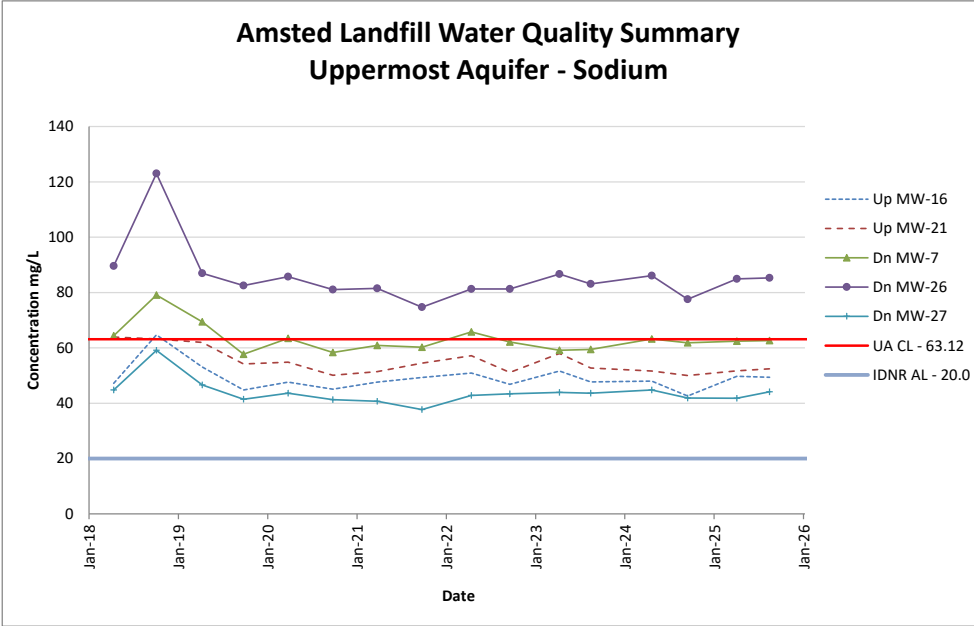
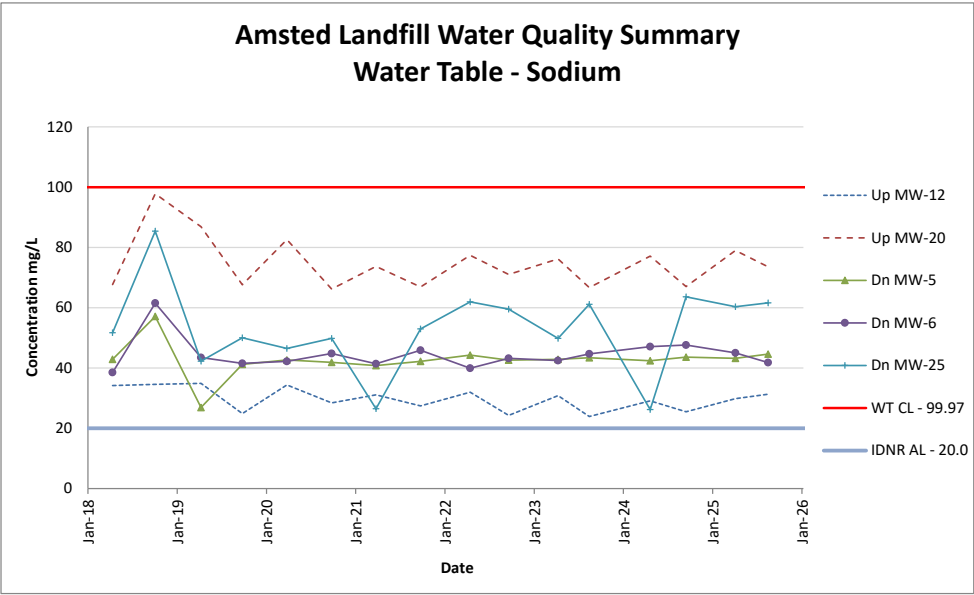
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

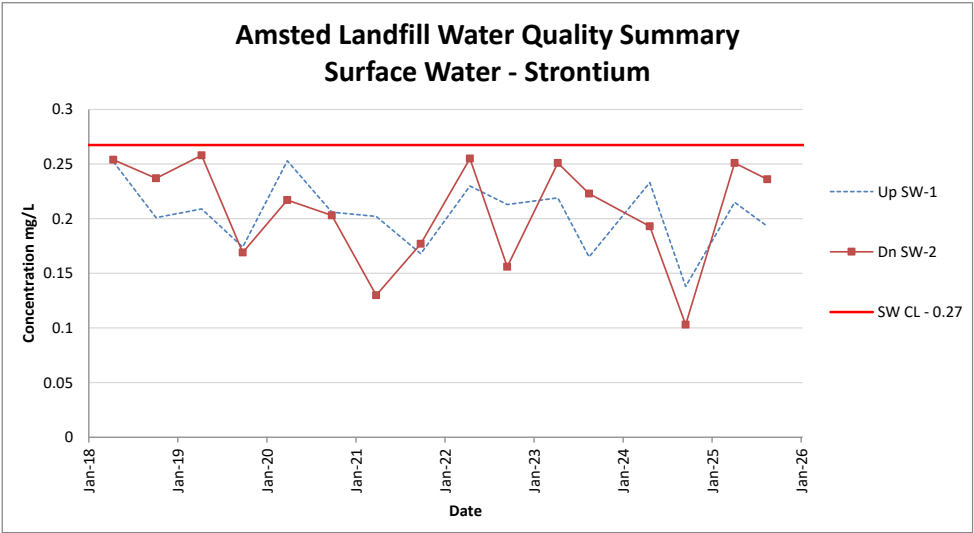
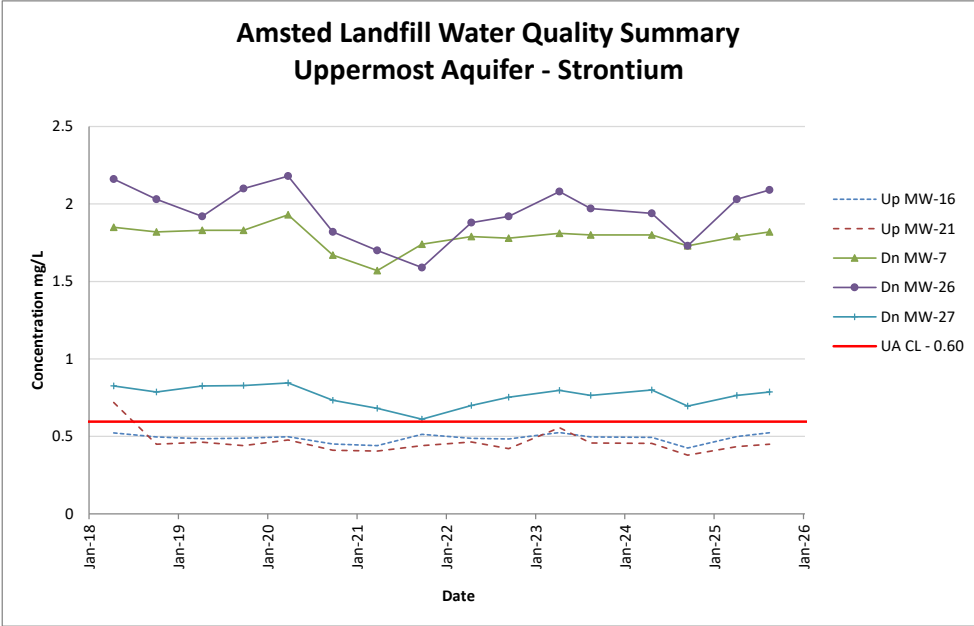
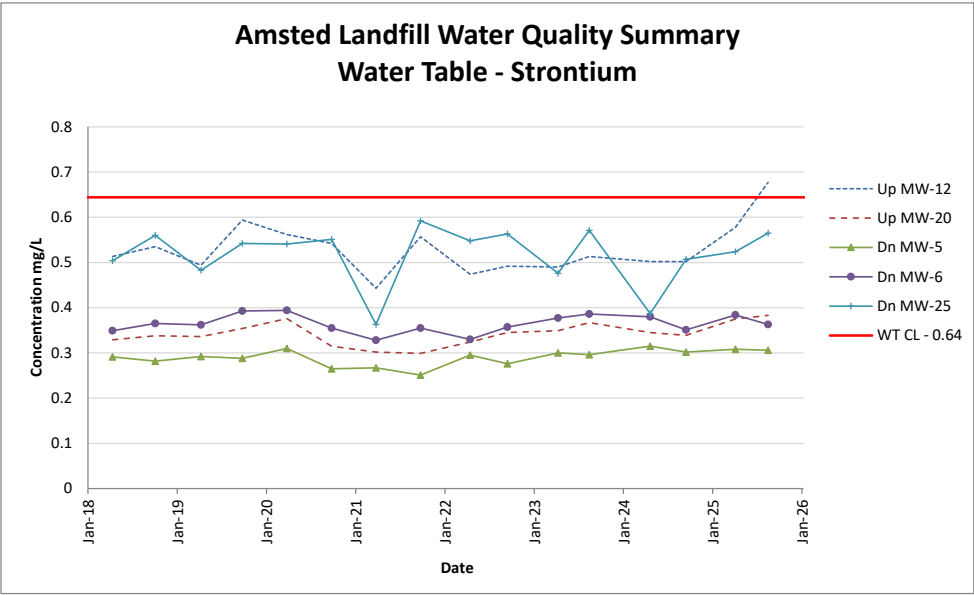
Strontium (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	0.05	0.513	0.329	0.291	0.349	0.504	0.523	0.719	1.85	2.16	0.826	0.252	0.254
Oct-18	0.05	0.535	0.338	0.282	0.365	0.56	0.496	0.449	1.82	2.03	0.787	0.201	0.237
Apr-19	0.05	0.494	0.336	0.292	0.362	0.483	0.485	0.463	1.83	1.92	0.826	0.209	0.258
Oct-19	0.05	0.594	0.354	0.288	0.393	0.542	0.489	0.441	1.83	2.1	0.828	0.174	0.169
Apr-20	0.05	0.562	0.376	0.31	0.394	0.541	0.498	0.477	1.93	2.18	0.845	0.253	0.217
Oct-20	0.05	0.542	0.315	0.265	0.355	0.551	0.451	0.41	1.67	1.82	0.733	0.206	0.203
Apr-21	0.05	0.443	0.302	0.267	0.328	0.363	0.440	0.406	1.57	1.7	0.681	0.202	0.13
Oct-21	0.05	0.557	0.299	0.251	0.355	0.592	0.513	0.44	1.74	1.59	0.611	0.168	0.177
Apr-22	0.05	0.474	0.324	0.295	0.330	0.548	0.488	0.464	1.79	1.88	0.700	0.23	0.255
Sep-22	0.05	0.492	0.345	0.276	0.357	0.563	0.484	0.421	1.78	1.92	0.753	0.213	0.156
Apr-23	0.05	0.490	0.349	0.300	0.377	0.476	0.525	0.556	1.81	2.08	0.797	0.219	0.251
Aug-23	0.05	0.513	0.367	0.296	0.386	0.571	0.497	0.458	1.80	1.97	0.764	0.165	0.223
Apr-24	0.05	0.502	0.345	0.315	0.380	0.387	0.494	0.455	1.80	1.94	0.800	0.233	0.193
Sep-24	0.05	0.502	0.339	0.302	0.351	0.507	0.425	0.379	1.73	1.73	0.695	0.138	0.103
Apr-25	0.05	0.578	0.375	0.308	0.384	0.524	0.499	0.434	1.79	2.03	0.765	0.215	0.251
Aug-25	0.05	0.677	0.383	0.306	0.363	0.565	0.524	0.449	1.82	2.09	0.786	0.193	0.236
Mean 0.436 Mean 0.48 Mean 0.20 WT UCL 0.64 UA UCL 0.60 SW UCL 0.27													

Notes:

CL = Control Limit
 NA = Not applicable.
 NS = Not sampled due to insufficient amount of water.
 SW = Surface Water
 UA = Uppermost Aquifer
 WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Sulfate (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	1.0-50	46.6	41.3	36.4	12.7	62.7	67.1	45.9	1250	1390	263	56.2	56.3
Oct-18	1.0-100	47.8	30.9	38.7	10.5	53.3	62.6	31.9	1220	1330	263	26.3	31.4
Apr-19	1.0-100	48.2	61.3	40.4	13	43.2	63	20.7	1,250	1,420	266	27	35.7
Oct-19	1.0-10.0	38.9	40	41	14.8	49.9	69.8	29.1	1,240	1,370	268	37	30.7
Apr-20	1.0-25.0	44	63.7	38.5	12.2	50	60.2	19.7	1320	1430	264	29.7	39.2
Oct-20	1.0-10.0	40.7	27.8	39	13.7	57.3	69.8	23.5	1240	1410	275	16.9	25.3
Apr-21	1.0-10.0	46.4	39.8	35.7	13.2	40.7	65.7	18.5	1370	1390	264	31.3	32
Oct-21	1.0-10.0	38.4	26.9	38.5	8.35	60.6	71.9	19.7	1440	1600	270	33.1	34.9
Apr-22	1.0-10.0	43.3	48.7	30.3	12.3	55.3	66.8	18.2	1340	1440	275	38	38.9
Sep-22	1.0-10.0	35.1	24.6	33.2	11	57.7	70.3	17.9	1320	1450	261	29.5	37.4
Apr-23	1.0-10.0	45.6	40	36.1	15.7	61.5	72.4	32.3	1330	1500	257	38.8	40
Aug-23	1.0-10.0	37	23.3	33.9	9.62	55.8	70	14.9	1350	1500	254	69.2	30.6
Apr-24	1.0-10.0	42.4	38.1	31.5	9.59	47.4	68.4	15.5	1300	1480	249	43.5	40.5
Sep-24	1.0-10.0	51.8	25.1	35.4	12.9	59.2	72.2	17.2	1430	1520	269	36.6	53.5
Apr-25	1.0-10.0	56.2	32.7	30.8	8.61	49.4	61.2	15.4	1240	1330	252	45.3	32.2
Aug-25	1.0-10.0	58.9	32.5	34.2	11	53.6	68.1	16.3	1410	1450	256	44.5	29.6
Mean 41.188 Mean 44.88 Mean 37.68 WT UCL 62.06 UA UCL 92.58 SW UCL 62.69													

Notes:

CL = Control Limit

NA = Not applicable.

NS = Not sampled due to insufficient amount of water.

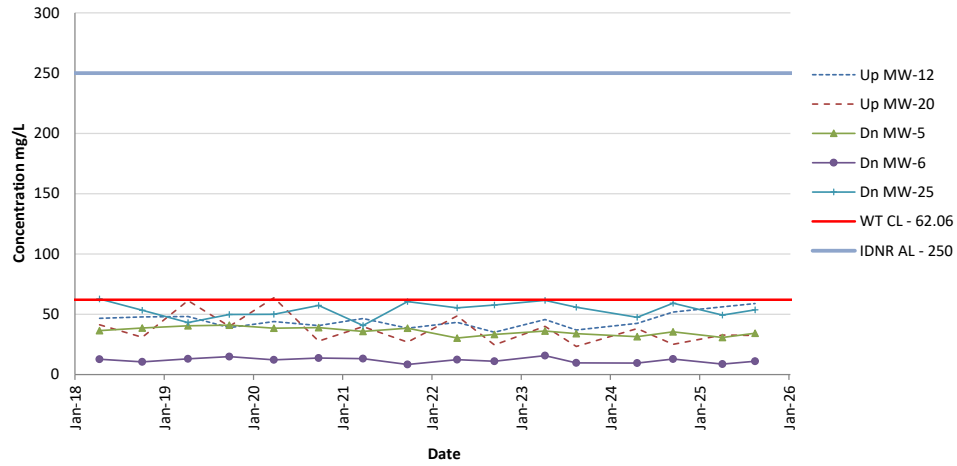
SW = Surface Water

UA = Uppermost Aquifer

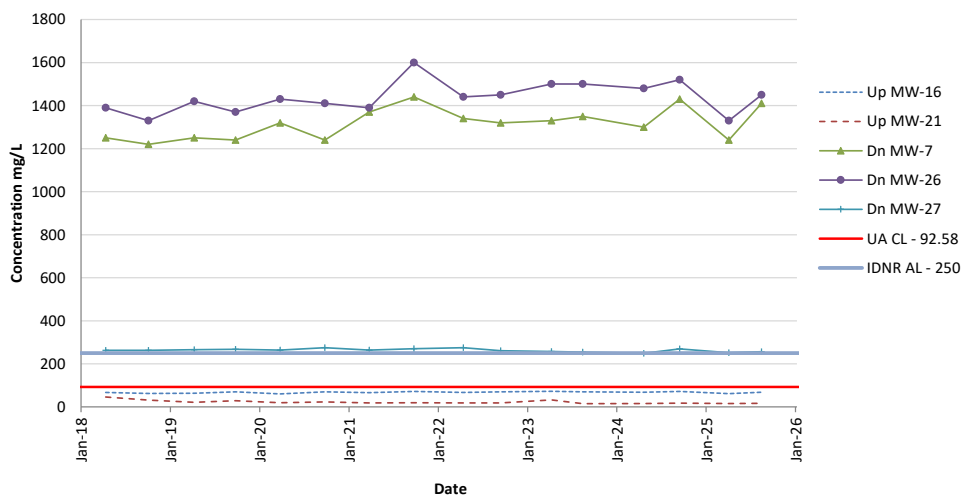
WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.

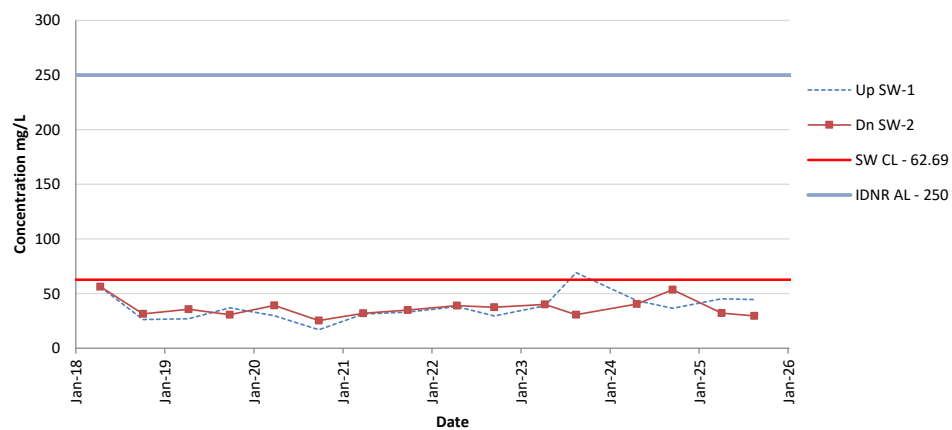
Amsted Landfill Water Quality Summary Water Table - Sulfate



Amsted Landfill Water Quality Summary Uppermost Aquifer - Sulfate



Amsted Landfill Water Quality Summary Surface Water - Sulfate



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Temperature, Degree C

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18	NA	10.6	11.62	8.47	6.96	11.28	7.99	10.41	8.4	13.75	10.28	7.89	8.57
Oct-18	NA	15.86	13.77	15.76	15.97	16.38	13.71	12.59	15.4	15.12	15.38	18.67	18.54
Apr-19	NA	7.72	9.47	10.37	8.84	9.79	9.8	11.73	10.06	11.89	11.98	9.73	15.94
Oct-19	NA	17.42	16.93	18.81	17.78	18.34	16.81	16.01	18.12	18.05	16.39	23.51	23
Apr-20	NA	12.1	12.26	10.79	13.59	14.27	10.59	17.78	12.52	14.5	11.73	13.5	18.47
Oct-20	NA	15.15	13.83	15.83	17.46	15.86	13.72	16.04	15.55	15.41	14.31	15.2	10.25
Apr-21	NA	10.52	12.95	13.56	12.22	10.75	11.88	11.72	12.66	14.15	13.26	13.5	9.2
Oct-21	NA	15.41	14.99	17.12	18.03	17.05	17.32	17.89	15.14	16.94	15.2	18.45	17.54
Apr-22	NA	10.78	11.02	9.12	8.47	11.5	12.56	8.95	10.46	11.7	11.21	7.3	5.12
Sep-22	NA	15.68	15.15	15.57	20.16	14.68	15.28	16.3	15.19	13.56	13.82	18.05	15.72
Apr-23	NA	14.33	13.71	13.41	13.13	14.4	14.65	17.04	15.40	15.15	14.05	12.34	10.17
Aug-23	NA	20.95	26.75	20.68	28.77	22.86	21.28	22.32	28.99	23.42	19.37	23.77	27.59
Apr-24	NA	14.64	16.12	20.24	23.30	15.54	12.56	15.35	23.69	16.50	22.31	16.82	17.10
Sep-24	NA	18.66	19.39	25.33	17.44	21.56	20.25	18.6	26.76	20.98	20.88	22.00	22.37
Apr-25	NA	12.93	14.06	14.43	17.05	11.43	14.38	14.77	12.29	11.77	16.07	13.36	16.02
Aug-25	NA	17.89	20.67	19.35	21.66	17.86	17.97	18.63	19.46	21.36	19.72	21.15	19.39
Mean 14.792 WT UCL 22.46 Mean 14.90 UA UCL 22.03 Mean 15.95 SW UCL 26.43													

Notes:

CL = Control Limit

NA = Not applicable.

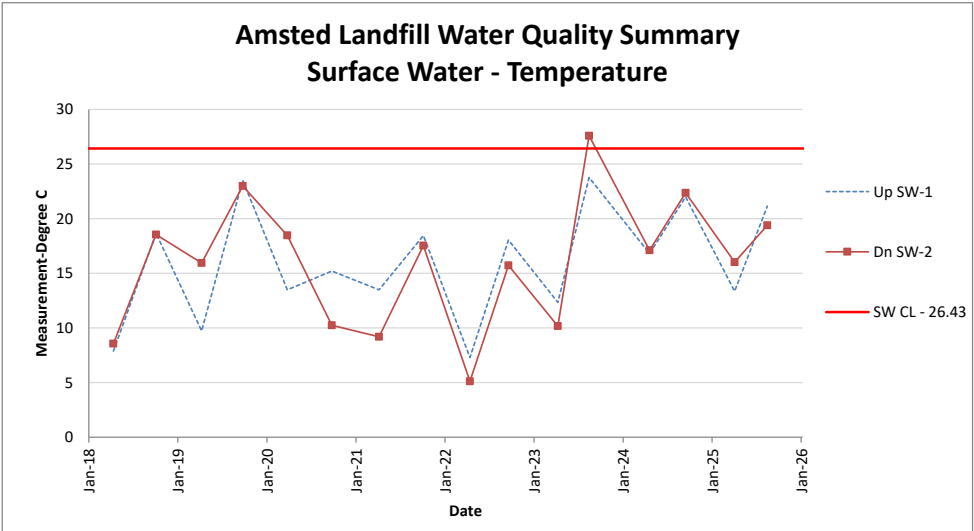
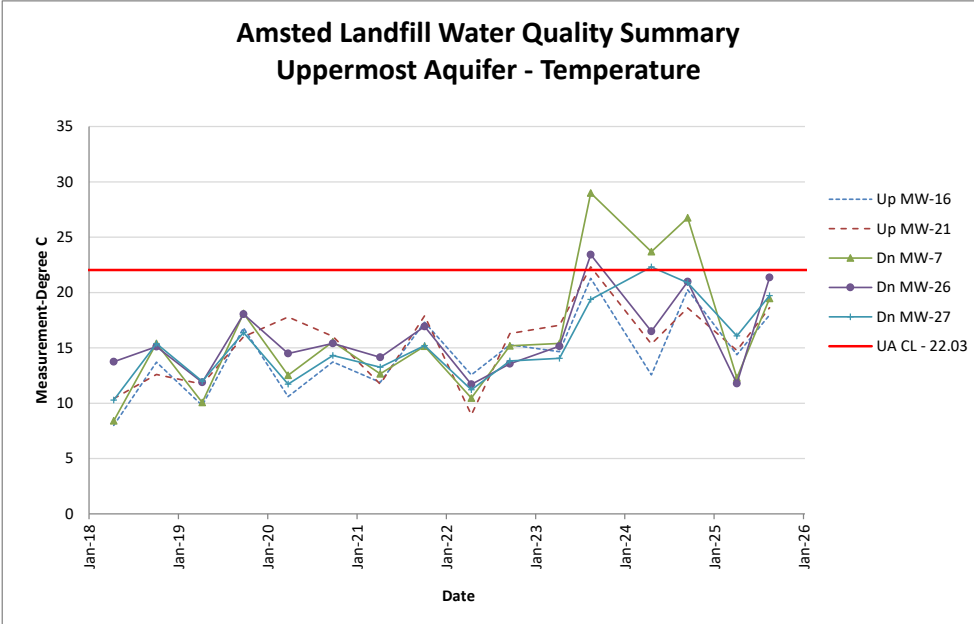
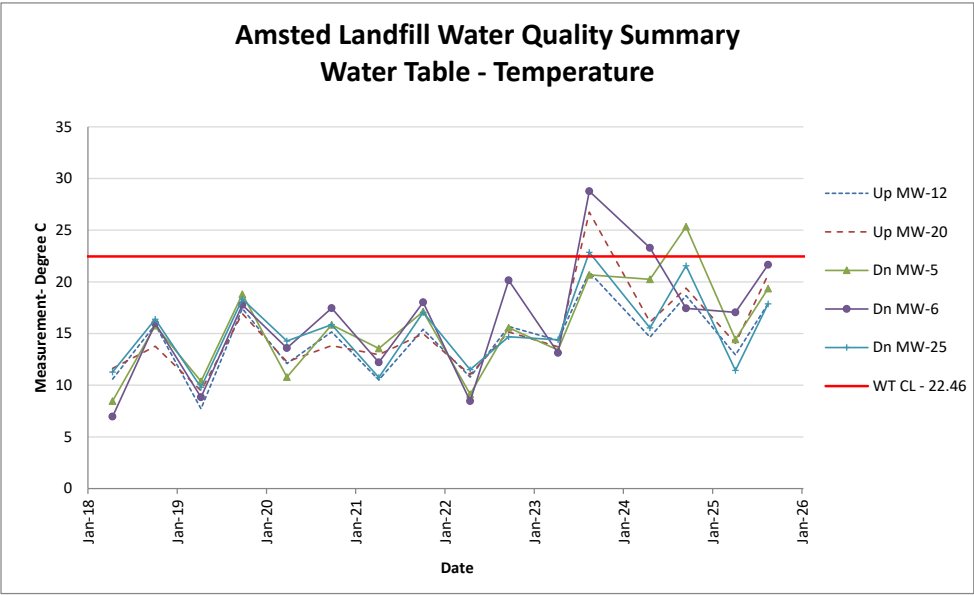
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

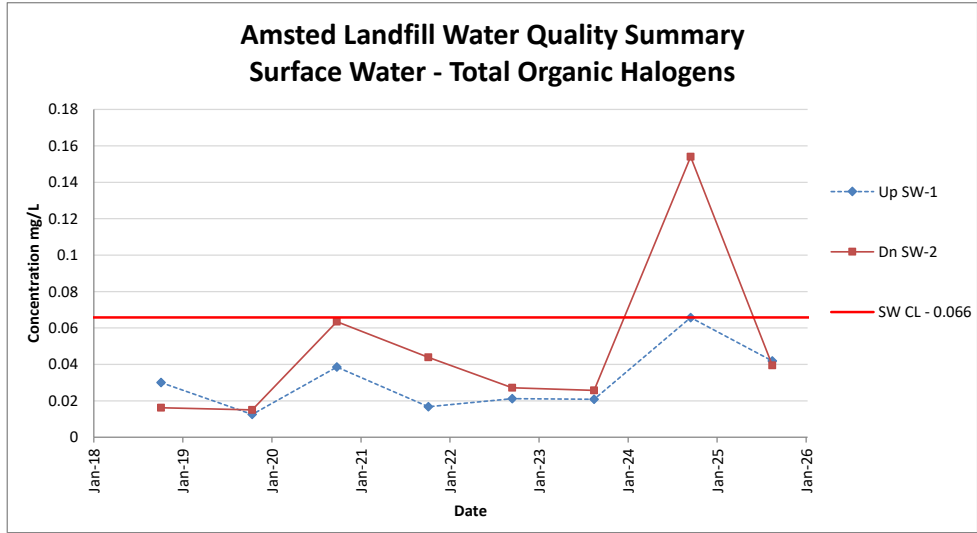
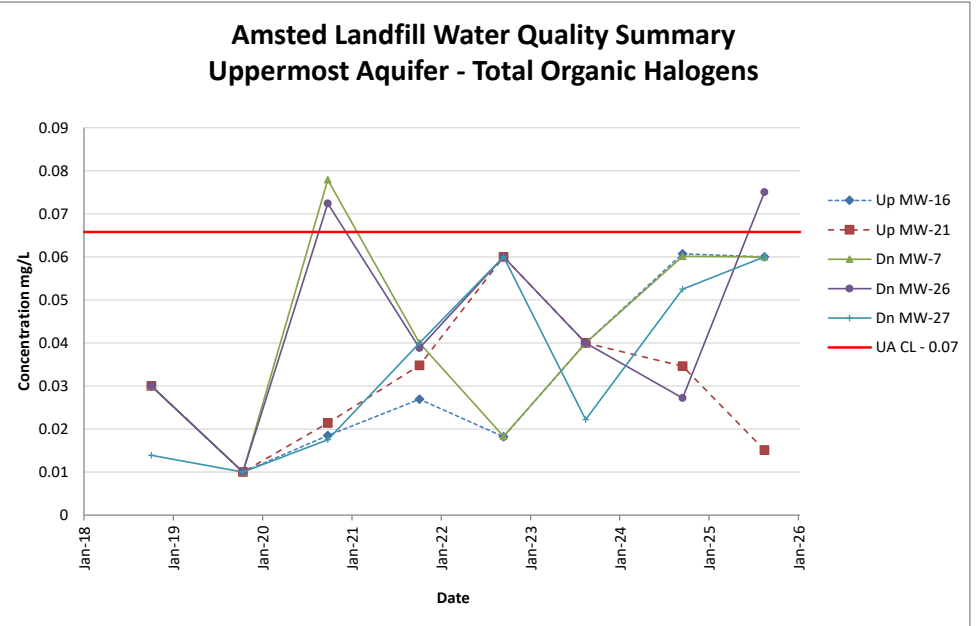
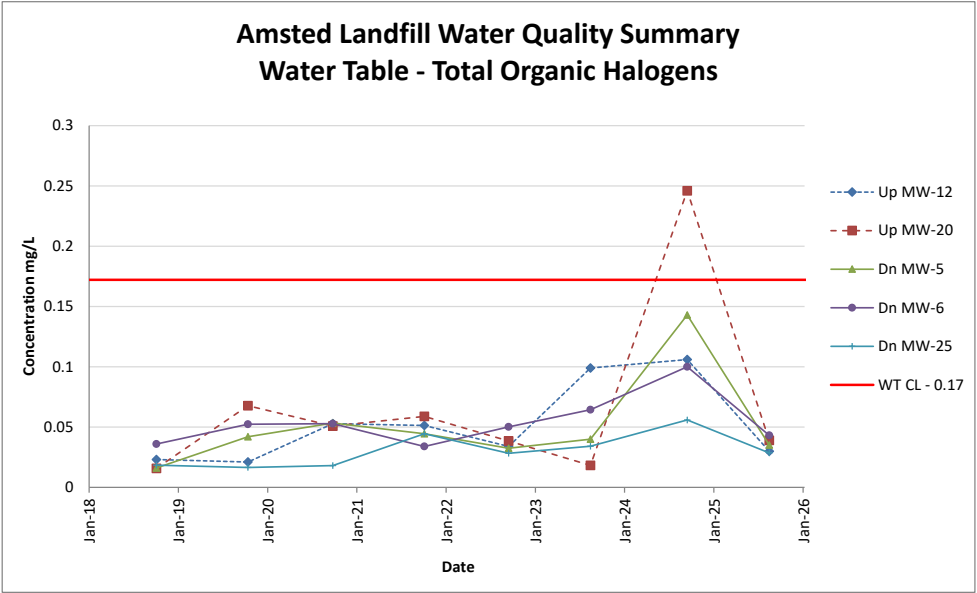
Total Organic Halogens (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18													
Oct-18	0.03	0.0231	0.0158	0.0161	0.036	0.0184	0.03	0.03	0.03	0.03	0.0139	0.03	0.0162
Apr-19													
Oct-19	0.01	0.021	0.0678	0.042	0.0524	0.0165	0.01	0.01	0.01	0.01	0.01	0.0125	0.015
Apr-20													
Oct-20	0.04	0.0529	0.0508	0.0533	0.0528	0.018	0.0185	0.0214	0.0779	0.0724	0.0175	0.0385	0.0635
Apr-21													
Oct-21	0.04	0.0513	0.0588	0.0445	0.0339	0.0444	0.0269	0.0348	0.04	0.0388	0.04	0.0167	0.0439
Apr-22													
Sep-22	0.02-0.06	0.0339	0.0385	0.0325	0.0502	0.0282	0.0182	0.06	0.0183	0.06	0.06	0.0212	0.0271
Apr-23													
Aug-23	0.04	0.099	0.0183	0.04	0.0643	0.0341	0.04	0.04	0.04	0.04	0.0222	0.0208	0.0257
Apr-24													
Sep-24	0.04	0.106	0.246	0.143	0.1	0.0559	0.0607	0.0346	0.0601	0.0272	0.0525	0.0657	0.154
Apr-25													
Aug-25	0.06-0.075	0.03	0.0389	0.0352	0.0431	0.0286	0.06	0.0151	0.06	0.075	0.06	0.0419	0.0394
Mean 0.060 WT UCL 0.17 Mean 0.03 UA UCL 0.066 Mean 0.03 SW UCL 0.07													

Notes:

CL = Control Limit
 NA = Not applicable.
 NS = Not sampled due to insufficient amount of water.
 SW = Surface Water
 UA = Uppermost Aquifer
 WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

WATER QUALITY DATA - AMSTED FOUNDRY WASTE LANDFILL

Total Phenols (mg/L)

	Quantitation	Water Table					Uppermost Aquifer					Surface Water	
		Upgradient		Downgradient			Upgradient		Downgradient			Upstream	Downstream
Date	Limit	MW-12	MW-20	MW-5	MW-6	MW-25	MW-16	MW-21	MW-7	MW-26	MW-27	SW-1	SW-2
Apr-18													
Oct-18	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Apr-19													
Oct-19	0.0180-0.0216	0.0196	0.018	0.0196	0.02	0.018	0.02	0.02	0.0204	0.0208	0.0188	0.0204	0.0204
Apr-20													
Oct-20	0.018-0.0204	0.0204	0.0196	0.0188	0.0204	0.018	0.0196	0.02	0.02	0.0184	0.0184	0.0192	0.0188
Apr-21													
Oct-21	0.0180-0.0204	0.02	0.0184	0.0184	0.0184	0.0196	0.0188	0.0192	0.0184	0.0204	0.0192	0.0196	0.018
Apr-22													
Sep-22	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Apr-23													
Aug-23	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Apr-23													
Sep-24	0.01	0.01	0.01	0.01	0.00477	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Apr-25													
Aug-25	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Mean 0.01 WT UCL 0.0246 Mean 0.01 UA UCL 0.0249 Mean 0.01 SW UCL 0.0254													

Notes:

CL = Control Limit

NA = Not applicable.

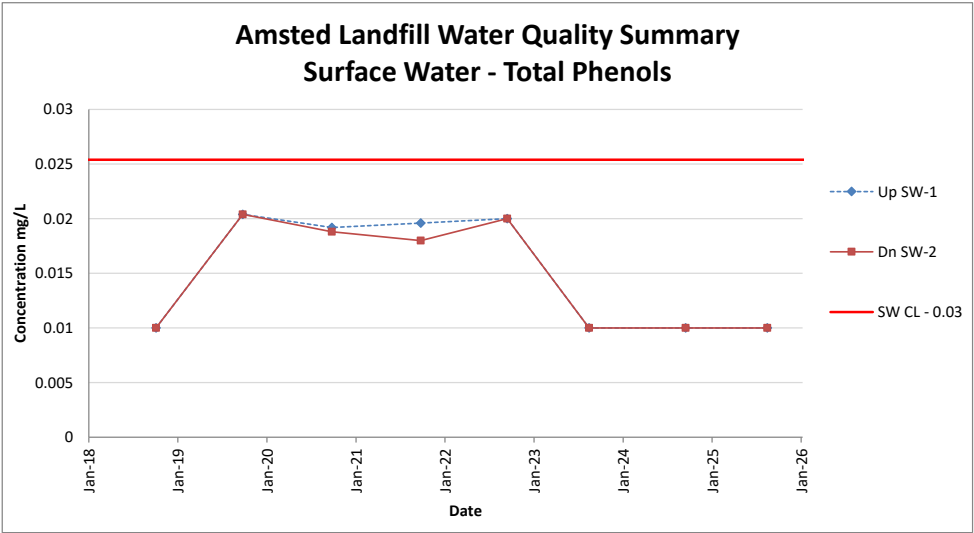
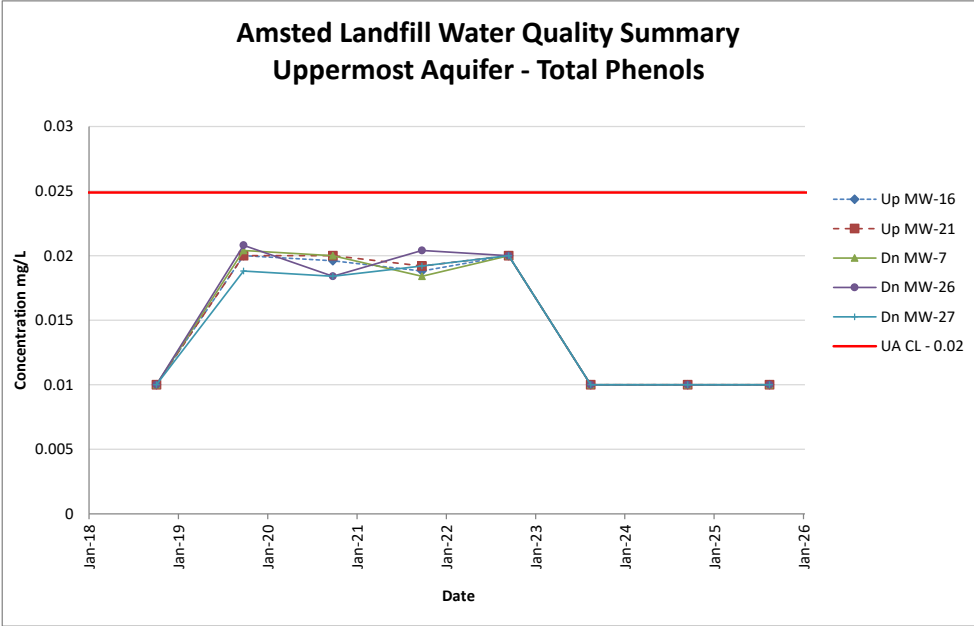
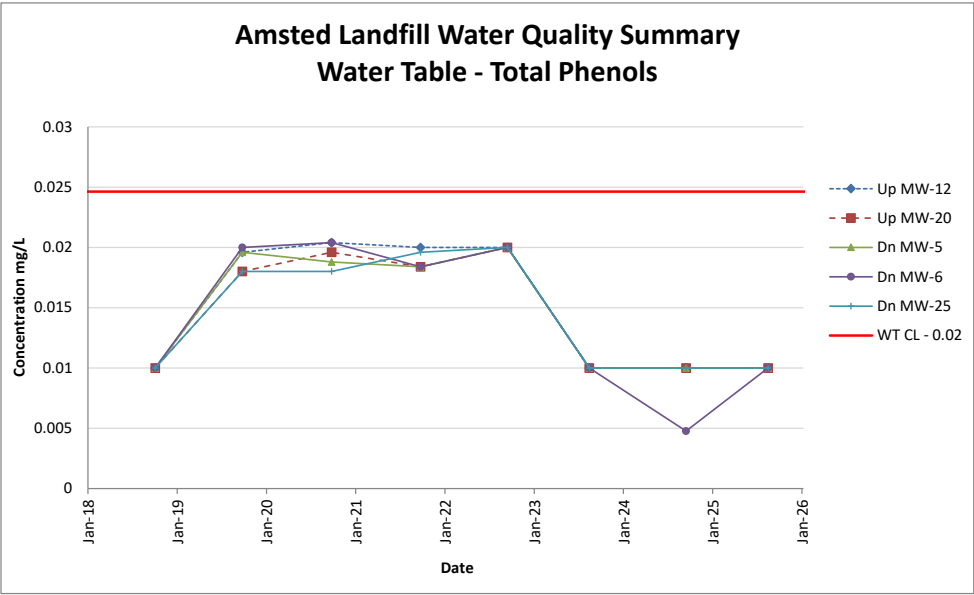
NS = Not sampled due to insufficient amount of water.

SW = Surface Water

UA = Uppermost Aquifer

WT = Water Table

A **bolded** value indicates parameter present above method reporting limit.



Notes: Up = Upgradient, Dn = Downgradient, SW = Surface Water

APPENDIX D

ChemStat Output

Concentrations (ppb)

Parameter: Chemical Oxygen Demand (COD)

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 96

Total Non-Detect: 27

Percent Non-Detects: 28.125%

Total Background Measurements: 0

There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 6 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

MW-12	16	7 (43.75%)	4/17/2018	ND<20000 U	ND<20000 U
			10/9/2018	5250 J	5250 J
			4/14/2019	7520 J	7520 J
			10/2/2019	8590 J	8590 J
			4/8/2020	11300	11300
			10/1/2020	25500 J+	25500 J+
			4/15/2021	ND<10000 U	ND<10000 U
			10/14/2021	ND<25000 U	ND<25000 U
			4/19/2022	9000 J	9000 J
			9/28/2022	ND<25000 U	ND<25000 U
			4/18/2023	ND<10000 UJ	ND<10000 UJ
			8/24/2023	ND<10000 U	ND<10000 U
			5/1/2024	ND<10000 U	ND<10000 U
			9/12/2024	11100	11100
			4/16/2025	14500	14500
			8/28/2025	10400	10400

MW-20	16	6 (37.5%)	4/17/2018	ND<20000 U	ND<20000 U
			10/10/2018	ND<20000 U	ND<20000 U
			4/14/2019	8150 J	8150 J
			10/2/2019	ND<10000 U	ND<10000 U
			4/9/2020	9250 J	9250 J
			10/2/2020	38900 J+	38900 J+
			4/15/2021	ND<10000 U	ND<10000 U
			10/12/2021	33800	33800
			4/20/2022	7500 J	7500 J
			9/28/2022	ND<25000 U	ND<25000 U
			4/19/2023	5420 J	5420 J
			8/23/2023	5620 J	5620 J
			4/30/2024	ND<10000 U	ND<10000 U
			9/11/2024	12300	12300
			4/15/2025	6330 J	6330 J
			8/26/2025	4200 J	4200 J

MW-25	16	5 (31.25%)	4/17/2018	4170 J+	4170 J+
			10/9/2018	ND<20000 U	ND<20000 U
			4/13/2019	6500 J	6500 J
			10/1/2019	5630 J	5630 J
			4/8/2020	12300	12300
			10/1/2020	ND<25000 U	ND<25000 U
			4/14/2021	10700	10700

			10/13/2021	35600	35600
			4/19/2022	ND<10000 U	ND<10000 U
			9/29/2022	ND<25000 U	ND<25000 U
			4/19/2023	5420 J	5420 J
			8/24/2023	ND<10000 U	ND<10000 U
			4/29/2024	14800	14800
			9/10/2024	13500	13500
			4/14/2025	3410 J	3410 J
			8/26/2025	5580 J	5580 J
MW-26	16	5 (31.25%)	4/17/2018	5400 J+	5400 J+
			10/9/2018	ND<20000 U	ND<20000 U
			4/13/2019	10800 J	10800 J
			10/1/2019	6680 J	6680 J
			4/8/2020	56000	56000
			10/1/2020	37200 J+	37200 J+
			4/14/2021	ND<10000 U	ND<10000 U
			10/13/2021	ND<25000 U	ND<25000 U
			4/19/2022	7500 J	7500 J
			9/29/2022	ND<25000 U	ND<25000 U
			4/19/2023	3530 J	3530 J
			8/24/2023	ND<10000 U	ND<10000 U
			4/29/2024	9670 J	9670 J
			9/10/2024	18400	18400
			4/15/2025	7630 J	7630 J
			8/26/2025	8000 J	8000 J
SW-01	16	2 (12.5%)	4/16/2018	11500 J	11500 J
			10/8/2018	15100 J	15100 J
			4/13/2019	4450 J	4450 J
			9/30/2019	20300	20300
			4/7/2020	20100	20100
			10/2/2020	35600 J+	35600 J+
			4/13/2021	14300	14300
			10/14/2021	42800	42800
			4/19/2022	11000	11000
			9/27/2022	ND<25000 U	ND<25000 U
			4/18/2023	2580 J	2580 J
			8/22/2023	5070 J	5070 J
			4/30/2024	ND<10000 U	ND<10000 U
			9/10/2024	19600	19600
			4/14/2025	10900	10900
			8/26/2025	7650 J	7650 J
SW-02	16	2 (12.5%)	4/16/2018	14400 J	14400 J
			10/8/2018	14100 J	14100 J
			4/13/2019	16200 J	16200 J
			9/30/2019	11800	11800
			4/7/2020	36500	36500
			10/2/2020	47300 J+	47300 J+
			4/13/2021	10200	10200
			10/14/2021	41000	41000
			4/19/2022	18000	18000
			9/27/2022	ND<25000 U	ND<25000 U
			4/18/2023	6690 J	6690 J
			8/22/2023	ND<10000 U	ND<10000 U
			4/30/2024	6730 J	6730 J

9/10/2024	18700	18700
4/14/2025	14100	14100
8/26/2025	21100	21100

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Chemical Oxygen Demand (COD)

Location: MW-12

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0295683	0.169114	0.507	None

Loc.	Date	Conc.	Outlier
MW-12	4/17/2018	ND<20000 U	FALSE
	10/9/2018	5250 J	FALSE
	4/14/2019	7520 J	FALSE
	10/2/2019	8590 J	FALSE
	4/8/2020	11300	FALSE
	10/1/2020	25500 J+	FALSE
	4/15/2021	ND<10000 U	FALSE
	10/14/2021	ND<25000 U	FALSE
	4/19/2022	9000 J	FALSE
	9/28/2022	ND<25000 U	FALSE
	4/18/2023	ND<10000 UJ	FALSE
	8/24/2023	ND<10000 U	FALSE
	5/1/2024	ND<10000 U	FALSE
	9/12/2024	11100	FALSE
	4/16/2025	14500	FALSE
	8/28/2025	10400	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chemical Oxygen Demand (COD)

Location: MW-12

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	5250	25500	20250	0.5056	10238.4
2	7520	25000	17480	0.329	5750.92
3	8590	25000	16410	0.2521	4136.96
4	9000	20000	11000	0.1939	2132.9
5	10000	14500	4500	0.1447	651.15
6	10000	11300	1300	0.1005	130.65
7	10000	11100	1100	0.0593	65.23
8	10000	10400	400	0.0196	7.84
9	10400	10000	-400		
10	11100	10000	-1100		
11	11300	10000	-1300		
12	14500	10000	-4500		
13	20000	9000	-11000		
14	25000	8590	-16410		
15	25000	7520	-17480		
16	25500	5250	-20250		

Sum of b values = 23114.1

Sample Standard Deviation = 6676.51

W Statistic = 0.799028

5% Critical value of 0.887 exceeds 0.799028

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.799028

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chemical Oxygen Demand (COD)

Location: MW-12

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
5250 J	ND<20000 U	-14750	0	1
7520 J	ND<20000 U	-12480	0	2
8590 J	ND<20000 U	-11410	0	3
11300	ND<20000 U	-8700	0	4
25500 J+	ND<20000 U	5500	1	4
ND<10000 U	ND<20000 U	-10000	1	5
ND<25000 U	ND<20000 U	5000	2	5
9000 J	ND<20000 U	-11000	2	6
ND<25000 U	ND<20000 U	5000	3	6
ND<10000 UJ	ND<20000 U	-10000	3	7
ND<10000 U	ND<20000 U	-10000	3	8
ND<10000 U	ND<20000 U	-10000	3	9
11100	ND<20000 U	-8900	3	10
14500	ND<20000 U	-5500	3	11
10400	ND<20000 U	-9600	3	12
7520 J	5250 J	2270	4	12
8590 J	5250 J	3340	5	12
11300	5250 J	6050	6	12
25500 J+	5250 J	20250	7	12
ND<10000 U	5250 J	4750	8	12
ND<25000 U	5250 J	19750	9	12
9000 J	5250 J	3750	10	12
ND<25000 U	5250 J	19750	11	12
ND<10000 UJ	5250 J	4750	12	12
ND<10000 U	5250 J	4750	13	12
ND<10000 U	5250 J	4750	14	12
11100	5250 J	5850	15	12
14500	5250 J	9250	16	12
10400	5250 J	5150	17	12
8590 J	7520 J	1070	18	12
11300	7520 J	3780	19	12
25500 J+	7520 J	17980	20	12
ND<10000 U	7520 J	2480	21	12
ND<25000 U	7520 J	17480	22	12
9000 J	7520 J	1480	23	12
ND<25000 U	7520 J	17480	24	12
ND<10000 UJ	7520 J	2480	25	12
ND<10000 U	7520 J	2480	26	12
ND<10000 U	7520 J	2480	27	12
11100	7520 J	3580	28	12
14500	7520 J	6980	29	12
10400	7520 J	2880	30	12
11300	8590 J	2710	31	12
25500 J+	8590 J	16910	32	12

ND<10000 U	8590 J	1410	33	12
ND<25000 U	8590 J	16410	34	12
9000 J	8590 J	410	35	12
ND<25000 U	8590 J	16410	36	12
ND<10000 UJ	8590 J	1410	37	12
ND<10000 U	8590 J	1410	38	12
ND<10000 U	8590 J	1410	39	12
11100	8590 J	2510	40	12
14500	8590 J	5910	41	12
10400	8590 J	1810	42	12
25500 J+	11300	14200	43	12
ND<10000 U	11300	-1300	43	13
ND<25000 U	11300	13700	44	13
9000 J	11300	-2300	44	14
ND<25000 U	11300	13700	45	14
ND<10000 UJ	11300	-1300	45	15
ND<10000 U	11300	-1300	45	16
ND<10000 U	11300	-1300	45	17
11100	11300	-200	45	18
14500	11300	3200	46	18
10400	11300	-900	46	19
ND<10000 U	25500 J+	-15500	46	20
ND<25000 U	25500 J+	-500	46	21
9000 J	25500 J+	-16500	46	22
ND<25000 U	25500 J+	-500	46	23
ND<10000 UJ	25500 J+	-15500	46	24
ND<10000 U	25500 J+	-15500	46	25
ND<10000 U	25500 J+	-15500	46	26
11100	25500 J+	-14400	46	27
14500	25500 J+	-11000	46	28
10400	25500 J+	-15100	46	29
ND<25000 U	ND<10000 U	15000	47	29
9000 J	ND<10000 U	-1000	47	30
ND<25000 U	ND<10000 U	15000	48	30
ND<10000 UJ	ND<10000 U	0	48	30
ND<10000 U	ND<10000 U	0	48	30
ND<10000 U	ND<10000 U	0	48	30
11100	ND<10000 U	1100	49	30
14500	ND<10000 U	4500	50	30
10400	ND<10000 U	400	51	30
9000 J	ND<25000 U	-16000	51	31
ND<25000 U	ND<25000 U	0	51	31
ND<10000 UJ	ND<25000 U	-15000	51	32
ND<10000 U	ND<25000 U	-15000	51	33
ND<10000 U	ND<25000 U	-15000	51	34
11100	ND<25000 U	-13900	51	35
14500	ND<25000 U	-10500	51	36
10400	ND<25000 U	-14600	51	37
ND<25000 U	9000 J	16000	52	37
ND<10000 UJ	9000 J	1000	53	37
ND<10000 U	9000 J	1000	54	37
ND<10000 U	9000 J	1000	55	37

11100	9000 J	2100	56	37
14500	9000 J	5500	57	37
10400	9000 J	1400	58	37
ND<10000 UJ	ND<25000 U	-15000	58	38
ND<10000 U	ND<25000 U	-15000	58	39
ND<10000 U	ND<25000 U	-15000	58	40
11100	ND<25000 U	-13900	58	41
14500	ND<25000 U	-10500	58	42
10400	ND<25000 U	-14600	58	43
ND<10000 U	ND<10000 UJ	0	58	43
ND<10000 U	ND<10000 UJ	0	58	43
11100	ND<10000 UJ	1100	59	43
14500	ND<10000 UJ	4500	60	43
10400	ND<10000 UJ	400	61	43
ND<10000 U	ND<10000 U	0	61	43
11100	ND<10000 U	1100	62	43
14500	ND<10000 U	4500	63	43
10400	ND<10000 U	400	64	43
11100	ND<10000 U	1100	65	43
14500	ND<10000 U	4500	66	43
10400	ND<10000 U	400	67	43
14500	11100	3400	68	43
10400	11100	-700	68	44
10400	14500	-4100	68	45

S Statistic = 68 - 45 = 23

Tied Group	Value	Members
1	10000	4
2	25000	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/14/2019	1
10/2/2019	1
4/8/2020	1
10/1/2020	1
4/15/2021	1
10/14/2021	1
4/19/2022	1
9/28/2022	1
4/18/2023	1
8/24/2023	1
5/1/2024	1
9/12/2024	1
4/16/2025	1
8/28/2025	1

There are 0 time periods with multiple data

A = 174

B = 0

C = 24

D = 0

E = 14

F = 0

a = 8880

b = 30240

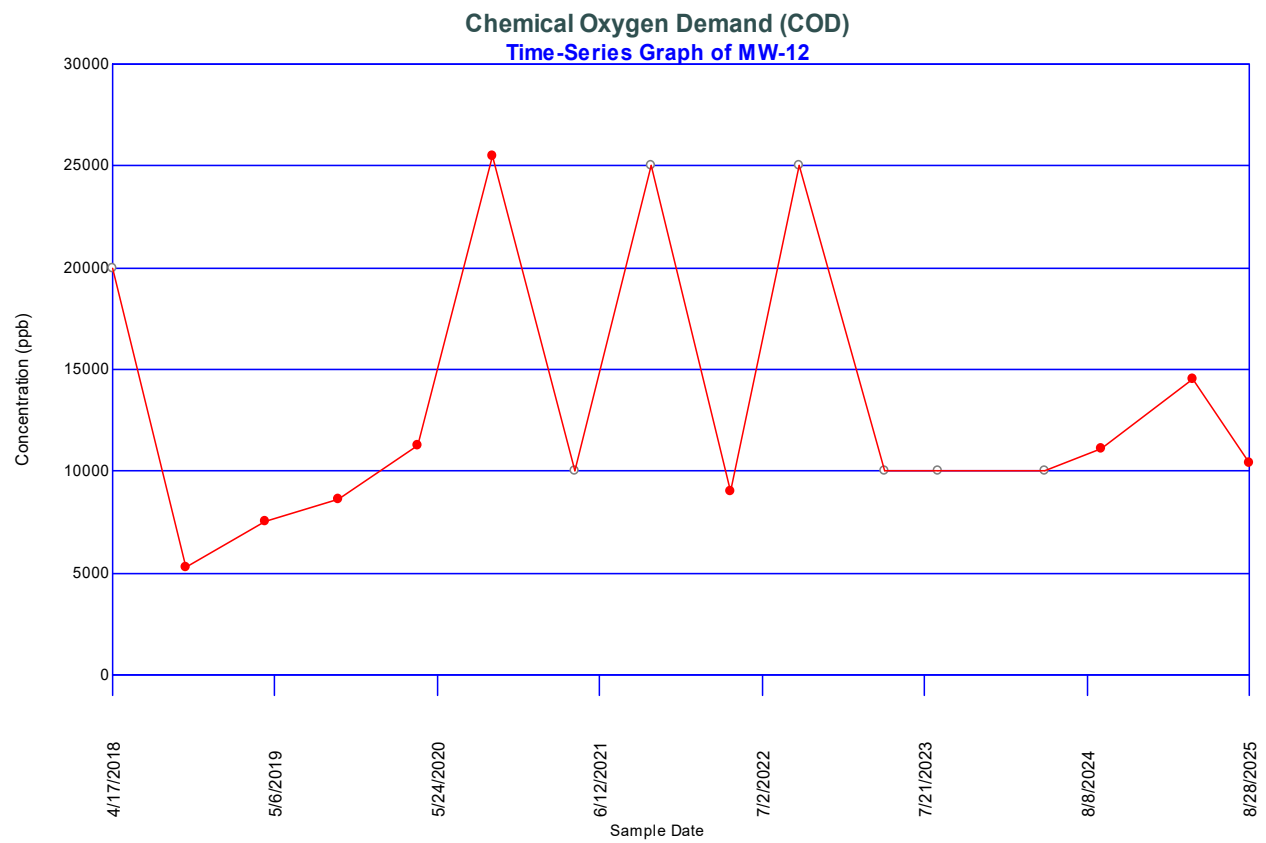
c = 480

Group Variance = 483.667

Z-Score = 1.00034

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

|1.00034| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Chemical Oxygen Demand (COD)

Location: MW-20

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.417668	0.0682692	0.507	None

Loc.	Date	Conc.	Outlier
MW-20	4/17/2018	ND<20000 U	FALSE
	10/10/2018	ND<20000 U	FALSE
	4/14/2019	8150 J	FALSE
	10/2/2019	ND<10000 U	FALSE
	4/9/2020	9250 J	FALSE
	10/2/2020	38900 J+	FALSE
	4/15/2021	ND<10000 U	FALSE
	10/12/2021	33800	FALSE
	4/20/2022	7500 J	FALSE
	9/28/2022	ND<25000 U	FALSE
	4/19/2023	5420 J	FALSE
	8/23/2023	5620 J	FALSE
	4/30/2024	ND<10000 U	FALSE
	9/11/2024	12300	FALSE
	4/15/2025	6330 J	FALSE
	8/26/2025	4200 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chemical Oxygen Demand (COD)

Location: MW-20

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	4200	38900	34700	0.5056	17544.3
2	5420	33800	28380	0.329	9337.02
3	5620	25000	19380	0.2521	4885.7
4	6330	20000	13670	0.1939	2650.61
5	7500	20000	12500	0.1447	1808.75
6	8150	12300	4150	0.1005	417.075
7	9250	10000	750	0.0593	44.475
8	10000	10000	0	0.0196	0
9	10000	10000	0		
10	10000	9250	-750		
11	12300	8150	-4150		
12	20000	7500	-12500		
13	20000	6330	-13670		
14	25000	5620	-19380		
15	33800	5420	-28380		
16	38900	4200	-34700		

Sum of b values = 36688

Sample Standard Deviation = 10498.6

W Statistic = 0.814131

5% Critical value of 0.887 exceeds 0.814131

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.814131

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Chemical Oxygen Demand (COD)
Location: MW-20
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<20000 U	ND<20000 U	0	0	0
8150 J	ND<20000 U	-11850	0	1
ND<10000 U	ND<20000 U	-10000	0	2
9250 J	ND<20000 U	-10750	0	3
38900 J+	ND<20000 U	18900	1	3
ND<10000 U	ND<20000 U	-10000	1	4
33800	ND<20000 U	13800	2	4
7500 J	ND<20000 U	-12500	2	5
ND<25000 U	ND<20000 U	5000	3	5
5420 J	ND<20000 U	-14580	3	6
5620 J	ND<20000 U	-14380	3	7
ND<10000 U	ND<20000 U	-10000	3	8
12300	ND<20000 U	-7700	3	9
6330 J	ND<20000 U	-13670	3	10
4200 J	ND<20000 U	-15800	3	11
8150 J	ND<20000 U	-11850	3	12
ND<10000 U	ND<20000 U	-10000	3	13
9250 J	ND<20000 U	-10750	3	14
38900 J+	ND<20000 U	18900	4	14
ND<10000 U	ND<20000 U	-10000	4	15
33800	ND<20000 U	13800	5	15
7500 J	ND<20000 U	-12500	5	16
ND<25000 U	ND<20000 U	5000	6	16
5420 J	ND<20000 U	-14580	6	17
5620 J	ND<20000 U	-14380	6	18
ND<10000 U	ND<20000 U	-10000	6	19
12300	ND<20000 U	-7700	6	20
6330 J	ND<20000 U	-13670	6	21
4200 J	ND<20000 U	-15800	6	22
ND<10000 U	8150 J	1850	7	22
9250 J	8150 J	1100	8	22
38900 J+	8150 J	30750	9	22
ND<10000 U	8150 J	1850	10	22
33800	8150 J	25650	11	22
7500 J	8150 J	-650	11	23
ND<25000 U	8150 J	16850	12	23
5420 J	8150 J	-2730	12	24
5620 J	8150 J	-2530	12	25
ND<10000 U	8150 J	1850	13	25
12300	8150 J	4150	14	25
6330 J	8150 J	-1820	14	26
4200 J	8150 J	-3950	14	27
9250 J	ND<10000 U	-750	14	28
38900 J+	ND<10000 U	28900	15	28

ND<10000 U	ND<10000 U	0	15	28
33800	ND<10000 U	23800	16	28
7500 J	ND<10000 U	-2500	16	29
ND<25000 U	ND<10000 U	15000	17	29
5420 J	ND<10000 U	-4580	17	30
5620 J	ND<10000 U	-4380	17	31
ND<10000 U	ND<10000 U	0	17	31
12300	ND<10000 U	2300	18	31
6330 J	ND<10000 U	-3670	18	32
4200 J	ND<10000 U	-5800	18	33
38900 J+	9250 J	29650	19	33
ND<10000 U	9250 J	750	20	33
33800	9250 J	24550	21	33
7500 J	9250 J	-1750	21	34
ND<25000 U	9250 J	15750	22	34
5420 J	9250 J	-3830	22	35
5620 J	9250 J	-3630	22	36
ND<10000 U	9250 J	750	23	36
12300	9250 J	3050	24	36
6330 J	9250 J	-2920	24	37
4200 J	9250 J	-5050	24	38
ND<10000 U	38900 J+	-28900	24	39
33800	38900 J+	-5100	24	40
7500 J	38900 J+	-31400	24	41
ND<25000 U	38900 J+	-13900	24	42
5420 J	38900 J+	-33480	24	43
5620 J	38900 J+	-33280	24	44
ND<10000 U	38900 J+	-28900	24	45
12300	38900 J+	-26600	24	46
6330 J	38900 J+	-32570	24	47
4200 J	38900 J+	-34700	24	48
33800	ND<10000 U	23800	25	48
7500 J	ND<10000 U	-2500	25	49
ND<25000 U	ND<10000 U	15000	26	49
5420 J	ND<10000 U	-4580	26	50
5620 J	ND<10000 U	-4380	26	51
ND<10000 U	ND<10000 U	0	26	51
12300	ND<10000 U	2300	27	51
6330 J	ND<10000 U	-3670	27	52
4200 J	ND<10000 U	-5800	27	53
7500 J	33800	-26300	27	54
ND<25000 U	33800	-8800	27	55
5420 J	33800	-28380	27	56
5620 J	33800	-28180	27	57
ND<10000 U	33800	-23800	27	58
12300	33800	-21500	27	59
6330 J	33800	-27470	27	60
4200 J	33800	-29600	27	61
ND<25000 U	7500 J	17500	28	61
5420 J	7500 J	-2080	28	62
5620 J	7500 J	-1880	28	63
ND<10000 U	7500 J	2500	29	63

12300	7500 J	4800	30	63
6330 J	7500 J	-1170	30	64
4200 J	7500 J	-3300	30	65
5420 J	ND<25000 U	-19580	30	66
5620 J	ND<25000 U	-19380	30	67
ND<10000 U	ND<25000 U	-15000	30	68
12300	ND<25000 U	-12700	30	69
6330 J	ND<25000 U	-18670	30	70
4200 J	ND<25000 U	-20800	30	71
5620 J	5420 J	200	31	71
ND<10000 U	5420 J	4580	32	71
12300	5420 J	6880	33	71
6330 J	5420 J	910	34	71
4200 J	5420 J	-1220	34	72
ND<10000 U	5620 J	4380	35	72
12300	5620 J	6680	36	72
6330 J	5620 J	710	37	72
4200 J	5620 J	-1420	37	73
12300	ND<10000 U	2300	38	73
6330 J	ND<10000 U	-3670	38	74
4200 J	ND<10000 U	-5800	38	75
6330 J	12300	-5970	38	76
4200 J	12300	-8100	38	77
4200 J	6330 J	-2130	38	78

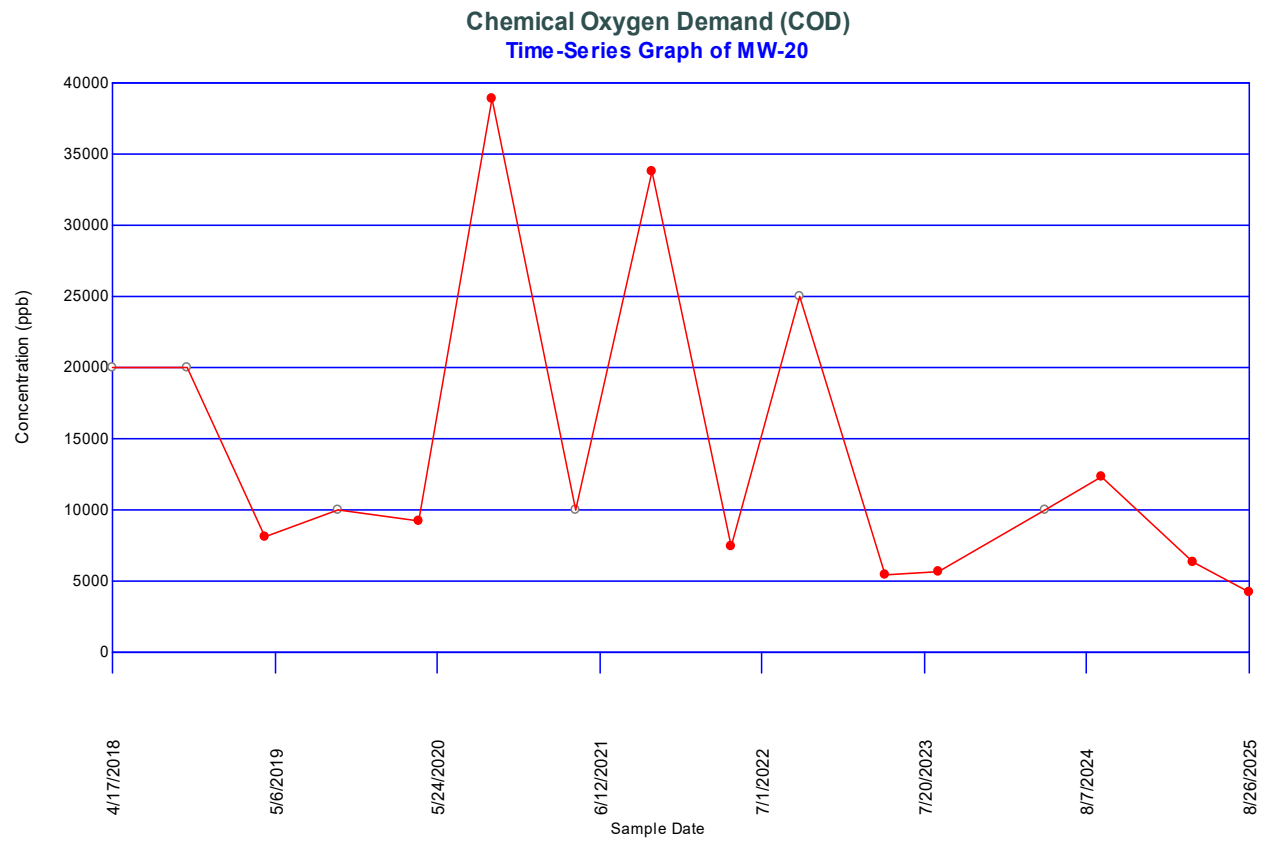
S Statistic = 38 - 78 = -40

Tied Group	Value	Members
1	20000	2
2	10000	3

Time Period	Observations
4/17/2018	1
10/10/2018	1
4/14/2019	1
10/2/2019	1
4/9/2020	1
10/2/2020	1
4/15/2021	1
10/12/2021	1
4/20/2022	1
9/28/2022	1
4/19/2023	1
8/23/2023	1
4/30/2024	1
9/11/2024	1
4/15/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 488.667
Z-Score = -1.76424
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|-1.76424| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Chemical Oxygen Demand (COD)

Location: MW-25

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.351226	0.0930987	0.507	None

Loc.	Date	Conc.	Outlier
MW-25	4/17/2018	4170 J+	FALSE
	10/9/2018	ND<20000 U	FALSE
	4/13/2019	6500 J	FALSE
	10/1/2019	5630 J	FALSE
	4/8/2020	12300	FALSE
	10/1/2020	ND<25000 U	FALSE
	4/14/2021	10700	FALSE
	10/13/2021	35600	FALSE
	4/19/2022	ND<10000 U	FALSE
	9/29/2022	ND<25000 U	FALSE
	4/19/2023	5420 J	FALSE
	8/24/2023	ND<10000 U	FALSE
	4/29/2024	14800	FALSE
	9/10/2024	13500	FALSE
	4/14/2025	3410 J	FALSE
	8/26/2025	5580 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chemical Oxygen Demand (COD)

Location: MW-25

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	3410	35600	32190	0.5056	16275.3
2	4170	25000	20830	0.329	6853.07
3	5420	25000	19580	0.2521	4936.12
4	5580	20000	14420	0.1939	2796.04
5	5630	14800	9170	0.1447	1326.9
6	6500	13500	7000	0.1005	703.5
7	10000	12300	2300	0.0593	136.39
8	10000	10700	700	0.0196	13.72
9	10700	10000	-700		
10	12300	10000	-2300		
11	13500	6500	-7000		
12	14800	5630	-9170		
13	20000	5580	-14420		
14	25000	5420	-19580		
15	25000	4170	-20830		
16	35600	3410	-32190		

Sum of b values = 33041

Sample Standard Deviation = 9143.44

W Statistic = 0.870554

5% Critical value of 0.887 exceeds 0.870554

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.870554

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chemical Oxygen Demand (COD)

Location: MW-25

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<20000 U	4170 J+	15830	1	0
6500 J	4170 J+	2330	2	0
5630 J	4170 J+	1460	3	0
12300	4170 J+	8130	4	0
ND<25000 U	4170 J+	20830	5	0
10700	4170 J+	6530	6	0
35600	4170 J+	31430	7	0
ND<10000 U	4170 J+	5830	8	0
ND<25000 U	4170 J+	20830	9	0
5420 J	4170 J+	1250	10	0
ND<10000 U	4170 J+	5830	11	0
14800	4170 J+	10630	12	0
13500	4170 J+	9330	13	0
3410 J	4170 J+	-760	13	1
5580 J	4170 J+	1410	14	1
6500 J	ND<20000 U	-13500	14	2
5630 J	ND<20000 U	-14370	14	3
12300	ND<20000 U	-7700	14	4
ND<25000 U	ND<20000 U	5000	15	4
10700	ND<20000 U	-9300	15	5
35600	ND<20000 U	15600	16	5
ND<10000 U	ND<20000 U	-10000	16	6
ND<25000 U	ND<20000 U	5000	17	6
5420 J	ND<20000 U	-14580	17	7
ND<10000 U	ND<20000 U	-10000	17	8
14800	ND<20000 U	-5200	17	9
13500	ND<20000 U	-6500	17	10
3410 J	ND<20000 U	-16590	17	11
5580 J	ND<20000 U	-14420	17	12
5630 J	6500 J	-870	17	13
12300	6500 J	5800	18	13
ND<25000 U	6500 J	18500	19	13
10700	6500 J	4200	20	13
35600	6500 J	29100	21	13
ND<10000 U	6500 J	3500	22	13
ND<25000 U	6500 J	18500	23	13
5420 J	6500 J	-1080	23	14
ND<10000 U	6500 J	3500	24	14
14800	6500 J	8300	25	14
13500	6500 J	7000	26	14
3410 J	6500 J	-3090	26	15
5580 J	6500 J	-920	26	16
12300	5630 J	6670	27	16
ND<25000 U	5630 J	19370	28	16

10700	5630 J	5070	29	16
35600	5630 J	29970	30	16
ND<10000 U	5630 J	4370	31	16
ND<25000 U	5630 J	19370	32	16
5420 J	5630 J	-210	32	17
ND<10000 U	5630 J	4370	33	17
14800	5630 J	9170	34	17
13500	5630 J	7870	35	17
3410 J	5630 J	-2220	35	18
5580 J	5630 J	-50	35	19
ND<25000 U	12300	12700	36	19
10700	12300	-1600	36	20
35600	12300	23300	37	20
ND<10000 U	12300	-2300	37	21
ND<25000 U	12300	12700	38	21
5420 J	12300	-6880	38	22
ND<10000 U	12300	-2300	38	23
14800	12300	2500	39	23
13500	12300	1200	40	23
3410 J	12300	-8890	40	24
5580 J	12300	-6720	40	25
10700	ND<25000 U	-14300	40	26
35600	ND<25000 U	10600	41	26
ND<10000 U	ND<25000 U	-15000	41	27
ND<25000 U	ND<25000 U	0	41	27
5420 J	ND<25000 U	-19580	41	28
ND<10000 U	ND<25000 U	-15000	41	29
14800	ND<25000 U	-10200	41	30
13500	ND<25000 U	-11500	41	31
3410 J	ND<25000 U	-21590	41	32
5580 J	ND<25000 U	-19420	41	33
35600	10700	24900	42	33
ND<10000 U	10700	-700	42	34
ND<25000 U	10700	14300	43	34
5420 J	10700	-5280	43	35
ND<10000 U	10700	-700	43	36
14800	10700	4100	44	36
13500	10700	2800	45	36
3410 J	10700	-7290	45	37
5580 J	10700	-5120	45	38
ND<10000 U	35600	-25600	45	39
ND<25000 U	35600	-10600	45	40
5420 J	35600	-30180	45	41
ND<10000 U	35600	-25600	45	42
14800	35600	-20800	45	43
13500	35600	-22100	45	44
3410 J	35600	-32190	45	45
5580 J	35600	-30020	45	46
ND<25000 U	ND<10000 U	15000	46	46
5420 J	ND<10000 U	-4580	46	47
ND<10000 U	ND<10000 U	0	46	47
14800	ND<10000 U	4800	47	47

13500	ND<10000 U	3500	48	47
3410 J	ND<10000 U	-6590	48	48
5580 J	ND<10000 U	-4420	48	49
5420 J	ND<25000 U	-19580	48	50
ND<10000 U	ND<25000 U	-15000	48	51
14800	ND<25000 U	-10200	48	52
13500	ND<25000 U	-11500	48	53
3410 J	ND<25000 U	-21590	48	54
5580 J	ND<25000 U	-19420	48	55
ND<10000 U	5420 J	4580	49	55
14800	5420 J	9380	50	55
13500	5420 J	8080	51	55
3410 J	5420 J	-2010	51	56
5580 J	5420 J	160	52	56
14800	ND<10000 U	4800	53	56
13500	ND<10000 U	3500	54	56
3410 J	ND<10000 U	-6590	54	57
5580 J	ND<10000 U	-4420	54	58
13500	14800	-1300	54	59
3410 J	14800	-11390	54	60
5580 J	14800	-9220	54	61
3410 J	13500	-10090	54	62
5580 J	13500	-7920	54	63
5580 J	3410 J	2170	55	63

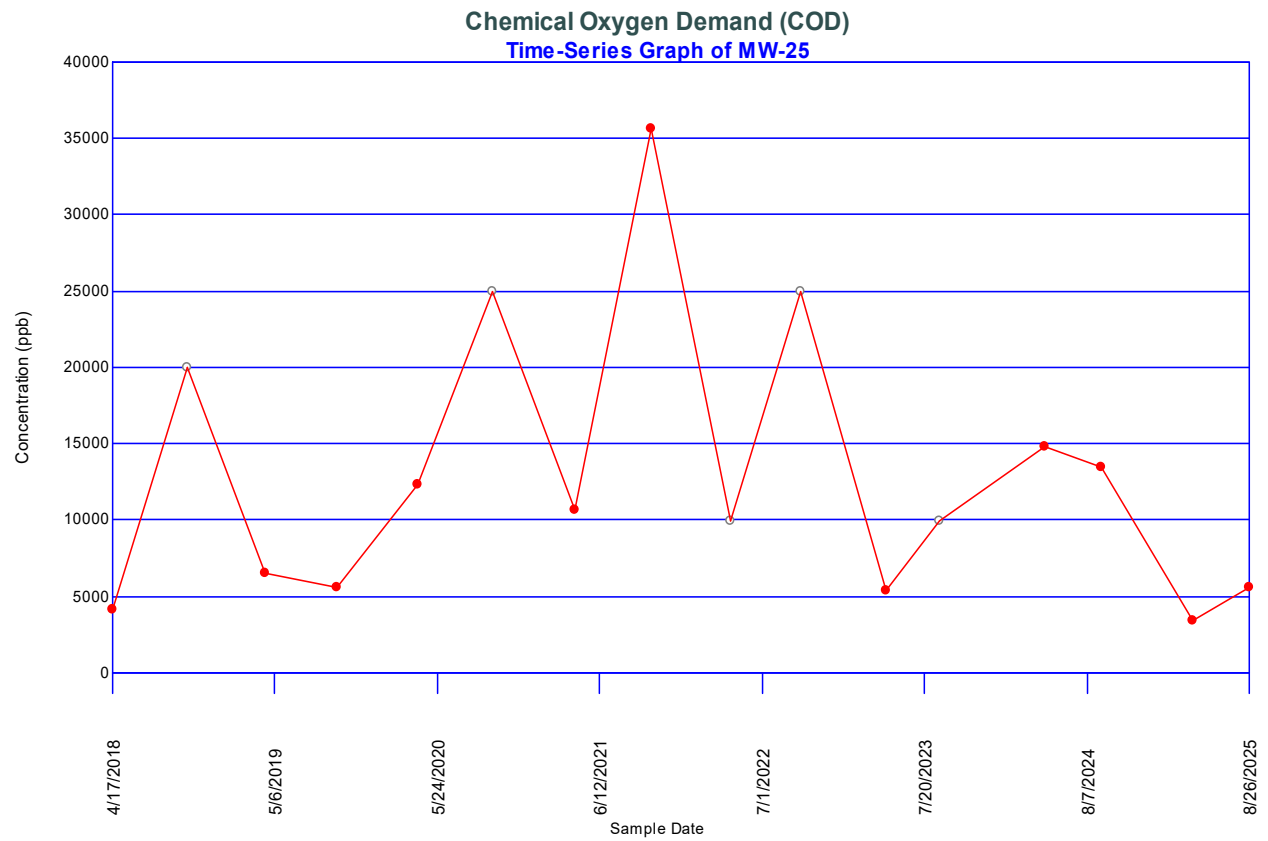
S Statistic = 55 - 63 = -8

Tied Group	Value	Members
1	25000	2
2	10000	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/8/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/19/2022	1
9/29/2022	1
4/19/2023	1
8/24/2023	1
4/29/2024	1
9/10/2024	1
4/14/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 491.333
Z-Score = -0.315798
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|-0.315798| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Chemical Oxygen Demand (COD)

Location: MW-26

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.628548	0.146716	0.507	56000
2	0.399738	0.146716	0.525	None

Loc.	Date	Conc.	Outlier
MW-26	4/17/2018	5400 J+	FALSE
	10/9/2018	ND<20000 U	FALSE
	4/13/2019	10800 J	FALSE
	10/1/2019	6680 J	FALSE
	4/8/2020	56000	TRUE
	10/1/2020	37200 J+	FALSE
	4/14/2021	ND<10000 U	FALSE
	10/13/2021	ND<25000 U	FALSE
	4/19/2022	7500 J	FALSE
	9/29/2022	ND<25000 U	FALSE
	4/19/2023	3530 J	FALSE
	8/24/2023	ND<10000 U	FALSE
	4/29/2024	9670 J	FALSE
	9/10/2024	18400	FALSE
	4/15/2025	7630 J	FALSE
	8/26/2025	8000 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chemical Oxygen Demand (COD)

Location: MW-26

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	3530	56000	52470	0.5056	26528.8
2	5400	37200	31800	0.329	10462.2
3	6680	25000	18320	0.2521	4618.47
4	7500	25000	17500	0.1939	3393.25
5	7630	20000	12370	0.1447	1789.94
6	8000	18400	10400	0.1005	1045.2
7	9670	10800	1130	0.0593	67.009
8	10000	10000	0	0.0196	0
9	10000	10000	0		
10	10800	9670	-1130		
11	18400	8000	-10400		
12	20000	7630	-12370		
13	25000	7500	-17500		
14	25000	6680	-18320		
15	37200	5400	-31800		
16	56000	3530	-52470		

Sum of b values = 47904.9

Sample Standard Deviation = 13980.7

W Statistic = 0.78273

5% Critical value of 0.887 exceeds 0.78273

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.78273

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chemical Oxygen Demand (COD)

Location: MW-26

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<20000 U	5400 J+	14600	1	0
10800 J	5400 J+	5400	2	0
6680 J	5400 J+	1280	3	0
56000	5400 J+	50600	4	0
37200 J+	5400 J+	31800	5	0
ND<10000 U	5400 J+	4600	6	0
ND<25000 U	5400 J+	19600	7	0
7500 J	5400 J+	2100	8	0
ND<25000 U	5400 J+	19600	9	0
3530 J	5400 J+	-1870	9	1
ND<10000 U	5400 J+	4600	10	1
9670 J	5400 J+	4270	11	1
18400	5400 J+	13000	12	1
7630 J	5400 J+	2230	13	1
8000 J	5400 J+	2600	14	1
10800 J	ND<20000 U	-9200	14	2
6680 J	ND<20000 U	-13320	14	3
56000	ND<20000 U	36000	15	3
37200 J+	ND<20000 U	17200	16	3
ND<10000 U	ND<20000 U	-10000	16	4
ND<25000 U	ND<20000 U	5000	17	4
7500 J	ND<20000 U	-12500	17	5
ND<25000 U	ND<20000 U	5000	18	5
3530 J	ND<20000 U	-16470	18	6
ND<10000 U	ND<20000 U	-10000	18	7
9670 J	ND<20000 U	-10330	18	8
18400	ND<20000 U	-1600	18	9
7630 J	ND<20000 U	-12370	18	10
8000 J	ND<20000 U	-12000	18	11
6680 J	10800 J	-4120	18	12
56000	10800 J	45200	19	12
37200 J+	10800 J	26400	20	12
ND<10000 U	10800 J	-800	20	13
ND<25000 U	10800 J	14200	21	13
7500 J	10800 J	-3300	21	14
ND<25000 U	10800 J	14200	22	14
3530 J	10800 J	-7270	22	15
ND<10000 U	10800 J	-800	22	16
9670 J	10800 J	-1130	22	17
18400	10800 J	7600	23	17
7630 J	10800 J	-3170	23	18
8000 J	10800 J	-2800	23	19
56000	6680 J	49320	24	19
37200 J+	6680 J	30520	25	19

ND<10000 U	6680 J	3320	26	19
ND<25000 U	6680 J	18320	27	19
7500 J	6680 J	820	28	19
ND<25000 U	6680 J	18320	29	19
3530 J	6680 J	-3150	29	20
ND<10000 U	6680 J	3320	30	20
9670 J	6680 J	2990	31	20
18400	6680 J	11720	32	20
7630 J	6680 J	950	33	20
8000 J	6680 J	1320	34	20
37200 J+	56000	-18800	34	21
ND<10000 U	56000	-46000	34	22
ND<25000 U	56000	-31000	34	23
7500 J	56000	-48500	34	24
ND<25000 U	56000	-31000	34	25
3530 J	56000	-52470	34	26
ND<10000 U	56000	-46000	34	27
9670 J	56000	-46330	34	28
18400	56000	-37600	34	29
7630 J	56000	-48370	34	30
8000 J	56000	-48000	34	31
ND<10000 U	37200 J+	-27200	34	32
ND<25000 U	37200 J+	-12200	34	33
7500 J	37200 J+	-29700	34	34
ND<25000 U	37200 J+	-12200	34	35
3530 J	37200 J+	-33670	34	36
ND<10000 U	37200 J+	-27200	34	37
9670 J	37200 J+	-27530	34	38
18400	37200 J+	-18800	34	39
7630 J	37200 J+	-29570	34	40
8000 J	37200 J+	-29200	34	41
ND<25000 U	ND<10000 U	15000	35	41
7500 J	ND<10000 U	-2500	35	42
ND<25000 U	ND<10000 U	15000	36	42
3530 J	ND<10000 U	-6470	36	43
ND<10000 U	ND<10000 U	0	36	43
9670 J	ND<10000 U	-330	36	44
18400	ND<10000 U	8400	37	44
7630 J	ND<10000 U	-2370	37	45
8000 J	ND<10000 U	-2000	37	46
7500 J	ND<25000 U	-17500	37	47
ND<25000 U	ND<25000 U	0	37	47
3530 J	ND<25000 U	-21470	37	48
ND<10000 U	ND<25000 U	-15000	37	49
9670 J	ND<25000 U	-15330	37	50
18400	ND<25000 U	-6600	37	51
7630 J	ND<25000 U	-17370	37	52
8000 J	ND<25000 U	-17000	37	53
ND<25000 U	7500 J	17500	38	53
3530 J	7500 J	-3970	38	54
ND<10000 U	7500 J	2500	39	54
9670 J	7500 J	2170	40	54

18400	7500 J	10900	41	54
7630 J	7500 J	130	42	54
8000 J	7500 J	500	43	54
3530 J	ND<25000 U	-21470	43	55
ND<10000 U	ND<25000 U	-15000	43	56
9670 J	ND<25000 U	-15330	43	57
18400	ND<25000 U	-6600	43	58
7630 J	ND<25000 U	-17370	43	59
8000 J	ND<25000 U	-17000	43	60
ND<10000 U	3530 J	6470	44	60
9670 J	3530 J	6140	45	60
18400	3530 J	14870	46	60
7630 J	3530 J	4100	47	60
8000 J	3530 J	4470	48	60
9670 J	ND<10000 U	-330	48	61
18400	ND<10000 U	8400	49	61
7630 J	ND<10000 U	-2370	49	62
8000 J	ND<10000 U	-2000	49	63
18400	9670 J	8730	50	63
7630 J	9670 J	-2040	50	64
8000 J	9670 J	-1670	50	65
7630 J	18400	-10770	50	66
8000 J	18400	-10400	50	67
8000 J	7630 J	370	51	67

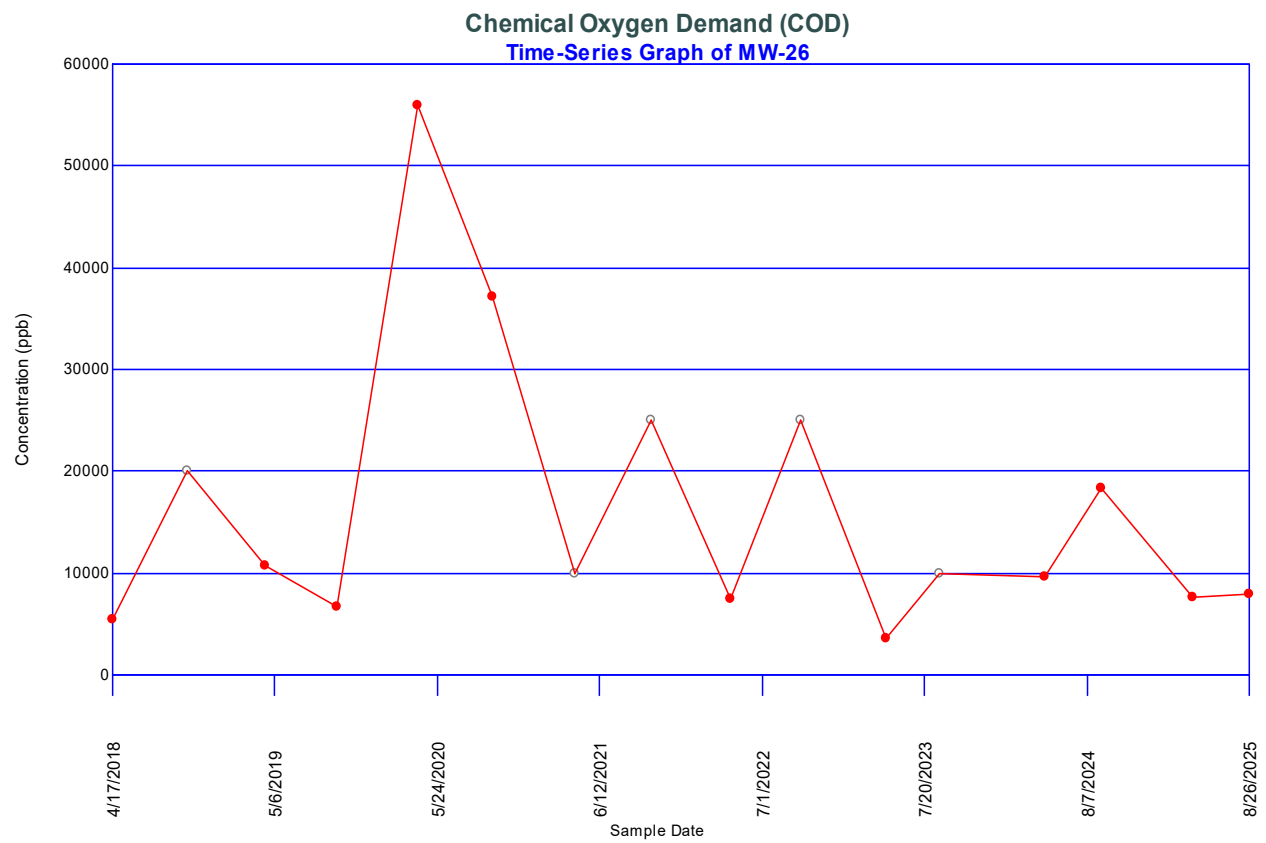
S Statistic = 51 - 67 = -16

Tied Group	Value	Members
1	10000	2
2	25000	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/8/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/19/2022	1
9/29/2022	1
4/19/2023	1
8/24/2023	1
4/29/2024	1
9/10/2024	1
4/15/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 491.333
Z-Score = -0.676711
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|-0.676711| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Chemical Oxygen Demand (COD)

Location: SW-01

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.471773	0.111062	0.507	None

Loc.	Date	Conc.	Outlier
SW-01	4/16/2018	11500 J	FALSE
	10/8/2018	15100 J	FALSE
	4/13/2019	4450 J	FALSE
	9/30/2019	20300	FALSE
	4/7/2020	20100	FALSE
	10/2/2020	35600 J+	FALSE
	4/13/2021	14300	FALSE
	10/14/2021	42800	FALSE
	4/19/2022	11000	FALSE
	9/27/2022	ND<25000 U	FALSE
	4/18/2023	2580 J	FALSE
	8/22/2023	5070 J	FALSE
	4/30/2024	ND<10000 U	FALSE
	9/10/2024	19600	FALSE
	4/14/2025	10900	FALSE
	8/26/2025	7650 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chemical Oxygen Demand (COD)

Location: SW-01

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2580	42800	40220	0.5056	20335.2
2	4450	35600	31150	0.329	10248.4
3	5070	25000	19930	0.2521	5024.35
4	7650	20300	12650	0.1939	2452.84
5	10000	20100	10100	0.1447	1461.47
6	10900	19600	8700	0.1005	874.35
7	11000	15100	4100	0.0593	243.13
8	11500	14300	2800	0.0196	54.88
9	14300	11500	-2800		
10	15100	11000	-4100		
11	19600	10900	-8700		
12	20100	10000	-10100		
13	20300	7650	-12650		
14	25000	5070	-19930		
15	35600	4450	-31150		
16	42800	2580	-40220		

Sum of b values = 40694.6

Sample Standard Deviation = 11091.5

W Statistic = 0.897439

5% Critical value of 0.887 is less than 0.897439

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.897439

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chemical Oxygen Demand (COD)

Location: SW-01

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
15100 J	11500 J	3600	1	0
4450 J	11500 J	-7050	1	1
20300	11500 J	8800	2	1
20100	11500 J	8600	3	1
35600 J+	11500 J	24100	4	1
14300	11500 J	2800	5	1
42800	11500 J	31300	6	1
11000	11500 J	-500	6	2
ND<25000 U	11500 J	13500	7	2
2580 J	11500 J	-8920	7	3
5070 J	11500 J	-6430	7	4
ND<10000 U	11500 J	-1500	7	5
19600	11500 J	8100	8	5
10900	11500 J	-600	8	6
7650 J	11500 J	-3850	8	7
4450 J	15100 J	-10650	8	8
20300	15100 J	5200	9	8
20100	15100 J	5000	10	8
35600 J+	15100 J	20500	11	8
14300	15100 J	-800	11	9
42800	15100 J	27700	12	9
11000	15100 J	-4100	12	10
ND<25000 U	15100 J	9900	13	10
2580 J	15100 J	-12520	13	11
5070 J	15100 J	-10030	13	12
ND<10000 U	15100 J	-5100	13	13
19600	15100 J	4500	14	13
10900	15100 J	-4200	14	14
7650 J	15100 J	-7450	14	15
20300	4450 J	15850	15	15
20100	4450 J	15650	16	15
35600 J+	4450 J	31150	17	15
14300	4450 J	9850	18	15
42800	4450 J	38350	19	15
11000	4450 J	6550	20	15
ND<25000 U	4450 J	20550	21	15
2580 J	4450 J	-1870	21	16
5070 J	4450 J	620	22	16
ND<10000 U	4450 J	5550	23	16
19600	4450 J	15150	24	16
10900	4450 J	6450	25	16
7650 J	4450 J	3200	26	16
20100	20300	-200	26	17
35600 J+	20300	15300	27	17

14300	20300	-6000	27	18
42800	20300	22500	28	18
11000	20300	-9300	28	19
ND<25000 U	20300	4700	29	19
2580 J	20300	-17720	29	20
5070 J	20300	-15230	29	21
ND<10000 U	20300	-10300	29	22
19600	20300	-700	29	23
10900	20300	-9400	29	24
7650 J	20300	-12650	29	25
35600 J+	20100	15500	30	25
14300	20100	-5800	30	26
42800	20100	22700	31	26
11000	20100	-9100	31	27
ND<25000 U	20100	4900	32	27
2580 J	20100	-17520	32	28
5070 J	20100	-15030	32	29
ND<10000 U	20100	-10100	32	30
19600	20100	-500	32	31
10900	20100	-9200	32	32
7650 J	20100	-12450	32	33
14300	35600 J+	-21300	32	34
42800	35600 J+	7200	33	34
11000	35600 J+	-24600	33	35
ND<25000 U	35600 J+	-10600	33	36
2580 J	35600 J+	-33020	33	37
5070 J	35600 J+	-30530	33	38
ND<10000 U	35600 J+	-25600	33	39
19600	35600 J+	-16000	33	40
10900	35600 J+	-24700	33	41
7650 J	35600 J+	-27950	33	42
42800	14300	28500	34	42
11000	14300	-3300	34	43
ND<25000 U	14300	10700	35	43
2580 J	14300	-11720	35	44
5070 J	14300	-9230	35	45
ND<10000 U	14300	-4300	35	46
19600	14300	5300	36	46
10900	14300	-3400	36	47
7650 J	14300	-6650	36	48
11000	42800	-31800	36	49
ND<25000 U	42800	-17800	36	50
2580 J	42800	-40220	36	51
5070 J	42800	-37730	36	52
ND<10000 U	42800	-32800	36	53
19600	42800	-23200	36	54
10900	42800	-31900	36	55
7650 J	42800	-35150	36	56
ND<25000 U	11000	14000	37	56
2580 J	11000	-8420	37	57
5070 J	11000	-5930	37	58
ND<10000 U	11000	-1000	37	59

19600	11000	8600	38	59
10900	11000	-100	38	60
7650 J	11000	-3350	38	61
2580 J	ND<25000 U	-22420	38	62
5070 J	ND<25000 U	-19930	38	63
ND<10000 U	ND<25000 U	-15000	38	64
19600	ND<25000 U	-5400	38	65
10900	ND<25000 U	-14100	38	66
7650 J	ND<25000 U	-17350	38	67
5070 J	2580 J	2490	39	67
ND<10000 U	2580 J	7420	40	67
19600	2580 J	17020	41	67
10900	2580 J	8320	42	67
7650 J	2580 J	5070	43	67
ND<10000 U	5070 J	4930	44	67
19600	5070 J	14530	45	67
10900	5070 J	5830	46	67
7650 J	5070 J	2580	47	67
19600	ND<10000 U	9600	48	67
10900	ND<10000 U	900	49	67
7650 J	ND<10000 U	-2350	49	68
10900	19600	-8700	49	69
7650 J	19600	-11950	49	70
7650 J	10900	-3250	49	71

S Statistic = 49 - 71 = -22

Tied Group	Value	Members
Time Period	Observations	
4/16/2018	1	
10/8/2018	1	
4/13/2019	1	
9/30/2019	1	
4/7/2020	1	
10/2/2020	1	
4/13/2021	1	
10/14/2021	1	
4/19/2022	1	
9/27/2022	1	
4/18/2023	1	
8/22/2023	1	
4/30/2024	1	
9/10/2024	1	
4/14/2025	1	
8/26/2025	1	
There are 0 time periods with multiple data		

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

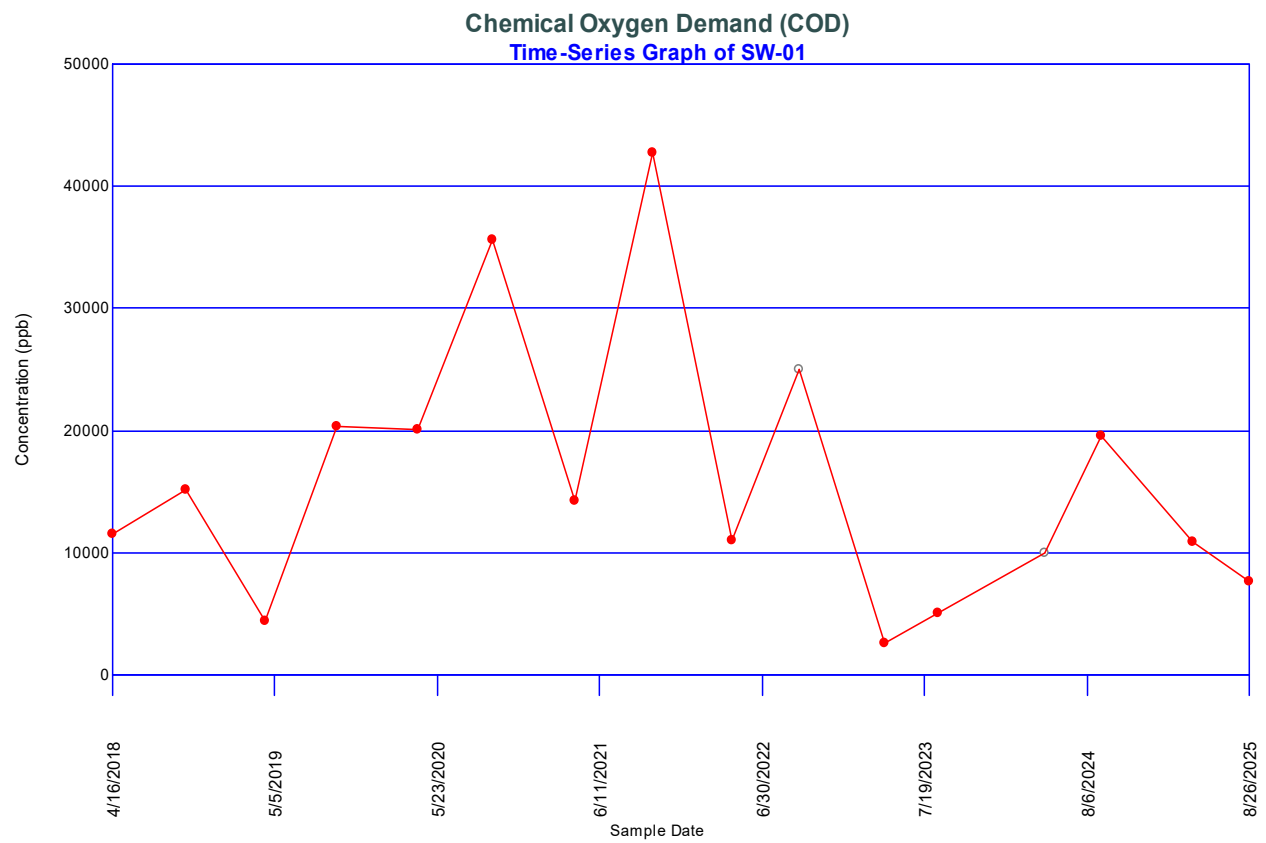
c = 480

Group Variance = 493.333

Z-Score = -0.945473

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.945473| \leq 1.97737$ indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Chemical Oxygen Demand (COD)

Location: SW-02

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.289544	0.111037	0.507	None

Loc.	Date	Conc.	Outlier
SW-02	4/16/2018	14400 J	FALSE
	10/8/2018	14100 J	FALSE
	4/13/2019	16200 J	FALSE
	9/30/2019	11800	FALSE
	4/7/2020	36500	FALSE
	10/2/2020	47300 J+	FALSE
	4/13/2021	10200	FALSE
	10/14/2021	41000	FALSE
	4/19/2022	18000	FALSE
	9/27/2022	ND<25000 U	FALSE
	4/18/2023	6690 J	FALSE
	8/22/2023	ND<10000 U	FALSE
	4/30/2024	6730 J	FALSE
	9/10/2024	18700	FALSE
	4/14/2025	14100	FALSE
	8/26/2025	21100	FALSE

Shapiro-Wilks Test of Normality

Parameter: Chemical Oxygen Demand (COD)

Location: SW-02

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6690	47300	40610	0.5056	20532.4
2	6730	41000	34270	0.329	11274.8
3	10000	36500	26500	0.2521	6680.65
4	10200	25000	14800	0.1939	2869.72
5	11800	21100	9300	0.1447	1345.71
6	14100	18700	4600	0.1005	462.3
7	14100	18000	3900	0.0593	231.27
8	14400	16200	1800	0.0196	35.28
9	16200	14400	-1800		
10	18000	14100	-3900		
11	18700	14100	-4600		
12	21100	11800	-9300		
13	25000	10200	-14800		
14	36500	10000	-26500		
15	41000	6730	-34270		
16	47300	6690	-40610		

Sum of b values = 43432.2

Sample Standard Deviation = 12160.6

W Statistic = 0.850396

5% Critical value of 0.887 exceeds 0.850396

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.850396

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Chemical Oxygen Demand (COD)

Location: SW-02

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
14100 J	14400 J	-300	0	1
16200 J	14400 J	1800	1	1
11800	14400 J	-2600	1	2
36500	14400 J	22100	2	2
47300 J+	14400 J	32900	3	2
10200	14400 J	-4200	3	3
41000	14400 J	26600	4	3
18000	14400 J	3600	5	3
ND<25000 U	14400 J	10600	6	3
6690 J	14400 J	-7710	6	4
ND<10000 U	14400 J	-4400	6	5
6730 J	14400 J	-7670	6	6
18700	14400 J	4300	7	6
14100	14400 J	-300	7	7
21100	14400 J	6700	8	7
16200 J	14100 J	2100	9	7
11800	14100 J	-2300	9	8
36500	14100 J	22400	10	8
47300 J+	14100 J	33200	11	8
10200	14100 J	-3900	11	9
41000	14100 J	26900	12	9
18000	14100 J	3900	13	9
ND<25000 U	14100 J	10900	14	9
6690 J	14100 J	-7410	14	10
ND<10000 U	14100 J	-4100	14	11
6730 J	14100 J	-7370	14	12
18700	14100 J	4600	15	12
14100	14100 J	0	15	12
21100	14100 J	7000	16	12
11800	16200 J	-4400	16	13
36500	16200 J	20300	17	13
47300 J+	16200 J	31100	18	13
10200	16200 J	-6000	18	14
41000	16200 J	24800	19	14
18000	16200 J	1800	20	14
ND<25000 U	16200 J	8800	21	14
6690 J	16200 J	-9510	21	15
ND<10000 U	16200 J	-6200	21	16
6730 J	16200 J	-9470	21	17
18700	16200 J	2500	22	17
14100	16200 J	-2100	22	18
21100	16200 J	4900	23	18
36500	11800	24700	24	18
47300 J+	11800	35500	25	18

10200	11800	-1600	25	19
41000	11800	29200	26	19
18000	11800	6200	27	19
ND<25000 U	11800	13200	28	19
6690 J	11800	-5110	28	20
ND<10000 U	11800	-1800	28	21
6730 J	11800	-5070	28	22
18700	11800	6900	29	22
14100	11800	2300	30	22
21100	11800	9300	31	22
47300 J+	36500	10800	32	22
10200	36500	-26300	32	23
41000	36500	4500	33	23
18000	36500	-18500	33	24
ND<25000 U	36500	-11500	33	25
6690 J	36500	-29810	33	26
ND<10000 U	36500	-26500	33	27
6730 J	36500	-29770	33	28
18700	36500	-17800	33	29
14100	36500	-22400	33	30
21100	36500	-15400	33	31
10200	47300 J+	-37100	33	32
41000	47300 J+	-6300	33	33
18000	47300 J+	-29300	33	34
ND<25000 U	47300 J+	-22300	33	35
6690 J	47300 J+	-40610	33	36
ND<10000 U	47300 J+	-37300	33	37
6730 J	47300 J+	-40570	33	38
18700	47300 J+	-28600	33	39
14100	47300 J+	-33200	33	40
21100	47300 J+	-26200	33	41
41000	10200	30800	34	41
18000	10200	7800	35	41
ND<25000 U	10200	14800	36	41
6690 J	10200	-3510	36	42
ND<10000 U	10200	-200	36	43
6730 J	10200	-3470	36	44
18700	10200	8500	37	44
14100	10200	3900	38	44
21100	10200	10900	39	44
18000	41000	-23000	39	45
ND<25000 U	41000	-16000	39	46
6690 J	41000	-34310	39	47
ND<10000 U	41000	-31000	39	48
6730 J	41000	-34270	39	49
18700	41000	-22300	39	50
14100	41000	-26900	39	51
21100	41000	-19900	39	52
ND<25000 U	18000	7000	40	52
6690 J	18000	-11310	40	53
ND<10000 U	18000	-8000	40	54
6730 J	18000	-11270	40	55

18700	18000	700	41	55
14100	18000	-3900	41	56
21100	18000	3100	42	56
6690 J	ND<25000 U	-18310	42	57
ND<10000 U	ND<25000 U	-15000	42	58
6730 J	ND<25000 U	-18270	42	59
18700	ND<25000 U	-6300	42	60
14100	ND<25000 U	-10900	42	61
21100	ND<25000 U	-3900	42	62
ND<10000 U	6690 J	3310	43	62
6730 J	6690 J	40	44	62
18700	6690 J	12010	45	62
14100	6690 J	7410	46	62
21100	6690 J	14410	47	62
6730 J	ND<10000 U	-3270	47	63
18700	ND<10000 U	8700	48	63
14100	ND<10000 U	4100	49	63
21100	ND<10000 U	11100	50	63
18700	6730 J	11970	51	63
14100	6730 J	7370	52	63
21100	6730 J	14370	53	63
14100	18700	-4600	53	64
21100	18700	2400	54	64
21100	14100	7000	55	64

S Statistic = 55 - 64 = -9

Tied Group	Value	Members
1	14100	2

Time Period	Observations
4/16/2018	1
10/8/2018	1
4/13/2019	1
9/30/2019	1
4/7/2020	1
10/2/2020	1
4/13/2021	1
10/14/2021	1
4/19/2022	1
9/27/2022	1
4/18/2023	1
8/22/2023	1
4/30/2024	1
9/10/2024	1
4/14/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

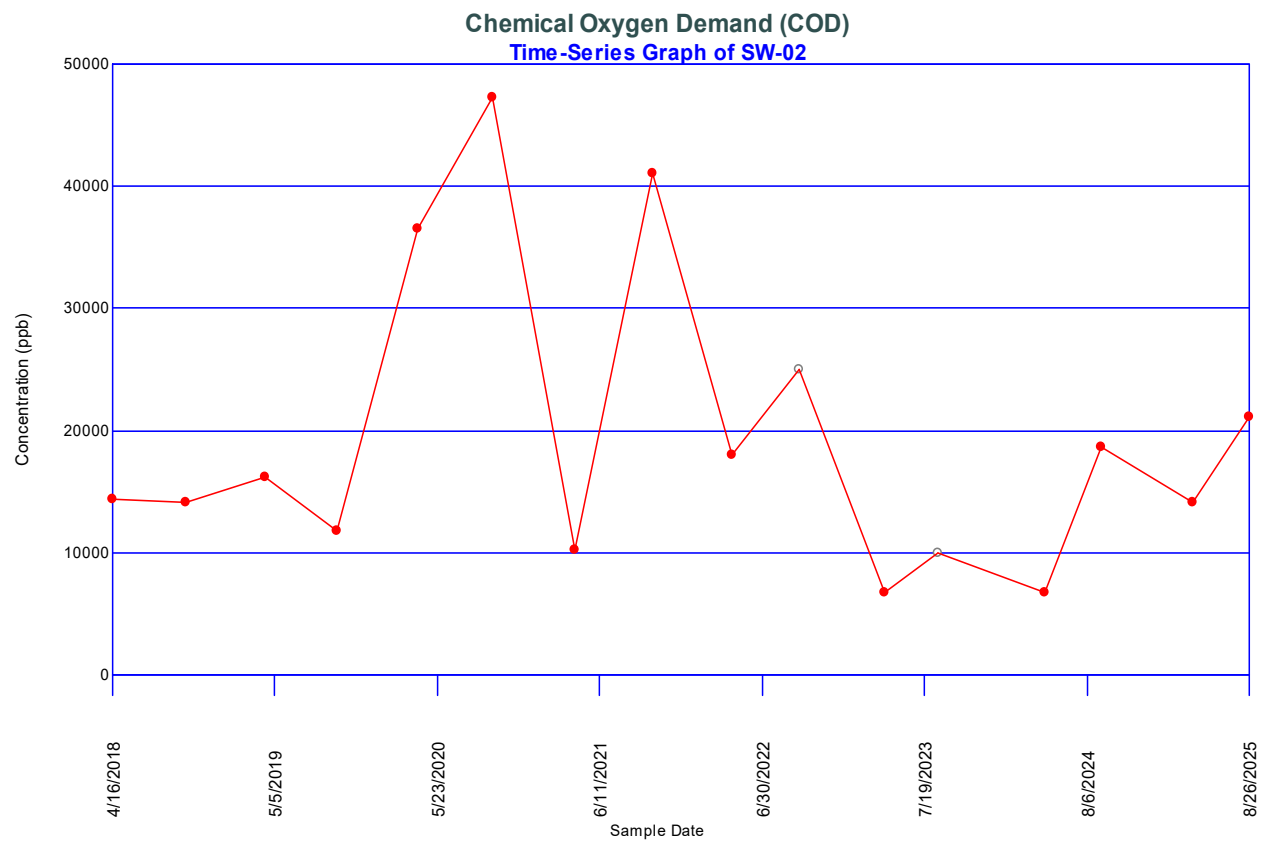
c = 480

Group Variance = 492.333

Z-Score = -0.360546

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.360546| \leq 1.97737$ indicating no evidence of a trend



Concentrations (ppb)

Parameter: Fluoride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 16

Total Non-Detect: 0

Percent Non-Detects: 0%

Total Background Measurements: 0

There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There is 1 compliance location

Loc.	Meas.	ND	Date	Conc.	Original
MW-25	16	0 (0%)	4/17/2018	2530	2530
			10/9/2018	1770	1770
			4/13/2019	2530	2530
			10/1/2019	2010	2010
			4/8/2020	2010	2010
			10/1/2020	2090	2090
			4/14/2021	3800	3800
			10/13/2021	2400	2400
			4/19/2022	1560	1560
			9/29/2022	2160	2160
			4/19/2023	2380	2380
			8/24/2023	1830	1830
			4/29/2024	4540	4540
			9/10/2024	1950	1950
			4/14/2025	1550	1550
			8/26/2025	1930	1930

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Fluoride

Location: MW-25

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.725632	0.22449	0.507	4540
2	0.625616	0.22449	0.525	3800
3	0.171053	0.258824	0.546	None

Loc.	Date	Conc.	Outlier
MW-25	4/17/2018	2530	FALSE
	10/9/2018	1770	FALSE
	4/13/2019	2530	FALSE
	10/1/2019	2010	FALSE
	4/8/2020	2010	FALSE
	10/1/2020	2090	FALSE
	4/14/2021	3800	TRUE
	10/13/2021	2400	FALSE
	4/19/2022	1560	FALSE
	9/29/2022	2160	FALSE
	4/19/2023	2380	FALSE
	8/24/2023	1830	FALSE
	4/29/2024	4540	TRUE
	9/10/2024	1950	FALSE
	4/14/2025	1550	FALSE
	8/26/2025	1930	FALSE

Shapiro-Wilks Test of Normality

Parameter: Fluoride

Location: MW-25

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1550	4540	2990	0.5056	1511.74
2	1560	3800	2240	0.329	736.96
3	1770	2530	760	0.2521	191.596
4	1830	2530	700	0.1939	135.73
5	1930	2400	470	0.1447	68.009
6	1950	2380	430	0.1005	43.215
7	2010	2160	150	0.0593	8.895
8	2010	2090	80	0.0196	1.568
9	2090	2010	-80		
10	2160	2010	-150		
11	2380	1950	-430		
12	2400	1930	-470		
13	2530	1830	-700		
14	2530	1770	-760		
15	3800	1560	-2240		
16	4540	1550	-2990		

Sum of b values = 2697.72

Sample Standard Deviation = 795.378

W Statistic = 0.766927

5% Critical value of 0.887 exceeds 0.766927

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.766927

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Fluoride
Location: MW-25
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1770	2530	-760	0	1
2530	2530	0	0	1
2010	2530	-520	0	2
2010	2530	-520	0	3
2090	2530	-440	0	4
3800	2530	1270	1	4
2400	2530	-130	1	5
1560	2530	-970	1	6
2160	2530	-370	1	7
2380	2530	-150	1	8
1830	2530	-700	1	9
4540	2530	2010	2	9
1950	2530	-580	2	10
1550	2530	-980	2	11
1930	2530	-600	2	12
2530	1770	760	3	12
2010	1770	240	4	12
2010	1770	240	5	12
2090	1770	320	6	12
3800	1770	2030	7	12
2400	1770	630	8	12
1560	1770	-210	8	13
2160	1770	390	9	13
2380	1770	610	10	13
1830	1770	60	11	13
4540	1770	2770	12	13
1950	1770	180	13	13
1550	1770	-220	13	14
1930	1770	160	14	14
2010	2530	-520	14	15
2010	2530	-520	14	16
2090	2530	-440	14	17
3800	2530	1270	15	17
2400	2530	-130	15	18
1560	2530	-970	15	19
2160	2530	-370	15	20
2380	2530	-150	15	21
1830	2530	-700	15	22
4540	2530	2010	16	22
1950	2530	-580	16	23
1550	2530	-980	16	24
1930	2530	-600	16	25
2010	2010	0	16	25
2090	2010	80	17	25

3800	2010	1790	18	25
2400	2010	390	19	25
1560	2010	-450	19	26
2160	2010	150	20	26
2380	2010	370	21	26
1830	2010	-180	21	27
4540	2010	2530	22	27
1950	2010	-60	22	28
1550	2010	-460	22	29
1930	2010	-80	22	30
2090	2010	80	23	30
3800	2010	1790	24	30
2400	2010	390	25	30
1560	2010	-450	25	31
2160	2010	150	26	31
2380	2010	370	27	31
1830	2010	-180	27	32
4540	2010	2530	28	32
1950	2010	-60	28	33
1550	2010	-460	28	34
1930	2010	-80	28	35
3800	2090	1710	29	35
2400	2090	310	30	35
1560	2090	-530	30	36
2160	2090	70	31	36
2380	2090	290	32	36
1830	2090	-260	32	37
4540	2090	2450	33	37
1950	2090	-140	33	38
1550	2090	-540	33	39
1930	2090	-160	33	40
2400	3800	-1400	33	41
1560	3800	-2240	33	42
2160	3800	-1640	33	43
2380	3800	-1420	33	44
1830	3800	-1970	33	45
4540	3800	740	34	45
1950	3800	-1850	34	46
1550	3800	-2250	34	47
1930	3800	-1870	34	48
1560	2400	-840	34	49
2160	2400	-240	34	50
2380	2400	-20	34	51
1830	2400	-570	34	52
4540	2400	2140	35	52
1950	2400	-450	35	53
1550	2400	-850	35	54
1930	2400	-470	35	55
2160	1560	600	36	55
2380	1560	820	37	55
1830	1560	270	38	55
4540	1560	2980	39	55

1950	1560	390	40	55
1550	1560	-10	40	56
1930	1560	370	41	56
2380	2160	220	42	56
1830	2160	-330	42	57
4540	2160	2380	43	57
1950	2160	-210	43	58
1550	2160	-610	43	59
1930	2160	-230	43	60
1830	2380	-550	43	61
4540	2380	2160	44	61
1950	2380	-430	44	62
1550	2380	-830	44	63
1930	2380	-450	44	64
4540	1830	2710	45	64
1950	1830	120	46	64
1550	1830	-280	46	65
1930	1830	100	47	65
1950	4540	-2590	47	66
1550	4540	-2990	47	67
1930	4540	-2610	47	68
1550	1950	-400	47	69
1930	1950	-20	47	70
1930	1550	380	48	70

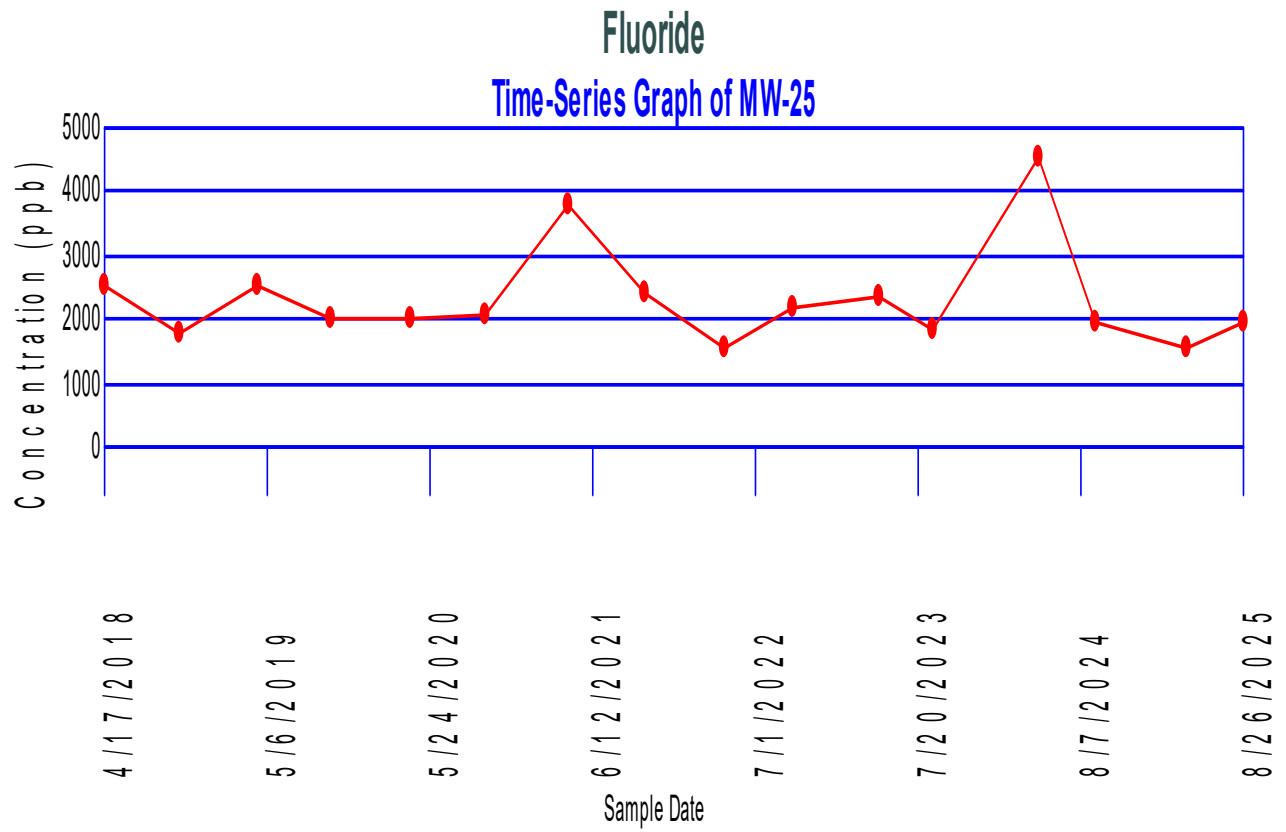
S Statistic = 48 - 70 = -22

Tied Group	Value	Members
1	2530	2
2	2010	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/8/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/19/2022	1
9/29/2022	1
4/19/2023	1
8/24/2023	1
4/29/2024	1
9/10/2024	1
4/14/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 491.333
Z-Score = -0.947395
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|-0.947395| <= 1.97737 indicating no evidence of a trend



Concentrations (ppb)

Parameter: Iron, Dissolved

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 92

Total Non-Detect: 27

Percent Non-Detects: 29.3478%

Total Background Measurements: 0

There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 6 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

MW-16	16	4 (25%)	4/17/2018	ND<25 U	ND<25 U
			10/9/2018	45.4	45.4
			4/14/2019	ND<25 R	ND<25 R
			10/2/2019	ND<100 U	ND<100 U
			4/9/2020	159	159
			10/1/2020	ND<100 U	ND<100 U
			4/15/2021	137	137
			10/14/2021	216	216
			4/19/2022	175	175
			9/28/2022	113	113
			4/18/2023	819	819
			8/24/2023	204	204
			5/2/2024	93.8 J	93.8 J
			9/12/2024	100	100
			4/16/2025	73.7 J	73.7 J
			8/28/2025	130	130

MW-07	16	4 (25%)	4/18/2018	ND<25 U	ND<25 U
			10/10/2018	297	297
			4/14/2019	ND<213 R	ND<213 R
			10/2/2019	204	204
			4/8/2020	7930	7930
			9/30/2020	801 J	801 J
			4/13/2021	8800	8800
			10/14/2021	9640	9640
			4/20/2022	8680	8680
			9/27/2022	9630	9630
			4/18/2023	2420	2420
			8/23/2023	2510	2510
			5/1/2024	52.2 J	52.2 J
			9/11/2024	9600	9600
			4/16/2025	ND<100 U	ND<100 U
			8/27/2025	ND<100 U	ND<100 U

MW-27	16	4 (25%)	4/18/2018	ND<25 U	ND<25 U
			10/9/2018	377	377
			4/13/2019	ND<25 R	ND<25 R
			10/1/2019	ND<100 U	ND<100 U
			4/9/2020	2560	2560
			10/1/2020	ND<100 U	ND<100 U
			4/14/2021	2320	2320

			10/13/2021	2200	2200
			4/20/2022	2620	2620
			9/28/2022	2560	2560
			4/19/2023	3110	3110
			8/24/2023	2340	2340
			5/1/2024	2380	2380
			9/11/2024	2520	2520
			4/16/2025	2500	2500
			8/27/2025	2400	2400
MW-26	16	3 (18.75%)	4/17/2018	18.6 J	18.6 J
			10/9/2018	500	500
			4/13/2019	ND<25 R	ND<25 R
			10/1/2019	ND<100 U	ND<100 U
			4/8/2020	1250	1250
			10/1/2020	ND<100 U	ND<100 U
			4/14/2021	1150	1150
			10/13/2021	1580	1580
			4/19/2022	1530	1530
			9/29/2022	1860	1860
			4/19/2023	1850	1850
			8/24/2023	1940	1940
			4/30/2024	1990	1990
			9/10/2024	1770	1770
			4/15/2025	2130	2130
			8/26/2025	2090	2090
SW-01	14	5 (35.7143%)	4/16/2018	210	210
			10/8/2018	379	379
			4/13/2019	1350 J+	1350 J+
			9/30/2019	298	298
			4/7/2020	4060	4060
			10/2/2020	ND<100 U	ND<100 U
			4/13/2021	ND<100 U	ND<100 U
			10/14/2021	1340	1340
			4/19/2022	ND<100 U	ND<100 U
			8/22/2023	276	276
			4/30/2024	82.8 J	82.8 J
			9/10/2024	ND<100 U	ND<100 U
			4/14/2025	ND<100 U	ND<100 U
			8/26/2025	48.6 J	48.6 J
SW-02	14	7 (50%)	4/16/2018	31.9	31.9
			10/8/2018	191	191
			4/13/2019	1040 J+	1040 J+
			9/30/2019	ND<100 U	ND<100 U
			4/7/2020	1140	1140
			10/2/2020	71.2 J	71.2 J
			4/13/2021	ND<100 U	ND<100 U
			10/14/2021	408	408
			4/19/2022	ND<100 U	ND<100 U
			8/22/2023	ND<100 U	ND<100 U
			4/30/2024	ND<100 U	ND<100 U
			9/10/2024	ND<100 U	ND<100 U
			4/14/2025	ND<100 U	ND<100 U
			8/26/2025	49.3 J	49.3 J

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Iron, Dissolved

Location: MW-07

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.00419287	0.0078329	0.507	None

Loc.	Date	Conc.	Outlier
MW-07	4/18/2018	ND<25 U	FALSE
	10/10/2018	297	FALSE
	4/14/2019	ND<213 R	FALSE
	10/2/2019	204	FALSE
	4/8/2020	7930	FALSE
	9/30/2020	801 J	FALSE
	4/13/2021	8800	FALSE
	10/14/2021	9640	FALSE
	4/20/2022	8680	FALSE
	9/27/2022	9630	FALSE
	4/18/2023	2420	FALSE
	8/23/2023	2510	FALSE
	5/1/2024	52.2 J	FALSE
	9/11/2024	9600	FALSE
	4/16/2025	ND<100 U	FALSE
	8/27/2025	ND<100 U	FALSE

Shapiro-Wilks Test of Normality

Parameter: Iron, Dissolved

Location: MW-07

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	25	9640	9615	0.5056	4861.34
2	52.2	9630	9577.8	0.329	3151.1
3	100	9600	9500	0.2521	2394.95
4	100	8800	8700	0.1939	1686.93
5	204	8680	8476	0.1447	1226.48
6	213	7930	7717	0.1005	775.559
7	297	2510	2213	0.0593	131.231
8	801	2420	1619	0.0196	31.7324
9	2420	801	-1619		
10	2510	297	-2213		
11	7930	213	-7717		
12	8680	204	-8476		
13	8800	100	-8700		
14	9600	100	-9500		
15	9630	52.2	-9577.8		
16	9640	25	-9615		

Sum of b values = 14259.3

Sample Standard Deviation = 4273.26

W Statistic = 0.742314

5% Critical value of 0.887 exceeds 0.742314

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.742314

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Iron, Dissolved
Location: MW-07
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
297	ND<25 U	272	1	0
ND<213 R	ND<25 U	188	2	0
204	ND<25 U	179	3	0
7930	ND<25 U	7905	4	0
801 J	ND<25 U	776	5	0
8800	ND<25 U	8775	6	0
9640	ND<25 U	9615	7	0
8680	ND<25 U	8655	8	0
9630	ND<25 U	9605	9	0
2420	ND<25 U	2395	10	0
2510	ND<25 U	2485	11	0
52.2 J	ND<25 U	27.2	12	0
9600	ND<25 U	9575	13	0
ND<100 U	ND<25 U	75	14	0
ND<100 U	ND<25 U	75	15	0
ND<213 R	297	-84	15	1
204	297	-93	15	2
7930	297	7633	16	2
801 J	297	504	17	2
8800	297	8503	18	2
9640	297	9343	19	2
8680	297	8383	20	2
9630	297	9333	21	2
2420	297	2123	22	2
2510	297	2213	23	2
52.2 J	297	-244.8	23	3
9600	297	9303	24	3
ND<100 U	297	-197	24	4
ND<100 U	297	-197	24	5
204	ND<213 R	-9	24	6
7930	ND<213 R	7717	25	6
801 J	ND<213 R	588	26	6
8800	ND<213 R	8587	27	6
9640	ND<213 R	9427	28	6
8680	ND<213 R	8467	29	6
9630	ND<213 R	9417	30	6
2420	ND<213 R	2207	31	6
2510	ND<213 R	2297	32	6
52.2 J	ND<213 R	-160.8	32	7
9600	ND<213 R	9387	33	7
ND<100 U	ND<213 R	-113	33	8
ND<100 U	ND<213 R	-113	33	9
7930	204	7726	34	9
801 J	204	597	35	9

8800	204	8596	36	9
9640	204	9436	37	9
8680	204	8476	38	9
9630	204	9426	39	9
2420	204	2216	40	9
2510	204	2306	41	9
52.2 J	204	-151.8	41	10
9600	204	9396	42	10
ND<100 U	204	-104	42	11
ND<100 U	204	-104	42	12
801 J	7930	-7129	42	13
8800	7930	870	43	13
9640	7930	1710	44	13
8680	7930	750	45	13
9630	7930	1700	46	13
2420	7930	-5510	46	14
2510	7930	-5420	46	15
52.2 J	7930	-7877.8	46	16
9600	7930	1670	47	16
ND<100 U	7930	-7830	47	17
ND<100 U	7930	-7830	47	18
8800	801 J	7999	48	18
9640	801 J	8839	49	18
8680	801 J	7879	50	18
9630	801 J	8829	51	18
2420	801 J	1619	52	18
2510	801 J	1709	53	18
52.2 J	801 J	-748.8	53	19
9600	801 J	8799	54	19
ND<100 U	801 J	-701	54	20
ND<100 U	801 J	-701	54	21
9640	8800	840	55	21
8680	8800	-120	55	22
9630	8800	830	56	22
2420	8800	-6380	56	23
2510	8800	-6290	56	24
52.2 J	8800	-8747.8	56	25
9600	8800	800	57	25
ND<100 U	8800	-8700	57	26
ND<100 U	8800	-8700	57	27
8680	9640	-960	57	28
9630	9640	-10	57	29
2420	9640	-7220	57	30
2510	9640	-7130	57	31
52.2 J	9640	-9587.8	57	32
9600	9640	-40	57	33
ND<100 U	9640	-9540	57	34
ND<100 U	9640	-9540	57	35
9630	8680	950	58	35
2420	8680	-6260	58	36
2510	8680	-6170	58	37
52.2 J	8680	-8627.8	58	38

9600	8680	920	59	38
ND<100 U	8680	-8580	59	39
ND<100 U	8680	-8580	59	40
2420	9630	-7210	59	41
2510	9630	-7120	59	42
52.2 J	9630	-9577.8	59	43
9600	9630	-30	59	44
ND<100 U	9630	-9530	59	45
ND<100 U	9630	-9530	59	46
2510	2420	90	60	46
52.2 J	2420	-2367.8	60	47
9600	2420	7180	61	47
ND<100 U	2420	-2320	61	48
ND<100 U	2420	-2320	61	49
52.2 J	2510	-2457.8	61	50
9600	2510	7090	62	50
ND<100 U	2510	-2410	62	51
ND<100 U	2510	-2410	62	52
9600	52.2 J	9547.8	63	52
ND<100 U	52.2 J	47.8	64	52
ND<100 U	52.2 J	47.8	65	52
ND<100 U	9600	-9500	65	53
ND<100 U	9600	-9500	65	54
ND<100 U	ND<100 U	0	65	54

S Statistic = 65 - 54 = 11

Tied Group	Value	Members
1	100	2

Time Period	Observations
4/18/2018	1
10/10/2018	1
4/14/2019	1
10/2/2019	1
4/8/2020	1
9/30/2020	1
4/13/2021	1
10/14/2021	1
4/20/2022	1
9/27/2022	1
4/18/2023	1
8/23/2023	1
5/1/2024	1
9/11/2024	1
4/16/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

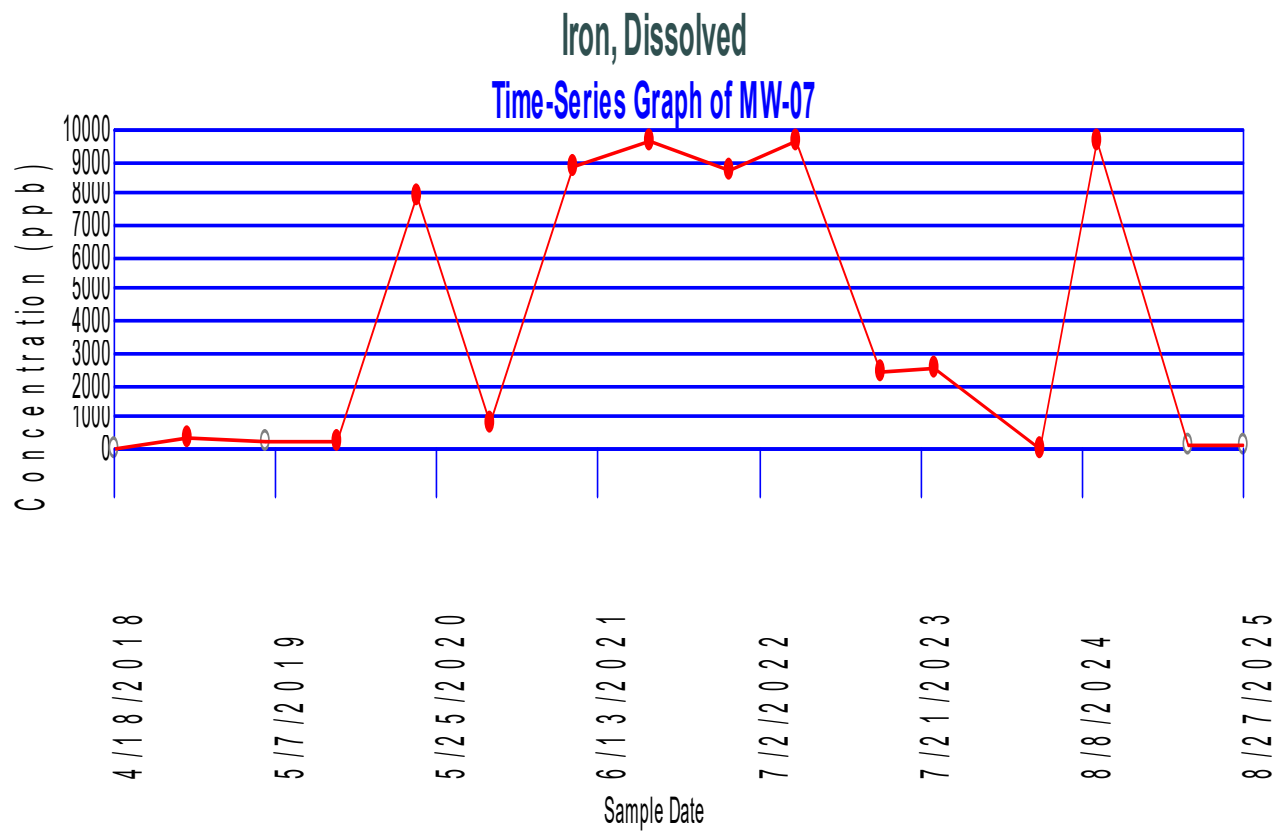
c = 480

Group Variance = 492.333

Z-Score = 0.450682

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

|0.450682| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Iron, Dissolved

Location: MW-16

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.794984	0.113966	0.507	819
2	0.240328	0.136	0.525	None

Loc.	Date	Conc.	Outlier
MW-16	4/17/2018	ND<25 U	FALSE
	10/9/2018	45.4	FALSE
	4/14/2019	ND<25 R	FALSE
	10/2/2019	ND<100 U	FALSE
	4/9/2020	159	FALSE
	10/1/2020	ND<100 U	FALSE
	4/15/2021	137	FALSE
	10/14/2021	216	FALSE
	4/19/2022	175	FALSE
	9/28/2022	113	FALSE
	4/18/2023	819	TRUE
	8/24/2023	204	FALSE
	5/2/2024	93.8 J	FALSE
	9/12/2024	100	FALSE
	4/16/2025	73.7 J	FALSE
	8/28/2025	130	FALSE

Shapiro-Wilks Test of Normality

Parameter: Iron, Dissolved

Location: MW-16

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	25	819	794	0.5056	401.446
2	25	216	191	0.329	62.839
3	45.4	204	158.6	0.2521	39.9831
4	73.7	175	101.3	0.1939	19.6421
5	93.8	159	65.2	0.1447	9.43444
6	100	137	37	0.1005	3.7185
7	100	130	30	0.0593	1.779
8	100	113	13	0.0196	0.2548
9	113	100	-13		
10	130	100	-30		
11	137	100	-37		
12	159	93.8	-65.2		
13	175	73.7	-101.3		
14	204	45.4	-158.6		
15	216	25	-191		
16	819	25	-794		

Sum of b values = 539.097

Sample Standard Deviation = 185.348

W Statistic = 0.563984

5% Critical value of 0.887 exceeds 0.563984

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.563984

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Iron, Dissolved
Location: MW-16
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
45.4	ND<25 U	20.4	1	0
ND<25 R	ND<25 U	0	1	0
ND<100 U	ND<25 U	75	2	0
159	ND<25 U	134	3	0
ND<100 U	ND<25 U	75	4	0
137	ND<25 U	112	5	0
216	ND<25 U	191	6	0
175	ND<25 U	150	7	0
113	ND<25 U	88	8	0
819	ND<25 U	794	9	0
204	ND<25 U	179	10	0
93.8 J	ND<25 U	68.8	11	0
100	ND<25 U	75	12	0
73.7 J	ND<25 U	48.7	13	0
130	ND<25 U	105	14	0
ND<25 R	45.4	-20.4	14	1
ND<100 U	45.4	54.6	15	1
159	45.4	113.6	16	1
ND<100 U	45.4	54.6	17	1
137	45.4	91.6	18	1
216	45.4	170.6	19	1
175	45.4	129.6	20	1
113	45.4	67.6	21	1
819	45.4	773.6	22	1
204	45.4	158.6	23	1
93.8 J	45.4	48.4	24	1
100	45.4	54.6	25	1
73.7 J	45.4	28.3	26	1
130	45.4	84.6	27	1
ND<100 U	ND<25 R	75	28	1
159	ND<25 R	134	29	1
ND<100 U	ND<25 R	75	30	1
137	ND<25 R	112	31	1
216	ND<25 R	191	32	1
175	ND<25 R	150	33	1
113	ND<25 R	88	34	1
819	ND<25 R	794	35	1
204	ND<25 R	179	36	1
93.8 J	ND<25 R	68.8	37	1
100	ND<25 R	75	38	1
73.7 J	ND<25 R	48.7	39	1
130	ND<25 R	105	40	1
159	ND<100 U	59	41	1
ND<100 U	ND<100 U	0	41	1

137	ND<100 U	37	42	1
216	ND<100 U	116	43	1
175	ND<100 U	75	44	1
113	ND<100 U	13	45	1
819	ND<100 U	719	46	1
204	ND<100 U	104	47	1
93.8 J	ND<100 U	-6.2	47	2
100	ND<100 U	0	47	2
73.7 J	ND<100 U	-26.3	47	3
130	ND<100 U	30	48	3
ND<100 U	159	-59	48	4
137	159	-22	48	5
216	159	57	49	5
175	159	16	50	5
113	159	-46	50	6
819	159	660	51	6
204	159	45	52	6
93.8 J	159	-65.2	52	7
100	159	-59	52	8
73.7 J	159	-85.3	52	9
130	159	-29	52	10
137	ND<100 U	37	53	10
216	ND<100 U	116	54	10
175	ND<100 U	75	55	10
113	ND<100 U	13	56	10
819	ND<100 U	719	57	10
204	ND<100 U	104	58	10
93.8 J	ND<100 U	-6.2	58	11
100	ND<100 U	0	58	11
73.7 J	ND<100 U	-26.3	58	12
130	ND<100 U	30	59	12
216	137	79	60	12
175	137	38	61	12
113	137	-24	61	13
819	137	682	62	13
204	137	67	63	13
93.8 J	137	-43.2	63	14
100	137	-37	63	15
73.7 J	137	-63.3	63	16
130	137	-7	63	17
175	216	-41	63	18
113	216	-103	63	19
819	216	603	64	19
204	216	-12	64	20
93.8 J	216	-122.2	64	21
100	216	-116	64	22
73.7 J	216	-142.3	64	23
130	216	-86	64	24
113	175	-62	64	25
819	175	644	65	25
204	175	29	66	25
93.8 J	175	-81.2	66	26

100	175	-75	66	27
73.7 J	175	-101.3	66	28
130	175	-45	66	29
819	113	706	67	29
204	113	91	68	29
93.8 J	113	-19.2	68	30
100	113	-13	68	31
73.7 J	113	-39.3	68	32
130	113	17	69	32
204	819	-615	69	33
93.8 J	819	-725.2	69	34
100	819	-719	69	35
73.7 J	819	-745.3	69	36
130	819	-689	69	37
93.8 J	204	-110.2	69	38
100	204	-104	69	39
73.7 J	204	-130.3	69	40
130	204	-74	69	41
100	93.8 J	6.2	70	41
73.7 J	93.8 J	-20.1	70	42
130	93.8 J	36.2	71	42
73.7 J	100	-26.3	71	43
130	100	30	72	43
130	73.7 J	56.3	73	43

S Statistic = 73 - 43 = 30

Tied Group	Value	Members
1	25	2
2	100	3

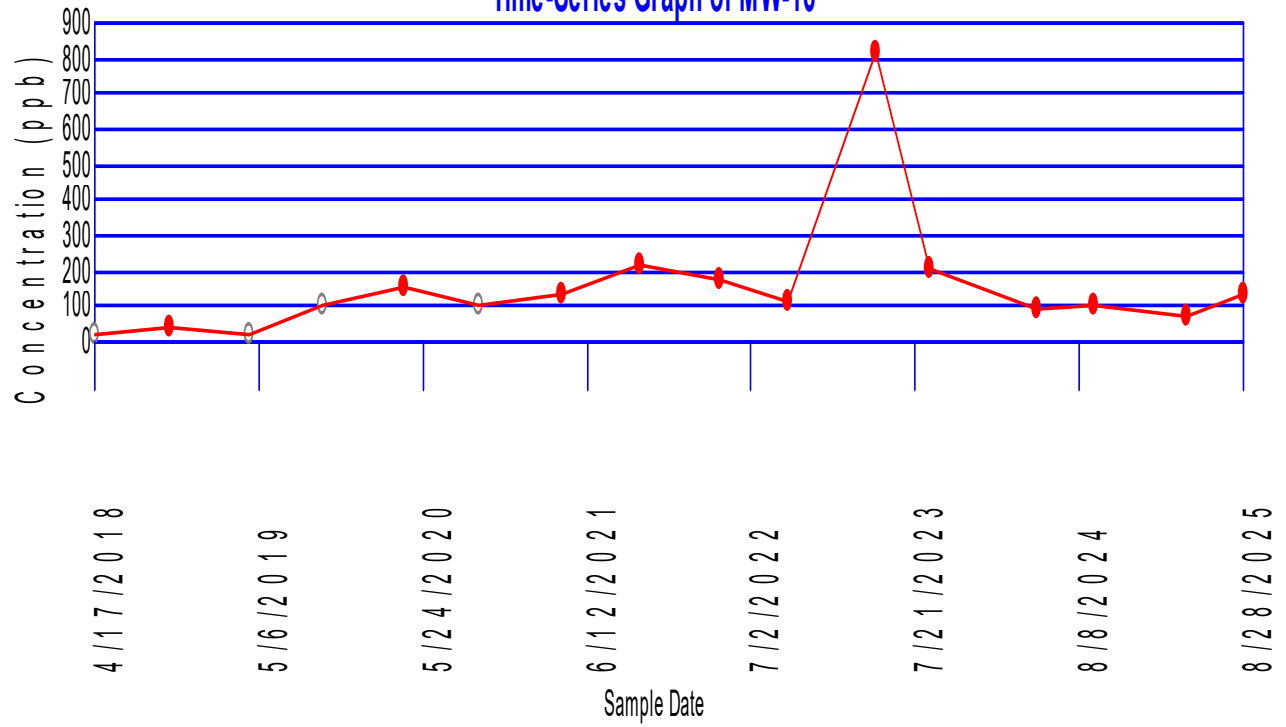
Time Period	Observations
4/17/2018	1
10/9/2018	1
4/14/2019	1
10/2/2019	1
4/9/2020	1
10/1/2020	1
4/15/2021	1
10/14/2021	1
4/19/2022	1
9/28/2022	1
4/18/2023	1
8/24/2023	1
5/2/2024	1
9/12/2024	1
4/16/2025	1
8/28/2025	1

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 488.667
Z-Score = 1.31187
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
 $|1.31187| \leq 1.97737$ indicating no evidence of a trend

Iron, Dissolved

Time-Series Graph of MW-16



Dixon's Test for Outliers

Parameter: Iron, Dissolved

Location: MW-26

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0689655	0.0412905	0.507	None

Loc.	Date	Conc.	Outlier
MW-26	4/17/2018	18.6 J	FALSE
	10/9/2018	500	FALSE
	4/13/2019	ND<25 R	FALSE
	10/1/2019	ND<100 U	FALSE
	4/8/2020	1250	FALSE
	10/1/2020	ND<100 U	FALSE
	4/14/2021	1150	FALSE
	10/13/2021	1580	FALSE
	4/19/2022	1530	FALSE
	9/29/2022	1860	FALSE
	4/19/2023	1850	FALSE
	8/24/2023	1940	FALSE
	4/30/2024	1990	FALSE
	9/10/2024	1770	FALSE
	4/15/2025	2130	FALSE
	8/26/2025	2090	FALSE

Shapiro-Wilks Test of Normality

Parameter: Iron, Dissolved

Location: MW-26

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	18.6	2130	2111.4	0.5056	1067.52
2	25	2090	2065	0.329	679.385
3	100	1990	1890	0.2521	476.469
4	100	1940	1840	0.1939	356.776
5	500	1860	1360	0.1447	196.792
6	1150	1850	700	0.1005	70.35
7	1250	1770	520	0.0593	30.836
8	1530	1580	50	0.0196	0.98
9	1580	1530	-50		
10	1770	1250	-520		
11	1850	1150	-700		
12	1860	500	-1360		
13	1940	100	-1840		
14	1990	100	-1890		
15	2090	25	-2065		
16	2130	18.6	-2111.4		

Sum of b values = 2879.11

Sample Standard Deviation = 813.516

W Statistic = 0.835014

5% Critical value of 0.887 exceeds 0.835014

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.835014

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Iron, Dissolved
Location: MW-26
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
500	18.6 J	481.4	1	0
ND<25 R	18.6 J	6.4	2	0
ND<100 U	18.6 J	81.4	3	0
1250	18.6 J	1231.4	4	0
ND<100 U	18.6 J	81.4	5	0
1150	18.6 J	1131.4	6	0
1580	18.6 J	1561.4	7	0
1530	18.6 J	1511.4	8	0
1860	18.6 J	1841.4	9	0
1850	18.6 J	1831.4	10	0
1940	18.6 J	1921.4	11	0
1990	18.6 J	1971.4	12	0
1770	18.6 J	1751.4	13	0
2130	18.6 J	2111.4	14	0
2090	18.6 J	2071.4	15	0
ND<25 R	500	-475	15	1
ND<100 U	500	-400	15	2
1250	500	750	16	2
ND<100 U	500	-400	16	3
1150	500	650	17	3
1580	500	1080	18	3
1530	500	1030	19	3
1860	500	1360	20	3
1850	500	1350	21	3
1940	500	1440	22	3
1990	500	1490	23	3
1770	500	1270	24	3
2130	500	1630	25	3
2090	500	1590	26	3
ND<100 U	ND<25 R	75	27	3
1250	ND<25 R	1225	28	3
ND<100 U	ND<25 R	75	29	3
1150	ND<25 R	1125	30	3
1580	ND<25 R	1555	31	3
1530	ND<25 R	1505	32	3
1860	ND<25 R	1835	33	3
1850	ND<25 R	1825	34	3
1940	ND<25 R	1915	35	3
1990	ND<25 R	1965	36	3
1770	ND<25 R	1745	37	3
2130	ND<25 R	2105	38	3
2090	ND<25 R	2065	39	3
1250	ND<100 U	1150	40	3
ND<100 U	ND<100 U	0	40	3

1150	ND<100 U	1050	41	3
1580	ND<100 U	1480	42	3
1530	ND<100 U	1430	43	3
1860	ND<100 U	1760	44	3
1850	ND<100 U	1750	45	3
1940	ND<100 U	1840	46	3
1990	ND<100 U	1890	47	3
1770	ND<100 U	1670	48	3
2130	ND<100 U	2030	49	3
2090	ND<100 U	1990	50	3

ND<100 U	1250	-1150	50	4
1150	1250	-100	50	5
1580	1250	330	51	5
1530	1250	280	52	5
1860	1250	610	53	5
1850	1250	600	54	5
1940	1250	690	55	5
1990	1250	740	56	5
1770	1250	520	57	5
2130	1250	880	58	5
2090	1250	840	59	5

1150	ND<100 U	1050	60	5
1580	ND<100 U	1480	61	5
1530	ND<100 U	1430	62	5
1860	ND<100 U	1760	63	5
1850	ND<100 U	1750	64	5
1940	ND<100 U	1840	65	5
1990	ND<100 U	1890	66	5
1770	ND<100 U	1670	67	5
2130	ND<100 U	2030	68	5
2090	ND<100 U	1990	69	5

1580	1150	430	70	5
1530	1150	380	71	5
1860	1150	710	72	5
1850	1150	700	73	5
1940	1150	790	74	5
1990	1150	840	75	5
1770	1150	620	76	5
2130	1150	980	77	5
2090	1150	940	78	5

1530	1580	-50	78	6
1860	1580	280	79	6
1850	1580	270	80	6
1940	1580	360	81	6
1990	1580	410	82	6
1770	1580	190	83	6
2130	1580	550	84	6
2090	1580	510	85	6

1860	1530	330	86	6
1850	1530	320	87	6
1940	1530	410	88	6
1990	1530	460	89	6

1770	1530	240	90	6
2130	1530	600	91	6
2090	1530	560	92	6
1850	1860	-10	92	7
1940	1860	80	93	7
1990	1860	130	94	7
1770	1860	-90	94	8
2130	1860	270	95	8
2090	1860	230	96	8
1940	1850	90	97	8
1990	1850	140	98	8
1770	1850	-80	98	9
2130	1850	280	99	9
2090	1850	240	100	9
1990	1940	50	101	9
1770	1940	-170	101	10
2130	1940	190	102	10
2090	1940	150	103	10
1770	1990	-220	103	11
2130	1990	140	104	11
2090	1990	100	105	11
2130	1770	360	106	11
2090	1770	320	107	11
2090	2130	-40	107	12

S Statistic = 107 - 12 = 95

Tied Group	Value	Members
1	100	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/8/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/19/2022	1
9/29/2022	1
4/19/2023	1
8/24/2023	1
4/30/2024	1
9/10/2024	1
4/15/2025	1
8/26/2025	1
There are 0 time periods with multiple data	

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

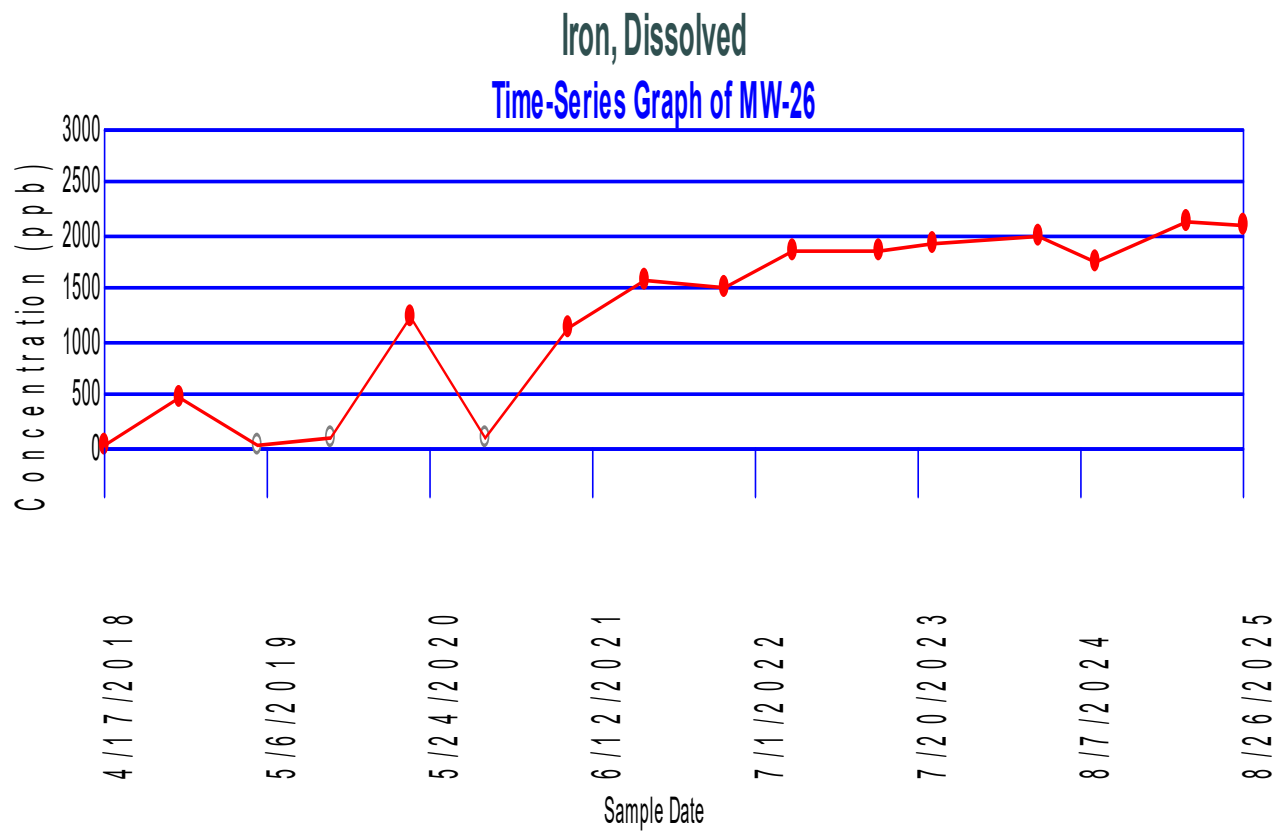
c = 480

Group Variance = 492.333

Z-Score = 4.23641

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

|4.23641| > 1.97737 indicating a trend



Dixon's Test for Outliers

Parameter: Iron, Dissolved

Location: MW-27

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.182724	0.0295858	0.507	None

Loc.	Date	Conc.	Outlier
MW-27	4/18/2018	ND<25 U	FALSE
	10/9/2018	377	FALSE
	4/13/2019	ND<25 R	FALSE
	10/1/2019	ND<100 U	FALSE
	4/9/2020	2560	FALSE
	10/1/2020	ND<100 U	FALSE
	4/14/2021	2320	FALSE
	10/13/2021	2200	FALSE
	4/20/2022	2620	FALSE
	9/28/2022	2560	FALSE
	4/19/2023	3110	FALSE
	8/24/2023	2340	FALSE
	5/1/2024	2380	FALSE
	9/11/2024	2520	FALSE
	4/16/2025	2500	FALSE
	8/27/2025	2400	FALSE

Shapiro-Wilks Test of Normality

Parameter: Iron, Dissolved

Location: MW-27

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	25	3110	3085	0.5056	1559.78
2	25	2620	2595	0.329	853.755
3	100	2560	2460	0.2521	620.166
4	100	2560	2460	0.1939	476.994
5	377	2520	2143	0.1447	310.092
6	2200	2500	300	0.1005	30.15
7	2320	2400	80	0.0593	4.744
8	2340	2380	40	0.0196	0.784
9	2380	2340	-40		
10	2400	2320	-80		
11	2500	2200	-300		
12	2520	377	-2143		
13	2560	100	-2460		
14	2560	100	-2460		
15	2620	25	-2595		
16	3110	25	-3085		

Sum of b values = 3856.46

Sample Standard Deviation = 1156.12

W Statistic = 0.74179

5% Critical value of 0.887 exceeds 0.74179

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.74179

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Iron, Dissolved
Location: MW-27
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
377	ND<25 U	352	1	0
ND<25 R	ND<25 U	0	1	0
ND<100 U	ND<25 U	75	2	0
2560	ND<25 U	2535	3	0
ND<100 U	ND<25 U	75	4	0
2320	ND<25 U	2295	5	0
2200	ND<25 U	2175	6	0
2620	ND<25 U	2595	7	0
2560	ND<25 U	2535	8	0
3110	ND<25 U	3085	9	0
2340	ND<25 U	2315	10	0
2380	ND<25 U	2355	11	0
2520	ND<25 U	2495	12	0
2500	ND<25 U	2475	13	0
2400	ND<25 U	2375	14	0
ND<25 R	377	-352	14	1
ND<100 U	377	-277	14	2
2560	377	2183	15	2
ND<100 U	377	-277	15	3
2320	377	1943	16	3
2200	377	1823	17	3
2620	377	2243	18	3
2560	377	2183	19	3
3110	377	2733	20	3
2340	377	1963	21	3
2380	377	2003	22	3
2520	377	2143	23	3
2500	377	2123	24	3
2400	377	2023	25	3
ND<100 U	ND<25 R	75	26	3
2560	ND<25 R	2535	27	3
ND<100 U	ND<25 R	75	28	3
2320	ND<25 R	2295	29	3
2200	ND<25 R	2175	30	3
2620	ND<25 R	2595	31	3
2560	ND<25 R	2535	32	3
3110	ND<25 R	3085	33	3
2340	ND<25 R	2315	34	3
2380	ND<25 R	2355	35	3
2520	ND<25 R	2495	36	3
2500	ND<25 R	2475	37	3
2400	ND<25 R	2375	38	3
2560	ND<100 U	2460	39	3
ND<100 U	ND<100 U	0	39	3

2320	ND<100 U	2220	40	3
2200	ND<100 U	2100	41	3
2620	ND<100 U	2520	42	3
2560	ND<100 U	2460	43	3
3110	ND<100 U	3010	44	3
2340	ND<100 U	2240	45	3
2380	ND<100 U	2280	46	3
2520	ND<100 U	2420	47	3
2500	ND<100 U	2400	48	3
2400	ND<100 U	2300	49	3
ND<100 U	2560	-2460	49	4
2320	2560	-240	49	5
2200	2560	-360	49	6
2620	2560	60	50	6
2560	2560	0	50	6
3110	2560	550	51	6
2340	2560	-220	51	7
2380	2560	-180	51	8
2520	2560	-40	51	9
2500	2560	-60	51	10
2400	2560	-160	51	11
2320	ND<100 U	2220	52	11
2200	ND<100 U	2100	53	11
2620	ND<100 U	2520	54	11
2560	ND<100 U	2460	55	11
3110	ND<100 U	3010	56	11
2340	ND<100 U	2240	57	11
2380	ND<100 U	2280	58	11
2520	ND<100 U	2420	59	11
2500	ND<100 U	2400	60	11
2400	ND<100 U	2300	61	11
2200	2320	-120	61	12
2620	2320	300	62	12
2560	2320	240	63	12
3110	2320	790	64	12
2340	2320	20	65	12
2380	2320	60	66	12
2520	2320	200	67	12
2500	2320	180	68	12
2400	2320	80	69	12
2620	2200	420	70	12
2560	2200	360	71	12
3110	2200	910	72	12
2340	2200	140	73	12
2380	2200	180	74	12
2520	2200	320	75	12
2500	2200	300	76	12
2400	2200	200	77	12
2560	2620	-60	77	13
3110	2620	490	78	13
2340	2620	-280	78	14
2380	2620	-240	78	15

2520	2620	-100	78	16
2500	2620	-120	78	17
2400	2620	-220	78	18
3110	2560	550	79	18
2340	2560	-220	79	19
2380	2560	-180	79	20
2520	2560	-40	79	21
2500	2560	-60	79	22
2400	2560	-160	79	23
2340	3110	-770	79	24
2380	3110	-730	79	25
2520	3110	-590	79	26
2500	3110	-610	79	27
2400	3110	-710	79	28
2380	2340	40	80	28
2520	2340	180	81	28
2500	2340	160	82	28
2400	2340	60	83	28
2520	2380	140	84	28
2500	2380	120	85	28
2400	2380	20	86	28
2500	2520	-20	86	29
2400	2520	-120	86	30
2400	2500	-100	86	31

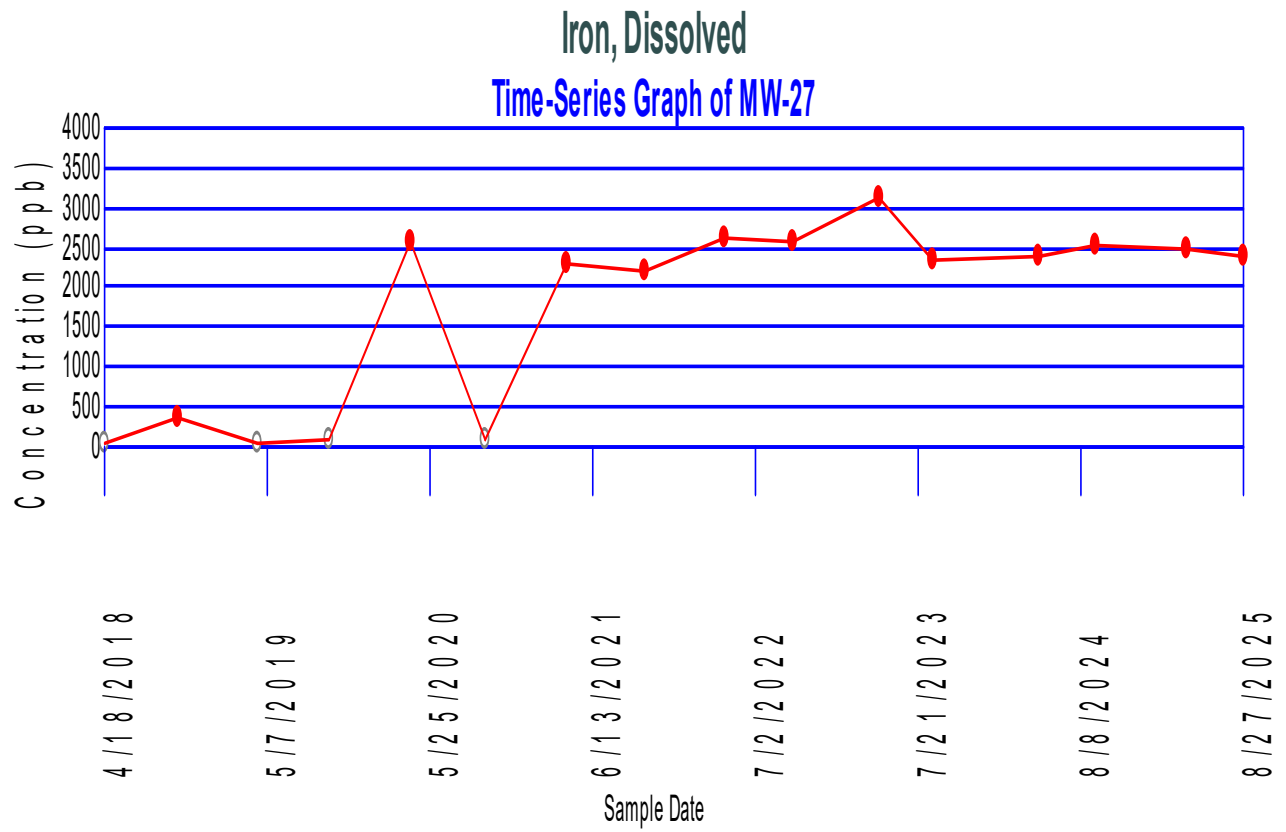
S Statistic = 86 - 31 = 55

Tied Group	Value	Members
1	25	2
2	100	2
3	2560	2

Time Period	Observations
4/18/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/9/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/20/2022	1
9/28/2022	1
4/19/2023	1
8/24/2023	1
5/1/2024	1
9/11/2024	1
4/16/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 490.333
Z-Score = 2.43864
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|2.43864| > 1.97737 indicating a trend



Dixon's Test for Outliers

Parameter: Iron, Dissolved

Location: SW-01

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 14 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.686869	0.0398018	0.546	4060
2	0.766256	0.0398018	0.521	1350
3	0.828826	0.155569	0.546	1340
4	0.347738	0.206095	0.576	None

Loc.	Date	Conc.	Outlier
SW-01	4/16/2018	210	FALSE
	10/8/2018	379	FALSE
	4/13/2019	1350 J+	TRUE
	9/30/2019	298	FALSE
	4/7/2020	4060	TRUE
	10/2/2020	ND<100 U	FALSE
	4/13/2021	ND<100 U	FALSE
	10/14/2021	1340	TRUE
	4/19/2022	ND<100 U	FALSE
	8/22/2023	276	FALSE
	4/30/2024	82.8 J	FALSE
	9/10/2024	ND<100 U	FALSE
	4/14/2025	ND<100 U	FALSE
	8/26/2025	48.6 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Iron, Dissolved

Location: SW-01

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 7 for 14 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	48.6	4060	4011.4	0.5251	2106.39
2	82.8	1350	1267.2	0.3318	420.457
3	100	1340	1240	0.246	305.04
4	100	379	279	0.1802	50.2758
5	100	298	198	0.124	24.552
6	100	276	176	0.0727	12.7952
7	100	210	110	0.024	2.64
8	210	100	-110		
9	276	100	-176		
10	298	100	-198		
11	379	100	-279		
12	1340	100	-1240		
13	1350	82.8	-1267.2		
14	4060	48.6	-4011.4		

Sum of b values = 2922.15

Sample Standard Deviation = 1084.82

W Statistic = 0.558142

5% Critical value of 0.874 exceeds 0.558142

Evidence of non-normality at 95% level of significance

1% Critical value of 0.825 exceeds 0.558142

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Iron, Dissolved
Location: SW-01
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
379	210	169	1	0
1350 J+	210	1140	2	0
298	210	88	3	0
4060	210	3850	4	0
ND<100 U	210	-110	4	1
ND<100 U	210	-110	4	2
1340	210	1130	5	2
ND<100 U	210	-110	5	3
276	210	66	6	3
82.8 J	210	-127.2	6	4
ND<100 U	210	-110	6	5
ND<100 U	210	-110	6	6
48.6 J	210	-161.4	6	7
1350 J+	379	971	7	7
298	379	-81	7	8
4060	379	3681	8	8
ND<100 U	379	-279	8	9
ND<100 U	379	-279	8	10
1340	379	961	9	10
ND<100 U	379	-279	9	11
276	379	-103	9	12
82.8 J	379	-296.2	9	13
ND<100 U	379	-279	9	14
ND<100 U	379	-279	9	15
48.6 J	379	-330.4	9	16
298	1350 J+	-1052	9	17
4060	1350 J+	2710	10	17
ND<100 U	1350 J+	-1250	10	18
ND<100 U	1350 J+	-1250	10	19
1340	1350 J+	-10	10	20
ND<100 U	1350 J+	-1250	10	21
276	1350 J+	-1074	10	22
82.8 J	1350 J+	-1267.2	10	23
ND<100 U	1350 J+	-1250	10	24
ND<100 U	1350 J+	-1250	10	25
48.6 J	1350 J+	-1301.4	10	26
4060	298	3762	11	26
ND<100 U	298	-198	11	27
ND<100 U	298	-198	11	28
1340	298	1042	12	28
ND<100 U	298	-198	12	29
276	298	-22	12	30
82.8 J	298	-215.2	12	31
ND<100 U	298	-198	12	32

ND<100 U	298	-198	12	33
48.6 J	298	-249.4	12	34
ND<100 U	4060	-3960	12	35
ND<100 U	4060	-3960	12	36
1340	4060	-2720	12	37
ND<100 U	4060	-3960	12	38
276	4060	-3784	12	39
82.8 J	4060	-3977.2	12	40
ND<100 U	4060	-3960	12	41
ND<100 U	4060	-3960	12	42
48.6 J	4060	-4011.4	12	43
ND<100 U	ND<100 U	0	12	43
1340	ND<100 U	1240	13	43
ND<100 U	ND<100 U	0	13	43
276	ND<100 U	176	14	43
82.8 J	ND<100 U	-17.2	14	44
ND<100 U	ND<100 U	0	14	44
ND<100 U	ND<100 U	0	14	44
48.6 J	ND<100 U	-51.4	14	45
1340	ND<100 U	1240	15	45
ND<100 U	ND<100 U	0	15	45
276	ND<100 U	176	16	45
82.8 J	ND<100 U	-17.2	16	46
ND<100 U	ND<100 U	0	16	46
ND<100 U	ND<100 U	0	16	46
48.6 J	ND<100 U	-51.4	16	47
ND<100 U	1340	-1240	16	48
276	1340	-1064	16	49
82.8 J	1340	-1257.2	16	50
ND<100 U	1340	-1240	16	51
ND<100 U	1340	-1240	16	52
48.6 J	1340	-1291.4	16	53
276	ND<100 U	176	17	53
82.8 J	ND<100 U	-17.2	17	54
ND<100 U	ND<100 U	0	17	54
ND<100 U	ND<100 U	0	17	54
48.6 J	ND<100 U	-51.4	17	55
82.8 J	276	-193.2	17	56
ND<100 U	276	-176	17	57
ND<100 U	276	-176	17	58
48.6 J	276	-227.4	17	59
ND<100 U	82.8 J	17.2	18	59
ND<100 U	82.8 J	17.2	19	59
48.6 J	82.8 J	-34.2	19	60
ND<100 U	ND<100 U	0	19	60
48.6 J	ND<100 U	-51.4	19	61
48.6 J	ND<100 U	-51.4	19	62

S Statistic = $19 - 62 = -43$

Tied Group	Value	Members
1	100	5

Time Period	Observations

4/16/2018	1
10/8/2018	1
4/13/2019	1
9/30/2019	1
4/7/2020	1
10/2/2020	1
4/13/2021	1
10/14/2021	1
4/19/2022	1
8/22/2023	1
4/30/2024	1
9/10/2024	1
4/14/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 300

B = 0

C = 60

D = 0

E = 20

F = 0

a = 6006

b = 19656

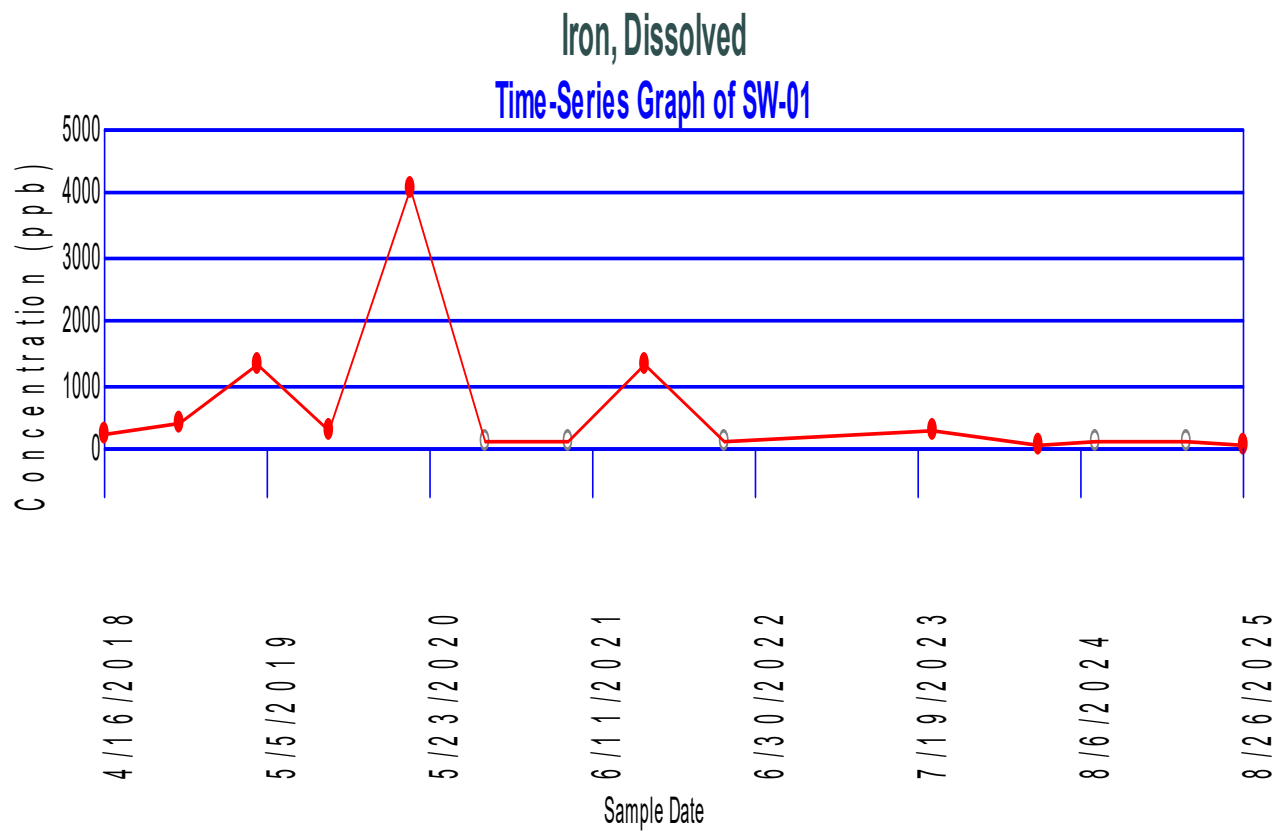
c = 364

Group Variance = 317

Z-Score = -2.35896

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-2.35896| > 1.97737$ indicating a trend



Dixon's Test for Outliers

Parameter: Iron, Dissolved

Location: SW-02

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 14 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.68488	0.104493	0.546	1140
2	0.85697	0.104493	0.521	1040
3	0.858656	0.247014	0.546	408
4	0.642202	0.577093	0.576	191
5	0	0.255507	0.477	None

Loc.	Date	Conc.	Outlier
SW-02	4/16/2018	31.9	FALSE
	10/8/2018	191	TRUE
	4/13/2019	1040 J+	TRUE
	9/30/2019	ND<100 U	FALSE
	4/7/2020	1140	TRUE
	10/2/2020	71.2 J	FALSE
	4/13/2021	ND<100 U	FALSE
	10/14/2021	408	TRUE
	4/19/2022	ND<100 U	FALSE
	8/22/2023	ND<100 U	FALSE
	4/30/2024	ND<100 U	FALSE
	9/10/2024	ND<100 U	FALSE
	4/14/2025	ND<100 U	FALSE
	8/26/2025	49.3 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Iron, Dissolved

Location: SW-02

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 7 for 14 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	31.9	1140	1108.1	0.5251	581.863
2	49.3	1040	990.7	0.3318	328.714
3	71.2	408	336.8	0.246	82.8528
4	100	191	91	0.1802	16.3982
5	100	100	0	0.124	0
6	100	100	0	0.0727	0
7	100	100	0	0.024	0
8	100	100	0		
9	100	100	0		
10	100	100	0		
11	191	100	-91		
12	408	71.2	-336.8		
13	1040	49.3	-990.7		
14	1140	31.9	-1108.1		

Sum of b values = 1009.83

Sample Standard Deviation = 363.818

W Statistic = 0.592629

5% Critical value of 0.874 exceeds 0.592629

Evidence of non-normality at 95% level of significance

1% Critical value of 0.825 exceeds 0.592629

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Iron, Dissolved
Location: SW-02
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
191	31.9	159.1	1	0
1040 J+	31.9	1008.1	2	0
ND<100 U	31.9	68.1	3	0
1140	31.9	1108.1	4	0
71.2 J	31.9	39.3	5	0
ND<100 U	31.9	68.1	6	0
408	31.9	376.1	7	0
ND<100 U	31.9	68.1	8	0
ND<100 U	31.9	68.1	9	0
ND<100 U	31.9	68.1	10	0
ND<100 U	31.9	68.1	11	0
ND<100 U	31.9	68.1	12	0
49.3 J	31.9	17.4	13	0
1040 J+	191	849	14	0
ND<100 U	191	-91	14	1
1140	191	949	15	1
71.2 J	191	-119.8	15	2
ND<100 U	191	-91	15	3
408	191	217	16	3
ND<100 U	191	-91	16	4
ND<100 U	191	-91	16	5
ND<100 U	191	-91	16	6
ND<100 U	191	-91	16	7
ND<100 U	191	-91	16	8
49.3 J	191	-141.7	16	9
ND<100 U	1040 J+	-940	16	10
1140	1040 J+	100	17	10
71.2 J	1040 J+	-968.8	17	11
ND<100 U	1040 J+	-940	17	12
408	1040 J+	-632	17	13
ND<100 U	1040 J+	-940	17	14
ND<100 U	1040 J+	-940	17	15
ND<100 U	1040 J+	-940	17	16
ND<100 U	1040 J+	-940	17	17
ND<100 U	1040 J+	-940	17	18
49.3 J	1040 J+	-990.7	17	19
1140	ND<100 U	1040	18	19
71.2 J	ND<100 U	-28.8	18	20
ND<100 U	ND<100 U	0	18	20
408	ND<100 U	308	19	20
ND<100 U	ND<100 U	0	19	20
ND<100 U	ND<100 U	0	19	20
ND<100 U	ND<100 U	0	19	20
ND<100 U	ND<100 U	0	19	20

ND<100 U	ND<100 U	0	19	20
49.3 J	ND<100 U	-50.7	19	21
71.2 J	1140	-1068.8	19	22
ND<100 U	1140	-1040	19	23
408	1140	-732	19	24
ND<100 U	1140	-1040	19	25
ND<100 U	1140	-1040	19	26
ND<100 U	1140	-1040	19	27
ND<100 U	1140	-1040	19	28
ND<100 U	1140	-1040	19	29
49.3 J	1140	-1090.7	19	30
ND<100 U	71.2 J	28.8	20	30
408	71.2 J	336.8	21	30
ND<100 U	71.2 J	28.8	22	30
ND<100 U	71.2 J	28.8	23	30
ND<100 U	71.2 J	28.8	24	30
ND<100 U	71.2 J	28.8	25	30
ND<100 U	71.2 J	28.8	26	30
49.3 J	71.2 J	-21.9	26	31
408	ND<100 U	308	27	31
ND<100 U	ND<100 U	0	27	31
ND<100 U	ND<100 U	0	27	31
ND<100 U	ND<100 U	0	27	31
ND<100 U	ND<100 U	0	27	31
ND<100 U	ND<100 U	0	27	31
49.3 J	ND<100 U	-50.7	27	32
ND<100 U	408	-308	27	33
ND<100 U	408	-308	27	34
ND<100 U	408	-308	27	35
ND<100 U	408	-308	27	36
ND<100 U	408	-308	27	37
49.3 J	408	-358.7	27	38
ND<100 U	ND<100 U	0	27	38
ND<100 U	ND<100 U	0	27	38
ND<100 U	ND<100 U	0	27	38
ND<100 U	ND<100 U	0	27	38
49.3 J	ND<100 U	-50.7	27	39
ND<100 U	ND<100 U	0	27	39
ND<100 U	ND<100 U	0	27	39
ND<100 U	ND<100 U	0	27	39
49.3 J	ND<100 U	-50.7	27	40
ND<100 U	ND<100 U	0	27	40
ND<100 U	ND<100 U	0	27	40
49.3 J	ND<100 U	-50.7	27	41
ND<100 U	ND<100 U	0	27	41
49.3 J	ND<100 U	-50.7	27	42
49.3 J	ND<100 U	-50.7	27	43

S Statistic = 27 - 43 = -16

Tied Group	Value	Members
1	100	7

Time Period	Observations

4/16/2018	1
10/8/2018	1
4/13/2019	1
9/30/2019	1
4/7/2020	1
10/2/2020	1
4/13/2021	1
10/14/2021	1
4/19/2022	1
8/22/2023	1
4/30/2024	1
9/10/2024	1
4/14/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 798

B = 0

C = 210

D = 0

E = 42

F = 0

a = 6006

b = 19656

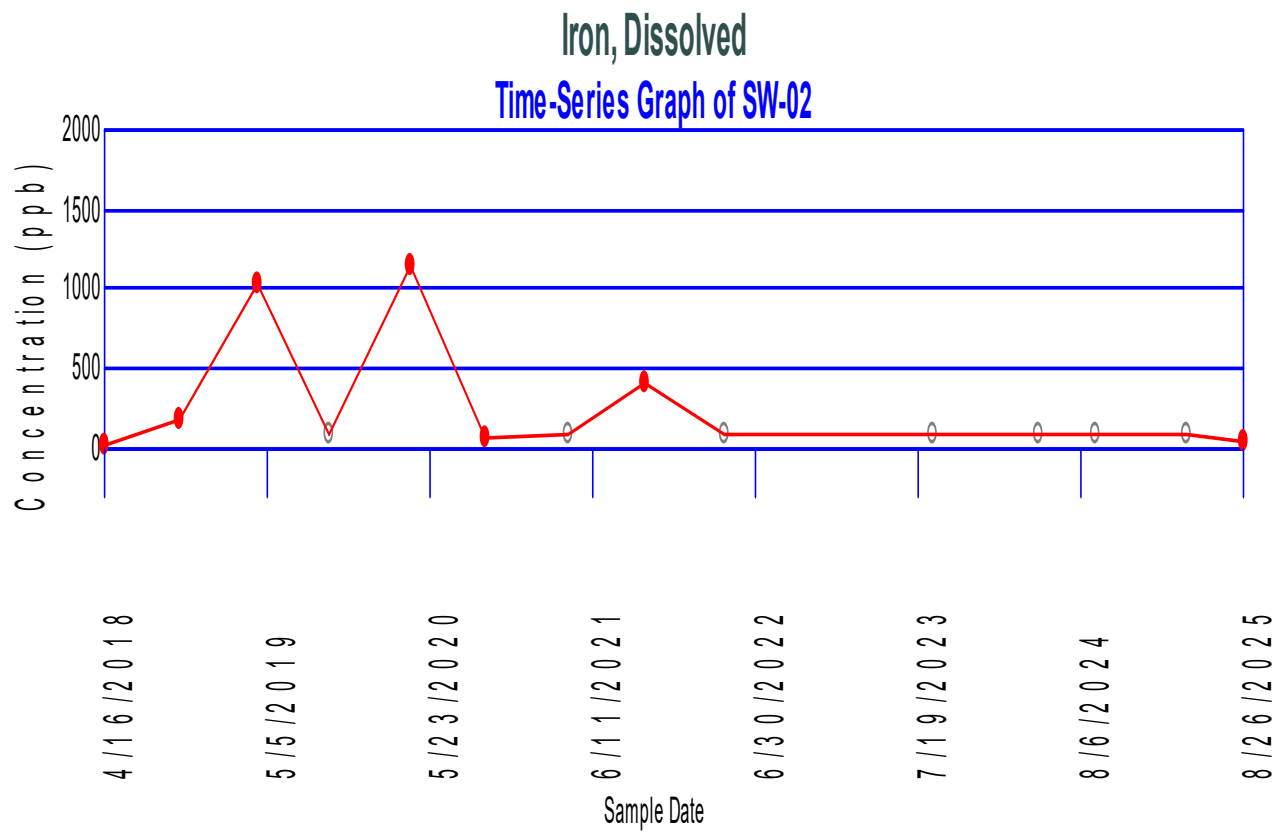
c = 364

Group Variance = 289.333

Z-Score = -0.881845

Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)

| -0.881845 | <= 1.97737 indicating no evidence of a trend



Concentrations (ppb)

Parameter: Total Organic Halogens

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 60

Total Non-Detect: 12

Percent Non-Detects: 20%

Total Background Measurements: 0

There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 10 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original
MW-06	6	0 (0%)	10/10/2018	36	36
			10/2/2019	52.4 J	52.4 J
			9/30/2020	52.8	52.8
			10/14/2021	33.9 J	33.9 J
			8/23/2023	64.3	64.3
			9/12/2024	100	100
MW-12	6	0 (0%)	10/9/2018	23.1 J	23.1 J
			10/2/2019	21 J	21 J
			10/1/2020	52.9	52.9
			10/14/2021	51.3	51.3
			8/24/2023	99	99
			9/12/2024	116	116
MW-05	6	1 (16.6667%)	10/10/2018	16.1 J	16.1 J
			10/1/2019	42	42
			10/1/2020	53.3	53.3
			10/13/2021	44.5	44.5
			8/24/2023	ND<40 U	ND<40 U
			9/11/2024	143	143
MW-07	6	4 (66.6667%)	10/10/2018	ND<30 U	ND<30 U
			10/2/2019	ND<10 U	ND<10 U
			9/30/2020	77.9 J	77.9 J
			10/14/2021	ND<40 U	ND<40 U
			8/23/2023	ND<40 U	ND<40 U
			9/11/2024	60.1	60.1
MW-20	6	0 (0%)	10/10/2018	15.8 J	15.8 J
			10/2/2019	67.8 J	67.8 J
			10/2/2020	50.8	50.8
			10/12/2021	58.8	58.8
			8/23/2023	18.3 J	18.3 J
			9/11/2024	246 J	246 J
MW-21	6	3 (50%)	10/10/2018	ND<30 U	ND<30 U
			10/1/2019	ND<10 U	ND<10 U
			9/30/2020	21.4 J	21.4 J
			10/12/2021	34.8 J	34.8 J
			8/23/2023	ND<40 U	ND<40 U
			9/11/2024	34.6 J	34.6 J

MW-25	6	0 (0%)	10/9/2018	18.4 J	18.4 J
			10/1/2019	16.5	16.5
			10/1/2020	18 J	18 J
			10/13/2021	44.4	44.4
			8/24/2023	34.1 J	34.1 J
			9/10/2024	55.9	55.9
MW-26	6	3 (50%)	10/9/2018	ND<30 U	ND<30 U
			10/1/2019	ND<10 UJ	ND<10 UJ
			10/1/2020	72.4	72.4
			10/13/2021	38.8 J	38.8 J
			8/24/2023	ND<40 U	ND<40 U
			9/10/2024	27.2 J	27.2 J
SW-01	6	1 (16.6667%)	10/8/2018	ND<30 U	ND<30 U
			9/30/2019	12.5 J	12.5 J
			10/2/2020	38.5 J	38.5 J
			10/14/2021	16.7 J	16.7 J
			8/22/2023	20.8 J	20.8 J
			9/10/2024	65.7	65.7
SW-02	6	0 (0%)	10/8/2018	16.2 J	16.2 J
			9/30/2019	15	15
			10/2/2020	66.9	66.9
			10/14/2021	43.9	43.9
			8/22/2023	25.7 J	25.7 J
			9/10/2024	154	154

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: MW-05

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.706856	0.188337	0.56	143
2	0.236559	0.642473	0.642	16.1
3	0.661654	0.150376	0.765	None

Loc.	Date	Conc.	Outlier
MW-05	10/10/2018	16.1 J	TRUE
	10/1/2019	42	FALSE
	10/1/2020	53.3	FALSE
	10/13/2021	44.5	FALSE
	8/24/2023	ND<40 U	FALSE
	9/11/2024	143	TRUE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: MW-05

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	16.1	143	126.9	0.6431	81.6094
2	40	53.3	13.3	0.2806	3.73198
3	42	44.5	2.5	0.0875	0.21875
4	44.5	42	-2.5		
5	53.3	40	-13.3		
6	143	16.1	-126.9		

Sum of b values = 85.5601

Sample Standard Deviation = 44.1614

W Statistic = 0.750736

5% Critical value of 0.788 exceeds 0.750736

Evidence of non-normality at 95% level of significance

1% Critical value of 0.713 is less than 0.750736

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: MW-05
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
42	16.1 J	25.9	1	0
53.3	16.1 J	37.2	2	0
44.5	16.1 J	28.4	3	0
ND<40 U	16.1 J	23.9	4	0
143	16.1 J	126.9	5	0
53.3	42	11.3	6	0
44.5	42	2.5	7	0
ND<40 U	42	-2	7	1
143	42	101	8	1
44.5	53.3	-8.8	8	2
ND<40 U	53.3	-13.3	8	3
143	53.3	89.7	9	3
ND<40 U	44.5	-4.5	9	4
143	44.5	98.5	10	4
143	ND<40 U	103	11	4

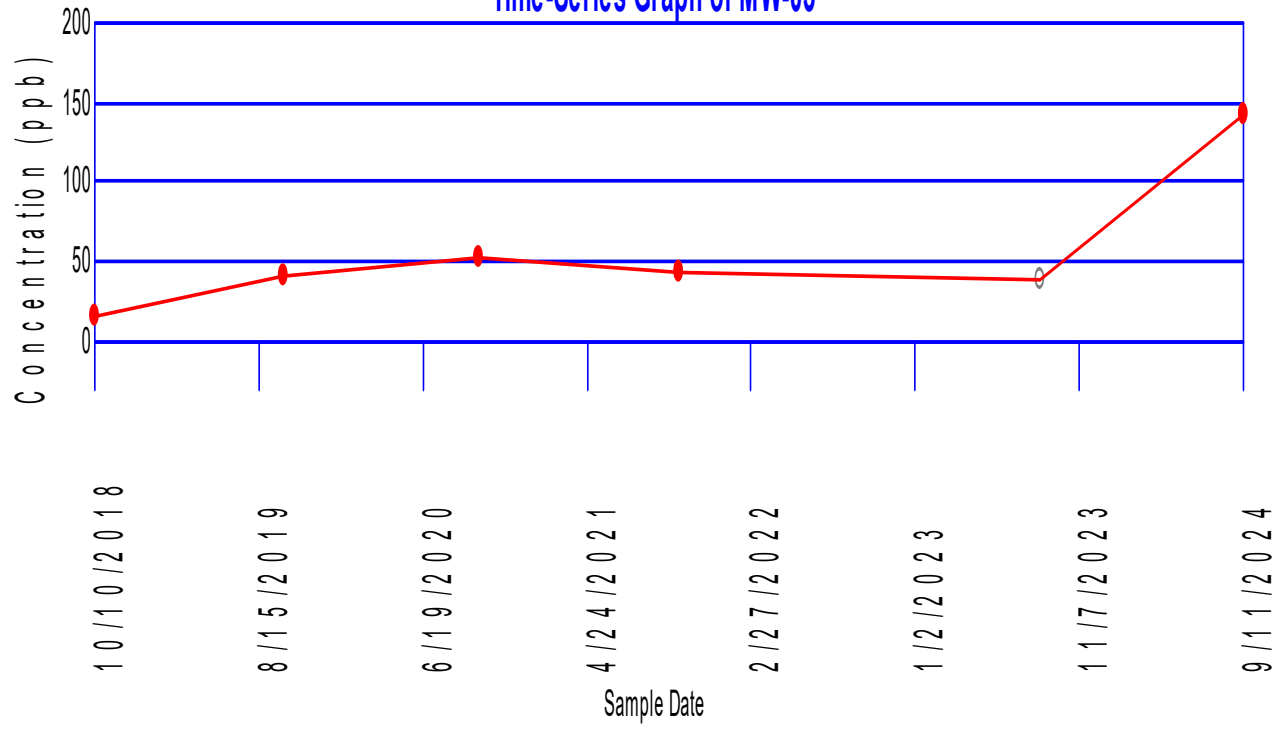
S Statistic = 11 - 4 = 7

Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)

Probability of obtaining S >= |7| is 0.272

0.272 >= 0.025 indicating no evidence of a trend

Total Organic Halogens Time-Series Graph of MW-05



Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: MW-06

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.540091	0.03177	0.56	None

Loc.	Date	Conc.	Outlier
MW-06	10/10/2018	36	FALSE
	10/2/2019	52.4 J	FALSE
	9/30/2020	52.8	FALSE
	10/14/2021	33.9 J	FALSE
	8/23/2023	64.3	FALSE
	9/12/2024	100	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: MW-06

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	33.9	100	66.1	0.6431	42.5089
2	36	64.3	28.3	0.2806	7.94098
3	52.4	52.8	0.4	0.0875	0.035
4	52.8	52.4	-0.4		
5	64.3	36	-28.3		
6	100	33.9	-66.1		

Sum of b values = 50.4849

Sample Standard Deviation = 24.1436

W Statistic = 0.874476

5% Critical value of 0.788 is less than 0.874476

Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.874476

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: MW-06
 Original Data (Not Transformed)
 Non-Detects Replaced with Detection Limit

95% Confidence Level

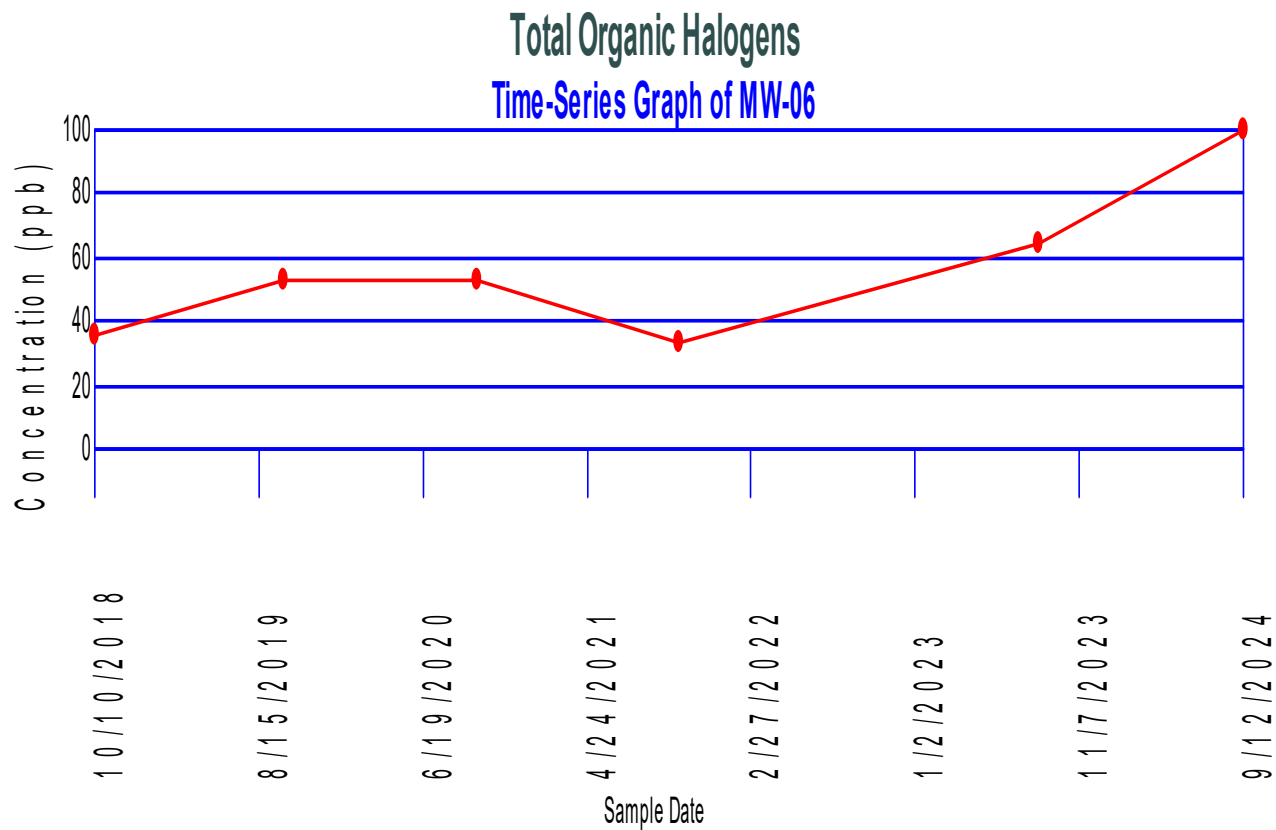
Xj	Xk	Xj - Xk	Positives	Negatives
52.4 J	36	16.4	1	0
52.8	36	16.8	2	0
33.9 J	36	-2.1	2	1
64.3	36	28.3	3	1
100	36	64	4	1
52.8	52.4 J	0.4	5	1
33.9 J	52.4 J	-18.5	5	2
64.3	52.4 J	11.9	6	2
100	52.4 J	47.6	7	2
33.9 J	52.8	-18.9	7	3
64.3	52.8	11.5	8	3
100	52.8	47.2	9	3
64.3	33.9 J	30.4	10	3
100	33.9 J	66.1	11	3
100	64.3	35.7	12	3

S Statistic = 12 - 3 = 9

Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)

Probability of obtaining S >= |9| is 0.136

0.136 >= 0.025 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: MW-07

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.26215	0.294551	0.56	None

Loc.	Date	Conc.	Outlier
MW-07	10/10/2018	ND<30 U	FALSE
	10/2/2019	ND<10 U	FALSE
	9/30/2020	77.9 J	FALSE
	10/14/2021	ND<40 U	FALSE
	8/23/2023	ND<40 U	FALSE
	9/11/2024	60.1	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: MW-07

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	10	77.9	67.9	0.6431	43.6665
2	30	60.1	30.1	0.2806	8.44606
3	40	40	0	0.0875	0
4	40	40	0		
5	60.1	30	-30.1		
6	77.9	10	-67.9		

Sum of b values = 52.1126

Sample Standard Deviation = 23.6069

W Statistic = 0.974626

5% Critical value of 0.788 is less than 0.974626

Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.974626

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: MW-07
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

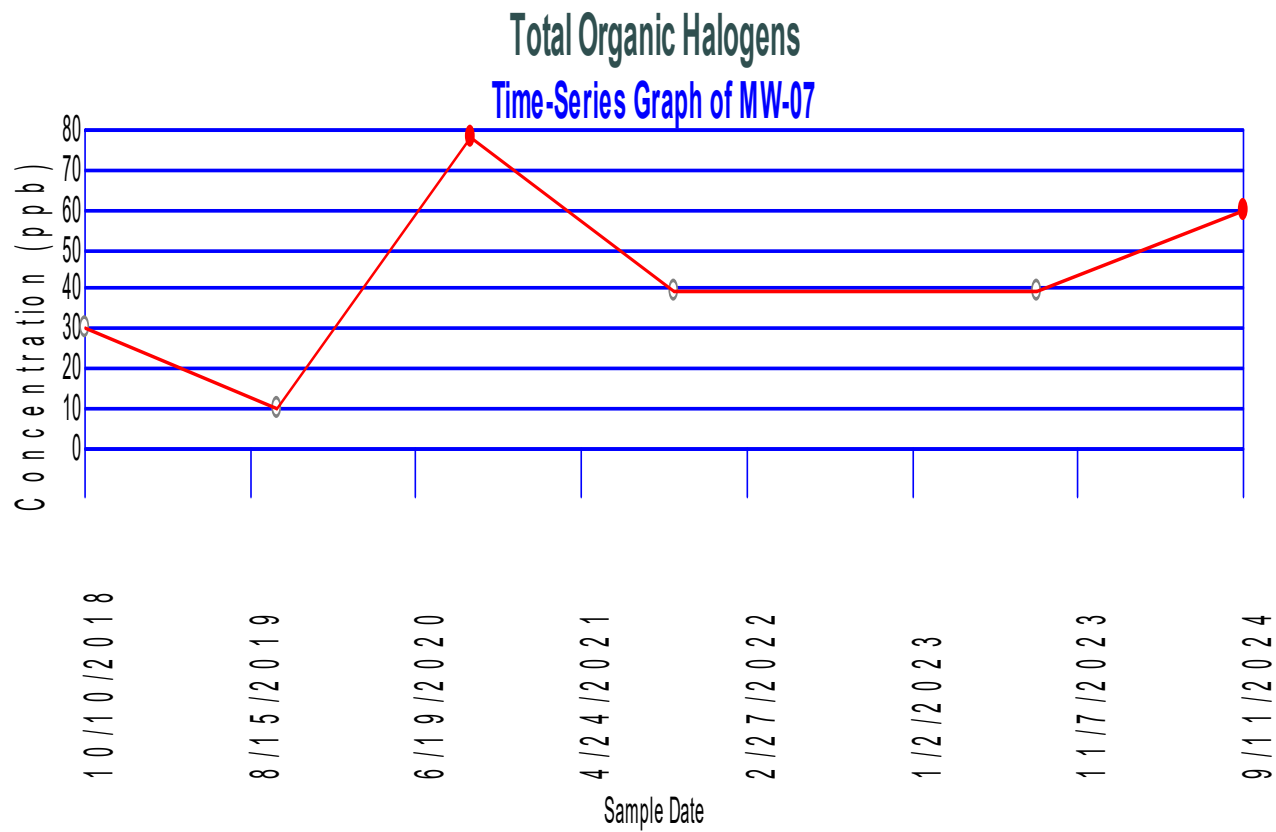
Xj	Xk	Xj - Xk	Positives	Negatives
ND<10 U	ND<30 U	-20	0	1
77.9 J	ND<30 U	47.9	1	1
ND<40 U	ND<30 U	10	2	1
ND<40 U	ND<30 U	10	3	1
60.1	ND<30 U	30.1	4	1
77.9 J	ND<10 U	67.9	5	1
ND<40 U	ND<10 U	30	6	1
ND<40 U	ND<10 U	30	7	1
60.1	ND<10 U	50.1	8	1
ND<40 U	77.9 J	-37.9	8	2
ND<40 U	77.9 J	-37.9	8	3
60.1	77.9 J	-17.8	8	4
ND<40 U	ND<40 U	0	8	4
60.1	ND<40 U	20.1	9	4
60.1	ND<40 U	20.1	10	4

S Statistic = 10 - 4 = 6

Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)

Probability of obtaining S >= |6| is 0.371

0.371 >= 0.025 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: MW-12

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.178947	0.0221053	0.56	None

Loc.	Date	Conc.	Outlier
MW-12	10/9/2018	23.1 J	FALSE
	10/2/2019	21 J	FALSE
	10/1/2020	52.9	FALSE
	10/14/2021	51.3	FALSE
	8/24/2023	99	FALSE
	9/12/2024	116	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: MW-12

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	21	116	95	0.6431	61.0945
2	23.1	99	75.9	0.2806	21.2975
3	51.3	52.9	1.6	0.0875	0.14
4	52.9	51.3	-1.6		
5	99	23.1	-75.9		
6	116	21	-95		

Sum of b values = 82.532

Sample Standard Deviation = 39.1507

W Statistic = 0.888783

5% Critical value of 0.788 is less than 0.888783

Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.888783

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: MW-12
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
21 J	23.1 J	-2.1	0	1
52.9	23.1 J	29.8	1	1
51.3	23.1 J	28.2	2	1
99	23.1 J	75.9	3	1
116	23.1 J	92.9	4	1
52.9	21 J	31.9	5	1
51.3	21 J	30.3	6	1
99	21 J	78	7	1
116	21 J	95	8	1
51.3	52.9	-1.6	8	2
99	52.9	46.1	9	2
116	52.9	63.1	10	2
99	51.3	47.7	11	2
116	51.3	64.7	12	2
116	99	17	13	2

S Statistic = $13 - 2 = 11$

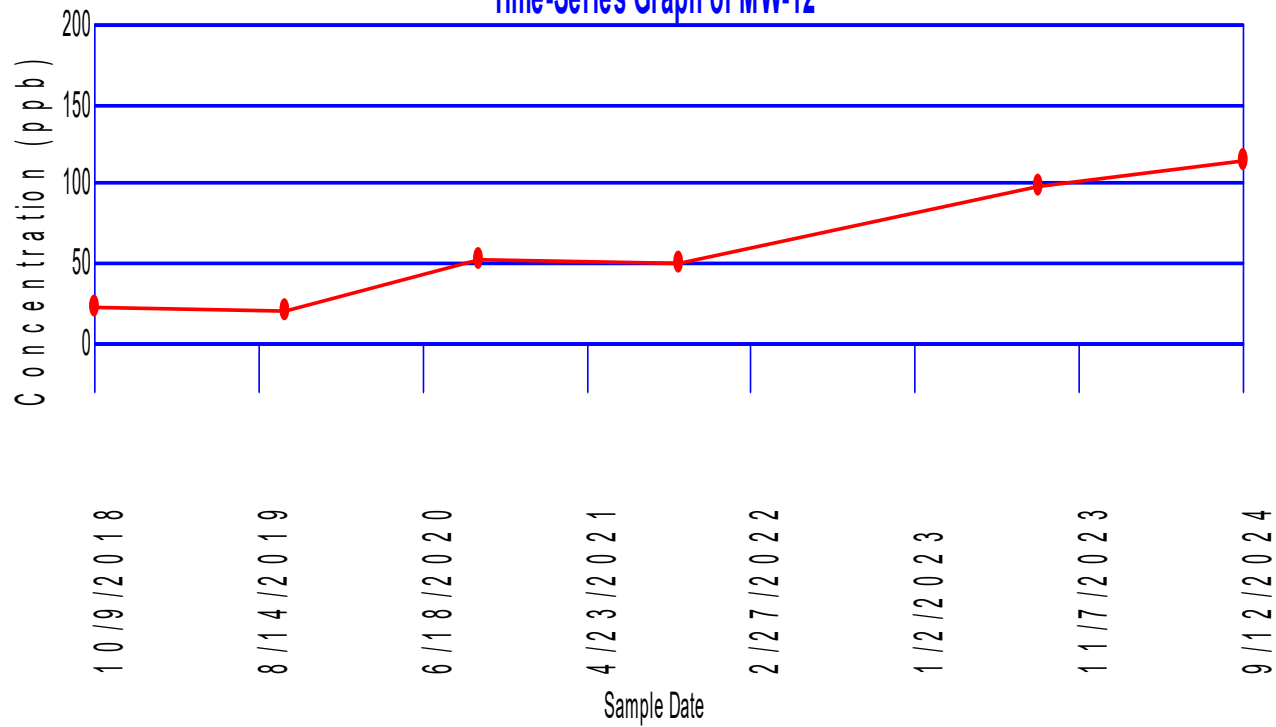
Comparing at $1.0 - (0.05 / 2) = 97.5\%$ confidence level (two-tailed)

Probability of obtaining $S \geq |11|$ is 0.056

0.056 $\geq$ 0.025 indicating no evidence of a trend

Total Organic Halogens

Time-Series Graph of MW-12



Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: MW-20

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.774109	0.0108601	0.56	246
2	0.173077	0.0480769	0.642	None

Loc.	Date	Conc.	Outlier
MW-20	10/10/2018	15.8 J	FALSE
	10/2/2019	67.8 J	FALSE
	10/2/2020	50.8	FALSE
	10/12/2021	58.8	FALSE
	8/23/2023	18.3 J	FALSE
	9/11/2024	246 J	TRUE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: MW-20

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	15.8	246	230.2	0.6431	148.042
2	18.3	67.8	49.5	0.2806	13.8897
3	50.8	58.8	8	0.0875	0.7
4	58.8	50.8	-8		
5	67.8	18.3	-49.5		
6	246	15.8	-230.2		

Sum of b values = 162.631

Sample Standard Deviation = 85.85

W Statistic = 0.717725

5% Critical value of 0.788 exceeds 0.717725

Evidence of non-normality at 95% level of significance

1% Critical value of 0.713 is less than 0.717725

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: MW-20
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
67.8 J	15.8 J	52	1	0
50.8	15.8 J	35	2	0
58.8	15.8 J	43	3	0
18.3 J	15.8 J	2.5	4	0
246 J	15.8 J	230.2	5	0
50.8	67.8 J	-17	5	1
58.8	67.8 J	-9	5	2
18.3 J	67.8 J	-49.5	5	3
246 J	67.8 J	178.2	6	3
58.8	50.8	8	7	3
18.3 J	50.8	-32.5	7	4
246 J	50.8	195.2	8	4
18.3 J	58.8	-40.5	8	5
246 J	58.8	187.2	9	5
246 J	18.3 J	227.7	10	5

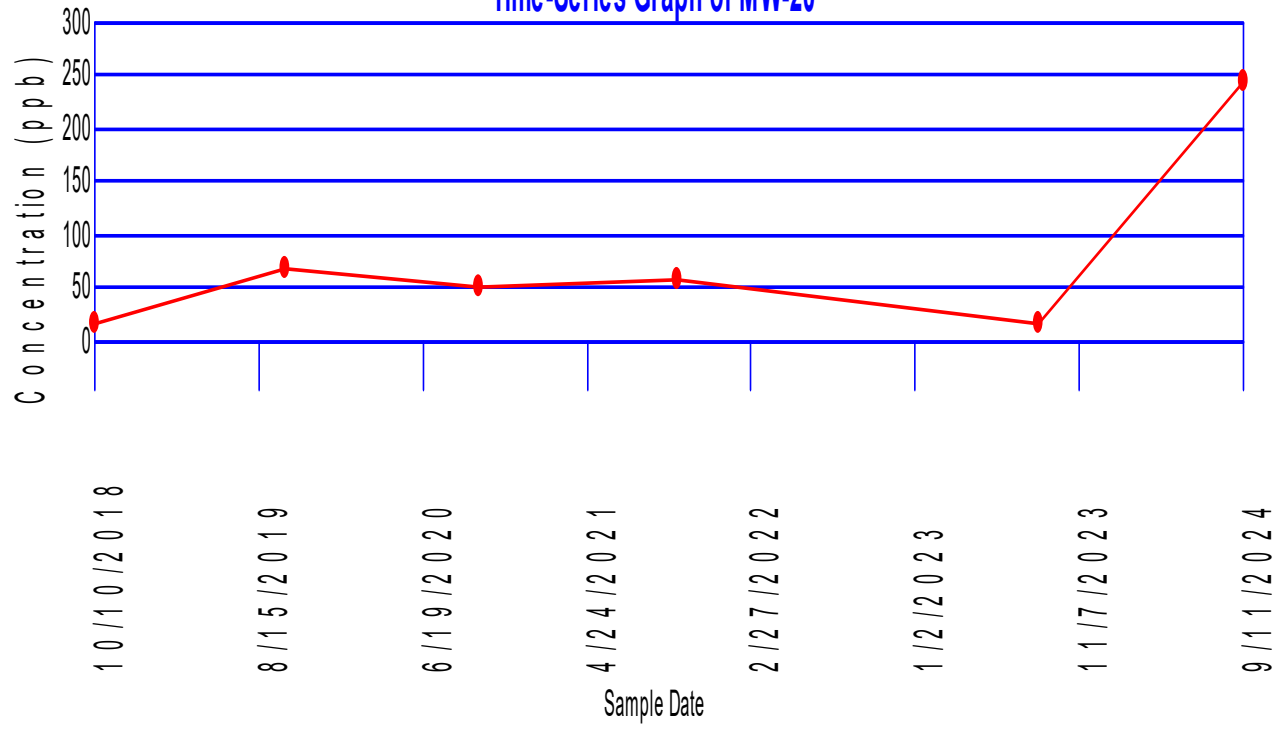
S Statistic = 10 - 5 = 5

Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)

Probability of obtaining S >= |5| is 0.47

0.47 >= 0.025 indicating no evidence of a trend

Total Organic Halogens Time-Series Graph of MW-20



Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.173333	0.38	0.56	None

Loc.	Date	Conc.	Outlier
MW-21	10/10/2018	ND<30 U	FALSE
	10/1/2019	ND<10 U	FALSE
	9/30/2020	21.4 J	FALSE
	10/12/2021	34.8 J	FALSE
	8/23/2023	ND<40 U	FALSE
	9/11/2024	34.6 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: MW-21

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	10	40	30	0.6431	19.293
2	21.4	34.8	13.4	0.2806	3.76004
3	30	34.6	4.6	0.0875	0.4025
4	34.6	30	-4.6		
5	34.8	21.4	-13.4		
6	40	10	-30		

Sum of b values = 23.4555

Sample Standard Deviation = 10.9914

W Statistic = 0.910784

5% Critical value of 0.788 is less than 0.910784

Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.910784

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: MW-21
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

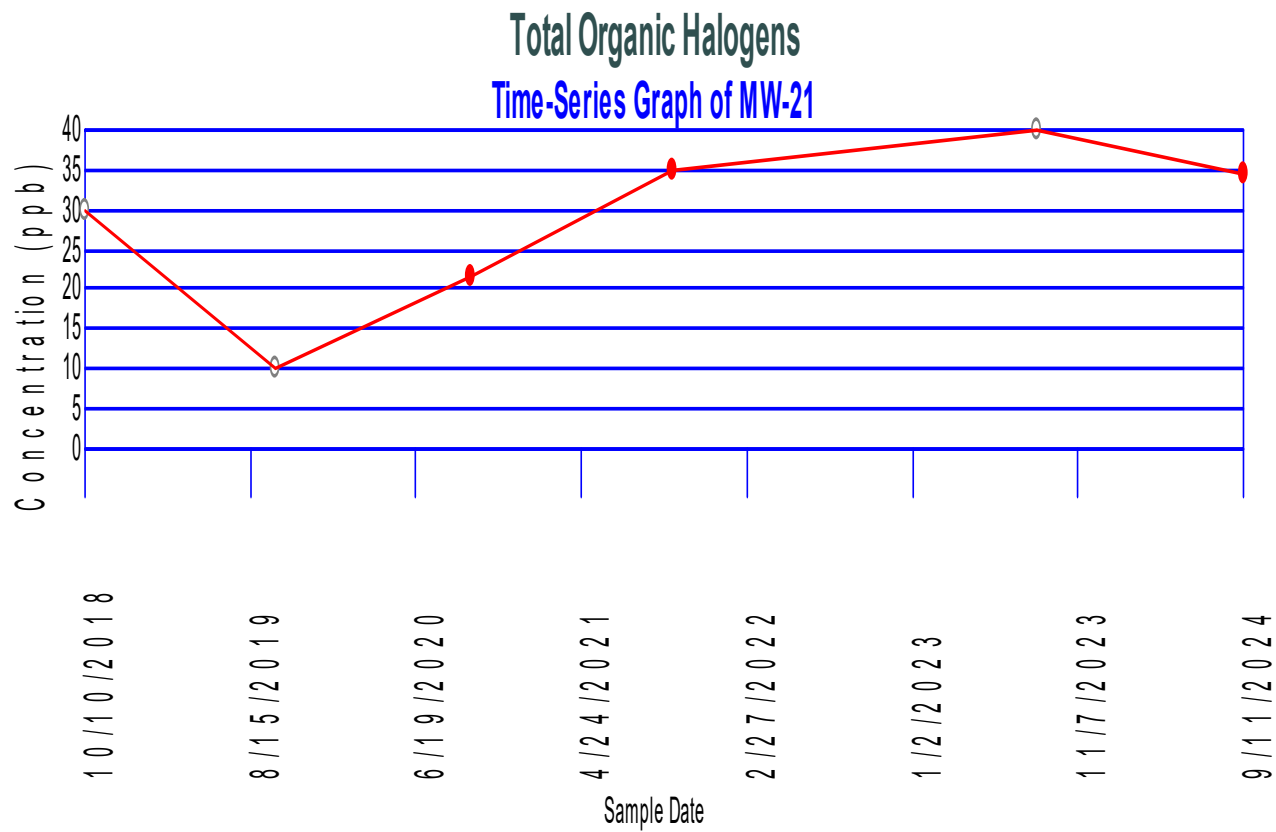
Xj	Xk	Xj - Xk	Positives	Negatives
ND<10 U	ND<30 U	-20	0	1
21.4 J	ND<30 U	-8.6	0	2
34.8 J	ND<30 U	4.8	1	2
ND<40 U	ND<30 U	10	2	2
34.6 J	ND<30 U	4.6	3	2
21.4 J	ND<10 U	11.4	4	2
34.8 J	ND<10 U	24.8	5	2
ND<40 U	ND<10 U	30	6	2
34.6 J	ND<10 U	24.6	7	2
34.8 J	21.4 J	13.4	8	2
ND<40 U	21.4 J	18.6	9	2
34.6 J	21.4 J	13.2	10	2
ND<40 U	34.8 J	5.2	11	2
34.6 J	34.8 J	-0.2	11	3
34.6 J	ND<40 U	-5.4	11	4

S Statistic = 11 - 4 = 7

Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)

Probability of obtaining S >= |7| is 0.272

0.272 >= 0.025 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: MW-25

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.291878	0.0380711	0.56	None

Loc.	Date	Conc.	Outlier

MW-25	10/9/2018	18.4 J	FALSE
	10/1/2019	16.5	FALSE
	10/1/2020	18 J	FALSE
	10/13/2021	44.4	FALSE
	8/24/2023	34.1 J	FALSE
	9/10/2024	55.9	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: MW-25

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	16.5	55.9	39.4	0.6431	25.3381
2	18	44.4	26.4	0.2806	7.40784
3	18.4	34.1	15.7	0.0875	1.37375
4	34.1	18.4	-15.7		
5	44.4	18	-26.4		
6	55.9	16.5	-39.4		

Sum of b values = 34.1197

Sample Standard Deviation = 16.4129

W Statistic = 0.864317

5% Critical value of 0.788 is less than 0.864317

Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.864317

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: MW-25
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

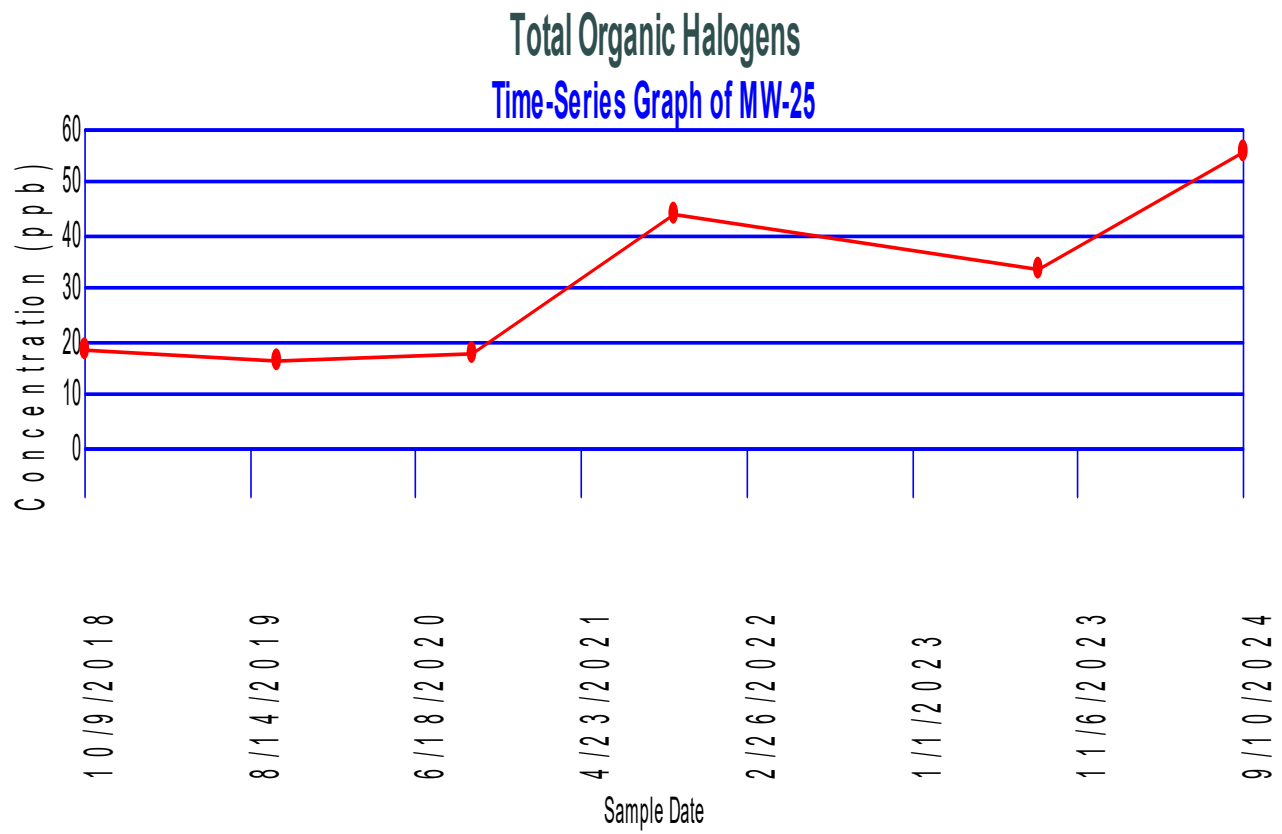
Xj	Xk	Xj - Xk	Positives	Negatives
16.5	18.4 J	-1.9	0	1
18 J	18.4 J	-0.4	0	2
44.4	18.4 J	26	1	2
34.1 J	18.4 J	15.7	2	2
55.9	18.4 J	37.5	3	2
18 J	16.5	1.5	4	2
44.4	16.5	27.9	5	2
34.1 J	16.5	17.6	6	2
55.9	16.5	39.4	7	2
44.4	18 J	26.4	8	2
34.1 J	18 J	16.1	9	2
55.9	18 J	37.9	10	2
34.1 J	44.4	-10.3	10	3
55.9	44.4	11.5	11	3
55.9	34.1 J	21.8	12	3

S Statistic = 12 - 3 = 9

Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)

Probability of obtaining S >= |9| is 0.136

0.136 >= 0.025 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: MW-26

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.519231	0.275641	0.56	None

Loc.	Date	Conc.	Outlier

MW-26	10/9/2018	ND<30 U	FALSE
	10/1/2019	ND<10 UJ	FALSE
	10/1/2020	72.4	FALSE
	10/13/2021	38.8 J	FALSE
	8/24/2023	ND<40 U	FALSE
	9/10/2024	27.2 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: MW-26

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	10	72.4	62.4	0.6431	40.1294
2	27.2	40	12.8	0.2806	3.59168
3	30	38.8	8.8	0.0875	0.77
4	38.8	30	-8.8		
5	40	27.2	-12.8		
6	72.4	10	-62.4		

Sum of b values = 44.4911

Sample Standard Deviation = 20.675

W Statistic = 0.926158

5% Critical value of 0.788 is less than 0.926158

Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.926158

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: MW-26
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

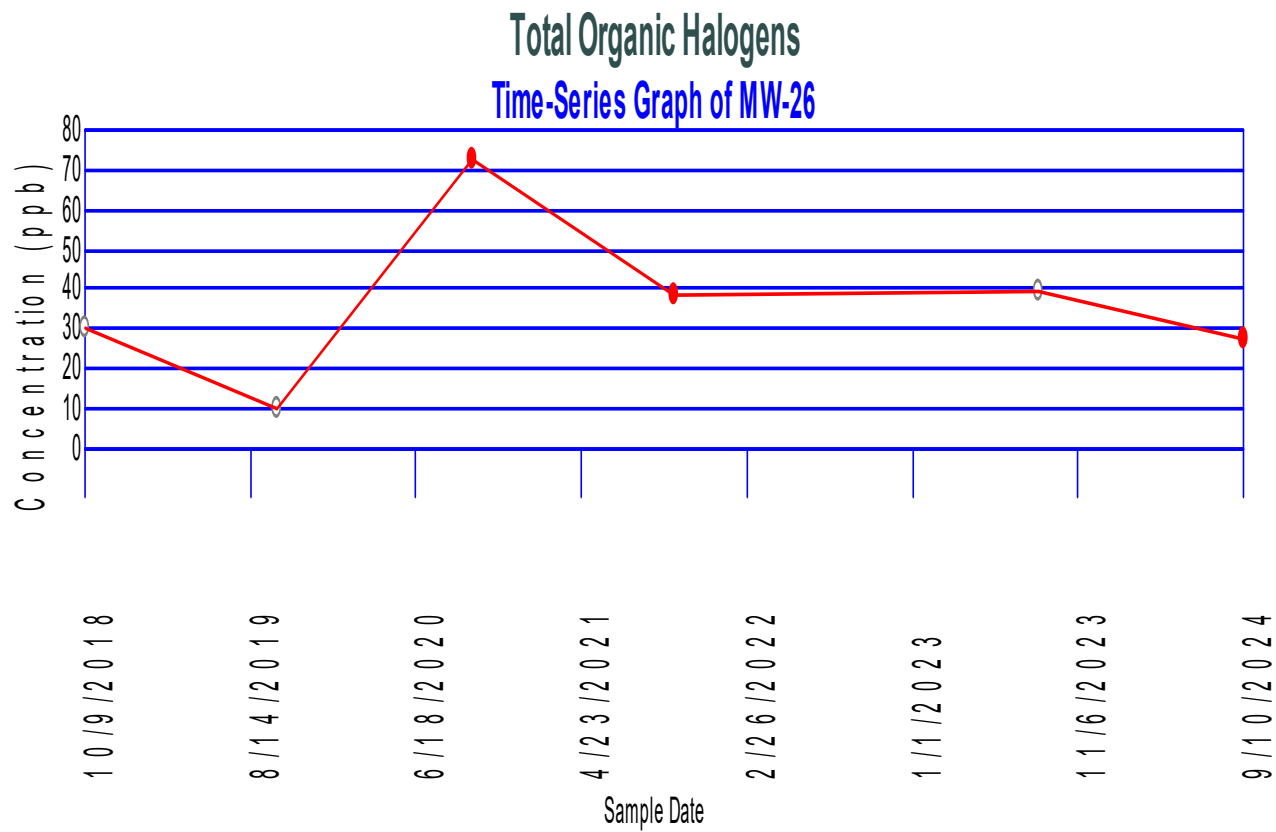
Xj	Xk	Xj - Xk	Positives	Negatives
ND<10 UJ	ND<30 U	-20	0	1
72.4	ND<30 U	42.4	1	1
38.8 J	ND<30 U	8.8	2	1
ND<40 U	ND<30 U	10	3	1
27.2 J	ND<30 U	-2.8	3	2
72.4	ND<10 UJ	62.4	4	2
38.8 J	ND<10 UJ	28.8	5	2
ND<40 U	ND<10 UJ	30	6	2
27.2 J	ND<10 UJ	17.2	7	2
38.8 J	72.4	-33.6	7	3
ND<40 U	72.4	-32.4	7	4
27.2 J	72.4	-45.2	7	5
ND<40 U	38.8 J	1.2	8	5
27.2 J	38.8 J	-11.6	8	6
27.2 J	ND<40 U	-12.8	8	7

S Statistic = 8 - 7 = 1

Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)

Probability of obtaining S >= |1| is 1

1 >= 0.025 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: SW-01

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.511278	0.0789474	0.56	None

Loc.	Date	Conc.	Outlier
SW-01	10/8/2018	ND<30 U	FALSE
	9/30/2019	12.5 J	FALSE
	10/2/2020	38.5 J	FALSE
	10/14/2021	16.7 J	FALSE
	8/22/2023	20.8 J	FALSE
	9/10/2024	65.7	FALSE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: SW-01

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	12.5	65.7	53.2	0.6431	34.2129
2	16.7	38.5	21.8	0.2806	6.11708
3	20.8	30	9.2	0.0875	0.805
4	30	20.8	-9.2		
5	38.5	16.7	-21.8		
6	65.7	12.5	-53.2		

Sum of b values = 41.135

Sample Standard Deviation = 19.5529

W Statistic = 0.885178

5% Critical value of 0.788 is less than 0.885178

Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.885178

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: SW-01
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

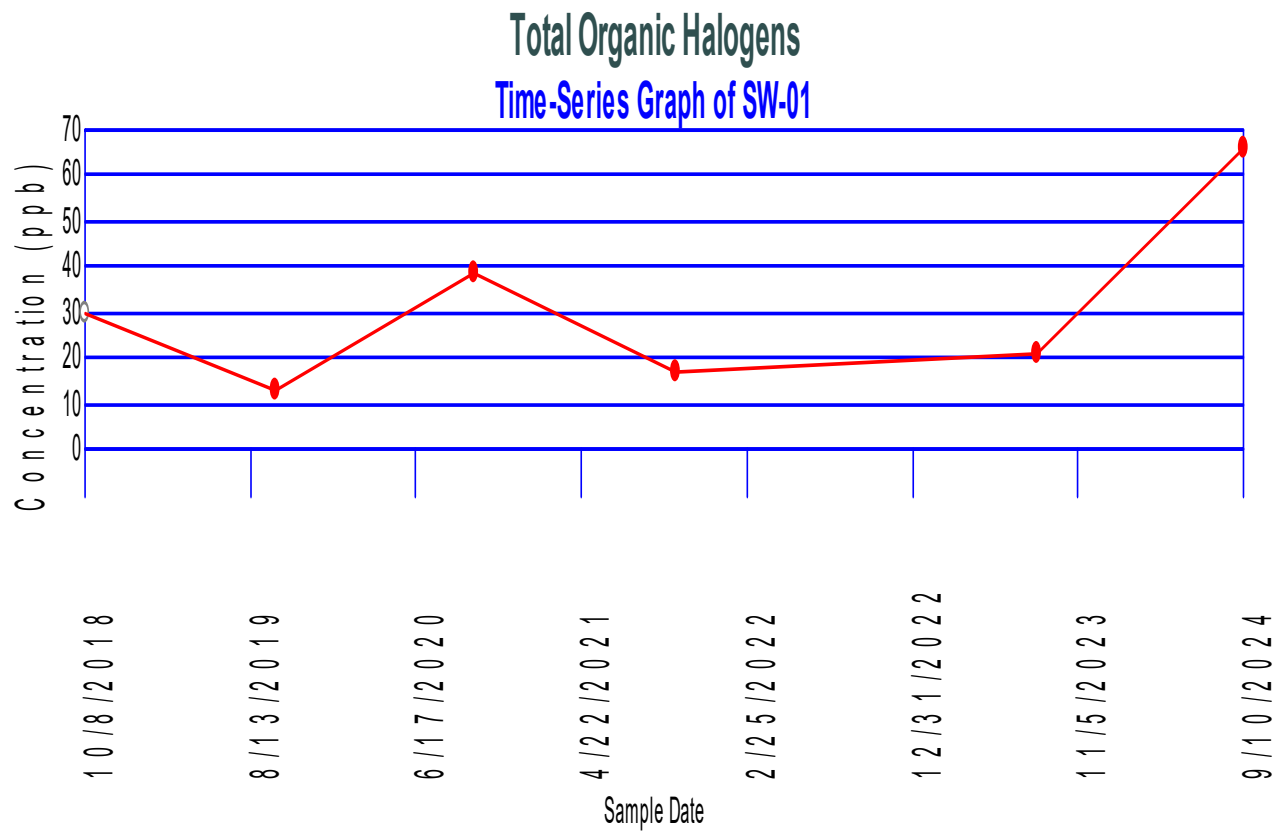
Xj	Xk	Xj - Xk	Positives	Negatives
12.5 J	ND<30 U	-17.5	0	1
38.5 J	ND<30 U	8.5	1	1
16.7 J	ND<30 U	-13.3	1	2
20.8 J	ND<30 U	-9.2	1	3
65.7	ND<30 U	35.7	2	3
38.5 J	12.5 J	26	3	3
16.7 J	12.5 J	4.2	4	3
20.8 J	12.5 J	8.3	5	3
65.7	12.5 J	53.2	6	3
16.7 J	38.5 J	-21.8	6	4
20.8 J	38.5 J	-17.7	6	5
65.7	38.5 J	27.2	7	5
20.8 J	16.7 J	4.1	8	5
65.7	16.7 J	49	9	5
65.7	20.8 J	44.9	10	5

S Statistic = 10 - 5 = 5

Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)

Probability of obtaining S >= |5| is 0.47

0.47 >= 0.025 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Total Organic Halogens

Location: SW-02

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 6 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.626619	0.00863309	0.56	154
2	0.44316	0.0231214	0.642	None

Loc.	Date	Conc.	Outlier
SW-02	10/8/2018	16.2 J	FALSE
	9/30/2019	15	FALSE
	10/2/2020	66.9	FALSE
	10/14/2021	43.9	FALSE
	8/22/2023	25.7 J	FALSE
	9/10/2024	154	TRUE

Shapiro-Wilks Test of Normality

Parameter: Total Organic Halogens

Location: SW-02

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	15	154	139	0.6431	89.3909
2	16.2	66.9	50.7	0.2806	14.2264
3	25.7	43.9	18.2	0.0875	1.5925
4	43.9	25.7	-18.2		
5	66.9	16.2	-50.7		
6	154	15	-139		

Sum of b values = 105.21

Sample Standard Deviation = 52.9495

W Statistic = 0.78962

5% Critical value of 0.788 is less than 0.78962

Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.78962

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Total Organic Halogens
Location: SW-02
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

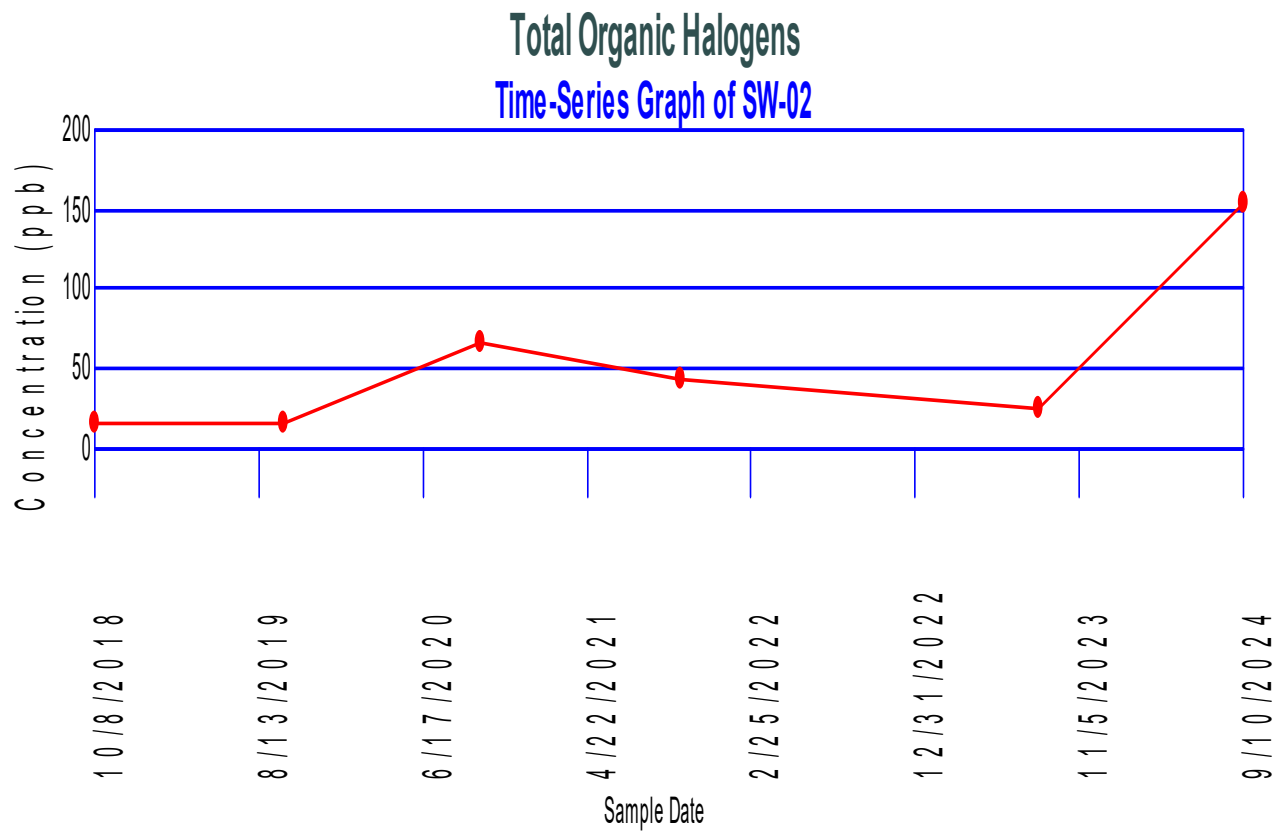
Xj	Xk	Xj - Xk	Positives	Negatives
15	16.2 J	-1.2	0	1
66.9	16.2 J	50.7	1	1
43.9	16.2 J	27.7	2	1
25.7 J	16.2 J	9.5	3	1
154	16.2 J	137.8	4	1
66.9	15	51.9	5	1
43.9	15	28.9	6	1
25.7 J	15	10.7	7	1
154	15	139	8	1
43.9	66.9	-23	8	2
25.7 J	66.9	-41.2	8	3
154	66.9	87.1	9	3
25.7 J	43.9	-18.2	9	4
154	43.9	110.1	10	4
154	25.7 J	128.3	11	4

S Statistic = 11 - 4 = 7

Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)

Probability of obtaining S >= |7| is 0.272

0.272 >= 0.025 indicating no evidence of a trend



Concentrations (ppb)

Parameter: Lithium, Total

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 160

Total Non-Detect: 30

Percent Non-Detects: 18.75%

Total Background Measurements: 0

There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 10 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

MW-12	16	11 (68.75%)	4/17/2018	19.3 J	19.3 J
			10/9/2018	ND<50 U	ND<50 U
			4/14/2019	17.5 J	17.5 J
			10/2/2019	ND<50 U	ND<50 U
			4/8/2020	ND<50 U	ND<50 U
			10/1/2020	12.8 J	12.8 J
			4/15/2021	7.96 J	7.96 J
			10/14/2021	10.2 J	10.2 J
			4/19/2022	ND<50 U	ND<50 U
			9/28/2022	ND<50 U	ND<50 U
			4/18/2023	ND<50 U	ND<50 U
			8/24/2023	ND<50 U	ND<50 U
			5/1/2024	ND<50 U	ND<50 U
			9/12/2024	ND<50 U	ND<50 U

MW-16	16	0 (0%)	4/17/2018	70.3	70.3
			10/9/2018	89.3	89.3
			4/14/2019	64.8	64.8
			10/2/2019	61.7	61.7
			4/9/2020	54.3	54.3
			10/1/2020	61.8	61.8
			4/15/2021	51.2	51.2
			10/14/2021	63	63
			4/19/2022	68.4 J+	68.4 J+
			9/28/2022	58	58
			4/18/2023	49.8 J	49.8 J
			8/24/2023	55.6	55.6
			5/2/2024	62.6	62.6
			9/12/2024	51.5	51.5

MW-05	16	1 (6.25%)	4/18/2018	30.1 J	30.1 J
			10/10/2018	66.2	66.2
			4/13/2019	25.5 J	25.5 J
			10/1/2019	25.1 J	25.1 J
			4/9/2020	18.2 J	18.2 J
			10/1/2020	24.9 J	24.9 J

			10/13/2021	21.7 J	21.7 J
			4/20/2022	ND<50 U	ND<50 U
			9/28/2022	21.6 J	21.6 J
			4/19/2023	25.5 J	25.5 J
			8/24/2023	22.1 J	22.1 J
			5/1/2024	25.9 J	25.9 J
			9/11/2024	20 J	20 J
			4/15/2025	22.2 J	22.2 J
			8/27/2025	26.8 J	26.8 J
MW-06	16	8 (50%)	4/18/2018	19.2 J	19.2 J
			10/10/2018	ND<50 U	ND<50 U
			4/14/2019	19.6 J	19.6 J
			10/2/2019	14.3 J	14.3 J
			4/8/2020	10.4 J	10.4 J
			9/30/2020	13 J	13 J
			4/13/2021	6.96 J	6.96 J
			10/14/2021	9.78 J	9.78 J
			4/20/2022	ND<50 U	ND<50 U
			9/27/2022	12.2 J	12.2 J
			4/18/2023	ND<50 U	ND<50 U
			8/23/2023	ND<50 U	ND<50 U
			5/1/2024	ND<50 U	ND<50 U
			9/12/2024	ND<50 U	ND<50 U
			4/16/2025	ND<50 U	ND<50 U
			8/27/2025	ND<50 U	ND<50 U
MW-07	16	0 (0%)	4/18/2018	87.2	87.2
			10/10/2018	116	116
			4/14/2019	91.6	91.6
			10/2/2019	77.6	77.6
			4/8/2020	69.6	69.6
			9/30/2020	78.4	78.4
			4/13/2021	67.1	67.1
			10/14/2021	73	73
			4/20/2022	82.9	82.9
			9/27/2022	77	77
			4/18/2023	57.3	57.3
			8/23/2023	71.1	71.1
			5/1/2024	80.8	80.8
			9/11/2024	73.4	73.4
			4/16/2025	67.6	67.6
			8/27/2025	80.5	80.5
MW-27	16	1 (6.25%)	4/18/2018	56.6	56.6
			10/9/2018	77	77
			4/13/2019	58.4	58.4
			10/1/2019	51.6	51.6
			4/9/2020	46.6 J	46.6 J
			10/1/2020	52.5	52.5
			4/14/2021	41 J	41 J
			10/13/2021	39.1 J	39.1 J
			4/20/2022	ND<55.6 U	ND<55.6 U
			9/28/2022	47.9 J	47.9 J
			4/19/2023	55.3	55.3
			8/24/2023	44.7 J	44.7 J
			5/1/2024	51.6	51.6

			9/11/2024	43.8 J	43.8 J
			4/16/2025	48.5 J	48.5 J
			8/27/2025	51.8	51.8
MW-20	16	1 (6.25%)	4/17/2018	33.6 J	33.6 J
			10/10/2018	56.6	56.6
			4/14/2019	31.6 J	31.6 J
			10/2/2019	29.5 J	29.5 J
			4/9/2020	29.1 J	29.1 J
			10/2/2020	30.8 J	30.8 J
			4/15/2021	19.5 J	19.5 J
			10/12/2021	25.1 J	25.1 J
			4/20/2022	ND<50 U	ND<50 U
			9/28/2022	29.1 J	29.1 J
			4/19/2023	29.3 J	29.3 J
			8/23/2023	28.7 J	28.7 J
			4/30/2024	25.3 J	25.3 J
			9/11/2024	25.3 J	25.3 J
			4/15/2025	35.5 J	35.5 J
			8/26/2025	30.1 J	30.1 J
MW-21	16	1 (6.25%)	4/17/2018	50.7	50.7
			10/10/2018	66	66
			4/13/2019	44.2 J	44.2 J
			10/1/2019	38.1 J	38.1 J
			4/7/2020	40.9 J	40.9 J
			9/30/2020	36.2 J	36.2 J
			4/14/2021	32.8 J	32.8 J
			10/12/2021	40.1 J	40.1 J
			4/20/2022	ND<50 U	ND<50 U
			9/29/2022	35 J	35 J
			4/18/2023	34.6 J	34.6 J
			8/23/2023	35.2 J	35.2 J
			5/1/2024	38.9 J	38.9 J
			9/11/2024	29.8 J	29.8 J
			4/15/2025	39.5 J	39.5 J
			8/26/2025	38.3 J	38.3 J
MW-25	16	1 (6.25%)	4/17/2018	42.7 J	42.7 J
			10/9/2018	73.7	73.7
			4/13/2019	27.3 J	27.3 J
			10/1/2019	44.2 J	44.2 J
			4/8/2020	35.8 J	35.8 J
			10/1/2020	48.7 J	48.7 J
			4/14/2021	13.4 J	13.4 J
			10/13/2021	42.9 J	42.9 J
			4/19/2022	ND<50 U	ND<50 U
			9/29/2022	42.7 J	42.7 J
			4/19/2023	37 J	37 J
			8/24/2023	44 J	44 J
			4/29/2024	18.1 J	18.1 J
			9/10/2024	36.9 J	36.9 J
			4/14/2025	47 J	47 J
			8/26/2025	46.2 J	46.2 J
MW-26	16	6 (37.5%)	4/17/2018	28.4 J	28.4 J
			10/9/2018	ND<50 U	ND<50 U

4/13/2019	32.5 J	32.5 J
10/1/2019	17.7 J	17.7 J
4/8/2020	14.3 J	14.3 J
10/1/2020	28.7 J	28.7 J
4/14/2021	12 J	12 J
10/13/2021	14.7 J	14.7 J
4/19/2022	ND<50 U	ND<50 U
9/29/2022	21 J	21 J
4/19/2023	ND<50 U	ND<50 U
8/24/2023	ND<50 U	ND<50 U
4/29/2024	30.1 J	30.1 J
9/10/2024	ND<50 U	ND<50 U
4/15/2025	ND<50 U	ND<50 U
8/26/2025	23.5 J	23.5 J

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-05

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.781385	0.198413	0.507	66.2
2	0.773333	0.268817	0.525	50
3	0.415842	0.297619	0.546	None

Loc.	Date	Conc.	Outlier
MW-05	4/18/2018	30.1 J	FALSE
	10/10/2018	66.2	TRUE
	4/13/2019	25.5 J	FALSE
	10/1/2019	25.1 J	FALSE
	4/9/2020	18.2 J	FALSE
	10/1/2020	24.9 J	FALSE
	4/14/2021	17.5 J	FALSE
	10/13/2021	21.7 J	FALSE
	4/20/2022	ND<50 U	TRUE
	9/28/2022	21.6 J	FALSE
	4/19/2023	25.5 J	FALSE
	8/24/2023	22.1 J	FALSE
	5/1/2024	25.9 J	FALSE
	9/11/2024	20 J	FALSE
	4/15/2025	22.2 J	FALSE
	8/27/2025	26.8 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-05

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	17.5	66.2	48.7	0.5056	24.6227
2	18.2	50	31.8	0.329	10.4622
3	20	30.1	10.1	0.2521	2.54621
4	21.6	26.8	5.2	0.1939	1.00828
5	21.7	25.9	4.2	0.1447	0.60774
6	22.1	25.5	3.4	0.1005	0.3417
7	22.2	25.5	3.3	0.0593	0.19569
8	24.9	25.1	0.2	0.0196	0.00392
9	25.1	24.9	-0.2		
10	25.5	22.2	-3.3		
11	25.5	22.1	-3.4		
12	25.9	21.7	-4.2		
13	26.8	21.6	-5.2		
14	30.1	20	-10.1		
15	50	18.2	-31.8		
16	66.2	17.5	-48.7		

Sum of b values = 39.7885

Sample Standard Deviation = 12.6545

W Statistic = 0.659077

5% Critical value of 0.887 exceeds 0.659077

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.659077

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-05
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
66.2	30.1 J	36.1	1	0
25.5 J	30.1 J	-4.6	1	1
25.1 J	30.1 J	-5	1	2
18.2 J	30.1 J	-11.9	1	3
24.9 J	30.1 J	-5.2	1	4
17.5 J	30.1 J	-12.6	1	5
21.7 J	30.1 J	-8.4	1	6
ND<50 U	30.1 J	19.9	2	6
21.6 J	30.1 J	-8.5	2	7
25.5 J	30.1 J	-4.6	2	8
22.1 J	30.1 J	-8	2	9
25.9 J	30.1 J	-4.2	2	10
20 J	30.1 J	-10.1	2	11
22.2 J	30.1 J	-7.9	2	12
26.8 J	30.1 J	-3.3	2	13
25.5 J	66.2	-40.7	2	14
25.1 J	66.2	-41.1	2	15
18.2 J	66.2	-48	2	16
24.9 J	66.2	-41.3	2	17
17.5 J	66.2	-48.7	2	18
21.7 J	66.2	-44.5	2	19
ND<50 U	66.2	-16.2	2	20
21.6 J	66.2	-44.6	2	21
25.5 J	66.2	-40.7	2	22
22.1 J	66.2	-44.1	2	23
25.9 J	66.2	-40.3	2	24
20 J	66.2	-46.2	2	25
22.2 J	66.2	-44	2	26
26.8 J	66.2	-39.4	2	27
25.1 J	25.5 J	-0.4	2	28
18.2 J	25.5 J	-7.3	2	29
24.9 J	25.5 J	-0.6	2	30
17.5 J	25.5 J	-8	2	31
21.7 J	25.5 J	-3.8	2	32
ND<50 U	25.5 J	24.5	3	32
21.6 J	25.5 J	-3.9	3	33
25.5 J	25.5 J	0	3	33
22.1 J	25.5 J	-3.4	3	34
25.9 J	25.5 J	0.4	4	34
20 J	25.5 J	-5.5	4	35
22.2 J	25.5 J	-3.3	4	36
26.8 J	25.5 J	1.3	5	36
18.2 J	25.1 J	-6.9	5	37
24.9 J	25.1 J	-0.2	5	38

17.5 J	25.1 J	-7.6	5	39
21.7 J	25.1 J	-3.4	5	40
ND<50 U	25.1 J	24.9	6	40
21.6 J	25.1 J	-3.5	6	41
25.5 J	25.1 J	0.4	7	41
22.1 J	25.1 J	-3	7	42
25.9 J	25.1 J	0.8	8	42
20 J	25.1 J	-5.1	8	43
22.2 J	25.1 J	-2.9	8	44
26.8 J	25.1 J	1.7	9	44
24.9 J	18.2 J	6.7	10	44
17.5 J	18.2 J	-0.7	10	45
21.7 J	18.2 J	3.5	11	45
ND<50 U	18.2 J	31.8	12	45
21.6 J	18.2 J	3.4	13	45
25.5 J	18.2 J	7.3	14	45
22.1 J	18.2 J	3.9	15	45
25.9 J	18.2 J	7.7	16	45
20 J	18.2 J	1.8	17	45
22.2 J	18.2 J	4	18	45
26.8 J	18.2 J	8.6	19	45
17.5 J	24.9 J	-7.4	19	46
21.7 J	24.9 J	-3.2	19	47
ND<50 U	24.9 J	25.1	20	47
21.6 J	24.9 J	-3.3	20	48
25.5 J	24.9 J	0.6	21	48
22.1 J	24.9 J	-2.8	21	49
25.9 J	24.9 J	1	22	49
20 J	24.9 J	-4.9	22	50
22.2 J	24.9 J	-2.7	22	51
26.8 J	24.9 J	1.9	23	51
21.7 J	17.5 J	4.2	24	51
ND<50 U	17.5 J	32.5	25	51
21.6 J	17.5 J	4.1	26	51
25.5 J	17.5 J	8	27	51
22.1 J	17.5 J	4.6	28	51
25.9 J	17.5 J	8.4	29	51
20 J	17.5 J	2.5	30	51
22.2 J	17.5 J	4.7	31	51
26.8 J	17.5 J	9.3	32	51
ND<50 U	21.7 J	28.3	33	51
21.6 J	21.7 J	-0.1	33	52
25.5 J	21.7 J	3.8	34	52
22.1 J	21.7 J	0.4	35	52
25.9 J	21.7 J	4.2	36	52
20 J	21.7 J	-1.7	36	53
22.2 J	21.7 J	0.5	37	53
26.8 J	21.7 J	5.1	38	53
21.6 J	ND<50 U	-28.4	38	54
25.5 J	ND<50 U	-24.5	38	55
22.1 J	ND<50 U	-27.9	38	56
25.9 J	ND<50 U	-24.1	38	57

20 J	ND<50 U	-30	38	58
22.2 J	ND<50 U	-27.8	38	59
26.8 J	ND<50 U	-23.2	38	60
25.5 J	21.6 J	3.9	39	60
22.1 J	21.6 J	0.5	40	60
25.9 J	21.6 J	4.3	41	60
20 J	21.6 J	-1.6	41	61
22.2 J	21.6 J	0.6	42	61
26.8 J	21.6 J	5.2	43	61
22.1 J	25.5 J	-3.4	43	62
25.9 J	25.5 J	0.4	44	62
20 J	25.5 J	-5.5	44	63
22.2 J	25.5 J	-3.3	44	64
26.8 J	25.5 J	1.3	45	64
25.9 J	22.1 J	3.8	46	64
20 J	22.1 J	-2.1	46	65
22.2 J	22.1 J	0.1	47	65
26.8 J	22.1 J	4.7	48	65
20 J	25.9 J	-5.9	48	66
22.2 J	25.9 J	-3.7	48	67
26.8 J	25.9 J	0.9	49	67
22.2 J	20 J	2.2	50	67
26.8 J	20 J	6.8	51	67
26.8 J	22.2 J	4.6	52	67

S Statistic = 52 - 67 = -15

Tied Group	Value	Members
1	25.5	2

Time Period	Observations
4/18/2018	1
10/10/2018	1
4/13/2019	1
10/1/2019	1
4/9/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/20/2022	1
9/28/2022	1
4/19/2023	1
8/24/2023	1
5/1/2024	1
9/11/2024	1
4/15/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

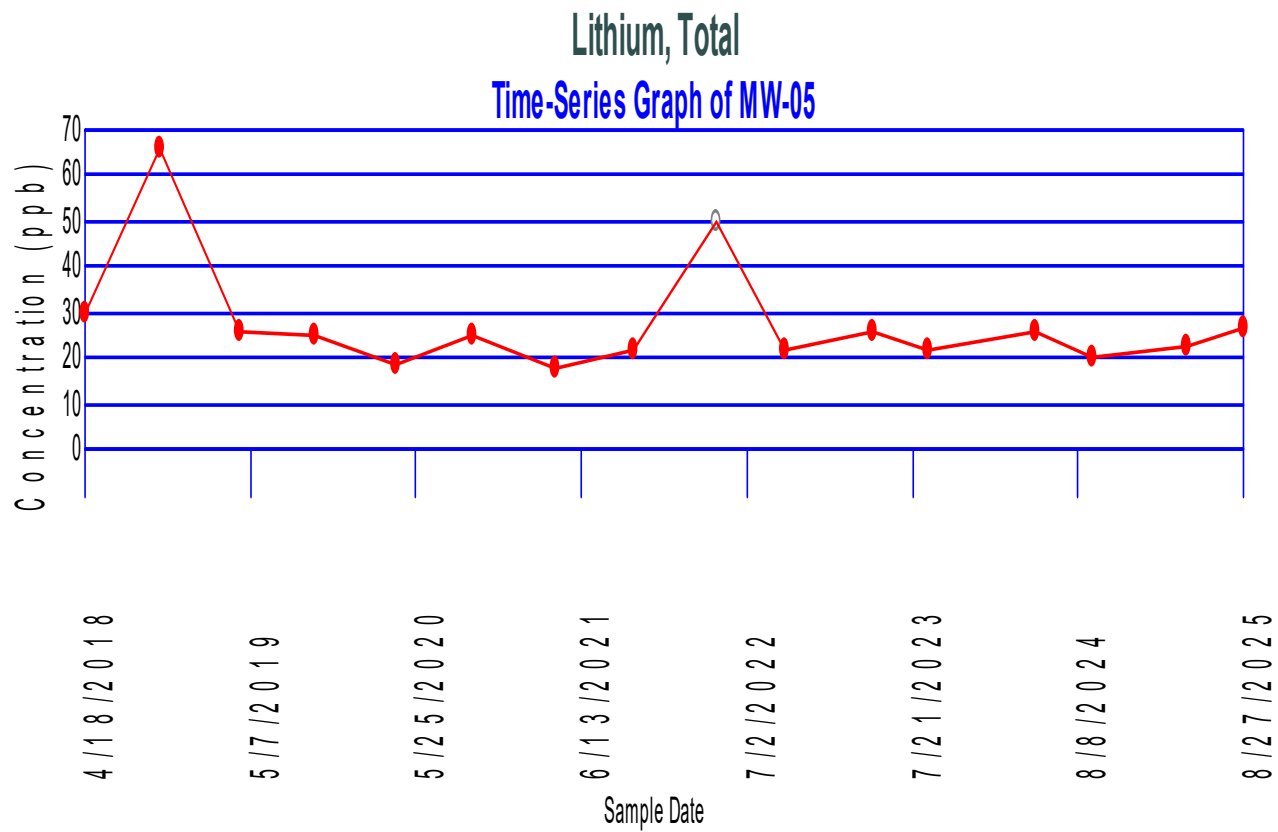
c = 480

Group Variance = 492.333

Z-Score = -0.630955

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.630955| \leq 1.97737$ indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-06

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0	0.0799257	0.507	None

Loc.	Date	Conc.	Outlier
MW-06	4/18/2018	19.2 J	FALSE
	10/10/2018	ND<50 U	FALSE
	4/14/2019	19.6 J	FALSE
	10/2/2019	14.3 J	FALSE
	4/8/2020	10.4 J	FALSE
	9/30/2020	13 J	FALSE
	4/13/2021	6.96 J	FALSE
	10/14/2021	9.78 J	FALSE
	4/20/2022	ND<50 U	FALSE
	9/27/2022	12.2 J	FALSE
	4/18/2023	ND<50 U	FALSE
	8/23/2023	ND<50 U	FALSE
	5/1/2024	ND<50 U	FALSE
	9/12/2024	ND<50 U	FALSE
	4/16/2025	ND<50 U	FALSE
	8/27/2025	ND<50 U	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-06

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.96	50	43.04	0.5056	21.761
2	9.78	50	40.22	0.329	13.2324
3	10.4	50	39.6	0.2521	9.98316
4	12.2	50	37.8	0.1939	7.32942
5	13	50	37	0.1447	5.3539
6	14.3	50	35.7	0.1005	3.58785
7	19.2	50	30.8	0.0593	1.82644
8	19.6	50	30.4	0.0196	0.59584
9	50	19.6	-30.4		
10	50	19.2	-30.8		
11	50	14.3	-35.7		
12	50	13	-37		
13	50	12.2	-37.8		
14	50	10.4	-39.6		
15	50	9.78	-40.22		
16	50	6.96	-43.04		

Sum of b values = 63.67

Sample Standard Deviation = 19.2536

W Statistic = 0.729044

5% Critical value of 0.887 exceeds 0.729044

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.729044

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-06
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<50 U	19.2 J	30.8	1	0
19.6 J	19.2 J	0.4	2	0
14.3 J	19.2 J	-4.9	2	1
10.4 J	19.2 J	-8.8	2	2
13 J	19.2 J	-6.2	2	3
6.96 J	19.2 J	-12.24	2	4
9.78 J	19.2 J	-9.42	2	5
ND<50 U	19.2 J	30.8	3	5
12.2 J	19.2 J	-7	3	6
ND<50 U	19.2 J	30.8	4	6
ND<50 U	19.2 J	30.8	5	6
ND<50 U	19.2 J	30.8	6	6
ND<50 U	19.2 J	30.8	7	6
ND<50 U	19.2 J	30.8	8	6
ND<50 U	19.2 J	30.8	9	6
19.6 J	ND<50 U	-30.4	9	7
14.3 J	ND<50 U	-35.7	9	8
10.4 J	ND<50 U	-39.6	9	9
13 J	ND<50 U	-37	9	10
6.96 J	ND<50 U	-43.04	9	11
9.78 J	ND<50 U	-40.22	9	12
ND<50 U	ND<50 U	0	9	12
12.2 J	ND<50 U	-37.8	9	13
ND<50 U	ND<50 U	0	9	13
ND<50 U	ND<50 U	0	9	13
ND<50 U	ND<50 U	0	9	13
ND<50 U	ND<50 U	0	9	13
ND<50 U	ND<50 U	0	9	13
14.3 J	19.6 J	-5.3	9	14
10.4 J	19.6 J	-9.2	9	15
13 J	19.6 J	-6.6	9	16
6.96 J	19.6 J	-12.64	9	17
9.78 J	19.6 J	-9.82	9	18
ND<50 U	19.6 J	30.4	10	18
12.2 J	19.6 J	-7.4	10	19
ND<50 U	19.6 J	30.4	11	19
ND<50 U	19.6 J	30.4	12	19
ND<50 U	19.6 J	30.4	13	19
ND<50 U	19.6 J	30.4	14	19
ND<50 U	19.6 J	30.4	15	19
ND<50 U	19.6 J	30.4	16	19
10.4 J	14.3 J	-3.9	16	20
13 J	14.3 J	-1.3	16	21

6.96 J	14.3 J	-7.34	16	22
9.78 J	14.3 J	-4.52	16	23
ND<50 U	14.3 J	35.7	17	23
12.2 J	14.3 J	-2.1	17	24
ND<50 U	14.3 J	35.7	18	24
ND<50 U	14.3 J	35.7	19	24
ND<50 U	14.3 J	35.7	20	24
ND<50 U	14.3 J	35.7	21	24
ND<50 U	14.3 J	35.7	22	24
ND<50 U	14.3 J	35.7	23	24
13 J	10.4 J	2.6	24	24
6.96 J	10.4 J	-3.44	24	25
9.78 J	10.4 J	-0.62	24	26
ND<50 U	10.4 J	39.6	25	26
12.2 J	10.4 J	1.8	26	26
ND<50 U	10.4 J	39.6	27	26
ND<50 U	10.4 J	39.6	28	26
ND<50 U	10.4 J	39.6	29	26
ND<50 U	10.4 J	39.6	30	26
ND<50 U	10.4 J	39.6	31	26
ND<50 U	10.4 J	39.6	32	26
6.96 J	13 J	-6.04	32	27
9.78 J	13 J	-3.22	32	28
ND<50 U	13 J	37	33	28
12.2 J	13 J	-0.8	33	29
ND<50 U	13 J	37	34	29
ND<50 U	13 J	37	35	29
ND<50 U	13 J	37	36	29
ND<50 U	13 J	37	37	29
ND<50 U	13 J	37	38	29
ND<50 U	13 J	37	39	29
9.78 J	6.96 J	2.82	40	29
ND<50 U	6.96 J	43.04	41	29
12.2 J	6.96 J	5.24	42	29
ND<50 U	6.96 J	43.04	43	29
ND<50 U	6.96 J	43.04	44	29
ND<50 U	6.96 J	43.04	45	29
ND<50 U	6.96 J	43.04	46	29
ND<50 U	6.96 J	43.04	47	29
ND<50 U	6.96 J	43.04	48	29
ND<50 U	9.78 J	40.22	49	29
12.2 J	9.78 J	2.42	50	29
ND<50 U	9.78 J	40.22	51	29
ND<50 U	9.78 J	40.22	52	29
ND<50 U	9.78 J	40.22	53	29
ND<50 U	9.78 J	40.22	54	29
ND<50 U	9.78 J	40.22	55	29
ND<50 U	9.78 J	40.22	56	29
12.2 J	ND<50 U	-37.8	56	30
ND<50 U	ND<50 U	0	56	30
ND<50 U	ND<50 U	0	56	30
ND<50 U	ND<50 U	0	56	30

ND<50 U	ND<50 U	0	56	30
ND<50 U	ND<50 U	0	56	30
ND<50 U	ND<50 U	0	56	30
ND<50 U	12.2 J	37.8	57	30
ND<50 U	12.2 J	37.8	58	30
ND<50 U	12.2 J	37.8	59	30
ND<50 U	12.2 J	37.8	60	30
ND<50 U	12.2 J	37.8	61	30
ND<50 U	12.2 J	37.8	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30
ND<50 U	ND<50 U	0	62	30

S Statistic = 62 - 30 = 32

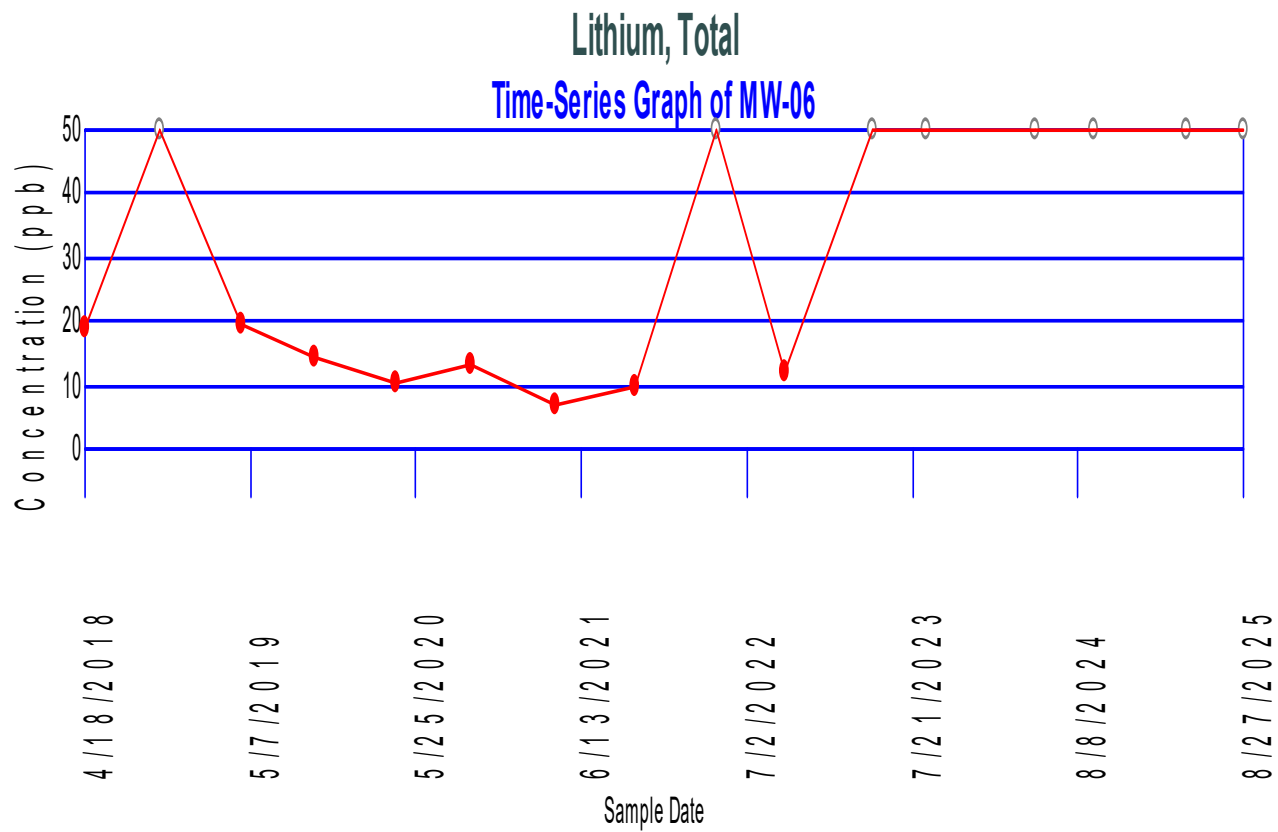
Tied Group	Value	Members
1	50	8

Time Period	Observations
4/18/2018	1
10/10/2018	1
4/14/2019	1
10/2/2019	1
4/8/2020	1
9/30/2020	1
4/13/2021	1
10/14/2021	1
4/20/2022	1
9/27/2022	1
4/18/2023	1
8/23/2023	1
5/1/2024	1
9/12/2024	1
4/16/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 1176

B = 0
C = 336
D = 0
E = 56
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 428
Z-Score = 1.49844
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|1.49844| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-07

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.595041	0.344482	0.507	116
2	0.3625	0.402344	0.525	None

Loc.	Date	Conc.	Outlier
MW-07	4/18/2018	87.2	FALSE
	10/10/2018	116	TRUE
	4/14/2019	91.6	FALSE
	10/2/2019	77.6	FALSE
	4/8/2020	69.6	FALSE
	9/30/2020	78.4	FALSE
	4/13/2021	67.1	FALSE
	10/14/2021	73	FALSE
	4/20/2022	82.9	FALSE
	9/27/2022	77	FALSE
	4/18/2023	57.3	FALSE
	8/23/2023	71.1	FALSE
	5/1/2024	80.8	FALSE
	9/11/2024	73.4	FALSE
	4/16/2025	67.6	FALSE
	8/27/2025	80.5	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-07

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	57.3	116	58.7	0.5056	29.6787
2	67.1	91.6	24.5	0.329	8.0605
3	67.6	87.2	19.6	0.2521	4.94116
4	69.6	82.9	13.3	0.1939	2.57887
5	71.1	80.8	9.7	0.1447	1.40359
6	73	80.5	7.5	0.1005	0.75375
7	73.4	78.4	5	0.0593	0.2965
8	77	77.6	0.6	0.0196	0.01176
9	77.6	77	-0.6		
10	78.4	73.4	-5		
11	80.5	73	-7.5		
12	80.8	71.1	-9.7		
13	82.9	69.6	-13.3		
14	87.2	67.6	-19.6		
15	91.6	67.1	-24.5		
16	116	57.3	-58.7		

Sum of b values = 47.7249

Sample Standard Deviation = 13.0951

W Statistic = 0.885488

5% Critical value of 0.887 exceeds 0.885488

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.885488

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-07
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
116	87.2	28.8	1	0
91.6	87.2	4.4	2	0
77.6	87.2	-9.6	2	1
69.6	87.2	-17.6	2	2
78.4	87.2	-8.8	2	3
67.1	87.2	-20.1	2	4
73	87.2	-14.2	2	5
82.9	87.2	-4.3	2	6
77	87.2	-10.2	2	7
57.3	87.2	-29.9	2	8
71.1	87.2	-16.1	2	9
80.8	87.2	-6.4	2	10
73.4	87.2	-13.8	2	11
67.6	87.2	-19.6	2	12
80.5	87.2	-6.7	2	13
91.6	116	-24.4	2	14
77.6	116	-38.4	2	15
69.6	116	-46.4	2	16
78.4	116	-37.6	2	17
67.1	116	-48.9	2	18
73	116	-43	2	19
82.9	116	-33.1	2	20
77	116	-39	2	21
57.3	116	-58.7	2	22
71.1	116	-44.9	2	23
80.8	116	-35.2	2	24
73.4	116	-42.6	2	25
67.6	116	-48.4	2	26
80.5	116	-35.5	2	27
77.6	91.6	-14	2	28
69.6	91.6	-22	2	29
78.4	91.6	-13.2	2	30
67.1	91.6	-24.5	2	31
73	91.6	-18.6	2	32
82.9	91.6	-8.7	2	33
77	91.6	-14.6	2	34
57.3	91.6	-34.3	2	35
71.1	91.6	-20.5	2	36
80.8	91.6	-10.8	2	37
73.4	91.6	-18.2	2	38
67.6	91.6	-24	2	39
80.5	91.6	-11.1	2	40
69.6	77.6	-8	2	41
78.4	77.6	0.8	3	41

67.1	77.6	-10.5	3	42
73	77.6	-4.6	3	43
82.9	77.6	5.3	4	43
77	77.6	-0.6	4	44
57.3	77.6	-20.3	4	45
71.1	77.6	-6.5	4	46
80.8	77.6	3.2	5	46
73.4	77.6	-4.2	5	47
67.6	77.6	-10	5	48
80.5	77.6	2.9	6	48
78.4	69.6	8.8	7	48
67.1	69.6	-2.5	7	49
73	69.6	3.4	8	49
82.9	69.6	13.3	9	49
77	69.6	7.4	10	49
57.3	69.6	-12.3	10	50
71.1	69.6	1.5	11	50
80.8	69.6	11.2	12	50
73.4	69.6	3.8	13	50
67.6	69.6	-2	13	51
80.5	69.6	10.9	14	51
67.1	78.4	-11.3	14	52
73	78.4	-5.4	14	53
82.9	78.4	4.5	15	53
77	78.4	-1.4	15	54
57.3	78.4	-21.1	15	55
71.1	78.4	-7.3	15	56
80.8	78.4	2.4	16	56
73.4	78.4	-5	16	57
67.6	78.4	-10.8	16	58
80.5	78.4	2.1	17	58
73	67.1	5.9	18	58
82.9	67.1	15.8	19	58
77	67.1	9.9	20	58
57.3	67.1	-9.8	20	59
71.1	67.1	4	21	59
80.8	67.1	13.7	22	59
73.4	67.1	6.3	23	59
67.6	67.1	0.5	24	59
80.5	67.1	13.4	25	59
82.9	73	9.9	26	59
77	73	4	27	59
57.3	73	-15.7	27	60
71.1	73	-1.9	27	61
80.8	73	7.8	28	61
73.4	73	0.4	29	61
67.6	73	-5.4	29	62
80.5	73	7.5	30	62
77	82.9	-5.9	30	63
57.3	82.9	-25.6	30	64
71.1	82.9	-11.8	30	65
80.8	82.9	-2.1	30	66

73.4	82.9	-9.5	30	67
67.6	82.9	-15.3	30	68
80.5	82.9	-2.4	30	69
57.3	77	-19.7	30	70
71.1	77	-5.9	30	71
80.8	77	3.8	31	71
73.4	77	-3.6	31	72
67.6	77	-9.4	31	73
80.5	77	3.5	32	73
71.1	57.3	13.8	33	73
80.8	57.3	23.5	34	73
73.4	57.3	16.1	35	73
67.6	57.3	10.3	36	73
80.5	57.3	23.2	37	73
80.8	71.1	9.7	38	73
73.4	71.1	2.3	39	73
67.6	71.1	-3.5	39	74
80.5	71.1	9.4	40	74
73.4	80.8	-7.4	40	75
67.6	80.8	-13.2	40	76
80.5	80.8	-0.3	40	77
67.6	73.4	-5.8	40	78
80.5	73.4	7.1	41	78
80.5	67.6	12.9	42	78

S Statistic = 42 - 78 = -36

Tied Group	Value	Members
Time Period	Observations	
4/18/2018	1	
10/10/2018	1	
4/14/2019	1	
10/2/2019	1	
4/8/2020	1	
9/30/2020	1	
4/13/2021	1	
10/14/2021	1	
4/20/2022	1	
9/27/2022	1	
4/18/2023	1	
8/23/2023	1	
5/1/2024	1	
9/11/2024	1	
4/16/2025	1	
8/27/2025	1	

There are 0 time periods with multiple data

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

c = 480

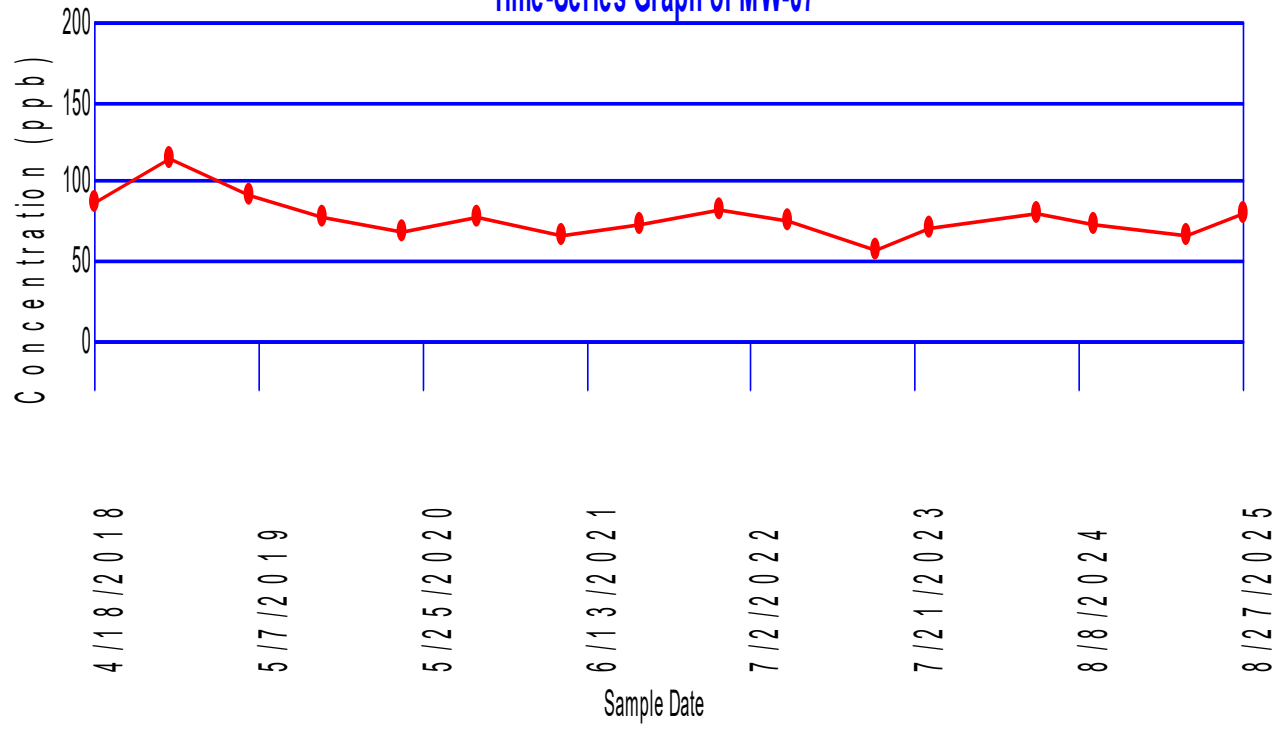
Group Variance = 493.333

Z-Score = -1.57579

Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)

| -1.57579 | <= 1.97737 indicating no evidence of a trend

Lithium, Total
Time-Series Graph of MW-07



Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-12

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0	0.115128	0.507	None

Loc.	Date	Conc.	Outlier
MW-12	4/17/2018	19.3 J	FALSE
	10/9/2018	ND<50 U	FALSE
	4/14/2019	17.5 J	FALSE
	10/2/2019	ND<50 U	FALSE
	4/8/2020	ND<50 U	FALSE
	10/1/2020	12.8 J	FALSE
	4/15/2021	7.96 J	FALSE
	10/14/2021	10.2 J	FALSE
	4/19/2022	ND<50 U	FALSE
	9/28/2022	ND<50 U	FALSE
	4/18/2023	ND<50 U	FALSE
	8/24/2023	ND<50 U	FALSE
	5/1/2024	ND<50 U	FALSE
	9/12/2024	ND<50 U	FALSE
	4/16/2025	ND<50 U	FALSE
	8/28/2025	ND<50 U	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-12

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	7.96	50	42.04	0.5056	21.2554
2	10.2	50	39.8	0.329	13.0942
3	12.8	50	37.2	0.2521	9.37812
4	17.5	50	32.5	0.1939	6.30175
5	19.3	50	30.7	0.1447	4.44229
6	50	50	0	0.1005	0
7	50	50	0	0.0593	0
8	50	50	0	0.0196	0
9	50	50	0		
10	50	50	0		
11	50	50	0		
12	50	19.3	-30.7		
13	50	17.5	-32.5		
14	50	12.8	-37.2		
15	50	10.2	-39.8		
16	50	7.96	-42.04		

Sum of b values = 54.4718

Sample Standard Deviation = 17.6225

W Statistic = 0.63697

5% Critical value of 0.887 exceeds 0.63697

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.63697

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-12
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<50 U	19.3 J	30.7	1	0
17.5 J	19.3 J	-1.8	1	1
ND<50 U	19.3 J	30.7	2	1
ND<50 U	19.3 J	30.7	3	1
12.8 J	19.3 J	-6.5	3	2
7.96 J	19.3 J	-11.34	3	3
10.2 J	19.3 J	-9.1	3	4
ND<50 U	19.3 J	30.7	4	4
ND<50 U	19.3 J	30.7	5	4
ND<50 U	19.3 J	30.7	6	4
ND<50 U	19.3 J	30.7	7	4
ND<50 U	19.3 J	30.7	8	4
ND<50 U	19.3 J	30.7	9	4
ND<50 U	19.3 J	30.7	10	4
ND<50 U	19.3 J	30.7	11	4
17.5 J	ND<50 U	-32.5	11	5
ND<50 U	ND<50 U	0	11	5
ND<50 U	ND<50 U	0	11	5
12.8 J	ND<50 U	-37.2	11	6
7.96 J	ND<50 U	-42.04	11	7
10.2 J	ND<50 U	-39.8	11	8
ND<50 U	ND<50 U	0	11	8
ND<50 U	ND<50 U	0	11	8
ND<50 U	ND<50 U	0	11	8
ND<50 U	ND<50 U	0	11	8
ND<50 U	ND<50 U	0	11	8
ND<50 U	ND<50 U	0	11	8
ND<50 U	ND<50 U	0	11	8
ND<50 U	17.5 J	32.5	12	8
ND<50 U	17.5 J	32.5	13	8
12.8 J	17.5 J	-4.7	13	9
7.96 J	17.5 J	-9.54	13	10
10.2 J	17.5 J	-7.3	13	11
ND<50 U	17.5 J	32.5	14	11
ND<50 U	17.5 J	32.5	15	11
ND<50 U	17.5 J	32.5	16	11
ND<50 U	17.5 J	32.5	17	11
ND<50 U	17.5 J	32.5	18	11
ND<50 U	17.5 J	32.5	19	11
ND<50 U	17.5 J	32.5	20	11
ND<50 U	17.5 J	32.5	21	11
ND<50 U	ND<50 U	0	21	11
12.8 J	ND<50 U	-37.2	21	12

7.96 J	ND<50 U	-42.04	21	13
10.2 J	ND<50 U	-39.8	21	14
ND<50 U	ND<50 U	0	21	14
ND<50 U	ND<50 U	0	21	14
ND<50 U	ND<50 U	0	21	14
ND<50 U	ND<50 U	0	21	14
ND<50 U	ND<50 U	0	21	14
ND<50 U	ND<50 U	0	21	14
ND<50 U	ND<50 U	0	21	14
ND<50 U	ND<50 U	0	21	14
12.8 J	ND<50 U	-37.2	21	15
7.96 J	ND<50 U	-42.04	21	16
10.2 J	ND<50 U	-39.8	21	17
ND<50 U	ND<50 U	0	21	17
ND<50 U	ND<50 U	0	21	17
ND<50 U	ND<50 U	0	21	17
ND<50 U	ND<50 U	0	21	17
ND<50 U	ND<50 U	0	21	17
ND<50 U	ND<50 U	0	21	17
ND<50 U	ND<50 U	0	21	17
ND<50 U	ND<50 U	0	21	17
7.96 J	12.8 J	-4.84	21	18
10.2 J	12.8 J	-2.6	21	19
ND<50 U	12.8 J	37.2	22	19
ND<50 U	12.8 J	37.2	23	19
ND<50 U	12.8 J	37.2	24	19
ND<50 U	12.8 J	37.2	25	19
ND<50 U	12.8 J	37.2	26	19
ND<50 U	12.8 J	37.2	27	19
ND<50 U	12.8 J	37.2	28	19
ND<50 U	12.8 J	37.2	29	19
10.2 J	7.96 J	2.24	30	19
ND<50 U	7.96 J	42.04	31	19
ND<50 U	7.96 J	42.04	32	19
ND<50 U	7.96 J	42.04	33	19
ND<50 U	7.96 J	42.04	34	19
ND<50 U	7.96 J	42.04	35	19
ND<50 U	7.96 J	42.04	36	19
ND<50 U	7.96 J	42.04	37	19
ND<50 U	7.96 J	42.04	38	19
ND<50 U	10.2 J	39.8	39	19
ND<50 U	10.2 J	39.8	40	19
ND<50 U	10.2 J	39.8	41	19
ND<50 U	10.2 J	39.8	42	19
ND<50 U	10.2 J	39.8	43	19
ND<50 U	10.2 J	39.8	44	19
ND<50 U	10.2 J	39.8	45	19
ND<50 U	10.2 J	39.8	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19

ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19
ND<50 U	ND<50 U	0	46	19

S Statistic = 46 - 19 = 27

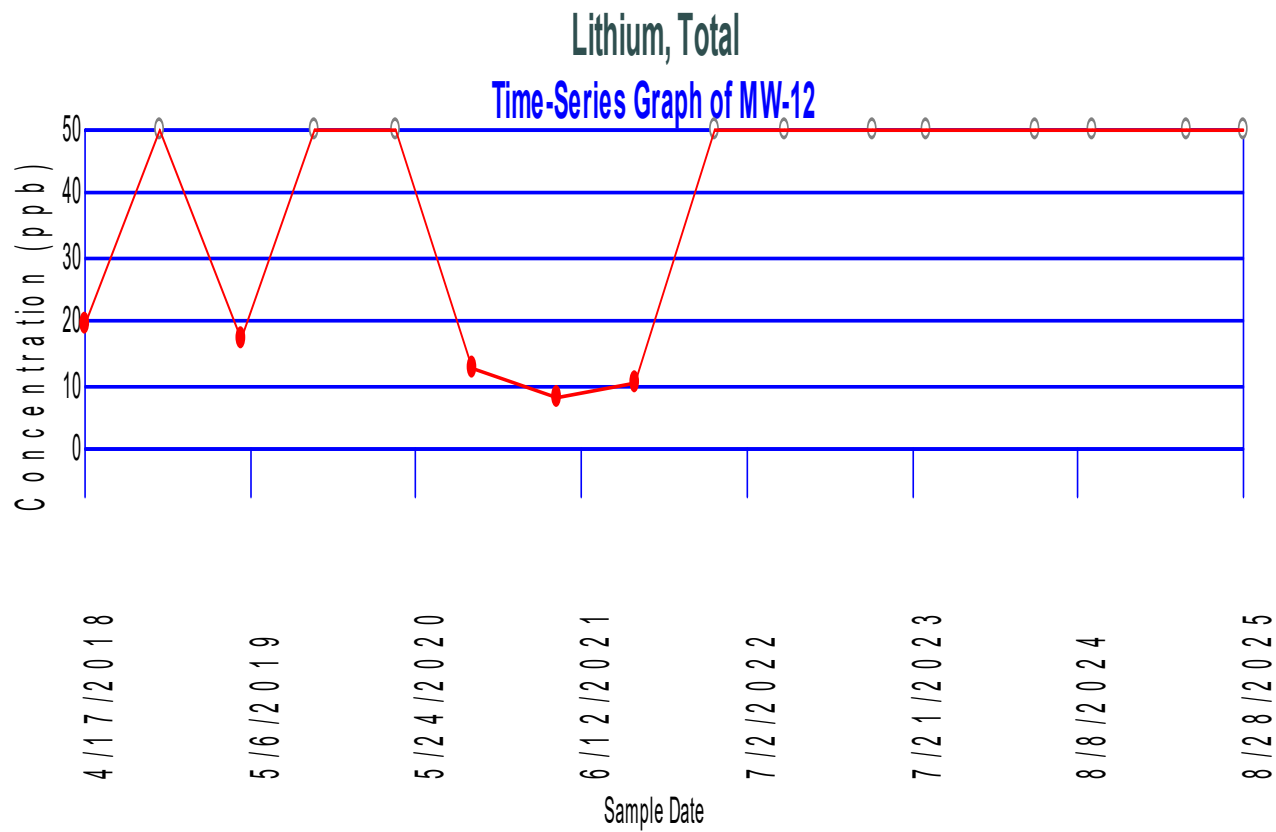
Tied Group	Value	Members
1	50	11

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/14/2019	1
10/2/2019	1
4/8/2020	1
10/1/2020	1
4/15/2021	1
10/14/2021	1
4/19/2022	1
9/28/2022	1
4/18/2023	1
8/24/2023	1
5/1/2024	1
9/12/2024	1
4/16/2025	1
8/28/2025	1

There are 0 time periods with multiple data

A = 2970

B = 0
C = 990
D = 0
E = 110
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 328.333
Z-Score = 1.43488
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|1.43488| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-16

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.55291	0.0913978	0.507	89.3
2	0.292553	0.113333	0.525	None

Loc.	Date	Conc.	Outlier
MW-16	4/17/2018	70.3	FALSE
	10/9/2018	89.3	TRUE
	4/14/2019	64.8	FALSE
	10/2/2019	61.7	FALSE
	4/9/2020	54.3	FALSE
	10/1/2020	61.8	FALSE
	4/15/2021	51.2	FALSE
	10/14/2021	63	FALSE
	4/19/2022	68.4 J+	FALSE
	9/28/2022	58	FALSE
	4/18/2023	49.8 J	FALSE
	8/24/2023	55.6	FALSE
	5/2/2024	62.6	FALSE
	9/12/2024	51.5	FALSE
	4/16/2025	61.5	FALSE
	8/28/2025	59.8	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-16

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	49.8	89.3	39.5	0.5056	19.9712
2	51.2	70.3	19.1	0.329	6.2839
3	51.5	68.4	16.9	0.2521	4.26049
4	54.3	64.8	10.5	0.1939	2.03595
5	55.6	63	7.4	0.1447	1.07078
6	58	62.6	4.6	0.1005	0.4623
7	59.8	61.8	2	0.0593	0.1186
8	61.5	61.7	0.2	0.0196	0.00392
9	61.7	61.5	-0.2		
10	61.8	59.8	-2		
11	62.6	58	-4.6		
12	63	55.6	-7.4		
13	64.8	54.3	-10.5		
14	68.4	51.5	-16.9		
15	70.3	51.2	-19.1		
16	89.3	49.8	-39.5		

Sum of b values = 34.2071

Sample Standard Deviation = 9.51185

W Statistic = 0.862208

5% Critical value of 0.887 exceeds 0.862208

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.862208

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-16
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
89.3	70.3	19	1	0
64.8	70.3	-5.5	1	1
61.7	70.3	-8.6	1	2
54.3	70.3	-16	1	3
61.8	70.3	-8.5	1	4
51.2	70.3	-19.1	1	5
63	70.3	-7.3	1	6
68.4 J+	70.3	-1.9	1	7
58	70.3	-12.3	1	8
49.8 J	70.3	-20.5	1	9
55.6	70.3	-14.7	1	10
62.6	70.3	-7.7	1	11
51.5	70.3	-18.8	1	12
61.5	70.3	-8.8	1	13
59.8	70.3	-10.5	1	14
64.8	89.3	-24.5	1	15
61.7	89.3	-27.6	1	16
54.3	89.3	-35	1	17
61.8	89.3	-27.5	1	18
51.2	89.3	-38.1	1	19
63	89.3	-26.3	1	20
68.4 J+	89.3	-20.9	1	21
58	89.3	-31.3	1	22
49.8 J	89.3	-39.5	1	23
55.6	89.3	-33.7	1	24
62.6	89.3	-26.7	1	25
51.5	89.3	-37.8	1	26
61.5	89.3	-27.8	1	27
59.8	89.3	-29.5	1	28
61.7	64.8	-3.1	1	29
54.3	64.8	-10.5	1	30
61.8	64.8	-3	1	31
51.2	64.8	-13.6	1	32
63	64.8	-1.8	1	33
68.4 J+	64.8	3.6	2	33
58	64.8	-6.8	2	34
49.8 J	64.8	-15	2	35
55.6	64.8	-9.2	2	36
62.6	64.8	-2.2	2	37
51.5	64.8	-13.3	2	38
61.5	64.8	-3.3	2	39
59.8	64.8	-5	2	40
54.3	61.7	-7.4	2	41
61.8	61.7	0.1	3	41

51.2	61.7	-10.5	3	42
63	61.7	1.3	4	42
68.4 J+	61.7	6.7	5	42
58	61.7	-3.7	5	43
49.8 J	61.7	-11.9	5	44
55.6	61.7	-6.1	5	45
62.6	61.7	0.9	6	45
51.5	61.7	-10.2	6	46
61.5	61.7	-0.2	6	47
59.8	61.7	-1.9	6	48
61.8	54.3	7.5	7	48
51.2	54.3	-3.1	7	49
63	54.3	8.7	8	49
68.4 J+	54.3	14.1	9	49
58	54.3	3.7	10	49
49.8 J	54.3	-4.5	10	50
55.6	54.3	1.3	11	50
62.6	54.3	8.3	12	50
51.5	54.3	-2.8	12	51
61.5	54.3	7.2	13	51
59.8	54.3	5.5	14	51
51.2	61.8	-10.6	14	52
63	61.8	1.2	15	52
68.4 J+	61.8	6.6	16	52
58	61.8	-3.8	16	53
49.8 J	61.8	-12	16	54
55.6	61.8	-6.2	16	55
62.6	61.8	0.8	17	55
51.5	61.8	-10.3	17	56
61.5	61.8	-0.3	17	57
59.8	61.8	-2	17	58
63	51.2	11.8	18	58
68.4 J+	51.2	17.2	19	58
58	51.2	6.8	20	58
49.8 J	51.2	-1.4	20	59
55.6	51.2	4.4	21	59
62.6	51.2	11.4	22	59
51.5	51.2	0.3	23	59
61.5	51.2	10.3	24	59
59.8	51.2	8.6	25	59
68.4 J+	63	5.4	26	59
58	63	-5	26	60
49.8 J	63	-13.2	26	61
55.6	63	-7.4	26	62
62.6	63	-0.4	26	63
51.5	63	-11.5	26	64
61.5	63	-1.5	26	65
59.8	63	-3.2	26	66
58	68.4 J+	-10.4	26	67
49.8 J	68.4 J+	-18.6	26	68
55.6	68.4 J+	-12.8	26	69
62.6	68.4 J+	-5.8	26	70

51.5	68.4 J+	-16.9	26	71
61.5	68.4 J+	-6.9	26	72
59.8	68.4 J+	-8.6	26	73
49.8 J	58	-8.2	26	74
55.6	58	-2.4	26	75
62.6	58	4.6	27	75
51.5	58	-6.5	27	76
61.5	58	3.5	28	76
59.8	58	1.8	29	76
55.6	49.8 J	5.8	30	76
62.6	49.8 J	12.8	31	76
51.5	49.8 J	1.7	32	76
61.5	49.8 J	11.7	33	76
59.8	49.8 J	10	34	76
62.6	55.6	7	35	76
51.5	55.6	-4.1	35	77
61.5	55.6	5.9	36	77
59.8	55.6	4.2	37	77
51.5	62.6	-11.1	37	78
61.5	62.6	-1.1	37	79
59.8	62.6	-2.8	37	80
61.5	51.5	10	38	80
59.8	51.5	8.3	39	80
59.8	61.5	-1.7	39	81

S Statistic = 39 - 81 = -42

Tied Group	Value	Members
Time Period	Observations	
4/17/2018	1	
10/9/2018	1	
4/14/2019	1	
10/2/2019	1	
4/9/2020	1	
10/1/2020	1	
4/15/2021	1	
10/14/2021	1	
4/19/2022	1	
9/28/2022	1	
4/18/2023	1	
8/24/2023	1	
5/2/2024	1	
9/12/2024	1	
4/16/2025	1	
8/28/2025	1	
There are 0 time periods with multiple data		

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

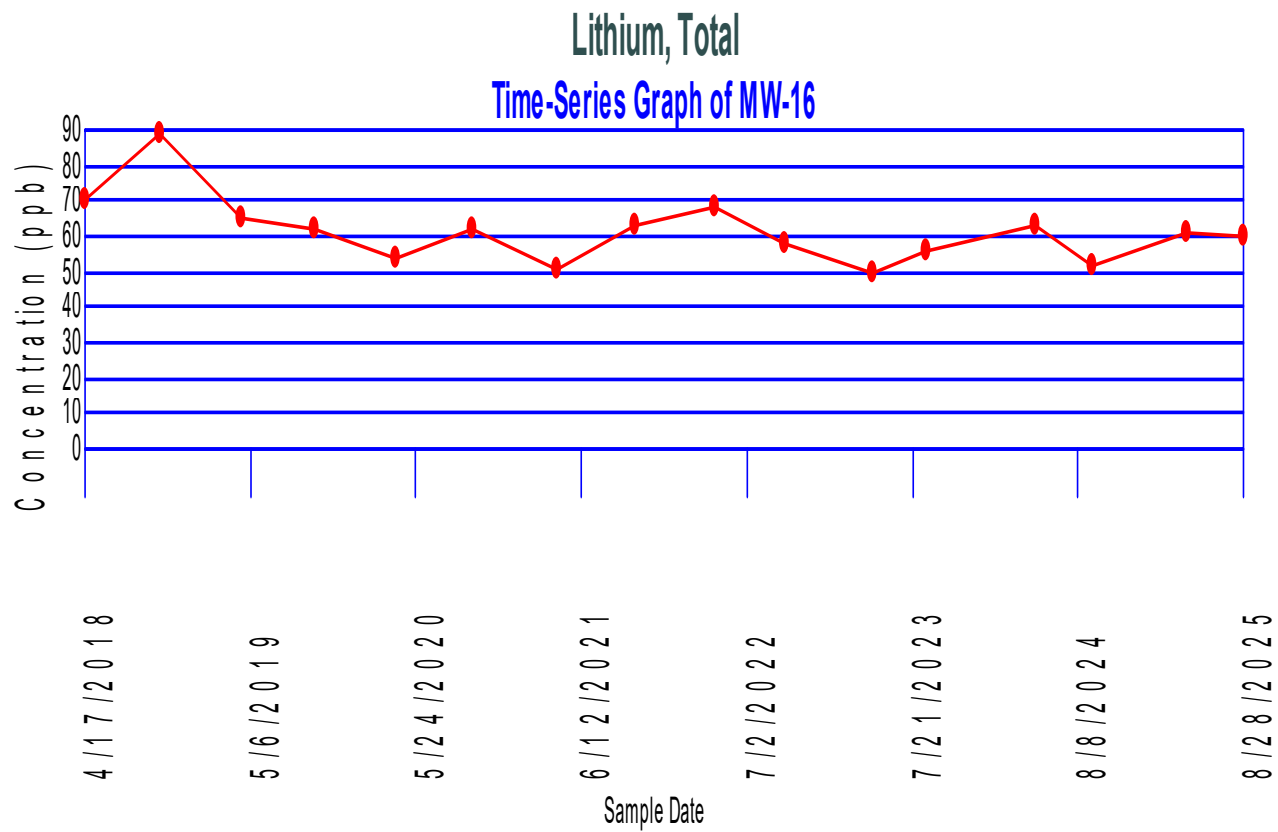
c = 480

Group Variance = 493.333

Z-Score = -1.84592

Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)

| -1.84592 | <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-20

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.674121	0.3625	0.507	56.6
2	0.663968	0.411348	0.525	50
3	0.382353	0.479339	0.546	None

Loc.	Date	Conc.	Outlier
MW-20	4/17/2018	33.6 J	FALSE
	10/10/2018	56.6	TRUE
	4/14/2019	31.6 J	FALSE
	10/2/2019	29.5 J	FALSE
	4/9/2020	29.1 J	FALSE
	10/2/2020	30.8 J	FALSE
	4/15/2021	19.5 J	FALSE
	10/12/2021	25.1 J	FALSE
	4/20/2022	ND<50 U	TRUE
	9/28/2022	29.1 J	FALSE
	4/19/2023	29.3 J	FALSE
	8/23/2023	28.7 J	FALSE
	4/30/2024	25.3 J	FALSE
	9/11/2024	25.3 J	FALSE
	4/15/2025	35.5 J	FALSE
	8/26/2025	30.1 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-20

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	19.5	56.6	37.1	0.5056	18.7578
2	25.1	50	24.9	0.329	8.1921
3	25.3	35.5	10.2	0.2521	2.57142
4	25.3	33.6	8.3	0.1939	1.60937
5	28.7	31.6	2.9	0.1447	0.41963
6	29.1	30.8	1.7	0.1005	0.17085
7	29.1	30.1	1	0.0593	0.0593
8	29.3	29.5	0.2	0.0196	0.00392
9	29.5	29.3	-0.2		
10	30.1	29.1	-1		
11	30.8	29.1	-1.7		
12	31.6	28.7	-2.9		
13	33.6	25.3	-8.3		
14	35.5	25.3	-10.2		
15	50	25.1	-24.9		
16	56.6	19.5	-37.1		

Sum of b values = 31.7844

Sample Standard Deviation = 9.25039

W Statistic = 0.787074

5% Critical value of 0.887 exceeds 0.787074

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.787074

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-20
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
56.6	33.6 J	23	1	0
31.6 J	33.6 J	-2	1	1
29.5 J	33.6 J	-4.1	1	2
29.1 J	33.6 J	-4.5	1	3
30.8 J	33.6 J	-2.8	1	4
19.5 J	33.6 J	-14.1	1	5
25.1 J	33.6 J	-8.5	1	6
ND<50 U	33.6 J	16.4	2	6
29.1 J	33.6 J	-4.5	2	7
29.3 J	33.6 J	-4.3	2	8
28.7 J	33.6 J	-4.9	2	9
25.3 J	33.6 J	-8.3	2	10
25.3 J	33.6 J	-8.3	2	11
35.5 J	33.6 J	1.9	3	11
30.1 J	33.6 J	-3.5	3	12
31.6 J	56.6	-25	3	13
29.5 J	56.6	-27.1	3	14
29.1 J	56.6	-27.5	3	15
30.8 J	56.6	-25.8	3	16
19.5 J	56.6	-37.1	3	17
25.1 J	56.6	-31.5	3	18
ND<50 U	56.6	-6.6	3	19
29.1 J	56.6	-27.5	3	20
29.3 J	56.6	-27.3	3	21
28.7 J	56.6	-27.9	3	22
25.3 J	56.6	-31.3	3	23
25.3 J	56.6	-31.3	3	24
35.5 J	56.6	-21.1	3	25
30.1 J	56.6	-26.5	3	26
29.5 J	31.6 J	-2.1	3	27
29.1 J	31.6 J	-2.5	3	28
30.8 J	31.6 J	-0.8	3	29
19.5 J	31.6 J	-12.1	3	30
25.1 J	31.6 J	-6.5	3	31
ND<50 U	31.6 J	18.4	4	31
29.1 J	31.6 J	-2.5	4	32
29.3 J	31.6 J	-2.3	4	33
28.7 J	31.6 J	-2.9	4	34
25.3 J	31.6 J	-6.3	4	35
25.3 J	31.6 J	-6.3	4	36
35.5 J	31.6 J	3.9	5	36
30.1 J	31.6 J	-1.5	5	37
29.1 J	29.5 J	-0.4	5	38
30.8 J	29.5 J	1.3	6	38

19.5 J	29.5 J	-10	6	39
25.1 J	29.5 J	-4.4	6	40
ND<50 U	29.5 J	20.5	7	40
29.1 J	29.5 J	-0.4	7	41
29.3 J	29.5 J	-0.2	7	42
28.7 J	29.5 J	-0.8	7	43
25.3 J	29.5 J	-4.2	7	44
25.3 J	29.5 J	-4.2	7	45
35.5 J	29.5 J	6	8	45
30.1 J	29.5 J	0.6	9	45
30.8 J	29.1 J	1.7	10	45
19.5 J	29.1 J	-9.6	10	46
25.1 J	29.1 J	-4	10	47
ND<50 U	29.1 J	20.9	11	47
29.1 J	29.1 J	0	11	47
29.3 J	29.1 J	0.2	12	47
28.7 J	29.1 J	-0.4	12	48
25.3 J	29.1 J	-3.8	12	49
25.3 J	29.1 J	-3.8	12	50
35.5 J	29.1 J	6.4	13	50
30.1 J	29.1 J	1	14	50
19.5 J	30.8 J	-11.3	14	51
25.1 J	30.8 J	-5.7	14	52
ND<50 U	30.8 J	19.2	15	52
29.1 J	30.8 J	-1.7	15	53
29.3 J	30.8 J	-1.5	15	54
28.7 J	30.8 J	-2.1	15	55
25.3 J	30.8 J	-5.5	15	56
25.3 J	30.8 J	-5.5	15	57
35.5 J	30.8 J	4.7	16	57
30.1 J	30.8 J	-0.7	16	58
25.1 J	19.5 J	5.6	17	58
ND<50 U	19.5 J	30.5	18	58
29.1 J	19.5 J	9.6	19	58
29.3 J	19.5 J	9.8	20	58
28.7 J	19.5 J	9.2	21	58
25.3 J	19.5 J	5.8	22	58
25.3 J	19.5 J	5.8	23	58
35.5 J	19.5 J	16	24	58
30.1 J	19.5 J	10.6	25	58
ND<50 U	25.1 J	24.9	26	58
29.1 J	25.1 J	4	27	58
29.3 J	25.1 J	4.2	28	58
28.7 J	25.1 J	3.6	29	58
25.3 J	25.1 J	0.2	30	58
25.3 J	25.1 J	0.2	31	58
35.5 J	25.1 J	10.4	32	58
30.1 J	25.1 J	5	33	58
29.1 J	ND<50 U	-20.9	33	59
29.3 J	ND<50 U	-20.7	33	60
28.7 J	ND<50 U	-21.3	33	61
25.3 J	ND<50 U	-24.7	33	62

25.3 J	ND<50 U	-24.7	33	63
35.5 J	ND<50 U	-14.5	33	64
30.1 J	ND<50 U	-19.9	33	65
29.3 J	29.1 J	0.2	34	65
28.7 J	29.1 J	-0.4	34	66
25.3 J	29.1 J	-3.8	34	67
25.3 J	29.1 J	-3.8	34	68
35.5 J	29.1 J	6.4	35	68
30.1 J	29.1 J	1	36	68
28.7 J	29.3 J	-0.6	36	69
25.3 J	29.3 J	-4	36	70
25.3 J	29.3 J	-4	36	71
35.5 J	29.3 J	6.2	37	71
30.1 J	29.3 J	0.8	38	71
25.3 J	28.7 J	-3.4	38	72
25.3 J	28.7 J	-3.4	38	73
35.5 J	28.7 J	6.8	39	73
30.1 J	28.7 J	1.4	40	73
25.3 J	25.3 J	0	40	73
35.5 J	25.3 J	10.2	41	73
30.1 J	25.3 J	4.8	42	73
35.5 J	25.3 J	10.2	43	73
30.1 J	25.3 J	4.8	44	73
30.1 J	35.5 J	-5.4	44	74

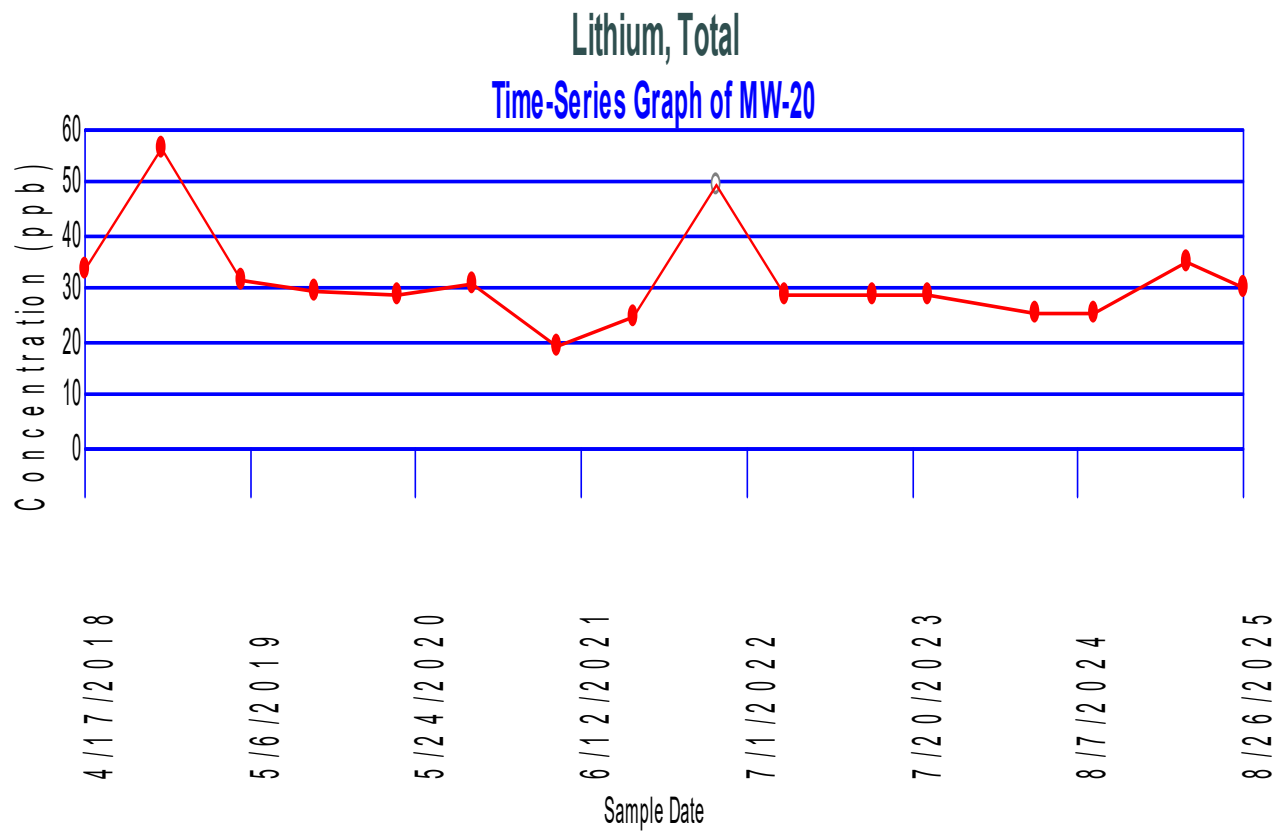
S Statistic = 44 - 74 = -30

Tied Group	Value	Members
1	29.1	2
2	25.3	2

Time Period	Observations
4/17/2018	1
10/10/2018	1
4/14/2019	1
10/2/2019	1
4/9/2020	1
10/2/2020	1
4/15/2021	1
10/12/2021	1
4/20/2022	1
9/28/2022	1
4/19/2023	1
8/23/2023	1
4/30/2024	1
9/11/2024	1
4/15/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 491.333
Z-Score = -1.30831
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|-1.30831| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.509554	0.237624	0.507	66
2	0.403727	0.333333	0.525	None

Loc.	Date	Conc.	Outlier
MW-21	4/17/2018	50.7	FALSE
	10/10/2018	66	TRUE
	4/13/2019	44.2 J	FALSE
	10/1/2019	38.1 J	FALSE
	4/7/2020	40.9 J	FALSE
	9/30/2020	36.2 J	FALSE
	4/14/2021	32.8 J	FALSE
	10/12/2021	40.1 J	FALSE
	4/20/2022	ND<50 U	FALSE
	9/29/2022	35 J	FALSE
	4/18/2023	34.6 J	FALSE
	8/23/2023	35.2 J	FALSE
	5/1/2024	38.9 J	FALSE
	9/11/2024	29.8 J	FALSE
	4/15/2025	39.5 J	FALSE
	8/26/2025	38.3 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-21

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	29.8	66	36.2	0.5056	18.3027
2	32.8	50.7	17.9	0.329	5.8891
3	34.6	50	15.4	0.2521	3.88234
4	35	44.2	9.2	0.1939	1.78388
5	35.2	40.9	5.7	0.1447	0.82479
6	36.2	40.1	3.9	0.1005	0.39195
7	38.1	39.5	1.4	0.0593	0.08302
8	38.3	38.9	0.6	0.0196	0.01176
9	38.9	38.3	-0.6		
10	39.5	38.1	-1.4		
11	40.1	36.2	-3.9		
12	40.9	35.2	-5.7		
13	44.2	35	-9.2		
14	50	34.6	-15.4		
15	50.7	32.8	-17.9		
16	66	29.8	-36.2		

Sum of b values = 31.1696

Sample Standard Deviation = 8.78559

W Statistic = 0.839128

5% Critical value of 0.887 exceeds 0.839128

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.839128

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-21
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
66	50.7	15.3	1	0
44.2 J	50.7	-6.5	1	1
38.1 J	50.7	-12.6	1	2
40.9 J	50.7	-9.8	1	3
36.2 J	50.7	-14.5	1	4
32.8 J	50.7	-17.9	1	5
40.1 J	50.7	-10.6	1	6
ND<50 U	50.7	-0.7	1	7
35 J	50.7	-15.7	1	8
34.6 J	50.7	-16.1	1	9
35.2 J	50.7	-15.5	1	10
38.9 J	50.7	-11.8	1	11
29.8 J	50.7	-20.9	1	12
39.5 J	50.7	-11.2	1	13
38.3 J	50.7	-12.4	1	14
44.2 J	66	-21.8	1	15
38.1 J	66	-27.9	1	16
40.9 J	66	-25.1	1	17
36.2 J	66	-29.8	1	18
32.8 J	66	-33.2	1	19
40.1 J	66	-25.9	1	20
ND<50 U	66	-16	1	21
35 J	66	-31	1	22
34.6 J	66	-31.4	1	23
35.2 J	66	-30.8	1	24
38.9 J	66	-27.1	1	25
29.8 J	66	-36.2	1	26
39.5 J	66	-26.5	1	27
38.3 J	66	-27.7	1	28
38.1 J	44.2 J	-6.1	1	29
40.9 J	44.2 J	-3.3	1	30
36.2 J	44.2 J	-8	1	31
32.8 J	44.2 J	-11.4	1	32
40.1 J	44.2 J	-4.1	1	33
ND<50 U	44.2 J	5.8	2	33
35 J	44.2 J	-9.2	2	34
34.6 J	44.2 J	-9.6	2	35
35.2 J	44.2 J	-9	2	36
38.9 J	44.2 J	-5.3	2	37
29.8 J	44.2 J	-14.4	2	38
39.5 J	44.2 J	-4.7	2	39
38.3 J	44.2 J	-5.9	2	40
40.9 J	38.1 J	2.8	3	40
36.2 J	38.1 J	-1.9	3	41

32.8 J	38.1 J	-5.3	3	42
40.1 J	38.1 J	2	4	42
ND<50 U	38.1 J	11.9	5	42
35 J	38.1 J	-3.1	5	43
34.6 J	38.1 J	-3.5	5	44
35.2 J	38.1 J	-2.9	5	45
38.9 J	38.1 J	0.8	6	45
29.8 J	38.1 J	-8.3	6	46
39.5 J	38.1 J	1.4	7	46
38.3 J	38.1 J	0.2	8	46
36.2 J	40.9 J	-4.7	8	47
32.8 J	40.9 J	-8.1	8	48
40.1 J	40.9 J	-0.8	8	49
ND<50 U	40.9 J	9.1	9	49
35 J	40.9 J	-5.9	9	50
34.6 J	40.9 J	-6.3	9	51
35.2 J	40.9 J	-5.7	9	52
38.9 J	40.9 J	-2	9	53
29.8 J	40.9 J	-11.1	9	54
39.5 J	40.9 J	-1.4	9	55
38.3 J	40.9 J	-2.6	9	56
32.8 J	36.2 J	-3.4	9	57
40.1 J	36.2 J	3.9	10	57
ND<50 U	36.2 J	13.8	11	57
35 J	36.2 J	-1.2	11	58
34.6 J	36.2 J	-1.6	11	59
35.2 J	36.2 J	-1	11	60
38.9 J	36.2 J	2.7	12	60
29.8 J	36.2 J	-6.4	12	61
39.5 J	36.2 J	3.3	13	61
38.3 J	36.2 J	2.1	14	61
40.1 J	32.8 J	7.3	15	61
ND<50 U	32.8 J	17.2	16	61
35 J	32.8 J	2.2	17	61
34.6 J	32.8 J	1.8	18	61
35.2 J	32.8 J	2.4	19	61
38.9 J	32.8 J	6.1	20	61
29.8 J	32.8 J	-3	20	62
39.5 J	32.8 J	6.7	21	62
38.3 J	32.8 J	5.5	22	62
ND<50 U	40.1 J	9.9	23	62
35 J	40.1 J	-5.1	23	63
34.6 J	40.1 J	-5.5	23	64
35.2 J	40.1 J	-4.9	23	65
38.9 J	40.1 J	-1.2	23	66
29.8 J	40.1 J	-10.3	23	67
39.5 J	40.1 J	-0.6	23	68
38.3 J	40.1 J	-1.8	23	69
35 J	ND<50 U	-15	23	70
34.6 J	ND<50 U	-15.4	23	71
35.2 J	ND<50 U	-14.8	23	72
38.9 J	ND<50 U	-11.1	23	73

29.8 J	ND<50 U	-20.2	23	74
39.5 J	ND<50 U	-10.5	23	75
38.3 J	ND<50 U	-11.7	23	76
34.6 J	35 J	-0.4	23	77
35.2 J	35 J	0.2	24	77
38.9 J	35 J	3.9	25	77
29.8 J	35 J	-5.2	25	78
39.5 J	35 J	4.5	26	78
38.3 J	35 J	3.3	27	78
35.2 J	34.6 J	0.6	28	78
38.9 J	34.6 J	4.3	29	78
29.8 J	34.6 J	-4.8	29	79
39.5 J	34.6 J	4.9	30	79
38.3 J	34.6 J	3.7	31	79
38.9 J	35.2 J	3.7	32	79
29.8 J	35.2 J	-5.4	32	80
39.5 J	35.2 J	4.3	33	80
38.3 J	35.2 J	3.1	34	80
29.8 J	38.9 J	-9.1	34	81
39.5 J	38.9 J	0.6	35	81
38.3 J	38.9 J	-0.6	35	82
39.5 J	29.8 J	9.7	36	82
38.3 J	29.8 J	8.5	37	82
38.3 J	39.5 J	-1.2	37	83

S Statistic = 37 - 83 = -46

Tied Group	Value	Members
Time Period	Observations	
4/17/2018	1	
10/10/2018	1	
4/13/2019	1	
10/1/2019	1	
4/7/2020	1	
9/30/2020	1	
4/14/2021	1	
10/12/2021	1	
4/20/2022	1	
9/29/2022	1	
4/18/2023	1	
8/23/2023	1	
5/1/2024	1	
9/11/2024	1	
4/15/2025	1	
8/26/2025	1	

There are 0 time periods with multiple data

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

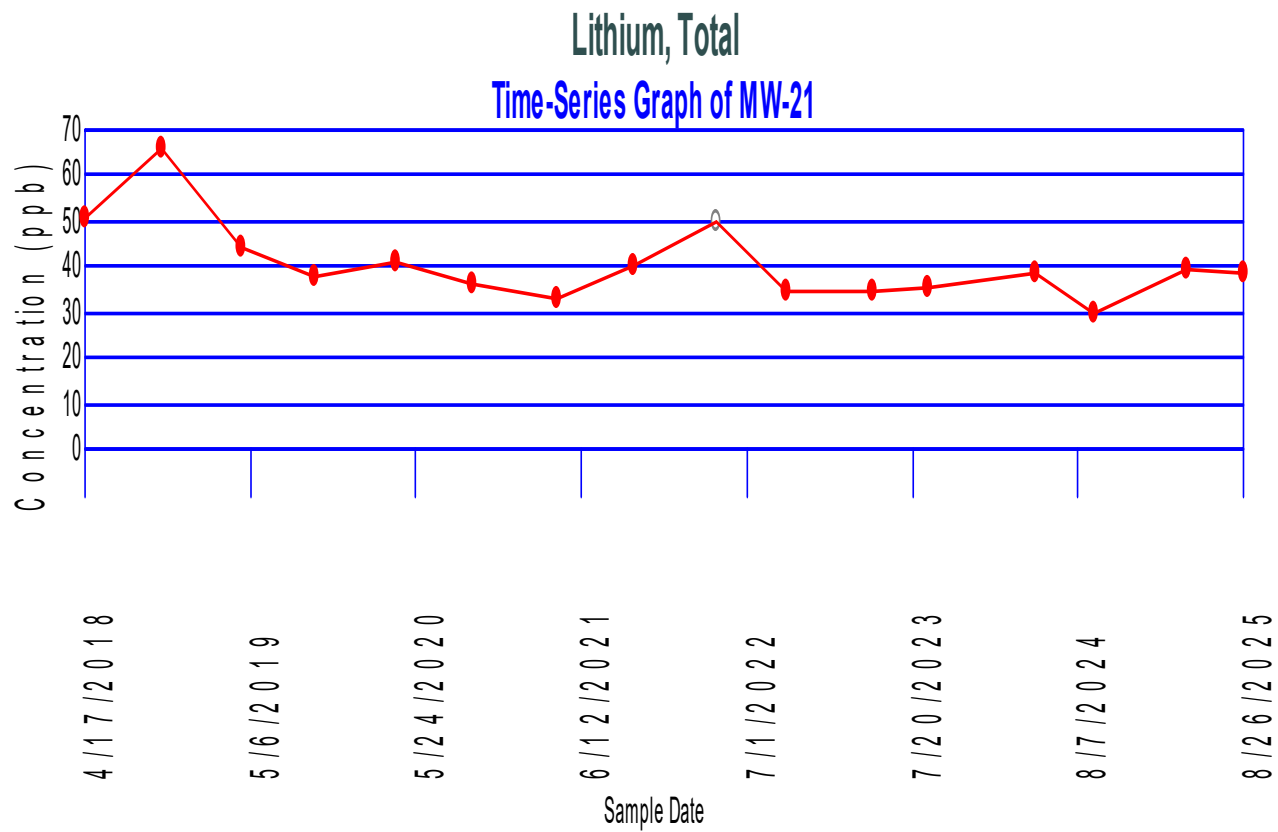
c = 480

Group Variance = 493.333

Z-Score = -2.02601

Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)

| -2.02601 | > 1.97737 indicating a trend



Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-25

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.538793	0.393768	0.507	73.7
2	0.132159	0.41369	0.525	None

Loc.	Date	Conc.	Outlier
MW-25	4/17/2018	42.7 J	FALSE
	10/9/2018	73.7	TRUE
	4/13/2019	27.3 J	FALSE
	10/1/2019	44.2 J	FALSE
	4/8/2020	35.8 J	FALSE
	10/1/2020	48.7 J	FALSE
	4/14/2021	13.4 J	FALSE
	10/13/2021	42.9 J	FALSE
	4/19/2022	ND<50 U	FALSE
	9/29/2022	42.7 J	FALSE
	4/19/2023	37 J	FALSE
	8/24/2023	44 J	FALSE
	4/29/2024	18.1 J	FALSE
	9/10/2024	36.9 J	FALSE
	4/14/2025	47 J	FALSE
	8/26/2025	46.2 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-25

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	13.4	73.7	60.3	0.5056	30.4877
2	18.1	50	31.9	0.329	10.4951
3	27.3	48.7	21.4	0.2521	5.39494
4	35.8	47	11.2	0.1939	2.17168
5	36.9	46.2	9.3	0.1447	1.34571
6	37	44.2	7.2	0.1005	0.7236
7	42.7	44	1.3	0.0593	0.07709
8	42.7	42.9	0.2	0.0196	0.00392
9	42.9	42.7	-0.2		
10	44	42.7	-1.3		
11	44.2	37	-7.2		
12	46.2	36.9	-9.3		
13	47	35.8	-11.2		
14	48.7	27.3	-21.4		
15	50	18.1	-31.9		
16	73.7	13.4	-60.3		

Sum of b values = 50.6997

Sample Standard Deviation = 13.7432

W Statistic = 0.907284

5% Critical value of 0.887 is less than 0.907284

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.907284

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-25
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
73.7	42.7 J	31	1	0
27.3 J	42.7 J	-15.4	1	1
44.2 J	42.7 J	1.5	2	1
35.8 J	42.7 J	-6.9	2	2
48.7 J	42.7 J	6	3	2
13.4 J	42.7 J	-29.3	3	3
42.9 J	42.7 J	0.2	4	3
ND<50 U	42.7 J	7.3	5	3
42.7 J	42.7 J	0	5	3
37 J	42.7 J	-5.7	5	4
44 J	42.7 J	1.3	6	4
18.1 J	42.7 J	-24.6	6	5
36.9 J	42.7 J	-5.8	6	6
47 J	42.7 J	4.3	7	6
46.2 J	42.7 J	3.5	8	6
27.3 J	73.7	-46.4	8	7
44.2 J	73.7	-29.5	8	8
35.8 J	73.7	-37.9	8	9
48.7 J	73.7	-25	8	10
13.4 J	73.7	-60.3	8	11
42.9 J	73.7	-30.8	8	12
ND<50 U	73.7	-23.7	8	13
42.7 J	73.7	-31	8	14
37 J	73.7	-36.7	8	15
44 J	73.7	-29.7	8	16
18.1 J	73.7	-55.6	8	17
36.9 J	73.7	-36.8	8	18
47 J	73.7	-26.7	8	19
46.2 J	73.7	-27.5	8	20
44.2 J	27.3 J	16.9	9	20
35.8 J	27.3 J	8.5	10	20
48.7 J	27.3 J	21.4	11	20
13.4 J	27.3 J	-13.9	11	21
42.9 J	27.3 J	15.6	12	21
ND<50 U	27.3 J	22.7	13	21
42.7 J	27.3 J	15.4	14	21
37 J	27.3 J	9.7	15	21
44 J	27.3 J	16.7	16	21
18.1 J	27.3 J	-9.2	16	22
36.9 J	27.3 J	9.6	17	22
47 J	27.3 J	19.7	18	22
46.2 J	27.3 J	18.9	19	22
35.8 J	44.2 J	-8.4	19	23
48.7 J	44.2 J	4.5	20	23

13.4 J	44.2 J	-30.8	20	24
42.9 J	44.2 J	-1.3	20	25
ND<50 U	44.2 J	5.8	21	25
42.7 J	44.2 J	-1.5	21	26
37 J	44.2 J	-7.2	21	27
44 J	44.2 J	-0.2	21	28
18.1 J	44.2 J	-26.1	21	29
36.9 J	44.2 J	-7.3	21	30
47 J	44.2 J	2.8	22	30
46.2 J	44.2 J	2	23	30
48.7 J	35.8 J	12.9	24	30
13.4 J	35.8 J	-22.4	24	31
42.9 J	35.8 J	7.1	25	31
ND<50 U	35.8 J	14.2	26	31
42.7 J	35.8 J	6.9	27	31
37 J	35.8 J	1.2	28	31
44 J	35.8 J	8.2	29	31
18.1 J	35.8 J	-17.7	29	32
36.9 J	35.8 J	1.1	30	32
47 J	35.8 J	11.2	31	32
46.2 J	35.8 J	10.4	32	32
13.4 J	48.7 J	-35.3	32	33
42.9 J	48.7 J	-5.8	32	34
ND<50 U	48.7 J	1.3	33	34
42.7 J	48.7 J	-6	33	35
37 J	48.7 J	-11.7	33	36
44 J	48.7 J	-4.7	33	37
18.1 J	48.7 J	-30.6	33	38
36.9 J	48.7 J	-11.8	33	39
47 J	48.7 J	-1.7	33	40
46.2 J	48.7 J	-2.5	33	41
42.9 J	13.4 J	29.5	34	41
ND<50 U	13.4 J	36.6	35	41
42.7 J	13.4 J	29.3	36	41
37 J	13.4 J	23.6	37	41
44 J	13.4 J	30.6	38	41
18.1 J	13.4 J	4.7	39	41
36.9 J	13.4 J	23.5	40	41
47 J	13.4 J	33.6	41	41
46.2 J	13.4 J	32.8	42	41
ND<50 U	42.9 J	7.1	43	41
42.7 J	42.9 J	-0.2	43	42
37 J	42.9 J	-5.9	43	43
44 J	42.9 J	1.1	44	43
18.1 J	42.9 J	-24.8	44	44
36.9 J	42.9 J	-6	44	45
47 J	42.9 J	4.1	45	45
46.2 J	42.9 J	3.3	46	45
42.7 J	ND<50 U	-7.3	46	46
37 J	ND<50 U	-13	46	47
44 J	ND<50 U	-6	46	48
18.1 J	ND<50 U	-31.9	46	49

36.9 J	ND<50 U	-13.1	46	50
47 J	ND<50 U	-3	46	51
46.2 J	ND<50 U	-3.8	46	52
37 J	42.7 J	-5.7	46	53
44 J	42.7 J	1.3	47	53
18.1 J	42.7 J	-24.6	47	54
36.9 J	42.7 J	-5.8	47	55
47 J	42.7 J	4.3	48	55
46.2 J	42.7 J	3.5	49	55
44 J	37 J	7	50	55
18.1 J	37 J	-18.9	50	56
36.9 J	37 J	-0.1	50	57
47 J	37 J	10	51	57
46.2 J	37 J	9.2	52	57
18.1 J	44 J	-25.9	52	58
36.9 J	44 J	-7.1	52	59
47 J	44 J	3	53	59
46.2 J	44 J	2.2	54	59
36.9 J	18.1 J	18.8	55	59
47 J	18.1 J	28.9	56	59
46.2 J	18.1 J	28.1	57	59
47 J	36.9 J	10.1	58	59
46.2 J	36.9 J	9.3	59	59
46.2 J	47 J	-0.8	59	60

S Statistic = 59 - 60 = -1

Tied Group	Value	Members
1	42.7	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/8/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/19/2022	1
9/29/2022	1
4/19/2023	1
8/24/2023	1
4/29/2024	1
9/10/2024	1
4/14/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

c = 480

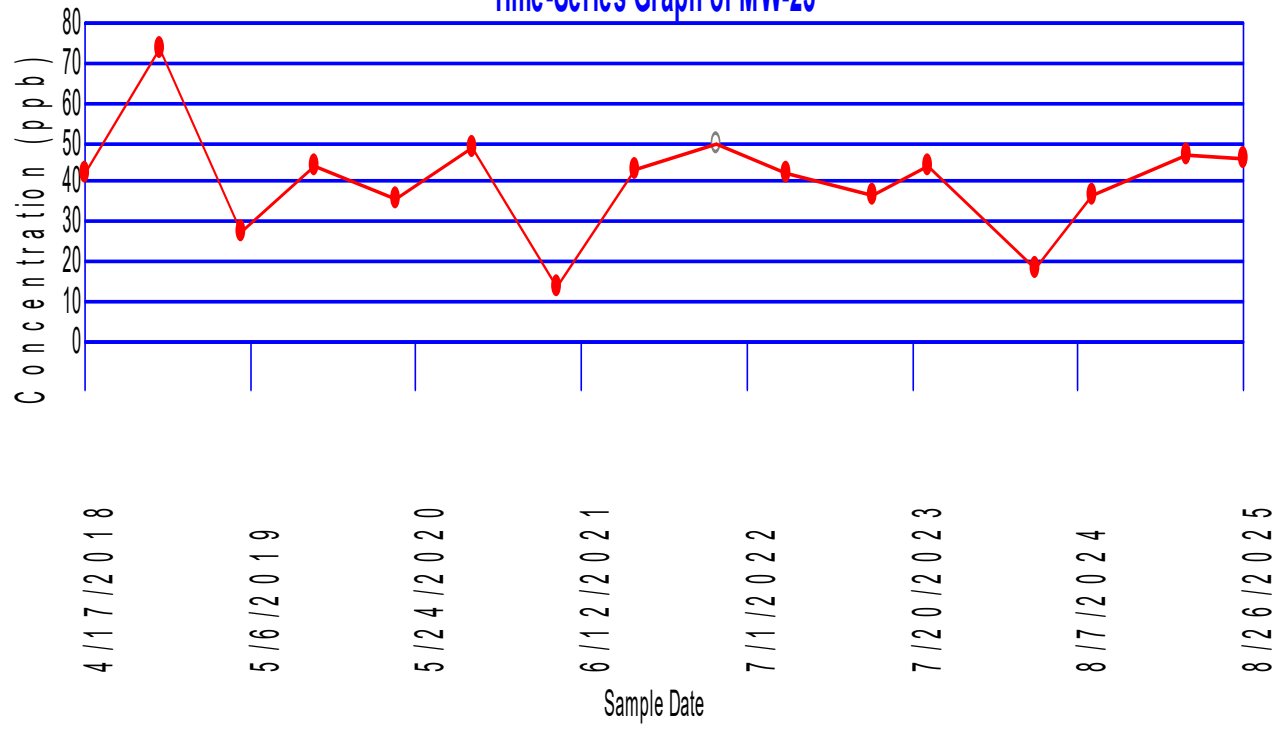
Group Variance = 492.333

Z-Score = 0

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

|0| <= 1.97737 indicating no evidence of a trend

Lithium, Total
Time-Series Graph of MW-25



Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-26

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0	0.0710526	0.507	None

Loc.	Date	Conc.	Outlier
MW-26	4/17/2018	28.4 J	FALSE
	10/9/2018	ND<50 U	FALSE
	4/13/2019	32.5 J	FALSE
	10/1/2019	17.7 J	FALSE
	4/8/2020	14.3 J	FALSE
	10/1/2020	28.7 J	FALSE
	4/14/2021	12 J	FALSE
	10/13/2021	14.7 J	FALSE
	4/19/2022	ND<50 U	FALSE
	9/29/2022	21 J	FALSE
	4/19/2023	ND<50 U	FALSE
	8/24/2023	ND<50 U	FALSE
	4/29/2024	30.1 J	FALSE
	9/10/2024	ND<50 U	FALSE
	4/15/2025	ND<50 U	FALSE
	8/26/2025	23.5 J	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-26

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	12	50	38	0.5056	19.2128
2	14.3	50	35.7	0.329	11.7453
3	14.7	50	35.3	0.2521	8.89913
4	17.7	50	32.3	0.1939	6.26297
5	21	50	29	0.1447	4.1963
6	23.5	50	26.5	0.1005	2.66325
7	28.4	32.5	4.1	0.0593	0.24313
8	28.7	30.1	1.4	0.0196	0.02744
9	30.1	28.7	-1.4		
10	32.5	28.4	-4.1		
11	50	23.5	-26.5		
12	50	21	-29		
13	50	17.7	-32.3		
14	50	14.7	-35.3		
15	50	14.3	-35.7		
16	50	12	-38		

Sum of b values = 53.2503

Sample Standard Deviation = 14.9991

W Statistic = 0.840275

5% Critical value of 0.887 exceeds 0.840275

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.840275

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-26
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
ND<50 U	28.4 J	21.6	1	0
32.5 J	28.4 J	4.1	2	0
17.7 J	28.4 J	-10.7	2	1
14.3 J	28.4 J	-14.1	2	2
28.7 J	28.4 J	0.3	3	2
12 J	28.4 J	-16.4	3	3
14.7 J	28.4 J	-13.7	3	4
ND<50 U	28.4 J	21.6	4	4
21 J	28.4 J	-7.4	4	5
ND<50 U	28.4 J	21.6	5	5
ND<50 U	28.4 J	21.6	6	5
30.1 J	28.4 J	1.7	7	5
ND<50 U	28.4 J	21.6	8	5
ND<50 U	28.4 J	21.6	9	5
23.5 J	28.4 J	-4.9	9	6
32.5 J	ND<50 U	-17.5	9	7
17.7 J	ND<50 U	-32.3	9	8
14.3 J	ND<50 U	-35.7	9	9
28.7 J	ND<50 U	-21.3	9	10
12 J	ND<50 U	-38	9	11
14.7 J	ND<50 U	-35.3	9	12
ND<50 U	ND<50 U	0	9	12
21 J	ND<50 U	-29	9	13
ND<50 U	ND<50 U	0	9	13
ND<50 U	ND<50 U	0	9	13
30.1 J	ND<50 U	-19.9	9	14
ND<50 U	ND<50 U	0	9	14
ND<50 U	ND<50 U	0	9	14
23.5 J	ND<50 U	-26.5	9	15
17.7 J	32.5 J	-14.8	9	16
14.3 J	32.5 J	-18.2	9	17
28.7 J	32.5 J	-3.8	9	18
12 J	32.5 J	-20.5	9	19
14.7 J	32.5 J	-17.8	9	20
ND<50 U	32.5 J	17.5	10	20
21 J	32.5 J	-11.5	10	21
ND<50 U	32.5 J	17.5	11	21
ND<50 U	32.5 J	17.5	12	21
30.1 J	32.5 J	-2.4	12	22
ND<50 U	32.5 J	17.5	13	22
ND<50 U	32.5 J	17.5	14	22
23.5 J	32.5 J	-9	14	23
14.3 J	17.7 J	-3.4	14	24
28.7 J	17.7 J	11	15	24

12 J	17.7 J	-5.7	15	25
14.7 J	17.7 J	-3	15	26
ND<50 U	17.7 J	32.3	16	26
21 J	17.7 J	3.3	17	26
ND<50 U	17.7 J	32.3	18	26
ND<50 U	17.7 J	32.3	19	26
30.1 J	17.7 J	12.4	20	26
ND<50 U	17.7 J	32.3	21	26
ND<50 U	17.7 J	32.3	22	26
23.5 J	17.7 J	5.8	23	26
28.7 J	14.3 J	14.4	24	26
12 J	14.3 J	-2.3	24	27
14.7 J	14.3 J	0.4	25	27
ND<50 U	14.3 J	35.7	26	27
21 J	14.3 J	6.7	27	27
ND<50 U	14.3 J	35.7	28	27
ND<50 U	14.3 J	35.7	29	27
30.1 J	14.3 J	15.8	30	27
ND<50 U	14.3 J	35.7	31	27
ND<50 U	14.3 J	35.7	32	27
23.5 J	14.3 J	9.2	33	27
12 J	28.7 J	-16.7	33	28
14.7 J	28.7 J	-14	33	29
ND<50 U	28.7 J	21.3	34	29
21 J	28.7 J	-7.7	34	30
ND<50 U	28.7 J	21.3	35	30
ND<50 U	28.7 J	21.3	36	30
30.1 J	28.7 J	1.4	37	30
ND<50 U	28.7 J	21.3	38	30
ND<50 U	28.7 J	21.3	39	30
23.5 J	28.7 J	-5.2	39	31
14.7 J	12 J	2.7	40	31
ND<50 U	12 J	38	41	31
21 J	12 J	9	42	31
ND<50 U	12 J	38	43	31
ND<50 U	12 J	38	44	31
30.1 J	12 J	18.1	45	31
ND<50 U	12 J	38	46	31
ND<50 U	12 J	38	47	31
23.5 J	12 J	11.5	48	31
ND<50 U	14.7 J	35.3	49	31
21 J	14.7 J	6.3	50	31
ND<50 U	14.7 J	35.3	51	31
ND<50 U	14.7 J	35.3	52	31
30.1 J	14.7 J	15.4	53	31
ND<50 U	14.7 J	35.3	54	31
ND<50 U	14.7 J	35.3	55	31
23.5 J	14.7 J	8.8	56	31
21 J	ND<50 U	-29	56	32
ND<50 U	ND<50 U	0	56	32
ND<50 U	ND<50 U	0	56	32
30.1 J	ND<50 U	-19.9	56	33

ND<50 U	ND<50 U	0	56	33
ND<50 U	ND<50 U	0	56	33
23.5 J	ND<50 U	-26.5	56	34
ND<50 U	21 J	29	57	34
ND<50 U	21 J	29	58	34
30.1 J	21 J	9.1	59	34
ND<50 U	21 J	29	60	34
ND<50 U	21 J	29	61	34
23.5 J	21 J	2.5	62	34
ND<50 U	ND<50 U	0	62	34
30.1 J	ND<50 U	-19.9	62	35
ND<50 U	ND<50 U	0	62	35
ND<50 U	ND<50 U	0	62	35
23.5 J	ND<50 U	-26.5	62	36
30.1 J	ND<50 U	-19.9	62	37
ND<50 U	ND<50 U	0	62	37
ND<50 U	ND<50 U	0	62	37
23.5 J	ND<50 U	-26.5	62	38
ND<50 U	30.1 J	19.9	63	38
ND<50 U	30.1 J	19.9	64	38
23.5 J	30.1 J	-6.6	64	39
ND<50 U	ND<50 U	0	64	39
23.5 J	ND<50 U	-26.5	64	40
23.5 J	ND<50 U	-26.5	64	41

S Statistic = 64 - 41 = 23

Tied Group	Value	Members
1	50	6

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/8/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/19/2022	1
9/29/2022	1
4/19/2023	1
8/24/2023	1
4/29/2024	1
9/10/2024	1
4/15/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 510

B = 0
C = 120
D = 0
E = 30
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 465
Z-Score = 1.02023
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|1.02023| <= 1.97737 indicating no evidence of a trend

Dixon's Test for Outliers

Parameter: Lithium, Total

Location: MW-27

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.614458	0.268571	0.507	77
2	0.191781	0.284848	0.525	None

Loc.	Date	Conc.	Outlier
MW-27	4/18/2018	56.6	FALSE
	10/9/2018	77	TRUE
	4/13/2019	58.4	FALSE
	10/1/2019	51.6	FALSE
	4/9/2020	46.6 J	FALSE
	10/1/2020	52.5	FALSE
	4/14/2021	41 J	FALSE
	10/13/2021	39.1 J	FALSE
	4/20/2022	ND<55.6 U	FALSE
	9/28/2022	47.9 J	FALSE
	4/19/2023	55.3	FALSE
	8/24/2023	44.7 J	FALSE
	5/1/2024	51.6	FALSE
	9/11/2024	43.8 J	FALSE
	4/16/2025	48.5 J	FALSE
	8/27/2025	51.8	FALSE

Shapiro-Wilks Test of Normality

Parameter: Lithium, Total

Location: MW-27

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	39.1	77	37.9	0.5056	19.1622
2	41	58.4	17.4	0.329	5.7246
3	43.8	56.6	12.8	0.2521	3.22688
4	44.7	55.6	10.9	0.1939	2.11351
5	46.6	55.3	8.7	0.1447	1.25889
6	47.9	52.5	4.6	0.1005	0.4623
7	48.5	51.8	3.3	0.0593	0.19569
8	51.6	51.6	0	0.0196	0
9	51.6	51.6	0		
10	51.8	48.5	-3.3		
11	52.5	47.9	-4.6		
12	55.3	46.6	-8.7		
13	55.6	44.7	-10.9		
14	56.6	43.8	-12.8		
15	58.4	41	-17.4		
16	77	39.1	-37.9		

Sum of b values = 32.1441

Sample Standard Deviation = 8.83738

W Statistic = 0.881991

5% Critical value of 0.887 exceeds 0.881991

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.881991

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Lithium, Total
Location: MW-27
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
77	56.6	20.4	1	0
58.4	56.6	1.8	2	0
51.6	56.6	-5	2	1
46.6 J	56.6	-10	2	2
52.5	56.6	-4.1	2	3
41 J	56.6	-15.6	2	4
39.1 J	56.6	-17.5	2	5
ND<55.6 U	56.6	-1	2	6
47.9 J	56.6	-8.7	2	7
55.3	56.6	-1.3	2	8
44.7 J	56.6	-11.9	2	9
51.6	56.6	-5	2	10
43.8 J	56.6	-12.8	2	11
48.5 J	56.6	-8.1	2	12
51.8	56.6	-4.8	2	13
58.4	77	-18.6	2	14
51.6	77	-25.4	2	15
46.6 J	77	-30.4	2	16
52.5	77	-24.5	2	17
41 J	77	-36	2	18
39.1 J	77	-37.9	2	19
ND<55.6 U	77	-21.4	2	20
47.9 J	77	-29.1	2	21
55.3	77	-21.7	2	22
44.7 J	77	-32.3	2	23
51.6	77	-25.4	2	24
43.8 J	77	-33.2	2	25
48.5 J	77	-28.5	2	26
51.8	77	-25.2	2	27
51.6	58.4	-6.8	2	28
46.6 J	58.4	-11.8	2	29
52.5	58.4	-5.9	2	30
41 J	58.4	-17.4	2	31
39.1 J	58.4	-19.3	2	32
ND<55.6 U	58.4	-2.8	2	33
47.9 J	58.4	-10.5	2	34
55.3	58.4	-3.1	2	35
44.7 J	58.4	-13.7	2	36
51.6	58.4	-6.8	2	37
43.8 J	58.4	-14.6	2	38
48.5 J	58.4	-9.9	2	39
51.8	58.4	-6.6	2	40
46.6 J	51.6	-5	2	41
52.5	51.6	0.9	3	41

41 J	51.6	-10.6	3	42
39.1 J	51.6	-12.5	3	43
ND<55.6 U	51.6	4	4	43
47.9 J	51.6	-3.7	4	44
55.3	51.6	3.7	5	44
44.7 J	51.6	-6.9	5	45
51.6	51.6	0	5	45
43.8 J	51.6	-7.8	5	46
48.5 J	51.6	-3.1	5	47
51.8	51.6	0.2	6	47
52.5	46.6 J	5.9	7	47
41 J	46.6 J	-5.6	7	48
39.1 J	46.6 J	-7.5	7	49
ND<55.6 U	46.6 J	9	8	49
47.9 J	46.6 J	1.3	9	49
55.3	46.6 J	8.7	10	49
44.7 J	46.6 J	-1.9	10	50
51.6	46.6 J	5	11	50
43.8 J	46.6 J	-2.8	11	51
48.5 J	46.6 J	1.9	12	51
51.8	46.6 J	5.2	13	51
41 J	52.5	-11.5	13	52
39.1 J	52.5	-13.4	13	53
ND<55.6 U	52.5	3.1	14	53
47.9 J	52.5	-4.6	14	54
55.3	52.5	2.8	15	54
44.7 J	52.5	-7.8	15	55
51.6	52.5	-0.9	15	56
43.8 J	52.5	-8.7	15	57
48.5 J	52.5	-4	15	58
51.8	52.5	-0.7	15	59
39.1 J	41 J	-1.9	15	60
ND<55.6 U	41 J	14.6	16	60
47.9 J	41 J	6.9	17	60
55.3	41 J	14.3	18	60
44.7 J	41 J	3.7	19	60
51.6	41 J	10.6	20	60
43.8 J	41 J	2.8	21	60
48.5 J	41 J	7.5	22	60
51.8	41 J	10.8	23	60
ND<55.6 U	39.1 J	16.5	24	60
47.9 J	39.1 J	8.8	25	60
55.3	39.1 J	16.2	26	60
44.7 J	39.1 J	5.6	27	60
51.6	39.1 J	12.5	28	60
43.8 J	39.1 J	4.7	29	60
48.5 J	39.1 J	9.4	30	60
51.8	39.1 J	12.7	31	60
47.9 J	ND<55.6 U	-7.7	31	61
55.3	ND<55.6 U	-0.3	31	62
44.7 J	ND<55.6 U	-10.9	31	63
51.6	ND<55.6 U	-4	31	64

43.8 J	ND<55.6 U	-11.8	31	65
48.5 J	ND<55.6 U	-7.1	31	66
51.8	ND<55.6 U	-3.8	31	67
55.3	47.9 J	7.4	32	67
44.7 J	47.9 J	-3.2	32	68
51.6	47.9 J	3.7	33	68
43.8 J	47.9 J	-4.1	33	69
48.5 J	47.9 J	0.6	34	69
51.8	47.9 J	3.9	35	69
44.7 J	55.3	-10.6	35	70
51.6	55.3	-3.7	35	71
43.8 J	55.3	-11.5	35	72
48.5 J	55.3	-6.8	35	73
51.8	55.3	-3.5	35	74
51.6	44.7 J	6.9	36	74
43.8 J	44.7 J	-0.9	36	75
48.5 J	44.7 J	3.8	37	75
51.8	44.7 J	7.1	38	75
43.8 J	51.6	-7.8	38	76
48.5 J	51.6	-3.1	38	77
51.8	51.6	0.2	39	77
48.5 J	43.8 J	4.7	40	77
51.8	43.8 J	8	41	77
51.8	48.5 J	3.3	42	77

S Statistic = 42 - 77 = -35

Tied Group	Value	Members
1	51.6	2

Time Period	Observations
4/18/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/9/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/20/2022	1
9/28/2022	1
4/19/2023	1
8/24/2023	1
5/1/2024	1
9/11/2024	1
4/16/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

c = 480

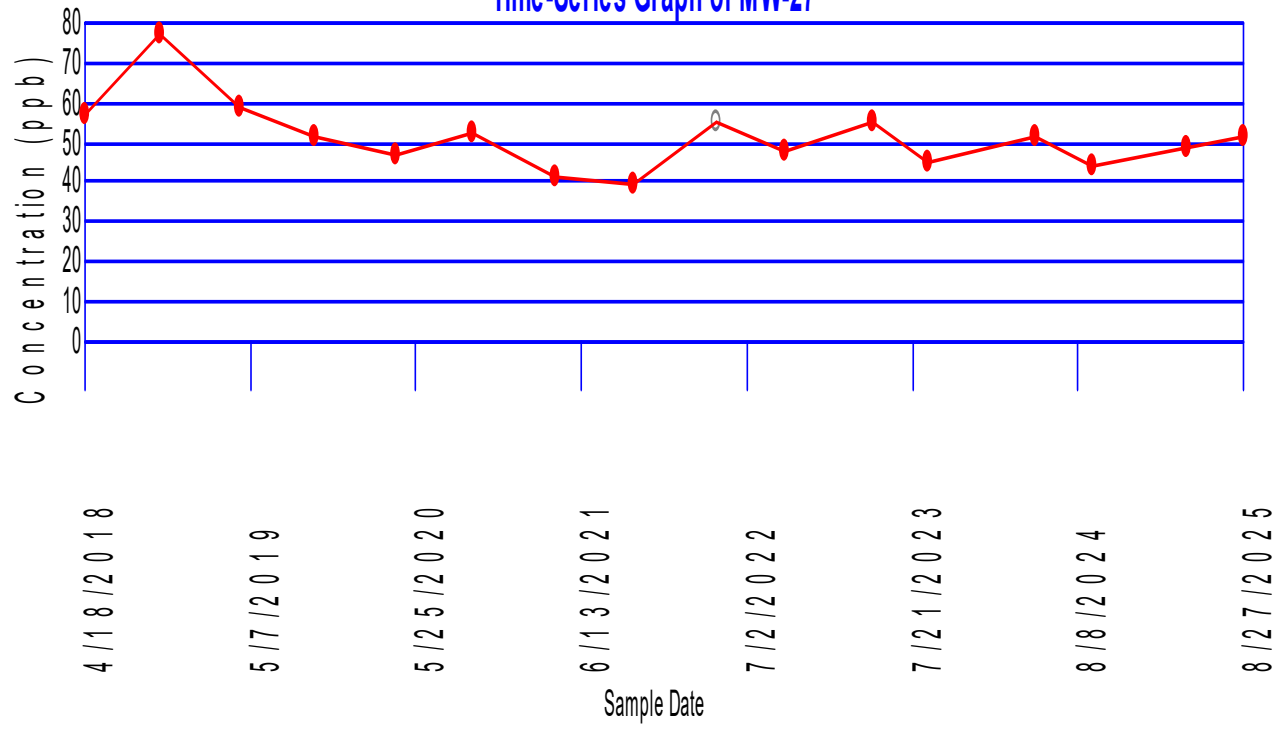
Group Variance = 492.333

Z-Score = -1.53232

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-1.53232| \leq 1.97737$ indicating no evidence of a trend

Lithium, Total
Time-Series Graph of MW-27



Concentrations (ppb)

Parameter: Manganese, Total

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 112

Total Non-Detect: 0

Percent Non-Detects: 0%

Total Background Measurements: 0

There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 7 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

MW-16	16	0 (0%)	4/17/2018	477	477
			10/9/2018	91	91
			4/14/2019	97.1	97.1
			10/2/2019	72.3	72.3
			4/9/2020	57.8	57.8
			10/1/2020	74.2	74.2
			4/15/2021	75.5	75.5
			10/14/2021	73.5	73.5
			4/19/2022	126	126
			9/28/2022	181	181
			4/18/2023	59.5	59.5
			8/24/2023	110	110
			5/2/2024	117	117
			9/12/2024	61.6	61.6
			4/16/2025	62.1	62.1
			8/28/2025	71.3	71.3

MW-06	16	0 (0%)	4/18/2018	124	124
			10/10/2018	549	549
			4/14/2019	78.6	78.6
			10/2/2019	200	200
			4/8/2020	90.9	90.9
			9/30/2020	436	436
			4/13/2021	55.7	55.7
			10/14/2021	703	703
			4/20/2022	72.9	72.9
			9/27/2022	253	253
			4/18/2023	14.9	14.9
			8/23/2023	575	575
			5/1/2024	71.2	71.2
			9/12/2024	185	185
			4/16/2025	72.1	72.1
			8/27/2025	138	138

MW-07	16	0 (0%)	4/18/2018	84.4	84.4
			10/10/2018	2330	2330
			4/14/2019	78.3	78.3
			10/2/2019	1760	1760
			4/8/2020	1280	1280
			9/30/2020	1490	1490
			4/13/2021	1300	1300

			10/14/2021	1490	1490
			4/20/2022	1460	1460
			9/27/2022	1580	1580
			4/18/2023	54.3	54.3
			8/23/2023	1410	1410
			5/1/2024	114	114
			9/11/2024	1780	1780
			4/16/2025	66.6	66.6
			8/27/2025	705	705
MW-21	16	0 (0%)	4/17/2018	553	553
			10/10/2018	69.5 J	69.5 J
			4/13/2019	67.6	67.6
			10/1/2019	47.5	47.5
			4/7/2020	43.6	43.6
			9/30/2020	48.6	48.6
			4/14/2021	51.2	51.2
			10/12/2021	21.7	21.7
			4/20/2022	79	79
			9/29/2022	44.4	44.4
			4/18/2023	161	161
			8/23/2023	21.6	21.6
			5/1/2024	36.6	36.6
			9/11/2024	21.5	21.5
			4/15/2025	26.6	26.6
			8/26/2025	23.7	23.7
MW-26	16	0 (0%)	4/17/2018	4000	4000
			10/9/2018	5140	5140
			4/13/2019	2630	2630
			10/1/2019	3450	3450
			4/8/2020	2620	2620
			10/1/2020	3070	3070
			4/14/2021	2720	2720
			10/13/2021	2500	2500
			4/19/2022	2670	2670
			9/29/2022	3390	3390
			4/19/2023	3350	3350
			8/24/2023	2830	2830
			4/29/2024	3020	3020
			9/10/2024	2540	2540
			4/15/2025	2810	2810
			8/26/2025	2580	2580
SW-01	16	0 (0%)	4/16/2018	375	375
			10/8/2018	184	184
			4/13/2019	510	510
			9/30/2019	275	275
			4/7/2020	817	817
			10/2/2020	533	533
			4/13/2021	254	254
			10/14/2021	245	245
			4/19/2022	340	340
			9/27/2022	572	572
			4/18/2023	497	497
			8/22/2023	710	710
			4/30/2024	308	308

			9/10/2024	228	228
			4/14/2025	258	258
			8/26/2025	196	196
SW-02	16	0 (0%)	4/16/2018	506	506
			10/8/2018	188	188
			4/13/2019	350	350
			9/30/2019	91	91
			4/7/2020	417	417
			10/2/2020	292	292
			4/13/2021	88.2	88.2
			10/14/2021	195	195
			4/19/2022	624	624
			9/27/2022	164	164
			4/18/2023	741	741
			8/22/2023	229	229
			4/30/2024	135	135
			9/10/2024	42.7	42.7
			4/14/2025	622	622
			8/26/2025	109	109

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Manganese, Total

Location: MW-06

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.243748	0.105411	0.507	None

Loc.	Date	Conc.	Outlier
MW-06	4/18/2018	124	FALSE
	10/10/2018	549	FALSE
	4/14/2019	78.6	FALSE
	10/2/2019	200	FALSE
	4/8/2020	90.9	FALSE
	9/30/2020	436	FALSE
	4/13/2021	55.7	FALSE
	10/14/2021	703	FALSE
	4/20/2022	72.9	FALSE
	9/27/2022	253	FALSE
	4/18/2023	14.9	FALSE
	8/23/2023	575	FALSE
	5/1/2024	71.2	FALSE
	9/12/2024	185	FALSE
	4/16/2025	72.1	FALSE
	8/27/2025	138	FALSE

Shapiro-Wilks Test of Normality

Parameter: Manganese, Total

Location: MW-06

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	14.9	703	688.1	0.5056	347.903
2	55.7	575	519.3	0.329	170.85
3	71.2	549	477.8	0.2521	120.453
4	72.1	436	363.9	0.1939	70.5602
5	72.9	253	180.1	0.1447	26.0605
6	78.6	200	121.4	0.1005	12.2007
7	90.9	185	94.1	0.0593	5.58013
8	124	138	14	0.0196	0.2744
9	138	124	-14		
10	185	90.9	-94.1		
11	200	78.6	-121.4		
12	253	72.9	-180.1		
13	436	72.1	-363.9		
14	549	71.2	-477.8		
15	575	55.7	-519.3		
16	703	14.9	-688.1		

Sum of b values = 753.882

Sample Standard Deviation = 216.583

W Statistic = 0.80773

5% Critical value of 0.887 exceeds 0.80773

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.80773

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Manganese, Total
Location: MW-06
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
549	124	425	1	0
78.6	124	-45.4	1	1
200	124	76	2	1
90.9	124	-33.1	2	2
436	124	312	3	2
55.7	124	-68.3	3	3
703	124	579	4	3
72.9	124	-51.1	4	4
253	124	129	5	4
14.9	124	-109.1	5	5
575	124	451	6	5
71.2	124	-52.8	6	6
185	124	61	7	6
72.1	124	-51.9	7	7
138	124	14	8	7
78.6	549	-470.4	8	8
200	549	-349	8	9
90.9	549	-458.1	8	10
436	549	-113	8	11
55.7	549	-493.3	8	12
703	549	154	9	12
72.9	549	-476.1	9	13
253	549	-296	9	14
14.9	549	-534.1	9	15
575	549	26	10	15
71.2	549	-477.8	10	16
185	549	-364	10	17
72.1	549	-476.9	10	18
138	549	-411	10	19
200	78.6	121.4	11	19
90.9	78.6	12.3	12	19
436	78.6	357.4	13	19
55.7	78.6	-22.9	13	20
703	78.6	624.4	14	20
72.9	78.6	-5.7	14	21
253	78.6	174.4	15	21
14.9	78.6	-63.7	15	22
575	78.6	496.4	16	22
71.2	78.6	-7.4	16	23
185	78.6	106.4	17	23
72.1	78.6	-6.5	17	24
138	78.6	59.4	18	24
90.9	200	-109.1	18	25
436	200	236	19	25

55.7	200	-144.3	19	26
703	200	503	20	26
72.9	200	-127.1	20	27
253	200	53	21	27
14.9	200	-185.1	21	28
575	200	375	22	28
71.2	200	-128.8	22	29
185	200	-15	22	30
72.1	200	-127.9	22	31
138	200	-62	22	32
436	90.9	345.1	23	32
55.7	90.9	-35.2	23	33
703	90.9	612.1	24	33
72.9	90.9	-18	24	34
253	90.9	162.1	25	34
14.9	90.9	-76	25	35
575	90.9	484.1	26	35
71.2	90.9	-19.7	26	36
185	90.9	94.1	27	36
72.1	90.9	-18.8	27	37
138	90.9	47.1	28	37
55.7	436	-380.3	28	38
703	436	267	29	38
72.9	436	-363.1	29	39
253	436	-183	29	40
14.9	436	-421.1	29	41
575	436	139	30	41
71.2	436	-364.8	30	42
185	436	-251	30	43
72.1	436	-363.9	30	44
138	436	-298	30	45
703	55.7	647.3	31	45
72.9	55.7	17.2	32	45
253	55.7	197.3	33	45
14.9	55.7	-40.8	33	46
575	55.7	519.3	34	46
71.2	55.7	15.5	35	46
185	55.7	129.3	36	46
72.1	55.7	16.4	37	46
138	55.7	82.3	38	46
72.9	703	-630.1	38	47
253	703	-450	38	48
14.9	703	-688.1	38	49
575	703	-128	38	50
71.2	703	-631.8	38	51
185	703	-518	38	52
72.1	703	-630.9	38	53
138	703	-565	38	54
253	72.9	180.1	39	54
14.9	72.9	-58	39	55
575	72.9	502.1	40	55
71.2	72.9	-1.7	40	56

185	72.9	112.1	41	56
72.1	72.9	-0.8	41	57
138	72.9	65.1	42	57
14.9	253	-238.1	42	58
575	253	322	43	58
71.2	253	-181.8	43	59
185	253	-68	43	60
72.1	253	-180.9	43	61
138	253	-115	43	62
575	14.9	560.1	44	62
71.2	14.9	56.3	45	62
185	14.9	170.1	46	62
72.1	14.9	57.2	47	62
138	14.9	123.1	48	62
71.2	575	-503.8	48	63
185	575	-390	48	64
72.1	575	-502.9	48	65
138	575	-437	48	66
185	71.2	113.8	49	66
72.1	71.2	0.9	50	66
138	71.2	66.8	51	66
72.1	185	-112.9	51	67
138	185	-47	51	68
138	72.1	65.9	52	68

S Statistic = 52 - 68 = -16

Tied Group	Value	Members
Time Period		Observations
4/18/2018		1
10/10/2018		1
4/14/2019		1
10/2/2019		1
4/8/2020		1
9/30/2020		1
4/13/2021		1
10/14/2021		1
4/20/2022		1
9/27/2022		1
4/18/2023		1
8/23/2023		1
5/1/2024		1
9/12/2024		1
4/16/2025		1
8/27/2025		1
There are 0 time periods with multiple data		

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

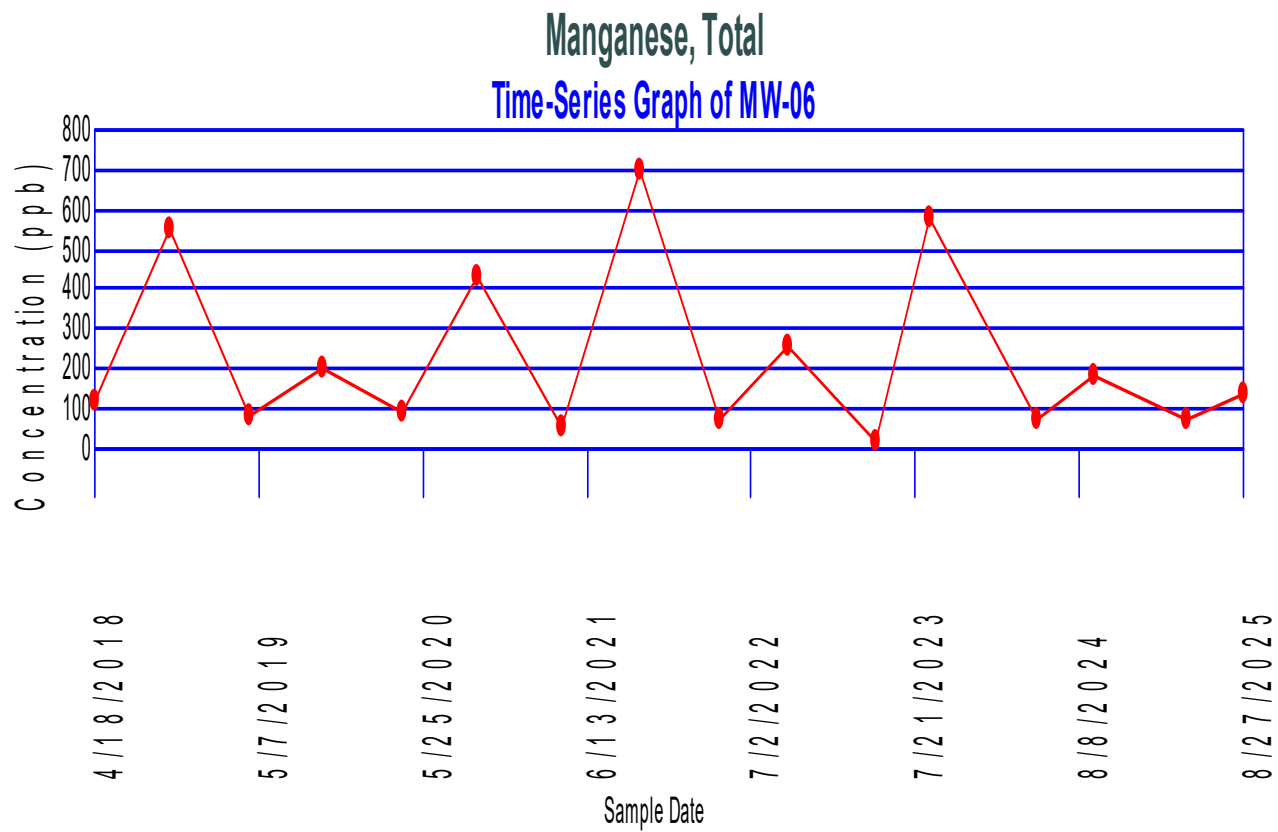
c = 480

Group Variance = 493.333

Z-Score = -0.675338

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.675338| \leq 1.97737$ indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Manganese, Total

Location: MW-07

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.253142	0.0140705	0.507	None

Loc.	Date	Conc.	Outlier
MW-07	4/18/2018	84.4	FALSE
	10/10/2018	2330	FALSE
	4/14/2019	78.3	FALSE
	10/2/2019	1760	FALSE
	4/8/2020	1280	FALSE
	9/30/2020	1490	FALSE
	4/13/2021	1300	FALSE
	10/14/2021	1490	FALSE
	4/20/2022	1460	FALSE
	9/27/2022	1580	FALSE
	4/18/2023	54.3	FALSE
	8/23/2023	1410	FALSE
	5/1/2024	114	FALSE
	9/11/2024	1780	FALSE
	4/16/2025	66.6	FALSE
	8/27/2025	705	FALSE

Shapiro-Wilks Test of Normality

Parameter: Manganese, Total

Location: MW-07

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	54.3	2330	2275.7	0.5056	1150.59
2	66.6	1780	1713.4	0.329	563.709
3	78.3	1760	1681.7	0.2521	423.957
4	84.4	1580	1495.6	0.1939	289.997
5	114	1490	1376	0.1447	199.107
6	705	1490	785	0.1005	78.8925
7	1280	1460	180	0.0593	10.674
8	1300	1410	110	0.0196	2.156
9	1410	1300	-110		
10	1460	1280	-180		
11	1490	705	-785		
12	1490	114	-1376		
13	1580	84.4	-1495.6		
14	1760	78.3	-1681.7		
15	1780	66.6	-1713.4		
16	2330	54.3	-2275.7		

Sum of b values = 2719.09

Sample Standard Deviation = 756.515

W Statistic = 0.861231

5% Critical value of 0.887 exceeds 0.861231

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.861231

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Manganese, Total
Location: MW-07
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2330	84.4	2245.6	1	0
78.3	84.4	-6.1	1	1
1760	84.4	1675.6	2	1
1280	84.4	1195.6	3	1
1490	84.4	1405.6	4	1
1300	84.4	1215.6	5	1
1490	84.4	1405.6	6	1
1460	84.4	1375.6	7	1
1580	84.4	1495.6	8	1
54.3	84.4	-30.1	8	2
1410	84.4	1325.6	9	2
114	84.4	29.6	10	2
1780	84.4	1695.6	11	2
66.6	84.4	-17.8	11	3
705	84.4	620.6	12	3
78.3	2330	-2251.7	12	4
1760	2330	-570	12	5
1280	2330	-1050	12	6
1490	2330	-840	12	7
1300	2330	-1030	12	8
1490	2330	-840	12	9
1460	2330	-870	12	10
1580	2330	-750	12	11
54.3	2330	-2275.7	12	12
1410	2330	-920	12	13
114	2330	-2216	12	14
1780	2330	-550	12	15
66.6	2330	-2263.4	12	16
705	2330	-1625	12	17
1760	78.3	1681.7	13	17
1280	78.3	1201.7	14	17
1490	78.3	1411.7	15	17
1300	78.3	1221.7	16	17
1490	78.3	1411.7	17	17
1460	78.3	1381.7	18	17
1580	78.3	1501.7	19	17
54.3	78.3	-24	19	18
1410	78.3	1331.7	20	18
114	78.3	35.7	21	18
1780	78.3	1701.7	22	18
66.6	78.3	-11.7	22	19
705	78.3	626.7	23	19
1280	1760	-480	23	20
1490	1760	-270	23	21

1300	1760	-460	23	22
1490	1760	-270	23	23
1460	1760	-300	23	24
1580	1760	-180	23	25
54.3	1760	-1705.7	23	26
1410	1760	-350	23	27
114	1760	-1646	23	28
1780	1760	20	24	28
66.6	1760	-1693.4	24	29
705	1760	-1055	24	30
1490	1280	210	25	30
1300	1280	20	26	30
1490	1280	210	27	30
1460	1280	180	28	30
1580	1280	300	29	30
54.3	1280	-1225.7	29	31
1410	1280	130	30	31
114	1280	-1166	30	32
1780	1280	500	31	32
66.6	1280	-1213.4	31	33
705	1280	-575	31	34
1300	1490	-190	31	35
1490	1490	0	31	35
1460	1490	-30	31	36
1580	1490	90	32	36
54.3	1490	-1435.7	32	37
1410	1490	-80	32	38
114	1490	-1376	32	39
1780	1490	290	33	39
66.6	1490	-1423.4	33	40
705	1490	-785	33	41
1490	1300	190	34	41
1460	1300	160	35	41
1580	1300	280	36	41
54.3	1300	-1245.7	36	42
1410	1300	110	37	42
114	1300	-1186	37	43
1780	1300	480	38	43
66.6	1300	-1233.4	38	44
705	1300	-595	38	45
1460	1490	-30	38	46
1580	1490	90	39	46
54.3	1490	-1435.7	39	47
1410	1490	-80	39	48
114	1490	-1376	39	49
1780	1490	290	40	49
66.6	1490	-1423.4	40	50
705	1490	-785	40	51
1580	1460	120	41	51
54.3	1460	-1405.7	41	52
1410	1460	-50	41	53
114	1460	-1346	41	54

1780	1460	320	42	54
66.6	1460	-1393.4	42	55
705	1460	-755	42	56
54.3	1580	-1525.7	42	57
1410	1580	-170	42	58
114	1580	-1466	42	59
1780	1580	200	43	59
66.6	1580	-1513.4	43	60
705	1580	-875	43	61
1410	54.3	1355.7	44	61
114	54.3	59.7	45	61
1780	54.3	1725.7	46	61
66.6	54.3	12.3	47	61
705	54.3	650.7	48	61
114	1410	-1296	48	62
1780	1410	370	49	62
66.6	1410	-1343.4	49	63
705	1410	-705	49	64
1780	114	1666	50	64
66.6	114	-47.4	50	65
705	114	591	51	65
66.6	1780	-1713.4	51	66
705	1780	-1075	51	67
705	66.6	638.4	52	67

S Statistic = 52 - 67 = -15

Tied Group	Value	Members
1	1490	2

Time Period	Observations
4/18/2018	1
10/10/2018	1
4/14/2019	1
10/2/2019	1
4/8/2020	1
9/30/2020	1
4/13/2021	1
10/14/2021	1
4/20/2022	1
9/27/2022	1
4/18/2023	1
8/23/2023	1
5/1/2024	1
9/11/2024	1
4/16/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

c = 480

Group Variance = 492.333

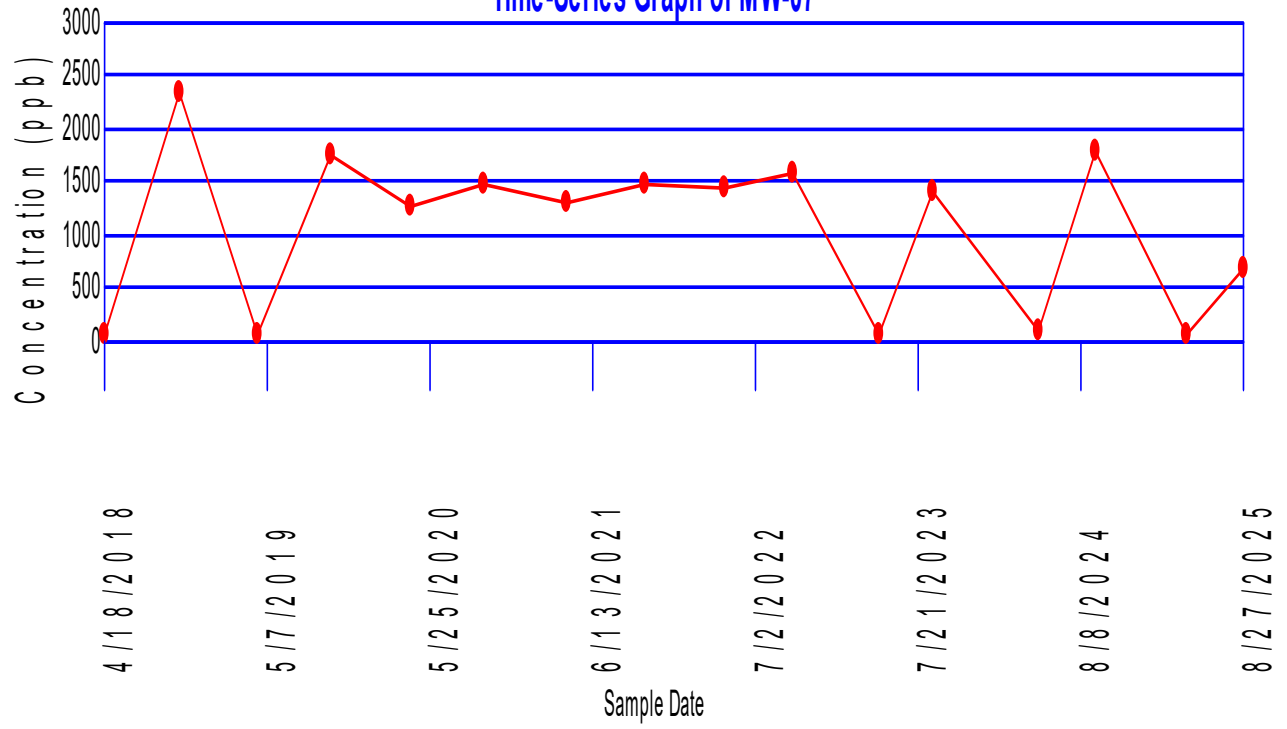
Z-Score = -0.630955

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.630955| \leq 1.97737$ indicating no evidence of a trend

Manganese, Total

Time-Series Graph of MW-07



Dixon's Test for Outliers

Parameter: Manganese, Total

Location: MW-16

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.844969	0.0557185	0.507	477
2	0.536013	0.0641892	0.525	181
3	0.248447	0.0727969	0.546	None

Loc.	Date	Conc.	Outlier
MW-16	4/17/2018	477	TRUE
	10/9/2018	91	FALSE
	4/14/2019	97.1	FALSE
	10/2/2019	72.3	FALSE
	4/9/2020	57.8	FALSE
	10/1/2020	74.2	FALSE
	4/15/2021	75.5	FALSE
	10/14/2021	73.5	FALSE
	4/19/2022	126	FALSE
	9/28/2022	181	TRUE
	4/18/2023	59.5	FALSE
	8/24/2023	110	FALSE
	5/2/2024	117	FALSE
	9/12/2024	61.6	FALSE
	4/16/2025	62.1	FALSE
	8/28/2025	71.3	FALSE

Shapiro-Wilks Test of Normality

Parameter: Manganese, Total

Location: MW-16

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	57.8	477	419.2	0.5056	211.948
2	59.5	181	121.5	0.329	39.9735
3	61.6	126	64.4	0.2521	16.2352
4	62.1	117	54.9	0.1939	10.6451
5	71.3	110	38.7	0.1447	5.59989
6	72.3	97.1	24.8	0.1005	2.4924
7	73.5	91	17.5	0.0593	1.03775
8	74.2	75.5	1.3	0.0196	0.02548
9	75.5	74.2	-1.3		
10	91	73.5	-17.5		
11	97.1	72.3	-24.8		
12	110	71.3	-38.7		
13	117	62.1	-54.9		
14	126	61.6	-64.4		
15	181	59.5	-121.5		
16	477	57.8	-419.2		

Sum of b values = 287.957

Sample Standard Deviation = 102.326

W Statistic = 0.527945

5% Critical value of 0.887 exceeds 0.527945

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.527945

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Manganese, Total
Location: MW-16
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
91	477	-386	0	1
97.1	477	-379.9	0	2
72.3	477	-404.7	0	3
57.8	477	-419.2	0	4
74.2	477	-402.8	0	5
75.5	477	-401.5	0	6
73.5	477	-403.5	0	7
126	477	-351	0	8
181	477	-296	0	9
59.5	477	-417.5	0	10
110	477	-367	0	11
117	477	-360	0	12
61.6	477	-415.4	0	13
62.1	477	-414.9	0	14
71.3	477	-405.7	0	15
97.1	91	6.1	1	15
72.3	91	-18.7	1	16
57.8	91	-33.2	1	17
74.2	91	-16.8	1	18
75.5	91	-15.5	1	19
73.5	91	-17.5	1	20
126	91	35	2	20
181	91	90	3	20
59.5	91	-31.5	3	21
110	91	19	4	21
117	91	26	5	21
61.6	91	-29.4	5	22
62.1	91	-28.9	5	23
71.3	91	-19.7	5	24
72.3	97.1	-24.8	5	25
57.8	97.1	-39.3	5	26
74.2	97.1	-22.9	5	27
75.5	97.1	-21.6	5	28
73.5	97.1	-23.6	5	29
126	97.1	28.9	6	29
181	97.1	83.9	7	29
59.5	97.1	-37.6	7	30
110	97.1	12.9	8	30
117	97.1	19.9	9	30
61.6	97.1	-35.5	9	31
62.1	97.1	-35	9	32
71.3	97.1	-25.8	9	33
57.8	72.3	-14.5	9	34
74.2	72.3	1.9	10	34

75.5	72.3	3.2	11	34
73.5	72.3	1.2	12	34
126	72.3	53.7	13	34
181	72.3	108.7	14	34
59.5	72.3	-12.8	14	35
110	72.3	37.7	15	35
117	72.3	44.7	16	35
61.6	72.3	-10.7	16	36
62.1	72.3	-10.2	16	37
71.3	72.3	-1	16	38
74.2	57.8	16.4	17	38
75.5	57.8	17.7	18	38
73.5	57.8	15.7	19	38
126	57.8	68.2	20	38
181	57.8	123.2	21	38
59.5	57.8	1.7	22	38
110	57.8	52.2	23	38
117	57.8	59.2	24	38
61.6	57.8	3.8	25	38
62.1	57.8	4.3	26	38
71.3	57.8	13.5	27	38
75.5	74.2	1.3	28	38
73.5	74.2	-0.7	28	39
126	74.2	51.8	29	39
181	74.2	106.8	30	39
59.5	74.2	-14.7	30	40
110	74.2	35.8	31	40
117	74.2	42.8	32	40
61.6	74.2	-12.6	32	41
62.1	74.2	-12.1	32	42
71.3	74.2	-2.9	32	43
73.5	75.5	-2	32	44
126	75.5	50.5	33	44
181	75.5	105.5	34	44
59.5	75.5	-16	34	45
110	75.5	34.5	35	45
117	75.5	41.5	36	45
61.6	75.5	-13.9	36	46
62.1	75.5	-13.4	36	47
71.3	75.5	-4.2	36	48
126	73.5	52.5	37	48
181	73.5	107.5	38	48
59.5	73.5	-14	38	49
110	73.5	36.5	39	49
117	73.5	43.5	40	49
61.6	73.5	-11.9	40	50
62.1	73.5	-11.4	40	51
71.3	73.5	-2.2	40	52
181	126	55	41	52
59.5	126	-66.5	41	53
110	126	-16	41	54
117	126	-9	41	55

61.6	126	-64.4	41	56
62.1	126	-63.9	41	57
71.3	126	-54.7	41	58
59.5	181	-121.5	41	59
110	181	-71	41	60
117	181	-64	41	61
61.6	181	-119.4	41	62
62.1	181	-118.9	41	63
71.3	181	-109.7	41	64
110	59.5	50.5	42	64
117	59.5	57.5	43	64
61.6	59.5	2.1	44	64
62.1	59.5	2.6	45	64
71.3	59.5	11.8	46	64
117	110	7	47	64
61.6	110	-48.4	47	65
62.1	110	-47.9	47	66
71.3	110	-38.7	47	67
61.6	117	-55.4	47	68
62.1	117	-54.9	47	69
71.3	117	-45.7	47	70
62.1	61.6	0.5	48	70
71.3	61.6	9.7	49	70
71.3	62.1	9.2	50	70

S Statistic = 50 - 70 = -20

Tied Group	Value	Members
Time Period	Observations	
4/17/2018	1	
10/9/2018	1	
4/14/2019	1	
10/2/2019	1	
4/9/2020	1	
10/1/2020	1	
4/15/2021	1	
10/14/2021	1	
4/19/2022	1	
9/28/2022	1	
4/18/2023	1	
8/24/2023	1	
5/2/2024	1	
9/12/2024	1	
4/16/2025	1	
8/28/2025	1	
There are 0 time periods with multiple data		

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

c = 480

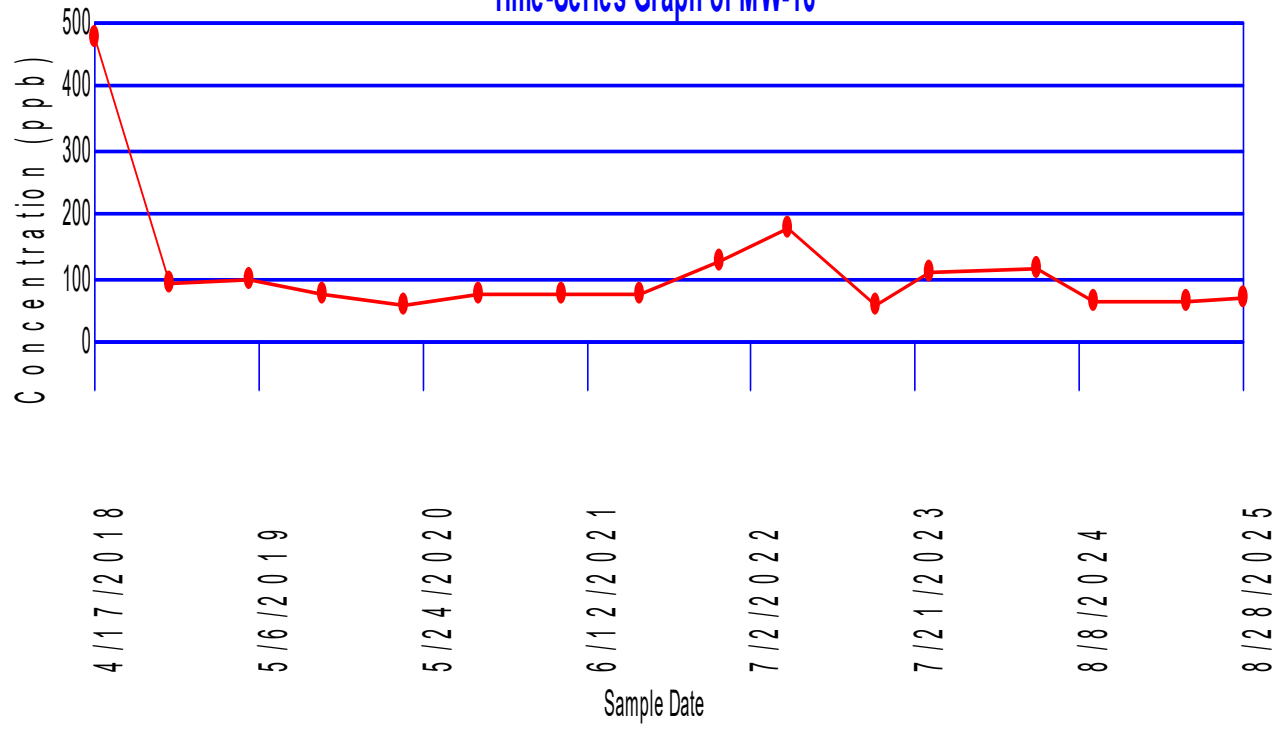
Group Variance = 493.333

Z-Score = -0.855428

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.855428| \leq 1.97737$ indicating no evidence of a trend

Manganese, Total Time-Series Graph of MW-16



Dixon's Test for Outliers

Parameter: Manganese, Total

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.892151	0.00347826	0.507	553
2	0.656856	0.00416667	0.525	161
3	0.198953	0.00433839	0.546	None

Loc.	Date	Conc.	Outlier
MW-21	4/17/2018	553	TRUE
	10/10/2018	69.5 J	FALSE
	4/13/2019	67.6	FALSE
	10/1/2019	47.5	FALSE
	4/7/2020	43.6	FALSE
	9/30/2020	48.6	FALSE
	4/14/2021	51.2	FALSE
	10/12/2021	21.7	FALSE
	4/20/2022	79	FALSE
	9/29/2022	44.4	FALSE
	4/18/2023	161	TRUE
	8/23/2023	21.6	FALSE
	5/1/2024	36.6	FALSE
	9/11/2024	21.5	FALSE
	4/15/2025	26.6	FALSE
	8/26/2025	23.7	FALSE

Shapiro-Wilks Test of Normality

Parameter: Manganese, Total

Location: MW-21

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	21.5	553	531.5	0.5056	268.726
2	21.6	161	139.4	0.329	45.8626
3	21.7	79	57.3	0.2521	14.4453
4	23.7	69.5	45.8	0.1939	8.88062
5	26.6	67.6	41	0.1447	5.9327
6	36.6	51.2	14.6	0.1005	1.4673
7	43.6	48.6	5	0.0593	0.2965
8	44.4	47.5	3.1	0.0196	0.06076
9	47.5	44.4	-3.1		
10	48.6	43.6	-5		
11	51.2	36.6	-14.6		
12	67.6	26.6	-41		
13	69.5	23.7	-45.8		
14	79	21.7	-57.3		
15	161	21.6	-139.4		
16	553	21.5	-531.5		

Sum of b values = 345.672

Sample Standard Deviation = 130.146

W Statistic = 0.470302

5% Critical value of 0.887 exceeds 0.470302

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.470302

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Manganese, Total
Location: MW-21
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
69.5 J	553	-483.5	0	1
67.6	553	-485.4	0	2
47.5	553	-505.5	0	3
43.6	553	-509.4	0	4
48.6	553	-504.4	0	5
51.2	553	-501.8	0	6
21.7	553	-531.3	0	7
79	553	-474	0	8
44.4	553	-508.6	0	9
161	553	-392	0	10
21.6	553	-531.4	0	11
36.6	553	-516.4	0	12
21.5	553	-531.5	0	13
26.6	553	-526.4	0	14
23.7	553	-529.3	0	15
67.6	69.5 J	-1.9	0	16
47.5	69.5 J	-22	0	17
43.6	69.5 J	-25.9	0	18
48.6	69.5 J	-20.9	0	19
51.2	69.5 J	-18.3	0	20
21.7	69.5 J	-47.8	0	21
79	69.5 J	9.5	1	21
44.4	69.5 J	-25.1	1	22
161	69.5 J	91.5	2	22
21.6	69.5 J	-47.9	2	23
36.6	69.5 J	-32.9	2	24
21.5	69.5 J	-48	2	25
26.6	69.5 J	-42.9	2	26
23.7	69.5 J	-45.8	2	27
47.5	67.6	-20.1	2	28
43.6	67.6	-24	2	29
48.6	67.6	-19	2	30
51.2	67.6	-16.4	2	31
21.7	67.6	-45.9	2	32
79	67.6	11.4	3	32
44.4	67.6	-23.2	3	33
161	67.6	93.4	4	33
21.6	67.6	-46	4	34
36.6	67.6	-31	4	35
21.5	67.6	-46.1	4	36
26.6	67.6	-41	4	37
23.7	67.6	-43.9	4	38
43.6	47.5	-3.9	4	39
48.6	47.5	1.1	5	39

51.2	47.5	3.7	6	39
21.7	47.5	-25.8	6	40
79	47.5	31.5	7	40
44.4	47.5	-3.1	7	41
161	47.5	113.5	8	41
21.6	47.5	-25.9	8	42
36.6	47.5	-10.9	8	43
21.5	47.5	-26	8	44
26.6	47.5	-20.9	8	45
23.7	47.5	-23.8	8	46
48.6	43.6	5	9	46
51.2	43.6	7.6	10	46
21.7	43.6	-21.9	10	47
79	43.6	35.4	11	47
44.4	43.6	0.8	12	47
161	43.6	117.4	13	47
21.6	43.6	-22	13	48
36.6	43.6	-7	13	49
21.5	43.6	-22.1	13	50
26.6	43.6	-17	13	51
23.7	43.6	-19.9	13	52
51.2	48.6	2.6	14	52
21.7	48.6	-26.9	14	53
79	48.6	30.4	15	53
44.4	48.6	-4.2	15	54
161	48.6	112.4	16	54
21.6	48.6	-27	16	55
36.6	48.6	-12	16	56
21.5	48.6	-27.1	16	57
26.6	48.6	-22	16	58
23.7	48.6	-24.9	16	59
21.7	51.2	-29.5	16	60
79	51.2	27.8	17	60
44.4	51.2	-6.8	17	61
161	51.2	109.8	18	61
21.6	51.2	-29.6	18	62
36.6	51.2	-14.6	18	63
21.5	51.2	-29.7	18	64
26.6	51.2	-24.6	18	65
23.7	51.2	-27.5	18	66
79	21.7	57.3	19	66
44.4	21.7	22.7	20	66
161	21.7	139.3	21	66
21.6	21.7	-0.1	21	67
36.6	21.7	14.9	22	67
21.5	21.7	-0.2	22	68
26.6	21.7	4.9	23	68
23.7	21.7	2	24	68
44.4	79	-34.6	24	69
161	79	82	25	69
21.6	79	-57.4	25	70
36.6	79	-42.4	25	71

21.5	79	-57.5	25	72
26.6	79	-52.4	25	73
23.7	79	-55.3	25	74
161	44.4	116.6	26	74
21.6	44.4	-22.8	26	75
36.6	44.4	-7.8	26	76
21.5	44.4	-22.9	26	77
26.6	44.4	-17.8	26	78
23.7	44.4	-20.7	26	79
21.6	161	-139.4	26	80
36.6	161	-124.4	26	81
21.5	161	-139.5	26	82
26.6	161	-134.4	26	83
23.7	161	-137.3	26	84
36.6	21.6	15	27	84
21.5	21.6	-0.1	27	85
26.6	21.6	5	28	85
23.7	21.6	2.1	29	85
21.5	36.6	-15.1	29	86
26.6	36.6	-10	29	87
23.7	36.6	-12.9	29	88
26.6	21.5	5.1	30	88
23.7	21.5	2.2	31	88
23.7	26.6	-2.9	31	89

S Statistic = 31 - 89 = -58

Tied Group	Value	Members
Time Period	Observations	
4/17/2018	1	
10/10/2018	1	
4/13/2019	1	
10/1/2019	1	
4/7/2020	1	
9/30/2020	1	
4/14/2021	1	
10/12/2021	1	
4/20/2022	1	
9/29/2022	1	
4/18/2023	1	
8/23/2023	1	
5/1/2024	1	
9/11/2024	1	
4/15/2025	1	
8/26/2025	1	

There are 0 time periods with multiple data

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

c = 480

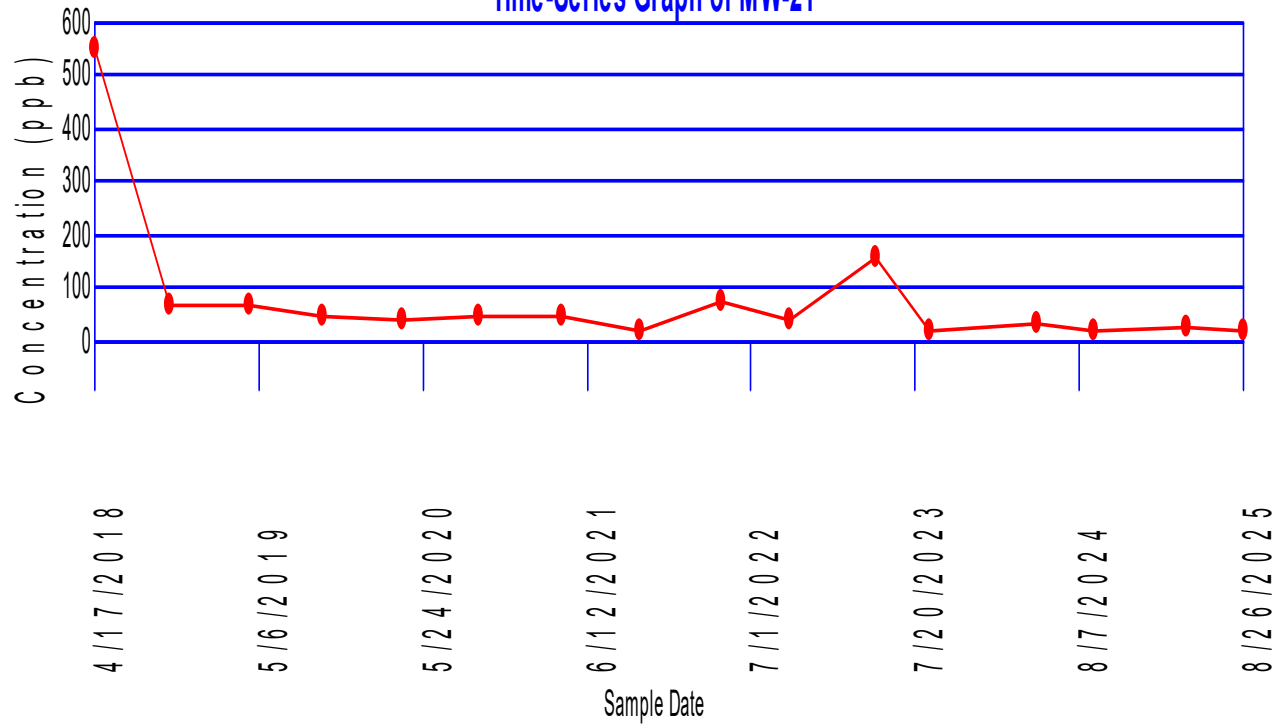
Group Variance = 493.333

Z-Score = -2.56628

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-2.56628| > 1.97737$ indicating a trend

Manganese, Total Time-Series Graph of MW-21



Dixon's Test for Outliers

Parameter: Manganese, Total

Location: MW-26

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.660156	0.0842105	0.507	5140
2	0.429577	0.0898876	0.525	None

Loc.	Date	Conc.	Outlier
MW-26	4/17/2018	4000	FALSE
	10/9/2018	5140	TRUE
	4/13/2019	2630	FALSE
	10/1/2019	3450	FALSE
	4/8/2020	2620	FALSE
	10/1/2020	3070	FALSE
	4/14/2021	2720	FALSE
	10/13/2021	2500	FALSE
	4/19/2022	2670	FALSE
	9/29/2022	3390	FALSE
	4/19/2023	3350	FALSE
	8/24/2023	2830	FALSE
	4/29/2024	3020	FALSE
	9/10/2024	2540	FALSE
	4/15/2025	2810	FALSE
	8/26/2025	2580	FALSE

Shapiro-Wilks Test of Normality

Parameter: Manganese, Total

Location: MW-26

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2500	5140	2640	0.5056	1334.78
2	2540	4000	1460	0.329	480.34
3	2580	3450	870	0.2521	219.327
4	2620	3390	770	0.1939	149.303
5	2630	3350	720	0.1447	104.184
6	2670	3070	400	0.1005	40.2
7	2720	3020	300	0.0593	17.79
8	2810	2830	20	0.0196	0.392
9	2830	2810	-20		
10	3020	2720	-300		
11	3070	2670	-400		
12	3350	2630	-720		
13	3390	2620	-770		
14	3450	2580	-870		
15	4000	2540	-1460		
16	5140	2500	-2640		

Sum of b values = 2346.32

Sample Standard Deviation = 689.188

W Statistic = 0.772695

5% Critical value of 0.887 exceeds 0.772695

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.772695

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Manganese, Total
Location: MW-26
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
5140	4000	1140	1	0
2630	4000	-1370	1	1
3450	4000	-550	1	2
2620	4000	-1380	1	3
3070	4000	-930	1	4
2720	4000	-1280	1	5
2500	4000	-1500	1	6
2670	4000	-1330	1	7
3390	4000	-610	1	8
3350	4000	-650	1	9
2830	4000	-1170	1	10
3020	4000	-980	1	11
2540	4000	-1460	1	12
2810	4000	-1190	1	13
2580	4000	-1420	1	14
2630	5140	-2510	1	15
3450	5140	-1690	1	16
2620	5140	-2520	1	17
3070	5140	-2070	1	18
2720	5140	-2420	1	19
2500	5140	-2640	1	20
2670	5140	-2470	1	21
3390	5140	-1750	1	22
3350	5140	-1790	1	23
2830	5140	-2310	1	24
3020	5140	-2120	1	25
2540	5140	-2600	1	26
2810	5140	-2330	1	27
2580	5140	-2560	1	28
3450	2630	820	2	28
2620	2630	-10	2	29
3070	2630	440	3	29
2720	2630	90	4	29
2500	2630	-130	4	30
2670	2630	40	5	30
3390	2630	760	6	30
3350	2630	720	7	30
2830	2630	200	8	30
3020	2630	390	9	30
2540	2630	-90	9	31
2810	2630	180	10	31
2580	2630	-50	10	32
2620	3450	-830	10	33
3070	3450	-380	10	34

2720	3450	-730	10	35
2500	3450	-950	10	36
2670	3450	-780	10	37
3390	3450	-60	10	38
3350	3450	-100	10	39
2830	3450	-620	10	40
3020	3450	-430	10	41
2540	3450	-910	10	42
2810	3450	-640	10	43
2580	3450	-870	10	44
3070	2620	450	11	44
2720	2620	100	12	44
2500	2620	-120	12	45
2670	2620	50	13	45
3390	2620	770	14	45
3350	2620	730	15	45
2830	2620	210	16	45
3020	2620	400	17	45
2540	2620	-80	17	46
2810	2620	190	18	46
2580	2620	-40	18	47
2720	3070	-350	18	48
2500	3070	-570	18	49
2670	3070	-400	18	50
3390	3070	320	19	50
3350	3070	280	20	50
2830	3070	-240	20	51
3020	3070	-50	20	52
2540	3070	-530	20	53
2810	3070	-260	20	54
2580	3070	-490	20	55
2500	2720	-220	20	56
2670	2720	-50	20	57
3390	2720	670	21	57
3350	2720	630	22	57
2830	2720	110	23	57
3020	2720	300	24	57
2540	2720	-180	24	58
2810	2720	90	25	58
2580	2720	-140	25	59
2670	2500	170	26	59
3390	2500	890	27	59
3350	2500	850	28	59
2830	2500	330	29	59
3020	2500	520	30	59
2540	2500	40	31	59
2810	2500	310	32	59
2580	2500	80	33	59
3390	2670	720	34	59
3350	2670	680	35	59
2830	2670	160	36	59
3020	2670	350	37	59

2540	2670	-130	37	60
2810	2670	140	38	60
2580	2670	-90	38	61
3350	3390	-40	38	62
2830	3390	-560	38	63
3020	3390	-370	38	64
2540	3390	-850	38	65
2810	3390	-580	38	66
2580	3390	-810	38	67
2830	3350	-520	38	68
3020	3350	-330	38	69
2540	3350	-810	38	70
2810	3350	-540	38	71
2580	3350	-770	38	72
3020	2830	190	39	72
2540	2830	-290	39	73
2810	2830	-20	39	74
2580	2830	-250	39	75
2540	3020	-480	39	76
2810	3020	-210	39	77
2580	3020	-440	39	78
2810	2540	270	40	78
2580	2540	40	41	78
2580	2810	-230	41	79

S Statistic = 41 - 79 = -38

Tied Group	Value	Members
Time Period	Observations	
4/17/2018	1	
10/9/2018	1	
4/13/2019	1	
10/1/2019	1	
4/8/2020	1	
10/1/2020	1	
4/14/2021	1	
10/13/2021	1	
4/19/2022	1	
9/29/2022	1	
4/19/2023	1	
8/24/2023	1	
4/29/2024	1	
9/10/2024	1	
4/15/2025	1	
8/26/2025	1	

There are 0 time periods with multiple data

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

c = 480

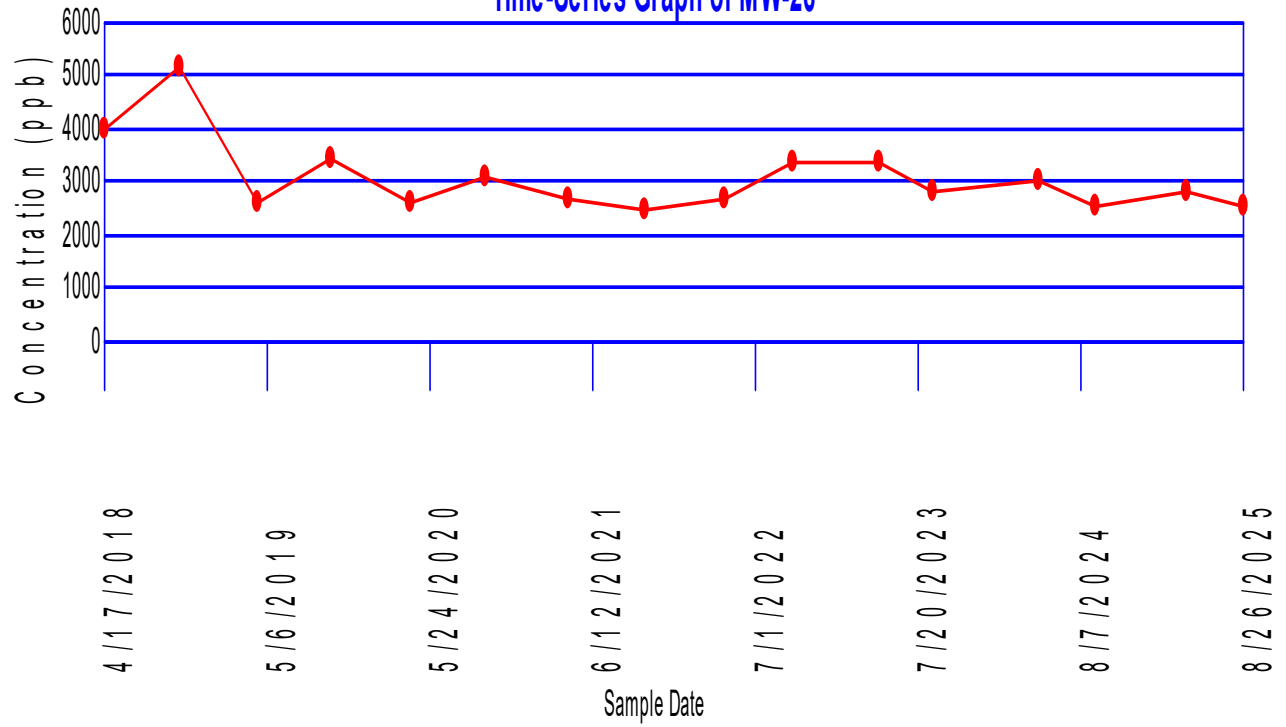
Group Variance = 493.333

Z-Score = -1.66583

Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)

| -1.66583 | <= 1.97737 indicating no evidence of a trend

Manganese, Total Time-Series Graph of MW-26



Dixon's Test for Outliers

Parameter: Manganese, Total

Location: SW-01

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.415959	0.113402	0.507	None

Loc.	Date	Conc.	Outlier
SW-01	4/16/2018	375	FALSE
	10/8/2018	184	FALSE
	4/13/2019	510	FALSE
	9/30/2019	275	FALSE
	4/7/2020	817	FALSE
	10/2/2020	533	FALSE
	4/13/2021	254	FALSE
	10/14/2021	245	FALSE
	4/19/2022	340	FALSE
	9/27/2022	572	FALSE
	4/18/2023	497	FALSE
	8/22/2023	710	FALSE
	4/30/2024	308	FALSE
	9/10/2024	228	FALSE
	4/14/2025	258	FALSE
	8/26/2025	196	FALSE

Shapiro-Wilks Test of Normality

Parameter: Manganese, Total

Location: SW-01

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	184	817	633	0.5056	320.045
2	196	710	514	0.329	169.106
3	228	572	344	0.2521	86.7224
4	245	533	288	0.1939	55.8432
5	254	510	256	0.1447	37.0432
6	258	497	239	0.1005	24.0195
7	275	375	100	0.0593	5.93
8	308	340	32	0.0196	0.6272
9	340	308	-32		
10	375	275	-100		
11	497	258	-239		
12	510	254	-256		
13	533	245	-288		
14	572	228	-344		
15	710	196	-514		
16	817	184	-633		

Sum of b values = 699.336

Sample Standard Deviation = 191.459

W Statistic = 0.88947

5% Critical value of 0.887 is less than 0.88947

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.88947

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Manganese, Total
Location: SW-01
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
184	375	-191	0	1
510	375	135	1	1
275	375	-100	1	2
817	375	442	2	2
533	375	158	3	2
254	375	-121	3	3
245	375	-130	3	4
340	375	-35	3	5
572	375	197	4	5
497	375	122	5	5
710	375	335	6	5
308	375	-67	6	6
228	375	-147	6	7
258	375	-117	6	8
196	375	-179	6	9
510	184	326	7	9
275	184	91	8	9
817	184	633	9	9
533	184	349	10	9
254	184	70	11	9
245	184	61	12	9
340	184	156	13	9
572	184	388	14	9
497	184	313	15	9
710	184	526	16	9
308	184	124	17	9
228	184	44	18	9
258	184	74	19	9
196	184	12	20	9
275	510	-235	20	10
817	510	307	21	10
533	510	23	22	10
254	510	-256	22	11
245	510	-265	22	12
340	510	-170	22	13
572	510	62	23	13
497	510	-13	23	14
710	510	200	24	14
308	510	-202	24	15
228	510	-282	24	16
258	510	-252	24	17
196	510	-314	24	18
817	275	542	25	18
533	275	258	26	18

254	275	-21	26	19
245	275	-30	26	20
340	275	65	27	20
572	275	297	28	20
497	275	222	29	20
710	275	435	30	20
308	275	33	31	20
228	275	-47	31	21
258	275	-17	31	22
196	275	-79	31	23
533	817	-284	31	24
254	817	-563	31	25
245	817	-572	31	26
340	817	-477	31	27
572	817	-245	31	28
497	817	-320	31	29
710	817	-107	31	30
308	817	-509	31	31
228	817	-589	31	32
258	817	-559	31	33
196	817	-621	31	34
254	533	-279	31	35
245	533	-288	31	36
340	533	-193	31	37
572	533	39	32	37
497	533	-36	32	38
710	533	177	33	38
308	533	-225	33	39
228	533	-305	33	40
258	533	-275	33	41
196	533	-337	33	42
245	254	-9	33	43
340	254	86	34	43
572	254	318	35	43
497	254	243	36	43
710	254	456	37	43
308	254	54	38	43
228	254	-26	38	44
258	254	4	39	44
196	254	-58	39	45
340	245	95	40	45
572	245	327	41	45
497	245	252	42	45
710	245	465	43	45
308	245	63	44	45
228	245	-17	44	46
258	245	13	45	46
196	245	-49	45	47
572	340	232	46	47
497	340	157	47	47
710	340	370	48	47
308	340	-32	48	48

228	340	-112	48	49
258	340	-82	48	50
196	340	-144	48	51
497	572	-75	48	52
710	572	138	49	52
308	572	-264	49	53
228	572	-344	49	54
258	572	-314	49	55
196	572	-376	49	56
710	497	213	50	56
308	497	-189	50	57
228	497	-269	50	58
258	497	-239	50	59
196	497	-301	50	60
308	710	-402	50	61
228	710	-482	50	62
258	710	-452	50	63
196	710	-514	50	64
228	308	-80	50	65
258	308	-50	50	66
196	308	-112	50	67
258	228	30	51	67
196	228	-32	51	68
196	258	-62	51	69

S Statistic = 51 - 69 = -18

Tied Group	Value	Members
Time Period	Observations	
4/16/2018	1	
10/8/2018	1	
4/13/2019	1	
9/30/2019	1	
4/7/2020	1	
10/2/2020	1	
4/13/2021	1	
10/14/2021	1	
4/19/2022	1	
9/27/2022	1	
4/18/2023	1	
8/22/2023	1	
4/30/2024	1	
9/10/2024	1	
4/14/2025	1	
8/26/2025	1	
There are 0 time periods with multiple data		

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

c = 480

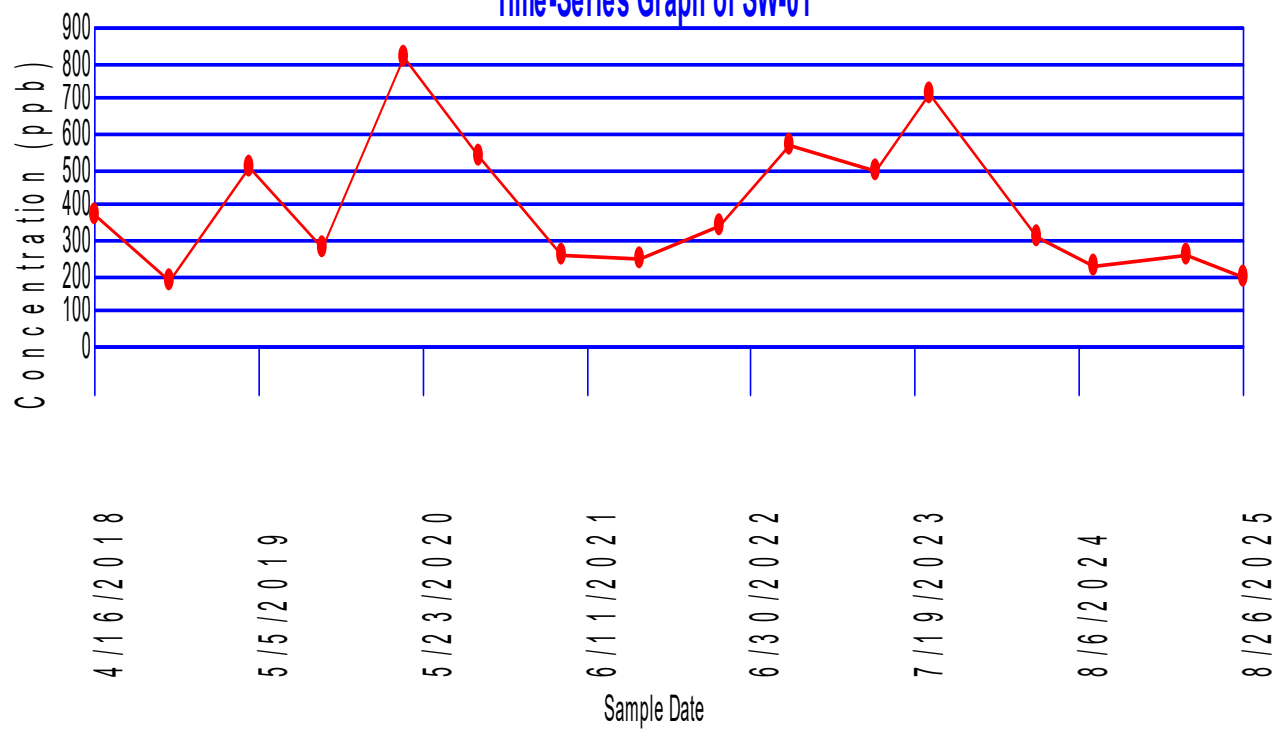
Group Variance = 493.333

Z-Score = -0.765383

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.765383| \leq 1.97737$ indicating no evidence of a trend

Manganese, Total
Time-Series Graph of SW-01



Dixon's Test for Outliers

Parameter: Manganese, Total

Location: SW-02

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.183077	0.0833765	0.507	None

Loc.	Date	Conc.	Outlier
SW-02	4/16/2018	506	FALSE
	10/8/2018	188	FALSE
	4/13/2019	350	FALSE
	9/30/2019	91	FALSE
	4/7/2020	417	FALSE
	10/2/2020	292	FALSE
	4/13/2021	88.2	FALSE
	10/14/2021	195	FALSE
	4/19/2022	624	FALSE
	9/27/2022	164	FALSE
	4/18/2023	741	FALSE
	8/22/2023	229	FALSE
	4/30/2024	135	FALSE
	9/10/2024	42.7	FALSE
	4/14/2025	622	FALSE
	8/26/2025	109	FALSE

Shapiro-Wilks Test of Normality

Parameter: Manganese, Total

Location: SW-02

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	42.7	741	698.3	0.5056	353.06
2	88.2	624	535.8	0.329	176.278
3	91	622	531	0.2521	133.865
4	109	506	397	0.1939	76.9783
5	135	417	282	0.1447	40.8054
6	164	350	186	0.1005	18.693
7	188	292	104	0.0593	6.1672
8	195	229	34	0.0196	0.6664
9	229	195	-34		
10	292	188	-104		
11	350	164	-186		
12	417	135	-282		
13	506	109	-397		
14	622	91	-531		
15	624	88.2	-535.8		
16	741	42.7	-698.3		

Sum of b values = 806.514

Sample Standard Deviation = 220.209

W Statistic = 0.894253

5% Critical value of 0.887 is less than 0.894253

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.894253

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Manganese, Total
Location: SW-02
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
188	506	-318	0	1
350	506	-156	0	2
91	506	-415	0	3
417	506	-89	0	4
292	506	-214	0	5
88.2	506	-417.8	0	6
195	506	-311	0	7
624	506	118	1	7
164	506	-342	1	8
741	506	235	2	8
229	506	-277	2	9
135	506	-371	2	10
42.7	506	-463.3	2	11
622	506	116	3	11
109	506	-397	3	12
350	188	162	4	12
91	188	-97	4	13
417	188	229	5	13
292	188	104	6	13
88.2	188	-99.8	6	14
195	188	7	7	14
624	188	436	8	14
164	188	-24	8	15
741	188	553	9	15
229	188	41	10	15
135	188	-53	10	16
42.7	188	-145.3	10	17
622	188	434	11	17
109	188	-79	11	18
91	350	-259	11	19
417	350	67	12	19
292	350	-58	12	20
88.2	350	-261.8	12	21
195	350	-155	12	22
624	350	274	13	22
164	350	-186	13	23
741	350	391	14	23
229	350	-121	14	24
135	350	-215	14	25
42.7	350	-307.3	14	26
622	350	272	15	26
109	350	-241	15	27
417	91	326	16	27
292	91	201	17	27

88.2	91	-2.8	17	28
195	91	104	18	28
624	91	533	19	28
164	91	73	20	28
741	91	650	21	28
229	91	138	22	28
135	91	44	23	28
42.7	91	-48.3	23	29
622	91	531	24	29
109	91	18	25	29
292	417	-125	25	30
88.2	417	-328.8	25	31
195	417	-222	25	32
624	417	207	26	32
164	417	-253	26	33
741	417	324	27	33
229	417	-188	27	34
135	417	-282	27	35
42.7	417	-374.3	27	36
622	417	205	28	36
109	417	-308	28	37
88.2	292	-203.8	28	38
195	292	-97	28	39
624	292	332	29	39
164	292	-128	29	40
741	292	449	30	40
229	292	-63	30	41
135	292	-157	30	42
42.7	292	-249.3	30	43
622	292	330	31	43
109	292	-183	31	44
195	88.2	106.8	32	44
624	88.2	535.8	33	44
164	88.2	75.8	34	44
741	88.2	652.8	35	44
229	88.2	140.8	36	44
135	88.2	46.8	37	44
42.7	88.2	-45.5	37	45
622	88.2	533.8	38	45
109	88.2	20.8	39	45
624	195	429	40	45
164	195	-31	40	46
741	195	546	41	46
229	195	34	42	46
135	195	-60	42	47
42.7	195	-152.3	42	48
622	195	427	43	48
109	195	-86	43	49
164	624	-460	43	50
741	624	117	44	50
229	624	-395	44	51
135	624	-489	44	52

42.7	624	-581.3	44	53
622	624	-2	44	54
109	624	-515	44	55
741	164	577	45	55
229	164	65	46	55
135	164	-29	46	56
42.7	164	-121.3	46	57
622	164	458	47	57
109	164	-55	47	58
229	741	-512	47	59
135	741	-606	47	60
42.7	741	-698.3	47	61
622	741	-119	47	62
109	741	-632	47	63
135	229	-94	47	64
42.7	229	-186.3	47	65
622	229	393	48	65
109	229	-120	48	66
42.7	135	-92.3	48	67
622	135	487	49	67
109	135	-26	49	68
622	42.7	579.3	50	68
109	42.7	66.3	51	68
109	622	-513	51	69

S Statistic = 51 - 69 = -18

Tied Group	Value	Members
Time Period	Observations	
4/16/2018	1	
10/8/2018	1	
4/13/2019	1	
9/30/2019	1	
4/7/2020	1	
10/2/2020	1	
4/13/2021	1	
10/14/2021	1	
4/19/2022	1	
9/27/2022	1	
4/18/2023	1	
8/22/2023	1	
4/30/2024	1	
9/10/2024	1	
4/14/2025	1	
8/26/2025	1	

There are 0 time periods with multiple data

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

c = 480

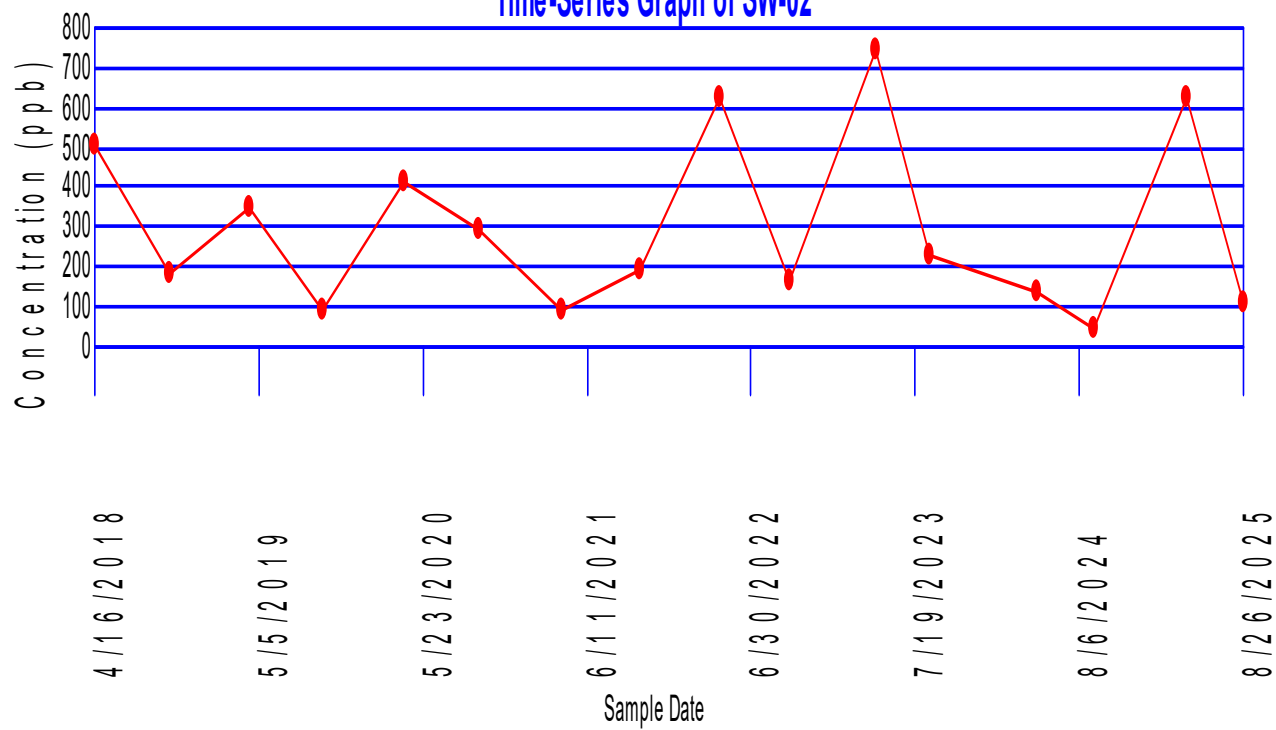
Group Variance = 493.333

Z-Score = -0.765383

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.765383| \leq 1.97737$ indicating no evidence of a trend

Manganese, Total
Time-Series Graph of SW-02



Concentrations (ppb)

Parameter: Sodium, Total

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 192

Total Non-Detect: 0

Percent Non-Detects: 0%

Total Background Measurements: 0

There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 12 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

MW-12	16	0 (0%)	4/17/2018	34200	34200
			10/9/2018	34600	34600
			4/14/2019	34900 J+	34900 J+
			10/2/2019	24900	24900
			4/8/2020	34400	34400
			10/1/2020	28400	28400
			4/15/2021	31100	31100
			10/14/2021	27400	27400
			4/19/2022	32000	32000
			9/28/2022	24300	24300
			4/18/2023	30800	30800
			8/24/2023	23900	23900
			5/1/2024	28200	28200
			9/12/2024	25500	25500
			4/16/2025	29800	29800
			8/28/2025	31300	31300

MW-16	16	0 (0%)	4/17/2018	47200	47200
			10/9/2018	64700	64700
			4/14/2019	53100 J+	53100 J+
			10/2/2019	44800	44800
			4/9/2020	47600	47600
			10/1/2020	45100	45100
			4/15/2021	47600	47600
			10/14/2021	49300	49300
			4/19/2022	50900	50900
			9/28/2022	46800	46800
			4/18/2023	51600	51600
			8/24/2023	47700	47700
			5/2/2024	48000	48000
			9/12/2024	42600	42600
			4/16/2025	49700	49700
			8/28/2025	49400	49400

MW-05	16	0 (0%)	4/18/2018	42900	42900
			10/10/2018	57100	57100
			4/13/2019	26900 J+	26900 J+
			10/1/2019	41200	41200
			4/9/2020	42700	42700
			10/1/2020	41900	41900
			4/14/2021	40800	40800

			10/13/2021	42200	42200
			4/20/2022	44300	44300
			9/28/2022	42600	42600
			4/19/2023	42900	42900
			8/24/2023	43400	43400
			5/1/2024	42400	42400
			9/11/2024	43600 J-	43600 J-
			4/15/2025	43200	43200
			8/27/2025	44600	44600
MW-06	16	0 (0%)	4/18/2018	38500	38500
			10/10/2018	61500	61500
			4/14/2019	43500 J+	43500 J+
			10/2/2019	41500	41500
			4/8/2020	42200	42200
			9/30/2020	44800	44800
			4/13/2021	41400	41400
			10/14/2021	45900	45900
			4/20/2022	39900	39900
			9/27/2022	43200	43200
			4/18/2023	42500	42500
			8/23/2023	44700	44700
			5/1/2024	47100	47100
			9/12/2024	47600	47600
			4/16/2025	45000	45000
			8/27/2025	41800	41800
MW-07	16	0 (0%)	4/18/2018	64400	64400
			10/10/2018	79100	79100
			4/14/2019	69400 J+	69400 J+
			10/2/2019	57700	57700
			4/8/2020	63400	63400
			9/30/2020	58300	58300
			4/13/2021	60900	60900
			10/14/2021	60200	60200
			4/20/2022	65800	65800
			9/27/2022	62100	62100
			4/18/2023	59100	59100
			8/23/2023	59400	59400
			5/1/2024	63200	63200
			9/11/2024	61800 J-	61800 J-
			4/16/2025	62400	62400
			8/27/2025	62600	62600
MW-27	16	0 (0%)	4/18/2018	44800	44800
			10/9/2018	59100	59100
			4/13/2019	46600 J+	46600 J+
			10/1/2019	41400	41400
			4/9/2020	43600	43600
			10/1/2020	41300	41300
			4/14/2021	40700	40700
			10/13/2021	37700	37700
			4/20/2022	42800	42800
			9/28/2022	43400	43400
			4/19/2023	43900	43900
			8/24/2023	43600	43600
			5/1/2024	44800	44800

			9/11/2024	41900 J-	41900 J-
			4/16/2025	41800	41800
			8/27/2025	44100	44100
MW-20	16	0 (0%)	4/17/2018	67700	67700
			10/10/2018	97800	97800
			4/14/2019	86900 J+	86900 J+
			10/2/2019	67600	67600
			4/9/2020	82600	82600
			10/2/2020	66200	66200
			4/15/2021	73700	73700
			10/12/2021	66900	66900
			4/20/2022	77400	77400
			9/28/2022	71000	71000
			4/19/2023	76200	76200
			8/23/2023	66700	66700
			4/30/2024	77100	77100
			9/11/2024	67000 J-	67000 J-
			4/15/2025	79000	79000
			8/26/2025	73600	73600
MW-21	16	0 (0%)	4/17/2018	63900	63900
			10/10/2018	63200	63200
			4/13/2019	62000 J+	62000 J+
			10/1/2019	54200	54200
			4/7/2020	54800	54800
			9/30/2020	50100	50100
			4/14/2021	51400	51400
			10/12/2021	54500	54500
			4/20/2022	57200	57200
			9/29/2022	51100	51100
			4/18/2023	58000	58000
			8/23/2023	52700	52700
			5/1/2024	51600	51600
			9/11/2024	50000 J-	50000 J-
			4/15/2025	51700	51700
			8/26/2025	52400	52400
MW-25	16	0 (0%)	4/17/2018	51700	51700
			10/9/2018	85400	85400
			4/13/2019	42300 J+	42300 J+
			10/1/2019	50000	50000
			4/8/2020	46500	46500
			10/1/2020	49800	49800
			4/14/2021	26500	26500
			10/13/2021	53000	53000
			4/19/2022	61900	61900
			9/29/2022	59500	59500
			4/19/2023	49800	49800
			8/24/2023	61100	61100
			4/29/2024	26200	26200
			9/10/2024	63600 J-	63600 J-
			4/14/2025	60300	60300
			8/26/2025	61600	61600
MW-26	16	0 (0%)	4/17/2018	89600	89600
			10/9/2018	123000	123000

			4/13/2019	87000 J+	87000 J+
			10/1/2019	82500	82500
			4/8/2020	85700	85700
			10/1/2020	81100	81100
			4/14/2021	81500	81500
			10/13/2021	74700	74700
			4/19/2022	81300	81300
			9/29/2022	81300	81300
			4/19/2023	86700	86700
			8/24/2023	83100	83100
			4/29/2024	86100	86100
			9/10/2024	77600 J-	77600 J-
			4/15/2025	84900	84900
			8/26/2025	85300	85300
SW-01	16	0 (0%)	4/16/2018	19600	19600
			10/8/2018	14800 J	14800 J
			4/13/2019	19400	19400
			9/30/2019	12300	12300
			4/7/2020	19800	19800
			10/2/2020	13100	13100
			4/13/2021	14300	14300
			10/14/2021	16900	16900
			4/19/2022	18200	18200
			9/27/2022	19700	19700
			4/18/2023	19700	19700
			8/22/2023	25200	25200
			4/30/2024	19300	19300
			9/10/2024	21000 J-	21000 J-
			4/14/2025	25500	25500
			8/26/2025	19500	19500
SW-02	16	0 (0%)	4/16/2018	71200	71200
			10/8/2018	40600	40600
			4/13/2019	47900	47900
			9/30/2019	24400	24400
			4/7/2020	41000	41000
			10/2/2020	35600	35600
			4/13/2021	33900	33900
			10/14/2021	33700	33700
			4/19/2022	44100	44100
			9/27/2022	36400	36400
			4/18/2023	39300	39300
			8/22/2023	35200	35200
			4/30/2024	31600	31600
			9/10/2024	25400 J-	25400 J-
			4/14/2025	46700	46700
			8/26/2025	32300	32300

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-05

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.805031	0.821839	0.507	57100
2	0.294118	0.856287	0.525	26900
3	0.37037	0.392857	0.546	None

Loc.	Date	Conc.	Outlier
MW-05	4/18/2018	42900	FALSE
	10/10/2018	57100	TRUE
	4/13/2019	26900 J+	TRUE
	10/1/2019	41200	FALSE
	4/9/2020	42700	FALSE
	10/1/2020	41900	FALSE
	4/14/2021	40800	FALSE
	10/13/2021	42200	FALSE
	4/20/2022	44300	FALSE
	9/28/2022	42600	FALSE
	4/19/2023	42900	FALSE
	8/24/2023	43400	FALSE
	5/1/2024	42400	FALSE
	9/11/2024	43600 J-	FALSE
	4/15/2025	43200	FALSE
	8/27/2025	44600	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-05

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	26900	57100	30200	0.5056	15269.1
2	40800	44600	3800	0.329	1250.2
3	41200	44300	3100	0.2521	781.51
4	41900	43600	1700	0.1939	329.63
5	42200	43400	1200	0.1447	173.64
6	42400	43200	800	0.1005	80.4
7	42600	42900	300	0.0593	17.79
8	42700	42900	200	0.0196	3.92
9	42900	42700	-200		
10	42900	42600	-300		
11	43200	42400	-800		
12	43400	42200	-1200		
13	43600	41900	-1700		
14	44300	41200	-3100		
15	44600	40800	-3800		
16	57100	26900	-30200		

Sum of b values = 17906.2

Sample Standard Deviation = 5607.34

W Statistic = 0.679832

5% Critical value of 0.887 exceeds 0.679832

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.679832

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-05
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
57100	42900	14200	1	0
26900 J+	42900	-16000	1	1
41200	42900	-1700	1	2
42700	42900	-200	1	3
41900	42900	-1000	1	4
40800	42900	-2100	1	5
42200	42900	-700	1	6
44300	42900	1400	2	6
42600	42900	-300	2	7
42900	42900	0	2	7
43400	42900	500	3	7
42400	42900	-500	3	8
43600 J-	42900	700	4	8
43200	42900	300	5	8
44600	42900	1700	6	8
26900 J+	57100	-30200	6	9
41200	57100	-15900	6	10
42700	57100	-14400	6	11
41900	57100	-15200	6	12
40800	57100	-16300	6	13
42200	57100	-14900	6	14
44300	57100	-12800	6	15
42600	57100	-14500	6	16
42900	57100	-14200	6	17
43400	57100	-13700	6	18
42400	57100	-14700	6	19
43600 J-	57100	-13500	6	20
43200	57100	-13900	6	21
44600	57100	-12500	6	22
41200	26900 J+	14300	7	22
42700	26900 J+	15800	8	22
41900	26900 J+	15000	9	22
40800	26900 J+	13900	10	22
42200	26900 J+	15300	11	22
44300	26900 J+	17400	12	22
42600	26900 J+	15700	13	22
42900	26900 J+	16000	14	22
43400	26900 J+	16500	15	22
42400	26900 J+	15500	16	22
43600 J-	26900 J+	16700	17	22
43200	26900 J+	16300	18	22
44600	26900 J+	17700	19	22
42700	41200	1500	20	22
41900	41200	700	21	22

40800	41200	-400	21	23
42200	41200	1000	22	23
44300	41200	3100	23	23
42600	41200	1400	24	23
42900	41200	1700	25	23
43400	41200	2200	26	23
42400	41200	1200	27	23
43600 J-	41200	2400	28	23
43200	41200	2000	29	23
44600	41200	3400	30	23
41900	42700	-800	30	24
40800	42700	-1900	30	25
42200	42700	-500	30	26
44300	42700	1600	31	26
42600	42700	-100	31	27
42900	42700	200	32	27
43400	42700	700	33	27
42400	42700	-300	33	28
43600 J-	42700	900	34	28
43200	42700	500	35	28
44600	42700	1900	36	28
40800	41900	-1100	36	29
42200	41900	300	37	29
44300	41900	2400	38	29
42600	41900	700	39	29
42900	41900	1000	40	29
43400	41900	1500	41	29
42400	41900	500	42	29
43600 J-	41900	1700	43	29
43200	41900	1300	44	29
44600	41900	2700	45	29
42200	40800	1400	46	29
44300	40800	3500	47	29
42600	40800	1800	48	29
42900	40800	2100	49	29
43400	40800	2600	50	29
42400	40800	1600	51	29
43600 J-	40800	2800	52	29
43200	40800	2400	53	29
44600	40800	3800	54	29
44300	42200	2100	55	29
42600	42200	400	56	29
42900	42200	700	57	29
43400	42200	1200	58	29
42400	42200	200	59	29
43600 J-	42200	1400	60	29
43200	42200	1000	61	29
44600	42200	2400	62	29
42600	44300	-1700	62	30
42900	44300	-1400	62	31
43400	44300	-900	62	32
42400	44300	-1900	62	33

43600 J-	44300	-700	62	34
43200	44300	-1100	62	35
44600	44300	300	63	35
42900	42600	300	64	35
43400	42600	800	65	35
42400	42600	-200	65	36
43600 J-	42600	1000	66	36
43200	42600	600	67	36
44600	42600	2000	68	36
43400	42900	500	69	36
42400	42900	-500	69	37
43600 J-	42900	700	70	37
43200	42900	300	71	37
44600	42900	1700	72	37
42400	43400	-1000	72	38
43600 J-	43400	200	73	38
43200	43400	-200	73	39
44600	43400	1200	74	39
43600 J-	42400	1200	75	39
43200	42400	800	76	39
44600	42400	2200	77	39
43200	43600 J-	-400	77	40
44600	43600 J-	1000	78	40
44600	43200	1400	79	40

S Statistic = 79 - 40 = 39

Tied Group	Value	Members
1	42900	2

Time Period	Observations
4/18/2018	1
10/10/2018	1
4/13/2019	1
10/1/2019	1
4/9/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/20/2022	1
9/28/2022	1
4/19/2023	1
8/24/2023	1
5/1/2024	1
9/11/2024	1
4/15/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

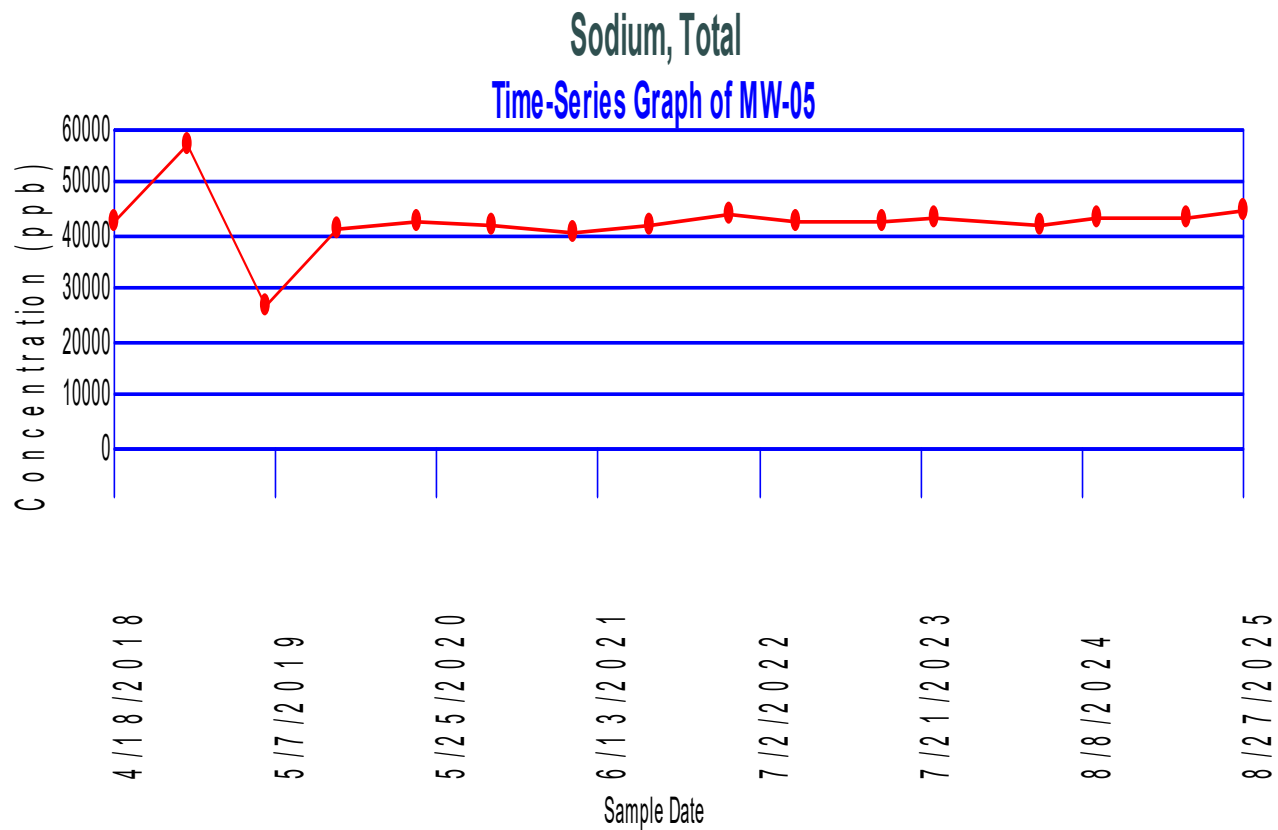
c = 480

Group Variance = 492.333

Z-Score = 1.71259

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

|1.71259| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-06

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.716418	0.337209	0.507	61500
2	0.274194	0.391892	0.525	None

Loc.	Date	Conc.	Outlier
MW-06	4/18/2018	38500	FALSE
	10/10/2018	61500	TRUE
	4/14/2019	43500 J+	FALSE
	10/2/2019	41500	FALSE
	4/8/2020	42200	FALSE
	9/30/2020	44800	FALSE
	4/13/2021	41400	FALSE
	10/14/2021	45900	FALSE
	4/20/2022	39900	FALSE
	9/27/2022	43200	FALSE
	4/18/2023	42500	FALSE
	8/23/2023	44700	FALSE
	5/1/2024	47100	FALSE
	9/12/2024	47600	FALSE
	4/16/2025	45000	FALSE
	8/27/2025	41800	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-06

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	38500	61500	23000	0.5056	11628.8
2	39900	47600	7700	0.329	2533.3
3	41400	47100	5700	0.2521	1436.97
4	41500	45900	4400	0.1939	853.16
5	41800	45000	3200	0.1447	463.04
6	42200	44800	2600	0.1005	261.3
7	42500	44700	2200	0.0593	130.46
8	43200	43500	300	0.0196	5.88
9	43500	43200	-300		
10	44700	42500	-2200		
11	44800	42200	-2600		
12	45000	41800	-3200		
13	45900	41500	-4400		
14	47100	41400	-5700		
15	47600	39900	-7700		
16	61500	38500	-23000		

Sum of b values = 17312.9

Sample Standard Deviation = 5181.37

W Statistic = 0.744319

5% Critical value of 0.887 exceeds 0.744319

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.744319

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-06
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
61500	38500	23000	1	0
43500 J+	38500	5000	2	0
41500	38500	3000	3	0
42200	38500	3700	4	0
44800	38500	6300	5	0
41400	38500	2900	6	0
45900	38500	7400	7	0
39900	38500	1400	8	0
43200	38500	4700	9	0
42500	38500	4000	10	0
44700	38500	6200	11	0
47100	38500	8600	12	0
47600	38500	9100	13	0
45000	38500	6500	14	0
41800	38500	3300	15	0
43500 J+	61500	-18000	15	1
41500	61500	-20000	15	2
42200	61500	-19300	15	3
44800	61500	-16700	15	4
41400	61500	-20100	15	5
45900	61500	-15600	15	6
39900	61500	-21600	15	7
43200	61500	-18300	15	8
42500	61500	-19000	15	9
44700	61500	-16800	15	10
47100	61500	-14400	15	11
47600	61500	-13900	15	12
45000	61500	-16500	15	13
41800	61500	-19700	15	14
41500	43500 J+	-2000	15	15
42200	43500 J+	-1300	15	16
44800	43500 J+	1300	16	16
41400	43500 J+	-2100	16	17
45900	43500 J+	2400	17	17
39900	43500 J+	-3600	17	18
43200	43500 J+	-300	17	19
42500	43500 J+	-1000	17	20
44700	43500 J+	1200	18	20
47100	43500 J+	3600	19	20
47600	43500 J+	4100	20	20
45000	43500 J+	1500	21	20
41800	43500 J+	-1700	21	21
42200	41500	700	22	21
44800	41500	3300	23	21

41400	41500	-100	23	22
45900	41500	4400	24	22
39900	41500	-1600	24	23
43200	41500	1700	25	23
42500	41500	1000	26	23
44700	41500	3200	27	23
47100	41500	5600	28	23
47600	41500	6100	29	23
45000	41500	3500	30	23
41800	41500	300	31	23
44800	42200	2600	32	23
41400	42200	-800	32	24
45900	42200	3700	33	24
39900	42200	-2300	33	25
43200	42200	1000	34	25
42500	42200	300	35	25
44700	42200	2500	36	25
47100	42200	4900	37	25
47600	42200	5400	38	25
45000	42200	2800	39	25
41800	42200	-400	39	26
41400	44800	-3400	39	27
45900	44800	1100	40	27
39900	44800	-4900	40	28
43200	44800	-1600	40	29
42500	44800	-2300	40	30
44700	44800	-100	40	31
47100	44800	2300	41	31
47600	44800	2800	42	31
45000	44800	200	43	31
41800	44800	-3000	43	32
45900	41400	4500	44	32
39900	41400	-1500	44	33
43200	41400	1800	45	33
42500	41400	1100	46	33
44700	41400	3300	47	33
47100	41400	5700	48	33
47600	41400	6200	49	33
45000	41400	3600	50	33
41800	41400	400	51	33
39900	45900	-6000	51	34
43200	45900	-2700	51	35
42500	45900	-3400	51	36
44700	45900	-1200	51	37
47100	45900	1200	52	37
47600	45900	1700	53	37
45000	45900	-900	53	38
41800	45900	-4100	53	39
43200	39900	3300	54	39
42500	39900	2600	55	39
44700	39900	4800	56	39
47100	39900	7200	57	39

47600	39900	7700	58	39
45000	39900	5100	59	39
41800	39900	1900	60	39
42500	43200	-700	60	40
44700	43200	1500	61	40
47100	43200	3900	62	40
47600	43200	4400	63	40
45000	43200	1800	64	40
41800	43200	-1400	64	41
44700	42500	2200	65	41
47100	42500	4600	66	41
47600	42500	5100	67	41
45000	42500	2500	68	41
41800	42500	-700	68	42
47100	44700	2400	69	42
47600	44700	2900	70	42
45000	44700	300	71	42
41800	44700	-2900	71	43
47600	47100	500	72	43
45000	47100	-2100	72	44
41800	47100	-5300	72	45
45000	47600	-2600	72	46
41800	47600	-5800	72	47
41800	45000	-3200	72	48

S Statistic = 72 - 48 = 24

Tied Group	Value	Members
Time Period	Observations	
4/18/2018	1	
10/10/2018	1	
4/14/2019	1	
10/2/2019	1	
4/8/2020	1	
9/30/2020	1	
4/13/2021	1	
10/14/2021	1	
4/20/2022	1	
9/27/2022	1	
4/18/2023	1	
8/23/2023	1	
5/1/2024	1	
9/12/2024	1	
4/16/2025	1	
8/27/2025	1	
There are 0 time periods with multiple data		

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

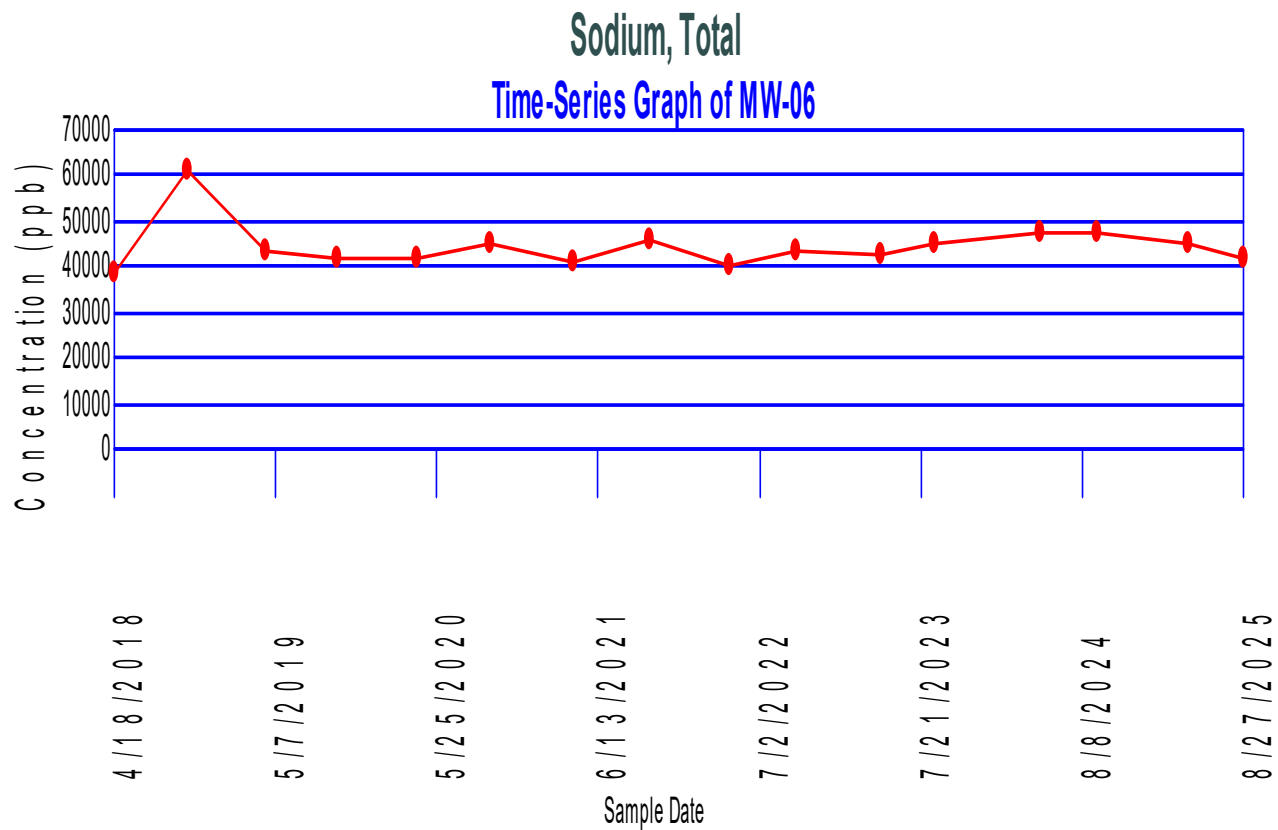
c = 480

Group Variance = 493.333

Z-Score = 1.03552

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

|1.03552| $\leq$ 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-07

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.665	0.17284	0.507	79100
2	0.485437	0.208955	0.525	None

Loc.	Date	Conc.	Outlier
MW-07	4/18/2018	64400	FALSE
	10/10/2018	79100	TRUE
	4/14/2019	69400 J+	FALSE
	10/2/2019	57700	FALSE
	4/8/2020	63400	FALSE
	9/30/2020	58300	FALSE
	4/13/2021	60900	FALSE
	10/14/2021	60200	FALSE
	4/20/2022	65800	FALSE
	9/27/2022	62100	FALSE
	4/18/2023	59100	FALSE
	8/23/2023	59400	FALSE
	5/1/2024	63200	FALSE
	9/11/2024	61800 J-	FALSE
	4/16/2025	62400	FALSE
	8/27/2025	62600	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-07

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	57700	79100	21400	0.5056	10819.8
2	58300	69400	11100	0.329	3651.9
3	59100	65800	6700	0.2521	1689.07
4	59400	64400	5000	0.1939	969.5
5	60200	63400	3200	0.1447	463.04
6	60900	63200	2300	0.1005	231.15
7	61800	62600	800	0.0593	47.44
8	62100	62400	300	0.0196	5.88
9	62400	62100	-300		
10	62600	61800	-800		
11	63200	60900	-2300		
12	63400	60200	-3200		
13	64400	59400	-5000		
14	65800	59100	-6700		
15	69400	58300	-11100		
16	79100	57700	-21400		

Sum of b values = 17877.8

Sample Standard Deviation = 5185.48

W Statistic = 0.792429

5% Critical value of 0.887 exceeds 0.792429

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.792429

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-07
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
79100	64400	14700	1	0
69400 J+	64400	5000	2	0
57700	64400	-6700	2	1
63400	64400	-1000	2	2
58300	64400	-6100	2	3
60900	64400	-3500	2	4
60200	64400	-4200	2	5
65800	64400	1400	3	5
62100	64400	-2300	3	6
59100	64400	-5300	3	7
59400	64400	-5000	3	8
63200	64400	-1200	3	9
61800 J-	64400	-2600	3	10
62400	64400	-2000	3	11
62600	64400	-1800	3	12
69400 J+	79100	-9700	3	13
57700	79100	-21400	3	14
63400	79100	-15700	3	15
58300	79100	-20800	3	16
60900	79100	-18200	3	17
60200	79100	-18900	3	18
65800	79100	-13300	3	19
62100	79100	-17000	3	20
59100	79100	-20000	3	21
59400	79100	-19700	3	22
63200	79100	-15900	3	23
61800 J-	79100	-17300	3	24
62400	79100	-16700	3	25
62600	79100	-16500	3	26
57700	69400 J+	-11700	3	27
63400	69400 J+	-6000	3	28
58300	69400 J+	-11100	3	29
60900	69400 J+	-8500	3	30
60200	69400 J+	-9200	3	31
65800	69400 J+	-3600	3	32
62100	69400 J+	-7300	3	33
59100	69400 J+	-10300	3	34
59400	69400 J+	-10000	3	35
63200	69400 J+	-6200	3	36
61800 J-	69400 J+	-7600	3	37
62400	69400 J+	-7000	3	38
62600	69400 J+	-6800	3	39
63400	57700	5700	4	39
58300	57700	600	5	39

60900	57700	3200	6	39
60200	57700	2500	7	39
65800	57700	8100	8	39
62100	57700	4400	9	39
59100	57700	1400	10	39
59400	57700	1700	11	39
63200	57700	5500	12	39
61800 J-	57700	4100	13	39
62400	57700	4700	14	39
62600	57700	4900	15	39
58300	63400	-5100	15	40
60900	63400	-2500	15	41
60200	63400	-3200	15	42
65800	63400	2400	16	42
62100	63400	-1300	16	43
59100	63400	-4300	16	44
59400	63400	-4000	16	45
63200	63400	-200	16	46
61800 J-	63400	-1600	16	47
62400	63400	-1000	16	48
62600	63400	-800	16	49
60900	58300	2600	17	49
60200	58300	1900	18	49
65800	58300	7500	19	49
62100	58300	3800	20	49
59100	58300	800	21	49
59400	58300	1100	22	49
63200	58300	4900	23	49
61800 J-	58300	3500	24	49
62400	58300	4100	25	49
62600	58300	4300	26	49
60200	60900	-700	26	50
65800	60900	4900	27	50
62100	60900	1200	28	50
59100	60900	-1800	28	51
59400	60900	-1500	28	52
63200	60900	2300	29	52
61800 J-	60900	900	30	52
62400	60900	1500	31	52
62600	60900	1700	32	52
65800	60200	5600	33	52
62100	60200	1900	34	52
59100	60200	-1100	34	53
59400	60200	-800	34	54
63200	60200	3000	35	54
61800 J-	60200	1600	36	54
62400	60200	2200	37	54
62600	60200	2400	38	54
62100	65800	-3700	38	55
59100	65800	-6700	38	56
59400	65800	-6400	38	57
63200	65800	-2600	38	58

61800 J-	65800	-4000	38	59
62400	65800	-3400	38	60
62600	65800	-3200	38	61
59100	62100	-3000	38	62
59400	62100	-2700	38	63
63200	62100	1100	39	63
61800 J-	62100	-300	39	64
62400	62100	300	40	64
62600	62100	500	41	64
59400	59100	300	42	64
63200	59100	4100	43	64
61800 J-	59100	2700	44	64
62400	59100	3300	45	64
62600	59100	3500	46	64
63200	59400	3800	47	64
61800 J-	59400	2400	48	64
62400	59400	3000	49	64
62600	59400	3200	50	64
61800 J-	63200	-1400	50	65
62400	63200	-800	50	66
62600	63200	-600	50	67
62400	61800 J-	600	51	67
62600	61800 J-	800	52	67
62600	62400	200	53	67

S Statistic = 53 - 67 = -14

Tied Group	Value	Members
Time Period	Observations	
4/18/2018	1	
10/10/2018	1	
4/14/2019	1	
10/2/2019	1	
4/8/2020	1	
9/30/2020	1	
4/13/2021	1	
10/14/2021	1	
4/20/2022	1	
9/27/2022	1	
4/18/2023	1	
8/23/2023	1	
5/1/2024	1	
9/11/2024	1	
4/16/2025	1	
8/27/2025	1	

There are 0 time periods with multiple data

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

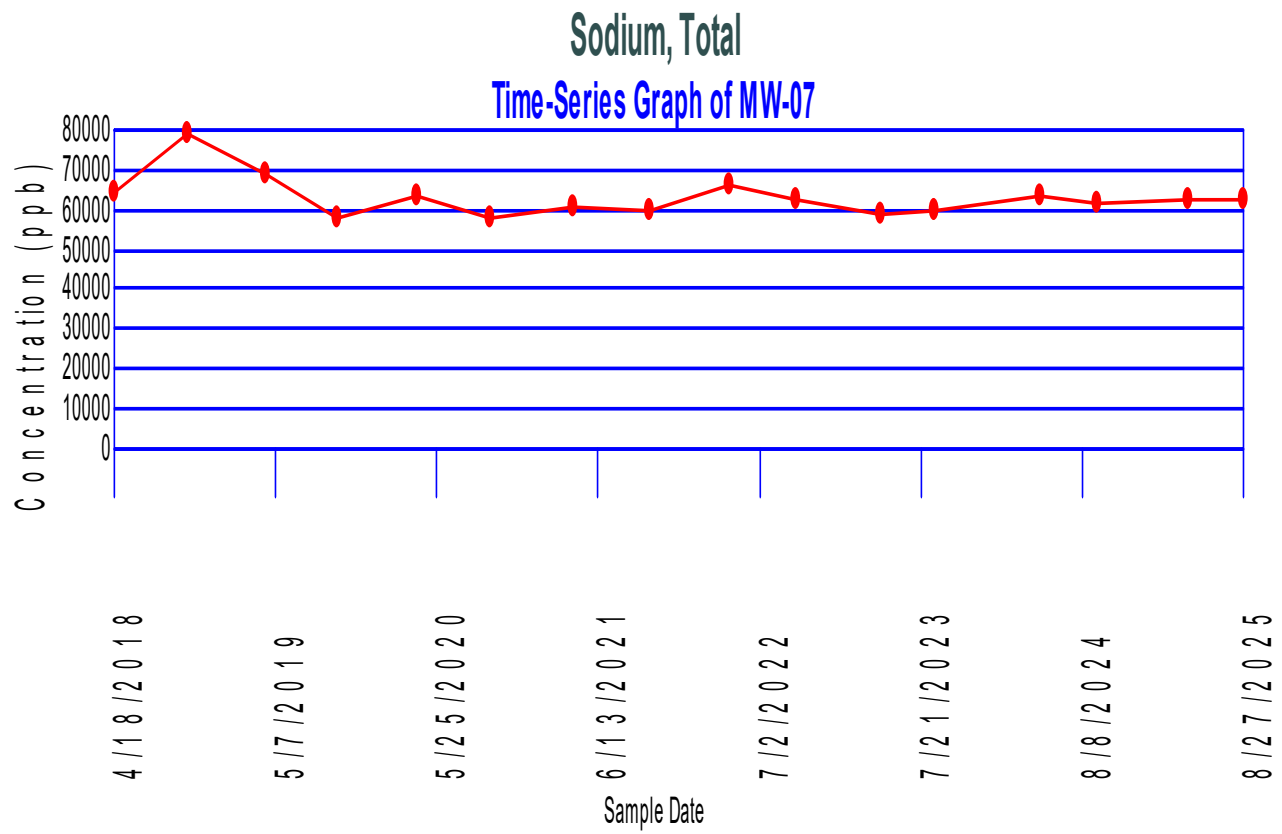
c = 480

Group Variance = 493.333

Z-Score = -0.585293

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.585293| \leq 1.97737$ indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-12

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.05	0.0952381	0.507	None

Loc.	Date	Conc.	Outlier
MW-12	4/17/2018	34200	FALSE
	10/9/2018	34600	FALSE
	4/14/2019	34900 J+	FALSE
	10/2/2019	24900	FALSE
	4/8/2020	34400	FALSE
	10/1/2020	28400	FALSE
	4/15/2021	31100	FALSE
	10/14/2021	27400	FALSE
	4/19/2022	32000	FALSE
	9/28/2022	24300	FALSE
	4/18/2023	30800	FALSE
	8/24/2023	23900	FALSE
	5/1/2024	28200	FALSE
	9/12/2024	25500	FALSE
	4/16/2025	29800	FALSE
	8/28/2025	31300	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-12

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	23900	34900	11000	0.5056	5561.6
2	24300	34600	10300	0.329	3388.7
3	24900	34400	9500	0.2521	2394.95
4	25500	34200	8700	0.1939	1686.93
5	27400	32000	4600	0.1447	665.62
6	28200	31300	3100	0.1005	311.55
7	28400	31100	2700	0.0593	160.11
8	29800	30800	1000	0.0196	19.6
9	30800	29800	-1000		
10	31100	28400	-2700		
11	31300	28200	-3100		
12	32000	27400	-4600		
13	34200	25500	-8700		
14	34400	24900	-9500		
15	34600	24300	-10300		
16	34900	23900	-11000		

Sum of b values = 14189.1

Sample Standard Deviation = 3804.51

W Statistic = 0.927297

5% Critical value of 0.887 is less than 0.927297

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.927297

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-12
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
34600	34200	400	1	0
34900 J+	34200	700	2	0
24900	34200	-9300	2	1
34400	34200	200	3	1
28400	34200	-5800	3	2
31100	34200	-3100	3	3
27400	34200	-6800	3	4
32000	34200	-2200	3	5
24300	34200	-9900	3	6
30800	34200	-3400	3	7
23900	34200	-10300	3	8
28200	34200	-6000	3	9
25500	34200	-8700	3	10
29800	34200	-4400	3	11
31300	34200	-2900	3	12
34900 J+	34600	300	4	12
24900	34600	-9700	4	13
34400	34600	-200	4	14
28400	34600	-6200	4	15
31100	34600	-3500	4	16
27400	34600	-7200	4	17
32000	34600	-2600	4	18
24300	34600	-10300	4	19
30800	34600	-3800	4	20
23900	34600	-10700	4	21
28200	34600	-6400	4	22
25500	34600	-9100	4	23
29800	34600	-4800	4	24
31300	34600	-3300	4	25
24900	34900 J+	-10000	4	26
34400	34900 J+	-500	4	27
28400	34900 J+	-6500	4	28
31100	34900 J+	-3800	4	29
27400	34900 J+	-7500	4	30
32000	34900 J+	-2900	4	31
24300	34900 J+	-10600	4	32
30800	34900 J+	-4100	4	33
23900	34900 J+	-11000	4	34
28200	34900 J+	-6700	4	35
25500	34900 J+	-9400	4	36
29800	34900 J+	-5100	4	37
31300	34900 J+	-3600	4	38
34400	24900	9500	5	38
28400	24900	3500	6	38

31100	24900	6200	7	38
27400	24900	2500	8	38
32000	24900	7100	9	38
24300	24900	-600	9	39
30800	24900	5900	10	39
23900	24900	-1000	10	40
28200	24900	3300	11	40
25500	24900	600	12	40
29800	24900	4900	13	40
31300	24900	6400	14	40
28400	34400	-6000	14	41
31100	34400	-3300	14	42
27400	34400	-7000	14	43
32000	34400	-2400	14	44
24300	34400	-10100	14	45
30800	34400	-3600	14	46
23900	34400	-10500	14	47
28200	34400	-6200	14	48
25500	34400	-8900	14	49
29800	34400	-4600	14	50
31300	34400	-3100	14	51
31100	28400	2700	15	51
27400	28400	-1000	15	52
32000	28400	3600	16	52
24300	28400	-4100	16	53
30800	28400	2400	17	53
23900	28400	-4500	17	54
28200	28400	-200	17	55
25500	28400	-2900	17	56
29800	28400	1400	18	56
31300	28400	2900	19	56
27400	31100	-3700	19	57
32000	31100	900	20	57
24300	31100	-6800	20	58
30800	31100	-300	20	59
23900	31100	-7200	20	60
28200	31100	-2900	20	61
25500	31100	-5600	20	62
29800	31100	-1300	20	63
31300	31100	200	21	63
32000	27400	4600	22	63
24300	27400	-3100	22	64
30800	27400	3400	23	64
23900	27400	-3500	23	65
28200	27400	800	24	65
25500	27400	-1900	24	66
29800	27400	2400	25	66
31300	27400	3900	26	66
24300	32000	-7700	26	67
30800	32000	-1200	26	68
23900	32000	-8100	26	69
28200	32000	-3800	26	70

25500	32000	-6500	26	71
29800	32000	-2200	26	72
31300	32000	-700	26	73
30800	24300	6500	27	73
23900	24300	-400	27	74
28200	24300	3900	28	74
25500	24300	1200	29	74
29800	24300	5500	30	74
31300	24300	7000	31	74
23900	30800	-6900	31	75
28200	30800	-2600	31	76
25500	30800	-5300	31	77
29800	30800	-1000	31	78
31300	30800	500	32	78
28200	23900	4300	33	78
25500	23900	1600	34	78
29800	23900	5900	35	78
31300	23900	7400	36	78
25500	28200	-2700	36	79
29800	28200	1600	37	79
31300	28200	3100	38	79
29800	25500	4300	39	79
31300	25500	5800	40	79
31300	29800	1500	41	79

S Statistic = 41 - 79 = -38

Tied Group	Value	Members
Time Period		Observations
4/17/2018		1
10/9/2018		1
4/14/2019		1
10/2/2019		1
4/8/2020		1
10/1/2020		1
4/15/2021		1
10/14/2021		1
4/19/2022		1
9/28/2022		1
4/18/2023		1
8/24/2023		1
5/1/2024		1
9/12/2024		1
4/16/2025		1
8/28/2025		1

There are 0 time periods with multiple data

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

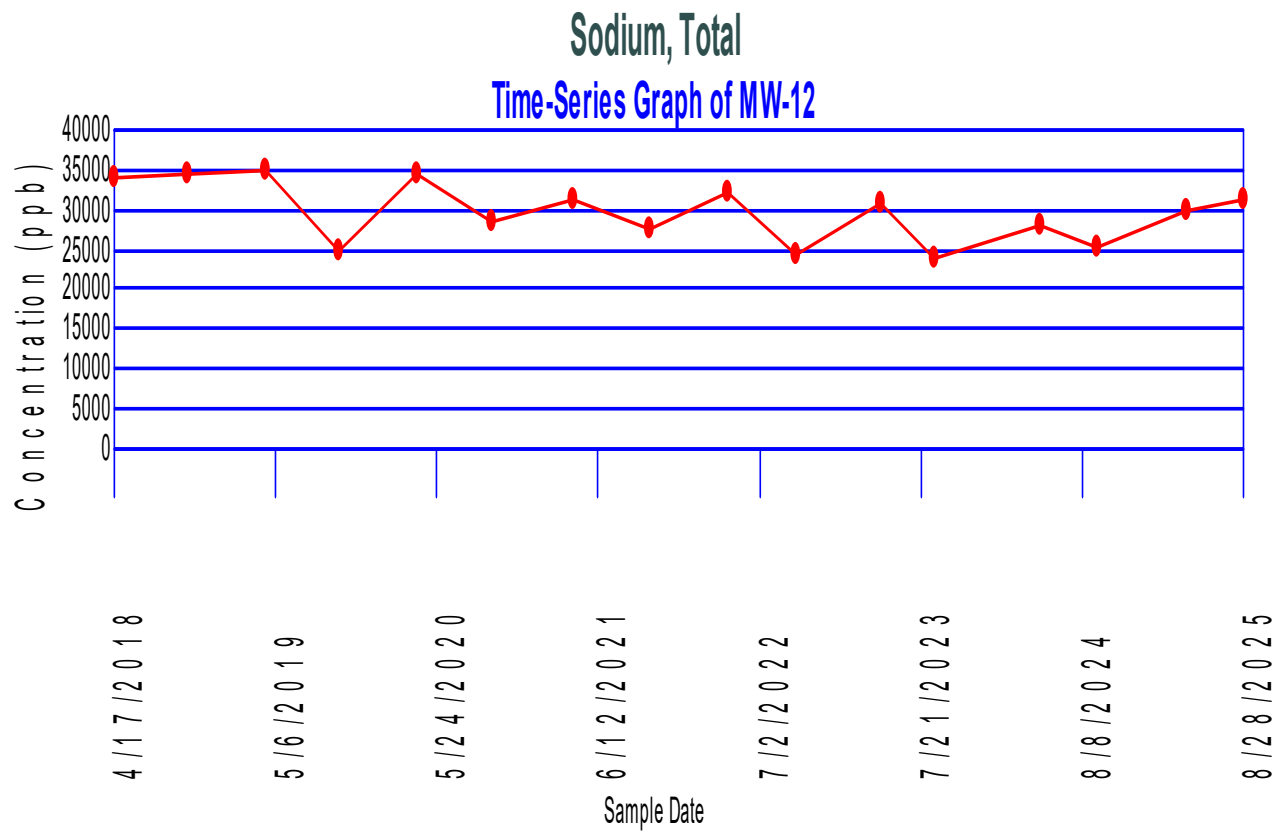
c = 480

Group Variance = 493.333

Z-Score = -1.66583

Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)

$|-1.66583| \leq 1.97737$ indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-16

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.668367	0.277778	0.507	64700
2	0.275	0.301205	0.525	None

Loc.	Date	Conc.	Outlier
MW-16	4/17/2018	47200	FALSE
	10/9/2018	64700	TRUE
	4/14/2019	53100 J+	FALSE
	10/2/2019	44800	FALSE
	4/9/2020	47600	FALSE
	10/1/2020	45100	FALSE
	4/15/2021	47600	FALSE
	10/14/2021	49300	FALSE
	4/19/2022	50900	FALSE
	9/28/2022	46800	FALSE
	4/18/2023	51600	FALSE
	8/24/2023	47700	FALSE
	5/2/2024	48000	FALSE
	9/12/2024	42600	FALSE
	4/16/2025	49700	FALSE
	8/28/2025	49400	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-16

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	42600	64700	22100	0.5056	11173.8
2	44800	53100	8300	0.329	2730.7
3	45100	51600	6500	0.2521	1638.65
4	46800	50900	4100	0.1939	794.99
5	47200	49700	2500	0.1447	361.75
6	47600	49400	1800	0.1005	180.9
7	47600	49300	1700	0.0593	100.81
8	47700	48000	300	0.0196	5.88
9	48000	47700	-300		
10	49300	47600	-1700		
11	49400	47600	-1800		
12	49700	47200	-2500		
13	50900	46800	-4100		
14	51600	45100	-6500		
15	53100	44800	-8300		
16	64700	42600	-22100		

Sum of b values = 16987.4

Sample Standard Deviation = 4916.87

W Statistic = 0.795769

5% Critical value of 0.887 exceeds 0.795769

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.795769

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-16
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
64700	47200	17500	1	0
53100 J+	47200	5900	2	0
44800	47200	-2400	2	1
47600	47200	400	3	1
45100	47200	-2100	3	2
47600	47200	400	4	2
49300	47200	2100	5	2
50900	47200	3700	6	2
46800	47200	-400	6	3
51600	47200	4400	7	3
47700	47200	500	8	3
48000	47200	800	9	3
42600	47200	-4600	9	4
49700	47200	2500	10	4
49400	47200	2200	11	4
53100 J+	64700	-11600	11	5
44800	64700	-19900	11	6
47600	64700	-17100	11	7
45100	64700	-19600	11	8
47600	64700	-17100	11	9
49300	64700	-15400	11	10
50900	64700	-13800	11	11
46800	64700	-17900	11	12
51600	64700	-13100	11	13
47700	64700	-17000	11	14
48000	64700	-16700	11	15
42600	64700	-22100	11	16
49700	64700	-15000	11	17
49400	64700	-15300	11	18
44800	53100 J+	-8300	11	19
47600	53100 J+	-5500	11	20
45100	53100 J+	-8000	11	21
47600	53100 J+	-5500	11	22
49300	53100 J+	-3800	11	23
50900	53100 J+	-2200	11	24
46800	53100 J+	-6300	11	25
51600	53100 J+	-1500	11	26
47700	53100 J+	-5400	11	27
48000	53100 J+	-5100	11	28
42600	53100 J+	-10500	11	29
49700	53100 J+	-3400	11	30
49400	53100 J+	-3700	11	31
47600	44800	2800	12	31
45100	44800	300	13	31

47600	44800	2800	14	31
49300	44800	4500	15	31
50900	44800	6100	16	31
46800	44800	2000	17	31
51600	44800	6800	18	31
47700	44800	2900	19	31
48000	44800	3200	20	31
42600	44800	-2200	20	32
49700	44800	4900	21	32
49400	44800	4600	22	32
45100	47600	-2500	22	33
47600	47600	0	22	33
49300	47600	1700	23	33
50900	47600	3300	24	33
46800	47600	-800	24	34
51600	47600	4000	25	34
47700	47600	100	26	34
48000	47600	400	27	34
42600	47600	-5000	27	35
49700	47600	2100	28	35
49400	47600	1800	29	35
47600	45100	2500	30	35
49300	45100	4200	31	35
50900	45100	5800	32	35
46800	45100	1700	33	35
51600	45100	6500	34	35
47700	45100	2600	35	35
48000	45100	2900	36	35
42600	45100	-2500	36	36
49700	45100	4600	37	36
49400	45100	4300	38	36
49300	47600	1700	39	36
50900	47600	3300	40	36
46800	47600	-800	40	37
51600	47600	4000	41	37
47700	47600	100	42	37
48000	47600	400	43	37
42600	47600	-5000	43	38
49700	47600	2100	44	38
49400	47600	1800	45	38
50900	49300	1600	46	38
46800	49300	-2500	46	39
51600	49300	2300	47	39
47700	49300	-1600	47	40
48000	49300	-1300	47	41
42600	49300	-6700	47	42
49700	49300	400	48	42
49400	49300	100	49	42
46800	50900	-4100	49	43
51600	50900	700	50	43
47700	50900	-3200	50	44
48000	50900	-2900	50	45

42600	50900	-8300	50	46
49700	50900	-1200	50	47
49400	50900	-1500	50	48
51600	46800	4800	51	48
47700	46800	900	52	48
48000	46800	1200	53	48
42600	46800	-4200	53	49
49700	46800	2900	54	49
49400	46800	2600	55	49
47700	51600	-3900	55	50
48000	51600	-3600	55	51
42600	51600	-9000	55	52
49700	51600	-1900	55	53
49400	51600	-2200	55	54
48000	47700	300	56	54
42600	47700	-5100	56	55
49700	47700	2000	57	55
49400	47700	1700	58	55
42600	48000	-5400	58	56
49700	48000	1700	59	56
49400	48000	1400	60	56
49700	42600	7100	61	56
49400	42600	6800	62	56
49400	49700	-300	62	57

S Statistic = 62 - 57 = 5

Tied Group	Value	Members
1	47600	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/14/2019	1
10/2/2019	1
4/9/2020	1
10/1/2020	1
4/15/2021	1
10/14/2021	1
4/19/2022	1
9/28/2022	1
4/18/2023	1
8/24/2023	1
5/2/2024	1
9/12/2024	1
4/16/2025	1
8/28/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

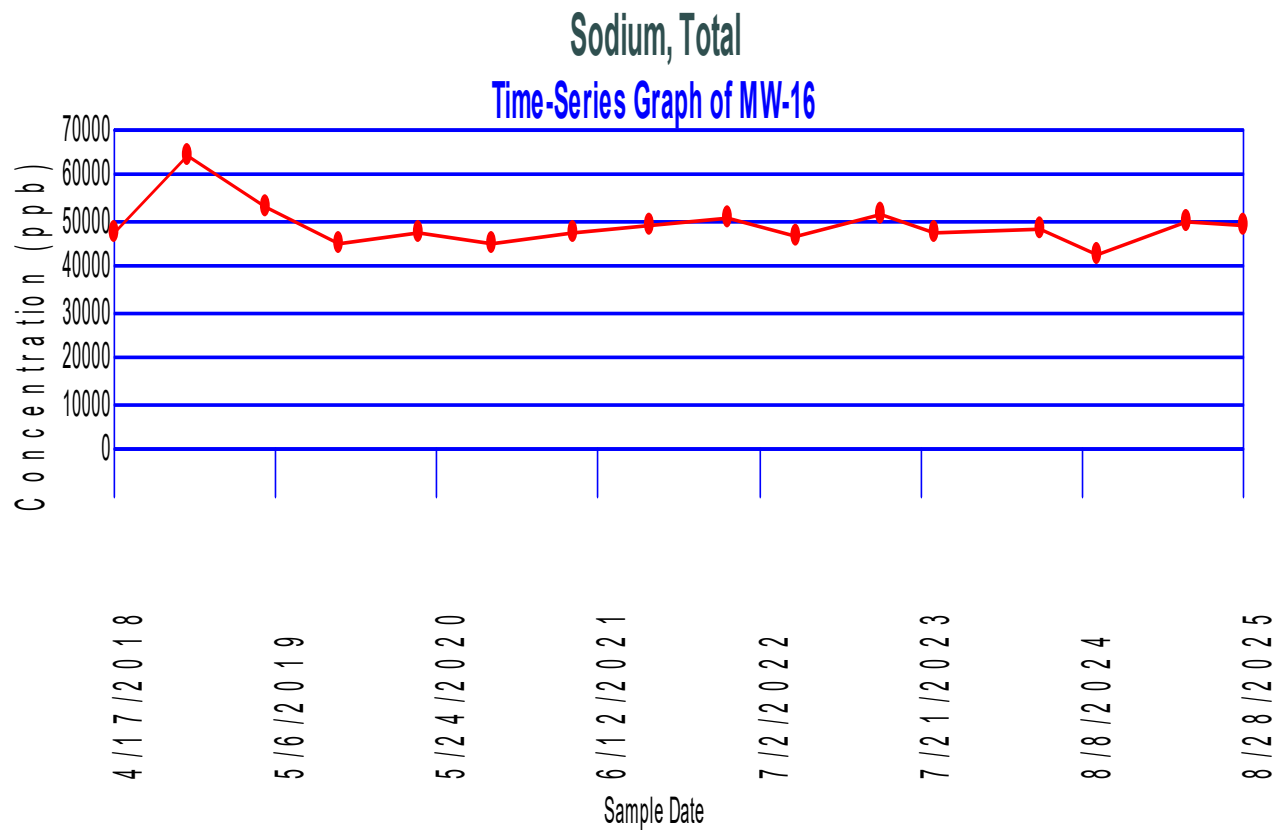
c = 480

Group Variance = 492.333

Z-Score = 0.180273

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

|0.180273| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-20

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.491909	0.0426829	0.507	None

Loc.	Date	Conc.	Outlier
MW-20	4/17/2018	67700	FALSE
	10/10/2018	97800	FALSE
	4/14/2019	86900 J+	FALSE
	10/2/2019	67600	FALSE
	4/9/2020	82600	FALSE
	10/2/2020	66200	FALSE
	4/15/2021	73700	FALSE
	10/12/2021	66900	FALSE
	4/20/2022	77400	FALSE
	9/28/2022	71000	FALSE
	4/19/2023	76200	FALSE
	8/23/2023	66700	FALSE
	4/30/2024	77100	FALSE
	9/11/2024	67000 J-	FALSE
	4/15/2025	79000	FALSE
	8/26/2025	73600	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-20

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	66200	97800	31600	0.5056	15977
2	66700	86900	20200	0.329	6645.8
3	66900	82600	15700	0.2521	3957.97
4	67000	79000	12000	0.1939	2326.8
5	67600	77400	9800	0.1447	1418.06
6	67700	77100	9400	0.1005	944.7
7	71000	76200	5200	0.0593	308.36
8	73600	73700	100	0.0196	1.96
9	73700	73600	-100		
10	76200	71000	-5200		
11	77100	67700	-9400		
12	77400	67600	-9800		
13	79000	67000	-12000		
14	82600	66900	-15700		
15	86900	66700	-20200		
16	97800	66200	-31600		

Sum of b values = 31580.6

Sample Standard Deviation = 8756.09

W Statistic = 0.867219

5% Critical value of 0.887 exceeds 0.867219

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.867219

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-20
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
97800	67700	30100	1	0
86900 J+	67700	19200	2	0
67600	67700	-100	2	1
82600	67700	14900	3	1
66200	67700	-1500	3	2
73700	67700	6000	4	2
66900	67700	-800	4	3
77400	67700	9700	5	3
71000	67700	3300	6	3
76200	67700	8500	7	3
66700	67700	-1000	7	4
77100	67700	9400	8	4
67000 J-	67700	-700	8	5
79000	67700	11300	9	5
73600	67700	5900	10	5
86900 J+	97800	-10900	10	6
67600	97800	-30200	10	7
82600	97800	-15200	10	8
66200	97800	-31600	10	9
73700	97800	-24100	10	10
66900	97800	-30900	10	11
77400	97800	-20400	10	12
71000	97800	-26800	10	13
76200	97800	-21600	10	14
66700	97800	-31100	10	15
77100	97800	-20700	10	16
67000 J-	97800	-30800	10	17
79000	97800	-18800	10	18
73600	97800	-24200	10	19
67600	86900 J+	-19300	10	20
82600	86900 J+	-4300	10	21
66200	86900 J+	-20700	10	22
73700	86900 J+	-13200	10	23
66900	86900 J+	-20000	10	24
77400	86900 J+	-9500	10	25
71000	86900 J+	-15900	10	26
76200	86900 J+	-10700	10	27
66700	86900 J+	-20200	10	28
77100	86900 J+	-9800	10	29
67000 J-	86900 J+	-19900	10	30
79000	86900 J+	-7900	10	31
73600	86900 J+	-13300	10	32
82600	67600	15000	11	32
66200	67600	-1400	11	33

73700	67600	6100	12	33
66900	67600	-700	12	34
77400	67600	9800	13	34
71000	67600	3400	14	34
76200	67600	8600	15	34
66700	67600	-900	15	35
77100	67600	9500	16	35
67000 J-	67600	-600	16	36
79000	67600	11400	17	36
73600	67600	6000	18	36
66200	82600	-16400	18	37
73700	82600	-8900	18	38
66900	82600	-15700	18	39
77400	82600	-5200	18	40
71000	82600	-11600	18	41
76200	82600	-6400	18	42
66700	82600	-15900	18	43
77100	82600	-5500	18	44
67000 J-	82600	-15600	18	45
79000	82600	-3600	18	46
73600	82600	-9000	18	47
73700	66200	7500	19	47
66900	66200	700	20	47
77400	66200	11200	21	47
71000	66200	4800	22	47
76200	66200	10000	23	47
66700	66200	500	24	47
77100	66200	10900	25	47
67000 J-	66200	800	26	47
79000	66200	12800	27	47
73600	66200	7400	28	47
66900	73700	-6800	28	48
77400	73700	3700	29	48
71000	73700	-2700	29	49
76200	73700	2500	30	49
66700	73700	-7000	30	50
77100	73700	3400	31	50
67000 J-	73700	-6700	31	51
79000	73700	5300	32	51
73600	73700	-100	32	52
77400	66900	10500	33	52
71000	66900	4100	34	52
76200	66900	9300	35	52
66700	66900	-200	35	53
77100	66900	10200	36	53
67000 J-	66900	100	37	53
79000	66900	12100	38	53
73600	66900	6700	39	53
71000	77400	-6400	39	54
76200	77400	-1200	39	55
66700	77400	-10700	39	56
77100	77400	-300	39	57

67000 J-	77400	-10400	39	58
79000	77400	1600	40	58
73600	77400	-3800	40	59
76200	71000	5200	41	59
66700	71000	-4300	41	60
77100	71000	6100	42	60
67000 J-	71000	-4000	42	61
79000	71000	8000	43	61
73600	71000	2600	44	61
66700	76200	-9500	44	62
77100	76200	900	45	62
67000 J-	76200	-9200	45	63
79000	76200	2800	46	63
73600	76200	-2600	46	64
77100	66700	10400	47	64
67000 J-	66700	300	48	64
79000	66700	12300	49	64
73600	66700	6900	50	64
67000 J-	77100	-10100	50	65
79000	77100	1900	51	65
73600	77100	-3500	51	66
79000	67000 J-	12000	52	66
73600	67000 J-	6600	53	66
73600	79000	-5400	53	67

S Statistic = 53 - 67 = -14

Tied Group	Value	Members
Time Period	Observations	
4/17/2018	1	
10/10/2018	1	
4/14/2019	1	
10/2/2019	1	
4/9/2020	1	
10/2/2020	1	
4/15/2021	1	
10/12/2021	1	
4/20/2022	1	
9/28/2022	1	
4/19/2023	1	
8/23/2023	1	
4/30/2024	1	
9/11/2024	1	
4/15/2025	1	
8/26/2025	1	
There are 0 time periods with multiple data		

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

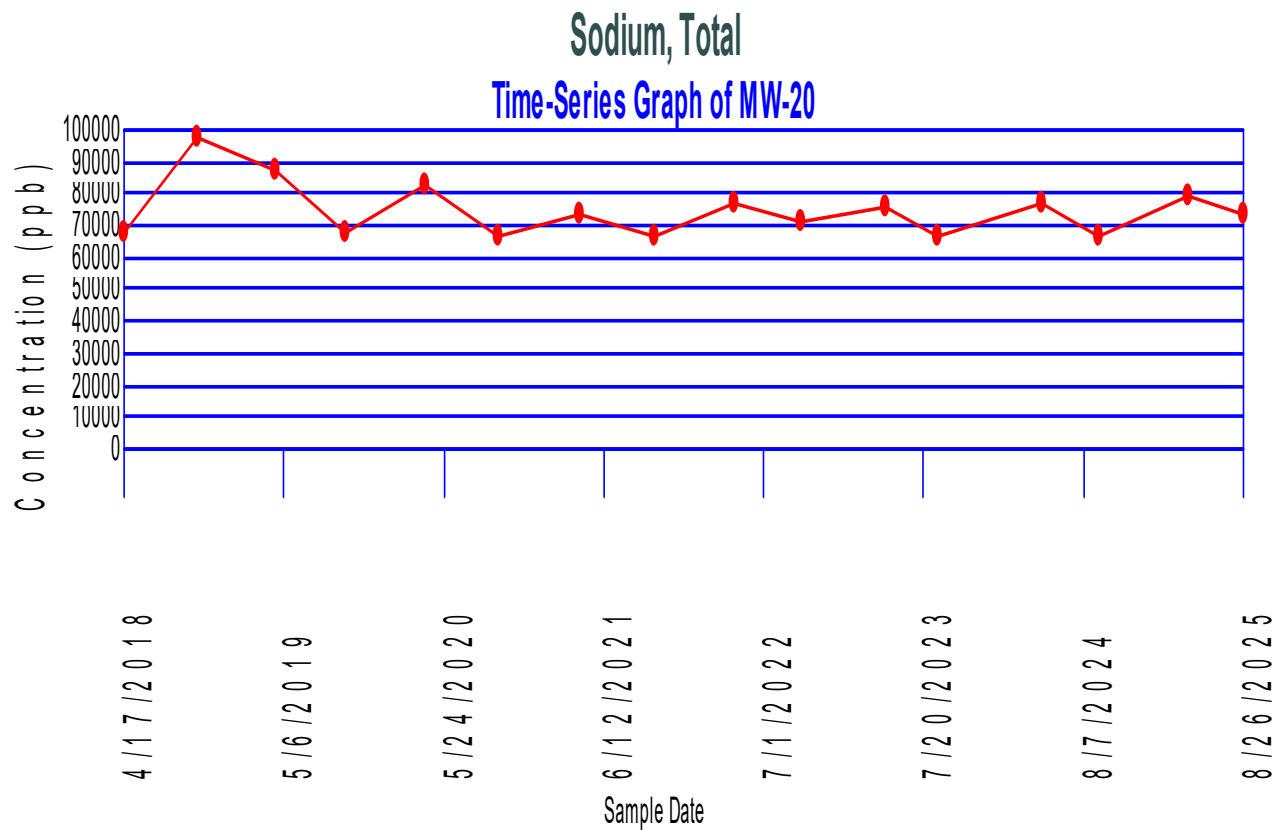
c = 480

Group Variance = 493.333

Z-Score = -0.585293

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-0.585293| \leq 1.97737$ indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-21

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.148438	0.0916667	0.507	None

Loc.	Date	Conc.	Outlier
MW-21	4/17/2018	63900	FALSE
	10/10/2018	63200	FALSE
	4/13/2019	62000 J+	FALSE
	10/1/2019	54200	FALSE
	4/7/2020	54800	FALSE
	9/30/2020	50100	FALSE
	4/14/2021	51400	FALSE
	10/12/2021	54500	FALSE
	4/20/2022	57200	FALSE
	9/29/2022	51100	FALSE
	4/18/2023	58000	FALSE
	8/23/2023	52700	FALSE
	5/1/2024	51600	FALSE
	9/11/2024	50000 J-	FALSE
	4/15/2025	51700	FALSE
	8/26/2025	52400	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-21

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	50000	63900	13900	0.5056	7027.84
2	50100	63200	13100	0.329	4309.9
3	51100	62000	10900	0.2521	2747.89
4	51400	58000	6600	0.1939	1279.74
5	51600	57200	5600	0.1447	810.32
6	51700	54800	3100	0.1005	311.55
7	52400	54500	2100	0.0593	124.53
8	52700	54200	1500	0.0196	29.4
9	54200	52700	-1500		
10	54500	52400	-2100		
11	54800	51700	-3100		
12	57200	51600	-5600		
13	58000	51400	-6600		
14	62000	51100	-10900		
15	63200	50100	-13100		
16	63900	50000	-13900		

Sum of b values = 16641.2

Sample Standard Deviation = 4631.85

W Statistic = 0.860534

5% Critical value of 0.887 exceeds 0.860534

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.860534

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-21
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
63200	63900	-700	0	1
62000 J+	63900	-1900	0	2
54200	63900	-9700	0	3
54800	63900	-9100	0	4
50100	63900	-13800	0	5
51400	63900	-12500	0	6
54500	63900	-9400	0	7
57200	63900	-6700	0	8
51100	63900	-12800	0	9
58000	63900	-5900	0	10
52700	63900	-11200	0	11
51600	63900	-12300	0	12
50000 J-	63900	-13900	0	13
51700	63900	-12200	0	14
52400	63900	-11500	0	15
62000 J+	63200	-1200	0	16
54200	63200	-9000	0	17
54800	63200	-8400	0	18
50100	63200	-13100	0	19
51400	63200	-11800	0	20
54500	63200	-8700	0	21
57200	63200	-6000	0	22
51100	63200	-12100	0	23
58000	63200	-5200	0	24
52700	63200	-10500	0	25
51600	63200	-11600	0	26
50000 J-	63200	-13200	0	27
51700	63200	-11500	0	28
52400	63200	-10800	0	29
54200	62000 J+	-7800	0	30
54800	62000 J+	-7200	0	31
50100	62000 J+	-11900	0	32
51400	62000 J+	-10600	0	33
54500	62000 J+	-7500	0	34
57200	62000 J+	-4800	0	35
51100	62000 J+	-10900	0	36
58000	62000 J+	-4000	0	37
52700	62000 J+	-9300	0	38
51600	62000 J+	-10400	0	39
50000 J-	62000 J+	-12000	0	40
51700	62000 J+	-10300	0	41
52400	62000 J+	-9600	0	42
54800	54200	600	1	42
50100	54200	-4100	1	43

51400	54200	-2800	1	44
54500	54200	300	2	44
57200	54200	3000	3	44
51100	54200	-3100	3	45
58000	54200	3800	4	45
52700	54200	-1500	4	46
51600	54200	-2600	4	47
50000 J-	54200	-4200	4	48
51700	54200	-2500	4	49
52400	54200	-1800	4	50
50100	54800	-4700	4	51
51400	54800	-3400	4	52
54500	54800	-300	4	53
57200	54800	2400	5	53
51100	54800	-3700	5	54
58000	54800	3200	6	54
52700	54800	-2100	6	55
51600	54800	-3200	6	56
50000 J-	54800	-4800	6	57
51700	54800	-3100	6	58
52400	54800	-2400	6	59
51400	50100	1300	7	59
54500	50100	4400	8	59
57200	50100	7100	9	59
51100	50100	1000	10	59
58000	50100	7900	11	59
52700	50100	2600	12	59
51600	50100	1500	13	59
50000 J-	50100	-100	13	60
51700	50100	1600	14	60
52400	50100	2300	15	60
54500	51400	3100	16	60
57200	51400	5800	17	60
51100	51400	-300	17	61
58000	51400	6600	18	61
52700	51400	1300	19	61
51600	51400	200	20	61
50000 J-	51400	-1400	20	62
51700	51400	300	21	62
52400	51400	1000	22	62
57200	54500	2700	23	62
51100	54500	-3400	23	63
58000	54500	3500	24	63
52700	54500	-1800	24	64
51600	54500	-2900	24	65
50000 J-	54500	-4500	24	66
51700	54500	-2800	24	67
52400	54500	-2100	24	68
51100	57200	-6100	24	69
58000	57200	800	25	69
52700	57200	-4500	25	70
51600	57200	-5600	25	71

50000 J-	57200	-7200	25	72
51700	57200	-5500	25	73
52400	57200	-4800	25	74
58000	51100	6900	26	74
52700	51100	1600	27	74
51600	51100	500	28	74
50000 J-	51100	-1100	28	75
51700	51100	600	29	75
52400	51100	1300	30	75
52700	58000	-5300	30	76
51600	58000	-6400	30	77
50000 J-	58000	-8000	30	78
51700	58000	-6300	30	79
52400	58000	-5600	30	80
51600	52700	-1100	30	81
50000 J-	52700	-2700	30	82
51700	52700	-1000	30	83
52400	52700	-300	30	84
50000 J-	51600	-1600	30	85
51700	51600	100	31	85
52400	51600	800	32	85
51700	50000 J-	1700	33	85
52400	50000 J-	2400	34	85
52400	51700	700	35	85

S Statistic = 35 - 85 = -50

Tied Group	Value	Members
Time Period	Observations	
4/17/2018	1	
10/10/2018	1	
4/13/2019	1	
10/1/2019	1	
4/7/2020	1	
9/30/2020	1	
4/14/2021	1	
10/12/2021	1	
4/20/2022	1	
9/29/2022	1	
4/18/2023	1	
8/23/2023	1	
5/1/2024	1	
9/11/2024	1	
4/15/2025	1	
8/26/2025	1	
There are 0 time periods with multiple data		

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

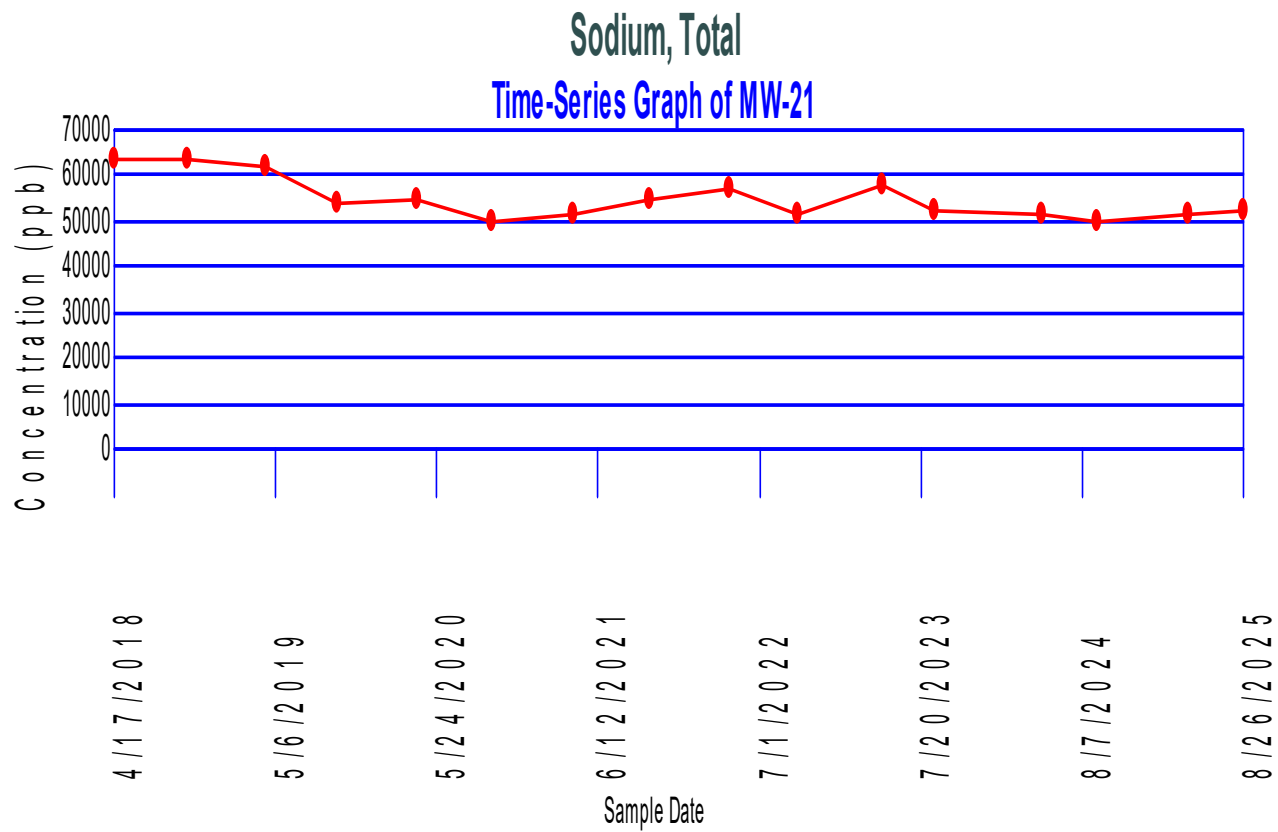
c = 480

Group Variance = 493.333

Z-Score = -2.2061

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-2.2061| > 1.97737$ indicating a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-25

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.545244	0.45098	0.507	85400
2	0.0938967	0.454802	0.525	None

Loc.	Date	Conc.	Outlier
MW-25	4/17/2018	51700	FALSE
	10/9/2018	85400	TRUE
	4/13/2019	42300 J+	FALSE
	10/1/2019	50000	FALSE
	4/8/2020	46500	FALSE
	10/1/2020	49800	FALSE
	4/14/2021	26500	FALSE
	10/13/2021	53000	FALSE
	4/19/2022	61900	FALSE
	9/29/2022	59500	FALSE
	4/19/2023	49800	FALSE
	8/24/2023	61100	FALSE
	4/29/2024	26200	FALSE
	9/10/2024	63600 J-	FALSE
	4/14/2025	60300	FALSE
	8/26/2025	61600	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-25

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	26200	85400	59200	0.5056	29931.5
2	26500	63600	37100	0.329	12205.9
3	42300	61900	19600	0.2521	4941.16
4	46500	61600	15100	0.1939	2927.89
5	49800	61100	11300	0.1447	1635.11
6	49800	60300	10500	0.1005	1055.25
7	50000	59500	9500	0.0593	563.35
8	51700	53000	1300	0.0196	25.48
9	53000	51700	-1300		
10	59500	50000	-9500		
11	60300	49800	-10500		
12	61100	49800	-11300		
13	61600	46500	-15100		
14	61900	42300	-19600		
15	63600	26500	-37100		
16	85400	26200	-59200		

Sum of b values = 53285.7

Sample Standard Deviation = 14340.5

W Statistic = 0.920451

5% Critical value of 0.887 is less than 0.920451

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.920451

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-25
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
85400	51700	33700	1	0
42300 J+	51700	-9400	1	1
50000	51700	-1700	1	2
46500	51700	-5200	1	3
49800	51700	-1900	1	4
26500	51700	-25200	1	5
53000	51700	1300	2	5
61900	51700	10200	3	5
59500	51700	7800	4	5
49800	51700	-1900	4	6
61100	51700	9400	5	6
26200	51700	-25500	5	7
63600 J-	51700	11900	6	7
60300	51700	8600	7	7
61600	51700	9900	8	7
42300 J+	85400	-43100	8	8
50000	85400	-35400	8	9
46500	85400	-38900	8	10
49800	85400	-35600	8	11
26500	85400	-58900	8	12
53000	85400	-32400	8	13
61900	85400	-23500	8	14
59500	85400	-25900	8	15
49800	85400	-35600	8	16
61100	85400	-24300	8	17
26200	85400	-59200	8	18
63600 J-	85400	-21800	8	19
60300	85400	-25100	8	20
61600	85400	-23800	8	21
50000	42300 J+	7700	9	21
46500	42300 J+	4200	10	21
49800	42300 J+	7500	11	21
26500	42300 J+	-15800	11	22
53000	42300 J+	10700	12	22
61900	42300 J+	19600	13	22
59500	42300 J+	17200	14	22
49800	42300 J+	7500	15	22
61100	42300 J+	18800	16	22
26200	42300 J+	-16100	16	23
63600 J-	42300 J+	21300	17	23
60300	42300 J+	18000	18	23
61600	42300 J+	19300	19	23
46500	50000	-3500	19	24
49800	50000	-200	19	25

26500	50000	-23500	19	26
53000	50000	3000	20	26
61900	50000	11900	21	26
59500	50000	9500	22	26
49800	50000	-200	22	27
61100	50000	11100	23	27
26200	50000	-23800	23	28
63600 J-	50000	13600	24	28
60300	50000	10300	25	28
61600	50000	11600	26	28
49800	46500	3300	27	28
26500	46500	-20000	27	29
53000	46500	6500	28	29
61900	46500	15400	29	29
59500	46500	13000	30	29
49800	46500	3300	31	29
61100	46500	14600	32	29
26200	46500	-20300	32	30
63600 J-	46500	17100	33	30
60300	46500	13800	34	30
61600	46500	15100	35	30
26500	49800	-23300	35	31
53000	49800	3200	36	31
61900	49800	12100	37	31
59500	49800	9700	38	31
49800	49800	0	38	31
61100	49800	11300	39	31
26200	49800	-23600	39	32
63600 J-	49800	13800	40	32
60300	49800	10500	41	32
61600	49800	11800	42	32
53000	26500	26500	43	32
61900	26500	35400	44	32
59500	26500	33000	45	32
49800	26500	23300	46	32
61100	26500	34600	47	32
26200	26500	-300	47	33
63600 J-	26500	37100	48	33
60300	26500	33800	49	33
61600	26500	35100	50	33
61900	53000	8900	51	33
59500	53000	6500	52	33
49800	53000	-3200	52	34
61100	53000	8100	53	34
26200	53000	-26800	53	35
63600 J-	53000	10600	54	35
60300	53000	7300	55	35
61600	53000	8600	56	35
59500	61900	-2400	56	36
49800	61900	-12100	56	37
61100	61900	-800	56	38
26200	61900	-35700	56	39

63600 J-	61900	1700	57	39
60300	61900	-1600	57	40
61600	61900	-300	57	41
49800	59500	-9700	57	42
61100	59500	1600	58	42
26200	59500	-33300	58	43
63600 J-	59500	4100	59	43
60300	59500	800	60	43
61600	59500	2100	61	43
61100	49800	11300	62	43
26200	49800	-23600	62	44
63600 J-	49800	13800	63	44
60300	49800	10500	64	44
61600	49800	11800	65	44
26200	61100	-34900	65	45
63600 J-	61100	2500	66	45
60300	61100	-800	66	46
61600	61100	500	67	46
63600 J-	26200	37400	68	46
60300	26200	34100	69	46
61600	26200	35400	70	46
60300	63600 J-	-3300	70	47
61600	63600 J-	-2000	70	48
61600	60300	1300	71	48

S Statistic = 71 - 48 = 23

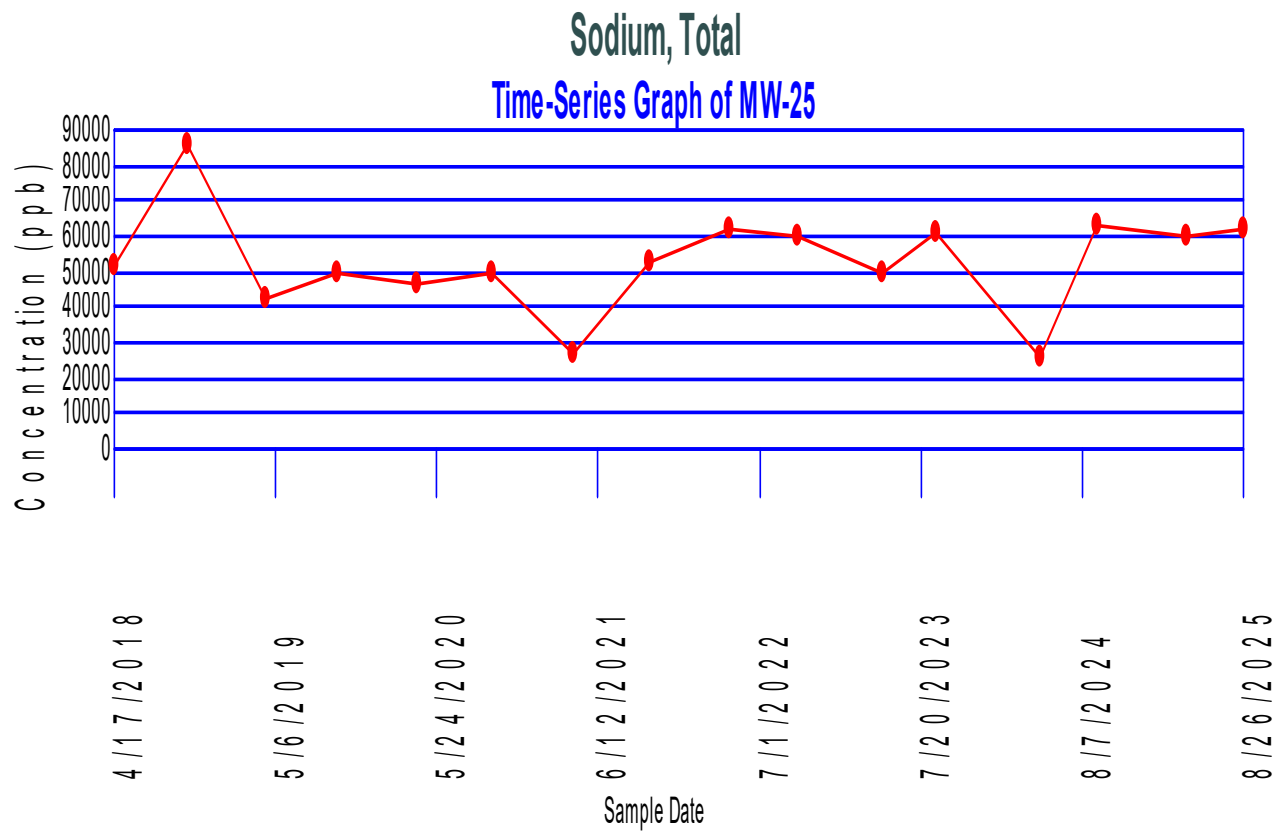
Tied Group	Value	Members
1	49800	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/8/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/19/2022	1
9/29/2022	1
4/19/2023	1
8/24/2023	1
4/29/2024	1
9/10/2024	1
4/14/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 18

B = 0
C = 0
D = 0
E = 2
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 492.333
Z-Score = 0.991501
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|0.991501| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-26

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.859189	0.520325	0.507	123000
2	0.341176	0.533333	0.525	74700
3	0.349398	0.406593	0.546	None

Loc.	Date	Conc.	Outlier
MW-26	4/17/2018	89600	FALSE
	10/9/2018	123000	TRUE
	4/13/2019	87000 J+	FALSE
	10/1/2019	82500	FALSE
	4/8/2020	85700	FALSE
	10/1/2020	81100	FALSE
	4/14/2021	81500	FALSE
	10/13/2021	74700	TRUE
	4/19/2022	81300	FALSE
	9/29/2022	81300	FALSE
	4/19/2023	86700	FALSE
	8/24/2023	83100	FALSE
	4/29/2024	86100	FALSE
	9/10/2024	77600 J-	FALSE
	4/15/2025	84900	FALSE
	8/26/2025	85300	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-26

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	74700	123000	48300	0.5056	24420.5
2	77600	89600	12000	0.329	3948
3	81100	87000	5900	0.2521	1487.39
4	81300	86700	5400	0.1939	1047.06
5	81300	86100	4800	0.1447	694.56
6	81500	85700	4200	0.1005	422.1
7	82500	85300	2800	0.0593	166.04
8	83100	84900	1800	0.0196	35.28
9	84900	83100	-1800		
10	85300	82500	-2800		
11	85700	81500	-4200		
12	86100	81300	-4800		
13	86700	81300	-5400		
14	87000	81100	-5900		
15	89600	77600	-12000		
16	123000	74700	-48300		

Sum of b values = 32220.9

Sample Standard Deviation = 10618.5

W Statistic = 0.613848

5% Critical value of 0.887 exceeds 0.613848

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.613848

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-26
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
123000	89600	33400	1	0
87000 J+	89600	-2600	1	1
82500	89600	-7100	1	2
85700	89600	-3900	1	3
81100	89600	-8500	1	4
81500	89600	-8100	1	5
74700	89600	-14900	1	6
81300	89600	-8300	1	7
81300	89600	-8300	1	8
86700	89600	-2900	1	9
83100	89600	-6500	1	10
86100	89600	-3500	1	11
77600 J-	89600	-12000	1	12
84900	89600	-4700	1	13
85300	89600	-4300	1	14
87000 J+	123000	-36000	1	15
82500	123000	-40500	1	16
85700	123000	-37300	1	17
81100	123000	-41900	1	18
81500	123000	-41500	1	19
74700	123000	-48300	1	20
81300	123000	-41700	1	21
81300	123000	-41700	1	22
86700	123000	-36300	1	23
83100	123000	-39900	1	24
86100	123000	-36900	1	25
77600 J-	123000	-45400	1	26
84900	123000	-38100	1	27
85300	123000	-37700	1	28
82500	87000 J+	-4500	1	29
85700	87000 J+	-1300	1	30
81100	87000 J+	-5900	1	31
81500	87000 J+	-5500	1	32
74700	87000 J+	-12300	1	33
81300	87000 J+	-5700	1	34
81300	87000 J+	-5700	1	35
86700	87000 J+	-300	1	36
83100	87000 J+	-3900	1	37
86100	87000 J+	-900	1	38
77600 J-	87000 J+	-9400	1	39
84900	87000 J+	-2100	1	40
85300	87000 J+	-1700	1	41
85700	82500	3200	2	41
81100	82500	-1400	2	42

81500	82500	-1000	2	43
74700	82500	-7800	2	44
81300	82500	-1200	2	45
81300	82500	-1200	2	46
86700	82500	4200	3	46
83100	82500	600	4	46
86100	82500	3600	5	46
77600 J-	82500	-4900	5	47
84900	82500	2400	6	47
85300	82500	2800	7	47
81100	85700	-4600	7	48
81500	85700	-4200	7	49
74700	85700	-11000	7	50
81300	85700	-4400	7	51
81300	85700	-4400	7	52
86700	85700	1000	8	52
83100	85700	-2600	8	53
86100	85700	400	9	53
77600 J-	85700	-8100	9	54
84900	85700	-800	9	55
85300	85700	-400	9	56
81500	81100	400	10	56
74700	81100	-6400	10	57
81300	81100	200	11	57
81300	81100	200	12	57
86700	81100	5600	13	57
83100	81100	2000	14	57
86100	81100	5000	15	57
77600 J-	81100	-3500	15	58
84900	81100	3800	16	58
85300	81100	4200	17	58
74700	81500	-6800	17	59
81300	81500	-200	17	60
81300	81500	-200	17	61
86700	81500	5200	18	61
83100	81500	1600	19	61
86100	81500	4600	20	61
77600 J-	81500	-3900	20	62
84900	81500	3400	21	62
85300	81500	3800	22	62
81300	74700	6600	23	62
81300	74700	6600	24	62
86700	74700	12000	25	62
83100	74700	8400	26	62
86100	74700	11400	27	62
77600 J-	74700	2900	28	62
84900	74700	10200	29	62
85300	74700	10600	30	62
81300	81300	0	30	62
86700	81300	5400	31	62
83100	81300	1800	32	62
86100	81300	4800	33	62

77600 J-	81300	-3700	33	63
84900	81300	3600	34	63
85300	81300	4000	35	63
86700	81300	5400	36	63
83100	81300	1800	37	63
86100	81300	4800	38	63
77600 J-	81300	-3700	38	64
84900	81300	3600	39	64
85300	81300	4000	40	64
83100	86700	-3600	40	65
86100	86700	-600	40	66
77600 J-	86700	-9100	40	67
84900	86700	-1800	40	68
85300	86700	-1400	40	69
86100	83100	3000	41	69
77600 J-	83100	-5500	41	70
84900	83100	1800	42	70
85300	83100	2200	43	70
77600 J-	86100	-8500	43	71
84900	86100	-1200	43	72
85300	86100	-800	43	73
84900	77600 J-	7300	44	73
85300	77600 J-	7700	45	73
85300	84900	400	46	73

S Statistic = 46 - 73 = -27

Tied Group	Value	Members
1	81300	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/8/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/19/2022	1
9/29/2022	1
4/19/2023	1
8/24/2023	1
4/29/2024	1
9/10/2024	1
4/15/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

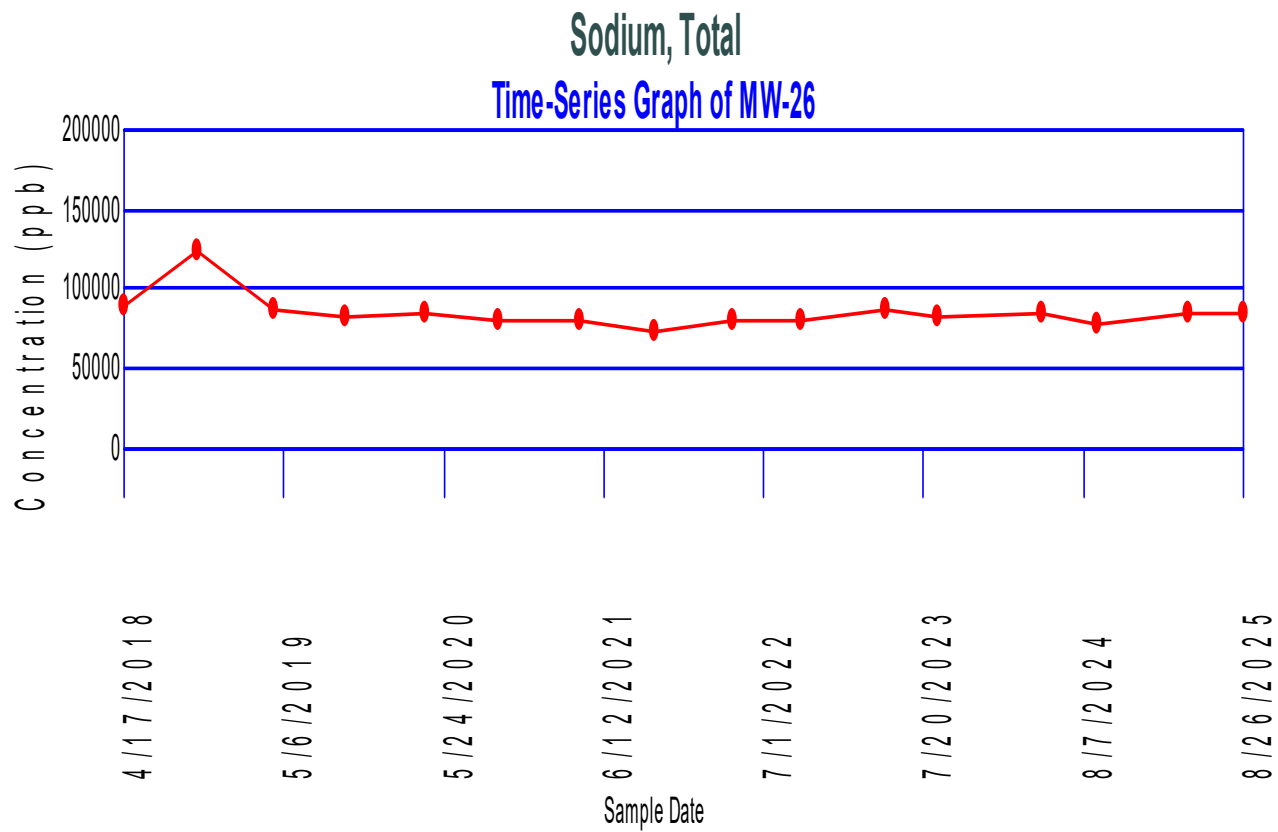
c = 480

Group Variance = 492.333

Z-Score = -1.17177

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

$|-1.17177| \leq 1.97737$ indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: MW-27

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.803371	0.507042	0.507	59100
2	0.339623	0.507042	0.525	None

Loc.	Date	Conc.	Outlier
MW-27	4/18/2018	44800	FALSE
	10/9/2018	59100	TRUE
	4/13/2019	46600 J+	FALSE
	10/1/2019	41400	FALSE
	4/9/2020	43600	FALSE
	10/1/2020	41300	FALSE
	4/14/2021	40700	FALSE
	10/13/2021	37700	FALSE
	4/20/2022	42800	FALSE
	9/28/2022	43400	FALSE
	4/19/2023	43900	FALSE
	8/24/2023	43600	FALSE
	5/1/2024	44800	FALSE
	9/11/2024	41900 J-	FALSE
	4/16/2025	41800	FALSE
	8/27/2025	44100	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: MW-27

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	37700	59100	21400	0.5056	10819.8
2	40700	46600	5900	0.329	1941.1
3	41300	44800	3500	0.2521	882.35
4	41400	44800	3400	0.1939	659.26
5	41800	44100	2300	0.1447	332.81
6	41900	43900	2000	0.1005	201
7	42800	43600	800	0.0593	47.44
8	43400	43600	200	0.0196	3.92
9	43600	43400	-200		
10	43600	42800	-800		
11	43900	41900	-2000		
12	44100	41800	-2300		
13	44800	41400	-3400		
14	44800	41300	-3500		
15	46600	40700	-5900		
16	59100	37700	-21400		

Sum of b values = 14887.7

Sample Standard Deviation = 4558.36

W Statistic = 0.711129

5% Critical value of 0.887 exceeds 0.711129

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 exceeds 0.711129

Evidence of non-normality at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: MW-27
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
59100	44800	14300	1	0
46600 J+	44800	1800	2	0
41400	44800	-3400	2	1
43600	44800	-1200	2	2
41300	44800	-3500	2	3
40700	44800	-4100	2	4
37700	44800	-7100	2	5
42800	44800	-2000	2	6
43400	44800	-1400	2	7
43900	44800	-900	2	8
43600	44800	-1200	2	9
44800	44800	0	2	9
41900 J-	44800	-2900	2	10
41800	44800	-3000	2	11
44100	44800	-700	2	12
46600 J+	59100	-12500	2	13
41400	59100	-17700	2	14
43600	59100	-15500	2	15
41300	59100	-17800	2	16
40700	59100	-18400	2	17
37700	59100	-21400	2	18
42800	59100	-16300	2	19
43400	59100	-15700	2	20
43900	59100	-15200	2	21
43600	59100	-15500	2	22
44800	59100	-14300	2	23
41900 J-	59100	-17200	2	24
41800	59100	-17300	2	25
44100	59100	-15000	2	26
41400	46600 J+	-5200	2	27
43600	46600 J+	-3000	2	28
41300	46600 J+	-5300	2	29
40700	46600 J+	-5900	2	30
37700	46600 J+	-8900	2	31
42800	46600 J+	-3800	2	32
43400	46600 J+	-3200	2	33
43900	46600 J+	-2700	2	34
43600	46600 J+	-3000	2	35
44800	46600 J+	-1800	2	36
41900 J-	46600 J+	-4700	2	37
41800	46600 J+	-4800	2	38
44100	46600 J+	-2500	2	39
43600	41400	2200	3	39
41300	41400	-100	3	40

40700	41400	-700	3	41
37700	41400	-3700	3	42
42800	41400	1400	4	42
43400	41400	2000	5	42
43900	41400	2500	6	42
43600	41400	2200	7	42
44800	41400	3400	8	42
41900 J-	41400	500	9	42
41800	41400	400	10	42
44100	41400	2700	11	42
41300	43600	-2300	11	43
40700	43600	-2900	11	44
37700	43600	-5900	11	45
42800	43600	-800	11	46
43400	43600	-200	11	47
43900	43600	300	12	47
43600	43600	0	12	47
44800	43600	1200	13	47
41900 J-	43600	-1700	13	48
41800	43600	-1800	13	49
44100	43600	500	14	49
40700	41300	-600	14	50
37700	41300	-3600	14	51
42800	41300	1500	15	51
43400	41300	2100	16	51
43900	41300	2600	17	51
43600	41300	2300	18	51
44800	41300	3500	19	51
41900 J-	41300	600	20	51
41800	41300	500	21	51
44100	41300	2800	22	51
37700	40700	-3000	22	52
42800	40700	2100	23	52
43400	40700	2700	24	52
43900	40700	3200	25	52
43600	40700	2900	26	52
44800	40700	4100	27	52
41900 J-	40700	1200	28	52
41800	40700	1100	29	52
44100	40700	3400	30	52
42800	37700	5100	31	52
43400	37700	5700	32	52
43900	37700	6200	33	52
43600	37700	5900	34	52
44800	37700	7100	35	52
41900 J-	37700	4200	36	52
41800	37700	4100	37	52
44100	37700	6400	38	52
43400	42800	600	39	52
43900	42800	1100	40	52
43600	42800	800	41	52
44800	42800	2000	42	52

41900 J-	42800	-900	42	53
41800	42800	-1000	42	54
44100	42800	1300	43	54
43900	43400	500	44	54
43600	43400	200	45	54
44800	43400	1400	46	54
41900 J-	43400	-1500	46	55
41800	43400	-1600	46	56
44100	43400	700	47	56
43600	43900	-300	47	57
44800	43900	900	48	57
41900 J-	43900	-2000	48	58
41800	43900	-2100	48	59
44100	43900	200	49	59
44800	43600	1200	50	59
41900 J-	43600	-1700	50	60
41800	43600	-1800	50	61
44100	43600	500	51	61
41900 J-	44800	-2900	51	62
41800	44800	-3000	51	63
44100	44800	-700	51	64
41800	41900 J-	-100	51	65
44100	41900 J-	2200	52	65
44100	41800	2300	53	65

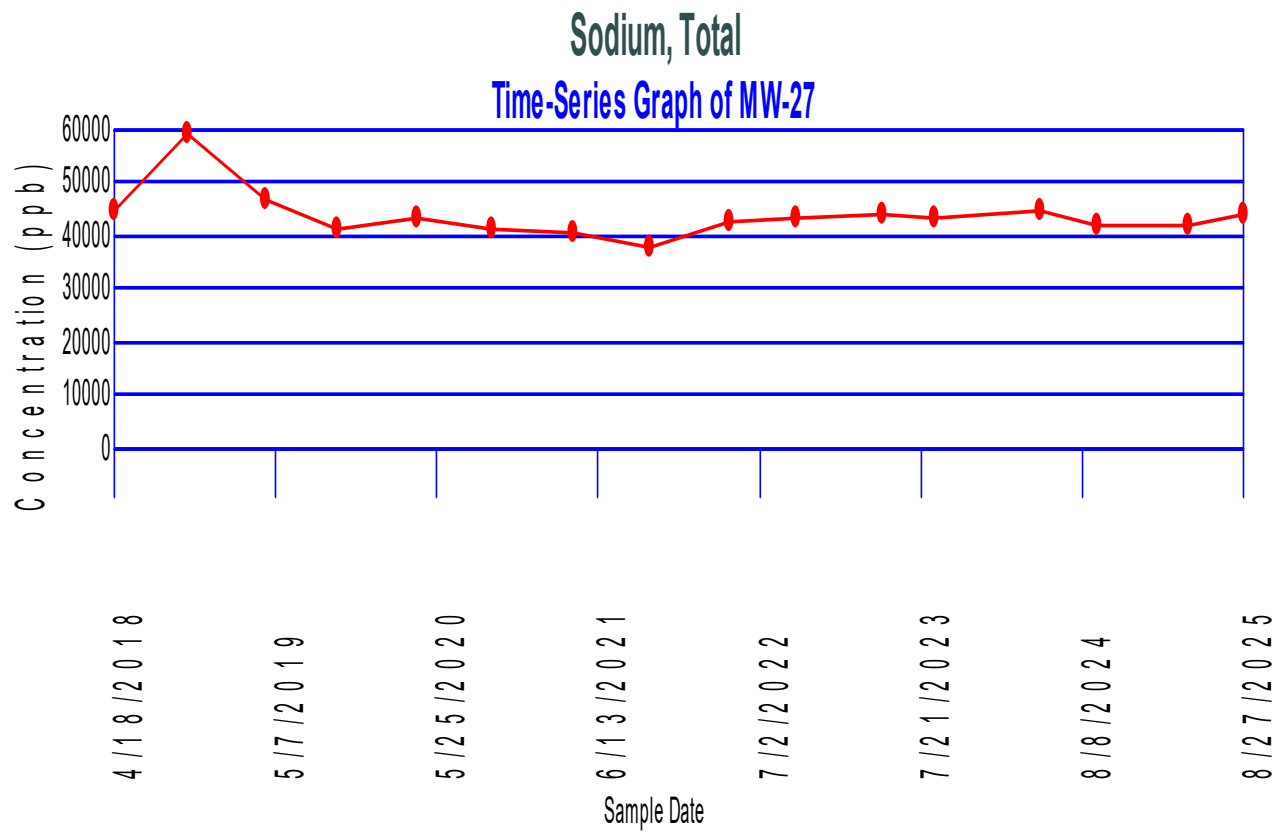
S Statistic = 53 - 65 = -12

Tied Group	Value	Members
1	44800	2
2	43600	2

Time Period	Observations
4/18/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/9/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/20/2022	1
9/28/2022	1
4/19/2023	1
8/24/2023	1
5/1/2024	1
9/11/2024	1
4/16/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 491.333
Z-Score = -0.496255
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|-0.496255| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: SW-01

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.401786	0.229885	0.507	None

Loc.	Date	Conc.	Outlier
SW-01	4/16/2018	19600	FALSE
	10/8/2018	14800 J	FALSE
	4/13/2019	19400	FALSE
	9/30/2019	12300	FALSE
	4/7/2020	19800	FALSE
	10/2/2020	13100	FALSE
	4/13/2021	14300	FALSE
	10/14/2021	16900	FALSE
	4/19/2022	18200	FALSE
	9/27/2022	19700	FALSE
	4/18/2023	19700	FALSE
	8/22/2023	25200	FALSE
	4/30/2024	19300	FALSE
	9/10/2024	21000 J-	FALSE
	4/14/2025	25500	FALSE
	8/26/2025	19500	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: SW-01

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	12300	25500	13200	0.5056	6673.92
2	13100	25200	12100	0.329	3980.9
3	14300	21000	6700	0.2521	1689.07
4	14800	19800	5000	0.1939	969.5
5	16900	19700	2800	0.1447	405.16
6	18200	19700	1500	0.1005	150.75
7	19300	19600	300	0.0593	17.79
8	19400	19500	100	0.0196	1.96
9	19500	19400	-100		
10	19600	19300	-300		
11	19700	18200	-1500		
12	19700	16900	-2800		
13	19800	14800	-5000		
14	21000	14300	-6700		
15	25200	13100	-12100		
16	25500	12300	-13200		

Sum of b values = 13889.1

Sample Standard Deviation = 3738.26

W Statistic = 0.920267

5% Critical value of 0.887 is less than 0.920267

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.920267

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: SW-01
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
14800 J	19600	-4800	0	1
19400	19600	-200	0	2
12300	19600	-7300	0	3
19800	19600	200	1	3
13100	19600	-6500	1	4
14300	19600	-5300	1	5
16900	19600	-2700	1	6
18200	19600	-1400	1	7
19700	19600	100	2	7
19700	19600	100	3	7
25200	19600	5600	4	7
19300	19600	-300	4	8
21000 J-	19600	1400	5	8
25500	19600	5900	6	8
19500	19600	-100	6	9
19400	14800 J	4600	7	9
12300	14800 J	-2500	7	10
19800	14800 J	5000	8	10
13100	14800 J	-1700	8	11
14300	14800 J	-500	8	12
16900	14800 J	2100	9	12
18200	14800 J	3400	10	12
19700	14800 J	4900	11	12
19700	14800 J	4900	12	12
25200	14800 J	10400	13	12
19300	14800 J	4500	14	12
21000 J-	14800 J	6200	15	12
25500	14800 J	10700	16	12
19500	14800 J	4700	17	12
12300	19400	-7100	17	13
19800	19400	400	18	13
13100	19400	-6300	18	14
14300	19400	-5100	18	15
16900	19400	-2500	18	16
18200	19400	-1200	18	17
19700	19400	300	19	17
19700	19400	300	20	17
25200	19400	5800	21	17
19300	19400	-100	21	18
21000 J-	19400	1600	22	18
25500	19400	6100	23	18
19500	19400	100	24	18
19800	12300	7500	25	18
13100	12300	800	26	18

14300	12300	2000	27	18
16900	12300	4600	28	18
18200	12300	5900	29	18
19700	12300	7400	30	18
19700	12300	7400	31	18
25200	12300	12900	32	18
19300	12300	7000	33	18
21000 J-	12300	8700	34	18
25500	12300	13200	35	18
19500	12300	7200	36	18
13100	19800	-6700	36	19
14300	19800	-5500	36	20
16900	19800	-2900	36	21
18200	19800	-1600	36	22
19700	19800	-100	36	23
19700	19800	-100	36	24
25200	19800	5400	37	24
19300	19800	-500	37	25
21000 J-	19800	1200	38	25
25500	19800	5700	39	25
19500	19800	-300	39	26
14300	13100	1200	40	26
16900	13100	3800	41	26
18200	13100	5100	42	26
19700	13100	6600	43	26
19700	13100	6600	44	26
25200	13100	12100	45	26
19300	13100	6200	46	26
21000 J-	13100	7900	47	26
25500	13100	12400	48	26
19500	13100	6400	49	26
16900	14300	2600	50	26
18200	14300	3900	51	26
19700	14300	5400	52	26
19700	14300	5400	53	26
25200	14300	10900	54	26
19300	14300	5000	55	26
21000 J-	14300	6700	56	26
25500	14300	11200	57	26
19500	14300	5200	58	26
18200	16900	1300	59	26
19700	16900	2800	60	26
19700	16900	2800	61	26
25200	16900	8300	62	26
19300	16900	2400	63	26
21000 J-	16900	4100	64	26
25500	16900	8600	65	26
19500	16900	2600	66	26
19700	18200	1500	67	26
19700	18200	1500	68	26
25200	18200	7000	69	26
19300	18200	1100	70	26

21000 J-	18200	2800	71	26
25500	18200	7300	72	26
19500	18200	1300	73	26
19700	19700	0	73	26
25200	19700	5500	74	26
19300	19700	-400	74	27
21000 J-	19700	1300	75	27
25500	19700	5800	76	27
19500	19700	-200	76	28
25200	19700	5500	77	28
19300	19700	-400	77	29
21000 J-	19700	1300	78	29
25500	19700	5800	79	29
19500	19700	-200	79	30
19300	25200	-5900	79	31
21000 J-	25200	-4200	79	32
25500	25200	300	80	32
19500	25200	-5700	80	33
21000 J-	19300	1700	81	33
25500	19300	6200	82	33
19500	19300	200	83	33
25500	21000 J-	4500	84	33
19500	21000 J-	-1500	84	34
19500	25500	-6000	84	35

S Statistic = 84 - 35 = 49

Tied Group	Value	Members
1	19700	2

Time Period	Observations
4/16/2018	1
10/8/2018	1
4/13/2019	1
9/30/2019	1
4/7/2020	1
10/2/2020	1
4/13/2021	1
10/14/2021	1
4/19/2022	1
9/27/2022	1
4/18/2023	1
8/22/2023	1
4/30/2024	1
9/10/2024	1
4/14/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 8880

b = 30240

c = 480

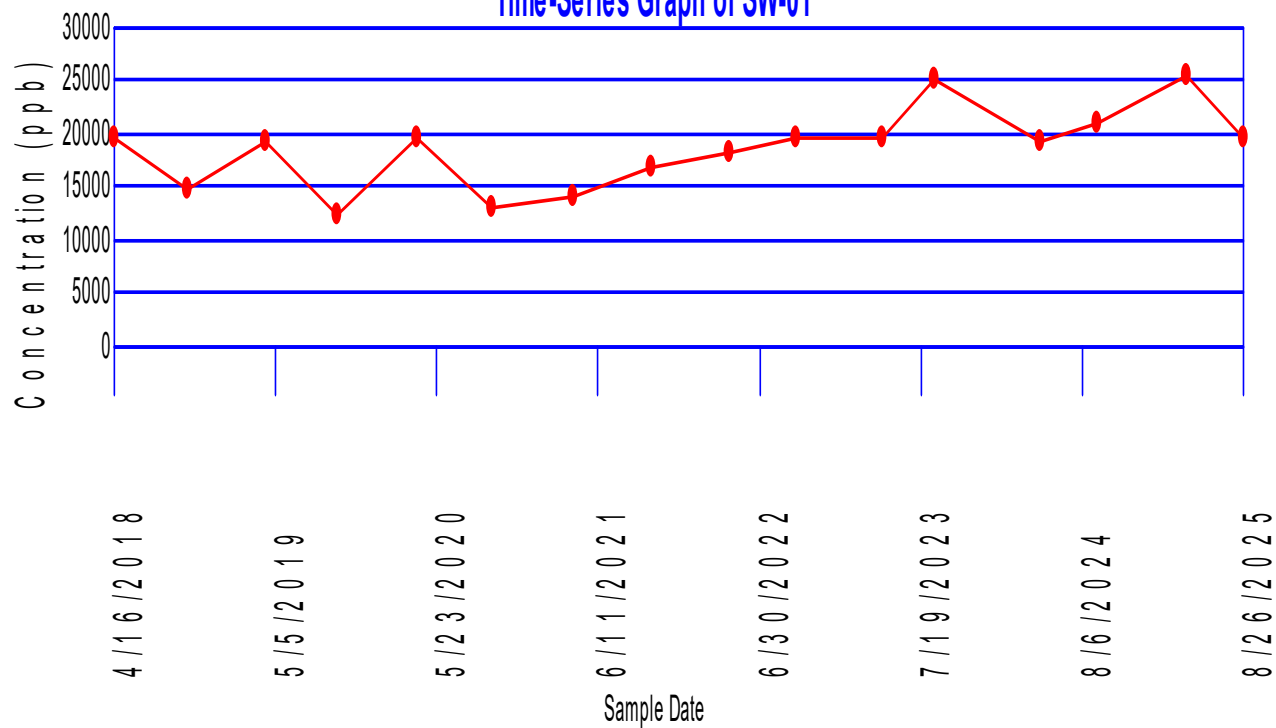
Group Variance = 492.333

Z-Score = 2.16327

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

|2.16327| > 1.97737 indicating a trend

Sodium, Total
Time-Series Graph of SW-01



Dixon's Test for Outliers

Parameter: Sodium, Total

Location: SW-02

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.618687	0.32287	0.507	71200
2	0.233129	0.365482	0.525	None

Loc.	Date	Conc.	Outlier
SW-02	4/16/2018	71200	TRUE
	10/8/2018	40600	FALSE
	4/13/2019	47900	FALSE
	9/30/2019	24400	FALSE
	4/7/2020	41000	FALSE
	10/2/2020	35600	FALSE
	4/13/2021	33900	FALSE
	10/14/2021	33700	FALSE
	4/19/2022	44100	FALSE
	9/27/2022	36400	FALSE
	4/18/2023	39300	FALSE
	8/22/2023	35200	FALSE
	4/30/2024	31600	FALSE
	9/10/2024	25400 J-	FALSE
	4/14/2025	46700	FALSE
	8/26/2025	32300	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sodium, Total

Location: SW-02

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	24400	71200	46800	0.5056	23662.1
2	25400	47900	22500	0.329	7402.5
3	31600	46700	15100	0.2521	3806.71
4	32300	44100	11800	0.1939	2288.02
5	33700	41000	7300	0.1447	1056.31
6	33900	40600	6700	0.1005	673.35
7	35200	39300	4100	0.0593	243.13
8	35600	36400	800	0.0196	15.68
9	36400	35600	-800		
10	39300	35200	-4100		
11	40600	33900	-6700		
12	41000	33700	-7300		
13	44100	32300	-11800		
14	46700	31600	-15100		
15	47900	25400	-22500		
16	71200	24400	-46800		

Sum of b values = 39147.8

Sample Standard Deviation = 10927.8

W Statistic = 0.855575

5% Critical value of 0.887 exceeds 0.855575

Evidence of non-normality at 95% level of significance

1% Critical value of 0.844 is less than 0.855575

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sodium, Total
Location: SW-02
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
40600	71200	-30600	0	1
47900	71200	-23300	0	2
24400	71200	-46800	0	3
41000	71200	-30200	0	4
35600	71200	-35600	0	5
33900	71200	-37300	0	6
33700	71200	-37500	0	7
44100	71200	-27100	0	8
36400	71200	-34800	0	9
39300	71200	-31900	0	10
35200	71200	-36000	0	11
31600	71200	-39600	0	12
25400 J-	71200	-45800	0	13
46700	71200	-24500	0	14
32300	71200	-38900	0	15
47900	40600	7300	1	15
24400	40600	-16200	1	16
41000	40600	400	2	16
35600	40600	-5000	2	17
33900	40600	-6700	2	18
33700	40600	-6900	2	19
44100	40600	3500	3	19
36400	40600	-4200	3	20
39300	40600	-1300	3	21
35200	40600	-5400	3	22
31600	40600	-9000	3	23
25400 J-	40600	-15200	3	24
46700	40600	6100	4	24
32300	40600	-8300	4	25
24400	47900	-23500	4	26
41000	47900	-6900	4	27
35600	47900	-12300	4	28
33900	47900	-14000	4	29
33700	47900	-14200	4	30
44100	47900	-3800	4	31
36400	47900	-11500	4	32
39300	47900	-8600	4	33
35200	47900	-12700	4	34
31600	47900	-16300	4	35
25400 J-	47900	-22500	4	36
46700	47900	-1200	4	37
32300	47900	-15600	4	38
41000	24400	16600	5	38
35600	24400	11200	6	38

33900	24400	9500	7	38
33700	24400	9300	8	38
44100	24400	19700	9	38
36400	24400	12000	10	38
39300	24400	14900	11	38
35200	24400	10800	12	38
31600	24400	7200	13	38
25400 J-	24400	1000	14	38
46700	24400	22300	15	38
32300	24400	7900	16	38
35600	41000	-5400	16	39
33900	41000	-7100	16	40
33700	41000	-7300	16	41
44100	41000	3100	17	41
36400	41000	-4600	17	42
39300	41000	-1700	17	43
35200	41000	-5800	17	44
31600	41000	-9400	17	45
25400 J-	41000	-15600	17	46
46700	41000	5700	18	46
32300	41000	-8700	18	47
33900	35600	-1700	18	48
33700	35600	-1900	18	49
44100	35600	8500	19	49
36400	35600	800	20	49
39300	35600	3700	21	49
35200	35600	-400	21	50
31600	35600	-4000	21	51
25400 J-	35600	-10200	21	52
46700	35600	11100	22	52
32300	35600	-3300	22	53
33700	33900	-200	22	54
44100	33900	10200	23	54
36400	33900	2500	24	54
39300	33900	5400	25	54
35200	33900	1300	26	54
31600	33900	-2300	26	55
25400 J-	33900	-8500	26	56
46700	33900	12800	27	56
32300	33900	-1600	27	57
44100	33700	10400	28	57
36400	33700	2700	29	57
39300	33700	5600	30	57
35200	33700	1500	31	57
31600	33700	-2100	31	58
25400 J-	33700	-8300	31	59
46700	33700	13000	32	59
32300	33700	-1400	32	60
36400	44100	-7700	32	61
39300	44100	-4800	32	62
35200	44100	-8900	32	63
31600	44100	-12500	32	64

25400 J-	44100	-18700	32	65
46700	44100	2600	33	65
32300	44100	-11800	33	66
39300	36400	2900	34	66
35200	36400	-1200	34	67
31600	36400	-4800	34	68
25400 J-	36400	-11000	34	69
46700	36400	10300	35	69
32300	36400	-4100	35	70
35200	39300	-4100	35	71
31600	39300	-7700	35	72
25400 J-	39300	-13900	35	73
46700	39300	7400	36	73
32300	39300	-7000	36	74
31600	35200	-3600	36	75
25400 J-	35200	-9800	36	76
46700	35200	11500	37	76
32300	35200	-2900	37	77
25400 J-	31600	-6200	37	78
46700	31600	15100	38	78
32300	31600	700	39	78
46700	25400 J-	21300	40	78
32300	25400 J-	6900	41	78
32300	46700	-14400	41	79

S Statistic = 41 - 79 = -38

Tied Group	Value	Members
Time Period	Observations	
4/16/2018	1	
10/8/2018	1	
4/13/2019	1	
9/30/2019	1	
4/7/2020	1	
10/2/2020	1	
4/13/2021	1	
10/14/2021	1	
4/19/2022	1	
9/27/2022	1	
4/18/2023	1	
8/22/2023	1	
4/30/2024	1	
9/10/2024	1	
4/14/2025	1	
8/26/2025	1	
There are 0 time periods with multiple data		

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 8880

b = 30240

c = 480

Group Variance = 493.333

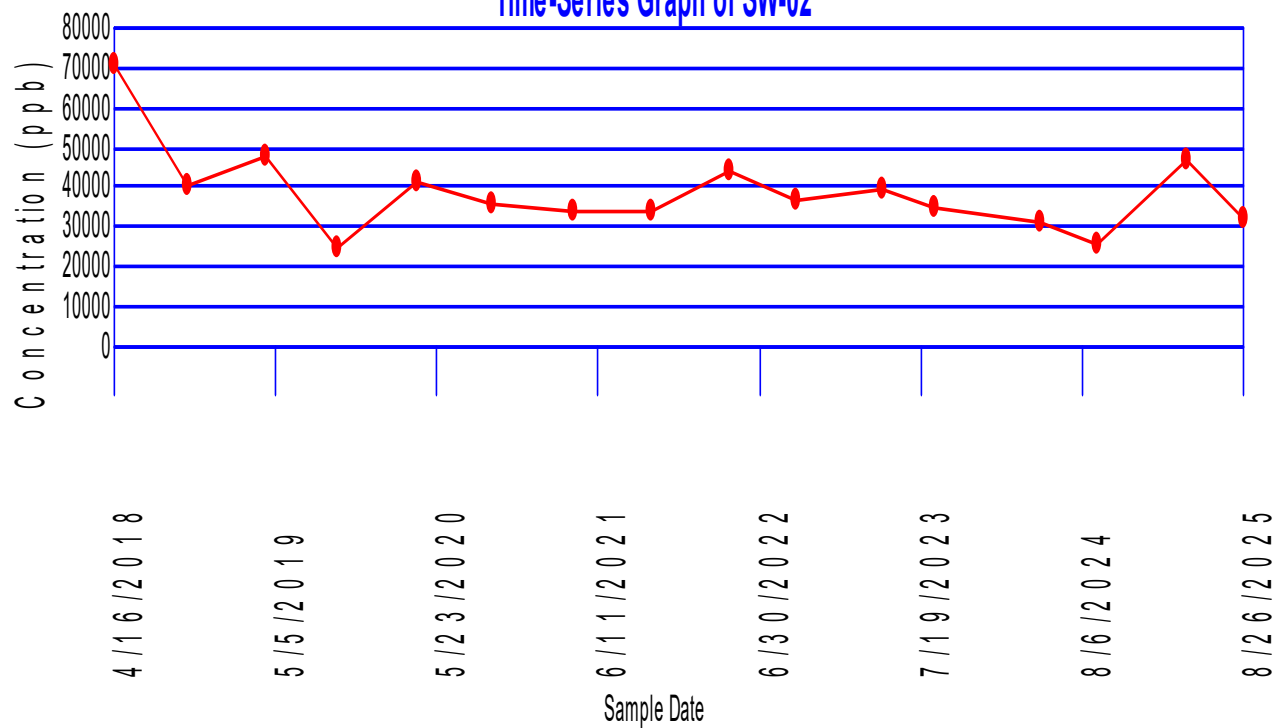
Z-Score = -1.66583

Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)

$|-1.66583| \leq 1.97737$ indicating no evidence of a trend

Sodium, Total

Time-Series Graph of SW-02



Concentrations (ppb)

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements: 48

Total Non-Detect: 0

Percent Non-Detects: 0%

Total Background Measurements: 0

There are 0 background locations

Loc.	Meas.	ND	Date	Conc.	Original

There are 3 compliance locations

Loc.	Meas.	ND	Date	Conc.	Original

MW-07	16	0 (0%)	4/18/2018	1.25e+006	1.25e+006
			10/10/2018	1.22e+006	1.22e+006
			4/14/2019	1.25e+006	1.25e+006
			10/2/2019	1.24e+006	1.24e+006
			4/8/2020	1.32e+006	1.32e+006
			9/30/2020	1.24e+006	1.24e+006
			4/13/2021	1.37e+006	1.37e+006
			10/14/2021	1.44e+006	1.44e+006
			4/20/2022	1.34e+006	1.34e+006
			9/27/2022	1.32e+006	1.32e+006
			4/18/2023	1.33e+006	1.33e+006
			8/23/2023	1.35e+006	1.35e+006
			5/1/2024	1.3e+006	1.3e+006
			9/11/2024	1.43e+006	1.43e+006
			4/16/2025	1.24e+006	1.24e+006
			8/27/2025	1.41e+006	1.41e+006

MW-27	16	0 (0%)	4/18/2018	263000	263000
			10/9/2018	263000	263000
			4/13/2019	266000	266000
			10/1/2019	268000	268000
			4/9/2020	264000	264000
			10/1/2020	275000	275000
			4/14/2021	264000	264000
			10/13/2021	270000	270000
			4/20/2022	275000	275000
			9/28/2022	261000	261000
			4/19/2023	257000	257000
			8/24/2023	254000	254000
			5/1/2024	249000	249000
			9/11/2024	269000	269000
			4/16/2025	252000	252000
			8/27/2025	256000	256000

MW-26	16	0 (0%)	4/17/2018	1.39e+006	1.39e+006
			10/9/2018	1.33e+006	1.33e+006
			4/13/2019	1.42e+006	1.42e+006
			10/1/2019	1.37e+006	1.37e+006
			4/8/2020	1.43e+006	1.43e+006
			10/1/2020	1.41e+006	1.41e+006
			4/14/2021	1.39e+006	1.39e+006

10/13/2021	1.6e+006	1.6e+006
4/19/2022	1.44e+006	1.44e+006
9/29/2022	1.45e+006	1.45e+006
4/19/2023	1.5e+006	1.5e+006
8/24/2023	1.5e+006	1.5e+006
4/29/2024	1.48e+006	1.48e+006
9/10/2024	1.52e+006	1.52e+006
4/15/2025	1.37e+006	1.37e+006
8/26/2025	1.45e+006	1.45e+006

There are 0 unused locations

Loc.	Meas.	ND	Date	Conc.	Original

Dixon's Test for Outliers

Parameter: Sulfate

Location: MW-07

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.15	0.105263	0.507	None

Loc.	Date	Conc.	Outlier
MW-07	4/18/2018	1.25e+006	FALSE
	10/10/2018	1.22e+006	FALSE
	4/14/2019	1.25e+006	FALSE
	10/2/2019	1.24e+006	FALSE
	4/8/2020	1.32e+006	FALSE
	9/30/2020	1.24e+006	FALSE
	4/13/2021	1.37e+006	FALSE
	10/14/2021	1.44e+006	FALSE
	4/20/2022	1.34e+006	FALSE
	9/27/2022	1.32e+006	FALSE
	4/18/2023	1.33e+006	FALSE
	8/23/2023	1.35e+006	FALSE
	5/1/2024	1.3e+006	FALSE
	9/11/2024	1.43e+006	FALSE
	4/16/2025	1.24e+006	FALSE
	8/27/2025	1.41e+006	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: MW-07

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.22e+006	1.44e+006	220000	0.5056	111232
2	1.24e+006	1.43e+006	190000	0.329	62510
3	1.24e+006	1.41e+006	170000	0.2521	42857
4	1.24e+006	1.37e+006	130000	0.1939	25207
5	1.25e+006	1.35e+006	100000	0.1447	14470
6	1.25e+006	1.34e+006	90000	0.1005	9045
7	1.3e+006	1.33e+006	30000	0.0593	1779
8	1.32e+006	1.32e+006	0	0.0196	0
9	1.32e+006	1.32e+006	0		
10	1.33e+006	1.3e+006	-30000		
11	1.34e+006	1.25e+006	-90000		
12	1.35e+006	1.25e+006	-100000		
13	1.37e+006	1.24e+006	-130000		
14	1.41e+006	1.24e+006	-170000		
15	1.43e+006	1.24e+006	-190000		
16	1.44e+006	1.22e+006	-220000		

Sum of b values = 267100

Sample Standard Deviation = 71923

W Statistic = 0.919435

5% Critical value of 0.887 is less than 0.919435

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.919435

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis

Parameter: Sulfate

Location: MW-07

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.22e+006	1.25e+006	-30000	0	1
1.25e+006	1.25e+006	0	0	1
1.24e+006	1.25e+006	-10000	0	2
1.32e+006	1.25e+006	70000	1	2
1.24e+006	1.25e+006	-10000	1	3
1.37e+006	1.25e+006	120000	2	3
1.44e+006	1.25e+006	190000	3	3
1.34e+006	1.25e+006	90000	4	3
1.32e+006	1.25e+006	70000	5	3
1.33e+006	1.25e+006	80000	6	3
1.35e+006	1.25e+006	100000	7	3
1.3e+006	1.25e+006	50000	8	3
1.43e+006	1.25e+006	180000	9	3
1.24e+006	1.25e+006	-10000	9	4
1.41e+006	1.25e+006	160000	10	4
1.25e+006	1.22e+006	30000	11	4
1.24e+006	1.22e+006	20000	12	4
1.32e+006	1.22e+006	100000	13	4
1.24e+006	1.22e+006	20000	14	4
1.37e+006	1.22e+006	150000	15	4
1.44e+006	1.22e+006	220000	16	4
1.34e+006	1.22e+006	120000	17	4
1.32e+006	1.22e+006	100000	18	4
1.33e+006	1.22e+006	110000	19	4
1.35e+006	1.22e+006	130000	20	4
1.3e+006	1.22e+006	80000	21	4
1.43e+006	1.22e+006	210000	22	4
1.24e+006	1.22e+006	20000	23	4
1.41e+006	1.22e+006	190000	24	4
1.24e+006	1.25e+006	-10000	24	5
1.32e+006	1.25e+006	70000	25	5
1.24e+006	1.25e+006	-10000	25	6
1.37e+006	1.25e+006	120000	26	6
1.44e+006	1.25e+006	190000	27	6
1.34e+006	1.25e+006	90000	28	6
1.32e+006	1.25e+006	70000	29	6
1.33e+006	1.25e+006	80000	30	6
1.35e+006	1.25e+006	100000	31	6
1.3e+006	1.25e+006	50000	32	6
1.43e+006	1.25e+006	180000	33	6
1.24e+006	1.25e+006	-10000	33	7
1.41e+006	1.25e+006	160000	34	7
1.32e+006	1.24e+006	80000	35	7
1.24e+006	1.24e+006	0	35	7

1.37e+006	1.24e+006	130000	36	7
1.44e+006	1.24e+006	200000	37	7
1.34e+006	1.24e+006	100000	38	7
1.32e+006	1.24e+006	80000	39	7
1.33e+006	1.24e+006	90000	40	7
1.35e+006	1.24e+006	110000	41	7
1.3e+006	1.24e+006	60000	42	7
1.43e+006	1.24e+006	190000	43	7
1.24e+006	1.24e+006	0	43	7
1.41e+006	1.24e+006	170000	44	7
1.24e+006	1.32e+006	-80000	44	8
1.37e+006	1.32e+006	50000	45	8
1.44e+006	1.32e+006	120000	46	8
1.34e+006	1.32e+006	20000	47	8
1.32e+006	1.32e+006	0	47	8
1.33e+006	1.32e+006	10000	48	8
1.35e+006	1.32e+006	30000	49	8
1.3e+006	1.32e+006	-20000	49	9
1.43e+006	1.32e+006	110000	50	9
1.24e+006	1.32e+006	-80000	50	10
1.41e+006	1.32e+006	90000	51	10
1.37e+006	1.24e+006	130000	52	10
1.44e+006	1.24e+006	200000	53	10
1.34e+006	1.24e+006	100000	54	10
1.32e+006	1.24e+006	80000	55	10
1.33e+006	1.24e+006	90000	56	10
1.35e+006	1.24e+006	110000	57	10
1.3e+006	1.24e+006	60000	58	10
1.43e+006	1.24e+006	190000	59	10
1.24e+006	1.24e+006	0	59	10
1.41e+006	1.24e+006	170000	60	10
1.44e+006	1.37e+006	70000	61	10
1.34e+006	1.37e+006	-30000	61	11
1.32e+006	1.37e+006	-50000	61	12
1.33e+006	1.37e+006	-40000	61	13
1.35e+006	1.37e+006	-20000	61	14
1.3e+006	1.37e+006	-70000	61	15
1.43e+006	1.37e+006	60000	62	15
1.24e+006	1.37e+006	-130000	62	16
1.41e+006	1.37e+006	40000	63	16
1.34e+006	1.44e+006	-100000	63	17
1.32e+006	1.44e+006	-120000	63	18
1.33e+006	1.44e+006	-110000	63	19
1.35e+006	1.44e+006	-90000	63	20
1.3e+006	1.44e+006	-140000	63	21
1.43e+006	1.44e+006	-10000	63	22
1.24e+006	1.44e+006	-200000	63	23
1.41e+006	1.44e+006	-30000	63	24
1.32e+006	1.34e+006	-20000	63	25
1.33e+006	1.34e+006	-10000	63	26
1.35e+006	1.34e+006	10000	64	26
1.3e+006	1.34e+006	-40000	64	27

1.43e+006	1.34e+006	90000	65	27
1.24e+006	1.34e+006	-100000	65	28
1.41e+006	1.34e+006	70000	66	28
1.33e+006	1.32e+006	10000	67	28
1.35e+006	1.32e+006	30000	68	28
1.3e+006	1.32e+006	-20000	68	29
1.43e+006	1.32e+006	110000	69	29
1.24e+006	1.32e+006	-80000	69	30
1.41e+006	1.32e+006	90000	70	30
1.35e+006	1.33e+006	20000	71	30
1.3e+006	1.33e+006	-30000	71	31
1.43e+006	1.33e+006	100000	72	31
1.24e+006	1.33e+006	-90000	72	32
1.41e+006	1.33e+006	80000	73	32
1.3e+006	1.35e+006	-50000	73	33
1.43e+006	1.35e+006	80000	74	33
1.24e+006	1.35e+006	-110000	74	34
1.41e+006	1.35e+006	60000	75	34
1.43e+006	1.3e+006	130000	76	34
1.24e+006	1.3e+006	-60000	76	35
1.41e+006	1.3e+006	110000	77	35
1.24e+006	1.43e+006	-190000	77	36
1.41e+006	1.43e+006	-20000	77	37
1.41e+006	1.24e+006	170000	78	37

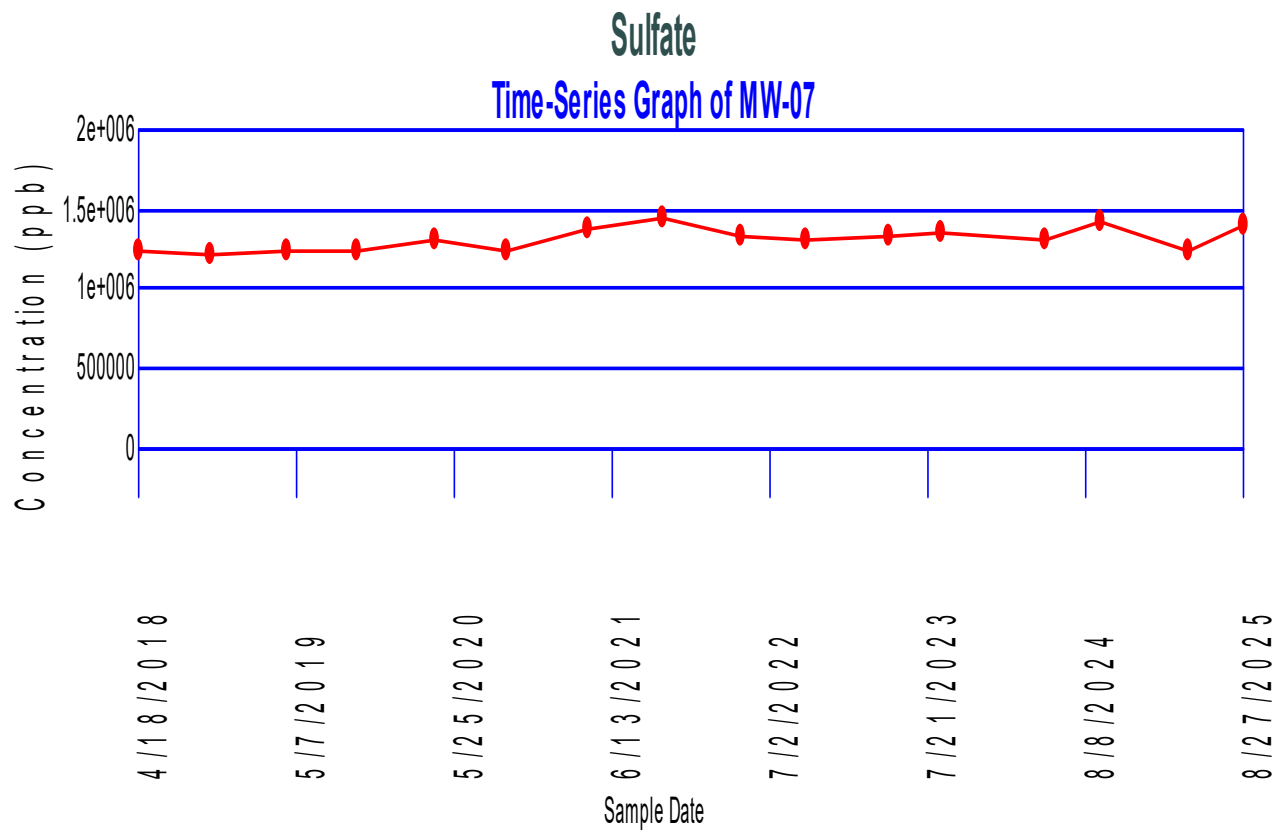
S Statistic = 78 - 37 = 41

Tied Group	Value	Members
1	1.25e+006	2
2	1.24e+006	3
3	1.32e+006	2

Time Period	Observations
4/18/2018	1
10/10/2018	1
4/14/2019	1
10/2/2019	1
4/8/2020	1
9/30/2020	1
4/13/2021	1
10/14/2021	1
4/20/2022	1
9/27/2022	1
4/18/2023	1
8/23/2023	1
5/1/2024	1
9/11/2024	1
4/16/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 102
B = 0
C = 6
D = 0
E = 10
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 487.667
Z-Score = 1.81133
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|1.81133| <= 1.97737 indicating no evidence of a trend



Dixon's Test for Outliers

Parameter: Sulfate

Location: MW-26

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.434783	0.235294	0.507	None

Loc.	Date	Conc.	Outlier
MW-26	4/17/2018	1.39e+006	FALSE
	10/9/2018	1.33e+006	FALSE
	4/13/2019	1.42e+006	FALSE
	10/1/2019	1.37e+006	FALSE
	4/8/2020	1.43e+006	FALSE
	10/1/2020	1.41e+006	FALSE
	4/14/2021	1.39e+006	FALSE
	10/13/2021	1.6e+006	FALSE
	4/19/2022	1.44e+006	FALSE
	9/29/2022	1.45e+006	FALSE
	4/19/2023	1.5e+006	FALSE
	8/24/2023	1.5e+006	FALSE
	4/29/2024	1.48e+006	FALSE
	9/10/2024	1.52e+006	FALSE
	4/15/2025	1.37e+006	FALSE
	8/26/2025	1.45e+006	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: MW-26

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.33e+006	1.6e+006	270000	0.5056	136512
2	1.37e+006	1.52e+006	150000	0.329	49350
3	1.37e+006	1.5e+006	130000	0.2521	32773
4	1.39e+006	1.5e+006	110000	0.1939	21329
5	1.39e+006	1.48e+006	90000	0.1447	13023
6	1.41e+006	1.45e+006	40000	0.1005	4020
7	1.42e+006	1.45e+006	30000	0.0593	1779
8	1.43e+006	1.44e+006	10000	0.0196	196
9	1.44e+006	1.43e+006	-10000		
10	1.45e+006	1.42e+006	-30000		
11	1.45e+006	1.41e+006	-40000		
12	1.48e+006	1.39e+006	-90000		
13	1.5e+006	1.39e+006	-110000		
14	1.5e+006	1.37e+006	-130000		
15	1.52e+006	1.37e+006	-150000		
16	1.6e+006	1.33e+006	-270000		

Sum of b values = 258982

Sample Standard Deviation = 67967.5

W Statistic = 0.967933

5% Critical value of 0.887 is less than 0.967933

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.967933

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sulfate
Location: MW-26
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.33e+006	1.39e+006	-60000	0	1
1.42e+006	1.39e+006	30000	1	1
1.37e+006	1.39e+006	-20000	1	2
1.43e+006	1.39e+006	40000	2	2
1.41e+006	1.39e+006	20000	3	2
1.39e+006	1.39e+006	0	3	2
1.6e+006	1.39e+006	210000	4	2
1.44e+006	1.39e+006	50000	5	2
1.45e+006	1.39e+006	60000	6	2
1.5e+006	1.39e+006	110000	7	2
1.5e+006	1.39e+006	110000	8	2
1.48e+006	1.39e+006	90000	9	2
1.52e+006	1.39e+006	130000	10	2
1.37e+006	1.39e+006	-20000	10	3
1.45e+006	1.39e+006	60000	11	3
1.42e+006	1.33e+006	90000	12	3
1.37e+006	1.33e+006	40000	13	3
1.43e+006	1.33e+006	100000	14	3
1.41e+006	1.33e+006	80000	15	3
1.39e+006	1.33e+006	60000	16	3
1.6e+006	1.33e+006	270000	17	3
1.44e+006	1.33e+006	110000	18	3
1.45e+006	1.33e+006	120000	19	3
1.5e+006	1.33e+006	170000	20	3
1.5e+006	1.33e+006	170000	21	3
1.48e+006	1.33e+006	150000	22	3
1.52e+006	1.33e+006	190000	23	3
1.37e+006	1.33e+006	40000	24	3
1.45e+006	1.33e+006	120000	25	3
1.37e+006	1.42e+006	-50000	25	4
1.43e+006	1.42e+006	10000	26	4
1.41e+006	1.42e+006	-10000	26	5
1.39e+006	1.42e+006	-30000	26	6
1.6e+006	1.42e+006	180000	27	6
1.44e+006	1.42e+006	20000	28	6
1.45e+006	1.42e+006	30000	29	6
1.5e+006	1.42e+006	80000	30	6
1.5e+006	1.42e+006	80000	31	6
1.48e+006	1.42e+006	60000	32	6
1.52e+006	1.42e+006	100000	33	6
1.37e+006	1.42e+006	-50000	33	7
1.45e+006	1.42e+006	30000	34	7
1.43e+006	1.37e+006	60000	35	7
1.41e+006	1.37e+006	40000	36	7

1.39e+006	1.37e+006	20000	37	7
1.6e+006	1.37e+006	230000	38	7
1.44e+006	1.37e+006	70000	39	7
1.45e+006	1.37e+006	80000	40	7
1.5e+006	1.37e+006	130000	41	7
1.5e+006	1.37e+006	130000	42	7
1.48e+006	1.37e+006	110000	43	7
1.52e+006	1.37e+006	150000	44	7
1.37e+006	1.37e+006	0	44	7
1.45e+006	1.37e+006	80000	45	7
1.41e+006	1.43e+006	-20000	45	8
1.39e+006	1.43e+006	-40000	45	9
1.6e+006	1.43e+006	170000	46	9
1.44e+006	1.43e+006	10000	47	9
1.45e+006	1.43e+006	20000	48	9
1.5e+006	1.43e+006	70000	49	9
1.5e+006	1.43e+006	70000	50	9
1.48e+006	1.43e+006	50000	51	9
1.52e+006	1.43e+006	90000	52	9
1.37e+006	1.43e+006	-60000	52	10
1.45e+006	1.43e+006	20000	53	10
1.39e+006	1.41e+006	-20000	53	11
1.6e+006	1.41e+006	190000	54	11
1.44e+006	1.41e+006	30000	55	11
1.45e+006	1.41e+006	40000	56	11
1.5e+006	1.41e+006	90000	57	11
1.5e+006	1.41e+006	90000	58	11
1.48e+006	1.41e+006	70000	59	11
1.52e+006	1.41e+006	110000	60	11
1.37e+006	1.41e+006	-40000	60	12
1.45e+006	1.41e+006	40000	61	12
1.6e+006	1.39e+006	210000	62	12
1.44e+006	1.39e+006	50000	63	12
1.45e+006	1.39e+006	60000	64	12
1.5e+006	1.39e+006	110000	65	12
1.5e+006	1.39e+006	110000	66	12
1.48e+006	1.39e+006	90000	67	12
1.52e+006	1.39e+006	130000	68	12
1.37e+006	1.39e+006	-20000	68	13
1.45e+006	1.39e+006	60000	69	13
1.44e+006	1.6e+006	-160000	69	14
1.45e+006	1.6e+006	-150000	69	15
1.5e+006	1.6e+006	-100000	69	16
1.5e+006	1.6e+006	-100000	69	17
1.48e+006	1.6e+006	-120000	69	18
1.52e+006	1.6e+006	-80000	69	19
1.37e+006	1.6e+006	-230000	69	20
1.45e+006	1.6e+006	-150000	69	21
1.45e+006	1.44e+006	10000	70	21
1.5e+006	1.44e+006	60000	71	21
1.5e+006	1.44e+006	60000	72	21
1.48e+006	1.44e+006	40000	73	21

1.52e+006	1.44e+006	80000	74	21
1.37e+006	1.44e+006	-70000	74	22
1.45e+006	1.44e+006	10000	75	22
1.5e+006	1.45e+006	50000	76	22
1.5e+006	1.45e+006	50000	77	22
1.48e+006	1.45e+006	30000	78	22
1.52e+006	1.45e+006	70000	79	22
1.37e+006	1.45e+006	-80000	79	23
1.45e+006	1.45e+006	0	79	23
1.5e+006	1.5e+006	0	79	23
1.48e+006	1.5e+006	-20000	79	24
1.52e+006	1.5e+006	20000	80	24
1.37e+006	1.5e+006	-130000	80	25
1.45e+006	1.5e+006	-50000	80	26
1.48e+006	1.5e+006	-20000	80	27
1.52e+006	1.5e+006	20000	81	27
1.37e+006	1.5e+006	-130000	81	28
1.45e+006	1.5e+006	-50000	81	29
1.52e+006	1.48e+006	40000	82	29
1.37e+006	1.48e+006	-110000	82	30
1.45e+006	1.48e+006	-30000	82	31
1.37e+006	1.52e+006	-150000	82	32
1.45e+006	1.52e+006	-70000	82	33
1.45e+006	1.37e+006	80000	83	33

S Statistic = 83 - 33 = 50

Tied Group	Value	Members
1	1.39e+006	2
2	1.37e+006	2
3	1.45e+006	2
4	1.5e+006	2

Time Period	Observations
4/17/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/8/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/19/2022	1
9/29/2022	1
4/19/2023	1
8/24/2023	1
4/29/2024	1
9/10/2024	1
4/15/2025	1
8/26/2025	1

There are 0 time periods with multiple data

A = 72

B = 0

C = 0

D = 0

E = 8

F = 0

a = 8880

b = 30240

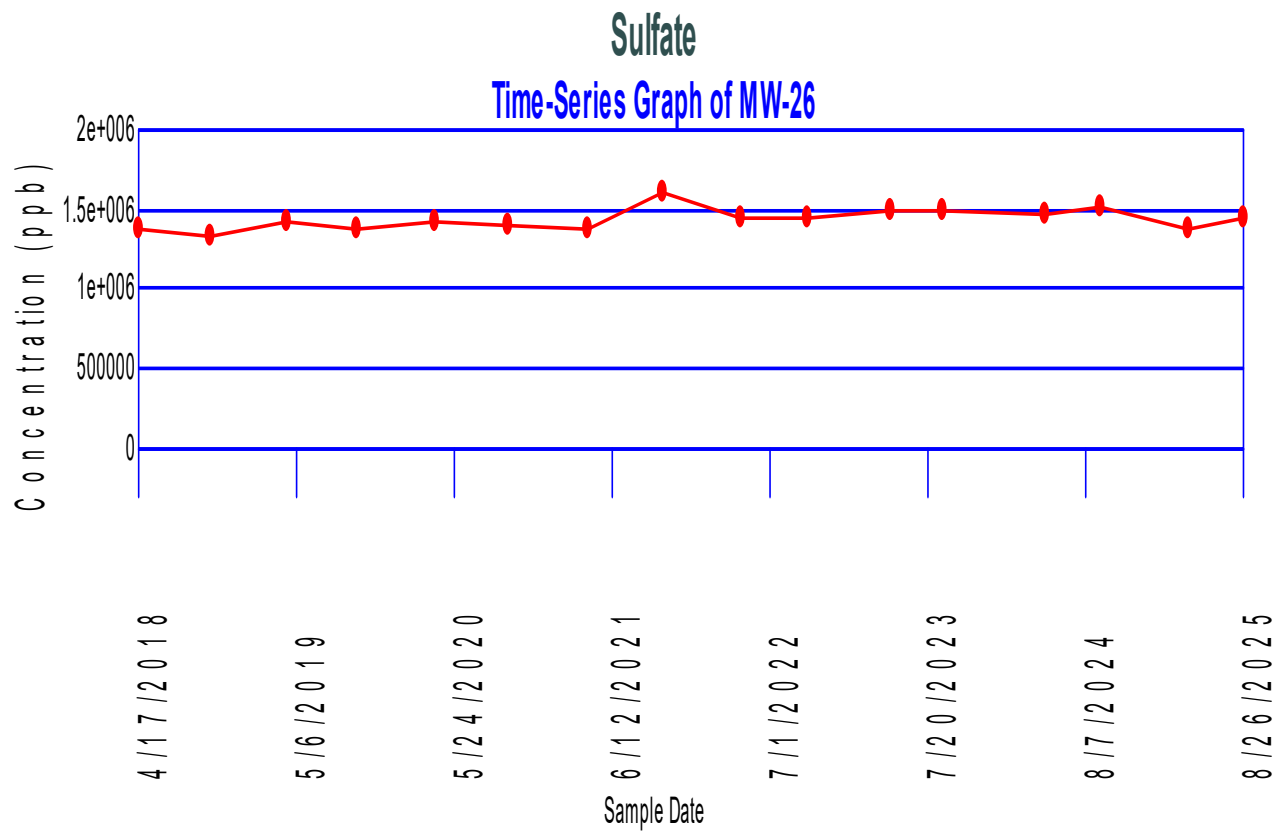
c = 480

Group Variance = 489.333

Z-Score = 2.2151

Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)

|2.2151| > 1.97737 indicating a trend



Dixon's Test for Outliers

Parameter: Sulfate

Location: MW-27

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 16 Measurements...

5% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.238095	0.238095	0.507	None

Loc.	Date	Conc.	Outlier
MW-27	4/18/2018	263000	FALSE
	10/9/2018	263000	FALSE
	4/13/2019	266000	FALSE
	10/1/2019	268000	FALSE
	4/9/2020	264000	FALSE
	10/1/2020	275000	FALSE
	4/14/2021	264000	FALSE
	10/13/2021	270000	FALSE
	4/20/2022	275000	FALSE
	9/28/2022	261000	FALSE
	4/19/2023	257000	FALSE
	8/24/2023	254000	FALSE
	5/1/2024	249000	FALSE
	9/11/2024	269000	FALSE
	4/16/2025	252000	FALSE
	8/27/2025	256000	FALSE

Shapiro-Wilks Test of Normality

Parameter: Sulfate

Location: MW-27

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 8 for 16 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	249000	275000	26000	0.5056	13145.6
2	252000	275000	23000	0.329	7567
3	254000	270000	16000	0.2521	4033.6
4	256000	269000	13000	0.1939	2520.7
5	257000	268000	11000	0.1447	1591.7
6	261000	266000	5000	0.1005	502.5
7	263000	264000	1000	0.0593	59.3
8	263000	264000	1000	0.0196	19.6
9	264000	263000	-1000		
10	264000	263000	-1000		
11	266000	261000	-5000		
12	268000	257000	-11000		
13	269000	256000	-13000		
14	270000	254000	-16000		
15	275000	252000	-23000		
16	275000	249000	-26000		

Sum of b values = 29440

Sample Standard Deviation = 7727.66

W Statistic = 0.967584

5% Critical value of 0.887 is less than 0.967584

Data is normally distributed at 95% level of significance

1% Critical value of 0.844 is less than 0.967584

Data is normally distributed at 99% level of significance

Mann-Kendall Trend Analysis
Parameter: Sulfate
Location: MW-27
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
263000	263000	0	0	0
266000	263000	3000	1	0
268000	263000	5000	2	0
264000	263000	1000	3	0
275000	263000	12000	4	0
264000	263000	1000	5	0
270000	263000	7000	6	0
275000	263000	12000	7	0
261000	263000	-2000	7	1
257000	263000	-6000	7	2
254000	263000	-9000	7	3
249000	263000	-14000	7	4
269000	263000	6000	8	4
252000	263000	-11000	8	5
256000	263000	-7000	8	6
266000	263000	3000	9	6
268000	263000	5000	10	6
264000	263000	1000	11	6
275000	263000	12000	12	6
264000	263000	1000	13	6
270000	263000	7000	14	6
275000	263000	12000	15	6
261000	263000	-2000	15	7
257000	263000	-6000	15	8
254000	263000	-9000	15	9
249000	263000	-14000	15	10
269000	263000	6000	16	10
252000	263000	-11000	16	11
256000	263000	-7000	16	12
268000	266000	2000	17	12
264000	266000	-2000	17	13
275000	266000	9000	18	13
264000	266000	-2000	18	14
270000	266000	4000	19	14
275000	266000	9000	20	14
261000	266000	-5000	20	15
257000	266000	-9000	20	16
254000	266000	-12000	20	17
249000	266000	-17000	20	18
269000	266000	3000	21	18
252000	266000	-14000	21	19
256000	266000	-10000	21	20
264000	268000	-4000	21	21
275000	268000	7000	22	21

264000	268000	-4000	22	22
270000	268000	2000	23	22
275000	268000	7000	24	22
261000	268000	-7000	24	23
257000	268000	-11000	24	24
254000	268000	-14000	24	25
249000	268000	-19000	24	26
269000	268000	1000	25	26
252000	268000	-16000	25	27
256000	268000	-12000	25	28
275000	264000	11000	26	28
264000	264000	0	26	28
270000	264000	6000	27	28
275000	264000	11000	28	28
261000	264000	-3000	28	29
257000	264000	-7000	28	30
254000	264000	-10000	28	31
249000	264000	-15000	28	32
269000	264000	5000	29	32
252000	264000	-12000	29	33
256000	264000	-8000	29	34
264000	275000	-11000	29	35
270000	275000	-5000	29	36
275000	275000	0	29	36
261000	275000	-14000	29	37
257000	275000	-18000	29	38
254000	275000	-21000	29	39
249000	275000	-26000	29	40
269000	275000	-6000	29	41
252000	275000	-23000	29	42
256000	275000	-19000	29	43
270000	264000	6000	30	43
275000	264000	11000	31	43
261000	264000	-3000	31	44
257000	264000	-7000	31	45
254000	264000	-10000	31	46
249000	264000	-15000	31	47
269000	264000	5000	32	47
252000	264000	-12000	32	48
256000	264000	-8000	32	49
275000	270000	5000	33	49
261000	270000	-9000	33	50
257000	270000	-13000	33	51
254000	270000	-16000	33	52
249000	270000	-21000	33	53
269000	270000	-1000	33	54
252000	270000	-18000	33	55
256000	270000	-14000	33	56
261000	275000	-14000	33	57
257000	275000	-18000	33	58
254000	275000	-21000	33	59
249000	275000	-26000	33	60

269000	275000	-6000	33	61
252000	275000	-23000	33	62
256000	275000	-19000	33	63
257000	261000	-4000	33	64
254000	261000	-7000	33	65
249000	261000	-12000	33	66
269000	261000	8000	34	66
252000	261000	-9000	34	67
256000	261000	-5000	34	68
254000	257000	-3000	34	69
249000	257000	-8000	34	70
269000	257000	12000	35	70
252000	257000	-5000	35	71
256000	257000	-1000	35	72
249000	254000	-5000	35	73
269000	254000	15000	36	73
252000	254000	-2000	36	74
256000	254000	2000	37	74
269000	249000	20000	38	74
252000	249000	3000	39	74
256000	249000	7000	40	74
252000	269000	-17000	40	75
256000	269000	-13000	40	76
256000	252000	4000	41	76

S Statistic = 41 - 76 = -35

Tied Group	Value	Members
1	263000	2
2	264000	2
3	275000	2

Time Period	Observations
4/18/2018	1
10/9/2018	1
4/13/2019	1
10/1/2019	1
4/9/2020	1
10/1/2020	1
4/14/2021	1
10/13/2021	1
4/20/2022	1
9/28/2022	1
4/19/2023	1
8/24/2023	1
5/1/2024	1
9/11/2024	1
4/16/2025	1
8/27/2025	1

There are 0 time periods with multiple data

A = 54
B = 0
C = 0
D = 0
E = 6
F = 0
a = 8880
b = 30240
c = 480
Group Variance = 490.333
Z-Score = -1.53544
Comparison Level at $1.0 - (0.05 / 2) = 97.5\%$ confidence level = 1.97737 (two-tailed)
|-1.53544| <= 1.97737 indicating no evidence of a trend

