

**THIRD QUARTER 2017 GROUNDWATER  
ASSESSMENT MONITORING REPORT  
SEPTEMBER 2017**

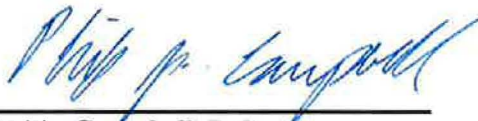
***Former Environmental Waste Solutions Camden Class II Landfill  
TDSWM Permit Number IDL 03-0212 (Terminated)  
200 Omar Circle  
Camden, TN 38320***

***Prepared for:***


**The Tennessee Department of Environment and Conservation  
Former Environmental Waste Solutions Camden Class II Landfill**

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## EXECUTIVE SUMMARY

This report documents the third quarter 2017 assessment monitoring event which was performed at the former Environmental Waste Solutions, LLC (EWS) Class II Landfill on September 27 & 28, 2017.

The former EWS Camden Class II landfill was registered with the Tennessee Division of Solid Waste Management (DSWM) with permit number IDL 03-0212. That permit was terminated in July 2017. 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). 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 as a result of chloride concentrations reported above the 250 mg/L EPA secondary drinking water standard 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, and completion of a private water use survey. Also, the semi-annual detection monitoring frequency was increased from semi-annual to quarterly assessment monitoring.

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 across the site. Additional quarterly sampling activities have been added to the sampling and analytical program across the site which included the addition of stream and sediment sampling in nearby Charlie Creek and Cane Creek. Also, the annual stormwater sample collected for Sector L National Pollutant Discharge Elimination System (NPDES) compliance will include the analysis of total cadmium.

On September 26, 2017, during the third quarter 2017 assessment monitoring event, surface water and sediment samples were collected from the stream by Civil & Environmental Consultants, Inc. (CEC). ESC Lab Sciences (ESC) was the chemical laboratory sub-contracted to perform the groundwater chemical analyses. The stream sampling activities were completed in general accordance with the United States Environmental Protection Agency (USEPA) Science and Ecosystem Support Division (SESD) sampling procedure -SESDPROC-201-R4 titled "Surface Water Sampling". The sediment sampling activities were completed in general accordance with the USEPA SESD sampling procedure -SESDPROC-200-R3 titled "Sediment Sampling". Surface water and sediment samples were collected from the stream beginning at the furthest downstream sampling location, moving back upstream, ending with the furthest designated upstream sampling

location. The surface water samples were collected prior to the collection of a sediment sample at approximately the same location in the stream. The surface water sample was collected directly into the sample container. The CEC sampler faced upstream, collected the sample without disturbing the bottom sediments, and added the laboratory-supplied preservative directly after sample collection. Surface water and sediment samples were collected from the stream at the following locations: Charlie Creek Upstream (US), Charlie Creek Midstream (MS), Cane Creek US, Cane Creek MS, and Cane Creek Downstream (DS-1). The stream samples (surface water and sediment) were collected by CEC on September 26, 2017 and ESC performed the chemical analyses. All surface water samples from the stream were analyzed for the Appendix I metals plus aluminum, calcium, iron, magnesium, manganese, potassium, sodium, bromide, chloride, fluoride, and total hardness. In addition, each surface water sample from the stream was analyzed for dissolved metals concentrations by placing the water directly into an unpreserved HDPE sample container, which was filtered by the laboratory before analysis. All sediment samples collected from the stream were analyzed for the same list of parameters with the exception of total hardness. The laboratory results for all sample locations are listed in Appendix A: Table 2a & Table 2b. The stream sample locations are shown on Figure 3- Groundwater and Stream Sample Locations located in Appendix A.

Groundwater samples were collected by CEC on September 28, 2017 and ESC performed the groundwater chemical analyses. All permanent groundwater monitoring wells (MWs) and temporary monitoring wells (TMWs) were sampled during the September 28, 2017 event with the exception of MW-2 (MW-2 routinely yields insufficient volumes of water for sampling purposes), which was replaced by MW-4 in April 2013. However, MW-2 remains in place and will continue to be monitored and tested for field parameters (i.e., pH, conductivity, temperature, turbidity, and dissolved oxygen) and water level data. Groundwater samples collected for this sampling event from MW-1, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 were analyzed for the Appendix I list of parameters plus aluminum, calcium, iron, magnesium, manganese, potassium, sodium, alkalinity, bromide, chloride, nitrate, sulfate, ammonia, chemical oxygen demand (COD), and boron. Also, each sample location was analyzed for dissolved metals concentrations by both field filtering and laboratory filtering methods. A field filtered metals sample was collected for dissolved metals analysis by field filtering the groundwater using a new disposable 0.45 micron filter and placing the filtered groundwater into a High Density Polyethylene (HDPE) container preserved with nitric acid (HNO<sub>3</sub>). The laboratory filtered metals sample was collected for dissolved metals analysis by placing the groundwater directly into an unpreserved HDPE sample container, which was shipped to the laboratory and filtered prior to analysis.

Since additional waste streams had been approved for disposal in the EWS Class II Landfill after the original Groundwater Monitoring Plan had been approved in 2008, the TDSWM requested that EWS add the volatile organic compounds (VOCs) included in the Appendix I *Constituents for Groundwater Monitoring* presented in Rule 0400-11-01-.04 (9.) d of the Rules and Regulations Governing Solid Waste Disposal in Tennessee to the existing list of groundwater monitoring

constituents. Therefore, EWS began monitoring VOCs at all monitoring well locations starting December 2013.

Samples were also collected by CEC on September 28, 2017 from the “Aluminum Processing Waste Cell (APWC)” and “Industrial Waste Cell (IWC)” leachate sample locations. The “APWC” leachate sample was collected from the leachate collection system associated with the aluminum processing waste cell, and was collected directly from the associated leachate collection hose, before the leachate entered the APWC leachate collection tanks. The “IWC” leachate sample was collected from the leachate collection system associated with the industrial waste cell, and was collected directly from the associated leachate collection hose within the secondary containment area and before the leachate entered the APWC leachate collection tank. The approximate APWC and IWC leachate sample locations are shown on Figure 2- Potentiometric Surface Map, located in Appendix A.

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 Standard (2DWS). Stream (surface water) samples were reviewed and compared to the upstream sampling results and the General Quality Criteria established in TDEC Rule Chapter 0400-40.03. 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. Statistical analysis methods were not used to identify any SSIs for the stream (surface water) samples, since previous samples have not been collected at these locations prior to this monitoring event and sample size is very limited at this time. The results of the analyses are summarized as follows:

Total cadmium was detected above the MCL (0.005 mg/L) at MW-3 during the September 28, 2017 event (total cadmium at MW-3 = 0.00926 mg/l). Total cadmium was first detected above the MCL at MW-3 during the June 8, 2017 event (total cadmium at MW-3 = 0.0286 mg/l). Another follow-up sampling event was carried out at MW-3 on August 8, 2017 in order to re-sample MW-3 to validate the previously reported cadmium concentrations. The August 8, 2017 re-sample result for total cadmium in MW-3 was 0.0113 mg/l. During this resampling event, MW-3 was allowed to recharge overnight which yielded a low turbidity sample. While the turbidity results were closer to the target recommended goal for turbidity of 10 Nephelometric Turbidity Units (NTUs) it was still slightly above the recommended goal when sampled (16.6 NTUs). The sampling results from this event indicated that the dissolved cadmium component in the field filtered and laboratory filtered samples collected at MW-3 were detected at a level above the MCL and similar to the total cadmium detection, which would indicate that the cadmium levels seen in previous events were not caused by excessive turbidity in MW-3. Currently, the role of turbidity on the total cadmium results is unclear and additional sampling data may lead to a better understanding of the effect turbidity has on the reported cadmium concentrations. The total cadmium results from the August 8, 2017 event at MW-3 were 60% lower than the concentration

that was detected during the sampling event on June 8, 2017. The statistical trend analysis for total cadmium at MW-3 does confirm an increasing trend having statistical significance. In contrast, statistical group comparisons, comparing background data to MW-3 data, do not draw any firm conclusions as to whether the increase in total cadmium at MW-3 is indicative of a statistically significant increase in concentrations, perhaps due to the limited number of cadmium detections above the laboratory detection limit of 0.001 mg/l (i.e., limited sample size and associated low Power of the Wilcoxon test for a given effect). Therefore, the results of the current statistical group comparison analyses come from a limited data set since cadmium was first detected in MW-3 during the fourth quarter 2016 sampling event completed on November 10, 2016 (total cadmium at MW-3=0.00177), which was below the MCL but slightly above the laboratory Practical Quantification Limit (PQL). Similarly, the statistical trend analysis for total zinc at MW-3 during this event (total zinc at MW-3= 0.0439 mg/l) confirmed an increasing trend having statistical significance, but was not indicative of a SSI in concentrations due to the limited number of zinc detections. Zinc was first detected above the laboratory PQL at MW-3 during the previous June 2017 groundwater event (total zinc=0.0769 mg/l). Before June 2017, zinc had remained below the current laboratory PQL of 0.025 mg/l since July of 2010.

It is worth noting that although there have been elevated detections of total cadmium in MW-3, there have been no detections, as of this date, from groundwater samples extracted from temporary monitoring wells TMW-2 and TMW-3 that are immediately down-gradient of MW-3. Also, cadmium was not detected above the laboratory PQL in the stream and sediment samples collected from nearby Charlie Creek and Cane Creek. However, the confirmed detections for total cadmium in MW-3 above the MCL and the accompanying statistically significant trend analysis for total cadmium in MW-3 are of concern and warrant more detailed attention during future quarterly monitoring events.

During this quarterly event, there were also three SSIs over background data for barium (MW-3), chloride (MW-3, MW-4, and MW-5), and sulfate (MW-3). The barium, chloride, and sulfate detections observed in the site monitoring wells were all below their associated MCLs or 2DWS.

## Glossary of Terms

Appendix I	Refers to the required regulatory sample list of groundwater parameters
CEC	Civil & Environmental Consultants, Inc.
Class I Landfill	Municipal Solid Waste Landfill
Class II Landfill	Industrial Waste Landfill
Class IV Landfill	Construction/Demolition Waste Landfill
Class III/IV Landfill	Landscaping and Construction/Demolition Waste Landfill
DML	Construction Demolition Landfill
EPA	Environmental Protection Agency
ESC	ESC Lab Sciences
EWS	Environmental Waste Solutions
GW	Groundwater
HDPE	High Density Polyethylene
HI	Hydrogeologic Investigation
MCL	Maximum Contaminant Level
$\mu\text{S}\cdot\text{cm}^{-1}$	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)
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 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 TDEC is in the process of achieving certified final closure of the site by coordinating necessary closure activities. The final closure activities being implemented at the facility are intended to protect the environment and human health. Final closure activities currently underway include leachate treatment, leachate trucking and disposal, storm water management activities, and landfill cap design and construction. The former EWS Camden Class II landfill previously received secondary aluminum smelter waste for disposal including aluminum dross, salt cakes, and other industrial wastes.

## 2.0 AQUIFER CHARACTERISTICS

### 2.1 GEOLOGIC AND AQUIFER CHARACTERISTICS

The extensive reworking of the site as a result of the excavation of chert for local road and fill projects has significantly 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, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3. Due to insufficient groundwater 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 are a response to elevated chloride concentrations at MW-3, which was first detected in 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 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:

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

Top of casing elevation has been determined by a licensed land surveyor and is referenced to the current Tennessee State Plan 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 monitor wells 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 first aquifer occurring beneath the former EWS Class II Landfill occurs at approximately twenty-three (23) feet below ground surface at the up-gradient monitor well MW-1 to approximately twelve (12) feet below ground surface at monitor well MW-4. The groundwater potentiometric data interpreted from the 1999 and 2006 hydrogeological investigations conducted at the site for the uppermost aquifer indicate that the uppermost water bearing zone generally moves in a southern direction. Comparisons of water bearing zone elevations to static groundwater elevations for both investigations indicate an unconfined aquifer. The potentiometric gradient calculated from groundwater elevation data collected on September 27, 2017 is approximately 1.23 %.

The potentiometric gradient is calculated according to the following formula:

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

$$\frac{(393.12') - (369.65')}{1,910'} * 100 = 1.23\%$$

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 (permanent and temporary monitoring wells) using a Solinst® electronic water level indicator, model #122. A YSI Professional Plus® multi-parameter instrument was used to record pH, conductivity, temperature, dissolved oxygen, and 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**

Groundwater was purged using new Teflon™-lined tubing connected to a peristaltic pump. Sampling was performed using disposable Teflon™ bailers. The bailers were factory decontaminated and sealed so as to prevent environmental cross contamination of the bailers. New nylon twine was fixed to each bailer via a tied knot.

The total volume of groundwater residing in each monitor well was calculated as follows: (1) subtracting the depth to water from the total depth of each well and (2) the depth of water in feet was multiplied by 0.163 gallons per foot in a 2 inch (inside diameter) monitoring well. The initial amount of purged groundwater was collected in a clean, HDPE flow-through cell that contains probes which measure temperature, pH, conductivity, dissolved oxygen, and oxidation-reduction potential (ORP). The turbidity was measured by collecting a small volume of water and using the Hach® model 2100Q turbidimeter. These values were noted in the site-specific field forms.

Groundwater was purged from the monitoring well until one calculated well volume of water passed into the flow-through cell. Once this volume of water was purged, the field chemistry parameters were again measured and recorded in the field forms as  $V_1$  (or recorded as gallons). This procedure for purging groundwater continued for an additional well volume,  $V_2$ , if sufficient groundwater was available. After the second purged well volume was observed for field parameter values, the values were checked against values for  $V_1$ . If the pH and conductivity values for each volume purged varied no more than 10% from  $V_1$  to  $V_2$  and the temperature stabilized to within one degree Celsius, preparations were made to collect the groundwater sample for submittal to the analytical laboratory. With respect to ground water chemistry, an adequate purge is achieved when the pH and conductivity have stabilized and the turbidity has either stabilized or is below 10 NTUs. If the field parameters were not stable, the purging procedures continued until either 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); or
3. A minimum of three well volumes were purged.

After adequate purge conditions were met, recharging groundwater was collected for analysis as soon as possible after purging and at least within twenty-four hours. The pH, conductivity, temperature, and turbidity were measured and recorded as the measurements of record for the sampling event during collection of the sample from the volume recovered.

Field parameter values for each well are presented in Table 1 – Groundwater Field Data in Appendix A. A detailed account of each purge and sample procedure conducted at each monitor well is presented in Appendix D – Standard Operating Procedures.

### **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 laboratory supplied sample vessels in the following order: Appendix I organics – three (3) forty (40) mL amber glass containers preserved with hydrochloric acid (HCl); total metals (Appendix I metals, Al, Ca, Fe, K, Mg, Mn, Na, and Boron) – one (1) five-hundred (500) ml HDPE container preserved with nitric acid (HNO<sub>3</sub>); alkalinity, 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<sub>2</sub>SO<sub>4</sub>). In addition to total metals analysis, a dissolved metals sample were collected for analysis (dissolved Appendix I metals, Al, Ca, Fe, K, Mg, Na, and Boron) at each location. Each dissolved metals sample was collected by field filtering the groundwater using a new disposable 0.45 micron filter and placing the filtered groundwater into one (1) five-hundred (500) ml HDPE container preserved with HNO<sub>3</sub>. The laboratory filtered dissolved metals sample was collected by placing the water directly into one (1) five-hundred (500) ml unpreserved HDPE container, which was filtered by the laboratory before analysis. As soon as samples were collected in their respective containers, samples were preserved accordingly and placed on ice in a sample cooler.

### **3.4 STREAM AND SEDIMENT SAMPLE COLLECTION AND PRESERVATION**

The stream sampling activities were completed in general accordance with the USEPA sampling procedure - SESDPROC-201-R4 titled “Surface Water Sampling”. The sediment sampling activities were completed in general accordance with the USEPA SESD sampling procedure -

SESDPROC-200-R3 titled “Sediment Sampling”. Stream (surface water and sediment) sample locations included the following:

- Charlie Creek US: Charlie creek upstream north side of SR-191 within Right-of-Way (ROW);
- Cane Creek US: Cane creek upstream side of S Forrest Ave. within ROW;
- Charlie Creek MS: South of landfill footprint, before confluence;
- Cane Creek MS: South of landfill footprint, after confluence, and
- Cane Creek DS-1: Stream location at landfill property boundary, before Camden WWTP.

Stream and sediment samples were taken beginning at the furthest downstream sampling location, moving back upstream, ending with the furthest designated upstream sampling location.

### 3.4.1 Stream Sampling

The surface water sample was collected prior to the collection of the sediment sample at approximately the same location in the stream. CEC sampling personnel faced upstream and collected the sample without disturbing the bottom sediments. The surface water samples were collected in laboratory supplied sample vessels for the analysis of: total metals (Appendix I metals, Al, Ca, Fe, K, Mg, Mn, Na, and Boron) – one (1) five-hundred (500) ml HDPE container preserved with nitric acid (HNO<sub>3</sub>); total hardness, bromide, chloride, and fluoride – one (1) two-hundred fifty (250) ml unpreserved HDPE container; dissolved metals (Appendix I metals, Al, Ca, Fe, K, Mg, Mn, Na, and Boron) - one (1) five-hundred (500) ml unpreserved HDPE container, which was submitted to the laboratory for filtering prior to analysis for dissolved metals.

### 3.4.2 Sediment Sampling

The sampling method was accomplished by wading into the surface water body and, while facing upstream (into the current), removing the upper surface layer of sediment using a stainless steel scoop or spoon along the bottom of the surface water body in the upstream direction.

Excess water was carefully drained from the scoop or spoon so as to minimize the loss of fine-grained particles associated with the sampled substrate. Aliquots of the sample thus collected were placed in a glass pan and homogenized according to the quartering method described in the USEPA SESD sampling procedures.

After the sediment aliquots were homogenized, the samples were placed into appropriate, lab-supplied sample containers using the alternative shoveling method and the caps were tightly secured. The alternate shoveling method is accomplished by placing separate scoops of the homogenized sediments in each container in sequence and repeating until all containers are full or the sample has been exhausted. The threads on each container and lid were cleaned to ensure a tight seal when closed. The sediment samples were collected in their respective sample containers

for the analysis of: total metals (Appendix I metals, Al, Ca, Fe, K, Mg, Mn, Na, and Boron), bromide, chloride, and fluoride.

Any equipment used to collect field samples was cleaned and decontaminated in accordance with SESD - Field Equipment Cleaning and Decontamination procedures.

### **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 monitoring event performed at the former EWS Class II Landfill. CEC collected a field blank next to monitoring well MW-3 and a duplicate sample was collected from MW-5 during this sampling event. 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. Also, 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 ESC for VOC analysis. No VOCs were detected above the laboratory PQL in the trip blank sample.

ESC reported the groundwater laboratory analytical results to CEC on October 13, 2017. Laboratory analytical testing of the field blank presented in the analytical report revealed that none of the tested constituents were above the PQL. The results for the duplicate sample collected from MW-5 were similar to the original MW-5 sample results.

#### **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 and Field Information Logs.

### 3.6 SAMPLE CHAIN-OF-CUSTODY

A sample Chain-of-Custody (COC) traveled along with the sample kit from ESC to the former EWS Class II Landfill site and back to ESC for the September 2017 sampling event. The CEC SOP 07-01-01 for maintaining sample Chain of Custody may be found in Appendix D – CEC Standard Operating Procedures.

## 4.0 LABORATORY ANALYTICAL PROCEDURES

### 4.1 ANALYTICAL METHODS

All laboratory analyses for the third quarter September 2017 groundwater assessment monitoring event were completed by ESC Lab Sciences in Mt. Juliet, Tennessee. The analytical methods chosen for these monitoring events were in full compliance with the procedures required by the DSWM and the USEPA's publication SW-846, entitled Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (3rd Edition).

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

Method 6010b	Inductively Coupled Plasma (ICP) – Atomic Emission Spectrometry (boron only)
Method 6020	ICP – Mass Spectrometry (metals & dissolved 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 350.1	Ammonia Nitrogen
Method 410.4	Chemical Oxygen Demand (COD)

The SW-846 methods used for the analysis of **stream samples** were as follows:

Method 6010b	Inductively Coupled Plasma (ICP) – Atomic Emission Spectrometry (boron only)
Method 6020	ICP – Mass Spectrometry (metals & dissolved metals)
Method 130.1	Total Hardness
Method 7470A	Mercury in Liquid Waste – Manual Cold Vapor Technique
Method 9056A	Determination of Inorganic Anions by Ion Chromatography (Bromide, Chloride, Fluoride)

The SW-846 methods used for the analysis of **sediment samples** were as follows:

Method 6010b	Inductively Coupled Plasma (ICP) – Atomic Emission Spectrometry
Method 7470A	Mercury in Liquid Waste – Manual Cold Vapor Technique

## **4.2    LABORATORY ANALYTICAL RESULTS**

Third quarter groundwater samples were collected by CEC on September 28, 2017. ESC performed the groundwater analysis and reported the results on October 13, 2017. Third quarter leachate samples were also collected by CEC on September 28, 2017 from the “Aluminum Processing Waste Cell (APWC)” and “Industrial Waste Cell (IWC)” leachate sample locations. ESC performed the leachate analysis and reported the results on October 12, 2017. Third quarter storm water and sediment samples were collected from the stream by CEC on September 26, 2017, and ESC reported the results on October 6, 2017.

Constituent values from all inorganic laboratory analyses for groundwater and leachate samples, along with applicable MCLs or 2DWSs, are presented in Table 2a – Groundwater and Leachate Analytical Results in Appendix A. Constituent values from all inorganic laboratory analyses for stream and sediment samples are presented in Table 2b – Stream and Sediment Analytical Results in Appendix A. Copies of the laboratory reports are located in Appendix C – Laboratory Analytical Reports.

## **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. ESC complies with this directive and reports all qualifiers along with explanations of QC qualifier codes. Three QC qualifier codes (B, J3, and P1) were indicated during the laboratory analysis of groundwater samples collected on September 28, 2017. Two QC qualifier codes (B and J) were indicated during the laboratory analysis of leachate samples during the third quarter monitoring event. Three QC qualifier codes (J6, P1, and O1) were indicated during the laboratory analysis of stream and sediment samples collected on September 26, 2017. Specific information concerning each laboratory QC qualifier code are described in the Laboratory Analytical Reports 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 1200-1-7-.04 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 sampling data was performed on monitoring wells MW-1, MW-3, MW-4, and MW-5. The temporary wells TMW-1, TMW-2, and TMW-3 were installed in response to the elevated chloride concentrations in MW-3 for the purpose of delineating groundwater hydrology/hydraulics during assessment monitoring and for collecting groundwater samples for water-quality analyses. Due to limited water-quality data acquired at this time, statistical analyses using data from these wells has not been performed.

First, the distribution of the data was evaluated for normality. The test for normality was 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 detection limit. Data determined to be normally distributed are to be evaluated using parametric prediction interval analysis. Data that were not normally distributed are to be evaluated using non-parametric statistical methods. Inter-well and intra-well parametric and non-parametric prediction limit analyses (NPPL) was deemed appropriate for this data set. Inter-well analyses compared the concentrations observed at the down-gradient monitoring locations (MW-3, MW-4, and MW-5) to the concentrations observed at the up-gradient monitoring location (MW-1) during this monitoring event. 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.

MW-5 was installed on April 26, 2016 and the initial background sampling event ( $n=1$ ) occurred on April 28, 2016. After the initial sampling event, MW-5 was sampled on May 9, 2016 ( $n=2$ ), November 10, 2016 ( $n=3$ ), and on June 8, 2017 ( $n=4$ ). At least four separate sampling events are needed at each sampling location in order to establish adequate background data for statistical analyses. Since four separate sampling events have now been completed at MW-5, the data were incorporated into the inter-well statistical analyses for the site during this reporting event.

On August 8, 2017, MW-3 and MW-4 were re-sampled and analyzed for total cadmium. Since the total cadmium detected at MW-3 during the initial June 2017 event was confirmed through re-sample in August 2017, the reported total cadmium concentrations at MW-3 on June 8, 2017 (0.0286 mg/l) and August 8, 2017 (0.0113 mg/l) are both included in this data set for statistical analyses purposes.

The percentage of inter-well background non-detects for each parameter determines the primary statistical method utilized for each parameter. If the percentage of non-detects in the background

samples is less than 50%, Shewart-CUSUM control charts are utilized. If more than 50% background non-detects exist for the given parameter, non-parametric inter-well prediction limit analyses was conducted on the data. For this site, based on the high amount of left-censored data (>50% of non-detects), non-parametric inter-well prediction limit analyses was conducted for the data from downgradient monitoring wells (MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3). Intra-well prediction limit analyses was conducted for the data from the upgradient monitoring well (MW-1). Additional statistical procedures performed included Mann-Kendall trend analysis and the non-parametric Wilcoxon Rank Sum group comparisons (with non-detects set to the highest reporting limit for the given constituent being analyzed).

The computer program ChemStat was used for all statistical computations. Worksheets for inter-well and intra-well statistical analysis and time versus concentration charts may be viewed in Appendix B – Statistical Evaluations and Time Series Plots.

## 5.2 STATISTICAL RESULTS

Total cadmium was detected above the MCL at MW-3, during the September 28, 2017 event (total cadmium at MW-3 = 0.00926 mg/l). Cadmium was first detected above the laboratory PQL in MW-3 during the 4th quarter 2016 sampling event completed on November 10, 2016 (total cadmium at MW-3=0.00177), which was below the MCL. Cadmium first detected above the MCL at MW-3 during the June 2017 sampling event (0.0286 mg/l). Another follow-up sampling event was carried out at MW-3 on August 8, 2017 in order to re-sample MW-3 to supplement the overall number of groundwater data values and to validate the previously observed results. The August 8, 2017 result for total cadmium in MW-3 was 0.0113 mg/l.

The chloride concentration reported at MW-3 was 112 mg/l during this sampling event, which was below the 2DWS for chloride concentrations (250 mg/l), and the result was less than the concentrations reported during the previous second quarter 2017 sampling event (163 mg/l). Also, the chloride concentration reported at MW-3 during this event was less than the reported chloride concentrations at MW-3 in March 2017 (164 mg/l) and August 2016 (218 mg/l). Since the second semi-annual monitoring event in November 2015 (458 mg/L), and the supplemental re-sampling event (360 mg/L) in December 2015, chloride concentrations at MW-3 have remained below the 250 mg/l 2DWS for chloride concentrations.

The chloride concentration observed at MW-4 (7.88 mg/l) and MW-5 (38.4 mg/l) produced an SSI over background during this event. However, the chloride detection at MW-4 is consistent with previous data and is below the 2DWS for chloride concentrations (250 mg/L). When considering all MW-4 chloride data to date, the data do not show an upward or downward trend in chloride concentrations using the Mann-Kendall trend analysis at the 95% confidence level. The chloride concentration observed at MW-5 is below the 2DWS for chloride concentrations, and when considering all MW-5 data to date, did not indicate an upward or downward trend in chloride concentrations using the Mann-Kendall trend analyses at the 95% confidence level.

SSIs over background identified for the current monitoring event include total barium at MW-3, chloride at MW-3, MW-4, and MW-5, and sulfate at MW-3. The total barium concentration at MW-3 was 0.125 mg/l during this sampling event, which was less than the previous June 2017 sampling event (0.134 mg/l) and is less than the previous eight sample results collected at MW-3 since November 21, 2014. Total barium also remains below the MCL for the primary drinking water standard for barium (2 mg/L). No SSIs in reported concentrations were identified in up-gradient well MW-1 using intra-well non-parametric analysis.

The sulfate concentration observed at MW-3 during this sampling event was 46.2 mg/l, and was less than the concentrations reported during the previous second quarter 2017 sampling event (93.7 mg/l) completed in June 2017. For further comparisons, the detected sulfate concentrations at MW-3 in November 2016 was 34 mg/L, 95.7 mg/L in August 2016 and 105 mg/L in March 2017. Prior to August 2016, the reported sulfate concentrations at MW-3 ranged from <5 mg/l to 29.1 mg/l. The reported sulfate concentrations have remained below the 2DWS for sulfate (250 mg/l) for all sampling events to date.

The Mann-Kendall trend analyses at the 95% confidence level was utilized by incorporating current and past groundwater data. Trend analyses revealed a statistically significant upward trend in barium, total cadmium, chloride, sulfate, and zinc concentrations reported at MW-3. Although the total cadmium (0.00926 mg/l) and zinc (0.0439 mg/l) concentrations reported in MW-3 were not considered SSIs over background detections using the Wilcoxon Rank Sum Non-Parametric Inter-Well Analysis, the Mann-Kendall trend analysis indicated a statistically significant upward trend in total cadmium and total zinc concentrations reported at MW-3 during this monitoring event. The Mann-Kendall trend analysis has indicated a statistically significant upward trend in total cadmium concentrations at MW-3 during two previous monitoring events (November 2016 and June 2017); and indicated a statistically significant upward trend in total zinc concentrations at MW-3 since the previous June, 2017 monitoring event. Trend analyses revealed a statistically significant downward trend in total barium detections at MW-4 and no distinct statistically significant trend in chloride detections at MW-4 and MW-5.

MW-3 was allowed to recharge overnight which yielded a low turbidity sample that was closer to the recommended goal for turbidity for each sample of 10 NTUs; the measured turbidity at MW-3 was 18.9 NTU when the total metals sample was collected at MW-3. A higher NTU value generally correlates to a higher amount of sediment in the water being sampled. Since total metals concentrations can be directly correlated to the amount of sediment in each sample and the NTU value was above the recommended goal of 10 NTU, analytical procedures were carried out for dissolved metals concentrations (field filtered and laboratory filtered). After field filtering the groundwater sample at MW-3, the measured turbidity was 3.80 NTU. Another dissolved metals sample was collected for analysis, which was filtered by the laboratory before sample analysis. The field filtered dissolved cadmium concentration (0.0104 mg/l) and the laboratory filtered dissolved cadmium concentration (0.0102 mg/l) at MW-3 were similar to the total cadmium at

MW-3 and were above the MCL for total cadmium concentrations, which would indicate that the cadmium levels seen in previous events were not caused by excessive turbidity in MW-3. However, a correlation cannot be made between the NTU value of the groundwater samples and the total cadmium concentrations observed at the wells based on this one sample event (e.g., total cadmium was detected in MW-3 with a turbidity of 18.9 NTUs while TMW-2 and TMW-3 had higher sample turbidities but no detections of total cadmium). Currently the role of turbidity on the total cadmium results is unclear and additional sampling data will be evaluated to determine if a correlation exists between the NTU value and the total cadmium concentrations. Therefore, CEC recommends to continue collecting field filtered samples for dissolved metals analysis in addition to total metals analysis at each monitoring well location until more data is collected.

When analyzing a sample for total and dissolved metals, it is normally expected that the dissolved metal concentrations would be less than the total metals. However, the accuracy of the analytical results are generally dependent upon sample preparation and analytical methods/operations. A sample analyzed for total and dissolved metals may have slightly different concentrations due to normal variations in the analytical process. Slightly higher concentrations present in dissolved versus total analyses can occur even though all quality controls are acceptable. This variation in sample results is commonly controlled by calculating the relative percent difference (RPD). In general, a RPD value less than 20% is acceptable for quality control purposes. The RPD between total and dissolved results can be used to evaluate whether the reported concentrations given for total and dissolved cadmium are indistinguishable at MW-3. The calculated RPD between sample results reported for total and dissolved cadmium (field-filtered and laboratory filtered) were less than 20% which suggests that the cadmium identified in monitoring well MW-3 was predominantly in the dissolved phase rather than the particulate phase.

The RPD for total cadmium (Cd) versus dissolved Cd at MW-3 was calculated according to the following formula:

$$\frac{|\text{Total Cd conc. in mg/l (MW-3)} - \text{Dissolved Cd conc. in mg/l (MW-3)}|}{[\text{Total Cd conc. in mg/l (MW-3)} + \text{Dissolved Cd conc. in mg/l (MW-3)}]} * 100 = \% \text{RPD}$$

Total Cd concentration compared to dissolved Cd (**field-filtered**) concentration:

$$\frac{|0.00926 \text{ mg/l (total Cd at MW-3)} - 0.0104 \text{ mg/l (dissolved Cd at MW-3)}|}{[0.00926 \text{ mg/l (total Cd at MW-3)} + 0.0104 \text{ mg/l (dissolved Cd at MW-3)}]} * 100 = 11.60\%$$

Total Cd concentration compared to dissolved Cd (**lab-filtered**) concentration:

$$\frac{|0.00926 \text{ mg/l (total Cd at MW-3)} - 0.0102 \text{ mg/l (dissolved Cd at MW-3)}|}{[0.00926 \text{ mg/l (total Cd at MW-3)} + 0.0102 \text{ mg/l (dissolved Cd at MW-3)}]} * 100 = 9.66\%$$

The statistical trend analysis for total cadmium at MW-3 does confirm an increasing trend having statistical significance when considering all current and past data for cadmium at MW-3. In contrast, statistical group comparisons, comparing background data to MW-3 data, do not draw any firm conclusions as to whether the increase in total cadmium at MW-3 is statistically significant. However, the results of the current statistical group comparison analyses come from a limited data set with few values exceeding the reporting limit. As a result, obtaining more groundwater samples from MW-3 for total cadmium, as well as the other measured constituents, is highly recommended.

It is worth noting that although there have been elevated detections of total cadmium in MW-3, there have been no detections, as of this date, from groundwater samples extracted from temporary monitoring wells TMW-2 and TMW-3 that are immediately down-gradient of MW-3. Also, cadmium was not detected above the laboratory PQL in the surface water and sediment samples collected from nearby Charlie Creek and Cane Creek. However, the confirmed detections for total and dissolved cadmium above the MCL and the accompanying statistically significant trend analysis for total cadmium in MW-3 are of concern and warrant more detailed attention during future quarterly monitoring events.

The chloride, total cadmium, sulfate, and total zinc concentrations at MW-3, MW-4, and MW-5 will continue to be closely monitored and statistically analyzed during future monitoring events.

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

Representative groundwater samples were collected from permanent monitoring wells MW-1, MW-3, MW-4, and MW-5, and temporary monitoring wells TMW-1, TMW-2, and TMW-3. The groundwater samples were analyzed for the Appendix I organics, total metals (appendix I metals plus aluminum, calcium, iron, magnesium, manganese, potassium, sodium, and boron), alkalinity, bromide, chloride, nitrate, sulfate, ammonia, and COD. Each groundwater well location was also sampled for analysis of dissolved metals (field filtered and laboratory filtered).

Stream (surface water) and sediment locations were sampled for analysis at Charlie Creek US, Charlie Creek MS, Cane Creek US, Cane Creek MS, and Cane Creek DS-1. All stream (surface water) samples were analyzed for the Appendix I metals plus aluminum, calcium, iron, magnesium, manganese, potassium, sodium, bromide, chloride, fluoride, and total hardness. Also, each stream sample location was sampled for analysis of dissolved metals (laboratory filtered only). All sediment samples collected from the stream were analyzed for the same list of parameters with the exception of total hardness.

The results of the third quarter assessment monitoring event of 2017 for MW-3 are summarized as follows.

- Total cadmium was detected above the MCL at MW-3 during the September 28, 2017 event (total cadmium at MW-3 = 0.00926 mg/l), which was the third consecutive cadmium detection above the MCL at MW-3. Total cadmium was first detected above the MCL at MW-3 during the June 8, 2017 event (total cadmium at MW-3 = 0.0286 mg/l). Another follow-up sampling event was carried out at MW-3 on August 8, 2017 in order to re-sample MW-3 to validate the previously reported cadmium concentrations. The August 8, 2017 re-sample result for total cadmium in MW-3 was 0.0113 mg/l. The statistical trend analysis for total cadmium at MW-3 does confirm an increasing trend having statistical significance. In contrast, statistical group comparisons, comparing background data to MW-3 data, do not draw any firm conclusions as to whether the increase in total cadmium at MW-3 is indicative of a statistically significant increase in concentrations due to the limited number of cadmium detections above the laboratory detection limit of 0.001 mg/l. Therefore, the results of the current statistical group comparison analyses come from a limited data set since cadmium was first detected in MW-3 during the 4th quarter 2016 sampling event completed on November 10, 2016 (total cadmium at MW-3=0.00177), which was below the MCL.
- The source of the cadmium detections above the MCL in MW-3 has not been determined at this point. Based on current data, the impact location appears to be limited to the MW-3 location, since there have been no detections from groundwater samples extracted from temporary monitoring wells TMW-2 and TMW-3 that are immediately down-gradient of MW-3. Also, cadmium was not detected above the laboratory PQL in the stream and sediment samples collected from nearby Charlie Creek and Cane Creek. Additionally, the

reported cadmium concentration at MW-3 has decreased since the second quarter monitoring event. However, the detections of total cadmium and dissolved cadmium are at levels above the MCL and the accompanying statistically significant trend analysis for total cadmium in MW-3 are of concern and warrant continued detailed attention during future quarterly monitoring events.

- Similarly, the statistical trend analysis for total zinc data at MW-3 (total zinc during the current event at MW-3= 0.0439 mg/l) confirmed an increasing trend having statistical significance, but analysis did not produce a SSI in concentrations due to the limited number of zinc detections in the past. Zinc was first detected above the laboratory PQL at MW-3 during the previous June 2017 groundwater event (total zinc=0.0769 mg/l). Before June 2017, zinc had remained below the current laboratory detection limit of 0.025 mg/l since July of 2010.
- A SSI was identified for the reported chloride concentrations at MW-3, MW-4, and MW-5 during this event. Chloride concentrations at MW-3 exhibited a statistically significant increasing trend per the Mann-Kendall non-parametric trend procedure. The chloride concentration reported at MW-3 was 112 mg/l during this sampling event, which was below the 2DWS for chloride concentrations (250 mg/l), and was less than the concentrations reported during the previous second quarter 2017 sampling event (163 mg/l). Also, the chloride concentration reported at MW-3 during this event was less than the reported chloride concentrations at MW-3 in March 2017 (164 mg/l) and August 2016 (218 mg/l). Since the second semi-annual monitoring event in November 2015 (458 mg/L), the supplemental re-sampling event (360 mg/L) in December 2015, chloride concentrations at MW-3 have remained below the 250 mg/l 2DWS for chloride concentrations.

The chloride concentration observed at MW-4 (7.88 mg/l) and MW-5 (38.4 mg/l) produced an SSI over background during this event. However, the chloride detection at MW-4 is consistent with previous data, is below the 2DWS for chloride concentrations (250 mg/L), and when considering all MW-4 chloride data to date, did not show an upward or downward trend in chloride concentrations using the Mann-Kendall trend analysis at the 95% confidence level. The chloride concentration observed at MW-5 is below the 2DWS for chloride concentrations, and when considering all MW-5 data to date, did not indicate an upward or downward trend in chloride concentrations using the Mann-Kendall trend analyses at the 95% confidence level.

- Time series graphs prepared for MW-3 indicate a general increasing trend starting in 2014 for chloride, total calcium, total magnesium, total potassium, total sodium, and sulfate.
- The Mann-Kendall trend analysis at the 95% confidence level revealed a statistically significant upward trend in total barium, total cadmium, chloride, sulfate, and total zinc concentrations reported at MW-3 during this event.

- No VOCs were detected above their respective laboratory PQL during the monitoring event.
- No constituents were detected above their respective MCL at any of the stream (surface water) samples.
- There were no cadmium detections in the sediment samples.

## 6.1 EWS GROUNDWATER QUALITY RELATIVE TO THE EPA PRIMARY DRINKING WATER STANDARDS

Laboratory analytical results for the groundwater samples collected in September of 2017 from the former EWS Class II Landfill indicate that total arsenic in MW-1 and total cadmium in MW-3 were detected at concentrations that exceeded the EPA MCLs.

**Total cadmium** was detected in MW-3 at a concentration of 0.00926 mg/l. The MCL for total cadmium is 0.005 mg/l. Total cadmium had not been detected above the laboratory PQL (0.001) before November of 2016. Also, total cadmium was detected above the MCL on August 8, 2017 (0.0113 mg/l) and June 8, 2017 (0.0286 mg/l). The total cadmium concentrations reported in MW-3 did not trigger an SSI over background detections using the Wilcoxon Rank Sum Non-Parametric Inter-Well Analysis during this event, and the total cadmium concentrations at MW-3 have been decreasing since the June 8, 2017 monitoring event. However, the Mann-Kendall trend analysis produced a statistically significant upward trend in total cadmium concentrations reported at MW-3. Due to the identified total cadmium detections above the MCL at MW-3 in June 2017, August 2017, and September 2017, groundwater samples will continue to be collected from temporary monitoring wells down-gradient from MW-3. Also, surface water samples and sediment samples will continue to be collected at selected locations along Charlie Creek and Cane Creek and analyzed for total and dissolved metals.

**Total Arsenic** was detected in up-gradient MW-1 at a concentration of 0.0199 mg/l. The MCL for arsenic is 0.01 mg/l. Arsenic has historically been detected at concentrations exceeding the primary drinking water MCL prior to the disposal of waste in the landfill. Laboratory analytical testing of groundwater samples taken from MW-1 during background testing of the groundwater prior to waste placement in the landfill revealed concentrations of arsenic ranging from 0.024 mg/L to 0.072 mg/L. 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 the well.

## 6.2 EWS GROUNDWATER QUALITY RELATIVE TO THE NATIONAL SECONDARY DRINKING WATER STANDARDS

Laboratory analytical results for the groundwater samples collected in September of 2017 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 which

exceeded the National Secondary Drinking Water Standards (2DWS). Those parameters included iron and manganese in up-gradient well MW-1, aluminum in TMW-1, TMW-2, and TMW-3, and manganese in down-gradient wells MW-3, MW-5, TMW-1, and TMW-3.

**Total Aluminum** concentrations observed in TMW-1 (0.106 mg/l), TMW-2 (1.87 mg/l), and TMW-3 (0.124 mg/L) during the September 2017 sampling event were slightly above the 2DWS (0.2 mg/L). However, the aluminum concentrations observed at TMW-1 and TMW-3 remain less than the highest concentrations observed in up-gradient well MW-1 (1.2 mg/L) and down-gradient well MW-3 (1.8 mg/L) prior to accepting waste within the landfill. Also, the aluminum concentration observed at TMW-2 was likely effected by the elevated turbidity (NTU=71) at the time of sampling.

**Total Iron** was detected at a concentration of 26 mg/L in MW-1 and 1.6 mg/L in MW-3 prior to the placement of waste. Iron was detected in MW-1 (13.2 mg/L), MW-3 (0.226 mg/L), MW-4 (0.109 mg/l), and MW-5 (0.92 mg/L) during the June 2017 monitoring event. The reported concentrations were less than the highest concentrations observed prior to placement of waste, do not exhibit a trend via time-series graphs, and do not appear to be the result of landfill operations.

**Total Manganese** has been consistently detected in up-gradient well MW-1 and the highest reported concentration was observed during the May 2016 monitoring event (0.952 mg/L). Manganese detections were observed in up-gradient MW-1 (0.535 mg/L) and down-gradient site monitoring wells MW-3 (0.311 mg/L), MW-4 (.0223 mg/L), and MW-5 (0.0505 mg/L).

**Chloride** concentrations exhibit an increasing trend in MW-3 when considering all data accumulated since April 19, 2008. However, the concentrations have been decreasing with time since the November 2015 event. The chloride concentration reported at MW-3 during this sampling event was 163 mg/L, below the 2DWS for chloride concentrations (250 mg/L), and was less than the concentrations reported during the second semi-annual monitoring event in November 2015 (458 mg/L), the supplemental re-sampling event (360 mg/L) in December 2015, and the third quarter assessment monitoring event in August 2016 (218 mg/l). The chloride concentrations at MW-3 will continue to be closely monitored during future quarterly assessment monitoring events. The chloride concentration observed at MW-4 of 6.67 mg/L is consistent with previous data and is below the 2DWS for chloride concentrations (250 mg/L).

The fourth quarter assessment monitoring event is tentatively scheduled for December 2017 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, TMW-3, and surface water and sediment samples from selected locations along Charlie Creek and Cane Creek. Collected samples will be analyzed for chloride, appendix I metals (total and dissolved), sulfate and additional leachate indicator parameters (alkalinity, ammonia, COD, calcium, iron, magnesium, manganese, potassium, sodium, and nitrate).

## 7.0 RECOMMENDATIONS

The following recommendations are presented in an effort to effectively identify the source(s) of the elevated total cadmium in MW-3, as well as the sources for elevated total barium, chloride, sulfate, and zinc concentrations in the given wells as detailed in the previous section. In addition, these recommendations are given in an effort to insure the continuance of securing representative groundwater samples and to obtain analytical results with a high-degree of accuracy and precision (i.e., repeatability).

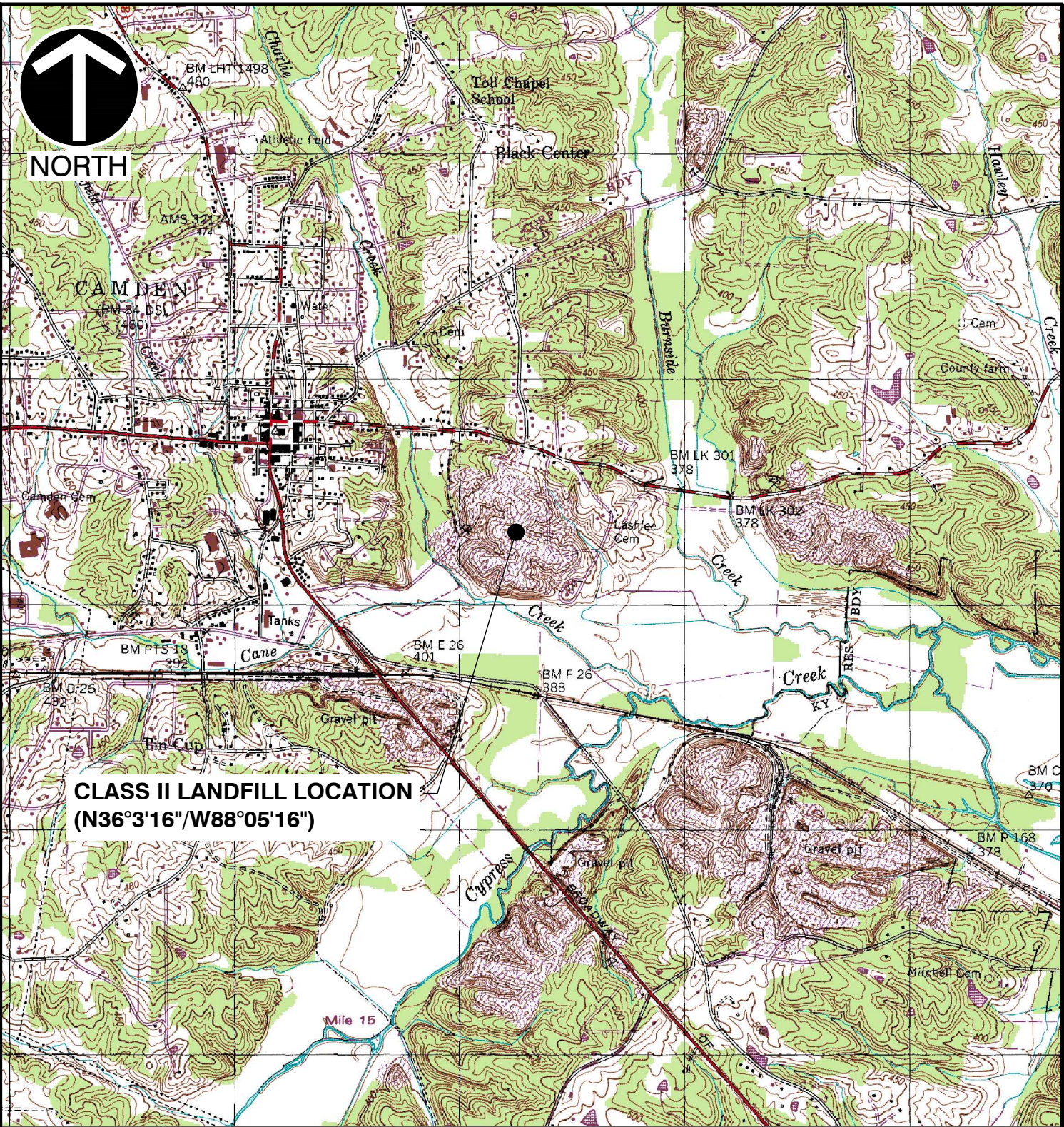
1. It is recommended that dedicated low-flow pumps of the same model type, sourced from a single manufacturer be installed within monitoring wells MW-1, MW-3, MW-4, MW-5, TMW-1, TMW-2, and TMW-3 in order to provide representative, consistent, low-turbidity samples for laboratory analysis. The target maximum reading for turbidity for each sample is 10 NTUs. CEC is aware that TDEC has ordered pumps and are expected to be installed before the next event.
2. It is recommended that all 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. Also, surface water samples and sediment samples will continue to be collected at selected locations along Charlie Creek and Cane Creek and analyzed for total and dissolved metals during future quarterly assessment monitoring activities.
3. It is recommended that the chosen analytical laboratory (ESC) continue to run methods for total and dissolved (field-filtered) metal constituents, using methods that will produce the lowest reporting limit. In addition to providing direct results for dissolved metals in the case where certain groundwater samples have turbidities that are above 10 NTUs, having a growing database of dissolved metal constituents is essential for accuracy if there is a future need for groundwater modeling.
4. A new annual area water-well survey should be performed before the end of 2017 in accordance with the TDSWM assessment monitoring requirements. CEC is scheduled to perform the annual area water-well survey in conjunction with the fourth quarter groundwater sampling event, which is tentatively scheduled for December 11, 2017.
5. It is recommended that annual sampling of storm water runoff occur in the same locations presented in the Stormwater Pollution Prevention Plan (SWPPP) and that cadmium be added to the analytical list.

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**APPENDIX A**  
**MAPS & TABLES**

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P:\2017\171-873\1-CADD\Dwg\Groundwater\171-873 SITE LOCATION MAP.dwg\LAYOUT1} LS:11/6/2017 - pcampbell) - LP: 11/6/2017 11:51 AM



**REFERENCE**

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



\* HAND SIGNATURE ON FILE



**Civil & Environmental Consultants, Inc.**

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 615-333-7797 · 800-763-2326  
 www.cecinc.com








**EWS SITE  
 CLASS II CAMDEN LANDFILL  
 CAMDEN, TENNESSEE**

**SITE LOCATION MAP**

DRAWN BY:	KLU	CHECKED BY:	PC	APPROVED BY:	KBW*	FIGURE NO.:	<b>1</b>
DATE:	November 2017	DWG SCALE:	1"=200'	PROJECT NO:	171-873		



**LEGEND**

-  **MW1** 392.60 GROUND WATER MONITORING WELL  
GROUND WATER ELEVATION (FMSL)
-  **TMW-1** 373.84 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.

$$i = \frac{393.12' (MW-1) - 369.65' (MW-4)}{1,910'} = 0.0123 \text{ ft/ft}$$

**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.



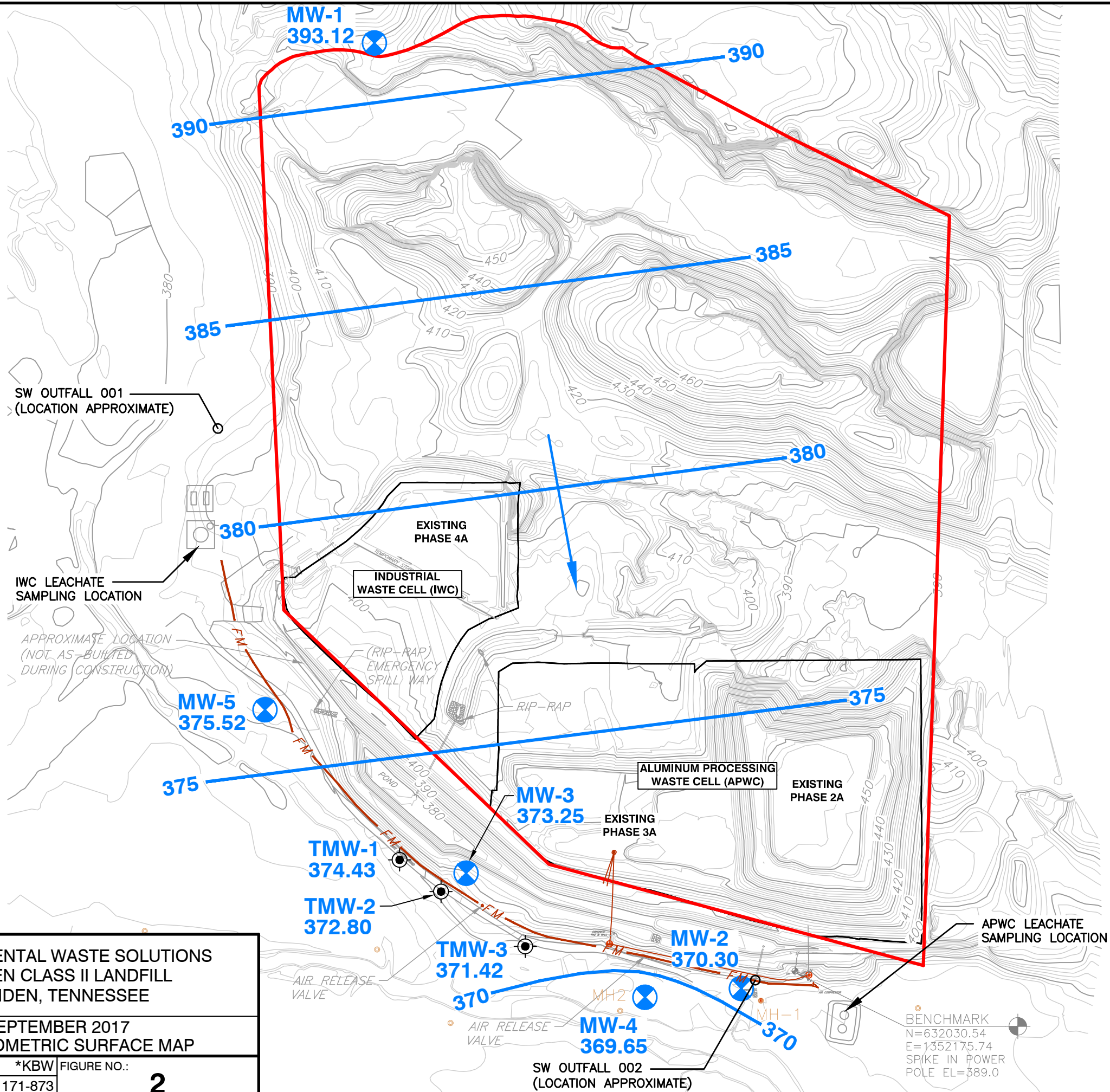
\*HAND SIGNATURE ON FILE

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ENVIRONMENTAL WASTE SOLUTIONS  
 CAMDEN CLASS II LANDFILL  
 CAMDEN, TENNESSEE

SEPTEMBER 2017  
 POTENTIOMETRIC SURFACE MAP

DRAWN BY: PC	CHECKED BY: MJ	APPROVED BY: *KBW	FIGURE NO.: 2
DATE: DECEMBER 2017	DWG SCALE: 1"=200'	PROJECT NO: 171-873	



P:\2017\171-873\CADD\DWG\GROUNDWATER\171-873 GROUNDWATER MAP SEPTEMBER 2017.DWG(FIG 2 (2))\LS:(KUNDERWOOD - 12/14/2017) - LP: 12/14/2017\_3:37:00\_PM





Charlie Creek US  
(36.05885, -88.09076)

MW-1  
(36.05647, -88.08798)

TMW-1  
(36.052161, -88.0877)

TMW-2  
(36.051998, -88.087427)

MW-3  
(36.05210, -88.08727)

MW-5  
(36.05294, -88.08860)

TMW-3  
(36.05172, -88.08687)

Charlie Creek MS  
(36.05227, -88.08802)

MW-4  
(36.05146, -88.08609)

Cane Creek US  
(36.05068, -88.09440)

MW-2  
(36.05152, -88.08546)

Cane Creek MS  
(36.05152, -88.08703)

Cane Creek DS-1  
(36.05048, -88.08376)

**LEGEND**

● Groundwater Wells    ▲ Stream Sample Locations

**REFERENCE**

ESRI WORLD IMAGERY / ARCGIS MAP SERVICE:  
HTTP://GOTO.ARCGISONLINE.COM/MAPS/WORLD\_IMAGERY,  
ACCESSED 12/13/2017, IMAGERY DATE: 2016.



**Civil & Environmental Consultants, Inc.**

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FORMER EWS SITE  
CLASS II CAMDEN LANDFILL  
CAMDEN, BENTON COUNTY, TN

GROUNDWATER AND  
STREAM SAMPLE LOCATIONS

DRAWN BY:

RLP

CHECKED BY:

PJC

APPROVED BY: JKH

\* Hand signature on file

FIGURE NO:

**3**

DATE:

12/13/2017

SCALE:

1" = 1,500'

PROJECT NO:

171-873

\\SVR-NASH\svr-nash\projects\2017\171-873-GIS\Maps\171-873\_Figure 3\_Map for Bi County GW Report.mxd (12/13/2017 3:51:37 PM)

**Table 1**  
**Former Environmental Waste Solutions Camden Class II Landfill**  
**Field Parameters and Potentiometric Data - September 27-28, 2017**

Monitoring Well/ Piezometric Well	Date	Sample Time	Top of Casing Elevation <sup>(1)</sup> (Feet MSL)	Bottom of Well Elevation (Feet)	Well Diameter (Feet)	Well Volume Gallons	Depth to Water <sup>(2)</sup> (Feet)	Potentiometric Surface (Feet MSL)	Temperature (°C)	Conductivity (micromhos/cm)	pH (SU)	Dissolved Oxygen (mg/l)	Oxidation Reduction Potential (Millivolts)	Turbidity (NTU)
MW-1	9/28/2017	8:45	416.47	385.97	0.17	1.2	23.35	393.12	17.0	111.2	5.39	2.24	-12.9	6.73
MW-2*	9/28/2017	13:35	380.35	367.70	0.17	0.4	10.05	370.30	22.6	252.2	5.94	2.21	-21.6	383
MW-3	9/28/2017	12:30	392.90	369.66	0.17	0.6	19.65	373.25	20.5	449.5	5.75	1.53	-6.4	18.9
MW-4	9/28/2017	12:00	381.47	358.37	0.17	1.9	11.82	369.65	18.8	61.6	5.85	3.84	-25.4	2.47
MW-5	9/28/2017	9:45	385.25	351.40	0.17	4.1	9.73	375.52	18.3	211.6	5.26	2.33	-5.4	8.87
TMW-1	9/28/2017	10:30	381.19	348.99	0.085	1.1	6.76	374.43	18.4	76.0	5.69	5.91	-11.5	18.9
TMW-2	9/28/2017	11:00	384.27	356.77	0.085	0.7	11.47	372.80	19.7	55.5	5.87	6.61	-20.8	71.0
TMW-3	9/28/2017	11:30	381.37	353.37	0.085	0.8	9.95	371.42	17.9	178.6	5.47	3.12	-17.0	41.5
Charlie Creek US	9/26/2017	14:15	NA	NA	NA	NA	NA	NA	23.6	134.2	6.44	7.45	0.2	2.81
Cane Creek US	9/26/2017	13:34	NA	NA	NA	NA	NA	NA	25.3	277.1	6.76	7.01	-5.8	4.90
Charlie Creek MS	9/26/2017	12:00	NA	NA	NA	NA	NA	NA	23.4	168.3	6.83	7.82	-9.4	2.80
Cane Creek MS	9/26/2017	11:29	NA	NA	NA	NA	NA	NA	23.2	247.9	6.81	4.18	-10.3	5.99
Cane Creek DS-1	9/26/2017	10:28	NA	NA	NA	NA	NA	NA	22.5	238.4	6.97	6.69	-15.5	4.60
Leachate (IWC-L)	9/28/2017	14:00	NA	NA	NA	NA	NA	NA	33.8	105,244	3.48	2.51	276.0	90.6
Leachate (Smelter Cell)	9/28/2017	14:45	NA	NA	NA	NA	NA	NA	55.6	480,895	8.89	0.08	-44.8	9.90

<sup>(1)</sup> Top of Casing Elevations from survey by Civil & Environmental Consultants, Inc. on May 12, 2016.

<sup>(2)</sup> Depth to water measurements collected by Civil & Environmental Consultants, Inc. on September 27, 2017.

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

NS= Not Sampled

NA= Not Applicable.

**Table 2a**  
**Former EWS Camden Class II Landfill IDL 03-0212 (Terminated)**  
**Inorganic Analytical Data -September 2017**

Parameter	MCL (mg/l)	MW-1	MW-3	MW-4	MW-5	TMW-1	TMW-2	TMW-3	Leachate IWC-L	Leachate-AWC-L
		9/28/2017	9/28/2017	9/28/2017	9/28/2017	9/28/2017	9/28/2017	9/28/2017	9/28/2017	9/28/2017
Alkalinity	-	35.6	34.9	20.6	21	<20	<20	<20	<20	9,180
Ammonia Nitrogen	-	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	2.01	684	9,930
COD	-	<200	<10	<10	<10	<10	<10	<10	3,690	2,600
Boron	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.434	9.36
Bromide	-	<1	<1	<1	<1	<1	<1	<1	<500	171
Chloride	250 <sup>2</sup>	4.11	112	7.88	48.7	10.4	5.45	48.5	<1	190,000
Fluoride	2 <sup>2</sup>	<0.1	0.226	<0.1	<0.1	<0.1	<0.1	<0.1	39.5	<0.1
Nitrate	10	<0.1	3.62	0.571	1.070	1.51	0.43	4.12	<50	1.18
Sulfate	250 <sup>2</sup>	<5	46.2	<5	<5	<5	<5	<5	<5	1,320
Aluminum	0.2 <sup>2</sup>	<0.1	<0.1	<0.1	<0.1	0.106	1.87	0.124	297.0	<9
Antimony	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.18
Arsenic	0.01	0.0199	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.202	0.0232
Barium	-	0.0175	0.125	0.00788	0.0239	0.0103	0.0282	0.0296	0.898	2.01
Barium (Dissolved-FF)	-	0.0178	0.105	0.00697	0.023	0.00712	0.0145	0.039	0.826	1.93
Barium (Dissolved-LF)	-	0.0154	0.116	0.00712	0.0214	0.00917	0.0147	0.0295	0.841	1.91
Beryllium	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.084	<0.18
Cadmium	0.005	<0.001	0.00926	<0.001	<0.001	<0.001	<0.001	<0.001	252	0.249
Cadmium (Dissolved-FF)	0.005	<0.001	0.0104	<0.001	<0.001	<0.001	<0.001	<0.001	257	0.229
Cadmium (Dissolved-LF)	0.005	<0.001	0.0102	<0.001	<0.001	<0.001	<0.001	<0.001	255	0.222
Calcium	-	3.18	30.9	4.33	13.2	8.03	5.4	14.9	4,240	298
Calcium (Dissolved-FF)	-	4.22	24.9	4.11	12.5	7.76	5.24	16.9	3,820	282
Calcium (Dissolved-LF)	-	2.96	30.6	4.19	12.7	7.9	5.03	15.1	3,950	288
Chromium	0.1	<0.002	<0.002	<0.002	<0.002	<0.002	0.00301	<0.002	0.0679	0.0623
Cobalt	-	0.0403	<0.002	<0.002	0.00223	<0.002	<0.002	<0.002	1.21	0.0646
Cobalt (Dissolved-FF)	-	0.046	<0.002	<0.002	0.00237	<0.002	<0.002	<0.002	1.42	0.0617
Cobalt (Dissolved-LF)	-	0.038	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	1.42	0.0624
Copper	1.3	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	44	10
Iron	0.3 <sup>2</sup>	13.4	<0.1	0.19	0.161	0.174	1.95	0.421	142	<9
Iron (Dissolved-FF)	0.3 <sup>2</sup>	14.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	160	<1
Iron (Dissolved-LF)	0.3 <sup>2</sup>	6.93	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	136	<1
Lead	0.015	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.386	<0.18
Magnesium	-	2.47	13.0	2.59	7.90	2.17	1.77	4.28	2,160	<90
Magnesium (Dissolved-FF)	-	3.10	10.9	2.54	8.10	2.08	1.71	5.86	2,460	<10
Magnesium (Dissolved-LF)	-	2.38	13.2	2.56	7.99	2.19	1.63	4.60	2,440	<10
Manganese	0.05 <sup>2</sup>	0.904	0.31	0.0203	0.0558	0.0537	0.0255	0.0315	394	0.387
Manganese (Dissolved-FF)	0.05 <sup>2</sup>	0.916	0.495	0.0164	0.0659	0.017	<0.005	0.015	404	0.035
Manganese (Dissolved-LF)	0.05 <sup>2</sup>	0.799	0.324	0.014	0.0526	0.0342	<0.005	0.0271	409	0.0395
Nickel	0.10 <sup>1</sup>	0.00445	<0.002	<0.002	0.00515	<0.002	<0.002	0.00289	1.13	0.764
Potassium	-	1.37	24.1	1.46	1.26	1.05	1.07	2.17	6,040	58,000
Potassium (Dissolved-FF)	-	1.27	22.3	1.12	1.29	<1	<1	1.93	5,770	55,300
Potassium (Dissolved-LF)	-	1.24	23.9	1.28	1.22	1.11	<1	2.11	5,840	55,200
Selenium	0.05	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.272	<0.18
Silver	0.10 <sup>2</sup>	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.02	<0.18
Sodium	-	3.84	43.3	3.69	14.0	3.21	2.65	7.31	9,630	82,200
Sodium (Dissolved-FF)	-	4.03	40.7	3.84	14.6	3.14	2.84	11.3	9,740	94,600
Sodium (Dissolved-LF)	-	3.84	45.4	3.86	14.5	3.36	2.78	8.31	9,960	91,100
Thallium	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.114	<0.18
Vanadium	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0157	0.0651
Zinc	5 <sup>2</sup>	<0.025	0.0439	<0.025	<0.025	<0.025	<0.025	<0.025	0.301	2,780
Zinc (Dissolved-FF)	5 <sup>2</sup>	<0.025	0.0334	<0.025	<0.025	<0.025	<0.025	0.046	3,080	48.6
Zinc (Dissolved-LF)	5 <sup>2</sup>	<0.025	0.0354	<0.025	<0.025	<0.025	<0.025	0.243	3,150	49.4
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.000991	<0.0002

Notes:

MCL: Maximum Contaminant Level Enforceable National Primary Drinking Water Standards

<sup>1</sup> - MCL value obtained from TN Division of Water Supply rule 1200-5-.06(1)(b)11

<sup>2</sup> - MCL value obtained from TN Division of Water Supply rule 1200-5-1-.12(1)(n). (EPA Secondary Drinking Water Standard)

**Bold** text indicates laboratory analytical detections above the practical quantitation level

**Dark gray shaded** text indicates detection above respective MCL

**Light gray shaded** text indicates detection above respective Non-Enforceable National Secondary Drinking Water Standard.

(Dissolved-FF): Dissolved metals samples were field filtered using a 0.45 micron filter before placing into sample containers preserved with HNO<sub>3</sub>.

(Dissolved-LF): Dissolved metals samples were filtered in the laboratory. Samples were placed into unreserved sample containers in the field.

**Table 2b**  
**Former EWS Camden Class II Landfill IDL 03-0212 (Terminated)**  
**Inorganic Analytical Data -September 2017**

Parameter	Stream Samples (Water)						Sediment Samples (Solids)					
	Charlie Creek US		Charlie Creek MS	Cane Creek US	Cane Creek MS	Cane Creek DS-1	Charlie Creek US	Charlie Creek MS	Cane Creek US	Cane Creek MS	Cane Creek DS-1	
	9/26/2017		9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	
Value (mg/l)		Value (mg/l)	Value (mg/l)	Value (mg/l)	Value (mg/l)	Value (mg/kg)	Value (mg/kg)	Value (mg/kg)	Value (mg/kg)	Value (mg/kg)		
Total Hardness	43.4		56.9	96.3	84.4	84.4	NS	NS	NS	NS	NS	
Total Hardness (Dissolved-LF)	37.4		50.5	87.9	77.9	78.3	NS	NS	NS	NS	NS	
Boron	<0.2		<0.2	<0.2	<0.2	<0.2	<10	<10	<10	<10	<10	
Bromide	<1	J6	<1	<1	<1	<1	<10	<10	<10	<10	<10	
Chloride	8.99	J6	12.8	12.0	13.2	15.4	51.8	52.6	48.2	45.2	<10	
Fluoride	<0.1	J6 P1	<0.1	0.210	0.173	0.172	1.85	2.10	2.15	2.50	<1	
Aluminum	<0.1		<0.1	<0.1	<0.1	<0.1	519	959	578	706	428	
Antimony	<0.002		<0.002	<0.002	<0.002	<0.002	<2	<2	<2	<2	<2	
Arsenic	<0.002		<0.002	<0.002	<0.002	<0.002	<2	<2	<2	<2	<2	
Barium	0.0278		0.0338	0.0342	0.0332	0.0398	5.74	13.10	4.98	9.83	4.02	
Barium (Dissolved-LF)	0.0262		0.0317	0.0325	0.0311	0.0368	NS	NS	NS	NS	NS	
Beryllium	<0.002		<0.002	<0.002	<0.002	<0.002	<0.2	<0.2	0.244	0.229	<0.2	
Cadmium	<0.001		<0.001	<0.001	<0.001	<0.001	<0.5	<0.5	<0.5	<0.5	<0.5	
Cadmium (Dissolved-LF)	<0.001		<0.001	<0.001	<0.001	<0.001	NS	NS	NS	NS	NS	
Calcium	12.3		16.2	24.4	22.7	22.5	<100	356	308	108	<100	
Calcium (Dissolved-LF)	12.5		16.6	24.2	22.1	22.6	NS	NS	NS	NS	NS	
Chromium	<0.002		<0.002	<0.002	<0.002	<0.002	3.27	2.58	2.9	9.53	2.11	
Cobalt	<0.002		<0.002	<0.002	<0.002	<0.002	<1	1.12	1.99	1.43	<1	
Cobalt (Dissolved-LF)	<0.002		<0.002	<0.002	<0.002	<0.002	NS	NS	NS	NS	NS	
Copper	<0.005		<0.005	<0.005	<0.005	<0.005	<2	<2	<2	<2	<2	
Iron	0.198		0.343	0.594	0.315	0.455	1650	3610	1930	2970	1430	
Iron (Dissolved-LF)	<0.1		<0.1	<0.1	<0.1	<0.1	NS	NS	NS	NS	NS	
Lead	<0.002		<0.002	<0.002	<0.002	<0.002	1.34	1.66	3.04	1.99	1.28	
Magnesium	2.39		3.07	6.55	5.50	5.55	<100	<100	<100	<100	<100	
Magnesium (Dissolved-LF)	2.31		3.00	6.41	5.19	5.49	NS	NS	NS	NS	NS	
Manganese	0.0418		0.248	0.188	0.123	0.205	48.7	138	112	132	26.2	
Manganese (Dissolved-LF)	<0.005		0.049	0.016	0.0402	0.0616	NS	NS	NS	NS	NS	
Nickel	<0.002		<0.002	<0.002	<0.002	<0.002	<2	<2	<2	<2	<2	
Potassium	1.73		2.03	2.92	2.81	3.1	<100	<100	<100	<100	<100	
Potassium (Dissolved-LF)	1.65		2.05	2.84	2.62	2.97	NS	NS	NS	NS	NS	
Selenium	<0.002		<0.002	<0.002	<0.002	<0.002	<2	<2	<2	<2	<2	
Silver	<0.002		<0.002	<0.002	<0.002	<0.002	<1	<1	<1	<1	<1	
Sodium	6.08		6.64	8.78	8.2	8.96	<100	<100	<100	<100	<100	
Sodium (Dissolved-LF)	6.00		6.72	8.65	7.88	8.87	NS	NS	NS	NS	NS	
Thallium	<0.002		<0.002	<0.002	<0.002	<0.002	<2	<2	<2	<2	<2	
Vanadium	<0.005		<0.005	<0.005	<0.005	<0.005	4.5	4.26	3.39	4.59	3.15	
Zinc	<0.025		<0.025	<0.025	<0.025	<0.025	6.23	6.45	9.36	9.77	5.22	
Zinc (Dissolved-LF)	<0.025		<0.025	<0.025	<0.025	<0.025	NS	NS	NS	NS	NS	
Mercury	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.02	<0.02	<0.02	<0.02	<0.02	

Notes:

**Bold** text indicates laboratory analytical detections above the laboratory practical quantitation level (PQL)

(Dissolved-LF): Dissolved metals samples were filtered in the laboratory. Samples were placed into unpreserved sample containers in the field.

Q: (ESC)- Additional QC Info:

O1-The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.

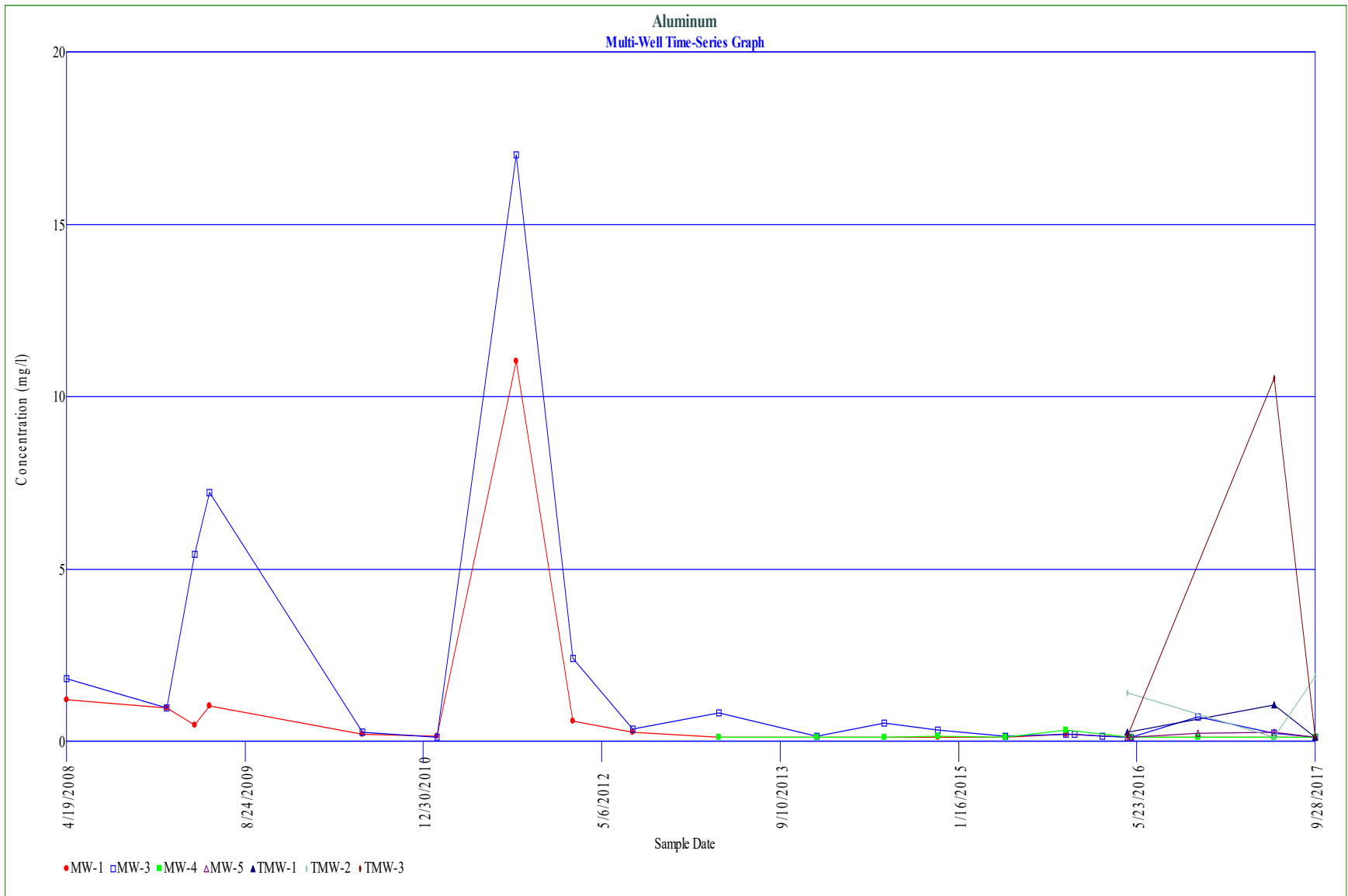
J6-The sample matrix interfered with the ability to make any accurate determination; spike value is low.

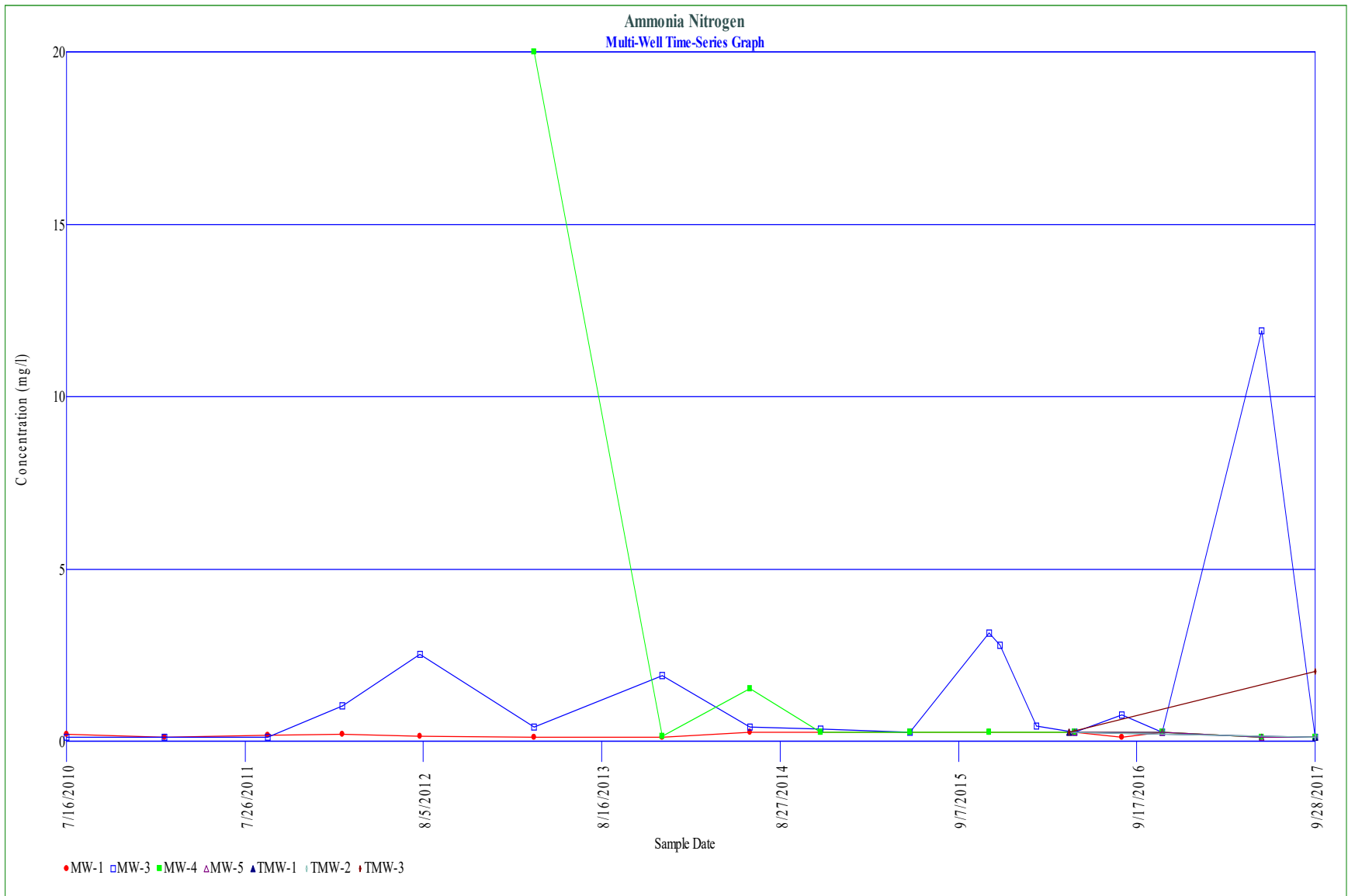
P1-RPD value not applicable for sample concentrations less than 5 times the reporting limit.

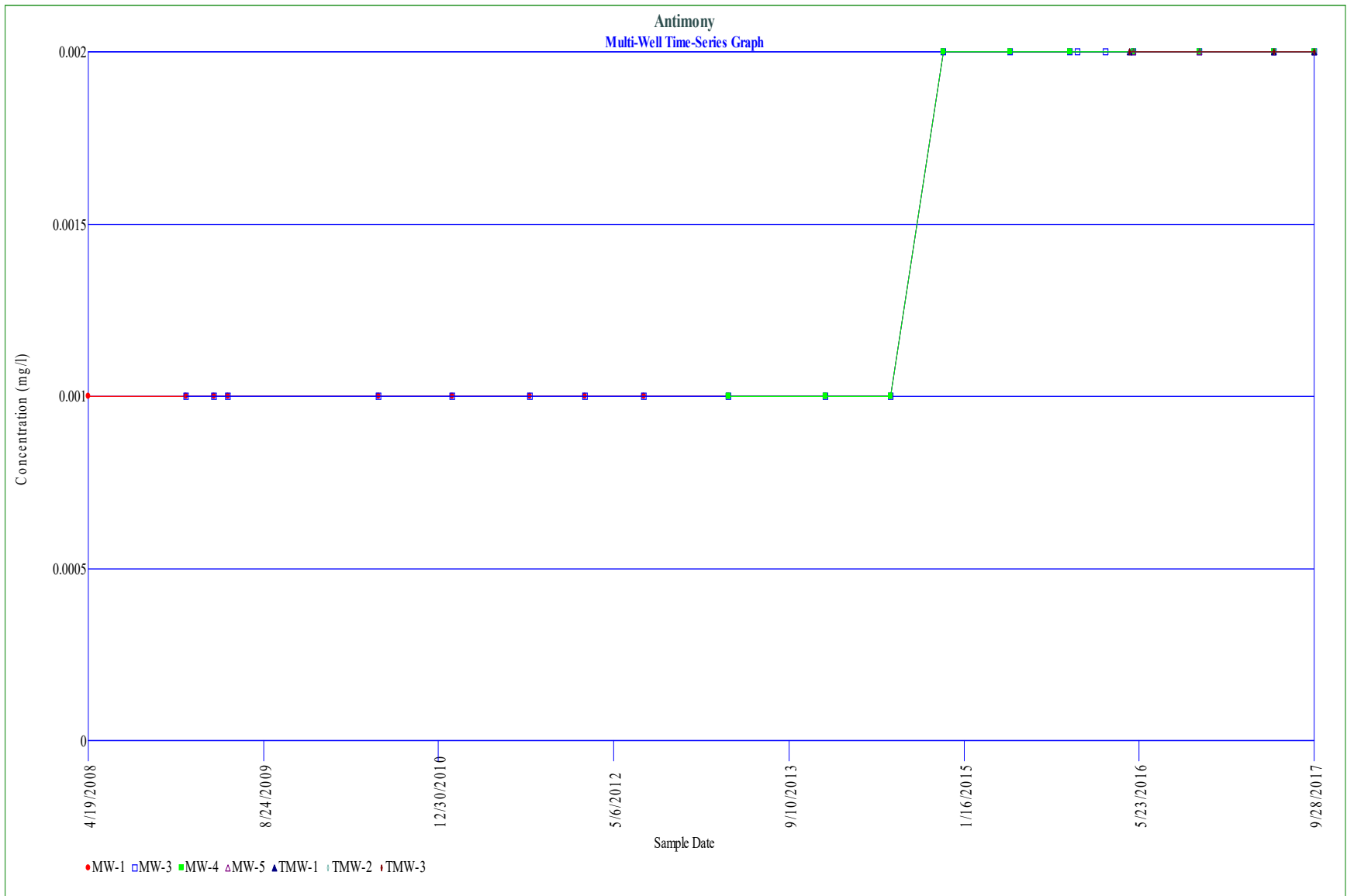
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**APPENDIX B**  
**STATISTICAL EVALUATIONS & TIME SERIES PLOTS**

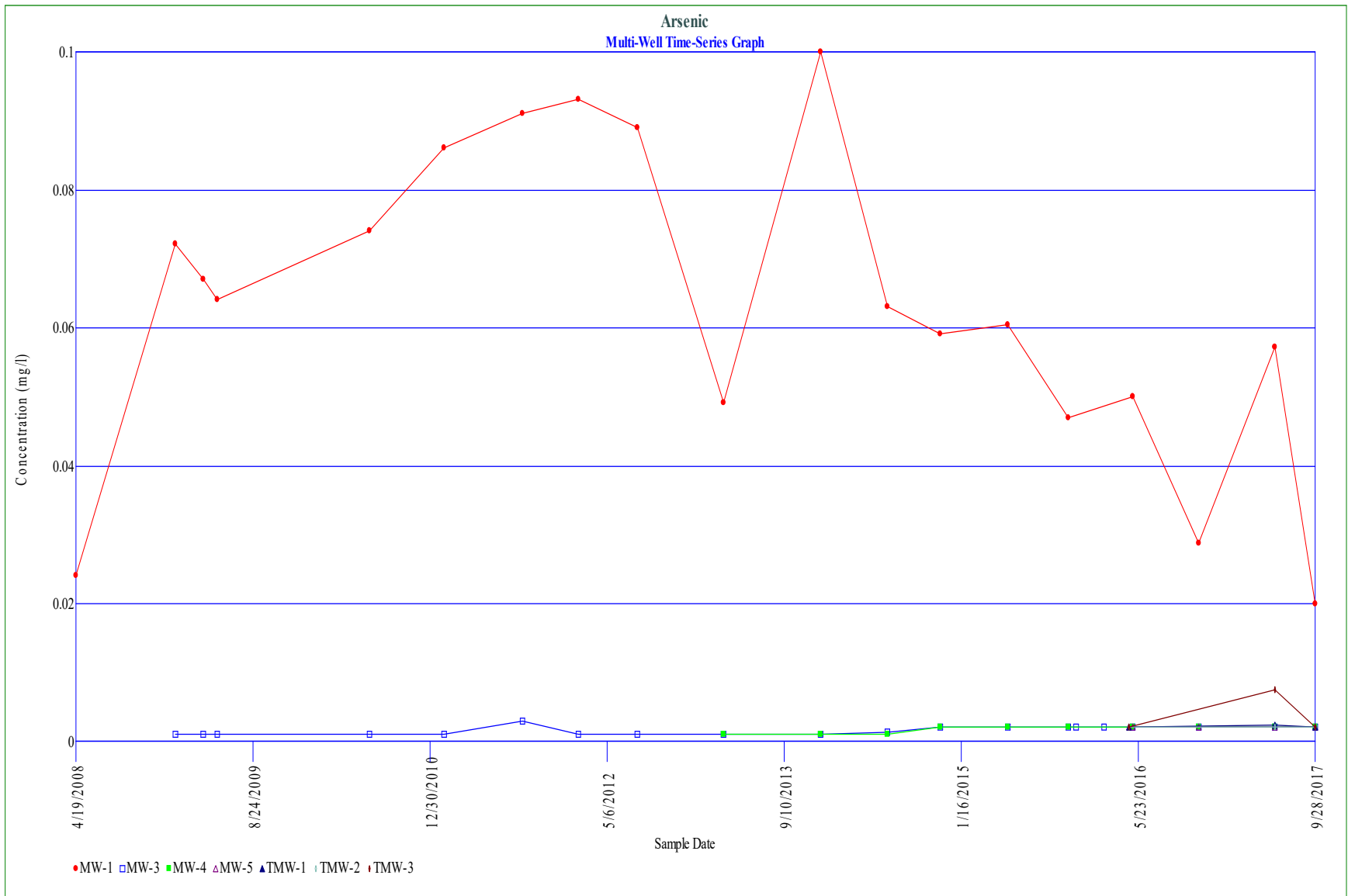
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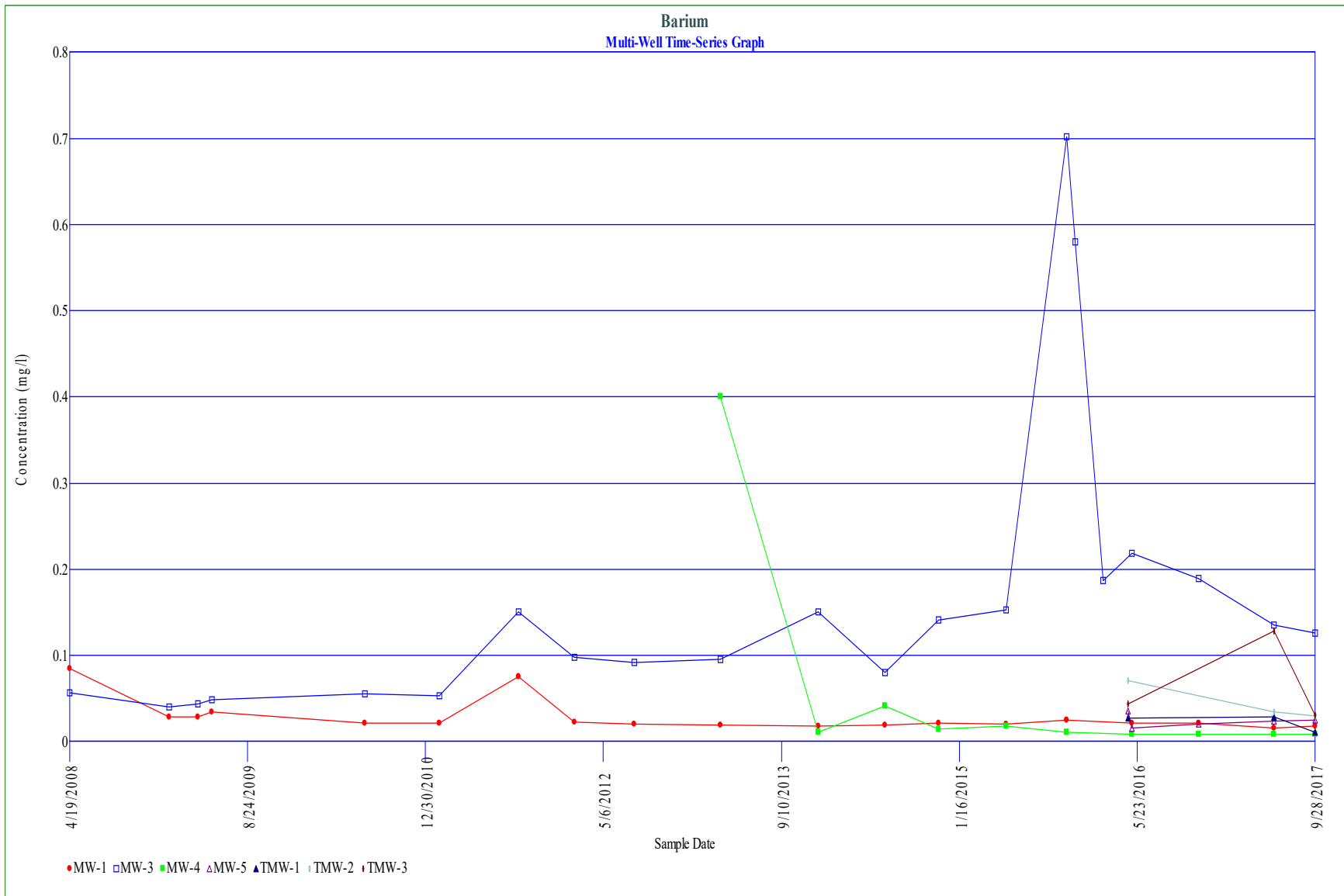


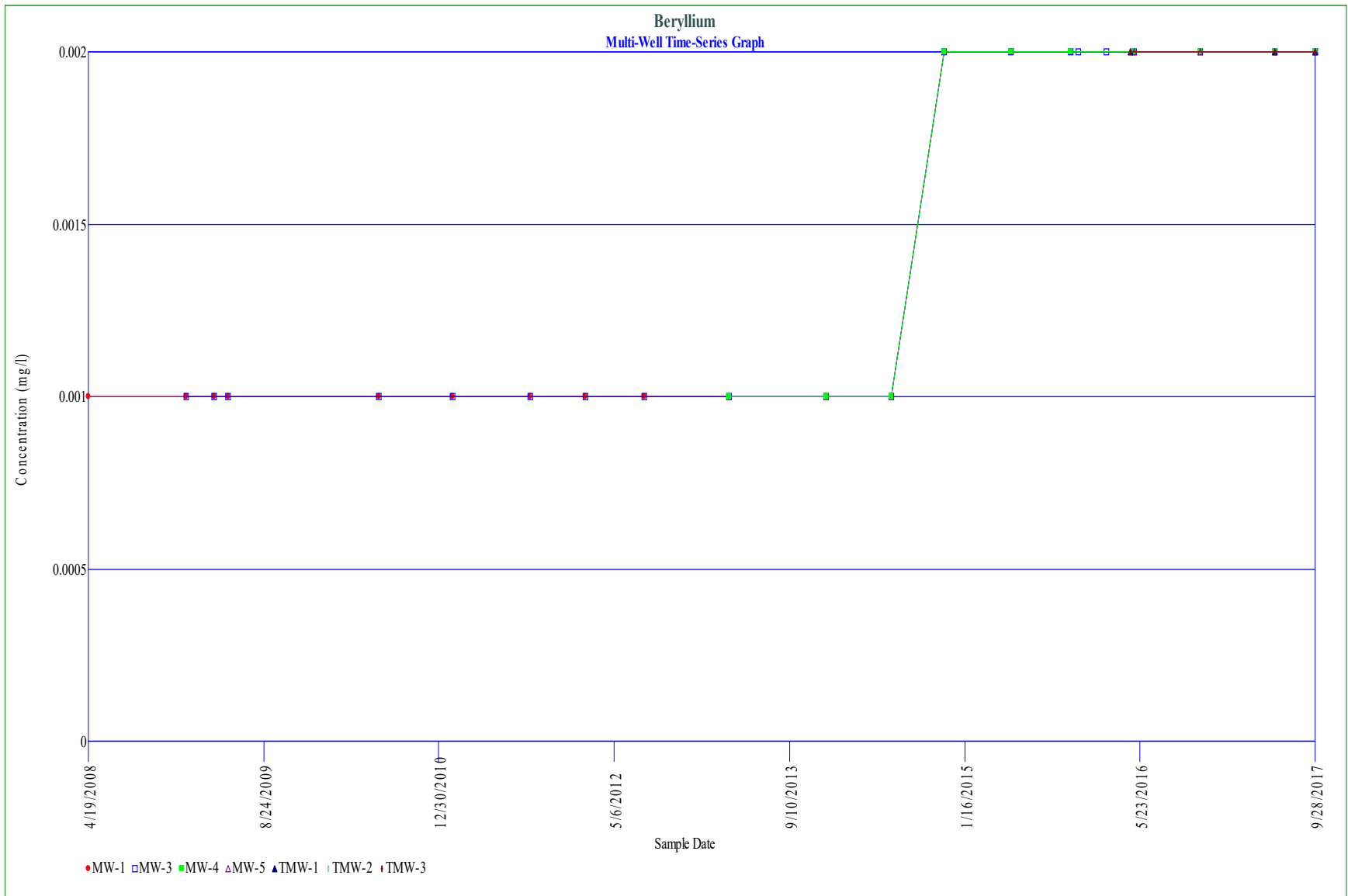


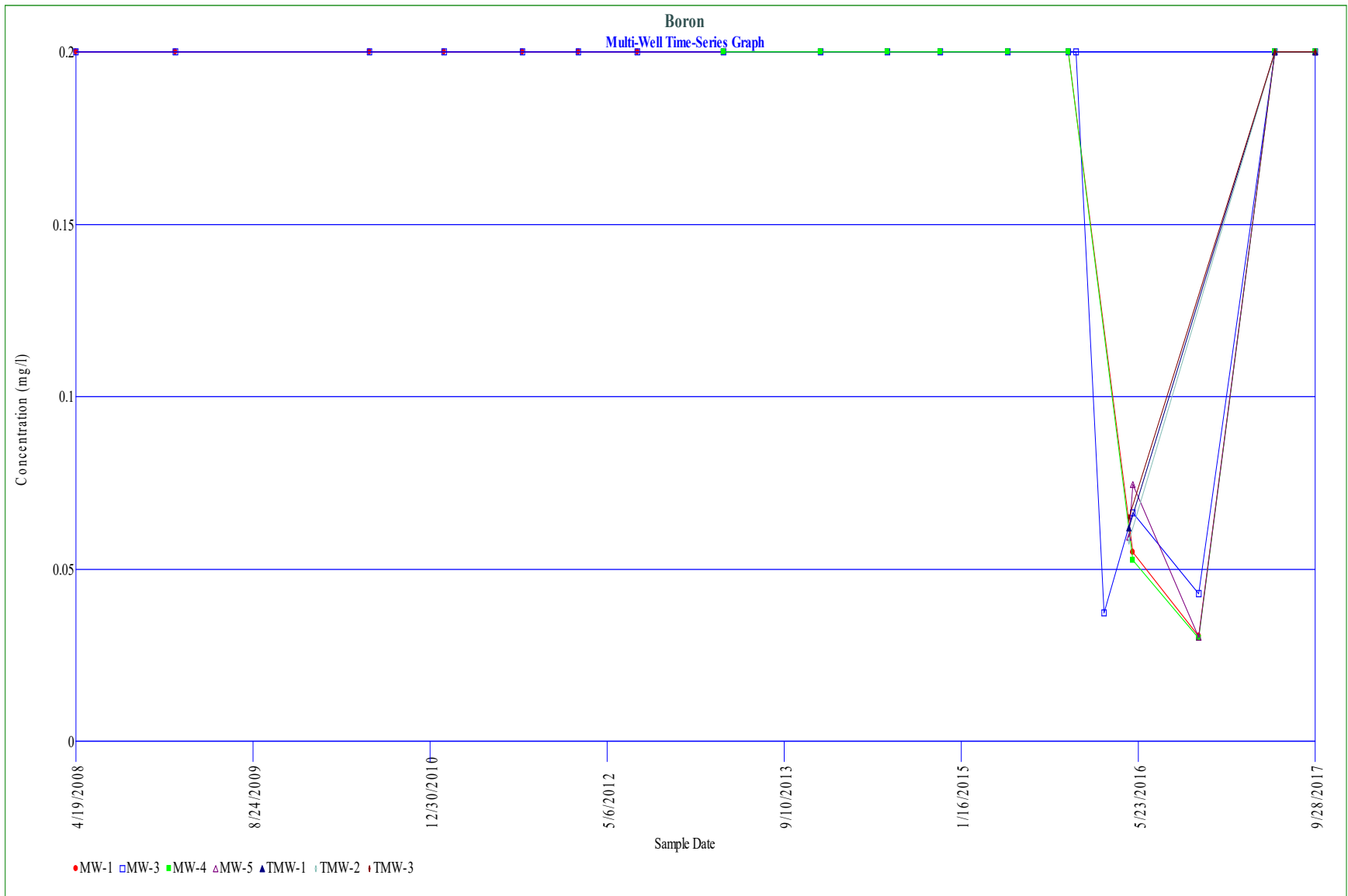


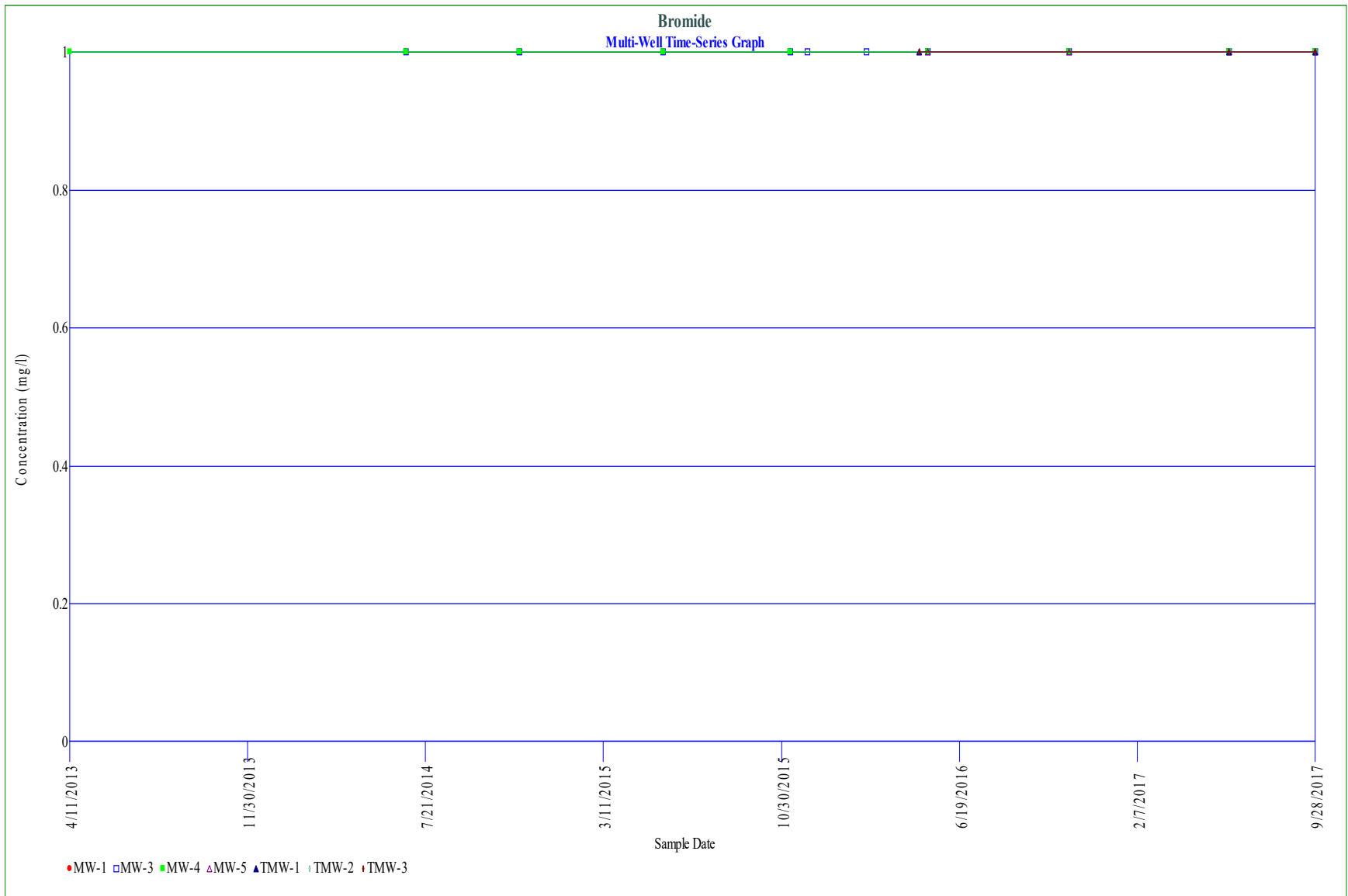


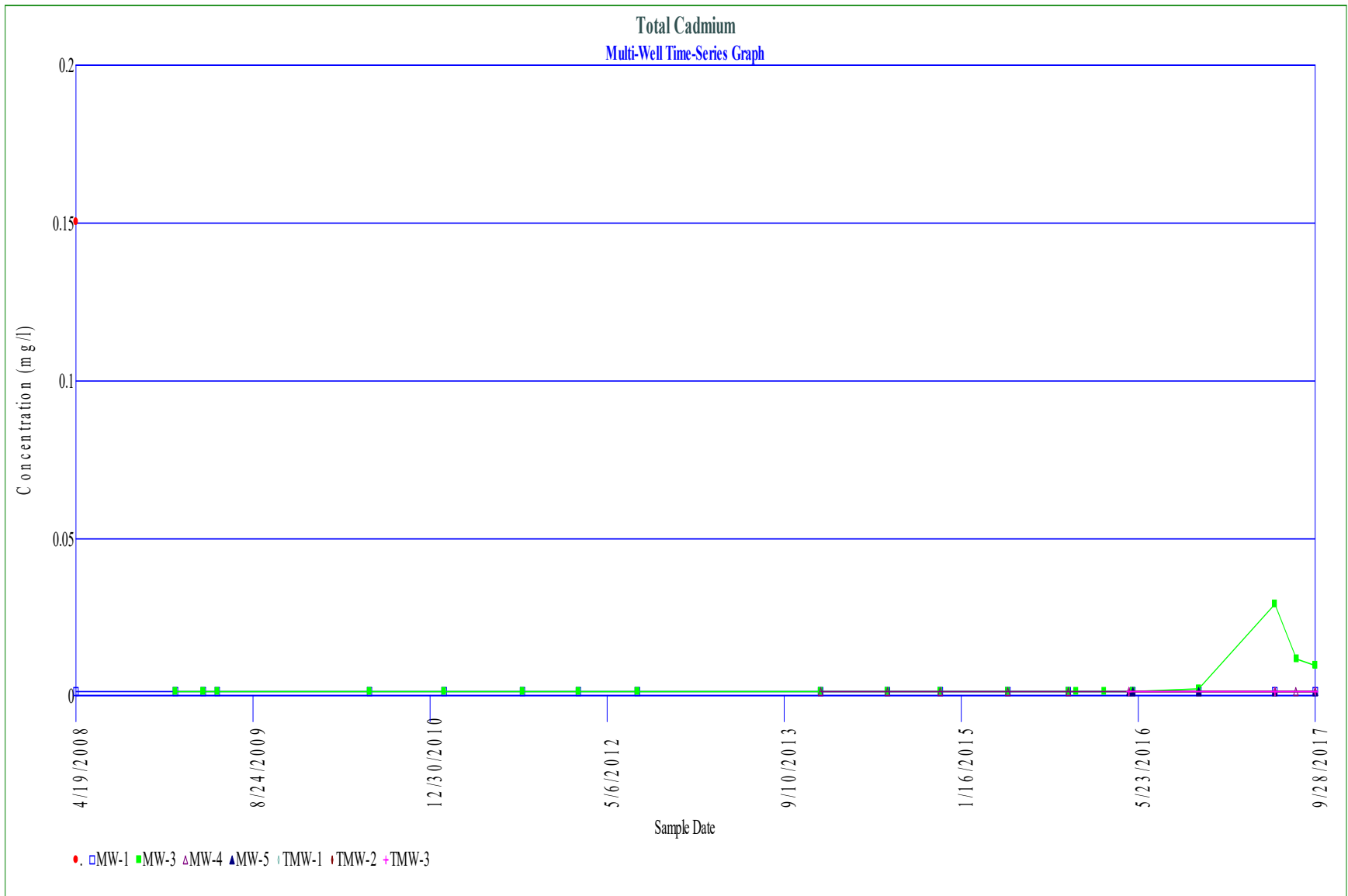


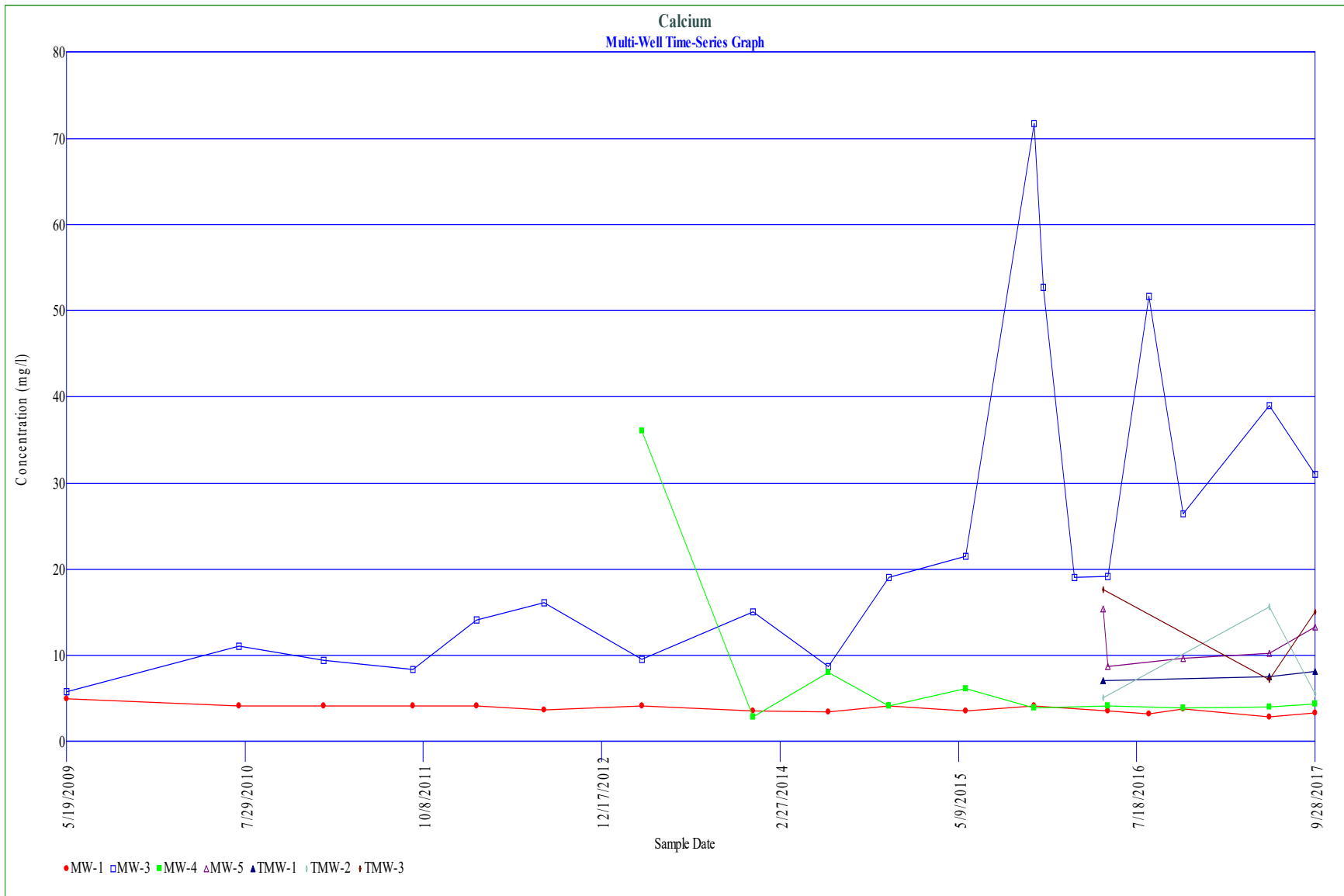


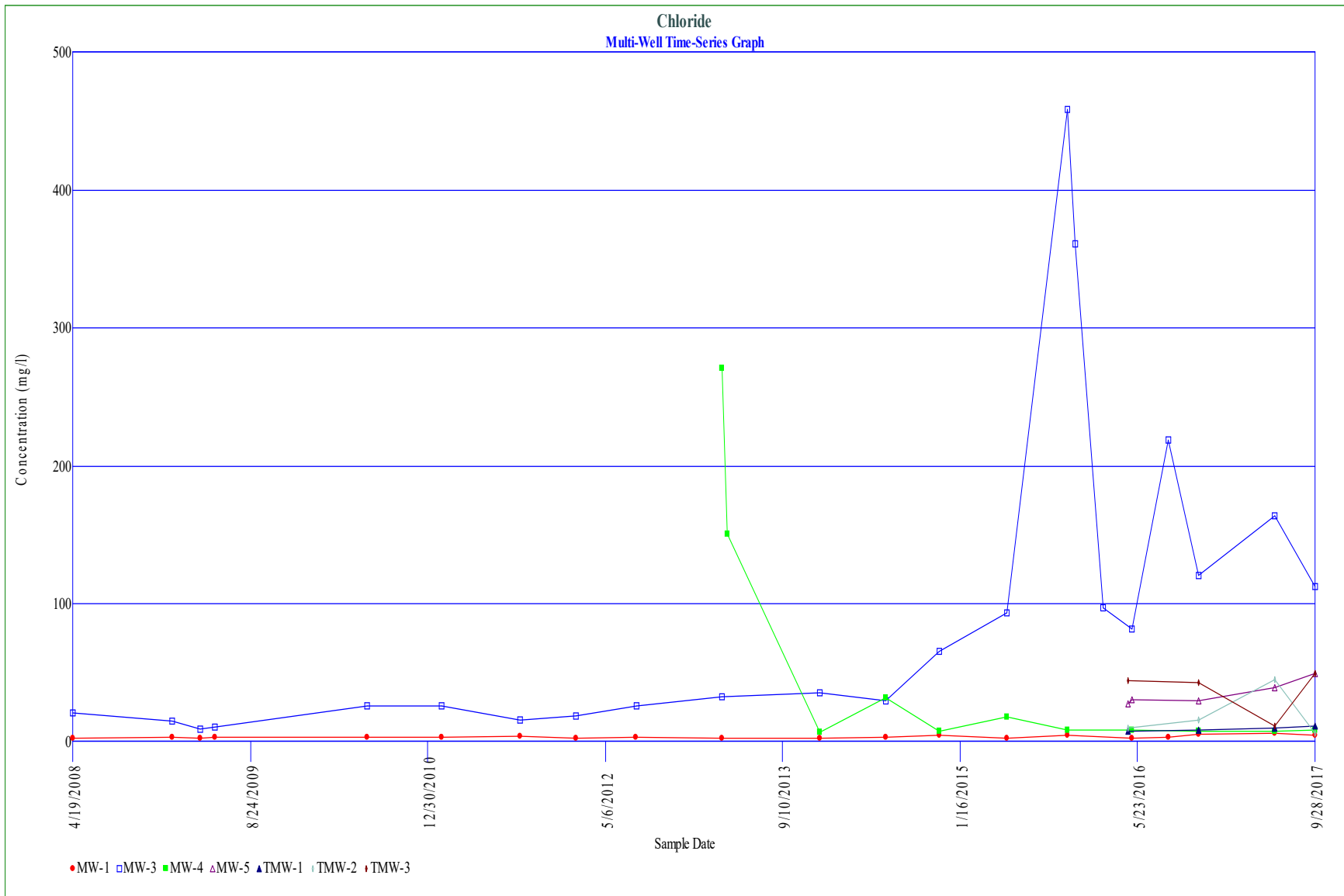




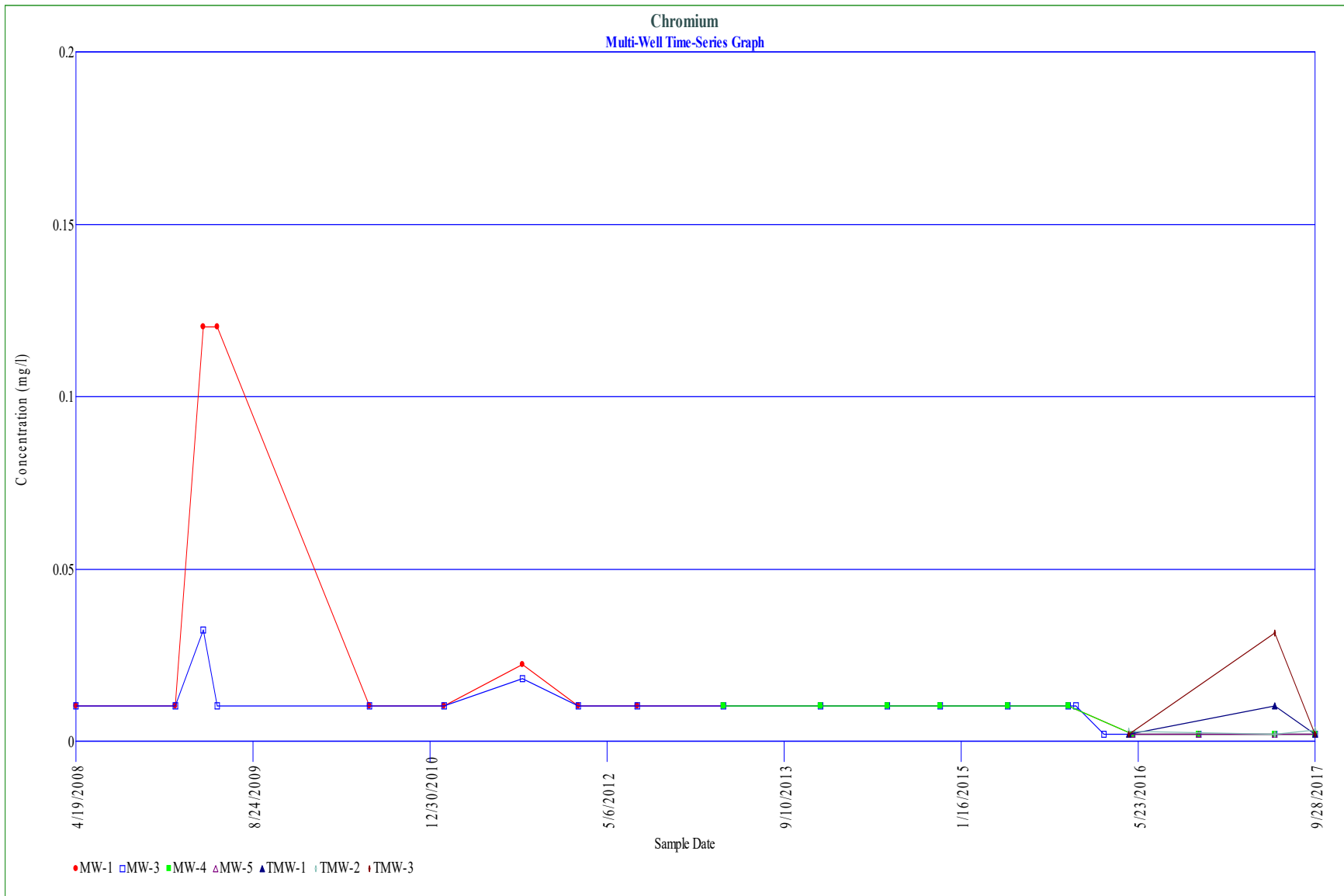


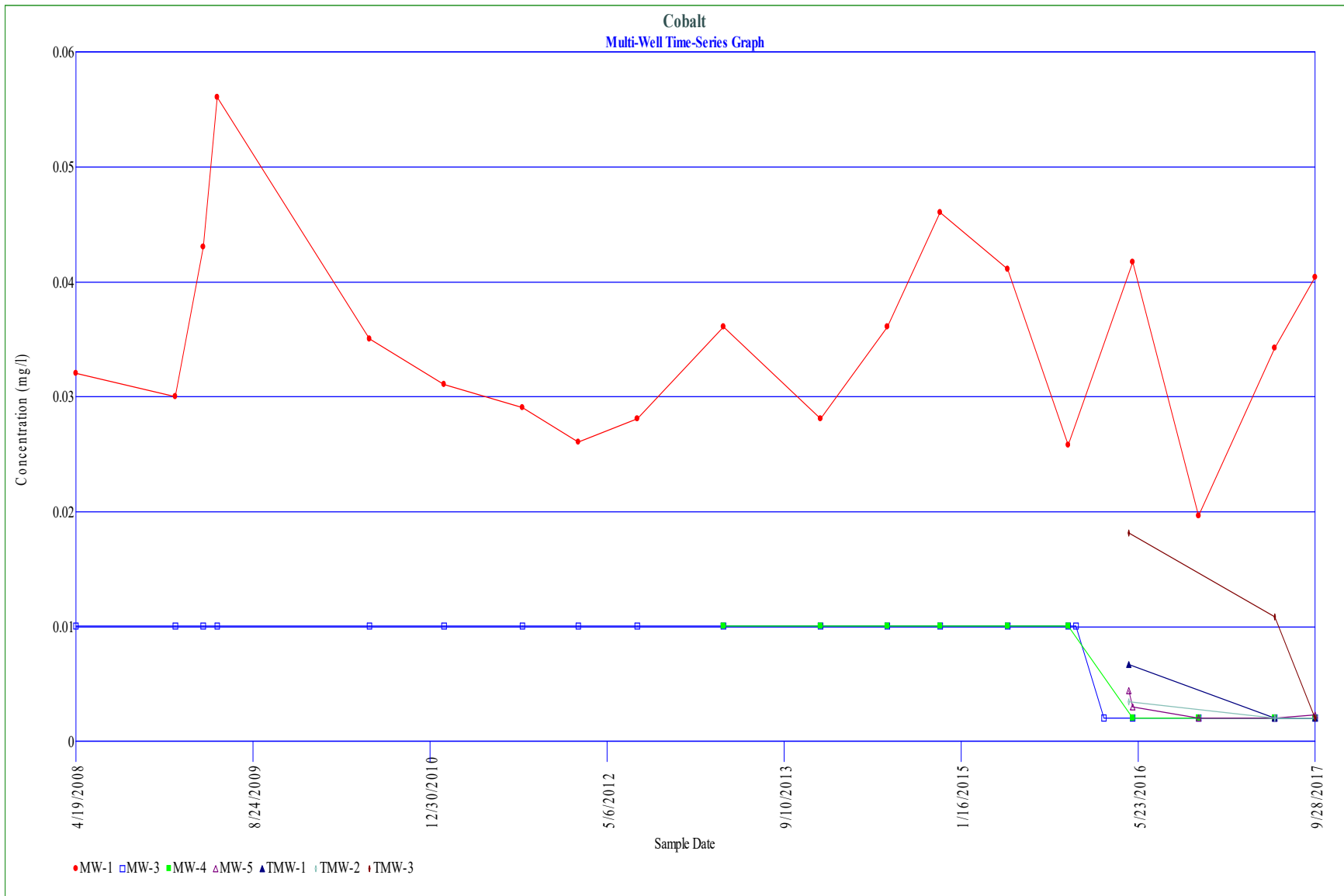


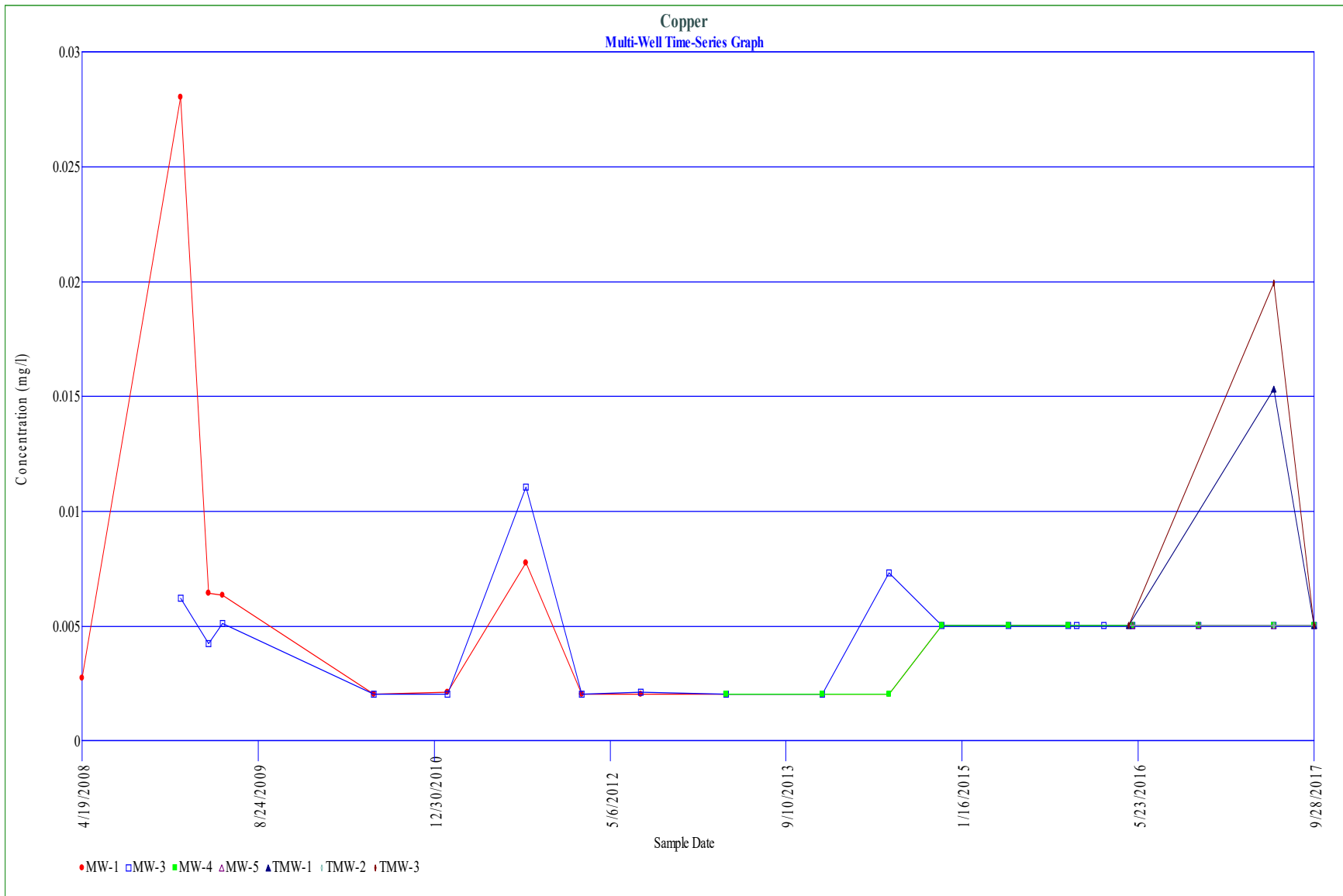


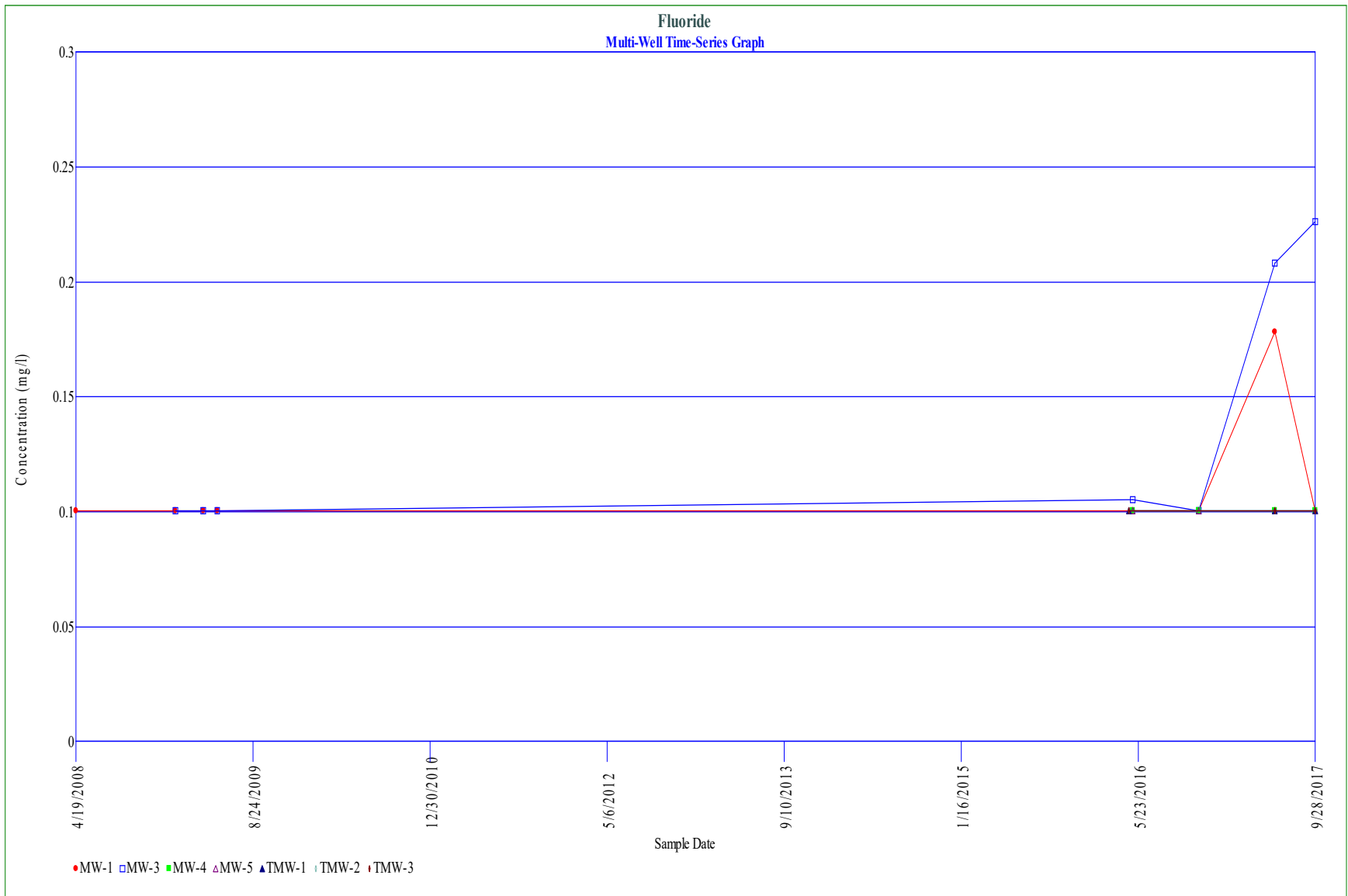


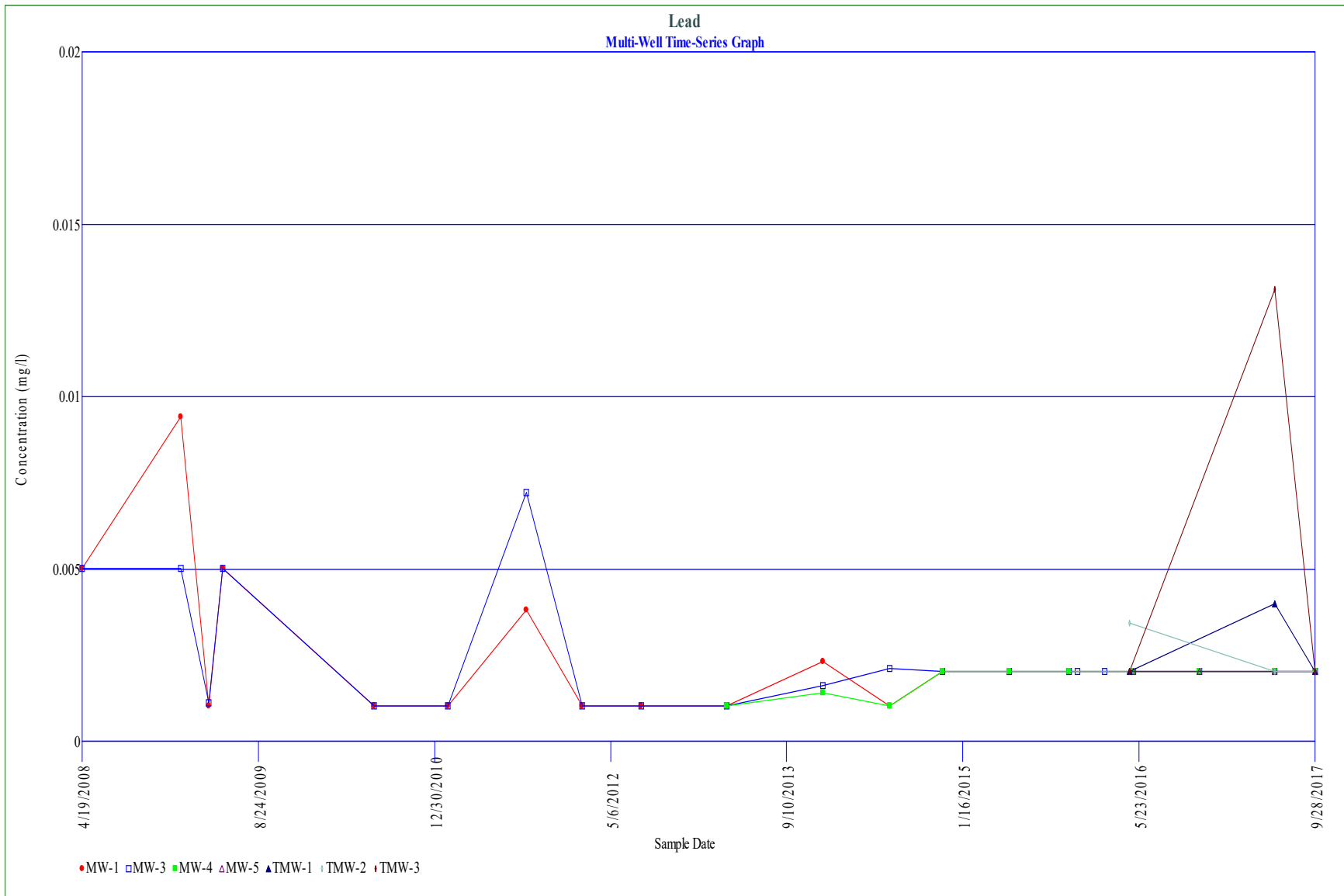




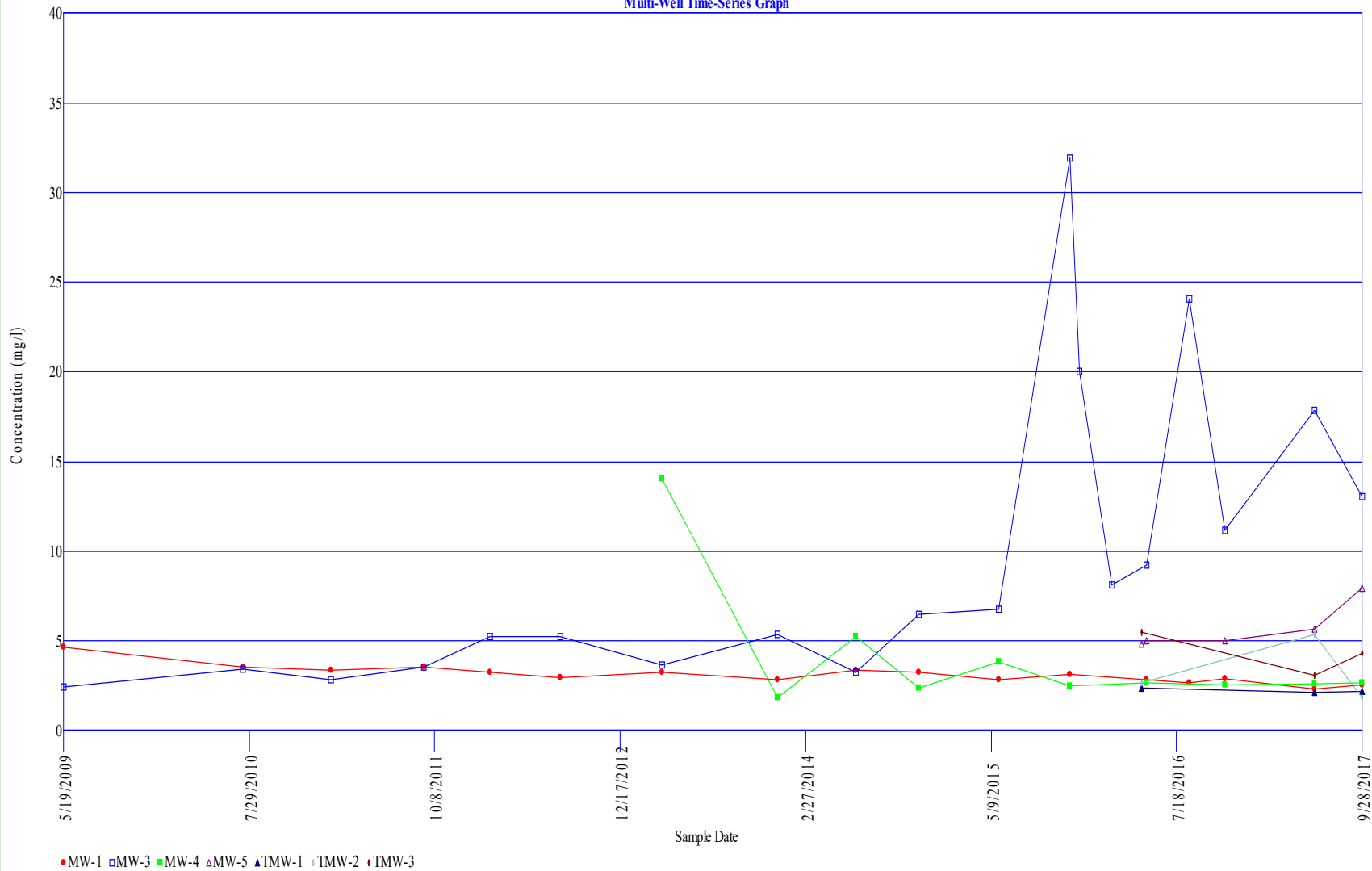


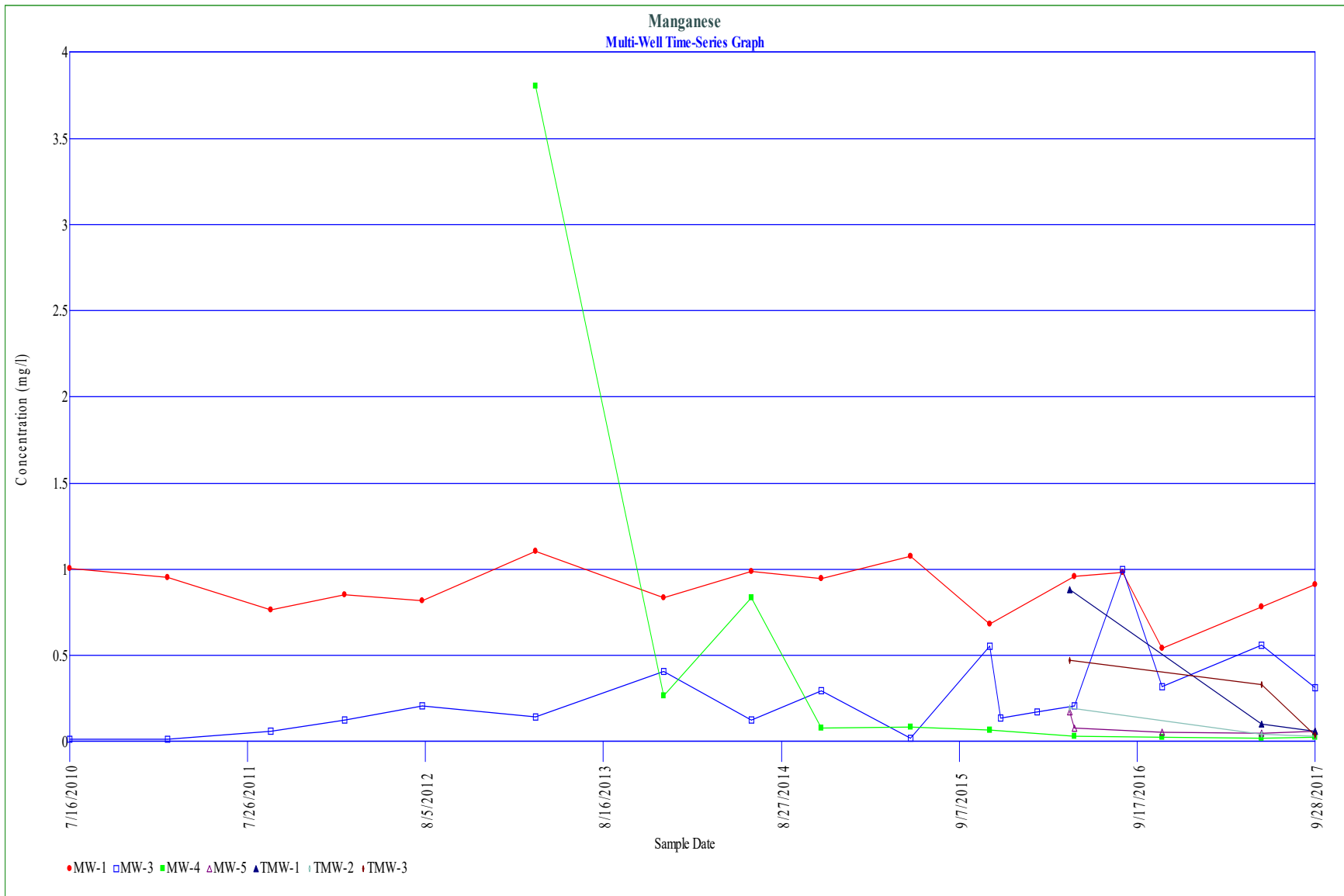


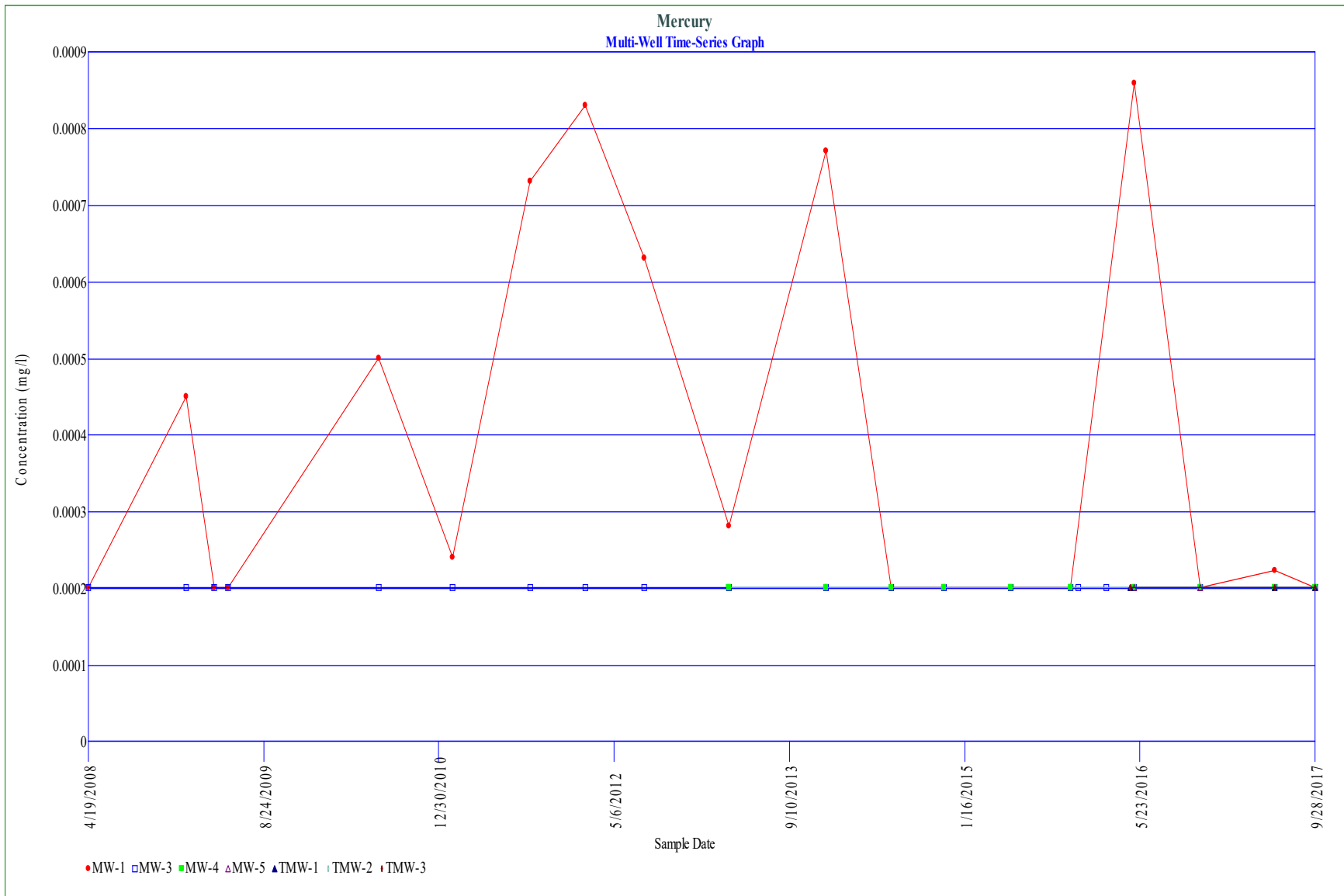




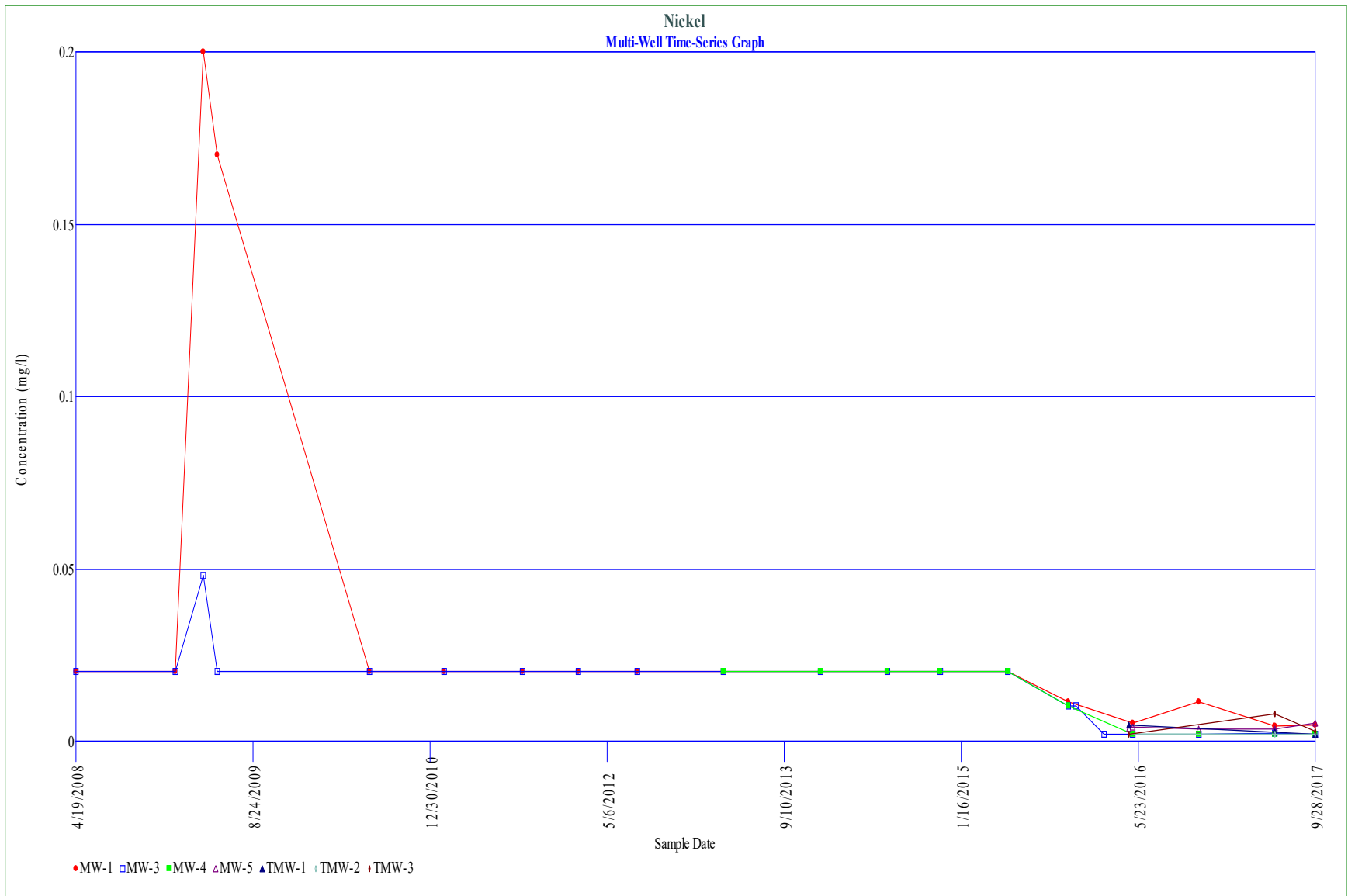
Magnesium  
Multi-Well Time-Series Graph

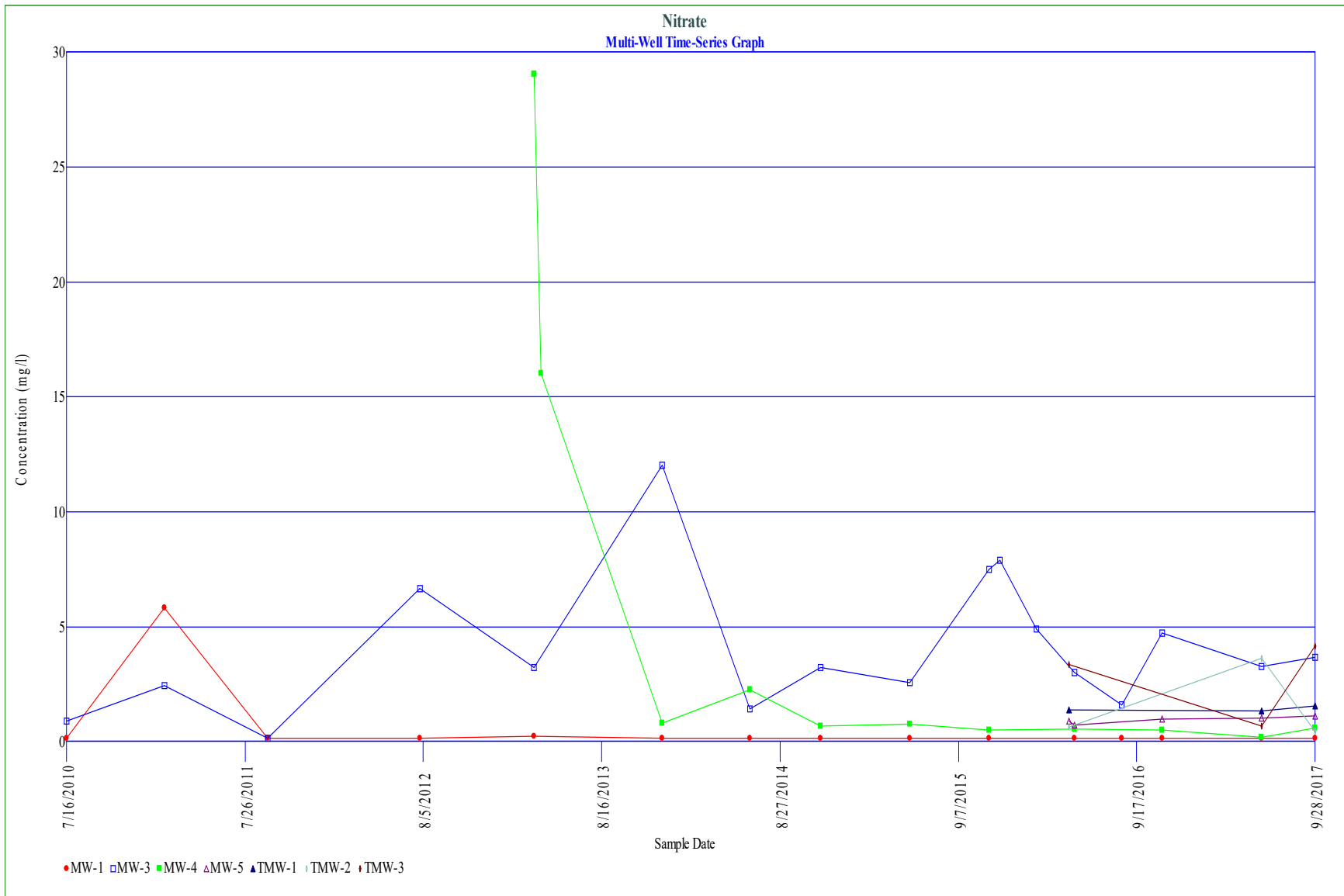


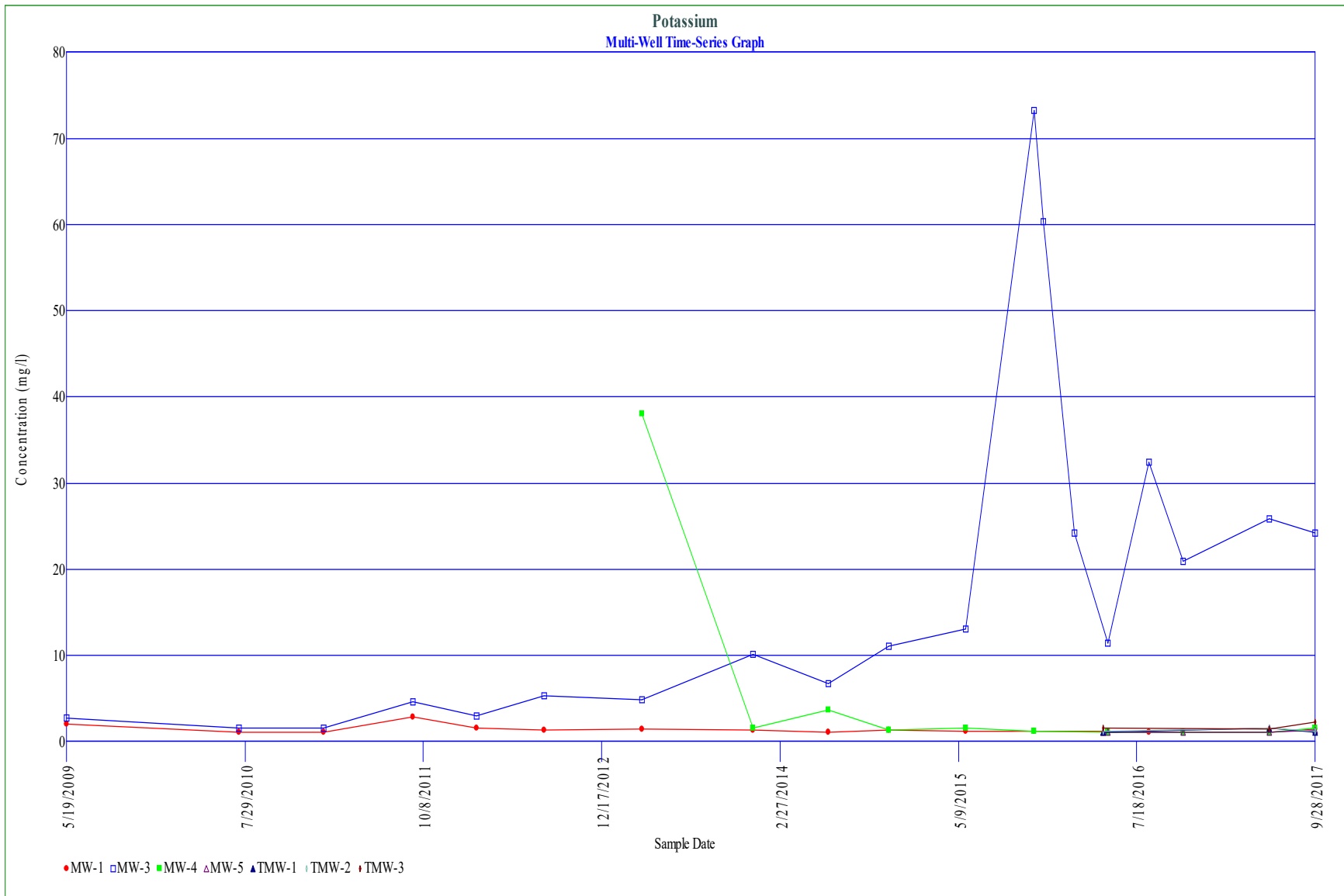


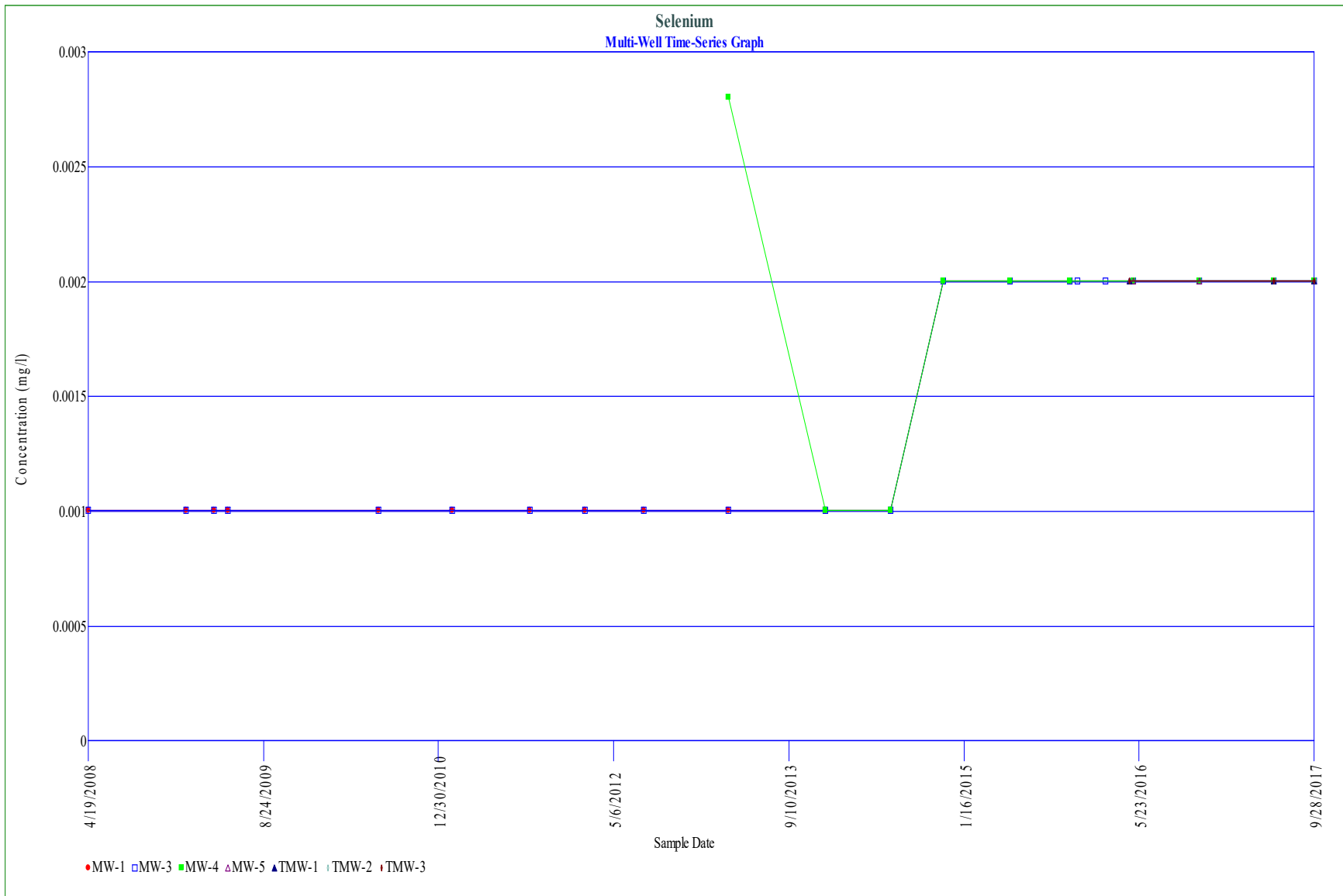


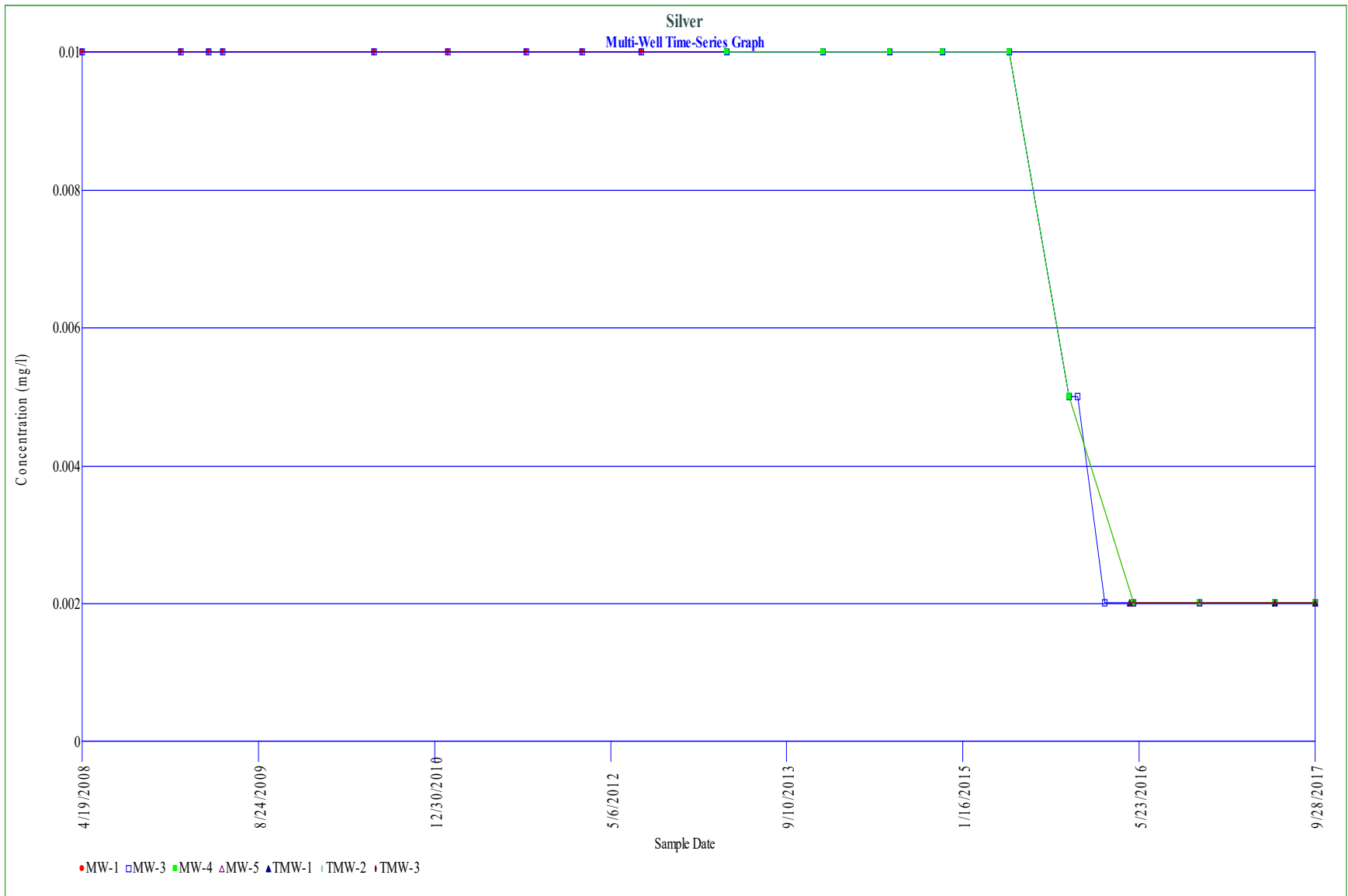


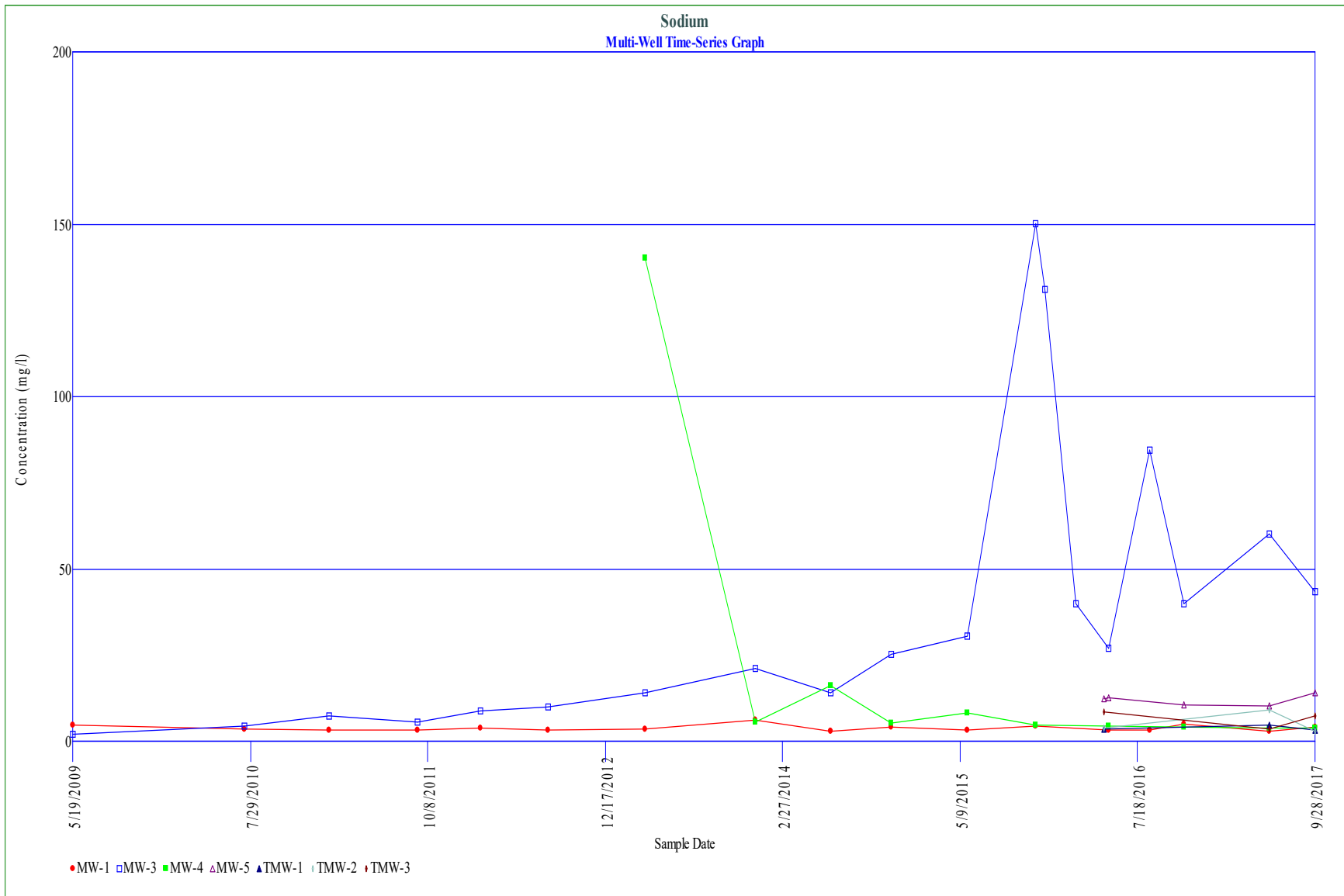


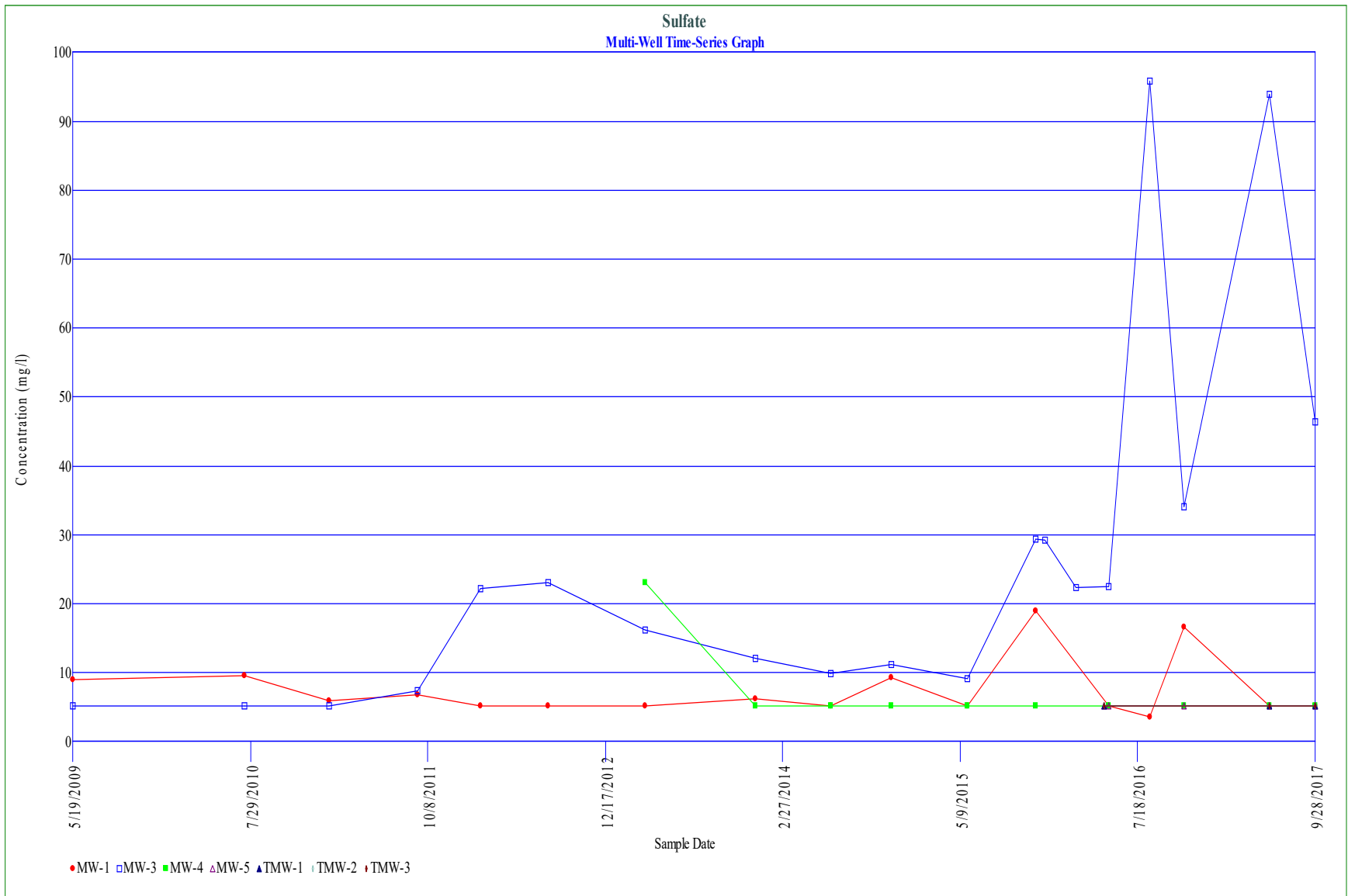


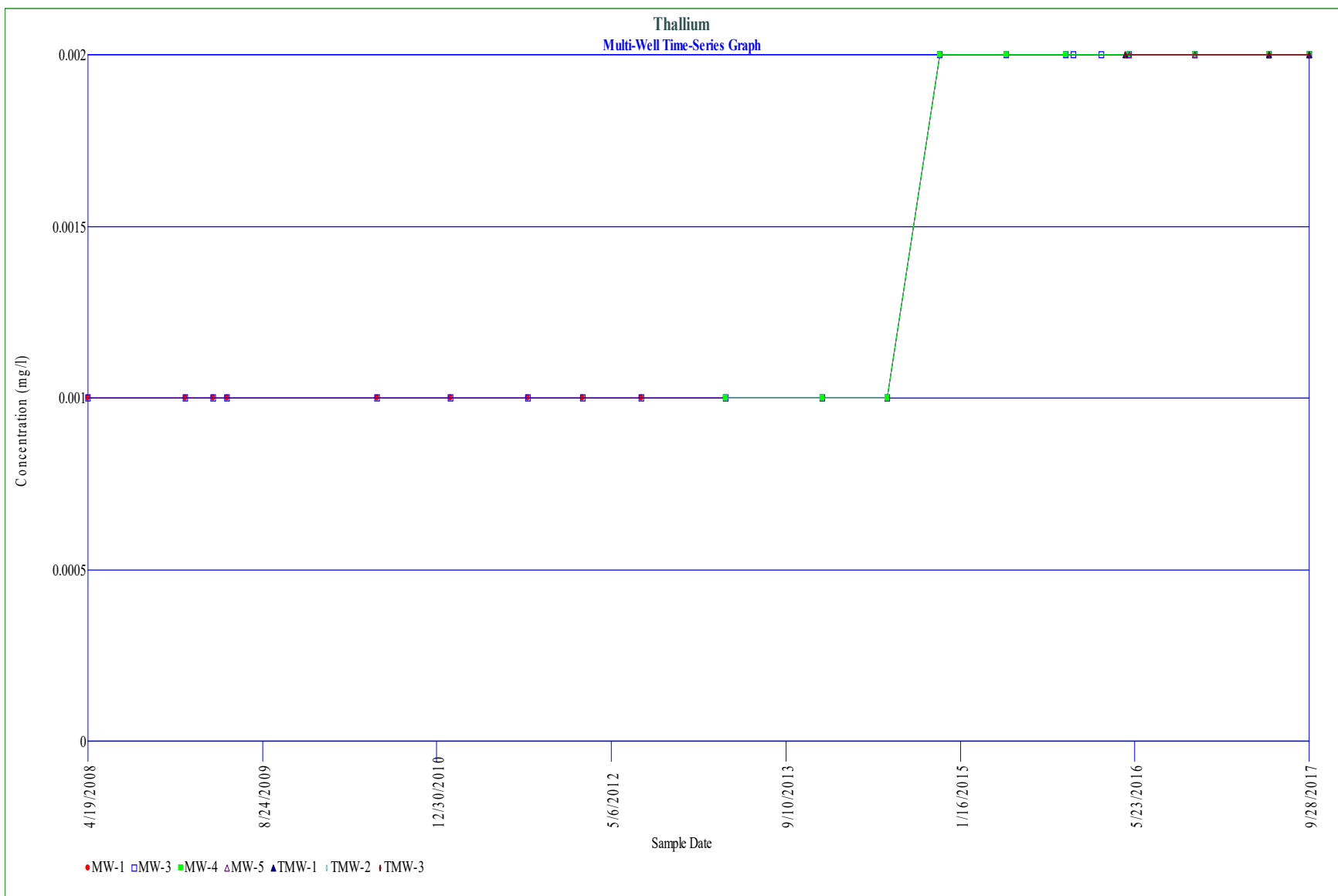




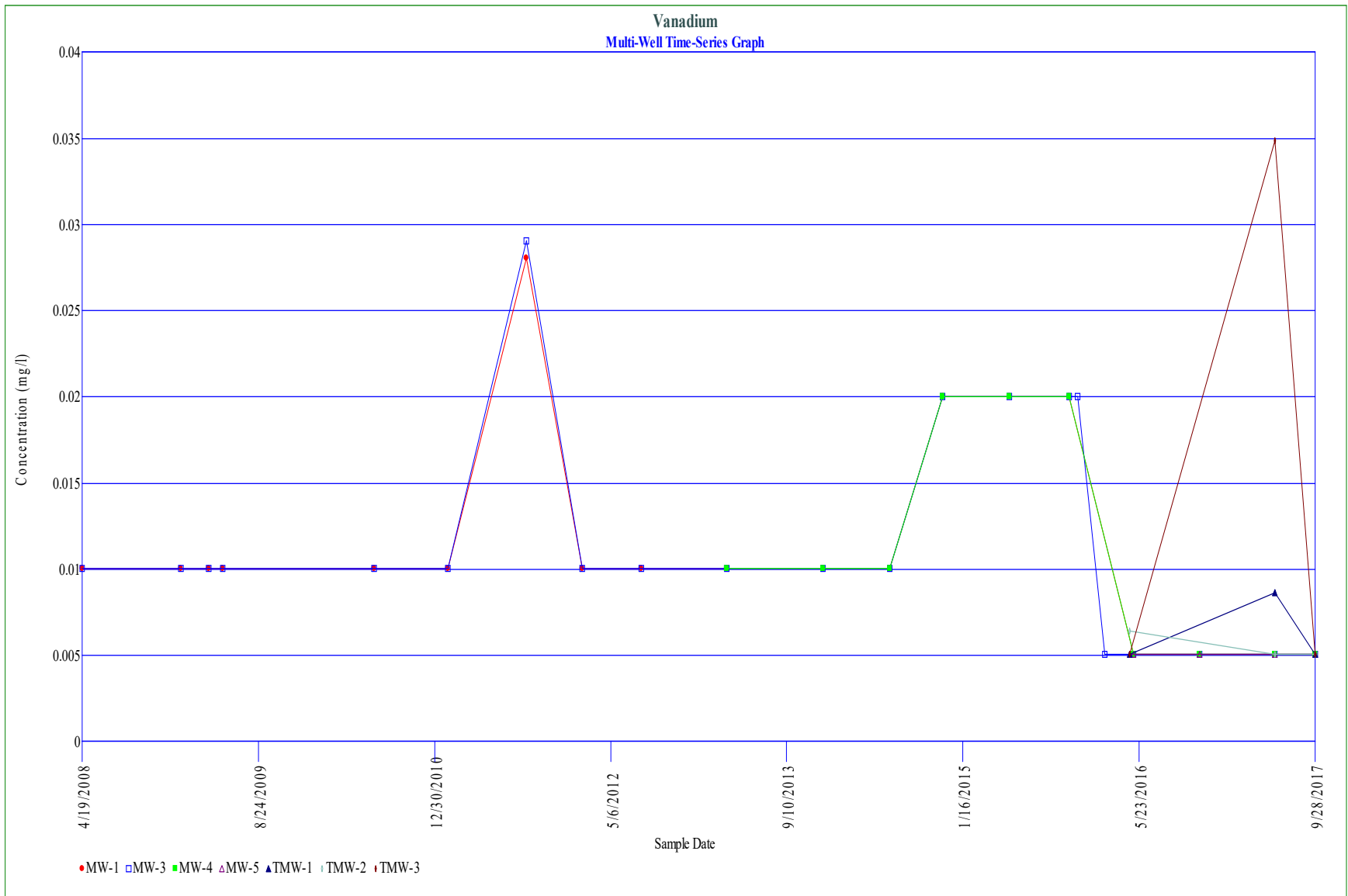


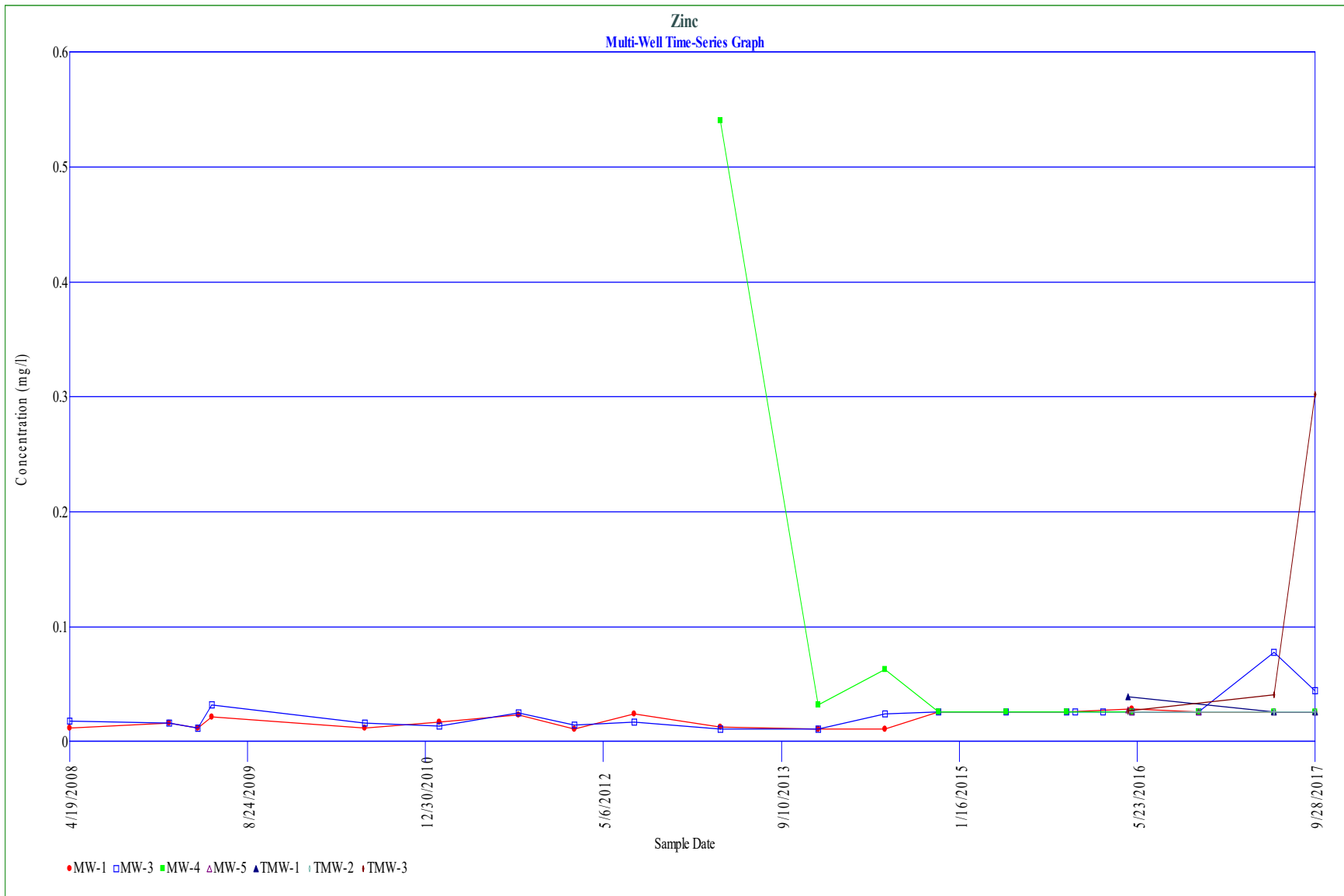


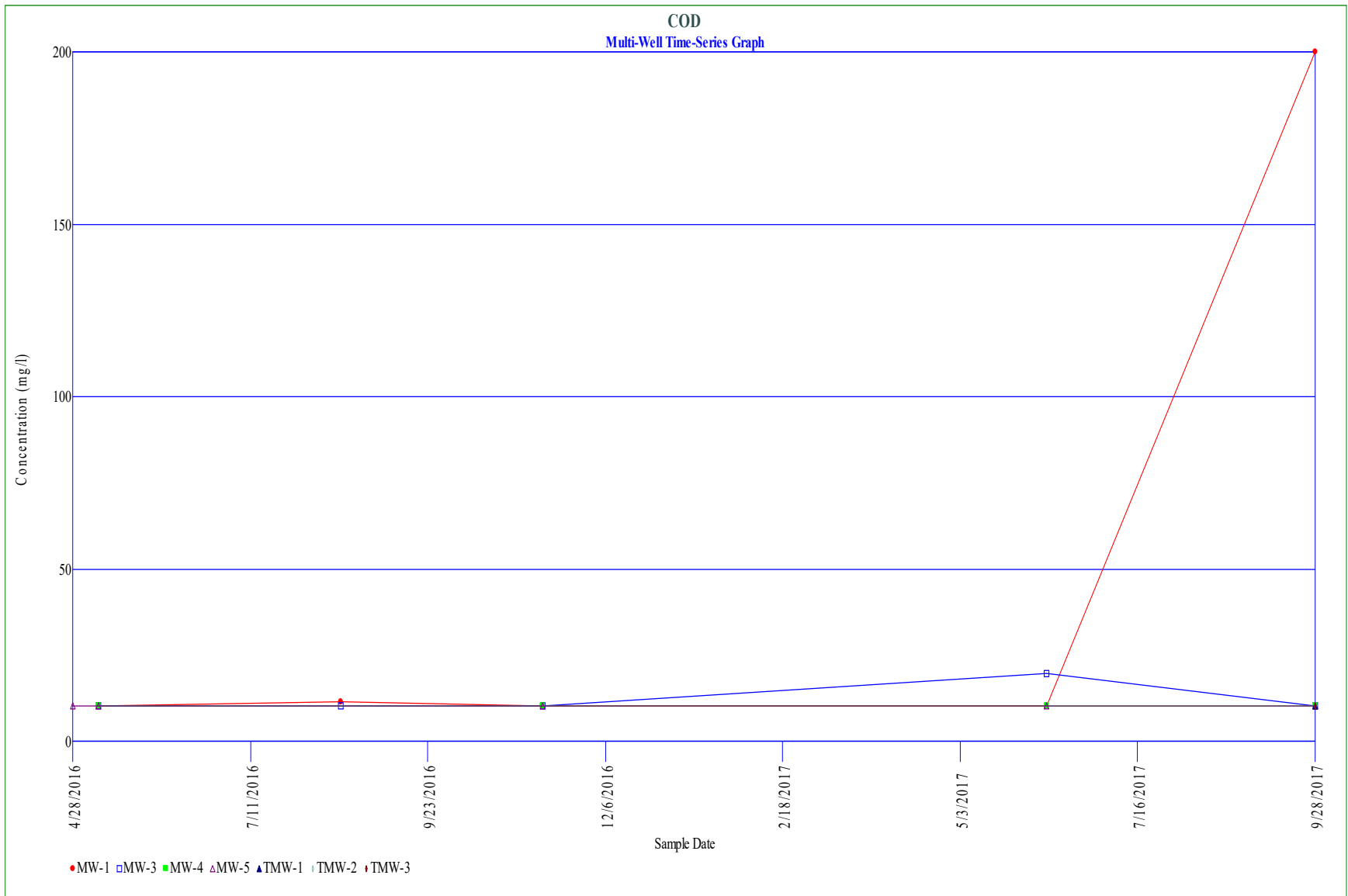


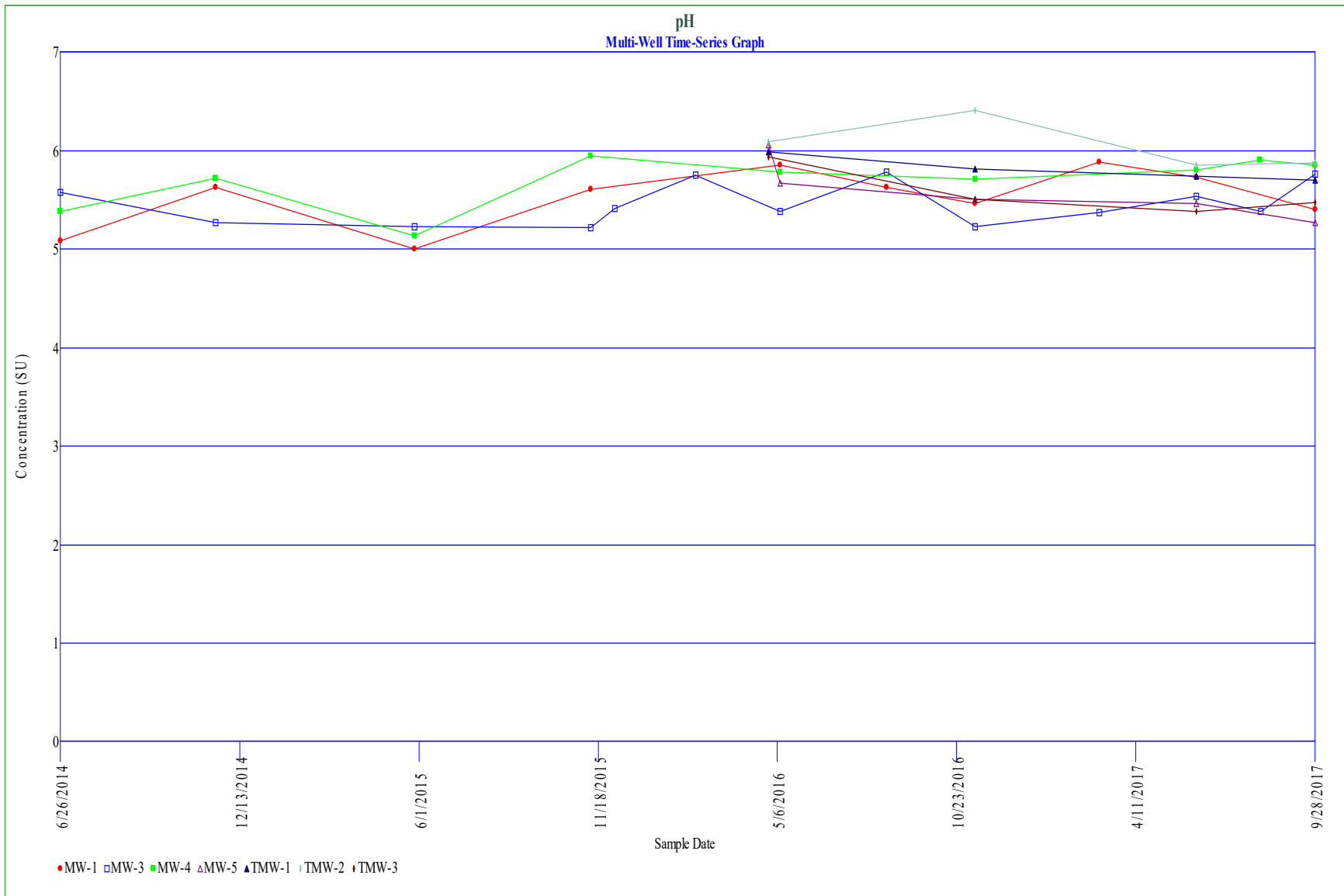


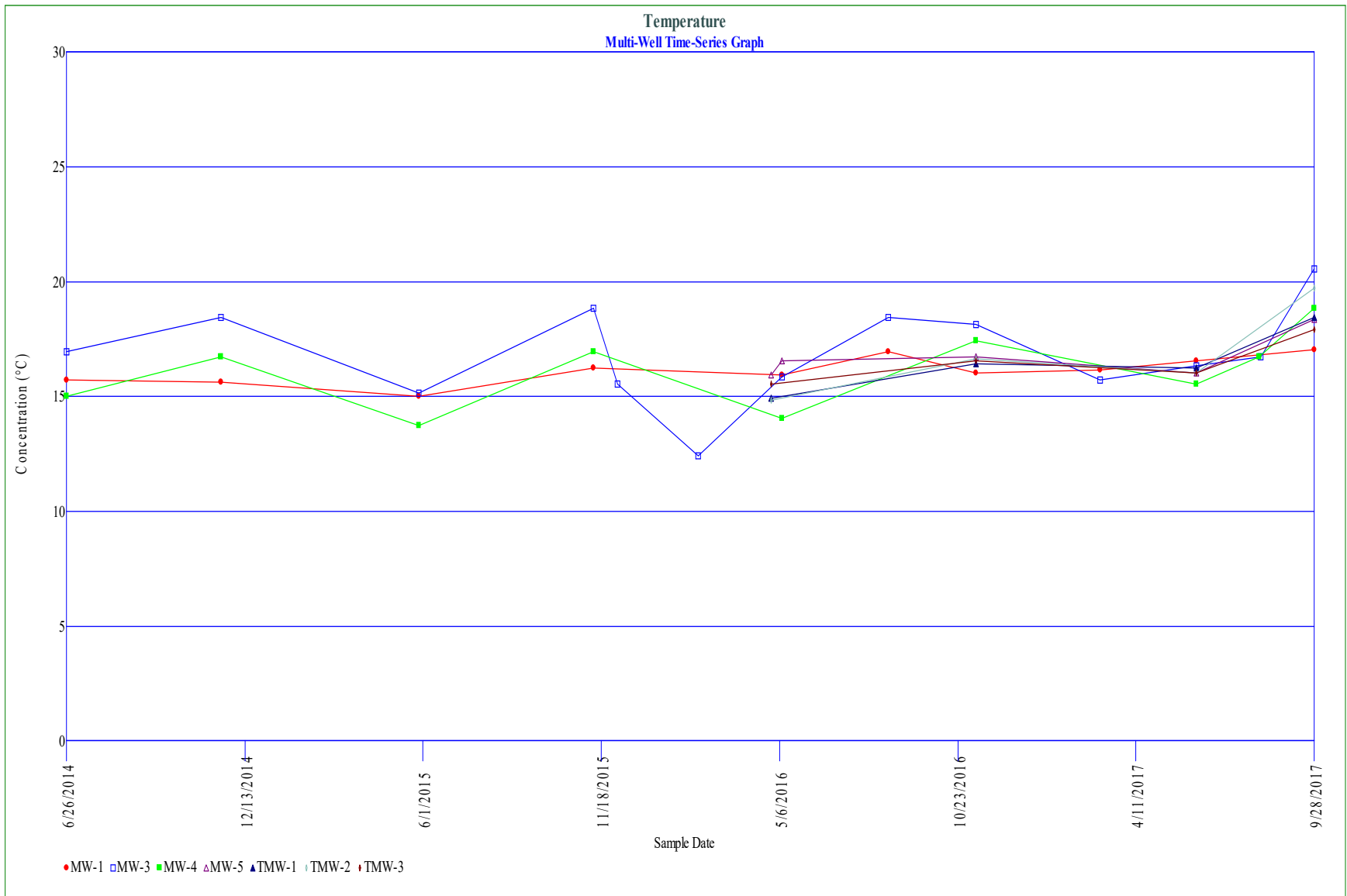


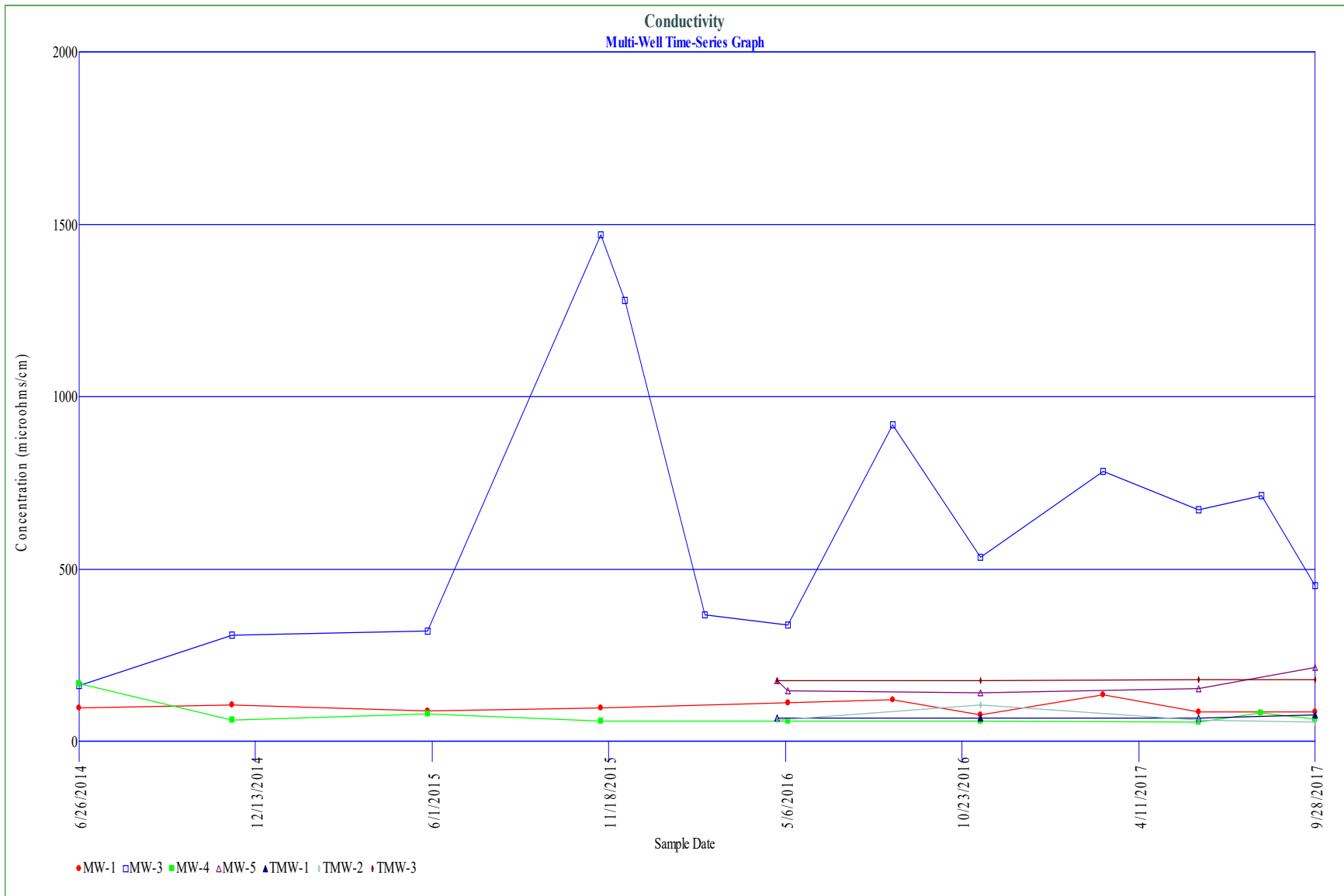


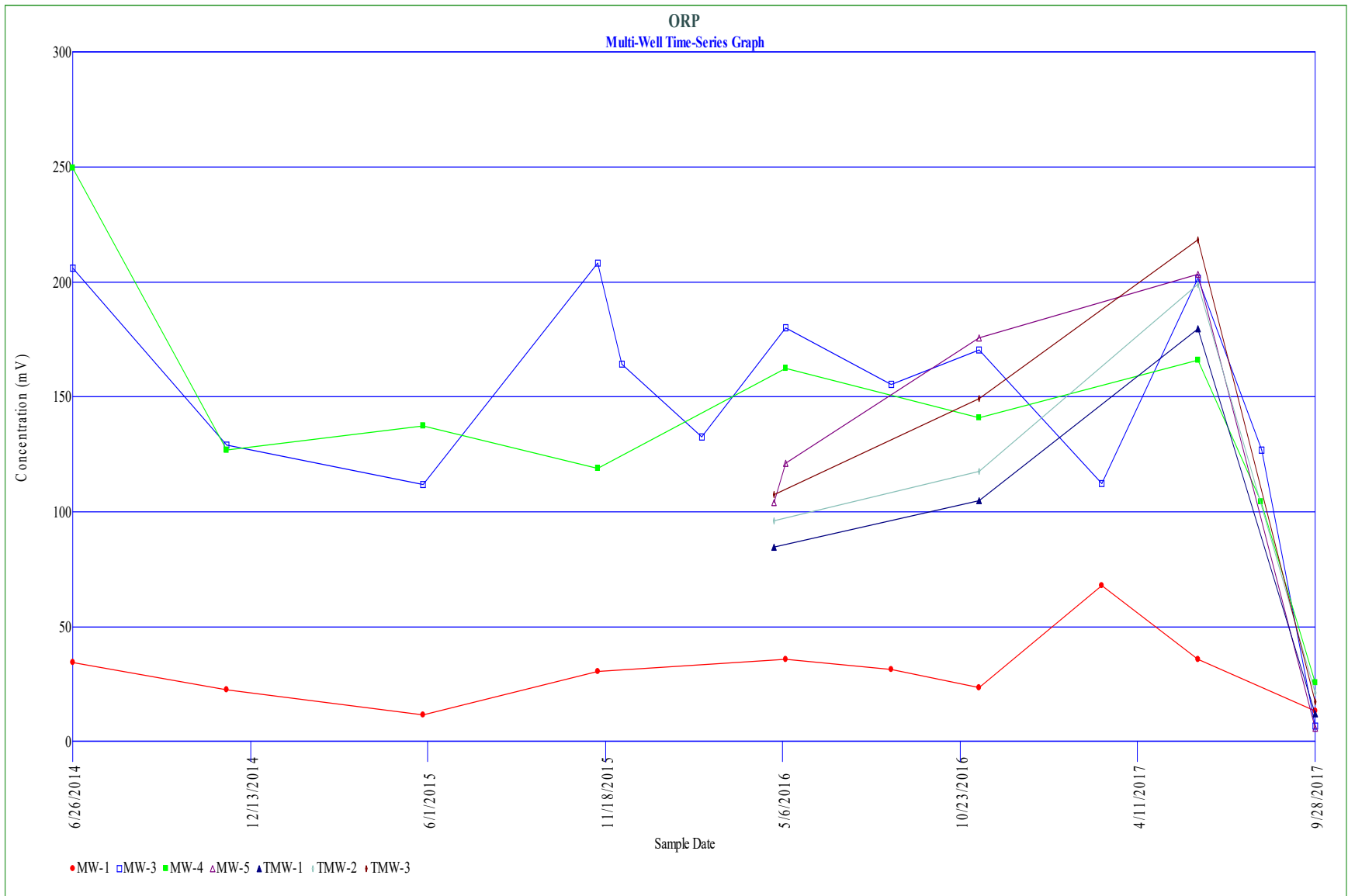


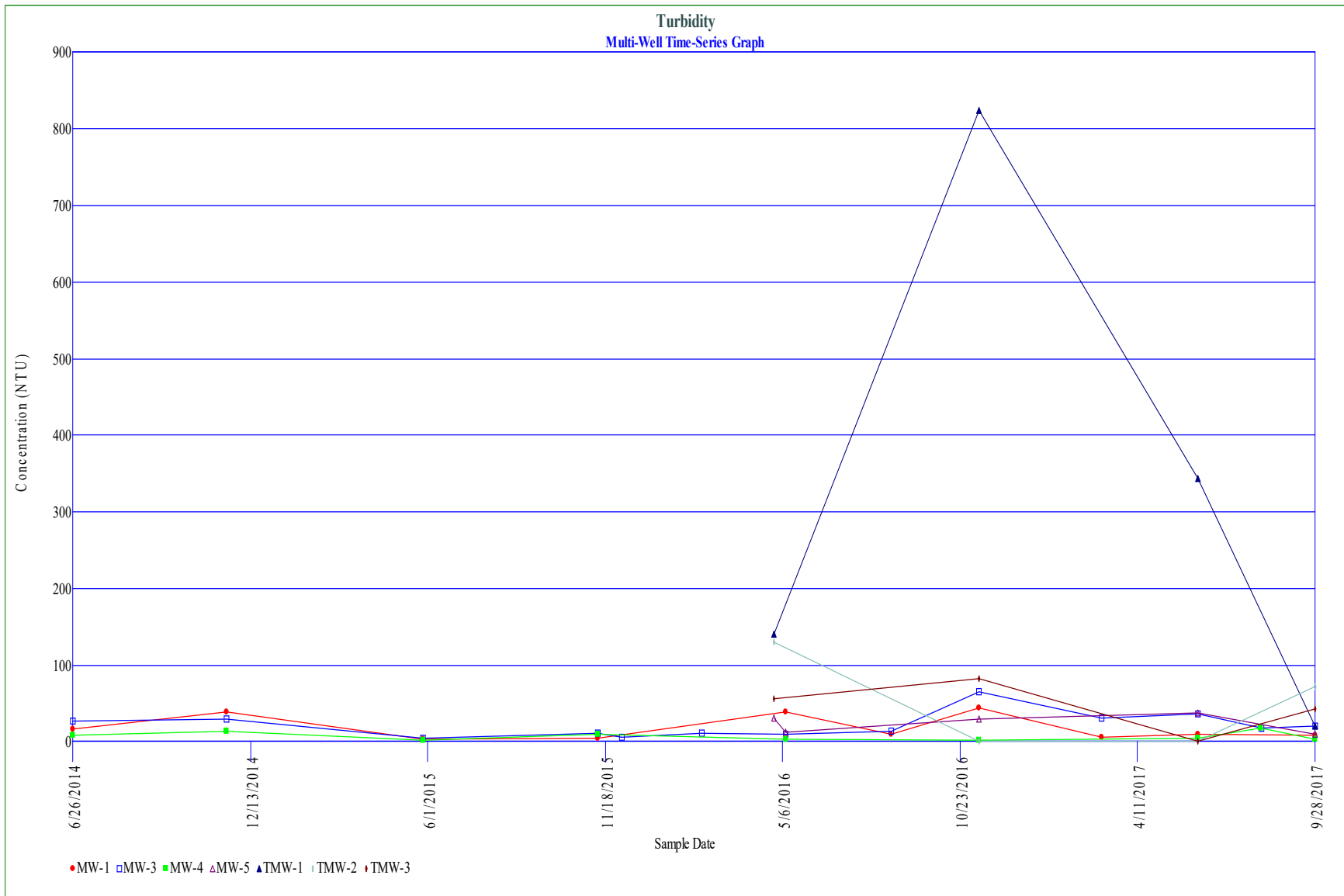














**Shapiro-Francia Test of Normality**  
**Parameter: Aluminum**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**  
Total Number of Measurements = 55

Data Set Standard Deviation = 2.87525  
Numerator = 7464.36  
Denominator = 21747.5  
W Statistic = 0.343228 = 7464.36 / 21747.5

**5% Critical value of 0.958 exceeds 0.343228**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.343228**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Barium**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**  
Total Number of Measurements = 55

Data Set Standard Deviation = 0.130909  
Numerator = 24.4762  
Denominator = 45.0813  
W Statistic = 0.542935 = 24.4762 / 45.0813

**5% Critical value of 0.958 exceeds 0.542935**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.542935**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Cadmium**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**  
Total Number of Measurements = 53

Data Set Standard Deviation = 0.00420333  
Numerator = 0.0101125  
Denominator = 0.0428504  
W Statistic = 0.235996 = 0.0101125 / 0.0428504

**5% Critical value of 0.957 exceeds 0.235996**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.938 exceeds 0.235996**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Chloride**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**  
Total Number of Measurements = 58

Data Set Standard Deviation = 88.5081  
Numerator = 1.26312e+007  
Denominator = 2.3111e+007  
W Statistic = 0.546545 = 1.26312e+007 / 2.3111e+007

**5% Critical value of 0.962 exceeds 0.546545**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.945 exceeds 0.546545**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Cobalt**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**  
Total Number of Measurements = 55

Data Set Standard Deviation = 0.0145078  
Numerator = 0.466288  
Denominator = 0.553681  
W Statistic = 0.84216 = 0.466288 / 0.553681

**5% Critical value of 0.958 exceeds 0.84216**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.84216**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Cobalt**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**  
Total Number of Measurements = 55

Data Set Standard Deviation = 0.0145078  
Numerator = 0.466288  
Denominator = 0.553681  
W Statistic = 0.84216 = 0.466288 / 0.553681

**5% Critical value of 0.958 exceeds 0.84216**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.84216**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Wilks Test of Normality**  
**Parameter: Fluoride**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**  
K = 12 for 24 measurements

Sum of b values = 0.111064  
Sample Standard Deviation = 0.0357904  
W Statistic = 0.418682

**5% Critical value of 0.916 exceeds 0.418682**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.884 exceeds 0.418682**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Nickel**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**  
Total Number of Measurements = 55

Data Set Standard Deviation = 0.0336205  
Numerator = 1.07612  
Denominator = 2.9735  
W Statistic = 0.361902 = 1.07612 / 2.9735

**5% Critical value of 0.958 exceeds 0.361902**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.361902**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Zinc**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**  
Total Number of Measurements = 55

Data Set Standard Deviation = 0.0706652  
Numerator = 2.4071  
Denominator = 13.1362  
W Statistic = 0.183242 = 2.4071 / 13.1362

**5% Critical value of 0.958 exceeds 0.183242**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.183242**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Aluminum**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Natural Logarithm Transformation**  
**Non-Detects Replaced with 1/2 DL**  
Total Number of Measurements = 55

Data Set Standard Deviation = 1.55056  
Numerator = 5375.12  
Denominator = 6324.66  
W Statistic = 0.849867 = 5375.12 / 6324.66

**5% Critical value of 0.958 exceeds 0.849867**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.849867**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Barium**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Natural Logarithm Transformation**  
**Non-Detects Replaced with 1/2 DL**  
Total Number of Measurements = 55

Data Set Standard Deviation = 1.12672  
Numerator = 3175.12  
Denominator = 3339.61  
W Statistic = 0.950747 = 3175.12 / 3339.61

**5% Critical value of 0.958 exceeds 0.950747**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 is less than 0.950747**  
**Data is normally distributed at 99% level of significance**

**Shapiro-Francia Test of Normality**  
**Parameter: Cadmium**  
**All Locations**  
**Normality Test of Parameter Concentrations**  
**Natural Logarithm Transformation**  
**Non-Detects Replaced with 1/2 DL**  
Total Number of Measurements = 53

Data Set Standard Deviation = 0.949352  
Numerator = 1181.23  
Denominator = 2185.86  
W Statistic = 0.540397 = 1181.23 / 2185.86

**5% Critical value of 0.957 exceeds 0.540397**  
**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.938 exceeds 0.540397**  
**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**

**Parameter: Chloride**

**All Locations**

**Normality Test of Parameter Concentrations**

**Natural Logarithm Transformation**

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

Total Number of Measurements = 58

Data Set Standard Deviation = 1.56997

Numerator = 6946.73

Denominator = 7271.67

W Statistic = 0.955314 = 6946.73 / 7271.67

**5% Critical value of 0.962 exceeds 0.955314**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.945 is less than 0.955314**

**Data is normally distributed at 99% level of significance**

**Shapiro-Francia Test of Normality**

**Parameter: Cobalt**

**All Locations**

**Normality Test of Parameter Concentrations**

**Natural Logarithm Transformation**

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

Total Number of Measurements = 55

Data Set Standard Deviation = 1.29065

Numerator = 3894

Denominator = 4382.07

W Statistic = 0.88862 = 3894 / 4382.07

**5% Critical value of 0.958 exceeds 0.88862**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.88862**

**Evidence of non-normality at 99% level of significance**

**Shapiro-Wilks Test of Normality**

**Parameter: Fluoride**

**All Locations**

**Normality Test of Parameter Concentrations**

**Natural Logarithm Transformation**

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

K = 12 for 24 measurements

Sum of b values = 1.60284

Sample Standard Deviation = 0.486839

W Statistic = 0.471283

**5% Critical value of 0.916 exceeds 0.471283**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.884 exceeds 0.471283**

**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**

**Parameter: Nickel**

**All Locations**

**Normality Test of Parameter Concentrations**

**Natural Logarithm Transformation**

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

Total Number of Measurements = 55

Data Set Standard Deviation = 1.06581

Numerator = 2334.14

Denominator = 2988.28

W Statistic = 0.781098 = 2334.14 / 2988.28

**5% Critical value of 0.958 exceeds 0.781098**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.781098**

**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**

**Parameter: Sulfate**

**All Locations**

**Normality Test of Parameter Concentrations**

**Natural Logarithm Transformation**

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

**Total Number of Measurements = 51**

Data Set Standard Deviation = 1.084

Numerator = 2223.53

Denominator = 2627.09

W Statistic = 0.846386 = 2223.53 / 2627.09

**5% Critical value of 0.954 exceeds 0.846386**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.935 exceeds 0.846386**

**Evidence of non-normality at 99% level of significance**

**Shapiro-Francia Test of Normality**

**Parameter: Zinc**

**All Locations**

**Normality Test of Parameter Concentrations**

**Natural Logarithm Transformation**

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

**Total Number of Measurements = 55**

Data Set Standard Deviation = 0.727919

Numerator = 989.742

Denominator = 1393.88

W Statistic = 0.710062 = 989.742 / 1393.88

**5% Critical value of 0.958 exceeds 0.710062**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.94 exceeds 0.710062**

**Evidence of non-normality at 99% level of significance**

## **Shapiro-Wilks Test of Normality**

**Parameter: Barium**

**Location: MW-1**

**Normality Test of Parameter Concentrations**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

K = 9 for 19 measurements

Sum of b values = 0.0604534

Sample Standard Deviation = 0.0188228

W Statistic = 0.573061

**5% Critical value of 0.901 exceeds 0.573061**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.863 exceeds 0.573061**

**Evidence of non-normality at 99% level of significance**

## **Shapiro-Wilks Test of Normality**

**Parameter: Cobalt**

**Location: MW-1**

**Normality Test of Parameter Concentrations**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

K = 9 for 19 measurements

Sum of b values = 0.0357622

Sample Standard Deviation = 0.0085766

W Statistic = 0.965931

5% Critical value of 0.901 is less than 0.965931

Data is normally distributed at 95% level of significance

1% Critical value of 0.863 is less than 0.965931

Data is normally distributed at 99% level of significance

## **Shapiro-Wilks Test of Normality**

**Parameter: Nickel**

**Location: MW-1**

**Normality Test of Parameter Concentrations**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

K = 9 for 19 measurements

Sum of b values = 0.154723

Sample Standard Deviation = 0.0537691

W Statistic = 0.460013

**5% Critical value of 0.901 exceeds 0.460013**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.863 exceeds 0.460013**

**Evidence of non-normality at 99% level of significance**



## **Shapiro-Wilks Test of Normality**

**Parameter: Barium**

**Location: MW-1**

**Normality Test of Parameter Concentrations**

**Natural Logarithm Transformation**

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

K = 9 for 19 measurements

Sum of b values = 1.69017

Sample Standard Deviation = 0.463266

W Statistic = 0.739482

**5% Critical value of 0.901 exceeds 0.739482**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.863 exceeds 0.739482**

**Evidence of non-normality at 99% level of significance**

## **Shapiro-Wilks Test of Normality**

**Parameter: Nickel**

**Location: MW-1**

**Normality Test of Parameter Concentrations**

**Natural Logarithm Transformation**

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

K = 9 for 19 measurements

Sum of b values = 3.26092

Sample Standard Deviation = 1.0047

W Statistic = 0.585241

**5% Critical value of 0.901 exceeds 0.585241**

**Evidence of non-normality at 95% level of significance**

**1% Critical value of 0.863 exceeds 0.585241**

**Evidence of non-normality at 99% level of significance**

## Parametric Prediction Interval Analysis

### Intra-Well Comparison for MW-1

Parameter: Arsenic

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

### Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	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
	9/14/2011	0.091
	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

From 18 baseline samples

Baseline mean = 0.0652222

Baseline std Dev = 0.0213848

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 = 18 (background observations) - 1

$t(0.95, 18) = 1.73961$

---

Date	Samples	Mean	Interval	Significant
9/28/2017	1	0.0199	[0, 0.103443]	FALSE

## Parametric Prediction Interval Analysis

### Intra-Well Comparison for MW-1

Parameter: Cobalt

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

### Intra-Well Unified Guid. Formula 95% One-Sided Comparison

Baseline Samples	Date	Result
	4/19/2008	0.032
	1/21/2009	0.03
	4/9/2009	0.043
	5/19/2009	0.056
	7/16/2010	0.035
	2/8/2011	0.031
	9/14/2011	0.029
	2/17/2012	0.026
	7/31/2012	0.028
	3/27/2013	0.036
	12/23/2013	0.028
	6/26/2014	0.036
	11/21/2014	0.046
	5/28/2015	0.041
	11/11/2015	0.0257
	5/9/2016	0.0417
	11/10/2016	0.0196
	6/8/2017	0.0342

From 18 baseline samples

Baseline mean = 0.0343444

Baseline std Dev = 0.00871255

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 = 18 (background observations) - 1

$t(0.95, 18) = 1.73961$

---

Date	Samples	Mean	Interval	Significant
9/28/2017	1	0.0403	[0, 0.0499162	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 = 66.6667%

Future Samples (k) = 1

Recent Dates = 1

Baseline Measurements (n) = 18

**Maximum Baseline Concentration = 0.2**

Confidence Level = 94.7%

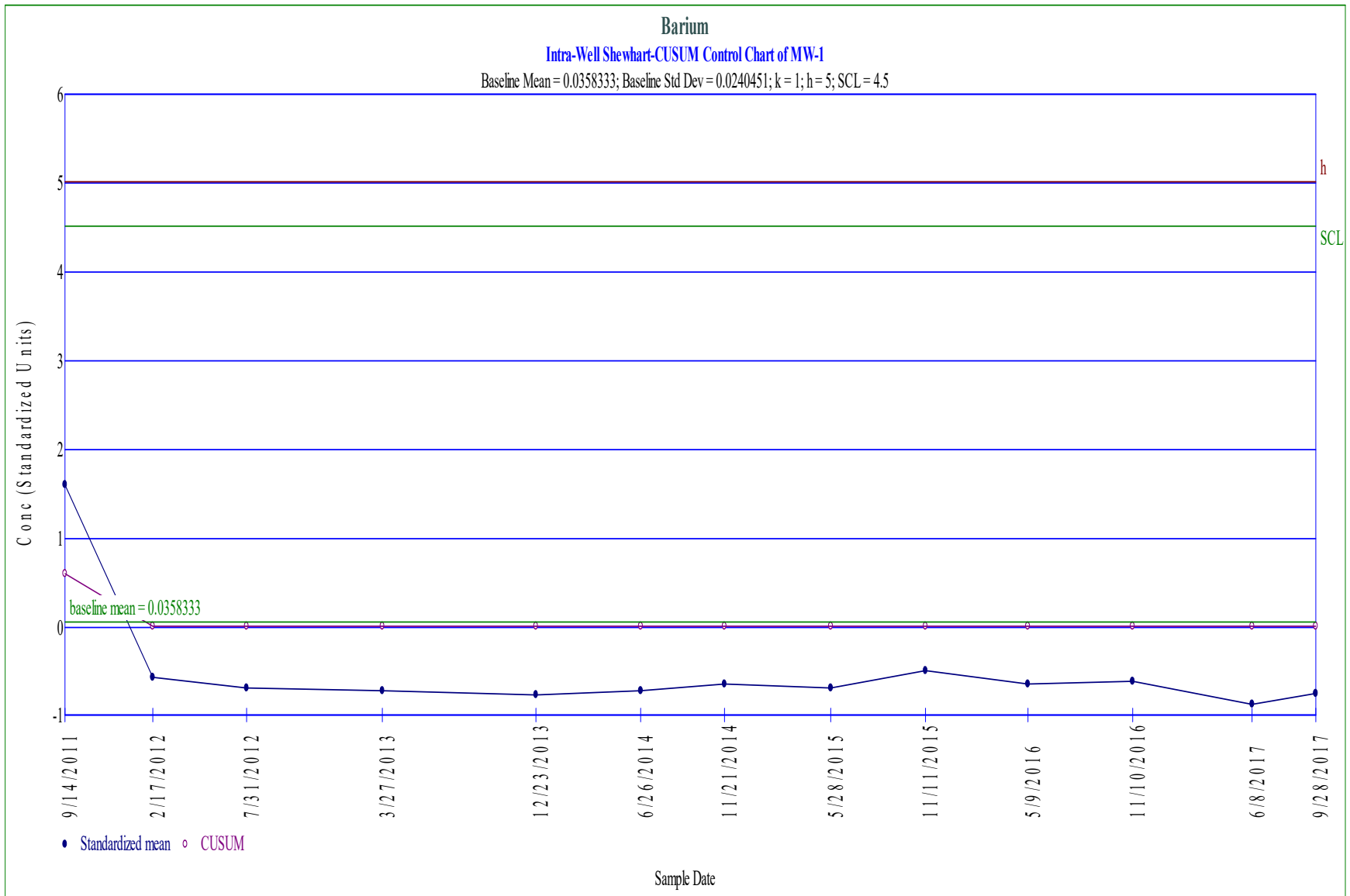
False Positive Rate = 5.3%

---

Baseline Measurements	Date	Value
	4/19/2008	ND<0.02
	1/21/2009	ND<0.02
	4/9/2009	0.2
	5/19/2009	0.17
	7/16/2010	ND<0.02
	2/8/2011	ND<0.02
	9/14/2011	ND<0.02
	2/17/2012	ND<0.02
	7/31/2012	ND<0.02
	3/27/2013	ND<0.02
	12/23/2013	ND<0.02
	6/26/2014	ND<0.02
	11/21/2014	ND<0.02
	5/28/2015	ND<0.02
	11/11/2015	0.0112
	5/9/2016	0.00512
	11/10/2016	0.0112
	6/8/2017	0.00418

---

Date	Count	Mean	Significant
9/28/2017	1	0.00445	FALSE



**Non-Parametric Prediction Interval**  
**Inter-Well Comparison**  
**Parameter: Cadmium**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 92.4528%

Number of comparisons = 3

Future Samples (k) = 3

Recent Dates = 1

Background Measurements (n) = 18

**Maximum Background Value = 0.001**

Confidence Level = 85.7%

False Positive Rate = 14.3%

---

<b>Location</b>	<b>Date</b>	<b>Count</b>	<b>Mean</b>	<b>Significant</b>
<b>MW-3</b>	<b>9/28/2017</b>	<b>1</b>	<b>0.00926</b>	<b>TRUE</b>
MW-4	9/28/2017	1	0.001	FALSE
MW-5	9/28/2017	1	0.001	FALSE

---

## Non-Parametric Prediction Interval

### Inter-Well Comparison

Parameter: Cobalt

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total Percent Non-Detects = 56.3636%

Number of comparisons = 3

Future Samples (k) = 3

Recent Dates = 1

Background Measurements (n) = 19

Maximum Background Value = 0.056

Confidence Level = 86.4%

False Positive Rate = 13.6%

---

Location	Date	Count	Mean	Significant
MW-3	9/28/2017	1	0.002	FALSE
MW-4	9/28/2017	1	0.002	FALSE
MW-5	9/28/2017	1	0.00223	FALSE

---



**Non-Parametric Prediction Interval**  
**Inter-Well Comparison**  
**Parameter: Fluoride**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 83.3333%

Number of comparisons = 3

Future Samples (k) = 3

Recent Dates = 1

Background Measurements (n) = 8

**Maximum Background Value = 0.178**

Confidence Level = 72.7%

False Positive Rate = 27.3%

---

<b>Location</b>	<b>Date</b>	<b>Count</b>	<b>Mean</b>	<b>Significant</b>
<b>MW-3</b>	<b>9/28/2017</b>	<b>1</b>	<b>0.226</b>	<b>TRUE</b>
MW-4	9/28/2017	1	0.1	FALSE
MW-5	9/28/2017	1	0.1	FALSE

---

**Non-Parametric Prediction Interval**  
**Inter-Well Comparison**  
**Parameter: Nickel**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 72.7273%

Number of comparisons = 3

Future Samples (k) = 3

Recent Dates = 1

Background Measurements (n) = 19

**Maximum Background Value = 0.2**

Confidence Level = 86.4%

False Positive Rate = 13.6%

---

<b>Location</b>	<b>Date</b>	<b>Count</b>	<b>Mean</b>	<b>Significant</b>
MW-3	9/28/2017	1	0.002	FALSE
MW-4	9/28/2017	1	0.002	FALSE
MW-5	9/28/2017	1	0.00515	FALSE

---

**Non-Parametric Prediction Interval**  
**Inter-Well Comparison**  
**Parameter: Zinc**  
**Original Data (Not Transformed)**  
**Non-Detects Replaced with Detection Limit**

Total Percent Non-Detects = 52.7273%

Number of comparisons = 3

Future Samples (k) = 3

Recent Dates = 1

Background Measurements (n) = 19

**Maximum Background Value = 0.0281**

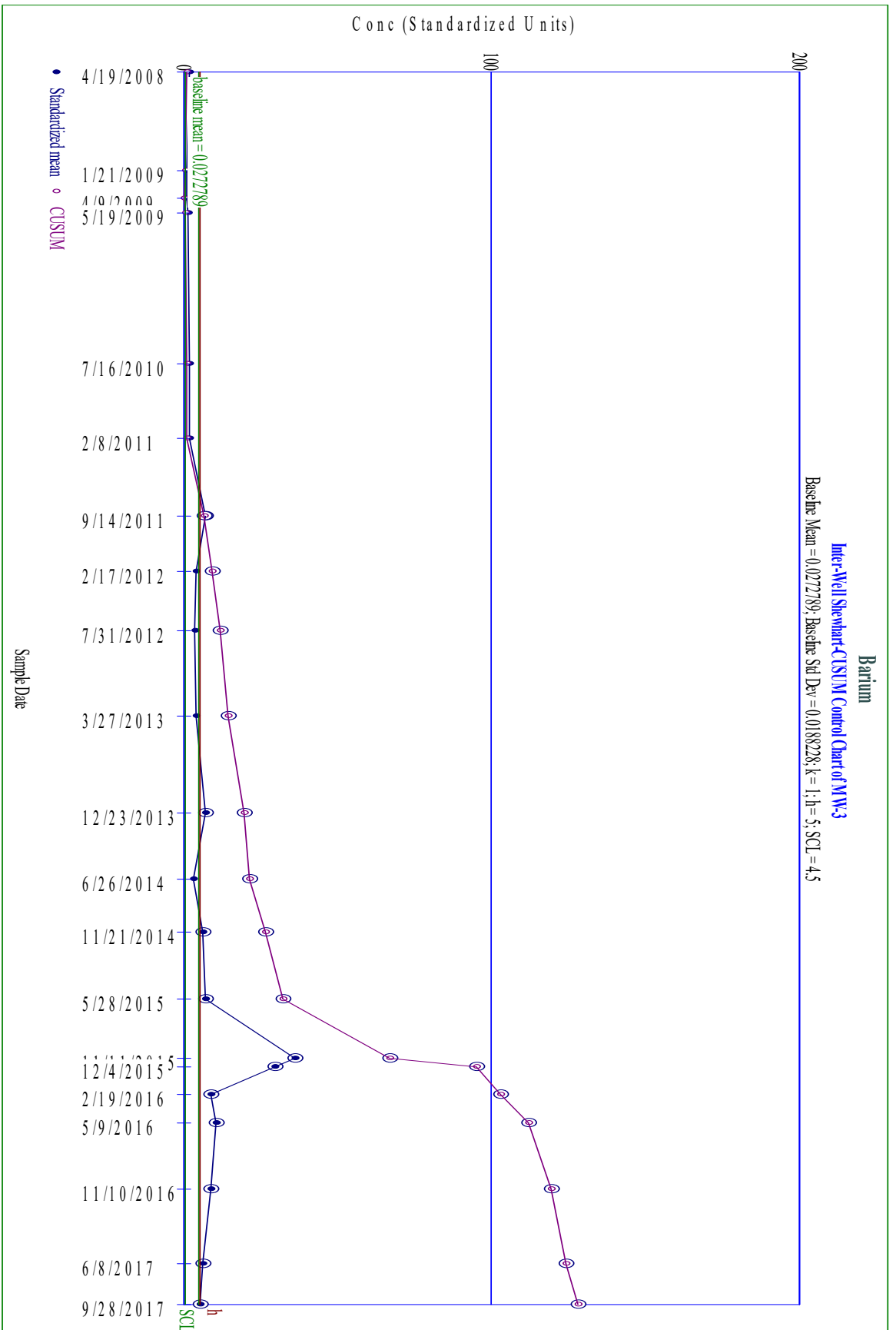
Confidence Level = 86.4%

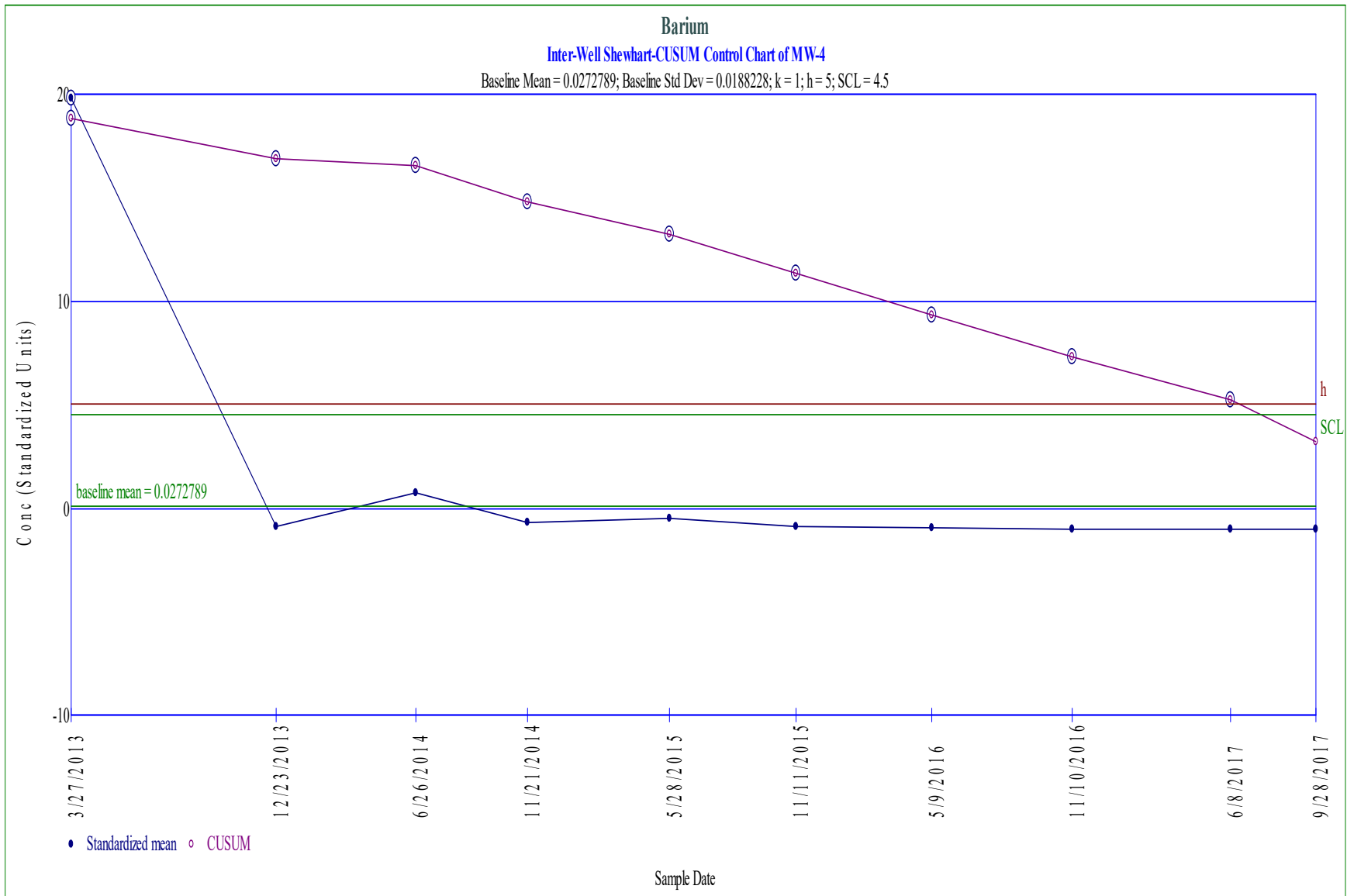
False Positive Rate = 13.6%

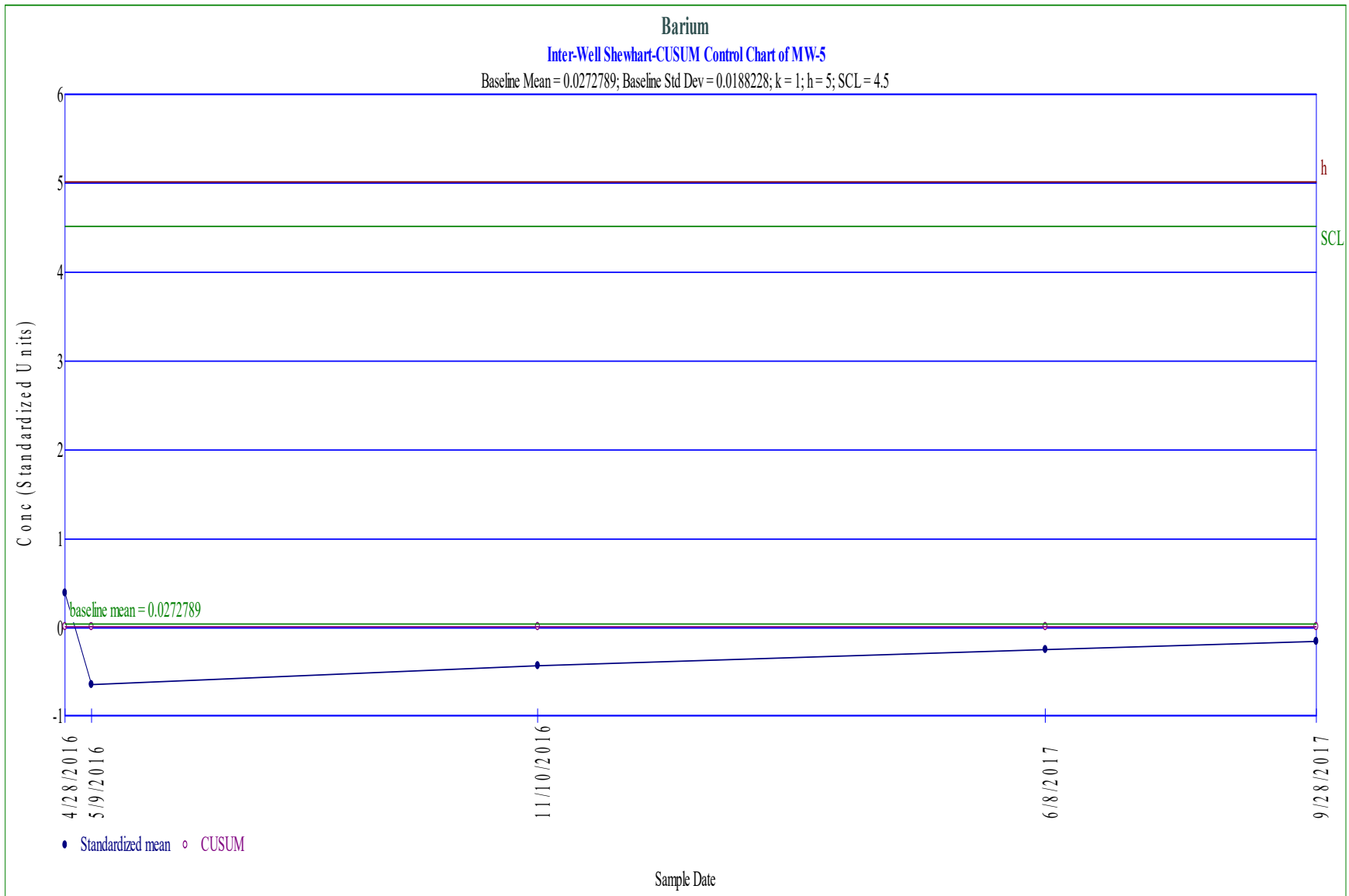
---

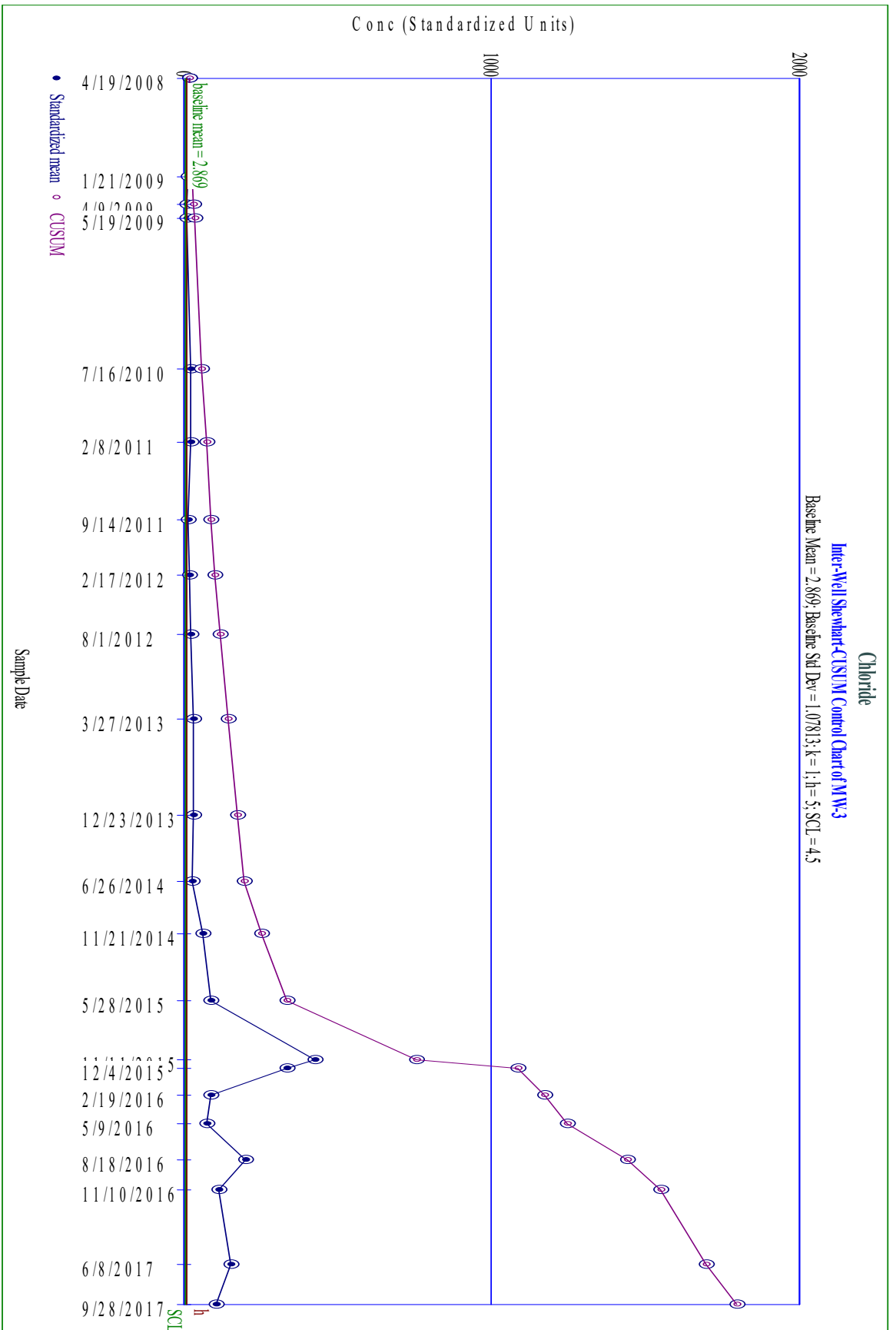
<b>Location</b>	<b>Date</b>	<b>Count</b>	<b>Mean</b>	<b>Significant</b>
<b>MW-3</b>	<b>9/28/2017</b>	<b>1</b>	<b>0.0439</b>	<b>TRUE</b>
MW-4	9/28/2017	1	0.025	FALSE
MW-5	9/28/2017	1	0.025	FALSE

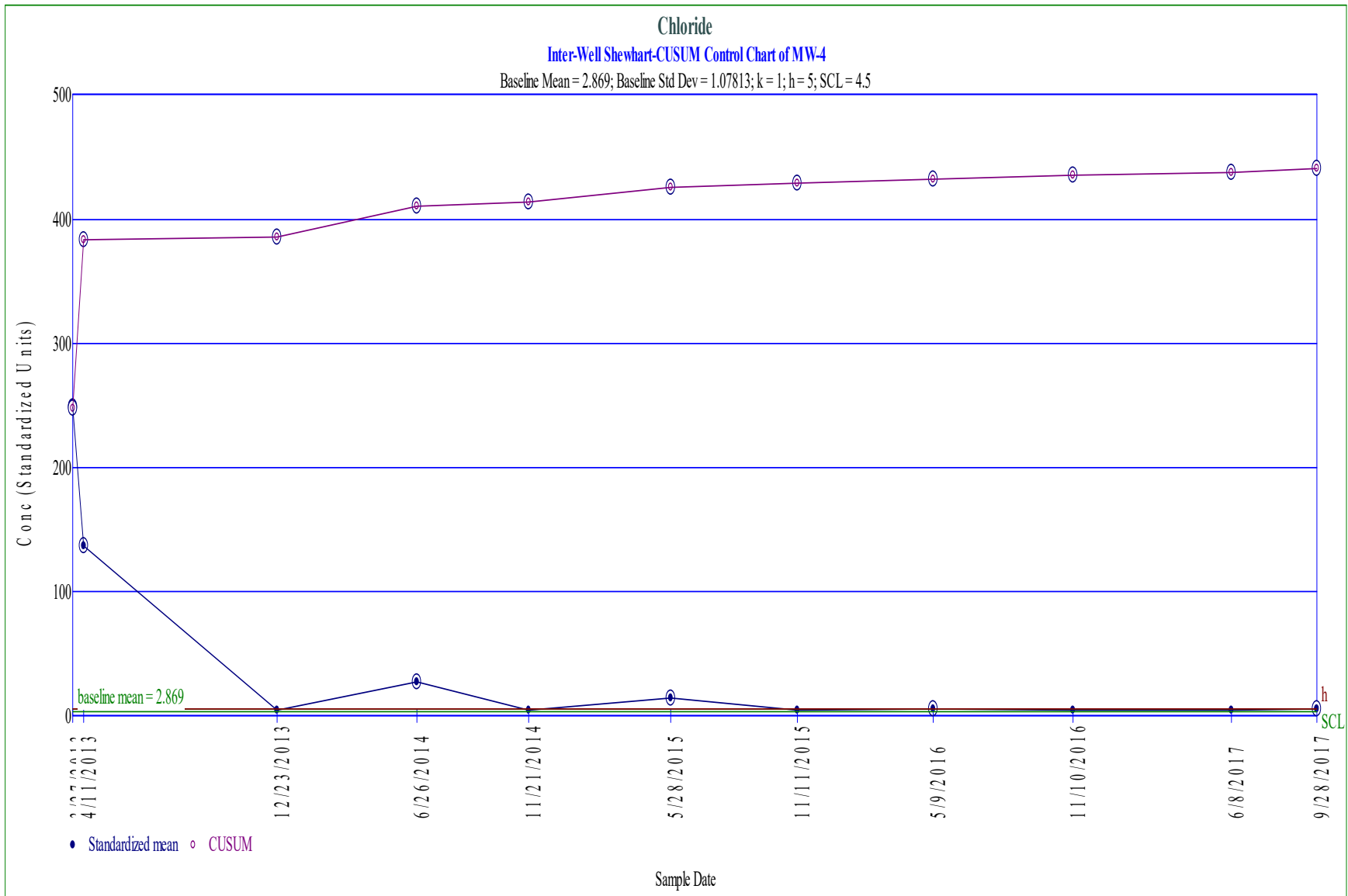
---



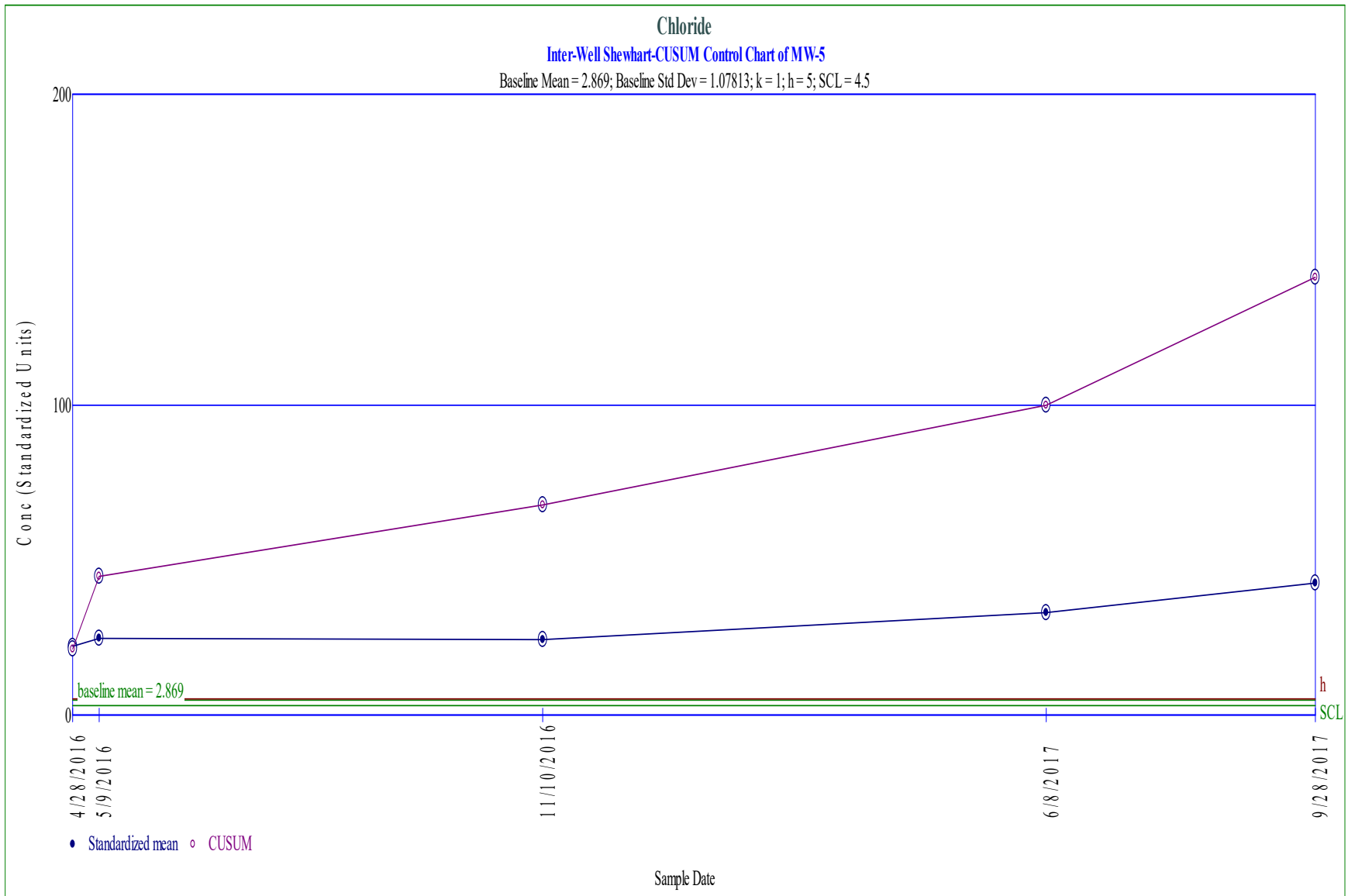


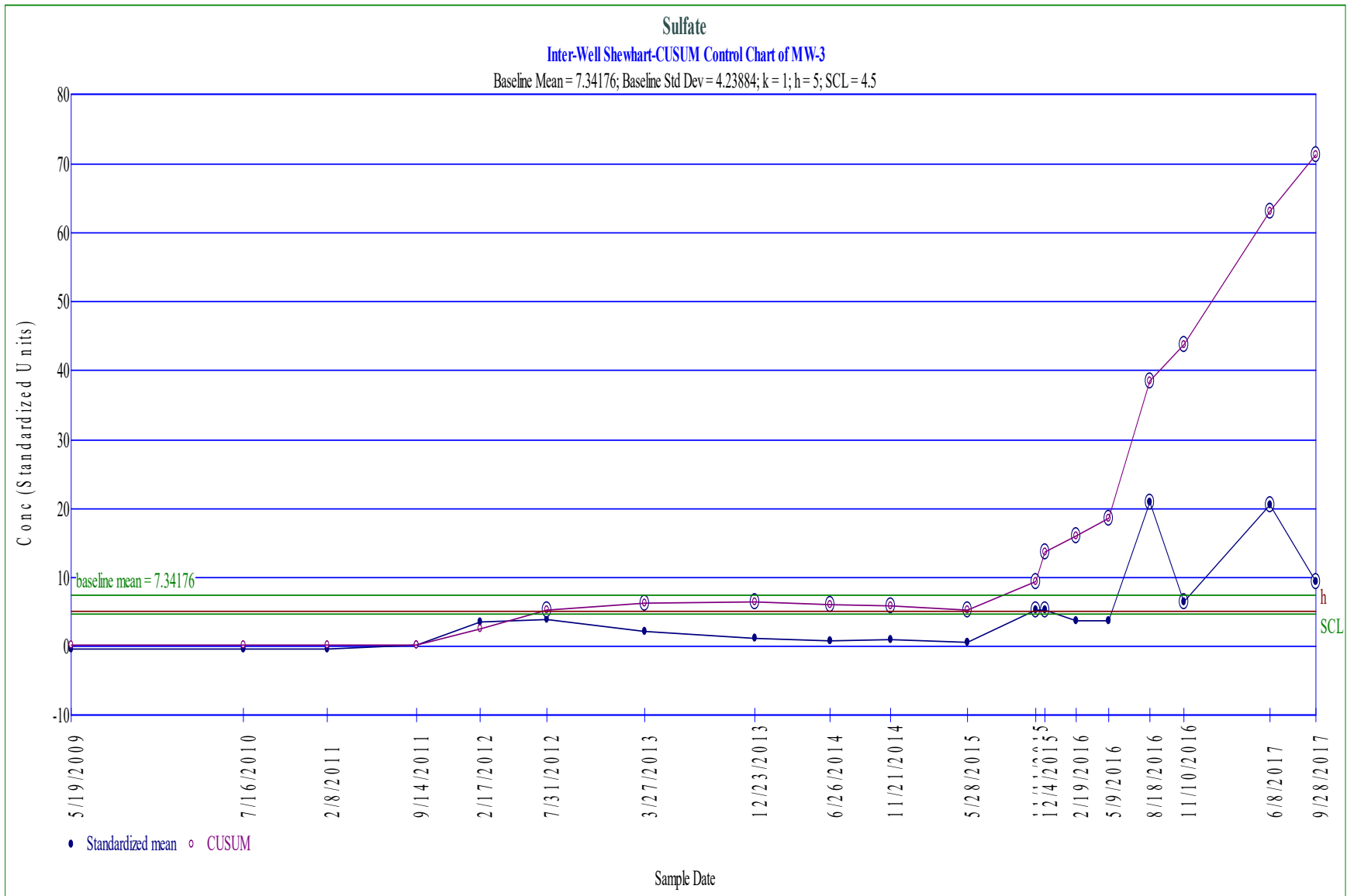












## Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Barium

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0

Non detect rank is 5

---

### Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	0.084	26
	1/21/2009	0.028	15
	4/9/2009	0.028	16
	5/19/2009	0.033	17
	7/16/2010	0.021	11
	2/8/2011	0.021	12
	9/14/2011	0.074	24
	2/17/2012	0.022	13
	7/31/2012	0.019	7
	3/27/2013	0.018	4
	12/23/2013	0.017	2
	6/26/2014	0.018	5
	11/21/2014	0.02	8
	5/28/2015	0.0188	6
	11/11/2015	0.0237	14
	5/9/2016	0.02	9
	11/10/2016	0.0207	10
6/8/2017	0.0146	1	
9/28/2017	0.0175	3	
MW-3	4/19/2008	0.056	23
	1/21/2009	0.039	18
	4/9/2009	0.043	19
	5/19/2009	0.047	20
	7/16/2010	0.055	22
	2/8/2011	0.052	21
	9/14/2011	0.15	33
	2/17/2012	0.097	29
	7/31/2012	0.091	27
	3/27/2013	0.094	28
12/23/2013	0.15	34	

6/26/2014	0.079	25
11/21/2014	0.14	32
5/28/2015	0.152	35
11/11/2015	0.701	40
12/4/2015	0.579	39
2/19/2016	0.186	36
5/9/2016	0.218	38
11/10/2016	0.188	37
6/8/2017	0.134	31
9/28/2017	0.125	30

---

The Wilcoxon Statistic is 386

The Expected value is 199.5

The Standard Deviation is 36.9222

The Z Score is 5.03762

The Standard Deviation adjusted for ties is 36.9222

The Z Score adjusted for ties is 5.03762

**5.03762 > 2.326 indicating statistical significance at 1% level**

**5.03762 > 2.326 indicating statistical significance at 1% level when adjusted for ties**

## Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Cadmium

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 34

Non detect rank is 17.5

---

### Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	ND<0.0005	17.5
	1/21/2009	ND<0.0005	17.5
	4/9/2009	ND<0.0005	17.5
	5/19/2009	ND<0.0005	17.5
	7/16/2010	ND<0.0005	17.5
	2/8/2011	ND<0.0005	17.5
	9/14/2011	ND<0.0005	17.5
	2/17/2012	ND<0.0005	17.5
	7/31/2012	ND<0.0005	17.5
	12/23/2013	ND<0.0005	17.5
	6/26/2014	ND<0.0005	17.5
	11/21/2014	ND<0.001	17.5
	5/28/2015	ND<0.001	17.5
	11/11/2015	ND<0.001	17.5
	5/9/2016	ND<0.001	17.5
	11/10/2016	ND<0.001	17.5
6/8/2017	ND<0.001	17.5	
9/28/2017	ND<0.001	17.5	
MW-3	1/21/2009	ND<0.0005	17.5
	4/9/2009	ND<0.0005	17.5
	5/19/2009	ND<0.0005	17.5
	7/16/2010	ND<0.0005	17.5
	2/8/2011	ND<0.0005	17.5
	9/14/2011	ND<0.0005	17.5
	2/17/2012	ND<0.0005	17.5
	7/31/2012	ND<0.0005	17.5
	12/23/2013	ND<0.0005	17.5
	6/26/2014	ND<0.0005	17.5
11/21/2014	ND<0.001	17.5	
5/28/2015	ND<0.001	17.5	

11/11/2015	ND<0.001	17.5
12/4/2015	ND<0.001	17.5
2/19/2016	ND<0.001	17.5
5/9/2016	ND<0.001	17.5
11/10/2016	0.00177	35
6/8/2017	0.0286	38
8/8/2017	0.0113	37
9/28/2017	0.00926	36

---

The Wilcoxon Statistic is 216

The Expected value is 180

The Standard Deviation is 34.2053

The Z Score is 1.03785

The Standard Deviation adjusted for ties is 18.2234

The Z Score adjusted for ties is 1.94805

1.03785 < 2.326 indicating no statistical significance at 1% level

1.94805 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

## Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Chloride

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0

Non detect rank is 17.5

---

### Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	2	4
	1/21/2009	2.9	13
	4/9/2009	1.9	3
	5/19/2009	2.8	11
	7/16/2010	2.8	12
	2/8/2011	2.6	10
	9/14/2011	3.1	15
	2/17/2012	2.1	6
	7/31/2012	2.2	8
	3/27/2013	1.8	2
	12/23/2013	1.5	1
	6/26/2014	2.9	14
	11/21/2014	3.9	16
	5/28/2015	2.01	5
	11/11/2015	3.97	17
	5/9/2016	2.12	7
	8/18/2016	2.4	9
	11/10/2016	4.59	19
6/8/2017	5.68	20	
9/28/2017	4.11	18	
MW-3	4/19/2008	20	26
	1/21/2009	14	23
	4/9/2009	8.2	21
	5/19/2009	10	22
	7/16/2010	25	27
	2/8/2011	25	28
	9/14/2011	15	24
	2/17/2012	18	25
8/1/2012	25	29	
3/27/2013	32	31	

12/23/2013	35	32
6/26/2014	29	30
11/21/2014	65	33
5/28/2015	92.8	35
11/11/2015	458	42
12/4/2015	360	41
2/19/2016	96.1	36
5/9/2016	80.7	34
8/18/2016	218	40
11/10/2016	120	38
6/8/2017	163	39
9/28/2017	112	37

---

The Wilcoxon Statistic is 440

The Expected value is 220

The Standard Deviation is 39.7073

The Z Score is 5.52796

The Standard Deviation adjusted for ties is 39.7073

The Z Score adjusted for ties is 5.52796

**5.52796 > 2.326 indicating statistical significance at 1% level**

**5.52796 > 2.326 indicating statistical significance at 1% level when adjusted for ties**



## Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Chloride

Location: MW-4

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0

Non detect rank is 17.5

---

### Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	2	4
	1/21/2009	2.9	13
	4/9/2009	1.9	3
	5/19/2009	2.8	11
	7/16/2010	2.8	12
	2/8/2011	2.6	10
	9/14/2011	3.1	15
	2/17/2012	2.1	6
	7/31/2012	2.2	8
	3/27/2013	1.8	2
	12/23/2013	1.5	1
	6/26/2014	2.9	14
	11/21/2014	3.9	16
	5/28/2015	2.01	5
	11/11/2015	3.97	17
	5/9/2016	2.12	7
	8/18/2016	2.4	9
	11/10/2016	4.59	19
	6/8/2017	5.68	20
	9/28/2017	4.11	18
MW-4	3/27/2013	270	31
	4/11/2013	150	30
	12/23/2013	6.4	21
	6/26/2014	31	29
	11/21/2014	6.7	24
	5/28/2015	17.5	28
	11/11/2015	7.34	25
	5/9/2016	7.91	27
	11/10/2016	6.61	22
	6/8/2017	6.67	23

The Wilcoxon Statistic is 220

The Expected value is 110

The Standard Deviation is 24.2212

The Z Score is 4.52083

The Standard Deviation adjusted for ties is 24.2212

The Z Score adjusted for ties is 4.52083

**4.52083 > 2.326 indicating statistical significance at 1% level**

**4.52083 > 2.326 indicating statistical significance at 1% level when adjusted for ties**

## Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Chloride

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 0

Non detect rank is 17.5

---

### Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	2	4
	1/21/2009	2.9	13
	4/9/2009	1.9	3
	5/19/2009	2.8	11
	7/16/2010	2.8	12
	2/8/2011	2.6	10
	9/14/2011	3.1	15
	2/17/2012	2.1	6
	7/31/2012	2.2	8
	3/27/2013	1.8	2
	12/23/2013	1.5	1
	6/26/2014	2.9	14
	11/21/2014	3.9	16
	5/28/2015	2.01	5
	11/11/2015	3.97	17
	5/9/2016	2.12	7
	8/18/2016	2.4	9
	11/10/2016	4.59	19
	6/8/2017	5.68	20
9/28/2017	4.11	18	
MW-5	4/28/2016	26.6	21
	5/9/2016	29.4	23
	11/10/2016	28.6	22
	6/8/2017	38.4	24
	9/28/2017	48.7	25

---

The Wilcoxon Statistic is 100

The Expected value is 50

The Standard Deviation is 14.7196

The Z Score is 3.36286

The Standard Deviation adjusted for ties is 14.7196

The Z Score adjusted for ties is 3.36286

**3.36286 > 2.326 indicating statistical significance at 1% level**

**3.36286 > 2.326 indicating statistical significance at 1% level when adjusted for ties**

## Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Fluoride

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 11

Non detect rank is 6

---

### Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	ND<0.1	6
	1/21/2009	ND<0.1	6
	4/9/2009	ND<0.1	6
	5/19/2009	ND<0.1	6
	5/9/2016	ND<0.1	6
	11/10/2016	ND<0.1	6
	6/8/2017	0.178	13
9/28/2017	ND<0.1	6	
MW-3	1/21/2009	ND<0.1	6
	4/9/2009	ND<0.1	6
	5/19/2009	ND<0.1	6
	5/9/2016	0.105	12
	11/10/2016	ND<0.1	6
	6/8/2017	0.208	14
	9/28/2017	0.226	15

---

The Wilcoxon Statistic is 37

The Expected value is 28

The Standard Deviation is 8.64099

The Z Score is 0.983684

The Standard Deviation adjusted for ties is 6.733

The Z Score adjusted for ties is 1.26244

0.983684 < 2.326 indicating no statistical significance at 1% level

1.26244 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

## Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Sulfate

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 9

Non detect rank is 5

---

### Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	5/19/2009	8.9	17
	7/16/2010	9.4	20
	2/8/2011	5.8	13
	9/14/2011	6.6	15
	2/17/2012	ND<5	5
	7/31/2012	ND<5	5
	3/27/2013	5.1	11
	12/23/2013	6.1	14
	6/26/2014	ND<5	5
	11/21/2014	9.1	19
	5/28/2015	ND<5	5
	11/11/2015	18.8	26
	5/9/2016	ND<5	5
	8/18/2016	3.51	10
	11/10/2016	16.5	25
6/8/2017	ND<5	5	
9/28/2017	ND<5	5	
MW-3	5/19/2009	ND<5	5
	7/16/2010	5.1	12
	2/8/2011	ND<5	5
	9/14/2011	7.3	16
	2/17/2012	22	27
	7/31/2012	23	30
	3/27/2013	16	24
	12/23/2013	12	23
	6/26/2014	9.7	21
	11/21/2014	11	22
	5/28/2015	9.09	18
	11/11/2015	29.3	32
12/4/2015	29.1	31	

2/19/2016	22.2	28
5/9/2016	22.3	29
8/18/2016	95.7	36
11/10/2016	34	33
6/8/2017	93.7	35
9/28/2017	46.2	34

---

The Wilcoxon Statistic is 271

The Expected value is 161.5

The Standard Deviation is 31.5581

The Z Score is 3.45394

The Standard Deviation adjusted for ties is 31.3135

The Z Score adjusted for ties is 3.48093

**3.45394 > 2.326 indicating statistical significance at 1% level**

**3.48093 > 2.326 indicating statistical significance at 1% level when adjusted for ties**

## Wilcoxon Non-Parametric Analysis (Inter-Well)

Parameter: Zinc

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Total non detects is 18

Non detect rank is 9.5

---

### Wilcoxon Ranks

Location	Date	Conc.	Rank
MW-1	4/19/2008	0.011	19
	1/21/2009	0.015	26
	4/9/2009	0.011	20
	5/19/2009	0.021	32
	7/16/2010	0.011	21
	2/8/2011	0.016	29
	9/14/2011	0.022	33
	2/17/2012	ND<0.01	9.5
	7/31/2012	0.023	34
	3/27/2013	0.012	23
	12/23/2013	ND<0.01	9.5
	6/26/2014	ND<0.01	9.5
	11/21/2014	ND<0.025	9.5
	5/28/2015	ND<0.025	9.5
	11/11/2015	ND<0.025	9.5
	5/9/2016	0.0281	37
	11/10/2016	ND<0.025	9.5
6/8/2017	ND<0.025	9.5	
9/28/2017	ND<0.025	9.5	
MW-3	4/19/2008	0.017	31
	1/21/2009	0.015	27
	4/9/2009	0.011	22
	5/19/2009	0.031	38
	7/16/2010	0.015	28
	2/8/2011	0.013	24
	9/14/2011	0.024	36
	2/17/2012	0.014	25
	7/31/2012	0.016	30
	3/27/2013	ND<0.01	9.5
	12/23/2013	ND<0.01	9.5



6/26/2014	0.023	35
11/21/2014	ND<0.025	9.5
5/28/2015	ND<0.025	9.5
11/11/2015	ND<0.025	9.5
12/4/2015	ND<0.025	9.5
2/19/2016	ND<0.025	9.5
5/9/2016	ND<0.025	9.5
11/10/2016	ND<0.025	9.5
6/8/2017	0.0769	40
9/28/2017	0.0439	39

---

The Wilcoxon Statistic is 229.5

The Expected value is 199.5

The Standard Deviation is 36.9222

The Z Score is 0.798977

The Standard Deviation adjusted for ties is 35.2041

The Z Score adjusted for ties is 0.83797

0.798977 < 2.326 indicating no statistical significance at 1% level

0.83797 < 2.326 indicating no statistical significance at 1% level when adjusted for ties

## Mann-Kendall Trend Analysis

**Parameter: Barium**

**Location: MW-3**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic =  $164 - 45 = 119$

---

<b>Tied Group</b>	<b>Value</b>	<b>Members</b>
1	0.15	2

---

<b>Time Period</b>	<b>Observations</b>
4/19/2008	1
1/21/2009	1
4/9/2009	1
5/19/2009	1
7/16/2010	1
2/8/2011	1
9/14/2011	1
2/17/2012	1
7/31/2012	1
3/27/2013	1
12/23/2013	1
6/26/2014	1
11/21/2014	1
5/28/2015	1
11/11/2015	1
12/4/2015	1
2/19/2016	1
5/9/2016	1
11/10/2016	1
6/8/2017	1
9/28/2017	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 = 3.56486

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

**3.56486 > 1.65463 indicating an upward 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 =  $8 - 37 = -29$

Comparing at 95% confidence level (downward trend)

Probability of obtaining  $S \geq 29$  is 0.0046

**$S < 0$  and  $0.0046 < 0.05$  indicating a downward 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 =  $6 - 4 = 2$

Comparing at  $1.0 - (0.05 / 2) = 97.5\%$  confidence level (two-tailed)

Probability of obtaining  $S \geq |2|$  is 0.816

0.816  $\geq$  0.025 indicating no evidence of a trend

## Mann-Kendall Trend Analysis

Parameter: Cadmium

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic =  $127 - 3 = 124$

---

Tied Group	Value	Members
1	0.0005	10
2	0.001	6

---

Time Period	Observations
1/21/2009	1
4/9/2009	1
5/19/2009	1
7/16/2010	1
2/8/2011	1
9/14/2011	1
2/17/2012	1
7/31/2012	1
12/23/2013	1
6/26/2014	1
11/21/2014	1
5/28/2015	1
11/11/2015	1
12/4/2015	1
2/19/2016	1
5/9/2016	1
11/10/2016	1
6/8/2017	1
8/8/2017	1
9/28/2017	1

There are 0 time periods with multiple data

---

A = 2760

B = 0

C = 840

D = 0

E = 120

F = 0

a = 17100

b = 61560

c = 760

Group Variance = 796.667

Z-Score = 4.35779

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

**4.35779 > 1.65463 indicating an upward 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 =  $195 - 33 = 162$

---

<b>Tied Group</b>	<b>Value</b>	<b>Members</b>
1	25	3

---

<b>Time Period</b>	<b>Observations</b>
4/19/2008	1
1/21/2009	1
4/9/2009	1
5/19/2009	1
7/16/2010	1
2/8/2011	1
9/14/2011	1
2/17/2012	1
8/1/2012	1
3/27/2013	1
12/23/2013	1
6/26/2014	1
11/21/2014	1
5/28/2015	1
11/11/2015	1
12/4/2015	1
2/19/2016	1
5/9/2016	1
8/18/2016	1
11/10/2016	1
6/8/2017	1
9/28/2017	1

There are 0 time periods with multiple data

---

A = 66

B = 0

C = 6

D = 0

E = 6



$$F = 0$$

$$a = 22638$$

$$b = 83160$$

$$c = 924$$

$$\text{Group Variance} = 1254$$

$$\text{Z-Score} = 4.5465$$

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

**4.5465 > 1.65463 indicating an upward 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 = 17 - 38 = -21

---

Tied Group Value	Members
<b>Time Period</b>	<b>Observations</b>
3/27/2013	1
4/11/2013	1
12/23/2013	1
6/26/2014	1
11/21/2014	1
5/28/2015	1
11/11/2015	1
5/9/2016	1
11/10/2016	1
6/8/2017	1
9/28/2017	1

There are 0 time periods with multiple data

---

A = 0

B = 0

C = 0

D = 0

E = 0

F = 0

a = 2970

b = 8910

c = 220

Group Variance = 165

Z-Score = -1.557

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

$|-1.557| \leq 1.97737$  indicating no evidence of a 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 =  $9 - 1 = 8$

Comparing at  $1.0 - (0.05 / 2) = 97.5\%$  confidence level (two-tailed)

Probability of obtaining  $S \geq |8|$  is 0.084

0.084  $\geq$  0.025 indicating no evidence of a trend

## Mann-Kendall Trend Analysis

Parameter: Cobalt

Location: MW-5

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic = 2 - 8 = -6

Comparing at  $1.0 - (0.05 / 2) = 97.5\%$  confidence level (two-tailed)

Probability of obtaining  $S \geq |-6|$  is 0.234

0.234  $\geq$  0.025 indicating no evidence of a trend

## **Mann-Kendall Trend Analysis**

**Parameter: Fluoride**

**Location: MW-3**

**Original Data (Not Transformed)**

**Non-Detects Replaced with Detection Limit**

95% Confidence Level

S Statistic =  $14 - 1 = 13$

Comparing at  $1.0 - (0.05 / 2) = 97.5\%$  confidence level (two-tailed)

Probability of obtaining  $S \geq |13|$  is 0.07

0.07  $\geq$  0.025 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 = 6 - 122 = -116

---

<b>Tied Group</b>	<b>Value</b>	<b>Members</b>
1	0.02	13
2	0.01	2
3	0.002	3

---

<b>Time Period</b>	<b>Observations</b>
4/19/2008	1
1/21/2009	1
4/9/2009	1
5/19/2009	1
7/16/2010	1
2/8/2011	1
9/14/2011	1
2/17/2012	1
7/31/2012	1
3/27/2013	1
12/23/2013	1
6/26/2014	1
11/21/2014	1
5/28/2015	1
11/11/2015	1
12/4/2015	1
2/19/2016	1
5/9/2016	1
11/10/2016	1
6/8/2017	1
9/28/2017	1

There are 0 time periods with multiple data

---

A = 4920

B = 0

C = 1722

D = 0

E = 164

F = 0

a = 19740

b = 71820

c = 840

Group Variance = 823.333

Z-Score = -4.00784

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

**-4.00784 < -1.65463 indicating a downward 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 = 5 - 5 = 0

Comparing at  $1.0 - (0.05 / 2) = 97.5\%$  confidence level (two-tailed)

Probability of obtaining  $S \geq |0|$  is 1.184

1.184  $\geq 0.025$  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 =  $139 - 31 = 108$

---

Tied Group	Value	Members
1	5	2

---

Time Period	Observations
5/19/2009	1
7/16/2010	1
2/8/2011	1
9/14/2011	1
2/17/2012	1
7/31/2012	1
3/27/2013	1
12/23/2013	1
6/26/2014	1
11/21/2014	1
5/28/2015	1
11/11/2015	1
12/4/2015	1
2/19/2016	1
5/9/2016	1
8/18/2016	1
11/10/2016	1
6/8/2017	1
9/28/2017	1

There are 0 time periods with multiple data

---

A = 18

B = 0

C = 0

D = 0

E = 2

F = 0

a = 14706

b = 52326

$c = 684$

Group Variance = 816

Z-Score = 3.74575

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

**3.74575 > 1.65463 indicating an upward trend**

## Mann-Kendall Trend Analysis

Parameter: Zinc

Location: MW-3

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

95% Confidence Level

S Statistic =  $141 - 46 = 95$

---

Tied Group	Value	Members
1	0.015	2
2	0.01	2
3	0.025	7

---

Time Period	Observations
4/19/2008	1
1/21/2009	1
4/9/2009	1
5/19/2009	1
7/16/2010	1
2/8/2011	1
9/14/2011	1
2/17/2012	1
7/31/2012	1
3/27/2013	1
12/23/2013	1
6/26/2014	1
11/21/2014	1
5/28/2015	1
11/11/2015	1
12/4/2015	1
2/19/2016	1
5/9/2016	1
11/10/2016	1
6/8/2017	1
9/28/2017	1

There are 0 time periods with multiple data

---

A = 834

B = 0

C = 210

D = 0

$E = 46$

$F = 0$

$a = 19740$

$b = 71820$

$c = 840$

Group Variance = 1050.33

Z-Score = 2.90044

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

**2.90044 > 1.65463 indicating an upward trend**

---

**APPENDIX C**  
**LABORATORY ANALYTICAL REPORT &**  
**FIELD INFORMATION LOGS**

---

October 13, 2017

## Civil & Environmental Consultants - TN

Sample Delivery Group: L939886  
Samples Received: 09/29/2017  
Project Number: 171-873  
Description: EWS Landfill

Report To: Matt Turner  
325 Seaboard Lane, Suite 170  
Franklin, TN 37067

Entire Report Reviewed By:



Jimmy Hunt

Technical Service Representative

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 ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



<b>Cp: Cover Page</b>	<b>1</b>	<b>1</b> Cp
<b>Tc: Table of Contents</b>	<b>2</b>	<b>2</b> Tc
<b>Ss: Sample Summary</b>	<b>3</b>	<b>3</b> Ss
<b>Cn: Case Narrative</b>	<b>8</b>	<b>4</b> Cn
<b>Sr: Sample Results</b>	<b>9</b>	<b>5</b> Sr
MW-1 L939886-01	9	
MW-1 (LAB FILTER) L939886-02	12	
MW-3 L939886-03	13	
MW-3 (LAB FILTER) L939886-04	16	
MW-4 L939886-05	17	<b>6</b> Qc
MW-4 (LAB FILTER) L939886-06	20	
MW-5 L939886-07	21	<b>7</b> Gl
MW-5 (LAB FILTER) L939886-08	24	<b>8</b> Al
TMW-1 L939886-09	25	
TMW-1 (LAB FILTER) L939886-10	28	
TMW-2 L939886-11	29	
TMW-2 (LAB FILTER) L939886-12	32	
TMW-3 L939886-13	33	
TMW-3 (LAB FILTER) L939886-14	36	
DUPLICATE L939886-15	37	
DUPLICATE (LAB FILTER) L939886-16	40	
FIELD BLANK L939886-17	41	
FIELD BLANK (LAB FILTER) L939886-18	44	
TRIP BLANK L939886-19	45	<b>9</b> Sc
<b>Qc: Quality Control Summary</b>	<b>46</b>	
Wet Chemistry by Method 2320 B-2011	46	
Wet Chemistry by Method 350.1	48	
Wet Chemistry by Method 410.4	49	
Wet Chemistry by Method 9056A	50	
Mercury by Method 7470A	54	
Metals (ICP) by Method 6010B	56	
Metals (ICPMS) by Method 6020	58	
Volatile Organic Compounds (GC/MS) by Method 8260B	62	
EDB / DBCP by Method 8011	65	
<b>Gl: Glossary of Terms</b>	<b>66</b>	
<b>Al: Accreditations &amp; Locations</b>	<b>67</b>	
<b>Sc: Sample Chain of Custody</b>	<b>68</b>	

# SAMPLE SUMMARY



## MW-1 L939886-01 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 08:45  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1029205	1	10/09/17 13:51	10/09/17 13:51	MCG
Wet Chemistry by Method 350.1	WG1027294	1	10/05/17 16:38	10/05/17 16:38	JER
Wet Chemistry by Method 410.4	WG1028352	20	10/05/17 16:53	10/05/17 20:37	MZ
Wet Chemistry by Method 9056A	WG1025962	1	09/29/17 18:30	09/29/17 18:30	MAJ
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:07	ABL
Mercury by Method 7470A	WG1027480	1	10/04/17 00:52	10/04/17 10:18	EL
Metals (ICP) by Method 6010B	WG1029498	1	10/09/17 17:43	10/10/17 08:45	TRB
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:05	TRB
Metals (ICPMS) by Method 6020	WG1027779	1	10/05/17 14:08	10/07/17 20:53	LAT
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:19	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 03:12	10/04/17 03:12	LRL
EDB / DBCP by Method 8011	WG1026739	1	10/02/17 10:01	10/03/17 18:56	HMH

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

## MW-1 (LAB FILTER) L939886-02 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 08:45  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:14	ABL
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:08	TRB
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:22	JPD

## MW-3 L939886-03 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 12:30  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1029205	1	10/09/17 13:57	10/09/17 13:57	MCG
Wet Chemistry by Method 350.1	WG1027294	1	10/05/17 16:41	10/05/17 16:41	JER
Wet Chemistry by Method 410.4	WG1028352	1	10/05/17 16:53	10/05/17 20:37	MZ
Wet Chemistry by Method 9056A	WG1025962	1	09/29/17 18:59	09/29/17 18:59	MAJ
Wet Chemistry by Method 9056A	WG1025962	5	09/29/17 19:14	09/29/17 19:14	MAJ
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:16	ABL
Mercury by Method 7470A	WG1027480	1	10/04/17 00:52	10/04/17 10:25	EL
Metals (ICP) by Method 6010B	WG1029498	1	10/09/17 17:43	10/10/17 08:53	TRB
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:10	TRB
Metals (ICPMS) by Method 6020	WG1027779	1	10/05/17 14:08	10/07/17 20:56	LAT
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:26	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 03:29	10/04/17 03:29	LRL
EDB / DBCP by Method 8011	WG1026739	1.01	10/02/17 10:01	10/03/17 19:07	HMH

## MW-3 (LAB FILTER) L939886-04 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 12:30  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:18	ABL
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:18	TRB
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:37	JPD



# SAMPLE SUMMARY



## MW-4 L939886-05 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 12:00  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1029205	1	10/09/17 14:03	10/09/17 14:03	MCG
Wet Chemistry by Method 350.1	WG1027294	1	10/05/17 16:44	10/05/17 16:44	JER
Wet Chemistry by Method 410.4	WG1028352	1	10/05/17 16:53	10/05/17 20:37	MZ
Wet Chemistry by Method 9056A	WG1025962	1	09/29/17 19:29	09/29/17 19:29	MAJ
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:21	ABL
Mercury by Method 7470A	WG1027480	1	10/04/17 00:52	10/04/17 10:27	EL
Metals (ICP) by Method 6010B	WG1029498	1	10/09/17 17:43	10/10/17 08:55	TRB
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:21	TRB
Metals (ICPMS) by Method 6020	WG1027779	1	10/05/17 14:08	10/07/17 21:00	LAT
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:40	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 03:47	10/04/17 03:47	LRL
EDB / DBCP by Method 8011	WG1026739	1.01	10/02/17 10:01	10/03/17 19:18	HMH

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## MW-4 (LAB FILTER) L939886-06 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 12:00  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:23	ABL
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:24	TRB
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:44	JPD

## MW-5 L939886-07 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 09:45  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1029205	1	10/09/17 14:08	10/09/17 14:08	MCG
Wet Chemistry by Method 350.1	WG1027294	1	10/05/17 16:46	10/05/17 16:46	JER
Wet Chemistry by Method 410.4	WG1028352	1	10/05/17 16:53	10/05/17 20:38	MZ
Wet Chemistry by Method 9056A	WG1025962	1	09/29/17 19:44	09/29/17 19:44	MAJ
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:25	ABL
Mercury by Method 7470A	WG1027480	1	10/04/17 00:52	10/04/17 10:29	EL
Metals (ICP) by Method 6010B	WG1029498	1	10/09/17 17:43	10/10/17 08:58	TRB
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:26	TRB
Metals (ICPMS) by Method 6020	WG1027779	1	10/05/17 14:08	10/07/17 21:03	LAT
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:47	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 04:05	10/04/17 04:05	LRL
EDB / DBCP by Method 8011	WG1026739	1.01	10/02/17 10:01	10/03/17 19:29	HMH

## MW-5 (LAB FILTER) L939886-08 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 09:45  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:27	ABL
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:29	TRB
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:51	JPD

# SAMPLE SUMMARY



## TMW-1 L939886-09 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 10:30  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1029205	1	10/09/17 14:14	10/09/17 14:14	MCG
Wet Chemistry by Method 350.1	WG1027294	1	10/05/17 16:47	10/05/17 16:47	JER
Wet Chemistry by Method 410.4	WG1028352	1	10/05/17 16:53	10/05/17 20:38	MZ
Wet Chemistry by Method 9056A	WG1025962	1	09/29/17 19:59	09/29/17 19:59	MAJ
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:34	ABL
Mercury by Method 7470A	WG1027480	1	10/04/17 00:52	10/04/17 10:31	EL
Metals (ICP) by Method 6010B	WG1029498	1	10/09/17 17:43	10/10/17 09:01	TRB
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:32	TRB
Metals (ICPMS) by Method 6020	WG1027779	1	10/05/17 14:08	10/07/17 21:14	LAT
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:54	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 04:22	10/04/17 04:22	LRL
EDB / DBCP by Method 8011	WG1026739	1	10/02/17 10:01	10/03/17 19:40	HMH

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## TMW-1 (LAB FILTER) L939886-10 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 10:30  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:36	ABL
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:34	TRB
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 17:58	JPD

## TMW-2 L939886-11 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 11:00  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1029205	1	10/09/17 14:55	10/09/17 14:55	MCG
Wet Chemistry by Method 350.1	WG1027294	1	10/05/17 16:54	10/05/17 16:54	JER
Wet Chemistry by Method 410.4	WG1028352	1	10/05/17 16:53	10/05/17 20:38	MZ
Wet Chemistry by Method 9056A	WG1026070	1	09/29/17 14:58	09/29/17 14:58	MAJ
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:39	ABL
Mercury by Method 7470A	WG1027480	1	10/04/17 00:52	10/04/17 10:34	EL
Metals (ICP) by Method 6010B	WG1029498	1	10/09/17 17:43	10/10/17 09:03	TRB
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:37	TRB
Metals (ICPMS) by Method 6020	WG1027779	1	10/05/17 14:08	10/07/17 21:17	LAT
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 18:01	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 04:40	10/04/17 04:40	LRL
EDB / DBCP by Method 8011	WG1026739	1.01	10/02/17 10:01	10/03/17 19:52	HMH

## TMW-2 (LAB FILTER) L939886-12 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 11:00  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:41	ABL
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:40	TRB
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 18:05	JPD

# SAMPLE SUMMARY



## TMW-3 L939886-13 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 11:30  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1029205	1	10/09/17 15:03	10/09/17 15:03	MCG
Wet Chemistry by Method 350.1	WG1027294	1	10/05/17 16:55	10/05/17 16:55	JER
Wet Chemistry by Method 410.4	WG1028352	1	10/05/17 16:53	10/05/17 20:38	MZ
Wet Chemistry by Method 9056A	WG1026070	1	09/29/17 15:57	09/29/17 15:57	MAJ
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:43	ABL
Mercury by Method 7470A	WG1027480	1	10/04/17 00:52	10/04/17 10:36	EL
Metals (ICP) by Method 6010B	WG1029498	1	10/09/17 17:43	10/10/17 09:06	TRB
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:42	TRB
Metals (ICPMS) by Method 6020	WG1027779	1	10/05/17 14:08	10/07/17 21:21	LAT
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 18:09	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 04:57	10/04/17 04:57	LRL
EDB / DBCP by Method 8011	WG1026739	1	10/02/17 10:01	10/03/17 20:03	HMH

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## TMW-3 (LAB FILTER) L939886-14 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 11:30  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:45	ABL
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:53	TRB
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 18:19	JPD

## DUPLICATE L939886-15 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 00:00  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1029205	1	10/09/17 15:30	10/09/17 15:30	MCG
Wet Chemistry by Method 350.1	WG1027294	1	10/05/17 16:57	10/05/17 16:57	JER
Wet Chemistry by Method 410.4	WG1028352	1	10/05/17 16:53	10/05/17 20:38	MZ
Wet Chemistry by Method 9056A	WG1026070	1	09/29/17 16:12	09/29/17 16:12	MAJ
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:48	ABL
Mercury by Method 7470A	WG1027480	1	10/04/17 00:52	10/04/17 10:38	EL
Metals (ICP) by Method 6010B	WG1029498	1	10/09/17 17:43	10/10/17 09:09	TRB
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:56	TRB
Metals (ICPMS) by Method 6020	WG1027779	1	10/05/17 14:08	10/07/17 21:25	LAT
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 18:23	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 05:15	10/04/17 05:15	LRL
EDB / DBCP by Method 8011	WG1026739	1	10/02/17 10:01	10/03/17 20:14	HMH

## DUPLICATE (LAB FILTER) L939886-16 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 00:00  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:50	ABL
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 14:58	TRB
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 18:26	JPD

# SAMPLE SUMMARY



## FIELD BLANK L939886-17 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 13:10  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1027215	1	10/06/17 07:51	10/06/17 07:51	MCG
Wet Chemistry by Method 350.1	WG1027294	1	10/05/17 16:59	10/05/17 16:59	JER
Wet Chemistry by Method 410.4	WG1028352	1	10/05/17 16:53	10/05/17 20:39	MZ
Wet Chemistry by Method 9056A	WG1026070	1	09/29/17 16:27	09/29/17 16:27	MAJ
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:52	ABL
Mercury by Method 7470A	WG1027480	1	10/04/17 00:52	10/04/17 10:47	EL
Metals (ICP) by Method 6010B	WG1029498	1	10/09/17 17:43	10/10/17 09:11	TRB
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 13:50	TRB
Metals (ICPMS) by Method 6020	WG1027779	1	10/05/17 14:08	10/07/17 21:28	LAT
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 18:30	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 05:33	10/04/17 05:33	LRL
EDB / DBCP by Method 8011	WG1026739	1	10/02/17 10:01	10/03/17 20:36	HMH

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## FIELD BLANK (LAB FILTER) L939886-18 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 13:10  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026603	1	10/04/17 12:28	10/05/17 11:54	ABL
Metals (ICP) by Method 6010B	WG1029540	1	10/10/17 08:33	10/10/17 15:01	TRB
Metals (ICPMS) by Method 6020	WG1027937	1	10/05/17 15:54	10/12/17 18:33	JPD

## TRIP BLANK L939886-19 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 00:00  
Received date/time 09/29/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 00:32	10/04/17 00:32	LRL



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. 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.

Jimmy Hunt  
Technical Service Representative

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



## Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Alkalinity	35.6		20.0	1	10/09/2017 13:51	<a href="#">WG1029205</a>

## Sample Narrative:

L939886-01 WG1029205: Endpoint pH 4.5

## Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Ammonia Nitrogen	ND		0.100	1	10/05/2017 16:38	<a href="#">WG1027294</a>

## Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
COD	ND		200	20	10/05/2017 20:37	<a href="#">WG1028352</a>

## Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Bromide	ND		1.00	1	09/29/2017 18:30	<a href="#">WG1025962</a>
Chloride	4.11		1.00	1	09/29/2017 18:30	<a href="#">WG1025962</a>
Fluoride	ND		0.100	1	09/29/2017 18:30	<a href="#">WG1025962</a>
Nitrate	ND		0.100	1	09/29/2017 18:30	<a href="#">WG1025962</a>
Sulfate	ND		5.00	1	09/29/2017 18:30	<a href="#">WG1025962</a>

## Mercury by Method 7470A

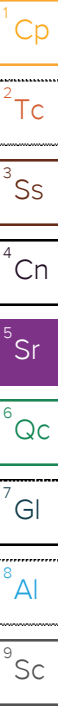
Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Mercury	ND		0.000200	1	10/04/2017 10:18	<a href="#">WG1027480</a>
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:07	<a href="#">WG1026603</a>

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Boron	ND		0.200	1	10/10/2017 08:45	<a href="#">WG1029498</a>
Boron,Dissolved	ND		0.200	1	10/10/2017 14:05	<a href="#">WG1029540</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Aluminum	ND		0.100	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Antimony	ND		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Arsenic	0.0199		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Arsenic,Dissolved	0.0405		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Barium	0.0175		0.00500	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Barium,Dissolved	0.0178		0.00500	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Beryllium	ND		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Cadmium	ND		0.00100	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Calcium	3.18		1.00	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Calcium,Dissolved	4.22		1.00	1	10/12/2017 17:19	<a href="#">WG1027937</a>





Collected date/time: 09/28/17 08:45

L939886

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	ND		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Cobalt	0.0403		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Cobalt,Dissolved	0.0460		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Copper	ND		0.00500	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Iron	13.4		0.100	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Iron,Dissolved	14.6		0.100	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Lead	ND		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Magnesium	2.47		1.00	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Magnesium,Dissolved	3.10		1.00	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Manganese	0.904		0.00500	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Manganese,Dissolved	0.916		0.00500	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Nickel	0.00445		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Nickel,Dissolved	0.00603		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Potassium	1.37		1.00	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Potassium,Dissolved	1.27	<b>B</b>	1.00	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Selenium	ND		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Silver	ND		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Sodium	3.84		1.00	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Sodium,Dissolved	4.03		1.00	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Thallium	ND		0.00200	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Vanadium	ND		0.00500	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:19	<a href="#">WG1027937</a>
Zinc	ND		0.0250	1	10/07/2017 20:53	<a href="#">WG1027779</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 17:19	<a href="#">WG1027937</a>

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	10/04/2017 03:12	<a href="#">WG1026488</a>
Acrylonitrile	ND		0.0100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Benzene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Bromochloromethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Bromodichloromethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Bromoform	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Bromomethane	ND		0.00500	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Carbon disulfide	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Carbon tetrachloride	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Chlorobenzene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Chlorodibromomethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Chloroethane	ND		0.00500	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Chloroform	ND		0.00500	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Chloromethane	ND		0.00250	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Dibromomethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>



Collected date/time: 09/28/17 08:45

L939886

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Ethylbenzene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
2-Hexanone	ND		0.0100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Iodomethane	ND		0.0100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Methylene Chloride	ND		0.00500	1	10/04/2017 03:12	<a href="#">WG1026488</a>
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Styrene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Tetrachloroethene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Toluene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Trichloroethene	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 03:12	<a href="#">WG1026488</a>
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Vinyl acetate	ND		0.0100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Vinyl chloride	ND		0.00100	1	10/04/2017 03:12	<a href="#">WG1026488</a>
Xylenes, Total	ND		0.00300	1	10/04/2017 03:12	<a href="#">WG1026488</a>
<i>(S) Toluene-d8</i>	107		80.0-120		10/04/2017 03:12	<a href="#">WG1026488</a>
<i>(S) Dibromofluoromethane</i>	91.9		76.0-123		10/04/2017 03:12	<a href="#">WG1026488</a>
<i>(S) a,a,a-Trifluorotoluene</i>	103		80.0-120		10/04/2017 03:12	<a href="#">WG1026488</a>
<i>(S) 4-Bromofluorobenzene</i>	95.8		80.0-120		10/04/2017 03:12	<a href="#">WG1026488</a>

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		0.0000100	1	10/03/2017 18:56	<a href="#">WG1026739</a>
1,2-Dibromo-3-Chloropropane	ND		0.0000200	1	10/03/2017 18:56	<a href="#">WG1026739</a>





Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:14	<a href="#">WG1026603</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/10/2017 14:08	<a href="#">WG1029540</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Barium,Dissolved	0.0154		0.00500	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Calcium,Dissolved	2.96		1.00	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Cobalt,Dissolved	0.0380		0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Iron,Dissolved	6.93		0.100	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Magnesium,Dissolved	2.38		1.00	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Manganese,Dissolved	0.799		0.00500	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Nickel,Dissolved	0.00534	<u>B</u>	0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Potassium,Dissolved	1.24		1.00	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Sodium,Dissolved	3.84		1.00	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:22	<a href="#">WG1027937</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 17:22	<a href="#">WG1027937</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



## Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Alkalinity	34.9		20.0	1	10/09/2017 13:57	<a href="#">WG1029205</a>

## Sample Narrative:

L939886-03 WG1029205: Endpoint pH 4.5

## Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Ammonia Nitrogen	0.108		0.100	1	10/05/2017 16:41	<a href="#">WG1027294</a>

## Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
COD	ND		10.0	1	10/05/2017 20:37	<a href="#">WG1028352</a>

## Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Bromide	ND		1.00	1	09/29/2017 18:59	<a href="#">WG1025962</a>
Chloride	112		5.00	5	09/29/2017 19:14	<a href="#">WG1025962</a>
Fluoride	0.226		0.100	1	09/29/2017 18:59	<a href="#">WG1025962</a>
Nitrate	3.62		0.100	1	09/29/2017 18:59	<a href="#">WG1025962</a>
Sulfate	46.2		5.00	1	09/29/2017 18:59	<a href="#">WG1025962</a>

## Mercury by Method 7470A

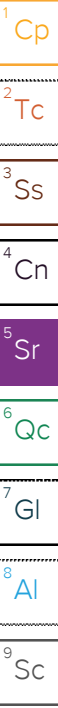
Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Mercury	ND		0.000200	1	10/04/2017 10:25	<a href="#">WG1027480</a>
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:16	<a href="#">WG1026603</a>

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Boron	ND		0.200	1	10/10/2017 08:53	<a href="#">WG1029498</a>
Boron,Dissolved	ND		0.200	1	10/10/2017 14:10	<a href="#">WG1029540</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Aluminum	ND		0.100	1	10/07/2017 20:56	<a href="#">WG1027779</a>
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:26	<a href="#">WG1027937</a>
Antimony	ND		0.00200	1	10/07/2017 20:56	<a href="#">WG1027779</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:26	<a href="#">WG1027937</a>
Arsenic	ND		0.00200	1	10/07/2017 20:56	<a href="#">WG1027779</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 17:26	<a href="#">WG1027937</a>
Barium	0.125		0.00500	1	10/07/2017 20:56	<a href="#">WG1027779</a>
Barium,Dissolved	0.105		0.00500	1	10/12/2017 17:26	<a href="#">WG1027937</a>
Beryllium	ND		0.00200	1	10/07/2017 20:56	<a href="#">WG1027779</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:26	<a href="#">WG1027937</a>
Cadmium	0.00926		0.00100	1	10/07/2017 20:56	<a href="#">WG1027779</a>
Cadmium,Dissolved	0.0104		0.00100	1	10/12/2017 17:26	<a href="#">WG1027937</a>
Calcium	30.9		1.00	1	10/07/2017 20:56	<a href="#">WG1027779</a>
Calcium,Dissolved	24.9		1.00	1	10/12/2017 17:26	<a href="#">WG1027937</a>





Collected date/time: 09/28/17 12:30

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Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	ND		0.00200	1	10/07/2017 20:56	WG1027779
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:26	WG1027937
Cobalt	ND		0.00200	1	10/07/2017 20:56	WG1027779
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 17:26	WG1027937
Copper	ND		0.00500	1	10/07/2017 20:56	WG1027779
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:26	WG1027937
Iron	ND		0.100	1	10/07/2017 20:56	WG1027779
Iron,Dissolved	ND		0.100	1	10/12/2017 17:26	WG1027937
Lead	ND		0.00200	1	10/07/2017 20:56	WG1027779
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:26	WG1027937
Magnesium	13.0		1.00	1	10/07/2017 20:56	WG1027779
Magnesium,Dissolved	10.9		1.00	1	10/12/2017 17:26	WG1027937
Manganese	0.310		0.00500	1	10/07/2017 20:56	WG1027779
Manganese,Dissolved	0.495		0.00500	1	10/12/2017 17:26	WG1027937
Nickel	ND		0.00200	1	10/07/2017 20:56	WG1027779
Nickel,Dissolved	ND		0.00200	1	10/12/2017 17:26	WG1027937
Potassium	24.1		1.00	1	10/07/2017 20:56	WG1027779
Potassium,Dissolved	22.3		1.00	1	10/12/2017 17:26	WG1027937
Selenium	ND		0.00200	1	10/07/2017 20:56	WG1027779
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:26	WG1027937
Silver	ND		0.00200	1	10/07/2017 20:56	WG1027779
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:26	WG1027937
Sodium	43.3		1.00	1	10/07/2017 20:56	WG1027779
Sodium,Dissolved	40.7		1.00	1	10/12/2017 17:26	WG1027937
Thallium	ND		0.00200	1	10/07/2017 20:56	WG1027779
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:26	WG1027937
Vanadium	ND		0.00500	1	10/07/2017 20:56	WG1027779
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:26	WG1027937
Zinc	0.0439		0.0250	1	10/07/2017 20:56	WG1027779
Zinc,Dissolved	0.0334		0.0250	1	10/12/2017 17:26	WG1027937

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	10/04/2017 03:29	WG1026488
Acrylonitrile	ND		0.0100	1	10/04/2017 03:29	WG1026488
Benzene	ND		0.00100	1	10/04/2017 03:29	WG1026488
Bromochloromethane	ND		0.00100	1	10/04/2017 03:29	WG1026488
Bromodichloromethane	ND		0.00100	1	10/04/2017 03:29	WG1026488
Bromoform	ND		0.00100	1	10/04/2017 03:29	WG1026488
Bromomethane	ND		0.00500	1	10/04/2017 03:29	WG1026488
Carbon disulfide	ND		0.00100	1	10/04/2017 03:29	WG1026488
Carbon tetrachloride	ND		0.00100	1	10/04/2017 03:29	WG1026488
Chlorobenzene	ND		0.00100	1	10/04/2017 03:29	WG1026488
Chlorodibromomethane	ND		0.00100	1	10/04/2017 03:29	WG1026488
Chloroethane	ND		0.00500	1	10/04/2017 03:29	WG1026488
Chloroform	ND		0.00500	1	10/04/2017 03:29	WG1026488
Chloromethane	ND		0.00250	1	10/04/2017 03:29	WG1026488
Dibromomethane	ND		0.00100	1	10/04/2017 03:29	WG1026488
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 03:29	WG1026488
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 03:29	WG1026488
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 03:29	WG1026488
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 03:29	WG1026488
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 03:29	WG1026488
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 03:29	WG1026488
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 03:29	WG1026488



Collected date/time: 09/28/17 12:30

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Ethylbenzene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
2-Hexanone	ND		0.0100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Iodomethane	ND		0.0100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Methylene Chloride	ND		0.00500	1	10/04/2017 03:29	<a href="#">WG1026488</a>
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Styrene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Tetrachloroethene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Toluene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Trichloroethene	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 03:29	<a href="#">WG1026488</a>
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Vinyl acetate	ND		0.0100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Vinyl chloride	ND		0.00100	1	10/04/2017 03:29	<a href="#">WG1026488</a>
Xylenes, Total	ND		0.00300	1	10/04/2017 03:29	<a href="#">WG1026488</a>
<i>(S) Toluene-d8</i>	106		80.0-120		10/04/2017 03:29	<a href="#">WG1026488</a>
<i>(S) Dibromofluoromethane</i>	91.7		76.0-123		10/04/2017 03:29	<a href="#">WG1026488</a>
<i>(S) a,a,a-Trifluorotoluene</i>	102		80.0-120		10/04/2017 03:29	<a href="#">WG1026488</a>
<i>(S) 4-Bromofluorobenzene</i>	98.1		80.0-120		10/04/2017 03:29	<a href="#">WG1026488</a>

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		0.0000101	1.01	10/03/2017 19:07	<a href="#">WG1026739</a>
1,2-Dibromo-3-Chloropropane	ND		0.0000202	1.01	10/03/2017 19:07	<a href="#">WG1026739</a>



Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:18	<a href="#">WG1026603</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/10/2017 14:18	<a href="#">WG1029540</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Barium,Dissolved	0.116		0.00500	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Cadmium,Dissolved	0.0102		0.00100	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Calcium,Dissolved	30.6		1.00	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Magnesium,Dissolved	13.2		1.00	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Manganese,Dissolved	0.324		0.00500	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Nickel,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Potassium,Dissolved	23.9		1.00	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Sodium,Dissolved	45.4		1.00	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:37	<a href="#">WG1027937</a>
Zinc,Dissolved	0.0354		0.0250	1	10/12/2017 17:37	<a href="#">WG1027937</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



## Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Alkalinity	20.6	B	20.0	1	10/09/2017 14:03	<a href="#">WG1029205</a>

## Sample Narrative:

L939886-05 WG1029205: Endpoint pH 4.5

## Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Ammonia Nitrogen	ND		0.100	1	10/05/2017 16:44	<a href="#">WG1027294</a>

## Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
COD	ND		10.0	1	10/05/2017 20:37	<a href="#">WG1028352</a>

## Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Bromide	ND		1.00	1	09/29/2017 19:29	<a href="#">WG1025962</a>
Chloride	7.88		1.00	1	09/29/2017 19:29	<a href="#">WG1025962</a>
Fluoride	ND		0.100	1	09/29/2017 19:29	<a href="#">WG1025962</a>
Nitrate	0.571		0.100	1	09/29/2017 19:29	<a href="#">WG1025962</a>
Sulfate	ND		5.00	1	09/29/2017 19:29	<a href="#">WG1025962</a>

## Mercury by Method 7470A

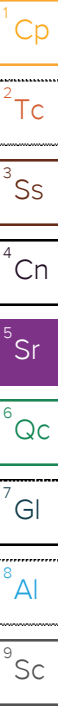
Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Mercury	ND		0.000200	1	10/04/2017 10:27	<a href="#">WG1027480</a>
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:21	<a href="#">WG1026603</a>

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Boron	ND		0.200	1	10/10/2017 08:55	<a href="#">WG1029498</a>
Boron,Dissolved	ND		0.200	1	10/10/2017 14:21	<a href="#">WG1029540</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Aluminum	ND		0.100	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Antimony	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Arsenic	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Barium	0.00788		0.00500	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Barium,Dissolved	0.00697		0.00500	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Beryllium	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Cadmium	ND		0.00100	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Calcium	4.33		1.00	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Calcium,Dissolved	4.11		1.00	1	10/12/2017 17:40	<a href="#">WG1027937</a>





Collected date/time: 09/28/17 12:00

L939886

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Cobalt	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Copper	ND		0.00500	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Iron	0.190		0.100	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Lead	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Magnesium	2.59		1.00	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Magnesium,Dissolved	2.54		1.00	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Manganese	0.0203		0.00500	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Manganese,Dissolved	0.0164		0.00500	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Nickel	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Nickel,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Potassium	1.46		1.00	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Potassium,Dissolved	1.12	<b>B</b>	1.00	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Selenium	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Silver	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Sodium	3.69		1.00	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Sodium,Dissolved	3.84		1.00	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Thallium	ND		0.00200	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Vanadium	ND		0.00500	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:40	<a href="#">WG1027937</a>
Zinc	ND		0.0250	1	10/07/2017 21:00	<a href="#">WG1027779</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 17:40	<a href="#">WG1027937</a>

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	10/04/2017 03:47	<a href="#">WG1026488</a>
Acrylonitrile	ND		0.0100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Benzene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Bromochloromethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Bromodichloromethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Bromoform	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Bromomethane	ND		0.00500	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Carbon disulfide	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Carbon tetrachloride	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Chlorobenzene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Chlorodibromomethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Chloroethane	ND		0.00500	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Chloroform	ND		0.00500	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Chloromethane	ND		0.00250	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Dibromomethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>



Collected date/time: 09/28/17 12:00

L939886

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Ethylbenzene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
2-Hexanone	ND		0.0100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Iodomethane	ND		0.0100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Methylene Chloride	ND		0.00500	1	10/04/2017 03:47	<a href="#">WG1026488</a>
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Styrene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Tetrachloroethene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Toluene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Trichloroethene	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 03:47	<a href="#">WG1026488</a>
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Vinyl acetate	ND		0.0100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Vinyl chloride	ND		0.00100	1	10/04/2017 03:47	<a href="#">WG1026488</a>
Xylenes, Total	ND		0.00300	1	10/04/2017 03:47	<a href="#">WG1026488</a>
<i>(S)</i> Toluene-d8	106		80.0-120		10/04/2017 03:47	<a href="#">WG1026488</a>
<i>(S)</i> Dibromofluoromethane	91.2		76.0-123		10/04/2017 03:47	<a href="#">WG1026488</a>
<i>(S)</i> <i>o,o,a</i> -Trifluorotoluene	103		80.0-120		10/04/2017 03:47	<a href="#">WG1026488</a>
<i>(S)</i> 4-Bromofluorobenzene	98.4		80.0-120		10/04/2017 03:47	<a href="#">WG1026488</a>

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		0.0000101	1.01	10/03/2017 19:18	<a href="#">WG1026739</a>
1,2-Dibromo-3-Chloropropane	ND		0.0000202	1.01	10/03/2017 19:18	<a href="#">WG1026739</a>





Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:23	<a href="#">WG1026603</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/10/2017 14:24	<a href="#">WG1029540</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Barium,Dissolved	0.00712		0.00500	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Calcium,Dissolved	4.19		1.00	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Magnesium,Dissolved	2.56		1.00	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Manganese,Dissolved	0.0140		0.00500	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Nickel,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Potassium,Dissolved	1.28	<u>B</u>	1.00	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Sodium,Dissolved	3.86		1.00	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:44	<a href="#">WG1027937</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 17:44	<a href="#">WG1027937</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



## Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	21.0	B	20.0	1	10/09/2017 14:08	<a href="#">WG1029205</a>

## Sample Narrative:

L939886-07 WG1029205: Endpoint pH 4.5

## Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.100	1	10/05/2017 16:46	<a href="#">WG1027294</a>

## Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	10/05/2017 20:38	<a href="#">WG1028352</a>

## Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	09/29/2017 19:44	<a href="#">WG1025962</a>
Chloride	48.7		1.00	1	09/29/2017 19:44	<a href="#">WG1025962</a>
Fluoride	ND		0.100	1	09/29/2017 19:44	<a href="#">WG1025962</a>
Nitrate	1.07		0.100	1	09/29/2017 19:44	<a href="#">WG1025962</a>
Sulfate	ND		5.00	1	09/29/2017 19:44	<a href="#">WG1025962</a>

## Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/04/2017 10:29	<a href="#">WG1027480</a>
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:25	<a href="#">WG1026603</a>

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/10/2017 08:58	<a href="#">WG1029498</a>
Boron,Dissolved	ND		0.200	1	10/10/2017 14:26	<a href="#">WG1029540</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Antimony	ND		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Arsenic	ND		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Barium	0.0239		0.00500	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Barium,Dissolved	0.0230		0.00500	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Beryllium	ND		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Cadmium	ND		0.00100	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Calcium	13.2		1.00	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Calcium,Dissolved	12.5		1.00	1	10/12/2017 17:47	<a href="#">WG1027937</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 09/28/17 09:45

L939886

## Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	ND		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Cobalt	0.00223		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Cobalt,Dissolved	0.00237		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Copper	ND		0.00500	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Iron	0.161		0.100	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Lead	ND		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Magnesium	7.90		1.00	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Magnesium,Dissolved	8.10		1.00	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Manganese	0.0558		0.00500	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Manganese,Dissolved	0.0659		0.00500	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Nickel	0.00515		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Nickel,Dissolved	0.00563		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Potassium	1.26		1.00	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Potassium,Dissolved	1.29	B	1.00	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Selenium	ND		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Silver	ND		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Sodium	14.0		1.00	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Sodium,Dissolved	14.6		1.00	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Thallium	ND		0.00200	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Vanadium	ND		0.00500	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:47	<a href="#">WG1027937</a>
Zinc	ND		0.0250	1	10/07/2017 21:03	<a href="#">WG1027779</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 17:47	<a href="#">WG1027937</a>

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	10/04/2017 04:05	<a href="#">WG1026488</a>
Acrylonitrile	ND		0.0100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Benzene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Bromochloromethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Bromodichloromethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Bromoform	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Bromomethane	ND		0.00500	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Carbon disulfide	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Carbon tetrachloride	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Chlorobenzene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Chlorodibromomethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Chloroethane	ND		0.00500	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Chloroform	ND		0.00500	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Chloromethane	ND		0.00250	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Dibromomethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>



Collected date/time: 09/28/17 09:45

L939886

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Ethylbenzene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
2-Hexanone	ND		0.0100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Iodomethane	ND		0.0100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Methylene Chloride	ND		0.00500	1	10/04/2017 04:05	<a href="#">WG1026488</a>
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Styrene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Tetrachloroethene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Toluene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Trichloroethene	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 04:05	<a href="#">WG1026488</a>
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Vinyl acetate	ND		0.0100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Vinyl chloride	ND		0.00100	1	10/04/2017 04:05	<a href="#">WG1026488</a>
Xylenes, Total	ND		0.00300	1	10/04/2017 04:05	<a href="#">WG1026488</a>
<i>(S) Toluene-d8</i>	106		80.0-120		10/04/2017 04:05	<a href="#">WG1026488</a>
<i>(S) Dibromofluoromethane</i>	90.5		76.0-123		10/04/2017 04:05	<a href="#">WG1026488</a>
<i>(S) a,a,a-Trifluorotoluene</i>	101		80.0-120		10/04/2017 04:05	<a href="#">WG1026488</a>
<i>(S) 4-Bromofluorobenzene</i>	97.9		80.0-120		10/04/2017 04:05	<a href="#">WG1026488</a>

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		0.0000101	1.01	10/03/2017 19:29	<a href="#">WG1026739</a>
1,2-Dibromo-3-Chloropropane	ND		0.0000202	1.01	10/03/2017 19:29	<a href="#">WG1026739</a>



Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:27	<a href="#">WG1026603</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/10/2017 14:29	<a href="#">WG1029540</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Barium,Dissolved	0.0214		0.00500	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Calcium,Dissolved	12.7		1.00	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Magnesium,Dissolved	7.99		1.00	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Manganese,Dissolved	0.0526		0.00500	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Nickel,Dissolved	0.00549		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Potassium,Dissolved	1.22	<u>B</u>	1.00	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Sodium,Dissolved	14.5		1.00	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:51	<a href="#">WG1027937</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 17:51	<a href="#">WG1027937</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	10/09/2017 14:14	<a href="#">WG1029205</a>

Sample Narrative:

L939886-09 WG1029205: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.100	1	10/05/2017 16:47	<a href="#">WG1027294</a>

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	10/05/2017 20:38	<a href="#">WG1028352</a>

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	09/29/2017 19:59	<a href="#">WG1025962</a>
Chloride	10.4		1.00	1	09/29/2017 19:59	<a href="#">WG1025962</a>
Fluoride	ND		0.100	1	09/29/2017 19:59	<a href="#">WG1025962</a>
Nitrate	1.51		0.100	1	09/29/2017 19:59	<a href="#">WG1025962</a>
Sulfate	ND		5.00	1	09/29/2017 19:59	<a href="#">WG1025962</a>

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/04/2017 10:31	<a href="#">WG1027480</a>
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:34	<a href="#">WG1026603</a>

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/10/2017 09:01	<a href="#">WG1029498</a>
Boron,Dissolved	ND		0.200	1	10/10/2017 14:32	<a href="#">WG1029540</a>

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	0.106		0.100	1	10/07/2017 21:14	<a href="#">WG1027779</a>
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:54	<a href="#">WG1027937</a>
Antimony	ND		0.00200	1	10/07/2017 21:14	<a href="#">WG1027779</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:54	<a href="#">WG1027937</a>
Arsenic	ND		0.00200	1	10/07/2017 21:14	<a href="#">WG1027779</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 17:54	<a href="#">WG1027937</a>
Barium	0.0103		0.00500	1	10/07/2017 21:14	<a href="#">WG1027779</a>
Barium,Dissolved	0.00712		0.00500	1	10/12/2017 17:54	<a href="#">WG1027937</a>
Beryllium	ND		0.00200	1	10/07/2017 21:14	<a href="#">WG1027779</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:54	<a href="#">WG1027937</a>
Cadmium	ND		0.00100	1	10/07/2017 21:14	<a href="#">WG1027779</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 17:54	<a href="#">WG1027937</a>
Calcium	8.03		1.00	1	10/07/2017 21:14	<a href="#">WG1027779</a>
Calcium,Dissolved	7.76		1.00	1	10/12/2017 17:54	<a href="#">WG1027937</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 09/28/17 10:30

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Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	ND		0.00200	1	10/07/2017 21:14	WG1027779
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:54	WG1027937
Cobalt	ND		0.00200	1	10/07/2017 21:14	WG1027779
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 17:54	WG1027937
Copper	ND		0.00500	1	10/07/2017 21:14	WG1027779
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:54	WG1027937
Iron	0.174		0.100	1	10/07/2017 21:14	WG1027779
Iron,Dissolved	ND		0.100	1	10/12/2017 17:54	WG1027937
Lead	ND		0.00200	1	10/07/2017 21:14	WG1027779
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:54	WG1027937
Magnesium	2.17		1.00	1	10/07/2017 21:14	WG1027779
Magnesium,Dissolved	2.08		1.00	1	10/12/2017 17:54	WG1027937
Manganese	0.0537		0.00500	1	10/07/2017 21:14	WG1027779
Manganese,Dissolved	0.0170		0.00500	1	10/12/2017 17:54	WG1027937
Nickel	ND		0.00200	1	10/07/2017 21:14	WG1027779
Nickel,Dissolved	ND		0.00200	1	10/12/2017 17:54	WG1027937
Potassium	1.05		1.00	1	10/07/2017 21:14	WG1027779
Potassium,Dissolved	ND		1.00	1	10/12/2017 17:54	WG1027937
Selenium	ND		0.00200	1	10/07/2017 21:14	WG1027779
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:54	WG1027937
Silver	ND		0.00200	1	10/07/2017 21:14	WG1027779
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:54	WG1027937
Sodium	3.21		1.00	1	10/07/2017 21:14	WG1027779
Sodium,Dissolved	3.14	B	1.00	1	10/12/2017 17:54	WG1027937
Thallium	ND		0.00200	1	10/07/2017 21:14	WG1027779
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:54	WG1027937
Vanadium	ND		0.00500	1	10/07/2017 21:14	WG1027779
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:54	WG1027937
Zinc	ND		0.0250	1	10/07/2017 21:14	WG1027779
Zinc,Dissolved	ND		0.0250	1	10/12/2017 17:54	WG1027937

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	10/04/2017 04:22	WG1026488
Acrylonitrile	ND		0.0100	1	10/04/2017 04:22	WG1026488
Benzene	ND		0.00100	1	10/04/2017 04:22	WG1026488
Bromochloromethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
Bromodichloromethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
Bromoform	ND		0.00100	1	10/04/2017 04:22	WG1026488
Bromomethane	ND		0.00500	1	10/04/2017 04:22	WG1026488
Carbon disulfide	ND		0.00100	1	10/04/2017 04:22	WG1026488
Carbon tetrachloride	ND		0.00100	1	10/04/2017 04:22	WG1026488
Chlorobenzene	ND		0.00100	1	10/04/2017 04:22	WG1026488
Chlorodibromomethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
Chloroethane	ND		0.00500	1	10/04/2017 04:22	WG1026488
Chloroform	ND		0.00500	1	10/04/2017 04:22	WG1026488
Chloromethane	ND		0.00250	1	10/04/2017 04:22	WG1026488
Dibromomethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 04:22	WG1026488
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 04:22	WG1026488
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 04:22	WG1026488
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 04:22	WG1026488
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 04:22	WG1026488



Collected date/time: 09/28/17 10:30

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 04:22	WG1026488
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 04:22	WG1026488
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 04:22	WG1026488
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 04:22	WG1026488
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 04:22	WG1026488
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 04:22	WG1026488
Ethylbenzene	ND		0.00100	1	10/04/2017 04:22	WG1026488
2-Hexanone	ND		0.0100	1	10/04/2017 04:22	WG1026488
Iodomethane	ND		0.0100	1	10/04/2017 04:22	WG1026488
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 04:22	WG1026488
Methylene Chloride	ND		0.00500	1	10/04/2017 04:22	WG1026488
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 04:22	WG1026488
Styrene	ND		0.00100	1	10/04/2017 04:22	WG1026488
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
Tetrachloroethene	ND		0.00100	1	10/04/2017 04:22	WG1026488
Toluene	ND		0.00100	1	10/04/2017 04:22	WG1026488
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 04:22	WG1026488
Trichloroethene	ND		0.00100	1	10/04/2017 04:22	WG1026488
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 04:22	WG1026488
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 04:22	WG1026488
Vinyl acetate	ND		0.0100	1	10/04/2017 04:22	WG1026488
Vinyl chloride	ND		0.00100	1	10/04/2017 04:22	WG1026488
Xylenes, Total	ND		0.00300	1	10/04/2017 04:22	WG1026488
(S) Toluene-d8	105		80.0-120		10/04/2017 04:22	WG1026488
(S) Dibromofluoromethane	90.9		76.0-123		10/04/2017 04:22	WG1026488
(S) a,a,a-Trifluorotoluene	103		80.0-120		10/04/2017 04:22	WG1026488
(S) 4-Bromofluorobenzene	95.9		80.0-120		10/04/2017 04:22	WG1026488

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		0.0000100	1	10/03/2017 19:40	WG1026739
1,2-Dibromo-3-Chloropropane	ND		0.0000200	1	10/03/2017 19:40	WG1026739





Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:36	<a href="#">WG1026603</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/10/2017 14:34	<a href="#">WG1029540</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Barium,Dissolved	0.00917		0.00500	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Calcium,Dissolved	7.90		1.00	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Magnesium,Dissolved	2.19		1.00	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Manganese,Dissolved	0.0342		0.00500	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Nickel,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Potassium,Dissolved	1.11	<u>B</u>	1.00	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Sodium,Dissolved	3.36		1.00	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 17:58	<a href="#">WG1027937</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 17:58	<a href="#">WG1027937</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	10/09/2017 14:55	<a href="#">WG1029205</a>

Sample Narrative:

L939886-11 WG1029205: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.100	1	10/05/2017 16:54	<a href="#">WG1027294</a>

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	10/05/2017 20:38	<a href="#">WG1028352</a>

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	09/29/2017 14:58	<a href="#">WG1026070</a>
Chloride	5.45		1.00	1	09/29/2017 14:58	<a href="#">WG1026070</a>
Fluoride	ND		0.100	1	09/29/2017 14:58	<a href="#">WG1026070</a>
Nitrate	0.430	J3	0.100	1	09/29/2017 14:58	<a href="#">WG1026070</a>
Sulfate	ND	P1	5.00	1	09/29/2017 14:58	<a href="#">WG1026070</a>

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/04/2017 10:34	<a href="#">WG1027480</a>
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:39	<a href="#">WG1026603</a>

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/10/2017 09:03	<a href="#">WG1029498</a>
Boron,Dissolved	ND		0.200	1	10/10/2017 14:37	<a href="#">WG1029540</a>

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	1.87		0.100	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Aluminum,Dissolved	ND		0.100	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Antimony	ND		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Arsenic	ND		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Barium	0.0282		0.00500	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Barium,Dissolved	0.0145		0.00500	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Beryllium	ND		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Cadmium	ND		0.00100	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Calcium	5.40		1.00	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Calcium,Dissolved	5.24		1.00	1	10/12/2017 18:01	<a href="#">WG1027937</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 09/28/17 11:00

L939886

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	0.00301		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Cobalt	ND		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Copper	ND		0.00500	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Iron	1.95		0.100	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Lead	ND		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Magnesium	1.77		1.00	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Magnesium,Dissolved	1.71		1.00	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Manganese	0.0255		0.00500	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Manganese,Dissolved	ND		0.00500	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Nickel	ND		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Nickel,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Potassium	1.07		1.00	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Potassium,Dissolved	ND		1.00	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Selenium	ND		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Silver	ND		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Sodium	2.65		1.00	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Sodium,Dissolved	2.84	<b>B</b>	1.00	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Thallium	ND		0.00200	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Vanadium	ND		0.00500	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 18:01	<a href="#">WG1027937</a>
Zinc	ND		0.0250	1	10/07/2017 21:17	<a href="#">WG1027779</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 18:01	<a href="#">WG1027937</a>

- 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	10/04/2017 04:40	<a href="#">WG1026488</a>
Acrylonitrile	ND		0.0100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Benzene	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Bromochloromethane	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Bromodichloromethane	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Bromoform	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Bromomethane	ND		0.00500	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Carbon disulfide	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Carbon tetrachloride	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Chlorobenzene	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Chlorodibromomethane	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Chloroethane	ND		0.00500	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Chloroform	ND		0.00500	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Chloromethane	ND		0.00250	1	10/04/2017 04:40	<a href="#">WG1026488</a>
Dibromomethane	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 04:40	<a href="#">WG1026488</a>
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 04:40	<a href="#">WG1026488</a>
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 04:40	<a href="#">WG1026488</a>



Collected date/time: 09/28/17 11:00

L939886

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 04:40	WG1026488
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 04:40	WG1026488
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 04:40	WG1026488
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 04:40	WG1026488
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 04:40	WG1026488
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 04:40	WG1026488
Ethylbenzene	ND		0.00100	1	10/04/2017 04:40	WG1026488
2-Hexanone	ND		0.0100	1	10/04/2017 04:40	WG1026488
Iodomethane	ND		0.0100	1	10/04/2017 04:40	WG1026488
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 04:40	WG1026488
Methylene Chloride	ND		0.00500	1	10/04/2017 04:40	WG1026488
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 04:40	WG1026488
Styrene	ND		0.00100	1	10/04/2017 04:40	WG1026488
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 04:40	WG1026488
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 04:40	WG1026488
Tetrachloroethene	ND		0.00100	1	10/04/2017 04:40	WG1026488
Toluene	ND		0.00100	1	10/04/2017 04:40	WG1026488
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 04:40	WG1026488
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 04:40	WG1026488
Trichloroethene	ND		0.00100	1	10/04/2017 04:40	WG1026488
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 04:40	WG1026488
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 04:40	WG1026488
Vinyl acetate	ND		0.0100	1	10/04/2017 04:40	WG1026488
Vinyl chloride	ND		0.00100	1	10/04/2017 04:40	WG1026488
Xylenes, Total	ND		0.00300	1	10/04/2017 04:40	WG1026488
<i>(S)</i> Toluene-d8	106		80.0-120		10/04/2017 04:40	WG1026488
<i>(S)</i> Dibromofluoromethane	91.8		76.0-123		10/04/2017 04:40	WG1026488
<i>(S)</i> α,α,α-Trifluorotoluene	100		80.0-120		10/04/2017 04:40	WG1026488
<i>(S)</i> 4-Bromofluorobenzene	97.2		80.0-120		10/04/2017 04:40	WG1026488

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		0.0000101	1.01	10/03/2017 19:52	WG1026739
1,2-Dibromo-3-Chloropropane	ND		0.0000202	1.01	10/03/2017 19:52	WG1026739



Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:41	<a href="#">WG1026603</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/10/2017 14:40	<a href="#">WG1029540</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Barium,Dissolved	0.0147		0.00500	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Calcium,Dissolved	5.03		1.00	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Magnesium,Dissolved	1.63		1.00	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Manganese,Dissolved	ND		0.00500	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Nickel,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Potassium,Dissolved	ND		1.00	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Sodium,Dissolved	2.78	<u>B</u>	1.00	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 18:05	<a href="#">WG1027937</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 18:05	<a href="#">WG1027937</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Alkalinity	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	10/09/2017 15:03	<a href="#">WG1029205</a>

Sample Narrative:

L939886-13 WG1029205: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Ammonia Nitrogen	mg/l		mg/l		date / time	
Ammonia Nitrogen	2.01		0.100	1	10/05/2017 16:55	<a href="#">WG1027294</a>

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
COD	mg/l		mg/l		date / time	
COD	ND		10.0	1	10/05/2017 20:38	<a href="#">WG1028352</a>

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Bromide	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	09/29/2017 15:57	<a href="#">WG1026070</a>
Chloride	48.5		1.00	1	09/29/2017 15:57	<a href="#">WG1026070</a>
Fluoride	ND		0.100	1	09/29/2017 15:57	<a href="#">WG1026070</a>
Nitrate	4.12		0.100	1	09/29/2017 15:57	<a href="#">WG1026070</a>
Sulfate	ND		5.00	1	09/29/2017 15:57	<a href="#">WG1026070</a>

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Mercury	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/04/2017 10:36	<a href="#">WG1027480</a>
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:43	<a href="#">WG1026603</a>

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Boron	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/10/2017 09:06	<a href="#">WG1029498</a>
Boron,Dissolved	ND		0.200	1	10/10/2017 14:42	<a href="#">WG1029540</a>

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Aluminum	mg/l		mg/l		date / time	
Aluminum	0.124		0.100	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Aluminum,Dissolved	ND		0.100	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Antimony	ND		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Arsenic	ND		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Barium	0.0296		0.00500	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Barium,Dissolved	0.0390		0.00500	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Beryllium	ND		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Cadmium	ND		0.00100	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Calcium	14.9		1.00	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Calcium,Dissolved	16.9		1.00	1	10/12/2017 18:09	<a href="#">WG1027937</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 09/28/17 11:30

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Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	ND		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Cobalt	ND		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Copper	ND		0.00500	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Iron	0.421		0.100	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Lead	ND		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Magnesium	4.28		1.00	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Magnesium,Dissolved	5.86		1.00	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Manganese	0.0315		0.00500	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Manganese,Dissolved	0.0150		0.00500	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Nickel	0.00289		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Nickel,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Potassium	2.17		1.00	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Potassium,Dissolved	1.93		1.00	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Selenium	ND		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Silver	ND		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Sodium	7.31		1.00	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Sodium,Dissolved	11.3		1.00	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Thallium	ND		0.00200	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Vanadium	ND		0.00500	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 18:09	<a href="#">WG1027937</a>
Zinc	0.301		0.0250	1	10/07/2017 21:21	<a href="#">WG1027779</a>
Zinc,Dissolved	0.0460		0.0250	1	10/12/2017 18:09	<a href="#">WG1027937</a>

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	10/04/2017 04:57	<a href="#">WG1026488</a>
Acrylonitrile	ND		0.0100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Benzene	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Bromochloromethane	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Bromodichloromethane	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Bromoform	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Bromomethane	ND		0.00500	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Carbon disulfide	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Carbon tetrachloride	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Chlorobenzene	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Chlorodibromomethane	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Chloroethane	ND		0.00500	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Chloroform	ND		0.00500	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Chloromethane	ND		0.00250	1	10/04/2017 04:57	<a href="#">WG1026488</a>
Dibromomethane	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 04:57	<a href="#">WG1026488</a>
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 04:57	<a href="#">WG1026488</a>
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 04:57	<a href="#">WG1026488</a>



Collected date/time: 09/28/17 11:30

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 04:57	WG1026488
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 04:57	WG1026488
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 04:57	WG1026488
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 04:57	WG1026488
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 04:57	WG1026488
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 04:57	WG1026488
Ethylbenzene	ND		0.00100	1	10/04/2017 04:57	WG1026488
2-Hexanone	ND		0.0100	1	10/04/2017 04:57	WG1026488
Iodomethane	ND		0.0100	1	10/04/2017 04:57	WG1026488
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 04:57	WG1026488
Methylene Chloride	ND		0.00500	1	10/04/2017 04:57	WG1026488
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 04:57	WG1026488
Styrene	ND		0.00100	1	10/04/2017 04:57	WG1026488
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 04:57	WG1026488
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 04:57	WG1026488
Tetrachloroethene	ND		0.00100	1	10/04/2017 04:57	WG1026488
Toluene	ND		0.00100	1	10/04/2017 04:57	WG1026488
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 04:57	WG1026488
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 04:57	WG1026488
Trichloroethene	ND		0.00100	1	10/04/2017 04:57	WG1026488
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 04:57	WG1026488
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 04:57	WG1026488
Vinyl acetate	ND		0.0100	1	10/04/2017 04:57	WG1026488
Vinyl chloride	ND		0.00100	1	10/04/2017 04:57	WG1026488
Xylenes, Total	ND		0.00300	1	10/04/2017 04:57	WG1026488
(S) Toluene-d8	105		80.0-120		10/04/2017 04:57	WG1026488
(S) Dibromofluoromethane	91.5		76.0-123		10/04/2017 04:57	WG1026488
(S) a,a,a-Trifluorotoluene	103		80.0-120		10/04/2017 04:57	WG1026488
(S) 4-Bromofluorobenzene	98.1		80.0-120		10/04/2017 04:57	WG1026488

- 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		0.0000100	1	10/03/2017 20:03	WG1026739
1,2-Dibromo-3-Chloropropane	ND		0.0000200	1	10/03/2017 20:03	WG1026739





Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:45	<a href="#">WG1026603</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/10/2017 14:53	<a href="#">WG1029540</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Barium,Dissolved	0.0295		0.00500	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Calcium,Dissolved	15.1		1.00	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Magnesium,Dissolved	4.60		1.00	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Manganese,Dissolved	0.0271		0.00500	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Nickel,Dissolved	0.00269		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Potassium,Dissolved	2.11		1.00	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Sodium,Dissolved	8.31		1.00	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 18:19	<a href="#">WG1027937</a>
Zinc,Dissolved	0.243		0.0250	1	10/12/2017 18:19	<a href="#">WG1027937</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Alkalinity	22.5	B	20.0	1	10/09/2017 15:30	<a href="#">WG1029205</a>

Sample Narrative:

L939886-15 WG1029205: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.100	1	10/05/2017 16:57	<a href="#">WG1027294</a>

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
COD	ND		10.0	1	10/05/2017 20:38	<a href="#">WG1028352</a>

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	09/29/2017 16:12	<a href="#">WG1026070</a>
Chloride	47.5		1.00	1	09/29/2017 16:12	<a href="#">WG1026070</a>
Fluoride	ND		0.100	1	09/29/2017 16:12	<a href="#">WG1026070</a>
Nitrate	0.981		0.100	1	09/29/2017 16:12	<a href="#">WG1026070</a>
Sulfate	ND		5.00	1	09/29/2017 16:12	<a href="#">WG1026070</a>

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/04/2017 10:38	<a href="#">WG1027480</a>
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:48	<a href="#">WG1026603</a>

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/10/2017 09:09	<a href="#">WG1029498</a>
Boron,Dissolved	ND		0.200	1	10/10/2017 14:56	<a href="#">WG1029540</a>

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	10/07/2017 21:25	<a href="#">WG1027779</a>
Aluminum,Dissolved	ND		0.100	1	10/12/2017 18:23	<a href="#">WG1027937</a>
Antimony	ND		0.00200	1	10/07/2017 21:25	<a href="#">WG1027779</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 18:23	<a href="#">WG1027937</a>
Arsenic	ND		0.00200	1	10/07/2017 21:25	<a href="#">WG1027779</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 18:23	<a href="#">WG1027937</a>
Barium	0.0217		0.00500	1	10/07/2017 21:25	<a href="#">WG1027779</a>
Barium,Dissolved	0.0238		0.00500	1	10/12/2017 18:23	<a href="#">WG1027937</a>
Beryllium	ND		0.00200	1	10/07/2017 21:25	<a href="#">WG1027779</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 18:23	<a href="#">WG1027937</a>
Cadmium	ND		0.00100	1	10/07/2017 21:25	<a href="#">WG1027779</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 18:23	<a href="#">WG1027937</a>
Calcium	13.1		1.00	1	10/07/2017 21:25	<a href="#">WG1027779</a>
Calcium,Dissolved	13.0		1.00	1	10/12/2017 18:23	<a href="#">WG1027937</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 09/28/17 00:00

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Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	ND		0.00200	1	10/07/2017 21:25	WG1027779
Chromium,Dissolved	ND		0.00200	1	10/12/2017 18:23	WG1027937
Cobalt	0.00225		0.00200	1	10/07/2017 21:25	WG1027779
Cobalt,Dissolved	0.00255		0.00200	1	10/12/2017 18:23	WG1027937
Copper	ND		0.00500	1	10/07/2017 21:25	WG1027779
Copper,Dissolved	ND		0.00500	1	10/12/2017 18:23	WG1027937
Iron	0.124		0.100	1	10/07/2017 21:25	WG1027779
Iron,Dissolved	ND		0.100	1	10/12/2017 18:23	WG1027937
Lead	ND		0.00200	1	10/07/2017 21:25	WG1027779
Lead,Dissolved	ND		0.00200	1	10/12/2017 18:23	WG1027937
Magnesium	7.90		1.00	1	10/07/2017 21:25	WG1027779
Magnesium,Dissolved	8.64		1.00	1	10/12/2017 18:23	WG1027937
Manganese	0.0536		0.00500	1	10/07/2017 21:25	WG1027779
Manganese,Dissolved	0.0678		0.00500	1	10/12/2017 18:23	WG1027937
Nickel	0.00518		0.00200	1	10/07/2017 21:25	WG1027779
Nickel,Dissolved	0.00562		0.00200	1	10/12/2017 18:23	WG1027937
Potassium	1.22		1.00	1	10/07/2017 21:25	WG1027779
Potassium,Dissolved	1.28	B	1.00	1	10/12/2017 18:23	WG1027937
Selenium	ND		0.00200	1	10/07/2017 21:25	WG1027779
Selenium,Dissolved	ND		0.00200	1	10/12/2017 18:23	WG1027937
Silver	ND		0.00200	1	10/07/2017 21:25	WG1027779
Silver,Dissolved	ND		0.00200	1	10/12/2017 18:23	WG1027937
Sodium	13.9		1.00	1	10/07/2017 21:25	WG1027779
Sodium,Dissolved	15.3		1.00	1	10/12/2017 18:23	WG1027937
Thallium	ND		0.00200	1	10/07/2017 21:25	WG1027779
Thallium,Dissolved	ND		0.00200	1	10/12/2017 18:23	WG1027937
Vanadium	ND		0.00500	1	10/07/2017 21:25	WG1027779
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 18:23	WG1027937
Zinc	ND		0.0250	1	10/07/2017 21:25	WG1027779
Zinc,Dissolved	ND		0.0250	1	10/12/2017 18:23	WG1027937

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	10/04/2017 05:15	WG1026488
Acrylonitrile	ND		0.0100	1	10/04/2017 05:15	WG1026488
Benzene	ND		0.00100	1	10/04/2017 05:15	WG1026488
Bromochloromethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
Bromodichloromethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
Bromoform	ND		0.00100	1	10/04/2017 05:15	WG1026488
Bromomethane	ND		0.00500	1	10/04/2017 05:15	WG1026488
Carbon disulfide	ND		0.00100	1	10/04/2017 05:15	WG1026488
Carbon tetrachloride	ND		0.00100	1	10/04/2017 05:15	WG1026488
Chlorobenzene	ND		0.00100	1	10/04/2017 05:15	WG1026488
Chlorodibromomethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
Chloroethane	ND		0.00500	1	10/04/2017 05:15	WG1026488
Chloroform	ND		0.00500	1	10/04/2017 05:15	WG1026488
Chloromethane	ND		0.00250	1	10/04/2017 05:15	WG1026488
Dibromomethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 05:15	WG1026488
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 05:15	WG1026488
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 05:15	WG1026488
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 05:15	WG1026488
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 05:15	WG1026488



Collected date/time: 09/28/17 00:00

L939886

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 05:15	WG1026488
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 05:15	WG1026488
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 05:15	WG1026488
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 05:15	WG1026488
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 05:15	WG1026488
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 05:15	WG1026488
Ethylbenzene	ND		0.00100	1	10/04/2017 05:15	WG1026488
2-Hexanone	ND		0.0100	1	10/04/2017 05:15	WG1026488
Iodomethane	ND		0.0100	1	10/04/2017 05:15	WG1026488
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 05:15	WG1026488
Methylene Chloride	ND		0.00500	1	10/04/2017 05:15	WG1026488
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 05:15	WG1026488
Styrene	ND		0.00100	1	10/04/2017 05:15	WG1026488
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
Tetrachloroethene	ND		0.00100	1	10/04/2017 05:15	WG1026488
Toluene	ND		0.00100	1	10/04/2017 05:15	WG1026488
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 05:15	WG1026488
Trichloroethene	ND		0.00100	1	10/04/2017 05:15	WG1026488
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 05:15	WG1026488
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 05:15	WG1026488
Vinyl acetate	ND		0.0100	1	10/04/2017 05:15	WG1026488
Vinyl chloride	ND		0.00100	1	10/04/2017 05:15	WG1026488
Xylenes, Total	ND		0.00300	1	10/04/2017 05:15	WG1026488
(S) Toluene-d8	106		80.0-120		10/04/2017 05:15	WG1026488
(S) Dibromofluoromethane	92.6		76.0-123		10/04/2017 05:15	WG1026488
(S) a,a,a-Trifluorotoluene	102		80.0-120		10/04/2017 05:15	WG1026488
(S) 4-Bromofluorobenzene	98.5		80.0-120		10/04/2017 05:15	WG1026488

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		0.0000100	1	10/03/2017 20:14	WG1026739
1,2-Dibromo-3-Chloropropane	ND		0.0000200	1	10/03/2017 20:14	WG1026739



Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:50	<a href="#">WG1026603</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/10/2017 14:58	<a href="#">WG1029540</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Barium,Dissolved	0.0202		0.00500	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Calcium,Dissolved	13.1		1.00	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Magnesium,Dissolved	7.85		1.00	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Manganese,Dissolved	0.0479		0.00500	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Nickel,Dissolved	0.00522	<u>B</u>	0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Potassium,Dissolved	1.20		1.00	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Sodium,Dissolved	14.3		1.00	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 18:26	<a href="#">WG1027937</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 18:26	<a href="#">WG1027937</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Alkalinity	mg/l		mg/l		date / time	
Alkalinity	ND		20.0	1	10/06/2017 07:51	<a href="#">WG1027215</a>

Sample Narrative:

L939886-17 WG1027215: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Ammonia Nitrogen	mg/l		mg/l		date / time	
Ammonia Nitrogen	ND		0.100	1	10/05/2017 16:59	<a href="#">WG1027294</a>

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
COD	mg/l		mg/l		date / time	
COD	ND		10.0	1	10/05/2017 20:39	<a href="#">WG1028352</a>

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Bromide	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	09/29/2017 16:27	<a href="#">WG1026070</a>
Chloride	ND		1.00	1	09/29/2017 16:27	<a href="#">WG1026070</a>
Fluoride	ND		0.100	1	09/29/2017 16:27	<a href="#">WG1026070</a>
Nitrate	ND		0.100	1	09/29/2017 16:27	<a href="#">WG1026070</a>
Sulfate	ND		5.00	1	09/29/2017 16:27	<a href="#">WG1026070</a>

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Mercury	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/04/2017 10:47	<a href="#">WG1027480</a>
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:52	<a href="#">WG1026603</a>

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Boron	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/10/2017 09:11	<a href="#">WG1029498</a>
Boron,Dissolved	ND		0.200	1	10/10/2017 13:50	<a href="#">WG1029540</a>

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
Aluminum	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Aluminum,Dissolved	ND		0.100	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Antimony	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Arsenic	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Barium	ND		0.00500	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Barium,Dissolved	ND		0.00500	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Beryllium	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Cadmium	ND		0.00100	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Calcium	ND		1.00	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Calcium,Dissolved	ND		1.00	1	10/12/2017 18:30	<a href="#">WG1027937</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 09/28/17 13:10

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Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Cobalt	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Copper	ND		0.00500	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Iron	ND		0.100	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Lead	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Magnesium	ND		1.00	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Magnesium,Dissolved	ND		1.00	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Manganese	ND		0.00500	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Manganese,Dissolved	ND		0.00500	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Nickel	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Nickel,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Potassium	ND		1.00	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Potassium,Dissolved	ND		1.00	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Selenium	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Silver	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Sodium	ND		1.00	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Sodium,Dissolved	ND		1.00	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Thallium	ND		0.00200	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Vanadium	ND		0.00500	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 18:30	<a href="#">WG1027937</a>
Zinc	ND		0.0250	1	10/07/2017 21:28	<a href="#">WG1027779</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 18:30	<a href="#">WG1027937</a>

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	10/04/2017 05:33	<a href="#">WG1026488</a>
Acrylonitrile	ND		0.0100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Benzene	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Bromochloromethane	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Bromodichloromethane	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Bromoform	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Bromomethane	ND		0.00500	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Carbon disulfide	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Carbon tetrachloride	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Chlorobenzene	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Chlorodibromomethane	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Chloroethane	ND		0.00500	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Chloroform	ND		0.00500	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Chloromethane	ND		0.00250	1	10/04/2017 05:33	<a href="#">WG1026488</a>
Dibromomethane	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 05:33	<a href="#">WG1026488</a>
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 05:33	<a href="#">WG1026488</a>
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 05:33	<a href="#">WG1026488</a>



Collected date/time: 09/28/17 13:10

L939886

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 05:33	WG1026488
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 05:33	WG1026488
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 05:33	WG1026488
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 05:33	WG1026488
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 05:33	WG1026488
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 05:33	WG1026488
Ethylbenzene	ND		0.00100	1	10/04/2017 05:33	WG1026488
2-Hexanone	ND		0.0100	1	10/04/2017 05:33	WG1026488
Iodomethane	ND		0.0100	1	10/04/2017 05:33	WG1026488
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 05:33	WG1026488
Methylene Chloride	ND		0.00500	1	10/04/2017 05:33	WG1026488
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 05:33	WG1026488
Styrene	ND		0.00100	1	10/04/2017 05:33	WG1026488
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 05:33	WG1026488
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 05:33	WG1026488
Tetrachloroethene	ND		0.00100	1	10/04/2017 05:33	WG1026488
Toluene	ND		0.00100	1	10/04/2017 05:33	WG1026488
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 05:33	WG1026488
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 05:33	WG1026488
Trichloroethene	ND		0.00100	1	10/04/2017 05:33	WG1026488
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 05:33	WG1026488
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 05:33	WG1026488
Vinyl acetate	ND		0.0100	1	10/04/2017 05:33	WG1026488
Vinyl chloride	ND		0.00100	1	10/04/2017 05:33	WG1026488
Xylenes, Total	ND		0.00300	1	10/04/2017 05:33	WG1026488
<i>(S)</i> Toluene- <i>d</i> 8	106		80.0-120		10/04/2017 05:33	WG1026488
<i>(S)</i> Dibromofluoromethane	92.3		76.0-123		10/04/2017 05:33	WG1026488
<i>(S)</i> <i>o,o,o</i> -Trifluorotoluene	103		80.0-120		10/04/2017 05:33	WG1026488
<i>(S)</i> 4-Bromofluorobenzene	97.7		80.0-120		10/04/2017 05:33	WG1026488

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		0.0000100	1	10/03/2017 20:36	WG1026739
1,2-Dibromo-3-Chloropropane	ND		0.0000200	1	10/03/2017 20:36	WG1026739





Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/05/2017 11:54	<a href="#">WG1026603</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/10/2017 15:01	<a href="#">WG1029540</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Antimony,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Arsenic,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Barium,Dissolved	ND		0.00500	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Beryllium,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Cadmium,Dissolved	ND		0.00100	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Calcium,Dissolved	ND		1.00	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Chromium,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Cobalt,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Copper,Dissolved	ND		0.00500	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Iron,Dissolved	ND		0.100	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Lead,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Magnesium,Dissolved	ND		1.00	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Manganese,Dissolved	ND		0.00500	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Nickel,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Potassium,Dissolved	ND		1.00	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Selenium,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Silver,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Sodium,Dissolved	ND		1.00	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Thallium,Dissolved	ND		0.00200	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Vanadium,Dissolved	ND		0.00500	1	10/12/2017 18:33	<a href="#">WG1027937</a>
Zinc,Dissolved	ND		0.0250	1	10/12/2017 18:33	<a href="#">WG1027937</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



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	10/04/2017 00:32	WG1026488
Acrylonitrile	ND		0.0100	1	10/04/2017 00:32	WG1026488
Benzene	ND		0.00100	1	10/04/2017 00:32	WG1026488
Bromochloromethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
Bromodichloromethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
Bromoform	ND		0.00100	1	10/04/2017 00:32	WG1026488
Bromomethane	ND		0.00500	1	10/04/2017 00:32	WG1026488
Carbon disulfide	ND		0.00100	1	10/04/2017 00:32	WG1026488
Carbon tetrachloride	ND		0.00100	1	10/04/2017 00:32	WG1026488
Chlorobenzene	ND		0.00100	1	10/04/2017 00:32	WG1026488
Chlorodibromomethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
Chloroethane	ND		0.00500	1	10/04/2017 00:32	WG1026488
Chloroform	ND		0.00500	1	10/04/2017 00:32	WG1026488
Chloromethane	ND		0.00250	1	10/04/2017 00:32	WG1026488
Dibromomethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,2-Dibromo-3-Chloropropane	ND		0.00500	1	10/04/2017 00:32	WG1026488
1,2-Dibromoethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,2-Dichlorobenzene	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,4-Dichlorobenzene	ND		0.00100	1	10/04/2017 00:32	WG1026488
trans-1,4-Dichloro-2-butene	ND		0.00250	1	10/04/2017 00:32	WG1026488
1,1-Dichloroethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,2-Dichloroethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,1-Dichloroethene	ND		0.00100	1	10/04/2017 00:32	WG1026488
cis-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 00:32	WG1026488
trans-1,2-Dichloroethene	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,2-Dichloropropane	ND		0.00100	1	10/04/2017 00:32	WG1026488
cis-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 00:32	WG1026488
trans-1,3-Dichloropropene	ND		0.00100	1	10/04/2017 00:32	WG1026488
Ethylbenzene	ND		0.00100	1	10/04/2017 00:32	WG1026488
2-Hexanone	ND		0.0100	1	10/04/2017 00:32	WG1026488
Iodomethane	ND		0.0100	1	10/04/2017 00:32	WG1026488
2-Butanone (MEK)	ND		0.0100	1	10/04/2017 00:32	WG1026488
Methylene Chloride	ND		0.00500	1	10/04/2017 00:32	WG1026488
4-Methyl-2-pentanone (MIBK)	ND		0.0100	1	10/04/2017 00:32	WG1026488
Styrene	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,1,1,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,1,2,2-Tetrachloroethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
Tetrachloroethene	ND		0.00100	1	10/04/2017 00:32	WG1026488
Toluene	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,1,1-Trichloroethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
1,1,2-Trichloroethane	ND		0.00100	1	10/04/2017 00:32	WG1026488
Trichloroethene	ND		0.00100	1	10/04/2017 00:32	WG1026488
Trichlorofluoromethane	ND		0.00500	1	10/04/2017 00:32	WG1026488
1,2,3-Trichloropropane	ND		0.00250	1	10/04/2017 00:32	WG1026488
Vinyl acetate	ND		0.0100	1	10/04/2017 00:32	WG1026488
Vinyl chloride	ND		0.00100	1	10/04/2017 00:32	WG1026488
Xylenes, Total	ND		0.00300	1	10/04/2017 00:32	WG1026488
(S) Toluene-d8	105		80.0-120		10/04/2017 00:32	WG1026488
(S) Dibromofluoromethane	91.4		76.0-123		10/04/2017 00:32	WG1026488
(S) a,a,a-Trifluorotoluene	102		80.0-120		10/04/2017 00:32	WG1026488
(S) 4-Bromofluorobenzene	96.7		80.0-120		10/04/2017 00:32	WG1026488

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

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Gl

8  
Al

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Sc



Method Blank (MB)

(MB) R3255406-1 10/06/17 07:23

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Alkalinity	3.33	↓	2.71	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L939879-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939879-01 10/06/17 07:30 • (DUP) R3255406-2 10/06/17 07:37

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Alkalinity	132	136	1	3.00		20

Sample Narrative:

OS: Endpoint pH 4.5  
DUP: Endpoint pH 4.5

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

(LCS) R3255406-3 10/06/17 08:33 • (LCSD) R3255406-4 10/06/17 10:18

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Alkalinity	100	109	111	109	111	85.0-115			2.00	20

Sample Narrative:

LCS: Endpoint pH 4.5  
LCSD: Endpoint pH 4.5

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3255943-1 10/09/17 09:57

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Alkalinity	2.76	↓	2.71	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L939998-26 Original Sample (OS) • Duplicate (DUP)

(OS) L939998-26 10/09/17 13:40 • (DUP) R3255943-7 10/09/17 13:45

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Alkalinity	ND	6.32	1	0.000		20

Sample Narrative:

OS: Endpoint pH 4.5  
DUP: Endpoint pH 4.5

L939877-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939877-01 10/09/17 15:47 • (DUP) R3255943-8 10/09/17 15:53

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Alkalinity	63.2	64.2	1	2.00		20

Sample Narrative:

OS: Endpoint pH 4.5  
DUP: Endpoint pH 4.5

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

(LCS) R3255943-2 10/09/17 11:01 • (LCSD) R3255943-6 10/09/17 12:26

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Alkalinity	100	96.1	111	96.0	111	85.0-115			14.0	20

Sample Narrative:

LCS: Endpoint pH 4.5  
LCSD: Endpoint pH 4.5

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3255184-1 10/05/17 16:33

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Ammonia Nitrogen	U		0.0317	0.100

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L939886-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939886-01 10/05/17 16:38 • (DUP) R3255184-4 10/05/17 16:40

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Ammonia Nitrogen	ND	0.0730	1	10	↓	20

L940725-01 Original Sample (OS) • Duplicate (DUP)

(OS) L940725-01 10/05/17 17:19 • (DUP) R3255184-6 10/05/17 17:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Ammonia Nitrogen	ND	0.000	1	0		20

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

(LCS) R3255184-2 10/05/17 16:35 • (LCSD) R3255184-3 10/05/17 16:36

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Ammonia Nitrogen	7.50	7.54	7.34	101	98	90-110			3	20

L939886-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L939886-03 10/05/17 16:41 • (MS) R3255184-5 10/05/17 16:43

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Ammonia Nitrogen	5.00	0.108	5.42	106	1	90-110	

L940725-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L940725-03 10/05/17 17:22 • (MS) R3255184-7 10/05/17 17:24 • (MSD) R3255184-8 10/05/17 17:26

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	5.35	5.30	107	106	1	90-110			1	20



Method Blank (MB)

(MB) R3255195-1 10/05/17 20:34

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
COD	U		3	10.0

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L939855-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939855-01 10/05/17 20:35 • (DUP) R3255195-4 10/05/17 20:36

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	3690	3840	20	4		20

L940238-03 Original Sample (OS) • Duplicate (DUP)

(OS) L940238-03 10/05/17 20:41 • (DUP) R3255195-7 10/05/17 20:42

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	249	250	1	0		20

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

(LCS) R3255195-2 10/05/17 20:34 • (LCSD) R3255195-3 10/05/17 20:35

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
COD	242	232	238	96	98	90-110			2	20

L939886-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939886-13 10/05/17 20:38 • (MS) R3255195-5 10/05/17 20:38 • (MSD) R3255195-6 10/05/17 20:38

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
COD	400	ND	402	388	99	96	1	80-120			4	20



Method Blank (MB)

(MB) R3253659-1 09/29/17 06:04

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Bromide	U		0.079	1.00
Chloride	U		0.0519	1.00
Fluoride	U		0.0099	0.100
Nitrate	U		0.0227	0.100
Sulfate	U		0.0774	5.00

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

L939134-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939134-01 09/29/17 12:01 • (DUP) R3253659-4 09/29/17 12:16

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Fluoride	3.75	3.99	1	6		15
Nitrate	6.29	6.30	1	0		15
Sulfate	ND	0.000	1	0		15

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

L939748-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939748-01 09/29/17 14:30 • (DUP) R3253659-7 09/29/17 14:45

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	ND	0.000	1	0		15
Fluoride	0.557	0.551	1	1		15
Nitrate	ND	1.34	1	200	J3	15
Sulfate	10.6	10.2	1	4		15

<sup>9</sup> Sc

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

(LCS) R3253659-2 09/29/17 06:19 • (LCSD) R3253659-3 09/29/17 06:34

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	%	%	%			%	%
Bromide	40.0	39.6	39.5	99	99	80-120			0	15
Chloride	40.0	39.3	39.3	98	98	80-120			0	15
Fluoride	8.00	8.00	7.98	100	100	80-120			0	15
Nitrate	8.00	8.01	8.02	100	100	80-120			0	15
Sulfate	40.0	39.6	39.5	99	99	80-120			0	15



L939134-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939134-01 09/29/17 12:01 • (MS) R3253659-5 09/29/17 12:31 • (MSD) R3253659-6 09/29/17 12:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fluoride	5.00	3.75	8.77	9.01	100	105	1	80-120			3	15
Nitrate	5.00	6.29	11.0	11.0	95	95	1	80-120	<u>E</u>	<u>E</u>	0	15
Sulfate	50.0	ND	ND	ND	0	0	1	80-120	<u>J6</u>	<u>J6</u>	0	15

L939748-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L939748-01 09/29/17 14:30 • (MS) R3253659-8 09/29/17 15:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	ND	49.1	98	1	80-120	
Fluoride	5.00	0.557	5.64	102	1	80-120	
Nitrate	5.00	ND	6.19	124	1	80-120	<u>J5</u>
Sulfate	50.0	10.6	59.9	99	1	80-120	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc





Method Blank (MB)

(MB) R3253660-1 09/29/17 08:04

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Bromide	U		0.079	1.00
Chloride	U		0.0519	1.00
Fluoride	U		0.0099	0.100
Nitrate	U		0.0227	0.100
Sulfate	U		0.0774	5.00

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

L939886-11 Original Sample (OS) • Duplicate (DUP)

(OS) L939886-11 09/29/17 14:58 • (DUP) R3253660-4 09/29/17 15:12

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	ND	0.000	1	0		15
Chloride	5.45	5.63	1	3		15
Fluoride	ND	0.000	1	0		15
Nitrate	0.430	0.537	1	22	J3	15
Sulfate	ND	0.542	1	200	J P1	15

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L939919-03 Original Sample (OS) • Duplicate (DUP)

(OS) L939919-03 09/29/17 20:56 • (DUP) R3253660-7 09/29/17 21:11

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	ND	0.000	1	0		15
Fluoride	0.124	0.131	1	6		15
Nitrate	ND	0.000	1	0		15

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

(LCS) R3253660-2 09/29/17 08:22 • (LCSD) R3253660-3 09/29/17 08:39

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	%	%	%			%	%
Bromide	40.0	39.6	39.8	99	99	80-120			1	15
Chloride	40.0	39.4	39.6	99	99	80-120			0	15
Fluoride	8.00	8.32	8.36	104	105	80-120			0	15
Nitrate	8.00	8.36	8.37	105	105	80-120			0	15
Sulfate	40.0	39.9	40.2	100	101	80-120			1	15



L939886-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939886-11 09/29/17 14:58 • (MS) R3253660-5 09/29/17 15:27 • (MSD) R3253660-6 09/29/17 15:42

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	50.0	ND	51.0	52.1	102	104	1	80-120			2	15
Chloride	50.0	5.45	57.4	57.3	104	104	1	80-120			0	15
Fluoride	5.00	ND	5.40	5.36	108	107	1	80-120			1	15
Nitrate	5.00	0.430	5.61	5.80	104	107	1	80-120			3	15
Sulfate	50.0	ND	52.5	52.2	105	104	1	80-120			1	15

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

L939919-03 Original Sample (OS) • Matrix Spike (MS)

(OS) L939919-03 09/29/17 20:56 • (MS) R3253660-8 09/29/17 21:25

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	ND	47.8	96	1	80-120	
Fluoride	5.00	0.124	5.27	103	1	80-120	
Nitrate	5.00	ND	5.14	103	1	80-120	

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3255026-1 10/05/17 10:53

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury,Dissolved	U		0.000049	0.000200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

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

(LCS) R3255026-2 10/05/17 10:55 • (LCSD) R3255026-3 10/05/17 10:58

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury,Dissolved	0.00300	0.00311	0.00311	104	104	80-120			0	20

<sup>7</sup> Gl

<sup>8</sup> Al

L939886-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939886-01 10/05/17 11:07 • (MS) R3255026-4 10/05/17 11:09 • (MSD) R3255026-5 10/05/17 11:11

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury,Dissolved	0.00300	ND	0.00306	0.00295	100	96	1	75-125			4	20

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3254694-1 10/04/17 10:06

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.000049	0.000200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

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

(LCS) R3254694-2 10/04/17 10:09 • (LCSD) R3254694-3 10/04/17 10:11

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury	0.00300	0.00256	0.00272	85	91	80-120			6	20

<sup>6</sup> Qc

L939886-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939886-01 10/04/17 10:18 • (MS) R3254694-4 10/04/17 10:20 • (MSD) R3254694-5 10/04/17 10:22

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	0.00279	0.00280	88	88	1	75-125			0	20

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3256118-1 10/10/17 08:20

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Boron	U		0.0126	0.200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

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

(LCS) R3256118-2 10/10/17 08:23 • (LCSD) R3256118-3 10/10/17 08:25

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Boron	1.00	1.02	0.998	102	100	80-120			2	20

L941259-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L941259-20 10/10/17 08:28 • (MS) R3256118-5 10/10/17 08:33 • (MSD) R3256118-6 10/10/17 08:35

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Boron	1.00	0.375	1.39	1.38	102	100	1	75-125			1	20

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3256227-1 10/10/17 13:40

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Boron,Dissolved	U		0.0126	0.200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

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

(LCS) R3256227-2 10/10/17 13:45 • (LCSD) R3256227-3 10/10/17 13:47

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Boron,Dissolved	1.00	1.03	1.01	103	101	80-120			1	20

L939886-17 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939886-17 10/10/17 13:50 • (MS) R3256227-5 10/10/17 14:00 • (MSD) R3256227-6 10/10/17 14:02

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	1.04	1.07	99	102	1	75-125			3	20

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3255443-1 10/06/17 13:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	U		0.00515	0.100
Antimony	U		0.000754	0.00200
Arsenic	U		0.00025	0.00200
Barium	U		0.00036	0.00500
Beryllium	U		0.00012	0.00200
Cadmium	U		0.00016	0.00100
Calcium	U		0.046	1.00
Chromium	U		0.00054	0.00200
Copper	U		0.00052	0.00500
Cobalt	U		0.00026	0.00200
Iron	U		0.015	0.100
Lead	U		0.00024	0.00200
Magnesium	U		0.1	1.00
Manganese	0.000705	J	0.00025	0.00500
Nickel	U		0.00035	0.00200
Potassium	U		0.037	1.00
Selenium	U		0.00038	0.00200
Silver	U		0.00031	0.00200
Sodium	U		0.11	1.00
Thallium	U		0.00019	0.00200
Vanadium	U		0.00018	0.00500
Zinc	U		0.00256	0.0250

- 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) R3255443-2 10/06/17 13:46 • (LCSD) R3255443-3 10/06/17 13:50

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 %
Aluminum	5.00	4.69	4.55	94	91	80-120			3	20
Antimony	0.0500	0.0484	0.0485	97	97	80-120			0	20
Arsenic	0.0500	0.0489	0.0484	98	97	80-120			1	20
Barium	0.0500	0.0478	0.0479	96	96	80-120			0	20
Beryllium	0.0500	0.0434	0.0423	87	85	80-120			3	20
Cadmium	0.0500	0.0516	0.0508	103	102	80-120			2	20
Calcium	5.00	4.99	4.76	100	95	80-120			5	20
Chromium	0.0500	0.0505	0.0498	101	100	80-120			1	20
Copper	0.0500	0.0490	0.0488	98	98	80-120			0	20
Cobalt	0.0500	0.0510	0.0510	102	102	80-120			0	20
Iron	5.00	5.05	4.99	101	100	80-120			1	20



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

(LCS) R3255443-2 10/06/17 13:46 • (LCSD) R3255443-3 10/06/17 13:50

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 %
Lead	0.0500	0.0494	0.0491	99	98	80-120			0	20
Magnesium	5.00	4.97	4.76	99	95	80-120			4	20
Manganese	0.0500	0.0487	0.0474	97	95	80-120			3	20
Nickel	0.0500	0.0509	0.0507	102	101	80-120			0	20
Potassium	5.00	4.83	4.63	97	93	80-120			4	20
Selenium	0.0500	0.0489	0.0487	98	97	80-120			0	20
Silver	0.0500	0.0509	0.0509	102	102	80-120			0	20
Sodium	5.00	4.98	4.80	100	96	80-120			3	20
Thallium	0.0500	0.0479	0.0483	96	97	80-120			1	20
Vanadium	0.0500	0.0485	0.0489	97	98	80-120			1	20
Zinc	0.0500	0.0547	0.0487	109	97	80-120			12	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L939244-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939244-01 10/06/17 13:54 • (MS) R3255443-5 10/06/17 14:01 • (MSD) R3255443-6 10/06/17 14:04

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	4.50	4.56	90	91	1	75-125			1	20
Antimony	0.0500	ND	0.0474	0.0486	95	97	1	75-125			3	20
Arsenic	0.0500	ND	0.0473	0.0471	95	94	1	75-125			0	20
Barium	0.0500	0.0114	0.0561	0.0600	89	97	1	75-125			7	20
Beryllium	0.0500	ND	0.0417	0.0416	83	83	1	75-125			0	20
Cadmium	0.0500	ND	0.0505	0.0509	101	102	1	75-125			1	20
Calcium	5.00	2.58	7.29	7.20	94	92	1	75-125			1	20
Chromium	0.0500	0.0168	0.0648	0.0653	96	97	1	75-125			1	20
Copper	0.0500	ND	0.0509	0.0510	96	96	1	75-125			0	20
Cobalt	0.0500	ND	0.0498	0.0502	100	100	1	75-125			1	20
Potassium	5.00	ND	5.20	5.16	94	93	1	75-125			1	20
Iron	5.00	ND	4.86	4.88	97	98	1	75-125			0	20
Lead	0.0500	ND	0.0482	0.0489	95	97	1	75-125			1	20
Magnesium	5.00	ND	5.72	5.75	95	96	1	75-125			0	20
Manganese	0.0500	ND	0.0461	0.0465	91	92	1	75-125			1	20
Nickel	0.0500	ND	0.0491	0.0492	98	98	1	75-125			0	20
Selenium	0.0500	ND	0.0454	0.0498	91	100	1	75-125			9	20
Silver	0.0500	ND	0.0498	0.0504	100	101	1	75-125			1	20
Sodium	5.00	6.14	10.8	10.8	92	93	1	75-125			0	20
Thallium	0.0500	ND	0.0466	0.0475	93	95	1	75-125			2	20
Vanadium	0.0500	ND	0.0479	0.0481	96	96	1	75-125			0	20
Zinc	0.0500	ND	0.0560	0.0562	96	97	1	75-125			0	20





Method Blank (MB)

(MB) R3257120-1 10/12/17 16:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum,Dissolved	0.00669	U	0.00515	0.100
Antimony,Dissolved	U		0.000754	0.00200
Arsenic,Dissolved	U		0.00025	0.00200
Barium,Dissolved	U		0.00036	0.00500
Beryllium,Dissolved	U		0.00012	0.00200
Cadmium,Dissolved	U		0.00016	0.00100
Calcium,Dissolved	U		0.046	1.00
Chromium,Dissolved	U		0.00054	0.00200
Copper,Dissolved	U		0.00052	0.00500
Cobalt,Dissolved	U		0.00026	0.00200
Iron,Dissolved	U		0.015	0.100
Lead,Dissolved	U		0.00024	0.00200
Magnesium,Dissolved	U		0.1	1.00
Manganese,Dissolved	0.000378	U	0.00025	0.00500
Nickel,Dissolved	U		0.00035	0.00200
Potassium,Dissolved	0.136	U	0.037	1.00
Selenium,Dissolved	U		0.00038	0.00200
Silver,Dissolved	U		0.00031	0.00200
Sodium,Dissolved	0.321	U	0.11	1.00
Thallium,Dissolved	U		0.00019	0.00200
Vanadium,Dissolved	U		0.00018	0.00500
Zinc,Dissolved	0.00293	U	0.00256	0.0250

1  
Cp

2  
Tc

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Ss

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Cn

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Sr

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Qc

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Gl

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Al

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Sc

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

(LCS) R3257120-2 10/12/17 16:58 • (LCSD) R3257120-3 10/12/17 17:01

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 %
Aluminum,Dissolved	5.00	5.01	4.88	100	98	80-120			3	20
Antimony,Dissolved	0.0500	0.0513	0.0534	103	107	80-120			4	20
Arsenic,Dissolved	0.0500	0.0517	0.0509	103	102	80-120			2	20
Barium,Dissolved	0.0500	0.0467	0.0470	93	94	80-120			1	20
Beryllium,Dissolved	0.0500	0.0441	0.0430	88	86	80-120			2	20
Cadmium,Dissolved	0.0500	0.0535	0.0533	107	107	80-120			0	20
Calcium,Dissolved	5.00	5.20	4.97	104	99	80-120			4	20
Chromium,Dissolved	0.0500	0.0514	0.0501	103	100	80-120			3	20
Copper,Dissolved	0.0500	0.0510	0.0506	102	101	80-120			1	20
Cobalt,Dissolved	0.0500	0.0530	0.0527	106	105	80-120			1	20
Iron,Dissolved	5.00	5.16	5.13	103	103	80-120			1	20



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

(LCS) R3257120-2 10/12/17 16:58 • (LCSD) R3257120-3 10/12/17 17:01

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 %
Lead,Dissolved	0.0500	0.0506	0.0504	101	101	80-120			0	20
Magnesium,Dissolved	5.00	5.22	5.04	104	101	80-120			3	20
Manganese,Dissolved	0.0500	0.0491	0.0492	98	98	80-120			0	20
Nickel,Dissolved	0.0500	0.0529	0.0525	106	105	80-120			1	20
Potassium,Dissolved	5.00	5.18	4.96	104	99	80-120			4	20
Selenium,Dissolved	0.0500	0.0499	0.0504	100	101	80-120			1	20
Silver,Dissolved	0.0500	0.0529	0.0527	106	105	80-120			0	20
Sodium,Dissolved	5.00	5.48	5.31	110	106	80-120			3	20
Thallium,Dissolved	0.0500	0.0496	0.0505	99	101	80-120			2	20
Vanadium,Dissolved	0.0500	0.0503	0.0499	101	100	80-120			1	20
Zinc,Dissolved	0.0500	0.0513	0.0524	103	105	80-120			2	20

1  
Cp

2  
Tc

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Ss

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Cn

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Sr

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Qc

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Gl

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Al

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Sc

L939828-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939828-02 10/12/17 17:05 • (MS) R3257120-5 10/12/17 17:12 • (MSD) R3257120-6 10/12/17 17:15

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 %
Aluminum,Dissolved	5.00	0.00882	4.97	4.91	99	98	1	75-125			1	20
Antimony,Dissolved	0.0500	U	0.0545	0.0547	109	109	1	75-125			0	20
Arsenic,Dissolved	0.0500	0.00399	0.0534	0.0560	99	104	1	75-125			5	20
Barium,Dissolved	0.0500	0.0745	0.127	0.125	105	101	1	75-125			2	20
Beryllium,Dissolved	0.0500	U	0.0435	0.0437	87	87	1	75-125			0	20
Cadmium,Dissolved	0.0500	U	0.0540	0.0545	108	109	1	75-125			1	20
Calcium,Dissolved	5.00	92.6	98.6	98.4	120	116	1	75-125			0	20
Chromium,Dissolved	0.0500	0.000593	0.0508	0.0516	100	102	1	75-125			2	20
Copper,Dissolved	0.0500	0.00122	0.0492	0.0508	96	99	1	75-125			3	20
Cobalt,Dissolved	0.0500	0.00812	0.0585	0.0605	101	105	1	75-125			3	20
Potassium,Dissolved	5.00	1.76	6.65	6.59	98	97	1	75-125			1	20
Iron,Dissolved	5.00	7.74	12.6	12.9	97	104	1	75-125			3	20
Lead,Dissolved	0.0500	U	0.0512	0.0522	102	104	1	75-125			2	20
Magnesium,Dissolved	5.00	44.1	49.1	49.1	101	101	1	75-125			0	20
Manganese,Dissolved	0.0500	1.66	1.72	1.72	116	108	1	75-125			0	20
Nickel,Dissolved	0.0500	0.00724	0.0571	0.0595	100	104	1	75-125			4	20
Selenium,Dissolved	0.0500	U	0.0510	0.0515	102	103	1	75-125			1	20
Silver,Dissolved	0.0500	U	0.0536	0.0541	107	108	1	75-125			1	20
Sodium,Dissolved	5.00	24.9	29.9	29.6	100	94	1	75-125			1	20
Thallium,Dissolved	0.0500	U	0.0513	0.0513	103	103	1	75-125			0	20
Vanadium,Dissolved	0.0500	0.000586	0.0500	0.0511	99	101	1	75-125			2	20
Zinc,Dissolved	0.0500	0.00534	0.0516	0.0540	92	97	1	75-125			5	20



Method Blank (MB)

(MB) R3255016-3 10/03/17 21:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	0.0500
Acrylonitrile	U		0.00187	0.0100
Benzene	U		0.000331	0.00100
Bromodichloromethane	U		0.000380	0.00100
Bromochloromethane	U		0.000520	0.00100
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
Carbon disulfide	U		0.000275	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
trans-1,4-Dichloro-2-butene	U		0.000866	0.00250
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100
trans-1,3-Dichloropropene	U		0.000419	0.00100
Ethylbenzene	U		0.000384	0.00100
2-Hexanone	U		0.00382	0.0100
Iodomethane	U		0.00171	0.0100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
Tetrachloroethene	U		0.000372	0.00100
Toluene	U		0.000412	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3255016-3 10/03/17 21:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichloroethene	U		0.000398	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
Vinyl acetate	U		0.00163	0.0100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	108			80.0-120
(S) Dibromofluoromethane	91.2			76.0-123
(S) a,a,a-Trifluorotoluene	102			80.0-120
(S) 4-Bromofluorobenzene	98.3			80.0-120

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

(LCS) R3255016-1 10/03/17 20:42 • (LCSD) R3255016-2 10/03/17 21:00

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	0.125	0.162	0.181	130	145	10.0-160			11.3	23
Acrylonitrile	0.125	0.126	0.122	101	97.6	60.0-142			3.26	20
Benzene	0.0250	0.0225	0.0228	90.0	91.4	69.0-123			1.57	20
Bromodichloromethane	0.0250	0.0236	0.0232	94.2	92.8	76.0-120			1.56	20
Bromochloromethane	0.0250	0.0245	0.0246	98.0	98.2	76.0-122			0.260	20
Bromoform	0.0250	0.0231	0.0230	92.5	92.1	67.0-132			0.460	20
Bromomethane	0.0250	0.0215	0.0224	86.0	89.5	18.0-160			4.07	20
Carbon disulfide	0.0250	0.0204	0.0217	81.6	86.8	55.0-127			6.18	20
Carbon tetrachloride	0.0250	0.0239	0.0243	95.8	97.4	63.0-122			1.64	20
Chlorobenzene	0.0250	0.0258	0.0258	103	103	79.0-121			0.250	20
Chlorodibromomethane	0.0250	0.0253	0.0249	101	99.5	75.0-125			1.73	20
Chloroethane	0.0250	0.0226	0.0229	90.4	91.8	47.0-152			1.52	20
Chloroform	0.0250	0.0224	0.0224	89.8	89.6	72.0-121			0.270	20
Chloromethane	0.0250	0.0186	0.0202	74.3	80.9	48.0-139			8.42	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0243	0.0236	97.3	94.4	64.0-127			3.04	20
1,2-Dibromoethane	0.0250	0.0268	0.0257	107	103	77.0-123			4.24	20
Dibromomethane	0.0250	0.0252	0.0241	101	96.4	78.0-120			4.49	20
1,2-Dichlorobenzene	0.0250	0.0253	0.0255	101	102	80.0-120			1.05	20
1,4-Dichlorobenzene	0.0250	0.0198	0.0200	79.1	80.2	77.0-120			1.29	20
trans-1,4-Dichloro-2-butene	0.0250	0.0189	0.0192	75.8	76.7	55.0-134			1.22	20
1,1-Dichloroethane	0.0250	0.0225	0.0231	90.2	92.5	70.0-126			2.55	20
1,2-Dichloroethane	0.0250	0.0235	0.0227	94.1	90.8	67.0-126			3.58	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) R3255016-1 10/03/17 20:42 • (LCSD) R3255016-2 10/03/17 21:00

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 %
1,1-Dichloroethene	0.0250	0.0233	0.0241	93.3	96.6	64.0-129			3.47	20
cis-1,2-Dichloroethene	0.0250	0.0219	0.0224	87.6	89.5	73.0-120			2.13	20
trans-1,2-Dichloroethene	0.0250	0.0216	0.0224	86.5	89.5	71.0-121			3.40	20
1,2-Dichloropropane	0.0250	0.0254	0.0256	102	103	75.0-125			0.950	20
cis-1,3-Dichloropropene	0.0250	0.0253	0.0248	101	99.2	79.0-123			1.98	20
trans-1,3-Dichloropropene	0.0250	0.0278	0.0272	111	109	74.0-127			2.02	20
Ethylbenzene	0.0250	0.0255	0.0255	102	102	77.0-120			0.0500	20
2-Hexanone	0.125	0.138	0.140	111	112	58.0-147			1.37	20
Iodomethane	0.125	0.0940	0.105	75.2	84.0	57.0-140			11.1	20
2-Butanone (MEK)	0.125	0.137	0.142	109	113	37.0-158			3.38	20
Methylene Chloride	0.0250	0.0216	0.0217	86.4	86.8	66.0-121			0.500	20
4-Methyl-2-pentanone (MIBK)	0.125	0.126	0.121	101	96.9	59.0-143			4.26	20
Styrene	0.0250	0.0234	0.0240	93.5	95.9	78.0-124			2.61	20
1,1,1,2-Tetrachloroethane	0.0250	0.0260	0.0255	104	102	75.0-122			2.00	20
1,1,2,2-Tetrachloroethane	0.0250	0.0240	0.0230	96.1	91.9	71.0-122			4.54	20
Tetrachloroethene	0.0250	0.0259	0.0266	104	106	70.0-127			2.49	20
Toluene	0.0250	0.0244	0.0250	97.7	100	77.0-120			2.46	20
1,1,1-Trichloroethane	0.0250	0.0223	0.0230	89.2	92.1	68.0-122			3.25	20
1,1,2-Trichloroethane	0.0250	0.0265	0.0255	106	102	78.0-120			4.01	20
Trichloroethene	0.0250	0.0243	0.0255	97.0	102	78.0-120			4.85	20
Trichlorofluoromethane	0.0250	0.0235	0.0245	94.1	98.1	56.0-137			4.10	20
1,2,3-Trichloropropane	0.0250	0.0246	0.0244	98.5	97.7	72.0-124			0.870	20
Vinyl acetate	0.125	0.101	0.0894	80.6	71.5	46.0-160			12.0	20
Vinyl chloride	0.0250	0.0223	0.0238	89.3	95.1	64.0-133			6.26	20
Xylenes, Total	0.0750	0.0760	0.0762	101	102	77.0-120			0.260	20
(S) Toluene-d8				104	104	80.0-120				
(S) Dibromofluoromethane				93.9	93.0	76.0-123				
(S) a,a,a-Trifluorotoluene				101	101	80.0-120				
(S) 4-Bromofluorobenzene				93.8	97.5	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) R3254596-1 10/03/17 18:00

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Ethylene Dibromide	U		0.0000240	0.0000100
1,2-Dibromo-3-Chloropropane	U		0.0000430	0.0000200

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L940360-05 Original Sample (OS) • Duplicate (DUP)

(OS) L940360-05 10/03/17 18:45 • (DUP) R3254596-3 10/03/17 18:33

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

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

(LCS) R3254596-4 10/03/17 20:25 • (LCSD) R3254596-5 10/03/17 22:27

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	0.000198	0.000196	79.2	78.3	60.0-140			1.16	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000221	0.000229	88.5	91.5	60.0-140			3.29	20

L940360-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L940360-04 10/03/17 18:22 • (MS) R3254596-2 10/03/17 18:11

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	mg/l	mg/l	mg/l	%		%	
Ethylene Dibromide	0.0000990	U	0.0000909	90.9	1.01	72.0-146	
1,2-Dibromo-3-Chloropropane	0.0000990	U	0.000106	106	1.01	63.0-149	



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.

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, 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.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
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.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.  
 \* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

## State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina <sup>1</sup>	DW21704
Florida	E87487	North Carolina <sup>2</sup>	41
Georgia	NELAP	North Dakota	R-140
Georgia <sup>1</sup>	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky <sup>1</sup>	90010	South Dakota	n/a
Kentucky <sup>2</sup>	16	Tennessee <sup>14</sup>	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

## Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>n/a</sup> Accreditation not applicable

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



3 coolers

<b>Civil &amp; Environmental Consultants - TN</b> 321 Seaboard Lane, Suite 170 Report to: <b>Philip Campbell</b> Project Description: <b>EWS Landfill</b>		Billing Information: <b>Dr. Kevin Wolfe</b> 325 Seaboard Lane, Suite 170 Franklin, TN 37067 Email To: <a href="mailto:mjohnson@cecinc.com">mjohnson@cecinc.com</a> , <a href="mailto:pcampbell@cecinc.com">pcampbell@cecinc.com</a>		City/State Collected: <b>Camden, TN</b>		Client Project # <b>142-059-171-873</b>		Lab Project # <b>CEC-142-059</b>		P.O. #		Quote #		Date Results Needed		No. of Entrs		
Phone: <b>615-333-7797</b> Fax: <b>615-333-7751</b>		Site/Facility ID #		P.O. #		Quote #		Date Results Needed		No. of Entrs		Date Results Needed		No. of Entrs				
Collected by (print): <b>Philip Campbell</b> Collected by (signature): <i>Philip Campbell</i> Immediately Packed on Ice <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> Y		Rush? (Lab MUST Be Notified) <input type="checkbox"/> Same Day <input type="checkbox"/> Five Day <input type="checkbox"/> Next Day <input type="checkbox"/> 5 Day (Rad Only) <input type="checkbox"/> Two Day <input type="checkbox"/> 10 Day (Rad Only) <input type="checkbox"/> Three Day		Quote #		Date Results Needed		No. of Entrs		No. of Entrs		No. of Entrs		No. of Entrs				
Sample ID		Comp/Grab	Matrix *	Depth	Date	Time	No. of Entrs	ALK 125mlHDPE-NoPres	Bromide,Cl,F,NO3,SO4 125mlHDPE-NoPres	COD 250mlHDPE-H2SO4	COLLETT MICROBIOLOGICAL	Diss Metals-LabFilt 250mlHDPE-NoPres	Diss. Metals (FFP) 250mlHDPE-NoPres HNO3	NH3 125mlHDPE-H2SO4	SV8011 40mlClr-NaThio	Total Metals 250mlHDPE-HNO3	V8260AP1 40mlAmb-HCl	
MW-1 (FFP)		Grab	GW	-	9-28-17	8:45	12	X	X	X	X	X	X	X	X	X	X	01
MW-1 (LAB FILTER)		↓	GW	↓	↓	8:45	1	X	X	X	X	X	X	X	X	X	X	02
MW-3 (FFP)		↓	GW	↓	↓	12:30	12	X	X	X	X	X	X	X	X	X	X	03
MW-3 (LAB FILTER)		↓	GW	↓	↓	12:30	1	X	X	X	X	X	X	X	X	X	X	04
MW-4 (FFP)		↓	GW	↓	↓	12:00	12	X	X	X	X	X	X	X	X	X	X	05
MW-4 (LAB FILTER)		↓	GW	↓	↓	12:00	1	X	X	X	X	X	X	X	X	X	X	06
MW-5 (FFP)		↓	GW	↓	↓	9:45	12	X	X	X	X	X	X	X	X	X	X	07
MW-5 (LAB FILTER)		↓	GW	↓	↓	9:45	1	X	X	X	X	X	X	X	X	X	X	08
TMW-1 (FFP)		↓	GW	↓	↓	10:30	12	X	X	X	X	X	X	X	X	X	X	09
TMW-1 (LAB FILTER)		↓	GW	↓	↓	10:30	1	X	X	X	X	X	X	X	X	X	X	10

Chain of Custody Page 1 of 2



LAB SCIENCES  
a subsidiary of

12065 Lebanon Rd  
Mount Juliet, TN 37122  
Phone: 615-758-5858  
Phone: 800-767-5859  
Fax: 615-758-5859



L# **934866**

Table **G100**

Acctnum: **CEC**

Template: **T128177**

Prelogin: **P619421**

TSR: **350 - Jimmy Hunt**

PB: **9-20-17**

Shipped Via: **Courier**

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

Remarks: FFP sample ID = Dissolved metals are field filtered and preserved  
 Lab Filter sample ID = Dissolved metals are lab filtered and preserved in the lab  
 \* Metals = App. I metals + Al, Ca, Boron, Fe, Mg, Mn, K, Na

Samples returned via:  
 UPS  FedEx  Courier

Tracking #

Received by: (Signature) \_\_\_\_\_ Date: **9-28-17** Time: **18:20**

Trip Blank Received:  Yes  No  
 HCl / MeOH  
 TBR

Temp: **1.5** °C Bottles Received: **117**

Received for lab by: (Signature) *WJD* Date: **9-29-17** Time: **9:47**

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

VQA Zero Headspace:  Y  N

Preservation Correct/Checked:  Y  N

Relinquished by: (Signature) *Philip Campbell* Date: **9-28-17** Time: **18:20**

Relinquished by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Relinquished by: (Signature) \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Hold: \_\_\_\_\_ Condition: **NCF 10K**

\* Analytical Report - ROL only

**Civil & Environmental Consultants - TN**

325 Seaboard Lane, Suite 170

Report to:  
**Philip Campbell**

Project Description: **EWS Landfill**

Phone: **615-333-7797**  
Fax: **615-333-7751**

Collected by (print):  
**Philip Campbell**

Collected by (signature):  
*Philip Campbell*

Immediately Packed on Ice N  Y

Billing Information:  
**Dr. Kevin Wolfe**  
325 Seaboard Lane, Suite 170  
Franklin, TN 37067

Email To: **mjohnson@cecinc.com,**  
**pcampbell@cecinc.com**

City/State Collected:

Lab Project #  
**CEC-142-059**

P.O. #

Quote #

Rush? (Lab MUST Be Notified)

Same Day  Five Day  
 Next Day  5 Day (Rad Only)  
 Two Day  10 Day (Rad Only)  
 Three Day

Date Results Needed

Pres Chk

Analysis / Container / Preservative

ALK 125mlHDPE-NoPres	Bromide, Cl, F, NO3, SO4 125mlHDPE-NoPres	COD 250mlHDPE-H2SO4	COLLERT Microbiological	Diss Metals-LabFilt 250mlHDPE-NoPres	Diss. Metals (FFP) 250mlHDPE-NoPres + HNO3	NH3 125mlHDPE-H2SO4	SV8011 40mlClr-NaThio	Total Metals 250mlHDPE-HNO3	V8260API 40mlAmb-HCl
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12065 Lebanon Rd  
Mount Juliet, TN 37122  
Phone: 615-758-5858  
Phone: 800-767-5859  
Fax: 615-758-5859

L# **939866**  
Table #  
Acctnum: **CEC**  
Template: **T128177**  
Prelogin: **P619421**  
TSR: **350 - Jimmy Hunt**  
PB: **9-20-17**  
Shipped Via: **Courier**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ALK 125mlHDPE-NoPres	Bromide, Cl, F, NO3, SO4 125mlHDPE-NoPres	COD 250mlHDPE-H2SO4	COLLERT Microbiological	Diss Metals-LabFilt 250mlHDPE-NoPres	Diss. Metals (FFP) 250mlHDPE-NoPres + HNO3	NH3 125mlHDPE-H2SO4	SV8011 40mlClr-NaThio	Total Metals 250mlHDPE-HNO3	V8260API 40mlAmb-HCl	Remarks	Sample # (lab only)
TMW-2 (FFP)	Grab	GW	-	9-28-17	1100	1	X	X	X	X		X	X	X	X	X		11
TMW-2 (LAB FILTER)		GW			1100	1					X							12
TMW-3 (FFP)		GW			1130	1	X	X	X	X		X	X	X	X	X		13
TMW-3 (LAB FILTER)		GW			1130	1					X							14
DUPLICATE (FFP)		GW			-	1	X	X	X	X		X	X	X	X	X		15
DUPLICATE (LAB FILTER)		GW			-	1					X							16
FIELD BLANK (FFP)		GW			13:10	1	X	X	X	X		X	X	X	X	X		17
FIELD BLANK (LAB FILTER)		GW			13:10	1					X							18
TRIP BLANK		GW			-	1										X		19

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

Remarks: FFP sample ID = Dissolved metals are field filtered and preserved  
Lab Filter sample ID = Dissolved metals are lab filtered and preserved  
Metals = App. I + Al, Ca, Fe, Brn, Fe, Mg, Mn, K, Na

pH \_\_\_\_\_ Temp \_\_\_\_\_  
Flow \_\_\_\_\_ Other \_\_\_\_\_

Samples returned via:  
 UPS  FedEx  Courier

Tracking #

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

Relinquished by: (Signature) <i>Philip Campbell</i>	Date: 9-28-17	Time: 18:20	Received by: (Signature)	Trip Blank Received: <input checked="" type="checkbox"/> Yes / No <input type="checkbox"/> MeOH TBR
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 1.5 °C Bottles Received: 117
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) <i>UK</i>	Date: 9-29-17 Time: 9:45 Hold: Condition: NCF / <input checked="" type="checkbox"/>

x Analytical Report - ROL only.

October 12, 2017

## Civil & Environmental Consultants - TN

Sample Delivery Group: L939855  
Samples Received: 09/29/2017  
Project Number: 171-873  
Description: EWS Landfill

Report To: Matt Turner  
325 Seaboard Lane, Suite 170  
Franklin, TN 37067

Entire Report Reviewed By:



Jimmy Hunt

Technical Service Representative

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 ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



<b>Cp: Cover Page</b>	<b>1</b>	<b>1</b> Cp
<b>Tc: Table of Contents</b>	<b>2</b>	<b>2</b> Tc
<b>Ss: Sample Summary</b>	<b>3</b>	<b>3</b> Ss
<b>Cn: Case Narrative</b>	<b>5</b>	<b>5</b> Cn
<b>Sr: Sample Results</b>	<b>6</b>	<b>6</b> Sr
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IWC-L (LAB FILTER) L939855-02	9	
LEACHATE-SMELTER (FFP) L939855-03	10	
LEACHATE-SMELTER (LAB FILTER) L939855-04	13	
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<b>Sc: Sample Chain of Custody</b>	<b>35</b>	<b>35</b> Sc

# SAMPLE SUMMARY



## IWC-L (FFP) L939855-01 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 14:00  
Received date/time 09/29/17 08:00

1  
Cp

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1026875	1	10/05/17 08:37	10/05/17 08:37	MCG
Wet Chemistry by Method 350.1	WG1028136	500	10/05/17 14:46	10/05/17 14:46	JER
Wet Chemistry by Method 410.4	WG1028352	20	10/05/17 16:53	10/05/17 20:35	MZ
Wet Chemistry by Method 9056A	WG1025962	1	09/29/17 15:30	09/29/17 15:30	MAJ
Wet Chemistry by Method 9056A	WG1025962	500	09/29/17 15:45	09/29/17 15:45	MAJ
Mercury by Method 7470A	WG1026601	1	10/04/17 12:31	10/04/17 18:37	EL
Mercury by Method 7470A	WG1027479	1	10/04/17 00:42	10/04/17 09:30	EL
Metals (ICP) by Method 6010B	WG1029498	10	10/09/17 17:43	10/10/17 13:29	RDS
Metals (ICP) by Method 6010B	WG1029541	10	10/10/17 10:46	10/11/17 10:47	CCE
Metals (ICPMS) by Method 6020	WG1027779	10	10/05/17 14:08	10/07/17 20:42	LAT
Metals (ICPMS) by Method 6020	WG1027779	20	10/05/17 14:08	10/07/17 20:39	LAT
Metals (ICPMS) by Method 6020	WG1027779	200	10/05/17 14:08	10/10/17 13:42	LAT
Metals (ICPMS) by Method 6020	WG1027779	2000	10/05/17 14:08	10/10/17 13:58	LAT
Metals (ICPMS) by Method 6020	WG1027779	50	10/05/17 14:08	10/10/17 10:58	LAT
Metals (ICPMS) by Method 6020	WG1028694	10	10/08/17 06:49	10/12/17 12:20	JPD
Metals (ICPMS) by Method 6020	WG1028694	100	10/08/17 06:49	10/12/17 12:23	JPD
Metals (ICPMS) by Method 6020	WG1028694	2000	10/08/17 06:49	10/12/17 15:08	JPD
Metals (ICPMS) by Method 6020	WG1028694	500	10/08/17 06:49	10/12/17 15:04	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 01:43	10/04/17 01:43	LRL
EDB / DBCP by Method 8011	WG1026738	1	10/02/17 10:00	10/03/17 15:45	HMH

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

## IWC-L (LAB FILTER) L939855-02 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 14:00  
Received date/time 09/29/17 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026601	1	10/04/17 12:31	10/04/17 18:40	EL
Metals (ICP) by Method 6010B	WG1029541	10	10/10/17 10:46	10/11/17 10:51	CCE
Metals (ICPMS) by Method 6020	WG1028694	10	10/08/17 06:49	10/12/17 12:27	JPD
Metals (ICPMS) by Method 6020	WG1028694	100	10/08/17 06:49	10/12/17 12:30	JPD
Metals (ICPMS) by Method 6020	WG1028694	2000	10/08/17 06:49	10/12/17 15:15	JPD
Metals (ICPMS) by Method 6020	WG1028694	500	10/08/17 06:49	10/12/17 15:11	JPD

## LEACHATE-SMELTER (FFP) L939855-03 GW

Collected by Philip Campbell  
Collected date/time 09/28/17 14:45  
Received date/time 09/29/17 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 2320 B-2011	WG1026875	5	10/05/17 09:35	10/05/17 09:35	MCG
Wet Chemistry by Method 350.1	WG1028136	2500	10/05/17 15:10	10/05/17 15:10	JER
Wet Chemistry by Method 410.4	WG1028352	20	10/05/17 16:53	10/05/17 20:36	MZ
Wet Chemistry by Method 9056A	WG1025962	1	09/29/17 16:00	09/29/17 16:00	MAJ
Wet Chemistry by Method 9056A	WG1025962	50	09/29/17 22:43	09/29/17 22:43	MAJ
Wet Chemistry by Method 9056A	WG1028409	10000	10/05/17 22:11	10/05/17 22:11	DR
Mercury by Method 7470A	WG1026601	1	10/04/17 12:31	10/04/17 18:42	EL
Mercury by Method 7470A	WG1027770	1	10/05/17 10:34	10/05/17 19:17	EL
Metals (ICP) by Method 6010B	WG1029498	9	10/09/17 17:43	10/10/17 08:42	TRB
Metals (ICP) by Method 6010B	WG1029541	100	10/10/17 10:46	10/11/17 10:55	CCE
Metals (ICPMS) by Method 6020	WG1027779	180	10/05/17 14:11	10/07/17 20:45	LAT
Metals (ICPMS) by Method 6020	WG1027779	90	10/05/17 14:11	10/07/17 20:49	LAT
Metals (ICPMS) by Method 6020	WG1028694	10	10/08/17 06:49	10/12/17 12:34	JPD
Metals (ICPMS) by Method 6020	WG1028694	200	10/08/17 06:49	10/12/17 12:37	JPD
Metals (ICPMS) by Method 6020	WG1028694	200	10/08/17 06:49	10/12/17 15:01	JPD
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1026488	1	10/04/17 02:01	10/04/17 02:01	LRL
EDB / DBCP by Method 8011	WG1026738	1	10/02/17 10:00	10/03/17 16:01	HMH



## LEACHATE-SMELTER (LAB FILTER) L939855-04 GW

Collected by Philip Campbell	Collected date/time 09/28/17 14:45	Received date/time 09/29/17 08:00
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Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7470A	WG1026601	1	10/04/17 12:31	10/04/17 18:44	EL
Metals (ICP) by Method 6010B	WG1029541	10	10/10/17 10:46	10/11/17 10:58	CCE
Metals (ICPMS) by Method 6020	WG1028694	10	10/08/17 06:49	10/12/17 12:41	JPD
Metals (ICPMS) by Method 6020	WG1028694	10	10/08/17 06:49	10/12/17 14:57	JPD
Metals (ICPMS) by Method 6020	WG1028694	200	10/08/17 06:49	10/12/17 12:44	JPD





All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. 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.

Jimmy Hunt  
 Technical Service Representative

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

Sample Handling and Receiving

The following analysis were performed from an unpreserved, insufficiently or inadequately preserved sample.

<u>ESC Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
<a href="#">L939855-03</a>	<a href="#">LEACHATE-SMELTER (FFP)</a>	6010B, 6020



## Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Alkalinity	U		2.71	20.0	1	10/05/2017 08:37	<a href="#">WG1026875</a>

## Sample Narrative:

L939855-01 WG1026875: Endpoint pH 4.5

## Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Ammonia Nitrogen	684		15.8	50.0	500	10/05/2017 14:46	<a href="#">WG1028136</a>

## Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
COD	3690		60.0	200	20	10/05/2017 20:35	<a href="#">WG1028352</a>

## Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Bromide	U		39.5	500	500	09/29/2017 15:45	<a href="#">WG1025962</a>
Chloride	U		0.0519	1.00	1	09/29/2017 15:30	<a href="#">WG1025962</a>
Fluoride	39.5	J	4.95	50.0	500	09/29/2017 15:45	<a href="#">WG1025962</a>
Nitrate	U		11.4	50.0	500	09/29/2017 15:45	<a href="#">WG1025962</a>
Sulfate	U		0.0774	5.00	1	09/29/2017 15:30	<a href="#">WG1025962</a>

## Mercury by Method 7470A

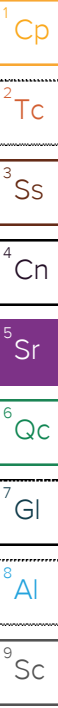
Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Mercury	0.000991		0.0000490	0.000200	1	10/04/2017 09:30	<a href="#">WG1027479</a>
Mercury,Dissolved	0.00101		0.0000490	0.000200	1	10/04/2017 18:37	<a href="#">WG1026601</a>

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Boron	0.434	J	0.126	2.00	10	10/10/2017 13:29	<a href="#">WG1029498</a>
Boron,Dissolved	0.593	J	0.126	2.00	10	10/11/2017 10:47	<a href="#">WG1029541</a>

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Aluminum	297		0.0515	1.00	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Aluminum,Dissolved	269		0.0515	1.00	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Antimony	U		0.00754	0.0200	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Antimony,Dissolved	U		0.00754	0.0200	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Arsenic	0.202		0.00500	0.0400	20	10/07/2017 20:39	<a href="#">WG1027779</a>
Arsenic,Dissolved	0.283		0.0250	0.200	100	10/12/2017 12:23	<a href="#">WG1028694</a>
Barium	0.898		0.00360	0.0500	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Barium,Dissolved	0.826		0.00360	0.0500	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Beryllium	0.0840		0.00120	0.0200	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Beryllium,Dissolved	0.0783		0.00120	0.0200	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Cadmium	252		0.00800	0.0500	50	10/10/2017 10:58	<a href="#">WG1027779</a>
Cadmium,Dissolved	257		0.0160	0.100	100	10/12/2017 12:23	<a href="#">WG1028694</a>
Calcium	4240		0.460	10.0	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Calcium,Dissolved	3820		0.460	10.0	10	10/12/2017 12:20	<a href="#">WG1028694</a>







Collected date/time: 09/28/17 14:00

L939855

## Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	0.0679		0.0108	0.0400	20	10/07/2017 20:39	<a href="#">WG1027779</a>
Chromium,Dissolved	0.0699	<u>B</u>	0.0540	0.200	100	10/12/2017 12:23	<a href="#">WG1028694</a>
Cobalt	1.21		0.00520	0.0400	20	10/07/2017 20:39	<a href="#">WG1027779</a>
Cobalt,Dissolved	1.42		0.0260	0.200	100	10/12/2017 12:23	<a href="#">WG1028694</a>
Copper	44.0		0.104	1.00	200	10/10/2017 13:42	<a href="#">WG1027779</a>
Copper,Dissolved	48.4		0.260	2.50	500	10/12/2017 15:04	<a href="#">WG1028694</a>
Iron	142		0.300	2.00	20	10/07/2017 20:39	<a href="#">WG1027779</a>
Iron,Dissolved	160		1.50	10.0	100	10/12/2017 12:23	<a href="#">WG1028694</a>
Lead	0.386		0.00240	0.0200	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Lead,Dissolved	0.350		0.00240	0.0200	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Magnesium	2160		2.00	20.0	20	10/07/2017 20:39	<a href="#">WG1027779</a>
Magnesium,Dissolved	2460		10.0	100	100	10/12/2017 12:23	<a href="#">WG1028694</a>
Manganese	394		0.0125	0.250	50	10/10/2017 10:58	<a href="#">WG1027779</a>
Manganese,Dissolved	409		0.0250	0.500	100	10/12/2017 12:23	<a href="#">WG1028694</a>
Nickel	1.13		0.00700	0.0400	20	10/07/2017 20:39	<a href="#">WG1027779</a>
Nickel,Dissolved	1.37		0.0350	0.200	100	10/12/2017 12:23	<a href="#">WG1028694</a>
Potassium	6040		0.370	10.0	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Potassium,Dissolved	5770		0.370	10.0	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Selenium	0.272		0.00380	0.0200	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Selenium,Dissolved	0.337		0.00380	0.0200	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Silver	U		0.00310	0.0200	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Silver,Dissolved	U		0.00310	0.0200	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Sodium	9630		2.20	20.0	20	10/07/2017 20:39	<a href="#">WG1027779</a>
Sodium,Dissolved	9740		1.10	10.0	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Thallium	0.114		0.00190	0.0200	10	10/07/2017 20:42	<a href="#">WG1027779</a>
Thallium,Dissolved	0.104		0.00190	0.0200	10	10/12/2017 12:20	<a href="#">WG1028694</a>
Vanadium	0.0157	<u>J</u>	0.00360	0.100	20	10/07/2017 20:39	<a href="#">WG1027779</a>
Vanadium,Dissolved	U		0.0180	0.500	100	10/12/2017 12:23	<a href="#">WG1028694</a>
Zinc	2780		5.12	50.0	2000	10/10/2017 13:58	<a href="#">WG1027779</a>
Zinc,Dissolved	3080		5.12	50.0	2000	10/12/2017 15:08	<a href="#">WG1028694</a>

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	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	0.866		0.0100	0.0500	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Acrylonitrile	U		0.00187	0.0100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Benzene	U		0.000331	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Bromochloromethane	U		0.000520	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Bromodichloromethane	U		0.000380	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Bromoform	U		0.000469	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Bromomethane	U		0.000866	0.00500	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Carbon disulfide	0.000707	<u>J</u>	0.000275	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Carbon tetrachloride	U		0.000379	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Chlorobenzene	U		0.000348	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Chlorodibromomethane	U		0.000327	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Chloroethane	U		0.000453	0.00500	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Chloroform	U		0.000324	0.00500	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Chloromethane	0.00807		0.000276	0.00250	1	10/04/2017 01:43	<a href="#">WG1026488</a>
Dibromomethane	U		0.000346	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	1	10/04/2017 01:43	<a href="#">WG1026488</a>
1,2-Dibromoethane	U		0.000381	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
1,2-Dichlorobenzene	U		0.000349	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
1,4-Dichlorobenzene	U		0.000274	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
trans-1,4-Dichloro-2-butene	U		0.000866	0.00250	1	10/04/2017 01:43	<a href="#">WG1026488</a>
1,1-Dichloroethane	U		0.000259	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>
1,2-Dichloroethane	U		0.000361	0.00100	1	10/04/2017 01:43	<a href="#">WG1026488</a>



Collected date/time: 09/28/17 14:00

L939855

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	U		0.000398	0.00100	1	10/04/2017 01:43	WG1026488
cis-1,2-Dichloroethene	U		0.000260	0.00100	1	10/04/2017 01:43	WG1026488
trans-1,2-Dichloroethene	U		0.000396	0.00100	1	10/04/2017 01:43	WG1026488
1,2-Dichloropropane	U		0.000306	0.00100	1	10/04/2017 01:43	WG1026488
cis-1,3-Dichloropropene	U		0.000418	0.00100	1	10/04/2017 01:43	WG1026488
trans-1,3-Dichloropropene	U		0.000419	0.00100	1	10/04/2017 01:43	WG1026488
Ethylbenzene	U		0.000384	0.00100	1	10/04/2017 01:43	WG1026488
2-Hexanone	0.00489	U	0.00382	0.0100	1	10/04/2017 01:43	WG1026488
Iodomethane	U		0.00171	0.0100	1	10/04/2017 01:43	WG1026488
2-Butanone (MEK)	0.0954		0.00393	0.0100	1	10/04/2017 01:43	WG1026488
Methylene Chloride	U		0.00100	0.00500	1	10/04/2017 01:43	WG1026488
4-Methyl-2-pentanone (MIBK)	0.0148		0.00214	0.0100	1	10/04/2017 01:43	WG1026488
Styrene	U		0.000307	0.00100	1	10/04/2017 01:43	WG1026488
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	1	10/04/2017 01:43	WG1026488
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	1	10/04/2017 01:43	WG1026488
Tetrachloroethene	U		0.000372	0.00100	1	10/04/2017 01:43	WG1026488
Toluene	0.000489	U	0.000412	0.00100	1	10/04/2017 01:43	WG1026488
1,1,1-Trichloroethane	U		0.000319	0.00100	1	10/04/2017 01:43	WG1026488
1,1,2-Trichloroethane	U		0.000383	0.00100	1	10/04/2017 01:43	WG1026488
Trichloroethene	U		0.000398	0.00100	1	10/04/2017 01:43	WG1026488
Trichlorofluoromethane	U		0.00120	0.00500	1	10/04/2017 01:43	WG1026488
1,2,3-Trichloropropane	U		0.000807	0.00250	1	10/04/2017 01:43	WG1026488
Vinyl acetate	U		0.00163	0.0100	1	10/04/2017 01:43	WG1026488
Vinyl chloride	U		0.000259	0.00100	1	10/04/2017 01:43	WG1026488
Xylenes, Total	U		0.00106	0.00300	1	10/04/2017 01:43	WG1026488
(S) Toluene-d8	106			80.0-120		10/04/2017 01:43	WG1026488
(S) Dibromofluoromethane	91.5			76.0-123		10/04/2017 01:43	WG1026488
(S) a,a,a-Trifluorotoluene	103			80.0-120		10/04/2017 01:43	WG1026488
(S) 4-Bromofluorobenzene	98.5			80.0-120		10/04/2017 01:43	WG1026488

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	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	U		0.0000240	0.0000100	1	10/03/2017 15:45	WG1026738
1,2-Dibromo-3-Chloropropane	U		0.0000430	0.0000200	1	10/03/2017 15:45	WG1026738



Mercury by Method 7470A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Mercury,Dissolved	0.00101		0.0000490	0.000200	1	10/04/2017 18:40	<a href="#">WG1026601</a>

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Boron,Dissolved	0.478	J	0.126	2.00	10	10/11/2017 10:51	<a href="#">WG1029541</a>

3 Ss

4 Cn

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Aluminum,Dissolved	278		0.0515	1.00	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Antimony,Dissolved	U		0.00754	0.0200	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Arsenic,Dissolved	0.276		0.0250	0.200	100	10/12/2017 12:30	<a href="#">WG1028694</a>
Barium,Dissolved	0.841		0.00360	0.0500	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Beryllium,Dissolved	0.0819		0.00120	0.0200	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Cadmium,Dissolved	255		0.0160	0.100	100	10/12/2017 12:30	<a href="#">WG1028694</a>
Calcium,Dissolved	3950		0.460	10.0	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Chromium,Dissolved	U		0.0540	0.200	100	10/12/2017 12:30	<a href="#">WG1028694</a>
Cobalt,Dissolved	1.42		0.0260	0.200	100	10/12/2017 12:30	<a href="#">WG1028694</a>
Copper,Dissolved	48.5		0.260	2.50	500	10/12/2017 15:11	<a href="#">WG1028694</a>
Iron,Dissolved	136		1.50	10.0	100	10/12/2017 12:30	<a href="#">WG1028694</a>
Lead,Dissolved	0.372		0.00240	0.0200	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Magnesium,Dissolved	2440		10.0	100	100	10/12/2017 12:30	<a href="#">WG1028694</a>
Manganese,Dissolved	404		0.0250	0.500	100	10/12/2017 12:30	<a href="#">WG1028694</a>
Nickel,Dissolved	1.30		0.0350	0.200	100	10/12/2017 12:30	<a href="#">WG1028694</a>
Potassium,Dissolved	5840		0.370	10.0	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Selenium,Dissolved	0.352		0.00380	0.0200	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Silver,Dissolved	U		0.00310	0.0200	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Sodium,Dissolved	9960		1.10	10.0	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Thallium,Dissolved	0.107		0.00190	0.0200	10	10/12/2017 12:27	<a href="#">WG1028694</a>
Vanadium,Dissolved	U		0.0180	0.500	100	10/12/2017 12:30	<a href="#">WG1028694</a>
Zinc,Dissolved	3150		5.12	50.0	2000	10/12/2017 15:15	<a href="#">WG1028694</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 2320 B-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Alkalinity	9180		2.71	20.0	5	10/05/2017 09:35	<a href="#">WG1026875</a>

Sample Narrative:

L939855-03 WG1026875: Endpoint pH 4.5

Wet Chemistry by Method 350.1

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Ammonia Nitrogen	9930		79.2	250	2500	10/05/2017 15:10	<a href="#">WG1028136</a>

Wet Chemistry by Method 410.4

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
COD	2600		60.0	200	20	10/05/2017 20:36	<a href="#">WG1028352</a>

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Bromide	171		3.95	50.0	50	09/29/2017 22:43	<a href="#">WG1025962</a>
Chloride	190000		519	10000	10000	10/05/2017 22:11	<a href="#">WG1028409</a>
Fluoride	U		0.00990	0.100	1	09/29/2017 16:00	<a href="#">WG1025962</a>
Nitrate	1.18		0.0227	0.100	1	09/29/2017 16:00	<a href="#">WG1025962</a>
Sulfate	1320		3.87	250	50	09/29/2017 22:43	<a href="#">WG1025962</a>

Mercury by Method 7470A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Mercury	U		0.0000490	0.000200	1	10/05/2017 19:17	<a href="#">WG1027770</a>
Mercury,Dissolved	0.000222		0.0000490	0.000200	1	10/04/2017 18:42	<a href="#">WG1026601</a>

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Boron	9.36		0.113	1.80	9	10/10/2017 08:42	<a href="#">WG1029498</a>
Boron,Dissolved	10.1	J	1.26	20.0	100	10/11/2017 10:55	<a href="#">WG1029541</a>

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Aluminum	U		0.464	9.00	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Aluminum,Dissolved	U		0.0515	1.00	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Antimony	U		0.0679	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Antimony,Dissolved	0.0531		0.00754	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Arsenic	0.0232	J	0.0225	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Arsenic,Dissolved	0.0222		0.00250	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Barium	2.01		0.0324	0.450	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Barium,Dissolved	1.93		0.00360	0.0500	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Beryllium	U		0.0108	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Beryllium,Dissolved	U		0.00120	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Cadmium	0.249		0.0144	0.0900	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Cadmium,Dissolved	0.229		0.00160	0.0100	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Calcium	298		4.14	90.0	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Calcium,Dissolved	282		0.460	10.0	10	10/12/2017 12:34	<a href="#">WG1028694</a>

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



Collected date/time: 09/28/17 14:45

L939855

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Chromium	0.0623	<u>J</u>	0.0486	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Chromium,Dissolved	U		0.00540	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Cobalt	0.0646	<u>J</u>	0.0234	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Cobalt,Dissolved	0.0617		0.00260	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Copper	10.0		0.0468	0.450	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Copper,Dissolved	10.6		0.104	1.00	200	10/12/2017 12:37	<a href="#">WG1028694</a>
Iron	U		1.35	9.00	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Iron,Dissolved	U		0.150	1.00	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Lead	U		0.0216	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Lead,Dissolved	0.00593	<u>BJ</u>	0.00240	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Magnesium	U		9.00	90.0	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Magnesium,Dissolved	U		1.00	10.0	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Manganese	0.387	<u>BJ</u>	0.0225	0.450	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Manganese,Dissolved	0.0395	<u>BJ</u>	0.00250	0.0500	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Nickel	0.764		0.0315	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Nickel,Dissolved	0.718		0.00350	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Potassium	58000		3.33	90.0	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Potassium,Dissolved	55300		7.40	200	200	10/12/2017 15:01	<a href="#">WG1028694</a>
Selenium	U		0.0342	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Selenium,Dissolved	0.0115	<u>J</u>	0.00380	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Silver	U		0.0279	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Silver,Dissolved	U		0.00310	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Sodium	82200		19.8	180	180	10/07/2017 20:45	<a href="#">WG1027779</a>
Sodium,Dissolved	94600		22.0	200	200	10/12/2017 15:01	<a href="#">WG1028694</a>
Thallium	U		0.0171	0.180	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Thallium,Dissolved	U		0.00190	0.0200	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Vanadium	0.0651	<u>J</u>	0.0162	0.450	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Vanadium,Dissolved	0.0696		0.00180	0.0500	10	10/12/2017 12:34	<a href="#">WG1028694</a>
Zinc	48.4		0.230	2.25	90	10/07/2017 20:49	<a href="#">WG1027779</a>
Zinc,Dissolved	48.6		0.512	5.00	200	10/12/2017 12:37	<a href="#">WG1028694</a>

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	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Acetone	0.692		0.0100	0.0500	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Acrylonitrile	U		0.00187	0.0100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Benzene	U		0.000331	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Bromochloromethane	U		0.000520	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Bromodichloromethane	U		0.000380	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Bromoform	U		0.000469	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Bromomethane	U		0.000866	0.00500	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Carbon disulfide	U		0.000275	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Carbon tetrachloride	U		0.000379	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Chlorobenzene	U		0.000348	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Chlorodibromomethane	U		0.000327	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Chloroethane	U		0.000453	0.00500	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Chloroform	U		0.000324	0.00500	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Chloromethane	U		0.000276	0.00250	1	10/04/2017 02:01	<a href="#">WG1026488</a>
Dibromomethane	U		0.000346	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500	1	10/04/2017 02:01	<a href="#">WG1026488</a>
1,2-Dibromoethane	U		0.000381	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
1,2-Dichlorobenzene	U		0.000349	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
1,4-Dichlorobenzene	U		0.000274	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
trans-1,4-Dichloro-2-butene	U		0.000866	0.00250	1	10/04/2017 02:01	<a href="#">WG1026488</a>
1,1-Dichloroethane	U		0.000259	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>
1,2-Dichloroethane	U		0.000361	0.00100	1	10/04/2017 02:01	<a href="#">WG1026488</a>



Collected date/time: 09/28/17 14:45

L939855

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

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	U		0.000398	0.00100	1	10/04/2017 02:01	WG1026488
cis-1,2-Dichloroethene	U		0.000260	0.00100	1	10/04/2017 02:01	WG1026488
trans-1,2-Dichloroethene	U		0.000396	0.00100	1	10/04/2017 02:01	WG1026488
1,2-Dichloropropane	U		0.000306	0.00100	1	10/04/2017 02:01	WG1026488
cis-1,3-Dichloropropene	U		0.000418	0.00100	1	10/04/2017 02:01	WG1026488
trans-1,3-Dichloropropene	U		0.000419	0.00100	1	10/04/2017 02:01	WG1026488
Ethylbenzene	U		0.000384	0.00100	1	10/04/2017 02:01	WG1026488
2-Hexanone	U		0.00382	0.0100	1	10/04/2017 02:01	WG1026488
Iodomethane	U		0.00171	0.0100	1	10/04/2017 02:01	WG1026488
2-Butanone (MEK)	0.0373		0.00393	0.0100	1	10/04/2017 02:01	WG1026488
Methylene Chloride	U		0.00100	0.00500	1	10/04/2017 02:01	WG1026488
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100	1	10/04/2017 02:01	WG1026488
Styrene	U		0.000307	0.00100	1	10/04/2017 02:01	WG1026488
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100	1	10/04/2017 02:01	WG1026488
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100	1	10/04/2017 02:01	WG1026488
Tetrachloroethene	U		0.000372	0.00100	1	10/04/2017 02:01	WG1026488
Toluene	U		0.000412	0.00100	1	10/04/2017 02:01	WG1026488
1,1,1-Trichloroethane	U		0.000319	0.00100	1	10/04/2017 02:01	WG1026488
1,1,2-Trichloroethane	U		0.000383	0.00100	1	10/04/2017 02:01	WG1026488
Trichloroethene	U		0.000398	0.00100	1	10/04/2017 02:01	WG1026488
Trichlorofluoromethane	U		0.00120	0.00500	1	10/04/2017 02:01	WG1026488
1,2,3-Trichloropropane	U		0.000807	0.00250	1	10/04/2017 02:01	WG1026488
Vinyl acetate	U		0.00163	0.0100	1	10/04/2017 02:01	WG1026488
Vinyl chloride	U		0.000259	0.00100	1	10/04/2017 02:01	WG1026488
Xylenes, Total	U		0.00106	0.00300	1	10/04/2017 02:01	WG1026488
(S) Toluene-d8	102			80.0-120		10/04/2017 02:01	WG1026488
(S) Dibromofluoromethane	89.4			76.0-123		10/04/2017 02:01	WG1026488
(S) a,a,a-Trifluorotoluene	92.3			80.0-120		10/04/2017 02:01	WG1026488
(S) 4-Bromofluorobenzene	103			80.0-120		10/04/2017 02:01	WG1026488

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	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Ethylene Dibromide	U		0.0000240	0.0000100	1	10/03/2017 16:01	WG1026738
1,2-Dibromo-3-Chloropropane	U		0.0000430	0.0000200	1	10/03/2017 16:01	WG1026738



Collected date/time: 09/28/17 14:45

L939855

## Mercury by Method 7470A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Mercury,Dissolved	0.000235		0.0000490	0.000200	1	10/04/2017 18:44	<a href="#">WG1026601</a>

1 Cp

2 Tc

## Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Boron,Dissolved	9.25		0.126	2.00	10	10/11/2017 10:58	<a href="#">WG1029541</a>

3 Ss

4 Cn

## Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	mg/l		mg/l	mg/l		date / time	
Aluminum,Dissolved	U		0.0515	1.00	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Antimony,Dissolved	0.0542		0.00754	0.0200	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Arsenic,Dissolved	0.0209		0.00250	0.0200	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Barium,Dissolved	1.91		0.00360	0.0500	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Beryllium,Dissolved	U		0.00120	0.0200	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Cadmium,Dissolved	0.222		0.00160	0.0100	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Calcium,Dissolved	288		0.460	10.0	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Chromium,Dissolved	U		0.00540	0.0200	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Cobalt,Dissolved	0.0624		0.00260	0.0200	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Copper,Dissolved	12.0		0.104	1.00	200	10/12/2017 12:44	<a href="#">WG1028694</a>
Iron,Dissolved	U		0.150	1.00	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Lead,Dissolved	0.00448	<u>B J</u>	0.00240	0.0200	10	10/12/2017 14:57	<a href="#">WG1028694</a>
Magnesium,Dissolved	U		1.00	10.0	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Manganese,Dissolved	0.0350	<u>B J</u>	0.00250	0.0500	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Nickel,Dissolved	0.727		0.00350	0.0200	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Potassium,Dissolved	55200		7.40	200	200	10/12/2017 12:44	<a href="#">WG1028694</a>
Selenium,Dissolved	0.0138	<u>J</u>	0.00380	0.0200	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Silver,Dissolved	U		0.00310	0.0200	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Sodium,Dissolved	91100		22.0	200	200	10/12/2017 12:44	<a href="#">WG1028694</a>
Thallium,Dissolved	U		0.00190	0.0200	10	10/12/2017 14:57	<a href="#">WG1028694</a>
Vanadium,Dissolved	0.0722		0.00180	0.0500	10	10/12/2017 12:41	<a href="#">WG1028694</a>
Zinc,Dissolved	49.4		0.512	5.00	200	10/12/2017 12:44	<a href="#">WG1028694</a>

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3255078-1 10/04/17 21:36

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Alkalinity	2.73	↓	2.71	20.0

Sample Narrative:

BLANK: Endpoint pH 4.5

L939157-03 Original Sample (OS) • Duplicate (DUP)

(OS) L939157-03 10/04/17 21:43 • (DUP) R3255078-3 10/04/17 21:50

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Alkalinity	89.9	91.8	1	2.00		20

Sample Narrative:

OS: Endpoint pH 4.5  
DUP: Endpoint pH 4.5

L939828-04 Original Sample (OS) • Duplicate (DUP)

(OS) L939828-04 10/05/17 10:05 • (DUP) R3255078-8 10/05/17 10:18

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Alkalinity	84.3	87.2	1	3.00		20

Sample Narrative:

OS: Endpoint pH 4.5  
DUP: Endpoint pH 4.5

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

(LCS) R3255078-6 10/04/17 23:15 • (LCSD) R3255078-7 10/05/17 08:27

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Alkalinity	100	110	110	110	110	85.0-115			0.000	20

Sample Narrative:

LCS: Endpoint pH 4.5  
LCSD: Endpoint pH 4.5

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc





Method Blank (MB)

(MB) R3255107-1 10/05/17 14:25

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Ammonia Nitrogen	U		0.0317	0.100

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

L940325-01 Original Sample (OS) • Duplicate (DUP)

(OS) L940325-01 10/05/17 14:49 • (DUP) R3255107-4 10/05/17 14:51

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Ammonia Nitrogen	ND	0.0710	1	0		20

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

(LCS) R3255107-2 10/05/17 14:27 • (LCSD) R3255107-3 10/05/17 14:28

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Ammonia Nitrogen	7.50	7.57	7.35	101	98	90-110			3	20

7 Gl

8 Al

L940325-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L940325-01 10/05/17 14:49 • (MS) R3255107-5 10/05/17 14:52 • (MSD) R3255107-6 10/05/17 14:54

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	5.40	5.41	108	108	1	90-110			0	20

9 Sc



Method Blank (MB)

(MB) R3255195-1 10/05/17 20:34

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
COD	U		3	10.0

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L939855-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939855-01 10/05/17 20:35 • (DUP) R3255195-4 10/05/17 20:36

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	3690	3840	20	4		20

L940238-03 Original Sample (OS) • Duplicate (DUP)

(OS) L940238-03 10/05/17 20:41 • (DUP) R3255195-7 10/05/17 20:42

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
COD	249	250	1	0		20

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

(LCS) R3255195-2 10/05/17 20:34 • (LCSD) R3255195-3 10/05/17 20:35

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
COD	242	232	238	96	98	90-110			2	20

L939886-13 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939886-13 10/05/17 20:38 • (MS) R3255195-5 10/05/17 20:38 • (MSD) R3255195-6 10/05/17 20:38

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
COD	400	4.35	402	388	99	96	1	80-120			4	20



Method Blank (MB)

(MB) R3253659-1 09/29/17 06:04

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Bromide	U		0.079	1.00
Chloride	U		0.0519	1.00
Fluoride	U		0.0099	0.100
Nitrate	U		0.0227	0.100
Sulfate	U		0.0774	5.00

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L939134-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939134-01 09/29/17 12:01 • (DUP) R3253659-4 09/29/17 12:16

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Fluoride	3.75	3.99	1	6		15
Nitrate	6.29	6.30	1	0		15
Sulfate	ND	0.000	1	0		15

L939748-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939748-01 09/29/17 14:30 • (DUP) R3253659-7 09/29/17 14:45

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	ND	0.000	1	0		15
Fluoride	0.557	0.551	1	1		15
Nitrate	ND	1.34	1	200	J3	15
Sulfate	10.6	10.2	1	4		15

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

(LCS) R3253659-2 09/29/17 06:19 • (LCSD) R3253659-3 09/29/17 06:34

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	%	%	%			%	%
Bromide	40.0	39.6	39.5	99	99	80-120			0	15
Chloride	40.0	39.3	39.3	98	98	80-120			0	15
Fluoride	8.00	8.00	7.98	100	100	80-120			0	15
Nitrate	8.00	8.01	8.02	100	100	80-120			0	15
Sulfate	40.0	39.6	39.5	99	99	80-120			0	15



L939134-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939134-01 09/29/17 12:01 • (MS) R3253659-5 09/29/17 12:31 • (MSD) R3253659-6 09/29/17 12:46

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fluoride	5.00	3.75	8.77	9.01	100	105	1	80-120			3	15
Nitrate	5.00	6.29	11.0	11.0	95	95	1	80-120	<u>E</u>	<u>E</u>	0	15
Sulfate	50.0	ND	ND	ND	0	0	1	80-120	<u>J6</u>	<u>J6</u>	0	15

L939748-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L939748-01 09/29/17 14:30 • (MS) R3253659-8 09/29/17 15:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	ND	49.1	98	1	80-120	
Fluoride	5.00	0.557	5.64	102	1	80-120	
Nitrate	5.00	ND	6.19	124	1	80-120	<u>J5</u>
Sulfate	50.0	10.6	59.9	99	1	80-120	

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



Method Blank (MB)

(MB) R3255218-1 10/05/17 20:21

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Chloride	U		0.0519	1.00

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L939458-02 Original Sample (OS) • Duplicate (DUP)

(OS) L939458-02 10/05/17 21:21 • (DUP) R3255218-4 10/05/17 21:31

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Chloride	15.5	15.6	1	0		15

L939881-02 Original Sample (OS) • Duplicate (DUP)

(OS) L939881-02 10/05/17 23:11 • (DUP) R3255218-7 10/05/17 23:21

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Chloride	19.9	19.9	1	0		15

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

(LCS) R3255218-2 10/05/17 20:31 • (LCSD) R3255218-3 10/05/17 20:41

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Chloride	40.0	39.5	39.3	99	98	80-120			1	15

L939458-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939458-02 10/05/17 21:21 • (MS) R3255218-5 10/05/17 21:41 • (MSD) R3255218-6 10/05/17 21:51

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Chloride	50.0	15.5	57.7	57.8	84	85	1	80-120			0	15

L939881-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L939881-02 10/05/17 23:11 • (MS) R3255218-8 10/05/17 23:31

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Chloride	50.0	19.9	61.9	84	1	80-120	



Method Blank (MB)

(MB) R3254802-1 10/04/17 17:54

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Mercury,Dissolved	U		0.000049	0.000200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

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

(LCS) R3254802-2 10/04/17 17:56 • (LCSD) R3254802-3 10/04/17 18:03

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	%	%	%			%	%
Mercury,Dissolved	0.00300	0.00298	0.00293	99	98	80-120			2	20

L939782-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939782-01 10/04/17 18:05 • (MS) R3254802-4 10/04/17 18:08 • (MSD) R3254802-5 10/04/17 18:10

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury,Dissolved	0.00300	U	0.00292	0.00281	97	94	1	75-125			4	20

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3254612-1 10/04/17 09:23

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.000049	0.000200

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

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

(LCS) R3254612-2 10/04/17 09:25 • (LCSD) R3254612-3 10/04/17 09:27

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury	0.00300	0.00286	0.00274	95	91	80-120			4	20

L939855-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939855-01 10/04/17 09:30 • (MS) R3254612-4 10/04/17 09:32 • (MSD) R3254612-5 10/04/17 09:34

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	0.000991	0.00374	0.00388	92	96	1	75-125			3	20

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3255199-1 10/05/17 18:58

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.000049	0.000200

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

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

(LCS) R3255199-2 10/05/17 19:01 • (LCSD) R3255199-3 10/05/17 19:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury	0.00300	0.00318	0.00317	106	106	80-120			0	20

L939998-21 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939998-21 10/05/17 19:10 • (MS) R3255199-4 10/05/17 19:12 • (MSD) R3255199-5 10/05/17 19:14

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	0.00322	0.00322	107	107	1	75-125			0	20

7 Gl

8 Al

9 Sc





Method Blank (MB)

(MB) R3256118-1 10/10/17 08:20

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Boron	U		0.0126	0.200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

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

(LCS) R3256118-2 10/10/17 08:23 • (LCSD) R3256118-3 10/10/17 08:25

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Boron	1.00	1.02	0.998	102	100	80-120			2	20

L941259-20 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L941259-20 10/10/17 08:28 • (MS) R3256118-5 10/10/17 08:33 • (MSD) R3256118-6 10/10/17 08:35

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Boron	1.00	0.375	1.39	1.38	102	100	1	75-125			1	20

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3256368-1 10/10/17 15:38

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Boron,Dissolved	U		0.0126	0.200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

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

(LCS) R3256368-2 10/10/17 15:41 • (LCSD) R3256368-3 10/10/17 15:44

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Boron,Dissolved	1.00	0.996	0.989	100	99	80-120			1	20

L941350-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L941350-01 10/10/17 15:47 • (MS) R3256368-5 10/10/17 15:53 • (MSD) R3256368-6 10/10/17 15:56

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	1.02	1.01	102	101	1	75-125			2	20

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3255443-1 10/06/17 13:43

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	U		0.00515	0.100
Antimony	U		0.000754	0.00200
Arsenic	U		0.00025	0.00200
Barium	U		0.00036	0.00500
Beryllium	U		0.00012	0.00200
Cadmium	U		0.00016	0.00100
Calcium	U		0.046	1.00
Chromium	U		0.00054	0.00200
Copper	U		0.00052	0.00500
Cobalt	U		0.00026	0.00200
Iron	U		0.015	0.100
Lead	U		0.00024	0.00200
Magnesium	U		0.1	1.00
Manganese	0.000705	J	0.00025	0.00500
Nickel	U		0.00035	0.00200
Potassium	U		0.037	1.00
Selenium	U		0.00038	0.00200
Silver	U		0.00031	0.00200
Sodium	U		0.11	1.00
Thallium	U		0.00019	0.00200
Vanadium	U		0.00018	0.00500
Zinc	U		0.00256	0.0250

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) R3255443-2 10/06/17 13:46 • (LCSD) R3255443-3 10/06/17 13:50

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 %
Aluminum	5.00	4.69	4.55	94	91	80-120			3	20
Antimony	0.0500	0.0484	0.0485	97	97	80-120			0	20
Arsenic	0.0500	0.0489	0.0484	98	97	80-120			1	20
Barium	0.0500	0.0478	0.0479	96	96	80-120			0	20
Beryllium	0.0500	0.0434	0.0423	87	85	80-120			3	20
Cadmium	0.0500	0.0516	0.0508	103	102	80-120			2	20
Calcium	5.00	4.99	4.76	100	95	80-120			5	20
Chromium	0.0500	0.0505	0.0498	101	100	80-120			1	20
Copper	0.0500	0.0490	0.0488	98	98	80-120			0	20
Cobalt	0.0500	0.0510	0.0510	102	102	80-120			0	20
Iron	5.00	5.05	4.99	101	100	80-120			1	20



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

(LCS) R3255443-2 10/06/17 13:46 • (LCSD) R3255443-3 10/06/17 13:50

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 %
Lead	0.0500	0.0494	0.0491	99	98	80-120			0	20
Magnesium	5.00	4.97	4.76	99	95	80-120			4	20
Manganese	0.0500	0.0487	0.0474	97	95	80-120			3	20
Nickel	0.0500	0.0509	0.0507	102	101	80-120			0	20
Potassium	5.00	4.83	4.63	97	93	80-120			4	20
Selenium	0.0500	0.0489	0.0487	98	97	80-120			0	20
Silver	0.0500	0.0509	0.0509	102	102	80-120			0	20
Sodium	5.00	4.98	4.80	100	96	80-120			3	20
Thallium	0.0500	0.0479	0.0483	96	97	80-120			1	20
Vanadium	0.0500	0.0485	0.0489	97	98	80-120			1	20
Zinc	0.0500	0.0547	0.0487	109	97	80-120			12	20

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

L939244-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939244-01 10/06/17 13:54 • (MS) R3255443-5 10/06/17 14:01 • (MSD) R3255443-6 10/06/17 14:04

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	4.50	4.56	90	91	1	75-125			1	20
Antimony	0.0500	ND	0.0474	0.0486	95	97	1	75-125			3	20
Arsenic	0.0500	ND	0.0473	0.0471	95	94	1	75-125			0	20
Barium	0.0500	0.0114	0.0561	0.0600	89	97	1	75-125			7	20
Beryllium	0.0500	ND	0.0417	0.0416	83	83	1	75-125			0	20
Cadmium	0.0500	ND	0.0505	0.0509	101	102	1	75-125			1	20
Calcium	5.00	2.58	7.29	7.20	94	92	1	75-125			1	20
Chromium	0.0500	0.0168	0.0648	0.0653	96	97	1	75-125			1	20
Copper	0.0500	ND	0.0509	0.0510	96	96	1	75-125			0	20
Cobalt	0.0500	ND	0.0498	0.0502	100	100	1	75-125			1	20
Potassium	5.00	ND	5.20	5.16	94	93	1	75-125			1	20
Iron	5.00	ND	4.86	4.88	97	98	1	75-125			0	20
Lead	0.0500	ND	0.0482	0.0489	95	97	1	75-125			1	20
Magnesium	5.00	ND	5.72	5.75	95	96	1	75-125			0	20
Manganese	0.0500	ND	0.0461	0.0465	91	92	1	75-125			1	20
Nickel	0.0500	ND	0.0491	0.0492	98	98	1	75-125			0	20
Selenium	0.0500	ND	0.0454	0.0498	91	100	1	75-125			9	20
Silver	0.0500	ND	0.0498	0.0504	100	101	1	75-125			1	20
Sodium	5.00	6.14	10.8	10.8	92	93	1	75-125			0	20
Thallium	0.0500	ND	0.0466	0.0475	93	95	1	75-125			2	20
Vanadium	0.0500	ND	0.0479	0.0481	96	96	1	75-125			0	20
Zinc	0.0500	ND	0.0560	0.0562	96	97	1	75-125			0	20



Method Blank (MB)

(MB) R3256871-1 10/12/17 10:50

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum,Dissolved	0.079	U	0.00515	0.100
Antimony,Dissolved	U		0.000754	0.00200
Arsenic,Dissolved	U		0.00025	0.00200
Barium,Dissolved	0.000842	U	0.00036	0.00500
Beryllium,Dissolved	U		0.00012	0.00200
Cadmium,Dissolved	U		0.00016	0.00100
Calcium,Dissolved	0.189	U	0.046	1.00
Chromium,Dissolved	0.000907	U	0.00054	0.00200
Copper,Dissolved	U		0.00052	0.00500
Cobalt,Dissolved	U		0.00026	0.00200
Iron,Dissolved	0.025	U	0.015	0.100
Lead,Dissolved	0.000853	U	0.00024	0.00200
Magnesium,Dissolved	U		0.1	1.00
Manganese,Dissolved	0.000584	U	0.00025	0.00500
Nickel,Dissolved	0.000571	U	0.00035	0.00200
Potassium,Dissolved	0.0485	U	0.037	1.00
Selenium,Dissolved	U		0.00038	0.00200
Silver,Dissolved	U		0.00031	0.00200
Sodium,Dissolved	U		0.11	1.00
Thallium,Dissolved	U		0.00019	0.00200
Vanadium,Dissolved	U		0.00018	0.00500
Zinc,Dissolved	U		0.00256	0.0250

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

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Gl

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Al

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Sc

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

(LCS) R3256871-2 10/12/17 10:53 • (LCSD) R3256871-7 10/12/17 15:50

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 %
Aluminum,Dissolved	5.00	5.10	4.91	102	98	80-120			4	20
Antimony,Dissolved	0.0500	0.0543	0.0513	109	103	80-120			6	20
Arsenic,Dissolved	0.0500	0.0518	0.0496	104	99	80-120			4	20
Barium,Dissolved	0.0500	0.0513	0.0497	103	99	80-120			3	20
Beryllium,Dissolved	0.0500	0.0481	0.0454	96	91	80-120			6	20
Cadmium,Dissolved	0.0500	0.0539	0.0507	108	101	80-120			6	20
Calcium,Dissolved	5.00	5.26	5.01	105	100	80-120			5	20
Chromium,Dissolved	0.0500	0.0530	0.0490	106	98	80-120			8	20
Copper,Dissolved	0.0500	0.0529	0.0511	106	102	80-120			4	20
Cobalt,Dissolved	0.0500	0.0544	0.0500	109	100	80-120			8	20
Iron,Dissolved	5.00	5.31	4.90	106	98	80-120			8	20



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

(LCS) R3256871-2 10/12/17 10:53 • (LCSD) R3256871-7 10/12/17 15:50

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 %
Lead,Dissolved	0.0500	0.0523	0.0498	105	100	80-120			5	20
Magnesium,Dissolved	5.00	5.20	5.02	104	100	80-120			4	20
Manganese,Dissolved	0.0500	0.0518	0.0466	104	93	80-120			11	20
Nickel,Dissolved	0.0500	0.0538	0.0503	108	101	80-120			7	20
Potassium,Dissolved	5.00	5.11	5.10	102	102	80-120			0	20
Selenium,Dissolved	0.0500	0.0517	0.0482	103	96	80-120			7	20
Silver,Dissolved	0.0500	0.0533	0.0513	107	103	80-120			4	20
Sodium,Dissolved	5.00	5.24	5.37	105	107	80-120			2	20
Thallium,Dissolved	0.0500	0.0513	0.0496	103	99	80-120			3	20
Vanadium,Dissolved	0.0500	0.0524	0.0478	105	96	80-120			9	20
Zinc,Dissolved	0.0500	0.0552	0.0489	110	98	80-120			12	20

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

L939998-24 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939998-24 10/12/17 11:00 • (MS) R3256871-5 10/12/17 11:07 • (MSD) R3256871-6 10/12/17 11:11

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	0.232	5.03	5.11	96	98	1	75-125			1	20
Antimony,Dissolved	0.0500	ND	0.0543	0.0555	107	109	1	75-125			2	20
Arsenic,Dissolved	0.0500	ND	0.0526	0.0525	103	103	1	75-125			0	20
Barium,Dissolved	0.0500	0.221	0.263	0.269	83	94	1	75-125			2	20
Beryllium,Dissolved	0.0500	ND	0.0453	0.0451	91	90	1	75-125			1	20
Cadmium,Dissolved	0.0500	ND	0.0548	0.0540	110	108	1	75-125			2	20
Calcium,Dissolved	5.00	504	502	506	0	47	1	75-125	V	V	1	20
Chromium,Dissolved	0.0500	0.0403	0.0915	0.0893	102	98	1	75-125			2	20
Copper,Dissolved	0.0500	ND	0.0532	0.0522	99	97	1	75-125			2	20
Cobalt,Dissolved	0.0500	ND	0.0533	0.0524	106	104	1	75-125			2	20
Potassium,Dissolved	5.00	25.5	30.0	30.4	90	97	1	75-125			1	20
Iron,Dissolved	5.00	ND	5.12	5.04	102	101	1	75-125			2	20
Lead,Dissolved	0.0500	ND	0.0526	0.0514	105	103	1	75-125			2	20
Magnesium,Dissolved	5.00	2.08	7.10	7.19	100	102	1	75-125			1	20
Manganese,Dissolved	0.0500	ND	0.0496	0.0497	97	98	1	75-125			0	20
Nickel,Dissolved	0.0500	ND	0.0526	0.0521	104	103	1	75-125			1	20
Selenium,Dissolved	0.0500	0.0151	0.0659	0.0650	102	100	1	75-125			1	20
Silver,Dissolved	0.0500	ND	0.0523	0.0529	105	106	1	75-125			1	20
Sodium,Dissolved	5.00	127	129	131	57	96	1	75-125	V		1	20
Thallium,Dissolved	0.0500	ND	0.0509	0.0508	102	102	1	75-125			0	20
Vanadium,Dissolved	0.0500	0.0829	0.134	0.133	101	101	1	75-125			0	20
Zinc,Dissolved	0.0500	0.0391	0.0890	0.0906	100	103	1	75-125			2	20



Method Blank (MB)

(MB) R3255016-3 10/03/17 21:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Acetone	U		0.0100	0.0500
Acrylonitrile	U		0.00187	0.0100
Benzene	U		0.000331	0.00100
Bromodichloromethane	U		0.000380	0.00100
Bromochloromethane	U		0.000520	0.00100
Bromoform	U		0.000469	0.00100
Bromomethane	U		0.000866	0.00500
Carbon disulfide	U		0.000275	0.00100
Carbon tetrachloride	U		0.000379	0.00100
Chlorobenzene	U		0.000348	0.00100
Chlorodibromomethane	U		0.000327	0.00100
Chloroethane	U		0.000453	0.00500
Chloroform	U		0.000324	0.00500
Chloromethane	U		0.000276	0.00250
1,2-Dibromo-3-Chloropropane	U		0.00133	0.00500
1,2-Dibromoethane	U		0.000381	0.00100
Dibromomethane	U		0.000346	0.00100
1,2-Dichlorobenzene	U		0.000349	0.00100
1,4-Dichlorobenzene	U		0.000274	0.00100
trans-1,4-Dichloro-2-butene	U		0.000866	0.00250
1,1-Dichloroethane	U		0.000259	0.00100
1,2-Dichloroethane	U		0.000361	0.00100
1,1-Dichloroethene	U		0.000398	0.00100
cis-1,2-Dichloroethene	U		0.000260	0.00100
trans-1,2-Dichloroethene	U		0.000396	0.00100
1,2-Dichloropropane	U		0.000306	0.00100
cis-1,3-Dichloropropene	U		0.000418	0.00100
trans-1,3-Dichloropropene	U		0.000419	0.00100
Ethylbenzene	U		0.000384	0.00100
2-Hexanone	U		0.00382	0.0100
Iodomethane	U		0.00171	0.0100
2-Butanone (MEK)	U		0.00393	0.0100
Methylene Chloride	U		0.00100	0.00500
4-Methyl-2-pentanone (MIBK)	U		0.00214	0.0100
Styrene	U		0.000307	0.00100
1,1,1,2-Tetrachloroethane	U		0.000385	0.00100
1,1,2,2-Tetrachloroethane	U		0.000130	0.00100
Tetrachloroethene	U		0.000372	0.00100
Toluene	U		0.000412	0.00100
1,1,1-Trichloroethane	U		0.000319	0.00100

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3255016-3 10/03/17 21:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
1,1,2-Trichloroethane	U		0.000383	0.00100
Trichloroethene	U		0.000398	0.00100
Trichlorofluoromethane	U		0.00120	0.00500
1,2,3-Trichloropropane	U		0.000807	0.00250
Vinyl acetate	U		0.00163	0.0100
Vinyl chloride	U		0.000259	0.00100
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	108			80.0-120
(S) Dibromofluoromethane	91.2			76.0-123
(S) a,a,a-Trifluorotoluene	102			80.0-120
(S) 4-Bromofluorobenzene	98.3			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) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3255016-1 10/03/17 20:42 • (LCSD) R3255016-2 10/03/17 21:00

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	0.125	0.162	0.181	130	145	10.0-160			11.3	23
Acrylonitrile	0.125	0.126	0.122	101	97.6	60.0-142			3.26	20
Benzene	0.0250	0.0225	0.0228	90.0	91.4	69.0-123			1.57	20
Bromodichloromethane	0.0250	0.0236	0.0232	94.2	92.8	76.0-120			1.56	20
Bromochloromethane	0.0250	0.0245	0.0246	98.0	98.2	76.0-122			0.260	20
Bromoform	0.0250	0.0231	0.0230	92.5	92.1	67.0-132			0.460	20
Bromomethane	0.0250	0.0215	0.0224	86.0	89.5	18.0-160			4.07	20
Carbon disulfide	0.0250	0.0204	0.0217	81.6	86.8	55.0-127			6.18	20
Carbon tetrachloride	0.0250	0.0239	0.0243	95.8	97.4	63.0-122			1.64	20
Chlorobenzene	0.0250	0.0258	0.0258	103	103	79.0-121			0.250	20
Chlorodibromomethane	0.0250	0.0253	0.0249	101	99.5	75.0-125			1.73	20
Chloroethane	0.0250	0.0226	0.0229	90.4	91.8	47.0-152			1.52	20
Chloroform	0.0250	0.0224	0.0224	89.8	89.6	72.0-121			0.270	20
Chloromethane	0.0250	0.0186	0.0202	74.3	80.9	48.0-139			8.42	20
1,2-Dibromo-3-Chloropropane	0.0250	0.0243	0.0236	97.3	94.4	64.0-127			3.04	20
1,2-Dibromoethane	0.0250	0.0268	0.0257	107	103	77.0-123			4.24	20
Dibromomethane	0.0250	0.0252	0.0241	101	96.4	78.0-120			4.49	20
1,2-Dichlorobenzene	0.0250	0.0253	0.0255	101	102	80.0-120			1.05	20
1,4-Dichlorobenzene	0.0250	0.0198	0.0200	79.1	80.2	77.0-120			1.29	20
trans-1,4-Dichloro-2-butene	0.0250	0.0189	0.0192	75.8	76.7	55.0-134			1.22	20
1,1-Dichloroethane	0.0250	0.0225	0.0231	90.2	92.5	70.0-126			2.55	20
1,2-Dichloroethane	0.0250	0.0235	0.0227	94.1	90.8	67.0-126			3.58	20





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

(LCS) R3255016-1 10/03/17 20:42 • (LCSD) R3255016-2 10/03/17 21:00

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 %
1,1-Dichloroethene	0.0250	0.0233	0.0241	93.3	96.6	64.0-129			3.47	20
cis-1,2-Dichloroethene	0.0250	0.0219	0.0224	87.6	89.5	73.0-120			2.13	20
trans-1,2-Dichloroethene	0.0250	0.0216	0.0224	86.5	89.5	71.0-121			3.40	20
1,2-Dichloropropane	0.0250	0.0254	0.0256	102	103	75.0-125			0.950	20
cis-1,3-Dichloropropene	0.0250	0.0253	0.0248	101	99.2	79.0-123			1.98	20
trans-1,3-Dichloropropene	0.0250	0.0278	0.0272	111	109	74.0-127			2.02	20
Ethylbenzene	0.0250	0.0255	0.0255	102	102	77.0-120			0.0500	20
2-Hexanone	0.125	0.138	0.140	111	112	58.0-147			1.37	20
Iodomethane	0.125	0.0940	0.105	75.2	84.0	57.0-140			11.1	20
2-Butanone (MEK)	0.125	0.137	0.142	109	113	37.0-158			3.38	20
Methylene Chloride	0.0250	0.0216	0.0217	86.4	86.8	66.0-121			0.500	20
4-Methyl-2-pentanone (MIBK)	0.125	0.126	0.121	101	96.9	59.0-143			4.26	20
Styrene	0.0250	0.0234	0.0240	93.5	95.9	78.0-124			2.61	20
1,1,1,2-Tetrachloroethane	0.0250	0.0260	0.0255	104	102	75.0-122			2.00	20
1,1,2,2-Tetrachloroethane	0.0250	0.0240	0.0230	96.1	91.9	71.0-122			4.54	20
Tetrachloroethene	0.0250	0.0259	0.0266	104	106	70.0-127			2.49	20
Toluene	0.0250	0.0244	0.0250	97.7	100	77.0-120			2.46	20
1,1,1-Trichloroethane	0.0250	0.0223	0.0230	89.2	92.1	68.0-122			3.25	20
1,1,2-Trichloroethane	0.0250	0.0265	0.0255	106	102	78.0-120			4.01	20
Trichloroethene	0.0250	0.0243	0.0255	97.0	102	78.0-120			4.85	20
Trichlorofluoromethane	0.0250	0.0235	0.0245	94.1	98.1	56.0-137			4.10	20
1,2,3-Trichloropropane	0.0250	0.0246	0.0244	98.5	97.7	72.0-124			0.870	20
Vinyl acetate	0.125	0.101	0.0894	80.6	71.5	46.0-160			12.0	20
Vinyl chloride	0.0250	0.0223	0.0238	89.3	95.1	64.0-133			6.26	20
Xylenes, Total	0.0750	0.0760	0.0762	101	102	77.0-120			0.260	20
(S) Toluene-d8				104	104	80.0-120				
(S) Dibromofluoromethane				93.9	93.0	76.0-123				
(S) a,a,a-Trifluorotoluene				101	101	80.0-120				
(S) 4-Bromofluorobenzene				93.8	97.5	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) R3254595-1 10/03/17 12:58

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Ethylene Dibromide	U		0.0000240	0.0000100
1,2-Dibromo-3-Chloropropane	U		0.0000430	0.0000200

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L940058-05 Original Sample (OS) • Duplicate (DUP)

(OS) L940058-05 10/03/17 13:42 • (DUP) R3254595-3 10/03/17 13:31

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

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

(LCS) R3254595-4 10/03/17 15:23 • (LCSD) R3254595-5 10/03/17 17:37

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	0.000195	0.000197	78.1	78.7	60.0-140			0.820	20
1,2-Dibromo-3-Chloropropane	0.000250	0.000215	0.000200	86.1	80.2	60.0-140			7.04	20

L940058-04 Original Sample (OS) • Matrix Spike (MS)

(OS) L940058-04 10/03/17 13:20 • (MS) R3254595-2 10/03/17 13:09

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	mg/l	mg/l	mg/l	%		%	
Ethylene Dibromide	0.0000990	U	0.0000999	99.9	1.01	72.0-146	
1,2-Dibromo-3-Chloropropane	0.0000990	U	0.000118	118	1.01	63.0-149	



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.

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, 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.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
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.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
V	The sample concentration is too high to evaluate accurate spike recoveries.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.  
 \* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

## State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina <sup>1</sup>	DW21704
Florida	E87487	North Carolina <sup>2</sup>	41
Georgia	NELAP	North Dakota	R-140
Georgia <sup>1</sup>	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky <sup>1</sup>	90010	South Dakota	n/a
Kentucky <sup>2</sup>	16	Tennessee <sup>14</sup>	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

## Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>n/a</sup> Accreditation not applicable

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



**Civil & Environmental Consultants - TN**

325 Seaboard Lane, Suite 170

Billing Information:  
 Dr. Kevin Wolfe  
 325 Seaboard Lane, Suite 170  
 Franklin, TN 37067

Email To: mjohnson@cecinc.com,  
 pcampbell@cecinc.com

Report to:  
 Philip Campbell

Project Description: EWS Landfill

Phone: 615-333-7797  
 Fax: 615-333-7751

Client Project #  
 142-059 171-873

City/State Collected: Camden, TN

Lab Project #  
 CEC-142-059-171-873

P.O. #

Quote #  
 Date Results Needed

Collected by (print): Philip Campbell

Collected by (signature): *Philip Campbell*

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

Immediately Packed on Ice N  Y

Pres. Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1



LAB SCIENCES  
 a subsidiary of Permutit

12065 Lebanon Rd  
 Mount Juliet, TN 37122  
 Phone: 615-758-5858  
 Phone: 800-767-5859  
 Fax: 615-758-5859



L# 939855

A030

Acctnum: CEC  
 Template: T128175  
 Prelogin: P619419  
 TSR: 350 - Jimmy Hunt  
 PB: 9-20-17 MJO  
 Shipped Via: Courier

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ALK 125mlHDPE-NoPres	Bromide, Cl, F, NO3, SO4 125mlHDPE-NoPres	COD 250mlHDPE-H2SO4	COLILERT-Microbiological	Diss Metals-LabFilt-250mlHDPE-NoPres	Diss. Metals (FFP) 250mlHDPE-NoPres HNO3	NH3 125mlHDPE-H2SO4	SV8011 40mlClr-NaThio	Total Metals 250mlHDPE-HNO3	VB250AP1 40mlAmb-HCl	Remarks	Sample # (lab only)
IWC-L (FFP)	Grab	GW	-	9-28-17	1400	12	X	X	X	X	X	X	X	X	X	X		01
IWC-L (LAB FILTER)	Grab	GW	↓		1400	1					X							02
LEACHATE-SMELTER (FFP)	Grab	GW	↓		1445	12	X	X	X	X	X	X	X	X	X	X		03
LEACHATE-SMELTER (LAB)	Grab	GW	↓		1445	1					X							04

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

Remarks: FFP sample ID = Dissolved metals are field filtered and preserved  
 Lab Filter sample ID = Dissolved metals are lab filtered and preserved in lab, unfiltered in field.  
 metals = App I + (Ca, Fe, Mg, Mn, Na, K, Boron, Al)  
 \* USE CAUTION, high conduct. v. to elevated levels of metals may

Samples returned via:  
 UPS  FedEx  Courier

Tracking #

COC Seal Present/Intact:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
COC Signed/Accurate:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Bottles arrive intact:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Correct bottles used:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Sufficient volume sent:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
VOA Zero Headspace:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Preservation Correct/Checked:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Relinquished by: (Signature) *Philip Campbell*  
 Date: 9-28-17  
 Time: 18:15

Date: Time:

Received by: (Signature)  
 Received by: (Signature)  
 Received for lab by: (Signature) *MW*

Trip Blank Received:  Yes /  No  
 HCL / MeOH  
 TBR  
 Temp: 1.9 °C  
 Bottles Received: 26  
 Date: 9-29-17  
 Time: 0900

If preservation required by Login: Date/Time  
 Hold:  
 Condition: NCF /  OK

\* use elevated concentrations like lg, Run analysis, 3 separate from other lower level @ media,

October 06, 2017

## Civil & Environmental Consultants - TN

Sample Delivery Group: L939503  
Samples Received: 09/27/2017  
Project Number: 142-059  
Description: EWS Landfill Sediment & Stream Sampling

Report To: Philip Campbell  
325 Seaboard Lane, Suite 170  
Franklin, TN 37067

Entire Report Reviewed By:

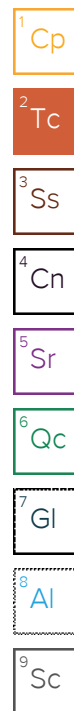


Jason Romer  
Technical Service Representative

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 ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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# SAMPLE SUMMARY



## CHARLIE CREEK US (FFP) L939503-01 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 14:21      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:39	10/02/17 23:39	ASK
Wet Chemistry by Method 9056A	WG1026987	1	10/03/17 13:31	10/03/17 13:31	DR
Mercury by Method 7470A	WG1025862	1	10/03/17 07:52	10/03/17 20:06	EL
Metals (ICP) by Method 6010B	WG1027620	1	10/04/17 12:27	10/04/17 19:07	ST
Metals (ICPMS) by Method 6020	WG1026118	1	10/03/17 09:57	10/03/17 17:01	JPD

1  
Cp

2  
Tc

3  
Ss

4  
Cn

## CHARLIE CREEK US (LAB FILTER) L939503-02 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 14:20      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:40	10/02/17 23:40	ASK
Mercury by Method 7470A	WG1025855	1	10/03/17 07:48	10/03/17 18:18	EL
Metals (ICP) by Method 6010B	WG1027255	1	10/04/17 10:04	10/04/17 16:56	ST
Metals (ICPMS) by Method 6020	WG1027100	1	10/03/17 14:35	10/04/17 14:37	JPD

5  
Sr

6  
Qc

7  
Gl

8  
Al

## CHARLIE CREEK MS (FFP) L939503-03 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 12:00      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:41	10/02/17 23:41	ASK
Wet Chemistry by Method 9056A	WG1026987	1	10/03/17 14:14	10/03/17 14:14	DR
Mercury by Method 7470A	WG1025862	1	10/03/17 07:52	10/03/17 20:08	EL
Metals (ICP) by Method 6010B	WG1027620	1	10/04/17 12:27	10/04/17 19:19	ST
Metals (ICPMS) by Method 6020	WG1026118	1	10/03/17 09:57	10/03/17 17:04	JPD

9  
Sc

## CHARLIE CREEK MS (LAB FILTER) L939503-04 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 12:00      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:41	10/02/17 23:41	ASK
Mercury by Method 7470A	WG1025855	1	10/03/17 07:48	10/03/17 18:45	EL
Metals (ICP) by Method 6010B	WG1027255	1	10/04/17 10:04	10/04/17 16:59	ST
Metals (ICPMS) by Method 6020	WG1027100	1	10/03/17 14:35	10/04/17 14:40	JPD

## CANE CREEK US (FFP) L939503-05 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 13:20      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:44	10/02/17 23:44	ASK
Wet Chemistry by Method 9056A	WG1026987	1	10/03/17 14:58	10/03/17 14:58	DR
Mercury by Method 7470A	WG1025862	1	10/03/17 07:52	10/03/17 20:10	EL
Metals (ICP) by Method 6010B	WG1027620	1	10/04/17 12:27	10/04/17 19:22	ST
Metals (ICPMS) by Method 6020	WG1026118	1	10/03/17 09:57	10/03/17 17:08	JPD

## CANE CREEK US (LAB FILTER) L939503-06 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 13:35      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:46	10/02/17 23:46	ASK
Mercury by Method 7470A	WG1025855	1	10/03/17 07:48	10/03/17 18:47	EL
Metals (ICP) by Method 6010B	WG1027255	1	10/04/17 10:04	10/04/17 17:01	ST



# SAMPLE SUMMARY



## CANE CREEK US (LAB FILTER) L939503-06 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 13:35      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 6020	WG1027100	1	10/03/17 14:35	10/04/17 14:51	JPD

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

## CANE CREEK MS (FFP) L939503-07 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 11:29      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:47	10/02/17 23:47	ASK
Wet Chemistry by Method 9056A	WG1026987	1	10/03/17 15:12	10/03/17 15:12	DR
Mercury by Method 7470A	WG1025862	1	10/03/17 07:52	10/03/17 20:12	EL
Metals (ICP) by Method 6010B	WG1027620	1	10/04/17 12:27	10/04/17 19:25	ST
Metals (ICPMS) by Method 6020	WG1026118	1	10/03/17 09:57	10/03/17 17:11	JPD

## CANE CREEK MS (LAB FILTER) L939503-08 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 11:29      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:47	10/02/17 23:47	ASK
Mercury by Method 7470A	WG1025855	1	10/03/17 07:48	10/03/17 18:49	EL
Metals (ICP) by Method 6010B	WG1027255	1	10/04/17 10:04	10/04/17 17:04	ST
Metals (ICPMS) by Method 6020	WG1027100	1	10/03/17 14:35	10/04/17 14:55	JPD

## CANE CREEK DS-1 (FFP) L939503-09 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 10:30      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:48	10/02/17 23:48	ASK
Wet Chemistry by Method 9056A	WG1026987	1	10/03/17 15:27	10/03/17 15:27	DR
Mercury by Method 7470A	WG1025862	1	10/03/17 07:52	10/03/17 20:15	EL
Metals (ICP) by Method 6010B	WG1027620	1	10/04/17 12:27	10/04/17 19:35	ST
Metals (ICPMS) by Method 6020	WG1026118	1	10/03/17 09:57	10/03/17 15:29	JPD

## CANE CREEK DS-1 (LAB FILTER) L939503-10 GW

Collected by  
CL/CD      Collected date/time  
09/26/17 10:30      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 130.1	WG1026948	1	10/02/17 23:49	10/02/17 23:49	ASK
Mercury by Method 7470A	WG1025855	1	10/03/17 07:48	10/03/17 18:52	EL
Metals (ICP) by Method 6010B	WG1027255	1	10/04/17 10:04	10/04/17 17:07	ST
Metals (ICPMS) by Method 6020	WG1027100	1	10/03/17 14:35	10/04/17 14:58	JPD

## CHARLIE CREEK US L939503-11 Solid

Collected by  
CL/CD      Collected date/time  
09/26/17 14:20      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1026991	1	10/03/17 12:50	10/04/17 02:57	MAJ
Mercury by Method 7471A	WG1026785	1	10/04/17 07:42	10/04/17 14:03	EL
Metals (ICP) by Method 6010B	WG1027052	1	10/03/17 16:53	10/03/17 21:32	ST

# SAMPLE SUMMARY



## CHARLIE CREEK MS L939503-12 Solid

Collected by  
CL/CD      Collected date/time  
09/26/17 14:08      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1026991	1	10/03/17 12:50	10/04/17 03:18	MAJ
Mercury by Method 7471A	WG1026785	1	10/04/17 07:42	10/04/17 14:06	EL
Metals (ICP) by Method 6010B	WG1027052	1	10/03/17 16:53	10/03/17 21:35	ST

1  
Cp

2  
Tc

3  
Ss

4  
Cn

5  
Sr

6  
Qc

7  
Gl

8  
Al

9  
Sc

## CANE CREEK US L939503-13 Solid

Collected by  
CL/CD      Collected date/time  
09/26/17 13:48      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1026991	1	10/03/17 12:50	10/04/17 03:39	MAJ
Mercury by Method 7471A	WG1026785	1	10/04/17 07:42	10/04/17 14:09	EL
Metals (ICP) by Method 6010B	WG1027052	1	10/03/17 16:53	10/03/17 21:38	ST

## CANE CREEK MS L939503-14 Solid

Collected by  
CL/CD      Collected date/time  
09/26/17 11:32      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1026991	1	10/03/17 12:50	10/04/17 04:00	MAJ
Mercury by Method 7471A	WG1026785	1	10/04/17 07:42	10/04/17 14:11	EL
Metals (ICP) by Method 6010B	WG1027052	1	10/03/17 16:53	10/03/17 21:41	ST

## CANE CREEK DS-1 L939503-15 Solid

Collected by  
CL/CD      Collected date/time  
09/26/17 10:28      Received date/time  
09/27/17 15:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1027390	1	10/03/17 17:35	10/04/17 12:49	MAJ
Wet Chemistry by Method 9056A	WG1028146	1	10/05/17 12:24	10/05/17 14:30	DR
Mercury by Method 7471A	WG1026785	1	10/04/17 07:42	10/04/17 14:14	EL
Metals (ICP) by Method 6010B	WG1027052	1	10/03/17 16:53	10/03/17 21:45	ST



All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. 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.

Jason Romer  
Technical Service Representative

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

### Sample Handling and Receiving

The following analysis were performed from an unpreserved, insufficiently or inadequately preserved sample.

<u>ESC Sample ID</u>	<u>Project Sample ID</u>	<u>Method</u>
<a href="#">L939503-02</a>	<a href="#">CHARLIE CREEK US (LAB FILTER)</a>	130.1
<a href="#">L939503-04</a>	<a href="#">CHARLIE CREEK MS (LAB FILTER)</a>	130.1
<a href="#">L939503-06</a>	<a href="#">CANE CREEK US (LAB FILTER)</a>	130.1
<a href="#">L939503-08</a>	<a href="#">CANE CREEK MS (LAB FILTER)</a>	130.1
<a href="#">L939503-10</a>	<a href="#">CANE CREEK DS-1 (LAB FILTER)</a>	130.1



Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	43.4		30.0	1	10/02/2017 23:39	<a href="#">WG1026948</a>

1 Cp

2 Tc

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND	J6	1.00	1	10/03/2017 13:31	<a href="#">WG1026987</a>
Chloride	8.99	J6	1.00	1	10/03/2017 13:31	<a href="#">WG1026987</a>
Fluoride	ND	J6 P1	0.100	1	10/03/2017 13:31	<a href="#">WG1026987</a>

3 Ss

4 Cn

5 Sr

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/03/2017 20:06	<a href="#">WG1025862</a>

6 Qc

7 Gl

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/04/2017 19:07	<a href="#">WG1027620</a>

8 Al

9 Sc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Antimony	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Arsenic	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Barium	0.0278		0.00500	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Beryllium	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Cadmium	ND		0.00100	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Calcium	12.3		1.00	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Chromium	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Cobalt	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Copper	ND		0.00500	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Iron	0.198		0.100	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Lead	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Magnesium	2.39		1.00	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Manganese	0.0418		0.00500	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Nickel	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Potassium	1.73		1.00	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Selenium	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Silver	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Sodium	6.08		1.00	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Thallium	ND		0.00200	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Vanadium	ND		0.00500	1	10/03/2017 17:01	<a href="#">WG1026118</a>
Zinc	ND		0.0250	1	10/03/2017 17:01	<a href="#">WG1026118</a>



Collected date/time: 09/26/17 14:20

L939503

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	37.4		30.0	1	10/02/2017 23:40	<a href="#">WG1026948</a>

1 Cp

2 Tc

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/03/2017 18:18	<a href="#">WG1025855</a>

3 Ss

4 Cn

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/04/2017 16:56	<a href="#">WG1027255</a>

5 Sr

6 Qc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Antimony,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Arsenic,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Barium,Dissolved	0.0262		0.00500	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Beryllium,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Cadmium,Dissolved	ND		0.00100	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Calcium,Dissolved	12.5		1.00	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Chromium,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Cobalt,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Copper,Dissolved	ND		0.00500	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Iron,Dissolved	ND		0.100	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Lead,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Magnesium,Dissolved	2.31		1.00	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Manganese,Dissolved	ND		0.00500	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Nickel,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Potassium,Dissolved	1.65		1.00	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Selenium,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Silver,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Sodium,Dissolved	6.00		1.00	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Thallium,Dissolved	ND		0.00200	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Vanadium,Dissolved	ND		0.00500	1	10/04/2017 14:37	<a href="#">WG1027100</a>
Zinc,Dissolved	ND		0.0250	1	10/04/2017 14:37	<a href="#">WG1027100</a>

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	56.9		30.0	1	10/02/2017 23:41	<a href="#">WG1026948</a>

1 Cp

2 Tc

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	10/03/2017 14:14	<a href="#">WG1026987</a>
Chloride	12.8		1.00	1	10/03/2017 14:14	<a href="#">WG1026987</a>
Fluoride	ND		0.100	1	10/03/2017 14:14	<a href="#">WG1026987</a>

3 Ss

4 Cn

5 Sr

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/03/2017 20:08	<a href="#">WG1025862</a>

6 Qc

7 Gl

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/04/2017 19:19	<a href="#">WG1027620</a>

8 Al

9 Sc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Antimony	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Arsenic	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Barium	0.0338		0.00500	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Beryllium	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Cadmium	ND		0.00100	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Calcium	16.2		1.00	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Chromium	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Cobalt	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Copper	ND		0.00500	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Iron	0.343		0.100	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Lead	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Magnesium	3.07		1.00	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Manganese	0.248		0.00500	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Nickel	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Potassium	2.03		1.00	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Selenium	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Silver	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Sodium	6.64		1.00	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Thallium	ND		0.00200	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Vanadium	ND		0.00500	1	10/03/2017 17:04	<a href="#">WG1026118</a>
Zinc	ND		0.0250	1	10/03/2017 17:04	<a href="#">WG1026118</a>



Collected date/time: 09/26/17 12:00

L939503

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	50.5		30.0	1	10/02/2017 23:41	<a href="#">WG1026948</a>

1 Cp

2 Tc

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/03/2017 18:45	<a href="#">WG1025855</a>

3 Ss

4 Cn

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/04/2017 16:59	<a href="#">WG1027255</a>

5 Sr

6 Qc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Antimony,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Arsenic,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Barium,Dissolved	0.0317		0.00500	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Beryllium,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Cadmium,Dissolved	ND		0.00100	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Calcium,Dissolved	16.6		1.00	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Chromium,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Cobalt,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Copper,Dissolved	ND		0.00500	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Iron,Dissolved	ND		0.100	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Lead,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Magnesium,Dissolved	3.00		1.00	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Manganese,Dissolved	0.0490		0.00500	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Nickel,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Potassium,Dissolved	2.05		1.00	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Selenium,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Silver,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Sodium,Dissolved	6.72		1.00	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Thallium,Dissolved	ND		0.00200	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Vanadium,Dissolved	ND		0.00500	1	10/04/2017 14:40	<a href="#">WG1027100</a>
Zinc,Dissolved	ND		0.0250	1	10/04/2017 14:40	<a href="#">WG1027100</a>

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	96.3		30.0	1	10/02/2017 23:44	<a href="#">WG1026948</a>

1 Cp

2 Tc

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	10/03/2017 14:58	<a href="#">WG1026987</a>
Chloride	12.0		1.00	1	10/03/2017 14:58	<a href="#">WG1026987</a>
Fluoride	0.210		0.100	1	10/03/2017 14:58	<a href="#">WG1026987</a>

3 Ss

4 Cn

5 Sr

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/03/2017 20:10	<a href="#">WG1025862</a>

6 Qc

7 Gl

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/04/2017 19:22	<a href="#">WG1027620</a>

8 Al

9 Sc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Antimony	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Arsenic	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Barium	0.0342		0.00500	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Beryllium	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Cadmium	ND		0.00100	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Calcium	24.4		1.00	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Chromium	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Cobalt	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Copper	ND		0.00500	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Iron	0.594		0.100	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Lead	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Magnesium	6.55		1.00	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Manganese	0.188		0.00500	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Nickel	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Potassium	2.92		1.00	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Selenium	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Silver	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Sodium	8.78		1.00	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Thallium	ND		0.00200	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Vanadium	ND		0.00500	1	10/03/2017 17:08	<a href="#">WG1026118</a>
Zinc	ND		0.0250	1	10/03/2017 17:08	<a href="#">WG1026118</a>





Collected date/time: 09/26/17 13:35

L939503

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	87.9		30.0	1	10/02/2017 23:46	<a href="#">WG1026948</a>

1 Cp

2 Tc

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/03/2017 18:47	<a href="#">WG1025855</a>

3 Ss

4 Cn

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/04/2017 17:01	<a href="#">WG1027255</a>

5 Sr

6 Qc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Antimony,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Arsenic,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Barium,Dissolved	0.0325		0.00500	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Beryllium,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Cadmium,Dissolved	ND		0.00100	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Calcium,Dissolved	24.2		1.00	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Chromium,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Cobalt,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Copper,Dissolved	ND		0.00500	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Iron,Dissolved	ND		0.100	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Lead,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Magnesium,Dissolved	6.41		1.00	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Manganese,Dissolved	0.0160		0.00500	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Nickel,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Potassium,Dissolved	2.84		1.00	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Selenium,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Silver,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Sodium,Dissolved	8.65		1.00	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Thallium,Dissolved	ND		0.00200	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Vanadium,Dissolved	ND		0.00500	1	10/04/2017 14:51	<a href="#">WG1027100</a>
Zinc,Dissolved	ND		0.0250	1	10/04/2017 14:51	<a href="#">WG1027100</a>

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	84.4		30.0	1	10/02/2017 23:47	<a href="#">WG1026948</a>

1 Cp

2 Tc

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	10/03/2017 15:12	<a href="#">WG1026987</a>
Chloride	13.2		1.00	1	10/03/2017 15:12	<a href="#">WG1026987</a>
Fluoride	0.173		0.100	1	10/03/2017 15:12	<a href="#">WG1026987</a>

3 Ss

4 Cn

5 Sr

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/03/2017 20:12	<a href="#">WG1025862</a>

6 Qc

7 Gl

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/04/2017 19:25	<a href="#">WG1027620</a>

8 Al

9 Sc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Antimony	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Arsenic	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Barium	0.0332		0.00500	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Beryllium	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Cadmium	ND		0.00100	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Calcium	22.7		1.00	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Chromium	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Cobalt	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Copper	ND		0.00500	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Iron	0.315		0.100	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Lead	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Magnesium	5.50		1.00	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Manganese	0.123		0.00500	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Nickel	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Potassium	2.81		1.00	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Selenium	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Silver	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Sodium	8.20		1.00	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Thallium	ND		0.00200	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Vanadium	ND		0.00500	1	10/03/2017 17:11	<a href="#">WG1026118</a>
Zinc	ND		0.0250	1	10/03/2017 17:11	<a href="#">WG1026118</a>



Collected date/time: 09/26/17 11:29

L939503

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	77.9		30.0	1	10/02/2017 23:47	<a href="#">WG1026948</a>

1 Cp

2 Tc

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/03/2017 18:49	<a href="#">WG1025855</a>

3 Ss

4 Cn

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/04/2017 17:04	<a href="#">WG1027255</a>

5 Sr

6 Qc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Antimony,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Arsenic,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Barium,Dissolved	0.0311		0.00500	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Beryllium,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Cadmium,Dissolved	ND		0.00100	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Calcium,Dissolved	22.1		1.00	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Chromium,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Cobalt,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Copper,Dissolved	ND		0.00500	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Iron,Dissolved	ND		0.100	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Lead,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Magnesium,Dissolved	5.19		1.00	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Manganese,Dissolved	0.0402		0.00500	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Nickel,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Potassium,Dissolved	2.62		1.00	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Selenium,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Silver,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Sodium,Dissolved	7.88		1.00	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Thallium,Dissolved	ND		0.00200	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Vanadium,Dissolved	ND		0.00500	1	10/04/2017 14:55	<a href="#">WG1027100</a>
Zinc,Dissolved	ND		0.0250	1	10/04/2017 14:55	<a href="#">WG1027100</a>

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	84.4		30.0	1	10/02/2017 23:48	<a href="#">WG1026948</a>

1 Cp

2 Tc

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Bromide	ND		1.00	1	10/03/2017 15:27	<a href="#">WG1026987</a>
Chloride	15.4		1.00	1	10/03/2017 15:27	<a href="#">WG1026987</a>
Fluoride	0.172		0.100	1	10/03/2017 15:27	<a href="#">WG1026987</a>

3 Ss

4 Cn

5 Sr

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/03/2017 20:15	<a href="#">WG1025862</a>

6 Qc

7 Gl

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron	ND		0.200	1	10/04/2017 19:35	<a href="#">WG1027620</a>

8 Al

9 Sc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum	ND		0.100	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Antimony	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Arsenic	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Barium	0.0398	Q1	0.00500	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Beryllium	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Cadmium	ND		0.00100	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Calcium	22.5		1.00	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Chromium	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Cobalt	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Copper	ND		0.00500	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Iron	0.455		0.100	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Lead	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Magnesium	5.55		1.00	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Manganese	0.205		0.00500	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Nickel	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Potassium	3.10		1.00	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Selenium	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Silver	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Sodium	8.96		1.00	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Thallium	ND		0.00200	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Vanadium	ND		0.00500	1	10/03/2017 15:29	<a href="#">WG1026118</a>
Zinc	ND		0.0250	1	10/03/2017 15:29	<a href="#">WG1026118</a>



Collected date/time: 09/26/17 10:30

L939503

Wet Chemistry by Method 130.1

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Hardness (colorimetric) as CaCO3	78.3		30.0	1	10/02/2017 23:49	<a href="#">WG1026948</a>

1 Cp

2 Tc

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury,Dissolved	ND		0.000200	1	10/03/2017 18:52	<a href="#">WG1025855</a>

3 Ss

4 Cn

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Boron,Dissolved	ND		0.200	1	10/04/2017 17:07	<a href="#">WG1027255</a>

5 Sr

6 Qc

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Aluminum,Dissolved	ND		0.100	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Antimony,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Arsenic,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Barium,Dissolved	0.0368		0.00500	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Beryllium,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Cadmium,Dissolved	ND		0.00100	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Calcium,Dissolved	22.6		1.00	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Chromium,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Cobalt,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Copper,Dissolved	ND		0.00500	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Iron,Dissolved	ND		0.100	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Lead,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Magnesium,Dissolved	5.49		1.00	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Manganese,Dissolved	0.0616		0.00500	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Nickel,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Potassium,Dissolved	2.97		1.00	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Selenium,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Silver,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Sodium,Dissolved	8.87		1.00	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Thallium,Dissolved	ND		0.00200	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Vanadium,Dissolved	ND		0.00500	1	10/04/2017 14:58	<a href="#">WG1027100</a>
Zinc,Dissolved	ND		0.0250	1	10/04/2017 14:58	<a href="#">WG1027100</a>

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Bromide	ND		10.0	1	10/04/2017 02:57	<a href="#">WG1026991</a>
Chloride	51.8		10.0	1	10/04/2017 02:57	<a href="#">WG1026991</a>
Fluoride	1.85		1.00	1	10/04/2017 02:57	<a href="#">WG1026991</a>

1 Cp

2 Tc

3 Ss

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0200	1	10/04/2017 14:03	<a href="#">WG1026785</a>

4 Cn

5 Sr

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aluminum	519		10.0	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Antimony	ND		2.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Arsenic	ND		2.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Barium	5.74		0.500	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Beryllium	ND		0.200	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Boron	ND		10.0	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Cadmium	ND		0.500	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Calcium	ND		100	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Chromium	3.27		1.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Cobalt	ND		1.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Copper	ND		2.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Iron	1650		10.0	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Lead	1.34		0.500	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Magnesium	ND		100	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Manganese	48.7		1.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Nickel	ND		2.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Potassium	ND		100	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Selenium	ND		2.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Silver	ND		1.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Sodium	ND		100	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Thallium	ND		2.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Vanadium	4.50		2.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>
Zinc	6.23		5.00	1	10/03/2017 21:32	<a href="#">WG1027052</a>

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Bromide	ND		10.0	1	10/04/2017 03:18	<a href="#">WG1026991</a>
Chloride	52.6		10.0	1	10/04/2017 03:18	<a href="#">WG1026991</a>
Fluoride	2.10		1.00	1	10/04/2017 03:18	<a href="#">WG1026991</a>

1 Cp

2 Tc

3 Ss

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0200	1	10/04/2017 14:06	<a href="#">WG1026785</a>

4 Cn

5 Sr

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aluminum	959		10.0	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Antimony	ND		2.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Arsenic	ND		2.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Barium	13.1		0.500	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Beryllium	ND		0.200	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Boron	ND		10.0	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Cadmium	ND		0.500	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Calcium	356		100	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Chromium	2.58		1.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Cobalt	1.12		1.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Copper	ND		2.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Iron	3610		10.0	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Lead	1.66		0.500	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Magnesium	ND		100	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Manganese	138		1.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Nickel	ND		2.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Potassium	ND		100	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Selenium	ND		2.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Silver	ND		1.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Sodium	ND		100	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Thallium	ND		2.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Vanadium	4.26		2.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>
Zinc	6.45		5.00	1	10/03/2017 21:35	<a href="#">WG1027052</a>

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Bromide	ND		10.0	1	10/04/2017 03:39	<a href="#">WG1026991</a>
Chloride	48.2		10.0	1	10/04/2017 03:39	<a href="#">WG1026991</a>
Fluoride	2.15		1.00	1	10/04/2017 03:39	<a href="#">WG1026991</a>

1 Cp

2 Tc

3 Ss

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0200	1	10/04/2017 14:09	<a href="#">WG1026785</a>

4 Cn

5 Sr

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aluminum	578		10.0	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Antimony	ND		2.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Arsenic	ND		2.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Barium	4.98		0.500	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Beryllium	0.244		0.200	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Boron	ND		10.0	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Cadmium	ND		0.500	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Calcium	308		100	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Chromium	2.90		1.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Cobalt	1.99		1.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Copper	ND		2.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Iron	1930		10.0	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Lead	3.04		0.500	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Magnesium	ND		100	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Manganese	112		1.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Nickel	ND		2.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Potassium	ND		100	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Selenium	ND		2.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Silver	ND		1.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Sodium	ND		100	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Thallium	ND		2.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Vanadium	3.39		2.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>
Zinc	9.36		5.00	1	10/03/2017 21:38	<a href="#">WG1027052</a>

6 Qc

7 Gl

8 Al

9 Sc





Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Bromide	ND		10.0	1	10/04/2017 04:00	<a href="#">WG1026991</a>
Chloride	45.2		10.0	1	10/04/2017 04:00	<a href="#">WG1026991</a>
Fluoride	2.50		1.00	1	10/04/2017 04:00	<a href="#">WG1026991</a>

1 Cp

2 Tc

3 Ss

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0200	1	10/04/2017 14:11	<a href="#">WG1026785</a>

4 Cn

5 Sr

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aluminum	706		10.0	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Antimony	ND		2.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Arsenic	ND		2.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Barium	9.83		0.500	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Beryllium	0.229		0.200	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Boron	ND		10.0	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Cadmium	ND		0.500	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Calcium	108		100	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Chromium	9.53		1.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Cobalt	1.43		1.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Copper	ND		2.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Iron	2970		10.0	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Lead	1.99		0.500	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Magnesium	ND		100	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Manganese	132		1.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Nickel	ND		2.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Potassium	ND		100	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Selenium	ND		2.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Silver	ND		1.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Sodium	ND		100	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Thallium	ND		2.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Vanadium	4.59		2.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>
Zinc	9.77		5.00	1	10/03/2017 21:41	<a href="#">WG1027052</a>

6 Qc

7 Gl

8 Al

9 Sc



Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Bromide	ND		10.0	1	10/05/2017 14:30	<a href="#">WG1028146</a>
Chloride	ND		10.0	1	10/04/2017 12:49	<a href="#">WG1027390</a>
Fluoride	ND		1.00	1	10/04/2017 12:49	<a href="#">WG1027390</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0200	1	10/04/2017 14:14	<a href="#">WG1026785</a>

6 Qc

7 Gl

8 Al

9 Sc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Aluminum	428		10.0	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Antimony	ND		2.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Arsenic	ND		2.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Barium	4.02		0.500	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Beryllium	ND		0.200	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Boron	ND		10.0	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Cadmium	ND		0.500	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Calcium	ND		100	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Chromium	2.11		1.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Cobalt	ND		1.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Copper	ND		2.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Iron	1430		10.0	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Lead	1.28		0.500	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Magnesium	ND		100	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Manganese	26.2		1.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Nickel	ND		2.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Potassium	ND		100	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Selenium	ND		2.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Silver	ND		1.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Sodium	ND		100	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Thallium	ND		2.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Vanadium	3.15		2.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>
Zinc	5.22		5.00	1	10/03/2017 21:45	<a href="#">WG1027052</a>



Method Blank (MB)

(MB) R3254160-1 10/02/17 23:24

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Hardness (colorimetric) as CaCO3	2.99	J	1.43	30.0

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L939029-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939029-01 10/02/17 23:26 • (DUP) R3254160-4 10/02/17 23:27

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Hardness (colorimetric) as CaCO3	157	156	1	1		20

L939503-05 Original Sample (OS) • Duplicate (DUP)

(OS) L939503-05 10/02/17 23:44 • (DUP) R3254160-7 10/02/17 23:45

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Hardness (colorimetric) as CaCO3	96.3	92.8	1	4		20

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

(LCS) R3254160-2 10/02/17 23:24 • (LCSD) R3254160-3 10/02/17 23:25

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Hardness (colorimetric) as CaCO3	150	139	139	93	93	85-115			0	20

L939029-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939029-02 10/02/17 23:28 • (MS) R3254160-5 10/02/17 23:29 • (MSD) R3254160-6 10/02/17 23:30

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Hardness (colorimetric) as CaCO3	150	152	223	223	47	47	1	80-120	E J6	E J6	0	20



Method Blank (MB)

(MB) R3254495-1 10/03/17 06:35

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/l		mg/l	mg/l
Bromide	U		0.079	1.00
Chloride	0.09	J	0.0519	1.00
Fluoride	U		0.0099	0.100

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L939460-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939460-01 10/03/17 10:38 • (DUP) R3254495-4 10/03/17 10:53

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	ND	0.000	1	0		15
Chloride	62.8	63.8	1	2		15
Fluoride	0.692	0.687	1	1		15

L939503-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939503-01 10/03/17 13:31 • (DUP) R3254495-7 10/03/17 13:46

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/l	mg/l		%		%
Bromide	ND	0.000	1	0		15
Chloride	8.99	9.22	1	3		15
Fluoride	ND	0.0612	1	35	J P1	15

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

(LCS) R3254495-2 10/03/17 06:50 • (LCSD) R3254495-3 10/03/17 07:04

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	%	%	%			%	%
Bromide	40.0	39.7	39.7	99	99	80-120			0	15
Chloride	40.0	39.3	39.3	98	98	80-120			0	15
Fluoride	8.00	7.95	7.96	99	99	80-120			0	15



L939460-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939460-01 10/03/17 10:38 • (MS) R3254495-5 10/03/17 11:07 • (MSD) R3254495-6 10/03/17 11:21

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	50.0	ND	49.6	49.8	99	100	1	80-120			0	15
Chloride	50.0	62.8	112	112	99	99	1	80-120	E	E	0	15
Fluoride	5.00	0.692	5.64	5.85	99	103	1	80-120			4	15

L939503-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L939503-01 10/03/17 13:31 • (MS) R3254495-8 10/03/17 14:00

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Bromide	50.0	ND	39.0	78	1	80-120	J6
Chloride	50.0	8.99	46.7	75	1	80-120	J6
Fluoride	5.00	ND	3.96	78	1	80-120	J6

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3254615-1 10/03/17 15:57

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Bromide	U		0.133	10.0
Chloride	1.22	J	0.795	10.0
Fluoride	U		0.261	1.00

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L939230-01 Original Sample (OS) • Duplicate (DUP)

(OS) L939230-01 10/04/17 01:02 • (DUP) R3254615-6 10/04/17 01:23

Analyte	Original Result (dry) mg/kg	DUP Result (dry) mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	ND	0	1	0		15
Chloride	1460	1290	1	12		15
Fluoride	60.9	62.5	1	3		15

L939377-12 Original Sample (OS) • Duplicate (DUP)

(OS) L939377-12 10/04/17 02:06 • (DUP) R3254615-7 10/04/17 02:35

Analyte	Original Result mg/kg	DUP Result mg/kg	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Bromide	U	0.000	1	0		15
Chloride	51.8	47.5	1	9		15
Fluoride	2.09	2.07	1	1		15

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

(LCS) R3254615-2 10/03/17 16:18 • (LCSD) R3254615-3 10/03/17 16:39

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromide	200	207	208	104	104	80-120			0	15
Chloride	200	208	209	104	104	80-120			1	15
Fluoride	20.0	21.0	21.0	105	105	80-120			0	15



L939147-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939147-01 10/03/17 19:02 • (MS) R3254615-4 10/03/17 19:23 • (MSD) R3254615-5 10/03/17 19:44

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Bromide	613	U	640	638	105	104	1	80-120			0	15
Chloride	613	64.9	710	706	105	105	1	80-120			1	15
Fluoride	61.3	8.47	49.9	47.4	68	64	1	80-120	<u>J6</u>	<u>J6</u>	5	15

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



Method Blank (MB)

(MB) R3255072-1 10/04/17 11:42

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Chloride	U		0.795	10.0
Fluoride	U		0.261	1.00

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L939503-15 Original Sample (OS) • Duplicate (DUP)

(OS) L939503-15 10/04/17 12:49 • (DUP) R3255072-4 10/04/17 13:02

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/kg	mg/kg		%		%
Chloride	ND	4.21	1	0		15
Fluoride	ND	0.366	1	0		15

L940112-01 Original Sample (OS) • Duplicate (DUP)

(OS) L940112-01 10/04/17 14:50 • (DUP) R3255072-7 10/04/17 15:03

Analyte	Original Result (dry)	DUP Result (dry)	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	mg/kg	mg/kg		%		%
Chloride	57.8	66.4	1	14		15
Fluoride	22.2	19.9	1	11		15

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

(LCS) R3255072-2 10/04/17 11:55 • (LCSD) R3255072-3 10/04/17 12:09

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Chloride	200	202	200	101	100	80-120			1	15
Fluoride	20.0	20.0	19.9	100	99	80-120			1	15

L939689-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939689-01 10/04/17 13:16 • (MS) R3255072-5 10/04/17 13:29 • (MSD) R3255072-6 10/04/17 13:43

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Chloride	576	20.2	643	637	108	107	1	80-120			1	15
Fluoride	57.6	0.756	34.7	34.5	59	58	1	80-120	J6	J6	1	15





Method Blank (MB)

(MB) R3255203-4 10/05/17 12:44

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Bromide	U		0.133	10.0

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

L939503-15 Original Sample (OS) • Duplicate (DUP)

(OS) L939503-15 10/05/17 14:30 • (DUP) R3255203-7 10/05/17 14:52

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Bromide	ND	0.000	1	0		15

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

(LCS) R3255203-5 10/05/17 13:06 • (LCSD) R3255203-6 10/05/17 13:27

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Bromide	200	196	203	98	102	80-120			4	15

7 Gl

8 Al

9 Sc

L939159-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939159-01 10/05/17 16:28 • (MS) R3255203-10 10/05/17 16:48 • (MSD) R3255203-11 10/05/17 17:10

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Bromide	616	U	579	595	94	97	1	80-120			3	15



Method Blank (MB)

(MB) R3254489-3 10/03/17 18:11

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury,Dissolved	U		0.000049	0.000200

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

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

(LCS) R3254489-4 10/03/17 18:13 • (LCSD) R3254489-5 10/03/17 18:15

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury,Dissolved	0.00300	0.00329	0.00317	110	106	80-120			4	20

L939503-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939503-02 10/03/17 18:18 • (MS) R3254489-6 10/03/17 18:20 • (MSD) R3254489-7 10/03/17 18:22

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury,Dissolved	0.00300	ND	0.00329	0.00310	110	103	1	75-125			6	20

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3254491-1 10/03/17 19:42

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.000049	0.000200

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

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

(LCS) R3254491-2 10/03/17 19:44 • (LCSD) R3254491-3 10/03/17 19:46

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury	0.00300	0.00323	0.00310	108	103	80-120			4	20

7 Gl

8 Al

L939609-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939609-05 10/03/17 19:49 • (MS) R3254491-4 10/03/17 19:51 • (MSD) R3254491-5 10/03/17 19:53

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	U	0.00325	0.00319	108	106	1	75-125			2	20

9 Sc



Method Blank (MB)

(MB) R3254698-1 10/04/17 13:04

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.0028	0.0200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

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

(LCS) R3254698-2 10/04/17 13:07 • (LCSD) R3254698-3 10/04/17 13:10

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury	0.300	0.346	0.340	115	113	80-120			2	20

L939462-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939462-06 10/04/17 13:12 • (MS) R3254698-4 10/04/17 13:22 • (MSD) R3254698-5 10/04/17 13:25

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury	0.300	0.0121	0.301	0.321	96	103	1	75-125			6	20

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3254485-1 10/03/17 20:48

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aluminum	U		3.5	10.0
Antimony	U		0.75	2.00
Arsenic	U		0.65	2.00
Barium	U		0.17	0.500
Beryllium	U		0.07	0.200
Boron	U		1.26	10.0
Cadmium	U		0.07	0.500
Calcium	U		4.63	100
Chromium	U		0.14	1.00
Cobalt	U		0.23	1.00
Copper	U		0.53	2.00
Iron	1.62	U	1.41	10.0
Lead	U		0.19	0.500
Magnesium	1.33	U	1.11	100
Manganese	U		0.12	1.00
Nickel	U		0.49	2.00
Potassium	U		10.2	100
Selenium	U		0.74	2.00
Silver	U		0.28	1.00
Sodium	U		9.85	100
Thallium	U		0.65	2.00
Vanadium	U		0.24	2.00
Zinc	U		0.59	5.00

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

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

(LCS) R3254485-2 10/03/17 20:51 • (LCSD) R3254485-3 10/03/17 20:54

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aluminum	1000	1070	1030	107	103	80-120			4	20
Antimony	100	104	99.2	104	99	80-120			4	20
Arsenic	100	102	96.7	102	97	80-120			5	20
Barium	100	107	102	107	102	80-120			4	20
Beryllium	100	105	101	105	101	80-120			4	20
Boron	100	104	99.9	104	100	80-120			4	20
Cadmium	100	101	97.1	101	97	80-120			4	20
Calcium	1000	1010	966	101	97	80-120			4	20
Chromium	100	102	96.7	102	97	80-120			6	20
Cobalt	100	107	102	107	102	80-120			5	20



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

(LCS) R3254485-2 10/03/17 20:51 • (LCSD) R3254485-3 10/03/17 20:54

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Copper	100	104	99.6	104	100	80-120			4	20
Iron	1000	1040	992	104	99	80-120			4	20
Lead	100	103	98.6	103	99	80-120			5	20
Magnesium	1000	1070	1030	107	103	80-120			4	20
Manganese	100	101	96.9	101	97	80-120			5	20
Nickel	100	105	99.8	105	100	80-120			5	20
Potassium	1000	999	952	100	95	80-120			5	20
Selenium	100	103	98.1	103	98	80-120			5	20
Silver	20.0	20.1	19.3	101	96	80-120			4	20
Sodium	1000	972	948	97	95	80-120			3	20
Thallium	100	105	99.6	105	100	80-120			6	20
Vanadium	100	104	100	104	100	80-120			4	20
Zinc	100	102	98.1	102	98	80-120			4	20

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L939368-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939368-01 10/03/17 20:57 • (MS) R3254485-6 10/03/17 21:07 • (MSD) R3254485-7 10/03/17 21:10

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD %	RPD Limits %
Aluminum	1000	9520	11300	10700	178	116	1	75-125	V		6	20
Antimony	100	ND	45.4	51.9	45	51	1	75-125	J6	J6	13	20
Arsenic	100	4.18	94.7	96.5	91	92	1	75-125			2	20
Barium	100	121	205	210	84	88	1	75-125			2	20
Beryllium	100	0.969	95.1	97.6	94	97	1	75-125			3	20
Boron	100	ND	85.5	87.4	85	87	1	75-125			2	20
Cadmium	100	ND	92.5	94.7	92	95	1	75-125			2	20
Calcium	1000	28100	33100	28900	492	74	1	75-125	V	V	13	20
Chromium	100	18.9	104	107	85	88	1	75-125			3	20
Cobalt	100	9.27	111	114	101	105	1	75-125			3	20
Copper	100	12.8	109	111	96	99	1	75-125			2	20
Iron	1000	24200	24100	26800	0	261	1	75-125	V	V	11	20
Lead	100	46.5	145	153	98	107	1	75-125			6	20
Magnesium	1000	1590	2670	2510	108	92	1	75-125			6	20
Manganese	100	665	661	859	0	194	1	75-125	V	J3 V	26	20
Nickel	100	13.7	113	114	99	101	1	75-125			1	20
Potassium	1000	1290	1900	1840	62	55	1	75-125	J6	J6	4	20
Selenium	100	ND	89.8	89.5	90	90	1	75-125			0	20
Silver	20.0	ND	18.9	19.2	94	96	1	75-125			2	20
Sodium	1000	ND	931	944	88	89	1	75-125			1	20



L939368-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939368-01 10/03/17 20:57 • (MS) R3254485-6 10/03/17 21:07 • (MSD) R3254485-7 10/03/17 21:10

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Thallium	100	ND	91.7	94.1	92	94	1	75-125			3	20
Vanadium	100	20.5	111	114	90	93	1	75-125			3	20
Zinc	100	82.7	170	172	87	89	1	75-125			1	20

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



Method Blank (MB)

(MB) R3254785-1 10/04/17 15:53

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Boron,Dissolved	U		0.0126	0.200

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

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

(LCS) R3254785-2 10/04/17 15:56 • (LCSD) R3254785-3 10/04/17 15:58

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Boron,Dissolved	1.00	1.01	1.01	101	101	80-120			0	20

L939302-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939302-02 10/04/17 16:01 • (MS) R3254785-5 10/04/17 16:06 • (MSD) R3254785-6 10/04/17 16:08

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	1.06	1.05	102	101	1	75-125			1	20

7 Gl

8 Al

9 Sc





Method Blank (MB)

(MB) R3254807-1 10/04/17 18:58

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Boron	U		0.0126	0.200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

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

(LCS) R3254807-2 10/04/17 19:01 • (LCSD) R3254807-3 10/04/17 19:04

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 %
Boron	1.00	1.01	1.01	101	101	80-120			0	20

L939503-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939503-01 10/04/17 19:07 • (MS) R3254807-5 10/04/17 19:13 • (MSD) R3254807-6 10/04/17 19:16

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Boron	1.00	ND	1.05	1.07	100	102	1	75-125			2	20

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



Method Blank (MB)

(MB) R3254447-1 10/03/17 15:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	U		0.00515	0.100
Antimony	U		0.000754	0.00200
Arsenic	U		0.00025	0.00200
Barium	U		0.00036	0.00500
Beryllium	U		0.00012	0.00200
Cadmium	U		0.00016	0.00100
Calcium	U		0.046	1.00
Chromium	U		0.00054	0.00200
Copper	0.000592	↓	0.00052	0.00500
Cobalt	U		0.00026	0.00200
Iron	U		0.015	0.100
Lead	U		0.00024	0.00200
Magnesium	U		0.1	1.00
Manganese	U		0.00025	0.00500
Nickel	U		0.00035	0.00200
Potassium	U		0.037	1.00
Selenium	U		0.00038	0.00200
Silver	U		0.00031	0.00200
Sodium	U		0.11	1.00
Thallium	U		0.00019	0.00200
Vanadium	U		0.00018	0.00500
Zinc	0.00273	↓	0.00256	0.0250

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) R3254447-2 10/03/17 15:22 • (LCSD) R3254447-3 10/03/17 15:26

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 %
Aluminum	5.00	4.64	4.62	93	92	80-120			1	20
Antimony	0.0500	0.0482	0.0488	96	98	80-120			1	20
Arsenic	0.0500	0.0491	0.0492	98	98	80-120			0	20
Barium	0.0500	0.0450	0.0479	90	96	80-120			6	20
Beryllium	0.0500	0.0439	0.0455	88	91	80-120			4	20
Cadmium	0.0500	0.0479	0.0483	96	97	80-120			1	20
Calcium	5.00	4.59	4.87	92	97	80-120			6	20
Chromium	0.0500	0.0486	0.0496	97	99	80-120			2	20
Copper	0.0500	0.0483	0.0489	97	98	80-120			1	20
Cobalt	0.0500	0.0499	0.0504	100	101	80-120			1	20
Iron	5.00	4.88	4.95	98	99	80-120			2	20



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

(LCS) R3254447-2 10/03/17 15:22 • (LCSD) R3254447-3 10/03/17 15:26

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 %
Lead	0.0500	0.0478	0.0478	96	96	80-120			0	20
Magnesium	5.00	4.82	4.87	96	97	80-120			1	20
Manganese	0.0500	0.0476	0.0474	95	95	80-120			0	20
Nickel	0.0500	0.0496	0.0509	99	102	80-120			3	20
Potassium	5.00	4.83	4.83	97	97	80-120			0	20
Selenium	0.0500	0.0524	0.0517	105	103	80-120			1	20
Silver	0.0500	0.0485	0.0487	97	97	80-120			0	20
Sodium	5.00	4.77	4.83	95	97	80-120			1	20
Thallium	0.0500	0.0468	0.0481	94	96	80-120			3	20
Vanadium	0.0500	0.0487	0.0482	97	96	80-120			1	20
Zinc	0.0500	0.0499	0.0552	100	110	80-120			10	20

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L939503-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939503-09 10/03/17 15:29 • (MS) R3254447-5 10/03/17 15:36 • (MSD) R3254447-6 10/03/17 15:40

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	4.70	4.70	93	93	1	75-125			0	20
Antimony	0.0500	ND	0.0478	0.0487	96	97	1	75-125			2	20
Arsenic	0.0500	ND	0.0493	0.0490	98	97	1	75-125			1	20
Barium	0.0500	0.0398	0.0824	0.0862	85	93	1	75-125			5	20
Beryllium	0.0500	ND	0.0440	0.0443	88	89	1	75-125			1	20
Cadmium	0.0500	ND	0.0481	0.0497	96	99	1	75-125			3	20
Calcium	5.00	22.5	27.1	27.3	92	96	1	75-125			1	20
Chromium	0.0500	ND	0.0482	0.0488	96	98	1	75-125			1	20
Copper	0.0500	ND	0.0473	0.0477	92	93	1	75-125			1	20
Cobalt	0.0500	ND	0.0489	0.0496	97	98	1	75-125			1	20
Potassium	5.00	3.10	7.77	7.83	93	95	1	75-125			1	20
Iron	5.00	0.455	5.32	5.29	97	97	1	75-125			1	20
Lead	0.0500	ND	0.0481	0.0486	96	97	1	75-125			1	20
Magnesium	5.00	5.55	10.3	10.2	94	93	1	75-125			1	20
Manganese	0.0500	0.205	0.246	0.244	82	78	1	75-125			1	20
Nickel	0.0500	ND	0.0498	0.0500	97	98	1	75-125			0	20
Selenium	0.0500	ND	0.0514	0.0526	103	105	1	75-125			2	20
Silver	0.0500	ND	0.0487	0.0497	97	99	1	75-125			2	20
Sodium	5.00	8.96	13.4	13.6	88	93	1	75-125			2	20
Thallium	0.0500	ND	0.0479	0.0486	96	97	1	75-125			1	20
Vanadium	0.0500	ND	0.0482	0.0487	96	97	1	75-125			1	20
Zinc	0.0500	ND	0.0558	0.0504	106	95	1	75-125			10	20



Method Blank (MB)

(MB) R3254758-1 10/04/17 14:11

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum,Dissolved	0.00534	┘	0.00515	0.100
Antimony,Dissolved	U		0.000754	0.00200
Arsenic,Dissolved	U		0.00025	0.00200
Barium,Dissolved	U		0.00036	0.00500
Beryllium,Dissolved	U		0.00012	0.00200
Cadmium,Dissolved	U		0.00016	0.00100
Calcium,Dissolved	U		0.046	1.00
Chromium,Dissolved	U		0.00054	0.00200
Copper,Dissolved	U		0.00052	0.00500
Cobalt,Dissolved	U		0.00026	0.00200
Iron,Dissolved	U		0.015	0.100
Lead,Dissolved	U		0.00024	0.00200
Magnesium,Dissolved	U		0.1	1.00
Manganese,Dissolved	U		0.00025	0.00500
Nickel,Dissolved	U		0.00035	0.00200
Potassium,Dissolved	U		0.037	1.00
Selenium,Dissolved	U		0.00038	0.00200
Silver,Dissolved	U		0.00031	0.00200
Sodium,Dissolved	0.121	┘	0.11	1.00
Thallium,Dissolved	U		0.00019	0.00200
Vanadium,Dissolved	U		0.00018	0.00500
Zinc,Dissolved	U		0.00256	0.0250

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

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

(LCS) R3254758-2 10/04/17 14:15 • (LCSD) R3254758-3 10/04/17 14:19

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 %
Aluminum,Dissolved	5.00	4.51	4.36	90	87	80-120			3	20
Antimony,Dissolved	0.0500	0.0485	0.0488	97	98	80-120			1	20
Arsenic,Dissolved	0.0500	0.0472	0.0477	94	95	80-120			1	20
Barium,Dissolved	0.0500	0.0466	0.0457	93	91	80-120			2	20
Beryllium,Dissolved	0.0500	0.0423	0.0412	85	82	80-120			3	20
Cadmium,Dissolved	0.0500	0.0491	0.0483	98	97	80-120			2	20
Calcium,Dissolved	5.00	4.56	4.85	91	97	80-120			6	20
Chromium,Dissolved	0.0500	0.0477	0.0477	95	95	80-120			0	20
Copper,Dissolved	0.0500	0.0477	0.0472	95	94	80-120			1	20
Cobalt,Dissolved	0.0500	0.0493	0.0497	99	99	80-120			1	20
Iron,Dissolved	5.00	4.73	4.76	95	95	80-120			1	20



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

(LCS) R3254758-2 10/04/17 14:15 • (LCSD) R3254758-3 10/04/17 14:19

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 %
Lead,Dissolved	0.0500	0.0477	0.0466	95	93	80-120			2	20
Magnesium,Dissolved	5.00	4.65	4.64	93	93	80-120			0	20
Manganese,Dissolved	0.0500	0.0454	0.0465	91	93	80-120			2	20
Nickel,Dissolved	0.0500	0.0487	0.0490	97	98	80-120			1	20
Potassium,Dissolved	5.00	4.57	4.54	91	91	80-120			1	20
Selenium,Dissolved	0.0500	0.0494	0.0505	99	101	80-120			2	20
Silver,Dissolved	0.0500	0.0471	0.0468	94	94	80-120			1	20
Sodium,Dissolved	5.00	4.75	4.66	95	93	80-120			2	20
Thallium,Dissolved	0.0500	0.0466	0.0465	93	93	80-120			0	20
Vanadium,Dissolved	0.0500	0.0466	0.0467	93	93	80-120			0	20
Zinc,Dissolved	0.0500	0.0464	0.0481	93	96	80-120			4	20

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

L939658-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L939658-01 10/04/17 14:22 • (MS) R3254758-5 10/04/17 14:29 • (MSD) R3254758-6 10/04/17 14:33

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	0.0216	4.43	4.51	88	90	1	75-125			2	20
Antimony,Dissolved	0.0500	U	0.0495	0.0490	99	98	1	75-125			1	20
Arsenic,Dissolved	0.0500	0.00505	0.0504	0.0527	91	95	1	75-125			4	20
Barium,Dissolved	0.0500	0.196	0.237	0.240	82	87	1	75-125			1	20
Beryllium,Dissolved	0.0500	U	0.0420	0.0432	84	86	1	75-125			3	20
Cadmium,Dissolved	0.0500	U	0.0486	0.0479	97	96	1	75-125			2	20
Calcium,Dissolved	5.00	120	121	123	14	52	1	75-125	V	V	2	20
Chromium,Dissolved	0.0500	U	0.0461	0.0465	92	93	1	75-125			1	20
Copper,Dissolved	0.0500	0.00166	0.0464	0.0466	90	90	1	75-125			0	20
Cobalt,Dissolved	0.0500	U	0.0467	0.0476	93	95	1	75-125			2	20
Potassium,Dissolved	5.00	2.78	7.07	7.28	86	90	1	75-125			3	20
Iron,Dissolved	5.00	27.1	31.0	31.1	77	79	1	75-125			0	20
Lead,Dissolved	0.0500	U	0.0480	0.0485	96	97	1	75-125			1	20
Magnesium,Dissolved	5.00	53.9	57.3	57.8	68	78	1	75-125	V		1	20
Manganese,Dissolved	0.0500	3.17	3.12	3.15	0	0	1	75-125	V	V	1	20
Nickel,Dissolved	0.0500	U	0.0460	0.0475	92	95	1	75-125			3	20
Selenium,Dissolved	0.0500	U	0.0523	0.0512	105	102	1	75-125			2	20
Silver,Dissolved	0.0500	U	0.0474	0.0478	95	96	1	75-125			1	20
Sodium,Dissolved	5.00	26.2	29.9	30.6	74	88	1	75-125	V		2	20
Thallium,Dissolved	0.0500	U	0.0473	0.0476	95	95	1	75-125			0	20
Vanadium,Dissolved	0.0500	U	0.0455	0.0466	91	93	1	75-125			2	20
Zinc,Dissolved	0.0500	0.00260	0.0474	0.0488	90	92	1	75-125			3	20



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.

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
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.
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, 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.
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.

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

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
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.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
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.



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.  
 \* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

## State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina <sup>1</sup>	DW21704
Florida	E87487	North Carolina <sup>2</sup>	41
Georgia	NELAP	North Dakota	R-140
Georgia <sup>1</sup>	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky <sup>1</sup>	90010	South Dakota	n/a
Kentucky <sup>2</sup>	16	Tennessee <sup>14</sup>	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

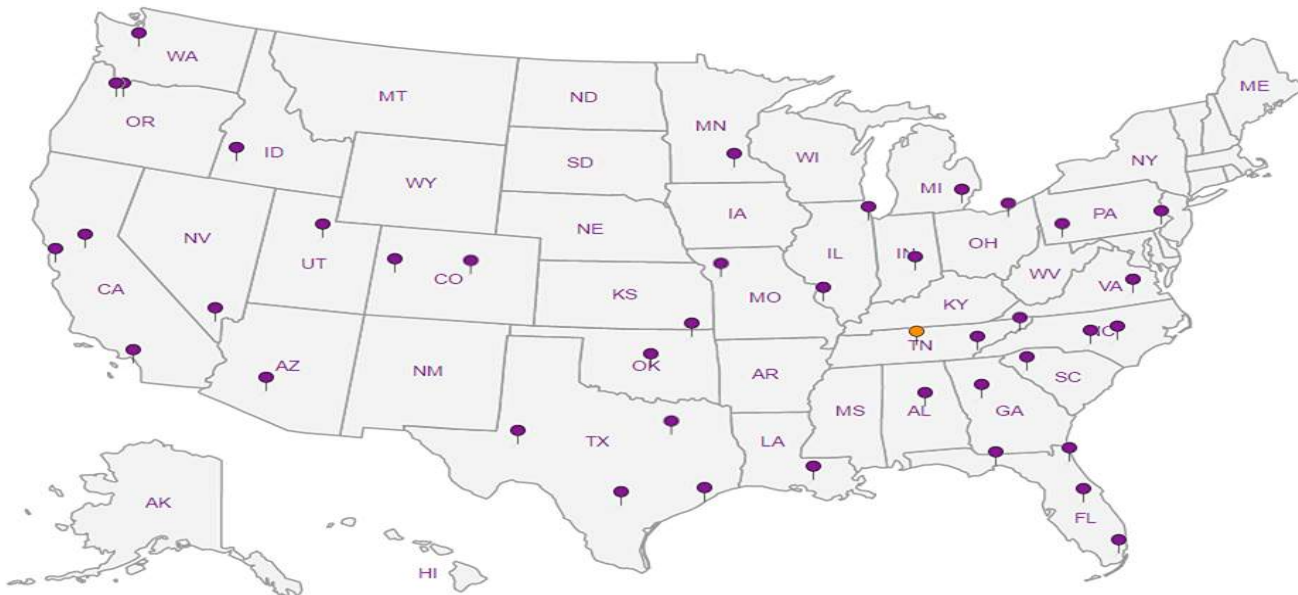
## Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>n/a</sup> Accreditation not applicable

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

**Civil & Environmental Consultants - TN**

325 Seaboard Lane, Suite 170

Report to:  
**Philip Campbell**

Project  
Description: **EWS Landfill**

Phone: **615-333-7797**  
Fax: **615-333-7751**

Client Project #  
**142-059**

City/State Collected:  
Lab Project #  
**CEC-142-059**

Collected by (print):  
**Cole Lissett  
Caleb Duke**

Site/Facility ID #

P.O. #

Collected by (signature):  
*[Signature]*

**Rush?** (Lab MUST Be Notified)

Same Day  Five Day  
 Next Day  5 Day (Rad Only)  
 Two Day  10 Day (Rad Only)  
 Three Day

Quote #

Date Results Needed

Immediately  
Packed on Ice: N  Y

Pres  
Chk

Analysis / Container / Preservative

Chain of Custody Page \_\_\_ of \_\_\_



12055 Lebanon Rd  
Mount Juliet, TN 37122  
Phone: 615-758-5858  
Phone: 800-767-5859  
Fax: 615-758-5859



L# **939503**  
**H117**

Acctnum: **CEC**  
Template: **T128179**  
Prelogin: **P619432**  
TSR: **350 - Jimmy Hunt**  
PB: **9-20-17**  
Shipped Via: **Courier**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Bromide, Cl, F 125mlHDPE-NoPres	Bromide, Cl, F 4ozClr-NoPres	COLLETT Microbiological	Diss Metals-LabFit 250mlHDPE-NoPres	Diss- Metals (FFP) 250mlHDPE-NoPres	Total Metals 250mlHDPE-HNO3	Total Metals 2ozClr-NoPres	Total Hardness	Remarks	Sample # (lab only)
CHARLIE CREEK US (FFP)		GW		04/26/17	1421	1	X		X		X	X		X		
CHARLIE CREEK US (LAB)		GW			1420	1				X				X		21
CHARLIE CREEK MS (FFP)		GW			1200	1	X		X		X	X		X		22
CHARLIE CREEK MS (LAB)		GW			1200	1				X				X		23
CANE CREEK US (FFP)		GW			1300	1	X		X		X	X		X		24
CANE CREEK US (LAB)		GW			1335	1				X				X		25
CANE CREEK MS (FFP)		GW			1129	1	X		X		X	X		X		26
CANE CREEK MS (LAB)		GW			1129	1				X				X		27
CANE CREEK DS-1 (FFP)		GW			1030	1	X		X		X	X		X		28
CANE CREEK DS-1 (LAB)		GW			1030	1				X				X		29

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

Remarks: FFP sample ID = Dissolved metals are field filtered and preserved  
Lab Filter sample ID = Dissolved metals are lab filtered and preserved

Samples returned via:  
 UPS  FedEx  Courier

Tracking #

Relinquished by: (Signature) *[Signature]*  
Date: 9/26/2017 Time: 5:40

Received by: (Signature) *[Signature]*

Trip Blank Received: Yes / No  
HCL / MeOH  
TBR

Relinquished by: (Signature) *[Signature]*  
Date: 9/26/2017 Time: 5:40

Received by: (Signature) *[Signature]*

Temp: 25.11 °C Bottles Received: 25

Relinquished by: (Signature) *[Signature]*  
Date: 9/27/17 Time: 15:00

Received for lab by: (Signature) *[Signature]*

Date: 9-27-17 Time: 1500

Sample Receipt Checklist

CDC Seal Present/Intact:	MP	Y	N
CDC Signed/Accurate:		Y	N
Bottles arrive intact:		Y	N
Correct bottles used:		Y	N
Sufficient volume sent:		Y	N
If Applicable			
VQA Zero Headspace:		Y	N
Preservation Correct/Checked:		Y	N

If preservation required by Login: Date/Time *[Signature]*

Hold: Condition: *[Signature]*



**Civil & Environmental Consultants - TN**

325 Seaboard Lane, Suite 170

Report to:  
**Philip Campbell**

Project  
Description: **EWS Landfill**

Phone: **615-333-7797**  
Fax: **615-333-7751**

Collected by (print):  
**Cole Lissett**  
**Caleb Duke**

Collected by (signature):  
*Cole Lissett*

Immediately  
Packed on ice: N Y X

Billing Information:  
**Dr. Kevin Wolfe**  
325 Seaboard Lane, Suite 170  
Franklin, TN 37067

Email To: **mjohnson@cecinc.com,**  
**pcampbell@cecinc.com**

City/State  
Collected:

Lab Project #  
**CEC-142-059**

P.O. #

Quote #

Date Results Needed

Pres  
Chk

Analysis / Container / Preservative

Chain of Custody Page    of   



12065 Lebanon Rd  
Mount Juliet, TN 37122  
Phone: 615-758-5858  
Phone: 800-767-5859  
Fax: 615-758-5859



L# **939503**

Table #

Acctnum: **CEC**

Template: **T128179**

Prelogin: **P619432**

TSR: **350 - Jimmy Hunt**

PB: **9.20.17**

Shipped Via: **Courier**

Remarks Sample # (lab only)

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Bromide, Cl, F 125mHDPE-NoPres	Bromide, Cl, F 4ozClr-NoPres	COLBERT Microbiological	Diss Metals-LabFilt 250mHDPE-NoPres	Diss. Metals (FFP) 250mHDPE-NoPres	Total Metals 250mHDPE-HNO3	Total Metals 2ozClr-NoPres
CANE CREEK DS-2 (FFP)		GW				1	X		X		X	X	
CANE CREEK DS-2 (LAB)		GW				1				X			
CHARLIE CREEK US		SS		9/26/17	2:20 AM	32		X	X				X
CHARLIE CREEK MS		SS		9/26/17	12:08 AM	32		X	X				X
CANE CREEK US		SS		9/26/17	1:48 AM	32		X	X				X
CANE CREEK MS		SS		9/26/17	11:32 AM	32		X	X				X
CANE CREEK DS-1		SS		9/26/17	10:28 AM	32		X	X				X
CANE CREEK DS-2		SS				32		X	X				X

Omit  
Omit  
-11  
-12  
-13  
-14  
-15

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

Remarks: FFP sample ID = Dissolved metals are field filtered and preserved  
Lab Filter sample ID = Dissolved metals are lab filtered and preserved

Samples returned via:  
   UPS    FedEx    Courier      

Tracking #

pH    Temp     
Flow    Other   

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

Relinquished by: (Signature)  
*Cole Lissett*

Date: **9/26/2017** Time: **5:40**

Received by: (Signature)

Trip Blank Received: Yes / No  
HCL / MeOH  
TBR

Relinquished by: (Signature)  
*Cole Lissett*

Date: **9/26/2017** Time: **5:40**

Received by: (Signature)  
*Johnny Fisher*

Temp: **25.7** °C  
Bottles Received: **25**

Relinquished by: (Signature)  
*Johnny Fisher*

Date: **9/27/17** Time: **15:00**

Received for lab by: (Signature)  
*Johnny Fisher*

Date: **9.27.17** Time: **4:59**

If preservation required by Login: Date/Time

Hold:    Condition:     
NCF    OK

L939503

---

**Jimmy Hunt**

**From:** Campbell, Philip <pcampbell@cecinc.com>  
**Sent:** Friday, September 29, 2017 8:29 AM  
**To:** Jimmy Hunt; Johnson, Michael  
**Cc:** Liggett, Cole; Duke, Caleb  
**Subject:** RE: EWS Landfill

Jimmy,

The Cane Creek DS-2 sample locations were removed (both soil and water) so you should not have received one. Thank you.

Philip

**Philip J. Campbell, \*P.G.** / Assistant Project Manager  
Civil & Environmental Consultants, Inc.  
325 Seaboard Lane · Suite 170 · Franklin, TN 37067  
Toll-Free: (800) 763-2326 · Direct: (615) 577-9354 · Fax: (615) 333-7751  
Mobile: (865) 742-2526 · <http://www.cecinc.com>  
Senior Leadership · Integrated Services · Personal Business Relationships

\*Licensed Professional Geologist in Tennessee

---

**From:** Jimmy Hunt [<mailto:JHunt@esclabsciences.com>]  
**Sent:** Thursday, September 28, 2017 7:35 AM  
**To:** Campbell, Philip <pcampbell@cecinc.com>; Johnson, Michael <mjohnson@cecinc.com>  
**Subject:** EWS Landfill

Philip/Mike,

We received the samples on the attached COC yesterday. The soil sample for Cane Creek DS-2 was missing. Should we have received it? We will proceed with the analysis of all samples that we did receive.

**Thanks,**

✉ *Jimmy Hunt*  
*Project Manager*

**ESC Lab Sciences**-a subsidiary of Pace Analytical  
12065 Lebanon Road | Mt. Juliet, TN 37122  
615.773.9668  
[jhunt@esclabsciences.com](mailto:jhunt@esclabsciences.com) | [www.esclabsciences.com](http://www.esclabsciences.com)

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**Matt Shacklock**

**ESC Lab Sciences**  
**Non-Conformance Form**

<b>Login #:939503</b>	<b>Client:CEC</b>	<b>Date:09/27/17</b>	<b>Evaluated by: Matthew Lockhart</b>
-----------------------	-------------------	----------------------	---------------------------------------

**Non-Conformance (check applicable items)**

<b>Sample Integrity</b>	<b>Chain of Custody Clarification</b>	<b>If Broken Container:</b>
Parameter(s) past holding time <input checked="" type="checkbox"/>	Login Clarification Needed	
Improper temperature <input type="checkbox"/>	Chain of custody is incomplete	Insufficient packing material around container
Improper container type <input type="checkbox"/>	Please specify Metals requested.	Insufficient packing material inside cooler
Improper preservation <input type="checkbox"/>	Please specify TCLP requested.	Improper handling by carrier (FedEx / UPS / Courier)
Insufficient sample volume. <input type="checkbox"/>	Received additional samples not listed on coc.	Sample was frozen
Sample is biphasic. <input type="checkbox"/>	Sample ids on containers do not match ids on coc	Container lid not intact
Vials received with headspace. <input type="checkbox"/>	Trip Blank not received.	<b>If no Chain of Custody:</b>
Broken container <input type="checkbox"/>	Client did not "X" analysis.	Received by:
Broken container: <input type="checkbox"/>	Chain of Custody is missing	Date/Time:
Sufficient sample remains <input type="checkbox"/>		Temp./Cont. Rec./pH:
		Carrier:
		Tracking#

**Login Comments:Did not receive sample for Sample ID: Cane Creek DS-2 for soil matrix.**

<b>Client informed by:</b>	<input type="checkbox"/> Call	<input checked="" type="checkbox"/> Email	<input type="checkbox"/> Voice Mail	<b>Date: 9/29/17</b>	<b>Time: 0829</b>
<b>TSR Initials:</b> jeh	<b>Client Contact:</b> Philip Campbell				

**Login Instructions:** Cane Creek DS-2 was not sampled. Please log all samples that were received.

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# EQUIPMENT CALIBRATION LOG

## EQUIPMENT CALIBRATION FORM

NAME OF REPRESENTATIVE	Philip Campbell
LOCATION	Camden, TN
DATE AND TIME	9-27-17 / 11:20
Equipment and Model # (ex. YSI Pro Plus 556)	YSI - Pro Plus w/ quattro / Turbidimeter = Hach 2100Q
Equipment Serial #	YSI #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	9/2017	4.14	183.0	160 to 180	No	4.0	yes
7	9/2017	7.16	-43.2	+/-50	Yes	7.01	yes
10	9/2017	9.91	-215.2	-160 to -180	No	10.01	yes

Temperature Calibration Check	
Cert. Thermometer Value (deg C)	Meter Value (deg C)
—	—

DO Calibration				
Actual Barometric Pressure	Barometric Pressure (mm Hg)	D.O. Value (% Saturated)	Unit reading (%)	% DO accepted?
—	—	—	—	—

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)
1,000	9-27-17	1113	1000	—	—	—	—

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					

9-28-17- 8:05 A.M. pH buffers checked + calibration was correct for 4.0, 7.0, + 10.0 standards



# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.ceclinc.com

## SITE AND MONITORING WELL DATA

FACILITY NAME	EWS - Former	MONITORING WELL I.D.	MW-1
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PC, 70's
DATE & TIME	9-27-17/11.35	EVENT FREQUENCY	Quarterly
PURGE METHOD	Peristaltic Pump w/ TCS log	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	30.5	SAMPLING EQUIPMENT	Bailer
DEPTH TO WATER (feet)	23.35	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	No
WATER COLUMN (feet)	7.15	FIELD BLANK COLLECTED?	No
PURGE VOLUME (gallons)	1 vol = 1.17 gal	EQUIPMENT BLANK COLLECTED?	No

## PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
0 v <sub>0</sub>	11:50	0	18.0	5.28	47.6	6.75	-40.0	202
1.17 v <sub>1</sub>	11:57	7	18.4	4.76	44.5	0.85	3.7	129
2.34 v <sub>2</sub>	12:07	17	18.6	5.10	67.5	0.56	-12.0	53.9
3.51 v <sub>3</sub>	12:17	27	18.4	5.43	89.1	0.31	-34.3	9.87

## SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
3.5	8:45	-	17.0	5.39	117.2	2.24	-12.9	6.73
Sample Characteristics (Odor, Color)			clear, No odor			Preservatives Used		
Number of Containers			13			Sampler Signature		

## WELL DATA

Number of Baffles	4	Well Cap Dedicated/In Place?	No pump
Well Clear of Weeds/Accessible?	yes/yes	Fittings/Well Head Condition	good
Pad/Casing Quality	good/good	Lock Condition	good



# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.ccecinc.com

## SITE AND MONITORING WELL DATA

FACILITY NAME	EWS - Former	MONITORING WELL I.D.	MW-2
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PS 80's
DATE & TIME	9-27-17 / 13:35	EVENT FREQUENCY	Quarterly
PURGE METHOD	NA, parameters only	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	12.45 <del>measured</del> → measurement	SAMPLING EQUIPMENT	YSI 600 pro plus, 2100 & Hach
DEPTH TO WATER (feet)	10.05 (dry?)	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (Inches)	2	DUPLICATE COLLECTED?	—
WATER COLUMN (feet)	<del>0.05</del> dry 2.40	FIELD BLANK COLLECTED?	—
PURGE VOLUME (gallons)	NA	EQUIPMENT BLANK COLLECTED?	—

9-28-17 - Parameters

## SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
0.5	13:35	—	22.6	5.94	252.2	2.21	-21.6	383
Sample Characteristics (Odor, Color)			Preservatives Used					
Number of Containers			Sampler Signature			Philip Campbell		

## WELL DATA

Number of Baffles	4	Well Cap Dedicated/In Place?	No
Well Clear of Weeds/Accessible?	yes	Fittings/Well Head Condition	OK
Pad/Casing Quality	good	Lock Condition	OK



# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

FACILITY NAME	EWS - Former	MONITORING WELL I.D.	MW-3
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PC, humid, 80's
DATE & TIME	9-27-17/17:20	EVENT FREQUENCY	Quarterly
PURGE METHOD	Peristaltic Pump w/teflon	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	27.00	SAMPLING EQUIPMENT	Bailer - teflon
DEPTH TO WATER (feet)	19.65	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	No
WATER COLUMN (feet)	7.35	FIELD BLANK COLLECTED?	yes - 13:10
PURGE VOLUME (gallons)	V <sub>1</sub> = 1.198 gallons ≈ 1.2 gal	EQUIPMENT BLANK COLLECTED?	No

## PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
V <sub>0</sub> = 0 gal	17:26	-	18.6	5.40	592	0.45	-19.6	13.7
V <sub>1</sub> = 1.2 gal	17:33	7	19.2	5.42	565	0.42	-23.2	66.0
V <sub>2</sub> = 2.4 gal	17:43	17	19.2	5.32	577	1.95	-20.6	623
<del>V<sub>3</sub> = 3.6 gal</del> 13.25	- Going dry @ 18:00		Let re charge before next reading.		769			
V <sub>3</sub> = 3.6 gal	18:08	34	20.0	5.38	540	5.09	-12.2	262

## SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
3.6	12:30	34	20.5	5.75	449.5	1.53	-6.4	18.9
Sample Characteristics (Odor, Color)		Clear, slightly white, no odor		Preservatives Used		seccoc		
Number of Containers		13		Sampler Signature		Philip Campbell		

## WELL DATA

Number of Baffles	4	Well Cap Dedicated/In Place?	No pump
Well Clear of Weeds/Accessible?	yes	Fittings/Well Head Condition	good
Pad/Casing Quality	good/good	Lock Condition	good

9-28-17  
sample -

at meter  
NTU = 52.8  
after  
sampling  
NTU = 380  
after  
field  
filter.



# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

FACILITY NAME	EWS - Form 1 ✓	MONITORING WELL I.D.	MW-4
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PC, humid, 80's
DATE & TIME	9-27-17 16:40	EVENT FREQUENCY	Quarterly
PURGE METHOD	Peristaltic Pump w/teflon	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	23.1 0	SAMPLING EQUIPMENT	Bailer - teflon
DEPTH TO WATER (feet)	11.80	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	No
WATER COLUMN (feet)	11.28	FIELD BLANK COLLECTED?	No
PURGE VOLUME (gallons)	$v_1 = 1.84$ gallons $v_2 = 1.85$ gal.	EQUIPMENT BLANK COLLECTED?	No

## PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
$v_0 = 0$ gal	16:42	0	18.2	5.81	56.8	3.71	-32.7	41.2
$v_1 = 1.85$ gal	16:48	6	18.2	5.72	57.0	3.10	-28.6	22.6
$v_2 = 3.70$ gal	16:58	16	17.9	5.63	55.0	3.08	-30.8	3.79
$v_3 = 5.55$	17:10	28	18.0	5.62	56.2	3.07	-29.0	2.13

## SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
5.55	17:00	28	18.8	5.85	61.6	3.84	-25.4	2.47
Sample Characteristics (Odor, Color)		Clear, No odor		Preservatives Used				
Number of Containers		13		Sampler Signature		Philip Campbell		

## WELL DATA

Number of Baffles	0	Well Cap Dedicated/In Place?	No pump
Well Clear of Weeds/Accessible?	yes	Fittings/Well Head Condition	OK
Pad/Casing Quality	OK	Lock Condition	good

9-28-17  
sample

2.64 NTU  
After  
Sample





# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

FACILITY NAME	EWS - Former	MONITORING WELL I.D.	MW-5
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PG humid, 80's
DATE & TIME	9-27-17 / 12:35	EVENT FREQUENCY	Quarterly
PURGE METHOD	Peristaltic Pump w/ teflon	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	33.85	SAMPLING EQUIPMENT	Bailer - teflon
DEPTH TO WATER (feet)	9.73	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	2	DUPLICATE COLLECTED?	yes
WATER COLUMN (feet)	24.12	FIELD BLANK COLLECTED?	No
PURGE VOLUME (gallons)	V <sub>1</sub> = 3.93 gallons ≈ 4 gallons	EQUIPMENT BLANK COLLECTED?	No

## PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
V <sub>0</sub> = 0	12:42	0	18.3	5.23	221.6	0.86	-12.7	644
V <sub>1</sub> = 4 gal.	13:14	32	18.5	5.22	209.7	0.85	-12.3	175
V <sub>2</sub> = 8 gal.	13:38	56	18.8	5.38	208.7	0.77	-10.0	62.4
V <sub>3</sub> = 12 gal	14:11	89	18.2	5.43	142.8	3.32	-18.2	23.8

\* getting clearer. cloudy again at 3 gal

9-28-17 sample

## SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
-	9:45	89	18.3	5.21	211.6	2.33	-5.4	8.87
Sample Characteristics (Odor, Color)			Preservatives Used					
Number of Containers			Sampler Signature					

## WELL DATA

Number of Baffles	4	Well Cap Dedicated/In Place?	Yes
Well Clear of Weeds/Accessible?	yes/yes	Fittings/Well Head Condition	good/good
Pad/Casing Quality	good/good	Lock Condition	good.

\* light orange color making water cloudy orange. very fine particles causing cloudiness.

~~$(0.6218) \times 7.481$~~   
 ~~$(0.6218) \times H$~~   
 ~~$(0.6218) \times H$~~   
 $0.0019444 \times H$

$(\frac{0.5}{12})^2 \times 3.14 \times 7.481 \approx 0.0419 \text{ gal/ft.}$   
 (ft)

# CEC

## GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

### SITE AND MONITORING WELL DATA

FACILITY NAME	EWS - Former	MONITORING WELL I.D.	TMW-1
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PL, humid, 80's
DATE & TIME	9-27-17 / 14:40	EVENT FREQUENCY	Quarterly
PURGE METHOD	Peristaltic Pump	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	32.5 @	SAMPLING EQUIPMENT	Bailer
DEPTH TO WATER (feet)	6.76	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	1"	DUPLICATE COLLECTED?	No
WATER COLUMN (feet)	25.74	FIELD BLANK COLLECTED?	No
PURGE VOLUME (gallons)	$0.041 \times 25.74 = 1.055 \text{ gal} = V_1$	EQUIPMENT BLANK COLLECTED?	No

### PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
$V_0 = 0 \text{ gal}$	14:43	0	19.5	5.77	72.6	5.74	-25.1	96.4
$V_1 = 1.06$	14:48	5	18.4	5.39	71.3	6.97	-6.5	26.2
$V_2 = 2.12$	14:55	12	18.2	5.31	70.3	7.02	-3.2	14.4
$V_3 = 3.18$	15:03	20	17.8	5.42	69.3	6.88	-6.0	26.3
$V_4 = 4.24$	15:10	27	17.9	5.51	68.9	6.97	-9.4	8.90
$V_5 = 5.30$								

9-28-17 = sample collection

### SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
5.30	10:30	-	18.4	5.69	76.0	5.91	-11.5	18.4
Sample Characteristics (Odor, Color)		Clear Lt. orange, No odor		Preservatives Used				
Number of Containers		13		Sampler Signature		Philip Campbell		

-36.8 NTU after samples

### WELL DATA

Number of Baffles	0	Well Cap Dedicated/In Place?	No pump
Well Clear of Weeds/Accessible?	yes	Fittings/Well Head Condition	OK
Pad/Casing Quality	No pad	Lock Condition	<del>OK</del> Needs lock



# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

FACILITY NAME	EWS - Former	MONITORING WELL I.D.	TMW-2
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PC, humid, 80's
DATE & TIME	9-27-17 / 13:10	EVENT FREQUENCY	Quarterly
PURGE METHOD	Peristaltic Pump	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	27.5	SAMPLING EQUIPMENT	Bailer
DEPTH TO WATER (feet)	11.47	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	1	DUPLICATE COLLECTED?	No
WATER COLUMN (feet)	16.03	FIELD BLANK COLLECTED?	No
PURGE VOLUME (gallons)	$0.041 \times 16.03 = 0.657 \text{ gal} = V_1$	EQUIPMENT BLANK COLLECTED?	No

## PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
$V_0 = 0 \text{ gal}$	15:20	0	19.1	5.88	29.3	8.12	-21.5	488
$V_1 = 0.66 \text{ gal}$	15:30	10	18.4	5.91	49.4	8.68	-24.1	71000
$V_2 = 1.32 \text{ gal}$	15:35	15	17.9	5.77	48.4	8.35	-24.0	71000
$V_3 = 1.98 \text{ gal}$	15:40	20	18.0	5.67	50.6	8.20	-20.2	797
$V_4 = 2.64 \text{ gal}$	15:44	24	18.2	5.66	52.1	7.87	-19.1	659
$V_5 = 3.30 \text{ gal}$	15:48	28	17.8	5.69	52.2	7.87	-21.5	<del>388</del>
								33.3

9-28-17 sample

## SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
3.30	1100	28	19.7	5.87	55.5	6.61	-20.8	71.0*
Sample Characteristics (Odor, Color)			Et. orange, No odor		Preservatives Used			
Number of Containers			13		Sampler Signature		[Signature]	

## WELL DATA

Number of Baffles	6	Well Cap Dedicated/In Place?	No pump
Well Clear of Weeds/Accessible?	yes	Fittings/Well Head Condition	OK
Pad/Casing Quality	No pad /	Lock Condition	OK, Needs protective

\* > 1 NTU @ metal's sample.

Casing to lock effectively. After collecting caps easy to remove even when locked. All samples.

Let sit 5 min to recharge turbidity lowered. End Turbidity = 249 NTU



# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

FACILITY NAME	EWS - Former	MONITORING WELL I.D.	TMW-3
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PL, humid, 80's
DATE & TIME	9-27-17	EVENT FREQUENCY	Quarterly
PURGE METHOD	Peristaltic Pump w/teflon	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	28	SAMPLING EQUIPMENT	Bailer - teflon
DEPTH TO WATER (feet)	9.95	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	1	DUPLICATE COLLECTED?	No
WATER COLUMN (feet)	18.05	FIELD BLANK COLLECTED?	No
PURGE VOLUME (gallons)	$0.047 \times 9.95 = 0.47 \text{ gal} = V_1$	EQUIPMENT BLANK COLLECTED?	No

## PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
$V_0 = 0$	16:05	0	18.3	5.31	192.4	1.70	-25.8	680
$V_1 = 0.75$	16:10	5	18.0	5.27	179.2	2.28	-23.8	129
$V_2 = 1.50$	16:15	10	17.9	5.22	174.7	2.25	-20.6	46.5
$V_3 = 2.25$	16:20	15	18.1	5.22	178.6	2.02	-19.5	155
$V_4 = 3.00$	16:25	20	17.9	5.26	173.4	2.25	-21.6	14.3
$V_5 = 3.75$								

9-28-17 Sample.

## SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
3.75	7:30		19.8	5.47	201.9	3.12	-17.0	41.5
Sample Characteristics (Odor, Color)			Lt. orange, No odor			Preservatives Used		
Number of Containers			13			Sampler Signature		

at metals  
75.9 NTU  
after  
sampling

## WELL DATA

Number of Baffles	0	Well Cap Dedicated/In Place?	No pump
Well Clear of Weeds/Accessible?	yes	Fittings/Well Head Condition	OK
Pad/Casing Quality	No pad	Lock Condition	Good; However, Cap is easy to remove even when locked. Needs steel protective casing + pad to truly lock out.

**Civil & Environmental Consultants - TN**

325 Seaboard Lane, Suite 170

Report to:  
**Philip Campbell**

Project  
Description: **EWS Landfill**

Phone: **615-333-7797**  
Fax: **615-333-7751**

Collected by (print):  
*Philip Campbell*

Collected by (signature):  
*Philip Campbell*

Immediately Packed on Ice N  Y

Billing Information:

**Dr. Kevin Wolfe**  
325 Seaboard Lane, Suite 170  
Franklin, TN 37067

Email To: **mjohnson@cecinc.com,**  
**pcampbell@cecinc.com**

City/State  
Collected: *London, TN*

Lab Project #  
**CEC-142-059**

P.O. #

Quote #

Date Results Needed

Pres  
Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1



12065 Lebanon Rd  
Mount Juliet, TN 37122  
Phone: 615-758-5858  
Phone: 800-767-5859  
Fax: 615-758-5859



Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ALK 125mlHDPE-NoPres	Bromide, Cl, F, NO3, SO4 125mlHDPE-NoPres	COD 250mlHDPE-H2SO4	COLLERT Microbiological	Diss Metals-LabFilt 250mlHDPE-NoPres	Diss. Metals (FFP) 250mlHDPE-NoPres <i>HNO3</i>	NH3 125mlHDPE-H2SO4	SV8011 40ml Clr-Na Thio	Total Metals 250mlHDPE-HNO3	V8260AP1 40ml Amb-HCl
MW-1 (FFP)	Grab	GW	-	9-28-17	8:45	14	X	X	X	X	X	X	X	X	X	X
MW-1 (LAB FILTER)		GW			8:45	1				X						
MW-3 (FFP)		GW			12:30	14	X	X	X	X	X	X	X	X	X	X
MW-3 (LAB FILTER)		GW			12:30	1				X						
MW-4 (FFP)		GW			12:00	14	X	X	X	X	X	X	X	X	X	X
MW-4 (LAB FILTER)		GW			12:00	1				X						
MW-5 (FFP)		GW			9:45	14	X	X	X	X	X	X	X	X	X	X
MW-5 (LAB FILTER)		GW			9:45	1				X						
TMW-1 (FFP)		GW			10:30	14	X	X	X	X	X	X	X	X	X	X
TMW-1 (LAB FILTER)		GW			10:30	1				X						

L #  
Table #  
Acctnum: **CEC**  
Template: **T128177**  
Prelogin: **P619421**  
TSR: **350 - Jimmy Hunt**  
PB: *9-20-17*  
Shipped Via: **Courier**

Remarks Sample # (lab only)

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

Remarks: FFP sample ID = Dissolved metals are field filtered and preserved

Lab Filter sample ID = Dissolved metals are lab filtered and preserved

\* Metals = All I metals + Al, Ca, Barium, Fe, Mg, Mn, K, Na

Samples returned via:  
 UPS  FedEx  Courier

Tracking #

pH \_\_\_\_\_ Temp \_\_\_\_\_

Flow \_\_\_\_\_ Other \_\_\_\_\_

Sample Receipt Checklist

COC Seal Present/Intact:  NP  Y  N  
COC Signed/Accurate:  Y  N  
Bottles arrive intact:  Y  N  
Correct bottles used:  Y  N  
Sufficient volume sent:  Y  N  
If Applicable  
VOA Zero Headspace:  Y  N  
Preservation Correct/Checked:  Y  N

Relinquished by: (Signature)  
*Philip Campbell*

Date: *9-28-17* Time: *11:20*

Received by: (Signature)

Trip Blank Received: Yes / No  
HCL / MeOH  
TBR

Relinquished by: (Signature)

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Received by: (Signature)

Temp: \_\_\_\_\_ °C Bottles Received:

If preservation required by Login: Date/Time

Relinquished by: (Signature)


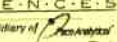

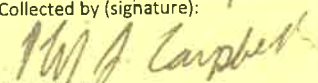
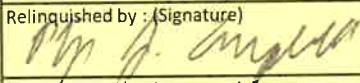
Date: \_\_\_\_\_ Time: \_\_\_\_\_

Received for lab by: (Signature)

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Hold: \_\_\_\_\_ Condition: NCF / OK

\* Analyst eat report - RDL only

<b>Civil &amp; Environmental Consultants - TN</b> 325 Seaboard Lane, Suite 170		Billing Information: <b>Dr. Kevin Wolfe</b> 325 Seaboard Lane, Suite 170 Franklin, TN 37067				Pres Chk	Analysis / Container / Preservative										Chain of Custody Page 2 of 2		
		Report to: <b>Philip Campbell</b>					Email To: <b>mjohnson@cecinc.com, pcampbell@cecinc.com</b>				 L.A.B. S.C.I.E.N.C.E.S. a subsidiary of  12065 Lebanon Rd Mount Juliet, TN 37122 Phone: 615-758-5858 Phone: 800-767-5859 Fax: 615-758-5859 								
Project Description: <b>EWS Landfill</b>		City/State Collected:		Client Project # <b>142-059</b>		Lab Project # <b>CEC-142-059</b>		ALK 125mlHDPE-NoPres	Bromide,Cl,F,NO3,SO4 125mlHDPE-NoPres	COD 250mlHDPE-H2SO4	COLLERT Microbiological	Diss Metals-LabFilt 250mlHDPE-NoPres	Diss. Metals (FFP) 250mlHDPE-NoPres+HNO3	NH3 125mlHDPE-H2SO4	SV8011 40mlClr-NaThio	Total Metals 250mlHDPE-HNO3	V8260AP1 40mlAmb-HCl	L #	
Phone: <b>615-333-7797</b> Fax: <b>615-333-7751</b>		Site/Facility ID #		P.O. #		Quote #												Table #	
Collected by (print): <i>Philip Campbell</i>		Rush? (Lab MUST Be Notified) <input type="checkbox"/> Same Day <input type="checkbox"/> Five Day <input type="checkbox"/> Next Day <input type="checkbox"/> 5 Day (Rad Only) <input type="checkbox"/> Two Day <input type="checkbox"/> 10 Day (Rad Only) <input type="checkbox"/> Three Day		Date Results Needed		No. of Cntrs													
Collected by (signature): 		Packed on Ice N <input type="checkbox"/> Y <input checked="" type="checkbox"/>																	
Sample ID		Comp/Grab	Matrix *	Depth	Date	Time	Cntrs												
<del>TMW-2 (FFP)</del>		Grab	GW	-	9-28-17	1100	14	X	X	X	X	X	X	X	X	X	X		
TMW-2 (LAB FILTER)		↓	GW	↓	↓	1100	1					X							
<del>TMW-3 (FFP)</del>		↓	GW	↓	↓	1130	14	X	X	X	X		X	X	X	X	X		
TMW-3 (LAB FILTER)		↓	GW	↓	↓	1130	1					X							
<del>DUPLICATE (FFP)</del>		↓	GW	↓	↓	-	14	X	X	X	X		X	X	X	X	X		
DUPLICATE (LAB FILTER)		↓	GW	↓	↓	-	1					X							
<del>FIELD BLANK (FFP)</del>		↓	GW	↓	↓	13.10	14	X	X	X	X		X	X	X	X	X		
FIELD BLANK (LAB FILTER)		↓	GW	↓	↓	13.10	1					X							
TRIP BLANK		↓	GW	↓	↓	-	1									X			
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater DW - Drinking Water OT - Other		Remarks: FFP sample ID = Dissolved metals are field filtered and preserved Lab Filter sample ID = Dissolved metals are lab filtered and preserved Metals = App. I + Al, Ca, Fe, Brn, Fe, Mg, Mn, K, Na										Sample Receipt Checklist COC Seal Present/Intact: <input type="checkbox"/> NP <input type="checkbox"/> Y <input type="checkbox"/> N COC Signed/Accurate: <input type="checkbox"/> Y <input type="checkbox"/> N Bottles arrive intact: <input type="checkbox"/> Y <input type="checkbox"/> N Correct bottles used: <input type="checkbox"/> Y <input type="checkbox"/> N Sufficient volume sent: <input type="checkbox"/> Y <input type="checkbox"/> N If Applicable VOA Zero Headspace: <input type="checkbox"/> Y <input type="checkbox"/> N Preservation Correct/Checked: <input type="checkbox"/> Y <input type="checkbox"/> N							
Relinquished by: (Signature) 		Date: 9-28-17	Time: 18:20	Received by: (Signature)				Trip Blank Received: Yes / No HCL / MeOH TBR											
Relinquished by: (Signature)		Date:	Time:	Received by: (Signature)				Temp: °C Bottles Received:				If preservation required by Login: Date/Time							
Relinquished by: (Signature)		Date:	Time:	Received for lab by: (Signature)				Date: Time:				Hold:		Condition: NCF / OK					

x Analytical Report - RDL only



# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

FACILITY NAME	Former EWS site	MONITORING WELL I.D.	Leachate - Smelter
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PC, 80's
DATE & TIME	9-28-17 / 1445	EVENT FREQUENCY	Quarterly
PURGE METHOD	—	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	—	SAMPLING EQUIPMENT	grab
DEPTH TO WATER (feet)	—	IS SAMPLE EQUIPMENT DEDICATED?	—
CASING DIAMETER (inches)	—	DUPLICATE COLLECTED?	—
WATER COLUMN (feet)	—	FIELD BLANK COLLECTED?	—
PURGE VOLUME (gallons)	—	EQUIPMENT BLANK COLLECTED?	—

## PURGE INFORMATION

Gallons Purged	Time (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU

## SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
—	14:45	—	55.6	8.89	480,895	0.08	-448	9.90
Sample Characteristics (Odor, Color)	Clear/white / strong odor		Preservatives Used					
Number of Containers	13		Sampler Signature			Philip Campbell		

## WELL DATA

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



# GROUNDWATER MONITORING FIELD INFORMATION LOG

Civil & Environmental Consultants, Inc. 325 Seaboard Lane, Ste. 170 Franklin, Tennessee 37067 - 800-763-2326 - www.cecinc.com

## SITE AND MONITORING WELL DATA

IWC-L \*

FACILITY NAME	EWS	MONITORING WELL I.D.	IWC-L <del>Peckate</del>
LOCATION	Camden, TN	TEMPERATURE & WEATHER	PC, 80's
DATE & TIME	9-28-17 / 1400	EVENT FREQUENCY	Grab
PURGE METHOD	Grab	FIELD REPRESENTATIVE	Philip Campbell
TOTAL WELL DEPTH (feet)	NA	SAMPLING EQUIPMENT	Bailer Grab
DEPTH TO WATER (feet)	NA	IS SAMPLE EQUIPMENT DEDICATED?	No
CASING DIAMETER (inches)	NA	DUPLICATE COLLECTED?	No
WATER COLUMN (feet)	NA	FIELD BLANK COLLECTED?	No
PURGE VOLUME (gallons)	NA	EQUIPMENT BLANK COLLECTED?	No

## SAMPLE DATA

Gallons Purged	Time Collected (00:00)	Minutes Purged	°C	pH	Conductivity (µs/cm)	DO (mg/L)	ORP	NTU
—	1400		33.8	3.48	105244	2.51	276	90.6
Sample Characteristics (Odor, Color)	Clear, No odor <del>some odor</del>		Preservatives Used					
Number of Containers	13	<del>28</del>	Sampler Signature			Philip Campbell		

\* IWC-L sample collected from landfill before entering blue tank.





9/26/17 EWS Stream Sampling

<u>Sample</u>	<u>Time</u>	<u>Pictures</u>
Cane Creek	10:28 a.m.	1-5
DS-1		

Temp - 22.5°C  
pH - 6.97  
Cond. - 238.4  
D.O. - 6.69 mg/L  
Orp - -15.5 mV  
Turbidity - 9.60

<u>Sample</u>	<u>Time</u>	<u>Pictures</u>
Cane Creek	11:29 a.m.	6-10
MS		

Temp - 23.2°C  
pH - 6.81  
Cond. - 247.9  
D.O. - 4.18 mg/L  
Orp - -10.3 mV  
Turbidity - 5.99

<u>Sample</u>	<u>Time</u>	<u>Pictures</u>
Charlie Creek	12:00 pm	11-17
MS		

Temp - 23.4°C  
pH - 6.83  
Cond. - 168.3  
D.O. - 7.82 mg/L  
Orp - -9.4 mV  
TURB - 2.90

<u>Sample</u>	<u>Time</u>	<u>Pictures</u>
Cane Creek	1:34 pm.	18-22
U/S		

Temp - 25.3°C  
pH - 6.76  
Cond. - 277.1  
D.O. - 7.01 mg/L  
Orp - -5.8  
Turbidity - 4.90

9/26/17

<u>Sample</u>	<u>Time</u>	<u>Pictures</u>
Charlie Creek U/S	2:15	23-29
Temp -	23.6 °C	
pH -	6.44	
Cond -	134.2	
D.O. -	7.45 mg/L	
Orp -	0.2	
Turbidity -	2.81	

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**APPENDIX D**  
**CEC STANDARD OPERATING PROCEDURES**

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## 03-02-01 MONITORING WELLS USING CONVENTIONAL PURGING

- I. SCOPE AND APPLICABILITY:** This procedure is applicable to the sampling of monitoring wells which do not contain free product using conventional purge methodology.
- II. PROJECT-SPECIFIC REQUIREMENTS**
- A. SAMPLE LOCATIONS AND NUMBERING SYSTEM:**
- B. ANALYTICAL PARAMETERS AND SAMPLE FREQUENCY:**
- C. FIELD SCREENING AND ANALYSES:** *Reference appropriate SOPs.*
- D. QUALITY ASSURANCE SAMPLES:** *Number and type of blanks and duplicates. Reference SOPs 04-01-01, 04-01-02, and 04-02-01 as appropriate.*
- E. FILTRATION:**
- F. PURGE CRITERION AND DISPOSAL OF PURGE WATER:**
- G. WELL KEYS:** *Indicate whether wells use CEC's standard key*
- H. DEDICATED EQUIPMENT:** *Indicate whether dedicated pumps or bailers have been installed.*
- I. OTHER REQUIREMENTS:**
- III. METHODOLOGY:** Monitoring wells should be sampled progressing from least contaminated to most contaminated to reduce the chances of cross contamination between samples. If a bailer is employed, use new rope for each well.
- A. PURGING:** Purging is performed to remove static water standing in the well bore, thereby allowing collection of a sample representative of water in the aquifer. Unless otherwise specified in Section II.F., well development may suffice for the purge, so long as the sample is collected immediately following development.
1. Measure the water level from the top of the riser pipe at the pre-marked reference point (SOP 06-01-01).
  2. Calculate the purge volume using the data presented in Exhibit 03-02-01 and the criterion presented in Section II.F.
  3. Remove the required volume of water using one of the following methods. If the well goes dry, the purge can be considered complete unless otherwise specified in Section II.F. However, attempts should be made to prevent the well from going dry during purging, drying the well disrupts the flow regime and can result in the loss of volatile compounds. Therefore:
    - ≡ If a well is known to have a low yield, it should be purged by bailing.
    - ≡ If a pump is used for purging, adjust the pumping rate to maintain a water column in the well, if possible.

≡ Do not attempt to purge a well to dryness unless it is infeasible to maintain water in the well at a reasonable purge rate.

**METHOD A:** If the purge criterion is specified on volume of water to be removed:

- a. Remove the required volume of water using a submersible pump or bailer. If a pump is used, a check valve must be installed on the pump to prevent pumped water from returning to the well. Begin purging at the top of the water column. Minimize aeration of the water during purging by pumping at a low rate or lowering the bailer gently into the water.
- b. Lower the pump or bailer as necessary to continue purging until the well volume criterion is met.

**METHOD B:** If the purge criteria are specified on stabilization of field analyses:

- a. Measure initial water quality by retrieving a sample from the top of the water column using a bailer. Conduct the field analyses specified in Section II.F. Record these results on the Groundwater Monitoring Data Sheet (SOP 07-02-01).
- b. Remove one well volume of water by submersible pump or bailer. If a pump is used, a check valve must be installed to prevent water from returning to the well. Begin purging at the top of the water column. Minimize aeration of the water during purging by pumping at a low rate or lowering the bailer gently into the water.
- c. After one well volume has been removed, conduct field analyses on the groundwater being discharged. Record results on the Monitoring Sampling Data Sheet.
- d. Repeat steps b and c until the purge criteria have been met.

**B. SAMPLE COLLECTION:** Groundwater samples should be collected immediately after purging, if the well will yield sufficiently. Some low-yielding wells may require time to recover prior to sampling. If the well will not yield a sample immediately after purging, a maximum of 24 hours between purging and sampling is permitted.

1. Collect water from the well by slowly lowering a decontaminated bailer into the water column.
2. Transfer the samples which do not require filtering directly into sample bottles in the following order:

Volatile Organic Compounds  
Semi-Volatile Organic Compounds  
Pesticides and PCBs  
Cations and Anions  
Radionuclides  
Bacteria.

3. If indicated in Section II.E., filter the required aliquots (SOP 05-03-02 or 05-03-03) and fill those sample bottles.

4. Preserve the samples immediately in accordance with SOP 07-01-02.
5. Conduct field analyses: pH (SOP 05-04-01 or 05-04-04), temperature, specific conductance (SOP 05-04-02), dissolved oxygen (SOP 05-04-03), Eh (SOP 05-04-08), and any other parameters listed in Section II.C.
6. If a dedicated sample bailer was used, return it to the well head. Otherwise, decontaminate the bailer as specified in SOP 01-01-00.
7. Replace the well cap and lock the protective casing.
8. Collect quality-assurance samples specified in Section II.D in accordance with SOP 04-01-01, 04-01-02, and 04-02-01.
9. Decontaminate samples in accordance with SOP 01-01-00.
10. Pack and ship the samples in accordance with SOP 07-01-03. Samples should be shipped on a daily basis and such that holding time requirements (SOP 07-01-02) can be met.

#### **IV. PRECAUTIONS AND COMMON PROBLEMS**

- A. When using a bailer, do not allow the rope to drag on the ground. If necessary, lay out plastic sheeting to catch the rope.
- B. When using a pump, exercise caution to prevent cross-contaminating samples with the hose. Do not sample from the pump discharge for trace organic compounds. Always use a check valve if not using a dedicated hose. Discard hose if there is a question about whether it can be adequately decontaminated.
- C. Check the holding times on the analyses to be conducted. The holding time for some parameters is 24 hours. Plan sampling and shipping of these samples accordingly.
- D. Preserve samples immediately after collection, including keeping them cool. Do not let samples sit in a hot vehicle until the end of the day.

#### **V. DOCUMENTATION**

- A. Record information on a Groundwater Monitoring Data Sheet (SOP 07-02-01).
- B. Prepare a Trip Report (SOP 07-02-04) and include:
  - ≡ Time, date, and method of sample shipment
  - ≡ Preservation methods and sample handling
  - ≡ Description of purge and sampling methods
  - ≡ The Groundwater Monitoring Data Sheet.

#### **VII. REFERENCES**

None

## 04-01-01 FIELD BLANKS

### I. SCOPE AND APPLICABILITY

The purpose of a blank in general is to evaluate artificially introduced sources of contamination. Field blanks are part of a continuum of blank types that may be used to monitor for contamination introduced throughout the life span of a sample from collection through to analysis (see Exhibit 1). Examples of field blanks include equipment blanks, lot checks of dedicated sampling equipment, bottle blanks, transfer blanks, decontamination/rinsate source blanks and trip blanks (see 04-01-02).

- A. Equipment Blanks are collected to assess the adequacy of decontamination procedures for non-dedicated sampling equipment and may help evaluate whether field conditions, and/or sampling equipment, sample transport, preparation and/or analysis are contributing contaminants to samples. Equipment blanks are typically performed on non-dedicated sampling equipment that requires decontamination between uses. Equipment blanks should not be collected near running machinery which may emit fumes that can contaminate the blanks
- B. Lot Checks are rinsates of disposable sampling equipment analyzed for the target analytes of interest that are sampled using that equipment. This may include peristolic tubing, sampling scoops or bailers as well as the empty bottles provided by the laboratory if there are concerns with their purity.
- C. Transfer Blanks are empty sample containers filled with water in the field to monitor for ambient contamination - they most typically are used for aqueous samples for organics such as volatiles, GRO, and DRO but may also be useful if airborne particulates are of concern for inorganic parameters. The water source should be the same as what will be used for the final rinse of decontaminated field equipment (see 04-04-01).
- D. Decontamination/Rinsate Source Blanks are samples created from the source of final rinsate water used in the field. They differ from Transfer Blanks in that they would typically be filled in a "clean" location as opposed to the field to avoid picking up unexpected ambient contamination. This type of blank, while rare, typically is utilized when an unexplained and persistent contaminant has been detected in the equipment blanks and all other potential sources of contamination have been eliminated as the source.

### II. PROJECT-SPECIFIC REQUIREMENTS

**WATER TYPES TO BE USED FOR BLANKS:** Blank water refers to water that is free of any analytes of interest. Common water types include distilled, deionized, HPLC-grade, pesticide grade etc. Depending on the data quality objectives for the project and expected levels of target analytes, the choice of water used for field blanks water may vary. Investigations where trace levels (parts per billion or lower) of contaminant are of interest may require water that meets higher purity standards than soil investigations where target analytes may be in the parts per million range.

Sources of water suitable for use for field blanks include:

- A. **Laboratory supplied water** is laboratory reagent water that is used in the analytical or cleaning processes, as well as for their method blanks. For the best comparability between field blanks and laboratory method or instrument blanks it is recommended that laboratory supplied water be used. This water should be in glass containers if organics analytes are of interest. In addition, this water should be from the laboratory performing the analyses and not left over from a prior investigation or from a different laboratory. This eliminates any variability introduced as a result of different blank water sources. Left over water from a previous project is not recommended for use as a field blank as the possibility exists that the water could have become contaminated during storage.



- B. **Store purchased distilled/deionized:** If trace level analyses are not required, the use of commercially prepared distilled/deionized water purchased from a supermarket or home improvement store may be sufficient. As this water typically is available in plastic jugs, it is not an appropriate blank water source when trace level organics are the constituents of interest.
- C. **Ultra Pure:** Certified metal-grade, pesticide-grade or HPLC-grade water may be purchased from most chemical supply companies.

### III. METHODOLOGY

- A. Review the SOP for the medium sampled, the project specific field sampling plan or quality assurance project plan to determine the blank collection frequency required for the project. Due to cost or other considerations, every project may not warrant the use of an equipment blank. Considerations impacting the frequency of equipment blank collection may include expected concentration ranges of the analytes of interest, field conditions (i.e. will sampling activities occur in an area where there are potential background ambient concentrations of target analytes), use of new sampling equipment, newly trained staff, or use of an unknown laboratory. Field blanks may also be collected if unexpected results in field samples are observed.
- B. Record the source, date opened and lot number of the water used for the rinsate blanks.
- C. Assemble a complete set of decontaminated sampling equipment for the subject sampling effort.
- D. Rinse the blank water across the sampling equipment, catching it in a decontaminated stainless-steel bucket or bowl. Handle the water in the same manner as the samples. For example, if samples for metals analysis are to be filtered with a disposable filter, the blank aliquot for metals analysis should be processed through a new disposable filter. Blanks for soil sampling may be run across the split-spoon sampler, trowel, and bucket and/or bowl used for homogenizing.
- E. Fill a complete set of sample bottles.
- F. Assign the blank a sample id – if it is desirable to obscure the fact that the sample is a blank, use the same format as the other samples in the series, otherwise a simplified sample id such as FB-mmddyy is recommended (where FB could be EB, TRB, LC etc. as appropriate for the blank type).
- G. Assign the blank a sample date and time. Laboratory protocols for assigning sampling date/time to improperly labeled samples vary widely and may impact sampling holding times for certain short hold parameters.
- H. Include the blanks on the Chain of Custody form along with the other samples.
- I. Store, handle, and ship the blanks in the same manner as the samples.

### IV. PRECAUTIONS AND COMMON PROBLEMS

- A. The selection of stock blank water depends upon the requirements of the project. Analyses for trace contaminants will require a purer blank solution than analyses for major constituents. Stringent analytical requirements will necessitate the use of laboratory-supplied blank water.
- B. Include ALL sampling equipment in the rinsing procedure.

### V. DOCUMENTATION: Record the following information in the field logbook:

- Source of blank water (include a lot number if available and the type of sample container)
- Time and sequence within the sampling event when the blanks were prepared

- Description of the procedure for preparing the blanks
- Sample numbers assigned to blanks.

Incorporate this information into the Trip Report (SOP 06-02-05).

## **VI. REFERENCES**

EPA, 1986. Test Methods for Evaluating Solid Waste: SW-846; Volume I, Chapter I. Washington, DC.  
EPA, 2009. Region III Fact Sheet: Quality Control Tool – Blanks  
(<http://www.epa.gov/region3/esc/qa/pdf/blanks.pdf>)

## 04-01-02 TRIP BLANKS

### I. SCOPE AND APPLICABILITY

A trip blank is a container of laboratory reagent water that is prepared by the laboratory and shipped, unopened, to the field with empty sample containers and then from the field along with the full sample containers. Trip blanks are used to document contamination attributable to shipping and field handling procedures (i.e., diffusion of volatile organics through the septum during daily collection activities, shipment and storage) as well as provide an independent assessment of laboratory introduced contamination. If the trip blank and associated laboratory preparation blanks are free of analytes of interest, it may safely be assumed that reported analytes are actually present in the environmental samples.

### II. PROJECT-SPECIFIC REQUIREMENTS

- A. Frequency: *Specify the project specific frequency based on the Work Plan.*
- B. Other Criteria: A trip blank is used for all classes of volatile organic analyte analyses (VOA), such as TCL volatile organic compounds (VOCs), BTEX, methanol or other purgeable organic compounds. If you are unsure whether a specific analysis is considered a purgeable method, confirm with the laboratory.
  - 1. Trip blanks are also required for soil samples submitted for TPH-gasoline range organics and other purgeable organics analyses (VOAs). These trip blanks should be prepared in the same manner as an aqueous trip blank.
  - 2. If some of the daily samples being collected/shipped together are submitted for typical VOCs (SW846-8260 or EPA 624) while others are submitted for TPH gasoline/diesel range organics (or another purgeable organic method), you will need to include 2 sets of trip blanks and analyze one for each unique (non-overlapping analyte list) method.
- C. Other Considerations: Even if the project Work Plan doesn't specifically call for the use of Trip Blanks there are certain situations where the use of a Trip Blank should be evaluated:
  - 1. If an unexpected high field PID reading is encountered during sampling, a trip blank may be warranted to monitor for cross contamination if other samples are included in the shipment.
  - 2. When there is suspicion of the potential of airborne contamination from external sources such as idling vehicles or machinery or operations upwind using VOCs (such as a refinery, spray painting etc.) although such contamination is best monitored for using a transfer blank where the VOA vial is filled in the field with the water used for equipment rinsate blanks.
  - 3. In general, if there is a suspicion of external cross contamination, a trip blank could be submitted to the laboratory to be placed on HOLD. If unexpected results are encountered in the other samples in the shipment, the laboratory can then be requested to analyze the trip blank to determine whether cross contamination has occurred however holding times must be closely monitored in such cases.

### III. METHODOLOGY

For those projects where trip blanks are required, appropriate procedures are discussed below:

- A. One trip blank should be included with each cooler containing volatile samples. To save on trip blank analysis costs, you may collect all volatile samples during the day in a single cooler and ship them separately from other sample bottles (if necessary to minimize the number of trip blanks required).

- B. When ordering bottles from the laboratory for the sampling event, request sufficient trip blanks such that there is at least one trip blank associated with each day of sample collection activities (with a few spares as a contingency if unexpected conditions expand the field activities or a trip blank container breaks).
- C. A trip blank is associated with a group of samples that are collected together throughout the day and shipped together. (It is not necessary to maintain the trip blanks with the same set(s) of vials that are shipped from the laboratory, unless there is a concern that these sample containers have potentially been exposed to contamination during shipment, when it is recommended that fresh containers be obtained.)
- D. The trip blank should go out to the field in a cooler (with ice) that volatile field samples containers are added to as they are collected during each day's sampling activities. Handle the blank in the same manner as the filled sample vials.
- E. Assign the trip blank a sample number identifying its source, consistent with the format used for the sampling event. One suggestion is to include the sample date in the sample number to aid in matching it with the associated field samples in presentation of results in the project report (i.e. TB0401 or TRIP0401 for the trip blank associated with samples collected on 04/01).
- F. Assign a date and time to the trip blank on the COC and sample container as if it were a field sample. The time stamp for the trip blank is when the first sample is added to the cooler containing the trip blank. Do not leave this field blank as the laboratory will require a date and time stamp to monitor analysis holding times. Laboratory protocols for assigning this date if left blank can vary considerably.
- G. Return the trip blanks to the laboratory with the samples. Include the trip blank information along with the samples on the Chain-of-Custody form (SOP 06-02-02). Analysis is performed for the same suite of volatile organic compounds as the associated samples. (i.e., it is only necessary to request BTEX if associated samples are only analyzed for BTEX). However, if samples with different subsets of volatile constituents are collected and shipped together, select the method that covers all of the constituents. It is not necessary to analyze for both BTEX and TCL VOCs, for example.

#### **IV. PRECAUTIONS AND COMMON PROBLEMS**

- A. Trip blanks should never be opened in the field.
- B. If there are multiple sample teams on the project that are collecting samples separately from each other during the day, a separate trip blank should be assigned to each group which is then shipped separately to the lab.
- C. Do not combine groupings of samples with different associated trip blanks into the same cooler for shipping.
- D. Do not combine multiple days' worth of VOC samples into a cooler for shipment unless they have been in the same cooler with the trip blank and each other throughout the sampling process.

#### **V. DOCUMENTATION**

Describe handling of the trip blanks in the Trip Report (SOP 06-02-05). Include the sample numbers assigned and associated samples (if more than one trip blank is used).

#### **VI. REFERENCES:**

EPA, 1986. Test Methods for Evaluating Solid Waste: SW-846; Volume II. Washington, DC

EPA Region III Quality Control Fact Sheet, Field Blanks,  
<http://www.epa.gov/region3/esc/qa/pdf/blanks.pdf>

## **05-03-05 BAILER**

**I. EQUIPMENT SPECIFICATION:** This procedure is applicable to the use of all bottom-fill bailers.

### **II. INSPECTION AND CALIBRATION**

**A. DAILY INSPECTION AND CHECKS:** Make sure fittings at both ends of the bailer are secure. Assure that the check valve opens and closes freely.

**B. CALIBRATION:** There is no calibration applicable to this equipment.

**C. ROUTINE MAINTENANCE:** There is no maintenance applicable to this equipment. Bailers are typically replaced if damaged.

### **III. USE**

A. Select a rope or cable for suspension of the bailer which is appropriate to project requirements. Typically, small gauge nylon rope is used, although stainless-steel cable may be used when samples will be analyzed to very low detection limits. The rope or cable should be new and clean. Do not use materials which have been used on another project, as this may result in cross contamination.

B. Consult the Project Manager to select a bailer composition which is compatible with the anticipated groundwater quality. For most applications, PVC bailers are adequate. Stainless-steel may be used where very low levels of organic compounds are of interest. Teflon bailers are available and may be requested on some projects.

C. Using a strong, non-slipping knot, such as a bowline, tie the rope or cable to the top of the bailer.

D. Lower the bailer into the well. Do not let the bailer free-fall down the well, as the device may shatter or the ball valve may become dislodged upon striking the water or the bottom of the well.

E. Raise the bailer by pulling the rope with a smooth, uniform motion. A jerky motion may open the check valve, resulting in water loss. Check the knot periodically.

Do not allow the bailer rope to drag on the ground. Place plastic sheeting on the ground to keep the rope clean if conditions are muddy, the ground surface is contaminated, or very low levels of contaminants are of interest.

**IV. DECONTAMINATION:** The equipment should be decontaminated in accordance with SOP 01-01-00.

Typically, the bailer is washed with a potable water and non-phosphate soap solution. The bailer is then rinsed with distilled water and wrapped in plastic or foil until used.

**V. TROUBLESHOOTING**

A. If the knot should come undone or the rope breaks, the bailer typically can be recovered using a weighted fishing hook tied to monofilament line.

B. When bailing turbid water, it may be necessary to rinse the ball-valve at the bottom of the bailer with distilled water if it clogs.

## 06-02-02 CHAIN-OF-CUSTODY FORM

### I. SCOPE AND APPLICABILITY

A Chain-of-Custody (COC) Form must be completed for each shipment of samples for laboratory analysis. The COC form is the communication record between the project field team and the laboratory login personnel. Accurate and legible completion of the COC form is necessary to insure that samples are analyzed for the correct parameters.

### II. PROJECT-SPECIFIC REQUIREMENTS: None.

### III. METHODOLOGY

Complete a Chain-of-Custody Form as provided by the laboratory for each shipping container of samples containing the following information (each laboratory will have their own preferred COC form so the location of the information on the form may vary):

- CEC project number and name
  - Project Manager or designated CEC contact with their phone number and email
  - Date and time of sample collection
  - Sample number
  - Sample Matrix
  - Total number of bottles or jars
  - Preservation (this is especially important if the laboratory is expected to preserve the bottles upon receipt)
  - Suites of analyses requested, in specific terms. Examples:
    - TCL VOCs
    - RCRA Metals
    - BTEX
    - PNAs-SW846 8270/SIM
- Avoid vague descriptors like "VOCs" or "metals." If a project specific analyte list (subset of metals or organic compounds for example) has been set up with the project and is referenced on the COC, include a copy of it with each shipment to the laboratory to ensure that it becomes part of the data report and the sample custody records. It should be possible to determine exactly what sample analyses were requested/required from the COC.
- Requested turnaround time (be specific (i.e. 48 hours, 3 days, etc.,) if not standard)
  - Any special notes/requests, for example indicate high PID readings if applicable, request for lower reporting limits – don't assume you will get drinking water limits just because you submit a drinking water sample, this must be requested either in advance or on the COC
  - Signature of CEC person relinquishing custody to the laboratory or shipping courier
  - Date and time samples were handed over to someone else or placed under custody seals

Signatures of every person who has control of the samples should appear on the Chain-of-Custody Form. If another person, even another CEC employee, takes responsibility for packing or shipping the samples after you have completed the form and before the samples have been sealed, that person should sign as receiving and subsequently relinquishing the samples.

### IV. PRECAUTIONS AND COMMON PROBLEMS

- Use of vague terms such as VOCs or Metals may lead to missing parameters. Verify with the laboratory which compounds/metals are part of their standard analyses to ensure that all necessary parameters will be reported.
- Illegible sample names/IDs will lead to the sample login personnel guessing/interpreting what was written which may result in the laboratory report not reflecting the intended sample names/ID. It is often not possible for the laboratory to retroactively edit the report and more importantly the



- underlying analysis records to correct sample names/IDs.
- If lower reporting limits are required, this must be communicated to the laboratory on the COC in addition to any prior communication as this may impact how samples are logged in for analysis.

**V. DOCUMENTATION**

Use the laboratory supplied COC forms (paper or electronic) or equivalent. If three part forms are not used, either make a photocopy, take a photo of or fax the COC before placing it in the cooler. Use of the Chain-of-Custody Form is discussed in SOP 06-01-01 and SOP 06-01-03.

**VI. REFERENCES: None.**

**07-02-01 GROUNDWATER MONITORING DATA SHEET**

- I. SCOPE AND APPLICABILITY:** A Groundwater Monitoring Data Sheet is completed each time water samples are collected to document field data and sampling methodology.
- II. PROJECT-SPECIFIC REQUIREMENTS:** None.
- III. METHODOLOGY:** Complete the form (Exhibit 07-02-01) as samples are collected, as follows:
- a. Self explanatory
  - b. CEC project number
  - c. Names or initials of all members of the sampling team
  - d. Complete well designation
  - e. Depth to water level, reported to  $\pm 0.01$  ft. (Check measurement datum at the top of the column.)
  - f. Date and time well purging is started
  - g. Volume of water removed, in gallons
  - h. Check if well was purged to dryness
  - i. Indicate method of purging, such as submersible pump or bailer
  - j. Date and time that the actual sample was withdrawn. If sample bottles were filled at multiple, separate times, these should all be indicated.
  - k. Self explanatory (Check units for temperature.)
  - l. Unusual odors or other observations
  - m. Other atypical information, such as special handling of purge water or field problems
- IV. PRECAUTIONS AND COMMON PROBLEMS:** All information required by the form must be provided.
- V. DOCUMENTATION:** Attach the form to the Trip Report (SOP 07-02-04).
- VI. REFERENCES:** None.