

**3rd QUARTER 2022 GROUNDWATER
ASSESSMENT MONITORING REPORT
AUGUST 2022 MONITORING EVENT**

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

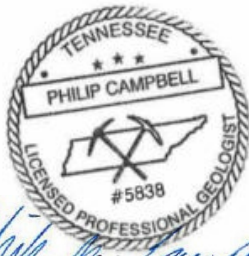
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200 OMAR CIRCLE
CAMDEN, TN 38320**

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EXECUTIVE SUMMARY

This report documents the 3rd quarter 2022 assessment-monitoring event, which was performed at the former Environmental Waste Solutions, LLC (EWS) Camden Class II Landfill on August 11-12, 2022.

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 into 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 August 2022 event (28.3 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.

The 3rd quarter 2022 sampling event at the facility included the following sampling activities:

Groundwater samples were collected by CEC on August 11, 2022, from MW-1, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 and on August 12, 2022 from MW-3. A leachate sample was collected from the "Industrial Waste Cell (IWC)" on August 11, 2022. 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 3rd quarter 2022 groundwater analyses were prepared by Pace and reported to CEC on September 13, 2022 for the groundwater samples and August 31, 2022 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.

During this sampling event, the turbidity values observed at MW-3 were well above the recommended 10 NTU's throughout the purging and sampling procedures. Although efforts were made during this sampling event to reduce the turbidity, the turbidity value at MW-3 was 146 NTU at the time of sample collection. The total metals concentrations from MW-3 reported during this August 2022 are not representative of actual groundwater conditions. Therefore, a dissolved metals sample was collected for analysis from MW-3 in addition to total metals analysis for reporting and statistical purposes. The dissolved metals concentrations reported at MW-3 during this August 2022 event provide a better representation of groundwater conditions at MW-3. Therefore, the total metals concentrations reported at MW-3 during this August 2022 event were removed from the statistical database and replaced with the dissolved metals concentrations reported during this event.

Dissolved cadmium was detected at MW-3 (0.00387 mg/l) and the duplicate sample collected from MW-3 (0.00383 mg/l) during this August 2022 sampling event, which were below the respective EPA maximum contamination limit (MCL) of 0.005 mg/l. The cadmium detections at MW-3 during this event were the only cadmium detections above the Practical Quantification Limit (PQL) at any of the groundwater monitoring locations. Cadmium was not detected over the laboratory PQL at MW-3 during the previous two groundwater events completed in May 2022 and February 2022. Based on the Mann-Kendall trend test, a downward trend was identified for total cadmium concentrations at MW-3, when considering data from the past 26 sampling events at MW-3 since November 2016. Since the fall of 2018, the total cadmium concentrations observed in MW-3 have shown an overall decrease in concentration. Cadmium has not been detected above the Practical Quantification Limit (PQL) at any of the other groundwater monitoring locations. Specifically, there have been no cadmium detections from groundwater samples obtained from temporary monitoring wells TMW-2 and TMW-3 that are immediately down-gradient of MW-3.

Nine SSIs were identified over background during this event. SSIs included cadmium (MW-3), chloride (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3), zinc (MW-3), and sulfate (MW-

3). The chloride, zinc, and sulfate detections observed in the site monitoring wells were all below their associated MCLs or 2DWS. The dissolved cadmium detections at MW-3 (0.00387 mg/l) and the duplicate sample collected from MW-3 (0.00383 mg/l) were below the respective EPA MCL.

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
microSiemens•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	Publically 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' 16" and west longitude -88° 05' 16" 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:

$$\text{Established Top of Casing Elevation} - \text{Depth to Water} = \text{Groundwater Elevation}$$

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 23.05 feet below the top of casing at the up-gradient monitor well MW-1 to approximately 11.72 feet below the top of casing at monitor well MW-4. The potentiometric gradient calculated from groundwater elevation data collected on August 11, 2022 is approximately 1.24%.

The potentiometric gradient is calculated according to the following formula:

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

$$\frac{(393.42) - (369.75)}{1,910'} * 100 = 1.24\%$$

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 August 2022 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.

Low-flow purging procedures were used at MW-3 during this event. However, the turbidity values observed at MW-3 were well above the recommended 10 NTU's throughout the purging procedure. In addition, the purge rate during low-flow purging procedures was very low (approximately 0.025 gallons per minute), indicating that the rate of groundwater recharge at MW-3 was very minimal. After three well volumes were removed from MW-3 during the purging procedure on August 11, 2022, the observed turbidity remained elevated (904 NTU). Therefore, purging ceased at MW-3 on August 11, 2022 after three well volumes were removed, and MW-3 was sampled for analysis the following morning of August 12, 2022. Although the turbidity value observed at MW-3 during sample collection (146 NTU) was lower than the turbidity observed during purging, the turbidity remained well above the recommended 10 NTU's. Therefore, a dissolved metals sample was collected for analysis from MW-3 in addition to total metals analysis for statistical analysis purposes. 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 ($\text{Na}_2\text{S}_2\text{O}_3$); 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 August 2022

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 MW-3 and a duplicate sample was collected from MW-3. 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 MW-3 at the same time. In addition, a laboratory supplied trip blank for VOC analysis was prepared and placed in a cooler, which was present during groundwater sampling activities. Upon the collection of the final groundwater sample, the trip blank was placed in a sample cooler and delivered to Pace for VOC analysis. No VOCs were detected above the laboratory PQL in the trip blank sample.

Pace reported the groundwater QA/QC laboratory analytical results to CEC on September 13, 2022. Laboratory analytical testing of the field blank presented in the analytical report showed one detection above the laboratory PQLs for barium (0.00209 mg/l) during this August 2022 event.

The results for the duplicate sample collected from MW-3 were similar to the original MW-3 sample results. The relative percent difference (RPD) between most constituent values reported in

MW-3 and the duplicate sample were within the acceptable 20% RPD control limit with the exception of total aluminum (22.62% RPD) and total chromium (52.25% RPD). However, the dissolved aluminum and dissolved chromium concentrations were below their respective laboratory PQLs. Therefore, the differences in the reported total arsenic and chromium concentrations is likely due to differences in the turbidity of samples at the time of sample collection.

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 63 of 66 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 3rd quarter 2022 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** 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 was detected above the MCL (0.01 mg/l) at up-gradient MW-1 (0.023 mg/l) during this 3rd Quarter 2022 event. Arsenic has been detected at concentrations that exceed the MCL during previous monitoring events only at up-gradient well MW-1. Arsenic was not detected above the laboratory PQL (<0.002 mg/l) in any of the down-gradient monitoring wells during this August 2022 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.

Total cadmium detections at MW-3 and the duplicate sample collected from MW-3 were just over the respective EPA MCL (<0.05 mg/l) during this August 2022 sampling event. However,

the dissolved cadmium detections at MW-3 and the duplicate sample collected from MW-3 were below the respective EPA MCL. Total cadmium was not detected over the laboratory PQLs during the previous May 2022 and February 2022 monitoring events. The cadmium detections at MW-3 during previous events since 2016 were the only cadmium detections above the Practical Quantification Limit (PQL) at any of the groundwater monitoring locations. 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				
Summary of Cadmium Concentrations, Turbidity Measurements, and Groundwater Elevations				
Date	Total Cadmium (mg/l)	Cadmium, Dissolved (mg/l)	Turbidity (NTU)	Groundwater Elevations (ft. MSL)
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

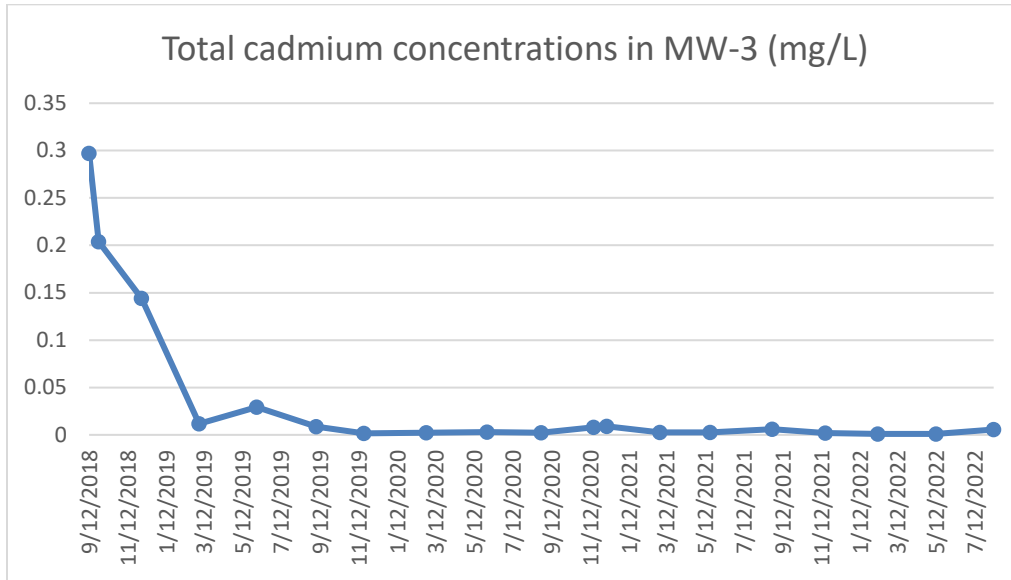


Figure – Cadmium Concentrations in MW-3

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 26 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 previous 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.

As mentioned previously, the turbidity values observed at MW-3 were well above the recommended 10 NTU’s throughout the purging and sampling procedures. The purge rate during low-flow purging procedures at MW-3 was very low (approximately 0.025 gallons per minute), indicating that the rate of groundwater recharge at MW-3 was very minimal. After three well volumes were removed from MW-3 during the low-flow purging procedure on August 11, 2022, the observed turbidity remained elevated (904 NTU). Therefore, purging ceased at MW-3 on August 11, 2022 after three well volumes were removed, and MW-3 was sampled for analysis the following morning of August 12, 2022. Although efforts were made in the field to reduce the turbidity at MW-3 during sample collection, the turbidity remained elevated during sample collection (146 NTU). Therefore, dissolved metals samples were collected for analysis from MW-3 for statistical analysis. Dissolved metals samples collected for analysis were lab-filtered, and were collected for analysis in an unpreserved container and placed on ice.

It is worth noting that the observed precipitation in the area during the months of July 2022 and August 2022 was very low compared to previous years. The lack of precipitation in the area likely contributed to the low rate of water recharge, which may have inadvertently affected the turbidity at MW-3 during this event.

Total Cobalt was detected in up-gradient well MW-1 (0.0582 mg/l) during this August 2022 event. 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 below the RSL for cobalt during this August 2022 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. Total cobalt was also detected just above the PQLs of the laboratory in downgradient well MW-3 (0.00218 mg/l) during this August 2022 event, which was lower than up-gradient well MW-1 and lower than the EPA RSL for cobalt concentrations.

Total Chromium was detected in downgradient wells MW-3 (0.00811 mg/l), MW-4 (0.00331 mg/l), MW-5 (0.00563 mg/l), and TMW-2 (0.00226 mg/l), which were all below the MCL of 0.1 mg/l for chromium. Chromium has been detected at similar concentrations in up-gradient well MW-1.

Total Mercury was not detected in any wells during this August 2022 sample event. Total mercury has consistently been detected above the PQL at MW-1 since January 2009. Total mercury was not detected above the laboratory PQL (0.000200 mg/l) at any of the down-gradient wells during this August 2022 event. Although total mercury has been previously detected above the PQL at up-gradient MW-1, 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 August 2022 sampling event from the former EWS Class II Landfill groundwater monitoring well network indicated that three of the site-specific groundwater-monitoring list of compounds were detected at concentrations that exceeded the National Secondary Drinking Water Standards (2DWS). Those parameters include total **aluminum** in down-gradient wells MW-3, MW-5, and TMW-2; total **iron** in up-gradient well MW-1 and down-gradient well MW-3; and **manganese** in up-gradient well MW-1 and down-gradient wells MW-3 and MW-5. However, dissolved aluminum and dissolved iron were not detected above the respective laboratory PQL in MW-3 during this event. **Chloride**,

sulfate, nickel, and zinc detections were below the 2DWS during this event. The observed concentrations for the constituents given below are discussed relative to the 2DWS.

The **Total Aluminum** concentrations observed in MW-1 (0.139 mg/l) during this August 2022 sampling event was below the 2DWS (0.2 mg/l). Total aluminum was also detected in down-gradient wells MW-3 (2.46 mg/l), MW-5 (0.246 mg/l), and TMW-2 (0.290 mg/l), 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. In addition, aluminum was not detected above the PQL (<0.1 mg/l) at MW-4, TMW-1, or TMW-3 during this August 2022 event.

The **Chloride** concentrations reported at MW-1, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 during this May 2022 event were below the 2DWS for chloride concentrations (250 mg/l). The chloride concentrations for this August 2022 event are similar to the concentrations observed at samples collected from each well during the recent previous events. The chloride concentration at MW-3 during this event (28.3 mg/l) continues to be significantly lower in concentration compared to the previous events in December 2018 (65 mg/l), September 2018 (222 mg/l), November 2015 (458 mg/l), and the supplemental re-sampling in December 2015 (360 mg/l).

Fluoride was detected in the duplicate sample for MW-3 (0.259 mg/l) during this August 2022 sampling event, which was well below the 2DWS for fluoride (2 mg/l). Fluoride was not detected (<0.150 mg/l) in any other wells during this current sample event.

Total Iron was detected above the 2DWS (0.3 mg/l) in up-gradient well MW-1 (16.8 mg/l) and down-gradient well MW-3 (3.07 mg/l) during this August 2022 monitoring event. However, dissolved iron was not detected above the laboratory PQL (<0.100 mg/l) in MW-3 during this event. Iron was detected above the PQLs of the laboratory (0.1 mg/l), but below the 2DWS (0.3 mg/l) during this August 2022 event at wells MW-4, MW-5, TMW-2, and TMW-3. Total iron was not detected above the PQL in MW-4, TMW-1, and TMW-2 during this event. 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 considered to be 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 Manganese detections were observed above the 2DWS (0.05 mg/l) in up-gradient MW-1 (0.934 mg/l) and down-gradient wells MW-3 (0.177 mg/l), MW-5 (0.232 mg/l) during this August 2022 monitoring event. 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. During this August 2022 event, total manganese was also detected below 2DWS (0.05 mg/l) but above the laboratory PQL (<0.005 mg/l) in wells MW-4, TMW-1, TMW-2, and TMW-3.

Total Nickel was detected in up-gradient well MW-1 (0.00737 mg/l) and down-gradient wells MW-3 (0.00617 mg/l), and MW-5 (0.00774 mg/l) during the August 2022 sampling event. Dissolved nickel was detected in down-gradient well MW-3 (0.005 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 (45.0 mg/l) during this August 2022 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 and down-gradient well MW-5, during this August 2022 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 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 August 2022 event (5.97 mg/l) shows that overall total magnesium levels in MW-3 have been decreasing since 2018. Magnesium was also detected above the laboratory PQL (1.00 mg/l) during the August 2022 event in MW-1, MW-4, MW-5, TMW-1, TMW-2, and TMW-3.

The **total zinc** was reported at MW-3 (0.0505 mg/l) and the duplicate sample collected from MW-3 (0.0596 mg/l) during this August 2022 event. In addition, dissolved zinc was reported at MW-3 (0.0658 mg/l) and the duplicate sample collected from MW-3 (0.0692 mg/l) during this August 2022 event. All zinc concentrations reported at MW-3 were below the respective 2DWS (<5 mg/l). Similar zinc concentrations have been reported in MW-3 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. Six (6) QC qualifier codes (J, J3, J4, J5, P1, and V) were indicated during the laboratory analysis of groundwater samples collected during the August 2022 event. Specific information concerning each laboratory QC qualifier code can be found on page 63 of 66 in the September 13, 2022 Groundwater Laboratory Analytical Report. Four (4) QC qualifier codes (J3, J4, J5, and V) were indicated during the laboratory analysis of the leachate

samples collected during this August 2022 event. Specific information concerning each laboratory QC qualifier code can be found on page 27 of 29 in the August 31, 2022 Leachate Analytical Report. 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.

Although efforts were made during this sampling event to reduce the turbidity, the turbidity value at MW-3 was 146 NTU at the time of sampling during this event, which was well above the recommended 10 NTU's. Total aluminum, cobalt, copper, iron, lead, and vanadium were detected in MW-3 during this event. However, the dissolved aluminum, cobalt, copper, iron, lead, and vanadium concentrations were below the respective laboratory PQL at MW-3 during this event. These reported total metals constituents were likely affected by the elevated turbidity observed at MW-3 at the time of sample collection. Therefore, the total metals concentrations from MW-3 reported during this August 2022 are not representative of actual groundwater conditions. However, the dissolved metals concentrations reported at MW-3 during this August 2022 event provide a better representation of groundwater conditions at MW-3. Therefore, the total metals concentrations reported at MW-3 during this August 2022 event were removed from the statistical database and replaced with the dissolved metals concentrations reported during this event.

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 was 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, mercury, and nickel 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 (aluminum, barium, total cadmium, chloride, chromium, 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 aluminum, barium, total cadmium, chloride, chromium, fluoride, nickel, 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 (SSIs) were identified in up-gradient well MW-1 during this event. When considering data since the November 10, 2016 sampling event, statistically significant trends in data from MW-1 were observed using the Mann-Kendall trend analyses at the 95% confidence level. Trend analyses for MW-1 revealed statistically significant upward trends in aluminum, barium and cobalt concentrations. In addition, trend analyses for MW-1 revealed a statistically significant downward trend in chloride concentrations. There were no distinct statistically significant trends in concentrations for the detected arsenic, mercury, and nickel concentrations at MW-1.

SSIs over background identified for the current monitoring event include cadmium at MW-3; chloride at MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3; zinc at MW-3; and sulfate at MW-3. 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 aluminum concentrations at TMW-2; barium concentrations at MW-3; cadmium concentrations at MW-3; chromium concentrations at TMW-2; 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 cadmium concentration observed at MW-3 indicated an SSI in reported concentrations using inter-well non-parametric prediction limits by using cadmium concentrations observed at the up-gradient monitoring location (MW-1) as background for comparison. The dissolved cadmium detections at MW-3 were used for statistical analysis and were below the respective EPA MCL during this event. The Mann-Kendall method identified a statistically significant trend for cadmium concentrations at MW-3 when considering data from the past 26 sampling events since November 10, 2016. The cadmium results during this August 2022 sampling event are similar to the previous sampling events prior to February 2022. During the two most previous sampling events in February 2022 and May 2022, total cadmium was not detected above the laboratory PQL (<0.001 mg/l).

The chloride concentrations observed at MW-3 (28.3 mg/l), MW-4 (11.7 mg/l), MW-5 (66.4 mg/l), TMW-1 (43.1 mg/l), TMW-2 (42.8 mg/l), and TMW-3 (65.4 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 chromium concentrations observed at MW-4 (0.00331 mg/l), MW-5 (0.00563 mg/l), and TMW-2 (0.00226 mg/l) were less than the MCL (0.1 mg/l), and did not produce SSIs in reported

concentrations during this event. When considering chromium data from MW-4 and MW-5 since November 2016, the data did not show an upward or downward trend in chromium concentrations using the Mann-Kendall trend analysis at the 95% confidence level. In addition, the total chromium data from TMW-2 indicated a downward trend in concentrations when considering total chromium data at TMW-2 since November 2016.

A 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 (45.0 mg/l) remains below the 2DWS of 250 mg/l. Sulfate was also detected in MW-5 (13.2 mg/l) during this August 2022 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 during this event.. 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 second quarter assessment-monitoring event of 2022 are summarized as follows:

- SSIs during this May 2022 event included chloride (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3), cadmium (MW-3), zinc (MW-3), and sulfate (MW-3).
- The total cadmium detections at MW-3 and the duplicate sample collected from MW-3 were just over the respective EPA MCL. However, the dissolved cadmium detections at MW-3 and the duplicate sample collected from MW-3 were below the respective EPA MCL. Although efforts were made during this sampling event to reduce the turbidity, the turbidity value at MW-3 was 146 NTU at the time of sampling during this event, which was well above the recommended 10 NTU's. These reported total metals constituents were likely affected by the elevated turbidity observed at MW-3 at the time of sample collection, and the dissolved metals concentrations reported at MW-3 during this August 2022 event provide a better representation of groundwater conditions at MW-3 and are appropriate for statistical analysis. Therefore, the total metals concentrations reported at MW-3 during this August 2022 event were removed from the statistical database and replaced with the dissolved metals concentrations reported during this event. Although cadmium was indicated as an SSI during this event, the Mann-Kendall trend analysis indicated a statistically significant downward trend in total cadmium concentrations since November 2016. Also, the total cadmium non-detect value observed at MW-3 during recent monitoring events in February 2022 and May 2022 continues to show that the total cadmium levels at MW-3 have generally improved since closure activities have been completed. In addition, there have been no cadmium detections from groundwater samples obtained from temporary monitoring wells TMW-2 and TMW-3 that are immediately down-gradient of MW-3.
- Based on the field data sheets, the rate of groundwater recharge at MW-3 was minimal during purging activities during this event compared to previous events. In addition, the observed precipitation in the area during the months of July and August was very low compared to previous years. The lack of precipitation in the area likely contributed to the low rate of water recharge, which may have inadvertently affected the turbidity at MW-3 during this event. It is the opinion of CEC that the observed turbidity value and total metals concentrations reported at MW-3 during this sampling event may be anomalous, and more representative samples (lower turbidity samples) should be collected at MW-3 during future monitoring events.
- 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 aluminum concentrations at TMW-2; barium concentrations at MW-3; total cadmium concentrations at MW-3; chromium concentrations in TMW-2; 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 during this event.

- A 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 concentration remains 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 fourth quarter 2022 assessment-monitoring event is tentatively scheduled for November 2022 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. As mentioned previously, the amount of leachate produced from the IWC and APWC has been minimal since the landfill was capped, and the leachate being pumped from the IWC and APWC cells has been intermittent. If possible, leachate samples will also be collected from the APWC and IWC during the third quarter 2022 assessment-monitoring event.

Since the former EWS Class II Landfill site remains in assessment monitoring, a private water use survey update is required annually. An annual water use survey update for the former EWS Class II Landfill site was completed by CEC in November 2021, and no new wells or springs were identified within the required search radius for the site during the November 2021 update. The next scheduled water use survey update is tentatively scheduled for November 2022.

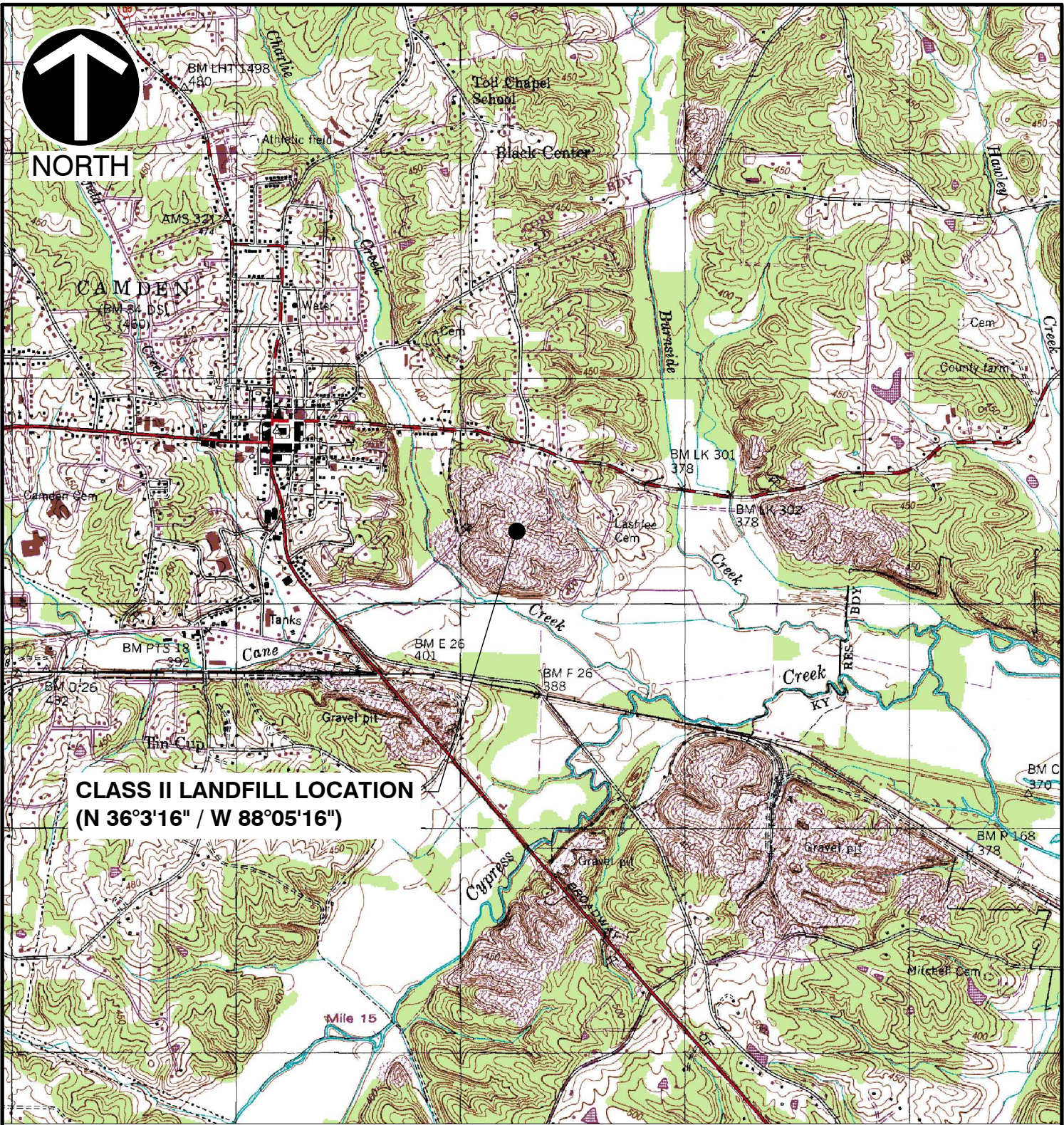
7.0 RECOMMENDATIONS

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. As mentioned in this report, the observed turbidity value at MW-3 during this monitoring event was well above the recommended 10 NTUs, and the total metals concentrations reported at MW-3 during this sampling event do not provide representative data for statistical analysis. Therefore, the total metals concentrations reported at MW-3 during this August 2022 event were removed from the statistical database and replaced with the dissolved metals concentrations for this event. More representative samples (lower turbidity samples) should be collected at MW-3 during future monitoring events. It is recommended that the dissolved metals data reported during this August 2022 event remain in the dataset for statistical evaluations of total metals during future events.

APPENDIX A
MAPS & TABLES

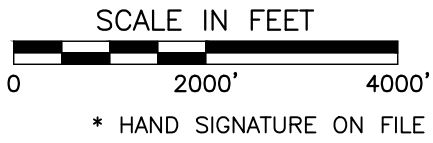
P:\2018\181-364\CADD\DWG\181-364-FIGURE 1 - SITE LOCATION MAP.dwg[LAYOUT1] LS:(10/12/2022 - pcampbell) - LP: 10/12/2022 3:48 PM



**CLASS II LANDFILL LOCATION
(N 36°3'16" / W 88°05'16")**

REFERENCE

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



Civil & Environmental Consultants, Inc.
117 Seaboard Lane · Suite E-100 · Franklin, TN 37067
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www.cecinc.com

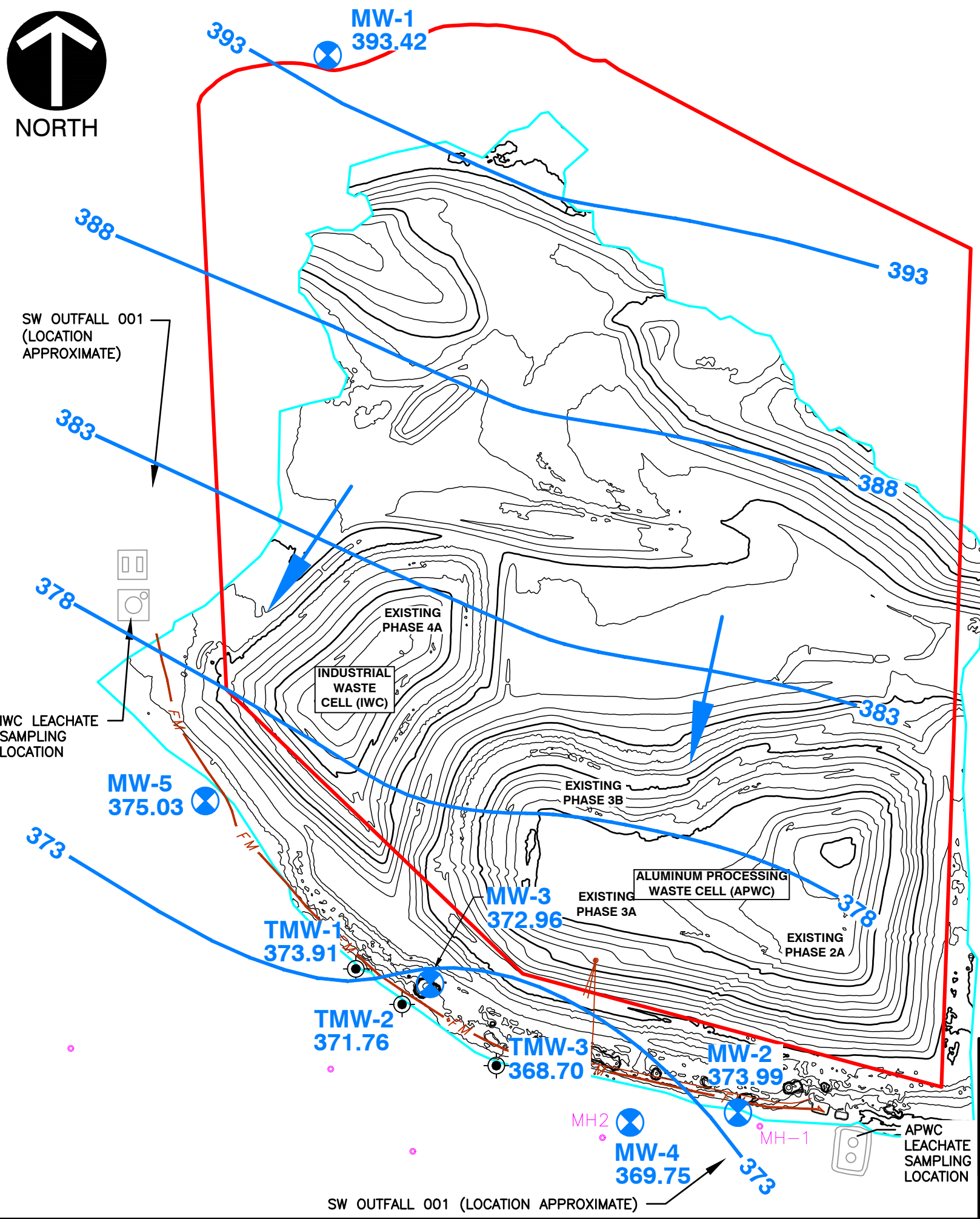
FORMER EWS SITE
CLASS II CAMDEN LANDFILL
CAMDEN, TENNESSEE

SITE LOCATION MAP 3Q2022

DRAWN BY:	AAB	CHECKED BY:	PJC	APPROVED BY:	KBW*	FIGURE NO.:	1
DATE:	SEPT 2022	DWG SCALE:	1"=2000'	PROJECT NO.:	181-364		



P:\2018\181-364\CADD\DWG\181-364_GROUNDWATER MAP AUGUST 2022.DWG(FIG 2 (2))\S:\PC\CAMPBELL - 10/12/2022 - 5:13:21_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.

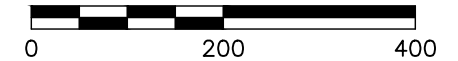
$$i = \frac{393.42' \text{ (MW-1)} - 369.75' \text{ (MW-4)}}{1,910'} = 0.0124 \text{ ft/ft}$$

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



*HAND SIGNATURE ON FILE



Civil & Environmental Consultants, Inc.

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www.cecinc.com

FORMER ENVIRONMENTAL WASTE SOLUTIONS
CAMDEN CLASS II LANDFILL
CAMDEN, TENNESSEE

AUGUST 2022
POTENTIOMETRIC SURFACE MAP

DRAWN BY:	AAB	CHECKED BY:	PC	APPROVED BY:	*KW	FIGURE NO.:	2
DATE:	OCTOBER 2022	DWG SCALE:	1"=200'	PROJECT NO:	181-364.0005		

Table 1
Former Environmental Waste Solutions Camden Class II Landfill
Field Parameters and Potentiometric Data - 3rd Quarter 2022

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)	Conductivity (µS/cm)	Specific Conductivity (µS/cm)	pH (SU)	Dissolved Oxygen (mg/l)	Oxidation Reduction Potential (mV)	Turbidity (NTU)
MW-1 (up-gradient)	8/11/2022	10:15	416.47	385.97	0.17	1.3	23.05	393.42	16.5	116.9	139.8	5.89	0.60	-1.4	9.89
MW-2*	8/11/2022	NS	380.35	367.70	0.17	1.1	6.36	373.99	25.5	219.4	217.4	6.26	3.99	122.9	NS
MW-3**	8/12/2022	10:20	392.90	365.10	0.17	1.3	19.94	372.96	22.7	223.7	234.0	5.33	1.72	208.8	146.0
MW-4	8/11/2022	11:40	381.47	358.37	0.17	1.9	11.72	369.75	16.6	74.3	88.6	6.21	3.53	170.1	1.28
MW-5	8/11/2022	11:10	385.25	351.40	0.17	4.0	10.22	375.03	17.2	257.9	301.9	5.44	1.31	186.9	9.07
TMW-1	8/11/2022	9:50	381.19	348.99	0.085	1.1	7.28	373.91	17.9	164.4	190.6	5.37	3.40	229.0	8.83
TMW-2	8/11/2022	11:15	384.27	356.77	0.085	0.6	12.51	371.76	18.1	155.6	179.1	5.41	4.97	235.2	8.0
TMW-3	8/11/2022	12:15	381.37	353.37	0.085	0.7	12.67	368.70	18.5	262.5	299.7	5.21	1.00	191.8	9.21
Leachate (IWC-L)	8/11/2022	13:05	NA	NA	NA	NA	NA	NA	22.8	188,144	195,705	3.30	2.72	295.0	12.70
***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 August 11, 2022.

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

**Elevated turbidity observed at MW-3 during purging on 8/11/22. Therefore, MW-3 was collected for analysis on 8/12/22.

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

NS= Not Sampled

NA= Not Applicable.

**Table 2
Former EWS Camden Class II Landfill IDL 03-0212 (Terminated)
Groundwater and Leachate Analytical Data - 3rd Quarter 2022**

Parameter	MCL/GWPS (mg/l)	(upgradient) MW-1		MW-3		Duplicate (MW-3)		MW-4		MW-5		TMW-1		TMW-2		TMW-3		IWC-Leachate*		APWC-Leachate**		Field Blank	
		8/11/2022	Qualifer	8/12/2022	Qualifer	8/12/2022	Qualifer	8/11/2022	Qualifer	8/11/2022	Qualifer	8/11/2022	Qualifer	8/11/2022	Qualifer	8/11/2022	Qualifer	8/11/2022	Qualifer	8/11/2022	Qualifer	8/11/2022	Qualifer
		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)	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	-	25.5		61.2		61.8		28.4		80.6		63.3		57.9		82.6		46.800		NS**		<2.50	
Alkalinity	-	57.3		20.0		22.0		21.7		<20.0		<20.0		25.1		20.2		<20.0		NS**		<20.0	
Ammonia Nitrogen	-	<0.250		<0.250		<0.250		<0.250		<0.250		<0.250		<0.250		<0.250	J5	1,740		NS**		<0.250	
COD	-	<20.0		<20.0		<20.0		<20.0		<20.0		<20.0		<20.0		<20.0		9,250		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, Dissolved	-			<0.200		<0.200												<2.00					
Bromide	-	<1.00		<1.00		<1.00		<1.00		<1.00		<1.00		<1.00		<1.00		<100		NS**		<1.00	
Chloride	250 ²	4.20		28.3		27.6		11.7		66.4		43.1		42.8		65.4		112,000		NS**		<1.00	
Fluoride	2 ²	<0.150		<0.150		<0.150		<0.150		<0.150		<0.150		<0.150		<0.150		<15.0		NS**		<0.150	
Nitrate	10 ¹	<0.100		0.718		0.672		1.11		0.946		1.65		0.865		6.45		<10.0		NS**		<0.100	
Sulfate	250 ²	5.52		45.0		48.7		<5.00		13.2		<5.00		<5.00		<5.00		1,060		NS**		<5.00	
Aluminum	0.2 ²	0.139		2.46		1.96		<0.100		0.264		<0.100		0.290		<0.100		383		NS**		<0.100	
Aluminum, Dissolved	0.2 ²	-		<0.100		<0.100		-		-		-		-		-		355		NS**		-	
Arsenic	0.01	0.023		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		0.302		NS**		<0.00200	
Arsenic, Dissolved	0.01	-		<0.00200		<0.00200		-		-		-		-		-		0.289		NS**		-	
Barium	2	0.0204		0.095		0.0824		0.0086		0.0487		0.0138		0.0307		0.0434		3.02		NS**		0.00209	
Barium, Dissolved	2	-		0.0629		0.0644		-		-		-		-		-		2.840		NS**		-	
Total Cadmium	0.005	<0.00100		0.00555		0.00503		<0.00100		<0.00100		<0.00100		<0.00100		<0.00100		9.06		NS**		<0.00100	
Cadmium, Dissolved	0.005	-		0.00387		0.00383		-		-		-		-		-		8.71		NS**		-	
Calcium	-	4.94		14.7		14.8		5.92		15.2		17.0		14.1		21.2		16,500		NS**		<1.00	
Calcium, Dissolved	-	-		14.6		14.6		-		-		-		-		-		15,700		NS**		-	
Chromium	0.1	<0.00200		0.00811		0.00475		0.00331		0.00563		<0.00200		0.00226		<0.00200		<0.200		NS**		<0.00200	
Chromium, Dissolved	0.1	-		<0.00200		<0.00200		-		-		-		-		-		<0.200		NS**		-	
Cobalt	0.006 ³	0.0582		0.00218		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		0.457		NS**		<0.00200	
Cobalt, Dissolved	0.006 ³	-		<0.00200		<0.00200		-		-		-		-		-		0.451		NS**		-	
Copper	1.3	<0.00500		0.00526		<0.00500		<0.00500		<0.00500		<0.00500		<0.00500		<0.00500		0.936		NS**		<0.00500	
Copper, Dissolved	1.3	-		<0.00500		<0.00500		-		-		-		-		-		0.925		NS**		-	
Iron	0.3 ²	16.8		3.07		2.48		0.13		0.278		<0.100		0.247		0.104		468		NS**		<0.100	
Iron, Dissolved	0.3 ²	-		<0.100		<0.100		-		-		-		-		-		457		NS**		-	
Lead	0.015	<0.00200		0.00412		0.00286		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		0.92		NS**		<0.00200	
Lead, Dissolved	0.015	-		<0.00200		<0.00200		-		-		-		-		-		0.948		NS**		-	
Magnesium	-	3.2		5.97		6.01		3.30		10.40		5.09		5.49		7.19		1,340		NS**		<1.00	
Magnesium, Dissolved	-	-		5.59		5.50		-		-		-		-		-		1,210		NS**		-	
Manganese	0.05 ²	0.934		0.177		0.137		0.0152		0.232		0.00547		0.00665		0.00953		24		NS**		<0.00500	
Manganese, Dissolved	0.05 ²	-		0.102		0.104		-		-		-		-		-		23.1		NS**		-	
Nickel	0.10 ¹	0.00737		0.00617		0.00635		<0.00200		0.00774		<0.00200		<0.00200		<0.00200		0.638		NS**		<0.00200	
Nickel, Dissolved	0.10 ¹	-		0.005		0.0051		-		-		-		-		-		0.642		NS**		-	
Potassium	-	<2.00		5.83		5.71		<2.00		<2.00		<2.00		<2.00		<2.00		17,300		NS**		<2.00	
Potassium, Dissolved	-	-		5.53		7.45		-		-		-		-		-		15,700		NS**		-	
Selenium	0.05	<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		0.241		NS**		<0.00200	
Selenium, Dissolved	0.05	-		<0.00200		<0.00200		-		-		-		-		-		0.21		NS**		-	
Sodium	-	4.05		13.9		12.6		3.77		18.3		4.55		5.66		15.0		22,900		NS**		<2.00	
Sodium, Dissolved	-	-		12.5		15.4		-		-		-		-		-		27,600		NS**		-	
Thallium	0.002	<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.00200		<0.200		NS**		<0.00200	
Thallium, Dissolved	0.002	-		<0.00200		<0.00200		-		-		-		-		-		<0.200		NS**		-	
Vanadium	-	<0.00500		0.00669		0.00587		<0.00500		<0.00500		<0.00500		<0.00500		<0.00500		<0.500		NS**		<0.00500	
Vanadium, Dissolved	-	-		<0.00500		<0.00500		-		-		-		-		-		<0.500		NS**		-	
Zinc	5 ²	0.025		0.0505		0.0596		<0.0250		<0.0250		<0.0250		<0.0250		<0.0250		93.5		NS**		<0.0250	
Zinc, Dissolved	5 ²	-		0.0658		0.0692		-		-		-		-		-		91.1		NS**		-	

Acetone	-	<0.0500		<0.0500		<0.0500	J4	<0.0500		<0.0500	J4	<0.0500	J4	<0.0500	J4	2.81		NS**		<0.0500	
Carbon Disulfide		<0.00100	J4	<0.00100	J4	<0.00100		<0.00100	J4	<0.00100	J4	<0.00100	J4	<0.00100	J4	0.0491		NS**		<0.00100	J4
2-Butanone (MEK)		<0.0100		<0.0100		<0.0100		<0.0100		<0.0100		<0.0100		<0.0100		0.24		NS**		<0.0100	

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.

Qualifiers:

Table 3
Intra-Well and Inter-Well Statistical Summary
Environmental Waste Solutions Camden Class II Landfill IDL 03-0212 (Terminated)
Inorganic Analytical Data - 3rd Quarter 2022

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
Aluminum	MW-1	57.89	non-parametric	Pass	--	No	Upward Trend
Arsenic	MW-1	0.00	non-parametric	Pass	--	No	No Trend
Barium	MW-1	7.89	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	Upward Trend
Nickel	MW-1	28.95	non-parametric	Pass	--	No	No Trend
Zinc	MW-1	29.73	non-parametric	Pass	--	No	No Trend

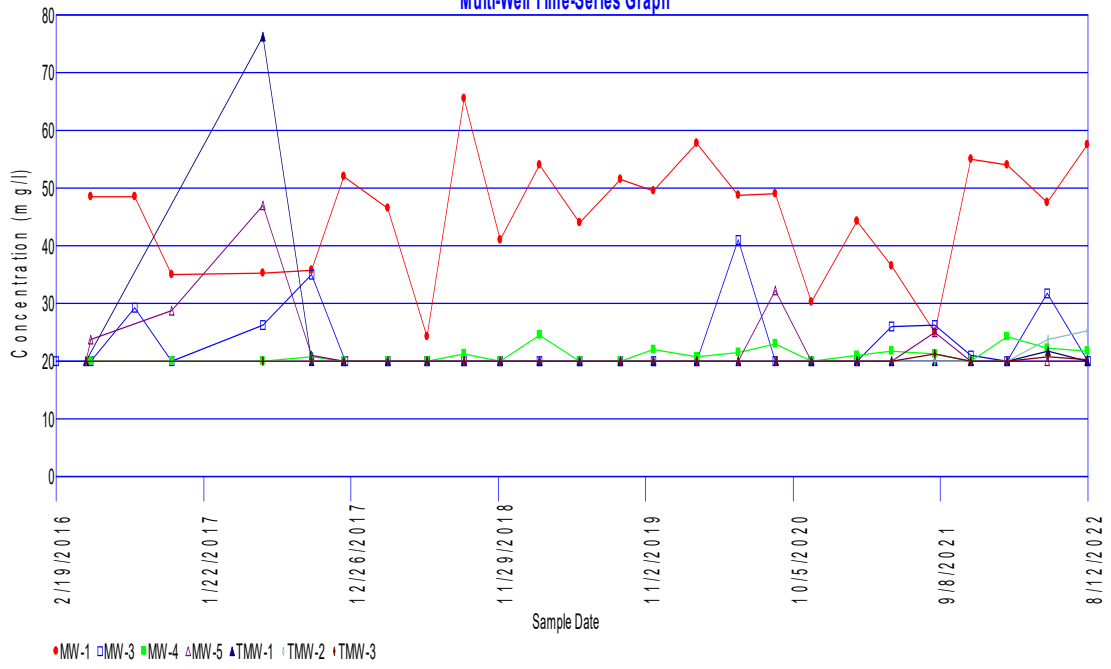
Inter-Well Statistical Summary (Downgradient Compliance Wells)							
Constituent	Well	% Non Detects in Background well MW-1	Normality (background MW-1)	Inter-well NPPL	Inter-well PPL	SSI	Mann-Kendall Trend Analysis ¹
Aluminum	MW-5	57.89	non-parametric	Pass	--	No	No Trend
	TMW-2		non-parametric	Pass	--	No	Downward Trend
Barium	MW-3*	7.89	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
Cadmium	MW-3*	100.00	non-parametric	Fail		Yes	Downward 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
Chromium	MW-4	92.11	non-parametric	Pass	--	No	No Trend
	MW-5		non-parametric	Pass	--	No	No Trend
	TMW-2		non-parametric	Pass	--	No	Downward Trend
Nickel	MW-3*	28.95	non-parametric	Pass	--	No	No Trend
	MW-5		non-parametric	Pass	--	No	No Trend
Zinc	MW-3*	73.68	non-parametric	Fail	--	Yes	Downward Trend
Sulfate	MW-3	58.33	non-parametric	Fail	--	Yes	No Trend
	MW-5		non-parametric	Pass	--	No	Upward Trend

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

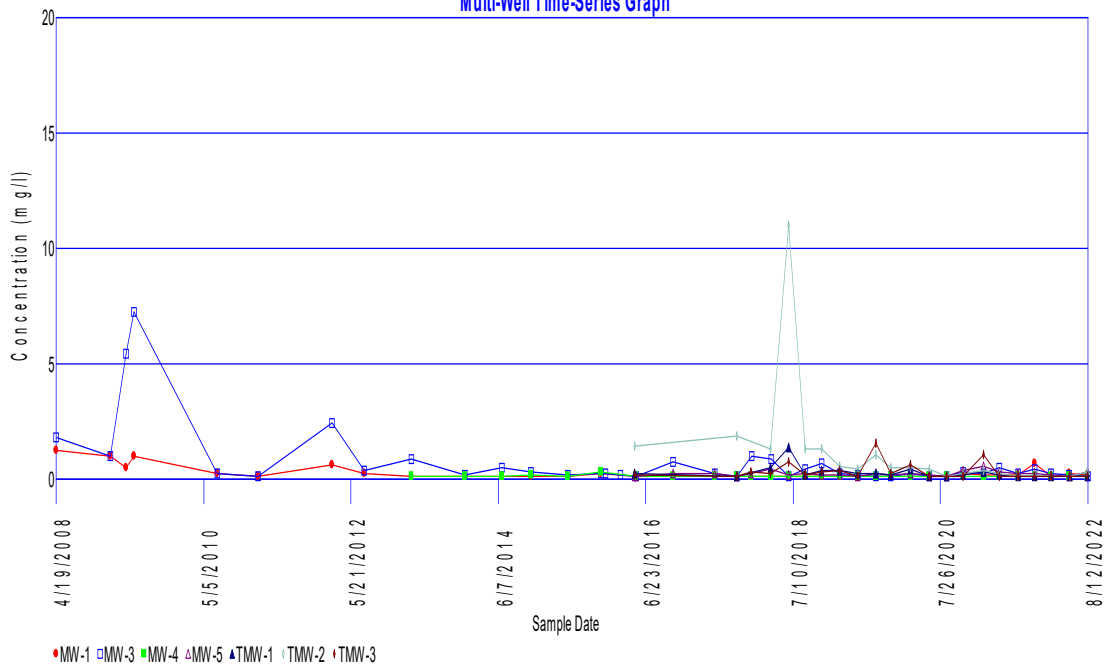
* Due to elevated turbidity at MW-3, the dissolved barium, cadmium, nickel, and zinc concentrations reported in MW-3 during the current August 2022 event were used for statistical analysis.

APPENDIX B
STATISTICAL EVALUATIONS & TIME SERIES PLOTS

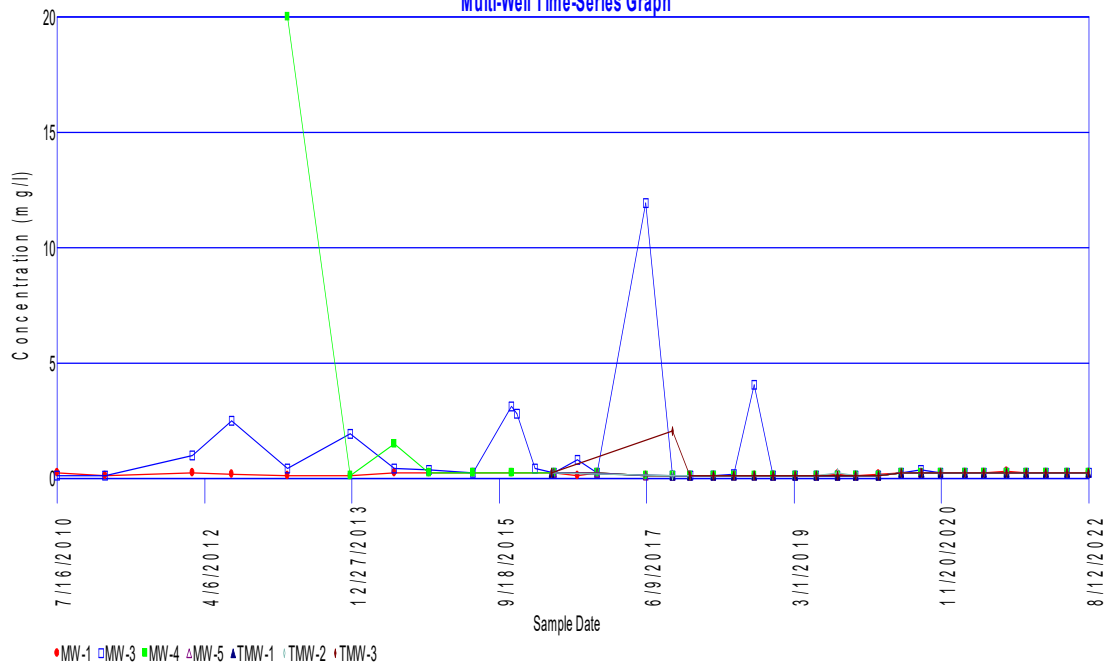
Alkalinity Multi-Well Time-Series Graph



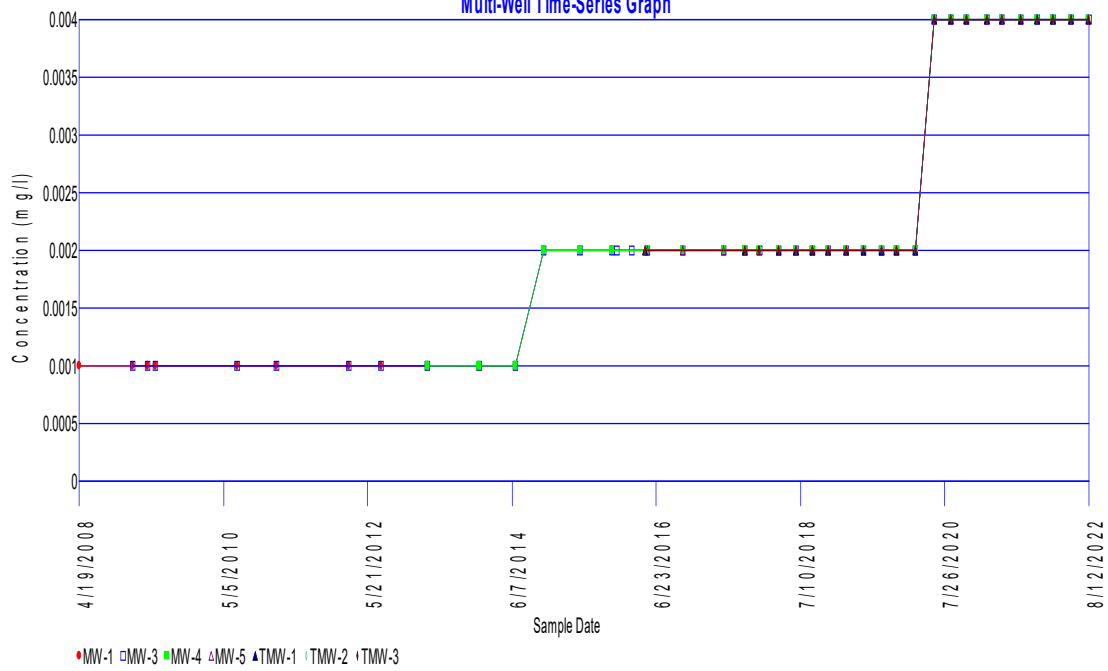
Aluminum Multi-Well Time-Series Graph

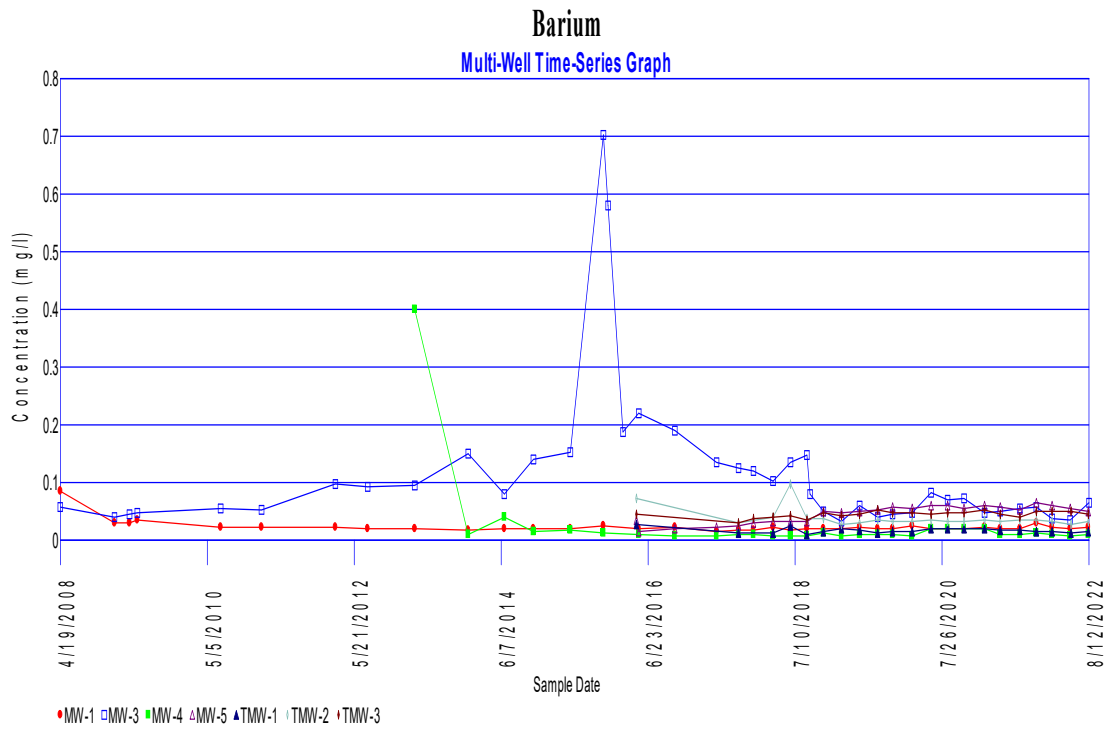
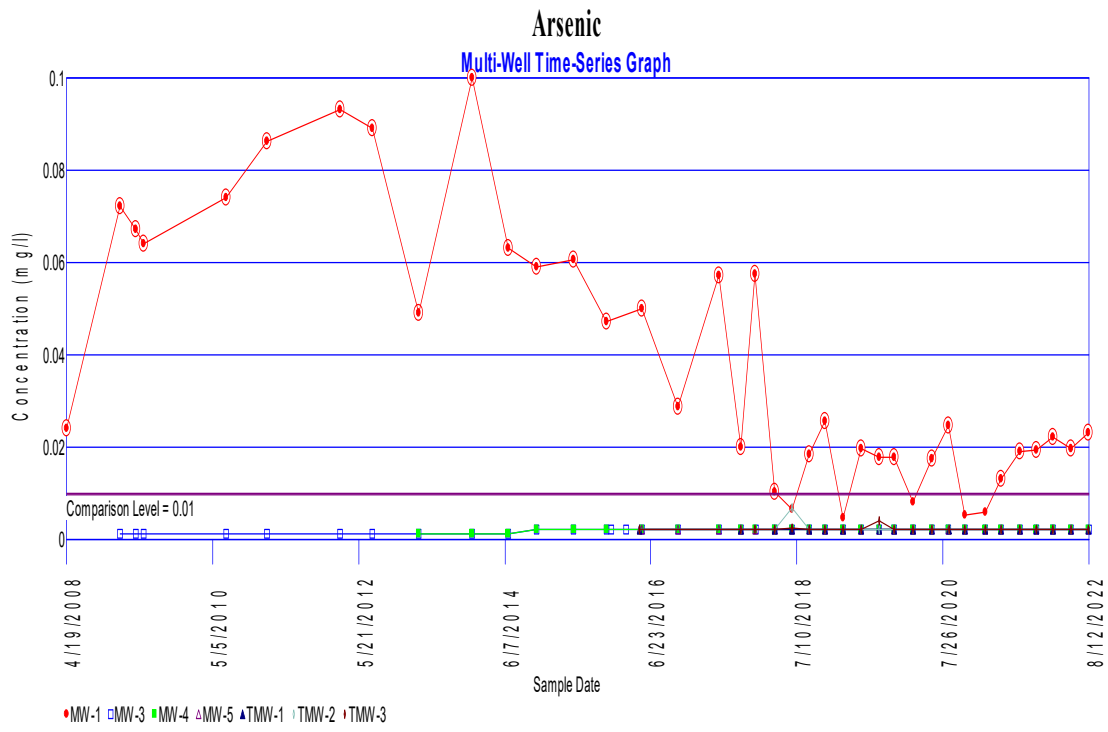


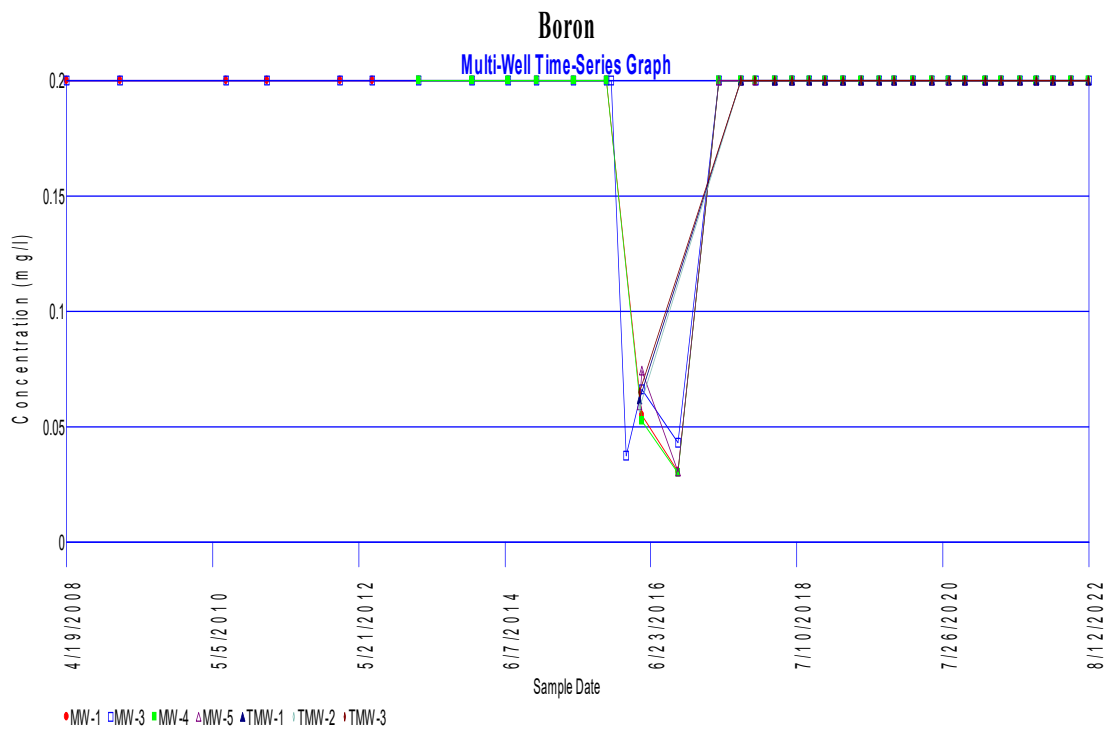
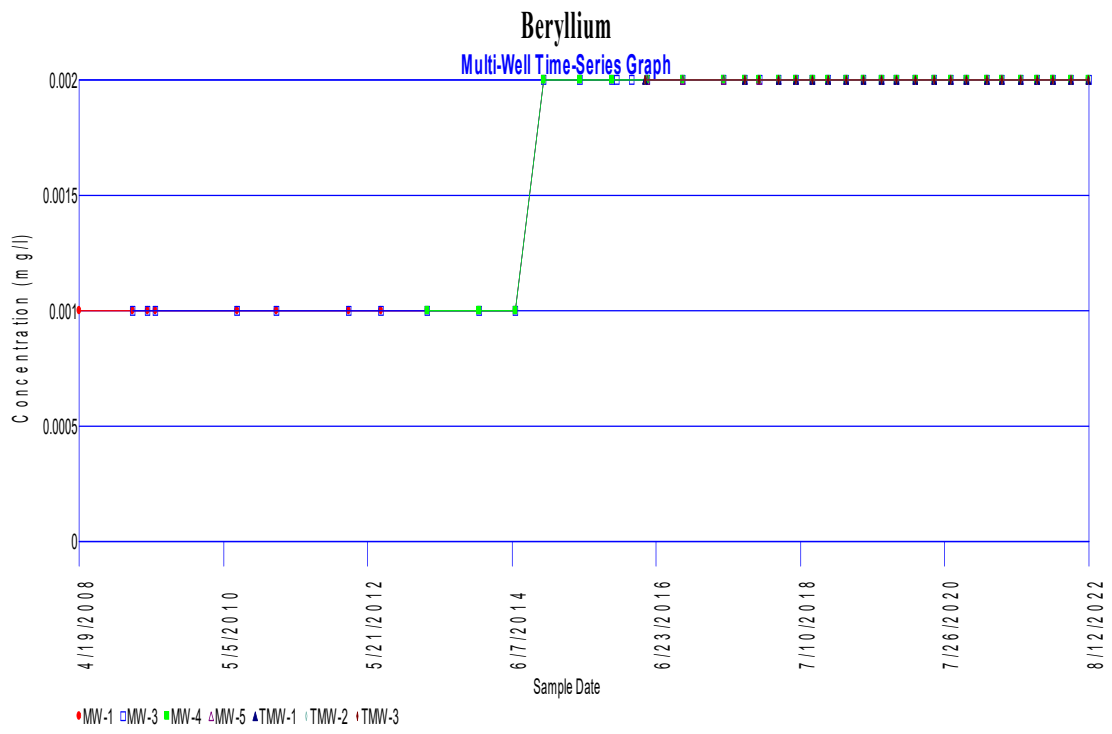
Ammonia Nitrogen Multi-Well Time-Series Graph



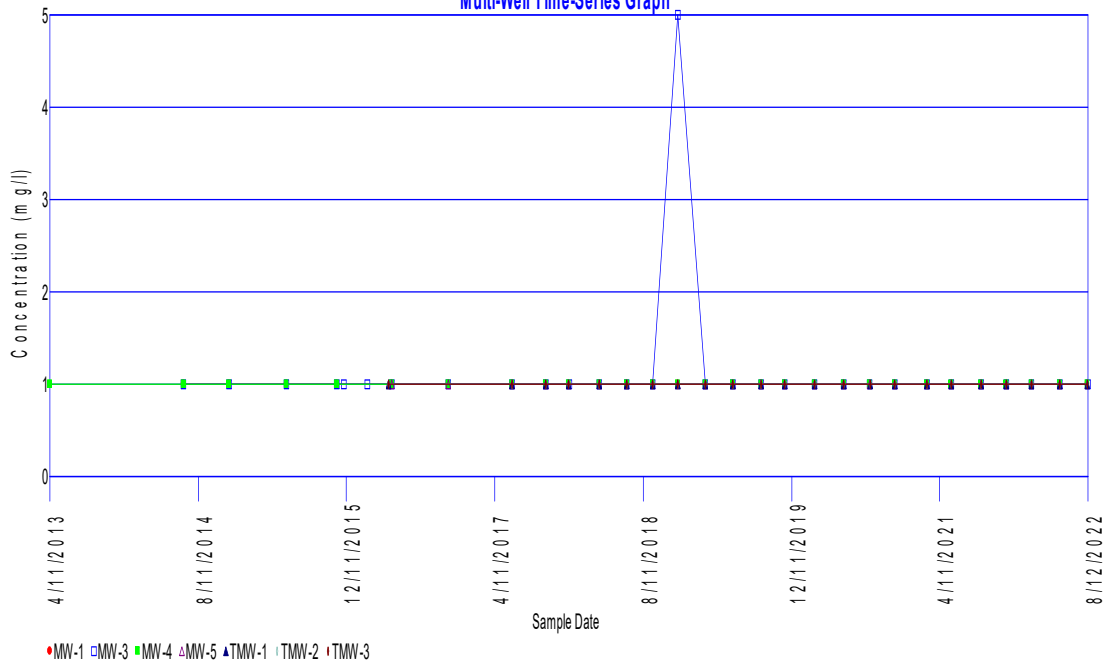
Antimony Multi-Well Time-Series Graph



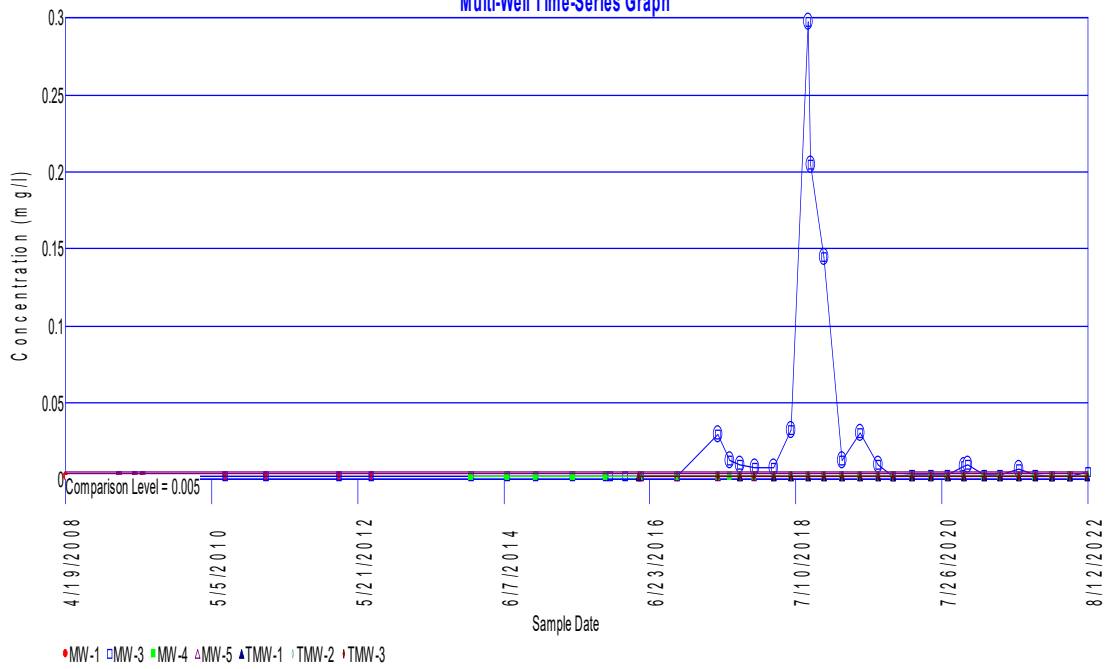




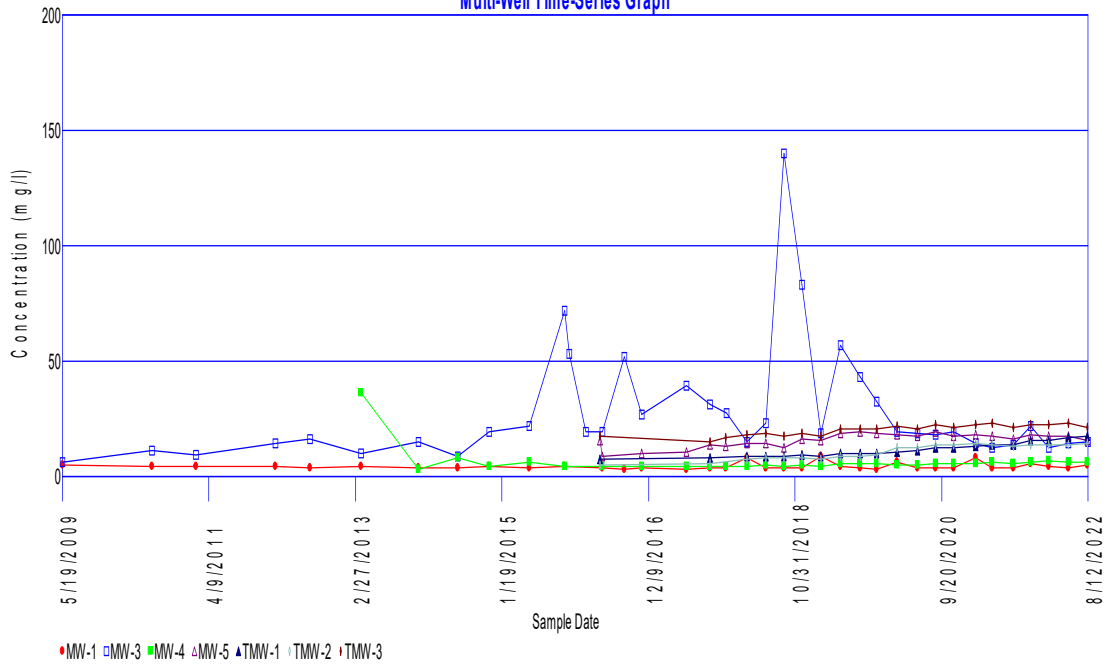
Bromide Multi-Well Time-Series Graph



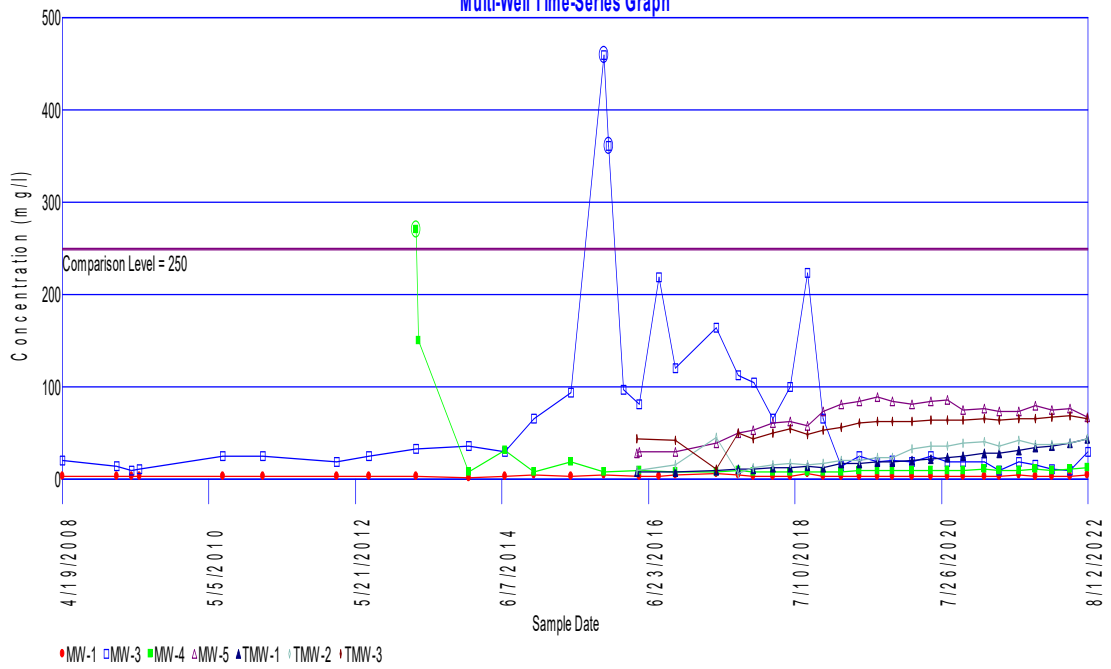
Total Cadmium Multi-Well Time-Series Graph



Calcium Multi-Well Time-Series Graph

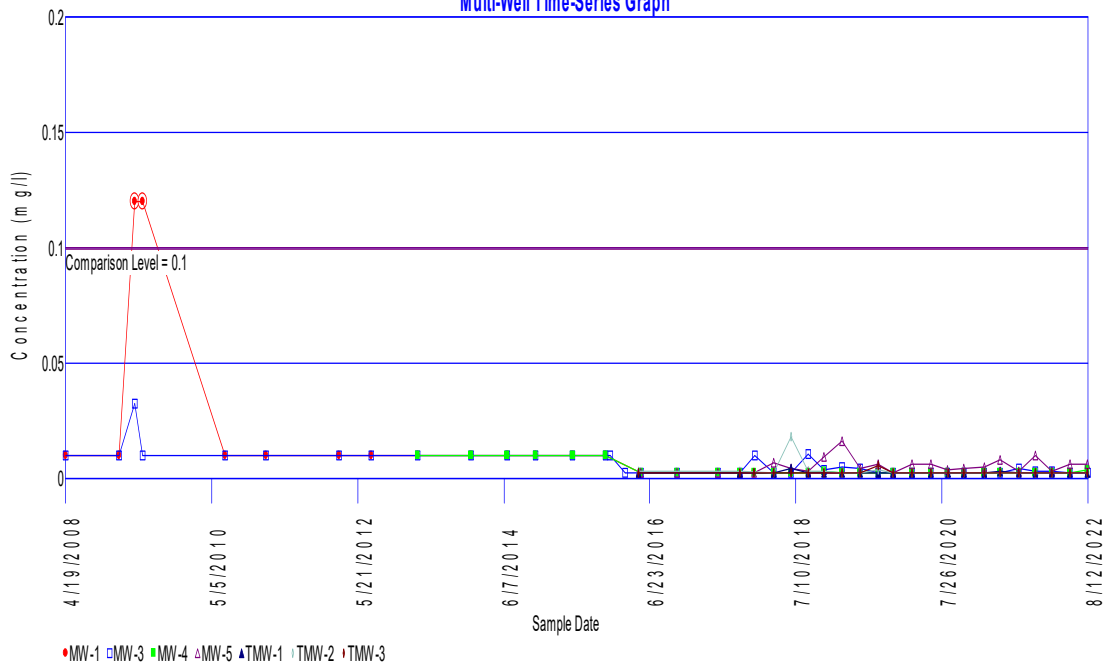


Chloride Multi-Well Time-Series Graph



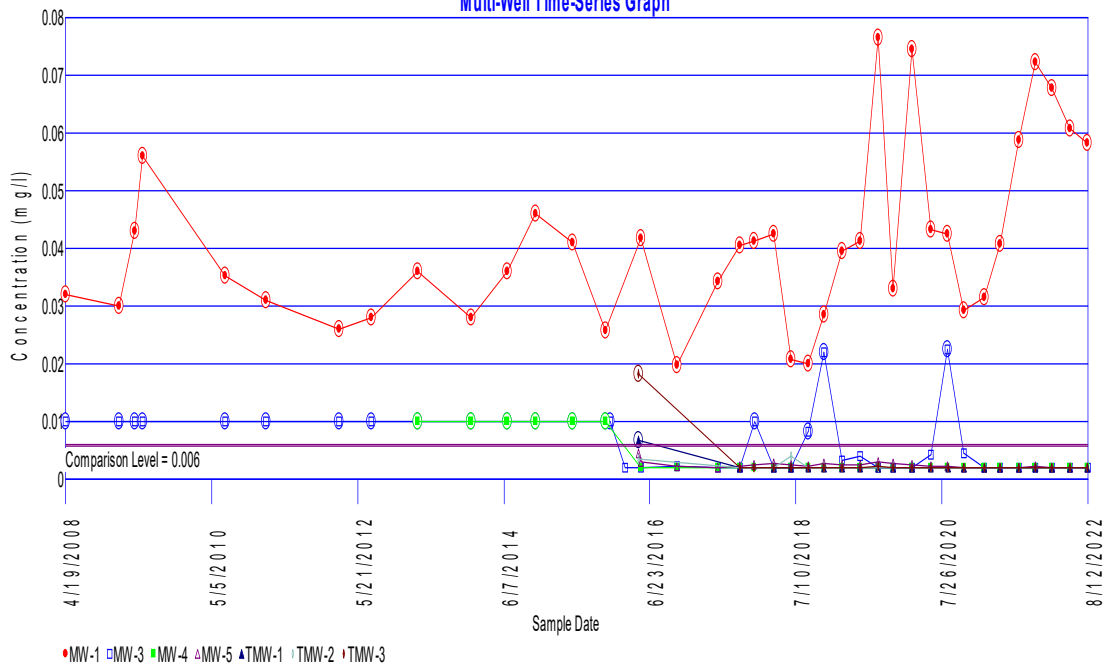
Chromium

Multi-Well Time-Series Graph



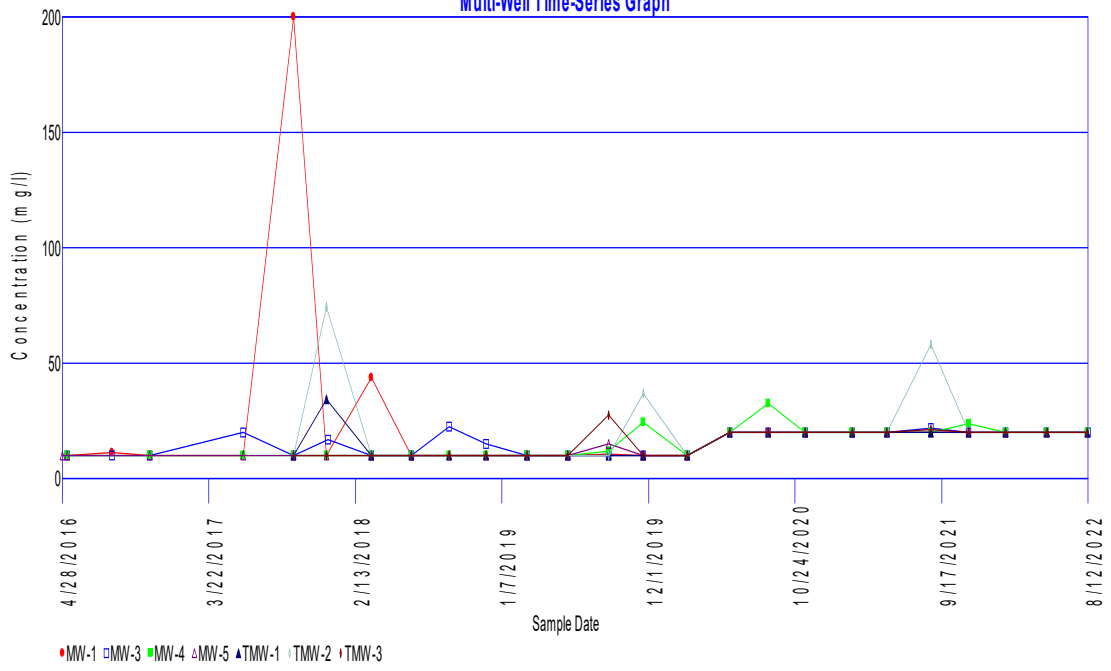
Cobalt

Multi-Well Time-Series Graph



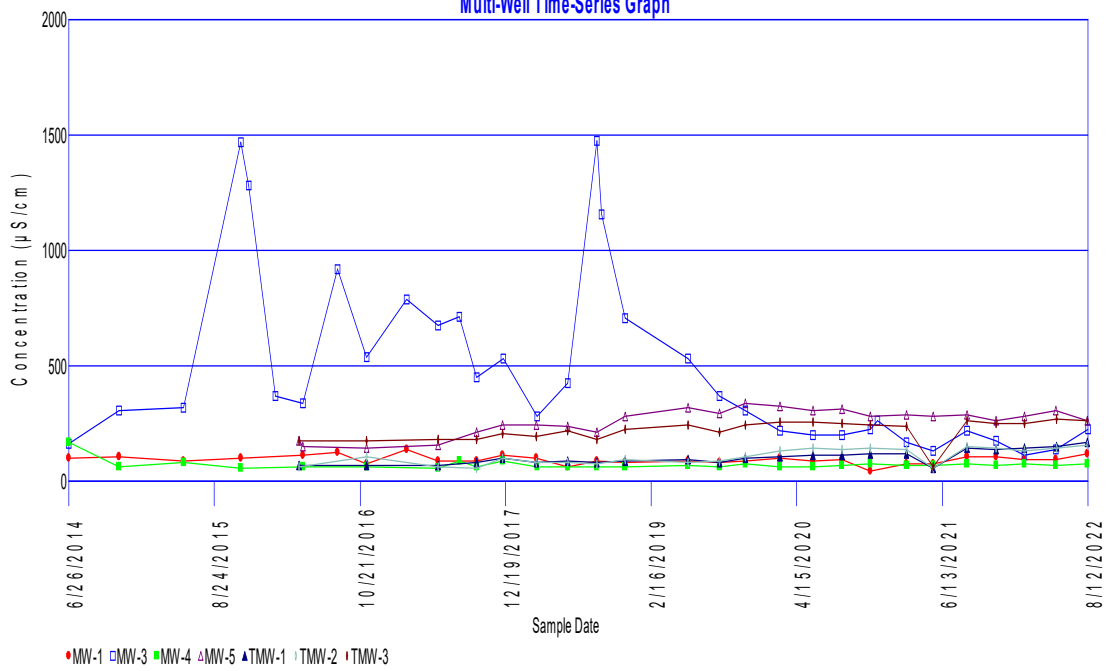
COD

Multi-Well Time-Series Graph

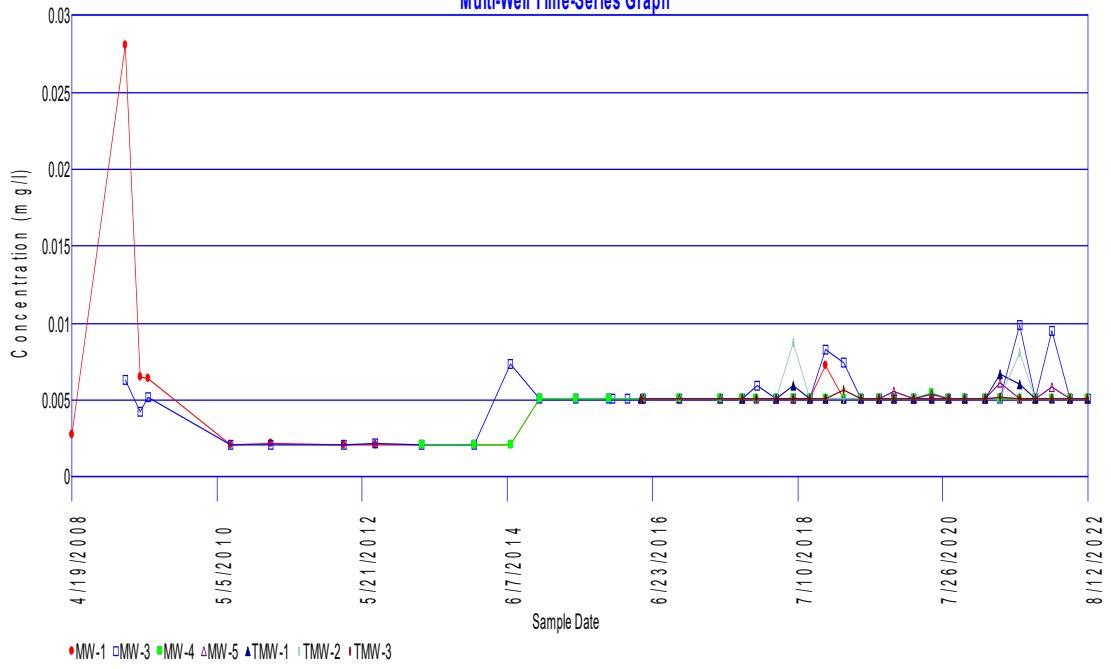


Conductivity

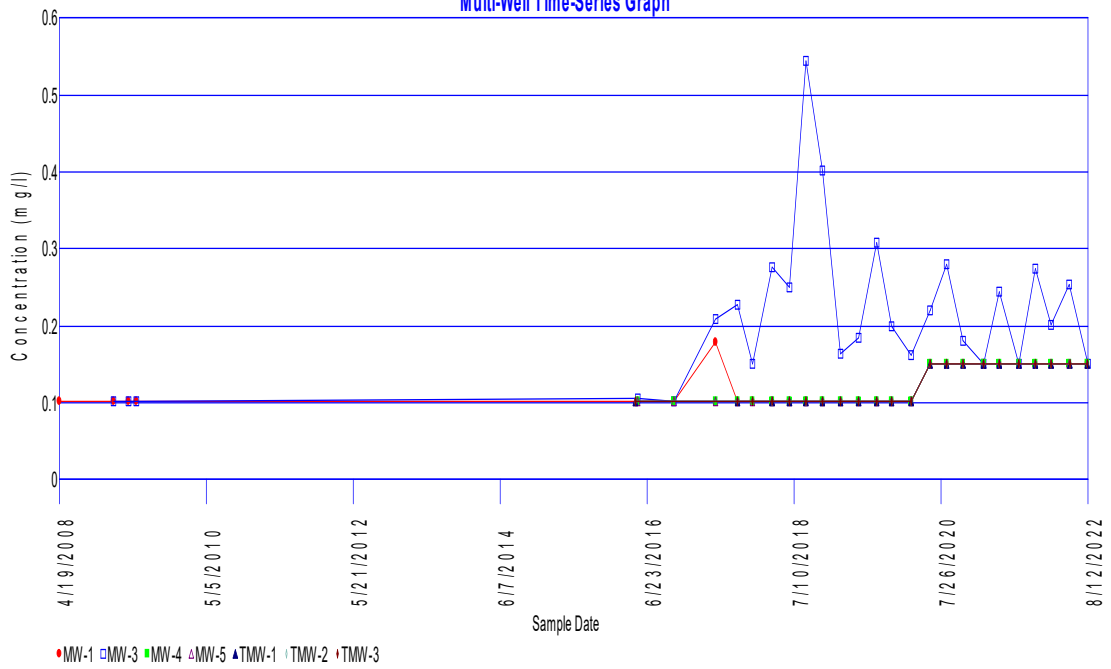
Multi-Well Time-Series Graph



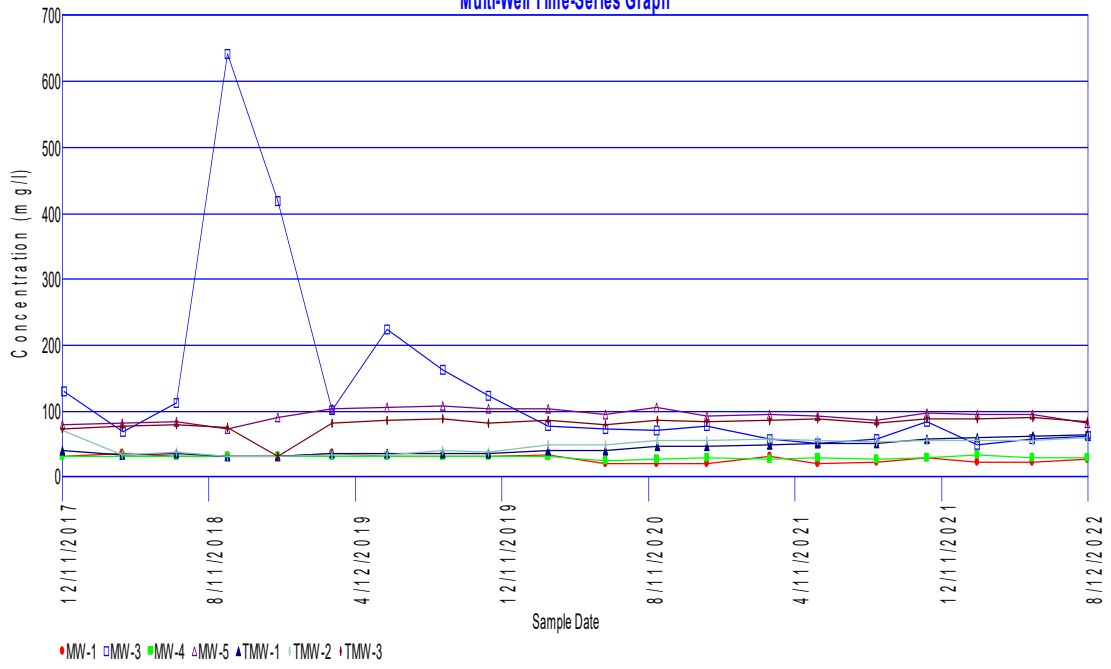
Copper Multi-Well Time-Series Graph



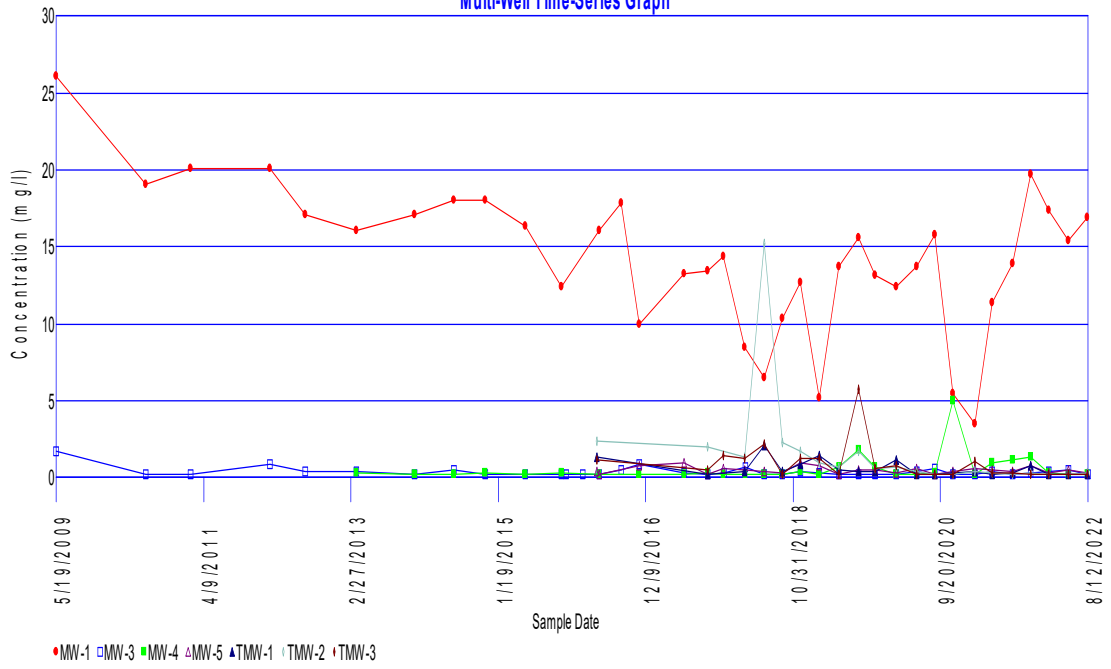
Fluoride Multi-Well Time-Series Graph



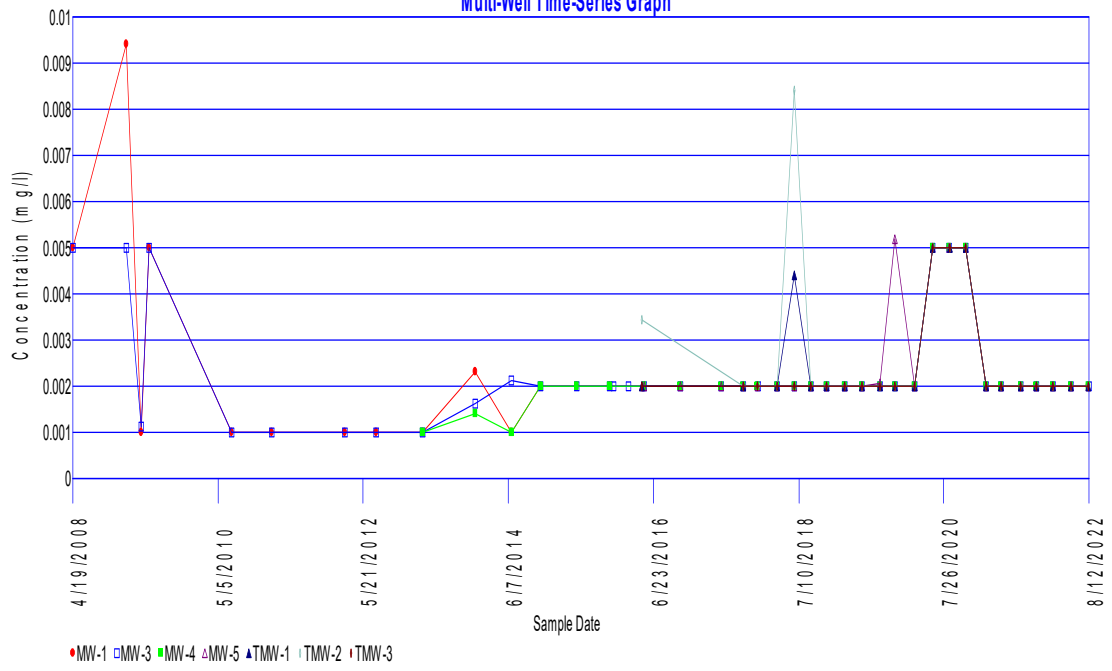
Hardness Multi-Well Time-Series Graph



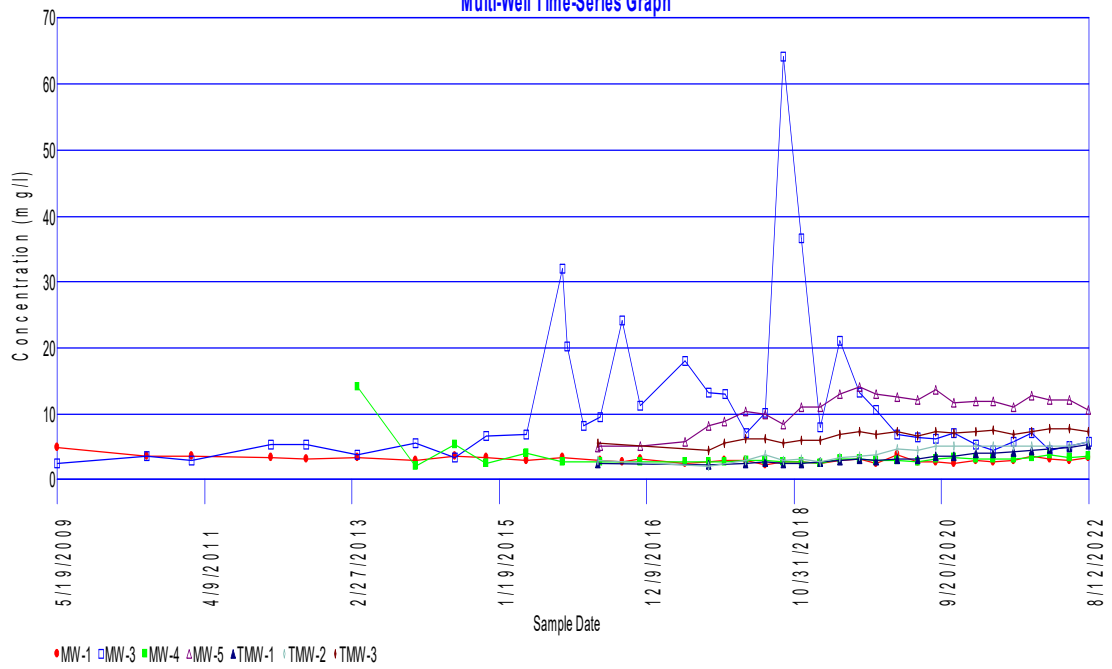
Iron Multi-Well Time-Series Graph



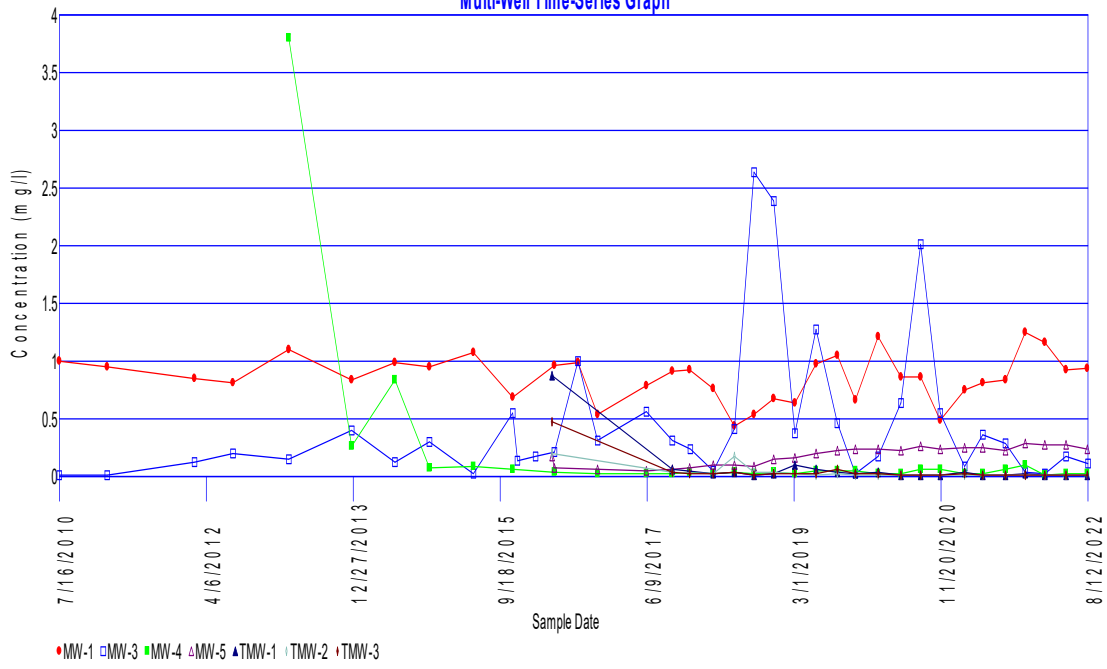
Lead Multi-Well Time-Series Graph



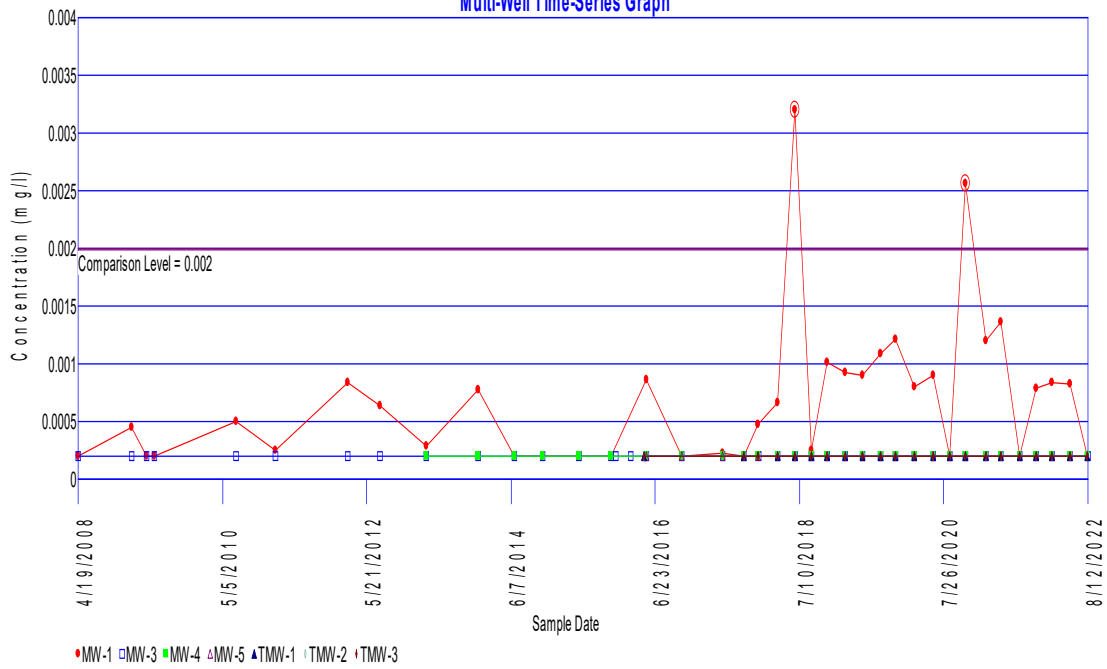
Magnesium Multi-Well Time-Series Graph



Manganese Multi-Well Time-Series Graph

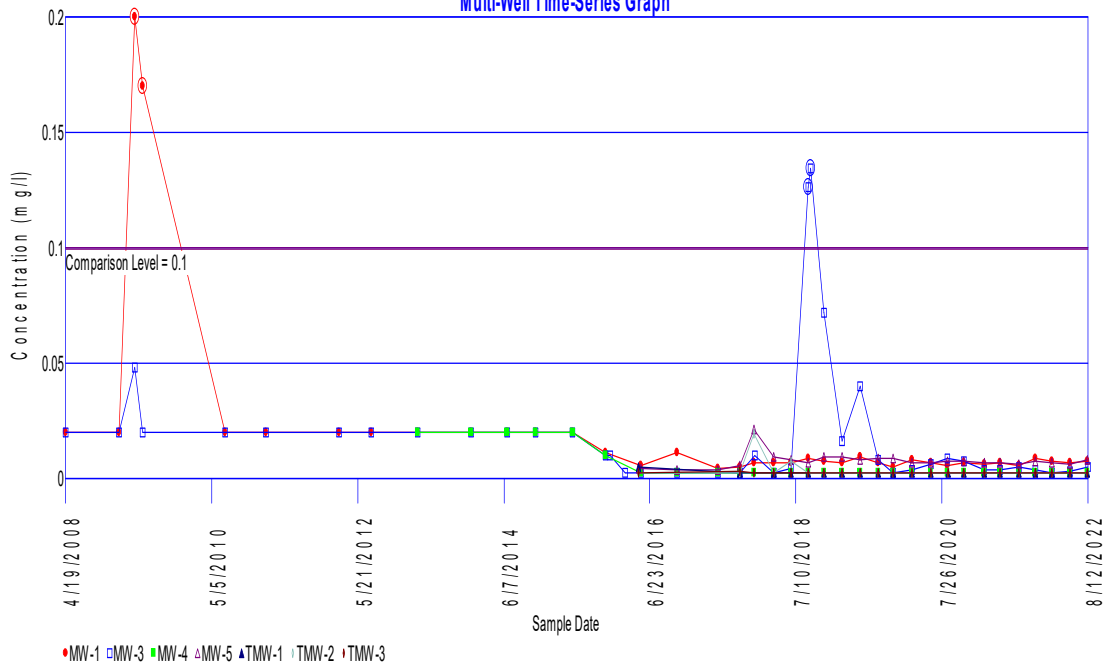


Mercury Multi-Well Time-Series Graph



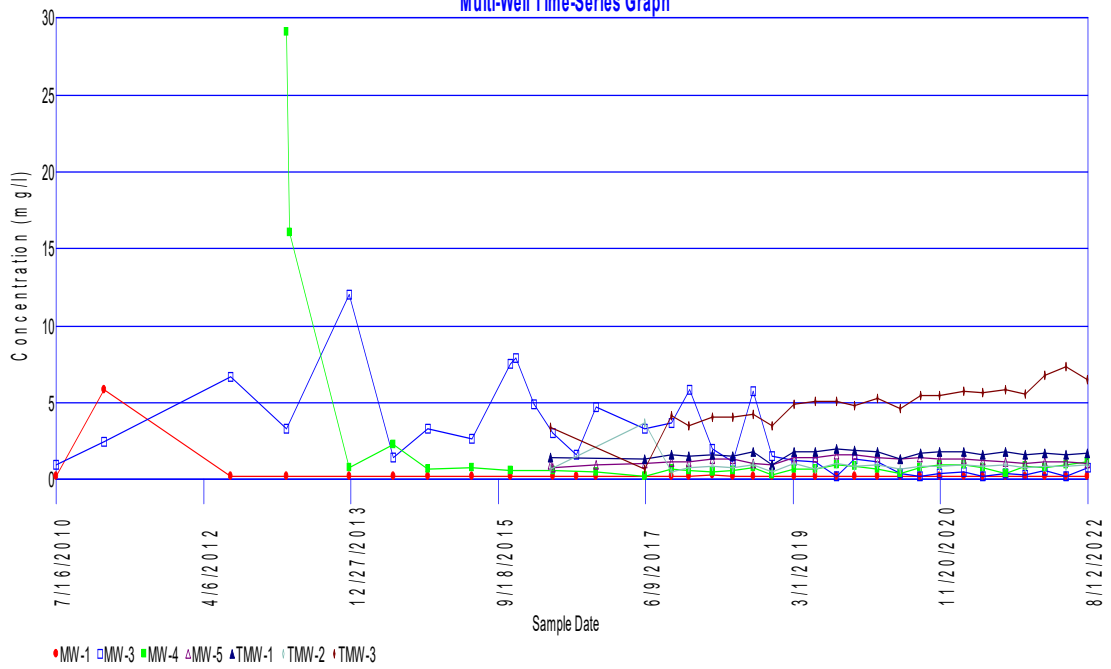
Nickel

Multi-Well Time-Series Graph



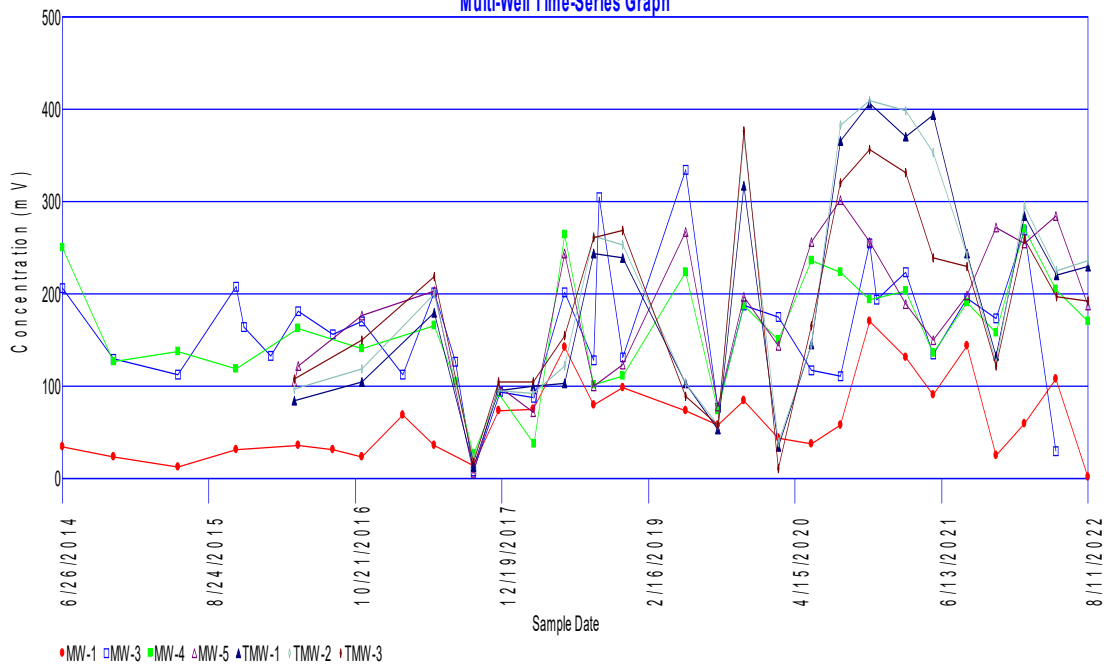
Nitrate

Multi-Well Time-Series Graph



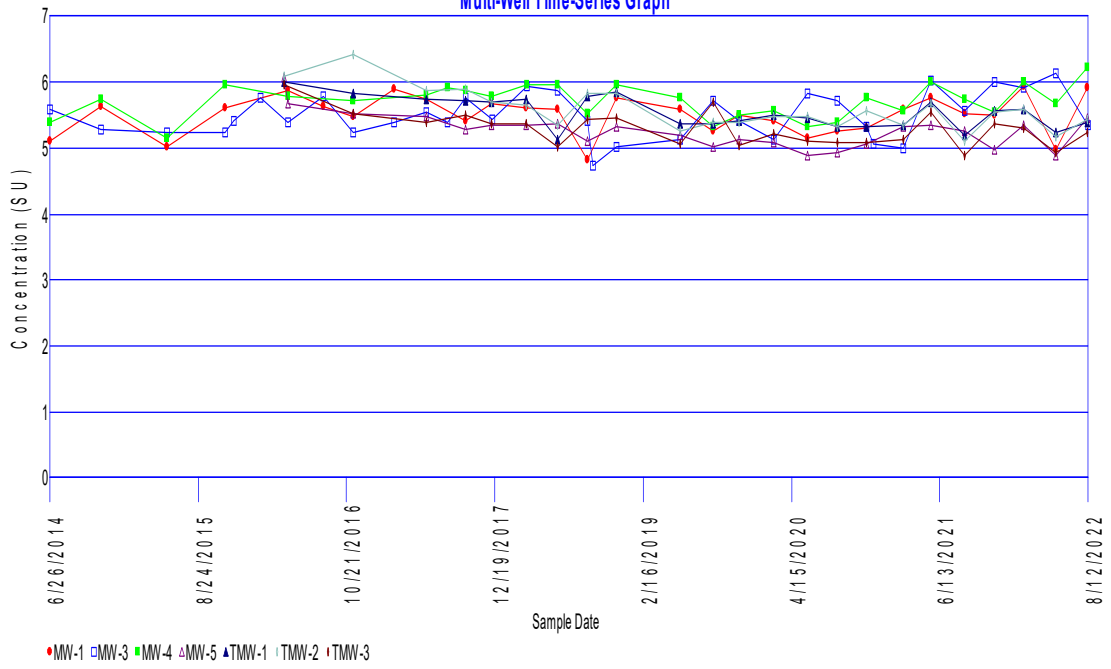
ORP

Multi-Well Time-Series Graph



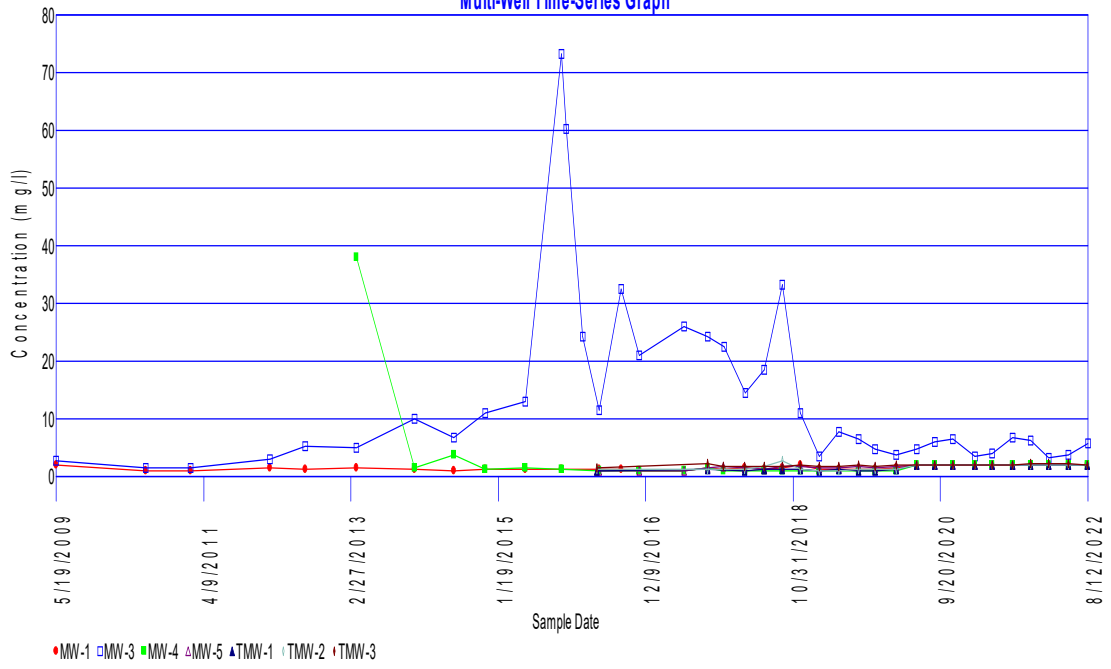
pH

Multi-Well Time-Series Graph



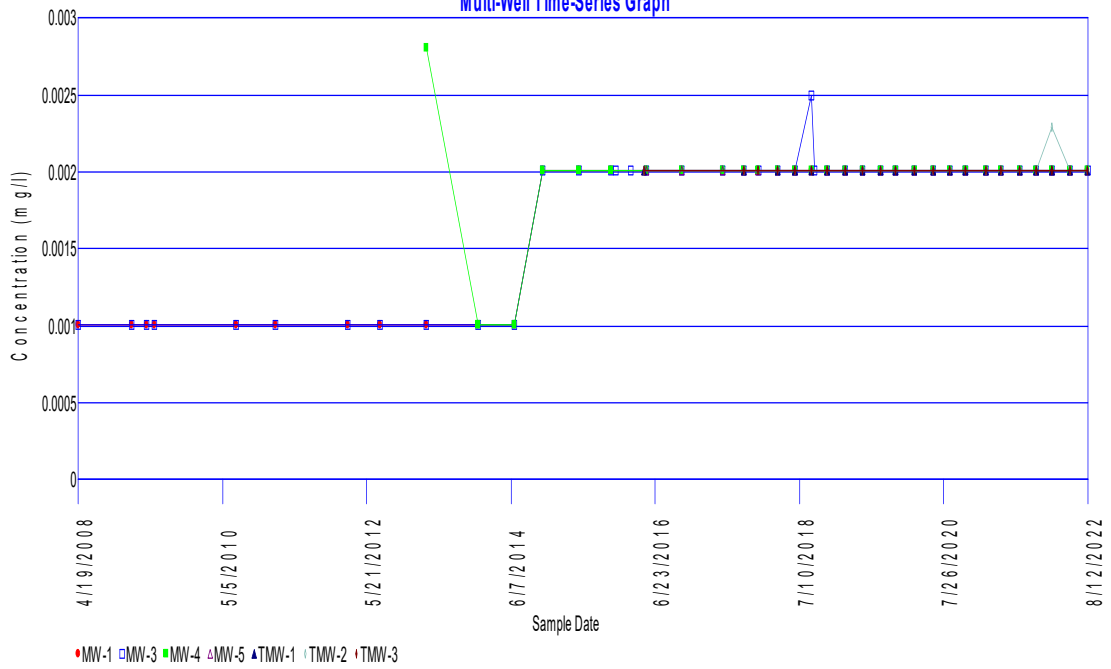
Potassium

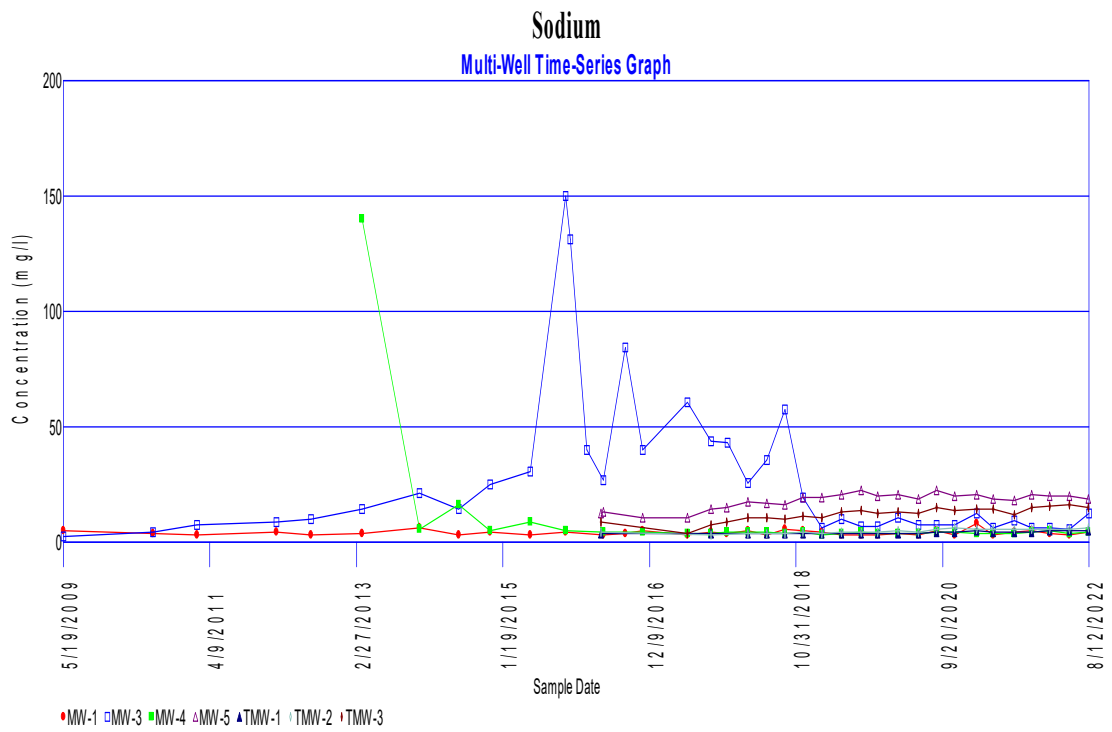
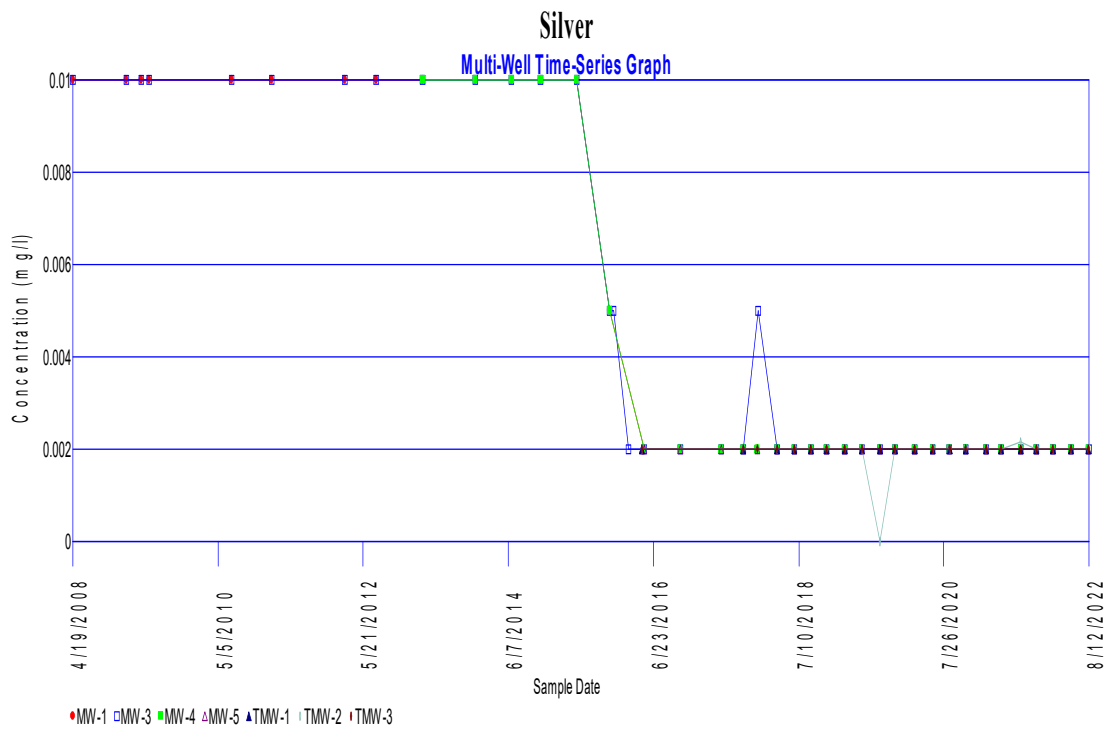
Multi-Well Time-Series Graph



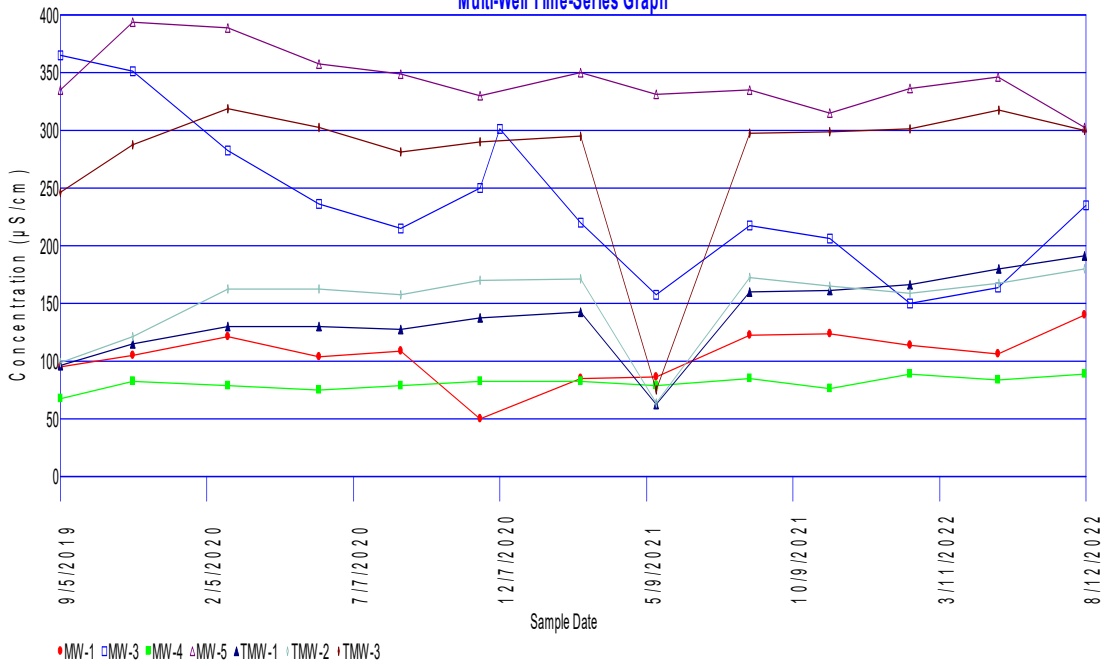
Selenium

Multi-Well Time-Series Graph

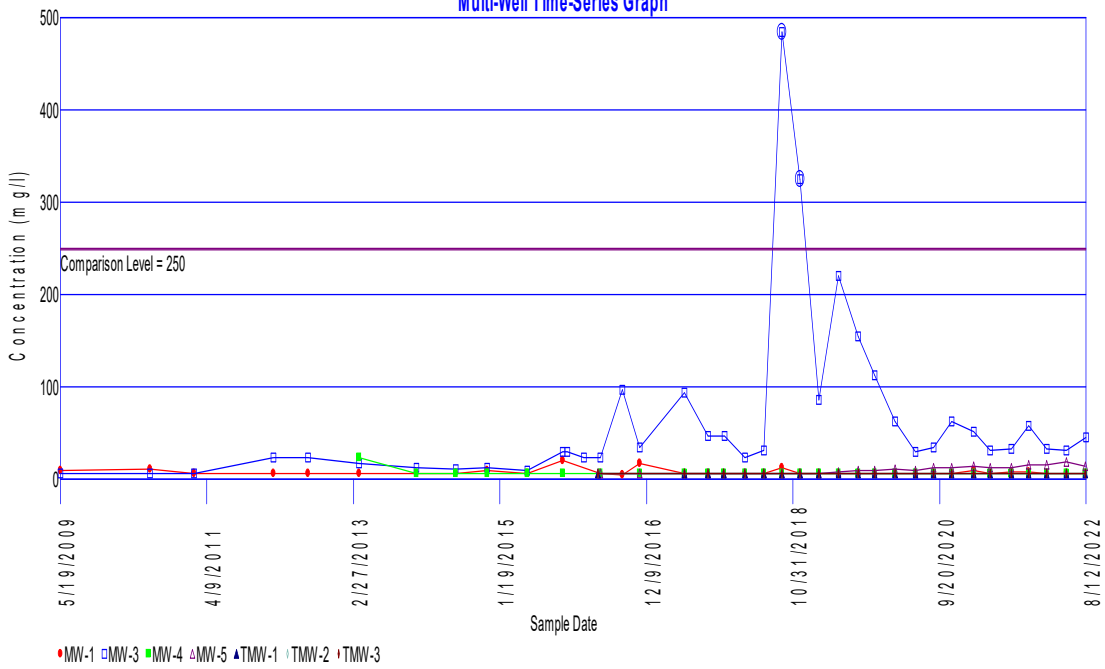


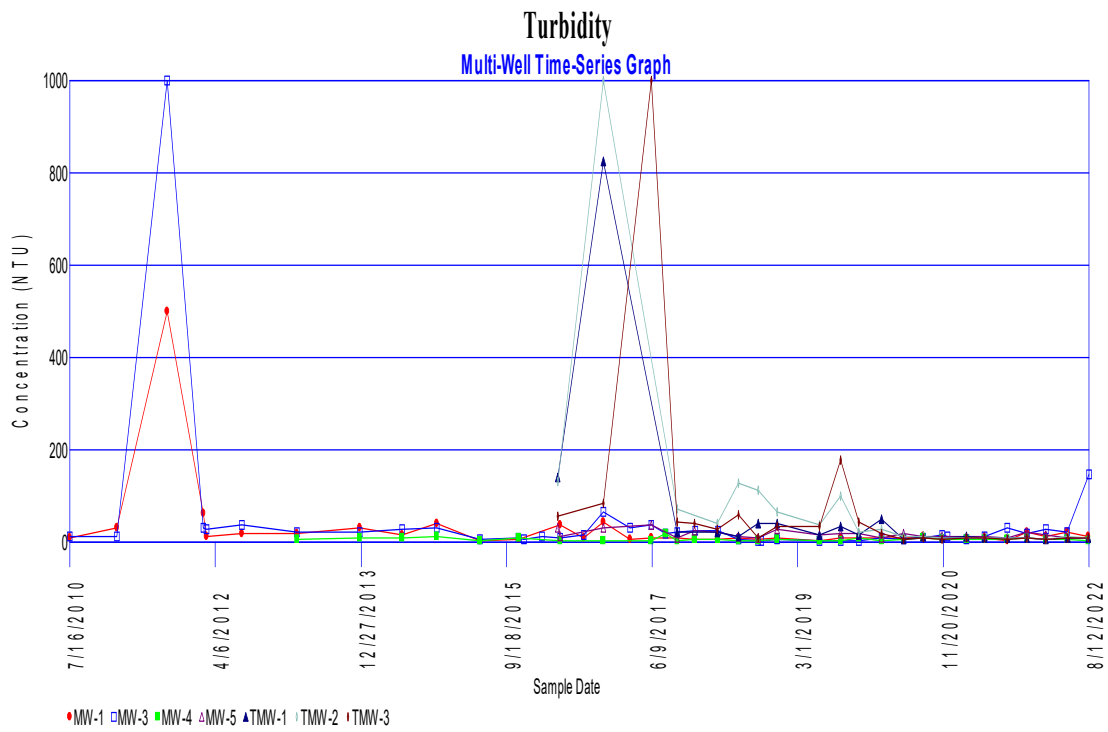
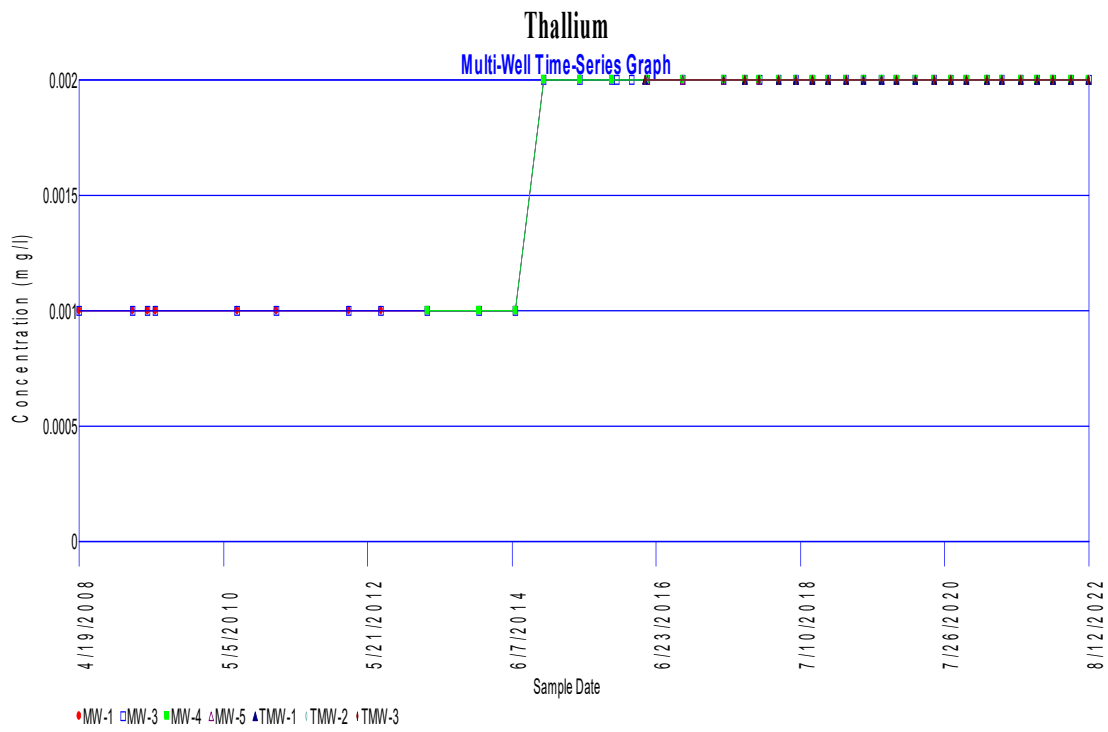


Specific Conductivity Multi-Well Time-Series Graph



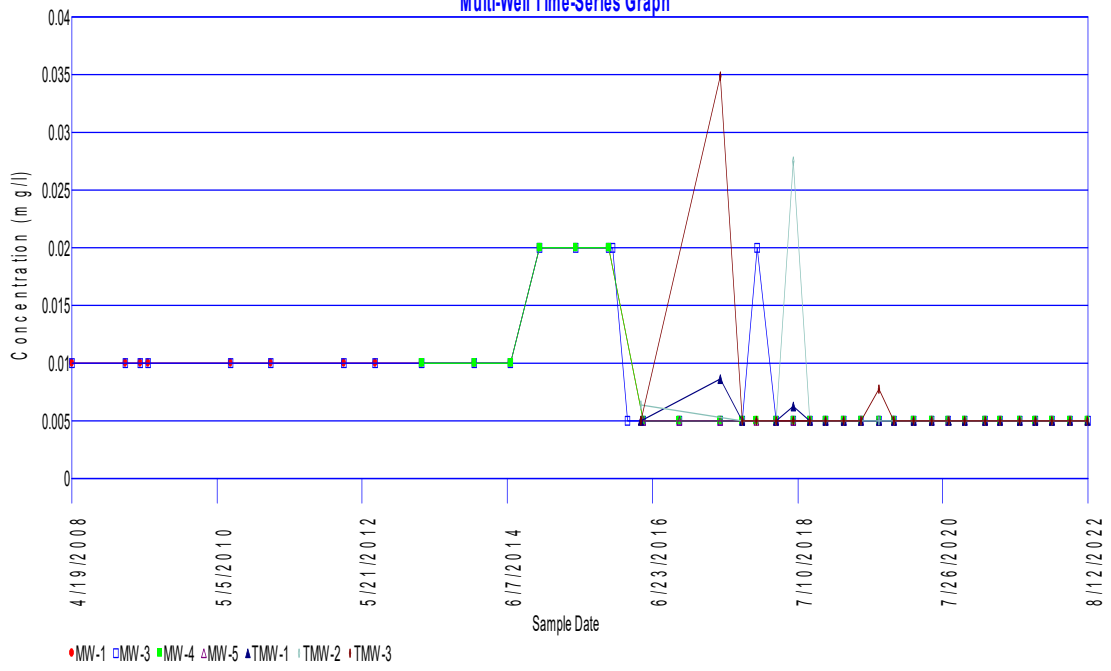
Sulfate Multi-Well Time-Series Graph





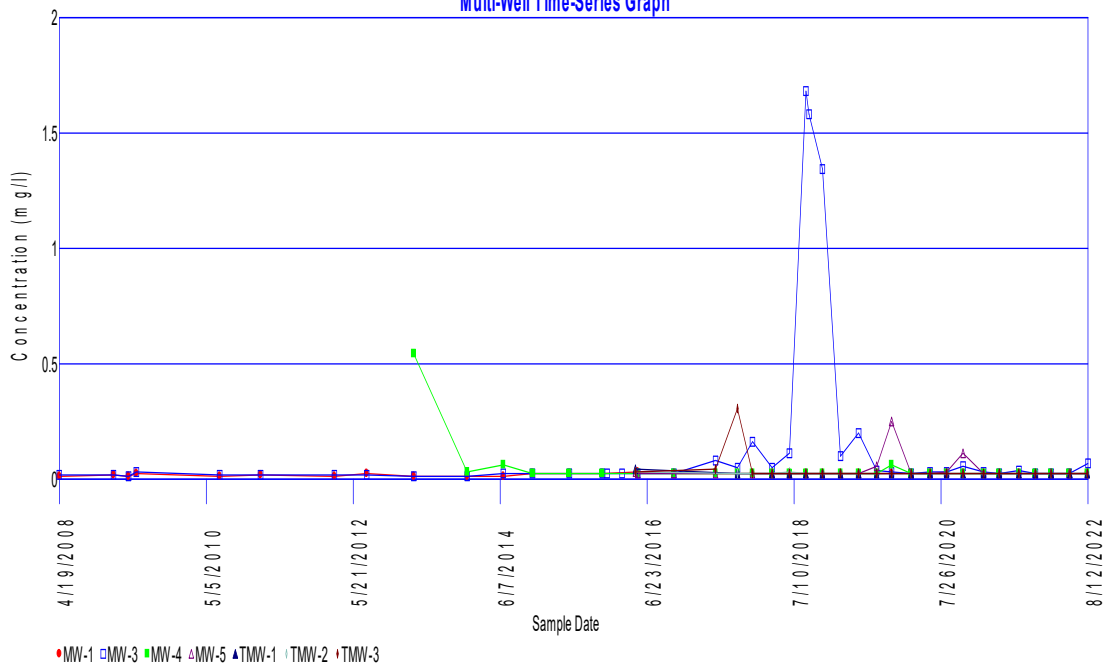
Vanadium

Multi-Well Time-Series Graph



Zinc

Multi-Well Time-Series Graph



Basic Statistics

Parameter: Aluminum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	38
Total Non-Detects	22 (57.8947%)
Pooled Mean	0.231289
Pooled Std Dev	0.273601

Compliance Meas.	0
Compliance Mean	0
Compliance Std Dev	0

Background Meas.	38
Background Mean	0.231289
Background Std Dev	0.273601

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total		
MW-1	38	22	57.8947	8.789		

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	0.231289	0.273601	0	741	19.5

Compliance Locations

There are 0 compliance location

Analysis of Variance Statistics

SS Wells	0
SS Total	2.76973

Kruskal-Wallis Statistics

Non-Detect Rank	11.5
Background Rank Sum	741
Background Rank Mean	19.5
H Statistic	0
H Adjusted for Ties	0

Basic Statistics

Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements 38
Total Non-Detects 0 (0%)
Pooled Mean 0.0383145
Pooled Std Dev 0.0281952

Compliance Meas. 0
Compliance Mean 0
Compliance Std Dev 0

Background Meas. 38
Background Mean 0.0383145
Background Std Dev 0.0281952

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total	
MW-1	38	0	0	1.45595	

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	0.0383145	0.0281952	0	741	19.5

Compliance Locations

There are 0 compliance location

Analysis of Variance Statistics

SS Wells -1.38778e-017
SS Total 0.0294138

Kruskal-Wallis Statistics

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

Basic Statistics

Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	38
Total Non-Detects	3 (7.89474%)
Pooled Mean	0.0223263
Pooled Std Dev	0.0108872
Compliance Meas.	0
Compliance Mean	0
Compliance Std Dev	0
Background Meas.	38
Background Mean	0.0223263
Background Std Dev	0.0108872

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total		
MW-1	38	3	7.89474	0.8484		

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	0.0223263	0.0108872	0	741	19.5

Compliance Locations

There are 0 compliance location

Analysis of Variance Statistics

SS Wells	0
SS Total	0.00438561

Kruskal-Wallis Statistics

Non-Detect Rank	2
Background Rank Sum	741
Background Rank Mean	19.5
H Statistic	0
H Adjusted for Ties	0

Basic Statistics

Parameter: Total Cadmium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	37
Total Non-Detects	37 (100%)
Pooled Mean	0.001
Pooled Std Dev	6.59494e-019
Compliance Meas.	0
Compliance Mean	0
Compliance Std Dev	0
Background Meas.	37
Background Mean	0.001
Background Std Dev	6.59494e-019

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total		
MW-1	37	37	100	0.037		

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	0.001	6.59494e-019	0	703	19

Compliance Locations

There are 0 compliance location

Analysis of Variance Statistics

SS Wells	0
SS Total	-6.09864e-020

Kruskal-Wallis Statistics

Non-Detect Rank	19
Background Rank Sum	703
Background Rank Mean	19
H Statistic	1.42109e-014
H Adjusted for Ties	0

Basic Statistics

Parameter: Chloride

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	39
Total Non-Detects	0 (0%)
Pooled Mean	2.69231
Pooled Std Dev	0.989355

Compliance Meas.	0
Compliance Mean	0
Compliance Std Dev	0

Background Meas.	39
Background Mean	2.69231
Background Std Dev	0.989355

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total		
MW-1	39	0	0	105		

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	2.69231	0.989355	0	780	20

Compliance Locations

There are 0 compliance location

Analysis of Variance Statistics

SS Wells	0
SS Total	37.1953

Kruskal-Wallis Statistics

Non-Detect Rank	0
Background Rank Sum	780
Background Rank Mean	20
H Statistic	0
H Adjusted for Ties	0

Basic Statistics

Parameter: Chromium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	38
Total Non-Detects	35 (92.1053%)
Pooled Mean	0.0107497
Pooled Std Dev	0.0263588

Compliance Meas.	0
Compliance Mean	0
Compliance Std Dev	0

Background Meas.	38
Background Mean	0.0107497
Background Std Dev	0.0263588

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total		
MW-1	38	35	92.1053	0.40849		

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	0.0107497	0.0263588	0	741	19.5

Compliance Locations

There are 0 compliance location

Analysis of Variance Statistics

SS Wells	0
SS Total	0.025707

Kruskal-Wallis Statistics

Non-Detect Rank	18
Background Rank Sum	741
Background Rank Mean	19.5
H Statistic	0
H Adjusted for Ties	0

Basic Statistics

Parameter: Nickel

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	38
Total Non-Detects	11 (28.9474%)
Pooled Mean	0.0200374
Pooled Std Dev	0.0400324
Compliance Meas.	0
Compliance Mean	0
Compliance Std Dev	0
Background Meas.	38
Background Mean	0.0200374
Background Std Dev	0.0400324

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total		
MW-1	38	11	28.9474	0.76142		

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	0.0200374	0.0400324	0	741	19.5

Compliance Locations

There are 0 compliance location

Analysis of Variance Statistics

SS Wells	0
SS Total	0.059296

Kruskal-Wallis Statistics

Non-Detect Rank	6
Background Rank Sum	741
Background Rank Mean	19.5
H Statistic	0
H Adjusted for Ties	0

Basic Statistics

Parameter: Sulfate

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	36
Total Non-Detects	21 (58.3333%)
Pooled Mean	6.52444
Pooled Std Dev	3.26549
Compliance Meas.	0
Compliance Mean	0
Compliance Std Dev	0
Background Meas.	36
Background Mean	6.52444
Background Std Dev	3.26549

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total		
MW-1	36	21	58.3333	234.88		

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	6.52444	3.26549	0	666	18.5

Compliance Locations

There are 0 compliance location

Analysis of Variance Statistics

SS Wells	4.54747e-013
SS Total	373.22

Kruskal-Wallis Statistics

Non-Detect Rank	11
Background Rank Sum	666
Background Rank Mean	18.5
H Statistic	0
H Adjusted for Ties	0

Basic Statistics

Parameter: Zinc

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Measurements	38
Total Non-Detects	28 (73.6842%)
Pooled Mean	0.0217921
Pooled Std Dev	0.00581603
Compliance Meas.	0
Compliance Mean	0
Compliance Std Dev	0
Background Meas.	38
Background Mean	0.0217921
Background Std Dev	0.00581603

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total
MW-1	38	28	73.6842	0.8281

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	0.0217921	0.00581603	0	741	19.5

Compliance Locations

There are 0 compliance location

Analysis of Variance Statistics

SS Wells	0
SS Total	0.00125157

Kruskal-Wallis Statistics

Non-Detect Rank	14.5
Background Rank Sum	741
Background Rank Mean	19.5
H Statistic	0
H Adjusted for Ties	0

Shapiro-Wilks Test of Normality

Parameter: Aluminum

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 = 1.23645

Sample Standard Deviation = 0.273601

W Statistic = 0.551969

5% Critical value of 0.938 exceeds 0.551969

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.551969

Evidence of non-normality at 99% level of significance

Page 1

Shapiro-Wilks Test of Normality

Parameter: Aluminum

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 = 5.36231

Sample Standard Deviation = 1.01616

W Statistic = 0.752622

5% Critical value of 0.938 exceeds 0.752622

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.752622

Evidence of non-normality at 99% level of significance

Page 2

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 = 19 for 38 measurements

Sum of b values = 0.160981

Sample Standard Deviation = 0.0281952

W Statistic = 0.881043

5% Critical value of 0.938 exceeds 0.881043

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.881043

Evidence of non-normality at 99% level of significance

Page 3

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 = 19 for 38 measurements

Sum of b values = 5.13355

Sample Standard Deviation = 0.876989

W Statistic = 0.926071

5% Critical value of 0.938 exceeds 0.926071

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 is less than 0.926071

Data is normally distributed at 99% level of significance

Page 4

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 = 19 for 38 measurements

Sum of b values = 0.0434799

Sample Standard Deviation = 0.0108872

W Statistic = 0.431068

5% Critical value of 0.938 exceeds 0.431068

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.431068

Evidence of non-normality 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 = 19 for 38 measurements

Sum of b values = 1.9121

Sample Standard Deviation = 0.347491

W Statistic = 0.818337

5% Critical value of 0.938 exceeds 0.818337

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.818337

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 = 19 for 39 measurements

Sum of b values = 5.52274

Sample Standard Deviation = 0.989355

W Statistic = 0.820014

5% Critical value of 0.939 exceeds 0.820014

Evidence of non-normality at 95% level of significance

1% Critical value of 0.917 exceeds 0.820014

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 = 19 for 39 measurements

Sum of b values = 1.87928

Sample Standard Deviation = 0.32113

W Statistic = 0.901237

5% Critical value of 0.939 exceeds 0.901237

Evidence of non-normality at 95% level of significance

1% Critical value of 0.917 exceeds 0.901237

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Chromium

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 = 0.0931674

Sample Standard Deviation = 0.0263588

W Statistic = 0.337657

5% Critical value of 0.938 exceeds 0.337657

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.337657

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Chromium

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 = 5.91621

Sample Standard Deviation = 1.21239

W Statistic = 0.64358

5% Critical value of 0.938 exceeds 0.64358

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.64358

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 = 19 for 38 measurements

Sum of b values = 0.0865497

Sample Standard Deviation = 0.0149734

W Statistic = 0.902997

5% Critical value of 0.938 exceeds 0.902997

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.902997

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 = 19 for 38 measurements

Sum of b values = 2.10734

Sample Standard Deviation = 0.353603

W Statistic = 0.959921

5% Critical value of 0.938 is less than 0.959921

Data is normally distributed at 95% level of significance

1% Critical value of 0.916 is less than 0.959921

Data is normally distributed 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 = 19 for 38 measurements

Sum of b values = 0.14771

Sample Standard Deviation = 0.0400324

W Statistic = 0.367955

5% Critical value of 0.938 exceeds 0.367955

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.367955

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 = 19 for 38 measurements

Sum of b values = 3.58465

Sample Standard Deviation = 0.774236

W Statistic = 0.579356

5% Critical value of 0.938 exceeds 0.579356

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.579356

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 = 18 for 36 measurements

Sum of b values = 14.9798

Sample Standard Deviation = 3.26549

W Statistic = 0.601235

5% Critical value of 0.935 exceeds 0.601235

Evidence of non-normality at 95% level of significance

1% Critical value of 0.912 exceeds 0.601235

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 = 18 for 36 measurements

Sum of b values = 3.26053

Sample Standard Deviation = 0.638718

W Statistic = 0.744546

5% Critical value of 0.935 exceeds 0.744546

Evidence of non-normality at 95% level of significance

1% Critical value of 0.912 exceeds 0.744546

Evidence of non-normality at 99% level of significance

Shapiro-Wilks Test of Normality

Parameter: Total Cadmium

Background Locations

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 18 for 37 measurements

Sum of b values = 0

Sample Standard Deviation = 6.59494e-019

W Statistic = 0

5% Critical value of 0.936 exceeds 0

Evidence of non-normality at 95% level of significance

1% Critical value of 0.914 exceeds 0

Evidence of non-normality at 99% level of significance

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Shapiro-Wilks Test of Normality

Parameter: Total Cadmium

Background Locations

Normality Test of Parameter Concentrations

Natural Logarithm Transformation

Non-Detects Replaced with 1/2 DL

K = 18 for 37 measurements

Sum of b values = 0

Sample Standard Deviation = 1.80086e-015

W Statistic = 0

5% Critical value of 0.936 exceeds 0

Evidence of non-normality at 95% level of significance

1% Critical value of 0.914 exceeds 0

Evidence of non-normality at 99% level of significance

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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 = 19 for 38 measurements

Sum of b values = 0.0279947

Sample Standard Deviation = 0.00581603

W Statistic = 0.626175

5% Critical value of 0.938 exceeds 0.626175

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.626175

Evidence of non-normality at 99% level of significance

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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 = 19 for 38 measurements

Sum of b values = 1.76985

Sample Standard Deviation = 0.346445

W Statistic = 0.705345

5% Critical value of 0.938 exceeds 0.705345

Evidence of non-normality at 95% level of significance

1% Critical value of 0.916 exceeds 0.705345

Evidence of non-normality at 99% level of significance

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Non-Parametric Prediction Interval

Intra-Well Comparison for MW-1

Parameter: Aluminum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 59.4595%

Future Samples (k) = 1

Recent Dates = 1

Baseline Measurements (n) = 37

Maximum Baseline Concentration = 1.2

Confidence Level = 97.4%

False Positive Rate = 2.6%

Baseline MeasuremDate	Value
4/19/2008	1.2
1/21/2009	0.94
4/9/2009	0.44
5/19/2009	1
7/16/2010	0.2
2/8/2011	0.12
2/17/2012	0.57
7/31/2012	0.24
3/27/2013	-0.1
12/23/2013	-0.1
6/26/2014	-0.1
11/21/2014	-0.1
5/28/2015	-0.1
11/11/2015	-0.2
5/9/2016	0.108
11/10/2016	-0.1
6/8/2017	-0.1
9/28/2017	-0.1
12/11/2017	-0.1
3/21/2018	-0.1
6/19/2018	-0.1
9/12/2018	-0.1
12/4/2018	-0.1
3/5/2019	-0.1
6/4/2019	-0.1
9/5/2019	-0.1
11/20/2019	-0.1
2/27/2020	-0.1
6/2/2020	-0.1
8/26/2020	-0.1
11/17/2020	0.19
3/2/2021	0.152
5/20/2021	0.17
8/26/2021	0.155
11/18/2021	0.634
2/9/2022	-0.1
5/12/2022	0.231

Date	Count	Mean	Significant
8/11/2022	1	0.139	FALSE

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) = 37

Maximum Baseline Concentration = 0.1

Confidence Level = 97.4%

False Positive Rate = 2.6%

Baseline MeasuremDate	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

Date	Count	Mean	Significant
8/11/2022	1	0.023	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 = 8.10811%

Future Samples (k) = 1

Recent Dates = 1

Baseline Measurements (n) = 37

Maximum Baseline Concentration = 0.084

Confidence Level = 97.4%

False Positive Rate = 2.6%

Baseline MeasuremDate	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	-0.02
8/26/2020	-0.02
11/17/2020	-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

Date	Count	Mean	Significant
8/11/2022	1	0.0204	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) = 37

Maximum Baseline Concentration = 5.68

Confidence Level = 97.4%

False Positive Rate = 2.6%

Baseline MeasuremDate	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

Date	Count	Mean	Significant
8/11/2022	1	4.2	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 = 29.7297%

Future Samples (k) = 1

Recent Dates = 1

Baseline Measurements (n) = 37

Maximum Baseline Concentration = 0.2

Confidence Level = 97.4%

False Positive Rate = 2.6%

Baseline MeasuremDate	Value
4/19/2008	-0.02
1/21/2009	-0.02
4/9/2009	0.2
5/19/2009	0.17
7/16/2010	-0.02
2/8/2011	-0.02
2/17/2012	-0.02
7/31/2012	-0.02
3/27/2013	-0.02
12/23/2013	-0.02
6/26/2014	-0.02
11/21/2014	-0.02
5/28/2015	-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

Date	Count	Mean	Significant
8/11/2022	1	0.00737	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 = 75.6757%

Future Samples (k) = 1

Recent Dates = 1

Baseline Measurements (n) = 37

Maximum Baseline Concentration = 0.0281

Confidence Level = 97.4%

False Positive Rate = 2.6%

Baseline MeasuremDate	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	-0.01
7/31/2012	0.023
3/27/2013	0.012
12/23/2013	-0.01
6/26/2014	-0.01
11/21/2014	-0.025
5/28/2015	-0.025
11/11/2015	-0.025
5/9/2016	0.0281
11/10/2016	-0.025
6/8/2017	-0.025
9/28/2017	-0.025
12/11/2017	-0.025
3/21/2018	-0.025
6/19/2018	-0.025
9/12/2018	-0.025
12/4/2018	-0.025
3/5/2019	-0.025
6/4/2019	-0.025
9/5/2019	-0.025
11/20/2019	-0.025
2/27/2020	-0.025
6/2/2020	-0.025
8/26/2020	-0.025
11/17/2020	-0.025
3/2/2021	-0.025
5/20/2021	-0.025
8/26/2021	-0.025
11/18/2021	-0.025
2/9/2022	-0.025
5/12/2022	-0.025

Date	Count	Mean	Significant
8/11/2022	1	0.025	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 Unified Guid. Formula 95% One-Sided 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

From 37 baseline samples

Baseline mean = -3.27247

Baseline std Dev = 0.351483

For 1 recent sampling event(s)

Actual confidence level is $1.0 - (0.05/1) = 95\%$

t is Percentile of Student's T-Test $(0.95/1) = 0.95$

Degrees of Freedom = 37 (background observations) - 1

$t(0.95, 37) = 1.6883$

Date	Samples	Mean	Interval	Significant
8/11/2022	1	-2.84387	[0, -2.67109]	FALSE

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Aluminum

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 41.1168%

Number of comparisons = 6

Future Samples (k) = 6

Recent Dates = 1

Background Measurements (n) = 38

Maximum Background Value = 1.2

Confidence Level = 86.4%

False Positive Rate = 13.6%

Location	Date	Count	Mean	Significant
MW-3	8/12/2022	1	0.1	FALSE
MW-4	8/11/2022	1	0.1	FALSE
MW-5	8/11/2022	1	0.264	FALSE
TMW-1	8/11/2022	1	0.1	FALSE
TMW-2	8/11/2022	1	0.29	FALSE
TMW-3	8/11/2022	1	0.1	FALSE

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Barium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 5.55556%

Number of comparisons = 6

Future Samples (k) = 6

Recent Dates = 1

Background Measurements (n) = 38

Maximum Background Value = 0.084

Confidence Level = 86.4%

False Positive Rate = 13.6%

Location	Date	Count	Mean	Significant
MW-3	8/12/2022	1	0.0629	FALSE
MW-4	8/11/2022	1	0.0086	FALSE
MW-5	8/11/2022	1	0.0487	FALSE
TMW-1	8/11/2022	1	0.0138	FALSE
TMW-2	8/11/2022	1	0.0307	FALSE
TMW-3	8/11/2022	1	0.0434	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) = 39

Maximum Background Value = 5.68

Confidence Level = 86.7%

False Positive Rate = 13.3%

Location	Date	Count	Mean	Significant
MW-3	8/12/2022	1	28.3	TRUE
MW-4	8/11/2022	1	11.7	TRUE
MW-5	8/11/2022	1	66.4	TRUE
TMW-1	8/11/2022	1	43.1	TRUE
TMW-2	8/11/2022	1	42.8	TRUE
TMW-3	8/11/2022	1	65.4	TRUE

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Chromium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 72.5888%

Number of comparisons = 6

Future Samples (k) = 6

Recent Dates = 1

Background Measurements (n) = 38

Maximum Background Value = 0.12

Confidence Level = 86.4%

False Positive Rate = 13.6%

Location	Date	Count	Mean	Significant
MW-3	8/12/2022	1	0.002	FALSE
MW-4	8/11/2022	1	0.00331	FALSE
MW-5	8/11/2022	1	0.00563	FALSE
TMW-1	8/11/2022	1	0.002	FALSE
TMW-2	8/11/2022	1	0.00226	FALSE
TMW-3	8/11/2022	1	0.002	FALSE

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Nickel

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 57.7889%

Number of comparisons = 6

Future Samples (k) = 6

Recent Dates = 1

Background Measurements (n) = 38

Maximum Background Value = 0.2

Confidence Level = 86.4%

False Positive Rate = 13.6%

Location	Date	Count	Mean	Significant
MW-3	8/12/2022	1	0.005	FALSE
MW-4	8/11/2022	1	0.002	FALSE
MW-5	8/11/2022	1	0.00774	FALSE
TMW-1	8/11/2022	1	0.002	FALSE
TMW-2	8/11/2022	1	0.002	FALSE
TMW-3	8/11/2022	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 = 64.6465%

Number of comparisons = 6

Future Samples (k) = 6

Recent Dates = 1

Background Measurements (n) = 36

Maximum Background Value = 18.8

Confidence Level = 85.7%

False Positive Rate = 14.3%

Location	Date	Count	Mean	Significant
MW-3	8/12/2022	1	45	TRUE
MW-4	8/11/2022	1	5	FALSE
MW-5	8/11/2022	1	13.2	FALSE
TMW-1	8/11/2022	1	5	FALSE
TMW-2	8/11/2022	1	5	FALSE
TMW-3	8/11/2022	1	5	FALSE

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Total Cadmium

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 87.8788%

Number of comparisons = 6

Future Samples (k) = 6

Recent Dates = 1

Background Measurements (n) = 37

Maximum Background Value = 0.001

Confidence Level = 86%

False Positive Rate = 14%

Location	Date	Count	Mean	Significant
MW-3	8/12/2022	1	0.00387	TRUE
MW-4	8/11/2022	1	0.001	FALSE
MW-5	8/11/2022	1	0.001	FALSE
TMW-1	8/11/2022	1	0.001	FALSE
TMW-2	8/11/2022	1	0.001	FALSE
TMW-3	8/11/2022	1	0.001	FALSE

Non-Parametric Prediction Interval

Inter-Well Comparison

Parameter: Zinc

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 73.8693%

Number of comparisons = 6

Future Samples (k) = 6

Recent Dates = 1

Background Measurements (n) = 38

Maximum Background Value = 0.0281

Confidence Level = 86.4%

False Positive Rate = 13.6%

Location	Date	Count	Mean	Significant
MW-3	8/12/2022	1	0.0658	TRUE
MW-4	8/11/2022	1	0.025	FALSE
MW-5	8/11/2022	1	0.025	FALSE
TMW-1	8/11/2022	1	0.025	FALSE
TMW-2	8/11/2022	1	0.025	FALSE
TMW-3	8/11/2022	1	0.025	FALSE

Mann-Kendall Trend Analysis

Parameter: Aluminum

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 117 - 16 = 101

Tied Group	Value	Members
1	0.1	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

There are 0 time periods with multiple data

A = 8880
B = 0
C = 3360
D = 0
E = 240
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 940.333
Z-Score = 3.26106
Comparison Level at 95% confidence level = 1.65463 (upward trend)
3.26106 > 1.65463 indicating an upward trend

Mann-Kendall Trend Analysis

Parameter: Aluminum

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 121 - 126 = -5

Tied Group	Value	Members
1	0.1	4

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

There are 0 time periods with multiple data

A = 156
B = 0
C = 24
D = 0
E = 12
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1425
Z-Score = -0.105963
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.105963| <= 1.97737 indicating no evidence of a trend

Mann-Kendall Trend Analysis

Parameter: Aluminum

Location: TMW-2

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 23 - 166 = -143

Tied Group	Value	Members
1	0.115	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

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 949
Z-Score = -4.60952
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-4.60952 < -1.65463 indicating a downward trend

Mann-Kendall Trend Analysis

Parameter: Arsenic

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 114 - 138 = -24

Tied Group	Value	Members
1	0.0176	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

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 = -0.607652
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.607652| <= 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 = 164 - 85 = 79

Tied Group	Value	Members
1	0.0199	2
2	0.02	3

Time Period Observations

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

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1429

Z-Score = 2.06338
Comparison Level at 95% confidence level = 1.65463 (upward trend)
2.06338 > 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 = 75 - 201 = -126

Tied Group	Value	Members
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Time Period Observations

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

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1625.33
Z-Score = -3.10055
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-3.10055 < -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 = 162 - 84 = 78

Tied Group	Value	Members
1	0.00749	2
2	0.02	4

Time Period Observations

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

There are 0 time periods with multiple data

A = 174
B = 0
C = 24
D = 0
E = 14
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1424

Z-Score = 2.0405
Comparison Level at 95% confidence level = 1.65463 (upward trend)
2.0405 > 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 = 204 - 49 = 155

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

Time Period Observations

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

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1433.67
Z-Score = 4.06721
Comparison Level at 95% confidence level = 1.65463 (upward trend)
4.06721 > 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 = 99 - 85 = 14

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

There are 0 time periods with multiple data

A = 156
B = 0
C = 24
D = 0
E = 12
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 941.333
Z-Score = 0.423713
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|0.423713| <= 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 = 67 - 122 = -55

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

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 949
Z-Score = -1.75291
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.75291| <= 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 = 147 - 62 = 85

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

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 19740
b = 71820
c = 840
Group Variance = 1095.67
Z-Score = 2.5377
Comparison Level at 95% confidence level = 1.65463 (upward trend)
2.5377 > 1.65463 indicating an upward 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 = 95 - 154 = -59

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

There are 0 time periods with multiple data

A = 84
B = 0
C = 6
D = 0
E = 8
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1429
Z-Score = -1.53431
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-1.53431| <= 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 = 50 - 201 = -151

Tied Group	Value	Members
1	23.9	2
2	18.4	2

Time Period Observations

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
8/11/2022	1

There are 0 time periods with multiple data

A = 36
 B = 0
 C = 0
 D = 0
 E = 4
 F = 0
 a = 25806
 b = 95634
 c = 1012
 Group Variance = 1431.67

Z-Score = -3.96433
 Comparison Level at 95% confidence level = -1.65463 (downward trend)
-3.96433 < -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 = 221 - 32 = 189

Tied Group	Value	Members
1	23.9	2
2	18.4	2

Time Period Observations

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

There are 0 time periods with multiple data

A = 0
 B = 0
 C = 0
 D = 0
 E = 0
 F = 0
 a = 25806
 b = 95634
 c = 1012
 Group Variance = 1433.67

Z-Score = 4.96517
 Comparison Level at 95% confidence level = 1.65463 (upward trend)
4.96517 > 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 = 168 - 84 = 84

Tied Group	Value	Members
1	83.5	2

Time Period Observations

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

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 = 2.19283
 Comparison Level at 95% confidence level = 1.65463 (upward trend)
2.19283 > 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 = 250 - 3 = 247

Tied Group	Value	Members
1	83.5	2

Time Period Observations

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

There are 0 time periods with multiple data

A = 0
 B = 0
 C = 0
 D = 0
 E = 0
 F = 0
 a = 25806
 b = 95634
 c = 1012
 Group Variance = 1433.67

Z-Score = 6.49697
 Comparison Level at 95% confidence level = 1.65463 (upward trend)
6.49697 > 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 = 215 - 38 = 177

Tied Group	Value	Members
1	0.002	19

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

There are 0 time periods with multiple data

A = 0
 B = 0
 C = 0
 D = 0
 E = 0
 F = 0
 a = 25806
 b = 95634
 c = 1012
 Group Variance = 1433.67
 Z-Score = 4.64824
 Comparison Level at 95% confidence level = 1.65463 (upward trend)
4.64824 > 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 = 239 - 14 = 225

Tied Group	Value	Members
1	0.002	4

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

There are 0 time periods with multiple data

A = 0
 B = 0
 C = 0
 D = 0
 E = 0
 F = 0
 a = 25806
 b = 95634
 c = 1012
 Group Variance = 1433.67
 Z-Score = 5.91594
 Comparison Level at 95% confidence level = 1.65463 (upward trend)
5.91594 > 1.65463 indicating an upward trend

Mann-Kendall Trend Analysis

Parameter: Chromium

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 47 - 35 = 12

Tied Group	Value	Members
1	0.002	19

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

There are 0 time periods with multiple data

A = 14706
 B = 0
 C = 5814
 D = 0
 E = 342
 F = 0
 a = 25806
 b = 95634
 c = 1012
 Group Variance = 616.667
 Z-Score = 0.442963
 Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
[0.442963] <= 1.97737 indicating no evidence of a trend

Mann-Kendall Trend Analysis

Parameter: Chromium

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 159 - 88 = 71

Tied Group	Value	Members
1	0.002	4

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

There are 0 time periods with multiple data

A = 156
 B = 0
 C = 24
 D = 0
 E = 12
 F = 0
 a = 25806
 b = 95634
 c = 1012
 Group Variance = 1425
 Z-Score = 1.85435
 Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
[1.85435] <= 1.97737 indicating no evidence of a trend

Mann-Kendall Trend Analysis

Parameter: Chromium

Location: TMW-2

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 25 - 87 = -62

Tied Group	Value	Members
1	0.002	13

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
9/27/2020	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
5/12/2022	1
8/11/2022	1

There are 0 time periods with multiple data

A = 4836
B = 0
C = 1716
D = 0
E = 156
F = 0
a = 17100
b = 61560
c = 760
Group Variance = 681.333
Z-Score = -2.33695
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-2.33695 < -1.65463 indicating a downward trend

Mann-Kendall Trend Analysis

Parameter: Cobalt

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 175 - 77 = 98

Tied Group	Value	Members
1	0.0411	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

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 = 2.56271
Comparison Level at 95% confidence level = 1.65463 (upward trend)
2.56271 > 1.65463 indicating an upward trend

Mann-Kendall Trend Analysis

Parameter: Nickel

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 131 - 122 = 9

Tied Group	Value	Members
1	0.002	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

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1433.67
Z-Score = 0.211284
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|0.211284| <= 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 = 129 - 144 = -15

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

There are 0 time periods with multiple data

A = 66
B = 0
C = 6
D = 0
E = 6
F = 0
a = 29256
b = 109296
c = 1104
Group Variance = 1621.67
Z-Score = -0.347654
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.347654| <= 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 = 111 - 141 = -30

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

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 = -0.76617
Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)
|-0.76617| <= 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 = 99 - 153 = -54

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

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 = -1.40024
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-1.40024 >= -1.65463 indicating no evidence of a downward 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 = 234 - 9 = 225

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

There are 0 time periods with multiple data

A = 300
B = 0
C = 60
D = 0
E = 20
F = 0
a = 25806
b = 95634
c = 1012
Group Variance = 1417
Z-Score = 5.95063
Comparison Level at 95% confidence level = 1.65463 (upward trend)
5.95063 > 1.65463 indicating an upward trend

Mann-Kendall Trend Analysis

Parameter: Total Cadmium

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 100 - 224 = -124

Tied Group	Value	Members
1	0.001	2

Time Period	Observations
11/10/2016	1
6/8/2017	1
8/8/2017	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
12/8/2020	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

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 37050
b = 140400
c = 1300
Group Variance = 2057.33
Z-Score = -2.71177
Comparison Level at 95% confidence level = -1.65463 (downward trend)
-2.71177 < -1.65463 indicating a downward trend

Mann-Kendall Trend Analysis

Parameter: Zinc

Location: MW-1

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 0 - 0 = 0

Tied Group	Value	Members
1	0.025	23

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

There are 0 time periods with multiple data

A = 25806

B = 0

C = 10626

D = 0

E = 506

F = 0

a = 25806

b = 95634

c = 1012

Group Variance = 0

Z-Score = 0

Comparison Level at 1.0 - (0.05 / 2) = 97.5% confidence level = 1.97737 (two-tailed)

|0| <= 1.97737 indicating no evidence of a trend

Mann-Kendall Trend Analysis

Parameter: Zinc

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 83 - 178 = -95

Tied Group	Value	Members
1	0.025	6

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

There are 0 time periods with multiple data

A = 510

B = 0

C = 120

D = 0

E = 30

F = 0

a = 29256

b = 109296

c = 1104

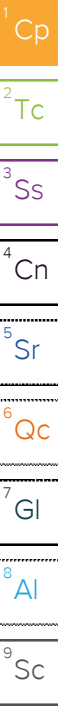
Group Variance = 1597

Z-Score = -2.35221

Comparison Level at 95% confidence level = -1.65463 (downward trend)

-2.35221 < -1.65463 indicating a downward trend

APPENDIX C
LABORATORY ANALYTICAL REPORTS &
FIELD INFORMATION LOGS



Civil & Environmental Consultants - TN

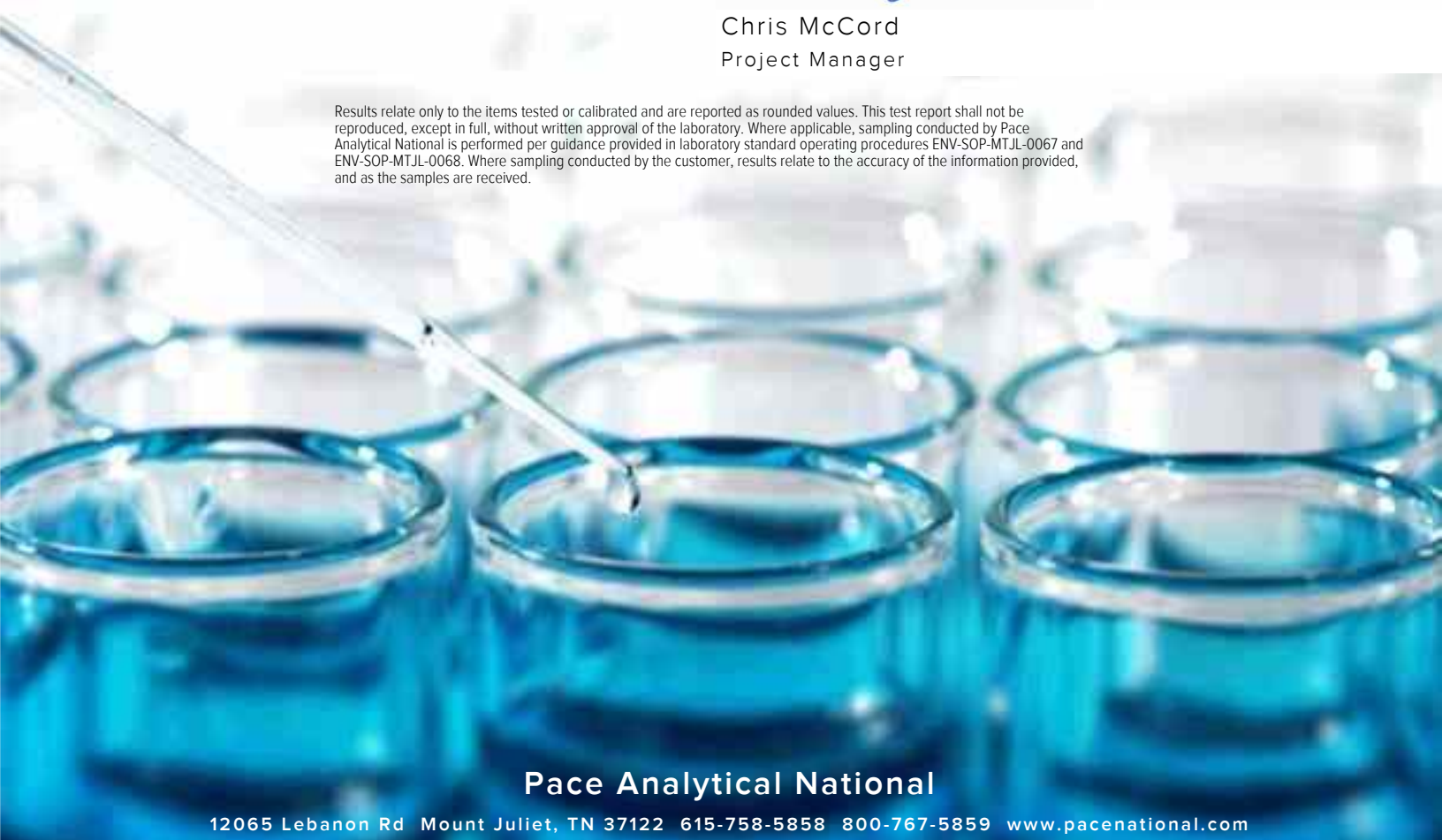
Sample Delivery Group: L1524871
Samples Received: 08/12/2022
Project Number: 181-364
Description: Former EWS Camden Class 2 Landfill
Site: CAMDEN, TN
Report To: Philip Campbell
117 Seaboard Ln.
Suite E100
Franklin, TN 37067

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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SAMPLE SUMMARY

MW-1 L1524871-01 GW

Collected by
Alex Black

Collected date/time
08/11/22 10:15

Received date/time
08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 17:53	08/18/22 17:53	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:06	08/21/22 15:06	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914696	1	08/22/22 17:26	08/22/22 17:26	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918978	1	08/31/22 12:33	08/31/22 18:47	RLS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	1	08/12/22 22:25	08/12/22 22:25	LBR	Mt. Juliet, TN
Mercury by Method 7470A	WG1910560	1	08/16/22 10:02	08/17/22 10:49	SRT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	1	08/17/22 23:39	08/19/22 09:10	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/18/22 17:53	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1911707	1	08/16/22 14:11	08/16/22 14:11	JCP	Mt. Juliet, TN
EDB / DBCP by Method 8011	WG1912937	1.07	08/19/22 11:51	08/19/22 17:19	CCW	Mt. Juliet, TN

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

MW-3 L1524871-02 GW

Collected by
Alex Black

Collected date/time
08/12/22 10:20

Received date/time
08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 17:56	08/18/22 17:56	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:11	08/21/22 15:11	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914696	1	08/22/22 17:10	08/22/22 17:10	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918978	1	08/31/22 12:33	08/31/22 18:48	RLS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	1	08/12/22 22:37	08/12/22 22:37	LBR	Mt. Juliet, TN
Mercury by Method 7470A	WG1910560	1	08/16/22 10:02	08/17/22 10:59	SRT	Mt. Juliet, TN
Mercury by Method 7470A	WG1910563	1	08/14/22 10:29	08/15/22 10:46	MRW	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1910291	1	08/17/22 21:12	08/18/22 15:56	KMG	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	1	08/17/22 23:39	08/19/22 09:13	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/18/22 17:56	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911350	1	08/16/22 22:27	08/17/22 17:21	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1911707	1	08/16/22 14:32	08/16/22 14:32	JCP	Mt. Juliet, TN
EDB / DBCP by Method 8011	WG1912937	1.02	08/19/22 11:51	08/19/22 17:31	CCW	Mt. Juliet, TN

MW-4 L1524871-03 GW

Collected by
Alex Black

Collected date/time
08/11/22 11:40

Received date/time
08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 17:59	08/18/22 17:59	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:13	08/21/22 15:13	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914696	1	08/22/22 17:11	08/22/22 17:11	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918978	1	08/31/22 12:33	08/31/22 18:49	RLS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	1	08/12/22 22:50	08/12/22 22:50	LBR	Mt. Juliet, TN
Mercury by Method 7470A	WG1910560	1	08/16/22 10:02	08/17/22 11:03	SRT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	1	08/17/22 23:39	08/19/22 09:16	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/18/22 17:59	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1911707	1	08/16/22 14:53	08/16/22 14:53	JCP	Mt. Juliet, TN
EDB / DBCP by Method 8011	WG1912937	1	08/19/22 11:51	08/19/22 17:44	CCW	Mt. Juliet, TN

MW-5 L1524871-04 GW

Collected by
Alex Black

Collected date/time
08/11/22 11:10

Received date/time
08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 18:09	08/18/22 18:09	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:15	08/21/22 15:15	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914696	1	08/22/22 17:13	08/22/22 17:13	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918978	1	08/31/22 12:33	08/31/22 18:49	RLS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	1	08/12/22 23:02	08/12/22 23:02	LBR	Mt. Juliet, TN

ACCOUNT:

Civil & Environmental Consultants - TN

PROJECT:

181-364

SDG:

L1524871

DATE/TIME:

09/13/22 13:57

PAGE:

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SAMPLE SUMMARY

MW-5 L1524871-04 GW

Collected by: Alex Black
 Collected date/time: 08/11/22 11:10
 Received date/time: 08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 7470A	WG1910560	1	08/16/22 10:02	08/17/22 11:06	SRT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	1	08/17/22 23:39	08/19/22 09:19	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/18/22 18:09	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/19/22 12:21	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1911707	1	08/16/22 15:14	08/16/22 15:14	JCP	Mt. Juliet, TN
EDB / DBCP by Method 8011	WG1911172	1.06	08/16/22 11:22	08/17/22 01:58	KLA	Mt. Juliet, TN



TMW-1 L1524871-05 GW

Collected by: Alex Black
 Collected date/time: 08/11/22 09:50
 Received date/time: 08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 18:12	08/18/22 18:12	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:17	08/21/22 15:17	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914697	1	08/22/22 16:00	08/22/22 16:00	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918979	1	08/30/22 22:00	08/31/22 02:14	CRB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	1	08/12/22 23:14	08/12/22 23:14	LBR	Mt. Juliet, TN
Mercury by Method 7470A	WG1910560	1	08/16/22 10:02	08/17/22 11:08	SRT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	1	08/17/22 23:39	08/19/22 09:21	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/18/22 18:12	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/19/22 12:24	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1912268	1	08/17/22 13:12	08/17/22 13:12	DWR	Mt. Juliet, TN
EDB / DBCP by Method 8011	WG1911172	1.02	08/16/22 11:22	08/17/22 02:11	KLA	Mt. Juliet, TN



TMW-2 L1524871-06 GW

Collected by: Alex Black
 Collected date/time: 08/11/22 11:15
 Received date/time: 08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 18:16	08/18/22 18:16	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:22	08/21/22 15:22	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914697	1	08/22/22 16:01	08/22/22 16:01	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918979	1	08/30/22 22:00	08/31/22 02:15	CRB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	1	08/12/22 23:27	08/12/22 23:27	LBR	Mt. Juliet, TN
Mercury by Method 7470A	WG1910560	1	08/16/22 10:02	08/17/22 11:14	SRT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	1	08/17/22 23:39	08/19/22 09:30	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/18/22 18:16	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/19/22 12:27	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1912268	1	08/17/22 13:33	08/17/22 13:33	DWR	Mt. Juliet, TN
EDB / DBCP by Method 8011	WG1911172	1.03	08/16/22 11:22	08/17/22 02:59	KLA	Mt. Juliet, TN

TMW-3 L1524871-07 GW

Collected by: Alex Black
 Collected date/time: 08/11/22 12:15
 Received date/time: 08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 18:19	08/18/22 18:19	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:34	08/21/22 15:34	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914697	1	08/22/22 16:03	08/22/22 16:03	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918979	1	08/30/22 22:00	08/31/22 02:15	CRB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	1	08/12/22 23:39	08/12/22 23:39	LBR	Mt. Juliet, TN
Mercury by Method 7470A	WG1910560	1	08/16/22 10:02	08/17/22 11:16	SRT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	1	08/17/22 23:39	08/19/22 09:32	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/18/22 18:19	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/19/22 12:30	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1912268	1	08/17/22 13:54	08/17/22 13:54	DWR	Mt. Juliet, TN

SAMPLE SUMMARY

TMW-3 L1524871-07 GW

Collected by: Alex Black
 Collected date/time: 08/11/22 12:15
 Received date/time: 08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
EDB / DBCP by Method 8011	WG1911172	1.08	08/16/22 11:22	08/17/22 03:12	KLA	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

DUPLICATE L1524871-08 GW

Collected by: Alex Black
 Collected date/time: 08/12/22 00:00
 Received date/time: 08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 18:22	08/18/22 18:22	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:36	08/21/22 15:36	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914697	1	08/22/22 16:07	08/22/22 16:07	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918979	1	08/30/22 22:00	08/31/22 02:16	CRB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	1	08/12/22 23:52	08/12/22 23:52	LBR	Mt. Juliet, TN
Mercury by Method 7470A	WG1910560	1	08/16/22 10:02	08/17/22 11:18	SRT	Mt. Juliet, TN
Mercury by Method 7470A	WG1910563	1	08/14/22 10:29	08/15/22 11:18	MRW	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1907163	1	08/15/22 01:11	08/15/22 10:59	CCE	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	1	08/17/22 23:39	08/19/22 09:35	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1909180	1	08/16/22 04:41	08/17/22 13:17	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1909180	1	08/16/22 04:41	08/17/22 17:24	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/18/22 18:22	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/19/22 12:34	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1912268	1	08/17/22 14:14	08/17/22 14:14	DWR	Mt. Juliet, TN
EDB / DBCP by Method 8011	WG1911172	1.03	08/16/22 11:22	08/17/22 03:24	KLA	Mt. Juliet, TN

FIELD BLANK L1524871-09 GW

Collected by: Alex Black
 Collected date/time: 08/11/22 12:45
 Received date/time: 08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 18:25	08/18/22 18:25	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:38	08/21/22 15:38	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914697	1	08/22/22 16:15	08/22/22 16:15	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918979	1	08/30/22 22:00	08/31/22 02:16	JAR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	1	08/13/22 00:29	08/13/22 00:29	LBR	Mt. Juliet, TN
Mercury by Method 7470A	WG1910560	1	08/16/22 10:02	08/17/22 11:20	SRT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	1	08/17/22 23:39	08/19/22 09:38	ZSA	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/18/22 18:25	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	1	08/18/22 01:31	08/19/22 12:37	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1911707	1	08/16/22 13:29	08/16/22 13:29	JCP	Mt. Juliet, TN
EDB / DBCP by Method 8011	WG1911172	1.03	08/16/22 11:22	08/17/22 03:36	KLA	Mt. Juliet, TN

TRIP BLANK L1524871-10 GW

Collected by: Alex Black
 Collected date/time: 08/11/22 00:00
 Received date/time: 08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1911707	1	08/16/22 13:51	08/16/22 13:51	JCP	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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	25.5		2.50	1	08/18/2022 17:53	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	57.3		20.0	1	08/21/2022 15:06	WG1914096

Sample Narrative:

L1524871-01 WG1914096: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.250	1	08/22/2022 17:26	WG1914696

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	ND		20.0	1	08/31/2022 18:47	WG1918978

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	08/12/2022 22:25	WG1910248
Chloride	4.20		1.00	1	08/12/2022 22:25	WG1910248
Fluoride	ND		0.150	1	08/12/2022 22:25	WG1910248
Nitrate	ND		0.100	1	08/12/2022 22:25	WG1910248
Sulfate	5.52		5.00	1	08/12/2022 22:25	WG1910248

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	08/17/2022 10:49	WG1910560

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	08/19/2022 09:10	WG1911343

Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.139		0.100	1	08/18/2022 17:53	WG1911347
Antimony	ND		0.00400	1	08/18/2022 17:53	WG1911347
Arsenic	0.0230		0.00200	1	08/18/2022 17:53	WG1911347
Barium	0.0204		0.00200	1	08/18/2022 17:53	WG1911347
Beryllium	ND		0.00200	1	08/18/2022 17:53	WG1911347
Cadmium	ND		0.00100	1	08/18/2022 17:53	WG1911347
Calcium	4.94		1.00	1	08/18/2022 17:53	WG1911347
Chromium	ND		0.00200	1	08/18/2022 17:53	WG1911347
Cobalt	0.0582		0.00200	1	08/18/2022 17:53	WG1911347
Copper	ND		0.00500	1	08/18/2022 17:53	WG1911347

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Iron	16.8		0.100	1	08/18/2022 17:53	WG1911347
Lead	ND		0.00200	1	08/18/2022 17:53	WG1911347
Magnesium	3.20		1.00	1	08/18/2022 17:53	WG1911347
Manganese	0.934		0.00500	1	08/18/2022 17:53	WG1911347
Nickel	0.00737		0.00200	1	08/18/2022 17:53	WG1911347
Potassium	ND		2.00	1	08/18/2022 17:53	WG1911347
Selenium	ND		0.00200	1	08/18/2022 17:53	WG1911347
Silver	ND		0.00200	1	08/18/2022 17:53	WG1911347
Sodium	4.05		2.00	1	08/18/2022 17:53	WG1911347
Thallium	ND		0.00200	1	08/18/2022 17:53	WG1911347
Vanadium	ND		0.00500	1	08/18/2022 17:53	WG1911347
Zinc	0.0250		0.0250	1	08/18/2022 17:53	WG1911347

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
Acetone	ND		0.0500	1	08/16/2022 14:11	WG1911707
Acrylonitrile	ND		0.0100	1	08/16/2022 14:11	WG1911707
Benzene	ND		0.00100	1	08/16/2022 14:11	WG1911707
Bromochloromethane	ND		0.00100	1	08/16/2022 14:11	WG1911707
Bromodichloromethane	ND		0.00100	1	08/16/2022 14:11	WG1911707
Bromoform	ND		0.00100	1	08/16/2022 14:11	WG1911707
Bromomethane	ND		0.00500	1	08/16/2022 14:11	WG1911707
Carbon disulfide	ND	J4	0.00100	1	08/16/2022 14:11	WG1911707
Carbon tetrachloride	ND		0.00100	1	08/16/2022 14:11	WG1911707
Chlorobenzene	ND		0.00100	1	08/16/2022 14:11	WG1911707
Chlorodibromomethane	ND		0.00100	1	08/16/2022 14:11	WG1911707
Chloroethane	ND	J3	0.00500	1	08/16/2022 14:11	WG1911707
Chloroform	ND		0.00500	1	08/16/2022 14:11	WG1911707
Chloromethane	ND		0.00250	1	08/16/2022 14:11	WG1911707
Dibromomethane	ND		0.00100	1	08/16/2022 14:11	WG1911707
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/16/2022 14:11	WG1911707
1,2-Dibromoethane	ND		0.00100	1	08/16/2022 14:11	WG1911707
1,2-Dichlorobenzene	ND		0.00100	1	08/16/2022 14:11	WG1911707
1,4-Dichlorobenzene	ND		0.00100	1	08/16/2022 14:11	WG1911707
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/16/2022 14:11	WG1911707
1,1-Dichloroethane	ND		0.00100	1	08/16/2022 14:11	WG1911707
1,2-Dichloroethane	ND		0.00100	1	08/16/2022 14:11	WG1911707
1,1-Dichloroethene	ND		0.00100	1	08/16/2022 14:11	WG1911707
cis-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 14:11	WG1911707
trans-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 14:11	WG1911707
1,2-Dichloropropane	ND		0.00100	1	08/16/2022 14:11	WG1911707
cis-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 14:11	WG1911707
trans-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 14:11	WG1911707
Ethylbenzene	ND		0.00100	1	08/16/2022 14:11	WG1911707
2-Hexanone	ND		0.0100	1	08/16/2022 14:11	WG1911707
Iodomethane	ND		0.0100	1	08/16/2022 14:11	WG1911707
2-Butanone (MEK)	ND		0.0100	1	08/16/2022 14:11	WG1911707
Methylene Chloride	ND		0.00500	1	08/16/2022 14:11	WG1911707
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/16/2022 14:11	WG1911707
Styrene	ND		0.00100	1	08/16/2022 14:11	WG1911707
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 14:11	WG1911707
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 14:11	WG1911707
Tetrachloroethene	ND		0.00100	1	08/16/2022 14:11	WG1911707
Toluene	ND		0.00100	1	08/16/2022 14:11	WG1911707
1,1,1-Trichloroethane	ND		0.00100	1	08/16/2022 14:11	WG1911707

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	08/16/2022 14:11	WG1911707
Trichloroethene	ND		0.00100	1	08/16/2022 14:11	WG1911707
Trichlorofluoromethane	ND		0.00500	1	08/16/2022 14:11	WG1911707
1,2,3-Trichloropropane	ND		0.00250	1	08/16/2022 14:11	WG1911707
Vinyl acetate	ND		0.0100	1	08/16/2022 14:11	WG1911707
Vinyl chloride	ND		0.00100	1	08/16/2022 14:11	WG1911707
Xylenes, Total	ND		0.00300	1	08/16/2022 14:11	WG1911707
<i>(S) Toluene-d8</i>	105		80.0-120		08/16/2022 14:11	WG1911707
<i>(S) 4-Bromofluorobenzene</i>	98.9		77.0-126		08/16/2022 14:11	WG1911707
<i>(S) 1,2-Dichloroethane-d4</i>	81.2		70.0-130		08/16/2022 14:11	WG1911707

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000214	1.07	08/19/2022 17:19	WG1912937
1,2-Dibromo-3-Chloropropane	ND		0.0000214	1.07	08/19/2022 17:19	WG1912937

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	61.2		2.50	1	08/18/2022 17:56	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	20.0		20.0	1	08/21/2022 15:11	WG1914096

Sample Narrative:

L1524871-02 WG1914096: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.250	1	08/22/2022 17:10	WG1914696

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	ND		20.0	1	08/31/2022 18:48	WG1918978

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	08/12/2022 22:37	WG1910248
Chloride	28.3		1.00	1	08/12/2022 22:37	WG1910248
Fluoride	ND		0.150	1	08/12/2022 22:37	WG1910248
Nitrate	0.718		0.100	1	08/12/2022 22:37	WG1910248
Sulfate	45.0		5.00	1	08/12/2022 22:37	WG1910248

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	08/17/2022 10:59	WG1910560
Mercury,Dissolved	ND		0.000200	1	08/15/2022 10:46	WG1910563

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	08/19/2022 09:13	WG1911343
Boron,Dissolved	ND		0.200	1	08/18/2022 15:56	WG1910291

Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	2.46		0.100	1	08/18/2022 17:56	WG1911347
Aluminum,Dissolved	ND		0.100	1	08/17/2022 17:21	WG1911350
Antimony	ND		0.00400	1	08/18/2022 17:56	WG1911347
Antimony,Dissolved	ND		0.00400	1	08/17/2022 17:21	WG1911350
Arsenic	ND		0.00200	1	08/18/2022 17:56	WG1911347
Arsenic,Dissolved	ND		0.00200	1	08/17/2022 17:21	WG1911350
Barium	0.0950		0.00200	1	08/18/2022 17:56	WG1911347
Barium,Dissolved	0.0629		0.00200	1	08/17/2022 17:21	WG1911350

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	08/18/2022 17:56	WG1911347
Beryllium,Dissolved	ND		0.00200	1	08/17/2022 17:21	WG1911350
Cadmium	0.00555		0.00100	1	08/18/2022 17:56	WG1911347
Cadmium,Dissolved	0.00387		0.00100	1	08/17/2022 17:21	WG1911350
Calcium	14.7		1.00	1	08/18/2022 17:56	WG1911347
Calcium,Dissolved	14.6		1.00	1	08/17/2022 17:21	WG1911350
Chromium	0.00811		0.00200	1	08/18/2022 17:56	WG1911347
Chromium,Dissolved	ND		0.00200	1	08/17/2022 17:21	WG1911350
Cobalt	0.00218		0.00200	1	08/18/2022 17:56	WG1911347
Cobalt,Dissolved	ND		0.00200	1	08/17/2022 17:21	WG1911350
Copper	0.00526		0.00500	1	08/18/2022 17:56	WG1911347
Copper,Dissolved	ND		0.00500	1	08/17/2022 17:21	WG1911350
Iron	3.07		0.100	1	08/18/2022 17:56	WG1911347
Iron,Dissolved	ND		0.100	1	08/17/2022 17:21	WG1911350
Lead	0.00412		0.00200	1	08/18/2022 17:56	WG1911347
Lead,Dissolved	ND		0.00200	1	08/17/2022 17:21	WG1911350
Magnesium	5.97		1.00	1	08/18/2022 17:56	WG1911347
Magnesium,Dissolved	5.59		1.00	1	08/17/2022 17:21	WG1911350
Manganese	0.177		0.00500	1	08/18/2022 17:56	WG1911347
Manganese,Dissolved	0.102		0.00500	1	08/17/2022 17:21	WG1911350
Nickel	0.00617		0.00200	1	08/18/2022 17:56	WG1911347
Nickel,Dissolved	0.00500		0.00200	1	08/17/2022 17:21	WG1911350
Potassium	5.83		2.00	1	08/18/2022 17:56	WG1911347
Potassium,Dissolved	5.53		2.00	1	08/17/2022 17:21	WG1911350
Selenium	ND		0.00200	1	08/18/2022 17:56	WG1911347
Selenium,Dissolved	ND		0.00200	1	08/17/2022 17:21	WG1911350
Silver	ND		0.00200	1	08/18/2022 17:56	WG1911347
Silver,Dissolved	ND		0.00200	1	08/17/2022 17:21	WG1911350
Sodium	13.9		2.00	1	08/18/2022 17:56	WG1911347
Sodium,Dissolved	12.5		2.00	1	08/17/2022 17:21	WG1911350
Thallium	ND		0.00200	1	08/18/2022 17:56	WG1911347
Thallium,Dissolved	ND		0.00200	1	08/17/2022 17:21	WG1911350
Vanadium	0.00669		0.00500	1	08/18/2022 17:56	WG1911347
Vanadium,Dissolved	ND		0.00500	1	08/17/2022 17:21	WG1911350
Zinc	0.0505		0.0250	1	08/18/2022 17:56	WG1911347
Zinc,Dissolved	0.0658		0.0250	1	08/17/2022 17:21	WG1911350

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
Acetone	ND		0.0500	1	08/16/2022 14:32	WG1911707
Acrylonitrile	ND		0.0100	1	08/16/2022 14:32	WG1911707
Benzene	ND		0.00100	1	08/16/2022 14:32	WG1911707
Bromochloromethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
Bromodichloromethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
Bromoform	ND		0.00100	1	08/16/2022 14:32	WG1911707
Bromomethane	ND		0.00500	1	08/16/2022 14:32	WG1911707
Carbon disulfide	ND	J4	0.00100	1	08/16/2022 14:32	WG1911707
Carbon tetrachloride	ND		0.00100	1	08/16/2022 14:32	WG1911707
Chlorobenzene	ND		0.00100	1	08/16/2022 14:32	WG1911707
Chlorodibromomethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
Chloroethane	ND	J3	0.00500	1	08/16/2022 14:32	WG1911707
Chloroform	ND		0.00500	1	08/16/2022 14:32	WG1911707
Chloromethane	ND		0.00250	1	08/16/2022 14:32	WG1911707
Dibromomethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/16/2022 14:32	WG1911707

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	08/16/2022 14:32	WG1911707
1,2-Dichlorobenzene	ND		0.00100	1	08/16/2022 14:32	WG1911707
1,4-Dichlorobenzene	ND		0.00100	1	08/16/2022 14:32	WG1911707
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/16/2022 14:32	WG1911707
1,1-Dichloroethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
1,2-Dichloroethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
1,1-Dichloroethene	ND		0.00100	1	08/16/2022 14:32	WG1911707
cis-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 14:32	WG1911707
trans-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 14:32	WG1911707
1,2-Dichloropropane	ND		0.00100	1	08/16/2022 14:32	WG1911707
cis-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 14:32	WG1911707
trans-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 14:32	WG1911707
Ethylbenzene	ND		0.00100	1	08/16/2022 14:32	WG1911707
2-Hexanone	ND		0.0100	1	08/16/2022 14:32	WG1911707
Iodomethane	ND		0.0100	1	08/16/2022 14:32	WG1911707
2-Butanone (MEK)	ND		0.0100	1	08/16/2022 14:32	WG1911707
Methylene Chloride	ND		0.00500	1	08/16/2022 14:32	WG1911707
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/16/2022 14:32	WG1911707
Styrene	ND		0.00100	1	08/16/2022 14:32	WG1911707
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
Tetrachloroethene	ND		0.00100	1	08/16/2022 14:32	WG1911707
Toluene	ND		0.00100	1	08/16/2022 14:32	WG1911707
1,1,1-Trichloroethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
1,1,2-Trichloroethane	ND		0.00100	1	08/16/2022 14:32	WG1911707
Trichloroethene	ND		0.00100	1	08/16/2022 14:32	WG1911707
Trichlorofluoromethane	ND		0.00500	1	08/16/2022 14:32	WG1911707
1,2,3-Trichloropropane	ND		0.00250	1	08/16/2022 14:32	WG1911707
Vinyl acetate	ND		0.0100	1	08/16/2022 14:32	WG1911707
Vinyl chloride	ND		0.00100	1	08/16/2022 14:32	WG1911707
Xylenes, Total	ND		0.00300	1	08/16/2022 14:32	WG1911707
(S) Toluene-d8	105		80.0-120		08/16/2022 14:32	WG1911707
(S) 4-Bromofluorobenzene	105		77.0-126		08/16/2022 14:32	WG1911707
(S) 1,2-Dichloroethane-d4	84.1		70.0-130		08/16/2022 14:32	WG1911707

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000204	1.02	08/19/2022 17:31	WG1912937
1,2-Dibromo-3-Chloropropane	ND		0.0000204	1.02	08/19/2022 17:31	WG1912937

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	28.4		2.50	1	08/18/2022 17:59	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	21.7		20.0	1	08/21/2022 15:13	WG1914096

Sample Narrative:

L1524871-03 WG1914096: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.250	1	08/22/2022 17:11	WG1914696

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	ND		20.0	1	08/31/2022 18:49	WG1918978

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	08/12/2022 22:50	WG1910248
Chloride	11.7		1.00	1	08/12/2022 22:50	WG1910248
Fluoride	ND		0.150	1	08/12/2022 22:50	WG1910248
Nitrate	1.11		0.100	1	08/12/2022 22:50	WG1910248
Sulfate	ND		5.00	1	08/12/2022 22:50	WG1910248

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	08/17/2022 11:03	WG1910560

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	08/19/2022 09:16	WG1911343

Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	ND		0.100	1	08/18/2022 17:59	WG1911347
Antimony	ND		0.00400	1	08/18/2022 17:59	WG1911347
Arsenic	ND		0.00200	1	08/18/2022 17:59	WG1911347
Barium	0.00860		0.00200	1	08/18/2022 17:59	WG1911347
Beryllium	ND		0.00200	1	08/18/2022 17:59	WG1911347
Cadmium	ND		0.00100	1	08/18/2022 17:59	WG1911347
Calcium	5.92		1.00	1	08/18/2022 17:59	WG1911347
Chromium	0.00331		0.00200	1	08/18/2022 17:59	WG1911347
Cobalt	ND		0.00200	1	08/18/2022 17:59	WG1911347
Copper	ND		0.00500	1	08/18/2022 17:59	WG1911347

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Iron	0.130		0.100	1	08/18/2022 17:59	WG1911347
Lead	ND		0.00200	1	08/18/2022 17:59	WG1911347
Magnesium	3.30		1.00	1	08/18/2022 17:59	WG1911347
Manganese	0.0152		0.00500	1	08/18/2022 17:59	WG1911347
Nickel	ND		0.00200	1	08/18/2022 17:59	WG1911347
Potassium	ND		2.00	1	08/18/2022 17:59	WG1911347
Selenium	ND		0.00200	1	08/18/2022 17:59	WG1911347
Silver	ND		0.00200	1	08/18/2022 17:59	WG1911347
Sodium	3.77		2.00	1	08/18/2022 17:59	WG1911347
Thallium	ND		0.00200	1	08/18/2022 17:59	WG1911347
Vanadium	ND		0.00500	1	08/18/2022 17:59	WG1911347
Zinc	ND		0.0250	1	08/18/2022 17:59	WG1911347

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
Acetone	ND		0.0500	1	08/16/2022 14:53	WG1911707
Acrylonitrile	ND		0.0100	1	08/16/2022 14:53	WG1911707
Benzene	ND		0.00100	1	08/16/2022 14:53	WG1911707
Bromochloromethane	ND		0.00100	1	08/16/2022 14:53	WG1911707
Bromodichloromethane	ND		0.00100	1	08/16/2022 14:53	WG1911707
Bromoform	ND		0.00100	1	08/16/2022 14:53	WG1911707
Bromomethane	ND		0.00500	1	08/16/2022 14:53	WG1911707
Carbon disulfide	ND	J4	0.00100	1	08/16/2022 14:53	WG1911707
Carbon tetrachloride	ND		0.00100	1	08/16/2022 14:53	WG1911707
Chlorobenzene	ND		0.00100	1	08/16/2022 14:53	WG1911707
Chlorodibromomethane	ND		0.00100	1	08/16/2022 14:53	WG1911707
Chloroethane	ND	J3	0.00500	1	08/16/2022 14:53	WG1911707
Chloroform	ND		0.00500	1	08/16/2022 14:53	WG1911707
Chloromethane	ND		0.00250	1	08/16/2022 14:53	WG1911707
Dibromomethane	ND		0.00100	1	08/16/2022 14:53	WG1911707
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/16/2022 14:53	WG1911707
1,2-Dibromoethane	ND		0.00100	1	08/16/2022 14:53	WG1911707
1,2-Dichlorobenzene	ND		0.00100	1	08/16/2022 14:53	WG1911707
1,4-Dichlorobenzene	ND		0.00100	1	08/16/2022 14:53	WG1911707
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/16/2022 14:53	WG1911707
1,1-Dichloroethane	ND		0.00100	1	08/16/2022 14:53	WG1911707
1,2-Dichloroethane	ND		0.00100	1	08/16/2022 14:53	WG1911707
1,1-Dichloroethene	ND		0.00100	1	08/16/2022 14:53	WG1911707
cis-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 14:53	WG1911707
trans-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 14:53	WG1911707
1,2-Dichloropropane	ND		0.00100	1	08/16/2022 14:53	WG1911707
cis-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 14:53	WG1911707
trans-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 14:53	WG1911707
Ethylbenzene	ND		0.00100	1	08/16/2022 14:53	WG1911707
2-Hexanone	ND		0.0100	1	08/16/2022 14:53	WG1911707
Iodomethane	ND		0.0100	1	08/16/2022 14:53	WG1911707
2-Butanone (MEK)	ND		0.0100	1	08/16/2022 14:53	WG1911707
Methylene Chloride	ND		0.00500	1	08/16/2022 14:53	WG1911707
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/16/2022 14:53	WG1911707
Styrene	ND		0.00100	1	08/16/2022 14:53	WG1911707
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 14:53	WG1911707
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 14:53	WG1911707
Tetrachloroethene	ND		0.00100	1	08/16/2022 14:53	WG1911707
Toluene	ND		0.00100	1	08/16/2022 14:53	WG1911707
1,1,1-Trichloroethane	ND		0.00100	1	08/16/2022 14:53	WG1911707

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	08/16/2022 14:53	WG1911707
Trichloroethene	ND		0.00100	1	08/16/2022 14:53	WG1911707
Trichlorofluoromethane	ND		0.00500	1	08/16/2022 14:53	WG1911707
1,2,3-Trichloropropane	ND		0.00250	1	08/16/2022 14:53	WG1911707
Vinyl acetate	ND		0.0100	1	08/16/2022 14:53	WG1911707
Vinyl chloride	ND		0.00100	1	08/16/2022 14:53	WG1911707
Xylenes, Total	ND		0.00300	1	08/16/2022 14:53	WG1911707
<i>(S) Toluene-d8</i>	106		80.0-120		08/16/2022 14:53	WG1911707
<i>(S) 4-Bromofluorobenzene</i>	98.6		77.0-126		08/16/2022 14:53	WG1911707
<i>(S) 1,2-Dichloroethane-d4</i>	84.7		70.0-130		08/16/2022 14:53	WG1911707

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000200	1	08/19/2022 17:44	WG1912937
1,2-Dibromo-3-Chloropropane	ND		0.0000200	1	08/19/2022 17:44	WG1912937

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	80.6		2.50	1	08/18/2022 18:09	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	08/21/2022 15:15	WG1914096

Sample Narrative:

L1524871-04 WG1914096: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.250	1	08/22/2022 17:13	WG1914696

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	ND		20.0	1	08/31/2022 18:49	WG1918978

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	08/12/2022 23:02	WG1910248
Chloride	66.4		1.00	1	08/12/2022 23:02	WG1910248
Fluoride	ND		0.150	1	08/12/2022 23:02	WG1910248
Nitrate	0.946		0.100	1	08/12/2022 23:02	WG1910248
Sulfate	13.2		5.00	1	08/12/2022 23:02	WG1910248

Mercury by Method 7470A

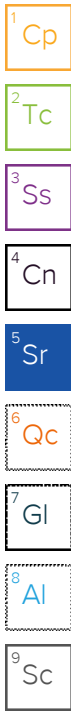
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	08/17/2022 11:06	WG1910560

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	08/19/2022 09:19	WG1911343

Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.264		0.100	1	08/18/2022 18:09	WG1911347
Antimony	ND		0.00400	1	08/18/2022 18:09	WG1911347
Arsenic	ND		0.00200	1	08/18/2022 18:09	WG1911347
Barium	0.0487		0.00200	1	08/18/2022 18:09	WG1911347
Beryllium	ND		0.00200	1	08/18/2022 18:09	WG1911347
Cadmium	ND		0.00100	1	08/18/2022 18:09	WG1911347
Calcium	15.2		1.00	1	08/18/2022 18:09	WG1911347
Chromium	0.00563		0.00200	1	08/18/2022 18:09	WG1911347
Cobalt	ND		0.00200	1	08/18/2022 18:09	WG1911347
Copper	ND		0.00500	1	08/18/2022 18:09	WG1911347



Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Iron	0.278		0.100	1	08/18/2022 18:09	WG1911347
Lead	ND		0.00200	1	08/18/2022 18:09	WG1911347
Magnesium	10.4		1.00	1	08/18/2022 18:09	WG1911347
Manganese	0.232		0.00500	1	08/18/2022 18:09	WG1911347
Nickel	0.00774		0.00200	1	08/18/2022 18:09	WG1911347
Potassium	ND		2.00	1	08/18/2022 18:09	WG1911347
Selenium	ND		0.00200	1	08/18/2022 18:09	WG1911347
Silver	ND		0.00200	1	08/18/2022 18:09	WG1911347
Sodium	18.3		2.00	1	08/19/2022 12:21	WG1911347
Thallium	ND		0.00200	1	08/18/2022 18:09	WG1911347
Vanadium	ND		0.00500	1	08/18/2022 18:09	WG1911347
Zinc	ND		0.0250	1	08/18/2022 18:09	WG1911347

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
Acetone	ND		0.0500	1	08/16/2022 15:14	WG1911707
Acrylonitrile	ND		0.0100	1	08/16/2022 15:14	WG1911707
Benzene	ND		0.00100	1	08/16/2022 15:14	WG1911707
Bromochloromethane	ND		0.00100	1	08/16/2022 15:14	WG1911707
Bromodichloromethane	ND		0.00100	1	08/16/2022 15:14	WG1911707
Bromoform	ND		0.00100	1	08/16/2022 15:14	WG1911707
Bromomethane	ND		0.00500	1	08/16/2022 15:14	WG1911707
Carbon disulfide	ND	J4	0.00100	1	08/16/2022 15:14	WG1911707
Carbon tetrachloride	ND		0.00100	1	08/16/2022 15:14	WG1911707
Chlorobenzene	ND		0.00100	1	08/16/2022 15:14	WG1911707
Chlorodibromomethane	ND		0.00100	1	08/16/2022 15:14	WG1911707
Chloroethane	ND	J3	0.00500	1	08/16/2022 15:14	WG1911707
Chloroform	ND		0.00500	1	08/16/2022 15:14	WG1911707
Chloromethane	ND		0.00250	1	08/16/2022 15:14	WG1911707
Dibromomethane	ND		0.00100	1	08/16/2022 15:14	WG1911707
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/16/2022 15:14	WG1911707
1,2-Dibromoethane	ND		0.00100	1	08/16/2022 15:14	WG1911707
1,2-Dichlorobenzene	ND		0.00100	1	08/16/2022 15:14	WG1911707
1,4-Dichlorobenzene	ND		0.00100	1	08/16/2022 15:14	WG1911707
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/16/2022 15:14	WG1911707
1,1-Dichloroethane	ND		0.00100	1	08/16/2022 15:14	WG1911707
1,2-Dichloroethane	ND		0.00100	1	08/16/2022 15:14	WG1911707
1,1-Dichloroethene	ND		0.00100	1	08/16/2022 15:14	WG1911707
cis-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 15:14	WG1911707
trans-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 15:14	WG1911707
1,2-Dichloropropane	ND		0.00100	1	08/16/2022 15:14	WG1911707
cis-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 15:14	WG1911707
trans-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 15:14	WG1911707
Ethylbenzene	ND		0.00100	1	08/16/2022 15:14	WG1911707
2-Hexanone	ND		0.0100	1	08/16/2022 15:14	WG1911707
Iodomethane	ND		0.0100	1	08/16/2022 15:14	WG1911707
2-Butanone (MEK)	ND		0.0100	1	08/16/2022 15:14	WG1911707
Methylene Chloride	ND		0.00500	1	08/16/2022 15:14	WG1911707
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/16/2022 15:14	WG1911707
Styrene	ND		0.00100	1	08/16/2022 15:14	WG1911707
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 15:14	WG1911707
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 15:14	WG1911707
Tetrachloroethene	ND		0.00100	1	08/16/2022 15:14	WG1911707
Toluene	ND		0.00100	1	08/16/2022 15:14	WG1911707
1,1,1-Trichloroethane	ND		0.00100	1	08/16/2022 15:14	WG1911707

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	08/16/2022 15:14	WG1911707
Trichloroethene	ND		0.00100	1	08/16/2022 15:14	WG1911707
Trichlorofluoromethane	ND		0.00500	1	08/16/2022 15:14	WG1911707
1,2,3-Trichloropropane	ND		0.00250	1	08/16/2022 15:14	WG1911707
Vinyl acetate	ND		0.0100	1	08/16/2022 15:14	WG1911707
Vinyl chloride	ND		0.00100	1	08/16/2022 15:14	WG1911707
Xylenes, Total	ND		0.00300	1	08/16/2022 15:14	WG1911707
<i>(S) Toluene-d8</i>	107		80.0-120		08/16/2022 15:14	WG1911707
<i>(S) 4-Bromofluorobenzene</i>	104		77.0-126		08/16/2022 15:14	WG1911707
<i>(S) 1,2-Dichloroethane-d4</i>	85.4		70.0-130		08/16/2022 15:14	WG1911707

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

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000212	1.06	08/17/2022 01:58	WG1911172
1,2-Dibromo-3-Chloropropane	ND		0.0000212	1.06	08/17/2022 01:58	WG1911172

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	63.3		2.50	1	08/18/2022 18:12	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	08/21/2022 15:17	WG1914096

Sample Narrative:

L1524871-05 WG1914096: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.250	1	08/22/2022 16:00	WG1914697

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	ND		20.0	1	08/31/2022 02:14	WG1918979

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	08/12/2022 23:14	WG1910248
Chloride	43.1		1.00	1	08/12/2022 23:14	WG1910248
Fluoride	ND		0.150	1	08/12/2022 23:14	WG1910248
Nitrate	1.65		0.100	1	08/12/2022 23:14	WG1910248
Sulfate	ND		5.00	1	08/12/2022 23:14	WG1910248

Mercury by Method 7470A

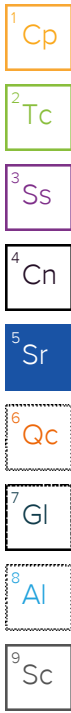
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	08/17/2022 11:08	WG1910560

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	08/19/2022 09:21	WG1911343

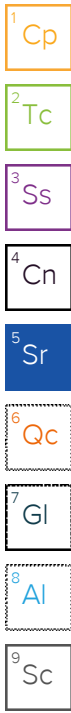
Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	ND		0.100	1	08/18/2022 18:12	WG1911347
Antimony	ND		0.00400	1	08/18/2022 18:12	WG1911347
Arsenic	ND		0.00200	1	08/18/2022 18:12	WG1911347
Barium	0.0138		0.00200	1	08/18/2022 18:12	WG1911347
Beryllium	ND		0.00200	1	08/18/2022 18:12	WG1911347
Cadmium	ND		0.00100	1	08/18/2022 18:12	WG1911347
Calcium	17.0		1.00	1	08/18/2022 18:12	WG1911347
Chromium	ND		0.00200	1	08/18/2022 18:12	WG1911347
Cobalt	ND		0.00200	1	08/18/2022 18:12	WG1911347
Copper	ND		0.00500	1	08/18/2022 18:12	WG1911347



Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Iron	ND		0.100	1	08/18/2022 18:12	WG1911347
Lead	ND		0.00200	1	08/18/2022 18:12	WG1911347
Magnesium	5.09		1.00	1	08/18/2022 18:12	WG1911347
Manganese	0.00547		0.00500	1	08/18/2022 18:12	WG1911347
Nickel	ND		0.00200	1	08/18/2022 18:12	WG1911347
Potassium	ND		2.00	1	08/18/2022 18:12	WG1911347
Selenium	ND		0.00200	1	08/18/2022 18:12	WG1911347
Silver	ND		0.00200	1	08/18/2022 18:12	WG1911347
Sodium	4.55		2.00	1	08/19/2022 12:24	WG1911347
Thallium	ND		0.00200	1	08/18/2022 18:12	WG1911347
Vanadium	ND		0.00500	1	08/18/2022 18:12	WG1911347
Zinc	ND		0.0250	1	08/18/2022 18:12	WG1911347



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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	ND	<u>J4</u>	0.0500	1	08/17/2022 13:12	WG1912268
Acrylonitrile	ND		0.0100	1	08/17/2022 13:12	WG1912268
Benzene	ND		0.00100	1	08/17/2022 13:12	WG1912268
Bromochloromethane	ND		0.00100	1	08/17/2022 13:12	WG1912268
Bromodichloromethane	ND		0.00100	1	08/17/2022 13:12	WG1912268
Bromoform	ND		0.00100	1	08/17/2022 13:12	WG1912268
Bromomethane	ND		0.00500	1	08/17/2022 13:12	WG1912268
Carbon disulfide	ND		0.00100	1	08/17/2022 13:12	WG1912268
Carbon tetrachloride	ND		0.00100	1	08/17/2022 13:12	WG1912268
Chlorobenzene	ND		0.00100	1	08/17/2022 13:12	WG1912268
Chlorodibromomethane	ND		0.00100	1	08/17/2022 13:12	WG1912268
Chloroethane	ND		0.00500	1	08/17/2022 13:12	WG1912268
Chloroform	ND		0.00500	1	08/17/2022 13:12	WG1912268
Chloromethane	ND		0.00250	1	08/17/2022 13:12	WG1912268
Dibromomethane	ND		0.00100	1	08/17/2022 13:12	WG1912268
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/17/2022 13:12	WG1912268
1,2-Dibromoethane	ND		0.00100	1	08/17/2022 13:12	WG1912268
1,2-Dichlorobenzene	ND		0.00100	1	08/17/2022 13:12	WG1912268
1,4-Dichlorobenzene	ND		0.00100	1	08/17/2022 13:12	WG1912268
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/17/2022 13:12	WG1912268
1,1-Dichloroethane	ND		0.00100	1	08/17/2022 13:12	WG1912268
1,2-Dichloroethane	ND		0.00100	1	08/17/2022 13:12	WG1912268
1,1-Dichloroethene	ND		0.00100	1	08/17/2022 13:12	WG1912268
cis-1,2-Dichloroethene	ND		0.00100	1	08/17/2022 13:12	WG1912268
trans-1,2-Dichloroethene	ND		0.00100	1	08/17/2022 13:12	WG1912268
1,2-Dichloropropane	ND		0.00100	1	08/17/2022 13:12	WG1912268
cis-1,3-Dichloropropene	ND		0.00100	1	08/17/2022 13:12	WG1912268
trans-1,3-Dichloropropene	ND		0.00100	1	08/17/2022 13:12	WG1912268
Ethylbenzene	ND		0.00100	1	08/17/2022 13:12	WG1912268
2-Hexanone	ND		0.0100	1	08/17/2022 13:12	WG1912268
Iodomethane	ND		0.0100	1	08/17/2022 13:12	WG1912268
2-Butanone (MEK)	ND		0.0100	1	08/17/2022 13:12	WG1912268
Methylene Chloride	ND		0.00500	1	08/17/2022 13:12	WG1912268
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/17/2022 13:12	WG1912268
Styrene	ND		0.00100	1	08/17/2022 13:12	WG1912268
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/17/2022 13:12	WG1912268
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/17/2022 13:12	WG1912268
Tetrachloroethene	ND		0.00100	1	08/17/2022 13:12	WG1912268
Toluene	ND		0.00100	1	08/17/2022 13:12	WG1912268
1,1,1-Trichloroethane	ND		0.00100	1	08/17/2022 13:12	WG1912268

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	08/17/2022 13:12	WG1912268
Trichloroethene	ND		0.00100	1	08/17/2022 13:12	WG1912268
Trichlorofluoromethane	ND		0.00500	1	08/17/2022 13:12	WG1912268
1,2,3-Trichloropropane	ND		0.00250	1	08/17/2022 13:12	WG1912268
Vinyl acetate	ND		0.0100	1	08/17/2022 13:12	WG1912268
Vinyl chloride	ND		0.00100	1	08/17/2022 13:12	WG1912268
Xylenes, Total	ND		0.00300	1	08/17/2022 13:12	WG1912268
<i>(S) Toluene-d8</i>	101		80.0-120		08/17/2022 13:12	WG1912268
<i>(S) 4-Bromofluorobenzene</i>	96.1		77.0-126		08/17/2022 13:12	WG1912268
<i>(S) 1,2-Dichloroethane-d4</i>	89.5		70.0-130		08/17/2022 13:12	WG1912268

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000204	1.02	08/17/2022 02:11	WG1911172
1,2-Dibromo-3-Chloropropane	ND		0.0000204	1.02	08/17/2022 02:11	WG1911172

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	57.9		2.50	1	08/18/2022 18:16	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	25.1		20.0	1	08/21/2022 15:22	WG1914096

Sample Narrative:

L1524871-06 WG1914096: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.250	1	08/22/2022 16:01	WG1914697

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	ND		20.0	1	08/31/2022 02:15	WG1918979

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	08/12/2022 23:27	WG1910248
Chloride	42.8		1.00	1	08/12/2022 23:27	WG1910248
Fluoride	ND		0.150	1	08/12/2022 23:27	WG1910248
Nitrate	0.865		0.100	1	08/12/2022 23:27	WG1910248
Sulfate	ND		5.00	1	08/12/2022 23:27	WG1910248

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	08/17/2022 11:14	WG1910560

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	08/19/2022 09:30	WG1911343

Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.290		0.100	1	08/18/2022 18:16	WG1911347
Antimony	ND		0.00400	1	08/18/2022 18:16	WG1911347
Arsenic	ND		0.00200	1	08/18/2022 18:16	WG1911347
Barium	0.0307		0.00200	1	08/18/2022 18:16	WG1911347
Beryllium	ND		0.00200	1	08/18/2022 18:16	WG1911347
Cadmium	ND		0.00100	1	08/18/2022 18:16	WG1911347
Calcium	14.1		1.00	1	08/18/2022 18:16	WG1911347
Chromium	0.00226		0.00200	1	08/18/2022 18:16	WG1911347
Cobalt	ND		0.00200	1	08/18/2022 18:16	WG1911347
Copper	ND		0.00500	1	08/18/2022 18:16	WG1911347



Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Iron	0.247		0.100	1	08/18/2022 18:16	WG1911347
Lead	ND		0.00200	1	08/18/2022 18:16	WG1911347
Magnesium	5.49		1.00	1	08/18/2022 18:16	WG1911347
Manganese	0.00665		0.00500	1	08/18/2022 18:16	WG1911347
Nickel	ND		0.00200	1	08/18/2022 18:16	WG1911347
Potassium	ND		2.00	1	08/18/2022 18:16	WG1911347
Selenium	ND		0.00200	1	08/18/2022 18:16	WG1911347
Silver	ND		0.00200	1	08/18/2022 18:16	WG1911347
Sodium	5.66		2.00	1	08/19/2022 12:27	WG1911347
Thallium	ND		0.00200	1	08/18/2022 18:16	WG1911347
Vanadium	ND		0.00500	1	08/18/2022 18:16	WG1911347
Zinc	ND		0.0250	1	08/18/2022 18:16	WG1911347

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
Acetone	ND	J4	0.0500	1	08/17/2022 13:33	WG1912268
Acrylonitrile	ND		0.0100	1	08/17/2022 13:33	WG1912268
Benzene	ND		0.00100	1	08/17/2022 13:33	WG1912268
Bromochloromethane	ND		0.00100	1	08/17/2022 13:33	WG1912268
Bromodichloromethane	ND		0.00100	1	08/17/2022 13:33	WG1912268
Bromoform	ND		0.00100	1	08/17/2022 13:33	WG1912268
Bromomethane	ND		0.00500	1	08/17/2022 13:33	WG1912268
Carbon disulfide	ND		0.00100	1	08/17/2022 13:33	WG1912268
Carbon tetrachloride	ND		0.00100	1	08/17/2022 13:33	WG1912268
Chlorobenzene	ND		0.00100	1	08/17/2022 13:33	WG1912268
Chlorodibromomethane	ND		0.00100	1	08/17/2022 13:33	WG1912268
Chloroethane	ND		0.00500	1	08/17/2022 13:33	WG1912268
Chloroform	ND		0.00500	1	08/17/2022 13:33	WG1912268
Chloromethane	ND		0.00250	1	08/17/2022 13:33	WG1912268
Dibromomethane	ND		0.00100	1	08/17/2022 13:33	WG1912268
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/17/2022 13:33	WG1912268
1,2-Dibromoethane	ND		0.00100	1	08/17/2022 13:33	WG1912268
1,2-Dichlorobenzene	ND		0.00100	1	08/17/2022 13:33	WG1912268
1,4-Dichlorobenzene	ND		0.00100	1	08/17/2022 13:33	WG1912268
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/17/2022 13:33	WG1912268
1,1-Dichloroethane	ND		0.00100	1	08/17/2022 13:33	WG1912268
1,2-Dichloroethane	ND		0.00100	1	08/17/2022 13:33	WG1912268
1,1-Dichloroethene	ND		0.00100	1	08/17/2022 13:33	WG1912268
cis-1,2-Dichloroethene	ND		0.00100	1	08/17/2022 13:33	WG1912268
trans-1,2-Dichloroethene	ND		0.00100	1	08/17/2022 13:33	WG1912268
1,2-Dichloropropane	ND		0.00100	1	08/17/2022 13:33	WG1912268
cis-1,3-Dichloropropene	ND		0.00100	1	08/17/2022 13:33	WG1912268
trans-1,3-Dichloropropene	ND		0.00100	1	08/17/2022 13:33	WG1912268
Ethylbenzene	ND		0.00100	1	08/17/2022 13:33	WG1912268
2-Hexanone	ND		0.0100	1	08/17/2022 13:33	WG1912268
Iodomethane	ND		0.0100	1	08/17/2022 13:33	WG1912268
2-Butanone (MEK)	ND		0.0100	1	08/17/2022 13:33	WG1912268
Methylene Chloride	ND		0.00500	1	08/17/2022 13:33	WG1912268
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/17/2022 13:33	WG1912268
Styrene	ND		0.00100	1	08/17/2022 13:33	WG1912268
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/17/2022 13:33	WG1912268
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/17/2022 13:33	WG1912268
Tetrachloroethene	ND		0.00100	1	08/17/2022 13:33	WG1912268
Toluene	ND		0.00100	1	08/17/2022 13:33	WG1912268
1,1,1-Trichloroethane	ND		0.00100	1	08/17/2022 13:33	WG1912268

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	08/17/2022 13:33	WG1912268
Trichloroethene	ND		0.00100	1	08/17/2022 13:33	WG1912268
Trichlorofluoromethane	ND		0.00500	1	08/17/2022 13:33	WG1912268
1,2,3-Trichloropropane	ND		0.00250	1	08/17/2022 13:33	WG1912268
Vinyl acetate	ND		0.0100	1	08/17/2022 13:33	WG1912268
Vinyl chloride	ND		0.00100	1	08/17/2022 13:33	WG1912268
Xylenes, Total	ND		0.00300	1	08/17/2022 13:33	WG1912268
<i>(S) Toluene-d8</i>	103		80.0-120		08/17/2022 13:33	WG1912268
<i>(S) 4-Bromofluorobenzene</i>	96.9		77.0-126		08/17/2022 13:33	WG1912268
<i>(S) 1,2-Dichloroethane-d4</i>	89.1		70.0-130		08/17/2022 13:33	WG1912268

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

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	08/17/2022 02:59	WG1911172
1,2-Dibromo-3-Chloropropane	ND		0.0000206	1.03	08/17/2022 02:59	WG1911172

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	82.6		2.50	1	08/18/2022 18:19	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	20.2		20.0	1	08/21/2022 15:34	WG1914096

Sample Narrative:

L1524871-07 WG1914096: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND	J5	0.250	1	08/22/2022 16:03	WG1914697

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	ND		20.0	1	08/31/2022 02:15	WG1918979

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	08/12/2022 23:39	WG1910248
Chloride	65.4		1.00	1	08/12/2022 23:39	WG1910248
Fluoride	ND		0.150	1	08/12/2022 23:39	WG1910248
Nitrate	6.45		0.100	1	08/12/2022 23:39	WG1910248
Sulfate	ND		5.00	1	08/12/2022 23:39	WG1910248

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	08/17/2022 11:16	WG1910560

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	08/19/2022 09:32	WG1911343

Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	ND		0.100	1	08/18/2022 18:19	WG1911347
Antimony	ND		0.00400	1	08/18/2022 18:19	WG1911347
Arsenic	ND		0.00200	1	08/18/2022 18:19	WG1911347
Barium	0.0434		0.00200	1	08/18/2022 18:19	WG1911347
Beryllium	ND		0.00200	1	08/18/2022 18:19	WG1911347
Cadmium	ND		0.00100	1	08/18/2022 18:19	WG1911347
Calcium	21.2		1.00	1	08/18/2022 18:19	WG1911347
Chromium	ND		0.00200	1	08/18/2022 18:19	WG1911347
Cobalt	ND		0.00200	1	08/18/2022 18:19	WG1911347
Copper	ND		0.00500	1	08/18/2022 18:19	WG1911347



Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Iron	0.104		0.100	1	08/18/2022 18:19	WG1911347
Lead	ND		0.00200	1	08/18/2022 18:19	WG1911347
Magnesium	7.19		1.00	1	08/18/2022 18:19	WG1911347
Manganese	0.00953		0.00500	1	08/18/2022 18:19	WG1911347
Nickel	ND		0.00200	1	08/18/2022 18:19	WG1911347
Potassium	ND		2.00	1	08/18/2022 18:19	WG1911347
Selenium	ND		0.00200	1	08/18/2022 18:19	WG1911347
Silver	ND		0.00200	1	08/18/2022 18:19	WG1911347
Sodium	15.0		2.00	1	08/19/2022 12:30	WG1911347
Thallium	ND		0.00200	1	08/18/2022 18:19	WG1911347
Vanadium	ND		0.00500	1	08/18/2022 18:19	WG1911347
Zinc	ND		0.0250	1	08/18/2022 18:19	WG1911347

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
Acetone	ND	J4	0.0500	1	08/17/2022 13:54	WG1912268
Acrylonitrile	ND		0.0100	1	08/17/2022 13:54	WG1912268
Benzene	ND		0.00100	1	08/17/2022 13:54	WG1912268
Bromochloromethane	ND		0.00100	1	08/17/2022 13:54	WG1912268
Bromodichloromethane	ND		0.00100	1	08/17/2022 13:54	WG1912268
Bromoform	ND		0.00100	1	08/17/2022 13:54	WG1912268
Bromomethane	ND		0.00500	1	08/17/2022 13:54	WG1912268
Carbon disulfide	ND		0.00100	1	08/17/2022 13:54	WG1912268
Carbon tetrachloride	ND		0.00100	1	08/17/2022 13:54	WG1912268
Chlorobenzene	ND		0.00100	1	08/17/2022 13:54	WG1912268
Chlorodibromomethane	ND		0.00100	1	08/17/2022 13:54	WG1912268
Chloroethane	ND		0.00500	1	08/17/2022 13:54	WG1912268
Chloroform	ND		0.00500	1	08/17/2022 13:54	WG1912268
Chloromethane	ND		0.00250	1	08/17/2022 13:54	WG1912268
Dibromomethane	ND		0.00100	1	08/17/2022 13:54	WG1912268
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/17/2022 13:54	WG1912268
1,2-Dibromoethane	ND		0.00100	1	08/17/2022 13:54	WG1912268
1,2-Dichlorobenzene	ND		0.00100	1	08/17/2022 13:54	WG1912268
1,4-Dichlorobenzene	ND		0.00100	1	08/17/2022 13:54	WG1912268
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/17/2022 13:54	WG1912268
1,1-Dichloroethane	ND		0.00100	1	08/17/2022 13:54	WG1912268
1,2-Dichloroethane	ND		0.00100	1	08/17/2022 13:54	WG1912268
1,1-Dichloroethene	ND		0.00100	1	08/17/2022 13:54	WG1912268
cis-1,2-Dichloroethene	ND		0.00100	1	08/17/2022 13:54	WG1912268
trans-1,2-Dichloroethene	ND		0.00100	1	08/17/2022 13:54	WG1912268
1,2-Dichloropropane	ND		0.00100	1	08/17/2022 13:54	WG1912268
cis-1,3-Dichloropropene	ND		0.00100	1	08/17/2022 13:54	WG1912268
trans-1,3-Dichloropropene	ND		0.00100	1	08/17/2022 13:54	WG1912268
Ethylbenzene	ND		0.00100	1	08/17/2022 13:54	WG1912268
2-Hexanone	ND		0.0100	1	08/17/2022 13:54	WG1912268
Iodomethane	ND		0.0100	1	08/17/2022 13:54	WG1912268
2-Butanone (MEK)	ND		0.0100	1	08/17/2022 13:54	WG1912268
Methylene Chloride	ND		0.00500	1	08/17/2022 13:54	WG1912268
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/17/2022 13:54	WG1912268
Styrene	ND		0.00100	1	08/17/2022 13:54	WG1912268
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/17/2022 13:54	WG1912268
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/17/2022 13:54	WG1912268
Tetrachloroethene	ND		0.00100	1	08/17/2022 13:54	WG1912268
Toluene	ND		0.00100	1	08/17/2022 13:54	WG1912268
1,1,1-Trichloroethane	ND		0.00100	1	08/17/2022 13:54	WG1912268

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	08/17/2022 13:54	WG1912268
Trichloroethene	ND		0.00100	1	08/17/2022 13:54	WG1912268
Trichlorofluoromethane	ND		0.00500	1	08/17/2022 13:54	WG1912268
1,2,3-Trichloropropane	ND		0.00250	1	08/17/2022 13:54	WG1912268
Vinyl acetate	ND		0.0100	1	08/17/2022 13:54	WG1912268
Vinyl chloride	ND		0.00100	1	08/17/2022 13:54	WG1912268
Xylenes, Total	ND		0.00300	1	08/17/2022 13:54	WG1912268
<i>(S) Toluene-d8</i>	102		80.0-120		08/17/2022 13:54	WG1912268
<i>(S) 4-Bromofluorobenzene</i>	97.0		77.0-126		08/17/2022 13:54	WG1912268
<i>(S) 1,2-Dichloroethane-d4</i>	89.8		70.0-130		08/17/2022 13:54	WG1912268

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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	08/17/2022 03:12	WG1911172
1,2-Dibromo-3-Chloropropane	ND		0.0000216	1.08	08/17/2022 03:12	WG1911172

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	61.8		2.50	1	08/18/2022 18:22	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	22.0		20.0	1	08/21/2022 15:36	WG1914096

Sample Narrative:

L1524871-08 WG1914096: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.250	1	08/22/2022 16:07	WG1914697

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	ND		20.0	1	08/31/2022 02:16	WG1918979

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	08/12/2022 23:52	WG1910248
Chloride	27.6		1.00	1	08/12/2022 23:52	WG1910248
Fluoride	0.259		0.150	1	08/12/2022 23:52	WG1910248
Nitrate	0.672		0.100	1	08/12/2022 23:52	WG1910248
Sulfate	48.7		5.00	1	08/12/2022 23:52	WG1910248

Mercury by Method 7470A

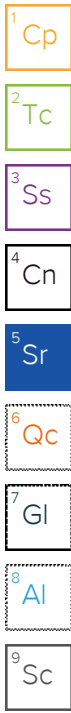
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	08/17/2022 11:18	WG1910560
Mercury,Dissolved	ND		0.000200	1	08/15/2022 11:18	WG1910563

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	08/19/2022 09:35	WG1911343
Boron,Dissolved	ND		0.200	1	08/15/2022 10:59	WG1907163

Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	1.96		0.100	1	08/18/2022 18:22	WG1911347
Aluminum,Dissolved	ND		0.100	1	08/17/2022 13:17	WG1909180
Antimony	ND		0.00400	1	08/18/2022 18:22	WG1911347
Antimony,Dissolved	ND		0.00400	1	08/17/2022 13:17	WG1909180
Arsenic	ND		0.00200	1	08/18/2022 18:22	WG1911347
Arsenic,Dissolved	ND		0.00200	1	08/17/2022 13:17	WG1909180
Barium	0.0824		0.00200	1	08/18/2022 18:22	WG1911347
Barium,Dissolved	0.0644		0.00200	1	08/17/2022 13:17	WG1909180



Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.00200	1	08/18/2022 18:22	WG1911347
Beryllium,Dissolved	ND		0.00200	1	08/17/2022 17:24	WG1909180
Cadmium	0.00503		0.00100	1	08/18/2022 18:22	WG1911347
Cadmium,Dissolved	0.00383		0.00100	1	08/17/2022 13:17	WG1909180
Calcium	14.8		1.00	1	08/18/2022 18:22	WG1911347
Calcium,Dissolved	14.6		1.00	1	08/17/2022 13:17	WG1909180
Chromium	0.00475		0.00200	1	08/18/2022 18:22	WG1911347
Chromium,Dissolved	ND		0.00200	1	08/17/2022 13:17	WG1909180
Cobalt	ND		0.00200	1	08/18/2022 18:22	WG1911347
Cobalt,Dissolved	ND		0.00200	1	08/17/2022 13:17	WG1909180
Copper	ND		0.00500	1	08/18/2022 18:22	WG1911347
Copper,Dissolved	ND		0.00500	1	08/17/2022 17:24	WG1909180
Iron	2.48		0.100	1	08/18/2022 18:22	WG1911347
Iron,Dissolved	ND		0.100	1	08/17/2022 13:17	WG1909180
Lead	0.00286		0.00200	1	08/18/2022 18:22	WG1911347
Lead,Dissolved	ND		0.00200	1	08/17/2022 13:17	WG1909180
Magnesium	6.01		1.00	1	08/18/2022 18:22	WG1911347
Magnesium,Dissolved	5.50		1.00	1	08/17/2022 13:17	WG1909180
Manganese	0.137		0.00500	1	08/18/2022 18:22	WG1911347
Manganese,Dissolved	0.104		0.00500	1	08/17/2022 13:17	WG1909180
Nickel	0.00635		0.00200	1	08/18/2022 18:22	WG1911347
Nickel,Dissolved	0.00510		0.00200	1	08/17/2022 13:17	WG1909180
Potassium	5.71		2.00	1	08/18/2022 18:22	WG1911347
Potassium,Dissolved	7.45		2.00	1	08/17/2022 13:17	WG1909180
Selenium	ND		0.00200	1	08/18/2022 18:22	WG1911347
Selenium,Dissolved	ND		0.00200	1	08/17/2022 13:17	WG1909180
Silver	ND		0.00200	1	08/18/2022 18:22	WG1911347
Silver,Dissolved	ND		0.00200	1	08/17/2022 13:17	WG1909180
Sodium	12.6		2.00	1	08/19/2022 12:34	WG1911347
Sodium,Dissolved	15.4		2.00	1	08/17/2022 13:17	WG1909180
Thallium	ND		0.00200	1	08/18/2022 18:22	WG1911347
Thallium,Dissolved	ND		0.00200	1	08/17/2022 13:17	WG1909180
Vanadium	0.00587		0.00500	1	08/18/2022 18:22	WG1911347
Vanadium,Dissolved	ND		0.00500	1	08/17/2022 13:17	WG1909180
Zinc	0.0596		0.0250	1	08/18/2022 18:22	WG1911347
Zinc,Dissolved	0.0692		0.0250	1	08/17/2022 13:17	WG1909180

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
Acetone	ND	J4	0.0500	1	08/17/2022 14:14	WG1912268
Acrylonitrile	ND		0.0100	1	08/17/2022 14:14	WG1912268
Benzene	ND		0.00100	1	08/17/2022 14:14	WG1912268
Bromochloromethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
Bromodichloromethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
Bromoform	ND		0.00100	1	08/17/2022 14:14	WG1912268
Bromomethane	ND		0.00500	1	08/17/2022 14:14	WG1912268
Carbon disulfide	ND		0.00100	1	08/17/2022 14:14	WG1912268
Carbon tetrachloride	ND		0.00100	1	08/17/2022 14:14	WG1912268
Chlorobenzene	ND		0.00100	1	08/17/2022 14:14	WG1912268
Chlorodibromomethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
Chloroethane	ND		0.00500	1	08/17/2022 14:14	WG1912268
Chloroform	ND		0.00500	1	08/17/2022 14:14	WG1912268
Chloromethane	ND		0.00250	1	08/17/2022 14:14	WG1912268
Dibromomethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/17/2022 14:14	WG1912268

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	08/17/2022 14:14	WG1912268
1,2-Dichlorobenzene	ND		0.00100	1	08/17/2022 14:14	WG1912268
1,4-Dichlorobenzene	ND		0.00100	1	08/17/2022 14:14	WG1912268
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/17/2022 14:14	WG1912268
1,1-Dichloroethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
1,2-Dichloroethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
1,1-Dichloroethene	ND		0.00100	1	08/17/2022 14:14	WG1912268
cis-1,2-Dichloroethene	ND		0.00100	1	08/17/2022 14:14	WG1912268
trans-1,2-Dichloroethene	ND		0.00100	1	08/17/2022 14:14	WG1912268
1,2-Dichloropropane	ND		0.00100	1	08/17/2022 14:14	WG1912268
cis-1,3-Dichloropropene	ND		0.00100	1	08/17/2022 14:14	WG1912268
trans-1,3-Dichloropropene	ND		0.00100	1	08/17/2022 14:14	WG1912268
Ethylbenzene	ND		0.00100	1	08/17/2022 14:14	WG1912268
2-Hexanone	ND		0.0100	1	08/17/2022 14:14	WG1912268
Iodomethane	ND		0.0100	1	08/17/2022 14:14	WG1912268
2-Butanone (MEK)	ND		0.0100	1	08/17/2022 14:14	WG1912268
Methylene Chloride	ND		0.00500	1	08/17/2022 14:14	WG1912268
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/17/2022 14:14	WG1912268
Styrene	ND		0.00100	1	08/17/2022 14:14	WG1912268
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
Tetrachloroethene	ND		0.00100	1	08/17/2022 14:14	WG1912268
Toluene	ND		0.00100	1	08/17/2022 14:14	WG1912268
1,1,1-Trichloroethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
1,1,2-Trichloroethane	ND		0.00100	1	08/17/2022 14:14	WG1912268
Trichloroethene	ND		0.00100	1	08/17/2022 14:14	WG1912268
Trichlorofluoromethane	ND		0.00500	1	08/17/2022 14:14	WG1912268
1,2,3-Trichloropropane	ND		0.00250	1	08/17/2022 14:14	WG1912268
Vinyl acetate	ND		0.0100	1	08/17/2022 14:14	WG1912268
Vinyl chloride	ND		0.00100	1	08/17/2022 14:14	WG1912268
Xylenes, Total	ND		0.00300	1	08/17/2022 14:14	WG1912268
(S) Toluene-d8	102		80.0-120		08/17/2022 14:14	WG1912268
(S) 4-Bromofluorobenzene	97.3		77.0-126		08/17/2022 14:14	WG1912268
(S) 1,2-Dichloroethane-d4	88.4		70.0-130		08/17/2022 14:14	WG1912268

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

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	08/17/2022 03:24	WG1911172
1,2-Dibromo-3-Chloropropane	ND		0.0000206	1.03	08/17/2022 03:24	WG1911172

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	ND	J	2.50	1	08/18/2022 18:25	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	08/21/2022 15:38	WG1914096

Sample Narrative:

L1524871-09 WG1914096: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	ND		0.250	1	08/22/2022 16:15	WG1914697

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	ND		20.0	1	08/31/2022 02:16	WG1918979

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		1.00	1	08/13/2022 00:29	WG1910248
Chloride	ND		1.00	1	08/13/2022 00:29	WG1910248
Fluoride	ND		0.150	1	08/13/2022 00:29	WG1910248
Nitrate	ND		0.100	1	08/13/2022 00:29	WG1910248
Sulfate	ND		5.00	1	08/13/2022 00:29	WG1910248

Mercury by Method 7470A

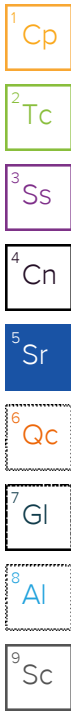
Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	08/17/2022 11:20	WG1910560

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		0.200	1	08/19/2022 09:38	WG1911343

Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	ND		0.100	1	08/18/2022 18:25	WG1911347
Antimony	ND		0.00400	1	08/18/2022 18:25	WG1911347
Arsenic	ND		0.00200	1	08/18/2022 18:25	WG1911347
Barium	0.00209		0.00200	1	08/18/2022 18:25	WG1911347
Beryllium	ND		0.00200	1	08/18/2022 18:25	WG1911347
Cadmium	ND		0.00100	1	08/18/2022 18:25	WG1911347
Calcium	ND		1.00	1	08/18/2022 18:25	WG1911347
Chromium	ND		0.00200	1	08/18/2022 18:25	WG1911347
Cobalt	ND		0.00200	1	08/18/2022 18:25	WG1911347
Copper	ND		0.00500	1	08/18/2022 18:25	WG1911347



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SAMPLE RESULTS - 09

Collected date/time: 08/11/22 12:45

L1524871

Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Iron	ND		0.100	1	08/18/2022 18:25	WG1911347
Lead	ND		0.00200	1	08/18/2022 18:25	WG1911347
Magnesium	ND		1.00	1	08/18/2022 18:25	WG1911347
Manganese	ND		0.00500	1	08/18/2022 18:25	WG1911347
Nickel	ND		0.00200	1	08/18/2022 18:25	WG1911347
Potassium	ND		2.00	1	08/18/2022 18:25	WG1911347
Selenium	ND		0.00200	1	08/18/2022 18:25	WG1911347
Silver	ND		0.00200	1	08/18/2022 18:25	WG1911347
Sodium	ND		2.00	1	08/19/2022 12:37	WG1911347
Thallium	ND		0.00200	1	08/18/2022 18:25	WG1911347
Vanadium	ND		0.00500	1	08/18/2022 18:25	WG1911347
Zinc	ND		0.0250	1	08/18/2022 18:25	WG1911347

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

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	08/16/2022 13:29	WG1911707
Acrylonitrile	ND		0.0100	1	08/16/2022 13:29	WG1911707
Benzene	ND		0.00100	1	08/16/2022 13:29	WG1911707
Bromochloromethane	ND		0.00100	1	08/16/2022 13:29	WG1911707
Bromodichloromethane	ND		0.00100	1	08/16/2022 13:29	WG1911707
Bromoform	ND		0.00100	1	08/16/2022 13:29	WG1911707
Bromomethane	ND		0.00500	1	08/16/2022 13:29	WG1911707
Carbon disulfide	ND	J4	0.00100	1	08/16/2022 13:29	WG1911707
Carbon tetrachloride	ND		0.00100	1	08/16/2022 13:29	WG1911707
Chlorobenzene	ND		0.00100	1	08/16/2022 13:29	WG1911707
Chlorodibromomethane	ND		0.00100	1	08/16/2022 13:29	WG1911707
Chloroethane	ND	J3	0.00500	1	08/16/2022 13:29	WG1911707
Chloroform	ND		0.00500	1	08/16/2022 13:29	WG1911707
Chloromethane	ND		0.00250	1	08/16/2022 13:29	WG1911707
Dibromomethane	ND		0.00100	1	08/16/2022 13:29	WG1911707
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/16/2022 13:29	WG1911707
1,2-Dibromoethane	ND		0.00100	1	08/16/2022 13:29	WG1911707
1,2-Dichlorobenzene	ND		0.00100	1	08/16/2022 13:29	WG1911707
1,4-Dichlorobenzene	ND		0.00100	1	08/16/2022 13:29	WG1911707
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/16/2022 13:29	WG1911707
1,1-Dichloroethane	ND		0.00100	1	08/16/2022 13:29	WG1911707
1,2-Dichloroethane	ND		0.00100	1	08/16/2022 13:29	WG1911707
1,1-Dichloroethene	ND		0.00100	1	08/16/2022 13:29	WG1911707
cis-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 13:29	WG1911707
trans-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 13:29	WG1911707
1,2-Dichloropropane	ND		0.00100	1	08/16/2022 13:29	WG1911707
cis-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 13:29	WG1911707
trans-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 13:29	WG1911707
Ethylbenzene	ND		0.00100	1	08/16/2022 13:29	WG1911707
2-Hexanone	ND		0.0100	1	08/16/2022 13:29	WG1911707
Iodomethane	ND		0.0100	1	08/16/2022 13:29	WG1911707
2-Butanone (MEK)	ND		0.0100	1	08/16/2022 13:29	WG1911707
Methylene Chloride	ND		0.00500	1	08/16/2022 13:29	WG1911707
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/16/2022 13:29	WG1911707
Styrene	ND		0.00100	1	08/16/2022 13:29	WG1911707
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 13:29	WG1911707
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 13:29	WG1911707
Tetrachloroethene	ND		0.00100	1	08/16/2022 13:29	WG1911707
Toluene	ND		0.00100	1	08/16/2022 13:29	WG1911707
1,1,1-Trichloroethane	ND		0.00100	1	08/16/2022 13:29	WG1911707

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	08/16/2022 13:29	WG1911707
Trichloroethene	ND		0.00100	1	08/16/2022 13:29	WG1911707
Trichlorofluoromethane	ND		0.00500	1	08/16/2022 13:29	WG1911707
1,2,3-Trichloropropane	ND		0.00250	1	08/16/2022 13:29	WG1911707
Vinyl acetate	ND		0.0100	1	08/16/2022 13:29	WG1911707
Vinyl chloride	ND		0.00100	1	08/16/2022 13:29	WG1911707
Xylenes, Total	ND		0.00300	1	08/16/2022 13:29	WG1911707
<i>(S) Toluene-d8</i>	104		80.0-120		08/16/2022 13:29	WG1911707
<i>(S) 4-Bromofluorobenzene</i>	103		77.0-126		08/16/2022 13:29	WG1911707
<i>(S) 1,2-Dichloroethane-d4</i>	85.2		70.0-130		08/16/2022 13:29	WG1911707

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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	08/17/2022 03:36	WG1911172
1,2-Dibromo-3-Chloropropane	ND		0.0000206	1.03	08/17/2022 03:36	WG1911172

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	08/16/2022 13:51	WG1911707
Acrylonitrile	ND		0.0100	1	08/16/2022 13:51	WG1911707
Benzene	ND		0.00100	1	08/16/2022 13:51	WG1911707
Bromochloromethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
Bromodichloromethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
Bromoform	ND		0.00100	1	08/16/2022 13:51	WG1911707
Bromomethane	ND		0.00500	1	08/16/2022 13:51	WG1911707
Carbon disulfide	ND	J4	0.00100	1	08/16/2022 13:51	WG1911707
Carbon tetrachloride	ND		0.00100	1	08/16/2022 13:51	WG1911707
Chlorobenzene	ND		0.00100	1	08/16/2022 13:51	WG1911707
Chlorodibromomethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
Chloroethane	ND	J3	0.00500	1	08/16/2022 13:51	WG1911707
Chloroform	ND		0.00500	1	08/16/2022 13:51	WG1911707
Chloromethane	ND		0.00250	1	08/16/2022 13:51	WG1911707
Dibromomethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	08/16/2022 13:51	WG1911707
1,2-Dibromoethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,2-Dichlorobenzene	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,4-Dichlorobenzene	ND		0.00100	1	08/16/2022 13:51	WG1911707
trans-1,4-Dichloro-2-butene	ND		0.00250	1	08/16/2022 13:51	WG1911707
1,1-Dichloroethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,2-Dichloroethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,1-Dichloroethene	ND		0.00100	1	08/16/2022 13:51	WG1911707
cis-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 13:51	WG1911707
trans-1,2-Dichloroethene	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,2-Dichloropropane	ND		0.00100	1	08/16/2022 13:51	WG1911707
cis-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 13:51	WG1911707
trans-1,3-Dichloropropene	ND		0.00100	1	08/16/2022 13:51	WG1911707
Ethylbenzene	ND		0.00100	1	08/16/2022 13:51	WG1911707
2-Hexanone	ND		0.0100	1	08/16/2022 13:51	WG1911707
Iodomethane	ND		0.0100	1	08/16/2022 13:51	WG1911707
2-Butanone (MEK)	ND		0.0100	1	08/16/2022 13:51	WG1911707
Methylene Chloride	ND		0.00500	1	08/16/2022 13:51	WG1911707
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	08/16/2022 13:51	WG1911707
Styrene	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,1,1,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,1,2,2-Tetrachloroethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
Tetrachloroethene	ND		0.00100	1	08/16/2022 13:51	WG1911707
Toluene	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,1,1-Trichloroethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
1,1,2-Trichloroethane	ND		0.00100	1	08/16/2022 13:51	WG1911707
Trichloroethene	ND		0.00100	1	08/16/2022 13:51	WG1911707
Trichlorofluoromethane	ND		0.00500	1	08/16/2022 13:51	WG1911707
1,2,3-Trichloropropane	ND		0.00250	1	08/16/2022 13:51	WG1911707
Vinyl acetate	ND		0.0100	1	08/16/2022 13:51	WG1911707
Vinyl chloride	ND		0.00100	1	08/16/2022 13:51	WG1911707
Xylenes, Total	ND		0.00300	1	08/16/2022 13:51	WG1911707
(S) Toluene-d8	107		80.0-120		08/16/2022 13:51	WG1911707
(S) 4-Bromofluorobenzene	99.4		77.0-126		08/16/2022 13:51	WG1911707
(S) 1,2-Dichloroethane-d4	84.8		70.0-130		08/16/2022 13:51	WG1911707

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3828792-2 08/21/22 14:01

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Alkalinity	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1524626-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1524626-01 08/21/22 14:11 • (DUP) R3828792-5 08/21/22 14:15

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Alkalinity	3210	3200	5	0.237		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1524626-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1524626-08 08/21/22 14:58 • (DUP) R3828792-6 08/21/22 15:02

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Alkalinity	5250	5330	5	1.48		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3828792-1 08/21/22 13:53

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Alkalinity	100	102	102	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5



Method Blank (MB)

(MB) R3829070-1 08/22/22 16:26

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Ammonia Nitrogen	U		0.117	0.250

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1524622-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1524622-02 08/22/22 16:37 • (DUP) R3829070-5 08/22/22 16:38

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Ammonia Nitrogen	4.23	4.22	1	0.355		10

L1524622-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1524622-08 08/22/22 16:53 • (DUP) R3829070-7 08/22/22 16:55

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Ammonia Nitrogen	0.762	0.755	1	0.923		10

Laboratory Control Sample (LCS)

(LCS) R3829070-2 08/22/22 16:28

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Ammonia Nitrogen	7.50	7.69	103	90.0-110	

L1524622-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524622-01 08/22/22 16:32 • (MS) R3829070-3 08/22/22 16:34 • (MSD) R3829070-4 08/22/22 16:35

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Ammonia Nitrogen	5.00	1.90	7.59	7.83	114	119	1	90.0-110	J5	J5	3.07	10

L1524622-07 Original Sample (OS) • Matrix Spike (MS)

(OS) L1524622-07 08/22/22 16:50 • (MS) R3829070-6 08/22/22 16:52

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Ammonia Nitrogen	5.00	0.580	6.34	115	1	90.0-110	J5

Method Blank (MB)

(MB) R3829065-1 08/22/22 15:55

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Ammonia Nitrogen	U		0.117	0.250

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1524871-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1524871-08 08/22/22 16:07 • (DUP) R3829065-5 08/22/22 16:09

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Ammonia Nitrogen	ND	ND	1	0.000		10

L1525008-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1525008-05 08/22/22 16:36 • (DUP) R3829065-7 08/22/22 16:37

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Ammonia Nitrogen	ND	ND	1	0.000		10

Laboratory Control Sample (LCS)

(LCS) R3829065-2 08/22/22 15:57

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Ammonia Nitrogen	7.50	7.44	99.2	90.0-110	

L1524871-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-07 08/22/22 16:03 • (MS) R3829065-3 08/22/22 16:04 • (MSD) R3829065-4 08/22/22 16:06

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Ammonia Nitrogen	5.00	ND	5.71	5.96	114	119	1	90.0-110	J5	J5	4.22	10

L1525008-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1525008-04 08/22/22 16:28 • (MS) R3829065-6 08/22/22 16:34

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Ammonia Nitrogen	5.00	ND	5.65	113	1	90.0-110	J5

Method Blank (MB)

(MB) R3832630-1 08/31/22 18:37

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
COD	U		11.7	20.0

1 Cp

2 Tc

3 Ss

L1522542-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1522542-01 08/31/22 18:39 • (DUP) R3832630-3 08/31/22 18:39

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	52.4	64.7	1	21.1	P1	20

4 Cn

5 Sr

L1524707-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1524707-01 08/31/22 18:44 • (DUP) R3832630-4 08/31/22 18:44

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	505	519	1	2.64		20

6 Qc

7 Gl

8 Al

9 Sc

Laboratory Control Sample (LCS)

(LCS) R3832630-2 08/31/22 18:38

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
COD	500	491	98.2	90.0-110	

L1524871-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-01 08/31/22 18:47 • (MS) R3832630-5 08/31/22 18:47 • (MSD) R3832630-6 08/31/22 18:48

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
COD	500	ND	516	518	103	104	1	80.0-120			0.453	20

Method Blank (MB)

(MB) R3832179-1 08/31/22 02:13

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
COD	U		11.7	20.0

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1524871-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1524871-05 08/31/22 02:14 • (DUP) R3832179-3 08/31/22 02:14

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	ND	ND	1	0.000		20

L1525008-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1525008-02 08/31/22 02:19 • (DUP) R3832179-6 08/31/22 02:19

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3832179-2 08/31/22 02:13

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
COD	500	512	102	90.0-110	

L1524871-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-06 08/31/22 02:15 • (MS) R3832179-4 08/31/22 02:15 • (MSD) R3832179-5 08/31/22 02:15

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
COD	500	ND	514	527	103	105	1	80.0-120			2.46	20

Method Blank (MB)

(MB) R3826371-1 08/12/22 21:02

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1524871-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1524871-09 08/13/22 00:29 • (DUP) R3826371-3 08/13/22 00:42

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	ND	ND	1	0.000		15
Chloride	ND	ND	1	0.000		15
Fluoride	ND	ND	1	0.000		15
Nitrate	ND	ND	1	0.000		15
Sulfate	ND	ND	1	0.000		15

L1522264-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1522264-04 08/13/22 02:21 • (DUP) R3826371-6 08/13/22 02:59

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	2.71	2.72	1	0.578		15
Chloride	36.7	36.7	1	0.113		15
Fluoride	1.37	1.37	1	0.270		15
Nitrate	2.43	2.42	1	0.293		15
Sulfate	29.2	29.1	1	0.355		15

Laboratory Control Sample (LCS)

(LCS) R3826371-2 08/12/22 21:15

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Bromide	40.0	40.8	102	80.0-120	
Chloride	40.0	40.9	102	80.0-120	
Fluoride	8.00	8.50	106	80.0-120	
Nitrate	8.00	7.97	99.7	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3826371-2 08/12/22 21:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Sulfate	40.0	41.1	103	80.0-120	

L1524871-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-09 08/13/22 00:29 • (MS) R3826371-4 08/13/22 00:54 • (MSD) R3826371-5 08/13/22 01:07

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Bromide	50.0	ND	51.1	52.0	102	104	1	80.0-120			1.68	15
Chloride	50.0	ND	51.4	52.4	103	105	1	80.0-120			1.78	15
Fluoride	5.00	ND	5.45	5.53	109	111	1	80.0-120			1.49	15
Nitrate	5.00	ND	5.15	5.24	103	105	1	80.0-120			1.64	15
Sulfate	50.0	ND	51.5	52.3	103	105	1	80.0-120			1.63	15

L1522264-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1522264-04 08/13/22 02:21 • (MS) R3826371-7 08/13/22 03:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>
Bromide	50.0	2.71	52.9	100	1	80.0-120	
Chloride	50.0	36.7	86.2	99.0	1	80.0-120	
Fluoride	5.00	1.37	6.63	105	1	80.0-120	
Nitrate	5.00	2.43	7.43	99.9	1	80.0-120	
Sulfate	50.0	29.2	78.7	99.2	1	80.0-120	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3827287-1 08/17/22 10:45

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.000100	0.000200

1 Cp

2 Tc

3 Ss

Laboratory Control Sample (LCS)

(LCS) R3827287-2 08/17/22 10:47

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Mercury	0.00300	0.00316	105	80.0-120	

4 Cn

5 Sr

L1524871-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-01 08/17/22 10:49 • (MS) R3827287-3 08/17/22 10:53 • (MSD) R3827287-4 08/17/22 10:55

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury	0.00300	ND	0.00315	0.00291	105	96.9	1	75.0-125			8.07	20

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3826268-1 08/15/22 10:39

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) R3826268-2 08/15/22 10:42

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury,Dissolved	0.00300	0.00265	88.5	80.0-120	

L1524871-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-02 08/15/22 10:46 • (MS) R3826268-3 08/15/22 10:52 • (MSD) R3826268-4 08/15/22 10:54

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	ND	0.00296	0.00290	98.8	96.8	1	75.0-125			2.00	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3826352-1 08/15/22 10:02

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

1 Cp

2 Tc

3 Ss

Laboratory Control Sample (LCS)

(LCS) R3826352-2 08/15/22 10:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron,Dissolved	1.00	0.961	96.1	80.0-120	

4 Cn

5 Sr

L1522012-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1522012-01 08/15/22 10:07 • (MS) R3826352-4 08/15/22 10:12 • (MSD) R3826352-5 08/15/22 10:15

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	0.942	0.949	94.2	94.9	1	75.0-125			0.765	20

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3827970-1 08/18/22 14:44

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

1 Cp

2 Tc

3 Ss

Laboratory Control Sample (LCS)

(LCS) R3827970-2 08/18/22 14:46

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Boron,Dissolved	1.00	0.951	95.1	80.0-120	

4 Cn

5 Sr

L1524453-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524453-13 08/18/22 14:49 • (MS) R3827970-4 08/18/22 14:55 • (MSD) R3827970-5 08/18/22 14:57

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	0.756	1.71	1.71	95.5	95.2	1	75.0-125			0.156	20

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3828082-1 08/18/22 23:16

Analyte	MB Result mg/l	<u>MB Qualifier</u>	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0200	0.200

Laboratory Control Sample (LCS)

(LCS) R3828082-2 08/18/22 23:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Boron	1.00	0.981	98.1	80.0-120	

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3827268-1 08/17/22 12:11

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
Cadmium,Dissolved	U		0.000150	0.00100
Calcium,Dissolved	U		0.0936	1.00
Chromium,Dissolved	U		0.00124	0.00200
Cobalt,Dissolved	U		0.0000596	0.00200
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	U		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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3827268-8 08/17/22 16:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Beryllium,Dissolved	U		0.000190	0.00200
Copper,Dissolved	U		0.00151	0.00500

Laboratory Control Sample (LCS)

(LCS) R3827268-2 08/17/22 12:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum,Dissolved	5.00	4.29	85.9	80.0-120	
Antimony,Dissolved	0.0500	0.0462	92.4	80.0-120	
Arsenic,Dissolved	0.0500	0.0462	92.4	80.0-120	
Barium,Dissolved	0.0500	0.0420	84.1	80.0-120	
Cadmium,Dissolved	0.0500	0.0493	98.7	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3827268-2 08/17/22 12:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Calcium,Dissolved	5.00	4.55	90.9	80.0-120	
Chromium,Dissolved	0.0500	0.0476	95.1	80.0-120	
Cobalt,Dissolved	0.0500	0.0484	96.9	80.0-120	
Iron,Dissolved	5.00	4.67	93.4	80.0-120	
Lead,Dissolved	0.0500	0.0450	90.1	80.0-120	
Magnesium,Dissolved	5.00	4.49	89.8	80.0-120	
Manganese,Dissolved	0.0500	0.0465	93.1	80.0-120	
Nickel,Dissolved	0.0500	0.0485	96.9	80.0-120	
Potassium,Dissolved	5.00	4.51	90.1	80.0-120	
Selenium,Dissolved	0.0500	0.0485	96.9	80.0-120	
Silver,Dissolved	0.0500	0.0464	92.9	80.0-120	
Sodium,Dissolved	5.00	4.67	93.4	80.0-120	
Thallium,Dissolved	0.0500	0.0441	88.2	80.0-120	
Vanadium,Dissolved	0.0500	0.0470	94.0	80.0-120	
Zinc,Dissolved	0.0500	0.0470	93.9	80.0-120	

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Laboratory Control Sample (LCS)

(LCS) R3827268-9 08/17/22 16:25

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Beryllium,Dissolved	0.0500	0.0431	86.3	80.0-120	
Copper,Dissolved	0.0500	0.0437	87.4	80.0-120	

L1523202-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-16 08/17/22 12:17 • (MS) R3827268-4 08/17/22 12:24 • (MSD) R3827268-5 08/17/22 12:27

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Aluminum,Dissolved	5.00	ND	4.36	4.34	87.3	86.8	1	75.0-125			0.531	20
Antimony,Dissolved	0.0500	ND	0.0487	0.0487	97.3	97.4	1	75.0-125			0.0759	20
Arsenic,Dissolved	0.0500	ND	0.0490	0.0476	97.5	94.8	1	75.0-125			2.82	20
Barium,Dissolved	0.0500	0.0843	0.129	0.129	88.7	89.4	1	75.0-125			0.257	20
Cadmium,Dissolved	0.0500	ND	0.0511	0.0507	102	101	1	75.0-125			0.827	20
Calcium,Dissolved	5.00	123	128	129	90.4	107	1	75.0-125			0.633	20
Chromium,Dissolved	0.0500	ND	0.0487	0.0484	97.5	96.7	1	75.0-125			0.757	20
Cobalt,Dissolved	0.0500	ND	0.0493	0.0485	98.3	96.9	1	75.0-125			1.45	20
Iron,Dissolved	5.00	ND	4.76	4.93	95.3	98.6	1	75.0-125			3.49	20
Lead,Dissolved	0.0500	ND	0.0466	0.0476	93.2	95.2	1	75.0-125			2.18	20

L1523202-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-16 08/17/22 12:17 • (MS) R3827268-4 08/17/22 12:24 • (MSD) R3827268-5 08/17/22 12:27

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 %
Magnesium,Dissolved	5.00	25.6	30.6	31.6	102	121	1	75.0-125			3.17	20
Manganese,Dissolved	0.0500	0.0731	0.120	0.119	93.3	92.6	1	75.0-125			0.312	20
Nickel,Dissolved	0.0500	0.00239	0.0508	0.0508	96.8	96.8	1	75.0-125			0.0649	20
Potassium,Dissolved	5.00	8.91	13.3	13.4	88.4	90.6	1	75.0-125			0.815	20
Selenium,Dissolved	0.0500	ND	0.0509	0.0502	102	100	1	75.0-125			1.36	20
Silver,Dissolved	0.0500	ND	0.0473	0.0473	94.6	94.6	1	75.0-125			0.0312	20
Sodium,Dissolved	5.00	316	326	332	196	310	1	75.0-125	V	V	1.75	20
Thallium,Dissolved	0.0500	ND	0.0470	0.0481	94.0	96.2	1	75.0-125			2.38	20
Vanadium,Dissolved	0.0500	ND	0.0496	0.0485	99.1	96.9	1	75.0-125			2.27	20
Zinc,Dissolved	0.0500	ND	0.0500	0.0484	93.7	90.4	1	75.0-125			3.31	20

L1523202-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-17 08/17/22 12:30 • (MS) R3827268-6 08/17/22 12:33 • (MSD) R3827268-7 08/17/22 12:37

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	4.39	4.36	87.7	87.3	1	75.0-125			0.512	20
Antimony,Dissolved	0.0500	ND	0.0479	0.0494	95.8	98.7	1	75.0-125			2.96	20
Arsenic,Dissolved	0.0500	ND	0.0489	0.0496	96.8	98.2	1	75.0-125			1.41	20
Barium,Dissolved	0.0500	0.549	0.581	0.589	63.9	79.7	1	75.0-125	V		1.35	20
Cadmium,Dissolved	0.0500	ND	0.0511	0.0512	102	102	1	75.0-125			0.118	20
Calcium,Dissolved	5.00	270	272	270	49.7	5.75	1	75.0-125	V	V	0.810	20
Chromium,Dissolved	0.0500	ND	0.0492	0.0496	98.4	99.1	1	75.0-125			0.803	20
Cobalt,Dissolved	0.0500	ND	0.0492	0.0494	98.1	98.6	1	75.0-125			0.483	20
Iron,Dissolved	5.00	ND	4.84	4.92	96.8	98.4	1	75.0-125			1.72	20
Lead,Dissolved	0.0500	ND	0.0472	0.0455	94.3	91.0	1	75.0-125			3.58	20
Magnesium,Dissolved	5.00	95.9	97.3	96.6	28.6	14.1	1	75.0-125	V	V	0.751	20
Manganese,Dissolved	0.0500	0.444	0.498	0.500	107	113	1	75.0-125			0.546	20
Nickel,Dissolved	0.0500	0.00476	0.0535	0.0540	97.4	98.5	1	75.0-125			1.03	20
Potassium,Dissolved	5.00	10.1	14.5	14.2	88.0	82.0	1	75.0-125			2.08	20
Selenium,Dissolved	0.0500	ND	0.0519	0.0508	104	102	1	75.0-125			2.26	20
Silver,Dissolved	0.0500	ND	0.0469	0.0479	93.9	95.7	1	75.0-125			1.99	20
Sodium,Dissolved	5.00	717	744	752	549	708	1	75.0-125	V	V	1.06	20
Thallium,Dissolved	0.0500	ND	0.0467	0.0464	93.4	92.8	1	75.0-125			0.543	20
Vanadium,Dissolved	0.0500	ND	0.0500	0.0501	100	100	1	75.0-125			0.253	20
Zinc,Dissolved	0.0500	ND	0.0490	0.0488	98.1	97.7	1	75.0-125			0.395	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1523202-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-16 08/17/22 16:28 • (MS) R3827268-11 08/17/22 16:35 • (MSD) R3827268-12 08/17/22 16:38

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 %
Beryllium,Dissolved	0.0500	ND	0.0456	0.0457	91.1	91.4	1	75.0-125			0.332	20
Copper,Dissolved	0.0500	ND	0.0482	0.0481	90.8	90.6	1	75.0-125			0.195	20

L1523202-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-17 08/17/22 16:41 • (MS) R3827268-13 08/17/22 16:44 • (MSD) R3827268-14 08/17/22 16:48

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 %
Beryllium,Dissolved	0.0500	ND	0.0503	0.0493	101	98.6	1	75.0-125			2.05	20
Copper,Dissolved	0.0500	ND	0.0478	0.0475	95.6	95.1	1	75.0-125			0.569	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3828018-1 08/18/22 17:30

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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

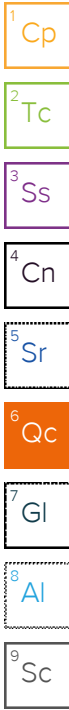
(LCS) R3828018-2 08/18/22 17:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum	5.00	4.61	92.1	80.0-120	
Antimony	0.0500	0.0487	97.4	80.0-120	
Arsenic	0.0500	0.0486	97.1	80.0-120	
Barium	0.0500	0.0477	95.4	80.0-120	
Beryllium	0.0500	0.0484	96.9	80.0-120	
Cadmium	0.0500	0.0517	103	80.0-120	
Calcium	5.00	4.72	94.4	80.0-120	
Chromium	0.0500	0.0518	104	80.0-120	
Cobalt	0.0500	0.0517	103	80.0-120	
Copper	0.0500	0.0483	96.6	80.0-120	
Iron	5.00	4.78	95.6	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3828018-2 08/18/22 17:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Lead	0.0500	0.0469	93.7	80.0-120	
Magnesium	5.00	4.95	98.9	80.0-120	
Manganese	0.0500	0.0511	102	80.0-120	
Nickel	0.0500	0.0516	103	80.0-120	
Potassium	5.00	4.55	90.9	80.0-120	
Selenium	0.0500	0.0510	102	80.0-120	
Silver	0.0500	0.0477	95.3	80.0-120	
Sodium	5.00	4.96	99.2	80.0-120	
Thallium	0.0500	0.0457	91.4	80.0-120	
Vanadium	0.0500	0.0508	102	80.0-120	
Zinc	0.0500	0.0489	97.9	80.0-120	



L1525008-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1525008-02 08/18/22 17:37 • (MS) R3828018-4 08/18/22 17:43 • (MSD) R3828018-5 08/18/22 17:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Aluminum	5.00	ND	4.51	4.56	90.3	91.2	1	75.0-125			1.08	20
Antimony	0.0500	ND	0.0486	0.0492	97.3	98.3	1	75.0-125			1.08	20
Arsenic	0.0500	ND	0.0463	0.0471	92.7	94.1	1	75.0-125			1.60	20
Barium	0.0500	0.0675	0.114	0.113	93.7	91.4	1	75.0-125			0.974	20
Beryllium	0.0500	ND	0.0445	0.0433	89.0	86.6	1	75.0-125			2.74	20
Cadmium	0.0500	ND	0.0476	0.0480	95.1	95.9	1	75.0-125			0.836	20
Calcium	5.00	60.8	64.1	64.6	65.1	75.8	1	75.0-125	V		0.829	20
Chromium	0.0500	ND	0.0494	0.0493	98.9	98.5	1	75.0-125			0.376	20
Cobalt	0.0500	ND	0.0472	0.0474	94.2	94.5	1	75.0-125			0.254	20
Copper	0.0500	ND	0.0475	0.0474	95.0	94.8	1	75.0-125			0.181	20
Iron	5.00	0.125	4.86	4.81	94.6	93.8	1	75.0-125			0.896	20
Lead	0.0500	ND	0.0454	0.0454	90.7	90.9	1	75.0-125			0.149	20
Magnesium	5.00	31.2	35.6	36.0	88.0	95.9	1	75.0-125			1.11	20
Manganese	0.0500	0.00576	0.0529	0.0537	94.2	95.9	1	75.0-125			1.55	20
Nickel	0.0500	ND	0.0482	0.0477	96.4	95.5	1	75.0-125			0.937	20
Potassium	5.00	4.12	8.67	8.86	91.0	95.0	1	75.0-125			2.25	20
Selenium	0.0500	ND	0.0495	0.0493	99.0	98.5	1	75.0-125			0.480	20
Silver	0.0500	ND	0.0476	0.0482	95.2	96.3	1	75.0-125			1.14	20
Sodium	5.00	25.8	29.5	30.3	74.7	90.2	1	75.0-125	V		2.60	20
Thallium	0.0500	ND	0.0438	0.0434	87.5	86.9	1	75.0-125			0.765	20
Vanadium	0.0500	ND	0.0485	0.0486	97.0	97.2	1	75.0-125			0.149	20
Zinc	0.0500	ND	0.0455	0.0456	91.0	91.2	1	75.0-125			0.287	20

Method Blank (MB)

(MB) R3827593-1 08/17/22 17:01

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	U		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	U		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

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

Laboratory Control Sample (LCS)

(LCS) R3827593-2 08/17/22 17:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum,Dissolved	5.00	4.74	94.8	80.0-120	
Antimony,Dissolved	0.0500	0.0468	93.6	80.0-120	
Arsenic,Dissolved	0.0500	0.0472	94.3	80.0-120	
Barium,Dissolved	0.0500	0.0456	91.3	80.0-120	
Beryllium,Dissolved	0.0500	0.0477	95.4	80.0-120	
Cadmium,Dissolved	0.0500	0.0482	96.4	80.0-120	
Calcium,Dissolved	5.00	4.77	95.5	80.0-120	
Chromium,Dissolved	0.0500	0.0482	96.4	80.0-120	
Cobalt,Dissolved	0.0500	0.0489	97.8	80.0-120	
Copper,Dissolved	0.0500	0.0438	87.5	80.0-120	
Iron,Dissolved	5.00	4.93	98.7	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3827593-2 08/17/22 17:04

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Lead,Dissolved	0.0500	0.0491	98.2	80.0-120	
Magnesium,Dissolved	5.00	4.64	92.8	80.0-120	
Manganese,Dissolved	0.0500	0.0481	96.1	80.0-120	
Nickel,Dissolved	0.0500	0.0487	97.3	80.0-120	
Potassium,Dissolved	5.00	4.58	91.6	80.0-120	
Selenium,Dissolved	0.0500	0.0484	96.9	80.0-120	
Silver,Dissolved	0.0500	0.0499	99.8	80.0-120	
Sodium,Dissolved	5.00	4.93	98.5	80.0-120	
Thallium,Dissolved	0.0500	0.0473	94.6	80.0-120	
Vanadium,Dissolved	0.0500	0.0484	96.8	80.0-120	
Zinc,Dissolved	0.0500	0.0479	95.8	80.0-120	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1523656-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523656-02 08/17/22 17:08 • (MS) R3827593-4 08/17/22 17:14 • (MSD) R3827593-5 08/17/22 17:18

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Aluminum,Dissolved	5.00	ND	4.63	4.51	92.6	90.1	1	75.0-125			2.67	20
Antimony,Dissolved	0.0500	ND	0.0482	0.0491	96.5	98.1	1	75.0-125			1.67	20
Arsenic,Dissolved	0.0500	ND	0.0466	0.0463	93.2	92.5	1	75.0-125			0.747	20
Barium,Dissolved	0.0500	0.0834	0.129	0.130	91.5	93.4	1	75.0-125			0.725	20
Beryllium,Dissolved	0.0500	ND	0.0449	0.0447	89.8	89.4	1	75.0-125			0.410	20
Cadmium,Dissolved	0.0500	ND	0.0486	0.0484	96.8	96.4	1	75.0-125			0.374	20
Calcium,Dissolved	5.00	13.8	18.3	18.3	89.0	89.7	1	75.0-125			0.189	20
Chromium,Dissolved	0.0500	ND	0.0477	0.0476	95.3	95.1	1	75.0-125			0.194	20
Cobalt,Dissolved	0.0500	ND	0.0492	0.0495	95.3	95.8	1	75.0-125			0.523	20
Copper,Dissolved	0.0500	ND	0.0452	0.0445	90.3	89.1	1	75.0-125			1.40	20
Iron,Dissolved	5.00	ND	4.89	4.74	97.7	94.8	1	75.0-125			3.00	20
Lead,Dissolved	0.0500	ND	0.0485	0.0477	96.9	95.5	1	75.0-125			1.50	20
Magnesium,Dissolved	5.00	3.60	8.04	8.04	88.8	88.8	1	75.0-125			0.00303	20
Manganese,Dissolved	0.0500	0.748	0.783	0.790	68.2	82.5	1	75.0-125	V		0.912	20
Nickel,Dissolved	0.0500	0.00248	0.0499	0.0501	94.8	95.2	1	75.0-125			0.414	20
Potassium,Dissolved	5.00	2.00	6.49	6.43	89.8	88.6	1	75.0-125			0.934	20
Selenium,Dissolved	0.0500	ND	0.0484	0.0482	96.7	96.4	1	75.0-125			0.368	20
Silver,Dissolved	0.0500	ND	0.0503	0.0511	101	102	1	75.0-125			1.58	20
Sodium,Dissolved	5.00	4.24	8.79	9.34	91.0	102	1	75.0-125			6.07	20
Thallium,Dissolved	0.0500	ND	0.0465	0.0473	93.0	94.5	1	75.0-125			1.61	20
Vanadium,Dissolved	0.0500	ND	0.0478	0.0474	95.7	94.8	1	75.0-125			0.859	20
Zinc,Dissolved	0.0500	ND	0.0567	0.0568	88.8	89.1	1	75.0-125			0.253	20

Method Blank (MB)

(MB) R3827388-3 08/16/22 09:25

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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Method Blank (MB)

(MB) R3827388-3 08/16/22 09:25

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	105			77.0-126
(S) 1,2-Dichloroethane-d4	84.3			70.0-130

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

(LCS) R3827388-1 08/16/22 08:21 • (LCSD) R3827388-2 08/16/22 08:42

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 %
Acetone	0.0250	0.0320	0.0319	128	128	19.0-160			0.313	27
Acrylonitrile	0.0250	0.0256	0.0258	102	103	55.0-149			0.778	20
Benzene	0.00500	0.00479	0.00485	95.8	97.0	70.0-123			1.24	20
Bromochloromethane	0.00500	0.00545	0.00586	109	117	76.0-122			7.25	20
Bromodichloromethane	0.00500	0.00470	0.00461	94.0	92.2	75.0-120			1.93	20
Bromoform	0.00500	0.00487	0.00482	97.4	96.4	68.0-132			1.03	20
Bromomethane	0.00500	0.00438	0.00454	87.6	90.8	10.0-160			3.59	25
Carbon disulfide	0.00500	0.00302	0.00293	60.4	58.6	61.0-128	J4	J4	3.03	20
Carbon tetrachloride	0.00500	0.00533	0.00547	107	109	68.0-126			2.59	20
Chlorobenzene	0.00500	0.00496	0.00512	99.2	102	80.0-121			3.17	20
Chlorodibromomethane	0.00500	0.00469	0.00472	93.8	94.4	77.0-125			0.638	20
Chloroethane	0.00500	0.00516	0.00647	103	129	47.0-150		J3	22.5	20
Chloroform	0.00500	0.00489	0.00496	97.8	99.2	73.0-120			1.42	20
Chloromethane	0.00500	0.00339	0.00371	67.8	74.2	41.0-142			9.01	20
Dibromomethane	0.00500	0.00544	0.00525	109	105	80.0-120			3.55	20
1,2-Dibromo-3-Chloropropane	0.00500	0.00358	0.00361	71.6	72.2	58.0-134			0.834	20
1,2-Dibromoethane	0.00500	0.00485	0.00504	97.0	101	80.0-122			3.84	20
1,2-Dichlorobenzene	0.00500	0.00420	0.00437	84.0	87.4	79.0-121			3.97	20
1,4-Dichlorobenzene	0.00500	0.00444	0.00461	88.8	92.2	79.0-120			3.76	20
trans-1,4-Dichloro-2-butene	0.00500	0.00359	0.00401	71.8	80.2	33.0-144			11.1	20
1,1-Dichloroethane	0.00500	0.00482	0.00487	96.4	97.4	70.0-126			1.03	20
1,2-Dichloroethane	0.00500	0.00452	0.00480	90.4	96.0	70.0-128			6.01	20
1,1-Dichloroethene	0.00500	0.00448	0.00453	89.6	90.6	71.0-124			1.11	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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

(LCS) R3827388-1 08/16/22 08:21 • (LCSD) R3827388-2 08/16/22 08:42

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
cis-1,2-Dichloroethene	0.00500	0.00519	0.00505	104	101	73.0-120			2.73	20
trans-1,2-Dichloroethene	0.00500	0.00452	0.00479	90.4	95.8	73.0-120			5.80	20
1,2-Dichloropropane	0.00500	0.00511	0.00535	102	107	77.0-125			4.59	20
cis-1,3-Dichloropropene	0.00500	0.00449	0.00470	89.8	94.0	80.0-123			4.57	20
trans-1,3-Dichloropropene	0.00500	0.00430	0.00427	86.0	85.4	78.0-124			0.700	20
Ethylbenzene	0.00500	0.00470	0.00482	94.0	96.4	79.0-123			2.52	20
2-Hexanone	0.0250	0.0234	0.0234	93.6	93.6	67.0-149			0.000	20
Iodomethane	0.0250	0.0242	0.0263	96.8	105	33.0-147			8.32	26
2-Butanone (MEK)	0.0250	0.0225	0.0226	90.0	90.4	44.0-160			0.443	20
Methylene Chloride	0.00500	0.00501	0.00538	100	108	67.0-120			7.12	20
4-Methyl-2-pentanone (MIBK)	0.0250	0.0199	0.0196	79.6	78.4	68.0-142			1.52	20
Styrene	0.00500	0.00434	0.00435	86.8	87.0	73.0-130			0.230	20
1,1,1,2-Tetrachloroethane	0.00500	0.00473	0.00486	94.6	97.2	75.0-125			2.71	20
1,1,2,2-Tetrachloroethane	0.00500	0.00459	0.00462	91.8	92.4	65.0-130			0.651	20
Tetrachloroethene	0.00500	0.00471	0.00463	94.2	92.6	72.0-132			1.71	20
Toluene	0.00500	0.00463	0.00473	92.6	94.6	79.0-120			2.14	20
1,1,1-Trichloroethane	0.00500	0.00475	0.00475	95.0	95.0	73.0-124			0.000	20
1,1,2-Trichloroethane	0.00500	0.00525	0.00515	105	103	80.0-120			1.92	20
Trichloroethene	0.00500	0.00527	0.00541	105	108	78.0-124			2.62	20
Trichlorofluoromethane	0.00500	0.00537	0.00491	107	98.2	59.0-147			8.95	20
1,2,3-Trichloropropane	0.00500	0.00487	0.00489	97.4	97.8	73.0-130			0.410	20
Vinyl acetate	0.0250	0.0265	0.0258	106	103	11.0-160			2.68	20
Vinyl chloride	0.00500	0.00560	0.00598	112	120	67.0-131			6.56	20
Xylenes, Total	0.0150	0.0134	0.0138	89.3	92.0	79.0-123			2.94	20
(S) Toluene-d8				103	103	80.0-120				
(S) 4-Bromofluorobenzene				97.7	97.9	77.0-126				
(S) 1,2-Dichloroethane-d4				85.2	86.3	70.0-130				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3828911-2 08/17/22 12:12

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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3828911-2 08/17/22 12:12

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	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	102			80.0-120
(S) 4-Bromofluorobenzene	94.6			77.0-126
(S) 1,2-Dichloroethane-d4	90.4			70.0-130

Laboratory Control Sample (LCS)

(LCS) R3828911-1 08/17/22 11:24

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Acetone	0.0250	0.0432	173	19.0-160	J4
Acrylonitrile	0.0250	0.0304	122	55.0-149	
Benzene	0.00500	0.00548	110	70.0-123	
Bromochloromethane	0.00500	0.00572	114	76.0-122	
Bromodichloromethane	0.00500	0.00509	102	75.0-120	
Bromoform	0.00500	0.00503	101	68.0-132	
Bromomethane	0.00500	0.00535	107	10.0-160	
Carbon disulfide	0.00500	0.00379	75.8	61.0-128	
Carbon tetrachloride	0.00500	0.00572	114	68.0-126	
Chlorobenzene	0.00500	0.00506	101	80.0-121	
Chlorodibromomethane	0.00500	0.00483	96.6	77.0-125	
Chloroethane	0.00500	0.00392	78.4	47.0-150	
Chloroform	0.00500	0.00526	105	73.0-120	
Chloromethane	0.00500	0.00482	96.4	41.0-142	
Dibromomethane	0.00500	0.00565	113	80.0-120	
1,2-Dibromo-3-Chloropropane	0.00500	0.00364	72.8	58.0-134	
1,2-Dibromoethane	0.00500	0.00494	98.8	80.0-122	
1,2-Dichlorobenzene	0.00500	0.00472	94.4	79.0-121	
1,4-Dichlorobenzene	0.00500	0.00453	90.6	79.0-120	
trans-1,4-Dichloro-2-butene	0.00500	0.00453	90.6	33.0-144	
1,1-Dichloroethane	0.00500	0.00512	102	70.0-126	
1,2-Dichloroethane	0.00500	0.00525	105	70.0-128	
1,1-Dichloroethene	0.00500	0.00481	96.2	71.0-124	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Laboratory Control Sample (LCS)

(LCS) R3828911-1 08/17/22 11:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
cis-1,2-Dichloroethene	0.00500	0.00537	107	73.0-120	
trans-1,2-Dichloroethene	0.00500	0.00531	106	73.0-120	
1,2-Dichloropropane	0.00500	0.00581	116	77.0-125	
cis-1,3-Dichloropropene	0.00500	0.00511	102	80.0-123	
trans-1,3-Dichloropropene	0.00500	0.00438	87.6	78.0-124	
Ethylbenzene	0.00500	0.00496	99.2	79.0-123	
2-Hexanone	0.0250	0.0243	97.2	67.0-149	
Iodomethane	0.0250	0.0274	110	33.0-147	
2-Butanone (MEK)	0.0250	0.0291	116	44.0-160	
Methylene Chloride	0.00500	0.00571	114	67.0-120	
4-Methyl-2-pentanone (MIBK)	0.0250	0.0227	90.8	68.0-142	
Styrene	0.00500	0.00448	89.6	73.0-130	
1,1,1,2-Tetrachloroethane	0.00500	0.00508	102	75.0-125	
1,1,2,2-Tetrachloroethane	0.00500	0.00400	80.0	65.0-130	
Tetrachloroethene	0.00500	0.00505	101	72.0-132	
Toluene	0.00500	0.00476	95.2	79.0-120	
1,1,1-Trichloroethane	0.00500	0.00497	99.4	73.0-124	
1,1,2-Trichloroethane	0.00500	0.00526	105	80.0-120	
Trichloroethene	0.00500	0.00608	122	78.0-124	
Trichlorofluoromethane	0.00500	0.00498	99.6	59.0-147	
1,2,3-Trichloropropane	0.00500	0.00404	80.8	73.0-130	
Vinyl acetate	0.0250	0.0332	133	11.0-160	
Vinyl chloride	0.00500	0.00563	113	67.0-131	
Xylenes, Total	0.0150	0.0146	97.3	79.0-123	
(S) Toluene-d8			95.1	80.0-120	
(S) 4-Bromofluorobenzene			100	77.0-126	
(S) 1,2-Dichloroethane-d4			87.8	70.0-130	

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Method Blank (MB)

(MB) R3827290-1 08/16/22 23:44

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Ethylene Dibromide	U		0.0000536	0.0000200
1,2-Dibromo-3-Chloropropane	U		0.0000748	0.0000200

1 Cp

2 Tc

3 Ss

4 Cn

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

(LCS) R3827290-3 08/17/22 02:35 • (LCSD) R3827290-4 08/17/22 05:14

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Ethylene Dibromide	0.000250	0.000291	0.000301	116	120	60.0-140			3.38	20
Ethylene Dibromide	0.000250	0.000291	0.000310	116	124	60.0-140			6.32	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000253	0.000255	101	102	60.0-140			0.787	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000253	0.000268	101	107	60.0-140			5.76	20

5 Sr

6 Qc

7 Gl

Laboratory Control Sample (LCS)

(LCS) R3827290-6 08/17/22 12:51

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Ethylene Dibromide	0.000250	0.000324	130	60.0-140	
1,2-Dibromo-3-Chloropropane	0.000250	0.000279	112	60.0-140	

8 Al

9 Sc

L1524609-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1524609-05 08/17/22 00:08 • (MS) R3827290-2 08/16/22 23:56

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	mg/l	mg/l	mg/l	%		%	
Ethylene Dibromide	0.0000995	ND	0.000102	103	1	64.0-159	
1,2-Dibromo-3-Chloropropane	0.0000995	ND	0.000108	109	1	72.0-148	

Method Blank (MB)

(MB) R3828531-1 08/19/22 16:16

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Ethylene Dibromide	U		0.0000536	0.0000200
1,2-Dibromo-3-Chloropropane	U		0.0000748	0.0000200

L1525262-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1525262-10 08/19/22 17:07 • (DUP) R3828531-3 08/19/22 16:55

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l	%	%		%
Ethylene Dibromide	ND	ND	1.06	0.000		20
1,2-Dibromo-3-Chloropropane	ND	ND	1.06	0.000		20

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

(LCS) R3828531-4 08/19/22 19:09 • (LCSD) R3828531-5 08/19/22 21:46

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Ethylene Dibromide	0.000250	0.000317	0.000336	127	134	60.0-140			5.82	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000237	0.000249	94.8	99.6	60.0-140			4.94	20

L1525262-11 Original Sample (OS) • Matrix Spike (MS)

(OS) L1525262-11 08/19/22 16:43 • (MS) R3828531-2 08/19/22 16:31

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	mg/l	mg/l	mg/l	%		%	
Ethylene Dibromide	0.000102	ND	0.000103	101	1.02	64.0-159	
1,2-Dibromo-3-Chloropropane	0.000102	ND	0.000102	100	1.02	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.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ACCREDITATIONS & LOCATIONS

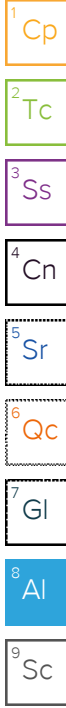
Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

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	LA000356
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.



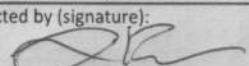
Company Name/Address:
Civil & Environmental Consultants - TN
 117 Seaboard Ln.
 Suite E100
 Franklin, TN 37067

Report to:
Philip Campbell

Project Description:
Former EWS Camden Class 2 Landfill

Phone: **615-333-7797**

Collected by (print):
Alex Black

Collected by (signature):


Immediately Packed on Ice N Y

Client Project #
181-364

Site/Facility ID #
CAMDEN, TN

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

Lab Project #
CEC-EWS CAMDEN LF

P.O. #

Quote #

Date Results Needed

No. of Cntrs

City/State Collected: *Camden TN*

Please Circle: PT MT CT ET

Email To: *pcampbell@cecinc.com*

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

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___


 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/hubs/pas-standard-terms.pdf>

SDG # *U524871*
A074

Acctnum: **CEC**
 Template: **T133579**
 Prelogin: **P942257**
 PM: **526 - Chris McCord**
 PB: *08/18/22*
 Shipped Via: **Courier**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	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-Bik	Remarks	Sample # (lab only)
MW-1	<i>0</i>	GW		<i>8/11/22</i>	<i>1015</i>	<i>10</i>	X	X	X	X	X	X	X			<i>01</i>
MW-3		GW		<i>8/2/22</i>	<i>1005</i>	<i>10</i>	X	X	X	X	X	X	X			<i>02</i>
MW-4		GW		<i>8/11/22</i>	<i>1140</i>	<i>10</i>	X	X	X	X	X	X	X			<i>03</i>
MW-5		GW			<i>1110</i>	<i>10</i>	X	X	X	X	X	X	X			<i>04</i>
TMW-1		GW			<i>0950</i>	<i>10</i>	X	X	X	X	X	X	X			<i>05</i>
TMW-2		GW			<i>1115</i>	<i>10</i>	X	X	X	X	X	X	X			<i>06</i>
TMW-3		GW			<i>1215</i>	<i>10</i>	X	X	X	X	X	X	X			<i>07</i>
DUPLICATE		GW		<i>8/2/22</i>	<i>—</i>	<i>11</i>	X	X	X	X	X	X	X			<i>08</i>
FIELD BLANK		GW		<i>8/11/22</i>	<i>1245</i>	<i>10</i>	X	X	X		X	X	X			<i>09</i>
EQUIPMENT BLANK		GW				<i>10</i>	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 #

Relinquished by: (Signature) *OB* Date: *8/12/22* Time: *14:10* Received by: (Signature) *[Signature]* Trip Blank Received: *Yes* / No *[Signature]*

Relinquished by: (Signature) *[Signature]* Date: *8-12-22* Time: *15:30* Received by: (Signature) *[Signature]* Temp: *11.1* Bottles Received: *92* If preservation required by Login: Date/Time

Relinquished by: (Signature) *[Signature]* Date: _____ Time: _____ Received for lab by: (Signature) *[Signature]* Date: *8/12/22* Time: *1530* Hold: _____ Condition: **NCF / OK**

Sample Receipt Checklist
 COC Seal Present/Intact: 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

Civil & Environmental Consultants - TN

Sample Delivery Group: L1524874
Samples Received: 08/12/2022
Project Number: 181-364
Description: EWS Camden Class 2 Landfill
Site: CAMDEN, TN
Report To: Philip Campbell
117 Seaboard Ln.
Suite E100
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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SAMPLE SUMMARY

IWC-L L1524874-01 GW

Collected by: Alex Black
 Collected date/time: 08/11/22 13:05
 Received date/time: 08/12/22 15:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Calculated Results	WG1911347	1	08/18/22 18:29	08/18/22 18:29	JPD	Mt. Juliet, TN
Wet Chemistry by Method 2320 B-2011	WG1914096	1	08/21/22 15:43	08/21/22 15:43	ARD	Mt. Juliet, TN
Wet Chemistry by Method 350.1	WG1914697	200	08/22/22 16:16	08/22/22 16:16	BMD	Mt. Juliet, TN
Wet Chemistry by Method 410.4	WG1918979	1	08/30/22 22:00	08/31/22 02:17	CRB	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	100	08/13/22 01:19	08/13/22 01:19	LBR	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1910248	5000	08/13/22 01:32	08/13/22 01:32	LBR	Mt. Juliet, TN
Mercury by Method 7470A	WG1910560	10	08/16/22 10:02	08/17/22 11:22	SRT	Mt. Juliet, TN
Mercury by Method 7470A	WG1910563	1	08/14/22 10:29	08/15/22 11:20	MRW	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1907163	10	08/15/22 01:11	08/15/22 13:58	ZSA	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1911343	5	08/17/22 23:39	08/19/22 20:42	KMG	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1909180	100	08/16/22 04:41	08/17/22 13:21	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1909180	100	08/16/22 04:41	08/17/22 17:27	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	100	08/18/22 01:31	08/18/22 18:29	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020A	WG1911347	100	08/18/22 01:31	08/19/22 12:40	JPD	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1914209	10	08/22/22 01:33	08/22/22 01:33	ACG	Mt. Juliet, TN
EDB / DBCP by Method 8011	WG1911172	1	08/16/22 11:22	08/17/22 03:48	KLA	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Calculated Results

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Hardness (calculated) as CaCO3	46800		250	1	08/18/2022 18:29	WG1911347

Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Alkalinity	ND		20.0	1	08/21/2022 15:43	WG1914096

Sample Narrative:

L1524874-01 WG1914096: Endpoint pH 4.5 Headspace

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Ammonia Nitrogen	1740		50.0	200	08/22/2022 16:16	WG1914697

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
COD	370		20.0	1	08/31/2022 02:17	WG1918979

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Bromide	ND		100	100	08/13/2022 01:19	WG1910248
Chloride	112000		5000	5000	08/13/2022 01:32	WG1910248
Fluoride	ND		15.0	100	08/13/2022 01:19	WG1910248
Nitrate	ND		10.0	100	08/13/2022 01:19	WG1910248
Sulfate	1060		500	100	08/13/2022 01:19	WG1910248

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Mercury	ND		0.00200	10	08/17/2022 11:22	WG1910560
Mercury,Dissolved	ND		0.000200	1	08/15/2022 11:20	WG1910563

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Boron	ND		1.00	5	08/19/2022 20:42	WG1911343
Boron,Dissolved	ND		2.00	10	08/15/2022 13:58	WG1907163

Metals (ICPMS) by Method 6020A

Analyte	Result	Qualifier	RDL	Dilution	Analysis date / time	Batch
Aluminum	383		10.0	100	08/18/2022 18:29	WG1911347
Aluminum,Dissolved	355		10.0	100	08/17/2022 13:21	WG1909180
Antimony	ND		0.400	100	08/18/2022 18:29	WG1911347
Antimony,Dissolved	ND		0.400	100	08/17/2022 13:21	WG1909180
Arsenic	0.302		0.200	100	08/18/2022 18:29	WG1911347
Arsenic,Dissolved	0.289		0.200	100	08/17/2022 13:21	WG1909180
Barium	3.02		0.200	100	08/18/2022 18:29	WG1911347
Barium,Dissolved	2.84		0.200	100	08/17/2022 13:21	WG1909180

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Metals (ICPMS) by Method 6020A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Beryllium	ND		0.200	100	08/18/2022 18:29	WG1911347
Beryllium,Dissolved	ND		0.200	100	08/17/2022 17:27	WG1909180
Cadmium	9.06		0.100	100	08/18/2022 18:29	WG1911347
Cadmium,Dissolved	8.71		0.100	100	08/17/2022 13:21	WG1909180
Calcium	16500		100	100	08/18/2022 18:29	WG1911347
Calcium,Dissolved	15700		100	100	08/17/2022 13:21	WG1909180
Chromium	ND		0.200	100	08/18/2022 18:29	WG1911347
Chromium,Dissolved	ND		0.200	100	08/17/2022 13:21	WG1909180
Cobalt	0.457		0.200	100	08/18/2022 18:29	WG1911347
Cobalt,Dissolved	0.451		0.200	100	08/17/2022 13:21	WG1909180
Copper	0.936		0.500	100	08/18/2022 18:29	WG1911347
Copper,Dissolved	0.925		0.500	100	08/17/2022 17:27	WG1909180
Iron	468		10.0	100	08/18/2022 18:29	WG1911347
Iron,Dissolved	457		10.0	100	08/17/2022 13:21	WG1909180
Lead	0.920		0.200	100	08/18/2022 18:29	WG1911347
Lead,Dissolved	0.948		0.200	100	08/17/2022 13:21	WG1909180
Magnesium	1340		100	100	08/18/2022 18:29	WG1911347
Magnesium,Dissolved	1210		100	100	08/17/2022 13:21	WG1909180
Manganese	23.6		0.500	100	08/18/2022 18:29	WG1911347
Manganese,Dissolved	23.1		0.500	100	08/17/2022 13:21	WG1909180
Nickel	0.638		0.200	100	08/18/2022 18:29	WG1911347
Nickel,Dissolved	0.642		0.200	100	08/17/2022 13:21	WG1909180
Potassium	17300		200	100	08/18/2022 18:29	WG1911347
Potassium,Dissolved	15700		200	100	08/17/2022 13:21	WG1909180
Selenium	0.241		0.200	100	08/18/2022 18:29	WG1911347
Selenium,Dissolved	0.210		0.200	100	08/17/2022 13:21	WG1909180
Silver	ND		0.200	100	08/18/2022 18:29	WG1911347
Silver,Dissolved	ND		0.200	100	08/17/2022 13:21	WG1909180
Sodium	22900		200	100	08/19/2022 12:40	WG1911347
Sodium,Dissolved	27600		200	100	08/17/2022 13:21	WG1909180
Thallium	ND		0.200	100	08/18/2022 18:29	WG1911347
Thallium,Dissolved	ND		0.200	100	08/17/2022 13:21	WG1909180
Vanadium	ND		0.500	100	08/18/2022 18:29	WG1911347
Vanadium,Dissolved	ND		0.500	100	08/17/2022 13:21	WG1909180
Zinc	93.5		2.50	100	08/18/2022 18:29	WG1911347
Zinc,Dissolved	91.1		2.50	100	08/17/2022 13:21	WG1909180

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
Acetone	2.81		0.500	10	08/22/2022 01:33	WG1914209
Acrylonitrile	ND		0.100	10	08/22/2022 01:33	WG1914209
Benzene	ND		0.0100	10	08/22/2022 01:33	WG1914209
Bromochloromethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
Bromodichloromethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
Bromoform	ND		0.0100	10	08/22/2022 01:33	WG1914209
Bromomethane	ND		0.0500	10	08/22/2022 01:33	WG1914209
Carbon disulfide	0.0491		0.0100	10	08/22/2022 01:33	WG1914209
Carbon tetrachloride	ND		0.0100	10	08/22/2022 01:33	WG1914209
Chlorobenzene	ND		0.0100	10	08/22/2022 01:33	WG1914209
Chlorodibromomethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
Chloroethane	ND		0.0500	10	08/22/2022 01:33	WG1914209
Chloroform	ND		0.0500	10	08/22/2022 01:33	WG1914209
Chloromethane	ND		0.0250	10	08/22/2022 01:33	WG1914209
Dibromomethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
1,2-Dibromo-3-Chloropropane	ND		0.0500	10	08/22/2022 01:33	WG1914209

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		0.0100	10	08/22/2022 01:33	WG1914209
1,2-Dichlorobenzene	ND		0.0100	10	08/22/2022 01:33	WG1914209
1,4-Dichlorobenzene	ND	J3 J4	0.0100	10	08/22/2022 01:33	WG1914209
trans-1,4-Dichloro-2-butene	ND		0.0250	10	08/22/2022 01:33	WG1914209
1,1-Dichloroethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
1,2-Dichloroethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
1,1-Dichloroethene	ND		0.0100	10	08/22/2022 01:33	WG1914209
cis-1,2-Dichloroethene	ND		0.0100	10	08/22/2022 01:33	WG1914209
trans-1,2-Dichloroethene	ND		0.0100	10	08/22/2022 01:33	WG1914209
1,2-Dichloropropane	ND		0.0100	10	08/22/2022 01:33	WG1914209
cis-1,3-Dichloropropene	ND		0.0100	10	08/22/2022 01:33	WG1914209
trans-1,3-Dichloropropene	ND		0.0100	10	08/22/2022 01:33	WG1914209
Ethylbenzene	ND		0.0100	10	08/22/2022 01:33	WG1914209
2-Hexanone	ND		0.100	10	08/22/2022 01:33	WG1914209
Iodomethane	ND		0.100	10	08/22/2022 01:33	WG1914209
2-Butanone (MEK)	0.240		0.100	10	08/22/2022 01:33	WG1914209
Methylene Chloride	ND		0.0500	10	08/22/2022 01:33	WG1914209
4-Methyl-2-pentanone (MIBK)	ND		0.100	10	08/22/2022 01:33	WG1914209
Styrene	ND	J3 J4	0.0100	10	08/22/2022 01:33	WG1914209
1,1,1-Tetrachloroethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
1,1,2,2-Tetrachloroethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
Tetrachloroethene	ND		0.0100	10	08/22/2022 01:33	WG1914209
Toluene	ND		0.0100	10	08/22/2022 01:33	WG1914209
1,1,1-Trichloroethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
1,1,2-Trichloroethane	ND		0.0100	10	08/22/2022 01:33	WG1914209
Trichloroethene	ND		0.0100	10	08/22/2022 01:33	WG1914209
Trichlorofluoromethane	ND		0.0500	10	08/22/2022 01:33	WG1914209
1,2,3-Trichloropropane	ND		0.0250	10	08/22/2022 01:33	WG1914209
Vinyl acetate	ND		0.100	10	08/22/2022 01:33	WG1914209
Vinyl chloride	ND		0.0100	10	08/22/2022 01:33	WG1914209
Xylenes, Total	ND		0.0300	10	08/22/2022 01:33	WG1914209
(S) Toluene-d8	111		80.0-120		08/22/2022 01:33	WG1914209
(S) 4-Bromofluorobenzene	98.3		77.0-126		08/22/2022 01:33	WG1914209
(S) 1,2-Dichloroethane-d4	110		70.0-130		08/22/2022 01:33	WG1914209

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

EDB / DBCP by Method 8011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	ND		0.0000200	1	08/17/2022 03:48	WG1911172
1,2-Dibromo-3-Chloropropane	ND		0.0000200	1	08/17/2022 03:48	WG1911172

Method Blank (MB)

(MB) R3828792-2 08/21/22 14:01

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Alkalinity	U		8.45	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L1524626-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1524626-01 08/21/22 14:11 • (DUP) R3828792-5 08/21/22 14:15

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Alkalinity	3210	3200	5	0.237		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

L1524626-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1524626-08 08/21/22 14:58 • (DUP) R3828792-6 08/21/22 15:02

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Alkalinity	5250	5330	5	1.48		20

Sample Narrative:

OS: Endpoint pH 4.5 Headspace

DUP: Endpoint pH 4.5

Laboratory Control Sample (LCS)

(LCS) R3828792-1 08/21/22 13:53

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Alkalinity	100	102	102	90.0-110	

Sample Narrative:

LCS: Endpoint pH 4.5



Method Blank (MB)

(MB) R3829065-1 08/22/22 15:55

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Ammonia Nitrogen	U		0.117	0.250

¹Cp

²Tc

³Ss

⁴Cn

L1524871-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1524871-08 08/22/22 16:07 • (DUP) R3829065-5 08/22/22 16:09

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Ammonia Nitrogen	ND	ND	1	0.000		10

⁵Sr

⁶Qc

L1525008-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1525008-05 08/22/22 16:36 • (DUP) R3829065-7 08/22/22 16:37

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Ammonia Nitrogen	ND	ND	1	0.000		10

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3829065-2 08/22/22 15:57

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Ammonia Nitrogen	7.50	7.44	99.2	90.0-110	

L1524871-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-07 08/22/22 16:03 • (MS) R3829065-3 08/22/22 16:04 • (MSD) R3829065-4 08/22/22 16:06

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Ammonia Nitrogen	5.00	ND	5.71	5.96	114	119	1	90.0-110	<u>J5</u>	<u>J5</u>	4.22	10

L1525008-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1525008-04 08/22/22 16:28 • (MS) R3829065-6 08/22/22 16:34

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Ammonia Nitrogen	5.00	ND	5.65	113	1	90.0-110	<u>J5</u>

Method Blank (MB)

(MB) R3832179-1 08/31/22 02:13

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
COD	U		11.7	20.0

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1524871-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1524871-05 08/31/22 02:14 • (DUP) R3832179-3 08/31/22 02:14

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	ND	ND	1	0.000		20

L1525008-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1525008-02 08/31/22 02:19 • (DUP) R3832179-6 08/31/22 02:19

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	ND	ND	1	0.000		20

Laboratory Control Sample (LCS)

(LCS) R3832179-2 08/31/22 02:13

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
COD	500	512	102	90.0-110	

L1524871-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-06 08/31/22 02:15 • (MS) R3832179-4 08/31/22 02:15 • (MSD) R3832179-5 08/31/22 02:15

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
COD	500	ND	514	527	103	105	1	80.0-120			2.46	20

Method Blank (MB)

(MB) R3826371-1 08/12/22 21:02

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

L1524871-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1524871-09 08/13/22 00:29 • (DUP) R3826371-3 08/13/22 00:42

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	ND	ND	1	0.000		15
Chloride	ND	ND	1	0.000		15
Fluoride	ND	ND	1	0.000		15
Nitrate	ND	ND	1	0.000		15
Sulfate	ND	ND	1	0.000		15

L1522264-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1522264-04 08/13/22 02:21 • (DUP) R3826371-6 08/13/22 02:59

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	2.71	2.72	1	0.578		15
Chloride	36.7	36.7	1	0.113		15
Fluoride	1.37	1.37	1	0.270		15
Nitrate	2.43	2.42	1	0.293		15
Sulfate	29.2	29.1	1	0.355		15

Laboratory Control Sample (LCS)

(LCS) R3826371-2 08/12/22 21:15

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Bromide	40.0	40.8	102	80.0-120	
Chloride	40.0	40.9	102	80.0-120	
Fluoride	8.00	8.50	106	80.0-120	
Nitrate	8.00	7.97	99.7	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3826371-2 08/12/22 21:15

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Sulfate	40.0	41.1	103	80.0-120	

L1524871-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-09 08/13/22 00:29 • (MS) R3826371-4 08/13/22 00:54 • (MSD) R3826371-5 08/13/22 01:07

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Bromide	50.0	ND	51.1	52.0	102	104	1	80.0-120			1.68	15
Chloride	50.0	ND	51.4	52.4	103	105	1	80.0-120			1.78	15
Fluoride	5.00	ND	5.45	5.53	109	111	1	80.0-120			1.49	15
Nitrate	5.00	ND	5.15	5.24	103	105	1	80.0-120			1.64	15
Sulfate	50.0	ND	51.5	52.3	103	105	1	80.0-120			1.63	15

L1522264-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L1522264-04 08/13/22 02:21 • (MS) R3826371-7 08/13/22 03:11

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>
Bromide	50.0	2.71	52.9	100	1	80.0-120	
Chloride	50.0	36.7	86.2	99.0	1	80.0-120	
Fluoride	5.00	1.37	6.63	105	1	80.0-120	
Nitrate	5.00	2.43	7.43	99.9	1	80.0-120	
Sulfate	50.0	29.2	78.7	99.2	1	80.0-120	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3827287-1 08/17/22 10:45

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.000100	0.000200

Laboratory Control Sample (LCS)

(LCS) R3827287-2 08/17/22 10:47

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Mercury	0.00300	0.00316	105	80.0-120	

L1524871-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-01 08/17/22 10:49 • (MS) R3827287-3 08/17/22 10:53 • (MSD) R3827287-4 08/17/22 10:55

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury	0.00300	ND	0.00315	0.00291	105	96.9	1	75.0-125			8.07	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3826268-1 08/15/22 10:39

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) R3826268-2 08/15/22 10:42

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury,Dissolved	0.00300	0.00265	88.5	80.0-120	

L1524871-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1524871-02 08/15/22 10:46 • (MS) R3826268-3 08/15/22 10:52 • (MSD) R3826268-4 08/15/22 10:54

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	ND	0.00296	0.00290	98.8	96.8	1	75.0-125			2.00	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3826352-1 08/15/22 10:02

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Boron,Dissolved	U		0.0200	0.200

1 Cp

2 Tc

3 Ss

Laboratory Control Sample (LCS)

(LCS) R3826352-2 08/15/22 10:04

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Boron,Dissolved	1.00	0.961	96.1	80.0-120	

4 Cn

5 Sr

L1522012-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1522012-01 08/15/22 10:07 • (MS) R3826352-4 08/15/22 10:12 • (MSD) R3826352-5 08/15/22 10:15

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Boron,Dissolved	1.00	ND	0.942	0.949	94.2	94.9	1	75.0-125			0.765	20

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3828082-1 08/18/22 23:16

Analyte	MB Result mg/l	<u>MB Qualifier</u>	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0200	0.200

Laboratory Control Sample (LCS)

(LCS) R3828082-2 08/18/22 23:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Boron	1.00	0.981	98.1	80.0-120	

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3827268-1 08/17/22 12:11

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
Cadmium,Dissolved	U		0.000150	0.00100
Calcium,Dissolved	U		0.0936	1.00
Chromium,Dissolved	U		0.00124	0.00200
Cobalt,Dissolved	U		0.0000596	0.00200
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	U		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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3827268-8 08/17/22 16:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Beryllium,Dissolved	U		0.000190	0.00200
Copper,Dissolved	U		0.00151	0.00500

Laboratory Control Sample (LCS)

(LCS) R3827268-2 08/17/22 12:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum,Dissolved	5.00	4.29	85.9	80.0-120	
Antimony,Dissolved	0.0500	0.0462	92.4	80.0-120	
Arsenic,Dissolved	0.0500	0.0462	92.4	80.0-120	
Barium,Dissolved	0.0500	0.0420	84.1	80.0-120	
Cadmium,Dissolved	0.0500	0.0493	98.7	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3827268-2 08/17/22 12:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Calcium,Dissolved	5.00	4.55	90.9	80.0-120	
Chromium,Dissolved	0.0500	0.0476	95.1	80.0-120	
Cobalt,Dissolved	0.0500	0.0484	96.9	80.0-120	
Iron,Dissolved	5.00	4.67	93.4	80.0-120	
Lead,Dissolved	0.0500	0.0450	90.1	80.0-120	
Magnesium,Dissolved	5.00	4.49	89.8	80.0-120	
Manganese,Dissolved	0.0500	0.0465	93.1	80.0-120	
Nickel,Dissolved	0.0500	0.0485	96.9	80.0-120	
Potassium,Dissolved	5.00	4.51	90.1	80.0-120	
Selenium,Dissolved	0.0500	0.0485	96.9	80.0-120	
Silver,Dissolved	0.0500	0.0464	92.9	80.0-120	
Sodium,Dissolved	5.00	4.67	93.4	80.0-120	
Thallium,Dissolved	0.0500	0.0441	88.2	80.0-120	
Vanadium,Dissolved	0.0500	0.0470	94.0	80.0-120	
Zinc,Dissolved	0.0500	0.0470	93.9	80.0-120	

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3827268-9 08/17/22 16:25

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Beryllium,Dissolved	0.0500	0.0431	86.3	80.0-120	
Copper,Dissolved	0.0500	0.0437	87.4	80.0-120	

L1523202-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-16 08/17/22 12:17 • (MS) R3827268-4 08/17/22 12:24 • (MSD) R3827268-5 08/17/22 12:27

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Aluminum,Dissolved	5.00	ND	4.36	4.34	87.3	86.8	1	75.0-125			0.531	20
Antimony,Dissolved	0.0500	ND	0.0487	0.0487	97.3	97.4	1	75.0-125			0.0759	20
Arsenic,Dissolved	0.0500	ND	0.0490	0.0476	97.5	94.8	1	75.0-125			2.82	20
Barium,Dissolved	0.0500	0.0843	0.129	0.129	88.7	89.4	1	75.0-125			0.257	20
Cadmium,Dissolved	0.0500	ND	0.0511	0.0507	102	101	1	75.0-125			0.827	20
Calcium,Dissolved	5.00	123	128	129	90.4	107	1	75.0-125			0.633	20
Chromium,Dissolved	0.0500	ND	0.0487	0.0484	97.5	96.7	1	75.0-125			0.757	20
Cobalt,Dissolved	0.0500	ND	0.0493	0.0485	98.3	96.9	1	75.0-125			1.45	20
Iron,Dissolved	5.00	ND	4.76	4.93	95.3	98.6	1	75.0-125			3.49	20
Lead,Dissolved	0.0500	ND	0.0466	0.0476	93.2	95.2	1	75.0-125			2.18	20

L1523202-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-16 08/17/22 12:17 • (MS) R3827268-4 08/17/22 12:24 • (MSD) R3827268-5 08/17/22 12:27

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 %
Magnesium,Dissolved	5.00	25.6	30.6	31.6	102	121	1	75.0-125			3.17	20
Manganese,Dissolved	0.0500	0.0731	0.120	0.119	93.3	92.6	1	75.0-125			0.312	20
Nickel,Dissolved	0.0500	0.00239	0.0508	0.0508	96.8	96.8	1	75.0-125			0.0649	20
Potassium,Dissolved	5.00	8.91	13.3	13.4	88.4	90.6	1	75.0-125			0.815	20
Selenium,Dissolved	0.0500	ND	0.0509	0.0502	102	100	1	75.0-125			1.36	20
Silver,Dissolved	0.0500	ND	0.0473	0.0473	94.6	94.6	1	75.0-125			0.0312	20
Sodium,Dissolved	5.00	316	326	332	196	310	1	75.0-125	V	V	1.75	20
Thallium,Dissolved	0.0500	ND	0.0470	0.0481	94.0	96.2	1	75.0-125			2.38	20
Vanadium,Dissolved	0.0500	ND	0.0496	0.0485	99.1	96.9	1	75.0-125			2.27	20
Zinc,Dissolved	0.0500	ND	0.0500	0.0484	93.7	90.4	1	75.0-125			3.31	20

L1523202-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-17 08/17/22 12:30 • (MS) R3827268-6 08/17/22 12:33 • (MSD) R3827268-7 08/17/22 12:37

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	4.39	4.36	87.7	87.3	1	75.0-125			0.512	20
Antimony,Dissolved	0.0500	ND	0.0479	0.0494	95.8	98.7	1	75.0-125			2.96	20
Arsenic,Dissolved	0.0500	ND	0.0489	0.0496	96.8	98.2	1	75.0-125			1.41	20
Barium,Dissolved	0.0500	0.549	0.581	0.589	63.9	79.7	1	75.0-125	V		1.35	20
Cadmium,Dissolved	0.0500	ND	0.0511	0.0512	102	102	1	75.0-125			0.118	20
Calcium,Dissolved	5.00	270	272	270	49.7	5.75	1	75.0-125	V	V	0.810	20
Chromium,Dissolved	0.0500	ND	0.0492	0.0496	98.4	99.1	1	75.0-125			0.803	20
Cobalt,Dissolved	0.0500	ND	0.0492	0.0494	98.1	98.6	1	75.0-125			0.483	20
Iron,Dissolved	5.00	ND	4.84	4.92	96.8	98.4	1	75.0-125			1.72	20
Lead,Dissolved	0.0500	ND	0.0472	0.0455	94.3	91.0	1	75.0-125			3.58	20
Magnesium,Dissolved	5.00	95.9	97.3	96.6	28.6	14.1	1	75.0-125	V	V	0.751	20
Manganese,Dissolved	0.0500	0.444	0.498	0.500	107	113	1	75.0-125			0.546	20
Nickel,Dissolved	0.0500	0.00476	0.0535	0.0540	97.4	98.5	1	75.0-125			1.03	20
Potassium,Dissolved	5.00	10.1	14.5	14.2	88.0	82.0	1	75.0-125			2.08	20
Selenium,Dissolved	0.0500	ND	0.0519	0.0508	104	102	1	75.0-125			2.26	20
Silver,Dissolved	0.0500	ND	0.0469	0.0479	93.9	95.7	1	75.0-125			1.99	20
Sodium,Dissolved	5.00	717	744	752	549	708	1	75.0-125	V	V	1.06	20
Thallium,Dissolved	0.0500	ND	0.0467	0.0464	93.4	92.8	1	75.0-125			0.543	20
Vanadium,Dissolved	0.0500	ND	0.0500	0.0501	100	100	1	75.0-125			0.253	20
Zinc,Dissolved	0.0500	ND	0.0490	0.0488	98.1	97.7	1	75.0-125			0.395	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L1523202-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-16 08/17/22 16:28 • (MS) R3827268-11 08/17/22 16:35 • (MSD) R3827268-12 08/17/22 16:38

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 %
Beryllium,Dissolved	0.0500	ND	0.0456	0.0457	91.1	91.4	1	75.0-125			0.332	20
Copper,Dissolved	0.0500	ND	0.0482	0.0481	90.8	90.6	1	75.0-125			0.195	20

L1523202-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1523202-17 08/17/22 16:41 • (MS) R3827268-13 08/17/22 16:44 • (MSD) R3827268-14 08/17/22 16:48

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 %
Beryllium,Dissolved	0.0500	ND	0.0503	0.0493	101	98.6	1	75.0-125			2.05	20
Copper,Dissolved	0.0500	ND	0.0478	0.0475	95.6	95.1	1	75.0-125			0.569	20

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

Method Blank (MB)

(MB) R3828018-1 08/18/22 17:30

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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3828018-2 08/18/22 17:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum	5.00	4.61	92.1	80.0-120	
Antimony	0.0500	0.0487	97.4	80.0-120	
Arsenic	0.0500	0.0486	97.1	80.0-120	
Barium	0.0500	0.0477	95.4	80.0-120	
Beryllium	0.0500	0.0484	96.9	80.0-120	
Cadmium	0.0500	0.0517	103	80.0-120	
Calcium	5.00	4.72	94.4	80.0-120	
Chromium	0.0500	0.0518	104	80.0-120	
Cobalt	0.0500	0.0517	103	80.0-120	
Copper	0.0500	0.0483	96.6	80.0-120	
Iron	5.00	4.78	95.6	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3828018-2 08/18/22 17:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Lead	0.0500	0.0469	93.7	80.0-120	
Magnesium	5.00	4.95	98.9	80.0-120	
Manganese	0.0500	0.0511	102	80.0-120	
Nickel	0.0500	0.0516	103	80.0-120	
Potassium	5.00	4.55	90.9	80.0-120	
Selenium	0.0500	0.0510	102	80.0-120	
Silver	0.0500	0.0477	95.3	80.0-120	
Sodium	5.00	4.96	99.2	80.0-120	
Thallium	0.0500	0.0457	91.4	80.0-120	
Vanadium	0.0500	0.0508	102	80.0-120	
Zinc	0.0500	0.0489	97.9	80.0-120	

L1525008-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1525008-02 08/18/22 17:37 • (MS) R3828018-4 08/18/22 17:43 • (MSD) R3828018-5 08/18/22 17:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Aluminum	5.00	ND	4.51	4.56	90.3	91.2	1	75.0-125			1.08	20
Antimony	0.0500	ND	0.0486	0.0492	97.3	98.3	1	75.0-125			1.08	20
Arsenic	0.0500	ND	0.0463	0.0471	92.7	94.1	1	75.0-125			1.60	20
Barium	0.0500	0.0675	0.114	0.113	93.7	91.4	1	75.0-125			0.974	20
Beryllium	0.0500	ND	0.0445	0.0433	89.0	86.6	1	75.0-125			2.74	20
Cadmium	0.0500	ND	0.0476	0.0480	95.1	95.9	1	75.0-125			0.836	20
Calcium	5.00	60.8	64.1	64.6	65.1	75.8	1	75.0-125	V		0.829	20
Chromium	0.0500	ND	0.0494	0.0493	98.9	98.5	1	75.0-125			0.376	20
Cobalt	0.0500	ND	0.0472	0.0474	94.2	94.5	1	75.0-125			0.254	20
Copper	0.0500	ND	0.0475	0.0474	95.0	94.8	1	75.0-125			0.181	20
Iron	5.00	0.125	4.86	4.81	94.6	93.8	1	75.0-125			0.896	20
Lead	0.0500	ND	0.0454	0.0454	90.7	90.9	1	75.0-125			0.149	20
Magnesium	5.00	31.2	35.6	36.0	88.0	95.9	1	75.0-125			1.11	20
Manganese	0.0500	0.00576	0.0529	0.0537	94.2	95.9	1	75.0-125			1.55	20
Nickel	0.0500	ND	0.0482	0.0477	96.4	95.5	1	75.0-125			0.937	20
Potassium	5.00	4.12	8.67	8.86	91.0	95.0	1	75.0-125			2.25	20
Selenium	0.0500	ND	0.0495	0.0493	99.0	98.5	1	75.0-125			0.480	20
Silver	0.0500	ND	0.0476	0.0482	95.2	96.3	1	75.0-125			1.14	20
Sodium	5.00	25.8	29.5	30.3	74.7	90.2	1	75.0-125	V		2.60	20
Thallium	0.0500	ND	0.0438	0.0434	87.5	86.9	1	75.0-125			0.765	20
Vanadium	0.0500	ND	0.0485	0.0486	97.0	97.2	1	75.0-125			0.149	20
Zinc	0.0500	ND	0.0455	0.0456	91.0	91.2	1	75.0-125			0.287	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3829021-3 08/21/22 22:18

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

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3829021-3 08/21/22 22:18

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	109			80.0-120
(S) 4-Bromofluorobenzene	105			77.0-126
(S) 1,2-Dichloroethane-d4	100			70.0-130

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

(LCS) R3829021-1 08/21/22 21:20 • (LCSD) R3829021-2 08/21/22 21:39

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 %
Acetone	0.0250	0.0231	0.0267	92.4	107	19.0-160			14.5	27
Acrylonitrile	0.0250	0.0209	0.0213	83.6	85.2	55.0-149			1.90	20
Benzene	0.00500	0.00473	0.00487	94.6	97.4	70.0-123			2.92	20
Bromochloromethane	0.00500	0.00548	0.00562	110	112	76.0-122			2.52	20
Bromodichloromethane	0.00500	0.00468	0.00504	93.6	101	75.0-120			7.41	20
Bromoform	0.00500	0.00395	0.00417	79.0	83.4	68.0-132			5.42	20
Bromomethane	0.00500	0.00610	0.00635	122	127	10.0-160			4.02	25
Carbon disulfide	0.00500	0.00418	0.00471	83.6	94.2	61.0-128			11.9	20
Carbon tetrachloride	0.00500	0.00452	0.00471	90.4	94.2	68.0-126			4.12	20
Chlorobenzene	0.00500	0.00476	0.00495	95.2	99.0	80.0-121			3.91	20
Chlorodibromomethane	0.00500	0.00468	0.00496	93.6	99.2	77.0-125			5.81	20
Chloroethane	0.00500	0.00513	0.00480	103	96.0	47.0-150			6.65	20
Chloroform	0.00500	0.00475	0.00521	95.0	104	73.0-120			9.24	20
Chloromethane	0.00500	0.00492	0.00537	98.4	107	41.0-142			8.75	20
Dibromomethane	0.00500	0.00420	0.00457	84.0	91.4	80.0-120			8.44	20
1,2-Dibromo-3-Chloropropane	0.00500	0.00367	0.00423	73.4	84.6	58.0-134			14.2	20
1,2-Dibromoethane	0.00500	0.00455	0.00447	91.0	89.4	80.0-122			1.77	20
1,2-Dichlorobenzene	0.00500	0.00447	0.00473	89.4	94.6	79.0-121			5.65	20
1,4-Dichlorobenzene	0.00500	0.00374	0.00469	74.8	93.8	79.0-120	J4	J3	22.5	20
trans-1,4-Dichloro-2-butene	0.00500	0.00223	0.00233	44.6	46.6	33.0-144			4.39	20
1,1-Dichloroethane	0.00500	0.00490	0.00499	98.0	99.8	70.0-126			1.82	20
1,2-Dichloroethane	0.00500	0.00514	0.00503	103	101	70.0-128			2.16	20
1,1-Dichloroethene	0.00500	0.00442	0.00474	88.4	94.8	71.0-124			6.99	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

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

(LCS) R3829021-1 08/21/22 21:20 • (LCSD) R3829021-2 08/21/22 21:39

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 %
cis-1,2-Dichloroethene	0.00500	0.00471	0.00486	94.2	97.2	73.0-120			3.13	20
trans-1,2-Dichloroethene	0.00500	0.00471	0.00499	94.2	99.8	73.0-120			5.77	20
1,2-Dichloropropane	0.00500	0.00445	0.00472	89.0	94.4	77.0-125			5.89	20
cis-1,3-Dichloropropene	0.00500	0.00409	0.00418	81.8	83.6	80.0-123			2.18	20
trans-1,3-Dichloropropene	0.00500	0.00402	0.00416	80.4	83.2	78.0-124			3.42	20
Ethylbenzene	0.00500	0.00457	0.00502	91.4	100	79.0-123			9.38	20
2-Hexanone	0.0250	0.0194	0.0225	77.6	90.0	67.0-149			14.8	20
Iodomethane	0.0250	0.0139	0.0180	55.6	72.0	33.0-147			25.7	26
2-Butanone (MEK)	0.0250	0.0195	0.0205	78.0	82.0	44.0-160			5.00	20
Methylene Chloride	0.00500	0.00482	0.00477	96.4	95.4	67.0-120			1.04	20
4-Methyl-2-pentanone (MIBK)	0.0250	0.0223	0.0246	89.2	98.4	68.0-142			9.81	20
Styrene	0.00500	0.00334	0.00433	66.8	86.6	73.0-130	J4	J3	25.8	20
1,1,1,2-Tetrachloroethane	0.00500	0.00449	0.00527	89.8	105	75.0-125			16.0	20
1,1,2,2-Tetrachloroethane	0.00500	0.00454	0.00497	90.8	99.4	65.0-130			9.04	20
Tetrachloroethene	0.00500	0.00454	0.00514	90.8	103	72.0-132			12.4	20
Toluene	0.00500	0.00451	0.00503	90.2	101	79.0-120			10.9	20
1,1,1-Trichloroethane	0.00500	0.00459	0.00504	91.8	101	73.0-124			9.35	20
1,1,2-Trichloroethane	0.00500	0.00504	0.00536	101	107	80.0-120			6.15	20
Trichloroethene	0.00500	0.00458	0.00491	91.6	98.2	78.0-124			6.95	20
Trichlorofluoromethane	0.00500	0.00462	0.00461	92.4	92.2	59.0-147			0.217	20
1,2,3-Trichloropropane	0.00500	0.00470	0.00499	94.0	99.8	73.0-130			5.99	20
Vinyl acetate	0.0250	0.0138	0.0155	55.2	62.0	11.0-160			11.6	20
Vinyl chloride	0.00500	0.00536	0.00563	107	113	67.0-131			4.91	20
Xylenes, Total	0.0150	0.0133	0.0149	88.7	99.3	79.0-123			11.3	20
(S) Toluene-d8				105	106	80.0-120				
(S) 4-Bromofluorobenzene				104	106	77.0-126				
(S) 1,2-Dichloroethane-d4				103	106	70.0-130				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3827290-1 08/16/22 23:44

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Ethylene Dibromide	U		0.0000536	0.0000200
1,2-Dibromo-3-Chloropropane	U		0.0000748	0.0000200

1 Cp

2 Tc

3 Ss

4 Cn

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

(LCS) R3827290-3 08/17/22 02:35 • (LCSD) R3827290-4 08/17/22 05:14

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	%	%	%			%	%
Ethylene Dibromide	0.000250	0.000291	0.000301	116	120	60.0-140			3.38	20
Ethylene Dibromide	0.000250	0.000291	0.000310	116	124	60.0-140			6.32	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000253	0.000255	101	102	60.0-140			0.787	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000253	0.000268	101	107	60.0-140			5.76	20

5 Sr

6 Qc

7 Gl

Laboratory Control Sample (LCS)

(LCS) R3827290-6 08/17/22 12:51

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/l	mg/l	%	%	
Ethylene Dibromide	0.000250	0.000324	130	60.0-140	
1,2-Dibromo-3-Chloropropane	0.000250	0.000279	112	60.0-140	

8 Al

9 Sc

L1524609-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L1524609-05 08/17/22 00:08 • (MS) R3827290-2 08/16/22 23:56

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	mg/l	mg/l	mg/l	%		%	
Ethylene Dibromide	0.0000995	ND	0.000102	103	1	64.0-159	
1,2-Dibromo-3-Chloropropane	0.0000995	ND	0.000108	109	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
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
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	LA000356
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.





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	80s, Sunny
DATE & TIME	8/11/22 0855	EVENT FREQUENCY	Quarterly
PURGE METHOD	Peristaltic Pump	FIELD REPRESENTATIVE	A. Black
TOTAL WELL DEPTH (feet)	30.5	SAMPLING EQUIPMENT	Bladder Pump
DEPTH TO WATER (feet)	23.05	IS SAMPLE EQUIPMENT DEDICATED?	Yes
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	N
WATER COLUMN (feet)	7.45	FIELD BLANK COLLECTED?	N
PURGE VOLUME (gallons)	8.0	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	23.05	0908	17.7	6.03	58.8	48.5	6.21	219.4	33.3
0.75	23.55	0912	16.4	5.29	44.2	40.3	2.89	281.9	41.7
1.0	23.65	0916	16.5	5.41	70.7	52.8	2.21	180.7	36.8
1.5	23.65	0920	16.5	5.62	119.0	99.9	1.44	91.3	29.4
2.0	23.65	0924	16.5	5.70	140.0	117.3	1.33	46.3	24.7
2.5	23.65	0928	16.5	5.74	147.2	123.3	1.13	30.9	19.5
3.0	23.65	0932	16.5	5.78	147.6	123.6	0.95	22.2	17.3
3.5	23.65	0936	16.5	5.79	147.2	127.2	0.86	18.9	15.3
4.0	23.65	0940	16.5	5.83	146.9	123.1	0.80	17.5	15.0
4.5	23.65	0944	16.5	5.85	147.3	123.4	0.75	12.1	14.8
5.0	23.65	0948	16.5	5.86	148.1	124.0	0.71	8.9	14.1
5.5	23.65	0952	16.6	5.87	178.2	124.3	0.69	7.7	13.6

SAMPLE DATA

(continued on back)

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
8.0	23.65	1015	16.5	5.89	137.8	116.9	0.60	-1.4	9.89 @ 1260s
Preservatives Used	SRL 12C			Sample Characteristics (Odor, Color)			Clear, no color, rotten egg smell		
Number of Containers	10			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	covered in weeds	Well Clear of Weeds/Accessible?	Yes

MU-1

CWS

8/11/22

Colbns	DTU	Time	OC	pH	Sp. Cond.	Cond.	DO	ORP	NTU
6.0	23.65	0956	16.5	5.88	146.5	122.6	0.67	2.0	12.5
6.5	23.65	1000	16.5	5.89	145.8	122.1	0.62	1.3	13.1
7.0	23.65	1004	16.5	5.85	141.3	118.4	0.62	-0.3	12.9
7.5	23.65	1008	16.7	5.94	140.7	117.7	0.62	-0.7	12.6
8.0	23.65	1012	16.5	5.89	139.8	116.9	0.60	-1.4	10.9



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	80s 7-007
DATE & TIME	8/11/22 1331	EVENT FREQUENCY	Quarterly
PURGE METHOD	NA, parameters only	FIELD REPRESENTATIVE	A. Black
TOTAL WELL DEPTH (feet)	10	SAMPLING EQUIPMENT	Bailer
DEPTH TO WATER (feet)	6.36	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	~
WATER COLUMN (feet)	3.64	FIELD BLANK COLLECTED?	~
PURGE VOLUME (gallons)		EQUIPMENT BLANK COLLECTED?	~

SAMPLE DATA

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
-	-	-	25.5	6.26	217.7	219.7	3.99	122.9	
Preservatives Used				Sample Characteristics (Odor, Color)			Clear no odor		
Number of Containers				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



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	80°, Partly Cloudy
DATE & TIME	8/11/22 1150	EVENT FREQUENCY	Quarterly
PURGE METHOD	Low-flow	FIELD REPRESENTATIVE	A. Glad
TOTAL WELL DEPTH (feet)	27	SAMPLING EQUIPMENT	Bladder Pump
DEPTH TO WATER (feet)	19.94	IS SAMPLE EQUIPMENT DEDICATED?	Yes
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	Y
WATER COLUMN (feet)	7.06	FIELD BLANK COLLECTED?	Y NYS 1245
PURGE VOLUME (gallons)	11.5 gal 35	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	19.94	1156	20.3	6.00	201.4	183.2	3.91	177.9	13.8
0.25	20.72	1200	19.8	5.80	227.7	202.1	0.78	160.2	9.37
0.5	21.02	1204	19.7	5.77	223.7	201.2	0.67	167.6	21.9
0.6	21.30	1208	19.7	5.73	224.2	201.6	0.64	166.4	28.5
0.7	21.50	1212	19.8	5.70	225.1	202.7	0.59	165.2	48.3
0.8	21.80	1216	19.9	5.71	226.0	204.0	0.43	160.5	76.6
0.9	21.90	1220	19.9	5.73	224.9	203.1	0.40	157.3	66.7
1.0	22.10	1227	19.9	5.72	225.3	203.5	0.38	159.9	92.7
1.1	22.30	1228	19.9	5.72	225.4	204.3	0.36	147.0	209
1.2	22.50	1232	19.9	5.73	227.0	205.0	0.45	146.5	273
1.5	22.60	1236	20.0	5.74	226.6	205.7	0.44	141.6	327
1.7	22.60	1240	20.1	5.70	226.1	205.1	0.52	141.8	284

SAMPLE DATA

(continued on back)

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
3.5	22.60	1020	22.7	5.33	234.0	223.7	1.72	208.8	146
Preservatives Used	See log			Sample Characteristics (Odor, Color)					
Number of Containers	10			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

⊗ Purged 3 well volumes. Will return on 8/12/22 to collect sample.

MU-3

8/11/22

GUS

Gallons	DTU	Time	OC	pH	Sp. cont.	Card.	DO	ORP	NTU
2.0	22.61	1244	20.7	5.67	229.8	209.2	0.99	27.7	012
2.1	22.60	1248	20.4	5.67	229.9	209.9	1.16	120.0	012
2.4	22.60	1252	21.1	5.61	230.4	213.5	3.90	74.4	012
2.5	22.60	1256	21.3	5.58	231.7	215.1	2.75	79.3	952
2.6	22.60	1300	21.3	5.56	231.6	215.1	2.55	87.6	878
2.7	22.60	1304	21.3	5.56	232.1	215.8	2.51	97.9	919
2.8	22.60	1308	21.6	5.54	231.8	217.0	2.67	104.7	146
2.9	22.60	1312	21.9	5.52	232.3	218.7	2.68	106.7	950
3.0	22.60	1316	21.8	5.53	232.0	219.9	2.66	94.7	926
3.2	22.60	1320	21.7	5.54	234.5	219.8	2.70	99.5	904
3.5	22.60								



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	80s Partly Cloudy
DATE & TIME	5/11/22 1120	EVENT FREQUENCY	Quarterly
PURGE METHOD	Low-flow	FIELD REPRESENTATIVE	A. Blouch
TOTAL WELL DEPTH (feet)	23.1	SAMPLING EQUIPMENT	Bladder Pump
DEPTH TO WATER (feet)	11.72	IS SAMPLE EQUIPMENT DEDICATED?	Yes
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	<input checked="" type="checkbox"/>
WATER COLUMN (feet)	11.38	FIELD BLANK COLLECTED?	<input checked="" type="checkbox"/>
PURGE VOLUME (gallons)	1.5	EQUIPMENT BLANK COLLECTED?	<input checked="" type="checkbox"/>

PURGE INFORMATION

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
0	11.72	1123	16.8	6.10	92.6	78.0	4.18	194.2	2.82
0.5	12.00	1127	16.6	6.13	89.6	75.1	3.87	189.8	1.28
1.0	12.09	1131	16.6	6.22	88.2	74.0	3.76	174.4	1.40
1.5	12.09	1135	16.6	6.21	88.6	74.3	3.53	170.1	1.28

SAMPLE DATA

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
1.5	12.09	1140	16.6	6.21	88.6	74.3	3.53	170.1	1.28
Preservatives Used	Sec ea			Sample Characteristics (Odor, Color)			clear no odor		
Number of Containers	10			Sampler Signature					

WELL DATA

Number of Baffles	0	Well Cap Dedicated/In Place?	Yes
Lock Condition	good	Fittings/Well Head Condition	good
Pad/Casing Quality	good	Well Clear of Weeds/Accessible?	Yes



GROUNDWATER MONITORING FIELD INFORMATION LOG

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SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	MONITORING WELL I.D.	MW-5
LOCATION	Camden, TN	TEMPERATURE & WEATHER	80% Overcast
DATE & TIME	8/11/22 1025	EVENT FREQUENCY	Quarterly
PURGE METHOD	Low-flow	FIELD REPRESENTATIVE	A. Black
TOTAL WELL DEPTH (feet)	33.85	SAMPLING EQUIPMENT	Bladder Pump
DEPTH TO WATER (feet)	10.22	IS SAMPLE EQUIPMENT DEDICATED?	Yes
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	N
WATER COLUMN (feet)	23.62	FIELD BLANK COLLECTED?	N
PURGE VOLUME (gallons)	5.0	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	10.23	1028	17.9	5.35	355.5	305.4	2.13	192.4	19.0
0.5	11.10	1032	17.2	5.38	339.1	288.1	0.89	156.0	26.5
1.0	11.30	1036	17.2	5.36	329.8	280.7	0.25	165.7	66.2
1.5	11.30	1040	17.2	5.36	326.5	277.7	0.96	171.2	50.4
2.0	11.30	1044	17.1	5.39	320.8	272.1	1.07	181.2	32.8
2.5	11.30	1048	17.2	5.39	318.1	270.7	1.11	184.6	28.6
3.0	11.30	1052	17.2	5.40	315.7	268.7	1.12	186.9	23.8
3.5	11.30	1056	17.1	5.43	311.6	264.7	1.16	187.9	16.4
4.0	11.30	1060	17.2	5.43	309.4	263.5	1.18	187.9	14.3
4.5	11.30	1064	17.2	5.44	305.2	259.1	1.25	187.2	11.7
5.0	11.30	1068	17.2	5.44	301.9	257.9	1.31	186.9	9.07

SAMPLE DATA

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
5.0	11.30	1110	17.2	5.44	301.9	257.9	1.31	186.9	9.07
Preservatives Used	5% HCl			Sample Characteristics (Odor, Color)					
Number of Containers	10			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



GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.ccecinc.com

SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	MONITORING WELL I.D.	TMW-1
LOCATION	Camden, TN	TEMPERATURE & WEATHER	80s cloudy
DATE & TIME	8/11/22 900	EVENT FREQUENCY	Quarterly
PURGE METHOD	Low-flow	FIELD REPRESENTATIVE	Baugh
TOTAL WELL DEPTH (feet)	32.50	SAMPLING EQUIPMENT	Bladder Pump
DEPTH TO WATER (feet)	7.28	IS SAMPLE EQUIPMENT DEDICATED?	Yes
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	N
WATER COLUMN (feet)	25.22	FIELD BLANK COLLECTED?	N
PURGE VOLUME (gallons)	2.1	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	7.28	914	18.2	6.37	182.1	159.6	5.63	176.7	42.1
.5	9.45	918	18.1	5.42	196.0	170.2	3.77	216.9	35.0
.75	9.6	922	18.1	5.58	199.3	169.7	3.23	219.9	24.6
1.0	9.8	926	18.1	5.35	192.8	167.2	3.13	227.8	19.8
1.25	9.90	930	18.1	5.35	192.0	166.5	3.45	222.3	19.5
1.5	9.9	934	18.1	5.35	190.7	165.0	3.41	224.7	18.2
1.7	9.9	938	18.1	5.36	191.2	166.0	3.41	223.8	15.2
1.9	9.8	942	18.1	5.36	190.5	165.1	3.42	228.8	12.89
2.1	9.8	946	17.9	5.37	190.6	164.4	3.40	229.0	12.61

SAMPLE DATA

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
2.1	9.8	950	17.9	5.37	190.6	164.4	3.40	229.0	8.83
Preservatives Used	See CEC			Sample Characteristics (Odor, Color)			clear		
Number of Containers	See CEC			Sampler Signature			Baugh		

WELL DATA

Number of Baffles	1 Barrier	Well Cap Dedicated/In Place?	Y
Lock Condition	OK	Fittings/Well Head Condition	OK
Pad/Casing Quality	OK	Well Clear of Weeds/Accessible?	CEC cleared weeds

@ meters



GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 600-763-2326 - www.cecinc.com

SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	MONITORING WELL I.D.	TMW-2
LOCATION	Camden, TN	TEMPERATURE & WEATHER	80, cloudy
DATE & TIME	8/11/22 1015	EVENT FREQUENCY	Quarterly
PURGE METHOD	Low-flow	FIELD REPRESENTATIVE	Baugh
TOTAL WELL DEPTH (feet)	27.50	SAMPLING EQUIPMENT	Bladder Pump
DEPTH TO WATER (feet)	12.51	IS SAMPLE EQUIPMENT DEDICATED?	Yes
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	✓
WATER COLUMN (feet)	14.99	FIELD BLANK COLLECTED?	N
PURGE VOLUME (gallons)	3.0	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
Ø	12.51	1028	18.7	5.72	111.7	98.1	7.13	198.9	78.6
.35	14.15	1032	18.1	5.39	168.1	146.1	5.66	221.4	211.6
.7	14.36	1036	17.7	5.41	172.5	148.4	5.32	226.8	116.8
1.1	14.5	1040	17.8	5.41	174.8	150.4	5.17	230.4	53.1
1.2	14.6	1044	17.6	5.41	175.0	150.4	5.18	231.5	41.4
1.45	14.6	1048	17.9	5.41	177.6	153.4	5.11	232.1	28.1
1.65	14.6	1052	17.9	5.41	177.5	153.6	5.10	232.6	22.6
1.95	14.6	1056	18.0	5.41	178.1	154.6	5.06	233.1	21.2
2.25	14.6	1100	19.1	5.41	178.4	154.9	5.03	234.1	20.5
2.50	14.6	1104	18.1	5.40	178.9	155.4	5.04	235.6	19.8
2.7	14.6	1108	18.0	5.40	178.9	154.4	5.02	236.3	16.5
3.0	14.6	1112	18.1	5.41	179.1	155.6	4.97	235.2	12.4

SAMPLE DATA

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
3.0	14.6	1115	18.1	5.41	179.1	155.6	4.97	235.2	7.98
Preservatives Used	Seccoc			Sample Characteristics (Odor, Color)			Clear		
Number of Containers	Seccoc			Sampler Signature			Baugh		

@metals

WELL DATA

Number of Baffles	1 Barrier	Well Cap Dedicated/In Place?	Y
Lock Condition	OK	Fittings/Well Head Condition	OK
Pad/Casing Quality	OK	Well Clear of Weeds/Accessible?	EC cleared weeds



GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane, Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.ceclnc.com

SITE AND MONITORING WELL DATA

FACILITY NAME	EWS	MONITORING WELL I.D.	TMW-3
LOCATION	Camden, TN	TEMPERATURE & WEATHER	80s Partly Cloudy
DATE & TIME	8/4/22 1130	EVENT FREQUENCY	Quarterly
PURGE METHOD	Low-flow	FIELD REPRESENTATIVE	Baugh
TOTAL WELL DEPTH (feet)	28.00	SAMPLING EQUIPMENT	Bladder Pump
DEPTH TO WATER (feet)	12.67	IS SAMPLE EQUIPMENT DEDICATED?	Yes
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	N
WATER COLUMN (feet)	15.33	FIELD BLANK COLLECTED?	N
PURGE VOLUME (gallons)	2.25	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	12.67	1144	19.8	5.27	321.7	289.6	2.63	205.0	24.3
.5	11.45	1148	18.5	5.15	308.4	270.8	1.1	208.9	76.2
.75	11.47	1152	18.4	5.20	306.1	267.1	1.06	199.2	36.5
1.0	11.5	1156	18.2	5.21	304.2	264.7	1.02	195.2	23.7
1.25	11.5	1200	18.1	5.21	302.5	262.7	1.02	194.7	20.9
1.50	11.5	1204	18.2	5.20	301.0	262.1	1.02	194.9	16.4
1.75	11.5	1208	18.1	5.20	300.5	261.0	1.02	194.9	15.1
2.0	11.5	1212	18.4	5.21	299.7	261.1	1.01	197.5	12.0
2.25	11.5	1215	18.5	5.21	299.7	262.5	1.00	191.8	9.2

SAMPLE DATA

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
2.25	11.5	1215	18.5	5.21	299.7	262.5	1.00	191.8	9.2
Preservatives Used	See Col			Sample Characteristics (Odor, Color)			Clear		
Number of Containers	See Col			Sampler Signature			Baugh		

WELL DATA

Number of Baffles	1 Barrier	Well Cap Dedicated/In Place?	OK
Lock Condition	OK	Fittings/Well Head Condition	OK
Pad/Casing Quality	OK	Well Clear of Weeds/Accessible?	CEC cleared weeds



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.	Leachate (IWC)
LOCATION	Camden, TN	TEMPERATURE & WEATHER	80s Partly Cloudy
DATE & TIME	8/11/22	EVENT FREQUENCY	Quarterly
PURGE METHOD	Grab	FIELD REPRESENTATIVE	A. Baugh
TOTAL WELL DEPTH (feet)	NA	SAMPLING EQUIPMENT	Grab
DEPTH TO WATER (feet)	NA	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	NA	DUPLICATE COLLECTED?	N
WATER COLUMN (feet)	NA	FIELD BLANK COLLECTED?	N
PURGE VOLUME (gallons)	NA	EQUIPMENT BLANK COLLECTED?	N

SAMPLE DATA

Cells Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
10-15 min	-	1305	22.6	7.30	195705	189144	2.72	295.0	12.7
Preservatives Used	Sealoc			Sample Characteristics (Odor, Color)			black, trash odor		
Number of Containers	11			Sampler Signature					

WELL DATA

Number of Baffles	-	Well Cap Dedicated/In Place?	-
Lock Condition	-	Fittings/Well Head Condition	-
Pad/Casing Quality	-	Well Clear of Weeds/Accessible?	-



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.	Leachate (APWC)
LOCATION	Camden, TN	TEMPERATURE & WEATHER	—
DATE & TIME	8/11/22	EVENT FREQUENCY	Quarterly
PURGE METHOD	Grab	FIELD REPRESENTATIVE	—
TOTAL WELL DEPTH (feet)	NA	SAMPLING EQUIPMENT	—
DEPTH TO WATER (feet)	NA	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	NA	DUPLICATE COLLECTED?	—
WATER COLUMN (feet)	NA	FIELD BLANK COLLECTED?	—
PURGE VOLUME (gallons)	NA	EQUIPMENT BLANK COLLECTED?	—

SAMPLE DATA

Gallons Purged	DTW (ft)	Time (00:00)	°C	pH	Specific Cond (µs/cm)	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
Preservatives Used	—			Sample Characteristics (Odor, Color)			—		
Number of Containers	—			Sampler Signature			D.R.Y.		

WELL DATA

Number of Baffles	—	Well Cap Dedicated/In Place?	—
Lock Condition	—	Fittings/Well Head Condition	—
Pad/Casing Quality	—	Well Clear of Weeds/Accessible?	—

D.R.Y.

Not Samples



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	A. Black
LOCATION	Former EUS
DATE AND TIME	8/10/22 1125
Equipment and Model # (ex. YSI Pro Plus 556)	YSI Pro Plus / HACH 2100Q
Equipment Serial #	YSI Pro #1 / HACH #7

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	8/24	4.00	143.5	160 to 180	N	3.96	Y
7	8/24	7.01	-14.0	+/-50	Y	7.02	Y
10	8/24	10.02	-160.6	-160 to -180	Y	9.98	Y
Temperature Calibration Check		DO Calibration					
Cert. Thermometer Value (deg C)	Meter Value (deg C)	Actual Barometric Pressure	Barometric Pressure (mm Hg)	D.O. Value (% Saturated)	Unit reading (%)	% DO accepted?	
24.1	23.3		771.0	95.6	99.6	Y	
Specific Conductivity Calibration				ORP Calibration			
Sp. Conductivity Calibration Standard buffer solution	Buffer solution exp. date	Pre Cal Reading (umhos)	Post Cal Reading (umhos)	ORP Calibration (mV)	Buffer solution exp. date	Pre Cal Reading (mV)	Post Cal Reading (mV)
1413	10/22	1442	1416	220	2/23	215.1	220.0
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						



EQUIPMENT CALIBRATION LOG

Civil & Environmental Consultants, Inc. 117 Seaboard Lane Suite E100 Franklin, Tennessee 37067 - 800-763-2326 - www.ceclinc.com

EQUIPMENT CALIBRATION FORM

NAME OF REPRESENTATIVE	A. Black
LOCATION	6 US
DATE AND TIME	8/10/22 1125
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	5/24	4.00	152.1	160 to 180	N	4.02	Y
7	5/24	7.01	-17.9	+/-50	Y	7.04	Y
10	5/24	10.01	-184.1	-160 to -180	N	9.97	Y

Temperature Calibration Check		DO Calibration				
Cert. Thermometer Value (deg C)	Meter Value (deg C)	Actual Barometric Pressure	Barometric Pressure (mm Hg)	D.O. Value (% Saturated)	Unit reading (%)	% DO accepted?
24.2	23.4		745.3	98.1	98.2	Y

Specific Conductivity Calibration				ORP Calibration			
Sp. Conductivity Calibration Standard buffer solution	Buffer solution exp. date	Pre Cal Reading (umhos)	Post Cal Reading (umhos)	ORP Calibration (mV)	Buffer solution exp. date	Pre Cal Reading (mV)	Post Cal Reading (mV)
1413	10/22	1415	1413	220	2/23	224.2	222.0

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				