# 1st QUARTER 2023 GROUNDWATER ASSESSMENT MONITORING REPORT JANUARY 2023 MONITORING EVENT

## FORMER ENVIRONMENTAL WASTE SOLUTIONS (EWS) CAMDEN CLASS II LANDFILL

## TDSWM PERMIT NUMBER IDL 03-0212 (TERMINATED) 200 OMAR CIRCLE CAMDEN, TN 38320

**Prepared for:**
**THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION**

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**CEC PROJECT 181-364**

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## EXECUTIVE SUMMARY

This report documents the 1st quarter 2023 assessment-monitoring event, which was performed at the former Environmental Waste Solutions, LLC (EWS) Camden Class II Landfill on January 31, 2023.

The former EWS Camden Class II Landfill is located in Benton County at 200 Omar Circle, Camden, Tennessee (latitude 36°03'16" N; longitude -88°05'16" W) and was formerly registered with the Tennessee Division of Solid Waste Management (DSWM) with permit number IDL 03-0212 and previously received secondary aluminum smelter waste for disposal including aluminum dross, salt cakes, and other industrial wastes. The IDL 03-0212 permit was terminated in July 2017.

Beginning in 2008, the site entered the Groundwater Detection-Monitoring Program, and groundwater samples were collected from site monitoring wells on a semi-annual basis. EWS entered the Assessment Monitoring Program because of chloride concentrations reported above the 250 mg/l EPA secondary drinking water standard (2DWS) at monitoring well MW-3 during the November 2015 semi-annual detection-monitoring event. As a result, additional groundwater quality assessment activities were completed which included the installation of a new permanent groundwater monitoring well (MW-5), the installation of three (3) temporary monitoring wells (TMW-1, TMW-2, TMW-3), and completion of a private water-use survey. In addition, the semi-annual detection monitoring frequency was increased from semi-annual to quarterly assessment monitoring. The observed chloride concentration at MW-3 during this January 2023 event (11.5 mg/l) was well below the 2DWS.

Quarterly assessment-monitoring activities have been performed since the November 2015 monitoring event in general accordance with the site's Groundwater Quality Assessment Plan (GWQAP) dated March 14, 2016. During the second quarter 2017 assessment-monitoring event, total cadmium was detected above the maximum contaminant level (MCL) at MW-3, which was the first MCL exceedance for total cadmium concentrations at any well location on site. As a result, enhancements have been made to the sampling and analytical program for the site. Cadmium was not detected above the PQL at any wells sampled during the first quarter 2023.

The 1st quarter 2023 sampling event at the facility included the following sampling activities:

Groundwater samples were collected by CEC on January 31, 2023, from MW-1, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3. A leachate sample was collected from the "Industrial Waste Cell (IWC)" on February 21, 2023. No leachate samples were collected from the "Aluminum Processing Waste Cell (APWC)" during this sampling event since leachate was not currently being generated from the APWC. The amount of leachate produced from the IWC and APWC has been minimal since the landfill was capped, and the leachate flows being pumped from

the IWC cell have been intermittent. In addition, the amount of leachate produced from the APWC appears to have halted since the landfill was capped.

Pace Analytical (Pace) is the laboratory sub-contracted to perform the chemical analyses. Laboratory reports for the 1st quarter 2023 groundwater analyses were prepared by Pace and reported to CEC on January 31, 2023 for the groundwater samples and February 22, 2023 for the IWC leachate samples.

The reported concentrations of chemicals detected in the groundwater monitoring wells and temporary monitoring wells were reviewed and compared against their respective U.S. EPA Maximum Contaminant Levels (MCLs) and U.S. National Secondary Drinking Water Standards (2DWS). Where primary or secondary standards were not available (i.e., cobalt), concentrations were reviewed and compared against their EPA Regional Screening Levels (RSLs). Statistical analysis methods were used to identify whether there were any statistically significant increases (SSIs) in any site monitoring wells over background concentrations for the analyzed water quality parameters. The results of the analyses during this assessment-monitoring event are summarized in the following paragraphs.

Although efforts were made during this sampling event to reduce the turbidity, the turbidity values observed at MW-1 (10.23 NTU), MW-3 (33.1 NTU), and MW-5 (12.30 NTU) during sample collection were slightly above the recommended 10 NTUs. Because these wells exceeded the recommended turbidity of 10 NTUs, a dissolved metals sample was collected at each location. Generally, when turbidity is high, dissolved metals concentrations can provide a better representation of groundwater conditions; however, the turbidity values measured during the first quarter 2023 monitoring event slightly exceeded the 10 NTU recommendation and the reported total metals and dissolved metals concentrations were similar during this monitoring event. Therefore, the total metals concentrations were not replaced with the dissolved metals concentrations in the statistical database. Since 2017, dissolved metals analysis has been completed in addition to total metals analysis for a number of events when the turbidity was above 10 NTU. Based on a review of the total metals analysis vs. dissolved metals analysis, the reported metals concentrations were similar in concentrations and were not greatly affected by turbidity considering most turbidity measurements at each sample location have been less than 50 NTU. Therefore, it may not be necessary to sample for dissolved metals analysis in addition to total metals analysis if the turbidity values remain less than 50 NTU.

Eight SSIs were identified over background during this event. SSIs included chloride (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3), zinc (MW-3), and sulfate (MW-3). The observed SSIs during this event were indicated as SSIs during the previous monitoring event. The current chloride, zinc, and sulfate detections observed in the site monitoring wells were all below their associated MCLs or 2DWS.

## Glossary of Terms

| | |
|---|---|
| Appendix I | Refers to the required regulatory sample list of groundwater parameters |
| CEC | Civil & Environmental Consultants, Inc. |
| Class I Landfill | Municipal Solid Waste Landfill |
| Class II Landfill | Industrial Waste Landfill |
| Class IV Landfill | Construction/Demolition Waste Landfill |
| Class III/IV Landfill | Landscaping and Construction/Demolition Waste Landfill |
| DML | Construction Demolition Landfill |
| US EPA | United States Environmental Protection Agency |
| Pace | Pace Analytical |
| EWS | Environmental Waste Solutions |
| GW | Groundwater |
| HDPE | High Density Polyethylene |
| HI | Hydrogeologic Investigation |
| MCL | Maximum Contaminant Level |
| microomhos•cm-1 | micro-Siemens per centimeter |
| mg/l | milligrams per Liter |
| MW | Monitor Well |
| NPPL | Non-parametric prediction limit analysis |
| ORP | Oxidation Reduction Potential |
| POTW | Publicly Owned Treatment Works |
| ppm | parts per million* |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| 2DWS | Secondary Drinking Water Standard (EPA) |
| SESD | Science and Ecosystem Support Division |
| SNL | Sanitary Landfill |
| SSI | Statistically Significant Increase |
| TDEC | Tennessee Department of Environment and Conservation |
| TDOG | Tennessee Division of Geology |
| TDSWM | Tennessee Division of Solid Waste Management |
| TOC | Top of Casing |
| VOC | Volatile Organic Compound |

* ppm – parts per million* is equivalent to mg/l – milligrams per Liter for water samples

# 1.0 INTRODUCTION

## 1.1 SITE LOCATION

The former EWS Camden Class II landfill is located just off Highway US 70 at 200 Omar Circle, Camden, Tennessee. The site is located on the Camden, Tennessee USGS quadrangle at north latitude 36° 03' 12" and west longitude -88° 05' 12" at an average elevation of 400 feet above mean sea level datum (MSL). The location of the facility is shown in **Appendix A – Figure 1 – Site Location Map**. The landfill footprint can be viewed in **Appendix A – Figure 2 – Potentiometric Surface Map**.

## 1.2 CURRENT ACTIVITIES

The former EWS Camden Class II landfill is not currently operating (i.e., the permit has been terminated) and landfill cap construction and closure activities have been completed by TDEC. Continued post-closure activities at the facility are being implemented to protect the environment and human health. These activities include leachate pre-treatment, leachate hauling and disposal, stormwater management activities, and groundwater monitoring activities.

# 2.0 AQUIFER CHARACTERISTICS

## 2.1 GEOLOGIC AND AQUIFER CHARACTERISTICS

The extensive reworking of the site because of the excavation of chert for local road and fill projects has impacted the original site geology. Based upon a review of the Tennessee Division of Geology (TDOG) Geologic Map and site observations, it appears that the site is within the Camden and Harriman Formations. It is reported by the TDOG that the Camden and Harriman Formations are lithologically identical and not enough fossils are present to form a convenient basis for subdivision.

### 2.1.1 Camden and Harriman Formations

The Camden and Harriman Formations are described as follows: chert, gray with specks and mottling's of very light-gray and yellowish-gray (surfaces stained pale to dark yellowish-orange), bedded and blocky (beds 2 to 8 inches thick), dense, conchoidal fracture, contains pods of white to light gray tripolitic clay, locally stained yellow and brown, and fossiliferous. Locally, especially near the top, fragments of chert are cemented into large masses and beds of breccia by dark-brown to moderate-red limonite.

Groundwater potentiometric data collected from the uppermost water-bearing zone across the entire landfill site footprint during the 1999 and 2006 hydrogeological investigations indicated that groundwater flow in the uppermost aquifer is generally to the south. Comparisons of the water bearing zone elevations to static groundwater elevations indicate an unconfined aquifer.

## 2.2 MONITOR WELL INTEGRITY & STATIC WATER LEVELS

The groundwater-monitoring network for the former EWS Class II Landfill currently consists of monitoring wells MW-1 (up-gradient), MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3. Due to insufficient groundwater recharge volumes for sampling, MW-2 has been removed from the regular sampling network and replaced by MW-4. MW-2 is still intact and is used for potentiometric surface measurements and field parameter testing. Monitoring well MW-1 serves as an up-gradient monitoring point, while monitoring wells MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 serve as down-gradient monitoring points. The temporary wells (TMW-1, TMW-2, and TMW-3) were installed with the purpose of delineating the areal extent of groundwater contamination and providing additional potentiometric interpretation. The installation of these temporary wells was in response to elevated chloride concentrations at MW-3, which were first detected during the November 2015 sampling event. In addition to providing potentiometric information for the site, these temporary wells yield groundwater samples for water-quality analyses.

The following table presents the wells that were used to develop this report.

| Up-gradient Monitoring Points | Down-gradient Monitoring Points |
|---|---|
| MW-1 | MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 |

Before purging and sampling activities began, depth to water (DTW) measurements were collected at each of the above-referenced monitoring wells using an electronic water level indicator such as the Solinst® model #122 electronic water-level indicator. DTW measurements were also collected from MW-2 for potentiometric interpretation. DTW measurements were collected in the following order from first to last: MW-1, MW-5, TMW-1, TMW-2, TMW-3, MW-4, MW-2, and finally MW-3.

The integrity of each monitoring well was checked during each sampling event prior to groundwater collection. The physical condition of each wellhead was observed and noted along with the condition of all locking mechanisms for each monitoring well. Once the watertight seal was removed from the top of each monitoring well's casing, the well was allowed to equilibrate to atmospheric conditions. The water-level indicator was decontaminated in accordance with the United States Environmental Protection Agency-Science and Ecosystem Support Division (USEPA SESD) procedures for field water-level measurements in between wells, and a new pair of clean nitrile gloves were donned at each monitoring location while collecting DTW measurements. The decontaminated electronic water-level indicator was slowly lowered into the well to establish the distance between the top of casing and the elevation of free groundwater. The electronic probe was capable of determining this distance to within one-hundredth of one foot (0.01 foot). The distance was written in the site-specific field book or field data sheet as DTW. Upon collection of these data, the electronic water-level indicator was removed from the monitoring well and decontaminated.

The following equation is used to determine the elevation of groundwater at each well:

*Established Top of Casing Elevation – Depth to Water = Groundwater Elevation*

Top of casing elevation has been determined by a licensed land surveyor and is referenced to the current Tennessee State Plane Coordinate System. The top of casing elevations for all site-monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3) were updated by a licensed land surveyor on May 12, 2016. Groundwater elevations are listed in **Appendix A – Table 1 – Field Parameters & Potentiometric Data** and reflect the most recent survey.

## 2.3 GROUNDWATER FLOW DIRECTION

Groundwater at the landfill appears to generally flow in a southern direction towards Charlie Creek and Cane Creek. Groundwater flow in the vicinity of the former EWS Class II Landfill generally flows from a topographic high north of the landfill towards monitoring wells MW-2, MW-3, MW-

4, and MW-5 and temporary monitoring wells TMW-1, TMW-2, and TMW-3, which are all down-gradient of the waste cells.

## 2.4 POTENTIOMETRIC GRADIENT

The potentiometric surface of the unconfined aquifer occurring beneath the former EWS Class II Landfill occurs at approximately 26.00 feet below the top of casing at the up-gradient monitor well MW-1 to approximately 11.45 feet below the top of casing at monitor well MW-4. The potentiometric gradient calculated from groundwater elevation data collected on January 31, 2023 is approximately 0.0118 ft./ft.

The potentiometric gradient is calculated according to the following formula:

$$\frac{\text{Highest GW. Elev. (MW-1)} - \text{Lowest GW. Elev. (MW-4)}}{\text{Horizontal Distance between the Wells}} * 100 = \text{Pot. Grad.}$$

$$\frac{(395.07') - (372.57')}{1{,}910'} = 0.0118 \text{ ft./ft.}$$

The above calculation assumes a perpendicular gradient between the potentiometric elevations from MW-1 and MW-4. These assumptions may provide an artificially higher potentiometric gradient than is likely occurring at the site.

## 2.5 HYDRAULIC CONDUCTIVITY

Hydraulic conductivity estimations within the uppermost aquifer occurring beneath the landfill have not been determined at this time.

# 3.0 GROUNDWATER SAMPLING PROCEDURES

## 3.1 INSTRUMENTATION

Before purging and sampling activities began, DTW measurements were collected at each of the monitoring wells. A YSI Professional Plus® multi-parameter instrument (YSI) was used to record pH, conductivity, temperature, dissolved oxygen (DO), and oxidation-reduction potential (ORP) during groundwater sampling events at the landfill. A Hach® model 2100Q turbidity meter was used to collect turbidity readings. Each instrument was either checked against known standards or calibrated per manufacturers' specifications prior to the commencement of sampling activities.

## 3.2 GROUNDWATER PURGING AND COLLECTION OF FIELD PARAMETER VALUES

On November 29, 2017, dedicated submersible bladder pumps (low-flow bladder pumps) were installed in each of the groundwater monitoring wells (MW-1, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3). During the December 11, 2017 sampling event, monitoring personnel for the former EWS Class II Landfill began utilizing low-flow protocols as described within the USEPA's Issue Paper EPA/540/S-95/504: Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, April 1996. The low-flow protocols have continued to be utilized by monitoring personnel during each quarterly groundwater assessment-monitoring event since December 11, 2017. Additionally, groundwater-sampling activities were completed during this sampling event in accordance with the USEPA SESD sampling procedure -SESDPROC-301-R4 titled "Groundwater Sampling", effective April 26, 2017.

Each dedicated submersible bladder pump is of stainless-steel construction, and each is equipped with a Teflon™ bladder and dedicated Teflon™-lined bonded twin polyethylene tubing (airline and water discharge line). The low-flow bladder pumps were operated by using a special control box, which controls the pressure and frequency of the pumping action and was used to adjust the flow rate of the water. The flow rate used was adjusted to minimize stress (drawdown), prevent damage to monitoring well components, and to minimize the risk of introducing sediments into the monitoring well through the well's gravel pack. Water pumped was withdrawn directly from the formation with little mixing of casing water or disturbance to the sampling zone. The initial amount of purged groundwater was collected in a clean, high-density polyethylene (HDPE) flow-through cell while measuring temperature, pH, conductivity, DO, and ORP. A turbidity meter was used to collect turbidity readings during low-flow purging activities.

The start time of purging, the parameter measurements at intervals during purging, estimated pumped volumes, depths to water for low-flow sampling, and any notes of unusual conditions were recorded during purging activities. Field parameter measurements (temperature, pH, conductivity, DO, ORP, and turbidity) were collected periodically until proper field stabilization goals had been met, which are defined by the USEPA SESD as: "for at least three consecutive measurements, the pH remains constant within 0.1 Standard Unit (SU), conductivity varies no

more than 5 percent, and the turbidity has either stabilized or is below 10 Nephelometric Turbidity Units (NTUs)". Other parameters such as DO were also measured as a purge-adequacy parameter. Normal goals for DO are 0.2 mg/l or 10% saturation, whichever is greater. Temperature and ORP were measured during purging to obtain measurements of record for these parameters for each sampling event.

During the January 2023 monitoring event, a peristaltic pump was utilized during purging activities in the temporary monitoring wells (TMW-1, TMW-2, and TMW-3). According to the USEPA SESD groundwater sampling procedures, peristaltic pumps can be utilized as an alternative and acceptable method for low-flow or multiple volume purging and sampling activities.

Peristaltic pumps require three separate pieces of tubing in order to function: (1) a section of Teflon® tubing, which is lowered into the well; (2) a small section of flexible Masterflex® silicone tubing, which is installed into the peristaltic pump head; and (3) a small section of Teflon® tubing, which connects the pump head to the flow-through cell. The first section of tubing was deployed to the approximate mid-screen within the well (approximately 4 feet above the bottom of the well casing) and cut above the ground surface. The free end of the first section of tubing was connected to the flexible Masterflex® silicone tubing situated in the peristaltic pump head. Finally, the third section of tubing (second section of Teflon® tubing) connected the Masterflex® silicone tubing at the pump head to the flow-through cell for collection of field chemistry parameter measurements. In order to prevent the transfer of residuals between sampling locations, all three sections of tubing were replaced between each well. After replacement of all sections of tubing, the peristaltic pump was turned on, and a suitable (slow) pumping rate was achieved to maintain a minimal and stable drawdown level. Field parameters were collected from the initial amount of water that was purged and measurements were collected periodically until the parameters had stabilized as described above.

With respect to groundwater chemistry, an adequate purge is achieved when the pH and conductivity have stabilized and the turbidity either has stabilized or is below 10 NTUs. If the field parameters were not stable, the purging procedures continued until one of the following adequate purge conditions were met:

1. Field stabilization occurred.
2. Well was purged dry. For wells with slow recovery, attempts were made to avoid purging to dryness by slowing the purge rate. In some situations, even with slow purge rates, the well may be pumped dry. This situation generally indicates that an adequate purge had been achieved and the well was sampled following sufficient recovery (enough volume to allow filling of all sample containers).
3. A minimum of three well volumes were purged.

Field chemistry parameters were collected periodically at the temporary wells until field parameter measurements had stabilized, and at least three well volumes were removed from each temporary

monitoring well. The purge water from down-gradient monitoring wells MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 were containerized and discarded into the on-site leachate collection system storage tank.

Turbidity values measured at MW-1 (10.23 NTU), MW-3 (33.1 NTU), and MW-5 (12.30 NTU) were slightly above the recommended value of 10 NTU; therefore, dissolved metals samples were collected at these locations (in addition to total metals). Dissolved metals samples collected for analysis were lab-filtered and were collected for analysis in an unpreserved container and placed on ice.

A summary of field parameter values for each well are presented in **Table 1 – Field Parameters and Potentiometric Data in Appendix A**. A detailed account of each purge and sample procedure conducted at each monitoring well is presented in the field information logs located in **Appendix C – Laboratory Analytical Report & Field Information Logs**.

## 3.3 GROUNDWATER SAMPLE COLLECTION & PRESERVATION

Groundwater samples were collected from monitoring wells when field parameter data indicated that stagnant water had been purged from the well and replaced by groundwater from the adjacent formation that is representative of actual aquifer conditions. Groundwater was placed in the laboratory supplied sample vessels in the following order: Appendix I organics – three (3) forty (40) mL amber glass containers preserved with hydrochloric acid (HCl); Appendix I organics EDB and DBCP – three (3) forty (40) mL clear glass containers preserved with sodium thiosulfate ($Na_2S_2O_3$); total metals (Appendix I metals, Al, Ca, Fe, K, Mg, Mn, Na, and Boron) – one (1) two-hundred fifty (250) ml HDPE container preserved with nitric acid ($HNO_3$); alkalinity – one (1) one-hundred (100) ml unpreserved amber glass container; bromide, chloride, nitrate, and sulfate – one (1) two-hundred fifty (250) ml unpreserved HDPE container; COD & ammonia – one (1) two-hundred fifty (250) ml HDPE jar preserved with sulfuric acid ($H_2SO_4$).

As described in the previous section, a peristaltic pump was used to purge temporary monitoring wells TMW-1, TMW-2, and TMW-3. Samples for organic analysis cannot be exposed to the flexible peristaltic pump-head tubing, due to the risk of contaminant sorption and/or the risk of the dissolution of organic compounds to the sample.

## 3.4 LEACHATE SAMPLING PROCEDURES

The amount of leachate produced from the "Industrial Waste Cell (IWC)" and "Aluminum Processing Waste Cell (APWC)" has been minimal since the landfill was capped, and the leachate being pumped from the IWC cell has been intermittent. In addition, it appears that the leachate generation in the APWC cell has halted since the landfill was capped. During this January 2023 groundwater-sampling event, a leachate sample was collected from the IWC cell. However, no leachate was being pumped from the APWC. Therefore, no APWC leachate sample was collected for analysis during this monitoring event, which is consistent with previous quarterly groundwater

monitoring events. Attempts will be made to sample the IWC leachate during each groundwater-monitoring event in the future. The approximate APWC and IWC leachate sample locations are shown on **Figure 2 – Potentiometric Surface Map located in Appendix A**.

The IWC leachate sample was collected directly from the associated leachate collection hose within the secondary containment area before the leachate entered the IWC leachate collection tank. A dedicated sample port has been installed on the IWC-leachate line, which was used for collecting the leachate sample. An air pump was utilized to pump leachate from the sump to the IWC leachate tank through associated hoses within the secondary containment area. To ensure the hoses were clear of stagnant water or leachate, the leachate was pumped for approximately 10 minutes prior to sample collection. After pumping for 10 minutes, the leachate sample was collected by opening the dedicated sample port valve and filling the sample containers appropriately.

## 3.5 QUALITY ASSURANCE AND QUALITY CONTROL

### 3.5.1 Field Quality Assurance and Quality Control

Field Quality Assurance and Quality Control (QA/QC) samples were collected as part of the groundwater-sampling program. Quality assurance (with internal laboratory quality controls) addresses the accuracy and repeatability of analytical results after analysis in the laboratory. Quality control addresses methods to preserve the integrity of samples in the field and during shipping to the laboratory. Quality control may be accomplished by incorporating trip blanks, field blanks, field duplicates, and equipment (rinsate) blanks into the analytical program.

A field blank and a duplicate sample were collected during this groundwater-monitoring event. CEC collected a field blank near monitoring well TMW-3 and a duplicate sample was collected from TMW-2. The field blank was collected by pouring deionized water into a set of sample bottles provided by the laboratory, thereby allowing any airborne contaminants a chance to enter the field blank sample. The duplicate sample was collected by taking separate samples at TMW-2 at the same time.

Pace reported the groundwater QA/QC laboratory analytical results to CEC on January 31, 2023. Laboratory analytical testing of the field blank presented in the analytical report showed that no constituents were detected above the laboratory PQLs during this January 2023 event.

The results for the duplicate sample collected from TMW-2 were similar to the original TMW-2 sample results. The relative percent difference (RPD) between all detected constituent values reported in TMW-2 and the duplicate sample were within the acceptable 20% RPD control limit.

### 3.5.2 Laboratory Quality Assurance and Quality Control

In order to demonstrate that a laboratory is producing data of adequate precision, accuracy and sensitivity, it is necessary to assess all laboratory procedures at all stages from sampling to reporting. The laboratory completed specific control and assessment procedures designed to monitor, quantitatively, the accuracy and precision of specific assays. Laboratory Internal Quality Assurance (IQA) refers to the full range of practices employed to ensure that laboratory results are reliable. Internal Laboratory Quality Control (IQC) consists of the operational techniques used by the laboratory staff for continuous assessment of the quality of the results of individual analytical procedures. The specific quality-control procedures utilized by the analytical laboratory are summarized in the following table:

| Quality Criteria Category | Quality Control Laboratory Methods |
|---|---|
| Precision | Laboratory duplicates at a frequency of one per matrix spike, one per laboratory control sample, and one per method blank. |
| Bias | Matrix spikes, laboratory control samples, method blanks at a frequency of one sample per standard batch. |
| Representative and Comparable Data | Adherence to standard analytical procedures, analytical methods, units of measurement, and detection limits. |

The internal laboratory IQA and IQC results are included in the laboratory analytical reports located in **Appendix C – Laboratory Analytical Reports & Field Information Logs**. All qualifier codes and their descriptions can be found on page 55 of 58 in the laboratory report found in **Appendix C**.

## 3.6 SAMPLE CHAIN-OF-CUSTODY

A sample Chain-of-Custody (COC) traveled with each sample kit from Pace to the former EWS Class II Landfill site and back to Pace for analysis.

# 4.0 LABORATORY ANALYTICAL PROCEDURES

## 4.1 ANALYTICAL METHODS

All laboratory analyses for the 1st quarter 2023 groundwater assessment-monitoring event were completed by Pace Analytical. The analytical methods chosen for these monitoring events were in full compliance with the procedures required by the DSWM and the USEPA's publication SW-846, entitled Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (3rd Edition).

The SW-846 methods used for the analysis of groundwater and leachate were as follows:

| | |
|---|---|
| Method 6010b | Inductively Coupled Plasma (ICP) – Atomic Emission Spectrometry (Boron only) |
| Method 6020 | ICP – Mass Spectrometry (metals) |
| Method 2320 B-2011 | Alkalinity |
| Method 7470A | Mercury in Liquid Waste – Manual Cold Vapor Technique |
| Method 8011 | 1,2-dibromoethane & 1,2 dibromo-3-chloropropane by Micro-extraction and Gas Chromatography |
| Method 8260B | Volatile Organic Compounds by Gas Chromatograph/Mass Spectrometry |
| Method 9056A | Determination of Inorganic Anions by Ion Chromatography (Bromide, Chloride, Fluoride, Nitrate, and Sulfate) |
| Method 130.1 | Hardness (colorimetric) as $CaCO_3$ |
| Method 350.1 | Ammonia Nitrogen |
| Method 410.4 | Chemical Oxygen Demand (COD) |

## 4.2 LABORATORY ANALYTICAL RESULTS

Constituent values from all inorganic laboratory analyses for groundwater and leachate samples, along with applicable MCLs or 2DWSs, are presented in **Table 2 – Groundwater and Leachate Analytical Data in Appendix A**. Copies of the laboratory reports are located in **Appendix C – Laboratory Analytical Report & Field Information Logs**.

### 4.2.1 EWS Groundwater Quality Relative to the EPA Primary Drinking Water Standards

**Total Arsenic** has been detected at concentrations that exceed the MCL during previous monitoring events at up-gradient well MW-1, only. Arsenic was not detected above the MCL (0.01 mg/l) at up-gradient MW-1 (0.00607 mg/l) during the first Quarter 2023 event. Arsenic was not detected above the laboratory PQL (<0.002 mg/l) in any of the down-gradient monitoring wells during this January 2023 event, which is consistent with previous sampling events. For this site, the presence of arsenic in the local groundwater is considered to be naturally occurring, originating from deposits in the soil overburden since there is no immediate development up-gradient of MW-1.

**Cadmium (Total or Dissolved)** was not detected at any of the locations sampled during the first quarter 2023 monitoring event. However, it is important to note that cadmium has been detected on multiple occasions at MW-3 since November 2016. A summary of cadmium concentrations (total cadmium and dissolved cadmium), turbidity values, and groundwater elevations observed at MW-3 during each sampling event since May 9, 2016 is referenced in the table and figure below:

| **MW-3**<br>**Summary of Cadmium Concentrations, Turbidity Measurements, and Groundwater Elevations** | | | | |
|---|---|---|---|---|
| **Date** | **Total Cadmium (mg/l)** | **Cadmium Dissolved (mg/l)** | **Turbidity (NTU)** | **Groundwater Elevations (ft. MSL)** |
| 01/31/2023 | <0.00100 | <0.00100 | **33.1** | 381.50 |
| 11/7/22 | **0.00686** | **0.00559** | **18.6** | 371.30 |
| 8/12/22 | **0.00555** | **0.00387** | **146** | 372.96 |
| 5/13/2022 | <0.00100 | **NA** | **18.9** | 374.80 |
| 2/9/2022 | <0.00100 | **NA** | **27.5** | 379.40 |
| 11/18/2021 | **0.00188** | **NA** | **18.5** | 374.10 |
| 8/26/21 | **0.00595** | **0.00589** | **28.7** | 373.10 |
| 5/20/2021 | **0.00265** | NA | **12.5** | 374.45 |
| 3/2/2021 | **0.00249** | NA | **5.38** | 384.27 |
| 12/8/2020 | **0.00906** | **0.00787** | **10.8** | 373.35 |
| 11/17/2020 | **0.00816** | NA | **14.0** | 373.24 |
| 8/26/2020 | **0.00242** | NA | **6.66** | 375.87 |
| 6/2/2020 | **0.00278** | NA | **5.38** | 374.31 |
| 2/27/2020 | **0.00214** | NA | **7.63** | 373.97 |
| 11/20/2019 | **0.00157** | NA | **2.11** | 378.22 |
| 9/6/2019 | **0.0088** | NA | **2.98** | 373.25 |
| 6/4/2019 | **0.0292** | **0.0297** | **2.98** | 374.29 |
| 3/5/2019 | **0.0117** | **0.0133** | **6.27** | 374.40 |
| 12/4/2018 | **0.144** | **0.139** | **4.77** | 377.73 |
| 9/27/2018 | **0.204** | **0.204** | **1.05** | 384.61 |
| 9/12/2018 | **0.297** | **0.320** | **1.12** | 375.02 |
| 6/19/2018 | **0.0312** | **0.0292** | **4.90** | 373.47 |
| 3/22/2018 | **0.00671** | **0.00637** | **24.3** | 377.25 |
| 12/14/2017 | **0.00659** | **0.00733** | **23.0** | 373.03 |
| 9/28/2017 | **0.00926** | **0.0102** | **18.9** | 373.25 |
| 8/8/2017 | **0.0113** | NA | **16.6** | 373.42 |
| 6/8/2017 | **0.0286** | NA | **34.8** | 372.92 |
| 11/10/2016 | **0.00177** | NA | **64.5** | 372.91 |
| 5/9/2016 | <0.001 | NA | **8.39** | 379.50 |

NA-Not Analyzed

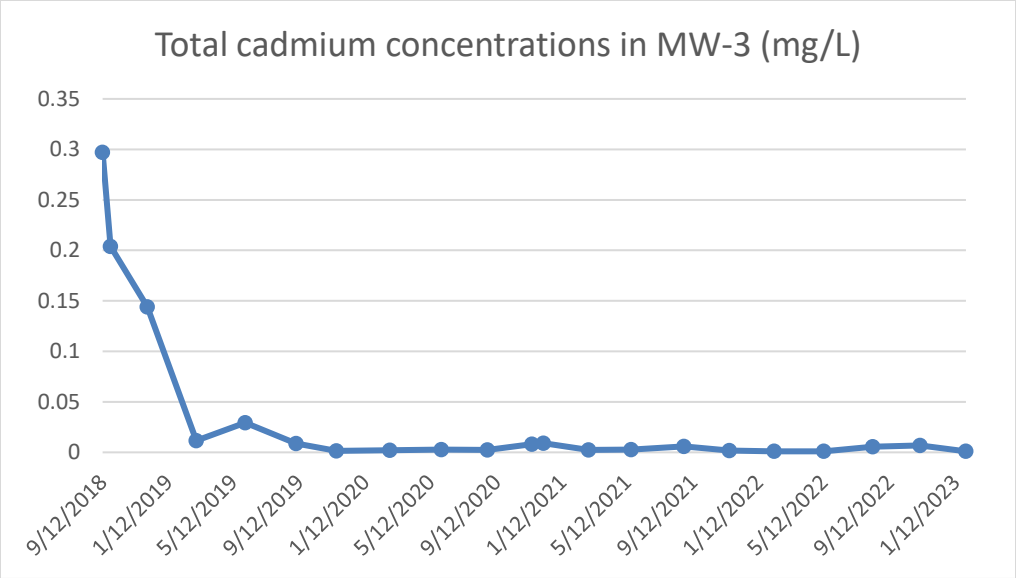



Figure – Cadmium Concentrations in MW-3

Since the fall of 2018, the total cadmium observed in MW-3 has shown an overall decrease in concentration. In addition, Mann-Kendall identified a statistically significant decreasing trend for total cadmium concentrations at MW-3 when considering data from the past 28 sampling events since November 10, 2016. During the four consecutive sampling events from November 2019 to August 2020, the cadmium concentrations at MW-3 were below the MCL. Since August 2020, the total cadmium detections at MW-3 have been intermittent during recent events at concentrations just above the MCL (November 2020, December 2020, and August 2021) and below the MCL (March 2020 and May 2021). During the November 2021 sample event, the total cadmium concentrations reported in MW-3 and the duplicate sample collected from MW-3 were below the MCL. Total cadmium was not detected over the laboratory PQL (<0.001 mg/l) at MW-3 or the duplicate sample collected from MW-3 during the previous May 2022 and February 2022 sampling events, but exceeded the MCL during the remainder of 2022.

As mentioned previously, the turbidity values observed at MW-3 were above the recommended 10 NTUs throughout the purging and sampling procedures during the previous November 2022 sampling event, and the turbidity value observed at MW-3 during this current January 2023 event was slightly over 10 NTUs during sampling. The purge rate during low-flow purging procedures at MW-3 was very low (approximately 0.05 gallons per minute), indicating that the rate of groundwater recharge at MW-3 was very minimal. Although efforts were made in the field to reduce the turbidity at MW-3 during sample collection, the turbidity remained elevated during sample collection (33.1 NTU). Therefore, dissolved metals samples were collected for analysis from MW-3 for statistical analysis.

**Total Cobalt** was detected in up-gradient well MW-1 (0.0458 mg/l) during this January 2023 event. Dissolved cobalt was also detected in MW-1 at a slightly lower concentration (0.0435 mg/l). Cobalt does not have an MCL; however, the TDEC-DSWM uses the EPA regional screening level (RSL) of 0.006 mg/l as the groundwater protection standard for this constituent. The reported

cobalt detection at up-gradient well MW-1 was above the RSL for cobalt during this January 2023 event. Cobalt has historically been detected at concentrations that exceed the RSL at MW-1 prior to the disposal of waste in the landfill, and total cobalt was detected in MW-1 at similar concentrations during previous events. For this site, the presence of cobalt in the local groundwater is considered to be naturally occurring, originating from deposits in the soil overburden, since there is no development immediately up-gradient of MW-1. In addition, cobalt was not detected above the PQL at any of the down-gradient monitoring well locations during this monitoring event.

**Total Chromium** was not detected at any wells during the first quarter 2023 sampling event. Dissolved chromium was detected above the PQL at MW-5; however, this detection was marked with a "B" qualifier indicating chromium was detected in the associated laboratory control blank. Therefore, this value did not replace the total metals value for chromium in the statistical database.

**Total Mercury** was not detected above the PQL (<0.000200 mg/l) in any wells during this January 2023 sample event. At upgradient MW-1, a dissolved mercury concentration of 0.000988 mg/l was reported during this event. Concentrations of total mercury have fluctuated above and below the PQL at MW-1 since January 2009. Total mercury has not been detected above the laboratory PQL in any of the down-gradient monitoring wells since monitoring began at the site in 2008. The presence of mercury in the local groundwater near up-gradient monitoring well MW-1 may be attributable to naturally occurring deposits in the soil overburden, since there is no development immediately up-gradient of MW-1.

### 4.2.2 EWS Groundwater Quality Relative to the National Secondary Drinking Water Standards

Laboratory analytical results for the groundwater samples collected during the January 2023 sampling event from the former EWS Class II Landfill groundwater monitoring well network indicated that three of the site-specific groundwater-monitoring lists of compounds were detected at concentrations that exceeded the National Secondary Drinking Water Standards (2DWS). Those parameters include total **aluminum** in down-gradient well MW-3; total **iron** in up-gradient well MW-1; and **manganese** in up-gradient well MW-1 and down-gradient well MW-5. Note dissolved aluminum was not detected above the laboratory PQL in MW-3 during this event. **Chloride, sulfate, nickel,** and **zinc** detections were below the 2DWS in all monitoring wells during this event. The observed concentrations for the constituents given below are discussed relative to the 2DWS.

The **Total Aluminum** concentration observed in down-gradient well MW-3 (0.473 mg/l) was above the 2DWS (0.2 mg/l). However, dissolved aluminum was not detected above the PQL (<0.1 mg/l) in MW-3 during this event. Aluminum was also detected above the PQL in wells MW-5 and TMW-2 during the first quarter 2023 sampling event but was below the 2DWS in both wells.

The **Chloride** concentrations reported at MW-1, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 during this January 2023 event were below the 2DWS for chloride (250 mg/l) and are

similar to concentrations reported during previous sampling events with the exception of MW-3, which continues its overall decreasing trend.

**Fluoride** was detected above its PQL at MW-3 during the first quarter 2023. Fluoride was not detected above the PQL at the remaining locations sampled during this monitoring event, consistent with historical results.

**Total Iron** was detected above the 2DWS (0.3 mg/l) in up-gradient well MW-1 (13.4 mg/l) during this January 2023 monitoring event. Total iron was also detected above the laboratory PQL (<0.100 mg/l) in MW-3 (0.243 mg/l) and MW-5 (0.174 mg/l) but was below the 2DWS in both wells. A dissolved concentration of iron (0.723 mg/l) was detected above the 2DWS in MW-5. The reported total iron concentrations at each of the groundwater monitoring wells were less than the highest concentrations observed prior to placement of waste and do not exhibit a trend via time-series graphs. The presence of iron in the local groundwater is naturally occurring, originating from deposits in the soil overburden, and iron has consistently been detected above the 2DWS in up-gradient well MW-1.

**Total Magnesium** does not currently have an established MCL, 2DWS, EPA RSL, or an approved alternate groundwater protection standard (GWPS). The total magnesium concentration at MW-3 during this January 2023 event (7.17 mg/l) is similar to the previous November 2022 event (6.48 mg/l). In general, the total magnesium levels reported in MW-3 have been decreasing since 2018. Magnesium was also detected above the laboratory PQL (1.00 mg/l) during the January 2023 event in MW-1, MW-4, MW-5, TMW-1, TMW-2, and TMW-3.

**Total Manganese** detections were observed above the 2DWS (0.05 mg/l) in up-gradient MW-1 (0.842 mg/l) and down-gradient well MW-5 (0.207 mg/l) during this January 2023 monitoring event. A total manganese concentration below the 2DWS was also detected in TMW-3. Total Manganese has been consistently detected at concentrations above the 2DWS (0.05 mg/l) in up-gradient well MW-1. The presence of total manganese in the local groundwater is considered to be naturally occurring, originating from deposits in the soil overburden.

**Total Nickel** was detected in up-gradient well MW-1 (0.00678 mg/l) and down-gradient wells MW-3 (0.00212 mg/l) and MW-5 (0.00650 mg/l) during the January 2023 sampling event. Dissolved nickel was detected in down-gradient well MW-1 (0.00743 mg/l), MW-3 (0.00230 mg/l), and MW-5 (0.00577 mg/l) during this event. All reported nickel concentrations were below the MCL value (0.10 mg/l) obtained from the Tennessee Division of Water Resources (TN DWR) Public Water Systems chapter rule 0400-45-01-.06 (0.10 mg/l). Total nickel was not detected above the PQL (<0.00200 mg/l) in MW-4, TMW-1, TMW-2, and TMW-3 during this monitoring event. Total nickel has been detected at concentrations above the TN DWR Public Water Systems MCL (0.1 mg/l) in up-gradient well MW-1 during previous events on April 9, 2009 (total nickel at MW-1= 0.2 mg/l) and May 19, 2009 (total nickel at MW-1=0.17 mg/l). Therefore, the presence of total nickel in the local groundwater is considered to be naturally occurring, originating from deposits in the soil overburden.

The **Sulfate** concentration reported at MW-3 (69.2 mg/l) during this January 2023 sampling event was below the 2DWS for sulfate (250 mg/l). In addition, the sulfate concentrations at MW-3 have been consistently decreasing each event since September 2018. Sulfate was also detected in up-gradient well MW-1 (5.01 mg/l) and down-gradient well MW-5 (17.4 mg/l) during this January 2023 event and were below the 2DWS. Sulfate was not detected above the PQL of 5.00 mg/l in any of the other monitoring wells across the site.

**Total Zinc** was reported at down-gradient well MW-3 (0.0604 mg/l) during the January 2023 event. Dissolved concentrations of zinc were also reported at MW-1 (0.0305 mg/l) and MW-3 (0.0458 mg/l) during this sampling event. All reported concentrations of zinc (total and dissolved) were below the 2DWS for this constituent. Similar zinc concentrations have been reported during previous events, and a downward trend in zinc concentrations was observed when considering total zinc concentrations at MW-3 since November 2016.

## 4.3 QUALITY CONTROL QUALIFIER CODES

The EPA Contract Laboratory Program states that sample and result qualifiers should be utilized as part of a total quality-control process. Pace complies with this directive and reports all qualifiers along with explanations of QC qualifier codes. Four (4) QC qualifier codes (B, J, J1, and V) were indicated during the laboratory analysis of groundwater samples collected during the January 2023 event. Specific information concerning each laboratory QC qualifier code can be found on page 55 of 58 in the February 9, 2023 Groundwater Laboratory Analytical Report. One QC qualifier code (B) was indicated in the Groundwater Analytical Report associated with dissolved chromium at MW-5. Dissolved chromium was detected in the associated method blank for MW-5, as indicated by qualifier "B". No other QC qualifier codes were indicated for any of the other detected constituents during this monitoring event and did not affect the usability of the data as reported. Three (3) QC qualifier codes (J, J6, and V) were indicated during the laboratory analysis of the leachate samples collected during this January 2023 event. Specific information concerning each laboratory QC qualifier code can be found on page 24 of 27 in the March 3, 2023 Leachate Analytical Report. It should be noted that due to the nature of the leachate sample, laboratory dilutions were necessary to report the concentrations of constituents more accurately within the leachate. Most of the QC qualifier codes indicated in the Leachate Analytical Report were not associated with any of the detected constituents during this monitoring event and did not affect the usability of the data as reported.

Based on the overall review of the QC qualifiers identified in the February 2023 groundwater and leachate laboratory analytical reports, the data as reported appears to be usable for quantitative purposes. The groundwater and leachate laboratory analytical reports are included in **Appendix C**.

# 5.0 STATISTICAL ANALYSIS

## 5.1 APPLICABLE METHODS

The Rules of the Tennessee Department of Environment and Conservation, Division of Solid Waste Management Chapter 0400-11-01-.04(7) state, in part, that each landfill must conduct and report statistical analyses as part of the evaluation of groundwater monitoring data. Statistical analyses of the data for each constituent detected was performed on monitoring wells MW-1, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3.

The solid waste rules require groundwater sample results and associated statistical methods used to determine the statistical background of a groundwater detection/assessment monitoring program be "protective of human health and the environment". Furthermore, the rules require that the results be "representative" of the background groundwater quality of the geologic formation(s) being monitored. Various influences may affect the representativeness of sample results, which include possible errors in sampling. As previously discussed, reported total metals concentrations are likely affected by elevated turbidity values and would not be representative of the natural groundwater conditions. Before statistical evaluations were completed, the turbidity values which were collected during historical groundwater sampling events were evaluated for elevated turbidity values (>150 NTU). If the turbidity value at the time of sample collection at any given location was greater than 150 NTUs, the total metals concentrations for each sample location would not be representative of natural groundwater conditions. As a result, the corresponding data were removed from the background data set.

After the non-representative background sample data were removed accordingly, the distribution of the data in the background monitoring well (MW-1) was evaluated for normality. The tests for normality were conducted using the Shapiro-Wilks method if N <50 or Shapiro-Francia method if N>50. The normality test was performed for both raw and log-transformed data, with replacement of non-detects to half of the corresponding laboratory PQL. Data determined to be normally distributed in the background well were evaluated using parametric prediction limit (PPL) analysis. Inter-well and intra-well (intra-well utilized for upgradient MW-1) statistical methods were appropriately utilized to determine statistically significant increases in constituent concentrations in compliance (down-gradient) monitoring wells MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3.

Intra-well analyses were utilized only at MW-1 to compare the concentrations observed during the current groundwater-sampling event to the established background data set for MW-1 concentrations. Intra-well PPL and non-parametric statistical methods were appropriately utilized to determine statistically significant changes in background water quality data in up-gradient monitoring well MW-1. The cobalt data at MW-1 were normally distributed using the Shapiro-Wilks test for normality when the data were log-transformed and non-detects were replaced by half of the corresponding PQL. Therefore, intra-well PPL analysis was performed for the transformed cobalt data set that passed normality testing. However, all other data sets (arsenic,

barium, chloride, nickel, zinc, and sulfate data) for MW-1 were not normally distributed and were evaluated using intra-well non-parametric statistical methods.

Inter-well analyses compared the concentrations observed at the down-gradient monitoring locations (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3) to the concentrations observed at the up-gradient monitoring location (MW-1) during this monitoring event. The data distribution tests using the background data set (from MW-1) for all detected constituents in the downgradient wells (barium, chloride, copper, fluoride, nickel, zinc and sulfate data) indicated that the background data for each constituent are not normally distributed and were evaluated for SSIs using inter-well non-parametric statistical methods.

If the data are normally distributed (using normal or log-transformed data), parametric statistical procedures may be used to evaluate SSIs. If the data are normally distributed, the percentage of non-detects in background well MW-1 for each parameter determined the primary statistical method utilized for inter-well analysis. If the background data are normally distributed and < 50% non-detects exist for the given parameter, parametric inter-well prediction limit analysis may be conducted on the data. If the percentage of non-detects in the background samples was less than 50%, Shewart-CUSUM control charts may also be utilized as a secondary statistical method utilized for inter-well analysis. However, since the barium, chloride, copper, fluoride, nickel, zinc and sulfate background data are not normally distributed, non-parametric inter-well prediction limit analysis was conducted for the background data from up-gradient well MW-1 compared to down-gradient monitoring wells (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3). Additional statistical procedures performed included Mann-Kendall trend analyses. Although the Mann-Kendall trend analyses are not used to determine SSIs relative to background, they provide a non-parametric intra-well statistical procedure to identify statistical trends (increasing, decreasing, or no trend) in data at a single well over a given period. For this monitoring event, the Mann-Kendall trend analysis was completed using recent data since the November 10, 2016 sampling event.

The computer program ChemStat v.6.4 was used for all statistical computations. Worksheets for inter-well and intra-well statistical analysis and time versus concentration charts are given in **Appendix B – Statistical Evaluations and Time Series Plots.**

## 5.2 STATISTICAL RESULTS

No statistically significant increases (SSI) were identified in upgradient well MW-1 during the first quarter 2023 sampling event. When considering data since the November 10, 2016 sampling event, a statistically significant trend in the barium data from MW-1 was observed using the Mann-Kendall trend analyses at the 95% confidence level. There were no distinct statistically significant trends in concentrations for the detected arsenic, chloride, cobalt, nickel, zinc, and sulfate concentrations at MW-1.

SSIs over background identified for the current monitoring event include chloride at MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3; zinc at MW-3; and sulfate at MW-3. No SSIs were identified for the barium (at MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3), copper (at MW-3), nickel (at MW-3 and MW-5), fluoride (at MW-3), or sulfate (at MW-5) concentrations reported during this monitoring event. When considering data since the November 10, 2016 sampling event, statistically significant trends in data were observed using the Mann-Kendall trend analyses at the 95% confidence level. Trend analyses revealed a statistically significant upward trend in barium at MW-4, MW-5, and TMW-3; chloride at MW-4, MW-5, TMW-1, TMW-2, and TMW-3; and sulfate at MW-5. Trend analysis revealed a downward trend in barium concentrations at MW-3; zinc concentrations at MW-3; and chloride concentrations at MW-3. There were no distinct statistically significant trends in concentrations for any of the other detected constituents.

The chloride concentrations observed at MW-3 (11.5 mg/l), MW-4 (10.5 mg/l), MW-5 (75.1 mg/l), TMW-1 (44.4 mg/l), TMW-2 (41.9 mg/l), and TMW-3 (67.8 mg/l) produced SSIs over background during this event. The chloride detections at MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 are consistent with previous data and are below the 2DWS for chloride concentrations (250 mg/l). When considering data from the monitoring events since November 2016, the data showed a downward trend in chloride concentrations at MW-3 and an upward trend in chloride concentrations at MW-4, MW-5, TMW-1, TMW-2, and TMW-3 using the Mann-Kendall trend analyses at the 95% confidence level.

The zinc concentration observed at MW-3 (0.0712 mg/l) during this event exceeded the non-parametric prediction limit of 0.0287 mg/l. However, the observed zinc concentration at MW-3 was well below the 2DWS for zinc (5 mg/l). When considering zinc data from MW-3 November 2016, the data showed a decreasing trend in zinc concentrations at MW-3 using the Mann-Kendall trend analysis at the 95% confidence level. Similar zinc concentrations have been observed in MW-3 during previous monitoring events.

An SSI for sulfate concentrations at MW-3 was identified during this sampling event. However, when considering all data accumulated from MW-3 since November 10, 2016, the data did not show an upward or downward trend in sulfate concentrations at MW-3 using the Mann-Kendall trend analysis at the 95% confidence level. The sulfate concentration reported during this sampling event at MW-3 (69.2 mg/l) remains below the 2DWS of 250 mg/l. Sulfate was also detected in MW-5 (17.4 mg/l) during this January 2023 event, which was well below the 2DWS of 250 mg/l. While there was an upward trend in sulfate concentrations identified in MW-5 during this event, there was no reported SSI in the sulfate concentration. Sulfate was also detected in up-gradient MW-1 (8.74 mg/l) during this January 2023 monitoring event. However, sulfate was not detected above the PQL in any of the other monitoring wells across the site.

A summary of intra-well and inter-well statistical analysis is presented in **Table 3 – Intra-Well and Inter-Well Statistical Summary in Appendix A.**

## 6.0 CONCLUSIONS

The results of the first quarter assessment-monitoring event of 2023 are summarized as follows:

- SSIs during this January 2023 event included chloride (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3), zinc (MW-3), and sulfate (MW-3). No SSIs were identified in upgradient well MW-1 during this event.

- Cadmium (Total or Dissolved) was not detected at any of the locations sampled during the first quarter 2023 monitoring event. Additionally, cadmium at MW-3 has been reported below the PQL in three out of the past five sampling events and continues to be reported below the PQL at downgradient temporary monitoring wells TMW-2 and TMW-3.

- Trend analyses revealed a statistically significant upward trend in barium at MW-4, MW-5, and TMW-3; chloride at MW-4, MW-5, TMW-1, TMW-2, and TMW-3; and sulfate at MW-5. Trend analysis revealed a downward trend in barium concentrations at MW-3; zinc concentrations at MW-3; and chloride concentrations at MW-3. There were no distinct statistically significant trends in concentrations for any of the other detected constituents.

- An SSI was identified for the reported sulfate concentration at MW-3. However, the sulfate concentrations at MW-3 do not exhibit a statistically significant increasing or decreasing trend when considering data from MW-3 since November 10, 2016.

- The chloride concentrations at MW-1, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 remain well below the 250 mg/l 2DWS.

- Although the zinc concentration reported at MW-3 was indicated as an SSI using all available data since 2008, the concentrations remain well below the 2DWS of 5 mg/l. In addition, the zinc concentrations at MW-3 exhibited a statistically significant decreasing trend when considering data from MW-3 since November 10, 2016.

- No VOCs were detected above their respective laboratory PQL in any of the groundwater monitoring wells during the monitoring event.

The second quarter 2023 assessment-monitoring event is tentatively scheduled for May 2023 and will consist of collecting groundwater samples from up-gradient well MW-1 and down-gradient wells MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3. No leachate samples have been collected from the APWC for the past several years since no leachate has been generated from the APWC. Therefore, it is unlikely that leachate samples will be collected from the APWC during future quarterly monitoring events. The APWC leachate levels will be checked annually, and if leachate is available samples will be collected for leachate analysis. If no leachate is observed from

the APWC, no APWC leachate samples will be collected for analysis. However, the amount of leachate produced from the IWC has been minimal since the landfill was capped, and the leachate being pumped from the IWC cells has been intermittent. If possible, leachate samples will be collected from the IWC during the second quarter 2023 assessment-monitoring event.

Since the former EWS Class II Landfill site remains in assessment monitoring, a private water use survey update is required annually. The next water use survey update will be performed in conjunction with the 4th Quarter 2023 monitoring event in November 2023, and will be submitted as a separate report.

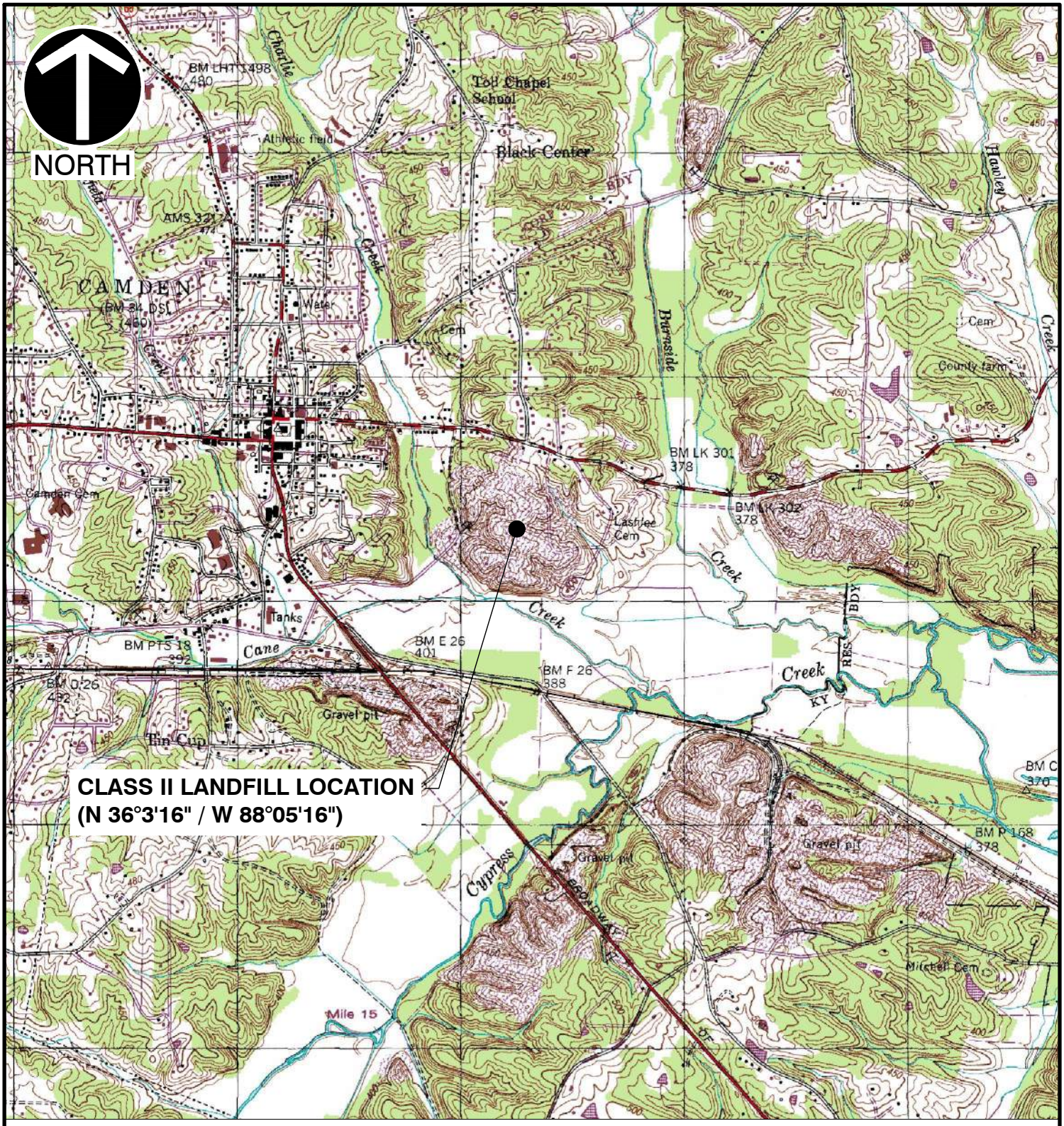
## 7.0 RECOMMENDATIONS

The following recommendations are presented in an effort to ensure the continuance of securing representative groundwater samples and to obtain analytical results with a high degree of accuracy and precision (i.e., repeatability).

1. It is recommended that all permanent monitoring wells on the site continue to be monitored quarterly. In addition, quarterly groundwater samples will continue to be collected from temporary monitoring wells down-gradient from MW-3. However, if the observed constituent of concern concentrations have no significant variation in the overall constituent mean, the assessment monitoring frequency may be re-evaluated. According to the DSWM guidance manual, "At minimum, eight consecutive quarters of groundwater monitoring data should be provided to demonstrate that there has been no significant variation in the overall mean value for any constituent at any sampling location."

2. Based on a review of the total metals analysis vs. dissolved metals analysis since 2017, the reported metals concentrations were similar in concentrations and were not greatly affected by turbidity considering most turbidity measurements at each sample location have been less than 50 NTU. Therefore, it may not be necessary to sample for dissolved metals analysis in addition to total metals analysis if the turbidity values remain less than 50 NTU. It is recommended that efforts continue to be made during purging and sampling procedures to reduce the turbidity values to below the EPA recommended 10 NTU during each sampling event. However, if the observed turbidity values during sample collection are stable at turbidity values up to 50 NTU, additional dissolved metals samples will not be collected for analysis. If the turbidity values observed are above 50 NTU, samples will be collected for dissolved metals analysis in addition to total metals analysis for comparable and statistical purposes.

# APPENDIX A
# MAPS & TABLES




## REFERENCE

1. U.S.G.S. 7.5' TOPOGRAPHIC MAP, CAMDEN QUADRANGLE, TENN. DATED: 1950, PHOTOREVISED: 1984.

SCALE IN FEET

0 2000' 4000'

* HAND SIGNATURE ON FILE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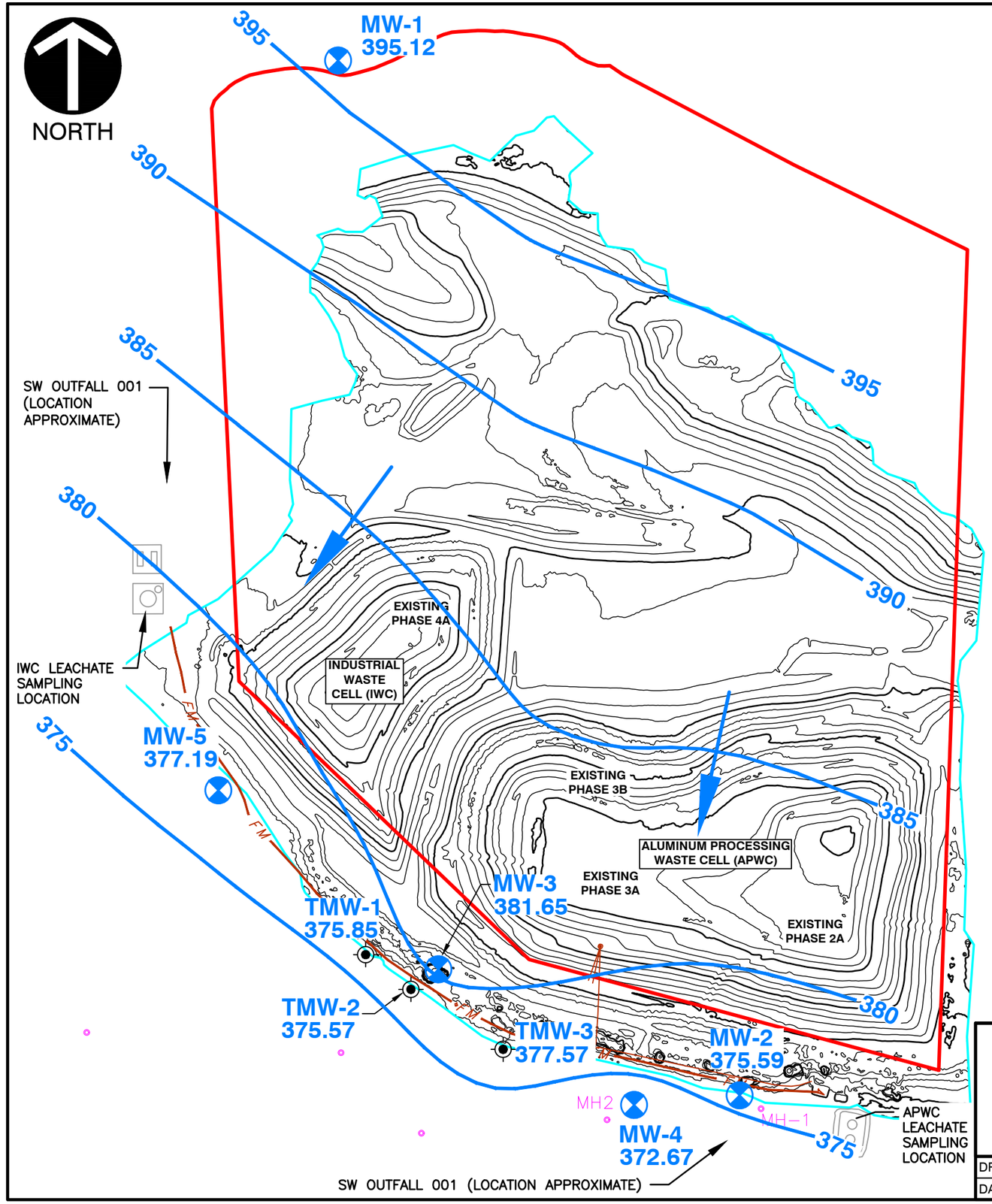
# FORMER EWS SITE
# CLASS II CAMDEN LANDFILL
# CAMDEN, TENNESSEE

## SITE LOCATION MAP 1Q2023

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AAB | CHECKED BY: | PJC | APPROVED BY: | KBW* | FIGURE NO.: | 1 |
| DATE: | APRIL 2023 | DWG SCALE: | 1"=2000' | PROJECT NO: | 181-364 | | |

P:\2018\181-364\-CADD\Dwg\181-364_ FIGURE 1 - SITE LOCATION MAP.dwg{LAYOUT1} LS:(4/6/2023 - pcampbell) - LP: 4/6/2023 4:04 PM




## LEGEND

- MW1 395.06 — GROUND WATER MONITORING WELL GROUND WATER ELEVATION (FMSL)
- TMW-1 374.79 — TEMPORARY GROUND WATER MONITORING WELL GROUND WATER ELEVATION (FMSL)
- 390 — POTENTIOMETRIC SURFACE CONTOUR (FMSL)
- GROUND WATER FLOW DIRECTION
- MH1 — MANHOLE
- APPROXIMATE FILL LIMITS
- FM — LEACHATE FORCE MAIN

## NOTE:

Hydraulic gradient calculation between MW–1 and MW–4 locations.

$$i = \frac{395.12' \text{ (MW–1)} - 372.67' \text{ (MW–4)}}{1{,}910'} = 0.0118 \text{ ft/ft}$$

GROUNDWATER CONDITIONS

THE WATER LEVELS PRESENTED HEREIN ARE APPLICABLE TO THE LOCATION AND TIME OF MEASUREMENT. WATER LEVELS MAY FLUCTUATE THROUGH TIME.

POTENTIOMETRIC CONTOURS GENERATED FROM THESE DATA ARE CONSTRUCTED BY INTERPOLATION BETWEEN POINTS OF KNOWN STATIC WATER LEVEL ELEVATIONS AND USING KNOWLEDGE OF SPECIFIC SITE CONDITIONS. ACTUAL STATIC WATER LEVELS AT LOCATIONS BETWEEN THE MONITORING POINTS MAY DIFFER FROM THOSE DEPICTED.

SCALE IN FEET
0 200 400

*HAND SIGNATURE ON FILE

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FORMER ENVIRONMENTAL WASTE SOLUTIONS
CAMDEN CLASS II LANDFILL
CAMDEN, TENNESSEE

JANUARY 2023
POTENTIOMETRIC SURFACE MAP

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DRAWN BY: | AAB | CHECKED BY: | PJC | APPROVED BY: | *KW | FIGURE NO.: | 2 |
| DATE: | APRIL 2023 | DWG SCALE: | 1"=200' | PROJECT NO: | 181-364.0005 | | |

P:\2018\181-364\-CADD\DWG\181-364_ GROUNDWATER MAP JANUARY 2023.DWG{FIG 2 (2)}LS:(PCAMPBELL - 4/10/2023) - LP: 4/10/2023_11:25:34_AM

## Table 1

**Former Environmental Waste Solutions Camden Class II Landfill**
**Field Parameters and Potentiometric Data - 1st Quarter 2023**

| Monitoring Well/ Sample Location | Date | Sample Time | Top of Casing Elevation[1] (Feet MSL) | Bottom of Well Elevation (Feet) | Well Diameter (Feet) | Well Volume Gallons | Depth to Water (Feet)[2] | Potentiometric Surface (Feet MSL) | Temp. (˚C) | pH (SU) | Conductivity (µS/cm) | Specific Conductivity (µS/cm) | Dissolved Oxygen (mg/l) | Oxidation Reduction Potential (mV) | Turbidity (NTU) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 (up-gradient)** | 1/31/2023 | 8:09 | 416.47 | 385.97 | 0.17 | 1.6 | 21.35 | 395.12 | 12.6 | 5.40 | 185.0 | 242.0 | 1.60 | 92.5 | 10.23 |
| MW-2* | 1/31/2023 | 13:08 | 380.35 | 367.70 | 0.17 | 1.3 | 4.76 | 375.59 | 8.6 | 6.26 | 474.5 | 691.0 | 8.20 | 195.6 | 4.75 |
| MW-3** | 1/31/2023 | 14:15 | 392.90 | 365.10 | 0.17 | 2.8 | 11.25 | 381.65 | 7.9 | 6.33 | 179.3 | 266.2 | 8.48 | 195.1 | 33.1 |
| MW-4 | 1/31/2023 | 12:15 | 381.47 | 358.37 | 0.17 | 2.4 | 8.80 | 372.67 | 13.1 | 5.80 | 67.5 | 87.9 | 3.10 | 221.1 | 2.87 |
| MW-5** | 1/31/2023 | 10:15 | 385.25 | 351.40 | 0.17 | 4.4 | 8.06 | 377.19 | 11.0 | 5.15 | 290.1 | 387.3 | 0.64 | 250.6 | 12.30 |
| TMW-1 | 1/31/2023 | 10:12 | 381.19 | 348.99 | 0.085 | 1.1 | 5.34 | 375.85 | 13.3 | 5.49 | 343.9 | 441.9 | 3.79 | 249.8 | 3.80 |
| TMW-2 | 1/31/2023 | 12:12 | 384.27 | 356.77 | 0.085 | 0.8 | 8.70 | 375.57 | 13.7 | 5.52 | 312.9 | 398.6 | 5.58 | 272.1 | 7.68 |
| TMW-3 | 1/31/2023 | 14:14 | 381.37 | 353.37 | 0.085 | 1.0 | 3.80 | 377.57 | 13.6 | 5.36 | 549.0 | 703.0 | 1.10 | 205.0 | 5.25 |
| Leachate (IWC-L) | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| ***Leachate (APWC-L) | NS | NS | NA | NA | NA | NA | NA | NA | NS | NS | NS | NS | NS | NS | NS |

[1] Top of Casing Elevations from survey by Civil & Environmental Consultants, Inc. on May 12, 2016.

[2] Depth to water measurements collected by Civil & Environmental Consultants, Inc. on January 31, 2023.

*MW-2 has been removed from monitoring network. Only water level and field parameters collected at MW-2.

**Elevated turbidity observed at MW-1, MW-3, and MW-5 during purging on 1/31/23. Therefore, MW-1, MW-3, and MW-5 were collected for dissolved metals analysis on 1/31/23.

***APWC-L was not producing leachate and was not sampled during this event.

NS= Not Sampled

**Table 2**
**Former EWS Camden Class II Landfill IDL 03-0212 (Terminated)**
**Groundwater and Leachate Analytical Data - 1st Quarter 2023**

| Parameter | MCL/GWPS (mg/l) | (upgradient) MW-1 | Qualifier | MW-3 | Qualifier | MW-4 | Qualifier | MW-5 | Qualifier | TMW-1 | Qualifier | TMW-2 | Qualifier | Duplicate (TMW-2) | Qualifier | TMW-3 | Qualifier | IWC-Leachate* | Qualifier | APWC-Leachate** | Qualifier | Field Blank | Qualifier |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1/31/2023 | | 1/31/2023 | | 1/31/2023 | | 1/31/2023 | | 1/31/2023 | | 1/31/2023 | | 1/31/2023 | | 1/31/2023 | | 2/21/2023 | | 1/31/2023 | | 1/31/2023 | |
| | | Value (mg/l) | | Value (mg/l) | | Value (mg/l) | | Value (mg/l) | | Value (mg/l) | | Value (mg/l) | | Value (mg/l) | | Value (mg/l) | | Value (mg/l) | | Value (mg/l) | | Value (mg/l) | |
| Hardness | - | **23.9** | | **85.2** | | **26.0** | | **95.1** | | **67** | | **57.8** | | **58.8** | | **88.8** | | **30,200** | | NS** | | <2.50 | J |
| Alkalinity | - | **35.8** | | < 20.0 | | < 20.0 | | < 20.0 | | <0.100 | | < 20.0 | | <20.0 | | < 20.0 | | <20.0 | | NS** | | <20.0 | |
| Ammonia Nitrogen | - | <0.250 | | <0.250 | | <0.250 | | <0.250 | | <0.250 | | <0.250 | | <0.250 | | <0.250 | | **1,190** | | NS** | | <0.250 | |
| COD | - | <20.0 | | <20.0 | | <20.0 | | <20.0 | | <20.0 | | <20.0 | | <20.0 | | <20.0 | | **6,950** | | NS** | | <20.0 | |
| Boron | - | <0.200 | | <0.200 | | <0.200 | | <0.200 | | <0.200 | | <0.200 | | <0.200 | | <0.200 | | <1.00 | | NS** | | <0.200 | |
| Boron, Dissoloved | - | <0.200 | | <0.200 | | NS | | <0.200 | | NS | | NS | | NS | | NS | | <1.00 | | NS** | | NS | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| Bromide | - | <1.00 | | <1.00 | | <1.00 | | <1.00 | | <1.00 | | <1.00 | | <1.00 | | <1.00 | | <100 | | NS** | | <1.00 | |
| Chloride | 250 [2] | **3.55** | | **11.5** | | **10.5** | | **75.1** | | **44.4** | | **41.9** | | **41.8** | | **67.8** | | **68,000** | | NS** | | <1.00 | |
| Fluoride | 2 [2] | <0.150 | | **0.178** | | <0.150 | | <0.150 | | <0.150 | | <0.150 | | <0.150 | | <0.150 | | <15.0 | | NS** | | <0.150 | |
| Nitrate | 10 [1] | <0.100 | | **0.616** | | **0.808** | | **1.09** | | **1.63** | | **0.886** | | **0.904** | | **7.47** | | <10.0 | | NS** | | <0.100 | |
| Sulfate | 250 [2] | **5.01** | | **69.2** | | <5.00 | | **17.4** | | <5.00 | | <5.00 | | <5.00 | | <5.00 | | **880** | | NS** | | <5.00 | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 0.2 [2] | <0.100 | | **0.473** | | <0.100 | | **0.162** | | <0.100 | | **0.107** | | <0.100 | | <0.100 | | **190** | | NS** | | <0.100 | |
| Aluminum,Dissolved | 0.2 [2] | **0.131** | | <0.100 | | NS | | **0.647** | | NS | | NS | | NS | | NS | | **159** | | NS** | | NS | |
| Arsenic | 0.01 | **0.00607** | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | **0.149** | | NS** | | <0.00200 | |
| Arsenic,Dissolved | 0.01 | **0.00588** | | <0.00200 | | NS | | <0.00200 | | NS | | NS | | NS | | NS | | **0.144** | | NS** | | NS | |
| Barium | 2 | **0.0244** | | **0.0577** | | **0.00837** | | **0.0595** | | **0.0134** | | **0.0316** | | **0.0312** | | **0.0527** | | **1.83** | | NS** | | <0.00200 | |
| Barium,Dissolved | 2 | **0.0263** | | **0.047** | | NS | | **0.0547** | | NS | | NS | | NS | | NS | | **1.950** | | NS** | | NS | |
| Total Cadmium | 0.005 | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | **14.4** | | NS** | | <0.00200 | |
| Cadmium,Dissolved | 0.005 | <0.00100 | | <0.00100 | | NS | | <0.00100 | | NS | | NS | | NS | | NS | | **12.1** | | NS** | | NS | |
| Calcium | - | **4.62** | | **22.3** | | **5.52** | | **17.4** | | **18.4** | | **14.5** | | **14.8** | | **22.9** | | **10,500** | | NS** | | <0.00100 | |
| Calcium,Dissolved | - | **4.59** | | **19.4** | | NS | | **15.5** | | NS | | NS | | NS | | NS | | **11,200** | | NS** | | NS | |
| Chromium | 0.1 | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.100 | | NS** | | <1.00 | |
| Chromium,Dissolved | 0.1 | <0.00200 | | <0.00200 | | NS | | **0.00395** | **B** | NS | | NS | | NS | | NS | | <0.100 | | NS** | | NS | |
| Cobalt | 0.006 [3] | **0.0458** | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | **0.342** | | NS** | | <0.00200 | |
| Cobalt,Dissolved | 0.006 [3] | **0.0435** | | <0.00200 | | NS | | <0.00200 | | NS | | NS | | NS | | NS | | **0.282** | | NS** | | NS | |
| Copper | 1.3 | <0.00500 | | **0.00512** | | <0.00500 | | <0.00500 | | <0.00500 | | <0.00500 | | <0.00500 | | <0.00500 | | **0.936** | | NS** | | <0.00200 | |
| Copper,Dissolved | 1.3 | **0.0124** | | <0.00500 | | NS | | <0.00500 | | NS | | NS | | NS | | NS | | **0.147** | | NS** | | NS | |
| Iron | 0.3 [2] | **13.4** | | **0.243** | | <0.100 | | **0.174** | | <0.100 | | <0.100 | | <0.100 | | <0.100 | | **270** | | NS** | | <0.00500 | |
| Iron,Dissolved | 0.3 [2] | **12.5** | | <0.100 | | NS | | **0.723** | | NS | | NS | | NS | | NS | | **247** | | NS** | | NS | |
| Lead | 0.015 | <0.00200 | | <0.00200 | | <0.00200 | | **0.0025** | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | **0.507** | | NS** | | <0.00200 | |
| Lead,Dissolved | 0.015 | <0.00200 | | <0.00200 | | NS | | **0.00237** | | NS | | NS | | NS | | NS | | **0.467** | | NS** | | NS | |
| Magnesium | - | **2.99** | | **7.17** | | **2.96** | | **12.5** | | **5.15** | | **5.22** | | **5.33** | | **7.69** | | **980** | | NS** | | <1.00 | |
| Magnesium,Dissolved | - | **2.9** | | **6.24** | | NS | | **10.7** | | NS | | NS | | NS | | NS | | **1,020** | | NS** | | NS | |
| Manganese | 0.05 [2] | **0.842** | | <0.00500 | | <0.00500 | | **0.322** | | <0.00500 | | <0.00500 | | <0.00500 | | **0.0129** | | **48.6** | | NS** | | <0.00500 | |
| Manganese,Dissolved | 0.05 [2] | **0.793** | | <0.00500 | | NS | | **0.276** | | NS | | NS | | NS | | NS | | **47.0** | | NS** | | NS | |
| Mercury | 0.002 | <0.000200 | | <0.000200 | | <0.000200 | | <0.000200 | | <0.000200 | | <0.000200 | | <0.000200 | | <0.000200 | | <0.000200 | | NS** | | <0.000200 | |
| Mercury, Dissolved | 0.002 | **0.000988** | | <0.000200 | | NS | | <0.000200 | | NS | | NS | | NS | | NS | | <0.000200 | | NS** | | <0.000200 | |
| Nickel | 0.10 [1] | **0.00678** | | **0.00212** | | <0.00200 | | **0.0065** | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | **0.435** | | NS** | | <0.00200 | |
| Nickel,Dissolved | 0.10 [1] | **0.00743** | | **0.0023** | | NS | | **0.00577** | | NS | | NS | | NS | | NS | | **0.306** | | NS** | | NS | |
| Potassium | - | <2.00 | | **4.90** | | <2.00 | | <2.00 | | <2.00 | | <2.00 | | <2.00 | | **2.09** | | **10,200** | | NS** | | <2.00 | |
| Potassium,Dissolved | - | <2.00 | | **4.17** | | NS | | <2.00 | | NS | | NS | | NS | | NS | | **11,100** | | NS** | | NS | |
| Selenium | 0.05 | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | **0.142** | | NS** | | <0.00200 | |
| Selenium,Dissolved | 0.05 | <0.00200 | | <0.00200 | | NS | | <0.00200 | | NS | | NS | | NS | | NS | | **0.14** | | NS** | | NS | |
| Sodium | - | **3.36** | | **6.01** | | **3.41** | | **20.6** | | **4.58** | | **5.65** | | **5.80** | | **16.6** | | **17,100** | | NS** | | <2.00 | |
| Sodium,Dissolved | - | **3.3** | | **5.25** | | NS | | **17.7** | | NS | | NS | | NS | | NS | | **18,200** | | NS** | | NS | |
| Thallium | 0.002 | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.00200 | | <0.0400 | | NS** | | <0.00200 | |
| Thallium,Dissolved | 0.002 | <0.00200 | | <0.00200 | | NS | | <0.00200 | | NS | | NS | | NS | | NS | | <0.0400 | | NS** | | NS | |
| Vanadium | - | <0.00500 | | <0.00500 | | <0.00500 | | <0.00500 | | <0.00500 | | <0.00500 | | <0.00500 | | <0.00500 | | <0.250 | | NS** | | <0.00500 | |
| Vanadium,Dissolved | - | <0.00500 | | <0.00500 | | NS | | <0.00500 | | NS | | NS | | NS | | NS | | <0.250 | | NS** | | NS | |
| Zinc | 5 [2] | <0.0250 | | **0.0604** | | <0.0250 | | <0.0250 | | <0.0250 | | <0.0250 | | <0.0250 | | <0.0250 | | **159** | | NS** | | <0.0250 | |
| Zinc,Dissolved | 5 [2] | **0.0305** | | **0.0458** | | NS | | <0.0250 | | NS | | NS | | NS | | NS | | **146** | | NS** | | NS | |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | - | <0.0500 | | <0.0500 | | <0.0500 | | <0.0500 | | <0.0500 | | <0.0500 | | <0.0500 | | <0.0500 | | **1.68** | | NS** | | <0.0500 | |
| Carbon Disulfide | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | **0.229** | | NS** | | <0.00100 | |
| 2-Butanone (MEK) | | <0.0100 | | <0.0100 | | <0.0100 | | <0.0100 | | <0.0100 | | <0.0100 | | <0.0100 | | <0.0100 | | **0.31** | | NS** | | <0.0100 | |
| Trichloroethene | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | <0.00100 | | **0.0364** | | NS** | | <0.00100 | |

Notes:
MCL: Maximum Contaminant Level Enforceable National Primary Drinking Water Standards
GWPS: Groundwater Protection Standard
[1] - MCL value obtained from TN Division of Water Supply rule 1200-5-.06(1)(b)11
[2] - MCL value obtained from TN Division of Water Supply rule 1200-5-1-.12(1)(n). (EPA Secondary Drinking Water Standard)
[3] - GWPS value is referenced from EPA Regional Screening Level for Cobalt
--Not Sampled for analysis.
NS**- Not Sampled for analysis. APWC Leachate levels were minimal during the groundwater sampling event and no APWC Leachate sample was collected for analysis.
**Bold** text indicates laboratory analytical detections above the practical quantitation level
Dark gray shaded text indicates detection above respective MCL/GWPS
Light gray shaded text indicates detection above respective Non-Enforceable National Secondary Drinking Water Standard or EPA RSL for tapwater.
Qualifiers:
J1: Surrogate recovery limits have been exceeded; values are outside upper control limits.
B: The same analyte is found in the associated blank

**Table 3**
**Intra-Well and Inter-Well Statistical Summary**
**Environmental Waste Solutions Camden Class II Landfill IDL 03-0212 (Terminated)**
**Inorganic Analytical Data - 1st Quarter 2023**

| Intra-Well Statistical Summary (Upgradient Background Well MW-1) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Constituent | Well | % Non Detects | Normality | Intra-well NPPL | Intra-well PPL | SSI | Mann-Kendall Trend Analysis[1] |
| Arsenic | MW-1 | 0 | non-parametric | Pass | -- | No | No Trend |
| Barium | MW-1 | 7.50 | non-parametric | Pass | -- | No | **Upward Trend** |
| Chloride | MW-1 | 0.00 | non-parametric | Pass | -- | No | No Trend |
| Cobalt | MW-1 | 0.00 | log-normal | -- | Pass | No | No Trend |
| Nickel | MW-1 | 27.50 | non-parametric | Pass | -- | No | No Trend |
| Sulfate | MW-1 | 55.26 | non-parametric | Pass | -- | No | No Trend |

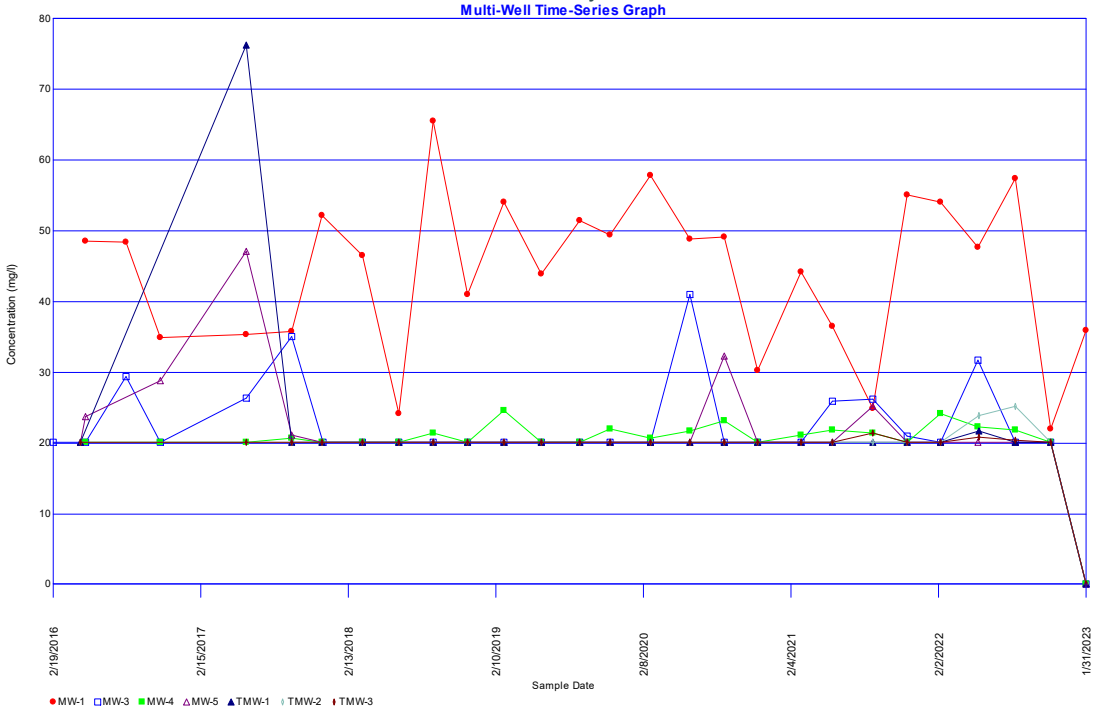
| Inter-Well Statistical Summary (Downgradient Compliance Wells) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Constituent | Well | % Non Detects in Background well MW-1 | Normality (background MW-1) | Inter-well NPPL | Inter-well PPL | SSI | Mann-Kendall Trend Analysis[1] |
| Barium | MW-3 | 7.50 | non-parametric | Pass | -- | No | **Downward Trend** |
| | MW-4 | | non-parametric | Pass | -- | No | **Upward Trend** |
| | MW-5 | | non-parametric | Pass | -- | No | **Upward Trend** |
| | TMW-1 | | non-parametric | Pass | -- | No | No Trend |
| | TMW-2 | | non-parametric | Pass | -- | No | No Trend |
| | TMW-3 | | non-parametric | Pass | -- | No | **Upward Trend** |
| Chloride | MW-3 | 0.00 | non-parametric | **Fail** | -- | **Yes** | **Downward Trend** |
| | MW-4 | | non-parametric | **Fail** | -- | **Yes** | **Upward Trend** |
| | MW-5 | | non-parametric | **Fail** | -- | **Yes** | **Upward Trend** |
| | TMW-1 | | non-parametric | **Fail** | -- | **Yes** | **Upward Trend** |
| | TMW-2 | | non-parametric | **Fail** | -- | **Yes** | **Upward Trend** |
| | TMW-3 | | non-parametric | **Fail** | -- | **Yes** | **Upward Trend** |
| Copper | MW-3 | 85.00 | non-parametric | Pass | -- | No | No Trend |
| Flouride | MW-3 | 96.67 | non-parametric | Pass | -- | No | No Trend |
| Nickel | MW-3 | 27.50 | non-parametric | Pass | -- | No | No Trend |
| | MW-5 | | non-parametric | Pass | -- | No | No Trend |
| Sulfate | MW-3 | 55.26 | non-parametric | **Fail** | -- | **Yes** | No Trend |
| | MW-5 | | non-parametric | Pass | -- | No | **Upward Trend** |
| Zinc | MW-3 | 72.50 | non-parametric | **Fail** | -- | **Yes** | **Downward Trend** |

[1] **Mann-Kendall Trend Analysis was completed using recent data since the November 10, 2016 sampling event.**

# APPENDIX B
# STATISTICAL EVALUATIONS & TIME SERIES PLOTS

## Alkalinity

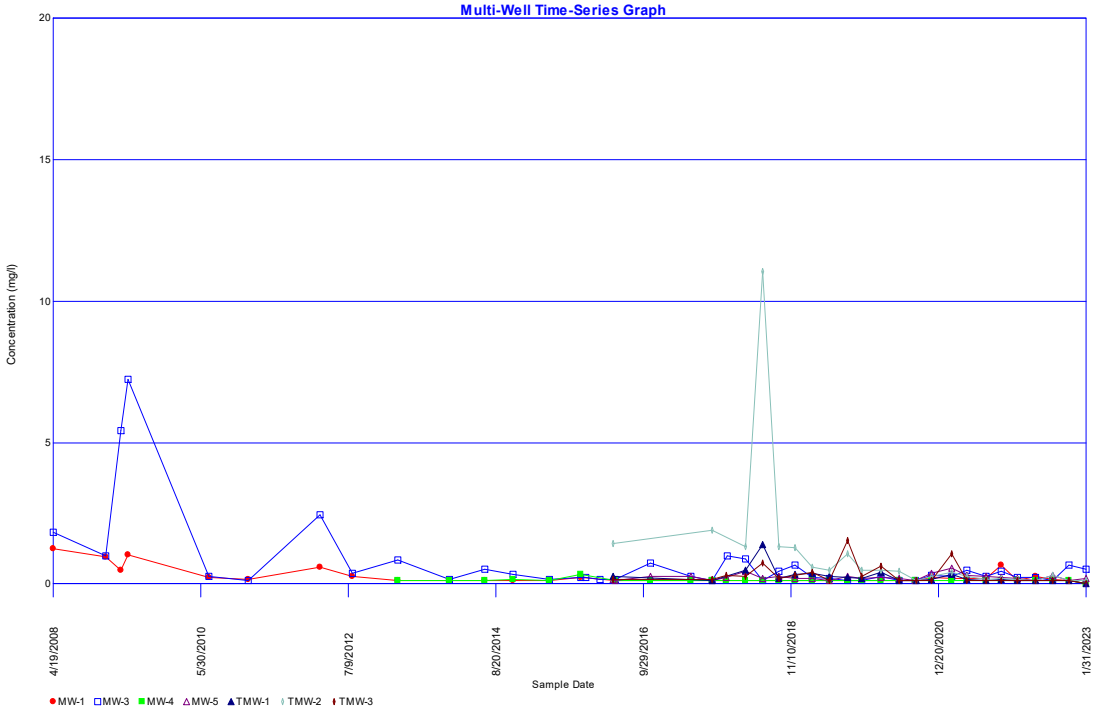
**Multi-Well Time-Series Graph**

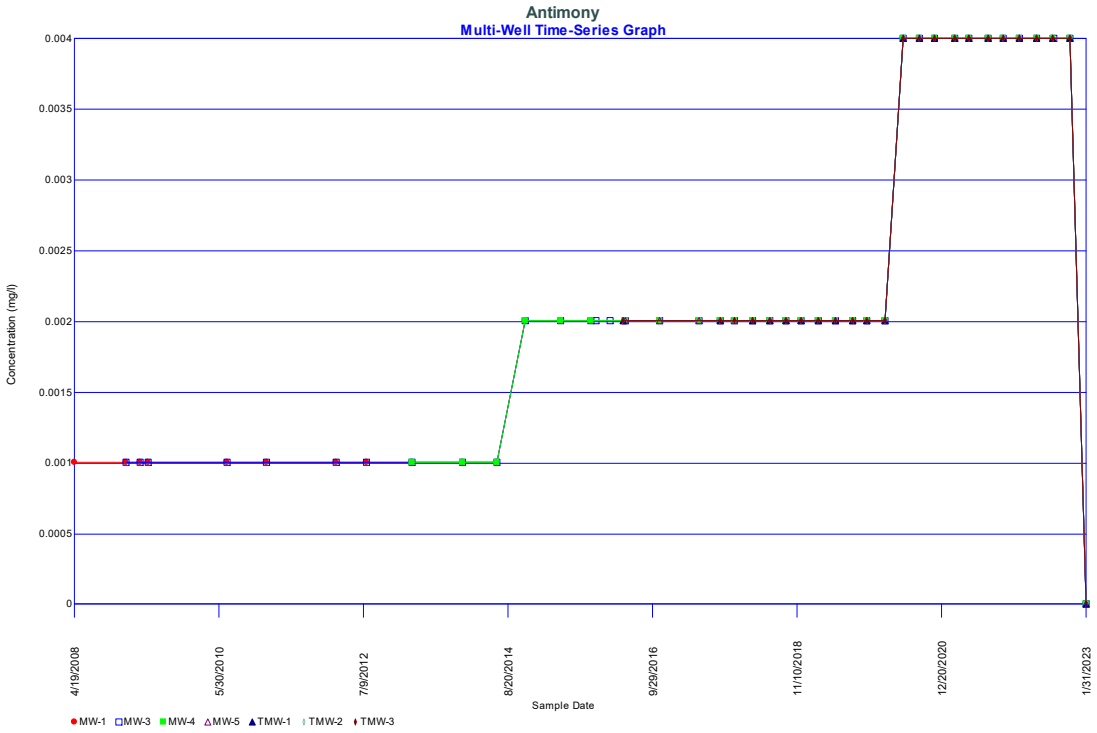




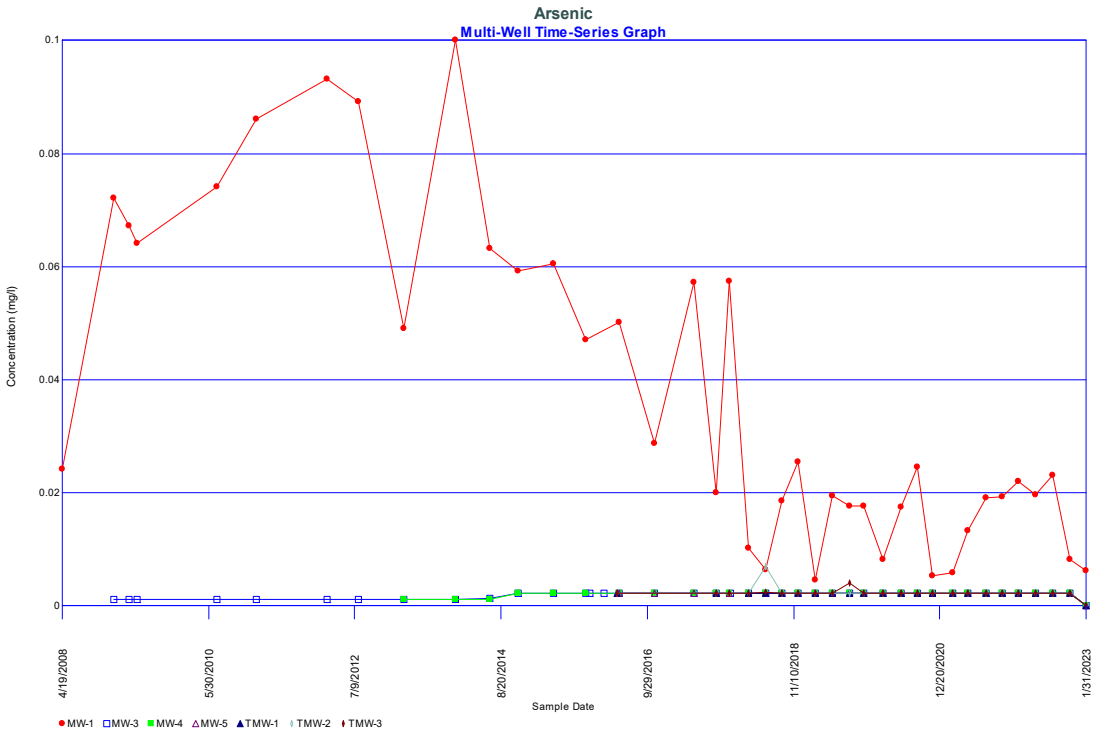

## Aluminum

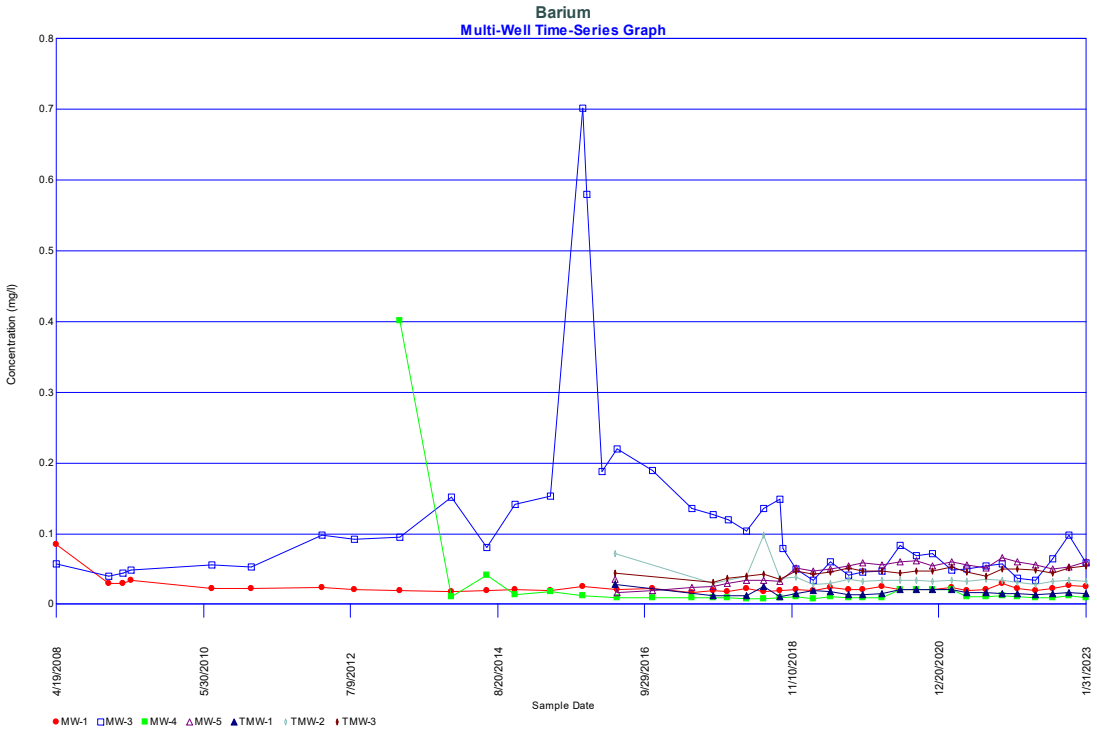
**Multi-Well Time-Series Graph**



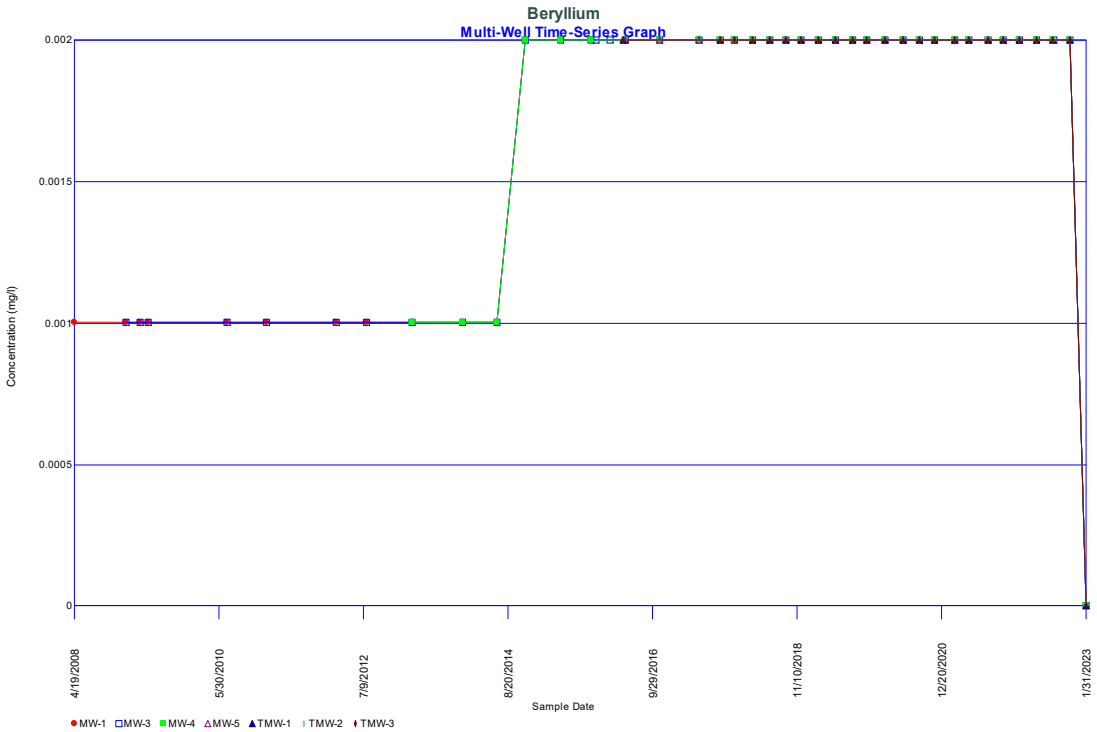

Antimony
Multi-Well Time-Series Graph
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
Concentration (mg/l)
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

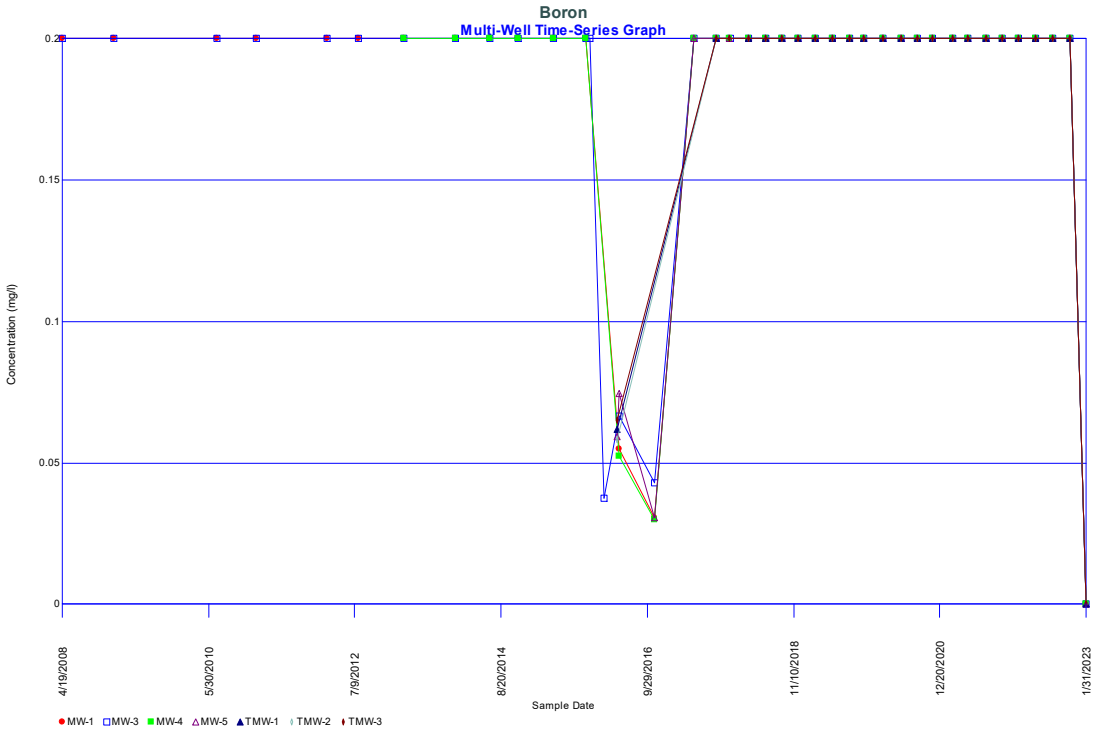



Arsenic
Multi-Well Time-Series Graph
0.1
0.08
0.06
0.04
0.02
0
Concentration (mg/l)
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

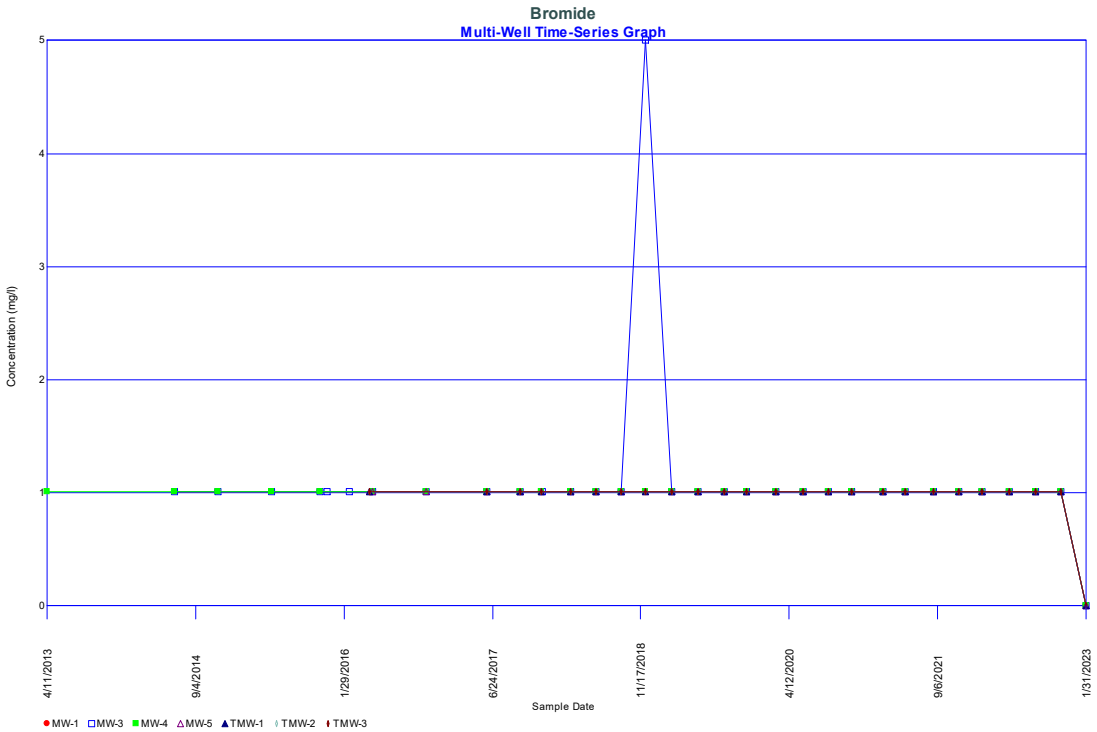

Barium
Multi-Well Time-Series Graph
Concentration (mg/l)
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

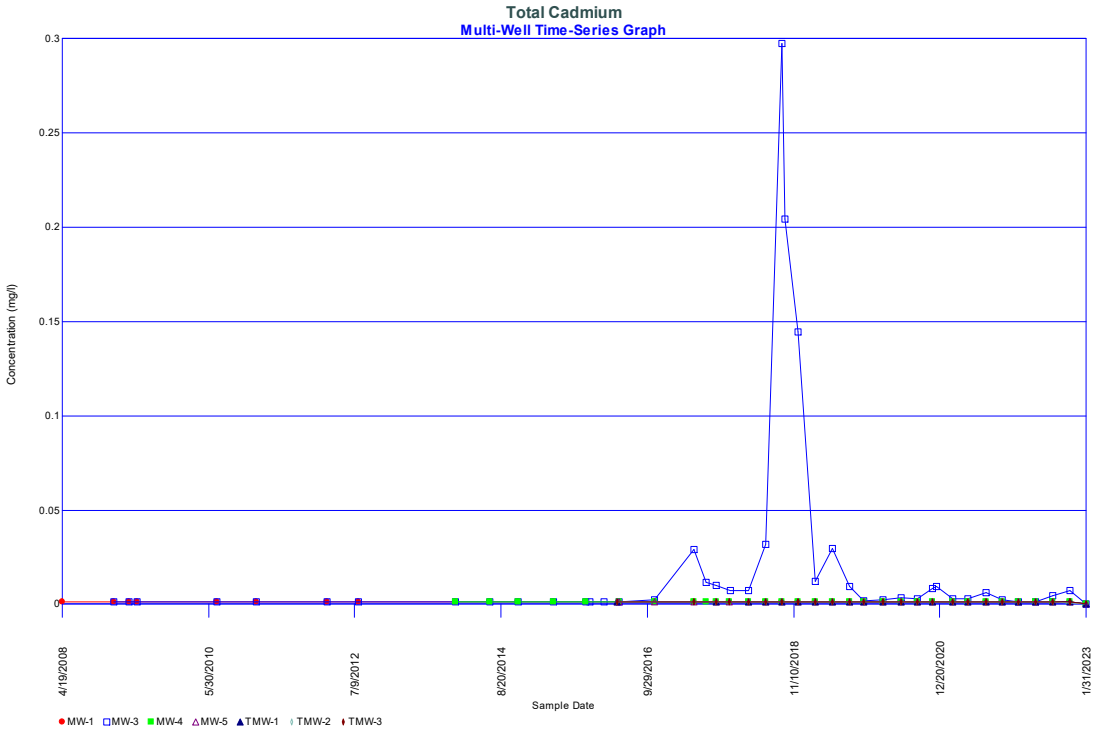



Beryllium
Multi-Well Time-Series Graph
Concentration (mg/l)
0.002
0.0015
0.001
0.0005
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

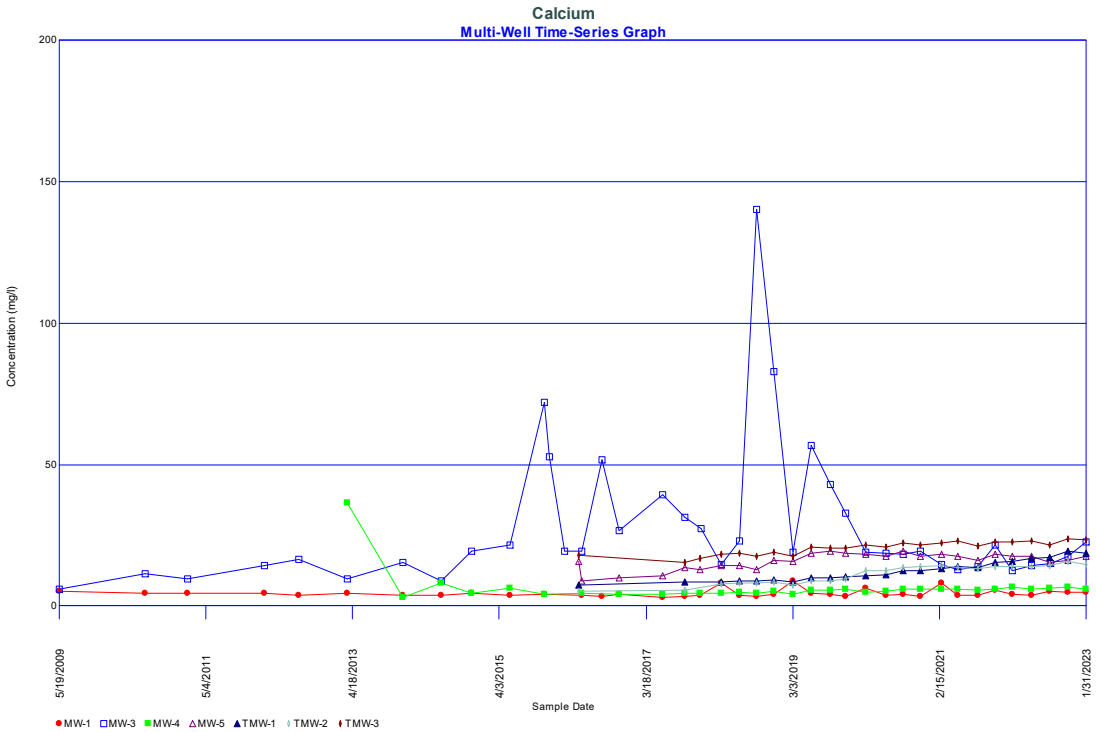

Boron
Multi-Well Time-Series Graph
0.2
0.15
0.1
0.05
0
Concentration (mg/l)
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

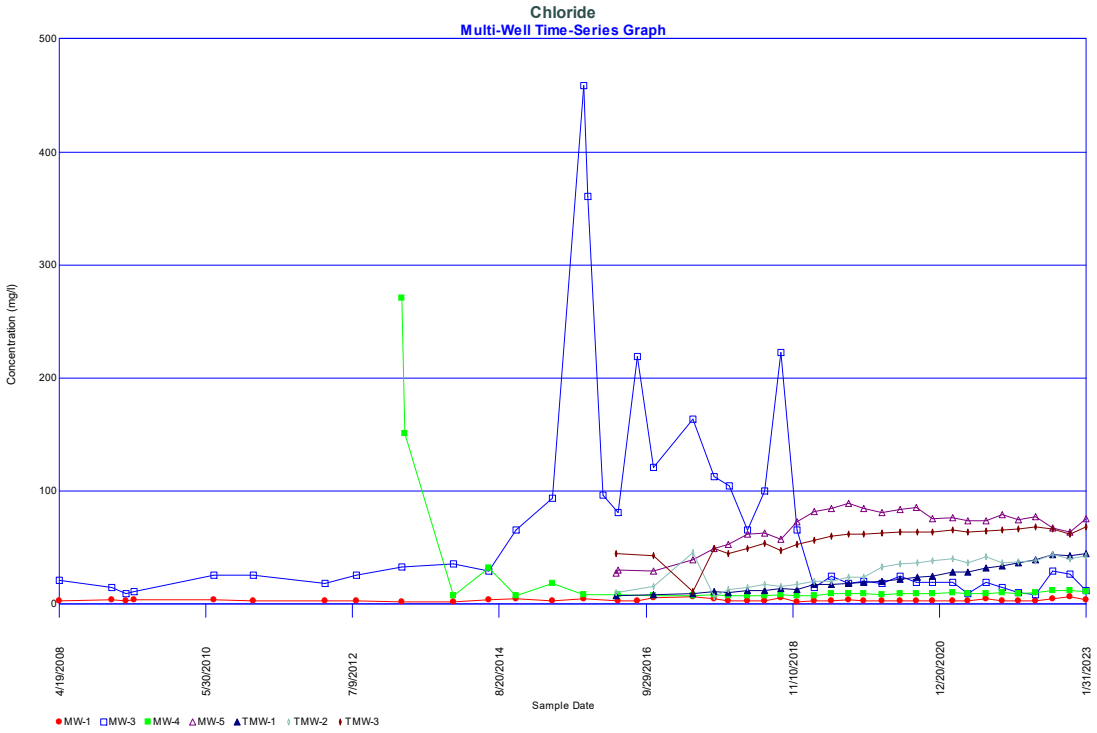



Bromide
Multi-Well Time-Series Graph
5
4
3
2
1
0
Concentration (mg/l)
4/11/2013
9/4/2014
1/29/2016
6/24/2017
11/17/2018
4/12/2020
9/6/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

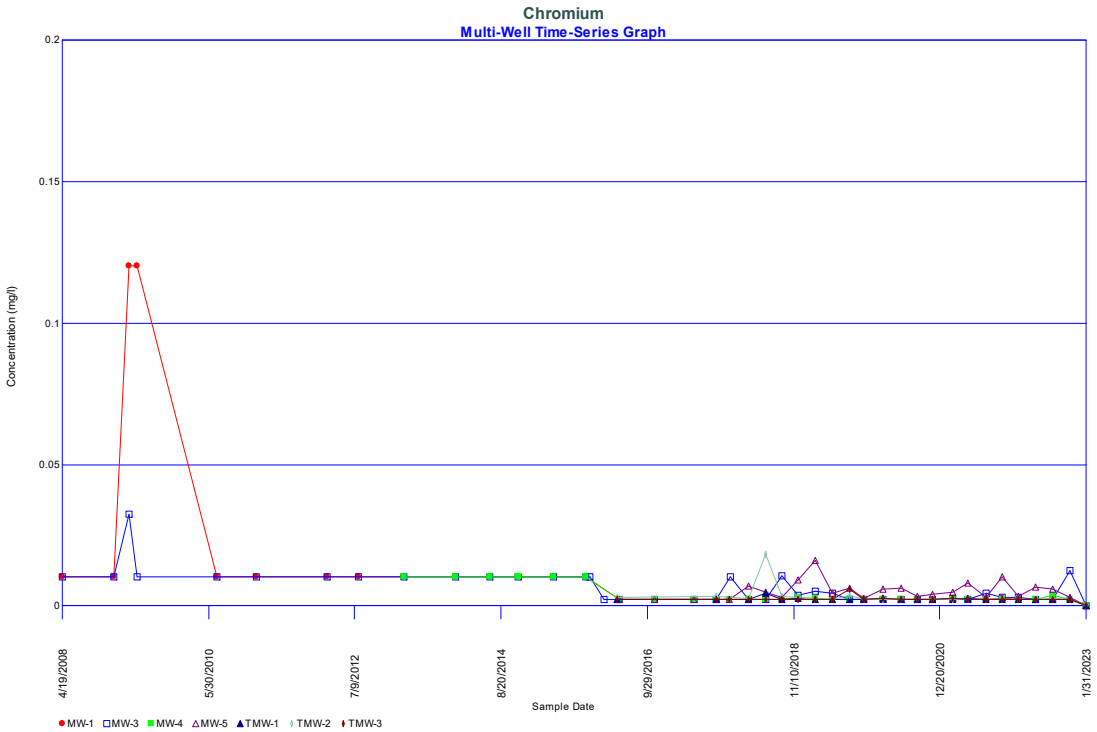

Total Cadmium
Multi-Well Time-Series Graph
Concentration (mg/l)
0.3
0.25
0.2
0.15
0.1
0.05
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

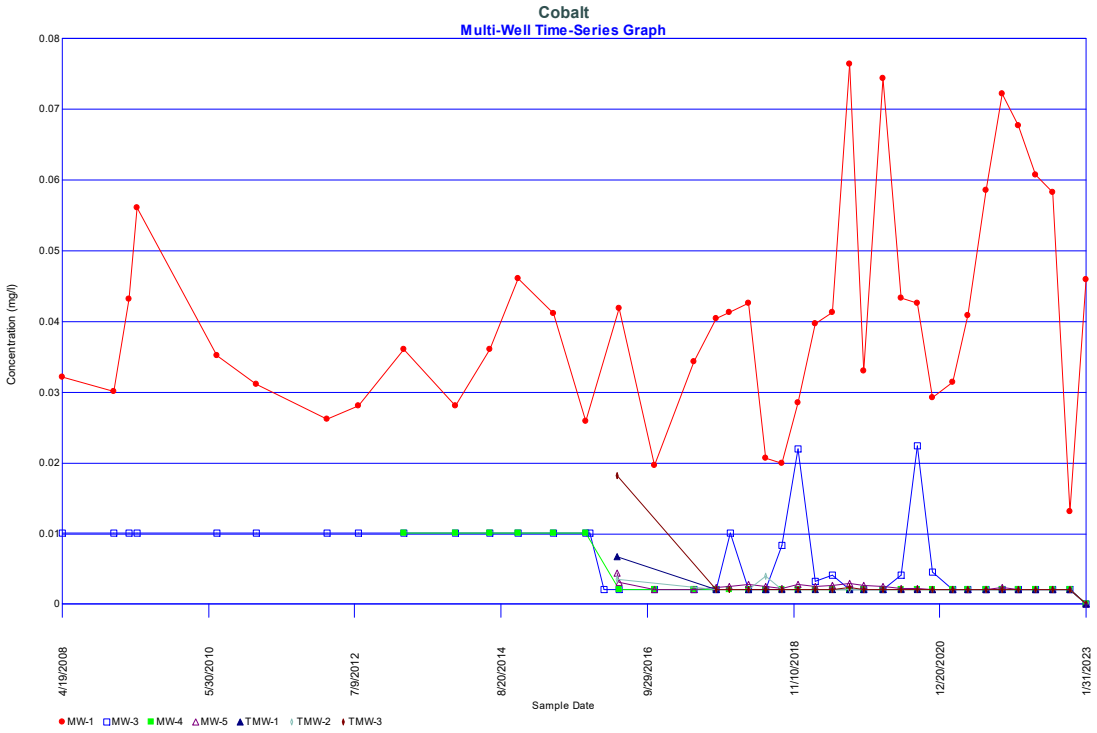



Calcium
Multi-Well Time-Series Graph
Concentration (mg/l)
200
150
100
50
0
5/19/2009
5/4/2011
4/18/2013
4/3/2015
3/18/2017
3/3/2019
2/15/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

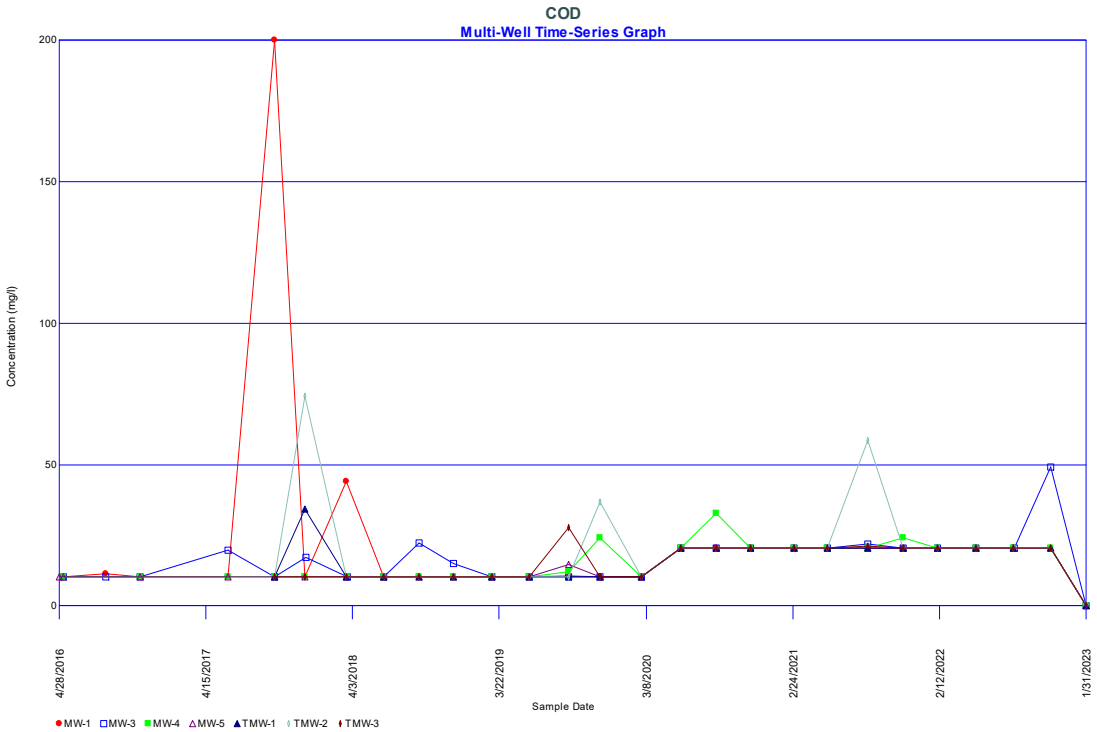

Chloride
Multi-Well Time-Series Graph
Concentration (mg/l)
500
400
300
200
100
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

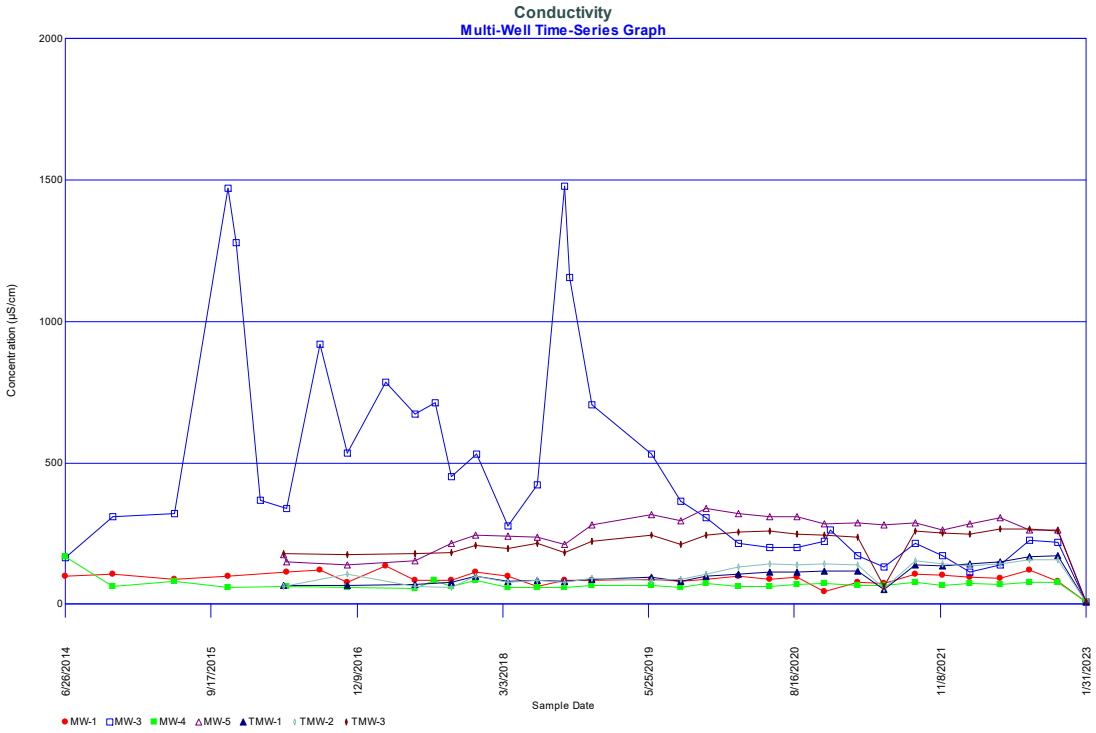



Chromium
Multi-Well Time-Series Graph
Concentration (mg/l)
0.2
0.15
0.1
0.05
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

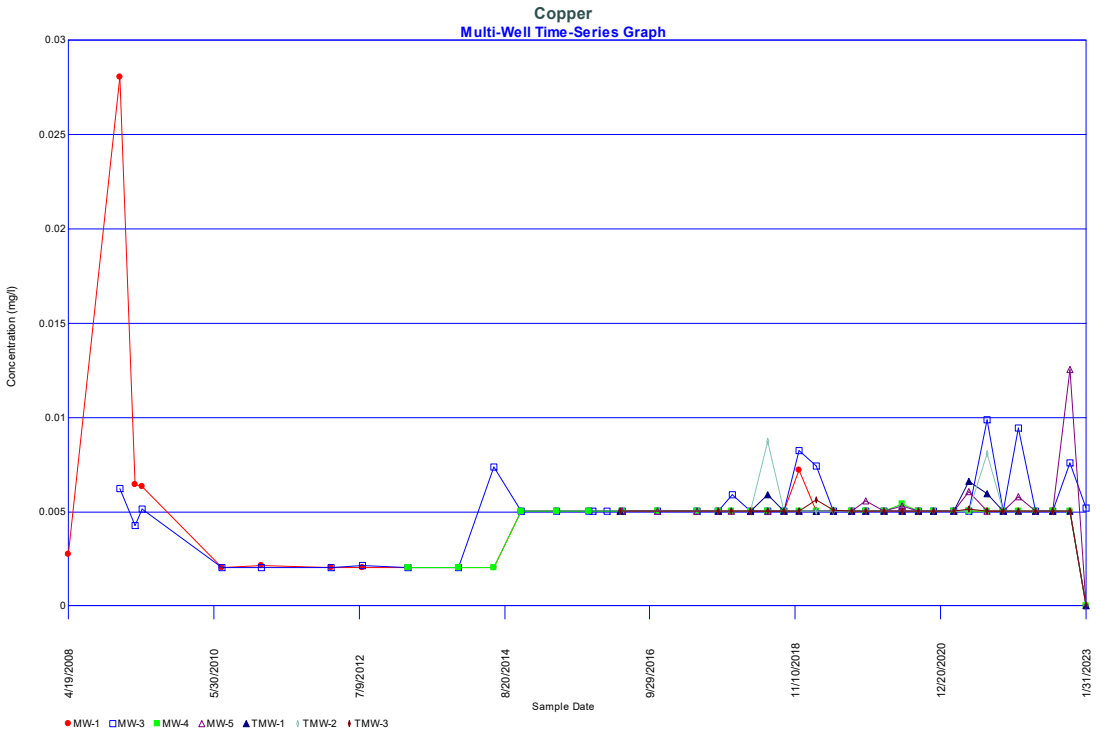

Cobalt
Multi-Well Time-Series Graph
Concentration (mg/l)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

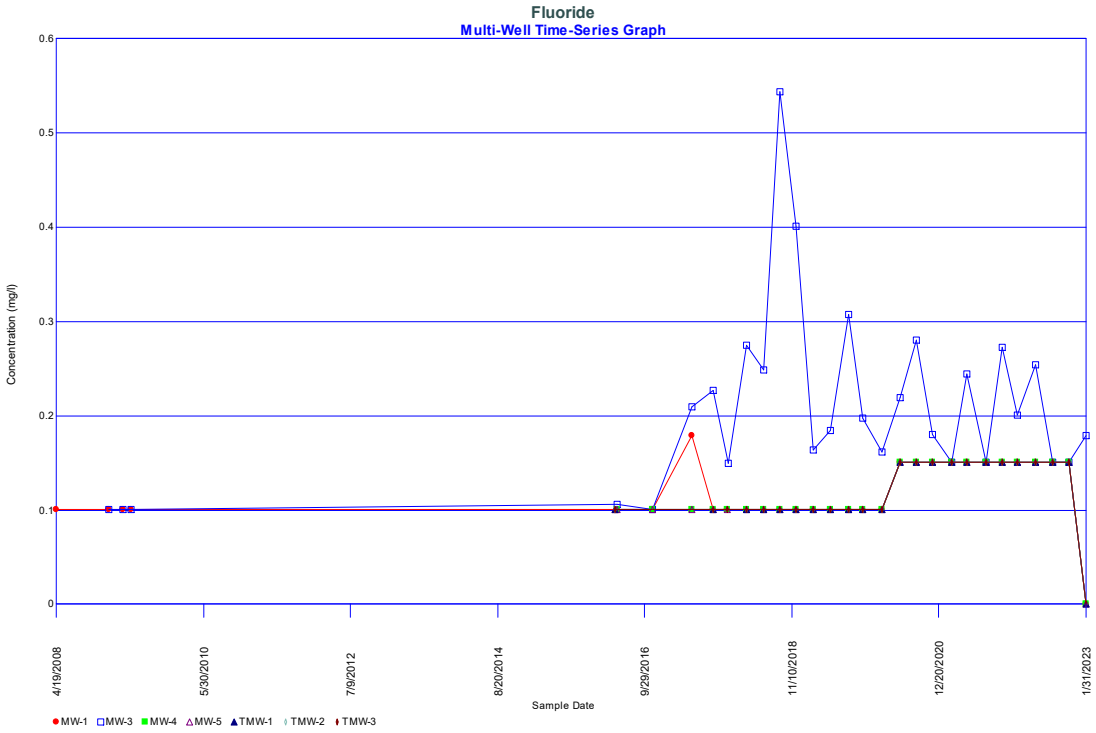



COD
Multi-Well Time-Series Graph
Concentration (mg/l)
200
150
100
50
0
4/28/2016
4/15/2017
4/3/2018
3/22/2019
3/8/2020
2/24/2021
2/12/2022
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

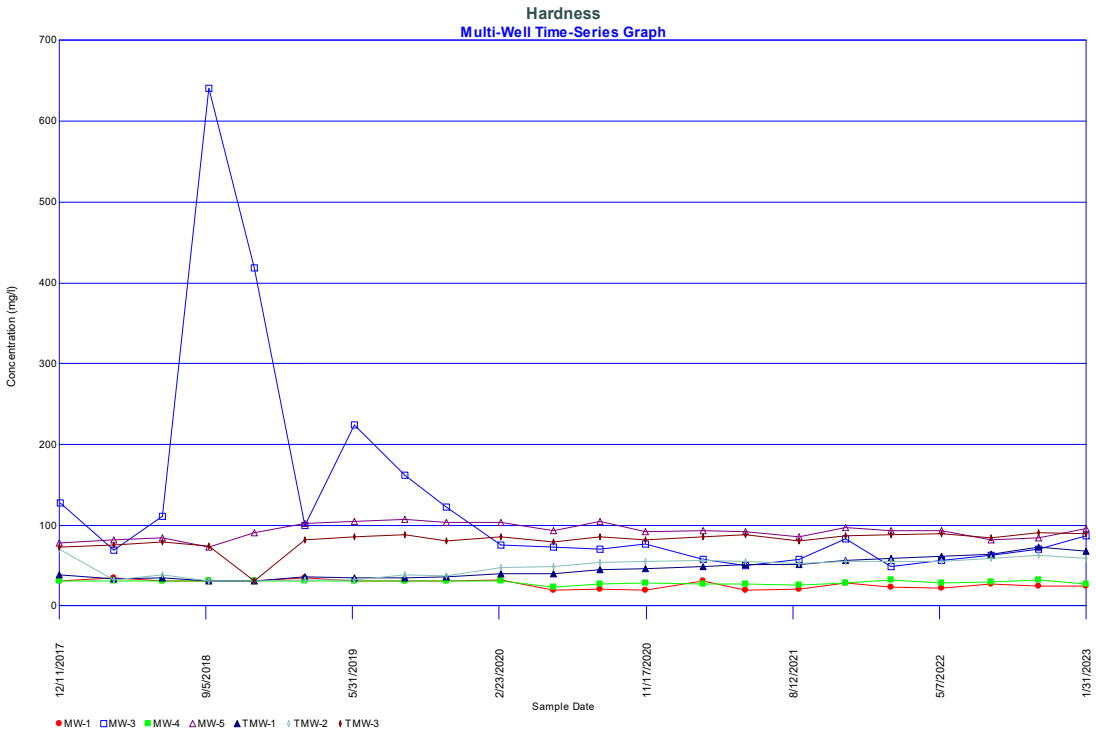

Conductivity
Multi-Well Time-Series Graph
2000
1500
1000
500
0
Concentration (µS/cm)
6/26/2014
9/17/2015
12/9/2016
3/3/2018
5/25/2019
8/16/2020
11/8/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

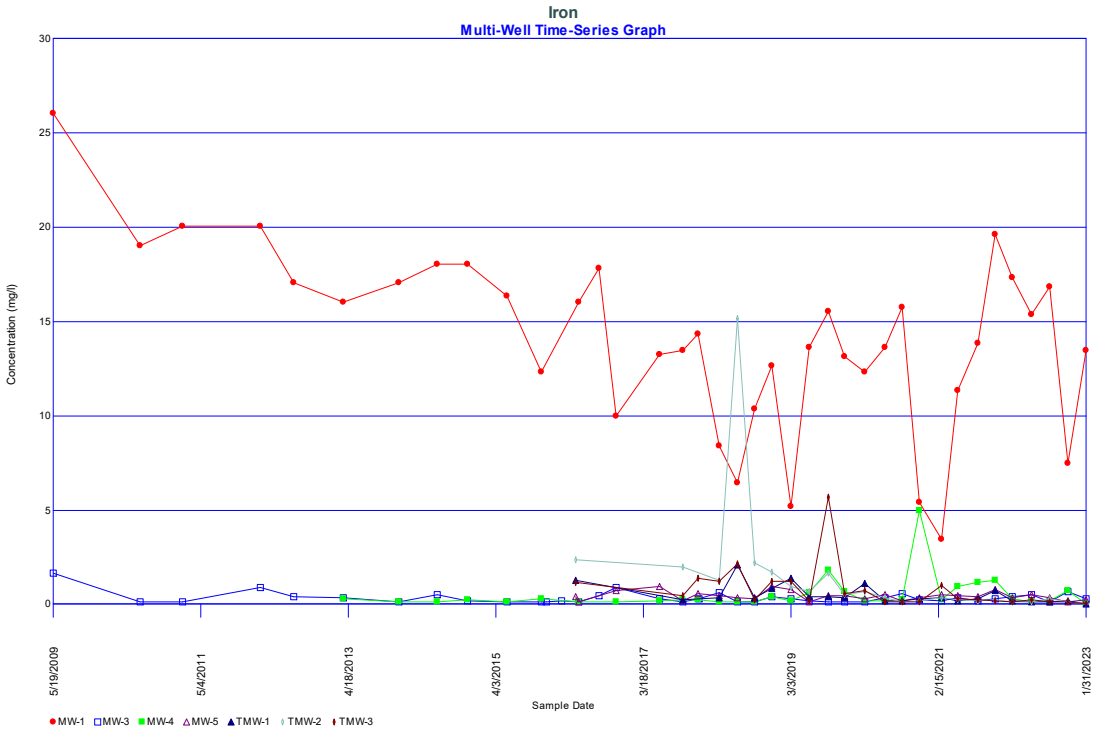



Copper
Multi-Well Time-Series Graph
0.03
0.025
0.02
0.015
0.01
0.005
0
Concentration (mg/l)
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

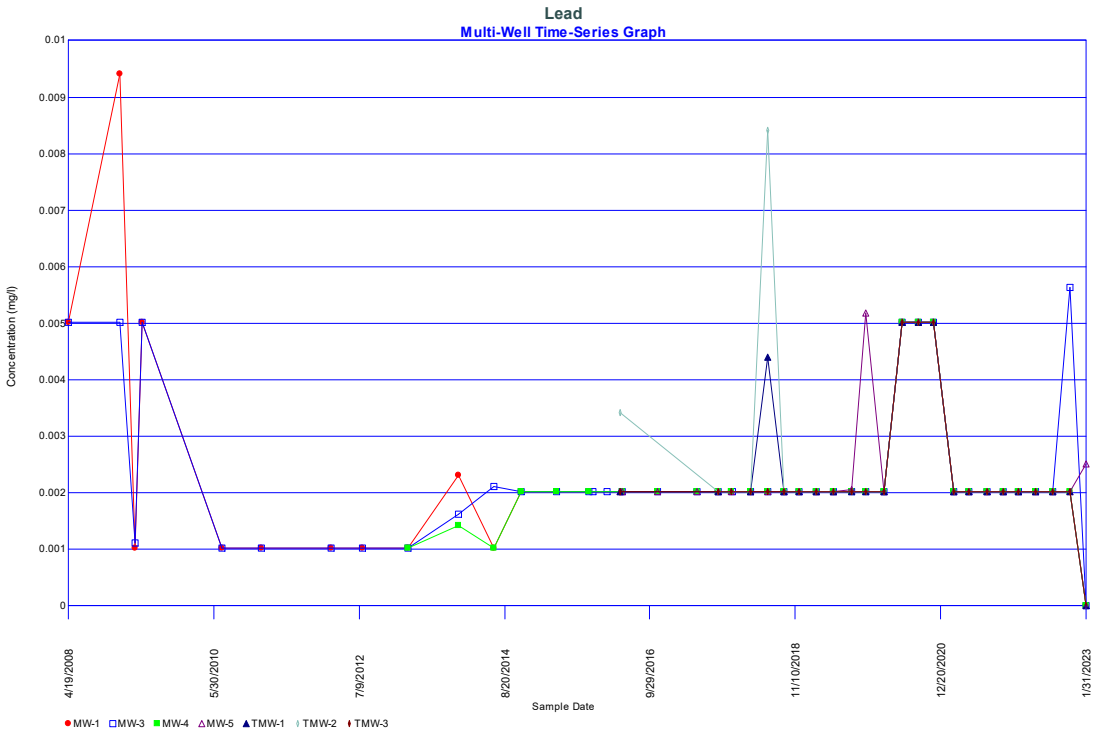

Fluoride
Multi-Well Time-Series Graph
Concentration (mg/l)
0.6
0.5
0.4
0.3
0.2
0.1
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

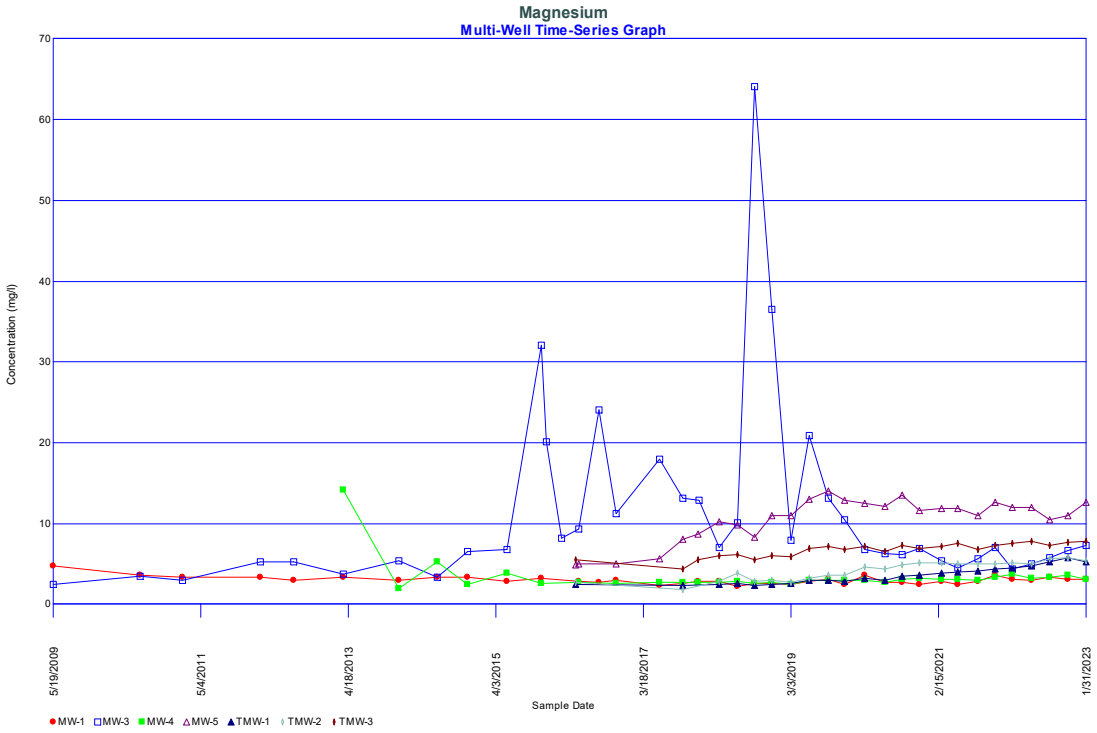



Hardness
Multi-Well Time-Series Graph
Concentration (mg/l)
700
600
500
400
300
200
100
0
12/11/2017
9/5/2018
5/31/2019
2/23/2020
11/17/2020
8/12/2021
5/7/2022
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

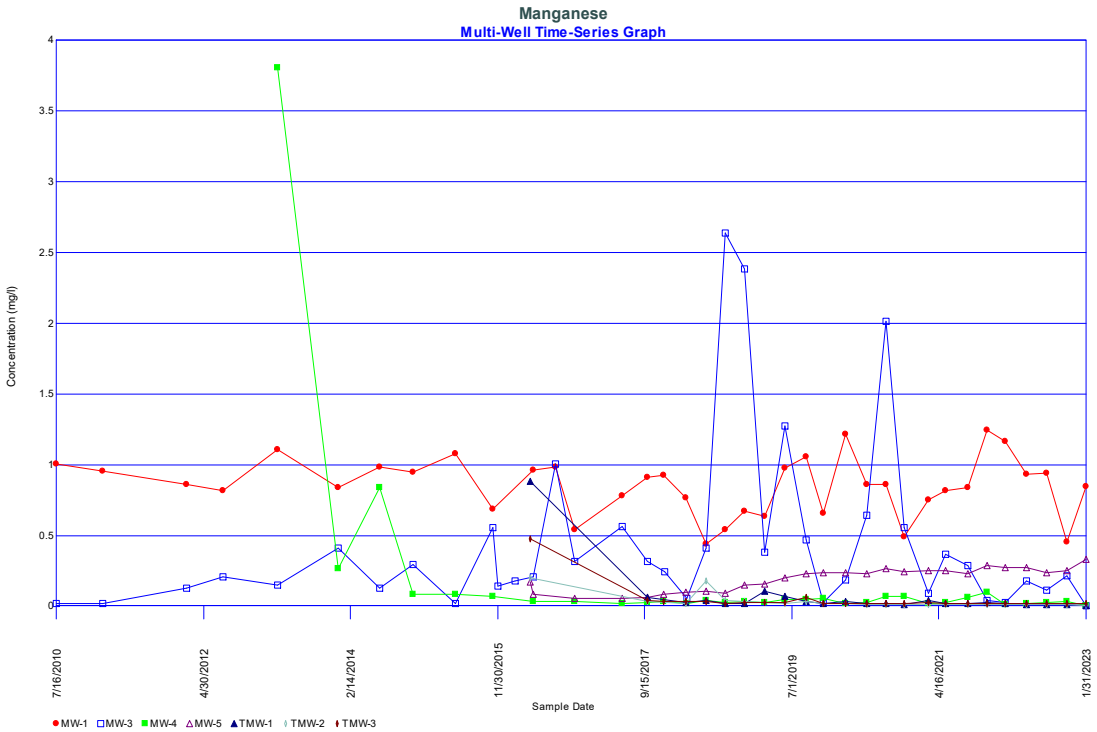

Iron
Multi-Well Time-Series Graph
Concentration (mg/l)
30
25
20
15
10
5
0
5/19/2009
5/4/2011
4/18/2013
4/3/2015
3/18/2017
3/3/2019
2/15/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

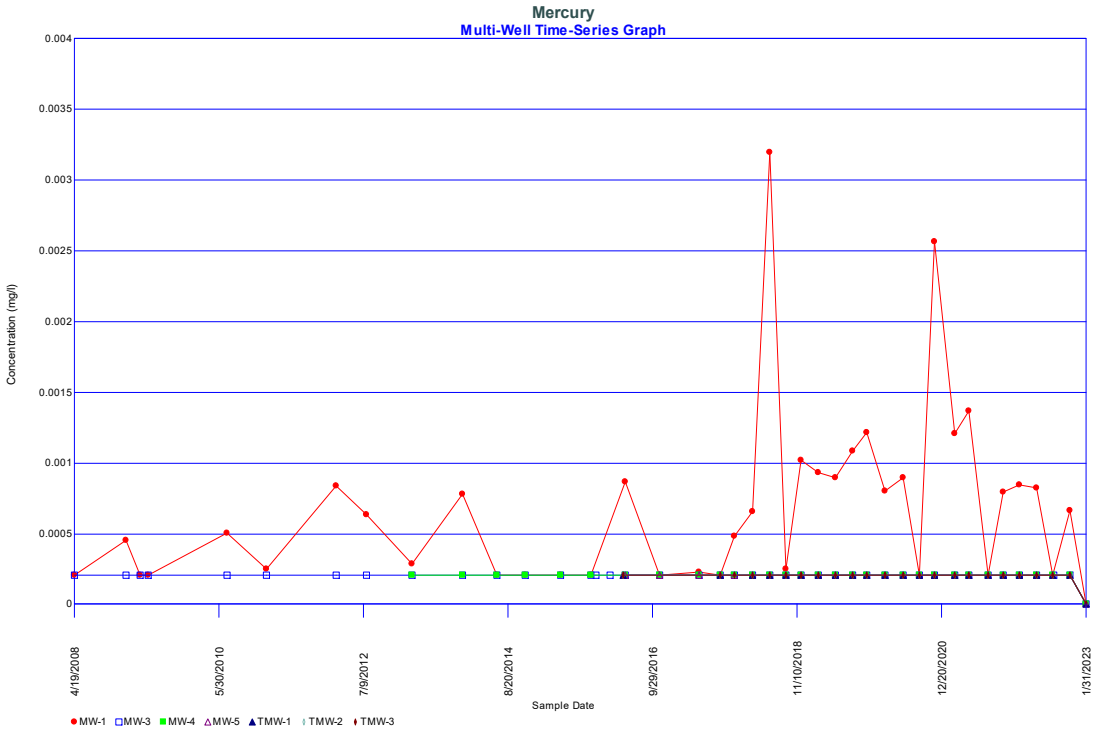



Lead
Multi-Well Time-Series Graph
Concentration (mg/l)
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

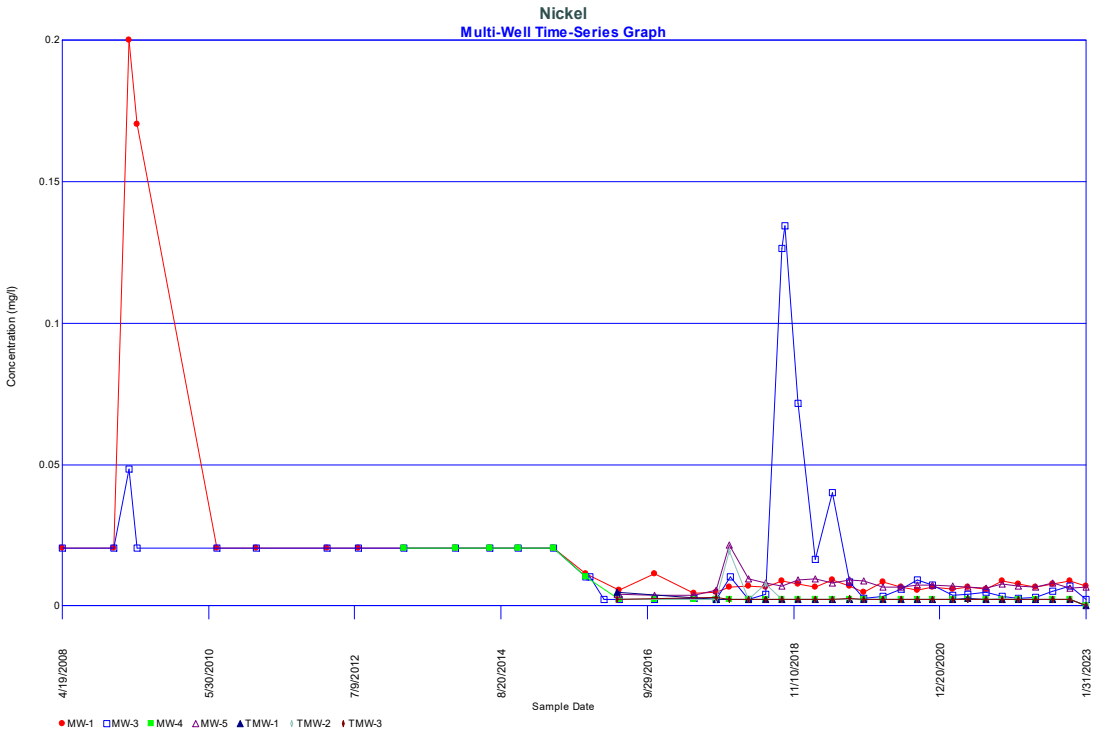

Magnesium
Multi-Well Time-Series Graph
Concentration (mg/l)
70
60
50
40
30
20
10
0
5/19/2009
5/4/2011
4/18/2013
4/3/2015
3/18/2017
3/3/2019
2/15/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

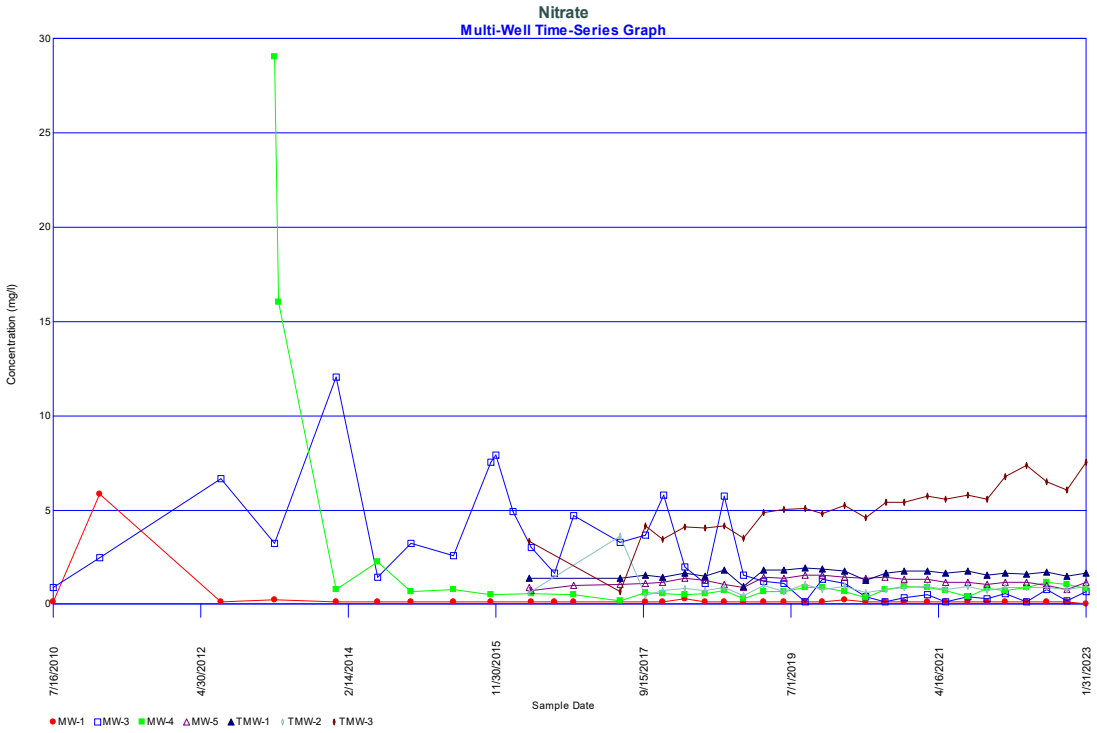



Manganese
Multi-Well Time-Series Graph
Concentration (mg/l)
4
3.5
3
2.5
2
1.5
1
0.5
0
7/16/2010
4/30/2012
2/14/2014
11/30/2015
9/15/2017
7/1/2019
4/16/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

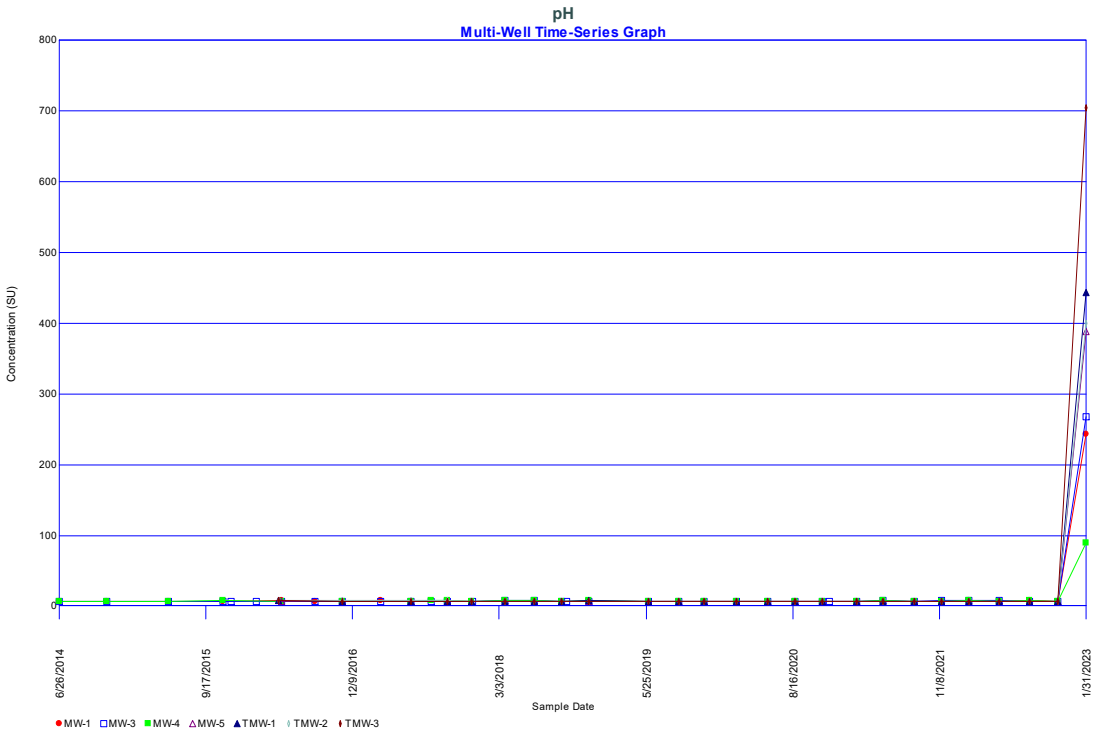

Mercury
Multi-Well Time-Series Graph
0.004
0.0035
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
Concentration (mg/l)
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

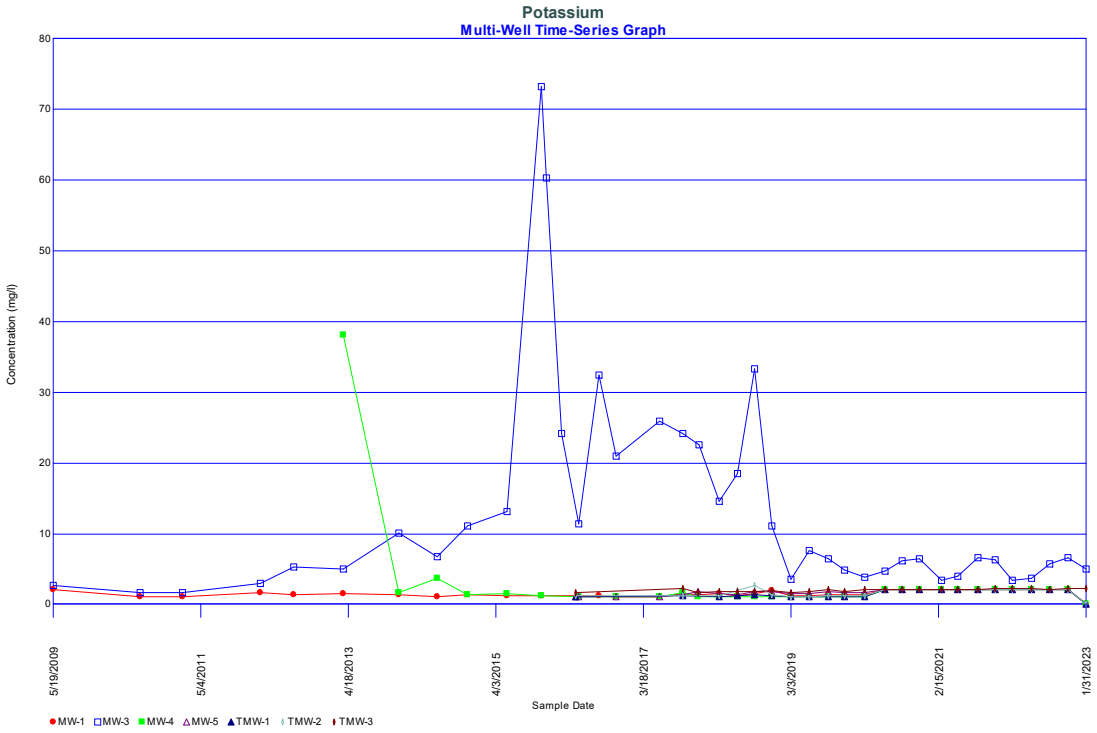



Nickel
Multi-Well Time-Series Graph
0.2
0.15
0.1
0.05
0
Concentration (mg/l)
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

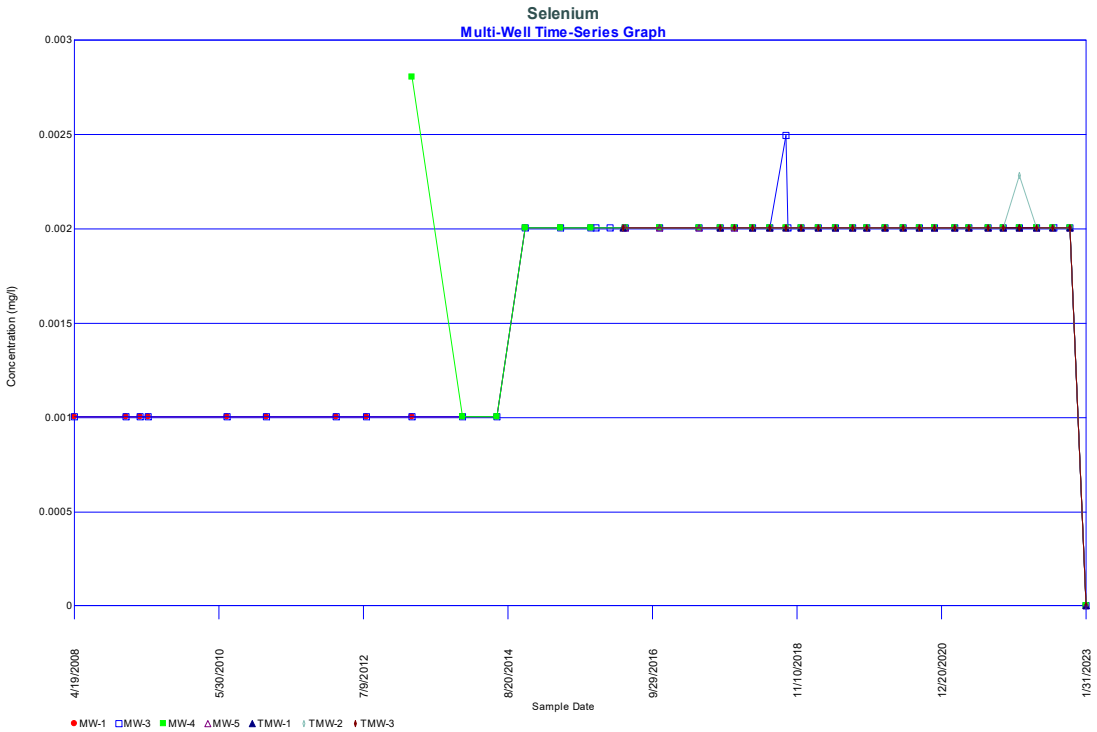

Nitrate
Multi-Well Time-Series Graph
Concentration (mg/l)
30
25
20
15
10
5
0
7/16/2010
4/30/2012
2/14/2014
11/30/2015
9/15/2017
7/1/2019
4/16/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

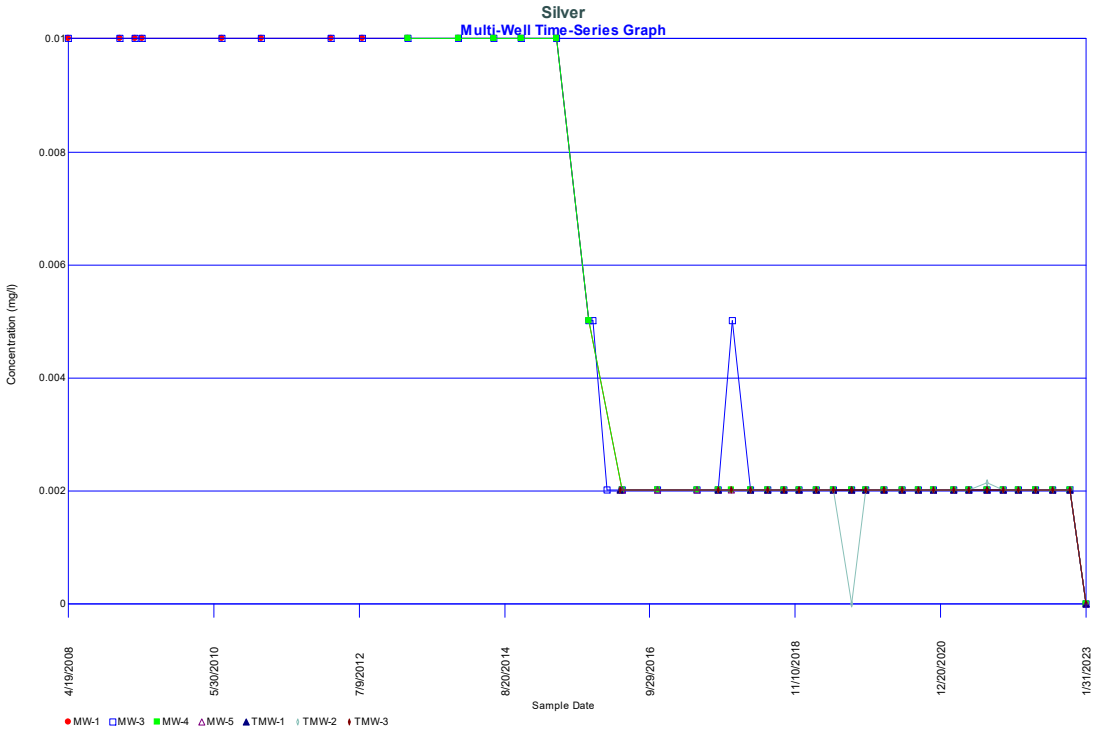



pH
Multi-Well Time-Series Graph
Concentration (SU)
800
700
600
500
400
300
200
100
0
6/26/2014
9/17/2015
12/9/2016
3/3/2018
5/25/2019
8/16/2020
11/8/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

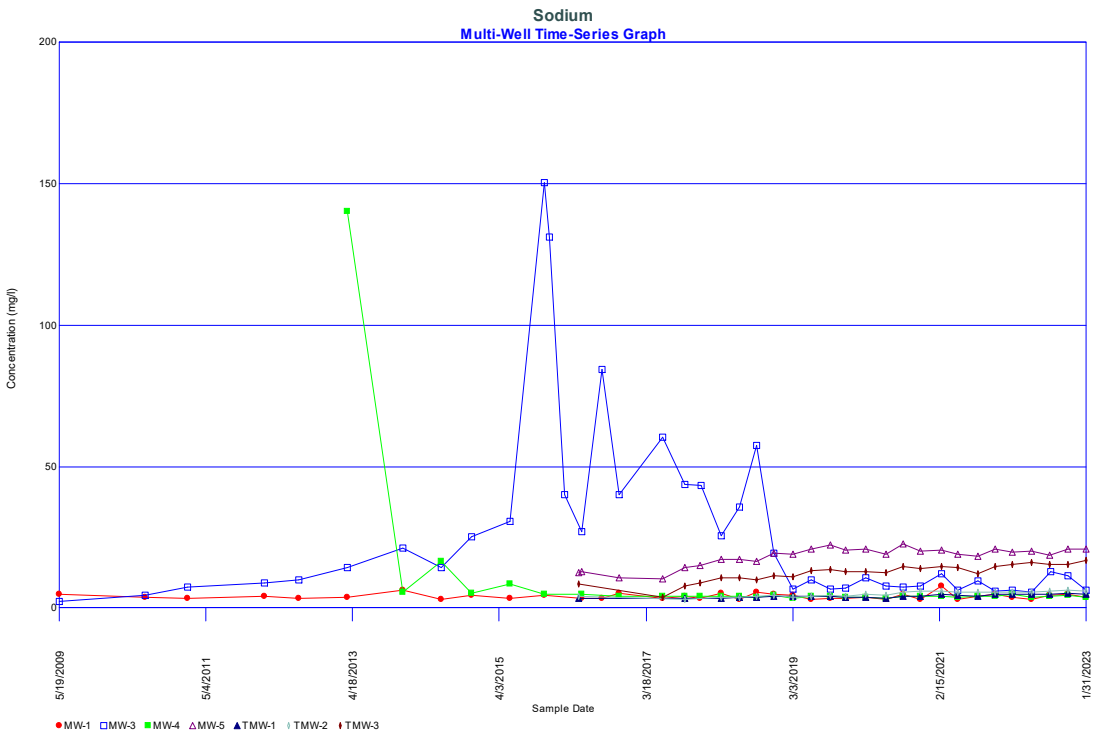

Potassium
Multi-Well Time-Series Graph
Concentration (mg/l)
80
70
60
50
40
30
20
10
0
5/19/2009
5/4/2011
4/18/2013
4/3/2015
3/18/2017
3/3/2019
2/15/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

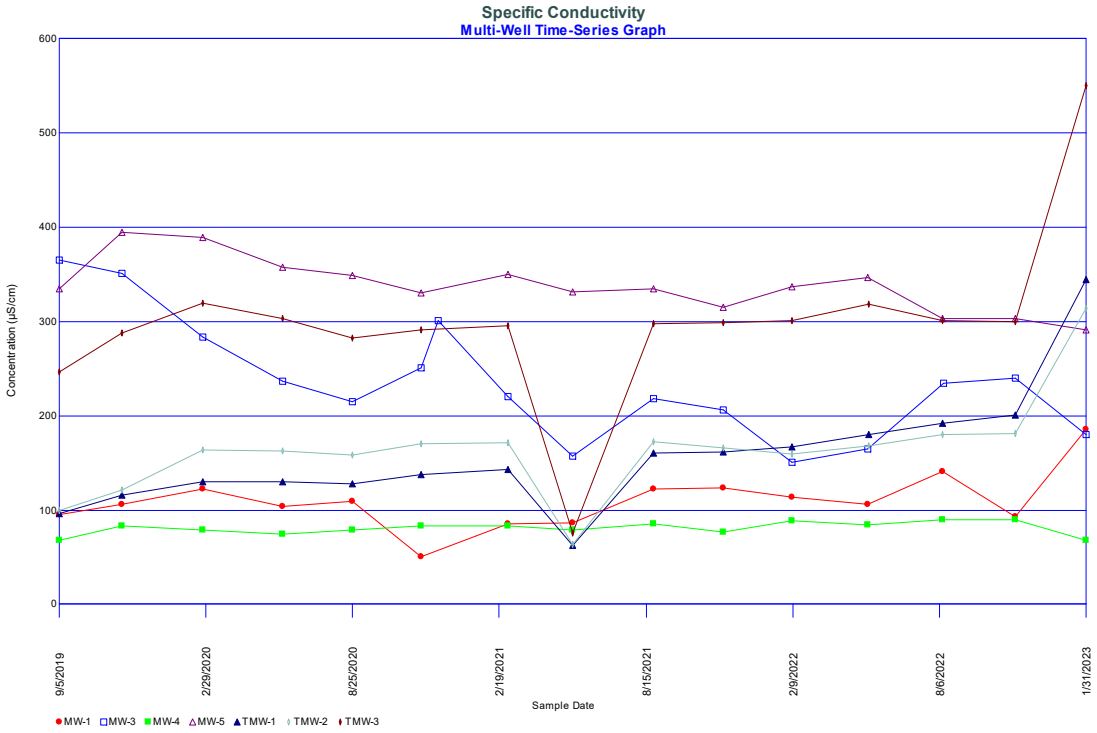



Selenium
Multi-Well Time-Series Graph
Concentration (mg/l)
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

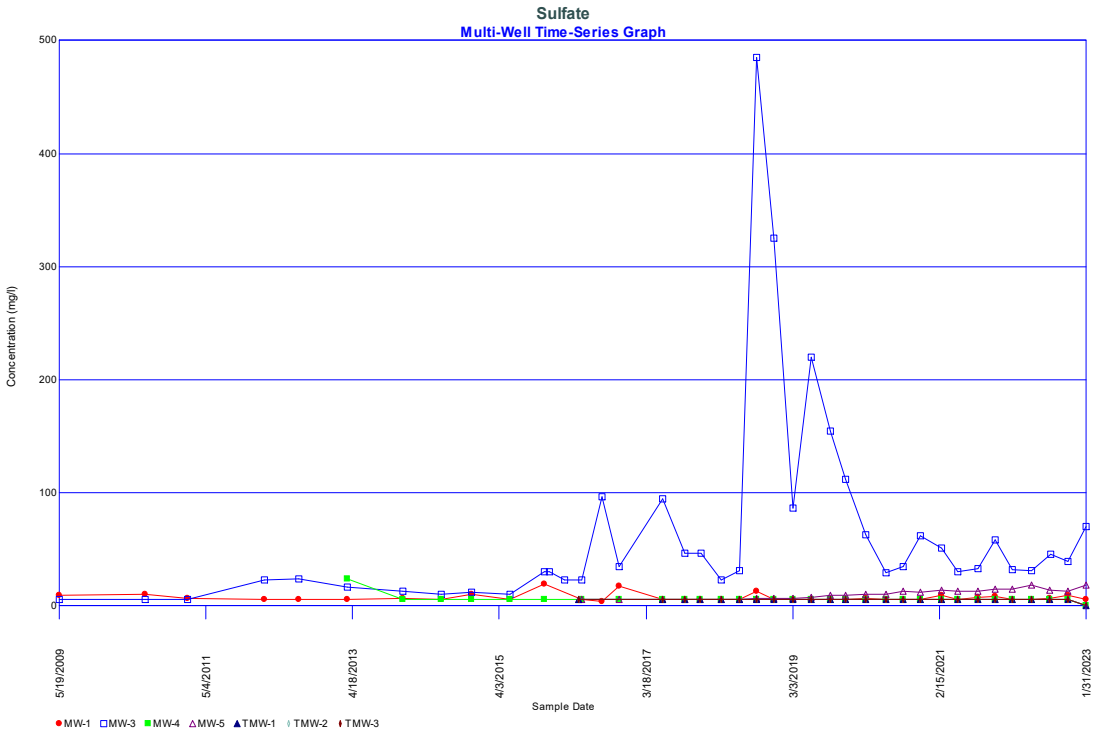

Silver
Multi-Well Time-Series Graph
0.01
0.008
0.006
0.004
0.002
0
Concentration (mg/l)
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

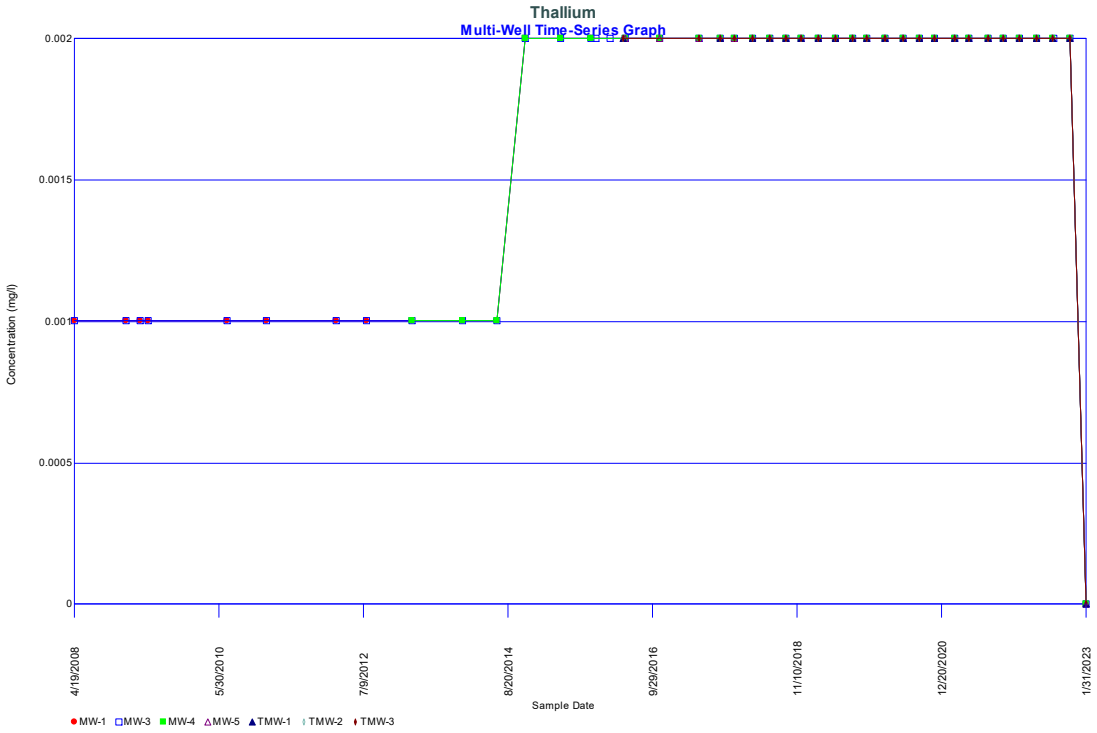



Sodium
Multi-Well Time-Series Graph
200
150
100
50
0
Concentration (mg/l)
5/19/2009
5/4/2011
4/18/2013
4/3/2015
3/18/2017
3/3/2019
2/15/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

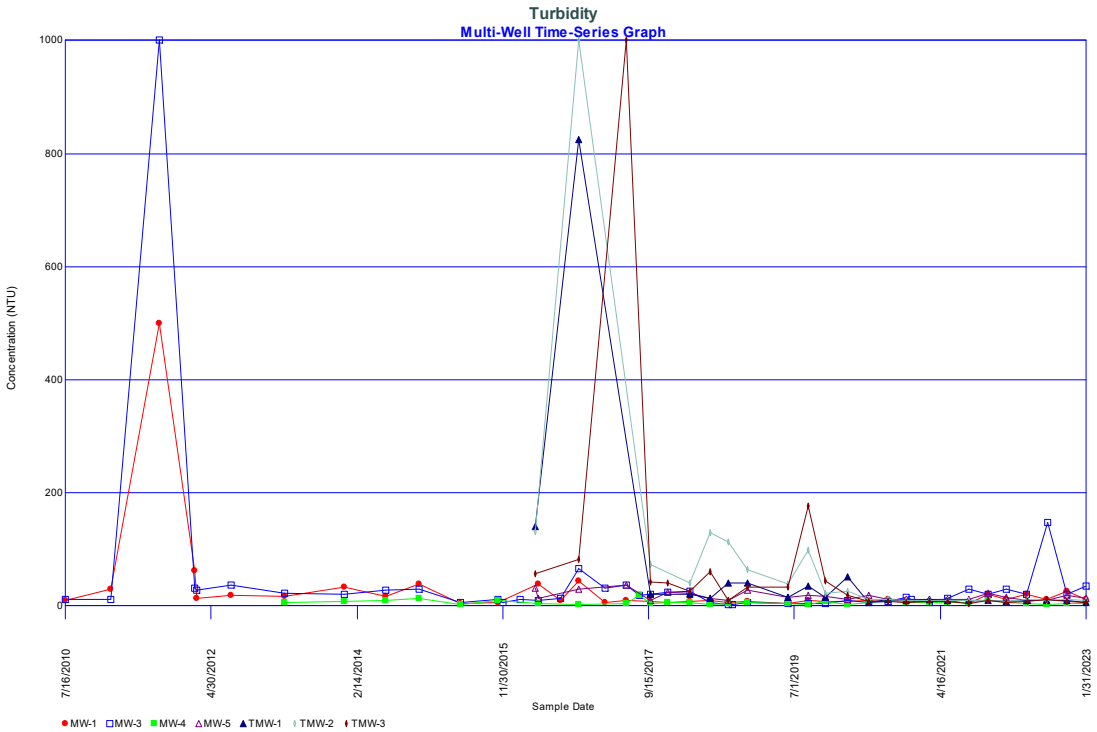

Specific Conductivity
Multi-Well Time-Series Graph
Concentration (µS/cm)
600
500
400
300
200
100
0
9/5/2019
2/29/2020
8/25/2020
2/19/2021
8/15/2021
2/9/2022
8/6/2022
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

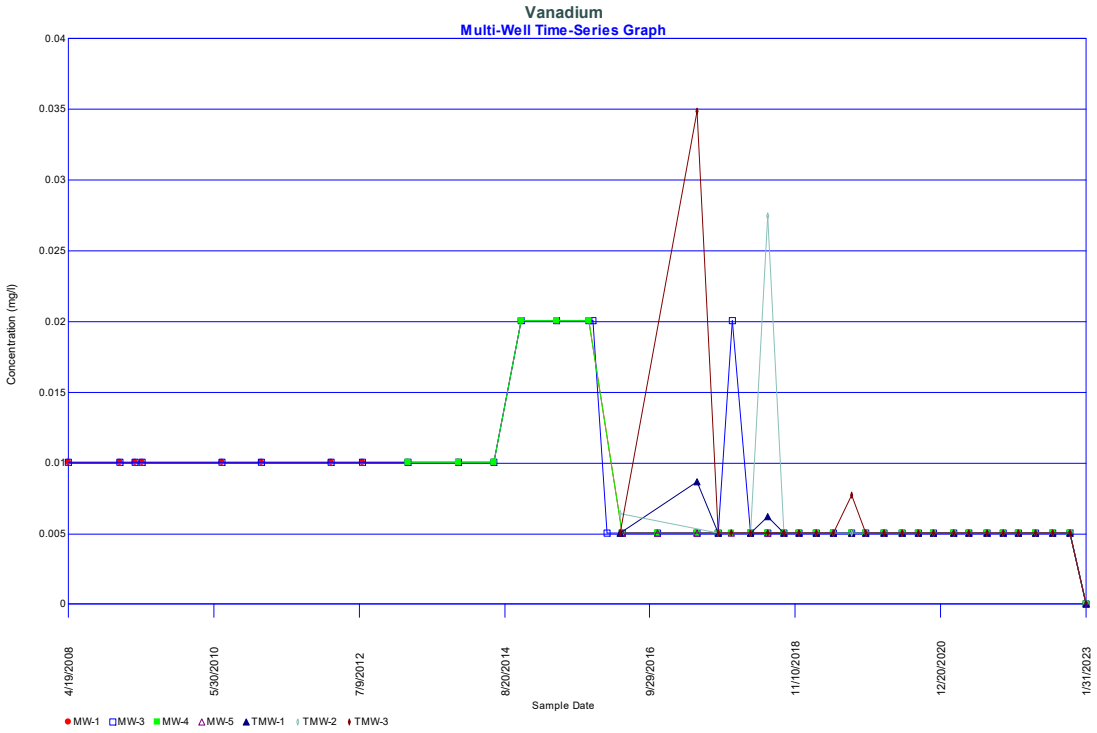



Sulfate
Multi-Well Time-Series Graph
Concentration (mg/l)
500
400
300
200
100
0
5/19/2009
5/4/2011
4/18/2013
4/3/2015
3/18/2017
3/3/2019
2/15/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

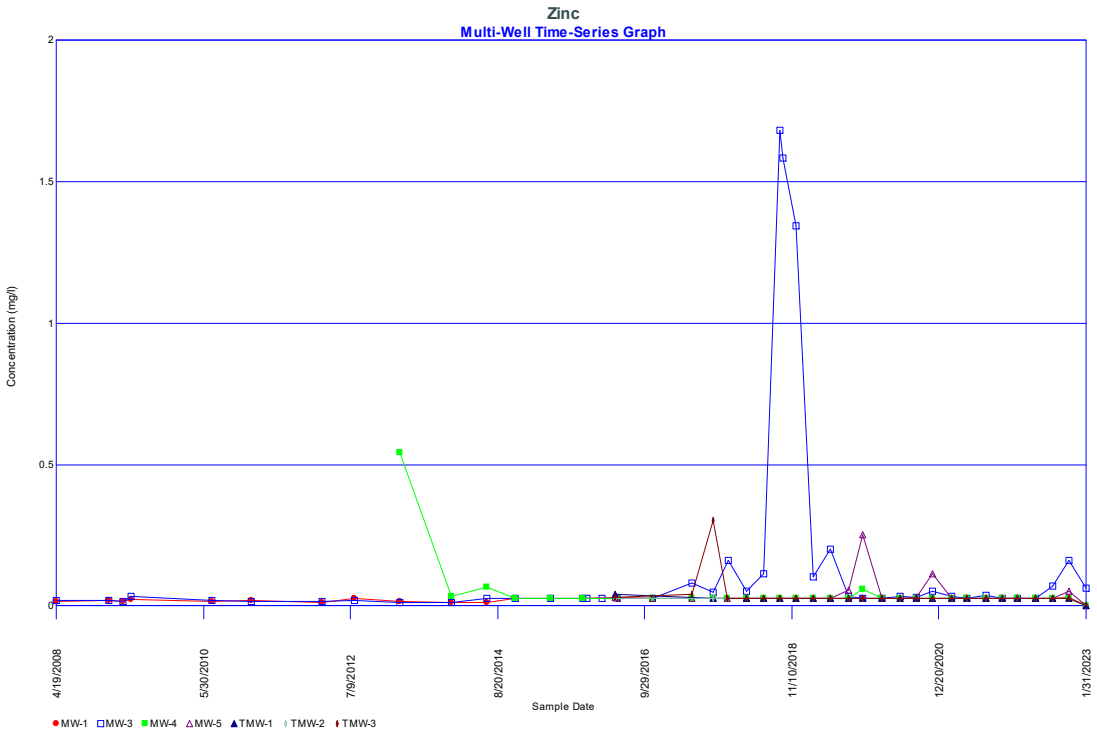

Thallium
Multi-Well Time-Series Graph
0.002
0.0015
0.001
0.0005
0
Concentration (mg/l)
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3




Turbidity
Multi-Well Time-Series Graph
1000
800
600
400
200
0
Concentration (NTU)
7/16/2010
4/30/2012
2/14/2014
11/30/2015
9/15/2017
7/1/2019
4/16/2021
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3


Vanadium
Multi-Well Time-Series Graph
Concentration (mg/l)
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3




Zinc
Multi-Well Time-Series Graph
Concentration (mg/l)
2
1.5
1
0.5
0
4/19/2008
5/30/2010
7/9/2012
8/20/2014
9/29/2016
11/10/2018
12/20/2020
1/31/2023
Sample Date
MW-1 MW-3 MW-4 MW-5 TMW-1 TMW-2 TMW-3

# Basic Statistics

## Parameter: Arsenic

### Original Data (Not Transformed)

### Non-Detects Replaced with Detection Limit

| | |
|---|---|
| Total Measurements | 40 |
| Total Non-Detects | 0 (0%) |
| Pooled Mean | 0.0367523 |
| Pooled Std Dev | 0.0283163 |
| | |
| Compliance Meas. | 0 |
| Compliance Mean | 0 |
| Compliance Std Dev | 0 |
| | |
| Background Meas. | 40 |
| Background Mean | 0.0367523 |
| Background Std Dev | 0.0283163 |

## Background Locations

There is 1 background location

| Location | Meas. | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 40 | 0 | 0 | 1.47009 |

| Location | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 0.0367523 | 0.0283163 | 0 | 820 | 20.5 |

## Compliance Locations

There are 0 compliance location

## Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 0 |
| SS Total | 0.0312706 |

## Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 0 |
| Background Rank Sum | 820 |
| Background Rank Mean | 20.5 |
| H Statistic | 1.42109e-014 |
| H Adjusted for Ties | 1.42109e-014 |

## Basic Statistics

### Parameter: Barium

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

| | |
|---|---|
| Total Measurements | 40 |
| Total Non-Detects | 3 (7.5%) |
| Pooled Mean | 0.0224375 |
| Pooled Std Dev | 0.0106157 |
| | |
| Compliance Meas. | 0 |
| Compliance Mean | 0 |
| Compliance Std Dev | 0 |
| | |
| Background Meas. | 40 |
| Background Mean | 0.0224375 |
| Background Std Dev | 0.0106157 |

### Background Locations

There is 1 background location

| Location | Meas. | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 40 | 3 | 7.5 | 0.8975 |

| Location | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 0.0224375 | 0.0106157 | 0 | 820 | 20.5 |

### Compliance Locations

There are 0 compliance location

### Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 0 |
| SS Total | 0.00439505 |

### Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 2 |
| Background Rank Sum | 820 |
| Background Rank Mean | 20.5 |
| H Statistic | 1.42109e-014 |
| H Adjusted for Ties | 1.42162e-014 |

## Basic Statistics

### Parameter: Chloride

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

| | |
|---|---|
| Total Measurements | 41 |
| Total Non-Detects | 0 (0%) |
| Pooled Mean | 2.79341 |
| Pooled Std Dev | 1.0991 |
| | |
| Compliance Meas. | 0 |
| Compliance Mean | 0 |
| Compliance Std Dev | 0 |
| | |
| Background Meas. | 41 |
| Background Mean | 2.79341 |
| Background Std Dev | 1.0991 |

### Background Locations

There is 1 background location

| Location | Meas. | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 41 | 0 | 0 | 114.53 |

| Location | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 2.79341 | 1.0991 | 0 | 861 | 21 |

### Compliance Locations

There are 0 compliance location

### Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | -5.68434e-014 |
| SS Total | 48.3207 |

### Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 0 |
| Background Rank Sum | 861 |
| Background Rank Mean | 21 |
| H Statistic | 0 |
| H Adjusted for Ties | 0 |

## Basic Statistics

### Parameter: Cobalt

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

| | |
|---|---|
| Total Measurements | 40 |
| Total Non-Detects | 0 (0%) |
| Pooled Mean | 0.0402125 |
| Pooled Std Dev | 0.0152581 |
| Compliance Meas. | 0 |
| Compliance Mean | 0 |
| Compliance Std Dev | 0 |
| Background Meas. | 40 |
| Background Mean | 0.0402125 |
| Background Std Dev | 0.0152581 |

### Background Locations

There is 1 background location

| Location | Meas. | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 40 | 0 | 0 | 1.6085 |

| Location | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 0.0402125 | 0.0152581 | 0 | 820 | 20.5 |

### Compliance Locations

There are 0 compliance location

### Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 0 |
| SS Total | 0.00907958 |

### Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 0 |
| Background Rank Sum | 820 |
| Background Rank Mean | 20.5 |
| H Statistic | 1.42109e-014 |
| H Adjusted for Ties | 1.42109e-014 |

## Basic Statistics

### Parameter: Copper

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

| | |
|---|---|
| Total Measurements | 40 |
| Total Non-Detects | 34 (85%) |
| Pooled Mean | 0.00499125 |
| Pooled Std Dev | 0.00401909 |
| | |
| Compliance Meas. | 0 |
| Compliance Mean | 0 |
| Compliance Std Dev | 0 |
| | |
| Background Meas. | 40 |
| Background Mean | 0.00499125 |
| Background Std Dev | 0.00401909 |

### Background Locations

There is 1 background location

| Location | Meas. | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 40 | 34 | 85 | 0.19965 |

| Location | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 0.00499125 | 0.00401909 | 0 | 820 | 20.5 |

### Compliance Locations

There are 0 compliance location

### Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 0 |
| SS Total | 0.000629969 |

### Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 17.5 |
| Background Rank Sum | 820 |
| Background Rank Mean | 20.5 |
| H Statistic | 1.42109e-014 |
| H Adjusted for Ties | 3.68135e-014 |

## Basic Statistics

### Parameter: Fluoride

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

| | |
|---|---|
| Total Measurements | 30 |
| Total Non-Detects | 29 (96.6667%) |
| Pooled Mean | 0.1176 |
| Pooled Std Dev | 0.0343868 |
| | |
| Compliance Meas. | 0 |
| Compliance Mean | 0 |
| Compliance Std Dev | 0 |
| | |
| Background Meas. | 30 |
| Background Mean | 0.1176 |
| Background Std Dev | 0.0343868 |

### Background Locations

There is 1 background location

| Location | Meas. | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 30 | 29 | 96.6667 | 3.528 |

| Location | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 0.1176 | 0.0343868 | 0 | 465 | 15.5 |

### Compliance Locations

There are 0 compliance location

### Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 0 |
| SS Total | 0.0342912 |

### Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 15 |
| Background Rank Sum | 465 |
| Background Rank Mean | 15.5 |
| H Statistic | 0 |
| H Adjusted for Ties | 0 |

## Basic Statistics

### Parameter: Nickel

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

| | |
|---|---|
| Total Measurements | 40 |
| Total Non-Detects | 11 (27.5%) |
| Pooled Mean | 0.019415 |
| Pooled Std Dev | 0.0390895 |
| | |
| Compliance Meas. | 0 |
| Compliance Mean | 0 |
| Compliance Std Dev | 0 |
| | |
| Background Meas. | 40 |
| Background Mean | 0.019415 |
| Background Std Dev | 0.0390895 |

### Background Locations

There is 1 background location

| Location | Meas. | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 40 | 11 | 27.5 | 0.7766 |

| Location | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 0.019415 | 0.0390895 | 0 | 820 | 20.5 |

### Compliance Locations

There are 0 compliance location

### Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 0 |
| SS Total | 0.0595917 |

### Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 6 |
| Background Rank Sum | 820 |
| Background Rank Mean | 20.5 |
| H Statistic | 1.42109e-014 |
| H Adjusted for Ties | 1.45103e-014 |

## Basic Statistics

### Parameter: Sulfate

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

| | |
|---|---|
| Total Measurements | 38 |
| Total Non-Detects | 21 (55.2632%) |
| Pooled Mean | 6.54289 |
| Pooled Std Dev | 3.20645 |
| | |
| Compliance Meas. | 0 |
| Compliance Mean | 0 |
| Compliance Std Dev | 0 |
| | |
| Background Meas. | 38 |
| Background Mean | 6.54289 |
| Background Std Dev | 3.20645 |

### Background Locations

There is 1 background location

| Location | Meas. | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 38 | 21 | 55.2632 | 248.63 |

| Location | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 6.54289 | 3.20645 | 0 | 741 | 19.5 |

### Compliance Locations

There are 0 compliance location

### Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 0 |
| SS Total | 380.41 |

### Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 11 |
| Background Rank Sum | 741 |
| Background Rank Mean | 19.5 |
| H Statistic | 0 |
| H Adjusted for Ties | 0 |

## Basic Statistics

### Parameter: Zinc

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

| | |
|---|---|
| Total Measurements | 40 |
| Total Non-Detects | 29 (72.5%) |
| Pooled Mean | 0.02142 |
| Pooled Std Dev | 0.00673423 |
| | |
| Compliance Meas. | 0 |
| Compliance Mean | 0 |
| Compliance Std Dev | 0 |
| | |
| Background Meas. | 40 |
| Background Mean | 0.02142 |
| Background Std Dev | 0.00673423 |

### Background Locations

There is 1 background location

| Location | Meas. | Non-Detects | % ND | Total |
|---|---|---|---|---|
| MW-1 | 40 | 29 | 72.5 | 0.8568 |

| Location | Mean | Std Dev | Std Err | Rank Sum | Rank Mean |
|---|---|---|---|---|---|
| MW-1 | 0.02142 | 0.00673423 | 0 | 820 | 20.5 |

### Compliance Locations

There are 0 compliance location

### Analysis of Variance Statistics

| | |
|---|---|
| SS Wells | 0 |
| SS Total | 0.00176864 |

### Kruskal-Wallis Statistics

| | |
|---|---|
| Non-Detect Rank | 15 |
| Background Rank Sum | 820 |
| Background Rank Mean | 20.5 |
| H Statistic | 1.42109e-014 |
| H Adjusted for Ties | 2.29527e-014 |

## Shapiro-Wilks Test of Normality

**Parameter: Arsenic**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**
K = 20 for 40 measurements

Sum of b values = 0.165089
Sample Standard Deviation = 0.0283163
W Statistic = 0.871565

**5% Critical value of 0.94 exceeds 0.871565**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.919 exceeds 0.871565**
**Evidence of non-normality at 99% level of significance**



## Shapiro-Wilks Test of Normality

**Parameter: Barium**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**
K = 20 for 40 measurements

Sum of b values = 0.0440678
Sample Standard Deviation = 0.0106157
W Statistic = 0.441853

**5% Critical value of 0.94 exceeds 0.441853**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.919 exceeds 0.441853**
**Evidence of non-normality at 99% level of significance**

## Shapiro-Wilks Test of Normality

**Parameter: Chloride**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**
K = 20 for 41 measurements

Sum of b values = 6.30172
Sample Standard Deviation = 1.0991
W Statistic = 0.821835

**5% Critical value of 0.941 exceeds 0.821835**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.92 exceeds 0.821835**
**Evidence of non-normality at 99% level of significance**



## Shapiro-Wilks Test of Normality

**Parameter: Cobalt**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**
K = 20 for 40 measurements

Sum of b values = 0.0919108
Sample Standard Deviation = 0.0152581
W Statistic = 0.930394

**5% Critical value of 0.94 exceeds 0.930394**
**Evidence of non-normality at 95% level of significance**

1% Critical value of 0.919 is less than 0.930394
Data is normally distributed at 99% level of significance

## Shapiro-Wilks Test of Normality

**Parameter: Copper**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**
K = 20 for 40 measurements

Sum of b values = 0.0166649
Sample Standard Deviation = 0.00401909
W Statistic = 0.440843

**5% Critical value of 0.94 exceeds 0.440843**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.919 exceeds 0.440843**
**Evidence of non-normality at 99% level of significance**



## Shapiro-Wilks Test of Normality

**Parameter: Fluoride**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**
K = 15 for 30 measurements

Sum of b values = 0.159946
Sample Standard Deviation = 0.0343868
W Statistic = 0.746045

**5% Critical value of 0.927 exceeds 0.746045**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.9 exceeds 0.746045**
**Evidence of non-normality at 99% level of significance**

## Shapiro-Wilks Test of Normality

**Parameter: Nickel**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**
K = 20 for 40 measurements

Sum of b values = 0.146489
Sample Standard Deviation = 0.0390895
W Statistic = 0.360099

**5% Critical value of 0.94 exceeds 0.360099**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.919 exceeds 0.360099**
**Evidence of non-normality at 99% level of significance**



## Shapiro-Wilks Test of Normality

**Parameter: Sulfate**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**
K = 19 for 38 measurements

Sum of b values = 15.2763
Sample Standard Deviation = 3.20645
W Statistic = 0.613456

**5% Critical value of 0.938 exceeds 0.613456**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.916 exceeds 0.613456**
**Evidence of non-normality at 99% level of significance**

## Shapiro-Wilks Test of Normality

**Parameter: Zinc**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**
K = 20 for 40 measurements

Sum of b values = 0.0347541
Sample Standard Deviation = 0.00673423
W Statistic = 0.682921

**5% Critical value of 0.94 exceeds 0.682921**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.919 exceeds 0.682921**
**Evidence of non-normality at 99% level of significance**



## Shapiro-Wilks Test of Normality

**Parameter: Arsenic**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**
K = 20 for 40 measurements

Sum of b values = 5.45173
Sample Standard Deviation = 0.907321
W Statistic = 0.925725

**5% Critical value of 0.94 exceeds 0.925725**
**Evidence of non-normality at 95% level of significance**

1% Critical value of 0.919 is less than 0.925725
Data is normally distributed at 99% level of significance

## Shapiro-Wilks Test of Normality

**Parameter: Barium**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**
K = 20 for 40 measurements

Sum of b values = 1.94205
Sample Standard Deviation = 0.341434
W Statistic = 0.829551

**5% Critical value of 0.94 exceeds 0.829551**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.919 exceeds 0.829551**
**Evidence of non-normality at 99% level of significance**



## Shapiro-Wilks Test of Normality

**Parameter: Chloride**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**
K = 20 for 41 measurements

Sum of b values = 2.06647
Sample Standard Deviation = 0.34356
W Statistic = 0.90447

**5% Critical value of 0.941 exceeds 0.90447**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.92 exceeds 0.90447**
**Evidence of non-normality at 99% level of significance**

## Shapiro-Wilks Test of Normality

**Parameter: Cobalt**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**
K = 20 for 40 measurements

Sum of b values = 2.37438
Sample Standard Deviation = 0.385884
W Statistic = 0.970785

5% Critical value of 0.94 is less than 0.970785
Data is normally distributed at 95% level of significance

1% Critical value of 0.919 is less than 0.970785
Data is normally distributed at 99% level of significance



## Shapiro-Wilks Test of Normality

**Parameter: Copper**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**
K = 20 for 40 measurements

Sum of b values = 5.04574
Sample Standard Deviation = 1.11895
W Statistic = 0.521389

**5% Critical value of 0.94 exceeds 0.521389**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.919 exceeds 0.521389**
**Evidence of non-normality at 99% level of significance**

## Shapiro-Wilks Test of Normality

**Parameter: Fluoride**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**
K = 15 for 30 measurements

Sum of b values = 2.22729
Sample Standard Deviation = 0.583014
W Statistic = 0.503265

**5% Critical value of 0.927 exceeds 0.503265**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.9 exceeds 0.503265**
**Evidence of non-normality at 99% level of significance**



## Shapiro-Wilks Test of Normality

**Parameter: Nickel**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**
K = 20 for 40 measurements

Sum of b values = 3.5733
Sample Standard Deviation = 0.755405
W Statistic = 0.573739

**5% Critical value of 0.94 exceeds 0.573739**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.919 exceeds 0.573739**
**Evidence of non-normality at 99% level of significance**

## Shapiro-Wilks Test of Normality

**Parameter: Sulfate**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**
K = 19 for 38 measurements

Sum of b values = 3.38065
Sample Standard Deviation = 0.634624
W Statistic = 0.76695

**5% Critical value of 0.938 exceeds 0.76695**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.916 exceeds 0.76695**
**Evidence of non-normality at 99% level of significance**



## Shapiro-Wilks Test of Normality

**Parameter: Zinc**
**Background Locations**
**Normality Test of Parameter Concentrations**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**
K = 20 for 40 measurements

Sum of b values = 3.47642
Sample Standard Deviation = 0.779279
W Statistic = 0.510288

**5% Critical value of 0.94 exceeds 0.510288**
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.919 exceeds 0.510288**
**Evidence of non-normality at 99% level of significance**

## Non-Parametric Prediction Interval

**Intra-Well Comparison for MW-1**

**Parameter: Arsenic**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 39
**Maximum Baseline Concentration = 0.1**
Confidence Level = 97.5%
False Positive Rate = 2.5%

| Baseline Measurements | Date | Value |
|---|---|---|
| | 4/19/2008 | 0.024 |
| | 1/21/2009 | 0.072 |
| | 4/9/2009 | 0.067 |
| | 5/19/2009 | 0.064 |
| | 7/16/2010 | 0.074 |
| | 2/8/2011 | 0.086 |
| | 2/17/2012 | 0.093 |
| | 7/31/2012 | 0.089 |
| | 3/27/2013 | 0.049 |
| | 12/23/2013 | 0.1 |
| | 6/26/2014 | 0.063 |
| | 11/21/2014 | 0.059 |
| | 5/28/2015 | 0.0604 |
| | 11/11/2015 | 0.0469 |
| | 5/9/2016 | 0.05 |
| | 11/10/2016 | 0.0286 |
| | 6/8/2017 | 0.0571 |
| | 9/28/2017 | 0.0199 |
| | 12/11/2017 | 0.0573 |
| | 3/21/2018 | 0.0101 |
| | 6/19/2018 | 0.0063 |
| | 9/12/2018 | 0.0184 |
| | 12/4/2018 | 0.0254 |
| | 3/5/2019 | 0.00449 |
| | 6/4/2019 | 0.0194 |
| | 9/5/2019 | 0.0176 |
| | 11/20/2019 | 0.0176 |
| | 2/27/2020 | 0.00807 |
| | 6/2/2020 | 0.0174 |
| | 8/26/2020 | 0.0244 |
| | 11/17/2020 | 0.00513 |
| | 3/2/2021 | 0.00576 |
| | 5/20/2021 | 0.0131 |
| | 8/26/2021 | 0.019 |
| | 11/18/2021 | 0.0192 |
| | 2/9/2022 | 0.0219 |
| | 5/12/2022 | 0.0195 |
| | 8/11/2022 | 0.023 |
| | 11/7/2022 | 0.00807 |

| Date | Count | Mean | Significant |
|---|---|---|---|
| 1/31/2023 | 1 | 0.00607 | FALSE |

## Non-Parametric Prediction Interval

**Intra-Well Comparison for MW-1**

**Parameter: Barium**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 7.69231%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 39
**Maximum Baseline Concentration = 0.084**
Confidence Level = 97.5%
False Positive Rate = 2.5%

| Baseline Measurements | Date | Value |
|---|---|---|
| | 4/19/2008 | 0.084 |
| | 1/21/2009 | 0.028 |
| | 4/9/2009 | 0.028 |
| | 5/19/2009 | 0.033 |
| | 7/16/2010 | 0.021 |
| | 2/8/2011 | 0.021 |
| | 2/17/2012 | 0.022 |
| | 7/31/2012 | 0.019 |
| | 3/27/2013 | 0.018 |
| | 12/23/2013 | 0.017 |
| | 6/26/2014 | 0.018 |
| | 11/21/2014 | 0.02 |
| | 5/28/2015 | 0.0188 |
| | 11/11/2015 | 0.0237 |
| | 5/9/2016 | 0.02 |
| | 11/10/2016 | 0.0207 |
| | 6/8/2017 | 0.0146 |
| | 9/28/2017 | 0.0175 |
| | 12/11/2017 | 0.0166 |
| | 3/21/2018 | 0.0212 |
| | 6/19/2018 | 0.0163 |
| | 9/12/2018 | 0.0186 |
| | 12/4/2018 | 0.0199 |
| | 3/5/2019 | 0.0184 |
| | 6/4/2019 | 0.0219 |
| | 9/5/2019 | 0.0199 |
| | 11/20/2019 | 0.0194 |
| | 2/27/2020 | 0.0241 |
| | 6/2/2020 | ND<0.02 |
| | 8/26/2020 | ND<0.02 |
| | 11/17/2020 | ND<0.02 |
| | 3/2/2021 | 0.0222 |
| | 5/20/2021 | 0.0177 |
| | 8/26/2021 | 0.0198 |
| | 11/18/2021 | 0.0276 |
| | 2/9/2022 | 0.0213 |
| | 5/12/2022 | 0.0188 |
| | 8/11/2022 | 0.0204 |
| | 11/7/2022 | 0.0247 |

| Date | Count | Mean | Significant |
|---|---|---|---|



| | | | |
|---|---|---|---|
| 1/31/2023 | 1 | 0.0244 | FALSE |

## Non-Parametric Prediction Interval

**Intra-Well Comparison for MW-1**

**Parameter: Chloride**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 0%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 39
**Maximum Baseline Concentration = 5.68**
Confidence Level = 97.5%
False Positive Rate = 2.5%

| Baseline Measurements | Date | Value |
|---|---|---|
| | 4/19/2008 | 2 |
| | 1/21/2009 | 2.9 |
| | 4/9/2009 | 1.9 |
| | 5/19/2009 | 2.8 |
| | 7/16/2010 | 2.8 |
| | 2/8/2011 | 2.6 |
| | 2/17/2012 | 2.1 |
| | 7/31/2012 | 2.2 |
| | 3/27/2013 | 1.8 |
| | 12/23/2013 | 1.5 |
| | 6/26/2014 | 2.9 |
| | 11/21/2014 | 3.9 |
| | 5/28/2015 | 2.01 |
| | 11/11/2015 | 3.97 |
| | 5/9/2016 | 2.12 |
| | 8/18/2016 | 2.4 |
| | 11/10/2016 | 4.59 |
| | 6/8/2017 | 5.68 |
| | 9/28/2017 | 4.11 |
| | 12/11/2017 | 2.31 |
| | 3/21/2018 | 2.1 |
| | 6/19/2018 | 2.24 |
| | 9/12/2018 | 4.94 |
| | 12/4/2018 | 1.67 |
| | 3/5/2019 | 2.11 |
| | 6/4/2019 | 2.15 |
| | 9/5/2019 | 2.84 |
| | 11/20/2019 | 2.52 |
| | 2/27/2020 | 1.95 |
| | 6/2/2020 | 2.27 |
| | 8/26/2020 | 2.61 |
| | 11/17/2020 | 2.48 |
| | 3/2/2021 | 2.15 |
| | 5/20/2021 | 2.15 |
| | 8/26/2021 | 4.1 |
| | 11/18/2021 | 1.95 |
| | 2/9/2022 | 1.93 |
| | 5/12/2022 | 2.05 |
| | 8/11/2022 | 4.2 |

| Date | Count | Mean | Significant |
|---|---|---|---|



| | | | |
|---|---|---|---|
| 1/31/2023 | 1 | 3.55 | FALSE |

## Parametric Prediction Interval Analysis

**Intra-Well Comparison for MW-1**

**Parameter: Cobalt**

**Natural Logarithm Transformation**

**Non-Detects Replaced with 1/2 DL**

**Intra-Well USEPA (1989/1992) Formula 95% Comparison**

| Baseline Samples | Date | Result |
|---|---|---|
| | 4/19/2008 | -3.44202 |
| | 1/21/2009 | -3.50656 |
| | 4/9/2009 | -3.14656 |
| | 5/19/2009 | -2.8824 |
| | 7/16/2010 | -3.35241 |
| | 2/8/2011 | -3.47377 |
| | 2/17/2012 | -3.64966 |
| | 7/31/2012 | -3.57555 |
| | 3/27/2013 | -3.32424 |
| | 12/23/2013 | -3.57555 |
| | 6/26/2014 | -3.32424 |
| | 11/21/2014 | -3.07911 |
| | 5/28/2015 | -3.19418 |
| | 11/11/2015 | -3.66126 |
| | 5/9/2016 | -3.17725 |
| | 11/10/2016 | -3.93223 |
| | 6/8/2017 | -3.37553 |
| | 9/28/2017 | -3.2114 |
| | 12/11/2017 | -3.19175 |
| | 3/21/2018 | -3.15825 |
| | 6/19/2018 | -3.88246 |
| | 9/12/2018 | -3.92207 |
| | 12/4/2018 | -3.56137 |
| | 3/5/2019 | -3.23145 |
| | 6/4/2019 | -3.19175 |
| | 9/5/2019 | -2.57308 |
| | 11/20/2019 | -3.41428 |
| | 2/27/2020 | -2.59964 |
| | 6/2/2020 | -3.14191 |
| | 8/26/2020 | -3.16061 |
| | 11/17/2020 | -3.53702 |
| | 3/2/2021 | -3.46414 |
| | 5/20/2021 | -3.20153 |
| | 8/26/2021 | -2.83873 |
| | 11/18/2021 | -2.6297 |
| | 2/9/2022 | -2.69415 |
| | 5/12/2022 | -2.80346 |
| | 8/11/2022 | -2.84387 |
| | 11/7/2022 | -4.34281 |

From 39 baseline samples
Baseline mean = -3.28892
Baseline std Dev = 0.389541

For 1 recent sampling event(s)
95% confidence t = 1.68595 at 38 degrees of freedom

| Date | Samples | Mean | Interval | Significant |
|---|---|---|---|---|
| 1/31/2023 | 1 | -3.08347 | [0, -2.62381] | FALSE |

## Non-Parametric Prediction Interval

**Intra-Well Comparison for MW-1**

**Parameter: Nickel**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 28.2051%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 39
**Maximum Baseline Concentration = 0.2**
Confidence Level = 97.5%
False Positive Rate = 2.5%

| Baseline Measurements | Date | Value |
|---|---|---|
| | 4/19/2008 | ND<0.02 |
| | 1/21/2009 | ND<0.02 |
| | 4/9/2009 | 0.2 |
| | 5/19/2009 | 0.17 |
| | 7/16/2010 | ND<0.02 |
| | 2/8/2011 | ND<0.02 |
| | 2/17/2012 | ND<0.02 |
| | 7/31/2012 | ND<0.02 |
| | 3/27/2013 | ND<0.02 |
| | 12/23/2013 | ND<0.02 |
| | 6/26/2014 | ND<0.02 |
| | 11/21/2014 | ND<0.02 |
| | 5/28/2015 | ND<0.02 |
| | 11/11/2015 | 0.0112 |
| | 5/9/2016 | 0.00512 |
| | 11/10/2016 | 0.0112 |
| | 6/8/2017 | 0.00418 |
| | 9/28/2017 | 0.00445 |
| | 12/11/2017 | 0.00652 |
| | 3/21/2018 | 0.00658 |
| | 6/19/2018 | 0.00637 |
| | 9/12/2018 | 0.00839 |
| | 12/4/2018 | 0.00744 |
| | 3/5/2019 | 0.00638 |
| | 6/4/2019 | 0.0088 |
| | 9/5/2019 | 0.00686 |
| | 11/20/2019 | 0.00468 |
| | 2/27/2020 | 0.00803 |
| | 6/2/2020 | 0.0063 |
| | 8/26/2020 | 0.00512 |
| | 11/17/2020 | 0.00632 |
| | 3/2/2021 | 0.0057 |
| | 5/20/2021 | 0.0064 |
| | 8/26/2021 | 0.00559 |
| | 11/18/2021 | 0.00859 |
| | 2/9/2022 | 0.00739 |
| | 5/12/2022 | 0.00644 |
| | 8/11/2022 | 0.00737 |
| | 11/7/2022 | 0.0084 |

| Date | Count | Mean | Significant |
|---|---|---|---|



| | | | |
|---|---|---|---|
| 1/31/2023 | 1 | 0.00678 | FALSE |

## Non-Parametric Prediction Interval

**Intra-Well Comparison for MW-1**

**Parameter: Sulfate**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 53.8462%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 39
**Maximum Baseline Concentration = 18.8**
Confidence Level = 97.5%
False Positive Rate = 2.5%

| Baseline Measurements | Date | Value |
|---|---|---|
| | 5/19/2009 | 8.9 |
| | 7/16/2010 | 9.4 |
| | 2/8/2011 | 5.8 |
| | 2/17/2012 | ND<5 |
| | 7/31/2012 | ND<5 |
| | 3/27/2013 | 5.1 |
| | 12/23/2013 | 6.1 |
| | 6/26/2014 | ND<5 |
| | 11/21/2014 | 9.1 |
| | 5/28/2015 | ND<5 |
| | 11/11/2015 | 18.8 |
| | 5/9/2016 | ND<5 |
| | 8/18/2016 | 3.51 |
| | 11/10/2016 | 16.5 |
| | 6/8/2017 | ND<5 |
| | 9/28/2017 | ND<5 |
| | 12/11/2017 | ND<5 |
| | 3/21/2018 | ND<5 |
| | 6/19/2018 | ND<5 |
| | 9/12/2018 | 12.3 |
| | 12/4/2018 | ND<5 |
| | 3/5/2019 | ND<5 |
| | 6/4/2019 | ND<5 |
| | 9/5/2019 | ND<5 |
| | 11/20/2019 | ND<5 |
| | 2/27/2020 | 5.72 |
| | 6/2/2020 | ND<5 |
| | 8/26/2020 | ND<5 |
| | 11/17/2020 | ND<5 |
| | 3/2/2021 | 8.91 |
| | 5/20/2021 | ND<5 |
| | 8/26/2021 | 6.63 |
| | 11/18/2021 | 7.59 |
| | 2/9/2022 | ND<5 |
| | 5/12/2022 | ND<5 |
| | 8/11/2022 | 5.52 |
| | 11/7/2022 | 8.74 |
| | 1/31/2023 | 5.01 |

| Date | Count | Mean | Significant |
|---|---|---|---|



| | | | |
|---|---|---|---|
| 1/31/2023 | 1 | 5.01 | FALSE |

## Non-Parametric Prediction Interval

**Intra-Well Comparison for MW-1**

**Parameter: Zinc**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 71.7949%
Future Samples (k) = 1
Recent Dates = 1
Baseline Measurements (n) = 39
**Maximum Baseline Concentration = 0.0287**
Confidence Level = 97.5%
False Positive Rate = 2.5%

| Baseline Measurements | Date | Value |
|---|---|---|
| | 4/19/2008 | 0.011 |
| | 1/21/2009 | 0.015 |
| | 4/9/2009 | 0.011 |
| | 5/19/2009 | 0.021 |
| | 7/16/2010 | 0.011 |
| | 2/8/2011 | 0.016 |
| | 2/17/2012 | ND<0.01 |
| | 7/31/2012 | 0.023 |
| | 3/27/2013 | 0.012 |
| | 12/23/2013 | ND<0.01 |
| | 6/26/2014 | ND<0.01 |
| | 11/21/2014 | ND<0.025 |
| | 5/28/2015 | ND<0.025 |
| | 11/11/2015 | ND<0.025 |
| | 5/9/2016 | 0.0281 |
| | 11/10/2016 | ND<0.025 |
| | 6/8/2017 | ND<0.025 |
| | 9/28/2017 | ND<0.025 |
| | 12/11/2017 | ND<0.025 |
| | 3/21/2018 | ND<0.025 |
| | 6/19/2018 | ND<0.025 |
| | 9/12/2018 | ND<0.025 |
| | 12/4/2018 | ND<0.025 |
| | 3/5/2019 | ND<0.025 |
| | 6/4/2019 | ND<0.025 |
| | 9/5/2019 | ND<0.025 |
| | 11/20/2019 | ND<0.025 |
| | 2/27/2020 | ND<0.025 |
| | 6/2/2020 | ND<0.025 |
| | 8/26/2020 | ND<0.025 |
| | 11/17/2020 | ND<0.025 |
| | 3/2/2021 | ND<0.025 |
| | 5/20/2021 | ND<0.025 |
| | 8/26/2021 | ND<0.025 |
| | 11/18/2021 | ND<0.025 |
| | 2/9/2022 | ND<0.025 |
| | 5/12/2022 | ND<0.025 |
| | 8/11/2022 | 0.025 |
| | 11/7/2022 | 0.0287 |

| Date | Count | Mean | Significant |
|---|---|---|---|



| | | | |
|---|---|---|---|
| 1/31/2023 | 1 | 0 | FALSE |

## Non-Parametric Prediction Interval

### Inter-Well Comparison

### Parameter: Barium

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 5.18868%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 40
**Maximum Background Value = 0.084**
Confidence Level = 87%
False Positive Rate = 13%

| Location | Date | Count | Mean | Significant |
|---|---|---|---|---|
| MW-3 | 1/31/2023 | 1 | 0.0577 | FALSE |
| MW-4 | 1/31/2023 | 1 | 0.00837 | FALSE |
| MW-5 | 1/31/2023 | 1 | 0.0595 | FALSE |
| TMW-1 | 1/31/2023 | 1 | 0.0134 | FALSE |
| TMW-2 | 1/31/2023 | 1 | 0.0316 | FALSE |
| TMW-3 | 1/31/2023 | 1 | 0.0527 | FALSE |



## Non-Parametric Prediction Interval

### Inter-Well Comparison

### Parameter: Chloride

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 0%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 41
**Maximum Background Value = 5.98**
Confidence Level = 87.2%
False Positive Rate = 12.8%

| Location | Date | Count | Mean | Significant |
|---|---|---|---|---|
| MW-3 | 1/31/2023 | 1 | 11.5 | TRUE |
| MW-4 | 1/31/2023 | 1 | 10.5 | TRUE |
| MW-5 | 1/31/2023 | 1 | 75.1 | TRUE |
| TMW-1 | 1/31/2023 | 1 | 44.4 | TRUE |
| TMW-2 | 1/31/2023 | 1 | 41.9 | TRUE |
| TMW-3 | 1/31/2023 | 1 | 67.8 | TRUE |

## Non-Parametric Prediction Interval

### Inter-Well Comparison

### Parameter: Copper

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 84.7619%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 40
**Maximum Background Value = 0.028**
Confidence Level = 87%
False Positive Rate = 13%

| Location | Date | Count | Mean | Significant |
|---|---|---|---|---|
| MW-3 | 1/31/2023 | 1 | 0.00512 | FALSE |
| MW-4 | 1/31/2023 | 1 | 0.005 | FALSE |
| MW-5 | 1/31/2023 | 1 | 0.005 | FALSE |
| TMW-1 | 1/31/2023 | 1 | 0.005 | FALSE |
| TMW-2 | 1/31/2023 | 1 | 0.005 | FALSE |
| TMW-3 | 1/31/2023 | 1 | 0.005 | FALSE |



## Non-Parametric Prediction Interval

### Inter-Well Comparison

### Parameter: Fluoride

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 87.9121%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 30
**Maximum Background Value = 0.178**
Confidence Level = 83.3%
False Positive Rate = 16.7%

| Location | Date | Count | Mean | Significant |
|---|---|---|---|---|
| MW-3 | 1/31/2023 | 1 | 0.178 | FALSE |
| MW-4 | 1/31/2023 | 1 | 0.15 | FALSE |
| MW-5 | 1/31/2023 | 1 | 0.15 | FALSE |
| TMW-1 | 1/31/2023 | 1 | 0.15 | FALSE |
| TMW-2 | 1/31/2023 | 1 | 0.15 | FALSE |
| TMW-3 | 1/31/2023 | 1 | 0.15 | FALSE |

## Non-Parametric Prediction Interval

### Inter-Well Comparison

### Parameter: Nickel

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 57.7465%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 40
**Maximum Background Value = 0.2**
Confidence Level = 87%
False Positive Rate = 13%

| Location | Date | Count | Mean | Significant |
|---|---|---|---|---|
| MW-3 | 1/31/2023 | 1 | 0.00212 | FALSE |
| MW-4 | 1/31/2023 | 1 | 0.002 | FALSE |
| MW-5 | 1/31/2023 | 1 | 0.0065 | FALSE |
| TMW-1 | 1/31/2023 | 1 | 0.002 | FALSE |
| TMW-2 | 1/31/2023 | 1 | 0.002 | FALSE |
| TMW-3 | 1/31/2023 | 1 | 0.002 | FALSE |



## Non-Parametric Prediction Interval

### Inter-Well Comparison

### Parameter: Sulfate

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 64.1509%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 38
**Maximum Background Value = 18.8**
Confidence Level = 86.4%
False Positive Rate = 13.6%

| Location | Date | Count | Mean | Significant |
|---|---|---|---|---|
| **MW-3** | **1/31/2023** | **1** | **69.2** | **TRUE** |
| MW-4 | 1/31/2023 | 1 | 5 | FALSE |
| MW-5 | 1/31/2023 | 1 | 17.4 | FALSE |
| TMW-1 | 1/31/2023 | 1 | 5 | FALSE |
| TMW-2 | 1/31/2023 | 1 | 5 | FALSE |
| TMW-3 | 1/31/2023 | 1 | 5 | FALSE |

## Non-Parametric Prediction Interval

### Inter-Well Comparison

### Parameter: Zinc

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 73.7089%
Number of comparisons = 6
Future Samples (k) = 6
Recent Dates = 1
Background Measurements (n) = 40
**Maximum Background Value = 0.0287**
Confidence Level = 87%
False Positive Rate = 13%

| Location | Date | Count | Mean | Significant |
|---|---|---|---|---|
| **MW-3** | **1/31/2023** | **1** | **0.0604** | **TRUE** |
| MW-4 | 1/31/2023 | 1 | 0.025 | FALSE |
| MW-5 | 1/31/2023 | 1 | 0.025 | FALSE |
| TMW-1 | 1/31/2023 | 1 | 0.025 | FALSE |
| TMW-2 | 1/31/2023 | 1 | 0.025 | FALSE |
| TMW-3 | 1/31/2023 | 1 | 0.025 | FALSE |

## Mann-Kendall Trend Analysis

**Parameter: Arsenic**
**Location: MW-1**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 121 - 177 = -56

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.0176 | 2 |
| 2 | 0.00807 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1831.33
Z-Score = -1.28522
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.28522| <= 1.97737 indicating no evidence of a trend



## Mann-Kendall Trend Analysis

**Parameter: Barium**
**Location: MW-1**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 208 - 88 = 120

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.0199 | 2 |
| 2 | 0.02 | 3 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1828.67
Z-Score = 2.78279
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**2.78279 > 1.65463 indicating an upward trend**

## Mann-Kendall Trend Analysis

**Parameter: Barium**
**Location: MW-3**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 103 - 222 = -119

| Tied Group | Value | Members |
|---|---|---|

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/14/2017 | 1 |
| 3/22/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 9/27/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/12/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 37050
b = 140400
c = 1300
Group Variance = 2058.33
Z-Score = -2.6009
Comparison Level at 95% confidence level = -1.65463 (downward trend)
**-2.6009 < -1.65463 indicating a downward trend**



## Mann-Kendall Trend Analysis

**Parameter: Barium**
**Location: MW-4**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 191 - 101 = 90

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.00749 | 2 |
| 2 | 0.02 | 4 |
| 3 | 0.0102 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/22/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 192
B = 0
C = 24
D = 0
E = 16
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1822.67
Z-Score = 2.08467
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**2.08467 > 1.65463 indicating an upward trend**

## Mann-Kendall Trend Analysis

**Parameter: Barium**
**Location: MW-5**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 238 - 62 = 176

| Tied Group | Value | Members |
|---|---|---|

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1833.33
Z-Score = 4.08712
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**4.08712 > 1.65463 indicating an upward trend**

## Mann-Kendall Trend Analysis

**Parameter: Barium**
**Location: TMW-1**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 118 - 107 = 11

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.02 | 4 |

| Time Period | Observations |
|---|---|
| 9/28/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/27/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/13/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 156
B = 0
C = 24
D = 0
E = 12
F = 0
a = 22638
b = 83160
c = 924
Group Variance = 1249
Z-Score = 0.282956
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|0.282956| <= 1.97737 indicating no evidence of a trend



## Mann-Kendall Trend Analysis

**Parameter: Barium**
**Location: TMW-2**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 87 - 143 = -56

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.033 | 2 |

| Time Period | Observations |
|---|---|
| 9/28/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/27/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/13/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 22638
b = 83160
c = 924
Group Variance = 1256.67
Z-Score = -1.5515
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.5515| <= 1.97737 indicating no evidence of a trend

## Mann-Kendall Trend Analysis

**Parameter: Barium**
**Location: TMW-3**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 188 - 64 = 124

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.0451 | 2 |

| Time Period | Observations |
|---|---|
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/27/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/13/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1432.67
Z-Score = 3.24962
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**3.24962 > 1.65463 indicating an upward trend**



## Mann-Kendall Trend Analysis

**Parameter: Cobalt**
**Location: MW-1**
**Natural Logarithm Transformation**
**Non-Detects Replaced with 1/2 DL**

95% Confidence Level

S Statistic = 192 - 107 = 85

| Tied Group | Value | Members |
|---|---|---|
| 1 | -3.19175 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1832.33
Z-Score = 1.96235
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.96235| <= 1.97737 indicating no evidence of a trend

## Mann-Kendall Trend Analysis

**Parameter: Chloride**
**Location: MW-1**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 135 - 161 = -26

| Tied Group | Value | Members |
|---|---|---|
| 1 | 2.15 | 3 |
| 2 | 1.95 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1828.67
Z-Score = -0.584619
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.584619| <= 1.97737 indicating no evidence of a trend



## Mann-Kendall Trend Analysis

**Parameter: Chloride**
**Location: MW-3**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 67 - 231 = -164

| Tied Group | Value | Members |
|---|---|---|
| 1 | 23.9 | 2 |
| 2 | 18.4 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/14/2017 | 1 |
| 3/22/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/12/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1831.33
Z-Score = -3.80894
Comparison Level at 95% confidence level = -1.65463 (downward trend)
**-3.80894 < -1.65463 indicating a downward trend**

## Mann-Kendall Trend Analysis

**Parameter: Chloride**
**Location: MW-4**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 265 - 35 = 230

| Tied Group | Value | Members |
|---|---|---|

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/22/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1833.33
Z-Score = 5.34829
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**5.34829 > 1.65463 indicating an upward trend**



## Mann-Kendall Trend Analysis

**Parameter: Chloride**
**Location: MW-5**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 189 - 110 = 79

| Tied Group | Value | Members |
|---|---|---|
| 1 | 83.5 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1832.33
Z-Score = 1.82218
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**1.82218 > 1.65463 indicating an upward trend**

## Mann-Kendall Trend Analysis

**Parameter: Chloride**
**Location: TMW-1**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 296 - 4 = 292

| Tied Group | Value | Members |
|---|---|---|

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/27/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/13/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1833.33
Z-Score = 6.7963
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**6.7963 > 1.65463 indicating an upward trend**



## Mann-Kendall Trend Analysis

**Parameter: Chloride**
**Location: TMW-2**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 257 - 43 = 214

| Tied Group | Value | Members |
|---|---|---|

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/27/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/13/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1833.33
Z-Score = 4.97461
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**4.97461 > 1.65463 indicating an upward trend**

## Mann-Kendall Trend Analysis

**Parameter: Chloride**
**Location: TMW-3**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 273 - 26 = 247

| Tied Group | Value | Members |
|---|---|---|
| 1 | 67.8 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/27/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/13/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1832.33
Z-Score = 5.74689
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**5.74689 > 1.65463 indicating an upward trend**



## Mann-Kendall Trend Analysis

**Parameter: Copper**
**Location: MW-3**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 92 - 55 = 37

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.005 | 18 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/14/2017 | 1 |
| 3/22/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/12/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 12546
B = 0
C = 4896
D = 0
E = 306
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1136.33
Z-Score = 1.06795
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.06795| <= 1.97737 indicating no evidence of a trend

## Mann-Kendall Trend Analysis

**Parameter: Fluoride**
**Location: MW-3**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 130 - 164 = -34

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.15 | 4 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/14/2017 | 1 |
| 3/22/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/12/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 156
B = 0
C = 24
D = 0
E = 12
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1824.67
Z-Score = -0.772542
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.772542| <= 1.97737 indicating no evidence of a trend



## Mann-Kendall Trend Analysis

**Parameter: Nickel**
**Location: MW-1**
**Natural Logarithm Transformation**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 165 - 135 = 30

| Tied Group | Value | Members |
|---|---|---|

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1833.33
Z-Score = 0.677294
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|0.677294| <= 1.97737 indicating no evidence of a trend

## Mann-Kendall Trend Analysis

**Parameter: Nickel**
**Location: MW-3**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 147 - 175 = -28

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.002 | 3 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/14/2017 | 1 |
| 3/22/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 9/27/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/12/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0
a = 37050
b = 140400
c = 1300
Group Variance = 2054.67
Z-Score = -0.595653
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.595653| <= 1.97737 indicating no evidence of a trend



## Mann-Kendall Trend Analysis

**Parameter: Nickel**
**Location: MW-5**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 122 - 177 = -55

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.00651 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1832.33
Z-Score = -1.26151
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.26151| <= 1.97737 indicating no evidence of a trend

## Mann-Kendall Trend Analysis

**Parameter: Sulfate**
**Location: MW-1**
**Natural Logarithm Transformation**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 112 - 68 = 44

| Tied Group | Value | Members |
|---|---|---|
| 1 | 1.60944 | 16 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 8880
B = 0
C = 3360
D = 0
E = 240
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1340
Z-Score = 1.17467
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|1.17467| <= 1.97737 indicating no evidence of a trend



## Mann-Kendall Trend Analysis

**Parameter: Sulfate**
**Location: MW-3**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 125 - 174 = -49

| Tied Group | Value | Members |
|---|---|---|
| 1 | 46.2 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/14/2017 | 1 |
| 3/22/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/12/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1832.33
Z-Score = -1.12134
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.12134| <= 1.97737 indicating no evidence of a trend

## Mann-Kendall Trend Analysis

**Parameter: Sulfate**
**Location: MW-5**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 276 - 14 = 262

| Tied Group | Value | Members |
|---|---|---|
| 1 | 5 | 5 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/11/2017 | 1 |
| 3/21/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/11/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 300
B = 0
C = 60
D = 0
E = 20
F = 0
a = 33000
b = 124200
c = 1200
Group Variance = 1816.67
Z-Score = 6.12354
Comparison Level at 95% confidence level = 1.65463 (upward trend)
**6.12354 > 1.65463 indicating an upward trend**



## Mann-Kendall Trend Analysis

**Parameter: Zinc**
**Location: MW-3**
**Original Data (Not Transformed)**
**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic = 117 - 192 = -75

| Tied Group | Value | Members |
|---|---|---|
| 1 | 0.025 | 6 |
| 2 | 0.159 | 2 |

| Time Period | Observations |
|---|---|
| 11/10/2016 | 1 |
| 6/8/2017 | 1 |
| 9/28/2017 | 1 |
| 12/14/2017 | 1 |
| 3/22/2018 | 1 |
| 6/19/2018 | 1 |
| 9/12/2018 | 1 |
| 9/27/2018 | 1 |
| 12/4/2018 | 1 |
| 3/5/2019 | 1 |
| 6/4/2019 | 1 |
| 9/5/2019 | 1 |
| 11/20/2019 | 1 |
| 2/27/2020 | 1 |
| 6/2/2020 | 1 |
| 8/26/2020 | 1 |
| 11/17/2020 | 1 |
| 3/2/2021 | 1 |
| 5/20/2021 | 1 |
| 8/26/2021 | 1 |
| 11/18/2021 | 1 |
| 2/9/2022 | 1 |
| 5/12/2022 | 1 |
| 8/12/2022 | 1 |
| 11/7/2022 | 1 |
| 1/31/2023 | 1 |

There are 0 time periods with multiple data

A = 528
B = 0
C = 120
D = 0
E = 32
F = 0
a = 37050
b = 140400
c = 1300
Group Variance = 2029
Z-Score = -1.64282
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.64282| <= 1.97737 indicating no evidence of a trend

# APPENDIX C
# LABORATORY ANALYTICAL REPORTS & FIELD INFORMATION LOGS

# ANALYTICAL REPORT

February 09, 2023



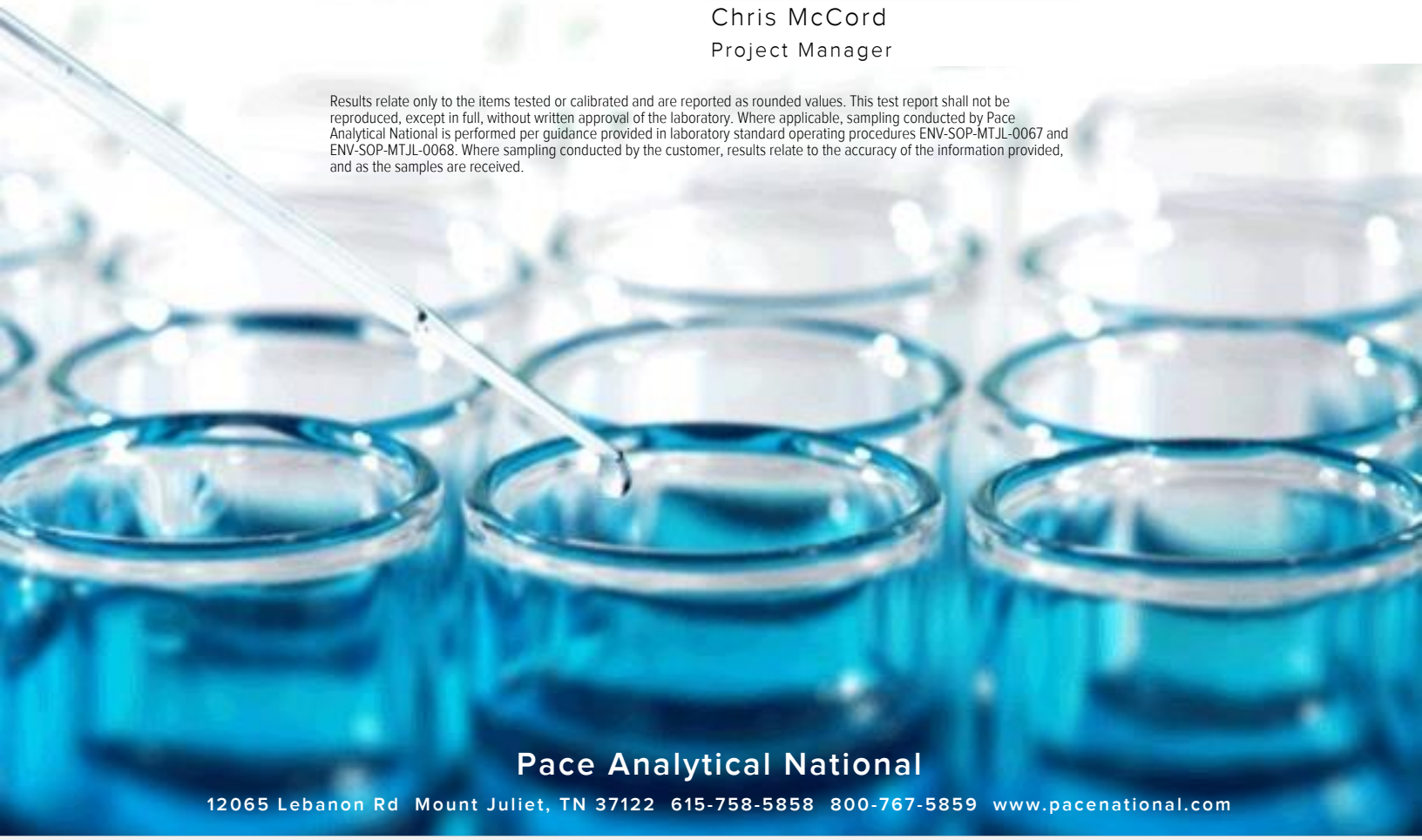
## Civil & Environmental Consultants - TN

| | |
|---|---|
| Sample Delivery Group: | L1581082 |
| Samples Received: | 02/01/2023 |
| Project Number: | 181-364 |
| Description: | Former EWS Camden Class 2 Landfill |
| Site: | CAMDEN, TN |
| Report To: | Philip Campbell<br>117 Seaboard Ln.<br>Suite E100<br>Franklin, TN 37067 |

Entire Report Reviewed By:

Chris McCord
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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## MW-1 L1581082-01 GW

Collected by: Stuart Miller | Collected date/time: 01/31/23 08:01 | Received date/time: 02/01/23 15:20

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG1998312 | 1 | 02/02/23 10:06 | 02/02/23 10:06 | JPD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG1998655 | 1 | 02/06/23 09:41 | 02/06/23 09:41 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG1998586 | 1 | 02/02/23 12:50 | 02/02/23 12:50 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG1998623 | 1 | 02/02/23 09:58 | 02/02/23 13:25 | CAH | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG1997693 | 1 | 02/01/23 22:35 | 02/01/23 22:35 | GEB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998364 | 1 | 02/02/23 09:13 | 02/02/23 17:23 | AKB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998365 | 1 | 02/02/23 10:36 | 02/02/23 19:04 | AKB | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998305 | 1 | 02/02/23 02:39 | 02/02/23 13:10 | ABL | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998310 | 1 | 02/01/23 19:09 | 02/02/23 11:32 | ZSA | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 10:06 | JPD | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998541 | 1 | 02/02/23 09:53 | 02/02/23 12:00 | JPD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1999818 | 1 | 02/03/23 19:52 | 02/03/23 19:52 | JAH | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG1999316 | 1.08 | 02/03/23 10:24 | 02/03/23 21:29 | HMH | Mt. Juliet, TN |

## MW-3 L1581082-02 GW

Collected by: Stuart Miller | Collected date/time: 01/31/23 14:15 | Received date/time: 02/01/23 15:20

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG1998312 | 1 | 02/02/23 10:09 | 02/02/23 10:09 | JPD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG1998655 | 1 | 02/06/23 09:46 | 02/06/23 09:46 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG1998586 | 1 | 02/02/23 12:53 | 02/02/23 12:53 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG1998623 | 1 | 02/02/23 09:58 | 02/02/23 13:26 | CAH | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG1997693 | 1 | 02/02/23 01:17 | 02/02/23 01:17 | GEB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998364 | 1 | 02/02/23 09:13 | 02/02/23 17:25 | AKB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998365 | 1 | 02/02/23 10:36 | 02/02/23 19:12 | AKB | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998305 | 1 | 02/02/23 02:39 | 02/02/23 13:13 | ABL | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998310 | 1 | 02/01/23 19:09 | 02/02/23 11:48 | ZSA | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 10:09 | JPD | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998541 | 1 | 02/02/23 09:53 | 02/02/23 12:03 | JPD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1999818 | 1 | 02/03/23 20:13 | 02/03/23 20:13 | JAH | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG2000380 | 1.12 | 02/05/23 10:55 | 02/05/23 16:51 | DLH | Mt. Juliet, TN |

## MW-4 L1581082-03 GW

Collected by: Stuart Miller | Collected date/time: 01/31/23 12:15 | Received date/time: 02/01/23 15:20

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG1998312 | 1 | 02/02/23 10:12 | 02/02/23 10:12 | JPD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG1998655 | 1 | 02/06/23 09:53 | 02/06/23 09:53 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG1998587 | 1 | 02/02/23 13:46 | 02/02/23 13:46 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG1998623 | 1 | 02/02/23 09:58 | 02/02/23 13:26 | CAH | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG1997693 | 1 | 02/01/23 23:02 | 02/01/23 23:02 | GEB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998364 | 1 | 02/02/23 09:13 | 02/02/23 17:27 | AKB | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998310 | 1 | 02/01/23 19:09 | 02/02/23 11:50 | ZSA | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 10:12 | JPD | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 13:03 | JPD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1999818 | 1 | 02/03/23 20:37 | 02/03/23 20:37 | JAH | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG2000380 | 1.04 | 02/05/23 10:55 | 02/05/23 16:28 | DLH | Mt. Juliet, TN |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## MW-5 L1581082-04 GW

Collected by: Stuart Miller | Collected date/time: 01/31/23 10:15 | Received date/time: 02/01/23 15:20

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG1998312 | 1 | 02/02/23 10:22 | 02/02/23 10:22 | JPD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG1998655 | 1 | 02/06/23 09:59 | 02/06/23 09:59 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG1998587 | 1 | 02/02/23 13:48 | 02/02/23 13:48 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG1998623 | 1 | 02/02/23 09:58 | 02/02/23 13:27 | CAH | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG1997693 | 1 | 02/01/23 23:15 | 02/01/23 23:15 | GEB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998364 | 1 | 02/02/23 09:13 | 02/02/23 17:34 | AKB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998365 | 1 | 02/02/23 10:36 | 02/02/23 19:14 | AKB | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998305 | 1 | 02/02/23 02:39 | 02/02/23 13:16 | ABL | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998310 | 1 | 02/01/23 19:09 | 02/02/23 11:58 | ZSA | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 10:22 | JPD | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998541 | 1 | 02/02/23 09:53 | 02/02/23 12:07 | JPD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1999818 | 1 | 02/03/23 21:01 | 02/03/23 21:01 | JAH | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG2000380 | 1 | 02/05/23 10:55 | 02/05/23 17:03 | DLH | Mt. Juliet, TN |

## TMW-1 L1581082-05 GW

Collected by: Stuart Miller | Collected date/time: 01/31/23 10:12 | Received date/time: 02/01/23 15:20

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG1998312 | 1 | 02/02/23 10:26 | 02/02/23 10:26 | JPD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG1998655 | 1 | 02/06/23 10:17 | 02/06/23 10:17 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG1998587 | 1 | 02/02/23 13:49 | 02/02/23 13:49 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG1998623 | 1 | 02/02/23 09:58 | 02/02/23 13:27 | CAH | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG1997693 | 1 | 02/01/23 23:29 | 02/01/23 23:29 | GEB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998364 | 1 | 02/02/23 09:13 | 02/02/23 17:36 | AKB | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998310 | 1 | 02/01/23 19:09 | 02/02/23 12:01 | ZSA | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 10:26 | JPD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1999818 | 1 | 02/03/23 21:23 | 02/03/23 21:23 | JAH | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG2000380 | 1 | 02/05/23 10:55 | 02/05/23 17:14 | DLH | Mt. Juliet, TN |

## TMW-2 L1581082-06 GW

Collected by: Stuart Miller | Collected date/time: 01/31/23 12:12 | Received date/time: 02/01/23 15:20

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG1998312 | 1 | 02/02/23 10:29 | 02/02/23 10:29 | JPD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG1998655 | 1 | 02/06/23 10:23 | 02/06/23 10:23 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG1998587 | 1 | 02/02/23 13:51 | 02/02/23 13:51 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG1998623 | 1 | 02/02/23 09:58 | 02/02/23 13:31 | CAH | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG1997693 | 1 | 02/02/23 00:50 | 02/02/23 00:50 | GEB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998364 | 1 | 02/02/23 09:13 | 02/02/23 17:38 | AKB | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998310 | 1 | 02/01/23 19:09 | 02/02/23 12:04 | ZSA | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 10:29 | JPD | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 13:06 | JPD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1999818 | 1 | 02/03/23 21:45 | 02/03/23 21:45 | JAH | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG2000380 | 1.03 | 02/05/23 10:55 | 02/05/23 17:26 | DLH | Mt. Juliet, TN |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## TMW-3 L1581082-07 GW

Collected by: Stuart Miller | Collected date/time: 01/31/23 14:14 | Received date/time: 02/01/23 15:20

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG1998312 | 1 | 02/02/23 10:32 | 02/02/23 10:32 | JPD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG1998655 | 1 | 02/06/23 10:27 | 02/06/23 10:27 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG1998587 | 1 | 02/02/23 13:52 | 02/02/23 13:52 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG1998623 | 1 | 02/02/23 09:58 | 02/02/23 13:33 | CAH | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG1997693 | 1 | 02/02/23 01:03 | 02/02/23 01:03 | GEB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998364 | 1 | 02/02/23 09:13 | 02/02/23 17:41 | AKB | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998310 | 1 | 02/01/23 19:09 | 02/02/23 12:06 | ZSA | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 10:32 | JPD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1999818 | 1 | 02/03/23 22:05 | 02/03/23 22:05 | JAH | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG2000380 | 1 | 02/05/23 10:55 | 02/05/23 17:38 | DLH | Mt. Juliet, TN |

## DUPLICATE L1581082-08 GW

Collected by: Stuart Miller | Collected date/time: 01/31/23 00:00 | Received date/time: 02/01/23 15:20

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG1998312 | 1 | 02/02/23 10:36 | 02/02/23 10:36 | JPD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG1998655 | 1 | 02/06/23 10:32 | 02/06/23 10:32 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG1998587 | 1 | 02/02/23 13:54 | 02/02/23 13:54 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG1998623 | 1 | 02/02/23 09:58 | 02/02/23 13:33 | CAH | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG1997693 | 1 | 02/01/23 22:48 | 02/01/23 22:48 | GEB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998364 | 1 | 02/02/23 09:13 | 02/02/23 17:43 | AKB | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998310 | 1 | 02/01/23 19:09 | 02/02/23 12:09 | ZSA | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 10:36 | JPD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1999818 | 1 | 02/03/23 22:27 | 02/03/23 22:27 | JAH | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG2000380 | 1.11 | 02/05/23 10:55 | 02/05/23 17:49 | DLH | Mt. Juliet, TN |

## FIELD BLANK L1581082-09 GW

Collected by: Stuart Miller | Collected date/time: 01/31/23 14:15 | Received date/time: 02/01/23 15:20

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG1998312 | 1 | 02/02/23 10:39 | 02/02/23 10:39 | JPD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG2000611 | 1 | 02/06/23 12:49 | 02/06/23 12:49 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG1998587 | 1 | 02/02/23 14:01 | 02/02/23 14:01 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG1998623 | 1 | 02/02/23 09:58 | 02/02/23 13:33 | CAH | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG1997693 | 1 | 02/02/23 01:30 | 02/02/23 01:30 | GEB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG1998364 | 1 | 02/02/23 09:13 | 02/02/23 17:53 | AKB | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG1998310 | 1 | 02/01/23 19:09 | 02/02/23 12:12 | ZSA | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG1998312 | 1 | 02/01/23 19:11 | 02/02/23 10:39 | JPD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG1999818 | 1 | 02/03/23 15:43 | 02/03/23 15:43 | BAM | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG2000380 | 1.03 | 02/05/23 10:55 | 02/05/23 18:01 | DLH | Mt. Juliet, TN |

# CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris McCord
Project Manager

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | 23.9 | | 2.50 | 1 | 02/02/2023 10:06 | WG1998312 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | 35.8 | | 20.0 | 1 | 02/06/2023 09:41 | WG1998655 |

Sample Narrative:
L1581082-01 WG1998655: Endpoint pH 4.5 Headspace

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | | 0.250 | 1 | 02/02/2023 12:50 | WG1998586 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | ND | | 20.0 | 1 | 02/02/2023 13:25 | WG1998623 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 1.00 | 1 | 02/01/2023 22:35 | WG1997693 |
| Chloride | 3.55 | | 1.00 | 1 | 02/01/2023 22:35 | WG1997693 |
| Fluoride | ND | | 0.150 | 1 | 02/01/2023 22:35 | WG1997693 |
| Nitrate | ND | | 0.100 | 1 | 02/01/2023 22:35 | WG1997693 |
| Sulfate | 5.01 | | 5.00 | 1 | 02/01/2023 22:35 | WG1997693 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 1 | 02/02/2023 17:23 | WG1998364 |
| Mercury,Dissolved | 0.000988 | | 0.000200 | 1 | 02/02/2023 19:04 | WG1998365 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 1 | 02/02/2023 11:32 | WG1998310 |
| Boron,Dissolved | ND | | 0.200 | 1 | 02/02/2023 13:10 | WG1998305 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | ND | | 0.100 | 1 | 02/02/2023 10:06 | WG1998312 |
| Aluminum,Dissolved | 0.131 | | 0.100 | 1 | 02/02/2023 12:00 | WG1998541 |
| Antimony | ND | | 0.00400 | 1 | 02/02/2023 10:06 | WG1998312 |
| Antimony,Dissolved | ND | | 0.00400 | 1 | 02/02/2023 12:00 | WG1998541 |
| Arsenic | 0.00607 | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Arsenic,Dissolved | 0.00588 | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |
| Barium | 0.0244 | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Barium,Dissolved | 0.0263 | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Beryllium | ND | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Beryllium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |
| Cadmium | ND | | 0.00100 | 1 | 02/02/2023 10:06 | WG1998312 |
| Cadmium,Dissolved | ND | | 0.00100 | 1 | 02/02/2023 12:00 | WG1998541 |
| Calcium | 4.62 | | 1.00 | 1 | 02/02/2023 10:06 | WG1998312 |
| Calcium,Dissolved | 4.59 | | 1.00 | 1 | 02/02/2023 12:00 | WG1998541 |
| Chromium | ND | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Chromium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |
| Cobalt | 0.0458 | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Cobalt,Dissolved | 0.0435 | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |
| Copper | ND | | 0.00500 | 1 | 02/02/2023 10:06 | WG1998312 |
| Copper,Dissolved | 0.0124 | | 0.00500 | 1 | 02/02/2023 12:00 | WG1998541 |
| Iron | 13.4 | | 0.100 | 1 | 02/02/2023 10:06 | WG1998312 |
| Iron,Dissolved | 12.5 | | 0.100 | 1 | 02/02/2023 12:00 | WG1998541 |
| Lead | ND | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Lead,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |
| Magnesium | 2.99 | | 1.00 | 1 | 02/02/2023 10:06 | WG1998312 |
| Magnesium,Dissolved | 2.90 | | 1.00 | 1 | 02/02/2023 12:00 | WG1998541 |
| Manganese | 0.842 | | 0.00500 | 1 | 02/02/2023 10:06 | WG1998312 |
| Manganese,Dissolved | 0.793 | | 0.00500 | 1 | 02/02/2023 12:00 | WG1998541 |
| Nickel | 0.00678 | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Nickel,Dissolved | 0.00743 | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |
| Potassium | ND | | 2.00 | 1 | 02/02/2023 10:06 | WG1998312 |
| Potassium,Dissolved | ND | | 2.00 | 1 | 02/02/2023 12:00 | WG1998541 |
| Selenium | ND | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Selenium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |
| Silver | ND | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Silver,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |
| Sodium | 3.36 | | 2.00 | 1 | 02/02/2023 10:06 | WG1998312 |
| Sodium,Dissolved | 3.30 | | 2.00 | 1 | 02/02/2023 12:00 | WG1998541 |
| Thallium | ND | | 0.00200 | 1 | 02/02/2023 10:06 | WG1998312 |
| Thallium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:00 | WG1998541 |
| Vanadium | ND | | 0.00500 | 1 | 02/02/2023 10:06 | WG1998312 |
| Vanadium,Dissolved | ND | | 0.00500 | 1 | 02/02/2023 12:00 | WG1998541 |
| Zinc | ND | | 0.0250 | 1 | 02/02/2023 10:06 | WG1998312 |
| Zinc,Dissolved | 0.0305 | | 0.0250 | 1 | 02/02/2023 12:00 | WG1998541 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Acetone | ND | | 0.0500 | 1 | 02/03/2023 19:52 | WG1999818 |
| Acrylonitrile | ND | | 0.0100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Benzene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Bromochloromethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Bromodichloromethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Bromoform | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Bromomethane | ND | | 0.00500 | 1 | 02/03/2023 19:52 | WG1999818 |
| Carbon disulfide | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Carbon tetrachloride | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Chlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Chlorodibromomethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Chloroethane | ND | | 0.00500 | 1 | 02/03/2023 19:52 | WG1999818 |
| Chloroform | ND | | 0.00500 | 1 | 02/03/2023 19:52 | WG1999818 |
| Chloromethane | ND | | 0.00250 | 1 | 02/03/2023 19:52 | WG1999818 |
| Dibromomethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.00500 | 1 | 02/03/2023 19:52 | WG1999818 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,2-Dibromoethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,2-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,4-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| trans-1,4-Dichloro-2-butene | ND | | 0.00250 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,1-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,2-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,1-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| cis-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| trans-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,2-Dichloropropane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| cis-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| trans-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Ethylbenzene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 2-Hexanone | ND | | 0.0100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Iodomethane | ND | | 0.0100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 2-Butanone (MEK) | ND | | 0.0100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Methylene Chloride | ND | | 0.00500 | 1 | 02/03/2023 19:52 | WG1999818 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.0100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Styrene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Tetrachloroethene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Toluene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,1,1-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,1,2-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Trichloroethene | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Trichlorofluoromethane | ND | | 0.00500 | 1 | 02/03/2023 19:52 | WG1999818 |
| 1,2,3-Trichloropropane | ND | | 0.00250 | 1 | 02/03/2023 19:52 | WG1999818 |
| Vinyl acetate | ND | | 0.0100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Vinyl chloride | ND | | 0.00100 | 1 | 02/03/2023 19:52 | WG1999818 |
| Xylenes, Total | ND | | 0.00300 | 1 | 02/03/2023 19:52 | WG1999818 |
| *(S) Toluene-d8* | *118* | | *80.0-120* | | *02/03/2023 19:52* | WG1999818 |
| *(S) 4-Bromofluorobenzene* | *103* | | *77.0-126* | | *02/03/2023 19:52* | WG1999818 |
| *(S) 1,2-Dichloroethane-d4* | *95.1* | | *70.0-130* | | *02/03/2023 19:52* | WG1999818 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | | 0.0000216 | 1.08 | 02/03/2023 21:29 | WG1999316 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000216 | 1.08 | 02/03/2023 21:29 | WG1999316 |

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | 85.2 | | 2.50 | 1 | 02/02/2023 10:09 | WG1998312 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | ND | | 20.0 | 1 | 02/06/2023 09:46 | WG1998655 |

Sample Narrative:
L1581082-02 WG1998655: Endpoint pH 4.5 Headspace

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | | 0.250 | 1 | 02/02/2023 12:53 | WG1998586 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | ND | | 20.0 | 1 | 02/02/2023 13:26 | WG1998623 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 1.00 | 1 | 02/02/2023 01:17 | WG1997693 |
| Chloride | 11.5 | | 1.00 | 1 | 02/02/2023 01:17 | WG1997693 |
| Fluoride | 0.178 | | 0.150 | 1 | 02/02/2023 01:17 | WG1997693 |
| Nitrate | 0.616 | | 0.100 | 1 | 02/02/2023 01:17 | WG1997693 |
| Sulfate | 69.2 | | 5.00 | 1 | 02/02/2023 01:17 | WG1997693 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 1 | 02/02/2023 17:25 | WG1998364 |
| Mercury,Dissolved | ND | | 0.000200 | 1 | 02/02/2023 19:12 | WG1998365 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 1 | 02/02/2023 11:48 | WG1998310 |
| Boron,Dissolved | ND | | 0.200 | 1 | 02/02/2023 13:13 | WG1998305 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | 0.473 | | 0.100 | 1 | 02/02/2023 10:09 | WG1998312 |
| Aluminum,Dissolved | ND | | 0.100 | 1 | 02/02/2023 12:03 | WG1998541 |
| Antimony | ND | | 0.00400 | 1 | 02/02/2023 10:09 | WG1998312 |
| Antimony,Dissolved | ND | | 0.00400 | 1 | 02/02/2023 12:03 | WG1998541 |
| Arsenic | ND | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Arsenic,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |
| Barium | 0.0577 | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Barium,Dissolved | 0.0470 | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Beryllium | ND | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Beryllium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |
| Cadmium | ND | | 0.00100 | 1 | 02/02/2023 10:09 | WG1998312 |
| Cadmium,Dissolved | ND | | 0.00100 | 1 | 02/02/2023 12:03 | WG1998541 |
| Calcium | 22.3 | | 1.00 | 1 | 02/02/2023 10:09 | WG1998312 |
| Calcium,Dissolved | 19.4 | | 1.00 | 1 | 02/02/2023 12:03 | WG1998541 |
| Chromium | ND | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Chromium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |
| Cobalt | ND | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Cobalt,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |
| Copper | 0.00512 | | 0.00500 | 1 | 02/02/2023 10:09 | WG1998312 |
| Copper,Dissolved | ND | | 0.00500 | 1 | 02/02/2023 12:03 | WG1998541 |
| Iron | 0.243 | | 0.100 | 1 | 02/02/2023 10:09 | WG1998312 |
| Iron,Dissolved | ND | | 0.100 | 1 | 02/02/2023 12:03 | WG1998541 |
| Lead | ND | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Lead,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |
| Magnesium | 7.17 | | 1.00 | 1 | 02/02/2023 10:09 | WG1998312 |
| Magnesium,Dissolved | 6.24 | | 1.00 | 1 | 02/02/2023 12:03 | WG1998541 |
| Manganese | ND | | 0.00500 | 1 | 02/02/2023 10:09 | WG1998312 |
| Manganese,Dissolved | ND | | 0.00500 | 1 | 02/02/2023 12:03 | WG1998541 |
| Nickel | 0.00212 | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Nickel,Dissolved | 0.00230 | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |
| Potassium | 4.90 | | 2.00 | 1 | 02/02/2023 10:09 | WG1998312 |
| Potassium,Dissolved | 4.17 | | 2.00 | 1 | 02/02/2023 12:03 | WG1998541 |
| Selenium | ND | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Selenium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |
| Silver | ND | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Silver,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |
| Sodium | 6.01 | | 2.00 | 1 | 02/02/2023 10:09 | WG1998312 |
| Sodium,Dissolved | 5.25 | | 2.00 | 1 | 02/02/2023 12:03 | WG1998541 |
| Thallium | ND | | 0.00200 | 1 | 02/02/2023 10:09 | WG1998312 |
| Thallium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:03 | WG1998541 |
| Vanadium | ND | | 0.00500 | 1 | 02/02/2023 10:09 | WG1998312 |
| Vanadium,Dissolved | ND | | 0.00500 | 1 | 02/02/2023 12:03 | WG1998541 |
| Zinc | 0.0604 | | 0.0250 | 1 | 02/02/2023 10:09 | WG1998312 |
| Zinc,Dissolved | 0.0458 | | 0.0250 | 1 | 02/02/2023 12:03 | WG1998541 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Acetone | ND | | 0.0500 | 1 | 02/03/2023 20:13 | WG1999818 |
| Acrylonitrile | ND | | 0.0100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Benzene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Bromochloromethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Bromodichloromethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Bromoform | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Bromomethane | ND | | 0.00500 | 1 | 02/03/2023 20:13 | WG1999818 |
| Carbon disulfide | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Carbon tetrachloride | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Chlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Chlorodibromomethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Chloroethane | ND | | 0.00500 | 1 | 02/03/2023 20:13 | WG1999818 |
| Chloroform | ND | | 0.00500 | 1 | 02/03/2023 20:13 | WG1999818 |
| Chloromethane | ND | | 0.00250 | 1 | 02/03/2023 20:13 | WG1999818 |
| Dibromomethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.00500 | 1 | 02/03/2023 20:13 | WG1999818 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,2-Dibromoethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,2-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,4-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| trans-1,4-Dichloro-2-butene | ND | | 0.00250 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,1-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,2-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,1-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| cis-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| trans-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,2-Dichloropropane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| cis-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| trans-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Ethylbenzene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 2-Hexanone | ND | | 0.0100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Iodomethane | ND | | 0.0100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 2-Butanone (MEK) | ND | | 0.0100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Methylene Chloride | ND | | 0.00500 | 1 | 02/03/2023 20:13 | WG1999818 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.0100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Styrene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Tetrachloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Toluene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,1,1-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,1,2-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Trichloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Trichlorofluoromethane | ND | | 0.00500 | 1 | 02/03/2023 20:13 | WG1999818 |
| 1,2,3-Trichloropropane | ND | | 0.00250 | 1 | 02/03/2023 20:13 | WG1999818 |
| Vinyl acetate | ND | | 0.0100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Vinyl chloride | ND | | 0.00100 | 1 | 02/03/2023 20:13 | WG1999818 |
| Xylenes, Total | ND | | 0.00300 | 1 | 02/03/2023 20:13 | WG1999818 |
| *(S) Toluene-d8* | *116* | | *80.0-120* | | *02/03/2023 20:13* | WG1999818 |
| *(S) 4-Bromofluorobenzene* | *96.1* | | *77.0-126* | | *02/03/2023 20:13* | WG1999818 |
| *(S) 1,2-Dichloroethane-d4* | *94.8* | | *70.0-130* | | *02/03/2023 20:13* | WG1999818 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | | 0.0000224 | 1.12 | 02/05/2023 16:51 | WG2000380 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000224 | 1.12 | 02/05/2023 16:51 | WG2000380 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | 26.0 | | 2.50 | 1 | 02/02/2023 10:12 | WG1998312 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | ND | | 20.0 | 1 | 02/06/2023 09:53 | WG1998655 |

Sample Narrative:
L1581082-03 WG1998655: Endpoint pH 4.5 Headspace

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | | 0.250 | 1 | 02/02/2023 13:46 | WG1998587 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | ND | | 20.0 | 1 | 02/02/2023 13:26 | WG1998623 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 1.00 | 1 | 02/01/2023 23:02 | WG1997693 |
| Chloride | 10.5 | | 1.00 | 1 | 02/01/2023 23:02 | WG1997693 |
| Fluoride | ND | | 0.150 | 1 | 02/01/2023 23:02 | WG1997693 |
| Nitrate | 0.808 | | 0.100 | 1 | 02/01/2023 23:02 | WG1997693 |
| Sulfate | ND | | 5.00 | 1 | 02/01/2023 23:02 | WG1997693 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 1 | 02/02/2023 17:27 | WG1998364 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 1 | 02/02/2023 11:50 | WG1998310 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | ND | | 0.100 | 1 | 02/02/2023 10:12 | WG1998312 |
| Antimony | ND | | 0.00400 | 1 | 02/02/2023 10:12 | WG1998312 |
| Arsenic | ND | | 0.00200 | 1 | 02/02/2023 10:12 | WG1998312 |
| Barium | 0.00837 | | 0.00200 | 1 | 02/02/2023 10:12 | WG1998312 |
| Beryllium | ND | | 0.00200 | 1 | 02/02/2023 10:12 | WG1998312 |
| Cadmium | ND | | 0.00100 | 1 | 02/02/2023 10:12 | WG1998312 |
| Calcium | 5.52 | | 1.00 | 1 | 02/02/2023 10:12 | WG1998312 |
| Chromium | ND | | 0.00200 | 1 | 02/02/2023 10:12 | WG1998312 |
| Cobalt | ND | | 0.00200 | 1 | 02/02/2023 10:12 | WG1998312 |
| Copper | ND | | 0.00500 | 1 | 02/02/2023 10:12 | WG1998312 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Iron | ND | | 0.100 | 1 | 02/02/2023 10:12 | WG1998312 |
| Lead | ND | | 0.00200 | 1 | 02/02/2023 10:12 | WG1998312 |
| Magnesium | 2.96 | | 1.00 | 1 | 02/02/2023 10:12 | WG1998312 |
| Manganese | ND | | 0.00500 | 1 | 02/02/2023 10:12 | WG1998312 |
| Nickel | ND | | 0.00200 | 1 | 02/02/2023 10:12 | WG1998312 |
| Potassium | ND | | 2.00 | 1 | 02/02/2023 10:12 | WG1998312 |
| Selenium | ND | | 0.00200 | 1 | 02/02/2023 13:03 | WG1998312 |
| Silver | ND | | 0.00200 | 1 | 02/02/2023 10:12 | WG1998312 |
| Sodium | 3.41 | | 2.00 | 1 | 02/02/2023 10:12 | WG1998312 |
| Thallium | ND | | 0.00200 | 1 | 02/02/2023 10:12 | WG1998312 |
| Vanadium | ND | | 0.00500 | 1 | 02/02/2023 10:12 | WG1998312 |
| Zinc | ND | | 0.0250 | 1 | 02/02/2023 10:12 | WG1998312 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Acetone | ND | | 0.0500 | 1 | 02/03/2023 20:37 | WG1999818 |
| Acrylonitrile | ND | | 0.0100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Benzene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Bromochloromethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Bromodichloromethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Bromoform | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Bromomethane | ND | | 0.00500 | 1 | 02/03/2023 20:37 | WG1999818 |
| Carbon disulfide | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Carbon tetrachloride | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Chlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Chlorodibromomethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Chloroethane | ND | | 0.00500 | 1 | 02/03/2023 20:37 | WG1999818 |
| Chloroform | ND | | 0.00500 | 1 | 02/03/2023 20:37 | WG1999818 |
| Chloromethane | ND | | 0.00250 | 1 | 02/03/2023 20:37 | WG1999818 |
| Dibromomethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.00500 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,2-Dibromoethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,2-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,4-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| trans-1,4-Dichloro-2-butene | ND | | 0.00250 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,1-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,2-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,1-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| cis-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| trans-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,2-Dichloropropane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| cis-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| trans-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Ethylbenzene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 2-Hexanone | ND | | 0.0100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Iodomethane | ND | | 0.0100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 2-Butanone (MEK) | ND | | 0.0100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Methylene Chloride | ND | | 0.00500 | 1 | 02/03/2023 20:37 | WG1999818 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.0100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Styrene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Tetrachloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Toluene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,1,1-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Trichloroethene | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Trichlorofluoromethane | ND | | 0.00500 | 1 | 02/03/2023 20:37 | WG1999818 |
| 1,2,3-Trichloropropane | ND | | 0.00250 | 1 | 02/03/2023 20:37 | WG1999818 |
| Vinyl acetate | ND | | 0.0100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Vinyl chloride | ND | | 0.00100 | 1 | 02/03/2023 20:37 | WG1999818 |
| Xylenes, Total | ND | | 0.00300 | 1 | 02/03/2023 20:37 | WG1999818 |
| *(S) Toluene-d8* | *122* | J1 | *80.0-120* | | *02/03/2023 20:37* | WG1999818 |
| *(S) 4-Bromofluorobenzene* | *99.2* | | *77.0-126* | | *02/03/2023 20:37* | WG1999818 |
| *(S) 1,2-Dichloroethane-d4* | *94.5* | | *70.0-130* | | *02/03/2023 20:37* | WG1999818 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | | 0.0000208 | 1.04 | 02/05/2023 16:28 | WG2000380 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000208 | 1.04 | 02/05/2023 16:28 | WG2000380 |

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | 95.1 | | 2.50 | 1 | 02/02/2023 10:22 | WG1998312 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | ND | | 20.0 | 1 | 02/06/2023 09:59 | WG1998655 |

Sample Narrative:
L1581082-04 WG1998655: Endpoint pH 4.5 Headspace

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | | 0.250 | 1 | 02/02/2023 13:48 | WG1998587 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | ND | | 20.0 | 1 | 02/02/2023 13:27 | WG1998623 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 1.00 | 1 | 02/01/2023 23:15 | WG1997693 |
| Chloride | 75.1 | | 1.00 | 1 | 02/01/2023 23:15 | WG1997693 |
| Fluoride | ND | | 0.150 | 1 | 02/01/2023 23:15 | WG1997693 |
| Nitrate | 1.09 | | 0.100 | 1 | 02/01/2023 23:15 | WG1997693 |
| Sulfate | 17.4 | | 5.00 | 1 | 02/01/2023 23:15 | WG1997693 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 1 | 02/02/2023 17:34 | WG1998364 |
| Mercury,Dissolved | ND | | 0.000200 | 1 | 02/02/2023 19:14 | WG1998365 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 1 | 02/02/2023 11:58 | WG1998310 |
| Boron,Dissolved | ND | | 0.200 | 1 | 02/02/2023 13:16 | WG1998305 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | 0.162 | | 0.100 | 1 | 02/02/2023 10:22 | WG1998312 |
| Aluminum,Dissolved | 0.647 | | 0.100 | 1 | 02/02/2023 12:07 | WG1998541 |
| Antimony | ND | | 0.00400 | 1 | 02/02/2023 10:22 | WG1998312 |
| Antimony,Dissolved | ND | | 0.00400 | 1 | 02/02/2023 12:07 | WG1998541 |
| Arsenic | ND | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Arsenic,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |
| Barium | 0.0595 | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Barium,Dissolved | 0.0547 | | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Beryllium | ND | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Beryllium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |
| Cadmium | ND | | 0.00100 | 1 | 02/02/2023 10:22 | WG1998312 |
| Cadmium,Dissolved | ND | | 0.00100 | 1 | 02/02/2023 12:07 | WG1998541 |
| Calcium | 17.4 | | 1.00 | 1 | 02/02/2023 10:22 | WG1998312 |
| Calcium,Dissolved | 15.5 | | 1.00 | 1 | 02/02/2023 12:07 | WG1998541 |
| Chromium | ND | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Chromium,Dissolved | 0.00395 | B | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |
| Cobalt | ND | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Cobalt,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |
| Copper | ND | | 0.00500 | 1 | 02/02/2023 10:22 | WG1998312 |
| Copper,Dissolved | ND | | 0.00500 | 1 | 02/02/2023 12:07 | WG1998541 |
| Iron | 0.174 | | 0.100 | 1 | 02/02/2023 10:22 | WG1998312 |
| Iron,Dissolved | 0.723 | | 0.100 | 1 | 02/02/2023 12:07 | WG1998541 |
| Lead | 0.00250 | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Lead,Dissolved | 0.00237 | | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |
| Magnesium | 12.5 | | 1.00 | 1 | 02/02/2023 10:22 | WG1998312 |
| Magnesium,Dissolved | 10.7 | | 1.00 | 1 | 02/02/2023 12:07 | WG1998541 |
| Manganese | 0.322 | | 0.00500 | 1 | 02/02/2023 10:22 | WG1998312 |
| Manganese,Dissolved | 0.276 | | 0.00500 | 1 | 02/02/2023 12:07 | WG1998541 |
| Nickel | 0.00650 | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Nickel,Dissolved | 0.00577 | | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |
| Potassium | ND | | 2.00 | 1 | 02/02/2023 10:22 | WG1998312 |
| Potassium,Dissolved | ND | | 2.00 | 1 | 02/02/2023 12:07 | WG1998541 |
| Selenium | ND | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Selenium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |
| Silver | ND | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Silver,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |
| Sodium | 20.6 | | 2.00 | 1 | 02/02/2023 10:22 | WG1998312 |
| Sodium,Dissolved | 17.7 | | 2.00 | 1 | 02/02/2023 12:07 | WG1998541 |
| Thallium | ND | | 0.00200 | 1 | 02/02/2023 10:22 | WG1998312 |
| Thallium,Dissolved | ND | | 0.00200 | 1 | 02/02/2023 12:07 | WG1998541 |
| Vanadium | ND | | 0.00500 | 1 | 02/02/2023 10:22 | WG1998312 |
| Vanadium,Dissolved | ND | | 0.00500 | 1 | 02/02/2023 12:07 | WG1998541 |
| Zinc | ND | | 0.0250 | 1 | 02/02/2023 10:22 | WG1998312 |
| Zinc,Dissolved | ND | | 0.0250 | 1 | 02/02/2023 12:07 | WG1998541 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Acetone | ND | | 0.0500 | 1 | 02/03/2023 21:01 | WG1999818 |
| Acrylonitrile | ND | | 0.0100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Benzene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Bromochloromethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Bromodichloromethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Bromoform | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Bromomethane | ND | | 0.00500 | 1 | 02/03/2023 21:01 | WG1999818 |
| Carbon disulfide | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Carbon tetrachloride | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Chlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Chlorodibromomethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Chloroethane | ND | | 0.00500 | 1 | 02/03/2023 21:01 | WG1999818 |
| Chloroform | ND | | 0.00500 | 1 | 02/03/2023 21:01 | WG1999818 |
| Chloromethane | ND | | 0.00250 | 1 | 02/03/2023 21:01 | WG1999818 |
| Dibromomethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.00500 | 1 | 02/03/2023 21:01 | WG1999818 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,2-Dibromoethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,2-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,4-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| trans-1,4-Dichloro-2-butene | ND | | 0.00250 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,1-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,2-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,1-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| cis-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| trans-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,2-Dichloropropane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| cis-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| trans-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Ethylbenzene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 2-Hexanone | ND | | 0.0100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Iodomethane | ND | | 0.0100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 2-Butanone (MEK) | ND | | 0.0100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Methylene Chloride | ND | | 0.00500 | 1 | 02/03/2023 21:01 | WG1999818 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.0100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Styrene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Tetrachloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Toluene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,1,1-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,1,2-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Trichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Trichlorofluoromethane | ND | | 0.00500 | 1 | 02/03/2023 21:01 | WG1999818 |
| 1,2,3-Trichloropropane | ND | | 0.00250 | 1 | 02/03/2023 21:01 | WG1999818 |
| Vinyl acetate | ND | | 0.0100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Vinyl chloride | ND | | 0.00100 | 1 | 02/03/2023 21:01 | WG1999818 |
| Xylenes, Total | ND | | 0.00300 | 1 | 02/03/2023 21:01 | WG1999818 |
| *(S) Toluene-d8* | *123* | J1 | *80.0-120* | | *02/03/2023 21:01* | WG1999818 |
| *(S) 4-Bromofluorobenzene* | *102* | | *77.0-126* | | *02/03/2023 21:01* | WG1999818 |
| *(S) 1,2-Dichloroethane-d4* | *94.1* | | *70.0-130* | | *02/03/2023 21:01* | WG1999818 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | | 0.0000200 | 1 | 02/05/2023 17:03 | WG2000380 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000200 | 1 | 02/05/2023 17:03 | WG2000380 |

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | 67.0 | | 2.50 | 1 | 02/02/2023 10:26 | WG1998312 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | ND | | 20.0 | 1 | 02/06/2023 10:17 | WG1998655 |

Sample Narrative:

L1581082-05 WG1998655: Endpoint pH 4.5 Headspace

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | | 0.250 | 1 | 02/02/2023 13:49 | WG1998587 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | ND | | 20.0 | 1 | 02/02/2023 13:27 | WG1998623 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 1.00 | 1 | 02/01/2023 23:29 | WG1997693 |
| Chloride | 44.4 | | 1.00 | 1 | 02/01/2023 23:29 | WG1997693 |
| Fluoride | ND | | 0.150 | 1 | 02/01/2023 23:29 | WG1997693 |
| Nitrate | 1.63 | | 0.100 | 1 | 02/01/2023 23:29 | WG1997693 |
| Sulfate | ND | | 5.00 | 1 | 02/01/2023 23:29 | WG1997693 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 1 | 02/02/2023 17:36 | WG1998364 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 1 | 02/02/2023 12:01 | WG1998310 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | ND | | 0.100 | 1 | 02/02/2023 10:26 | WG1998312 |
| Antimony | ND | | 0.00400 | 1 | 02/02/2023 10:26 | WG1998312 |
| Arsenic | ND | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Barium | 0.0134 | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Beryllium | ND | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Cadmium | ND | | 0.00100 | 1 | 02/02/2023 10:26 | WG1998312 |
| Calcium | 18.4 | | 1.00 | 1 | 02/02/2023 10:26 | WG1998312 |
| Chromium | ND | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Cobalt | ND | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Copper | ND | | 0.00500 | 1 | 02/02/2023 10:26 | WG1998312 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Iron | ND | | 0.100 | 1 | 02/02/2023 10:26 | WG1998312 |
| Lead | ND | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Magnesium | 5.15 | | 1.00 | 1 | 02/02/2023 10:26 | WG1998312 |
| Manganese | ND | | 0.00500 | 1 | 02/02/2023 10:26 | WG1998312 |
| Nickel | ND | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Potassium | ND | | 2.00 | 1 | 02/02/2023 10:26 | WG1998312 |
| Selenium | ND | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Silver | ND | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Sodium | 4.58 | | 2.00 | 1 | 02/02/2023 10:26 | WG1998312 |
| Thallium | ND | | 0.00200 | 1 | 02/02/2023 10:26 | WG1998312 |
| Vanadium | ND | | 0.00500 | 1 | 02/02/2023 10:26 | WG1998312 |
| Zinc | ND | | 0.0250 | 1 | 02/02/2023 10:26 | WG1998312 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Acetone | ND | | 0.0500 | 1 | 02/03/2023 21:23 | WG1999818 |
| Acrylonitrile | ND | | 0.0100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Benzene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Bromochloromethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Bromodichloromethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Bromoform | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Bromomethane | ND | | 0.00500 | 1 | 02/03/2023 21:23 | WG1999818 |
| Carbon disulfide | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Carbon tetrachloride | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Chlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Chlorodibromomethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Chloroethane | ND | | 0.00500 | 1 | 02/03/2023 21:23 | WG1999818 |
| Chloroform | ND | | 0.00500 | 1 | 02/03/2023 21:23 | WG1999818 |
| Chloromethane | ND | | 0.00250 | 1 | 02/03/2023 21:23 | WG1999818 |
| Dibromomethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.00500 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,2-Dibromoethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,2-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,4-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| trans-1,4-Dichloro-2-butene | ND | | 0.00250 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,1-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,2-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,1-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| cis-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| trans-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,2-Dichloropropane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| cis-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| trans-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Ethylbenzene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 2-Hexanone | ND | | 0.0100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Iodomethane | ND | | 0.0100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 2-Butanone (MEK) | ND | | 0.0100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Methylene Chloride | ND | | 0.00500 | 1 | 02/03/2023 21:23 | WG1999818 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.0100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Styrene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Tetrachloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Toluene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,1,1-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Trichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Trichlorofluoromethane | ND | | 0.00500 | 1 | 02/03/2023 21:23 | WG1999818 |
| 1,2,3-Trichloropropane | ND | | 0.00250 | 1 | 02/03/2023 21:23 | WG1999818 |
| Vinyl acetate | ND | | 0.0100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Vinyl chloride | ND | | 0.00100 | 1 | 02/03/2023 21:23 | WG1999818 |
| Xylenes, Total | ND | | 0.00300 | 1 | 02/03/2023 21:23 | WG1999818 |
| *(S) Toluene-d8* | *118* | | *80.0-120* | | *02/03/2023 21:23* | WG1999818 |
| *(S) 4-Bromofluorobenzene* | *104* | | *77.0-126* | | *02/03/2023 21:23* | WG1999818 |
| *(S) 1,2-Dichloroethane-d4* | *94.0* | | *70.0-130* | | *02/03/2023 21:23* | WG1999818 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | | 0.0000200 | 1 | 02/05/2023 17:14 | WG2000380 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000200 | 1 | 02/05/2023 17:14 | WG2000380 |

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | 57.8 | | 2.50 | 1 | 02/02/2023 10:29 | WG1998312 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | ND | | 20.0 | 1 | 02/06/2023 10:23 | WG1998655 |

Sample Narrative:
L1581082-06 WG1998655: Endpoint pH 4.5 Headspace

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | | 0.250 | 1 | 02/02/2023 13:51 | WG1998587 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | ND | | 20.0 | 1 | 02/02/2023 13:31 | WG1998623 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 1.00 | 1 | 02/02/2023 00:50 | WG1997693 |
| Chloride | 41.9 | | 1.00 | 1 | 02/02/2023 00:50 | WG1997693 |
| Fluoride | ND | | 0.150 | 1 | 02/02/2023 00:50 | WG1997693 |
| Nitrate | 0.886 | | 0.100 | 1 | 02/02/2023 00:50 | WG1997693 |
| Sulfate | ND | | 5.00 | 1 | 02/02/2023 00:50 | WG1997693 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 1 | 02/02/2023 17:38 | WG1998364 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 1 | 02/02/2023 12:04 | WG1998310 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | 0.107 | | 0.100 | 1 | 02/02/2023 10:29 | WG1998312 |
| Antimony | ND | | 0.00400 | 1 | 02/02/2023 10:29 | WG1998312 |
| Arsenic | ND | | 0.00200 | 1 | 02/02/2023 10:29 | WG1998312 |
| Barium | 0.0316 | | 0.00200 | 1 | 02/02/2023 10:29 | WG1998312 |
| Beryllium | ND | | 0.00200 | 1 | 02/02/2023 10:29 | WG1998312 |
| Cadmium | ND | | 0.00100 | 1 | 02/02/2023 10:29 | WG1998312 |
| Calcium | 14.5 | | 1.00 | 1 | 02/02/2023 10:29 | WG1998312 |
| Chromium | ND | | 0.00200 | 1 | 02/02/2023 10:29 | WG1998312 |
| Cobalt | ND | | 0.00200 | 1 | 02/02/2023 10:29 | WG1998312 |
| Copper | ND | | 0.00500 | 1 | 02/02/2023 10:29 | WG1998312 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Iron | ND | | 0.100 | 1 | 02/02/2023 10:29 | WG1998312 |
| Lead | ND | | 0.00200 | 1 | 02/02/2023 10:29 | WG1998312 |
| Magnesium | 5.22 | | 1.00 | 1 | 02/02/2023 10:29 | WG1998312 |
| Manganese | ND | | 0.00500 | 1 | 02/02/2023 10:29 | WG1998312 |
| Nickel | ND | | 0.00200 | 1 | 02/02/2023 10:29 | WG1998312 |
| Potassium | ND | | 2.00 | 1 | 02/02/2023 10:29 | WG1998312 |
| Selenium | ND | | 0.00200 | 1 | 02/02/2023 13:06 | WG1998312 |
| Silver | ND | | 0.00200 | 1 | 02/02/2023 10:29 | WG1998312 |
| Sodium | 5.65 | | 2.00 | 1 | 02/02/2023 10:29 | WG1998312 |
| Thallium | ND | | 0.00200 | 1 | 02/02/2023 10:29 | WG1998312 |
| Vanadium | ND | | 0.00500 | 1 | 02/02/2023 10:29 | WG1998312 |
| Zinc | ND | | 0.0250 | 1 | 02/02/2023 10:29 | WG1998312 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Acetone | ND | | 0.0500 | 1 | 02/03/2023 21:45 | WG1999818 |
| Acrylonitrile | ND | | 0.0100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Benzene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Bromochloromethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Bromodichloromethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Bromoform | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Bromomethane | ND | | 0.00500 | 1 | 02/03/2023 21:45 | WG1999818 |
| Carbon disulfide | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Carbon tetrachloride | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Chlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Chlorodibromomethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Chloroethane | ND | | 0.00500 | 1 | 02/03/2023 21:45 | WG1999818 |
| Chloroform | ND | | 0.00500 | 1 | 02/03/2023 21:45 | WG1999818 |
| Chloromethane | ND | | 0.00250 | 1 | 02/03/2023 21:45 | WG1999818 |
| Dibromomethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.00500 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,2-Dibromoethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,2-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,4-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| trans-1,4-Dichloro-2-butene | ND | | 0.00250 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,1-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,2-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,1-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| cis-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| trans-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,2-Dichloropropane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| cis-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| trans-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Ethylbenzene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 2-Hexanone | ND | | 0.0100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Iodomethane | ND | | 0.0100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 2-Butanone (MEK) | ND | | 0.0100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Methylene Chloride | ND | | 0.00500 | 1 | 02/03/2023 21:45 | WG1999818 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.0100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Styrene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Tetrachloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Toluene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,1,1-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Trichloroethene | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Trichlorofluoromethane | ND | | 0.00500 | 1 | 02/03/2023 21:45 | WG1999818 |
| 1,2,3-Trichloropropane | ND | | 0.00250 | 1 | 02/03/2023 21:45 | WG1999818 |
| Vinyl acetate | ND | | 0.0100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Vinyl chloride | ND | | 0.00100 | 1 | 02/03/2023 21:45 | WG1999818 |
| Xylenes, Total | ND | | 0.00300 | 1 | 02/03/2023 21:45 | WG1999818 |
| *(S) Toluene-d8* | *117* | | *80.0-120* | | *02/03/2023 21:45* | WG1999818 |
| *(S) 4-Bromofluorobenzene* | *99.4* | | *77.0-126* | | *02/03/2023 21:45* | WG1999818 |
| *(S) 1,2-Dichloroethane-d4* | *95.8* | | *70.0-130* | | *02/03/2023 21:45* | WG1999818 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | | 0.0000206 | 1.03 | 02/05/2023 17:26 | WG2000380 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000206 | 1.03 | 02/05/2023 17:26 | WG2000380 |

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | 88.8 | | 2.50 | 1 | 02/02/2023 10:32 | WG1998312 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | ND | | 20.0 | 1 | 02/06/2023 10:27 | WG1998655 |

Sample Narrative:
L1581082-07 WG1998655: Endpoint pH 4.5 Headspace

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | | 0.250 | 1 | 02/02/2023 13:52 | WG1998587 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | ND | | 20.0 | 1 | 02/02/2023 13:33 | WG1998623 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 1.00 | 1 | 02/02/2023 01:03 | WG1997693 |
| Chloride | 67.8 | | 1.00 | 1 | 02/02/2023 01:03 | WG1997693 |
| Fluoride | ND | | 0.150 | 1 | 02/02/2023 01:03 | WG1997693 |
| Nitrate | 7.47 | | 0.100 | 1 | 02/02/2023 01:03 | WG1997693 |
| Sulfate | ND | | 5.00 | 1 | 02/02/2023 01:03 | WG1997693 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 1 | 02/02/2023 17:41 | WG1998364 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 1 | 02/02/2023 12:06 | WG1998310 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | ND | | 0.100 | 1 | 02/02/2023 10:32 | WG1998312 |
| Antimony | ND | | 0.00400 | 1 | 02/02/2023 10:32 | WG1998312 |
| Arsenic | ND | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Barium | 0.0527 | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Beryllium | ND | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Cadmium | ND | | 0.00100 | 1 | 02/02/2023 10:32 | WG1998312 |
| Calcium | 22.9 | | 1.00 | 1 | 02/02/2023 10:32 | WG1998312 |
| Chromium | ND | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Cobalt | ND | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Copper | ND | | 0.00500 | 1 | 02/02/2023 10:32 | WG1998312 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Iron | ND | | 0.100 | 1 | 02/02/2023 10:32 | WG1998312 |
| Lead | ND | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Magnesium | 7.69 | | 1.00 | 1 | 02/02/2023 10:32 | WG1998312 |
| Manganese | 0.0129 | | 0.00500 | 1 | 02/02/2023 10:32 | WG1998312 |
| Nickel | ND | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Potassium | 2.09 | | 2.00 | 1 | 02/02/2023 10:32 | WG1998312 |
| Selenium | ND | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Silver | ND | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Sodium | 16.6 | | 2.00 | 1 | 02/02/2023 10:32 | WG1998312 |
| Thallium | ND | | 0.00200 | 1 | 02/02/2023 10:32 | WG1998312 |
| Vanadium | ND | | 0.00500 | 1 | 02/02/2023 10:32 | WG1998312 |
| Zinc | ND | | 0.0250 | 1 | 02/02/2023 10:32 | WG1998312 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Acetone | ND | | 0.0500 | 1 | 02/03/2023 22:05 | WG1999818 |
| Acrylonitrile | ND | | 0.0100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Benzene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Bromochloromethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Bromodichloromethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Bromoform | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Bromomethane | ND | | 0.00500 | 1 | 02/03/2023 22:05 | WG1999818 |
| Carbon disulfide | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Carbon tetrachloride | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Chlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Chlorodibromomethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Chloroethane | ND | | 0.00500 | 1 | 02/03/2023 22:05 | WG1999818 |
| Chloroform | ND | | 0.00500 | 1 | 02/03/2023 22:05 | WG1999818 |
| Chloromethane | ND | | 0.00250 | 1 | 02/03/2023 22:05 | WG1999818 |
| Dibromomethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.00500 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,2-Dibromoethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,2-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,4-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| trans-1,4-Dichloro-2-butene | ND | | 0.00250 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,1-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,2-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,1-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| cis-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| trans-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,2-Dichloropropane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| cis-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| trans-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Ethylbenzene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 2-Hexanone | ND | | 0.0100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Iodomethane | ND | | 0.0100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 2-Butanone (MEK) | ND | | 0.0100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Methylene Chloride | ND | | 0.00500 | 1 | 02/03/2023 22:05 | WG1999818 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.0100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Styrene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Tetrachloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Toluene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,1,1-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Trichloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Trichlorofluoromethane | ND | | 0.00500 | 1 | 02/03/2023 22:05 | WG1999818 |
| 1,2,3-Trichloropropane | ND | | 0.00250 | 1 | 02/03/2023 22:05 | WG1999818 |
| Vinyl acetate | ND | | 0.0100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Vinyl chloride | ND | | 0.00100 | 1 | 02/03/2023 22:05 | WG1999818 |
| Xylenes, Total | ND | | 0.00300 | 1 | 02/03/2023 22:05 | WG1999818 |
| *(S) Toluene-d8* | *119* | | *80.0-120* | | *02/03/2023 22:05* | WG1999818 |
| *(S) 4-Bromofluorobenzene* | *95.4* | | *77.0-126* | | *02/03/2023 22:05* | WG1999818 |
| *(S) 1,2-Dichloroethane-d4* | *97.8* | | *70.0-130* | | *02/03/2023 22:05* | WG1999818 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | | 0.0000200 | 1 | 02/05/2023 17:38 | WG2000380 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000200 | 1 | 02/05/2023 17:38 | WG2000380 |

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | 58.8 | | 2.50 | 1 | 02/02/2023 10:36 | WG1998312 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | ND | | 20.0 | 1 | 02/06/2023 10:32 | WG1998655 |

Sample Narrative:

L1581082-08 WG1998655: Endpoint pH 4.5 Headspace

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | | 0.250 | 1 | 02/02/2023 13:54 | WG1998587 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | ND | | 20.0 | 1 | 02/02/2023 13:33 | WG1998623 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 1.00 | 1 | 02/01/2023 22:48 | WG1997693 |
| Chloride | 41.8 | | 1.00 | 1 | 02/01/2023 22:48 | WG1997693 |
| Fluoride | ND | | 0.150 | 1 | 02/01/2023 22:48 | WG1997693 |
| Nitrate | 0.904 | | 0.100 | 1 | 02/01/2023 22:48 | WG1997693 |
| Sulfate | ND | | 5.00 | 1 | 02/01/2023 22:48 | WG1997693 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 1 | 02/02/2023 17:43 | WG1998364 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 1 | 02/02/2023 12:09 | WG1998310 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | ND | | 0.100 | 1 | 02/02/2023 10:36 | WG1998312 |
| Antimony | ND | | 0.00400 | 1 | 02/02/2023 10:36 | WG1998312 |
| Arsenic | ND | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Barium | 0.0312 | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Beryllium | ND | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Cadmium | ND | | 0.00100 | 1 | 02/02/2023 10:36 | WG1998312 |
| Calcium | 14.8 | | 1.00 | 1 | 02/02/2023 10:36 | WG1998312 |
| Chromium | ND | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Cobalt | ND | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Copper | ND | | 0.00500 | 1 | 02/02/2023 10:36 | WG1998312 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result | Qualifier | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|
| | mg/l | | mg/l | | date / time | |
| Iron | ND | | 0.100 | 1 | 02/02/2023 10:36 | WG1998312 |
| Lead | ND | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Magnesium | 5.33 | | 1.00 | 1 | 02/02/2023 10:36 | WG1998312 |
| Manganese | ND | | 0.00500 | 1 | 02/02/2023 10:36 | WG1998312 |
| Nickel | ND | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Potassium | ND | | 2.00 | 1 | 02/02/2023 10:36 | WG1998312 |
| Selenium | ND | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Silver | ND | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Sodium | 5.80 | | 2.00 | 1 | 02/02/2023 10:36 | WG1998312 |
| Thallium | ND | | 0.00200 | 1 | 02/02/2023 10:36 | WG1998312 |
| Vanadium | ND | | 0.00500 | 1 | 02/02/2023 10:36 | WG1998312 |
| Zinc | ND | | 0.0250 | 1 | 02/02/2023 10:36 | WG1998312 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result | Qualifier | RDL | Dilution | Analysis | Batch |
|---|---|---|---|---|---|---|
| | mg/l | | mg/l | | date / time | |
| Acetone | ND | | 0.0500 | 1 | 02/03/2023 22:27 | WG1999818 |
| Acrylonitrile | ND | | 0.0100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Benzene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Bromochloromethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Bromodichloromethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Bromoform | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Bromomethane | ND | | 0.00500 | 1 | 02/03/2023 22:27 | WG1999818 |
| Carbon disulfide | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Carbon tetrachloride | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Chlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Chlorodibromomethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Chloroethane | ND | | 0.00500 | 1 | 02/03/2023 22:27 | WG1999818 |
| Chloroform | ND | | 0.00500 | 1 | 02/03/2023 22:27 | WG1999818 |
| Chloromethane | ND | | 0.00250 | 1 | 02/03/2023 22:27 | WG1999818 |
| Dibromomethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.00500 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,2-Dibromoethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,2-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,4-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| trans-1,4-Dichloro-2-butene | ND | | 0.00250 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,1-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,2-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,1-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| cis-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| trans-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,2-Dichloropropane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| cis-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| trans-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Ethylbenzene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 2-Hexanone | ND | | 0.0100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Iodomethane | ND | | 0.0100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 2-Butanone (MEK) | ND | | 0.0100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Methylene Chloride | ND | | 0.00500 | 1 | 02/03/2023 22:27 | WG1999818 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.0100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Styrene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Tetrachloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Toluene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,1,1-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Trichloroethene | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Trichlorofluoromethane | ND | | 0.00500 | 1 | 02/03/2023 22:27 | WG1999818 |
| 1,2,3-Trichloropropane | ND | | 0.00250 | 1 | 02/03/2023 22:27 | WG1999818 |
| Vinyl acetate | ND | | 0.0100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Vinyl chloride | ND | | 0.00100 | 1 | 02/03/2023 22:27 | WG1999818 |
| Xylenes, Total | ND | | 0.00300 | 1 | 02/03/2023 22:27 | WG1999818 |
| *(S) Toluene-d8* | *121* | J1 | *80.0-120* | | *02/03/2023 22:27* | WG1999818 |
| *(S) 4-Bromofluorobenzene* | *100* | | *77.0-126* | | *02/03/2023 22:27* | WG1999818 |
| *(S) 1,2-Dichloroethane-d4* | *98.6* | | *70.0-130* | | *02/03/2023 22:27* | WG1999818 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | | 0.0000222 | 1.11 | 02/05/2023 17:49 | WG2000380 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000222 | 1.11 | 02/05/2023 17:49 | WG2000380 |

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | ND | | 2.50 | 1 | 02/02/2023 10:39 | WG1998312 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | ND | | 20.0 | 1 | 02/06/2023 12:49 | WG2000611 |

Sample Narrative:
L1581082-09 WG2000611: Endpoint pH 4.5

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | | 0.250 | 1 | 02/02/2023 14:01 | WG1998587 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | ND | | 20.0 | 1 | 02/02/2023 13:33 | WG1998623 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 1.00 | 1 | 02/02/2023 01:30 | WG1997693 |
| Chloride | ND | | 1.00 | 1 | 02/02/2023 01:30 | WG1997693 |
| Fluoride | ND | | 0.150 | 1 | 02/02/2023 01:30 | WG1997693 |
| Nitrate | ND | | 0.100 | 1 | 02/02/2023 01:30 | WG1997693 |
| Sulfate | ND | | 5.00 | 1 | 02/02/2023 01:30 | WG1997693 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.000200 | 1 | 02/02/2023 17:53 | WG1998364 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 0.200 | 1 | 02/02/2023 12:12 | WG1998310 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | ND | | 0.100 | 1 | 02/02/2023 10:39 | WG1998312 |
| Antimony | ND | | 0.00400 | 1 | 02/02/2023 10:39 | WG1998312 |
| Arsenic | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Barium | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Beryllium | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Cadmium | ND | | 0.00100 | 1 | 02/02/2023 10:39 | WG1998312 |
| Calcium | ND | | 1.00 | 1 | 02/02/2023 10:39 | WG1998312 |
| Chromium | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Cobalt | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Copper | ND | | 0.00500 | 1 | 02/02/2023 10:39 | WG1998312 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Iron | ND | | 0.100 | 1 | 02/02/2023 10:39 | WG1998312 |
| Lead | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Magnesium | ND | | 1.00 | 1 | 02/02/2023 10:39 | WG1998312 |
| Manganese | ND | | 0.00500 | 1 | 02/02/2023 10:39 | WG1998312 |
| Nickel | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Potassium | ND | | 2.00 | 1 | 02/02/2023 10:39 | WG1998312 |
| Selenium | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Silver | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Sodium | ND | | 2.00 | 1 | 02/02/2023 10:39 | WG1998312 |
| Thallium | ND | | 0.00200 | 1 | 02/02/2023 10:39 | WG1998312 |
| Vanadium | ND | | 0.00500 | 1 | 02/02/2023 10:39 | WG1998312 |
| Zinc | ND | | 0.0250 | 1 | 02/02/2023 10:39 | WG1998312 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Acetone | ND | | 0.0500 | 1 | 02/03/2023 15:43 | WG1999818 |
| Acrylonitrile | ND | | 0.0100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Benzene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Bromochloromethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Bromodichloromethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Bromoform | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Bromomethane | ND | | 0.00500 | 1 | 02/03/2023 15:43 | WG1999818 |
| Carbon disulfide | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Carbon tetrachloride | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Chlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Chlorodibromomethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Chloroethane | ND | | 0.00500 | 1 | 02/03/2023 15:43 | WG1999818 |
| Chloroform | ND | | 0.00500 | 1 | 02/03/2023 15:43 | WG1999818 |
| Chloromethane | ND | | 0.00250 | 1 | 02/03/2023 15:43 | WG1999818 |
| Dibromomethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.00500 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,2-Dibromoethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,2-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,4-Dichlorobenzene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| trans-1,4-Dichloro-2-butene | ND | | 0.00250 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,1-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,2-Dichloroethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,1-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| cis-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| trans-1,2-Dichloroethene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,2-Dichloropropane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| cis-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| trans-1,3-Dichloropropene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Ethylbenzene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 2-Hexanone | ND | | 0.0100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Iodomethane | ND | | 0.0100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 2-Butanone (MEK) | ND | | 0.0100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Methylene Chloride | ND | | 0.00500 | 1 | 02/03/2023 15:43 | WG1999818 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.0100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Styrene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Tetrachloroethene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Toluene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,1,1-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Trichloroethene | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Trichlorofluoromethane | ND | | 0.00500 | 1 | 02/03/2023 15:43 | WG1999818 |
| 1,2,3-Trichloropropane | ND | | 0.00250 | 1 | 02/03/2023 15:43 | WG1999818 |
| Vinyl acetate | ND | | 0.0100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Vinyl chloride | ND | | 0.00100 | 1 | 02/03/2023 15:43 | WG1999818 |
| Xylenes, Total | ND | | 0.00300 | 1 | 02/03/2023 15:43 | WG1999818 |
| *(S) Toluene-d8* | *117* | | *80.0-120* | | *02/03/2023 15:43* | WG1999818 |
| *(S) 4-Bromofluorobenzene* | *101* | | *77.0-126* | | *02/03/2023 15:43* | WG1999818 |
| *(S) 1,2-Dichloroethane-d4* | *91.3* | | *70.0-130* | | *02/03/2023 15:43* | WG1999818 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | | 0.0000206 | 1.03 | 02/05/2023 18:01 | WG2000380 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000206 | 1.03 | 02/05/2023 18:01 | WG2000380 |

# QUALITY CONTROL SUMMARY

L1581082-01,02,03,04,05,06,07,08

## Method Blank (MB)

(MB) R3887799-2 02/06/23 07:54

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Alkalinity | U | | 8.45 | 20.0 |

Sample Narrative:

BLANK: Endpoint pH 4.5

## L1580443-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1580443-03 02/06/23 08:44 • (DUP) R3887799-4 02/06/23 08:48

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Alkalinity | ND | ND | 1 | 1.01 | | 20 |

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

## L1581078-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1581078-01 02/06/23 09:28 • (DUP) R3887799-6 02/06/23 09:35

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Alkalinity | 94.0 | 94.9 | 1 | 0.982 | | 20 |

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

## Laboratory Control Sample (LCS)

(LCS) R3887799-1 02/06/23 07:43

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Alkalinity | 100 | 100 | 100 | 90.0-110 | |

Sample Narrative:

LCS: Endpoint pH 4.5

## Method Blank (MB)

(MB) R3887929-2 02/06/23 12:36

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Alkalinity | U | | 8.45 | 20.0 |

Sample Narrative:

BLANK: Endpoint pH 4.5

## L1581143-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1581143-01 02/06/23 12:54 • (DUP) R3887929-4 02/06/23 12:59

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Alkalinity | 186 | 187 | 1 | 0.857 | | 20 |

Sample Narrative:

OS: Endpoint pH 4.5

DUP: Endpoint pH 4.5

## L1581910-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1581910-01 02/06/23 14:23 • (DUP) R3887929-6 02/06/23 14:29

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Alkalinity | 177 | 176 | 1 | 0.638 | | 20 |

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

## Laboratory Control Sample (LCS)

(LCS) R3887929-1 02/06/23 12:25

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Alkalinity | 100 | 102 | 102 | 90.0-110 | |

Sample Narrative:

LCS: Endpoint pH 4.5

## Method Blank (MB)

(MB) R3886897-1 02/02/23 12:07

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Ammonia Nitrogen | U | | 0.117 | 0.250 |

## L1580850-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1580850-01 02/02/23 12:28 • (DUP) R3886897-5 02/02/23 12:29

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 0.762 | 0.759 | 1 | 0.394 | | 10 |

## L1581082-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1581082-02 02/02/23 12:53 • (DUP) R3886897-7 02/02/23 12:55

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | ND | 1 | 0.000 | | 10 |

## Laboratory Control Sample (LCS)

(LCS) R3886897-2 02/02/23 12:08

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Ammonia Nitrogen | 7.50 | 7.33 | 97.8 | 90.0-110 | |

## L1580842-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1580842-01 02/02/23 12:19 • (MS) R3886897-3 02/02/23 12:20 • (MSD) R3886897-4 02/02/23 12:26

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 5.00 | ND | 4.95 | 5.11 | 96.2 | 99.3 | 1 | 90.0-110 | | | 3.12 | 10 |

## L1581082-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1581082-01 02/02/23 12:50 • (MS) R3886897-6 02/02/23 12:52

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 5.00 | ND | 4.91 | 98.2 | 1 | 90.0-110 | |

# QUALITY CONTROL SUMMARY

L1581082-03,04,05,06,07,08,09

## Method Blank (MB)

(MB) R3886899-1 02/02/23 13:22

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Ammonia Nitrogen | U | | 0.117 | 0.250 |

## L1580824-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1580824-02 02/02/23 13:30 • (DUP) R3886899-5 02/02/23 13:31

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | ND | 1 | 0.000 | | 10 |

## L1581082-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1581082-09 02/02/23 14:01 • (DUP) R3886899-7 02/02/23 14:03

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | ND | 1 | 0.000 | | 10 |

## Laboratory Control Sample (LCS)

(LCS) R3886899-2 02/02/23 13:24

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Ammonia Nitrogen | 7.50 | 7.48 | 99.8 | 90.0-110 | |

## L1580824-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1580824-01 02/02/23 13:25 • (MS) R3886899-3 02/02/23 13:27 • (MSD) R3886899-4 02/02/23 13:28

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 5.00 | ND | 4.90 | 4.91 | 98.0 | 98.2 | 1 | 90.0-110 | | | 0.122 | 10 |

## L1581082-08 Original Sample (OS) • Matrix Spike (MS)

(OS) L1581082-08 02/02/23 13:54 • (MS) R3886899-6 02/02/23 13:55

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 5.00 | ND | 4.73 | 94.6 | 1 | 90.0-110 | |

## Method Blank (MB)

(MB) R3886811-1 02/02/23 13:17

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| COD | U | | 11.7 | 20.0 |

## L1580824-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1580824-03 02/02/23 13:22 • (DUP) R3886811-3 02/02/23 13:23

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| COD | ND | ND | 1 | 0.000 | | 20 |

## L1581082-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1581082-06 02/02/23 13:31 • (DUP) R3886811-6 02/02/23 13:31

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| COD | ND | ND | 1 | 0.000 | | 20 |

## Laboratory Control Sample (LCS)

(LCS) R3886811-2 02/02/23 13:17

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| COD | 500 | 455 | 91.1 | 90.0-110 | |

## L1581082-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1581082-03 02/02/23 13:26 • (MS) R3886811-4 02/02/23 13:26 • (MSD) R3886811-5 02/02/23 13:26

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COD | 500 | ND | 440 | 464 | 87.9 | 92.8 | 1 | 80.0-120 | | | 5.46 | 20 |

## Method Blank (MB)

(MB) R3886683-1 02/01/23 11:26

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Bromide | U | | 0.353 | 1.00 |
| Chloride | U | | 0.379 | 1.00 |
| Fluoride | U | | 0.0640 | 0.150 |
| Nitrate | U | | 0.0480 | 0.100 |
| Sulfate | U | | 0.594 | 5.00 |

## Method Blank (MB)

(MB) R3886731-1 02/01/23 19:33

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Bromide | U | | 0.353 | 1.00 |
| Chloride | U | | 0.379 | 1.00 |
| Fluoride | U | | 0.0640 | 0.150 |
| Nitrate | U | | 0.0480 | 0.100 |
| Sulfate | U | | 0.594 | 5.00 |

## L1580725-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1580725-02 02/01/23 14:11 • (DUP) R3886683-3 02/01/23 14:24

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Bromide | ND | ND | 1 | 0.000 | | 15 |
| Fluoride | 0.654 | 0.591 | 1 | 10.1 | | 15 |

## L1581082-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1581082-05 02/01/23 23:29 • (DUP) R3886731-3 02/01/23 23:42

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Bromide | ND | ND | 1 | 0.000 | | 15 |
| Chloride | 44.4 | 44.2 | 1 | 0.546 | | 15 |
| Fluoride | ND | ND | 1 | 0.000 | | 15 |
| Nitrate | 1.63 | 1.59 | 1 | 2.39 | | 15 |
| Sulfate | ND | ND | 1 | 0.000 | | 15 |

## L1580725-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1580725-02 02/02/23 03:45 • (DUP) R3886731-6 02/02/23 03:58

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Bromide | ND | ND | 1 | 0.000 | | 15 |
| Chloride | 9.51 | 9.20 | 1 | 3.28 | | 15 |
| Fluoride | 0.654 | 0.617 | 1 | 5.83 | | 15 |
| Nitrate | 0.714 | 0.654 | 1 | 8.79 | | 15 |
| Sulfate | 13.0 | 12.7 | 1 | 2.23 | | 15 |

## Laboratory Control Sample (LCS)

(LCS) R3886683-2 02/01/23 11:40

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Bromide | 40.0 | 41.3 | 103 | 80.0-120 | |
| Chloride | 40.0 | 40.7 | 102 | 80.0-120 | |
| Fluoride | 8.00 | 8.44 | 105 | 80.0-120 | |
| Nitrate | 8.00 | 8.09 | 101 | 80.0-120 | |
| Sulfate | 40.0 | 41.3 | 103 | 80.0-120 | |

## Laboratory Control Sample (LCS)

(LCS) R3886731-2 02/01/23 19:46

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Bromide | 40.0 | 40.9 | 102 | 80.0-120 | |
| Chloride | 40.0 | 40.5 | 101 | 80.0-120 | |
| Fluoride | 8.00 | 8.36 | 105 | 80.0-120 | |
| Nitrate | 8.00 | 7.99 | 99.9 | 80.0-120 | |
| Sulfate | 40.0 | 40.8 | 102 | 80.0-120 | |

## L1580725-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1580725-02 02/01/23 14:11 • (MS) R3886683-4 02/01/23 14:37 • (MSD) R3886683-5 02/01/23 14:50

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromide | 50.0 | ND | 50.9 | 50.9 | 102 | 102 | 1 | 80.0-120 | | | 0.0601 | 15 |
| Fluoride | 5.00 | 0.654 | 5.71 | 5.73 | 101 | 101 | 1 | 80.0-120 | | | 0.227 | 15 |

## L1581082-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1581082-05 02/01/23 23:29 • (MS) R3886731-4 02/02/23 00:23 • (MSD) R3886731-5 02/02/23 00:36

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromide | 50.0 | ND | 49.2 | 48.7 | 98.5 | 97.5 | 1 | 80.0-120 | | | 1.04 | 15 |
| Chloride | 50.0 | 44.4 | 91.5 | 90.6 | 94.2 | 92.5 | 1 | 80.0-120 | | | 0.943 | 15 |
| Fluoride | 5.00 | ND | 5.20 | 5.09 | 104 | 102 | 1 | 80.0-120 | | | 1.99 | 15 |
| Nitrate | 5.00 | 1.63 | 6.45 | 6.38 | 96.4 | 94.9 | 1 | 80.0-120 | | | 1.16 | 15 |
| Sulfate | 50.0 | ND | 49.0 | 48.1 | 98.0 | 96.3 | 1 | 80.0-120 | | | 1.76 | 15 |

## L1580725-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1580725-02 02/02/23 03:45 • (MS) R3886731-7 02/02/23 04:12 • (MSD) R3886731-8 02/02/23 04:26

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromide | 50.0 | ND | 50.6 | 50.6 | 101 | 101 | 1 | 80.0-120 | | | 0.114 | 15 |
| Chloride | 50.0 | 9.51 | 59.5 | 59.5 | 99.9 | 100 | 1 | 80.0-120 | | | 0.0770 | 15 |
| Fluoride | 5.00 | 0.654 | 5.66 | 5.66 | 100 | 100 | 1 | 80.0-120 | | | 0.0159 | 15 |
| Nitrate | 5.00 | 0.714 | 5.67 | 5.68 | 99.2 | 99.3 | 1 | 80.0-120 | | | 0.0687 | 15 |
| Sulfate | 50.0 | 13.0 | 62.3 | 62.5 | 98.7 | 99.0 | 1 | 80.0-120 | | | 0.281 | 15 |

## Method Blank (MB)

(MB) R3887002-1 02/02/23 17:03

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Mercury | U | | 0.000100 | 0.000200 |

## Laboratory Control Sample (LCS)

(LCS) R3887002-2 02/02/23 17:05

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Mercury | 0.00300 | 0.00283 | 94.5 | 80.0-120 | |

## L1581037-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1581037-01 02/02/23 17:08 • (MS) R3887002-3 02/02/23 17:10 • (MSD) R3887002-4 02/02/23 17:13

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00300 | ND | 0.00300 | 0.00296 | 100 | 98.8 | 1 | 75.0-125 | | | 1.27 | 20 |

## Method Blank (MB)

(MB) R3887001-1 02/02/23 18:54

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Mercury,Dissolved | U | | 0.000100 | 0.000200 |

## Laboratory Control Sample (LCS)

(LCS) R3887001-2 02/02/23 18:56

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Mercury,Dissolved | 0.00300 | 0.00259 | 86.3 | 80.0-120 | |

## L1581082-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1581082-01 02/02/23 19:04 • (MS) R3887001-3 02/02/23 19:07 • (MSD) R3887001-4 02/02/23 19:09

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury,Dissolved | 0.00300 | 0.000988 | 0.00375 | 0.00368 | 91.9 | 89.7 | 1 | 75.0-125 | | | 1.81 | 20 |

## Method Blank (MB)

(MB) R3886822-1 02/02/23 12:34

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Boron,Dissolved | U | | 0.0200 | 0.200 |

## Laboratory Control Sample (LCS)

(LCS) R3886822-2 02/02/23 12:36

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Boron,Dissolved | 1.00 | 0.979 | 97.9 | 80.0-120 | |

## L1581017-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1581017-16 02/02/23 12:39 • (MS) R3886822-4 02/02/23 12:45 • (MSD) R3886822-5 02/02/23 12:48

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron,Dissolved | 1.00 | ND | ND | ND | 82.6 | 86.0 | 10 | 75.0-125 | | | 0.000 | 20 |

## Method Blank (MB)

(MB) R3886967-1 02/02/23 11:26

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Boron | U | | 0.0200 | 0.200 |

## Laboratory Control Sample (LCS)

(LCS) R3886967-2 02/02/23 11:29

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Boron | 1.00 | 0.866 | 86.6 | 80.0-120 | |

## L1581082-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1581082-01 02/02/23 11:32 • (MS) R3886967-4 02/02/23 11:37 • (MSD) R3886967-5 02/02/23 11:39

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1.00 | ND | 0.868 | 0.854 | 86.8 | 85.4 | 1 | 75.0-125 | | | 1.64 | 20 |

## Method Blank (MB)

(MB) R3886698-1 02/02/23 09:43

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Aluminum | U | | 0.0185 | 0.100 |
| Antimony | U | | 0.00103 | 0.00400 |
| Arsenic | U | | 0.000180 | 0.00200 |
| Barium | U | | 0.000381 | 0.00200 |
| Beryllium | U | | 0.000190 | 0.00200 |
| Cadmium | U | | 0.000150 | 0.00100 |
| Calcium | U | | 0.0936 | 1.00 |
| Chromium | U | | 0.00124 | 0.00200 |
| Cobalt | U | | 0.0000596 | 0.00200 |
| Copper | U | | 0.00151 | 0.00500 |
| Iron | U | | 0.0281 | 0.100 |
| Lead | U | | 0.000849 | 0.00200 |
| Magnesium | U | | 0.0735 | 1.00 |
| Manganese | U | | 0.000704 | 0.00500 |
| Nickel | U | | 0.000816 | 0.00200 |
| Potassium | U | | 0.108 | 2.00 |
| Selenium | U | | 0.000300 | 0.00200 |
| Silver | U | | 0.0000700 | 0.00200 |
| Sodium | U | | 0.376 | 2.00 |
| Thallium | U | | 0.000121 | 0.00200 |
| Vanadium | U | | 0.000664 | 0.00500 |
| Zinc | U | | 0.00302 | 0.0250 |

## Laboratory Control Sample (LCS)

(LCS) R3886698-2 02/02/23 09:46

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Aluminum | 5.00 | 4.91 | 98.3 | 80.0-120 | |
| Antimony | 0.0500 | 0.0485 | 97.0 | 80.0-120 | |
| Arsenic | 0.0500 | 0.0486 | 97.3 | 80.0-120 | |
| Barium | 0.0500 | 0.0490 | 98.0 | 80.0-120 | |
| Beryllium | 0.0500 | 0.0472 | 94.4 | 80.0-120 | |
| Cadmium | 0.0500 | 0.0510 | 102 | 80.0-120 | |
| Calcium | 5.00 | 4.94 | 98.9 | 80.0-120 | |
| Chromium | 0.0500 | 0.0497 | 99.4 | 80.0-120 | |
| Cobalt | 0.0500 | 0.0505 | 101 | 80.0-120 | |
| Copper | 0.0500 | 0.0505 | 101 | 80.0-120 | |
| Iron | 5.00 | 4.98 | 99.5 | 80.0-120 | |

## Laboratory Control Sample (LCS)

(LCS) R3886698-2 02/02/23 09:46

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Lead | 0.0500 | 0.0500 | 99.9 | 80.0-120 | |
| Magnesium | 5.00 | 5.00 | 100 | 80.0-120 | |
| Manganese | 0.0500 | 0.0507 | 101 | 80.0-120 | |
| Nickel | 0.0500 | 0.0494 | 98.7 | 80.0-120 | |
| Potassium | 5.00 | 4.98 | 99.6 | 80.0-120 | |
| Selenium | 0.0500 | 0.0560 | 112 | 80.0-120 | |
| Silver | 0.0500 | 0.0503 | 101 | 80.0-120 | |
| Sodium | 5.00 | 5.04 | 101 | 80.0-120 | |
| Thallium | 0.0500 | 0.0498 | 99.6 | 80.0-120 | |
| Vanadium | 0.0500 | 0.0495 | 99.1 | 80.0-120 | |
| Zinc | 0.0500 | 0.0485 | 97.1 | 80.0-120 | |

## L1580865-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1580865-01 02/02/23 09:49 • (MS) R3886698-4 02/02/23 09:56 • (MSD) R3886698-5 02/02/23 09:59

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5.00 | ND | 4.74 | 4.84 | 94.7 | 96.9 | 1 | 75.0-125 | | | 2.23 | 20 |
| Antimony | 0.0500 | ND | 0.0507 | 0.0511 | 101 | 102 | 1 | 75.0-125 | | | 0.830 | 20 |
| Arsenic | 0.0500 | ND | 0.0494 | 0.0492 | 96.8 | 96.6 | 1 | 75.0-125 | | | 0.257 | 20 |
| Barium | 0.0500 | 0.0987 | 0.147 | 0.148 | 96.5 | 99.2 | 1 | 75.0-125 | | | 0.930 | 20 |
| Beryllium | 0.0500 | ND | 0.0474 | 0.0475 | 94.8 | 95.1 | 1 | 75.0-125 | | | 0.279 | 20 |
| Cadmium | 0.0500 | ND | 0.0508 | 0.0505 | 102 | 101 | 1 | 75.0-125 | | | 0.551 | 20 |
| Calcium | 5.00 | 62.2 | 66.1 | 65.6 | 77.3 | 68.2 | 1 | 75.0-125 | | V | 0.694 | 20 |
| Chromium | 0.0500 | 0.00504 | 0.0518 | 0.0522 | 93.4 | 94.4 | 1 | 75.0-125 | | | 0.888 | 20 |
| Cobalt | 0.0500 | ND | 0.0480 | 0.0483 | 95.6 | 96.3 | 1 | 75.0-125 | | | 0.735 | 20 |
| Copper | 0.0500 | 0.00712 | 0.0559 | 0.0560 | 97.5 | 97.9 | 1 | 75.0-125 | | | 0.292 | 20 |
| Iron | 5.00 | ND | 4.80 | 4.78 | 95.4 | 95.1 | 1 | 75.0-125 | | | 0.381 | 20 |
| Lead | 0.0500 | ND | 0.0498 | 0.0494 | 99.5 | 98.9 | 1 | 75.0-125 | | | 0.626 | 20 |
| Magnesium | 5.00 | 26.2 | 30.7 | 30.5 | 89.9 | 86.1 | 1 | 75.0-125 | | | 0.618 | 20 |
| Manganese | 0.0500 | ND | 0.0488 | 0.0495 | 96.2 | 97.5 | 1 | 75.0-125 | | | 1.32 | 20 |
| Nickel | 0.0500 | ND | 0.0491 | 0.0488 | 94.6 | 94.1 | 1 | 75.0-125 | | | 0.577 | 20 |
| Potassium | 5.00 | 5.06 | 9.92 | 9.87 | 97.3 | 96.2 | 1 | 75.0-125 | | | 0.545 | 20 |
| Selenium | 0.0500 | 0.0124 | 0.0666 | 0.0677 | 108 | 111 | 1 | 75.0-125 | | | 1.75 | 20 |
| Silver | 0.0500 | ND | 0.0503 | 0.0508 | 101 | 102 | 1 | 75.0-125 | | | 0.946 | 20 |
| Sodium | 5.00 | 192 | 196 | 196 | 77.2 | 74.2 | 1 | 75.0-125 | | V | 0.0775 | 20 |
| Thallium | 0.0500 | ND | 0.0498 | 0.0494 | 99.6 | 98.7 | 1 | 75.0-125 | | | 0.895 | 20 |
| Vanadium | 0.0500 | ND | 0.0506 | 0.0507 | 96.7 | 97.0 | 1 | 75.0-125 | | | 0.313 | 20 |
| Zinc | 0.0500 | ND | 0.0539 | 0.0533 | 93.9 | 92.8 | 1 | 75.0-125 | | | 1.10 | 20 |

## Method Blank (MB)

(MB) R3886785-1 02/02/23 11:40

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Aluminum,Dissolved | U | | 0.0185 | 0.100 |
| Antimony,Dissolved | U | | 0.00103 | 0.00400 |
| Arsenic,Dissolved | U | | 0.000180 | 0.00200 |
| Barium,Dissolved | U | | 0.000381 | 0.00200 |
| Beryllium,Dissolved | U | | 0.000190 | 0.00200 |
| Cadmium,Dissolved | U | | 0.000150 | 0.00100 |
| Calcium,Dissolved | U | | 0.0936 | 1.00 |
| Chromium,Dissolved | 0.00135 | J | 0.00124 | 0.00200 |
| Cobalt,Dissolved | U | | 0.0000596 | 0.00200 |
| Copper,Dissolved | U | | 0.00151 | 0.00500 |
| Iron,Dissolved | U | | 0.0281 | 0.100 |
| Lead,Dissolved | U | | 0.000849 | 0.00200 |
| Magnesium,Dissolved | U | | 0.0735 | 1.00 |
| Manganese,Dissolved | U | | 0.000704 | 0.00500 |
| Nickel,Dissolved | U | | 0.000816 | 0.00200 |
| Potassium,Dissolved | U | | 0.108 | 2.00 |
| Selenium,Dissolved | 0.000415 | J | 0.000300 | 0.00200 |
| Silver,Dissolved | U | | 0.0000700 | 0.00200 |
| Sodium,Dissolved | U | | 0.376 | 2.00 |
| Thallium,Dissolved | U | | 0.000121 | 0.00200 |
| Vanadium,Dissolved | U | | 0.000664 | 0.00500 |
| Zinc,Dissolved | U | | 0.00302 | 0.0250 |

## Laboratory Control Sample (LCS)

(LCS) R3886785-2 02/02/23 11:44

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Aluminum,Dissolved | 5.00 | 4.63 | 92.6 | 80.0-120 | |
| Antimony,Dissolved | 0.0500 | 0.0459 | 91.7 | 80.0-120 | |
| Arsenic,Dissolved | 0.0500 | 0.0464 | 92.8 | 80.0-120 | |
| Barium,Dissolved | 0.0500 | 0.0463 | 92.7 | 80.0-120 | |
| Beryllium,Dissolved | 0.0500 | 0.0458 | 91.6 | 80.0-120 | |
| Cadmium,Dissolved | 0.0500 | 0.0481 | 96.2 | 80.0-120 | |
| Calcium,Dissolved | 5.00 | 4.74 | 94.7 | 80.0-120 | |
| Chromium,Dissolved | 0.0500 | 0.0470 | 94.1 | 80.0-120 | |
| Cobalt,Dissolved | 0.0500 | 0.0475 | 95.1 | 80.0-120 | |
| Copper,Dissolved | 0.0500 | 0.0472 | 94.3 | 80.0-120 | |
| Iron,Dissolved | 5.00 | 4.72 | 94.4 | 80.0-120 | |

## Laboratory Control Sample (LCS)

(LCS) R3886785-2 02/02/23 11:44

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Lead,Dissolved | 0.0500 | 0.0477 | 95.5 | 80.0-120 | |
| Magnesium,Dissolved | 5.00 | 4.68 | 93.6 | 80.0-120 | |
| Manganese,Dissolved | 0.0500 | 0.0479 | 95.8 | 80.0-120 | |
| Nickel,Dissolved | 0.0500 | 0.0475 | 95.0 | 80.0-120 | |
| Potassium,Dissolved | 5.00 | 4.66 | 93.1 | 80.0-120 | |
| Selenium,Dissolved | 0.0500 | 0.0508 | 102 | 80.0-120 | |
| Silver,Dissolved | 0.0500 | 0.0478 | 95.6 | 80.0-120 | |
| Sodium,Dissolved | 5.00 | 4.78 | 95.6 | 80.0-120 | |
| Thallium,Dissolved | 0.0500 | 0.0469 | 93.8 | 80.0-120 | |
| Vanadium,Dissolved | 0.0500 | 0.0474 | 94.8 | 80.0-120 | |
| Zinc,Dissolved | 0.0500 | 0.0456 | 91.2 | 80.0-120 | |

## L1580881-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1580881-01 02/02/23 11:47 • (MS) R3886785-4 02/02/23 11:54 • (MSD) R3886785-5 02/02/23 11:57

| Analyte | Spike Amount mg/l | Original Result | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum,Dissolved | 5.00 | | 4.65 | 4.58 | 92.9 | 91.6 | 1 | 75.0-125 | | | 1.40 | 20 |
| Antimony,Dissolved | 0.0500 | | 0.0482 | 0.0470 | 96.3 | 94.0 | 1 | 75.0-125 | | | 2.40 | 20 |
| Arsenic,Dissolved | 0.0500 | | 0.0465 | 0.0472 | 92.1 | 93.5 | 1 | 75.0-125 | | | 1.55 | 20 |
| Barium,Dissolved | 0.0500 | | 0.0782 | 0.0745 | 94.4 | 87.0 | 1 | 75.0-125 | | | 4.85 | 20 |
| Beryllium,Dissolved | 0.0500 | | 0.0469 | 0.0451 | 93.9 | 90.2 | 1 | 75.0-125 | | | 3.94 | 20 |
| Cadmium,Dissolved | 0.0500 | | 0.0491 | 0.0484 | 97.7 | 96.4 | 1 | 75.0-125 | | | 1.34 | 20 |
| Calcium,Dissolved | 5.00 | | 126 | 126 | 80.4 | 77.2 | 1 | 75.0-125 | | | 0.130 | 20 |
| Chromium,Dissolved | 0.0500 | ND | 0.0469 | 0.0472 | 93.7 | 94.4 | 1 | 75.0-125 | | | 0.692 | 20 |
| Cobalt,Dissolved | 0.0500 | | 0.0458 | 0.0461 | 91.2 | 91.8 | 1 | 75.0-125 | | | 0.700 | 20 |
| Copper,Dissolved | 0.0500 | | 0.0482 | 0.0465 | 93.0 | 89.6 | 1 | 75.0-125 | | | 3.61 | 20 |
| Iron,Dissolved | 5.00 | | 4.66 | 4.66 | 93.2 | 93.2 | 1 | 75.0-125 | | | 0.0317 | 20 |
| Lead,Dissolved | 0.0500 | ND | 0.0476 | 0.0482 | 95.2 | 96.5 | 1 | 75.0-125 | | | 1.35 | 20 |
| Magnesium,Dissolved | 5.00 | | 60.3 | 60.0 | 80.8 | 75.1 | 1 | 75.0-125 | | | 0.478 | 20 |
| Manganese,Dissolved | 0.0500 | | 0.0503 | 0.0516 | 93.1 | 95.6 | 1 | 75.0-125 | | | 2.42 | 20 |
| Nickel,Dissolved | 0.0500 | | 0.0475 | 0.0493 | 89.0 | 92.6 | 1 | 75.0-125 | | | 3.67 | 20 |
| Potassium,Dissolved | 5.00 | | 7.83 | 7.73 | 94.0 | 91.8 | 1 | 75.0-125 | | | 1.36 | 20 |
| Selenium,Dissolved | 0.0500 | ND | 0.0556 | 0.0513 | 110 | 102 | 1 | 75.0-125 | | | 8.01 | 20 |
| Silver,Dissolved | 0.0500 | | 0.0487 | 0.0473 | 97.3 | 94.6 | 1 | 75.0-125 | | | 2.79 | 20 |
| Sodium,Dissolved | 5.00 | | 7.51 | 7.49 | 95.4 | 95.0 | 1 | 75.0-125 | | | 0.238 | 20 |
| Thallium,Dissolved | 0.0500 | | 0.0480 | 0.0482 | 95.4 | 95.9 | 1 | 75.0-125 | | | 0.498 | 20 |
| Vanadium,Dissolved | 0.0500 | | 0.0464 | 0.0471 | 92.7 | 94.3 | 1 | 75.0-125 | | | 1.66 | 20 |
| Zinc,Dissolved | 0.0500 | ND | 0.0587 | 0.0591 | 88.0 | 88.8 | 1 | 75.0-125 | | | 0.757 | 20 |

## Method Blank (MB)

(MB) R3887446-2 02/03/23 12:37

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Acetone | U | | 0.0113 | 0.0500 |
| Acrylonitrile | U | | 0.000671 | 0.0100 |
| Benzene | U | | 0.0000941 | 0.00100 |
| Bromochloromethane | U | | 0.000128 | 0.00100 |
| Bromodichloromethane | U | | 0.000136 | 0.00100 |
| Bromoform | U | | 0.000129 | 0.00100 |
| Bromomethane | U | | 0.000605 | 0.00500 |
| Carbon disulfide | U | | 0.0000962 | 0.00100 |
| Carbon tetrachloride | U | | 0.000128 | 0.00100 |
| Chlorobenzene | U | | 0.000116 | 0.00100 |
| Chlorodibromomethane | U | | 0.000140 | 0.00100 |
| Chloroethane | U | | 0.000192 | 0.00500 |
| Chloroform | U | | 0.000111 | 0.00500 |
| Chloromethane | U | | 0.000960 | 0.00250 |
| Dibromomethane | U | | 0.000122 | 0.00100 |
| 1,2-Dibromo-3-Chloropropane | U | | 0.000276 | 0.00500 |
| 1,2-Dibromoethane | U | | 0.000126 | 0.00100 |
| 1,2-Dichlorobenzene | U | | 0.000107 | 0.00100 |
| 1,4-Dichlorobenzene | U | | 0.000120 | 0.00100 |
| trans-1,4-Dichloro-2-butene | U | | 0.000467 | 0.00250 |
| 1,1-Dichloroethane | U | | 0.000100 | 0.00100 |
| 1,2-Dichloroethane | U | | 0.0000819 | 0.00100 |
| 1,1-Dichloroethene | U | | 0.000188 | 0.00100 |
| cis-1,2-Dichloroethene | U | | 0.000126 | 0.00100 |
| trans-1,2-Dichloroethene | U | | 0.000149 | 0.00100 |
| 1,2-Dichloropropane | U | | 0.000149 | 0.00100 |
| cis-1,3-Dichloropropene | U | | 0.000111 | 0.00100 |
| trans-1,3-Dichloropropene | U | | 0.000118 | 0.00100 |
| Ethylbenzene | U | | 0.000137 | 0.00100 |
| 2-Hexanone | U | | 0.000787 | 0.0100 |
| Iodomethane | U | | 0.00600 | 0.0100 |
| 2-Butanone (MEK) | U | | 0.00119 | 0.0100 |
| Methylene Chloride | U | | 0.000430 | 0.00500 |
| 4-Methyl-2-pentanone (MIBK) | U | | 0.000478 | 0.0100 |
| Styrene | U | | 0.000118 | 0.00100 |
| 1,1,1,2-Tetrachloroethane | U | | 0.000147 | 0.00100 |
| 1,1,2,2-Tetrachloroethane | U | | 0.000133 | 0.00100 |
| Tetrachloroethene | U | | 0.000300 | 0.00100 |
| Toluene | U | | 0.000278 | 0.00100 |
| 1,1,1-Trichloroethane | U | | 0.000149 | 0.00100 |

## Method Blank (MB)

(MB) R3887446-2 02/03/23 12:37

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| 1,1,2-Trichloroethane | U | | 0.000158 | 0.00100 |
| Trichloroethene | U | | 0.000190 | 0.00100 |
| Trichlorofluoromethane | U | | 0.000160 | 0.00500 |
| 1,2,3-Trichloropropane | U | | 0.000237 | 0.00250 |
| Vinyl acetate | U | | 0.000692 | 0.0100 |
| Vinyl chloride | U | | 0.000234 | 0.00100 |
| Xylenes, Total | U | | 0.000174 | 0.00300 |
| *(S) Toluene-d8* | *115* | | | *80.0-120* |
| *(S) 4-Bromofluorobenzene* | *103* | | | *77.0-126* |
| *(S) 1,2-Dichloroethane-d4* | *92.3* | | | *70.0-130* |

## Laboratory Control Sample (LCS)

(LCS) R3887446-1 02/03/23 11:19

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Acetone | 0.0250 | 0.0204 | 81.6 | 19.0-160 | |
| Acrylonitrile | 0.0250 | 0.0241 | 96.4 | 55.0-149 | |
| Benzene | 0.00500 | 0.00428 | 85.6 | 70.0-123 | |
| Bromochloromethane | 0.00500 | 0.00515 | 103 | 76.0-122 | |
| Bromodichloromethane | 0.00500 | 0.00392 | 78.4 | 75.0-120 | |
| Bromoform | 0.00500 | 0.00561 | 112 | 68.0-132 | |
| Bromomethane | 0.00500 | 0.00510 | 102 | 10.0-160 | |
| Carbon disulfide | 0.00500 | 0.00410 | 82.0 | 61.0-128 | |
| Carbon tetrachloride | 0.00500 | 0.00439 | 87.8 | 68.0-126 | |
| Chlorobenzene | 0.00500 | 0.00574 | 115 | 80.0-121 | |
| Chlorodibromomethane | 0.00500 | 0.00539 | 108 | 77.0-125 | |
| Chloroethane | 0.00500 | 0.00451 | 90.2 | 47.0-150 | |
| Chloroform | 0.00500 | 0.00423 | 84.6 | 73.0-120 | |
| Chloromethane | 0.00500 | 0.00510 | 102 | 41.0-142 | |
| Dibromomethane | 0.00500 | 0.00424 | 84.8 | 80.0-120 | |
| 1,2-Dibromo-3-Chloropropane | 0.00500 | 0.00442 | 88.4 | 58.0-134 | |
| 1,2-Dibromoethane | 0.00500 | 0.00524 | 105 | 80.0-122 | |
| 1,2-Dichlorobenzene | 0.00500 | 0.00542 | 108 | 79.0-121 | |
| 1,4-Dichlorobenzene | 0.00500 | 0.00507 | 101 | 79.0-120 | |
| trans-1,4-Dichloro-2-butene | 0.00500 | 0.00462 | 92.4 | 33.0-144 | |
| 1,1-Dichloroethane | 0.00500 | 0.00493 | 98.6 | 70.0-126 | |
| 1,2-Dichloroethane | 0.00500 | 0.00430 | 86.0 | 70.0-128 | |
| 1,1-Dichloroethene | 0.00500 | 0.00434 | 86.8 | 71.0-124 | |

## Laboratory Control Sample (LCS)

(LCS) R3887446-1 02/03/23 11:19

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| cis-1,2-Dichloroethene | 0.00500 | 0.00464 | 92.8 | 73.0-120 | |
| trans-1,2-Dichloroethene | 0.00500 | 0.00456 | 91.2 | 73.0-120 | |
| 1,2-Dichloropropane | 0.00500 | 0.00484 | 96.8 | 77.0-125 | |
| cis-1,3-Dichloropropene | 0.00500 | 0.00417 | 83.4 | 80.0-123 | |
| trans-1,3-Dichloropropene | 0.00500 | 0.00480 | 96.0 | 78.0-124 | |
| Ethylbenzene | 0.00500 | 0.00537 | 107 | 79.0-123 | |
| 2-Hexanone | 0.0250 | 0.0257 | 103 | 67.0-149 | |
| Iodomethane | 0.0250 | 0.0250 | 100 | 33.0-147 | |
| 2-Butanone (MEK) | 0.0250 | 0.0220 | 88.0 | 44.0-160 | |
| Methylene Chloride | 0.00500 | 0.00433 | 86.6 | 67.0-120 | |
| 4-Methyl-2-pentanone (MIBK) | 0.0250 | 0.0252 | 101 | 68.0-142 | |
| Styrene | 0.00500 | 0.00519 | 104 | 73.0-130 | |
| 1,1,1,2-Tetrachloroethane | 0.00500 | 0.00592 | 118 | 75.0-125 | |
| 1,1,2,2-Tetrachloroethane | 0.00500 | 0.00435 | 87.0 | 65.0-130 | |
| Tetrachloroethene | 0.00500 | 0.00660 | 132 | 72.0-132 | |
| Toluene | 0.00500 | 0.00531 | 106 | 79.0-120 | |
| 1,1,1-Trichloroethane | 0.00500 | 0.00445 | 89.0 | 73.0-124 | |
| 1,1,2-Trichloroethane | 0.00500 | 0.00530 | 106 | 80.0-120 | |
| Trichloroethene | 0.00500 | 0.00469 | 93.8 | 78.0-124 | |
| Trichlorofluoromethane | 0.00500 | 0.00483 | 96.6 | 59.0-147 | |
| 1,2,3-Trichloropropane | 0.00500 | 0.00482 | 96.4 | 73.0-130 | |
| Vinyl acetate | 0.0250 | 0.0203 | 81.2 | 11.0-160 | |
| Vinyl chloride | 0.00500 | 0.00466 | 93.2 | 67.0-131 | |
| Xylenes, Total | 0.0150 | 0.0163 | 109 | 79.0-123 | |
| *(S) Toluene-d8* | | | *118* | *80.0-120* | |
| *(S) 4-Bromofluorobenzene* | | | *107* | *77.0-126* | |
| *(S) 1,2-Dichloroethane-d4* | | | *94.8* | *70.0-130* | |

## Method Blank (MB)

(MB) R3887901-1 02/03/23 17:12

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Ethylene Dibromide | U | | 0.00000536 | 0.0000200 |
| 1,2-Dibromo-3-Chloropropane | U | | 0.00000748 | 0.0000200 |

## L1580737-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1580737-01 02/03/23 17:59 • (DUP) R3887901-3 02/03/23 17:47

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | ND | 1 | 0.000 | | 20 |
| 1,2-Dibromo-3-Chloropropane | ND | ND | 1 | 0.000 | | 20 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3887901-4 02/03/23 19:56 • (LCSD) R3887901-5 02/03/23 22:27

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCSD Result mg/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Ethylene Dibromide | 0.000250 | 0.000240 | 0.000239 | 96.0 | 95.6 | 60.0-140 | | | 0.418 | 20 |
| 1,2-Dibromo-3-Chloropropane | 0.000250 | 0.000229 | 0.000222 | 91.6 | 88.8 | 60.0-140 | | | 3.10 | 20 |

## L1580737-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1580737-02 02/03/23 17:35 • (MS) R3887901-2 02/03/23 17:24

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Ethylene Dibromide | 0.000102 | ND | 0.000111 | 109 | 1.02 | 64.0-159 | |
| 1,2-Dibromo-3-Chloropropane | 0.000102 | ND | 0.000106 | 104 | 1.02 | 72.0-148 | |

## Method Blank (MB)

(MB) R3887725-1 02/05/23 16:04

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Ethylene Dibromide | U | | 0.00000536 | 0.0000200 |
| 1,2-Dibromo-3-Chloropropane | U | | 0.00000748 | 0.0000200 |

## L1581082-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1581082-02 02/05/23 16:51 • (DUP) R3887725-3 02/05/23 16:39

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | ND | 1.12 | 0.000 | | 20 |
| 1,2-Dibromo-3-Chloropropane | ND | ND | 1.12 | 0.000 | | 20 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3887725-4 02/05/23 18:47 • (LCSD) R3887725-5 02/05/23 21:18

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCSD Result mg/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Ethylene Dibromide | 0.000250 | 0.000233 | 0.000240 | 93.2 | 96.0 | 60.0-140 | | | 2.96 | 20 |
| 1,2-Dibromo-3-Chloropropane | 0.000250 | 0.000255 | 0.000263 | 102 | 105 | 60.0-140 | | | 3.09 | 20 |

## L1581082-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1581082-03 02/05/23 16:28 • (MS) R3887725-2 02/05/23 16:16

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Ethylene Dibromide | 0.000103 | ND | 0.000115 | 112 | 1.03 | 64.0-159 | |
| 1,2-Dibromo-3-Chloropropane | 0.000103 | ND | 0.000119 | 116 | 1.03 | 72.0-148 | |

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| ND | Not detected at the Reporting Limit (or MDL where applicable). |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| B | The same analyte is found in the associated blank. |
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J1 | Surrogate recovery limits have been exceeded; values are outside upper control limits. |
| V | The sample concentration is too high to evaluate accurate spike recoveries. |

## Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN000032021-1 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | TN00003 |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO000356 |
| Kentucky [1 6] | KY90010 | South Carolina | 84004002 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana | LA018 | Texas | T104704245-20-18 |
| Maine | TN00003 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN000032021-11 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 110033 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 998093910 |
| Montana | CERT0086 | Wyoming | A2LA |
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
**Civil & Environmental Consultants - TN**

117 Seaboard Ln.
Suite E100
Franklin. TN 37067

Billing Information:
Accounts Payable
117 Seaboard Ln.
Suite E100
Franklin, TN 37067

Report to: **Philip Campbell**

Email To: pcampbell@cecinc.com

Project Description: **Former EWS Camden Class 2 Landfill**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **615-333-7797**

Client Project # **181-364**

Lab Project # **CEC-EWS CAMDEN LF**

Collected by (print): Stuart Miller

Site/Facility ID # **CAMDEN, TN**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

***Rush?*** (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE

**MT JULIET, TN**
12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1561082
C050

Acctnum: **CEC**
Template: **T133579**
Prelogin: **P977820**
PM: **526 - Chris McCord**
PB: CT 1/28/23

Shipped Via: **Courier**

Analysis / Container / Preservative

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | **WetChem** 250mlHDPE-NoPres | ALK 100ml Amb-NoPres | COD,NH3 250mlHDPE-H2SO4 | Diss. Metals-FF 250mlHDPE-HNO3 | SV8011 40mlClr-NaThio | Total Metals,HARD 250mlHDPE-HNO3 | V8260AP1 40mlAmb-HCl | V8260AP1-Trip Blank 40mlAmb-HCl-Blk | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | Grab | GW | | 1/31/23 | 8:01 | 11 | X | X | X | X | X | X | X | | | -01 |
| MW-3 | Grab | GW | | 1/31/23 | 14:15 | 11 | X | X | X | X | X | X | X | | | -02 |
| MW-4 | Grab | GW | | 1/31/23 | 12:15 | 11 | X | X | X | X | X | X | X | | | -03 |
| MW-5 | Grab | GW | | 1/31/23 | 10:15 | 11 | X | X | X | X | X | X | X | | | -04 |
| TMW-1 | Grab | GW | | 1/31/23 | 10:12 | 10 | X | X | X | X | X | X | X | | | -05 |
| TMW-2 | Grab | GW | | 1/31/23 | 12:12 | 10 | X | X | X | X | X | X | X | | | -06 |
| TMW-3 | Grab | GW | | 1/31/23 | 14:14 | 10 | X | X | X | X | X | X | X | | | -07 |
| DUPLICATE | Grab | GW | | 1/31/23 | [illegible] | 10 | X | X | X | X | X | X | X | | | -08 |
| FIELD BLANK | Grab | GW | | 1/31/23 | 14:15 | 10 | X | X | X | | X | X | X | | | -09 |
| EQUIPMENT BLANK | | GW | | | | 10 | X | X | X | | X | X | X | | | |

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:**WetChem** = *NITRATE*(48hr hold),CHLORIDE,BROMIDE,SULFATE,FLUORIDE
Tot/Diss Metals=M6020AP1+Al,Ca,Fe,K,Mg,Mn,Na(6020/7470),and B(6010).

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier ✓

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD Screen <0.5 mR/hr: Y N

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Trip Blank Received: Yes / No HCl / MeoH TBR | If preservation required by Login: Date/Time |
|---|---|---|---|---|---|
| | 2/01/23 | 11:15 | | 1 | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Temp: °C Bottles Received: | |
| | 2-1-23 | 15:20 | | 94 | |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) | Date: Time: | Hold: Condition: NCF / OK |
| | | | D. Ramsey | 02-01-22 1520 | |

LR581082

| Tracking Numbers | Temperature |
| --- | --- |
| Courier | NSA 7<br>0.8 + 0.0 = 0.8 |
| courier | NSA 7<br>0.7 + 0.0 = 0.7 |
| | |
| | |
| | |
| | |

# ANALYTICAL REPORT

March 03, 2023



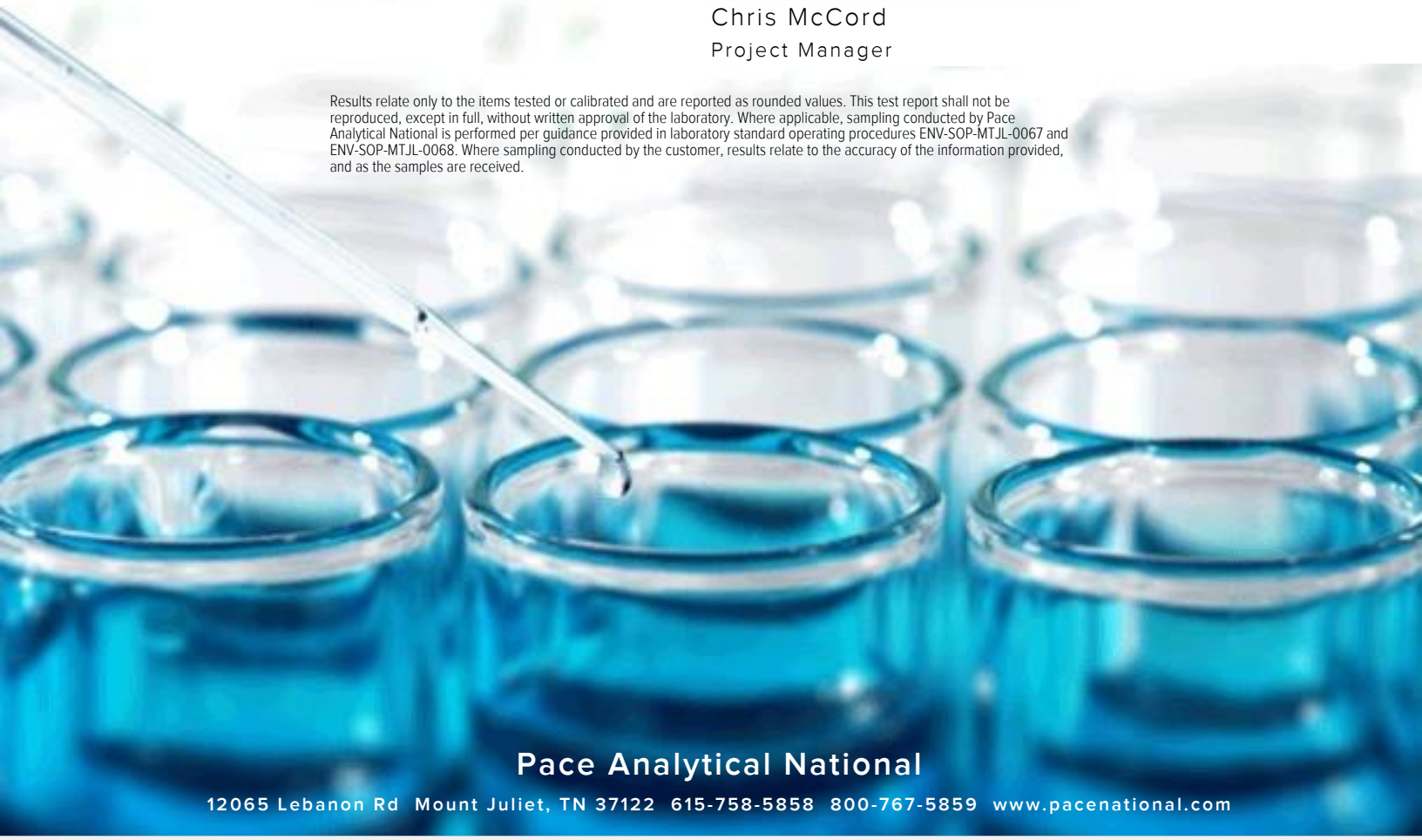
## Civil & Environmental Consultants - TN

| | |
|---|---|
| Sample Delivery Group: | L1587837 |
| Samples Received: | 02/21/2023 |
| Project Number: | 181-364 |
| Description: | EWS Camden Class 2 Landfill |
| Site: | CAMDEN, TN |
| Report To: | Philip Campbell<br>117 Seaboard Ln.<br>Suite E100<br>Franklin, TN 37067 |

Entire Report Reviewed By:

Chris McCord
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



**Pace Analytical National**
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

# TABLE OF CONTENTS

# SAMPLE SUMMARY

## IWC-L L1587837-01 GW

Collected by: JD
Collected date/time: 02/21/23 10:40
Received date/time: 02/21/23 15:50

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analyst | Location |
|---|---|---|---|---|---|---|
| Calculated Results | WG2010304 | 1 | 02/22/23 15:29 | 02/22/23 15:29 | LD | Mt. Juliet, TN |
| Wet Chemistry by Method 2320 B-2011 | WG2013386 | 1 | 02/27/23 14:17 | 02/27/23 14:17 | ARD | Mt. Juliet, TN |
| Wet Chemistry by Method 350.1 | WG2010358 | 200 | 02/22/23 12:15 | 02/22/23 12:15 | BMD | Mt. Juliet, TN |
| Wet Chemistry by Method 410.4 | WG2010272 | 10 | 02/21/23 20:00 | 02/22/23 00:09 | TQP | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG2010279 | 100 | 02/21/23 22:57 | 02/21/23 22:57 | LBR | Mt. Juliet, TN |
| Wet Chemistry by Method 9056A | WG2010279 | 1000 | 02/21/23 23:12 | 02/21/23 23:12 | LBR | Mt. Juliet, TN |
| Mercury by Method 7470A | WG2010277 | 10 | 02/22/23 10:32 | 02/22/23 22:50 | AKB | Mt. Juliet, TN |
| Mercury by Method 7470A | WG2010278 | 10 | 02/22/23 19:28 | 02/23/23 09:26 | SRT | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG2010302 | 5 | 02/22/23 10:25 | 02/23/23 09:59 | ABL | Mt. Juliet, TN |
| Metals (ICP) by Method 6010B | WG2010560 | 5 | 02/22/23 11:32 | 02/23/23 09:53 | ABL | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG2010301 | 20 | 02/22/23 08:37 | 02/22/23 12:00 | SJM | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG2010301 | 50 | 02/22/23 08:37 | 02/22/23 12:40 | SJM | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG2010304 | 20 | 02/22/23 12:10 | 02/22/23 15:29 | LD | Mt. Juliet, TN |
| Metals (ICPMS) by Method 6020A | WG2010304 | 50 | 02/22/23 12:10 | 02/22/23 15:39 | LD | Mt. Juliet, TN |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG2011270 | 25 | 02/23/23 06:33 | 02/23/23 06:33 | KSD | Mt. Juliet, TN |
| EDB / DBCP by Method 8011 | WG2013368 | 1.02 | 02/27/23 07:23 | 02/28/23 04:05 | HMH | Mt. Juliet, TN |

# CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Chris McCord
Project Manager

## Calculated Results

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Hardness (calculated) as CaCO3 | 30200 | | 49.9 | 1 | 02/22/2023 15:29 | WG2010304 |

## Wet Chemistry by Method 2320 B-2011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Alkalinity | ND | | 20.0 | 1 | 02/27/2023 14:17 | WG2013386 |

Sample Narrative:
L1587837-01 WG2013386: Endpoint pH 4.5

## Wet Chemistry by Method 350.1

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 1190 | | 50.0 | 200 | 02/22/2023 12:15 | WG2010358 |

## Wet Chemistry by Method 410.4

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| COD | 6950 | | 200 | 10 | 02/22/2023 00:09 | WG2010272 |

## Wet Chemistry by Method 9056A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Bromide | ND | | 100 | 100 | 02/21/2023 22:57 | WG2010279 |
| Chloride | 68000 | | 1000 | 1000 | 02/21/2023 23:12 | WG2010279 |
| Fluoride | ND | | 15.0 | 100 | 02/21/2023 22:57 | WG2010279 |
| Nitrate | ND | | 10.0 | 100 | 02/21/2023 22:57 | WG2010279 |
| Sulfate | 880 | | 500 | 100 | 02/21/2023 22:57 | WG2010279 |

## Mercury by Method 7470A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Mercury | ND | | 0.00200 | 10 | 02/22/2023 22:50 | WG2010277 |
| Mercury,Dissolved | ND | | 0.00200 | 10 | 02/23/2023 09:26 | WG2010278 |

## Metals (ICP) by Method 6010B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Boron | ND | | 1.00 | 5 | 02/23/2023 09:59 | WG2010302 |
| Boron,Dissolved | ND | | 1.00 | 5 | 02/23/2023 09:53 | WG2010560 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Aluminum | 190 | | 2.00 | 20 | 02/22/2023 15:29 | WG2010304 |
| Aluminum,Dissolved | 159 | | 2.00 | 20 | 02/22/2023 12:00 | WG2010301 |
| Antimony | ND | | 0.0800 | 20 | 02/22/2023 15:29 | WG2010304 |
| Antimony,Dissolved | ND | | 0.0800 | 20 | 02/22/2023 12:00 | WG2010301 |
| Arsenic | 0.149 | | 0.100 | 50 | 02/22/2023 15:39 | WG2010304 |
| Arsenic,Dissolved | 0.144 | | 0.100 | 50 | 02/22/2023 12:40 | WG2010301 |
| Barium | 1.83 | | 0.0400 | 20 | 02/22/2023 15:29 | WG2010304 |
| Barium,Dissolved | 1.95 | | 0.0400 | 20 | 02/22/2023 12:00 | WG2010301 |

## Metals (ICPMS) by Method 6020A

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Beryllium | ND | | 0.0400 | 20 | 02/22/2023 15:29 | WG2010304 |
| Beryllium,Dissolved | ND | | 0.0400 | 20 | 02/22/2023 12:00 | WG2010301 |
| Cadmium | 14.4 | | 0.0200 | 20 | 02/22/2023 15:29 | WG2010304 |
| Cadmium,Dissolved | 12.1 | | 0.0200 | 20 | 02/22/2023 12:00 | WG2010301 |
| Calcium | 10500 | | 20.0 | 20 | 02/22/2023 15:29 | WG2010304 |
| Calcium,Dissolved | 11200 | | 20.0 | 20 | 02/22/2023 12:00 | WG2010301 |
| Chromium | ND | | 0.100 | 50 | 02/22/2023 15:39 | WG2010304 |
| Chromium,Dissolved | ND | | 0.100 | 50 | 02/22/2023 12:40 | WG2010301 |
| Cobalt | 0.342 | | 0.100 | 50 | 02/22/2023 15:39 | WG2010304 |
| Cobalt,Dissolved | 0.282 | | 0.100 | 50 | 02/22/2023 12:40 | WG2010301 |
| Copper | 0.936 | | 0.250 | 50 | 02/22/2023 15:39 | WG2010304 |
| Copper,Dissolved | 0.147 | | 0.100 | 20 | 02/22/2023 12:00 | WG2010301 |
| Iron | 270 | | 5.00 | 50 | 02/22/2023 15:39 | WG2010304 |
| Iron,Dissolved | 247 | | 5.00 | 50 | 02/22/2023 12:40 | WG2010301 |
| Lead | 0.507 | | 0.0400 | 20 | 02/22/2023 15:29 | WG2010304 |
| Lead,Dissolved | 0.467 | | 0.0400 | 20 | 02/22/2023 12:00 | WG2010301 |
| Magnesium | 980 | | 20.0 | 20 | 02/22/2023 15:29 | WG2010304 |
| Magnesium,Dissolved | 1020 | | 20.0 | 20 | 02/22/2023 12:00 | WG2010301 |
| Manganese | 48.6 | | 0.250 | 50 | 02/22/2023 15:39 | WG2010304 |
| Manganese,Dissolved | 47.0 | | 0.250 | 50 | 02/22/2023 12:40 | WG2010301 |
| Nickel | 0.435 | | 0.100 | 50 | 02/22/2023 15:39 | WG2010304 |
| Nickel,Dissolved | 0.306 | | 0.100 | 50 | 02/22/2023 12:40 | WG2010301 |
| Potassium | 10200 | | 40.0 | 20 | 02/22/2023 15:29 | WG2010304 |
| Potassium,Dissolved | 11100 | | 40.0 | 20 | 02/22/2023 12:00 | WG2010301 |
| Selenium | 0.142 | | 0.0400 | 20 | 02/22/2023 15:29 | WG2010304 |
| Selenium,Dissolved | 0.140 | | 0.0400 | 20 | 02/22/2023 12:00 | WG2010301 |
| Silver | ND | | 0.0400 | 20 | 02/22/2023 15:29 | WG2010304 |
| Silver,Dissolved | ND | | 0.0400 | 20 | 02/22/2023 12:00 | WG2010301 |
| Sodium | 17100 | | 40.0 | 20 | 02/22/2023 15:29 | WG2010304 |
| Sodium,Dissolved | 18200 | | 40.0 | 20 | 02/22/2023 12:00 | WG2010301 |
| Thallium | ND | | 0.0400 | 20 | 02/22/2023 15:29 | WG2010304 |
| Thallium,Dissolved | ND | | 0.0400 | 20 | 02/22/2023 12:00 | WG2010301 |
| Vanadium | ND | | 0.250 | 50 | 02/22/2023 15:39 | WG2010304 |
| Vanadium,Dissolved | ND | | 0.250 | 50 | 02/22/2023 12:40 | WG2010301 |
| Zinc | 159 | | 1.25 | 50 | 02/22/2023 15:39 | WG2010304 |
| Zinc,Dissolved | 146 | | 1.25 | 50 | 02/22/2023 12:40 | WG2010301 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Acetone | 1.68 | | 1.25 | 25 | 02/23/2023 06:33 | WG2011270 |
| Acrylonitrile | ND | | 0.250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Benzene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Bromochloromethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Bromodichloromethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Bromoform | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Bromomethane | ND | | 0.125 | 25 | 02/23/2023 06:33 | WG2011270 |
| Carbon disulfide | 0.229 | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Carbon tetrachloride | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Chlorobenzene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Chlorodibromomethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Chloroethane | ND | | 0.125 | 25 | 02/23/2023 06:33 | WG2011270 |
| Chloroform | ND | | 0.125 | 25 | 02/23/2023 06:33 | WG2011270 |
| Chloromethane | ND | | 0.0625 | 25 | 02/23/2023 06:33 | WG2011270 |
| Dibromomethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.125 | 25 | 02/23/2023 06:33 | WG2011270 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| 1,2-Dibromoethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,2-Dichlorobenzene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,4-Dichlorobenzene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| trans-1,4-Dichloro-2-butene | ND | | 0.0625 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,1-Dichloroethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,2-Dichloroethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,1-Dichloroethene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| cis-1,2-Dichloroethene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| trans-1,2-Dichloroethene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,2-Dichloropropane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| cis-1,3-Dichloropropene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| trans-1,3-Dichloropropene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Ethylbenzene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 2-Hexanone | ND | | 0.250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Iodomethane | ND | | 0.250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 2-Butanone (MEK) | 0.310 | | 0.250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Methylene Chloride | ND | | 0.125 | 25 | 02/23/2023 06:33 | WG2011270 |
| 4-Methyl-2-pentanone (MIBK) | ND | | 0.250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Styrene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,1,1,2-Tetrachloroethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,1,2,2-Tetrachloroethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Tetrachloroethene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Toluene | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,1,1-Trichloroethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,1,2-Trichloroethane | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Trichloroethene | 0.0364 | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Trichlorofluoromethane | ND | | 0.125 | 25 | 02/23/2023 06:33 | WG2011270 |
| 1,2,3-Trichloropropane | ND | | 0.0625 | 25 | 02/23/2023 06:33 | WG2011270 |
| Vinyl acetate | ND | | 0.250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Vinyl chloride | ND | | 0.0250 | 25 | 02/23/2023 06:33 | WG2011270 |
| Xylenes, Total | ND | | 0.0750 | 25 | 02/23/2023 06:33 | WG2011270 |
| *(S) Toluene-d8* | *104* | | *80.0-120* | | *02/23/2023 06:33* | WG2011270 |
| *(S) 4-Bromofluorobenzene* | *83.9* | | *77.0-126* | | *02/23/2023 06:33* | WG2011270 |
| *(S) 1,2-Dichloroethane-d4* | *97.8* | | *70.0-130* | | *02/23/2023 06:33* | WG2011270 |

## EDB / DBCP by Method 8011

| Analyte | Result mg/l | Qualifier | RDL mg/l | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | 0.000157 | | 0.0000204 | 1.02 | 02/28/2023 04:05 | WG2013368 |
| 1,2-Dibromo-3-Chloropropane | ND | | 0.0000204 | 1.02 | 02/28/2023 04:05 | WG2013368 |

## Method Blank (MB)

(MB) R3895432-2 02/27/23 13:40

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Alkalinity | U | | 8.45 | 20.0 |

Sample Narrative:

BLANK: Endpoint pH 4.5

## L1587563-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1587563-01 02/27/23 13:53 • (DUP) R3895432-3 02/27/23 13:58

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Alkalinity | 404 | 402 | 1 | 0.335 | | 20 |

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

## Laboratory Control Sample (LCS)

(LCS) R3895432-1 02/27/23 13:33

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Alkalinity | 100 | 98.6 | 98.6 | 90.0-110 | |

Sample Narrative:

LCS: Endpoint pH 4.5

## Method Blank (MB)

(MB) R3893587-1 02/22/23 11:34

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Ammonia Nitrogen | U | | 0.117 | 0.250 |

## L1585779-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1585779-03 02/22/23 11:44 • (DUP) R3893587-5 02/22/23 11:46

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 31.6 | 31.4 | 20 | 0.784 | | 10 |

## L1587845-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1587845-01 02/22/23 12:21 • (DUP) R3893587-7 02/22/23 12:22

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Ammonia Nitrogen | ND | ND | 1 | 0.000 | | 10 |

## Laboratory Control Sample (LCS)

(LCS) R3893587-2 02/22/23 11:35

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Ammonia Nitrogen | 7.50 | 7.63 | 102 | 90.0-110 | |

## L1587844-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1587844-01 02/22/23 12:18 • (MS) R3893587-6 02/22/23 12:19

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 5.00 | 0.337 | 4.83 | 89.8 | 1 | 90.0-110 | J6 |

## L1585779-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1585779-02 02/22/23 11:40 • (MS) R3893587-3 02/22/23 11:41 • (MSD) R3893587-4 02/22/23 11:43

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Nitrogen | 5.00 | ND | 5.12 | 5.07 | 102 | 101 | 1 | 90.0-110 | | | 0.962 | 10 |

## Method Blank (MB)

(MB) R3893320-1 02/21/23 23:49

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| COD | U | | 11.7 | 20.0 |

## L1587658-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1587658-02 02/21/23 23:49 • (DUP) R3893320-3 02/21/23 23:49

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| COD | 153 | 152 | 1 | 1.10 | | 20 |

## L1587841-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1587841-01 02/21/23 23:54 • (DUP) R3893320-6 02/21/23 23:55

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| COD | ND | ND | 1 | 0.000 | | 20 |

## Laboratory Control Sample (LCS)

(LCS) R3893320-2 02/21/23 23:49

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| COD | 500 | 498 | 99.6 | 90.0-110 | |

## L1587658-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1587658-10 02/21/23 23:51 • (MS) R3893320-4 02/21/23 23:51 • (MSD) R3893320-5 02/21/23 23:52

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COD | 500 | ND | 470 | 469 | 94.0 | 93.8 | 1 | 80.0-120 | | | 0.207 | 20 |

## Method Blank (MB)

(MB) R3893786-1 02/21/23 10:32

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Bromide | U | | 0.353 | 1.00 |
| Chloride | U | | 0.379 | 1.00 |
| Fluoride | U | | 0.0640 | 0.150 |
| Nitrate | U | | 0.0480 | 0.100 |
| Sulfate | U | | 0.594 | 5.00 |

## L1587658-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1587658-09 02/21/23 20:49 • (DUP) R3893786-6 02/21/23 21:05

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Chloride | 113 | 114 | 1 | 0.0592 | | 15 |
| Sulfate | 21.3 | 21.3 | 1 | 0.112 | | 15 |

## Laboratory Control Sample (LCS)

(LCS) R3893786-2 02/21/23 10:48

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Bromide | 40.0 | 41.4 | 103 | 80.0-120 | |
| Chloride | 40.0 | 40.6 | 102 | 80.0-120 | |
| Fluoride | 8.00 | 8.33 | 104 | 80.0-120 | |
| Nitrate | 8.00 | 8.21 | 103 | 80.0-120 | |
| Sulfate | 40.0 | 40.7 | 102 | 80.0-120 | |

## L1587658-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1587658-09 02/21/23 20:49 • (MS) R3893786-7 02/21/23 21:53 • (MSD) R3893786-8 02/21/23 22:09

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 50.0 | 113 | 157 | 157 | 88.0 | 87.6 | 1 | 80.0-120 | | | 0.123 | 15 |
| Sulfate | 50.0 | 21.3 | 69.8 | 69.4 | 96.9 | 96.3 | 1 | 80.0-120 | | | 0.465 | 15 |

## Method Blank (MB)

(MB) R3893830-1 02/22/23 22:36

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Mercury | U | | 0.000100 | 0.000200 |

## Laboratory Control Sample (LCS)

(LCS) R3893830-2 02/22/23 22:38

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Mercury | 0.00300 | 0.00293 | 97.7 | 80.0-120 | |

## L1587787-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1587787-01 02/22/23 22:41 • (MS) R3893830-3 02/22/23 22:43 • (MSD) R3893830-4 02/22/23 22:45

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00300 | 0.000345 | 0.00323 | 0.00318 | 96.2 | 94.5 | 1 | 75.0-125 | | | 1.56 | 20 |

## Method Blank (MB)

(MB) R3893979-1 02/23/23 09:17

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Mercury,Dissolved | U | | 0.000100 | 0.000200 |

## Laboratory Control Sample (LCS)

(LCS) R3893979-2 02/23/23 09:24

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Mercury,Dissolved | 0.00300 | 0.00313 | 104 | 80.0-120 | |

## L1587837-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1587837-01 02/23/23 09:26 • (MS) R3893979-3 02/23/23 09:28 • (MSD) R3893979-4 02/23/23 09:30

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury,Dissolved | 0.0300 | ND | 0.0322 | 0.0317 | 107 | 106 | 10 | 75.0-125 | | | 1.36 | 20 |

## Method Blank (MB)

(MB) R3894107-1 02/23/23 09:38

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Boron | U | | 0.0200 | 0.200 |

## Laboratory Control Sample (LCS)

(LCS) R3894107-2 02/23/23 09:40

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Boron | 1.00 | 1.01 | 101 | 80.0-120 | |

## L1587804-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1587804-01 02/23/23 09:43 • (MS) R3894107-3 02/23/23 09:48 • (MSD) R3894107-4 02/23/23 09:51

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | 1.00 | 0.812 | 1.84 | 1.80 | 102 | 99.2 | 1 | 75.0-125 | | | 1.70 | 20 |

## Method Blank (MB)

(MB) R3893875-1 02/22/23 20:53

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Boron,Dissolved | U | | 0.0200 | 0.200 |

## Laboratory Control Sample (LCS)

(LCS) R3893875-2 02/22/23 20:56

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Boron,Dissolved | 1.00 | 0.948 | 94.8 | 80.0-120 | |

## L1587962-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1587962-03 02/22/23 20:59 • (MS) R3893875-4 02/22/23 21:05 • (MSD) R3893875-5 02/22/23 21:08

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron,Dissolved | 1.00 | 5.70 | 6.53 | 6.49 | 82.2 | 78.4 | 1 | 75.0-125 | | | 0.586 | 20 |

## L1587962-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1587962-05 02/22/23 21:12 • (MS) R3893875-6 02/22/23 21:15 • (MSD) R3893875-7 02/22/23 21:18

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron,Dissolved | 1.00 | 2.14 | 3.04 | 3.03 | 90.8 | 89.2 | 1 | 75.0-125 | | | 0.526 | 20 |

## Method Blank (MB)

(MB) R3893584-1 02/22/23 11:10

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Aluminum,Dissolved | 0.0201 | J | 0.0185 | 0.100 |
| Antimony,Dissolved | U | | 0.00103 | 0.00400 |
| Arsenic,Dissolved | U | | 0.000180 | 0.00200 |
| Barium,Dissolved | U | | 0.000381 | 0.00200 |
| Beryllium,Dissolved | U | | 0.000190 | 0.00200 |
| Cadmium,Dissolved | U | | 0.000150 | 0.00100 |
| Calcium,Dissolved | U | | 0.0936 | 1.00 |
| Chromium,Dissolved | U | | 0.00124 | 0.00200 |
| Cobalt,Dissolved | 0.0000998 | J | 0.0000596 | 0.00200 |
| Copper,Dissolved | U | | 0.00151 | 0.00500 |
| Iron,Dissolved | U | | 0.0281 | 0.100 |
| Lead,Dissolved | U | | 0.000849 | 0.00200 |
| Magnesium,Dissolved | U | | 0.0735 | 1.00 |
| Manganese,Dissolved | U | | 0.000704 | 0.00500 |
| Nickel,Dissolved | U | | 0.000816 | 0.00200 |
| Potassium,Dissolved | 0.147 | J | 0.108 | 2.00 |
| Selenium,Dissolved | U | | 0.000300 | 0.00200 |
| Silver,Dissolved | U | | 0.0000700 | 0.00200 |
| Sodium,Dissolved | U | | 0.376 | 2.00 |
| Thallium,Dissolved | 0.000182 | J | 0.000121 | 0.00200 |
| Vanadium,Dissolved | U | | 0.000664 | 0.00500 |
| Zinc,Dissolved | U | | 0.00302 | 0.0250 |

## Laboratory Control Sample (LCS)

(LCS) R3893584-2 02/22/23 11:13

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Aluminum,Dissolved | 5.00 | 4.98 | 99.6 | 80.0-120 | |
| Antimony,Dissolved | 0.0500 | 0.0477 | 95.5 | 80.0-120 | |
| Arsenic,Dissolved | 0.0500 | 0.0484 | 96.8 | 80.0-120 | |
| Barium,Dissolved | 0.0500 | 0.0466 | 93.3 | 80.0-120 | |
| Beryllium,Dissolved | 0.0500 | 0.0498 | 99.6 | 80.0-120 | |
| Cadmium,Dissolved | 0.0500 | 0.0514 | 103 | 80.0-120 | |
| Calcium,Dissolved | 5.00 | 4.97 | 99.4 | 80.0-120 | |
| Chromium,Dissolved | 0.0500 | 0.0495 | 99.0 | 80.0-120 | |
| Cobalt,Dissolved | 0.0500 | 0.0505 | 101 | 80.0-120 | |
| Copper,Dissolved | 0.0500 | 0.0484 | 96.8 | 80.0-120 | |
| Iron,Dissolved | 5.00 | 5.02 | 100 | 80.0-120 | |

## Laboratory Control Sample (LCS)

(LCS) R3893584-2 02/22/23 11:13

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Lead,Dissolved | 0.0500 | 0.0480 | 95.9 | 80.0-120 | |
| Magnesium,Dissolved | 5.00 | 5.09 | 102 | 80.0-120 | |
| Manganese,Dissolved | 0.0500 | 0.0508 | 102 | 80.0-120 | |
| Nickel,Dissolved | 0.0500 | 0.0491 | 98.2 | 80.0-120 | |
| Potassium,Dissolved | 5.00 | 5.18 | 104 | 80.0-120 | |
| Selenium,Dissolved | 0.0500 | 0.0532 | 106 | 80.0-120 | |
| Silver,Dissolved | 0.0500 | 0.0485 | 96.9 | 80.0-120 | |
| Sodium,Dissolved | 5.00 | 5.14 | 103 | 80.0-120 | |
| Thallium,Dissolved | 0.0500 | 0.0480 | 95.9 | 80.0-120 | |
| Vanadium,Dissolved | 0.0500 | 0.0501 | 100 | 80.0-120 | |
| Zinc,Dissolved | 0.0500 | 0.0492 | 98.5 | 80.0-120 | |

## L1587736-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1587736-08 02/22/23 11:17 • (MS) R3893584-4 02/22/23 11:23 • (MSD) R3893584-5 02/22/23 11:27

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum,Dissolved | 5.00 | ND | 4.82 | 4.96 | 96.3 | 99.2 | 1 | 75.0-125 | | | 2.95 | 20 |
| Antimony,Dissolved | 0.0500 | ND | 0.0484 | 0.0483 | 96.9 | 96.6 | 1 | 75.0-125 | | | 0.272 | 20 |
| Arsenic,Dissolved | 0.0500 | ND | 0.0478 | 0.0483 | 94.1 | 95.1 | 1 | 75.0-125 | | | 0.997 | 20 |
| Barium,Dissolved | 0.0500 | 0.0191 | 0.0575 | 0.0583 | 76.7 | 78.3 | 1 | 75.0-125 | | | 1.41 | 20 |
| Beryllium,Dissolved | 0.0500 | ND | 0.0491 | 0.0491 | 98.2 | 98.1 | 1 | 75.0-125 | | | 0.0693 | 20 |
| Cadmium,Dissolved | 0.0500 | ND | 0.0514 | 0.0527 | 103 | 105 | 1 | 75.0-125 | | | 2.51 | 20 |
| Calcium,Dissolved | 5.00 | 51.5 | 56.0 | 57.3 | 90.5 | 117 | 1 | 75.0-125 | | | 2.37 | 20 |
| Chromium,Dissolved | 0.0500 | ND | 0.0497 | 0.0490 | 99.3 | 98.1 | 1 | 75.0-125 | | | 1.25 | 20 |
| Cobalt,Dissolved | 0.0500 | ND | 0.0487 | 0.0489 | 97.1 | 97.4 | 1 | 75.0-125 | | | 0.376 | 20 |
| Copper,Dissolved | 0.0500 | ND | 0.0472 | 0.0480 | 94.5 | 95.9 | 1 | 75.0-125 | | | 1.53 | 20 |
| Iron,Dissolved | 5.00 | ND | 5.02 | 5.00 | 100 | 100 | 1 | 75.0-125 | | | 0.309 | 20 |
| Lead,Dissolved | 0.0500 | ND | 0.0484 | 0.0501 | 96.9 | 100 | 1 | 75.0-125 | | | 3.32 | 20 |
| Magnesium,Dissolved | 5.00 | 25.5 | 31.1 | 31.1 | 112 | 113 | 1 | 75.0-125 | | | 0.151 | 20 |
| Manganese,Dissolved | 0.0500 | 0.121 | 0.169 | 0.169 | 96.2 | 95.6 | 1 | 75.0-125 | | | 0.185 | 20 |
| Nickel,Dissolved | 0.0500 | 0.00335 | 0.0515 | 0.0513 | 96.2 | 95.9 | 1 | 75.0-125 | | | 0.289 | 20 |
| Potassium,Dissolved | 5.00 | 4.23 | 9.05 | 9.22 | 96.5 | 99.8 | 1 | 75.0-125 | | | 1.84 | 20 |
| Selenium,Dissolved | 0.0500 | ND | 0.0542 | 0.0539 | 108 | 108 | 1 | 75.0-125 | | | 0.549 | 20 |
| Silver,Dissolved | 0.0500 | ND | 0.0495 | 0.0494 | 98.9 | 98.8 | 1 | 75.0-125 | | | 0.147 | 20 |
| Sodium,Dissolved | 5.00 | 25.1 | 29.3 | 29.9 | 84.9 | 95.9 | 1 | 75.0-125 | | | 1.85 | 20 |
| Thallium,Dissolved | 0.0500 | ND | 0.0490 | 0.0477 | 98.0 | 95.4 | 1 | 75.0-125 | | | 2.65 | 20 |
| Vanadium,Dissolved | 0.0500 | ND | 0.0499 | 0.0508 | 97.1 | 98.8 | 1 | 75.0-125 | | | 1.74 | 20 |
| Zinc,Dissolved | 0.0500 | ND | 0.0491 | 0.0503 | 91.7 | 94.3 | 1 | 75.0-125 | | | 2.61 | 20 |

## Method Blank (MB)

(MB) R3893740-1 02/22/23 14:59

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Aluminum | U | | 0.0185 | 0.100 |
| Antimony | U | | 0.00103 | 0.00400 |
| Arsenic | U | | 0.000180 | 0.00200 |
| Barium | U | | 0.000381 | 0.00200 |
| Beryllium | U | | 0.000190 | 0.00200 |
| Cadmium | U | | 0.000150 | 0.00100 |
| Calcium | U | | 0.0936 | 1.00 |
| Chromium | U | | 0.00124 | 0.00200 |
| Cobalt | U | | 0.0000596 | 0.00200 |
| Copper | U | | 0.00151 | 0.00500 |
| Iron | 0.0545 | J | 0.0281 | 0.100 |
| Lead | U | | 0.000849 | 0.00200 |
| Magnesium | U | | 0.0735 | 1.00 |
| Manganese | U | | 0.000704 | 0.00500 |
| Nickel | U | | 0.000816 | 0.00200 |
| Potassium | U | | 0.108 | 2.00 |
| Selenium | U | | 0.000300 | 0.00200 |
| Silver | U | | 0.0000700 | 0.00200 |
| Sodium | U | | 0.376 | 2.00 |
| Thallium | U | | 0.000121 | 0.00200 |
| Vanadium | U | | 0.000664 | 0.00500 |
| Zinc | U | | 0.00302 | 0.0250 |

## Laboratory Control Sample (LCS)

(LCS) R3893740-2 02/22/23 15:03

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Aluminum | 5.00 | 4.93 | 98.5 | 80.0-120 | |
| Antimony | 0.0500 | 0.0481 | 96.2 | 80.0-120 | |
| Arsenic | 0.0500 | 0.0467 | 93.4 | 80.0-120 | |
| Barium | 0.0500 | 0.0492 | 98.4 | 80.0-120 | |
| Beryllium | 0.0500 | 0.0491 | 98.3 | 80.0-120 | |
| Cadmium | 0.0500 | 0.0543 | 109 | 80.0-120 | |
| Calcium | 5.00 | 5.08 | 102 | 80.0-120 | |
| Chromium | 0.0500 | 0.0502 | 100 | 80.0-120 | |
| Cobalt | 0.0500 | 0.0501 | 100 | 80.0-120 | |
| Copper | 0.0500 | 0.0479 | 95.8 | 80.0-120 | |
| Iron | 5.00 | 5.09 | 102 | 80.0-120 | |

## Laboratory Control Sample (LCS)

(LCS) R3893740-2 02/22/23 15:03

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Lead | 0.0500 | 0.0464 | 92.9 | 80.0-120 | |
| Magnesium | 5.00 | 5.03 | 101 | 80.0-120 | |
| Manganese | 0.0500 | 0.0510 | 102 | 80.0-120 | |
| Nickel | 0.0500 | 0.0498 | 99.5 | 80.0-120 | |
| Potassium | 5.00 | 4.98 | 99.5 | 80.0-120 | |
| Selenium | 0.0500 | 0.0522 | 104 | 80.0-120 | |
| Silver | 0.0500 | 0.0500 | 100 | 80.0-120 | |
| Sodium | 5.00 | 5.11 | 102 | 80.0-120 | |
| Thallium | 0.0500 | 0.0466 | 93.1 | 80.0-120 | |
| Vanadium | 0.0500 | 0.0498 | 99.7 | 80.0-120 | |
| Zinc | 0.0500 | 0.0479 | 95.9 | 80.0-120 | |

## L1587899-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1587899-01 02/22/23 15:06 • (MS) R3893740-4 02/22/23 15:12 • (MSD) R3893740-5 02/22/23 15:16

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MSD Result mg/l | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5.00 | 2.55 | 7.62 | 7.90 | 101 | 107 | 1 | 75.0-125 | | | 3.59 | 20 |
| Antimony | 0.0500 | 0.00423 | 0.0515 | 0.0519 | 94.5 | 95.3 | 1 | 75.0-125 | | | 0.762 | 20 |
| Arsenic | 0.0500 | 0.00289 | 0.0494 | 0.0492 | 93.0 | 92.7 | 1 | 75.0-125 | | | 0.311 | 20 |
| Barium | 0.0500 | 0.102 | 0.157 | 0.153 | 111 | 102 | 1 | 75.0-125 | | | 2.88 | 20 |
| Beryllium | 0.0500 | ND | 0.0486 | 0.0479 | 96.8 | 95.3 | 1 | 75.0-125 | | | 1.49 | 20 |
| Cadmium | 0.0500 | 0.00277 | 0.0549 | 0.0563 | 104 | 107 | 1 | 75.0-125 | | | 2.56 | 20 |
| Calcium | 5.00 | 59.7 | 66.2 | 65.7 | 130 | 119 | 1 | 75.0-125 | V | | 0.822 | 20 |
| Chromium | 0.0500 | 0.00952 | 0.0593 | 0.0601 | 99.6 | 101 | 1 | 75.0-125 | | | 1.31 | 20 |
| Cobalt | 0.0500 | 0.00418 | 0.0534 | 0.0533 | 98.5 | 98.3 | 1 | 75.0-125 | | | 0.134 | 20 |
| Copper | 0.0500 | 0.444 | 0.510 | 0.509 | 131 | 130 | 1 | 75.0-125 | V | V | 0.119 | 20 |
| Iron | 5.00 | 5.15 | 10.6 | 11.2 | 109 | 121 | 1 | 75.0-125 | | | 5.24 | 20 |
| Lead | 0.0500 | 0.0962 | 0.141 | 0.146 | 90.2 | 98.9 | 1 | 75.0-125 | | | 3.03 | 20 |
| Magnesium | 5.00 | 4.37 | 9.41 | 9.50 | 101 | 103 | 1 | 75.0-125 | | | 0.946 | 20 |
| Manganese | 0.0500 | 0.244 | 0.305 | 0.305 | 122 | 122 | 1 | 75.0-125 | | | 0.0179 | 20 |
| Nickel | 0.0500 | 0.0271 | 0.0755 | 0.0772 | 96.8 | 100 | 1 | 75.0-125 | | | 2.13 | 20 |
| Potassium | 5.00 | 13.8 | 18.8 | 19.2 | 98.6 | 108 | 1 | 75.0-125 | | | 2.38 | 20 |
| Selenium | 0.0500 | ND | 0.0539 | 0.0558 | 105 | 109 | 1 | 75.0-125 | | | 3.57 | 20 |
| Silver | 0.0500 | ND | 0.0497 | 0.0489 | 98.4 | 96.8 | 1 | 75.0-125 | | | 1.62 | 20 |
| Sodium | 5.00 | 30.8 | 36.0 | 35.2 | 106 | 88.1 | 1 | 75.0-125 | | | 2.45 | 20 |
| Thallium | 0.0500 | ND | 0.0465 | 0.0468 | 92.7 | 93.4 | 1 | 75.0-125 | | | 0.691 | 20 |
| Vanadium | 0.0500 | 0.0115 | 0.0627 | 0.0629 | 102 | 103 | 1 | 75.0-125 | | | 0.341 | 20 |
| Zinc | 0.0500 | 0.519 | 0.581 | 0.581 | 123 | 124 | 1 | 75.0-125 | | | 0.0937 | 20 |

## Method Blank (MB)

(MB) R3893971-2 02/22/23 23:04

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Acetone | U | | 0.0113 | 0.0500 |
| Acrylonitrile | U | | 0.000671 | 0.0100 |
| Benzene | U | | 0.0000941 | 0.00100 |
| Bromochloromethane | U | | 0.000128 | 0.00100 |
| Bromodichloromethane | U | | 0.000136 | 0.00100 |
| Bromoform | U | | 0.000129 | 0.00100 |
| Bromomethane | U | | 0.000605 | 0.00500 |
| Carbon disulfide | U | | 0.0000962 | 0.00100 |
| Carbon tetrachloride | U | | 0.000128 | 0.00100 |
| Chlorobenzene | U | | 0.000116 | 0.00100 |
| Chlorodibromomethane | U | | 0.000140 | 0.00100 |
| Chloroethane | U | | 0.000192 | 0.00500 |
| Chloroform | U | | 0.000111 | 0.00500 |
| Chloromethane | U | | 0.000960 | 0.00250 |
| Dibromomethane | U | | 0.000122 | 0.00100 |
| 1,2-Dibromo-3-Chloropropane | U | | 0.000276 | 0.00500 |
| 1,2-Dibromoethane | U | | 0.000126 | 0.00100 |
| 1,2-Dichlorobenzene | U | | 0.000107 | 0.00100 |
| 1,4-Dichlorobenzene | U | | 0.000120 | 0.00100 |
| trans-1,4-Dichloro-2-butene | U | | 0.000467 | 0.00250 |
| 1,1-Dichloroethane | U | | 0.000100 | 0.00100 |
| 1,2-Dichloroethane | U | | 0.0000819 | 0.00100 |
| 1,1-Dichloroethene | U | | 0.000188 | 0.00100 |
| cis-1,2-Dichloroethene | U | | 0.000126 | 0.00100 |
| trans-1,2-Dichloroethene | U | | 0.000149 | 0.00100 |
| 1,2-Dichloropropane | U | | 0.000149 | 0.00100 |
| cis-1,3-Dichloropropene | U | | 0.000111 | 0.00100 |
| trans-1,3-Dichloropropene | U | | 0.000118 | 0.00100 |
| Ethylbenzene | U | | 0.000137 | 0.00100 |
| 2-Hexanone | U | | 0.000787 | 0.0100 |
| Iodomethane | U | | 0.00600 | 0.0100 |
| 2-Butanone (MEK) | U | | 0.00119 | 0.0100 |
| Methylene Chloride | U | | 0.000430 | 0.00500 |
| 4-Methyl-2-pentanone (MIBK) | U | | 0.000478 | 0.0100 |
| Styrene | U | | 0.000118 | 0.00100 |
| 1,1,1,2-Tetrachloroethane | U | | 0.000147 | 0.00100 |
| 1,1,2,2-Tetrachloroethane | U | | 0.000133 | 0.00100 |
| Tetrachloroethene | U | | 0.000300 | 0.00100 |
| Toluene | U | | 0.000278 | 0.00100 |
| 1,1,1-Trichloroethane | U | | 0.000149 | 0.00100 |

## Method Blank (MB)

(MB) R3893971-2 02/22/23 23:04

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| 1,1,2-Trichloroethane | U | | 0.000158 | 0.00100 |
| Trichloroethene | U | | 0.000190 | 0.00100 |
| Trichlorofluoromethane | U | | 0.000160 | 0.00500 |
| 1,2,3-Trichloropropane | U | | 0.000237 | 0.00250 |
| Vinyl acetate | U | | 0.000692 | 0.0100 |
| Vinyl chloride | U | | 0.000234 | 0.00100 |
| Xylenes, Total | U | | 0.000174 | 0.00300 |
| *(S) Toluene-d8* | *103* | | | *80.0-120* |
| *(S) 4-Bromofluorobenzene* | *81.6* | | | *77.0-126* |
| *(S) 1,2-Dichloroethane-d4* | *103* | | | *70.0-130* |

## Laboratory Control Sample (LCS)

(LCS) R3893971-1 02/22/23 21:59

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Acetone | 0.0250 | 0.0194 | 77.6 | 19.0-160 | |
| Acrylonitrile | 0.0250 | 0.0241 | 96.4 | 55.0-149 | |
| Benzene | 0.00500 | 0.00542 | 108 | 70.0-123 | |
| Bromochloromethane | 0.00500 | 0.00541 | 108 | 76.0-122 | |
| Bromodichloromethane | 0.00500 | 0.00479 | 95.8 | 75.0-120 | |
| Bromoform | 0.00500 | 0.00506 | 101 | 68.0-132 | |
| Bromomethane | 0.00500 | 0.00500 | 100 | 10.0-160 | |
| Carbon disulfide | 0.00500 | 0.00491 | 98.2 | 61.0-128 | |
| Carbon tetrachloride | 0.00500 | 0.00469 | 93.8 | 68.0-126 | |
| Chlorobenzene | 0.00500 | 0.00599 | 120 | 80.0-121 | |
| Chlorodibromomethane | 0.00500 | 0.00539 | 108 | 77.0-125 | |
| Chloroethane | 0.00500 | 0.00586 | 117 | 47.0-150 | |
| Chloroform | 0.00500 | 0.00466 | 93.2 | 73.0-120 | |
| Chloromethane | 0.00500 | 0.00523 | 105 | 41.0-142 | |
| Dibromomethane | 0.00500 | 0.00513 | 103 | 80.0-120 | |
| 1,2-Dibromo-3-Chloropropane | 0.00500 | 0.00386 | 77.2 | 58.0-134 | |
| 1,2-Dibromoethane | 0.00500 | 0.00541 | 108 | 80.0-122 | |
| 1,2-Dichlorobenzene | 0.00500 | 0.00476 | 95.2 | 79.0-121 | |
| 1,4-Dichlorobenzene | 0.00500 | 0.00502 | 100 | 79.0-120 | |
| trans-1,4-Dichloro-2-butene | 0.00500 | 0.00414 | 82.8 | 33.0-144 | |
| 1,1-Dichloroethane | 0.00500 | 0.00483 | 96.6 | 70.0-126 | |
| 1,2-Dichloroethane | 0.00500 | 0.00491 | 98.2 | 70.0-128 | |
| 1,1-Dichloroethene | 0.00500 | 0.00456 | 91.2 | 71.0-124 | |

## Laboratory Control Sample (LCS)

(LCS) R3893971-1 02/22/23 21:59

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| cis-1,2-Dichloroethene | 0.00500 | 0.00449 | 89.8 | 73.0-120 | |
| trans-1,2-Dichloroethene | 0.00500 | 0.00471 | 94.2 | 73.0-120 | |
| 1,2-Dichloropropane | 0.00500 | 0.00578 | 116 | 77.0-125 | |
| cis-1,3-Dichloropropene | 0.00500 | 0.00556 | 111 | 80.0-123 | |
| trans-1,3-Dichloropropene | 0.00500 | 0.00551 | 110 | 78.0-124 | |
| Ethylbenzene | 0.00500 | 0.00472 | 94.4 | 79.0-123 | |
| 2-Hexanone | 0.0250 | 0.0258 | 103 | 67.0-149 | |
| Iodomethane | 0.0250 | 0.0252 | 101 | 33.0-147 | |
| 2-Butanone (MEK) | 0.0250 | 0.0271 | 108 | 44.0-160 | |
| Methylene Chloride | 0.00500 | 0.00485 | 97.0 | 67.0-120 | |
| 4-Methyl-2-pentanone (MIBK) | 0.0250 | 0.0246 | 98.4 | 68.0-142 | |
| Styrene | 0.00500 | 0.00468 | 93.6 | 73.0-130 | |
| 1,1,1,2-Tetrachloroethane | 0.00500 | 0.00497 | 99.4 | 75.0-125 | |
| 1,1,2,2-Tetrachloroethane | 0.00500 | 0.00439 | 87.8 | 65.0-130 | |
| Tetrachloroethene | 0.00500 | 0.00592 | 118 | 72.0-132 | |
| Toluene | 0.00500 | 0.00515 | 103 | 79.0-120 | |
| 1,1,1-Trichloroethane | 0.00500 | 0.00451 | 90.2 | 73.0-124 | |
| 1,1,2-Trichloroethane | 0.00500 | 0.00541 | 108 | 80.0-120 | |
| Trichloroethene | 0.00500 | 0.00613 | 123 | 78.0-124 | |
| Trichlorofluoromethane | 0.00500 | 0.00534 | 107 | 59.0-147 | |
| 1,2,3-Trichloropropane | 0.00500 | 0.00480 | 96.0 | 73.0-130 | |
| Vinyl acetate | 0.0250 | 0.0234 | 93.6 | 11.0-160 | |
| Vinyl chloride | 0.00500 | 0.00533 | 107 | 67.0-131 | |
| Xylenes, Total | 0.0150 | 0.0141 | 94.0 | 79.0-123 | |
| *(S) Toluene-d8* | | | *104* | *80.0-120* | |
| *(S) 4-Bromofluorobenzene* | | | *88.4* | *77.0-126* | |
| *(S) 1,2-Dichloroethane-d4* | | | *90.3* | *70.0-130* | |

## Method Blank (MB)

(MB) R3895830-1 02/28/23 00:58

| Analyte | MB Result mg/l | MB Qualifier | MB MDL mg/l | MB RDL mg/l |
|---|---|---|---|---|
| Ethylene Dibromide | U | | 0.00000536 | 0.0000200 |
| 1,2-Dibromo-3-Chloropropane | U | | 0.00000748 | 0.0000200 |

## L1587736-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1587736-02 02/28/23 01:45 • (DUP) R3895830-3 02/28/23 01:33

| Analyte | Original Result mg/l | DUP Result mg/l | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Ethylene Dibromide | ND | ND | 1 | 0.000 | | 20 |
| 1,2-Dibromo-3-Chloropropane | ND | ND | 1 | 0.000 | | 20 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3895830-4 02/28/23 03:42 • (LCSD) R3895830-5 02/28/23 06:14

| Analyte | Spike Amount mg/l | LCS Result mg/l | LCSD Result mg/l | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Ethylene Dibromide | 0.000250 | 0.000225 | 0.000230 | 90.0 | 92.0 | 60.0-140 | | | 2.20 | 20 |
| 1,2-Dibromo-3-Chloropropane | 0.000250 | 0.000221 | 0.000225 | 88.4 | 90.0 | 60.0-140 | | | 1.79 | 20 |

## L1587736-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L1587736-03 02/28/23 01:21 • (MS) R3895830-2 02/28/23 01:10

| Analyte | Spike Amount mg/l | Original Result mg/l | MS Result mg/l | MS Rec. % | Dilution | Rec. Limits % | MS Qualifier |
|---|---|---|---|---|---|---|---|
| Ethylene Dibromide | 0.0000975 | ND | 0.000102 | 105 | 1 | 64.0-159 | |
| 1,2-Dibromo-3-Chloropropane | 0.0000975 | ND | 0.0000951 | 97.5 | 1 | 72.0-148 | |

# GLOSSARY OF TERMS

## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

## Abbreviations and Definitions

| | |
|---|---|
| MDL | Method Detection Limit. |
| ND | Not detected at the Reporting Limit (or MDL where applicable). |
| RDL | Reported Detection Limit. |
| Rec. | Recovery. |
| RPD | Relative Percent Difference. |
| SDG | Sample Delivery Group. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| U | Not detected at the Reporting Limit (or MDL where applicable). |
| Analyte | The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported. |
| Dilution | If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor. |
| Limits | These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| Qualifier | This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable. |
| Result | The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte. |
| Uncertainty (Radiochemistry) | Confidence level of 2 sigma. |
| Case Narrative (Cn) | A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report. |
| Quality Control Summary (Qc) | This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material. |
| Sample Chain of Custody (Sc) | This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis. |
| Sample Results (Sr) | This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported. |
| Sample Summary (Ss) | This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J6 | The sample matrix interfered with the ability to make any accurate determination; spike value is low. |
| V | The sample concentration is too high to evaluate accurate spike recoveries. |

# ACCREDITATIONS & LOCATIONS

## Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nebraska | NE-OS-15-05 |
| Alaska | 17-026 | Nevada | TN000032021-1 |
| Arizona | AZ0612 | New Hampshire | 2975 |
| Arkansas | 88-0469 | New Jersey–NELAP | TN002 |
| California | 2932 | New Mexico [1] | TN00003 |
| Colorado | TN00003 | New York | 11742 |
| Connecticut | PH-0197 | North Carolina | Env375 |
| Florida | E87487 | North Carolina [1] | DW21704 |
| Georgia | NELAP | North Carolina [3] | 41 |
| Georgia [1] | 923 | North Dakota | R-140 |
| Idaho | TN00003 | Ohio–VAP | CL0069 |
| Illinois | 200008 | Oklahoma | 9915 |
| Indiana | C-TN-01 | Oregon | TN200002 |
| Iowa | 364 | Pennsylvania | 68-02979 |
| Kansas | E-10277 | Rhode Island | LAO000356 |
| Kentucky [1 6] | KY90010 | South Carolina | 84004002 |
| Kentucky [2] | 16 | South Dakota | n/a |
| Louisiana | AI30792 | Tennessee [1 4] | 2006 |
| Louisiana | LA018 | Texas | T104704245-20-18 |
| Maine | TN00003 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | TN000032021-11 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 110033 |
| Minnesota | 047-999-395 | Washington | C847 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 998093910 |
| Montana | CERT0086 | Wyoming | A2LA |
| A2LA – ISO 17025 | 1461.01 | AIHA-LAP,LLC EMLAP | 100789 |
| A2LA – ISO 17025 [5] | 1461.02 | DOD | 1461.01 |
| Canada | 1461.01 | USDA | P330-15-00234 |
| EPA–Crypto | TN00003 | | |

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
**Civil & Environmental Consultants - TN**

**117 Seaboard Ln.**
**Suite E100**
**Franklin. TN 37067**

Billing Information:
**Accounts Payable**
**117 Seaboard Ln.**
**Suite E100**
**Franklin, TN 37067**

Report to: **Philip Campbell**

Email To: **pcampbell@cecinc.com**

Project Description: **EWS Camden Class 2 Landfill**

City/State Collected: Camden TN

Please Circle: PT MT CT ET

Phone: **615-333-7797**

Client Project # **181-364**

Lab Project # **CEC-EWS CAMDEN LF**

Collected by (print): Joseph Daughtry

Site/Facility ID # **CAMDEN, TN**

P.O. #

Collected by (signature): Joseph Daughtry

Immediately Packed on Ice N ___ Y ✓

*Rush?* (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

| Sample ID | Comp/Grab | Matrix * | Depth | Date | Time | No. of Cntrs | **WetChem** 250mlHDPE-NoPres | ALK 100ml Amb-NoPres | COD,NH3 250mlHDPE-H2SO4 | Diss.Metals 250mlHDPE-NoPres | SV8011 40mlClr-NaThio | Total Metals,HARD 250mlHDPE-HNO3 | V8260AP1 40mlAmb-HCl | | | | Remarks | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | +2 | | | +2 | | | | | | |
| IWC-L | Grab | GW | — | 2/21/23 | 10:40 | 11 | X | X | X | X | X | X | X | | | | | -01 |
| ~~APWC-L~~ | | GW | | | | 11 | X | X | X | X | X | X | X | | | | | |

Chain of Custody Page ___ of ___

Pace PEOPLE ADVANCING SCIENCE

**MT JULIET, TN**

12065 Lebanon Rd Mount Juliet, TN 37122
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1587637

D160

Acctnum: **CEC**
Template: **T133582**
Prelogin: **P977821**
PM: **526 - Chris McCord**
PB: 8 1/28/23

Shipped Via: **Courier**

* Matrix:
**SS** - Soil **AIR** - Air **F** - Filter
**GW** - Groundwater **B** - Bioassay
**WW** - WasteWater
**DW** - Drinking Water
**OT** - Other_____

**Remarks:**WetChem** = *NITRATE*,CHLORIDE,BROMIDE,SULFATE,FLUORIDE**
**Tot/Diss Metals=M6020AP1 + Al,Ca,Fe,K,Mg,Mn,Na,B(6010)**

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier ✓

Tracking #

Sample Receipt Checklist

| | | |
|---|---|---|
| COC Seal Present/Intact: | NP | Y N |
| COC Signed/Accurate: | | Y N |
| Bottles arrive intact: | | Y N |
| Correct bottles used: | | Y N |
| Sufficient volume sent: | | Y N |
| If Applicable | | |
| VOA Zero Headspace: | | Y N |
| Preservation Correct/Checked: | | Y N |
| RAD Screen <0.5 mR/hr: | | Y N |

| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Trip Blank Received: Yes / No HCL / MeoH TBR | If preservation required by Login: Date/Time |
|---|---|---|---|---|---|
| Joseph Daughtry | 2-21-23 | 13:30 | | | |
| Relinquished by : (Signature) | Date: | Time: | Received by: (Signature) | Temp: °C Bottles Received: | |
| | 2-21-23 | 15:50 | | 1.5°C to 1.5°C 11 | |
| Relinquished by : (Signature) | Date: | Time: | Received for lab by: (Signature) | Date: Time: | Hold: Condition: NCF / OK |
| | | | | 2-21-23 1550 | |

# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

| | | | |
|---|---|---|---|
| FACILITY NAME | EWS | MONITORING WELL I.D. | MW-1 |
| LOCATION | Camden, TN | TEMPERATURE & WEATHER | 30's overcast |
| DATE & TIME | 1/31/23 7:00 | EVENT FREQUENCY | Quarterly |
| PURGE METHOD | Peristaltic Pump | FIELD REPRESENTATIVE | Miller, Riggins |
| TOTAL WELL DEPTH (feet) | 30.5 | SAMPLING EQUIPMENT | Bladder Pump |
| DEPTH TO WATER (feet) | 21.35 | IS SAMPLE EQUIPMENT DEDICATED? | Yes |
| CASING DIAMETER (inches) | 2 | DUPLICATE COLLECTED? | N |
| WATER COLUMN (feet) | 9.15 | FIELD BLANK COLLECTED? | N |
| PURGE VOLUME (gallons) | 2.50 | EQUIPMENT BLANK COLLECTED? | N |

## PURGE INFORMATION

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 21.35 | 7:16 | 12.3 | 5.09 | 253.8 | 145.5 | 4.85 | 76.5 | 18.8 |
| .5 | 21.50 | 7:21 | 14.3 | 4.83 | 143.7 | 114.7 | 3.99 | 276.2 | 17.1 |
| .85 | 21.75 | 7:26 | 15.3 | 5.06 | 166.7 | 138.5 | 2.72 | 137.6 | 17.9 |
| 1.10 | 21.40 | 7:31 | 14.7 | 5.21 | 192.9 | 154.8 | 2.37 | 109.0 | 16.8 |
| 1.25 | 21.40 | 7:36 | 11.2 | 5.26 | 198.6 | 145.7 | 2.46 | 110.3 | 16.5 |
| 1.35 | 21.41 | 7:41 | 10.2 | 5.27 | 197.7 | 142.0 | 2.52 | 113.9 | 17.0 |
| 1.60 | 21.45 | 7:46 | 13.7 | 5.28 | 208.9 | 163.0 | 1.97 | 105.2 | 18.2 |
| 1.75 | 21.40 | 7:51 | 12.5 | 5.34 | 226.2 | 172.3 | 1.86 | 98.6 | 15.6 |
| 1.90 | 21.42 | 7:56 | 12.4 | 5.37 | 238.2 | 176.8 | 1.74 | 96.7 | 13.8 |
| 2.20 | 21.40 | 8:01 | 12.3 | 5.38 | 238.0 | 180.0 | 1.61 | 94.1 | 11.6 |
| 2.50 | 21.40 | 8:06 | 12.6 | 5.40 | 242.0 | 185.0 | 1.60 | 92.5 | 10.23 |
| | | | | | | | | | |

## SAMPLE DATA

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 2.50 | 21.40 | 8:09 | 12.6 | 5.40 | 242.0 | 185.0 | 1.60 | 92.5 | 10.23 |

| | | | |
|---|---|---|---|
| Preservatives Used | See CoC | Sample Charateristics (Odor, Color) | none clear |
| Number of Containers | See CoC | Sampler Signature | |

## WELL DATA

| | | | |
|---|---|---|---|
| Number of Baffles | 4 | Well Cap Dedicated/In Place? | Yes |
| Lock Condition | good | Fittings/Well Head Condition | good |
| Pad/Casing Quality | good | Well Clear of Weeds/Accessible? | good gate 4723 |

# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

| | | | |
|---|---|---|---|
| **FACILITY NAME** | EWS | **MONITORING WELL I.D.** | MW-2 |
| **LOCATION** | Camden, TN | **TEMPERATURE & WEATHER** | 30's Overcast |
| **DATE & TIME** | 11/3/23 1:00 | **EVENT FREQUENCY** | Quarterly |
| **PURGE METHOD** | NA, parameters only | **FIELD REPRESENTATIVE** | Miller Riggins |
| **TOTAL WELL DEPTH (feet)** | 10 | **SAMPLING EQUIPMENT** | Bailer |
| **DEPTH TO WATER (feet)** | 4.76 | **IS SAMPLE EQUIPMENT DEDICATED?** | No |
| **CASING DIAMETER (inches)** | 2 | **DUPLICATE COLLECTED?** | N |
| **WATER COLUMN (feet)** | 5.24 | **FIELD BLANK COLLECTED?** | N |
| **PURGE VOLUME (gallons)** | - | **EQUIPMENT BLANK COLLECTED?** | N |

## SAMPLE DATA

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| - | 4.76 | 1:09 | 8.6 | 6.26 | 1.91 | 474.5 | 8.20 | 145.6 | 4.75 |
| **Preservatives Used** | see COC | | | **Sample Charateristics (Odor, Color)** | | | None - Clear | | |
| **Number of Containers** | see COC | | | **Sampler Signature** | | | | | |

## WELL DATA

| | | | |
|---|---|---|---|
| **Number of Baffles** | 4 | **Well Cap Dedicated/In Place?** | Yes |
| **Lock Condition** | Ok | **Fittings/Well Head Condition** | Good |
| **Pad/Casing Quality** | Ok | **Well Clear of Weeds/Accessible?** | Good |

# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

| | | | |
|---|---|---|---|
| FACILITY NAME | EWS | MONITORING WELL I.D. | MW-3 |
| LOCATION | Camden, TN | TEMPERATURE & WEATHER | 20°F ICY |
| DATE & TIME | 1 1330 | EVENT FREQUENCY | Quarterly |
| PURGE METHOD | Low-flow | FIELD REPRESENTATIVE | JACKSON ROBBINS |
| TOTAL WELL DEPTH (feet) | 27 | SAMPLING EQUIPMENT | Bladder Pump |
| DEPTH TO WATER (feet) | 11.25 | IS SAMPLE EQUIPMENT DEDICATED? | Yes |
| CASING DIAMETER (inches) | 2 | DUPLICATE COLLECTED? | N |
| WATER COLUMN (feet) | 15.75 | FIELD BLANK COLLECTED? | N |
| PURGE VOLUME (gallons) | 1.75 | EQUIPMENT BLANK COLLECTED? | N |

## PURGE INFORMATION

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 0.25 | 11.30 | 1335 | 6.9 | 6.25 | 264.8 | 174.5 | 10.54 | 204.0 | 57.2 |
| 0.5 | 11.40 | 1340 | 8.2 | 6.26 | 265.4 | 180.3 | 9.03 | 199.3 | 45.4 |
| 0.75 | 11.40 | 1345 | 9.2 | 6.31 | 265.9 | 180.6 | 8.62 | 196.4 | 36.2 |
| 1 | 11.40 | 1350 | 8.0 | 6.32 | 266.2 | 179.9 | 8.56 | 195.3 | 33.8 |
| 1.25 | 11.40 | 1355 | 7.0 | 6.31 | 266.0 | 179.7 | 8.52 | 196.0 | 35.4 |
| 1.50 | 11.40 | 1400 | 8.0 | 6.34 | 266.2 | 177.7 | 8.52 | 195.9 | 32.3 |
| 1.75 | 11.40 | 1405 | 7.9 | 6.33 | 266.2 | 179.4 | 8.49 | 194.9 | 31.5 |
| 2.00 | 11.40 | 1410 | 7.9 | 6.33 | 266.2 | 179.3 | 8.48 | 195.1 | 33.1 |
| | | | | | | | | | |
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D Metals

## SAMPLE DATA

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 1.75 | 11.40 | 1415 | 7.9 | 6.33 | 266.2 | 179.3 | 8.48 | 195.1 | 33.1 |

| | | | |
|---|---|---|---|
| Preservatives Used | SEE COC | Sample Charateristics (Odor, Color) | SLIGHTLY CLOUDY |
| Number of Containers | DISSOLVED METALS TAKEN | Sampler Signature | |

## WELL DATA

| | | | |
|---|---|---|---|
| Number of Baffles | 4 | Well Cap Dedicated/In Place? | Y |
| Lock Condition | OK | Fittings/Well Head Condition | OK |
| Pad/Casing Quality | OK | Well Clear of Weeds/Accessible? | Y |

# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 · 800-763-2326 · www.cecinc.com

## SITE AND MONITORING WELL DATA

| | | | |
|---|---|---|---|
| FACILITY NAME | EWS | MONITORING WELL I.D. | MW-4 |
| LOCATION | Camden, TN | TEMPERATURE & WEATHER | 20°F ICY |
| DATE & TIME | 1·31·23 1120 | EVENT FREQUENCY | Quarterly |
| PURGE METHOD | Low-flow | FIELD REPRESENTATIVE | JACKSON ROBBINS |
| TOTAL WELL DEPTH (feet) | 23.1 | SAMPLING EQUIPMENT | Bladder Pump |
| DEPTH TO WATER (feet) | 8.80 | IS SAMPLE EQUIPMENT DEDICATED? | Yes |
| CASING DIAMETER (inches) | 2 | DUPLICATE COLLECTED? | N |
| WATER COLUMN (feet) | 14.3 | FIELD BLANK COLLECTED? | N |
| PURGE VOLUME (gallons) | 1.75 | EQUIPMENT BLANK COLLECTED? | N |

## PURGE INFORMATION

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 0.25 | 8.98 | 1140 | 12.1 | 5.82 | 90.3 | 68.2 | 4.04 | 225.9 | 7.00 |
| .5 | 8.90 | 1145 | 12.7 | 5.80 | 88.3 | 67.8 | 3.45 | 223.9 | 6.98 |
| 1.00 | 8.90 | 1150 | 12.8 | 5.80 | 88.1 | 67.5 | 3.27 | 222.4 | 6.69 |
| 1.25 | 8.90 | 1155 | 12.8 | 5.80 | 87.9 | 67.4 | 3.19 | 221.7 | 4.87 |
| 1.5 | 8.90 | 1200 | 13.0 | 5.80 | 87.9 | 67.7 | 3.13 | 221.0 | 2.68 |
| 1.75 | 8.90 | 1205 | 13.1 | 5.80 | 87.9 | 67.5 | 3.10 | 221.1 | 2.87 |
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## SAMPLE DATA

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 1.75 | 8.90 | 1215 | 13.1 | 5.80 | 87.9 | 67.5 | 3.10 | 221.1 | 2.87 |

| | | | |
|---|---|---|---|
| Preservatives Used | SEE COC | Sample Charateristics (Odor, Color) | CLEAR NONE |
| Number of Containers | SEE COC | Sampler Signature | |

## WELL DATA

| | | | |
|---|---|---|---|
| Number of Baffles | NONE | Well Cap Dedicated/In Place? | Y |
| Lock Condition | OK | Fittings/Well Head Condition | OK |
| Pad/Casing Quality | OK | Well Clear of Weeds/Accessible? | Y |

# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

| | | | |
|---|---|---|---|
| FACILITY NAME | EWS | MONITORING WELL I.D. | MW-5 |
| LOCATION | Camden, TN | TEMPERATURE & WEATHER | 20°F 1 CY |
| DATE & TIME | 1.31.23 0910 | EVENT FREQUENCY | Quarterly |
| PURGE METHOD | Low-flow | FIELD REPRESENTATIVE | JACKSON ROBBINS |
| TOTAL WELL DEPTH (feet) | 33.85 | SAMPLING EQUIPMENT | Bladder Pump |
| DEPTH TO WATER (feet) | 8.06 | IS SAMPLE EQUIPMENT DEDICATED? | Yes |
| CASING DIAMETER (inches) | 2 | DUPLICATE COLLECTED? | N |
| WATER COLUMN (feet) | 25.79 | FIELD BLANK COLLECTED? | N |
| PURGE VOLUME (gallons) | 1.95 | EQUIPMENT BLANK COLLECTED? | N |

## PURGE INFORMATION

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 0.25 | 8.45 | 0925 | 13.2 | 5.07 | 394.3 | 302.8 | 1.31 | 245.2 | 89.7 |
| 0.5 | 8.41 | 0930 | 11.9 | 5.09 | 389.7 | 291.7 | 1.11 | 247.2 | 86.5 |
| 0.75 | 8.41 | 0935 | 12.1 | 5.08 | 387.9 | 292.8 | 0.94 | 252.4 | 43.4 |
| 1 | 8.41 | 0940 | 11.7 | 5.08 | 389.7 | 290.8 | 0.81 | 256.2 | 27.7 |
| 1.25 | 8.41 | 0945 | 12.1 | 5.08 | 388.4 | 293.2 | 0.74 | 258.8 | 23.4 |
| 1.30 | 8.41 | 0950 | 11.9 | 5.10 | 388.9 | 291.5 | 0.70 | 247.3 | 18.3 |
| 1.50 | 8.41 | 0955 | 11.9 | 5.12 | 387.0 | 290.8 | 0.67 | 236.6 | 14.9 |
| 1.75 | 8.41 | 1000 | 12.0 | 5.13 | 388.0 | 291.3 | 0.66 | 242.1 | 14.1 |
| 1.80 | 8.41 | 1005 | 12.0 | 5.14 | 387.4 | 291.0 | 0.64 | 248.5 | 12.8 |
| 1.95 | 8.41 | 1010 | 12.0 | 5.15 | 387.3 | 290.1 | 0.64 | 250.6 | 12.3 |
| | | | | | | | | | |
| | | | | | | | | | |

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## SAMPLE DATA

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 1.95 | 8.41 | 1015 | 11.0 | 5.15 | 387.3 | 290.1 | 0.64 | 250.6 | 12.3 |

| | | | |
|---|---|---|---|
| Preservatives Used | SEE COC | Sample Charateristics (Odor, Color) | CLOUDY |
| Number of Containers | DISSOLVED METALS TAKEN | Sampler Signature | |

## WELL DATA

| | | | |
|---|---|---|---|
| Number of Baffles | 4 | Well Cap Dedicated/In Place? | Y |
| Lock Condition | OK | Fittings/Well Head Condition | OK |
| Pad/Casing Quality | OK | Well Clear of Weeds/Accessible? | Y |

# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

| | | | |
|---|---|---|---|
| FACILITY NAME | EWS | MONITORING WELL I.D. | TMW-1 |
| LOCATION | Camden, TN | TEMPERATURE & WEATHER | 30's OVERCAST |
| DATE & TIME | 1/31/13 9:27 | EVENT FREQUENCY | Quarterly |
| PURGE METHOD | Low-flow | FIELD REPRESENTATIVE | M. Kelly Rabon |
| TOTAL WELL DEPTH (feet) | 32.50 | SAMPLING EQUIPMENT | Bladder Pump |
| DEPTH TO WATER (feet) | 5.34 | IS SAMPLE EQUIPMENT DEDICATED? | Yes |
| CASING DIAMETER (inches) | 2 | DUPLICATE COLLECTED? | N |
| WATER COLUMN (feet) | 27.16 | FIELD BLANK COLLECTED? | N |
| PURGE VOLUME (gallons) | 1.50 | EQUIPMENT BLANK COLLECTED? | N |

## PURGE INFORMATION

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 0 | ~~5.34~~ 5.34 | 9:39 | 12.1 | 5.55 | 371.2 | 285 | 5.83 | 161.7 | 6.34 |
| .45 | 7.50 | 9:44 | 13.2 | 5.47 | 422.1 | 328 | 4.33 | 201.1 | 29.4 |
| .60 | 7.60 | 9:49 | 13.2 | 5.46 | 444.3 | 344 | 3.97 | 218.4 | 20.6 |
| .80 | 7.69 | 9:54 | 13.3 | 5.47 | 442.4 | 342.6 | 3.94 | 228.7 | 18.70 |
| 1.10 | 7.85 | 9:59 | 13.3 | 5.48 | 443.9 | 344.6 | 3.84 | 238.9 | 10.90 |
| 1.30 | 7.74 | 10:04 | 13.3 | 5.48 | 442.2 | 344.1 | 3.80 | 243.6 | 5.69 |
| 1.50 | 7.74 | 10:09 | 13.3 | 5.49 | 441.9 | 343.9 | 3.79 | 249.8 | 3.80 |
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## SAMPLE DATA

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 1.50 | 7.74 | 10:12 | 13.3 | 5.49 | 441.9 | 343.9 | 3.79 | 249.8 | 3.80 |

| | | | |
|---|---|---|---|
| Preservatives Used | see COC | Sample Charateristics (Odor, Color) | none clear |
| Number of Containers | see COC | Sampler Signature | |

## WELL DATA

| | | | |
|---|---|---|---|
| Number of Baffles | 1 | Well Cap Dedicated/In Place? | yes |
| Lock Condition | none | Fittings/Well Head Condition | good |
| Pad/Casing Quality | good | Well Clear of Weeds/Accessible? | yes |

# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

| | | | |
|---|---|---|---|
| **FACILITY NAME** | EWS | **MONITORING WELL I.D.** | TMW-2 |
| **LOCATION** | Camden, TN | **TEMPERATURE & WEATHER** | 32° overcast |
| **DATE & TIME** | 1/31/23 10:49 | **EVENT FREQUENCY** | Quarterly |
| **PURGE METHOD** | Low-flow | **FIELD REPRESENTATIVE** | Miller Rubbins |
| **TOTAL WELL DEPTH (feet)** | 27.50 | **SAMPLING EQUIPMENT** | Bladder Pump |
| **DEPTH TO WATER (feet)** | 8.70 | **IS SAMPLE EQUIPMENT DEDICATED?** | Yes |
| **CASING DIAMETER (inches)** | 2 | **DUPLICATE COLLECTED?** | Yes 1/31/22 DUP2 |
| **WATER COLUMN (feet)** | 18.8 | **FIELD BLANK COLLECTED?** | N |
| **PURGE VOLUME (gallons)** | 3.00 | **EQUIPMENT BLANK COLLECTED?** | N |

## PURGE INFORMATION

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 8.70 | 10:59 | 12.5 | 5.54 | 339.6 | 259.3 | 6.81 | 210.6 | 2,90 |
| .50 | 10.70 | 11:04 | 13.4 | 5.49 | 368.9 | 287.6 | 6.23 | 234.1 | 234.0 |
| .65 | 10.65 | 11:09 | 13.6 | 5.48 | 389.1 | 303.0 | 5.86 | 245.9 | 410 |
| .80 | 10.65 | 11:14 | 13.6 | 5.50 | 385.3 | 302.0 | 5.84 | 251.5 | 271 |
| .95 | 10.70 | 11:19 | 13.7 | 5.50 | 392.9 | 307.8 | 5.74 | 258.0 | 138 |
| 1.25 | 10.78 | 11:24 | 13.9 | 5.51 | 390.0 | 307.6 | 5.73 | 260.5 | 84.8 |
| 1.40 | 10.79 | 11:29 | 13.8 | 5.52 | 387.5 | 304.5 | 5.74 | 262.3 | 68.7 |
| 1.60 | 10.75 | 11:34 | 13.5 | 5.52 | 399.5 | 303.7 | 5.73 | 264.7 | 37.6 |
| 1.80 | 10.80 | 11:39 | 13.8 | 5.52 | 392.5 | 309.1 | 5.67 | 266.0 | 31.9 |
| 2.00 | 10.81 | 11:44 | 13.9 | 5.52 | 395.2 | 310.9 | 5.63 | 266.2 | 21.0 |
| 2.25 | 10.81 | 11:49 | 13.9 | 5.52 | 395.1 | 311.7 | 5.62 | 269.4 | 16.8 |
| 2.45 | 10.81 | 11:54 | 13.8 | 5.52 | 395.6 | 311.0 | 5.63 | 270.1 | 19.4 |

## SAMPLE DATA

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 3.00 | 10.82 | 12:02 | 13.7 | 5.52 | 398.6 | 312.9 | 5.56 | 272.1 | 7.68 |
| **Preservatives Used** | See COC | | | **Sample Charateristics (Odor, Color)** | | | | | |
| **Number of Containers** | See COC | | | **Sampler Signature** | | | | | |

## WELL DATA

| | | | |
|---|---|---|---|
| **Number of Baffles** | 4 | **Well Cap Dedicated/In Place?** | yes |
| **Lock Condition** | good | **Fittings/Well Head Condition** | good |
| **Pad/Casing Quality** | good | **Well Clear of Weeds/Accessible?** | yes |

| Gallons purged | DTW | Time | °C | PH | Specific cond | cond | DO | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 2.60 | 10.81 | 11:59 | 13.6 | 5.52 | 398.7 | 312 | 5.60 | 270.6 | 12.1 |
| 2.80 | 10.82 | 12:04 | 13.8 | 5.52 | 394.3 | 313 | 5.58 | 271.4 | 10.8 |
| 3.00 | 10.82 | 12:09 | 13.7 | 5.52 | 398.6 | 312.9 | 5.58 | 272.1 | 7.68 |

# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

| | | | |
|---|---|---|---|
| FACILITY NAME | EWS | MONITORING WELL I.D. | TMW-3 |
| LOCATION | Camden, TN | TEMPERATURE & WEATHER | 20's OVERCAST |
| DATE & TIME | 1/31/23 1:20 | EVENT FREQUENCY | Quarterly |
| PURGE METHOD | Low-flow | FIELD REPRESENTATIVE | Miller Robbin |
| TOTAL WELL DEPTH (feet) | 28.00 | SAMPLING EQUIPMENT | Bladder Pump |
| DEPTH TO WATER (feet) | 3.80 | IS SAMPLE EQUIPMENT DEDICATED? | Yes |
| CASING DIAMETER (inches) | 2 | DUPLICATE COLLECTED? | N |
| WATER COLUMN (feet) | 24.2 | FIELD BLANK COLLECTED? | yes 14:15 |
| PURGE VOLUME (gallons) | 1.00 | EQUIPMENT BLANK COLLECTED? | N |

## PURGE INFORMATION

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 3.80 | 13:51 | 11.4 | 5.40 | 665 | 495.5 | 4.22 | 184.9 | 27.0 |
| .25 | 4.60 | 13:56 | 13.4 | 5.38 | 715 | 557 | 1.21 | 203 | 25.1 |
| .50 | 4.60 | 14:01 | 13.3 | 5.35 | 722 | 561 | 0.87 | 207.7 | 12.6 |
| .75 | 4.60 | 14:06 | 13.4 | 5.36 | 711 | 553 | 1.08 | 211.0 | 8.45 |
| 1.00 | 4.60 | 14:11 | 13.6 | 5.36 | 703 | 549 | 1.10 | 205.0 | 5.25 |
| | | | | | | | | | |
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## SAMPLE DATA

| Gallons Purged | DTW (ft) | Time (00:00) | °C | pH | Specific Cond (µs/cm) | Conductivity (µs/cm) | DO (mg/L) | ORP | NTU |
|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 4.60 | 14:11 | 13.6 | 5.36 | 703 | 549 | 1.10 | 205.0 | 5.25 |

| | | | |
|---|---|---|---|
| Preservatives Used | See COC | Sample Charateristics (Odor, Color) | none clear |
| Number of Containers | See COC | Sampler Signature | |

## WELL DATA

| | | | |
|---|---|---|---|
| Number of Baffles | 1 | Well Cap Dedicated/In Place? | yes |
| Lock Condition | yes | Fittings/Well Head Condition | good |
| Pad/Casing Quality | good | Well Clear of Weeds/Accessible? | yes |

# EQUIPMENT CALIBRATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## EQUIPMENT CALIBRATION FORM

| | |
|---|---|
| NAME OF REPRESENTATIVE | Stuart Miller |
| LOCATION | CEC |
| DATE AND TIME | 1/30/23 15:26 |
| Equipment and Model # (ex. YSI Pro Plus 556) | YSI Pro DSS (Rental) |
| Equipment Serial # | (Rental) |

### pH Calibration

| pH buffer Calibration Standard | Buffer solution exp. date | Pre-Cal Reading (S.U.) | ph mV Value | Accepted Range mV | Within Range? (Yes or No) | Post-Cal Reading (S.U.) | Calibrated? (yes/no) |
|---|---|---|---|---|---|---|---|
| 4 | Aug 24 | 4.17 | ~~167~~ 178 | 160 to 180 | ~~yes~~ no | 4.00 | yes |
| 7 | Aug 24 | ~~7.08~~ | -12.0 | +/-50 | yes | 7.02 | yes |
| 10 | Aug 24 | 10.28 | -182.0 | -160 to -180 | no | 10.05 | yes |

### Temperature Calibration Check

| Cert. Thermometer Value (deg C) | Meter Value (deg C) |
|---|---|
| 23.7 | 23.7 |

### DO Calibration

| Actual Barometric Pressure | Barometric Pressure (mm Hg) | D.O. Value (% Saturated) | Unit reading (%) | % DO accepted? |
|---|---|---|---|---|
| 767 | 786.2 | 100% | 100% | yes |

### Specific Conductivity Calibration

| Sp. Conductivity Calibration Standard buffer solution | Buffer solution exp. date | Pre Cal Reading (umhos) | Post Cal Reading (umhos) |
|---|---|---|---|
| 1413 | 1/30/24 | 691 | 1413 |

### ORP Calibration

| ORP Calibration (mV) | Buffer solution exp. date | Pre Cal Reading (mV) | Post Cal Reading (mV) |
|---|---|---|---|
| 220 | Jan/23 | 236 | 220 |

### Hach Model 2100P Turbidimeter Calibration

| Calibration verification Test performed and passed? | NTU Standard | Within Range? (Yes/No) | Measured Value | Stored? | Final Verification test passed? (Yes/No) |
|---|---|---|---|---|---|
| (Yes) / No | 20 | | | | |
| | 100 | | | | |
| Note: if verification passed, calibration not required | 800 | | | | |

# EQUIPMENT CALIBRATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane Suite E-100 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## EQUIPMENT CALIBRATION FORM

| | |
|---|---|
| **NAME OF REPRESENTATIVE** | S Miller |
| **LOCATION** | Former EWS |
| **DATE AND TIME** | 11:30 AM 1/30/22 |
| **Equipment and Model # (ex. YSI Pro Plus 556)** | YSI Pro DSS |
| **Equipment Serial #** | YSI Pro 1 |

**pH Calibration**

| pH buffer Calibration Standard | Buffer solution exp. date | Pre-Cal Reading (S.U.) | ph mV Value | Accepted Range mV | Within Range? (Yes or No) | Post-Cal Reading (S.U.) | Calibrated? (yes/no) |
|---|---|---|---|---|---|---|---|
| 4 | Aug 24 | 3.97 | 152.1 | 160 to 180 | no | 4.00 | Yes |
| 7 | Aug 24 | 6.88 | ~~-10.7~~ | +/-50 | no | 7.01 | yes |
| 10 | Aug 24 | ~~9.97~~ | ~~-181.5~~ | -160 to -180 | no | 10.04 | yes |

**Temperature Calibration Check**

| Cert. Thermometer Value (deg C) | Meter Value (deg C) |
|---|---|
| 18.6 | 18.4 |

**DO Calibration**

| Actual Barometric Pressure | Barometric Pressure (mm Hg) | D.O. Value (% Saturated) | Unit reading (%) | % DO accepted? |
|---|---|---|---|---|
| 768.4 | 746.7 | 100 | 98.2 | ~~yes~~ yes |

**Specific Conductivity Calibration**

| Sp. Conductivity Calibration Standard buffer solution | Buffer solution exp. date | Pre Cal Reading (umhos) | Post Cal Reading (umhos) |
|---|---|---|---|
| 1413 MS | 12/28/23 | 1496 | 1413 |

**ORP Calibration**

| ORP Calibration (mV) | Buffer solution exp. date | Pre Cal Reading (mV) | Post Cal Reading (mV) |
|---|---|---|---|
| 220.0 | Jan 23 | 229.4 | 229.0 |

**Hach Model 2100P Turbidimeter Calibration**

| Calibration verification Test performed and passed? | NTU Standard | Within Range? (Yes/No) | Measured Value | Stored? | Final Verification test passed? (Yes/No) |
|---|---|---|---|---|---|
| (Yes) | 20 | | | | |
| No | 100 | | | | |
| Note: if verification passed, calibration not required | 800 | | | | |